grass valley

K2

Storage Area Network

Installation and Service Manual

Software Version 7.1

www.grassvalley.com

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Safety Summaries

Read the following sections for important safety information.

- Safety Summary
- Sicherheit – Überblick
- Consignes desécurité
- Certifications and compliances

Safety Summary

Read and follow the important safety information below, noting especially those instructions related to risk of fire, electric shock or injury to persons. Additional specific warnings not listed here may be found throughout the manual.

WARNING: Any instructions in this manual that require opening the equipment cover or enclosure are for use by qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

Safety terms and symbols

Terms in this manual

Safety-related statements may appear in this manual in the following form:

WARNING: Warning statements identify conditions or practices that may result in personal injury or loss of life.

CAUTION: Caution statements identify conditions or practices that may result in damage to equipment or other property, or which may cause equipment crucial to your business environment to become temporarily non-operational.

Terms on the product

These terms may appear on the product:

DANGER — A personal injury hazard is immediately accessible as you read the marking.

WARNING — A personal injury hazard exists but is not immediately accessible as you read the marking.

CAUTION — A hazard to property, product, and other equipment is present.

Symbols on the product

The following symbols may appear on the product:

Indicates that dangerous high voltage is present within the equipment enclosure that may be of sufficient magnitude to constitute a risk of electric shock.

Indicates that user, operator or service technician should refer to product manual(s) for important operating, maintenance, or service instructions.

This is a prompt to note fuse rating when replacing fuse(s). The fuse referenced in the text must be replaced with one having the ratings indicated.

Identifies a protective grounding terminal which must be connected to earth ground prior to making any other equipment connections.

Identifies an external protective grounding terminal which may be connected to earth ground as a supplement to an internal grounding terminal.

Indicates that static sensitive components are present which may be damaged by electrostatic discharge. Use anti-static procedures, equipment and surfaces during servicing.

Warnings

The following warning statements identify conditions or practices that can result in personal injury or loss of life.

Dangerous voltage or current may be present — Disconnect power and remove battery (if applicable) before removing protective panels, soldering, or replacing components.

Do not service alone — Do not internally service this product unless another person capable of rendering first aid and resuscitation is present.

Remove jewelry — Prior to servicing, remove jewelry such as rings, watches, and other metallic objects.

Avoid exposed circuitry — Do not touch exposed connections, components or circuitry when power is present.

Use proper power cord — Use only the power cord supplied or specified for this product.

Ground product — Connect the grounding conductor of the power cord to earth ground.

Operate only with covers and enclosure panels in place — Do not operate this product when covers or enclosure panels are removed.

Use correct fuse — Use only the fuse type and rating specified for this product.

Use only in dry environment — Do not operate in wet or damp conditions.

Use only in non-explosive environment — Do not operate this product in an explosive atmosphere.

High leakage current may be present — Earth connection of product is essential before connecting power.

Dual power supplies may be present — Be certain to plug each power supply cord into a separate branch circuit employing a separate service ground. Disconnect both power supply cords prior to servicing.

Double pole neutral fusing — Disconnect mains power prior to servicing.

Use proper lift points — Do not use door latches to lift or move equipment.

Avoid mechanical hazards — Allow all rotating devices to come to a stop before servicing.

Cautions

The following caution statements identify conditions or practices that can result in damage to equipment or other property

Use correct power source — Do not operate this product from a power source that applies more than the voltage specified for the product.

Use correct voltage setting — If this product lacks auto-ranging power supplies, before applying power ensure that the each power supply is set to match the power source.

Provide proper ventilation — To prevent product overheating, provide equipment ventilation in accordance with installation instructions.

Use anti-static procedures — Static sensitive components are present which may be damaged by electrostatic discharge. Use anti-static procedures, equipment and surfaces during servicing.

Do not operate with suspected equipment failure — If you suspect product damage or equipment failure, have the equipment inspected by qualified service personnel.

Ensure mains disconnect — If mains switch is not provided, the power cord(s) of this equipment provide the means of disconnection. The socket outlet must be installed near the equipment and must be easily accessible. Verify that all mains power is disconnected before installing or removing power supplies and/or options.

Route cable properly — Route power cords and other cables so that they ar not likely to be damaged. Properly support heavy cable bundles to avoid connector damage.

Use correct power supply cords — Power cords for this equipment, if provided, meet all North American electrical codes. Operation of this equipment at voltages exceeding 130 VAC requires power supply cords which comply with NEMA configurations. International power cords, if provided, have the approval of the country of use.

Use correct replacement battery — This product may contain batteries. To reduce the risk of explosion, check polarity and replace only with the same or equivalent type recommended by manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Troubleshoot only to board level — Circuit boards in this product are densely populated with surface mount technology (SMT) components and application specific integrated circuits (ASICS). As a result, circuit board repair at the component level is very difficult in the field, if not impossible. For warranty compliance, do not troubleshoot systems beyond the board level.

Sicherheit – Überblick

Lesen und befolgen Sie die wichtigen Sicherheitsinformationen dieses Abschnitts. Beachten Sie insbesondere die Anweisungen bezüglich

Brand-, Stromschlag- und Verletzungsgefahren. Weitere spezifische, hier nicht aufgeführte Warnungen finden Sie im gesamten Handbuch.

WARNUNG: Alle Anweisungen in diesem Handbuch, die das Abnehmen der Geräteabdeckung oder des Gerätegehäuses erfordern, dürfen nur von qualifiziertem Servicepersonal ausgeführt werden. Um die Stromschlaggefahr zu verringern, führen Sie keine Wartungsarbeiten außer den in den Bedienungsanleitungen genannten Arbeiten aus, es sei denn, Sie besitzen die entsprechende Qualifikationen für diese Arbeiten.

Sicherheit – Begriffe und Symbole

In diesem Handbuch verwendete Begriffe

Sicherheitsrelevante Hinweise können in diesem Handbuch in der folgenden Form auftauchen:

WARNUNG: Warnungen weisen auf Situationen oder Vorgehensweisen hin, die Verletzungs- oder Lebensgefahr bergen.

VORSICHT: Vorsichtshinweise weisen auf Situationen oder Vorgehensweisen hin, die zu Schäden an Ausrüstungskomponenten oder anderen Gegenständen oder zum zeitweisen Ausfall wichtiger Komponenten in der Arbeitsumgebung führen können.

Hinweise am Produkt

Die folgenden Hinweise können sich am Produkt befinden:

GEFAHR – Wenn Sie diesen Begriff lesen, besteht ein unmittelbares Verletzungsrisiko.

WARNUNG – Wenn Sie diesen Begriff lesen, besteht ein mittelbares Verletzungsrisiko.

VORSICHT – Es besteht ein Risiko für Objekte in der Umgebung, den Mixer selbst oder andere Ausrüstungskomponenten.

Symbole am Produkt

Die folgenden Symbole können sich am Produkt befinden:

Weist auf eine gefährliche Hochspannung im Gerätegehäuse hin, die stark genug sein kann, um eine Stromschlaggefahr darzustellen.

Weist darauf hin, dass der Benutzer, Bediener oder Servicetechniker wichtige Bedienungs-, Wartungs- oder Serviceanweisungen in den Produkthandbüchern lesen sollte.

Dies ist eine Aufforderung, beim Wechsel von Sicherungen auf deren Nennwert zu achten. Die im Text angegebene Sicherung muss durch eine Sicherung ersetzt werden, die die angegebenen Nennwerte besitzt.

Weist auf eine Schutzerdungsklemme hin, die mit dem Erdungskontakt verbunden werden muss, bevor weitere Ausrüstungskomponenten angeschlossen werden.

Weist auf eine externe Schutzerdungsklemme hin, die als Ergänzung zu einem internen Erdungskontakt an die Erde angeschlossen werden kann.

Weist darauf hin, dass es statisch empfindliche Komponenten gibt, die durch eine elektrostatische Entladung beschädigt werden können. Verwenden Sie antistatische Prozeduren, Ausrüstung und Oberflächen während der Wartung.

Warnungen

Die folgenden Warnungen weisen auf Bedingungen oder Vorgehensweisen hin, die Verletzungs- oder Lebensgefahr bergen:

Gefährliche Spannungen oder Ströme – Schalten Sie den Strom ab, und entfernen Sie ggf. die Batterie, bevor sie Schutzabdeckungen abnehmen, löten oder Komponenten austauschen.

Servicearbeiten nicht alleine ausführen – Führen Sie interne Servicearbeiten nur aus, wenn eine weitere Person anwesend ist, die erste Hilfe leisten und Wiederbelebungsmaßnahmen einleiten kann.

Schmuck abnehmen – Legen Sie vor Servicearbeiten Schmuck wie Ringe, Uhren und andere metallische Objekte ab.

Keine offen liegenden Leiter berühren – Berühren Sie bei eingeschalteter Stromzufuhr keine offen liegenden Leitungen, Komponenten oder Schaltungen.

Richtiges Netzkabel verwenden – Verwenden Sie nur das mitgelieferte Netzkabel oder ein Netzkabel, das den Spezifikationen für dieses Produkt entspricht.

Gerät erden – Schließen Sie den Erdleiter des Netzkabels an den Erdungskontakt an.

Gerät nur mit angebrachten Abdeckungen und Gehäuseseiten betreiben – Schalten Sie dieses Gerät nicht ein, wenn die Abdeckungen oder Gehäuseseiten entfernt wurden.

Richtige Sicherung verwenden – Verwenden Sie nur Sicherungen, deren Typ und Nennwert den Spezifikationen für dieses Produkt entsprechen.

Gerät nur in trockener Umgebung verwenden – Betreiben Sie das Gerät nicht in nassen oder feuchten Umgebungen.

Gerät nur verwenden, wenn keine Explosionsgefahr besteht – Verwenden Sie dieses Produkt nur in Umgebungen, in denen keinerlei Explosionsgefahr besteht.

Hohe Kriechströme – Das Gerät muss vor dem Einschalten unbedingt geerdet werden.

Doppelte Spannungsversorgung kann vorhanden sein – Schließen Sie die beiden Anschlußkabel an getrennte Stromkreise an. Vor Servicearbeiten sind beide Anschlußkabel vom Netz zu trennen.

Zweipolige, neutrale Sicherung – Schalten Sie den Netzstrom ab, bevor Sie mit den Servicearbeiten beginnen.

Fassen Sie das Gerät beim Transport richtig an – Halten Sie das Gerät beim Transport nicht an Türen oder anderen beweglichen Teilen fest.

Gefahr durch mechanische Teile – Warten Sie, bis der Lüfter vollständig zum Halt gekommen ist, bevor Sie mit den Servicearbeiten beginnen.

Vorsicht

Die folgenden Vorsichtshinweise weisen auf Bedingungen oder Vorgehensweisen hin, die zu Schäden an Ausrüstungskomponenten oder anderen Gegenständen führen können:

Gerät nicht öffnen – Durch das unbefugte Öffnen wird die Garantie ungültig.

Richtige Spannungsquelle verwenden – Betreiben Sie das Gerät nicht an einer Spannungsquelle, die eine höhere Spannung liefert als in den Spezifikationen für dieses Produkt angegeben.

Gerät ausreichend belüften – Um eine Überhitzung des Geräts zu vermeiden, müssen die Ausrüstungskomponenten entsprechend den Installationsanweisungen belüftet werden. Legen Sie kein Papier unter das Gerät. Es könnte die Belüftung behindern. Platzieren Sie das Gerät auf einer ebenen Oberfläche.

Antistatische Vorkehrungen treffen – Es gibt statisch empfindliche Komponenten, die durch eine elektrostatische Entladung beschädigt werden können. Verwenden Sie antistatische Prozeduren, Ausrüstung und Oberflächen während der Wartung.

CF-Karte nicht mit einem PC verwenden – Die CF-Karte ist speziell formatiert. Die auf der CF-Karte gespeicherte Software könnte gelöscht werden.

Gerät nicht bei eventuellem Ausrüstungsfehler betreiben – Wenn Sie einen Produktschaden oder Ausrüstungsfehler vermuten, lassen Sie die Komponente von einem qualifizierten Servicetechniker untersuchen.

Kabel richtig verlegen – Verlegen Sie Netzkabel und andere Kabel so, dass Sie nicht beschädigt werden. Stützen Sie schwere Kabelbündel ordnungsgemäß ab, damit die Anschlüsse nicht beschädigt werden.

Richtige Netzkabel verwenden – Wenn Netzkabel mitgeliefert wurden, erfüllen diese alle nationalen elektrischen Normen. Der Betrieb dieses Geräts mit Spannungen über 130 V AC erfordert Netzkabel, die NEMA-Konfigurationen entsprechen. Wenn internationale Netzkabel mitgeliefert wurden, sind diese für das Verwendungsland zugelassen.

Richtige Ersatzbatterie verwenden – Dieses Gerät enthält eine Batterie. Um die Explosionsgefahr zu verringern, prüfen Sie die Polarität und tauschen die Batterie nur gegen eine Batterie desselben Typs oder eines gleichwertigen, vom Hersteller empfohlenen Typs aus. Entsorgen Sie gebrauchte Batterien entsprechend den Anweisungen des Batterieherstellers.

Das Gerät enthält keine Teile, die vom Benutzer gewartet werden können. Wenden Sie sich bei Problemen bitte an den nächsten Händler.

Consignes desécurité

Il est recommandé de lire, de bien comprendre et surtout de respecter les informations relatives à la sécurité qui sont exposées ci-après, notamment les consignes destinées à prévenir les risques d'incendie, les décharges électriques et les blessures aux personnes. Les avertissements complémentaires, qui ne sont pas nécessairement repris ci-dessous, mais présents dans toutes les sections du manuel, sont également à prendre en considération.

AVERTISSEMENT: Toutes les instructions présentes dans ce manuel qui concernent l'ouverture des capots ou des logements de cet équipement sont destinées exclusivement à des membres qualifiés du personnel de maintenance. Afin de diminuer les risques de décharges électriques, ne procédez à aucune intervention d'entretien autre que celles contenues dans le manuel de l'utilisateur, à moins que vous ne soyez habilité pour le faire.

Consignes et symboles de sécurité

Termes utilisés dans ce manuel

Les consignes de sécurité présentées dans ce manuel peuvent apparaître sous les formes suivantes :

AVERTISSEMENT: Les avertissements signalent des conditions ou des pratiques susceptibles d'occasionner des blessures graves, voire même fatales.

MISE EN GARDE: Les mises en garde signalent des conditions ou des pratiques susceptibles d'occasionner un endommagement à l'équipement ou aux installations, ou de rendre l'équipement temporairement non opérationnel, ce qui peut porter préjudice à vos activités.

Signalétique apposée sur le produit

La signalétique suivante peut être apposée sur le produit :

DANGER — risque de danger imminent pour l'utilisateur.

AVERTISSEMENT — Risque de danger non imminent pour l'utilisateur.

MISE EN GARDE — Risque d'endommagement du produit, des installations ou des autres équipements.

Symboles apposés sur le produit

Les symboles suivants peut être apposés sur le produit :

Signale la présence d'une tension élevée et dangereuse dans le boîtier de l'équipement ; cette tension peut être suffisante pour constituer un risque de décharge électrique.

Signale que l’utilisateur, l’opérateur ou le technicien de maintenance doit faire référence au(x) manuel(s) pour prendre connaissance des instructions d’utilisation, de maintenance ou d’entretien.

Il s’agit d’une invite à prendre note du calibre du fusible lors du remplacement de ce dernier. Le fusible auquel il est fait référence dans le texte doit être remplacé par un fusible du même calibre.

Identifie une borne de protection de mise à la masse qui doit être raccordée correctement avant de procéder au raccordement des autres équipements.

I dentifie une borne de protection de mise à la masse qui peut être connectée en tant que borne de mise à la masse supplémentaire.

Signale la présence de composants sensibles à l’électricité statique et qui sont susceptibles d’être endommagés par une décharge électrostatique. Utilisez des procédures, des équipements et des surfaces antistatiques durant les interventions d’entretien.

Avertissements

Les avertissements suivants signalent des conditions ou des pratiques susceptibles d’occasionner des blessures graves, voire même fatales :

Présence possible de tensions ou de courants dangereux — Mettez hors tension, débranchez et retirez la pile (le cas échéant) avant de déposer les couvercles de protection, de défaire une soudure ou de remplacer des composants.

Ne procédez pas seul à une intervention d’entretien — Ne réalisez pas une intervention d’entretien interne sur ce produit si une personne n’est pas présente pour fournir les premiers soins en cas d’accident.

Retirez tous vos bijoux — Avant de procéder à une intervention d’entretien, retirez tous vos bijoux, notamment les bagues, la montre ou tout autre objet métallique.

Évitez tout contact avec les circuits exposés — Évitez tout contact avec les connexions, les composants ou les circuits exposés s’ils sont sous tension.

Utilisez le cordon d’alimentation approprié — Utilisez exclusivement le cordon d’alimentation fourni avec ce produit ou spécifié pour ce produit.

Raccordez le produit à la masse — Raccordez le conducteur de masse du cordon d’alimentation à la borne de masse de la prise secteur.

Utilisez le produit lorsque les couvercles et les capots sont en place — N’utilisez pas ce produit si les couvercles et les capots sont déposés.

Utilisez le bon fusible — Utilisez exclusivement un fusible du type et du calibre spécifiés pour ce produit.

Utilisez ce produit exclusivement dans un environnement sec — N’utilisez pas ce produit dans un environnement humide.

Utilisez ce produit exclusivement dans un environnement non explosible — N’utilisez pas ce produit dans un environnement dont l’atmosphère est explosible.

Présence possible de courants de fuite — Un raccordement à la masse est indispensable avant la mise sous tension.

Deux alimentations peuvent être présentes dans l'équipement — Assurez vous que chaque cordon d'alimentation est raccordé à des circuits de terre séparés. Débranchez les deux cordons d'alimentation avant toute intervention.

Fusion neutre bipolaire — Débranchez l'alimentation principale avant de procéder à une intervention d'entretien.

Utilisez les points de levage appropriés — Ne pas utiliser les verrous de la porte pour lever ou déplacer l'équipement.

Évitez les dangers mécaniques — Laissez le ventilateur s'arrêter avant de procéder à une intervention d'entretien.

Mises en garde

Les mises en garde suivantes signalent les conditions et les pratiques susceptibles d'occasionner des endommagements à l'équipement et aux installations :

N'ouvrez pas l'appareil — Toute ouverture prohibée de l'appareil aura pour effet d'annuler la garantie.

Utilisez la source d'alimentation adéquate — Ne branchez pas ce produit à une source d'alimentation qui utilise une tension supérieure à la tension nominale spécifiée pour ce produit.

Assurez une ventilation adéquate — Pour éviter toute surchauffe du produit, assurez une ventilation de l'équipement conformément aux instructions d'installation. Ne déposez aucun document sous l'appareil – ils peuvent gêner la ventilation. Placez l'appareil sur une surface plane.

Utilisez des procédures antistatiques - Les composants sensibles à l'électricité statique présents dans l'équipement sont susceptibles d'être endommagés par une décharge électrostatique. Utilisez des procédures, des équipements et des surfaces antistatiques durant les interventions d'entretien.

N'utilisez pas la carte CF avec un PC — La carte CF a été spécialement formatée. Le logiciel enregistré sur la carte CF risque d'être effacé.

N'utilisez pas l'équipement si un dysfonctionnement est suspecté — Si vous suspectez un dysfonctionnement du produit, faites inspecter celui-ci par un membre qualifié du personnel d'entretien.

Acheminez les câbles correctement — Acheminez les câbles d'alimentation et les autres câbles de manière à ce qu'ils ne risquent pas d'être endommagés. Supportez correctement les enroulements de câbles afin de ne pas endommager les connecteurs.

Utilisez les cordons d'alimentation adéquats — Les cordons d'alimentation de cet équipement, s'ils sont fournis, satisfont aux exigences de toutes les réglementations régionales. L'utilisation de cet équipement à des tensions dépassant les 130 V en c.a. requiert des cordons d'alimentation qui satisfont aux exigences des configurations NEMA. Les cordons internationaux, s'ils sont fournis, ont reçu l'approbation du pays dans lequel l'équipement est utilisé.

Utilisez une pile de remplacement adéquate — Ce produit renferme une pile. Pour réduire le risque d'explosion, vérifiez la polarité et ne remplacez la pile que par une pile du même type, recommandée par le fabricant. Mettez les piles usagées au rebut conformément aux instructions du fabricant des piles.

Cette unité ne contient aucune partie qui peut faire l'objet d'un entretien par l'utilisateur. Si un problème survient, veuillez contacter votre distributeur local.

Certifications and compliances

Canadian certified power cords

Canadian approval includes the products and power cords appropriate for use in the North America power network. All other power cords supplied are approved for the country of use.

FCC emission control

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Changes or modifications not expressly approved by Grass Valley can affect emission compliance and could void the user's authority to operate this equipment.

Canadian EMC Notice of Compliance

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A préscrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

EN55103 1/2 Class A warning

This product has been evaluated for Electromagnetic Compatibility under the EN 55103-1/2 standards for Emissions and Immunity and meets the requirements for E4 environment.

This product complies with Class A (E4 environment). In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

FCC emission limits

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesirable operation.

Laser compliance

Laser safety requirements

This product may contain a Class 1 certified laser device. Operating this product outside specifications or altering its original design may result in hazardous radiation exposure, and may be considered an act of modifying or new manufacturing of a laser product under U.S. regulations contained in 21CFR Chapter 1, subchapter J or CENELEC regulations in HD 482 S1. People performing such an act are required by law to recertify and reidentify this product in accordance with provisions of 21CFR subchapter J for distribution within the U.S.A., and in accordance with CENELEC HD 482 S1 for distribution within countries using the IEC 825 standard.

Laser safety

Laser safety in the United States is regulated by the Center for Devices and Radiological Health (CDRH). The laser safety regulations are published in the "Laser Product Performance Standard," Code of Federal Regulation (CFR), Title 21, Subchapter J.

The International Electrotechnical Commission (IEC) Standard 825, "Radiation of Laser Products, Equipment Classification, Requirements and User's Guide," governs laser products outside the United States. Europe and member nations of the European Free Trade Association fall under the jurisdiction of the Comité Européen de Normalization Electrotechnique (CENELEC).

Safety certification

This product has been evaluated and meets the following Safety Certification Standards:

Standard	Designed/tested for compliance with:
ANSI/UL 60950-1	Safety of Information Technology Equipment, including Electrical Business Equipment (Second edition 2007).
IEC 60950-1 with CB cert.	Safety of Information Technology Equipment, including Electrical Business Equipment (Second edition, 2005).
CAN/CSA C22.2 No. 60950-1	Safety of Information Technology Equipment, including Electrical Business Equipment (Second edition 2007).
BS EN 60950-1	Safety of Information Technology Equipment, including Electrical Business Equipment 2006.

Finding Information

This is a K2™ product manual. It describes the K2 Storage Area Network (SAN) and provides instructions for installing and using the product in a variety of applications. The manual contains information for pre-defined levels, in both redundant and basic (non-redundant) configurations. Refer to the sections that apply to the level of your K2 SAN. For custom K2 SANs that do not fit one of these pre-defined levels, you must work with your Grass Valley representative for installation and operation.

This manual documents the K2 SAN with K2 software version 7.x and higher. Some devices and/or systems at previous versions of software are not compatible with this version of K2 SAN. Consult *K2 Release Notes* for compatibility information.

For information on products that are compatible as clients to the K2 SAN, refer to those product's manuals, such as the *Aurora Edit Installation and Configuration Guide* and the *Aurora Browse Installation and Configuration Guide*.

How this manual is organized

This manual is organized around the tasks required to install, configure, and operate the K2 SAN. The following describes the chapters included in this manual:

Chapter 1, *Product Description* — Provides the product functional description, an overview of key features, and system descriptions of each SAN level.

Chapter 2, *Preparing for installation* — Provides an overview checklist of the installation process and explains system concepts.

Chapter 3, *Cabling K2 SAN devices* — Provides instructions for making cable connections for the SAN.

Chapter 4, *Setting up K2 SAN infrastructure* — Provides instructions for networks switches and the control point PC.

Chapter 5, *Planning and implementing a K2 SAN with SiteConfig* — Provides instructions for planning the SAN system and establishing network communication for SAN devices.

Chapter 6, *Managing K2 software* — Provides procedures for installing and updating K2 software on the SAN and restoring using the recovery image.

Chapter 7, *Configuring the K2 SAN* — Provides procedures for configuring the different levels of the K2 SAN using the K2 System Configuration application.

Chapter 8, *Configuring K2 clients on the K2 SAN* — Provides instructions for adding K2 clients on the K2 SAN using the K2 System Configuration application.

Chapter 9, *Operating the K2 SAN* — Provides power on/off procedures and explanations of failover behaviors.

Chapter 10, *Description of K2 SAN Devices* — Provides descriptions and specifications of the devices of the K2 SAN.

Chapter 11, *Overview of K2 Storage Tools* — Contains overview descriptions for the system tools used with the K2 SAN.

Chapter 12, *Administering and maintaining the K2 SAN* — Contains instructions for customizing and maintaining the K2 SAN so that it meets your site's workflow requirements.

Chapter 13, *K2 FCP Connect access for Final Cut Pro systems* — Provides instructions for accessing K2 media from Macintosh and Final Cut Pro systems.

Appendix A, *Workgroup storage* — Contains instructions for installing and configuring Workgroup storage.

Getting more information

The following sections help you find the information you need in product manuals and elsewhere.

For the installer of a K2 product with internal storage

If you are installing a K2 client with stand-alone internal storage or a K2 Solo Media Server, refer to documentation in the following sequence:

	Find this document…	In these locations…	In these formats:
1	K2 Release Notes	K2 product shipping box	Printed
		Grass Valley Website	PDF file
2	Quick Start Guide for the K2 product	K2 product shipping box	Printed
		K2 Documentation CD	PDF file
		Grass Valley Website	PDF file
3	K2 System Guide	K2 Documentation CD	PDF file
		Grass Valley Website	PDF file

For the installer of a K2 client with direct connect storage

If you are installing a K2 client with stand-alone direct connect storage, refer to documentation in the following sequence:

	Find this document…	In these locations…	In these formats:
1	K2 Release Notes	K2 product shipping box	Printed
		Grass Valley Website	PDF file
2	K2 Storage Cabling Guide	K2 RAID shipping box	Printed
		K2 Documentation CD	PDF file
		Grass Valley Website	PDF file
2	Quick Start Guide for the K2 product	K2 product shipping box	Printed
		K2 Documentation CD	PDF file
		Grass Valley Website	PDF file
3	K2 System Guide	K2 Documentation CD	PDF file
		Grass Valley Website	PDF file

For the installer of K2 clients and K2 SAN shared storage

If you are installing a K2 SAN with connected K2 clients, refer to documentation in the following sequence:

	Find this document…	In these locations…	In these formats:
1	K2 Release Notes	K2 product shipping box	Printed
		Grass Valley Website	PDF file
2	K2 Storage Cabling Guide	K2 RAID shipping box	Printed
		K2 Documentation CD	PDF file
		Grass Valley Website	PDF file
2	Quick Start Guide for the K2 product	K2 product shipping box	Printed
		K2 Documentation CD	PDF file
		Grass Valley Website	PDF file
3	K2 SAN Installation and Service Manual	K2 Documentation CD	PDF file
		Grass Valley Website	PDF file
3	K2 System Guide	K2 Documentation CD	PDF file
		Grass Valley Website	PDF file

Release Notes

The K2 Release Notes contain the latest information about the software shipped on your system. The release notes include software upgrade instructions, software specifications and requirements, feature changes from the previous releases, and any known problems. Because release notes contain the latest information, they are printed out and included in the K2 product shipping box, rather than included in the Documentation CD-ROM. You should always check the Grass Valley Website to determine if there is an updated version of release notes available.

K2 Storage Cabling Guide

The cabling guide provides instructions for K2 Storage Area Network cabling and external configuration. The cabling guide provides instructions for each pre-defined level of K2 SAN and covers both redundant and basic (non-redundant) systems. You can find the cabling guide packaged with the primary RAID storage chassis.

Documentation CD

Except for the release notes, the full set of support documentation, including this manual, is available on the K2 Documentation CD that you receive with your K2 product. You can find the Documentation CD packaged in K2 product shipping boxes.

The Documentation CD includes the following:

- **K2 AppCenter User Manual** — Provides instructions for configuring and operating the media channels of product.
- **Quick Start Guides** — The Quick Start Guide provides step-by-step installation

instructions for basic installation and operation of the K2 product.

- **K2 System Guide** — Contains the product specifications and instructions for modifying system settings.
- **Service Manuals** — Contains information on servicing and maintaining the K2 product.
- **K2 SAN Installation and Service Manual** — Contains installation, configuration, and maintenance procedures for shared storage options.
- **K2 Storage Cabling Guide** — Contains diagrams for cabling the devices of the K2 SAN.
- **RAID Instruction Manuals** — There is an Instruction Manual for each type of RAID storage device that can be a part of a K2 SAN. These manuals contain procedures for configuring and servicing the device.
- **Fibre Channel Switch Installation Manual** — Contains information on configuring and servicing the Fibre Channel switch.

On-line Help Systems

K2 AppCenter Help — In the AppCenter user interface menu bar select **Help,** then choose **AppCenter Help Topics** from the drop-down menu.

SiteConfig Help — In the SiteConfig user interface menu bar select **Help,** then choose **SiteConfig Help Topics** from the drop-down menu.

NetCentral Help — From the NetCentral interface select **Help | NetCentral Help Topics**.

NetCentral documentation

The NetCentral product has its own documentation set, described as follows:

- **NetCentral Quick Start Guide** — Provides an overview of the installation process to quickly set up and run NetCentral.
- **NetCentral Installation Guide** — Identifies requirements and procedures to correctly set up servers and devices, as well as provides detailed instructions to install and configure NetCentral software.
- **NetCentral User Guide** — Describes how to use the NetCentral Manager to monitor devices.
- **NetCentral Help** — From the NetCentral interface access on-line help. Select **Help | NetCentral Help Topics**.

Grass Valley Web Site

This public Web site contains all the latest manuals and documentation, and additional support information. Use the following URL.

http://www.grassvalley.com.

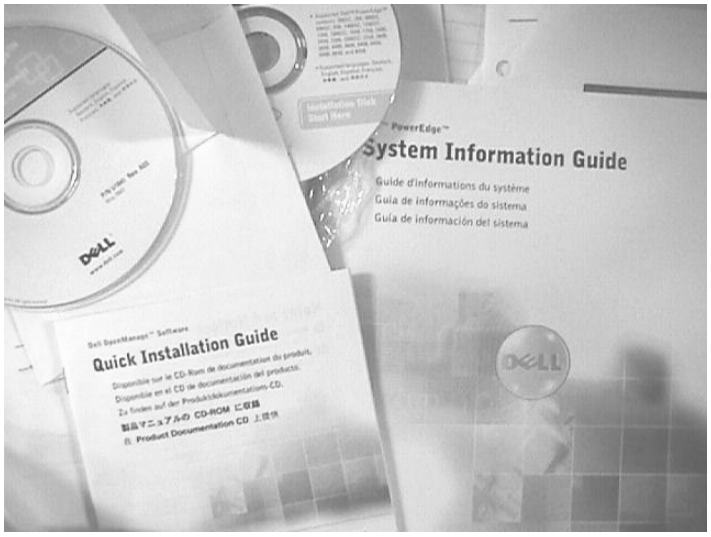
Using the Dell Server documentation

This manual contains all of the information you need to install the K2 SAN, however, a full set of Dell server documentation has been provided on the *Dell Product Documentation* CD-ROM. The Dell server documentation applies to the K2 Media Server. Refer to the documents on this CD-ROM only as required by procedures in this manual.

Information referenced on the *Dell Product Documentation* CD-ROM includes, but is not limited to:

- Unpacking and rack-mounting the K2 Media Server
- Important safety and regulatory information
- K2 Media Server Status indicators, messages, and error codes
- Troubleshooting help for the K2 Media Server hardware.

⚠ ***CAUTION: Do not use the Dell Quick Installation Guide provided with the Dell CD-ROM package. This guide includes instructions for using the OpenManage software CD-ROM to install an operating system. The K2 Media Server comes fully configured and is ready for installation. To begin installation, refer to one of the installation chapters in this manual.***



Grass Valley Product Support

For technical assistance, to check on the status of a question, or to report new issue, contact Grass Valley Product Support via e-mail, the Web, or by phone or fax.

Web Technical Support

To access support information on the Web, visit the product support Web page on the Grass Valley Web site. You can download software or find solutions to problems.

World Wide Web: http://www.grassvalley.com/support/
Technical Support E-mail Address: gvgtechsupport@grassvalley.com.

Telephone Support

Use the following information to contact Product Support by phone.

International Support Centers

Our international support centers are available 24 hours a day, 7 days a week.

Support Center	Toll free	In country
France	+800 80 80 20 20	+33 1 48 25 20 20
United States	+1 800 547 8949	+1 530 478 4148

Authorized Local Support Representative

A local support representative may be available in your country. To locate a support center during normal local business hours, refer to the following list. This list is regularly updated on the website for Grass Valley Product Support (http://www.grassvalley.com/support/contact/phone/).

After–hours local phone support is also available for warranty and contract customers.

Region	Country	Telephone
Asia	China	+86 10 5883 7575
	Hong Kong, Taiwan, Korea, Macau	+852 2531 3058
	Japan	+81 3 6848 5561
	Southeast Asia - Malaysia	+603 7492 3303
	Southeast Asia - Singapore	+65 6379 1769
	Indian Subcontinent	+91 11 515 282 502 +91 11 515 282 504
Pacific	Australia, New Zealand	+61 1300 721 495
Central America, South America	All	+55 11 5509 3440
North America	North America, Mexico, Caribbean	+1 800 547 8949 +1 530 478 4148

Region	Country	Telephone
Europe	UK, Ireland, Israel	+44 118 923 0499
	Benelux – Netherlands	+31 (0) 35 62 38 421
	Benelux – Belgium	+32 (0) 2 334 90 30
	France	+800 80 80 20 20 +33 1 48 25 20 20
	Germany, Austria, Eastern Europe	+49 6150 104 444
	Belarus, Russia, Tadzhikistan, Ukraine, Uzbekistan	+7 095 258 09 20 +33 (0) 2 334 90 30
	Nordics (Norway, Sweden, Finland, Denmark, Iceland)	+45 40 47 22 37
	Southern Europe – Italy	+39 02 24 13 16 01 +39 06 87 20 35 42
	Southern Europe – Spain	+34 91 512 03 50
Middle East, Near East, Africa	Middle East	+971 4 299 64 40
	Near East and Africa	+800 80 80 20 20 +33 1 48 25 20 20

grass valley

END-OF-LIFE PRODUCT RECYCLING NOTICE

Grass Valley's innovation and excellence in product design also extends to the programs we've established to manage the recycling of our products. Grass Valley has developed a comprehensive end-of-life product take back program for recycle or disposal of end-of-life products. Our program meets the requirements of the European Union's WEEE Directive, the United States Environmental Protection Agency, and U.S. state and local agencies.

Grass Valley's end-of-life product take back program assures proper disposal by use of Best Available Technology. This program accepts any Grass Valley branded equipment. Upon request, a Certificate of Recycling or a Certificate of Destruction, depending on the ultimate disposition of the product, can be sent to the requester.

Grass Valley will be responsible for all costs associated with recycling and disposal, including freight. However, you are responsible for the removal of the equipment from your facility and packing the equipment to make it ready for pickup.

For further information on the Grass Valley product take back system please contact Grass Valley at + 800 80 80 20 20 or +33 1 48 25 20 20 from most other countries. In the U.S. and Canada please call 800-547-8949 or 530-478-4148, and ask to be connected to the EH&S Department. Additional information concerning the program can be found at: www.thomsongrassvalley.com/environment

THOMSON images & beyond

Chapter 1

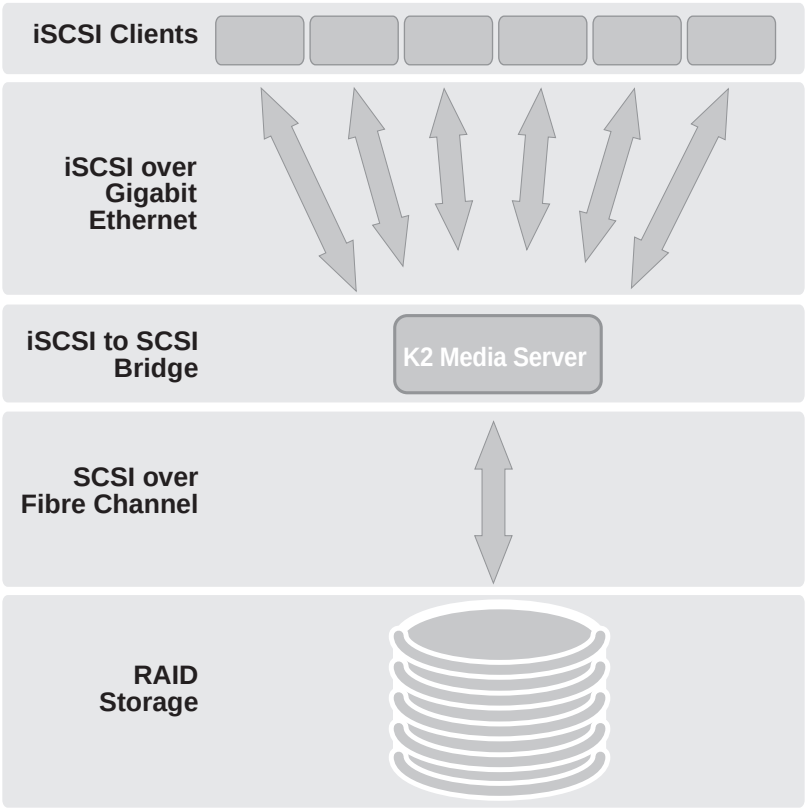
Product Description

This chapter describes the K2 SAN as follows:

- "Overview Description" on page 34
- "Key features" on page 34
- "K2 SAN Level descriptions" on page 35

Overview Description

The K2 Storage Area Network is Grass Valley's shared storage solution that gives multiple clients access to a common pool of media. In the iSCSI SAN, clients access the shared media storage via a Gigabit Ethernet network and a Fibre Channel connection. Data is communicated using the Small Computer System Interface (SCSI) data transfer interface and the Internet SCSI (iSCSI) protocol.



A custom-designed Fibre Channel SAN is also available in which clients access RAID storage via a Fibre Channel network, and the K2 Media Server connects via Ethernet for control functions only.

Refer to the *K2 System Guide* for diagrams and explanations of the media file system and the media database.

Key features

The key features of the iSCSI K2 SAN are as follows:

- iSCSI storage access protocol
- Gigabit Ethernet connectivity
- RAID 5 and RAID 6 storage
- FTP transfers

- Enhanced IT networked storage configurations to fit a wide variety of size and performance requirements.
- Scaling from 100 to < 5000 MB/s
- Redundancy and fault recovery with no single point of failure
- Tuned and optimized file system for reliable and robust transaction of media files
- Best in class storage management for high throughput, deterministic performance with load balancing, priority of service, and quality of service

K2 SAN Level descriptions

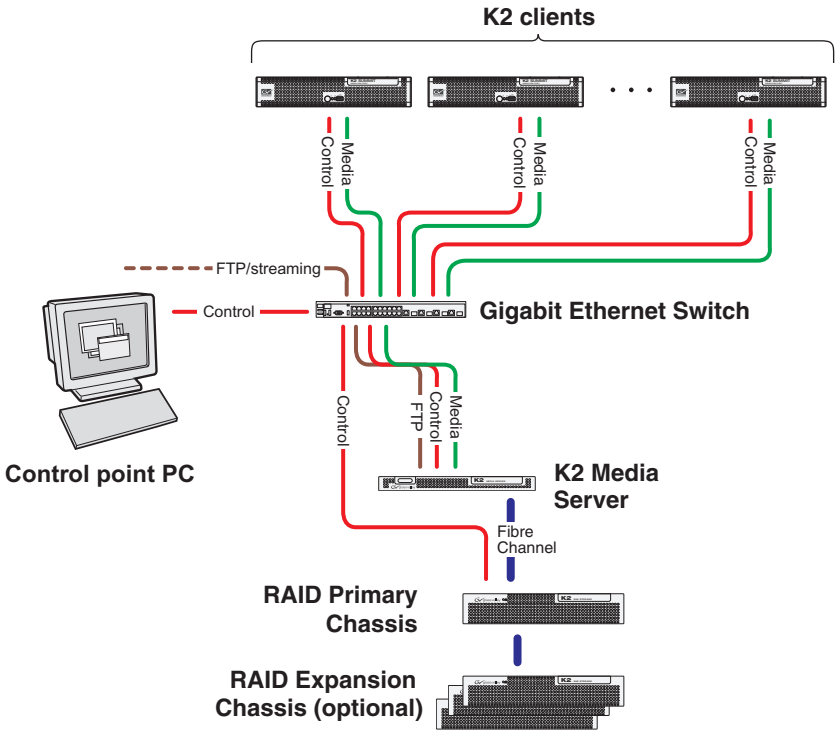
The following sections describe the pre-defined levels of the K2 SAN.

- "Level 10 system description" on page 36
- "Level 10R system description" on page 37
- "Level 20 system description" on page 39
- "Level 20R system description" on page 41
- "Level 30 system description" on page 43
- "Level 30R system description" on page 45
- "Nearline 10 system description" on page 51

For all levels of online (not nearline) K2 SAN's, you can configure the SAN with the Live Production mode enabled. This type of SAN has a shorter minimum delay between start record and start playout when the record and play are on different SAN K2 Summit Production Clients. To support this feature, the K2 SAN must be sized for increased bandwidth. Contact your Grass Valley representative for specifications relative to your needs.

For information about individual devices, refer to Chapter 10, *Description of K2 SAN Devices*. Also refer to "Design considerations for Ethernet switches" on page 465.

Level 10 system description



The Level 10 SAN has one Gigabit Ethernet switch, one GS K2 Media Server, and one L10 RAID chassis. Up to four RAID Expansion chassis are optional for increased storage capacity.

K2 clients and other iSCSI clients, such as Aurora Edits, are connected to the GigE switch. Each K2 client has one GigE connection for media (iSCSI) and one GigE connection for control. The GigE switch is configured with V-LANs to keep the control/FTP traffic and the media (iSCSI) traffic separate.

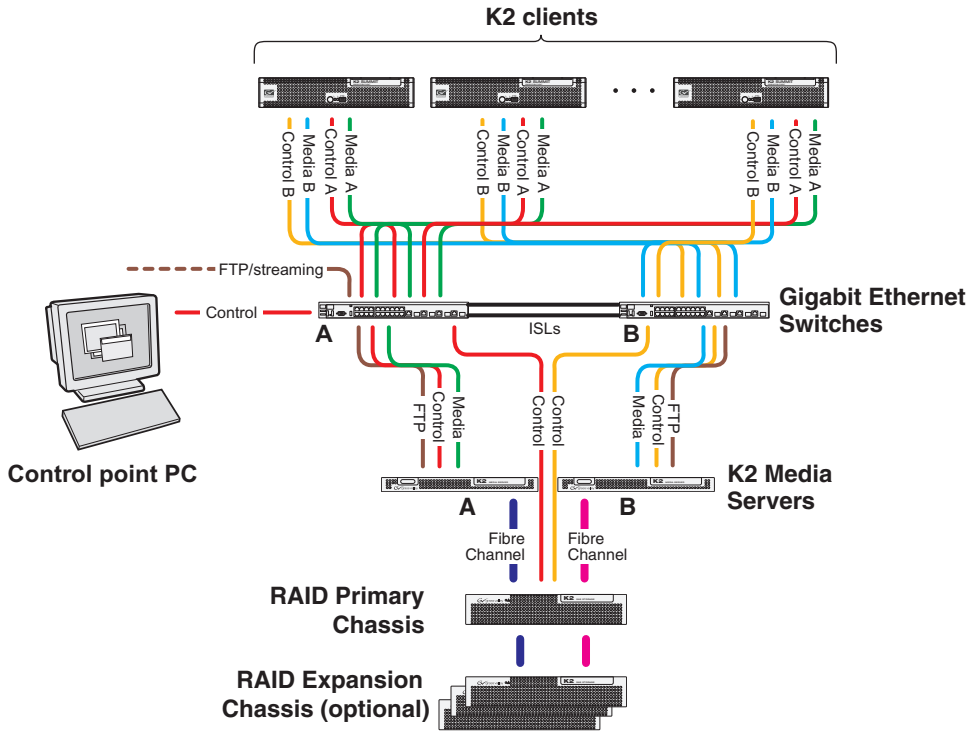
The GS K2 Media Server has one GigE connection for media (iSCSI), one GigE connection for control, one GigE connection for FTP, and one Fibre Channel connection to the RAID storage. The server hosts an iSCSI interface card for the GigE media connection and a Fibre Channel card for the RAID storage connection. The iSCSI interface card provides a bridge between GigE iSCSI and Fibre Channel SCSI. The server also hosts software components that allow it to function in various roles, including media file system manager, media database server, and FTP server. The GS K2 Media Server has redundant power supplies.

The L10 RAID chassis is connected via a single Fibre Channel connection to the K2 Media Server. It is also connected to the GigE control network, which is required for SNMP (NetCentral) monitoring.

The K2 configuration control point PC is connected to the GigE control network. The K2 System Configuration application runs on this PC for configuring the SAN.

FTP/streaming traffic accesses the K2 SAN via the FTP GigE port on K2 Media Servers. FTP/streaming traffic does not go to K2 clients.

Level 10R system description



The Level 10R SAN has two Gigabit Ethernet switches connected by Inter-Switch Links (ISLs) to support a redundant Ethernet fabric. The SAN also has redundant GS K2 Media Servers. The servers are configured to have identical roles. This provides redundancy for database, file system, iSCSI bridge, and FTP roles. One L10 RAID supports redundant Fibre Channel connections. Up to four Expansion chassis are optional for increased storage capacity.

K2 clients have a pair of redundant (teamed) Gigabit Ethernet ports for control and two Gigabit Ethernet ports (A and B) for media (iSCSI). Each port of the control team is connected to a different switch. The A media port goes to the A GigE switch and the B media port goes to the B GigE switch. The GigE switches are configured with V-LANs to keep the control/FTP and media (iSCSI) traffic separate.

Each GS K2 Media Server has one GigE connection for media (iSCSI), one GigE connection for control, one GigE connection for FTP, and one Fibre Channel connection to the RAID storage. All GigE connections on a server go to the same GigE switch. The server hosts an iSCSI interface card for the GigE media connection and a Fibre Channel card for the RAID storage connection. The iSCSI interface card provides a bridge between GigE iSCSI and Fibre Channel SCSI. The server also hosts software components that allow it to function in its roles, including media file system manager, media database server, and FTP server. Redundant K2 Media Servers are connected by a serial cable which supports the heartbeat signal required for automatic system recovery (failover) features. Each GS K2 Media Server has redundant power supplies.

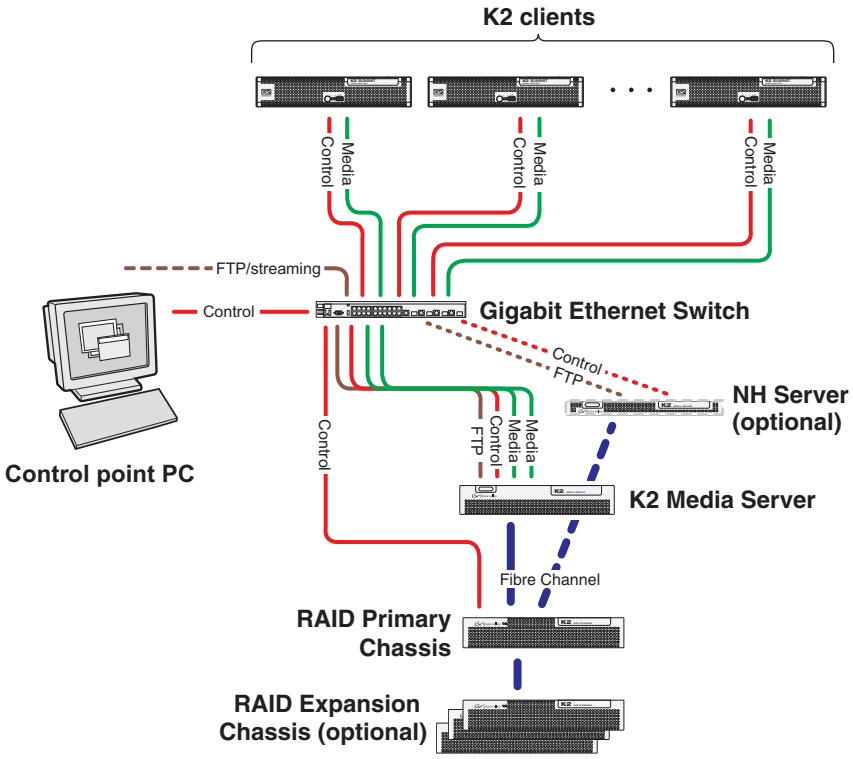
The L10 RAID chassis has redundant RAID controllers to support the Fibre Channel connections from the K2 Media Servers. The L10 RAID chassis is also connected to the GigE control network, which is required for SNMP (NetCentral) monitoring.

On the L10 RAID chassis there are two RAID 1 RANKs (also know as LUNs) for media file system metadata files and journal files. The remainder of the RAID storage is RAID 5 or RAID 6 for media.

The K2 configuration control point PC is connected to the GigE control network. The K2 System Configuration application runs on this PC for configuring the SAN.

FTP/streaming traffic accesses the K2 SAN via the FTP GigE port on K2 Media Servers. FTP/streaming traffic does not go to K2 clients.

Level 20 system description



The Level 20 SAN has one Gigabit Ethernet switch, one GS K2 Media Server, and one L20 RAID chassis. Up to seven RAID Expansion chassis are optional for increased storage capacity.

K2 clients and other iSCSI clients, such as Aurora Edits, are connected to the GigE switch. Each K2 client has one GigE connection for media (iSCSI) and one GigE connection for control. The GigE switch is configured with V-LANs to keep the control/FTP traffic and the media (iSCSI) traffic separate.

The GS K2 Media Server has two GigE connections for media (iSCSI), one GigE connection for control, one GigE connection for FTP, and one Fibre Channel connection to the RAID storage. The server hosts a dual-port iSCSI interface card for the GigE media connections and a Fibre Channel card for the RAID storage connection. The iSCSI interface card provides a bridge between GigE iSCSI and Fibre Channel SCSI. The server also hosts software components that allow it to function in various roles, including media file system manager, media database server, and FTP server.

The L20 RAID chassis is connected via a single Fibre Channel connection to the K2 Media Server. It is also connected to the GigE control network, which is required for SNMP (NetCentral) monitoring.

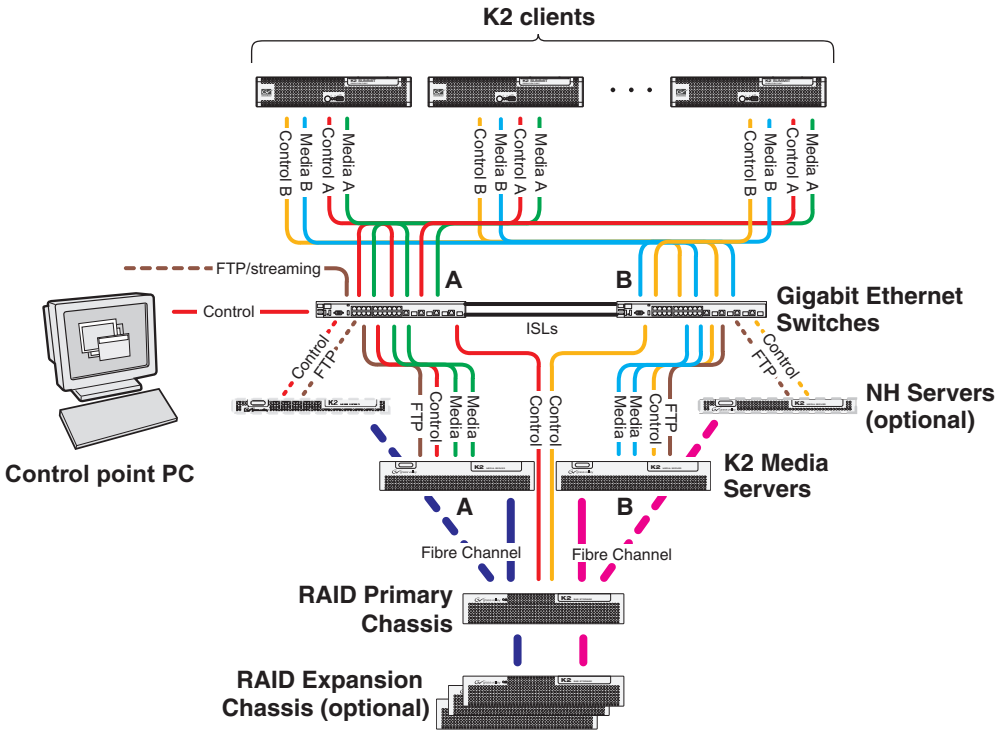
Optional NH K2 Media Servers are available to provide additional FTP bandwidth. These servers are available with either a one Gigabit connection or a ten Gigabit connection. If you have multiple NH K2 Media Servers on a K2 SAN, they must all

be of the same connection speed. They must be all one Gigabit servers or all ten Gigabit servers. If the optional NH server is used, all FTP traffic goes to this server, so the GS K2 Media Server is not cabled or configured for FTP.

The K2 configuration control point PC is connected to the GigE control network. The K2 System Configuration application runs on this PC for configuring the SAN.

FTP/streaming traffic accesses the K2 SAN via the FTP GigE port on K2 Media Servers. FTP/streaming traffic does not go to K2 clients.

Level 20R system description



The Level 20R SAN has two Gigabit Ethernet switches connected by Inter-Switch Links (ISLs) to support a redundant Ethernet fabric. The SAN also has redundant GS K2 Media Servers. The servers are configured to have identical roles. This provides redundancy for database, file system, iSCSI bridge, and FTP roles. One L20 RAID supports redundant Fibre Channel connections. Up to seven Expansion chassis are optional for increased storage capacity.

K2 clients have a pair of redundant (teamed) Gigabit Ethernet ports for control and two Gigabit Ethernet ports (A and B) for media (iSCSI). Each port of the control team is connected to a different switch. The A media port goes to the A GigE switch and the B media port goes to the B GigE switch. The GigE switches are configured with V-LANs to keep the control/FTP and media (iSCSI) traffic separate.

Each GS K2 Media Server has two GigE connections for media (iSCSI), one GigE connection for control, one GigE connection for FTP, and one Fibre Channel connection to the RAID storage. All GigE connections on a server go to the same GigE switch. The server hosts a dual-port iSCSI interface card for the GigE media connections and a Fibre Channel card for the RAID storage connection. The iSCSI interface card provides a bridge between GigE iSCSI and Fibre Channel SCSI. The server also hosts software components that allow it to function in its roles, including media file system manager, media database server, and FTP server. Redundant K2 Media Servers are connected by a serial cable which supports the heartbeat signal required for automatic system recovery (failover) features.

The L20 RAID chassis has redundant RAID controllers to support the Fibre Channel connections from the K2 Media Servers. The L20 RAID chassis is also connected to the GigE control network, which is required for SNMP (NetCentral) monitoring.

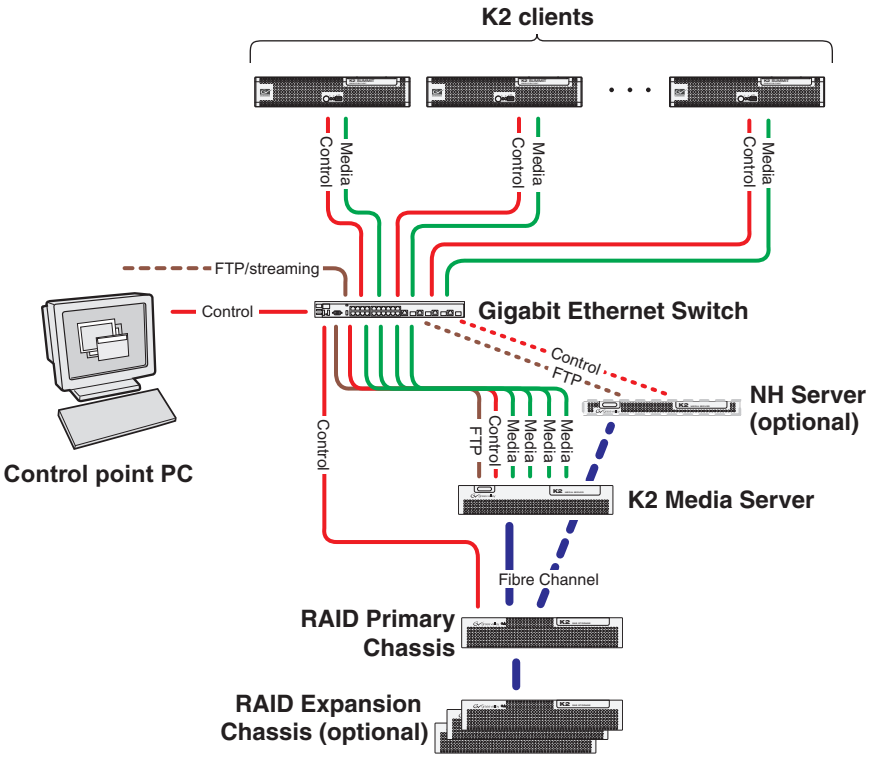
On the L20 RAID chassis there are two RAID 1 RANKs (also know as LUNs) for media file system metadata files and journal files. The remainder of the RAID storage is RAID 5 or RAID 6 for media.

Optional NH K2 Media Servers are available to provide additional FTP bandwidth. These servers are available with either a one Gigabit connection or a ten Gigabit connection. If you have multiple NH K2 Media Servers on a K2 SAN, they must all be of the same connection speed. They must be all one Gigabit servers or all ten Gigabit servers. If the optional NH server is used, all FTP traffic goes to this server, so neither GS K2 Media Server is cabled or configured for FTP.

The K2 configuration control point PC is connected to the GigE control network. The K2 System Configuration application runs on this PC for configuring the SAN.

FTP/streaming traffic accesses the K2 SAN via the FTP GigE port on K2 Media Servers. FTP/streaming traffic does not go to K2 clients.

Level 30 system description



The Level 30 SAN has one Gigabit Ethernet switch, one LS K2 Media Server, and one L30 RAID chassis. Up to eleven RAID Expansion chassis are optional for increased storage capacity.

K2 clients and other iSCSI clients, such as Aurora Edits, are connected to the GigE switch. Each K2 client has one GigE connection for media and one GigE connection for control. The GigE switch is configured with V-LANs to keep the control/FTP traffic and the media (iSCSI) traffic separate.

The LS K2 Media Server has four GigE connections for media (iSCSI), one GigE connection for control, one GigE connection for FTP, and one Fibre Channel connection to the RAID storage. The server hosts iSCSI interface cards for the GigE media connections and a Fibre Channel card for the RAID storage connection. The iSCSI interface card provides a bridge between GigE iSCSI and Fibre Channel SCSI. The server also hosts software components that allow it to function in various roles, including media file system manager, media database server, and FTP server.

The L30 RAID chassis is connected via a single Fibre Channel connection to the K2 Media Server. It is also connected to the GigE control network, which is required for SNMP (NetCentral) monitoring.

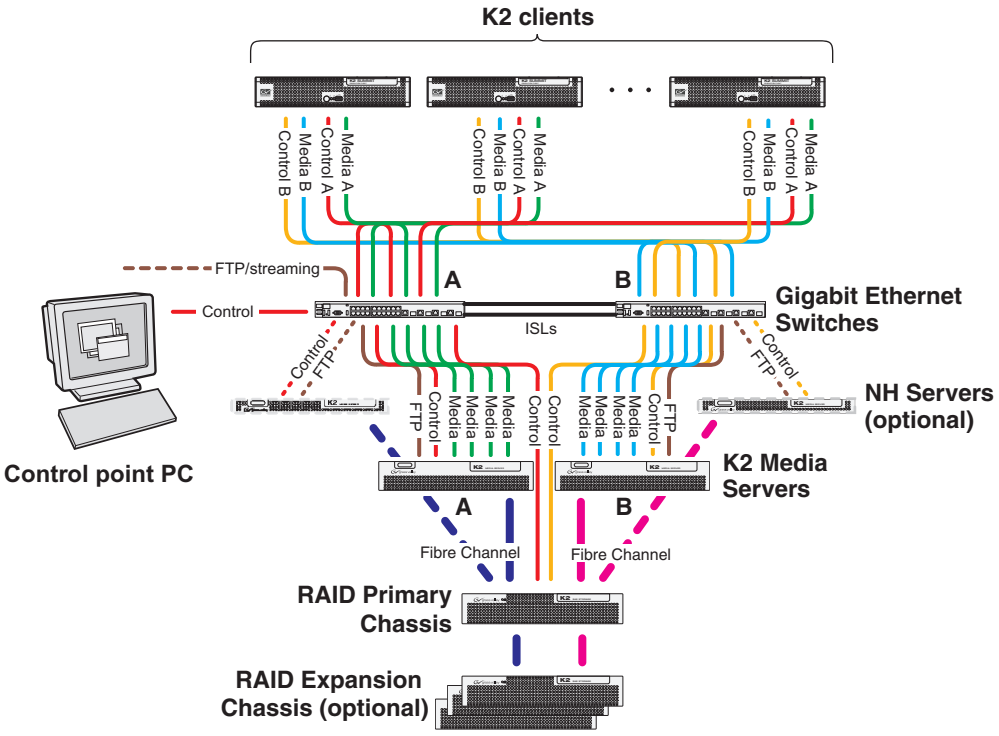
Optional NH K2 Media Servers are available to provide additional FTP bandwidth. These servers are available with either a one Gigabit connection or a ten Gigabit connection. If you have multiple NH K2 Media Servers on a K2 SAN, they must all

be of the same connection speed. They must be all one Gigabit servers or all ten Gigabit servers. If the optional NH server is used, all FTP traffic goes to this server, so the LS K2 Media Server is not cabled or configured for FTP.

The K2 configuration control point PC is connected to the GigE control network. The K2 System Configuration application runs on this PC for configuring the SAN.

FTP/streaming traffic accesses the K2 SAN via the FTP GigE port on K2 Media Servers. FTP/streaming traffic does not go to K2 clients.

Level 30R system description



The Level 30R SAN has two Gigabit Ethernet switches connected by Inter-Switch Links (ISLs) to support a redundant Ethernet fabric. The SAN also has redundant LS K2 Media Servers. The servers are configured to have identical roles. This provides redundancy for database, file system, iSCSI bridge, and FTP roles. One L30 RAID supports redundant Fibre Channel connections. Up to eleven Expansion chassis are optional for increased storage capacity.

K2 clients have a pair of redundant (teamed) Gigabit Ethernet ports for control and two Gigabit Ethernet ports (A and B) for media (iSCSI). Each port of the control team is connected to a different switch. The A media port goes to the A GigE switch and the B media port goes to the B GigE switch. The GigE switches are configured with V-LANs to keep the control/FTP and media (iSCSI) traffic separate.

Each LS K2 Media Server has four GigE connections for media (iSCSI), one GigE connection for control, one GigE connection for FTP, and one Fibre Channel connection to the RAID storage. All GigE connections on a server go to the same GigE switch. The server hosts iSCSI interface cards for the GigE media connections and a Fibre Channel card for the RAID storage connection. The iSCSI interface cards provide a bridge between GigE iSCSI and Fibre Channel SCSI. The server also hosts software components that allow it to function in its roles, including media file system manager, media database server, and FTP server. Redundant K2 Media Servers are connected by a serial cable which supports the heartbeat signal required for automatic system recovery (failover) features.

The L30 RAID chassis has redundant RAID controllers to support the Fibre Channel connections from the K2 Media Servers. The L30 RAID chassis is also connected to the GigE control network, which is required for SNMP (NetCentral) monitoring.

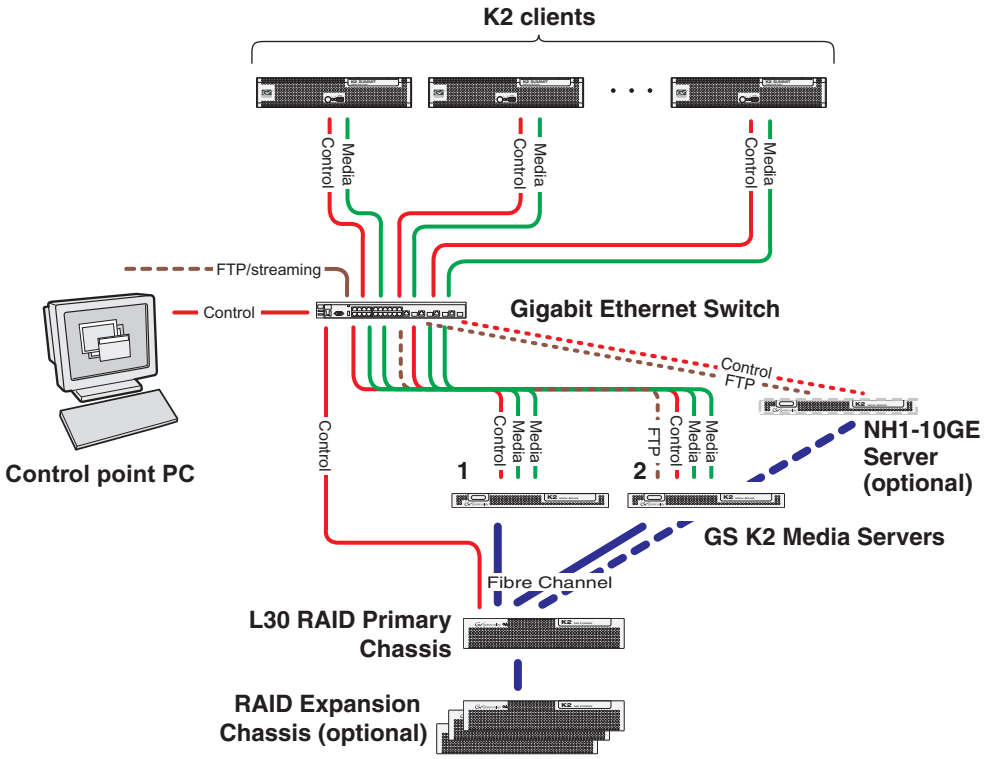
On the L30 RAID chassis there are two RAID 1 RANKs (also know as LUNs) for media file system metadata files and journal files. The remainder of the RAID storage is RAID 5 or RAID 6 for media.

Optional NH K2 Media Servers are available to provide additional FTP bandwidth. These servers are available with either a one Gigabit connection or a ten Gigabit connection. If you have multiple NH K2 Media Servers on a K2 SAN, they must all be of the same connection speed. They must be all one Gigabit servers or all ten Gigabit servers. If the optional NH server is used, all FTP traffic goes to this server, so neither LS K2 Media Server is cabled or configured for FTP.

The K2 configuration control point PC is connected to the GigE control network. The K2 System Configuration application runs on this PC for configuring the SAN.

FTP/streaming traffic accesses the K2 SAN via the FTP GigE port on K2 Media Servers. FTP/streaming traffic does not go to K2 clients.

L35 system description



This section describes the K2 Level 35 non-redundant (L35) SAN.

The Level 35 SAN has one Gigabit Ethernet switch, two GS K2 Media Servers, one optional NH1-10GE K2 Media Server, and one L30 RAID chassis. Up to eleven RAID Expansion chassis are optional for increased storage capacity.

K2 clients and other iSCSI clients, such as Aurora Edits, are connected to the GigE switch. Each K2 client has one GigE connection for media (iSCSI) and one GigE connection for control. The GigE switch is configured with V-LANs to keep the control/FTP traffic and the media (iSCSI) traffic separate.

Each GS K2 Media Server has two GigE connections for media (iSCSI), one GigE connection for control, one GigE connection for FTP, and one Fibre Channel connection to the RAID storage. The server hosts a dual-port iSCSI interface card for the GigE media connections and a Fibre Channel card for the RAID storage connection. The iSCSI interface card provides a bridge between GigE iSCSI and Fibre Channel SCSI. The server also hosts software components that allow it to function in various roles, including media file system manager, media database server, and FTP server.

Server roles are distributed between the two GS K2 Media Servers. In this way the Level 35 system is similar to the Level 3 system. One server runs as the media file system and database server while the other server can run as an FTP server. This boosts performance, as the system resources of each server can be optimized for specific roles. In addition, both servers take the role of iSCSI bridge, so that there are a total of four iSCSI media connections for increased bandwidth.

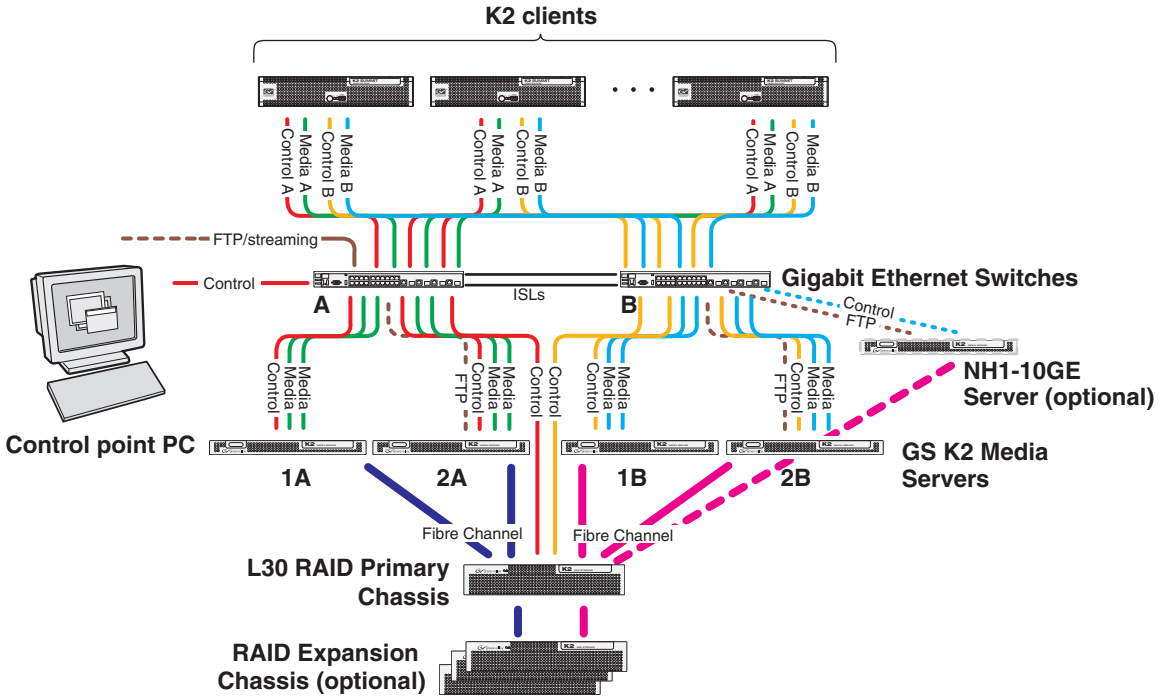
The optional NH1-10GE K2 Media Server is available to provide additional FTP bandwidth. This server has a ten Gigabit connection to the Ethernet switch. If the optional NH server is used, all FTP traffic goes to this server, so neither GS K2 Media Server is cabled or configured for FTP.

The controller in the L30 RAID chassis has the four optional Fibre Channel expansion ports installed, making a total of six Fibre Channel ports on the controller. This allows the controller to act in a limited way as a Fibre Channel switch. Two ports connect the GS K2 Media Servers and one port connects the optional NH1-10GE K2 Media Server. The remaining three ports are unused. The L30 RAID chassis is also connected to the GigE control network, which is required for SNMP (NetCentral) monitoring.

The K2 configuration control point PC is connected to the GigE control network. The K2 System Configuration application runs on this PC for configuring the SAN.

FTP/streaming traffic accesses the K2 SAN via the FTP GigE port on K2 Media Servers. FTP/streaming traffic does not go to K2 clients.

L35R system description



This section describes the K2 Level 35 Redundant (L35R) SAN.

The Level 35 SAN has two Gigabit Ethernet switches connected by Inter-Switch Links (ISLs) to support a redundant Ethernet fabric. The SAN also has four GS K2 Media Servers, one optional NH1-10GE K2 Media Server, and one L30 RAID chassis. Up to eleven RAID Expansion chassis are optional for increased storage capacity.

K2 clients have a pair of redundant (teamed) Gigabit Ethernet ports for control and two Gigabit Ethernet ports (A and B) for media (iSCSI). Each port of the control team is connected to a different switch. The A media port goes to the A GigE switch and the B media port goes to the B GigE switch. The GigE switches are configured with V-LANs to keep the control/FTP and media (iSCSI) traffic separate.

Each GS K2 Media Server has two GigE connections for media (iSCSI), one GigE connection for control, one GigE connection for FTP, and one Fibre Channel connection to the RAID storage. All GigE connections on a server go to the same GigE switch. The server hosts a dual-port iSCSI interface card for the GigE media connections and a Fibre Channel card for the RAID storage connection. The iSCSI interface card provides a bridge between GigE iSCSI and Fibre Channel SCSI. The server also hosts software components that allow it to function in various roles, including media file system manager, media database server, and FTP server. Redundant K2 Media Servers are connected by a serial cable which supports the heartbeat signal required for automatic system recovery (failover) features.

The SAN is redundant in that it has an A side and a B side, with each side providing complete and identical functionality. Server roles are distributed between the two GS K2 Media Servers on each side. In this way the Level 35 system is similar to the Level

3 system. One server on a side runs as the media file system and database server while the other server on the side can run as an FTP server. This boosts performance, as the system resources of each server can be optimized for specific roles. In addition, both servers on a side take the role of iSCSI bridge, so that there are a total of four iSCSI media connections on each side for increased bandwidth.

The optional NH1-10GE K2 Media Server is available to provide additional FTP bandwidth. This server has a ten Gigabit connection to the Ethernet switch. If the NH1-10GE is used, all FTP traffic goes to this server, so no GS K2 Media Server is cabled or configured for FTP.

The L30 RAID chassis has redundant RAID controllers to support the Fibre Channel connections from the K2 Media Servers. Each controller in the L30 RAID chassis has the four optional Fibre Channel expansion ports installed, making a total of six Fibre Channel ports on each controller. This allows the controller to act in a limited way as a Fibre Channel switch. Two ports connect the two GS K2 Media Servers on the side and one port can connect the optional NH1-10GE K2 Media Server. The remaining ports are unused. The L30 RAID chassis is also connected to the GigE control network, which is required for SNMP (NetCentral) monitoring.

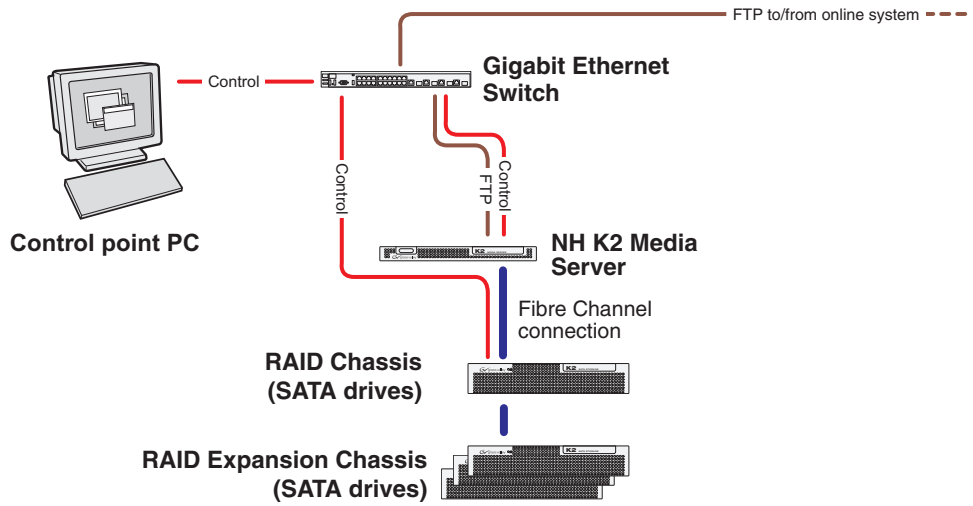
On the L30 RAID chassis there are two RAID 1 RANKs (also know as LUNs) for media file system metadata files and journal files. The remainder of the RAID storage is RAID 5 or RAID 6 for media.

The K2 configuration control point PC is connected to the GigE control network. The K2 System Configuration application runs on this PC for configuring the SAN.

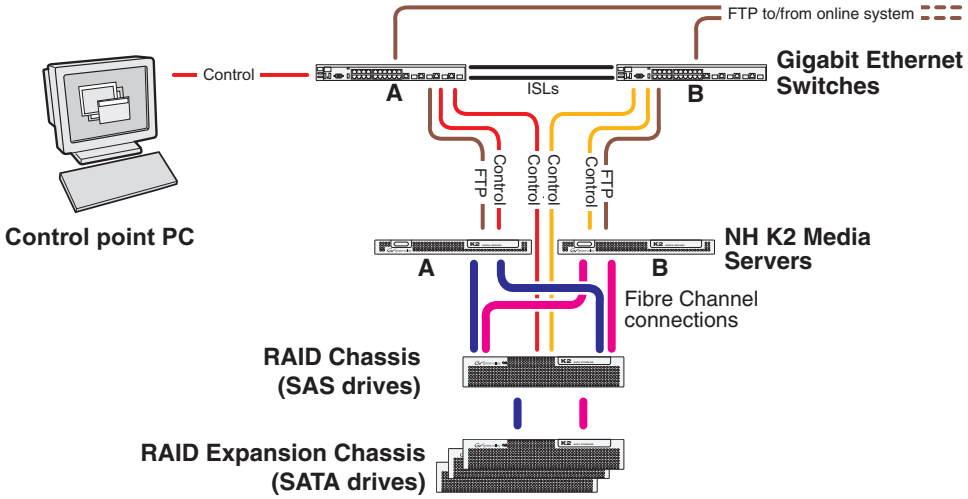
FTP/streaming traffic accesses the K2 SAN via the FTP GigE port on K2 Media Servers. FTP/streaming traffic does not go to K2 clients.

Nearline 10 system description

Nearline 10 (non-redundant)



Nearline 10 Redundant



This section describes both the Nearline 10 non-redundant (NL10) and the Nearline 10 redundant (NL10R) K2 SAN. This is a 4 Gb/s Nearline K2 SAN. The 4 Gb/s bandwidth available on this system is a feature that distinguishes it from the previous Nearline K2 SAN, which has a 2 Gb/s bandwidth.

The purpose of the Nearline SAN is to provide a large pool of storage to which files can be saved. The Nearline system is considered an “offline” system, which means the system stores files only, such GXF files or MXF files, with no ability to record or play those files directly on the system. This is because the Nearline system has no media database to support “movies” or “clips”, such as there is on an “online” K2 Level 10, 20, or 30 SAN. However, the files on a Nearline system can be readily available to an online K2 system via FTP transfer.

The non-redundant Nearline SAN has one Gigabit Ethernet switch. The redundant Nearline SAN has two Gigabit Ethernet switches, connected by Inter-Switch Links (ISLs) to support a redundant Ethernet fabric.

The SAN has one (non-redundant) or two (redundant) NH K2 Media Servers. These can be NH1 (one Gig FTP bandwidth) or NH1-10GE (ten Gig FTP bandwidth) servers, but all NH servers on a system must be of the same type: either all NH1 or all NH1-10GE. The NH server for a Nearline system has two ports for Fibre Channel connections. NH servers do not have media (iSCSI) ports.

A NH server on a Nearline system is configured with roles of FTP server and Media file system server. On a redundant system these roles are identical on both servers and provide redundancy as follows:

- FTP server — On a redundant system both servers are active in this role simultaneously. To provide FTP redundancy in the event of a server failure, your facility's FTP system must be able to access alternate FTP servers.
- Media file system server — On a redundant system only one server is active at any one time in this role, and the media file system provides redundancy. If a fault occurs on the active server, one of the other servers automatically takes over as the active media file system server.

In the Nearline system no K2 Media Servers take the role of iSCSI bridge or media database server.

No K2 clients or any other generic client are part of the Nearline system.

SATA drives provide the primary media file storage on a Nearline system. While these drives do not provide the high bandwidth of the SAS drives required by an online K2 SAN, they offer larger capacity and lower cost. This makes SATA drives ideal for the Nearline SAN.

The primary RAID chassis has one controller (NL10) or two controllers (NL10R). The primary RAID chassis is connected via Fibre Channel to the NH server. In the redundant system, these Fibre Channel connections access the disks simultaneously for increased bandwidth. Each controller in the RAID chassis is also connected to the GigE control network, which is required for SNMP (NetCentral) monitoring.

There must be one primary RAID chassis and may be up to six optional Expansion chassis. Primary chassis and Expansion chassis contain twelve SATA drives. All disks (SATA) in both primary and optional Expansion chassis are bound as RAID 6.

The K2 configuration control point PC is connected to the GigE control network. The K2 System Configuration application runs on this PC for configuring the SAN.

Refer to Chapter 10, *Description of K2 SAN Devices* for more information. Also refer to "Design considerations for Ethernet switches" on page 465.

Chapter 2

Preparing for installation

Use this chapter to do your pre-installation planning. This chapter includes the following topics:

- "K2 SAN installation checklists" on page 54
- "Understanding system concepts" on page 56

Work through these topics as you prepare to install the K2 SAN.

K2 SAN installation checklists

Use the following sequence of checklists to guide the overall task flow of installing and commissioning a K2 SAN.

Pre-installation planning checklist

	Task	Instructions	Comments
❑	Procure existing or create new SiteConfig system description	Chapter 5, *Planning and implementing systems with SiteConfig*, topic "About developing a system description"	You can do this before arriving at the customer site.
❑	Next: Infrastructure checklist		

Infrastructure checklist

	Task	Instructions	Comments
❑	Rack and cable	Follow the *K2 SAN Cabling Guide* and other documentation that comes packaged with devices. Also refer to Chapter 3, *Cabling K2 SAN devices*.	—
❑	Configure Ethernet switch(es)	Chapter 4, *Setting up K2 SAN infrastructure*, topic "Setting up the Ethernet switch"	—
❑	Install/update SiteConfig on control point PC	Chapter 4, topic "Installing SiteConfig on the control point PC"	—
❑	For K2 Summit Production Clients, disable the write filter.	*K2 System Guide*	You must connect keyboard, monitor, and mouse and do this on each K2 Summit Production Client before managing with SiteConfig.
❑	Next: Network setup and implementation checklist		

Network setup and implementation checklist

	Task	Instructions	Comments
❑	Import or create the SiteConfig system description on the control point PC	Chapter 5, topic "Importing a system description"	Select IP address range for each network and each device type.
❑	Modify names and networks in the SiteConfig system description.	Chapter 5, topics "Modifying a device name", "Modifying the control network", etc.	Set subnet mask and other settings.
❑	Verify/modify device interfaces	Chapter 5, topics "Modifying K2 client unassigned (unmanaged) interface", "Modifying K2 Media Server unassigned (unmanaged) interface".	Do not proceed until the system description accurately represents all aspects of the actual system. Refer to *SiteConfig Help Topics*. Use procedures as appropriate for your site.

	Task	Instructions	Comments
❑	Discover devices	Chapter 5, topic “Discovering devices with SiteConfig”	Make sure the write filter is disabled (device is unlocked) on K2 Summit Production Clients.
❑	Assign placeholder devices to discovered devices	Chapter 5, topic “Assigning discovered devices”	—
❑	Configure IP settings of network interfaces on discovered devices	Chapter 5, topics “Modifying K2 client managed network interfaces”, “Modifying K2 Media Server managed network interfaces”	—
❑	Configure names	Chapter 5, topic “Making the host name the same as the device name”	—
❑	Validate networks	Chapter 5, topic “Pinging devices from the control point PC”	—
❑	Distribute host table information	Chapter 5, topic “Generating host tables for devices”	—
❑	Next: Software update checklist		

Software update checklist

	Task	Instructions	Comments
❑	Create deployment groups	Chapter 6, *Managing K2 software*, topic “Configuring deployment groups”	—
❑	Place software on control point PC	Chapter 6, topic “Adding a software package to a deployment group”	—
❑	Check software on devices	Chapter 6, topic “Checking all currently installed software on devices”	—
❑	Upgrade/install software to devices from control point PC	Chapter 6, topic “About deploying software for the K2 SAN”	Refer to *K2 Release Notes*. Make sure the write filter is disabled (device is unlocked) on K2 Summit Production Clients.
❑	Next: SAN configuration checklist		

SAN configuration checklist

	Task	Instructions	Comments
❑	Import SiteConfig system description into K2Config	Chapter 7, *Configuring the K2 SAN*, topic “Importing a SiteConfig system description”	—
❑	Configure SAN in K2Config	Use the appropriate instructions for your K2 SAN level from Chapter 7.	Make sure the write filter is disabled (device is unlocked) on K2 Summit Production Clients.
❑	K2 SAN installation complete		

Understanding system concepts

Make sure you understand the following system concepts before planning or implementing a K2 SAN.

- "Control network description"
- "Streaming/FTP network description"
- "Media (iSCSI) network description"
- "Networking tips"
- "About hosts files"
- "Host table tips"

Control network description

The control network is for communication between devices and components. It does not have real-time media traffic or streaming/FTP media traffic. The control network must be on a different subnet than the streaming/FTP network and the Media (iSCSI) network. Static IP addresses with name resolution via host files are recommended for the control network.

The control network applies to both online and nearline K2 SANs.

All the devices of the K2 SAN are on the control network. Stand-alone K2 clients can also be on the same control network.

Redundant K2 SANs have one control network with hardware separated into an A side and a B side. There is an A Ethernet switch and a B Ethernet switch. Switches are connected by InterSwitch Links (ISLs) to provide redundant paths for control network traffic. On a redundant K2 SAN, devices are on the control network as follows:

- Shared Storage K2 client — The two control GigE ports are configured as a team. The control team shares a single IP address. One port of the team is on the A side and the other port of the team is on the B side.
- K2 Media Server — Redundant K2 Media Servers with role of media file system/metadata server are balanced between the A and B sides. One server is on the A side and the other server is on the B side. K2 Media Servers with other roles, such as FTP server, are likewise balanced between A and B sides.
- K2 RAID — When a K2 RAID device has redundant controllers, controller 0 is on the A side and controller 1 is on the B side.
- Ethernet switch — For control and configuration, the A switch is on the A side and the B switch is on the B side

Streaming/FTP network description

The streaming/FTP network is for media transfers and FTP traffic. It must be on a different subnet than the control network and the Media (iSCSI) network. Static IP addresses with name resolution via host files are recommended for the streaming/FTP network. Hostnames of network adapters that are dedicated to the streaming/FTP network must be aliased in the hosts file with the *_heo* suffix. This directs the streaming traffic to the correct port.

The streaming/FTP network applies to both online and nearline K2 SANs. For nearline systems, this is the primary network for moving media to and from the storage system.

Redundant K2 SANs have one streaming/FTP network with hardware separated into an A side and a B side. There is an A Ethernet switch and a B Ethernet switch. Switches are connected by InterSwitch Links (ISLs) to provide redundant paths for streaming/FTP traffic.

Only those K2 devices that host a K2 FTP interface are on the streaming/FTP network, as follows:

- K2 Media Servers — Those with the role of FTP server are connected via their dedicated FTP port. On a redundant K2 SAN, if you have multiple K2 Media Servers with role of FTP server, balance servers between the A and B sides.
- Stand-alone K2 clients — While not a part of a K2 SAN, stand-alone K2 clients can also be on the streaming/FTP network. Connect to the dedicated FTP port.

NOTE: Shared storage K2 clients are not on the streaming/FTP network. They do not have a FTP interface and they do not send or receive streaming/FTP traffic.

Automatic FTP server failover is not provided by the K2 SAN. If you require automatic failover to a redundant FTP server for your streaming/FTP traffic, you must provide it through your FTP application.

Media (iSCSI) network description

The media network is exclusively for real-time iSCSI traffic on a K2 SAN. It must be on a different subnet than the control network and the streaming/FTP network. Furthermore, its traffic is kept physically separate from that of other networks. This separation is provided by dedicated ports, cables, and by a dedicated VLAN on the Ethernet switch or by separate switches. Static IP addresses are required for the media network. Name resolution is not necessary, so media network IP addresses are not required in host files.

The media network applies to online K2 SANs. Nearline K2 SANs do not have a media network.

Redundant K2 SANs have redundant media networks: an A media network and a B media network. The two networks are on separate subnets and are also physically separated onto the A Ethernet switch and the B Ethernet switch. InterSwitch Links (ISLs) between switches do not carry media (iSCSI) traffic. ISLs provide redundant paths for control network traffic and streaming/FTP network traffic only.

Devices are on the media network as follows:

- Shared Storage K2 client — On a non-redundant K2 SAN, the A media port connects to the media network. On a redundant K2 SAN, the A media port connects to the A media network and the B media port connects to the B media network.
- K2 Media Server — A server has one to four ports available for connection to a media network. These are iSCSI interface adapters, each of which supports the functionality of a TCP/IP Offload Engine (TOE). All the available media ports on a single K2 Media Server always connect to a single media network. On a redundant K2 SAN, one server is on the A media network and one server is on the

B media network.

Networking tips

- Before configuring any devices for networks, determine the full scope of IP addresses and names needed for the all the machines in your K2 system.
- It is recommended that you use the patterns offered in SiteConfig by default to establish a consistent convention for machine names and IP addresses. You can plan, organize, and enter this information in SiteConfig as you develop a system description. You can do this even before you have devices installed and/or cabled.
- Work with the network administrator at your facility to have IP addresses and names available for your use.

About hosts files

The hosts file is used by the control network and the streaming/FTP network for name resolution, which determines the IP address of a device on the network when only the device name (hostname) is given. The hosts file is located at *C:\Windows\system32\drivers\etc\hosts* on Windows XP and Windows 2003 Server operating system computers. The hosts file must be the same on all network devices. It includes the names and addresses of all the devices on the network.

For FTP transfers on a K2 SAN, transfers go to/from K2 Media Servers that have the role of FTP server. No transfers go directly to/from the shared storage K2 clients that are on the K2 SAN. To support FTP transfers, in the hosts file the K2 Media Server hostname must have the *_he0* extension added at the end of the name and that hostname must be associated with the K2 Media Server's FTP/streaming network IP address.

Here is an example of IP addresses and names associated in a hosts file:

```
192.168.100.11   root_server_1
192.168.101.11   root_server_1_he0
192.168.100.21   root_server_2
192.168.101.21   root_server_2_he0
192.168.100.31   root_server_3
192.168.101.31   root_server_3_he0
192.168.100.41   root_server_4
192.168.101.41   root_server_4_he0
192.168.100.51   root_raid_1
192.168.100.61   root_gige_1
```

In this example 192.168.100.xx is the control network and 192.168.101.xx is the streaming/FTP network. Each K2 Media Server has its hostname associated with its control network IP address. In addition, each K2 Media Server (that has the role of FTP server) has its *_he0* hostname associated with its streaming/FTP network address.

Use SiteConfig to define your networks and devices. When you do so, SiteConfig creates the correct hosts file and copies the hosts file to each network device. This enforces consistent hosts files across networks and reduces errors introduced by editing and copying hosts files on individual devices. You can also view hosts files from SiteConfig for troubleshooting purposes.

Host table tips

- If transferring to or from a Profile XP or Open SAN system via UIM, the hosts file must also follow UIM naming conventions for those systems. Refer to the *UIM Instruction Manual*.
- Do not enable name resolutions for media (iSCSI) network IP addresses in the hosts file, as hostname resolution is not required for the media network. If desired, you can enter media network information in the hosts file as commented text as an aid to managing your networks.
- Use the following tip with care. While it can solve a problem, it also introduces a name resolution "anomaly" that might be confusing if not considered in future troubleshooting activities.

  For each SAN (shared storage) K2 client, add the "_he0" suffix to the hostname but then associate that hostname with the K2 Media Server's FTP/streaming network IP address, not the K2 client's IP address. Aliasing K2 client hostnames in this way would not be required if the transfer source/destination was always correctly specified as the K2 Media Server. However, a common mistake is to attempt a transfer in which the source/destination is incorrectly specified as the K2 client. The host file aliasing corrects this mistake and redirects to the K2 Media Server, which is the correct transfer source/destination.

  An example of a hosts file entry with this type of aliasing is as follows:

  192.168.101.11 server_1_he0 client_1_he0 client_2_he0

Chapter 3

Cabling K2 SAN devices

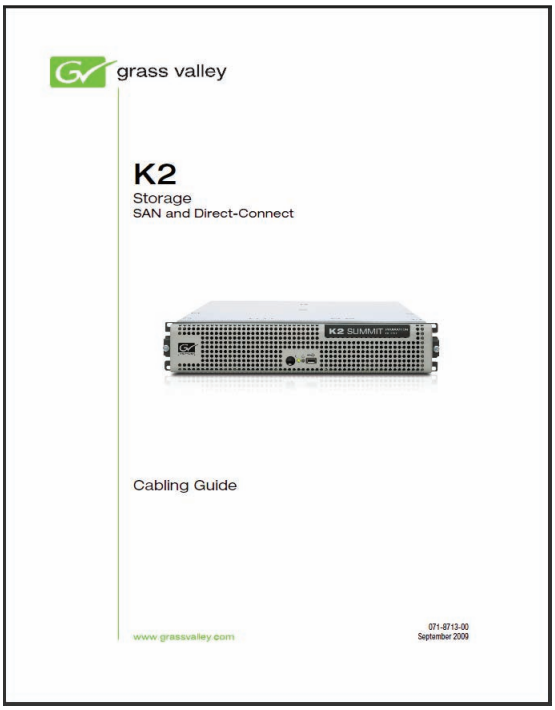
Use this chapter to cable the devices of your K2 SAN.

This chapter includes the following topics:

- "Using the cabling guide"
- "Cabling the Ethernet switch"
- "Cabling the K2 Media Server"
- "Cabling the Lx0 RAID chassis"
- "Cabling K2 Summit Clients for a K2 SAN"

Using the cabling guide

In most cases you should be able to cable your K2 SAN by referring to the cabling guide that comes packaged with your K2 SAN.



The cabling guides provides instructions specific for each level of K2 SAN. If you need additional information, you can refer to the following sections.

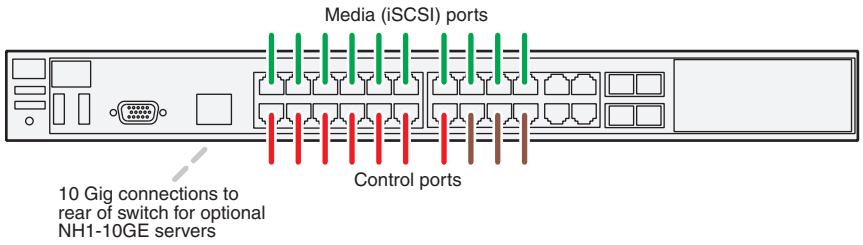
Cabling the Ethernet switch

These procedures are for the HP ProCurve switch 2900 and 2910 series. You must use this switch for iSCSI traffic.

For control and FTP/streaming traffic, it is allowed to use a different brand of switch, such as a Cisco Catalyst switch, if required by your site. If you are using a non-HP switch, apply the information in the following procedures accordingly. Refer to the documentation you received with the switch as necessary.

- Install the switch in its permanent location. When installing in a video equipment rack, use 10-32 screws. Do not use HP's 12-24 screws, as they can cause thread damage.
- Provide power to the switch.
- Use CAT5e or CAT6 cables. The maximum cable length is 50 meters for CAT5e and 100 meters for CAT6.
- Connect cables as follows:

One switch – HP ProCurve 29xx series – non-redundant



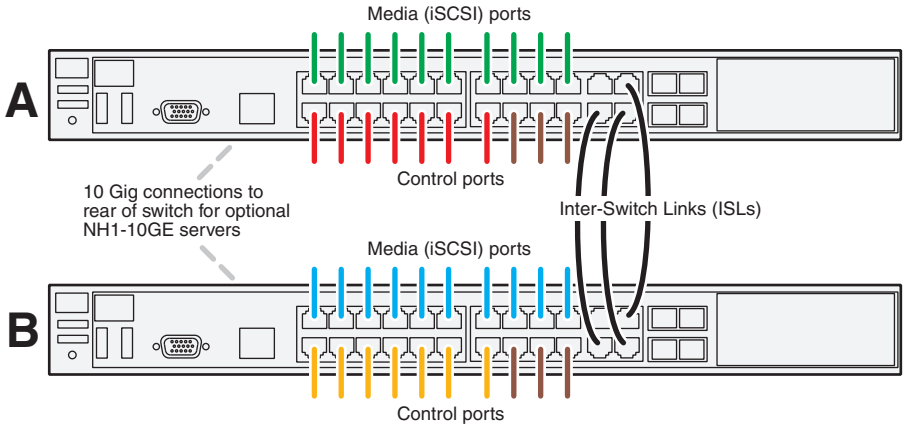
To the media ports make one iSCSI connection from each K2 client or other iSCSI client, and one to four iSCSI connections from the K2 Media Server.

To the control ports make a connection from each K2 client or other iSCSI client, from the RAID storage chassis, and from the control point PC. Also make the FTP network connection and the control network connection from the K2 Media Server.

If you have optional NH1 K2 Media Servers, connect their FTP network connections and control network connections to control ports on the switch.

If you have optional NH1-10GE K2 Media Servers, connect their 10 Gig FTP network connections to 10 Gig ports on the rear of the switch and connect their control network connections to control ports on the switch. Switches have two 10 Gig connectors standard and two 10 Gig connectors optional, so to connect three or four severs to a switch, you must first install the optional 10 Gig connectors in the switch.

Two switches – HP ProCurve 29xx series – redundant



To the media ports on switch A, make the “A” media (iSCSI) network connection from each K2 client. Also make one to four media (iSCSI) connections from K2 Media Server A.

To the media ports on switch B, make the “B” media (iSCSI) network connection from each K2 client. Also make one to four media (iSCSI) connections from K2 Media Server B.

To the control ports on switch A, make one connection from each K2 client, from RAID controller 0, and from the control point PC. Also make the control network connection and the FTP network connection from K2 Media Server A.

To the control ports on switch B, make the second control connection from each K2 client, and from RAID controller 1. Also make the control network connection and the FTP network connection from K2 Media Server B.

If you have other iSCSI clients, such as Aurora Edits, that have just one iSCSI connection and one control connection, approximately half of the clients should be connected to switch A and half of the clients should be connected to switch B. In a failover event, only the clients connected to one of the switches will remain operational, so make connections accordingly. Connect the client's iSCSI connection to one of the media ports on a switch and the client's control connection to one of the control ports on the same switch.

Interconnect switch A and switch B with three 1 Gig ISLs.

If you have optional NH1 K2 Media Servers, for each server connect its FTP network connection and its control network connection to the control ports on the same switch. Balance servers between switch A and switch B.

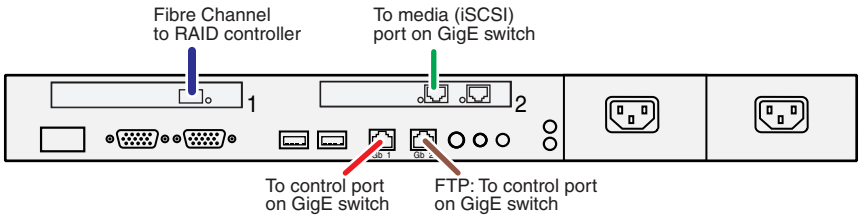
If you have optional NH1-10GE K2 Media Servers, for each server connect its 10 Gig FTP network connection to a 10 Gig port on the rear of the switch and connect its control network connection to a control port on the same switch. Balance servers between switch A and switch B. Switches have two 10 Gig connectors standard and two 10 Gig connectors optional, so to connect three or four severs to a switch, you must first install the optional 10 Gig connectors in the switch.

Cabling the K2 Media Server

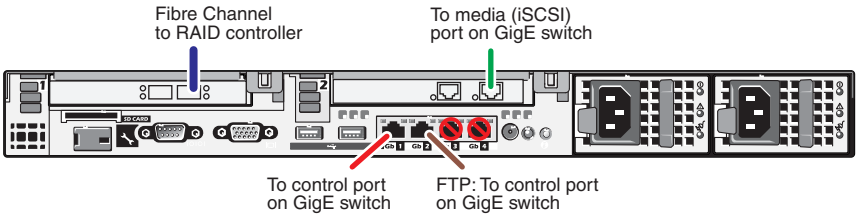
- Install the server in its permanent location. Refer to the rack mount instructions that you received with the server's product bundle.
- Provide power to the servers.
- Connect cables as follows:

Cabling the Level 10 K2 Media Server

One GS K2 Media Server – Dell 1950 PowerEdge – non-redundant



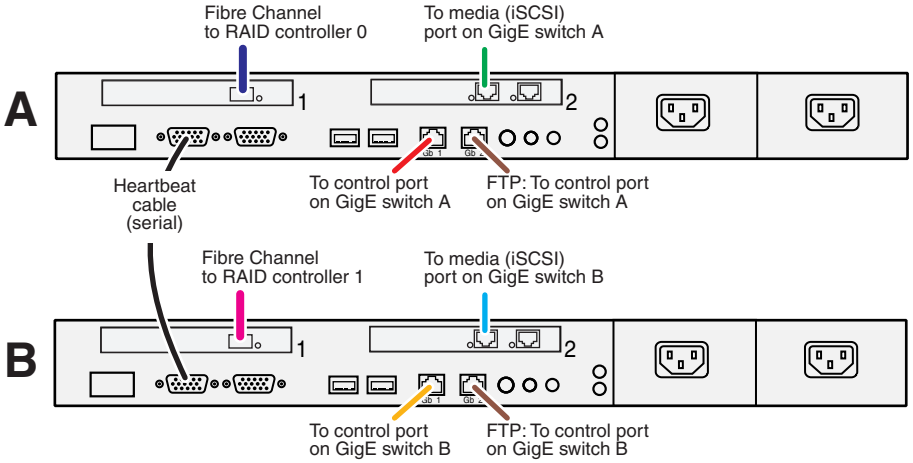
One GS K2 Media Server – Dell R610 PowerEdge – non-redundant



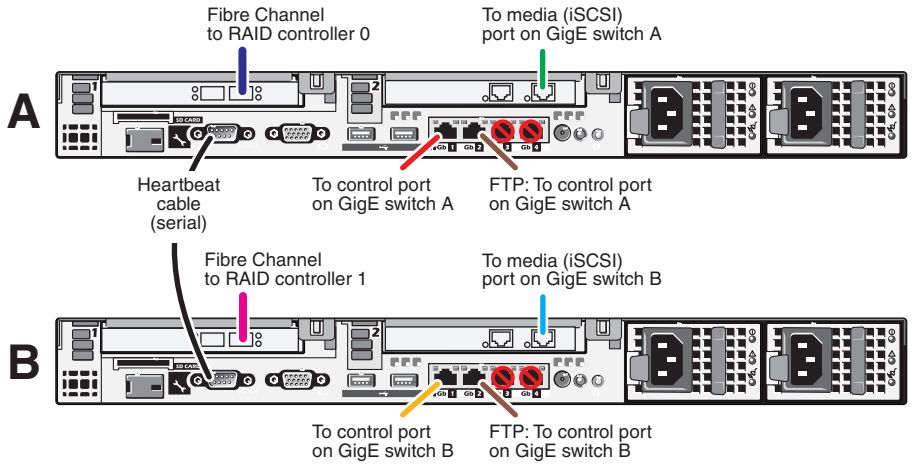
Connect the iSCSI interface port to a media port on the GigE switch. Connect the motherboard GigE port 1 and GigE port 2 to control ports on the GigE switch.

Connect the Fibre Channel port to the RAID storage device.

Two GS K2 Media Servers – Dell 1950 PowerEdge – redundant



Two GS K2 Media Servers – Dell R610 PowerEdge – redundant



Connect the iSCSI interface port to a media port on the GigE switch. Connect the A server to the A GigE switch. Connect the B server to the B GigE switch.

Connect the motherboard GigE port 1 and GigE port 2 to control ports on the GigE switch. Connect the A server to the A GigE switch. Connect the B server to the B GigE switch.

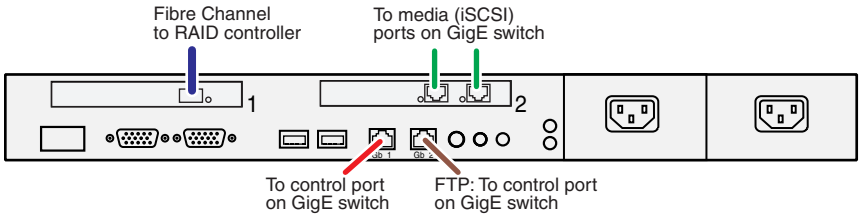
Connect the Fibre Channel port to the RAID storage device. Connect the A server to controller 0 and the B server to controller 1.

Make a direct connection between the serial ports of the two servers.

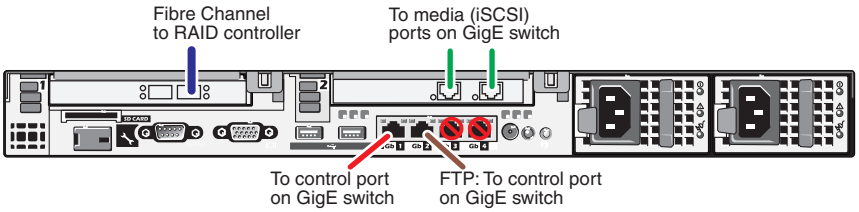
Take care to use the proper serial cable to interconnect redundant K2 Media Servers. This cable supports the heartbeat mechanism whereby the servers monitor each other's health. It is a 9 pin serial cable, but it is not a standard RS-232 null modem cable. The heartbeat cable is supplied with your system (Grass Valley part number 174-8137-00). Refer to the *K2 client System Guide* for pinout details.

Cabling the GS K2 Media Server

One GS K2 Media Server – Dell 1950 PowerEdge – non-redundant



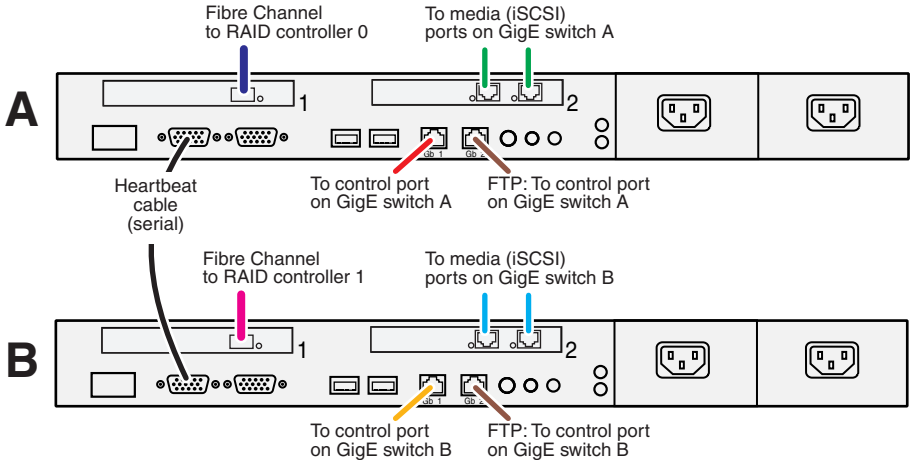
One GS K2 Media Server – Dell R610 PowerEdge – non-redundant



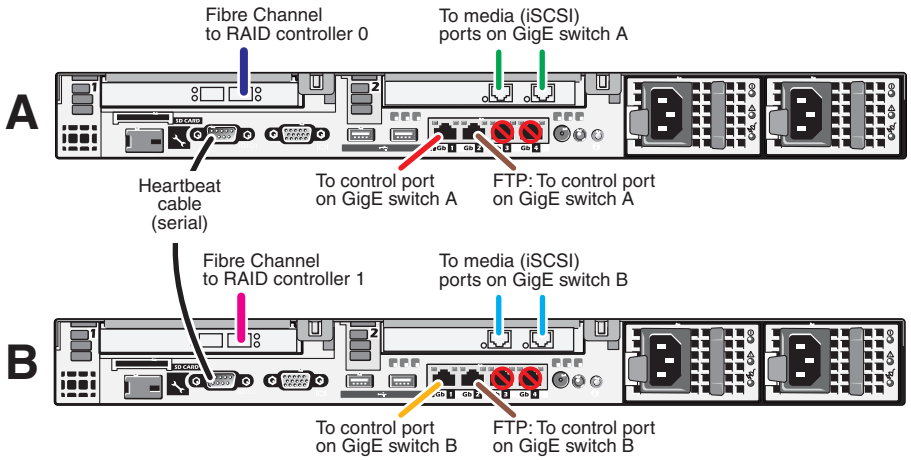
Connect the two iSCSI interface ports to media ports on the GigE switch. Connect the motherboard GigE port 1 and GigE port 2 to control ports on the GigE switch.

Connect the Fibre Channel port to the RAID storage device.

Two GS K2 Media Servers – Dell 1950 PowerEdge – redundant



Two GS K2 Media Servers – Dell R610 PowerEdge – redundant



Connect the two iSCSI interface ports to media ports on the GigE switch. Connect the A server to the A GigE switch. Connect the B server to the B GigE switch.

Connect the motherboard GigE port 1 and GigE port 2 to control ports on the GigE switch. Connect the A server to the A GigE switch. Connect the B server to the B GigE switch.

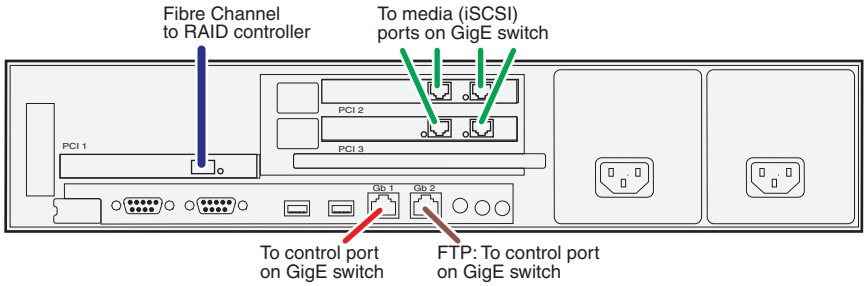
Connect the Fibre Channel port to the RAID storage device. Connect the A server to controller 0 and the B server to controller 1.

Make a direct connection between the serial ports of the two servers.

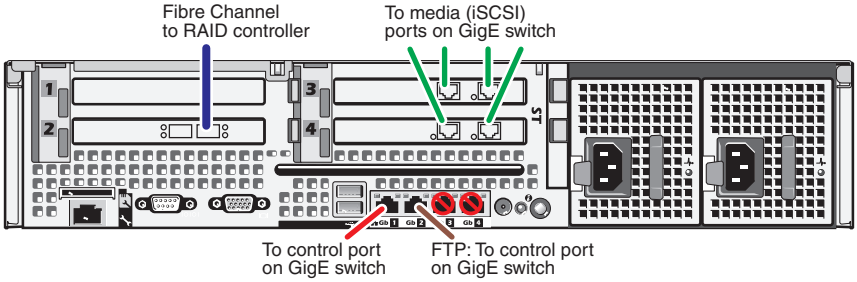
Take care to use the proper serial cable to interconnect redundant K2 Media Servers. This cable supports the heartbeat mechanism whereby the servers monitor each other's health. It is a 9 pin serial cable, but it is not a standard RS-232 null modem cable. The heartbeat cable is supplied with your system (Grass Valley part number 174-8137-00). Refer to the *K2 System Guide* for pinout details.

Cabling the LS K2 Media Server

One LS K2 Media Server – Dell 2950 PowerEdge – non-redundant



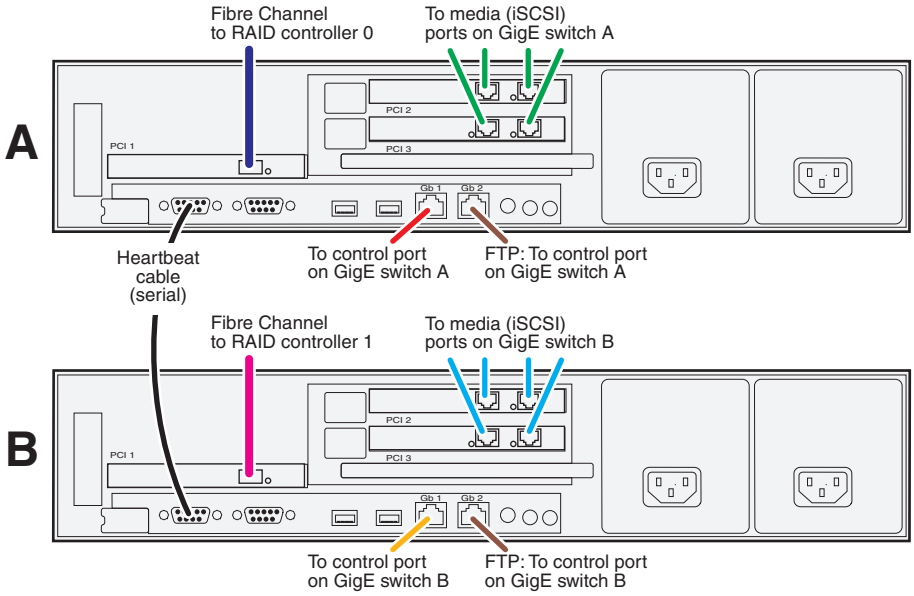
One LS K2 Media Server – Dell R710 PowerEdge – non-redundant



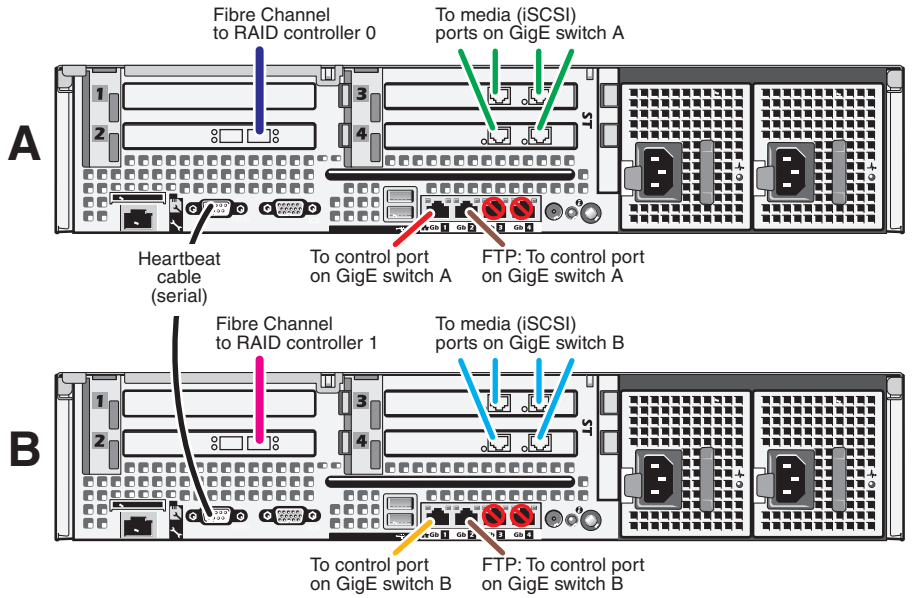
Connect the four iSCSI interface ports to media ports on the GigE switch. Connect the motherboard GigE port 1 and GigE port 2 to control ports on the GigE switch.

Connect the Fibre Channel port to the RAID storage device.

Two LS K2 Media Servers – Dell 2950 PowerEdge – redundant



Two LS K2 Media Servers – Dell R710 PowerEdge – redundant



Connect the four iSCSI interface ports to media ports on the GigE switch. Connect the A server to the A GigE switch. Connect the B server to the B GigE switch.

Connect the motherboard GigE port 1 and GigE port 2 to control ports on the GigE switch. Connect the A server to the A GigE switch. Connect the B server to the B GigE switch.

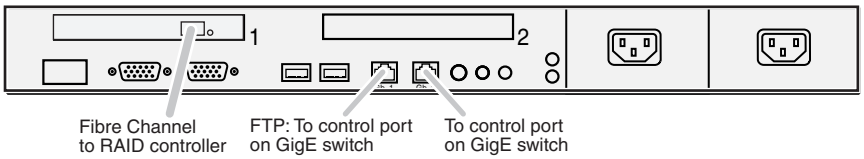
Connect the Fibre Channel port to the RAID storage device. Connect the A server to controller 0 and the B server to controller 1.

Make a direct connection between the serial ports of the two servers.

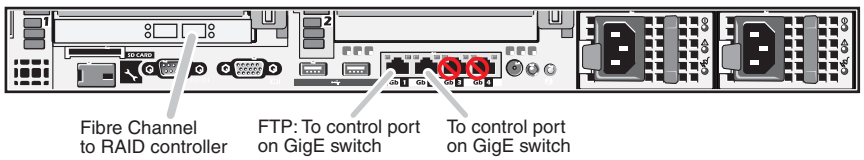
Take care to use the proper serial cable to interconnect redundant K2 Media Servers. This cable supports the heartbeat mechanism whereby the servers monitor each other's health. It is a 9 pin serial cable, but it is not a standard RS-232 null modem cable. The heartbeat cable is supplied with your system (Grass Valley part number 174-8137-00). Refer to the *K2 System Guide* for pinout details.

Cabling the NH K2 Media Server for an online K2 SAN

NH1 K2 Media Server – Dell 1950 PowerEdge – Online K2 SAN



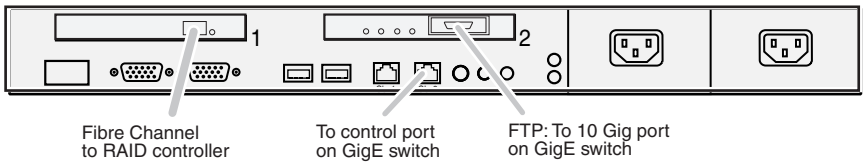
NH1 K2 Media Server – Dell R610 PowerEdge – Online K2 SAN



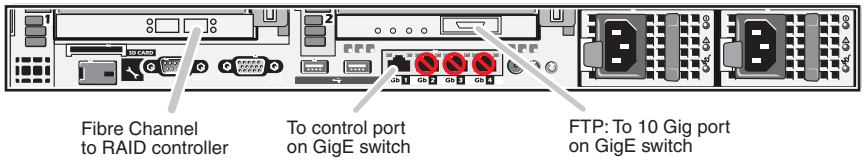
Connect the motherboard GigE port 1 (control) and GigE port 2 (FTP) to control ports on the GigE switch. If you have more than one NH1 server, balance servers between the A GigE switch and the B GigE switch.

Connect the Fibre Channel port to the RAID storage device. If you have more than one NH1 server, balance servers between controller 0 and controller 1.

NH1-10GE K2 Media Server – Dell 1950 PowerEdge – Online K2 SAN



NH1-10GE K2 Media Server – Dell R610 PowerEdge – Online K2 SAN



Connect the motherboard GigE port 1 (control) to a control port on the GigE switch. If you have more than one NH1-10GE server, balance servers between the A GigE switch and the B GigE switch.

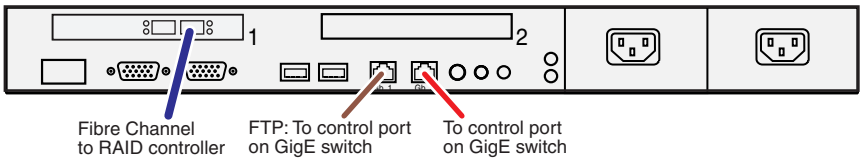
Connect the 10 Gig FTP port to the 10 Gig port on the rear of the GigE switch. If you have more than one NH1-10GE server, balance servers between the A

GigE switch and the B GigE switch.

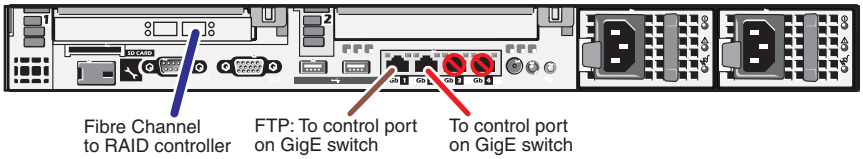
Connect the Fibre Channel port to the RAID storage device. If you have more than one NH1-10GE server, balance servers between controller 0 and controller 1.

Cabling the NH K2 Media Server for a Nearline K2 SAN

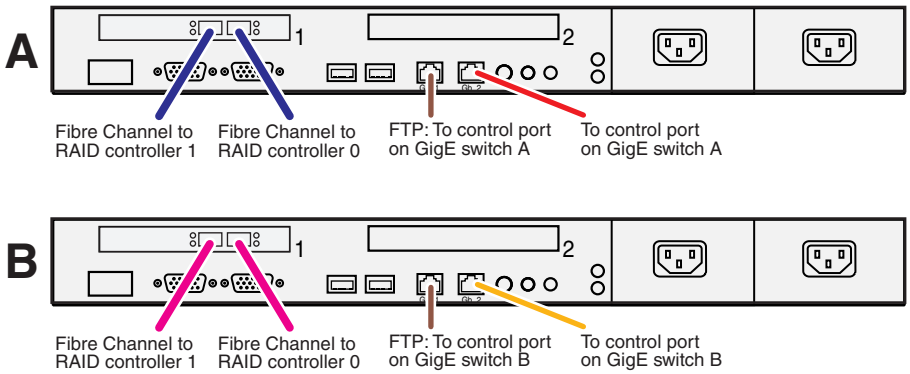
One NH1 K2 Media Server – Dell 1950 PowerEdge – Nearline 10 K2 SAN



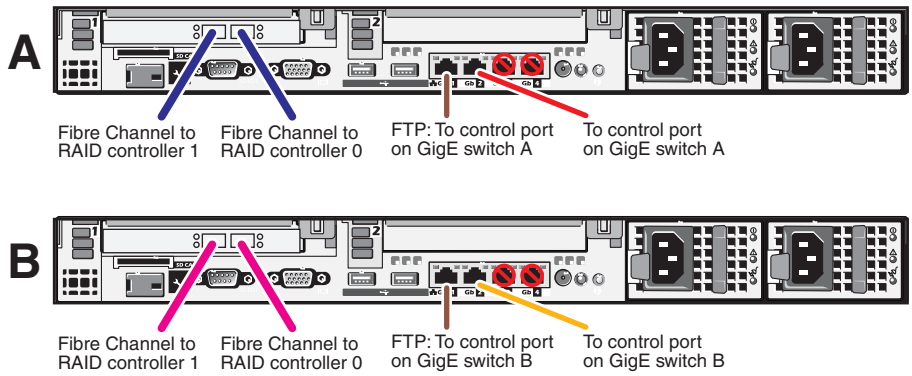
One NH1 K2 Media Server – Dell R610 PowerEdge – Nearline 10 K2 SAN



Two NH1 K2 Media Servers – Dell 1950 PowerEdge – Nearline 10R K2 SAN



Two NH1 K2 Media Servers – Dell R610 PowerEdge – Nearline 10R K2 SAN

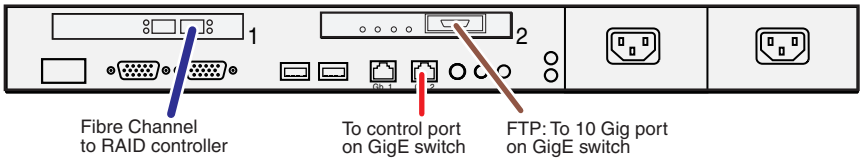


Connect the motherboard GigE port 1 (control) and GigE port 2 (FTP) to control ports on the GigE switch. For the NL10R system, connect server A to GigE switch A and connect server B to the GigE switch B.

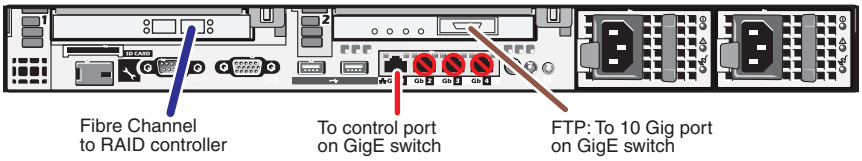
Connect Fibre Channel ports to the RAID storage device. For the NL10 system, connect one Fibre Channel port to the RAID controller. For the NL10R system, on each server connect one Fibre channel port to controller 0 and one Fibre channel port to controller 1.

- For the NL10R system, install MPIO software on the NH1 K2 Media Server.

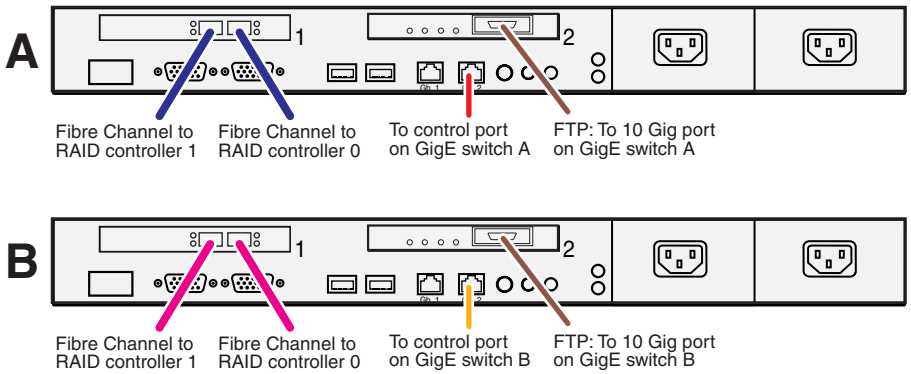
One NH1-10GE K2 Media Server – Dell 1950 PowerEdge – Nearline 10 K2 SAN



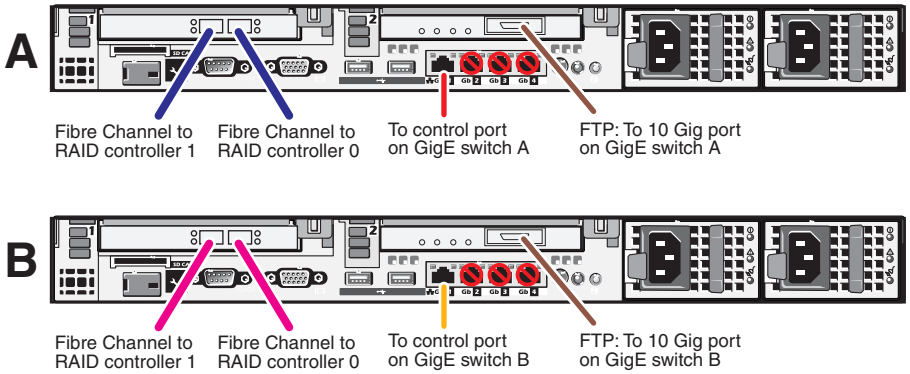
One NH1-10GE K2 Media Server – Dell R610 PowerEdge – Nearline 10 K2 SAN



Two NH1-10GE K2 Media Servers – Dell 1950 PowerEdge – Nearline 10R K2 SAN



Two NH1-10GE K2 Media Servers – Dell R610 PowerEdge – Nearline 10R K2 SAN



Connect the motherboard GigE port 1 (control) to a control port on the GigE switch. For the NL10R system, connect server A to GigE switch A and connect server B to the GigE switch B.

Connect the 10 Gig FTP port to the 10 Gig port on the rear of the GigE switch. For the NL10R system, connect server A to GigE switch A and connect server B to the GigE switch B.

Connect Fibre Channel ports to the RAID storage device. For the NL10 system, connect one Fibre Channel port to the RAID controller. For the NL10R system, on each server connect one Fibre channel port to controller 0 and one Fibre channel port to controller 1.

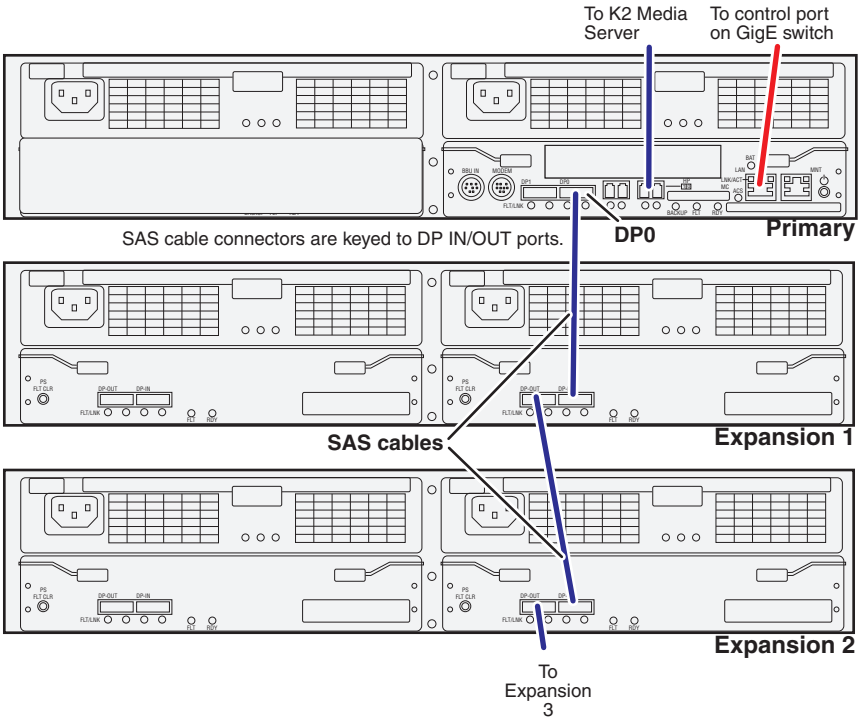
- For the NL10R system, install MPIO software on the NH-10GE K2 Media Server.

Cabling the Lx0 RAID chassis

- Install the chassis in its permanent location. After mounting the chassis in the rack, you must secure brackets to the front rail to support the Grass Valley bezel. Refer to the *K2 Lx0 RAID Instruction Manual* for rack mount instructions.
- On the Lx0 RAID, you do not need to manually set a Fibre Channel address ID on controllers or a chassis address on Expansion chassis.
- Cable as directed in the following sections.
- Once the RAID storage is connected and configured, do not swap Expansion chassis or otherwise reconfigure storage. If you connect an Expansion chassis in a different order or to the wrong controller, the controller will see a configuration mismatch and fault.

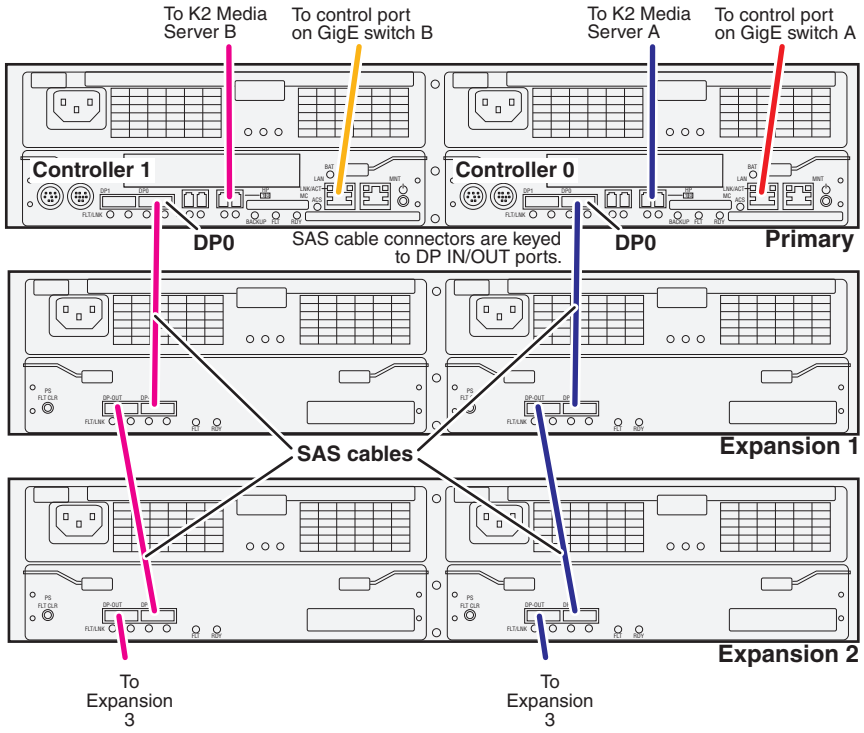
Connect Ethernet, Fibre Channel, and SAS cabling as shown.

Level 10 K2 SAN



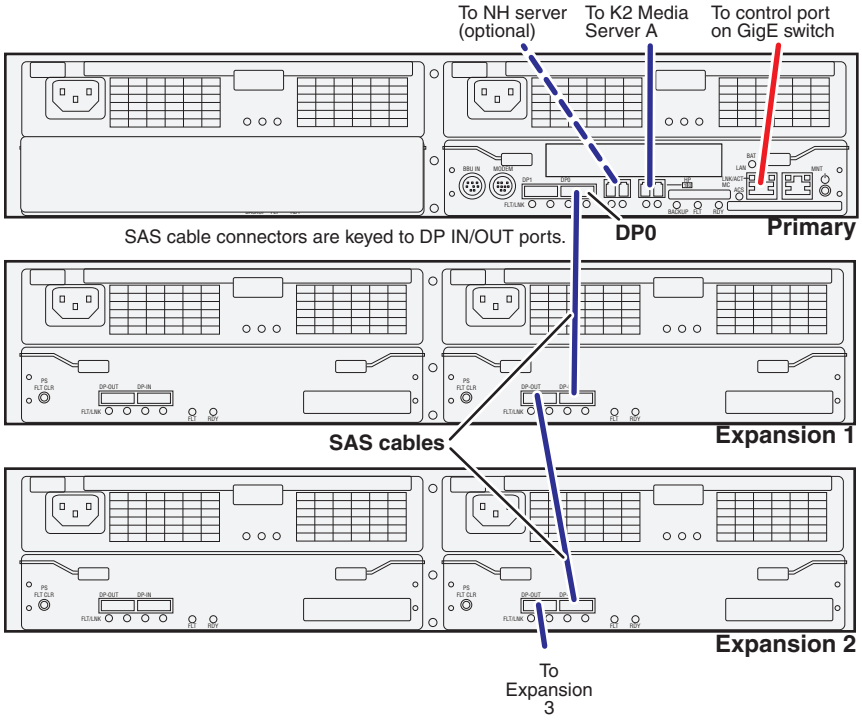
If you have more Expansion chassis than those illustrated, continue the indicated cabling pattern, connecting additional chassis to DP0.

Level 10R K2 SAN



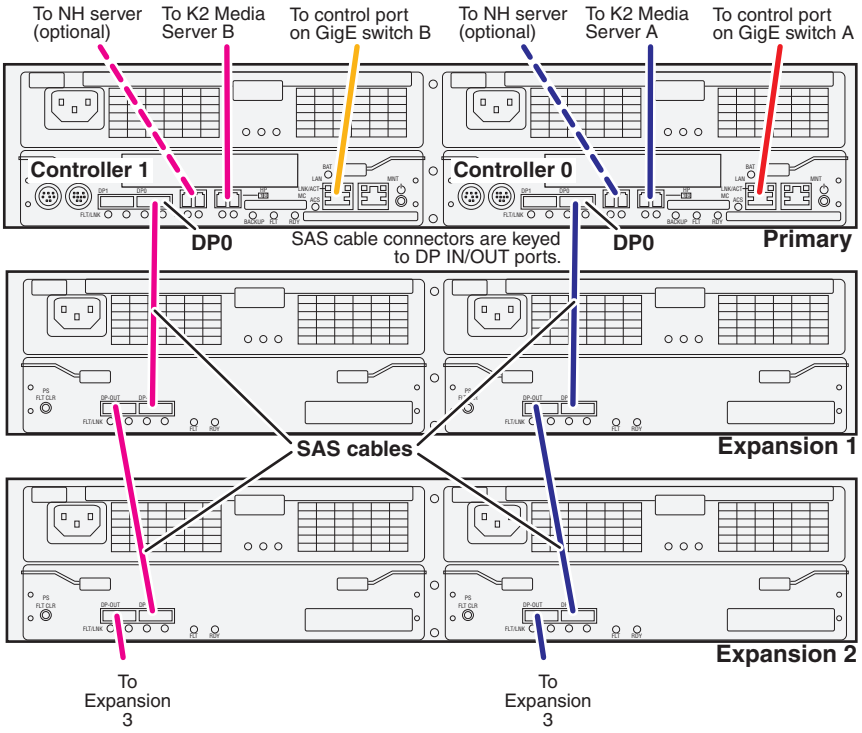
If you have more Expansion chassis than those illustrated, continue the indicated cabling pattern, connecting additional chassis to DP0.

Level 20 K2 SAN



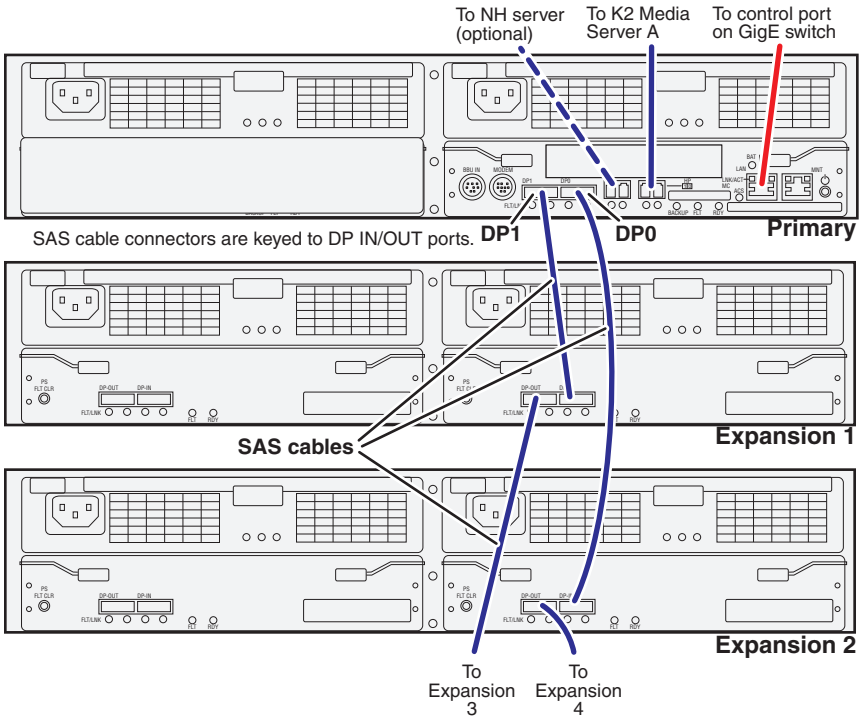
If you have more Expansion chassis than those illustrated, continue the indicated cabling pattern, connecting additional chassis to DP0.

Level 20R K2 SAN



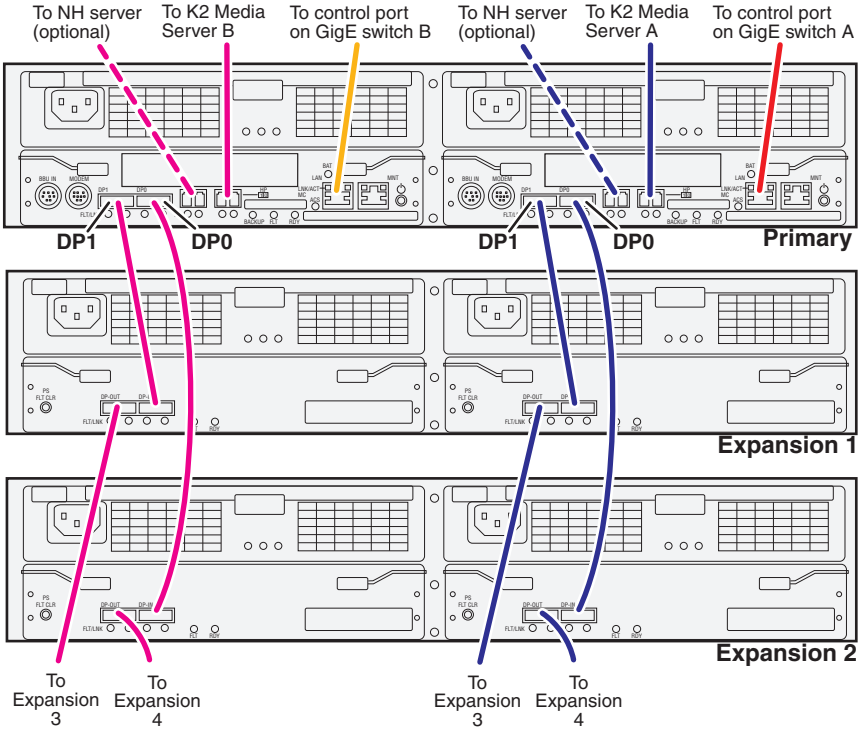
If you have more Expansion chassis than those illustrated, continue the indicated cabling pattern, connecting additional chassis to DP0.

Level 30 K2 SAN



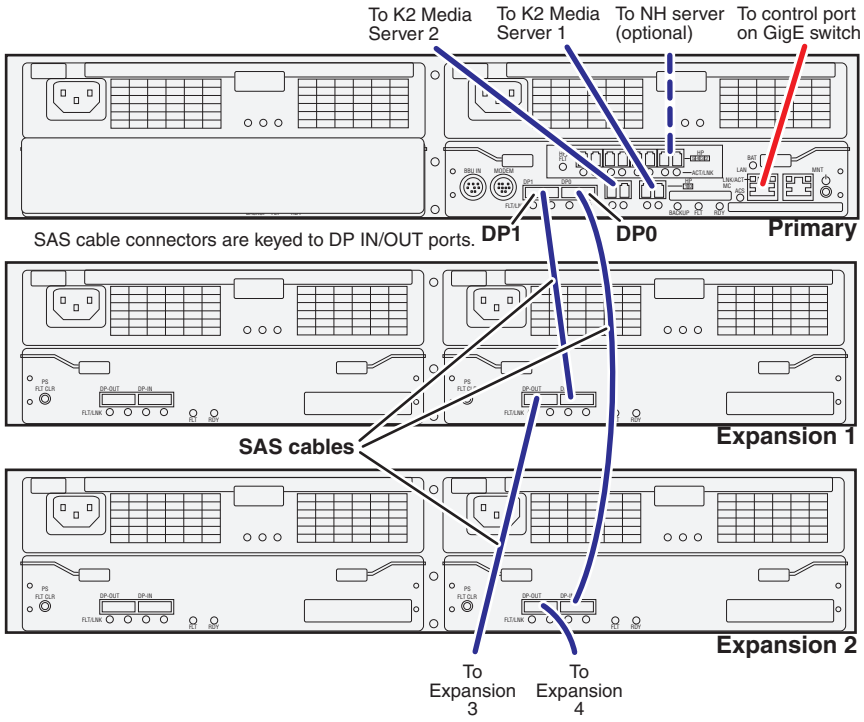
If you have more Expansion chassis than those illustrated, continue the indicated cabling pattern, alternating connections for additional Expansion chassis between DP1 and DP0. Expansion chassis 1, 3, 5, 7, etc. (odd numbers) connect to DP1. Expansion chassis 2, 4, 6, 8, etc. (even numbers) connect to DP0. For example, if you have four Expansion chassis (an even number), they are evenly balanced, so you have two connected to DP1 and two connected to DP0. If you have five Expansion chassis (an odd number), the “plus one” Expansion chassis is always connected to DP1, so you have three connected to DP1 and two connected to DP0.

Level 30R K2 SAN



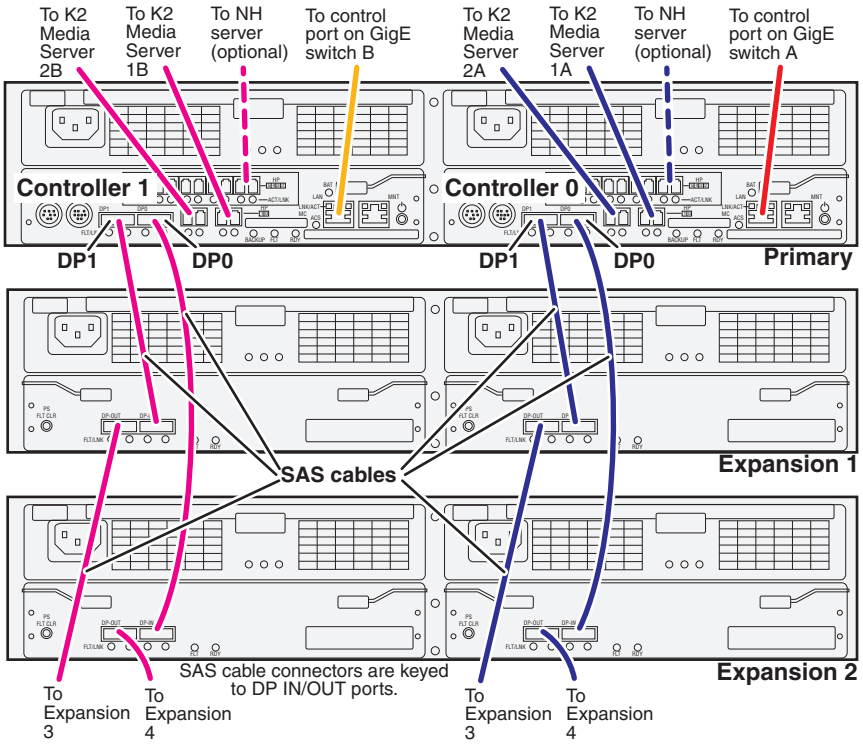
If you have more Expansion chassis than those illustrated, continue the indicated cabling pattern, alternating connections for additional Expansion chassis between DP1 and DP0. Expansion chassis 1, 3, 5, 7, etc. (odd numbers) connect to DP1. Expansion chassis 2, 4, 6, 8, etc. (even numbers) connect to DP0. For example, if you have four Expansion chassis (an even number), they are evenly balanced, so you have two connected to DP1 and two connected to DP0. If you have five Expansion chassis (an odd number), the “plus one” Expansion chassis is always connected to DP1, so you have three connected to DP1 and two connected to DP0.

Level 35 K2 SAN

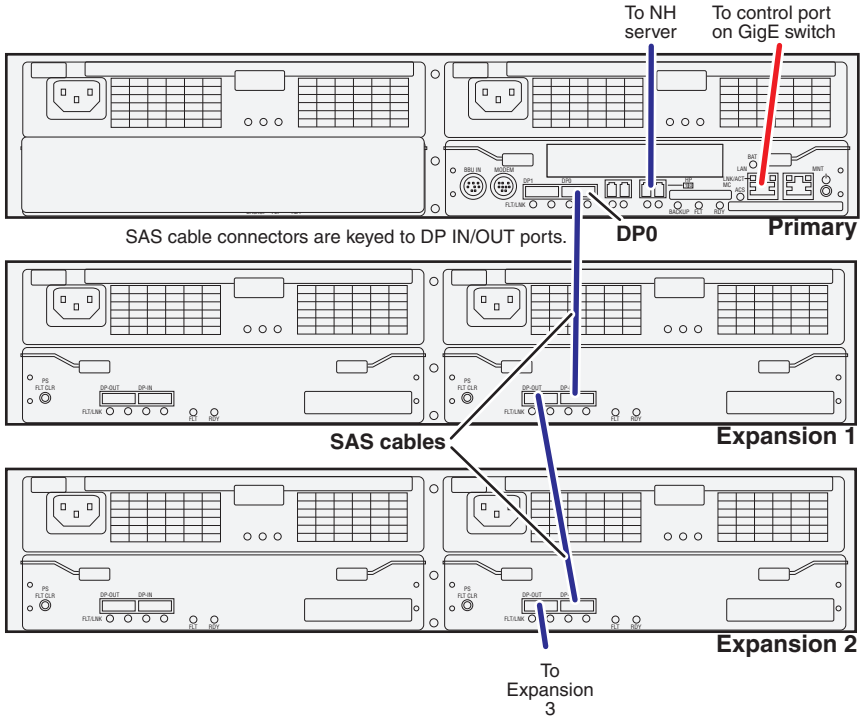


If you have more Expansion chassis than those illustrated, continue the indicated cabling pattern, alternating connections for additional Expansion chassis between DP1 and DP0. Expansion chassis 1, 3, 5, 7, etc. (odd numbers) connect to DP1. Expansion chassis 2, 4, 6, 8, etc. (even numbers) connect to DP0. For example, if you have four Expansion chassis (an even number), they are evenly balanced, so you have two connected to DP1 and two connected to DP0. If you have five Expansion chassis (an odd number), the “plus one” Expansion chassis is always connected to DP1, so you have three connected to DP1 and two connected to DP0.

Level 35R K2 SAN

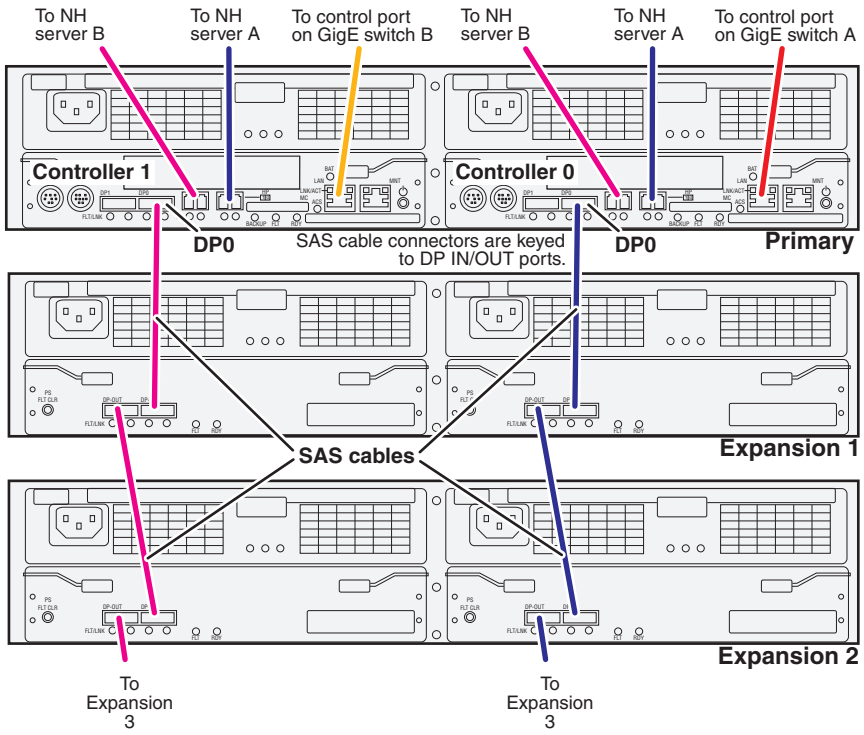


Nearline 10 K2 SAN



For the NL10 systems, if you have more Expansion chassis than those illustrated, continue the indicated cabling pattern, connecting additional chassis to DP0.

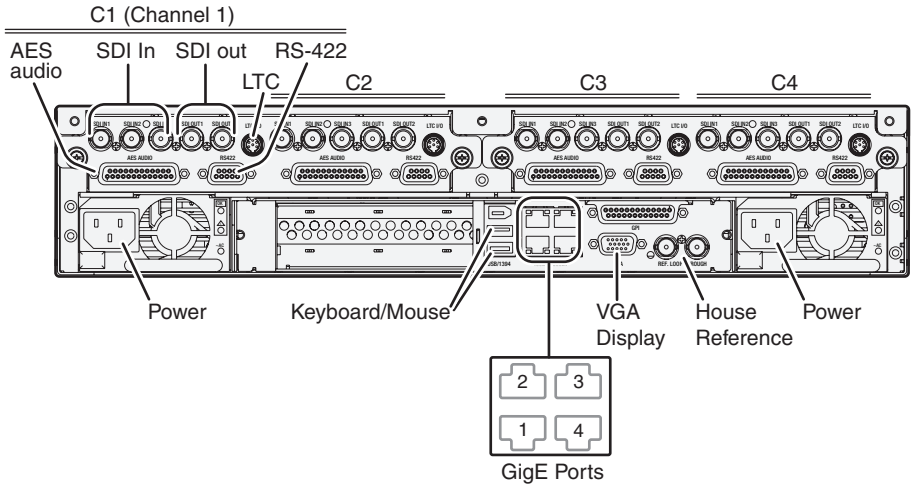
Nearline 10R K2 SAN



For the NL10R system, if you have more Expansion chassis than those illustrated, continue the indicated cabling pattern, alternating connections for additional Expansion chassis between DP1 and DP0. Expansion chassis 1, 3, 5, 7, and 9 connect to DP1. Expansion chassis 2, 4, 6, 8, and 10 connect to DP0.

Cabling K2 Summit Clients for a K2 SAN

- Install the K2 Summit Client in its permanent location.
- Provide power to the K2 Summit Client.
- Connect cables as follows:



Connect GigE port 1 to a control port on the K2 Ethernet switch. For a redundant connection connect GigE port 1 to a control port on the A Ethernet switch and GigE port 4 to a control port on the B Ethernet switch.

Connect GigE port 2 to a media (iSCSI) port on the K2 Ethernet switch. For a redundant connection connect GigE port 2 to a media port on the A Ethernet switch and GigE port 3 to a media port on the B Ethernet switch.

NOTE: The connections to GigE ports documented here are valid for external storage K2 Summit Clients that access shared storage on a K2 SAN. Refer to the K2 System Guide for GigE connections for internal storage or direct-connect storage (stand-alone) K2 Summit Clients.

Connect keyboard, mouse, and VGA monitor, if configuring locally. You can also access the Windows desktop remotely with Windows Remote Desktop Connection.

Connect other cabling as required.

•

Chapter 4

Setting up K2 SAN infrastructure

Use this chapter to implement the network switches and other infrastructure required for your K2 SAN.

This chapter includes the following topics:

- "Setting up the Ethernet switch"
- "Setting up the control point PC"

Setting up the Ethernet switch

These procedures are for the HP ProCurve switch 2900 and 2910 series. You must use this switch for iSCSI traffic.

For control and FTP/streaming traffic, it is allowed to use a different brand of switch, such as a Cisco Catalyst switch, if required by your site. If you are using a non-HP switch, apply the information in the following procedures accordingly. Refer to the documentation you received with the switch as necessary.

It is not required that a GigE switch be dedicated to the Nearline system. If enough "control" ports (non-iSCSI ports) are available on a switch or switches configured for an online K2 SAN, the Nearline system can be connected to those control ports.

Configuring the GigE switch via serial connection

The following procedure is for the HP ProCurve switch 29xx series. Do not use this procedure on other switch models.

Use a direct console connection to the switch, start a console session, and access the Switch Setup screen to set the IP address.

1. Configure the PC terminal emulator on the control point PC or another PC as a DEC VT-100 (ANSI) terminal or use a VT-100 terminal, and configure either one to operate with these settings:
   - Baud rate 9600
   - 8 data bits, 1 stop bit, no parity, and flow control set to Xon/Xoff
   - Also disable (uncheck) the "Use Function, Arrow, and Ctrl Keys for Windows" option
2. Connect the PC to the switch's Console Port using the console cable included with the switch. (If your PC or terminal has a 25-pin serial connector, first attach a 9-pin to 25-pin straight-through adapter at one end of the console cable.)
3. Turn on the PC's power and start the PC terminal program.
4. Press **Enter** two or three times and you will see the copyright page and the message "Press any key to continue". Press a key, and you will then see the switch console command (CLI) prompt.

NOTE: If you press Enter too many times and get past the log in, enter the command EN to get into the command line.

5. Type the following, then press **Enter**:

   ```
   menu
   ```

   If prompted to save the current configuration, answer no (press the n key) to proceed. The main menu opens.
6. On the main menu, choose **Switch Configuration,** then press **Enter**.
7. Select **IP Configuration**, then press **Enter**.
8. Press the right-arrow key to choose **Edit**, then press **Enter**. Tab to fields and enter

information as follows:

a. Change **Gateway** to be the default router.

b. Tab to the **IP Config (DHCP/Bootp)** field and use the Space bar to select the **Manual** option.

c. Tab to the **IP Address** field and enter the switch's control network IP address.

d. Tab to the **Subnet Mask** field and enter the subnet mask used for your network.

9. Press **Enter**, then right-arrow to **Save**. Press **Enter** and revert to previous menu.

10. Select **Return to Main Menu** and press **Enter**.

11. From the main menu, chose **Console Passwords** and press **Enter**. The Set Password Menu opens.

12. Chose **Set Manager Password** and press **Enter**.

13. When prompted for the password, type a password of up to 16 ASCII characters with no spaces and press **Enter**. The password can be one that is used on other K2 devices, such as "adminK2" or "K2Admin", or it can be your site's administrator password.

14. When prompted to enter the password again, retype the password and press **Enter**.

15. Select **Return to Main Menu** and press **Enter**.

16. From the main menu, tab to **Command Line (CLI)** and press **Enter**. The command prompt appears.

17. Type the following, then press **Enter**:

```
configure
```

You are now in configuration mode.

18. Configure an administrator username. The username can be one that is used on other K2 devices, such as "Administrator" or "K2Admin", or it can be your site's administrator username. For example, to set the username to "administrator" type the following, then press **Enter**:

```
password manager user-name administrator
```

19. When prompted, enter and re-enter the password.

20. Set spanning tree to RSTP. Type the following, then press **Enter**:

```
spanning-tree force-version rstp-operation
```

This configures spanning tree, but it does not turn spanning tree on. You must turn spanning tree on using the switch's Web interface.

21. Decide your SNMP community name as explained in the following options, then proceed with the next step:

- If you decide to use a unique SNMP community name (not "public"), add the community and set its RW permissions. For example, if the community name is "K2", type the following, then press **Enter**:

```
snmp-server community K2 unrestricted
```

- If you decide to use the default SNMP community "public" for NetCentral

monitoring, which already has RW permissions set as required by NetCentral, proceed to the next step.

22. Enter the SNMP community and IP address of the NetCentral server PC. For example, if the IP address is "192.168.40.11" and the community is "public", you type the following, then press **Enter**:

```
snmp-server host public 192.168.40.11
```

23. Enable Authentication traps. Type the following, then press **Enter**:

```
snmp-server enable traps snmp-authentication standard
```

This allows NetCentral to test the switch to verify that it can send its SNMP trap messages to NetCentral.

24. Type the following, then press **Enter**:

```
menu
```

When prompted, save the configuration by pressing the y key. The main menu opens.

25. If you need a trunk for ISLs to gang switches together, use the following steps. These steps illustrate trunking the last three 1 Gig ports for three 1 Gig ISLs, which is the recommended configuration for ISLs on all multi-switch K2 SANs. Consult with your Grass Valley representative if your requirements deviate from the recommended policy:

    a. At the main menu, select **Switch Configuration** and press **Enter**.

    b. Choose selection **Port/Trunk Settings** and press **Enter**.

    c. Press the right-arrow key to choose **Edit**, then press **Enter**.

    d. Down arrow until at the bottom of the list of ports and select the last (highest port number) 1 Gig port in the list.

    e. Right-arrow over to the Group column.

    f. Use the Space bar and set the bottom 1 Gig port to **Trk1**.

    g. Set the next port up also to **Trk1**.

    h. Set the next port up also to **Trk1**.

    i. Press **Enter**, then right-arrow to **Save**. Press **Enter** and revert to previous menu.

26. Select **Return to Main Menu** and press **Enter**.

27. From the main menu, tab to **Command Line (CLI)** and press **Enter**. The command prompt appears.

28. Check the version of firmware currently installed on the switch. Type the following, then press **Enter**:

```
show flash
```

Information is displayed similar to the following example:

```
HP_iSCSI_switch1# show flash
Image           Size(Bytes)   Date   Version
-----           -----------  -------- -------
```

```
Primary Image   : 6737518 07/25/08 T.13.23
Secondary Image : 5886358 10/26/06 T.11.12
Boot Rom Version: K.12.12
Current Boot    : Primary
```

29. Check the Primary Image Version and refer to your *K2 Release Notes* for information about currently supported versions. Then proceed as follows:
    - If *K2 Release Notes* instruct you to change the firmware on the switch, do so before continuing. Refer to the documentation you received with the switch for instructions to change the firmware. Then continue with the next procedure.
    - If *K2 Release Notes* confirm that the version on the switch is a currently supported version, continue with the next procedure.
30. Type the following, then press **Enter**:

    ```
    menu
    ```

    The main menu opens.
31. From the main menu, choose **Reboot Switch** and press **Enter**. When prompted "Continue Reboot…?', answer yes (press the y key) to proceed. The switch restarts.
32. You can now use the switch's web browser interface for further configuration, as instructed in the next procedure.
33. Close the PC terminal program and disconnect the console cable.
34. if you have multiple switches, repeat this procedure on the other switches.

Continue with the next procedure "Configuring the GigE switch via the Web interface".

Configuring the GigE switch via the Web interface

The following procedure is for the HP ProCurve switch 29xx series. Do not use this procedure on other switch models.

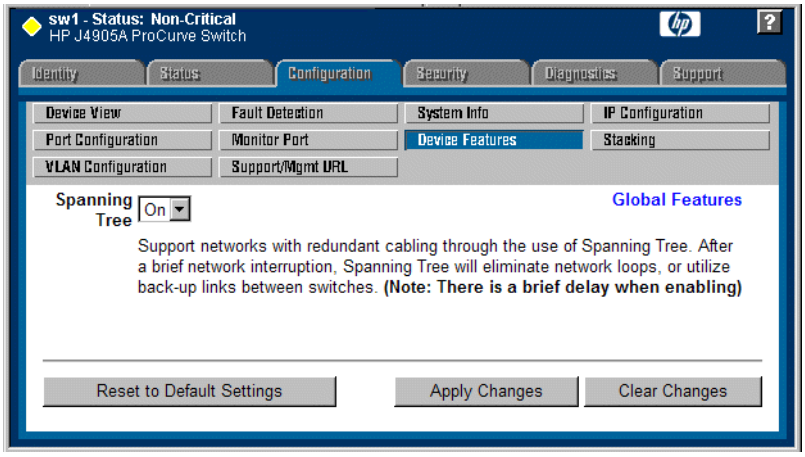
1. From the control point PC or another PC, make sure that you have a direct Ethernet cable connection to the switch, with no switches, routers, proxies, or other networking devices in between.
2. On the PC, open Internet Explorer and type the switch's IP address in the Address field, as in the following example.

   ```
   http://192.168.100.61
   ```

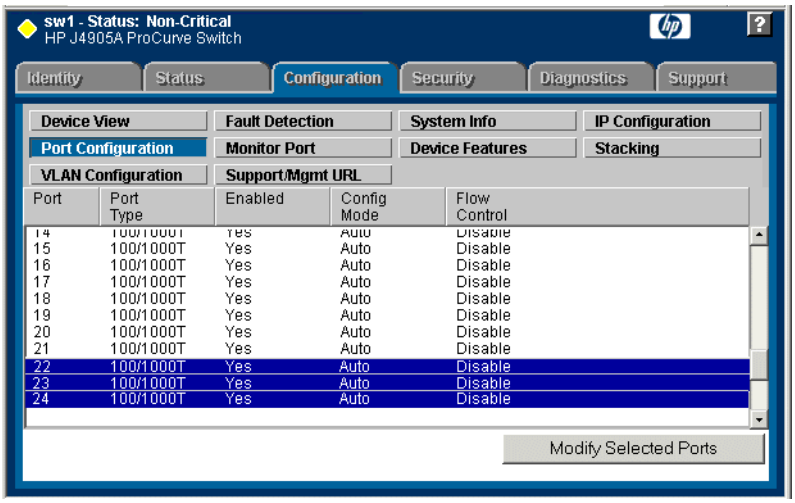
   This should be the name or IP address as currently configured on the switch.
3. Press **Enter** to open the switch's configuration application.

NOTE: The configuration application for the HP ProCurve switch requires Java.

   You can also access the switch's configuration application from the K2 System Configuration application.
4. In the switch's configuration application, choose **Configuration**, then **Device Features**.

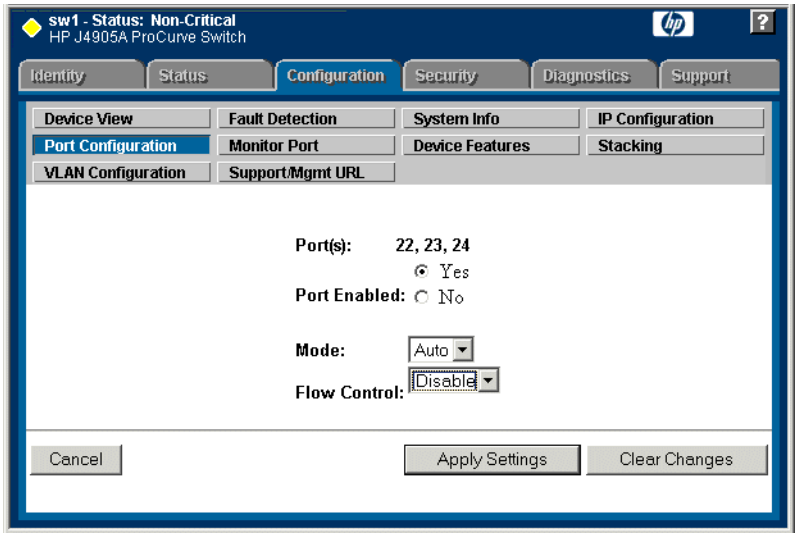


5. Set Spanning Tree to **On** and click **Apply Changes**. If prompted, log in with the switch's administrator username and password.
6. Click **Port Configuration**.



7. If you do not need trunks, such as on a one-switch system, skip to the next step in this procedure. If you need trunks, such as on a two-switch system with ISLs, do the following:
   a. Select (Ctrl + Click) the trunked ports. Typically the trunked ports are at the bottom of the list and are labeled Trk1.
   b. Click **Modify Selected Ports**.

      If prompted, log in as administrator.



c. For the trunked ports, set Port Enabled to **Yes**. On some switch models, some ports are disabled by default, so make sure you enable them. Leave Mode as default of **Auto**.

d. Set Flow Control as follows:

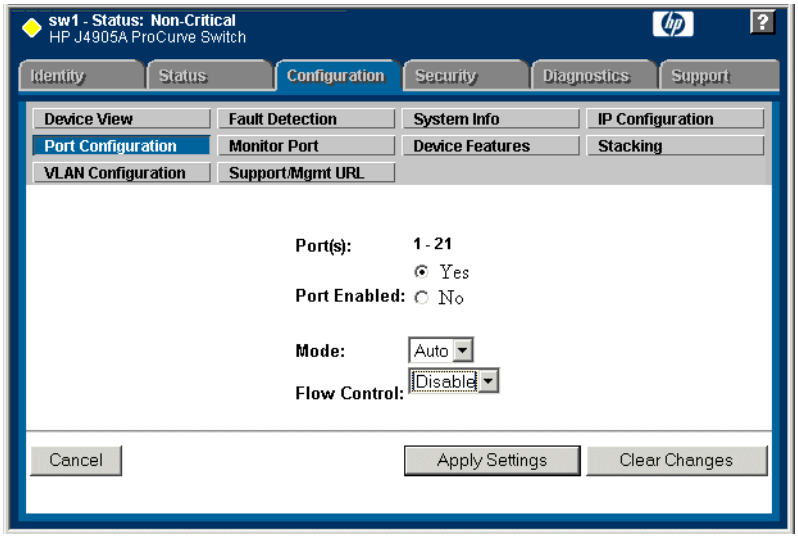
   - Set to **Disable**.

e. Click **Apply Settings**.

8. On the Port Configuration page, do one of the following:

   - If you do not have trunks, select all ports.
   - If you have trunks, select the remaining ports (the ports not trunked).

9. Click **Modify Selected Ports**.



10. Make sure Port Enabled is set to **Yes**, leave Mode as default of **Auto**.

11. Set Flow Control as follows:

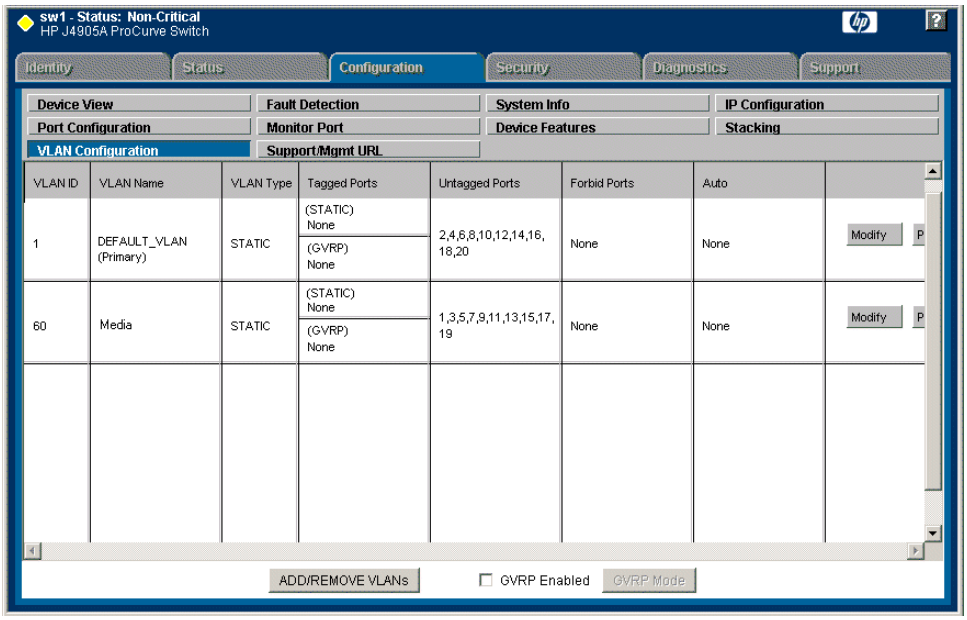
    - Set to **Disable**.

12. Click **Apply Settings**. Wait until settings are applied and the Web interface becomes active.

13. Proceed as follows:

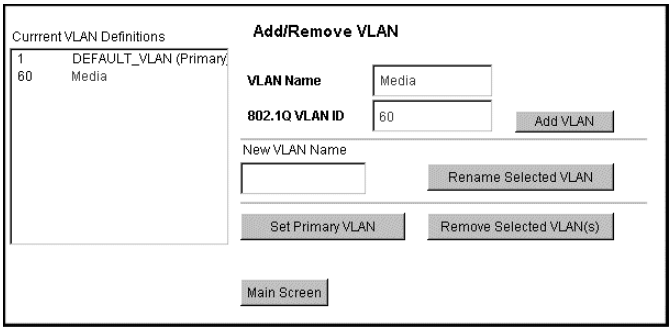
    - If the switch carries no media (iSCSI) traffic, such as for a Nearline system, there is no need to configure VLANs. Skip to the end of this procedure.
    - If the switch carries media (iSCSI) traffic, then it must have VLANs configured. Continue with the next step in this procedure.

14. Choose **VLAN Configuration**. If prompted, log in with the switch's administrator username and password.



15. Create a new Media (iSCSI) VLAN as follows:

    a. Click **Add/Remove VLANs**.



    b. In the VLAN Name field enter `Media`.

    c. In the VLAN ID field enter `60`.

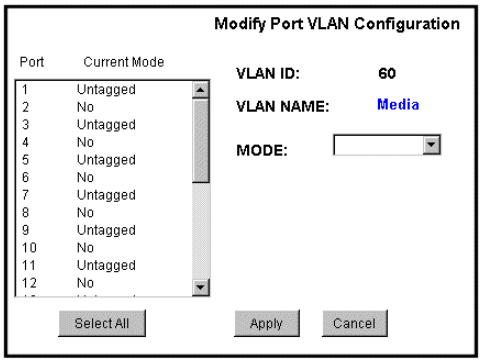
    d. Click **Add VLAN**.

    e. If prompted, log in as administrator.

    f. Click **Main Screen** to return to VLAN Configuration.

16. Configure the Media VLAN as follows:

    a. In the Media VLAN row, click **Modify**.



b. Select all the odd numbered ports. (Tip: Use Ctrl + Click.)

c. In the Mode drop-down list, select **Untagged**, then click **Apply**. This removes the odd ports from the default (Control) VLAN.

   If you have a trunk, do not configure it as "Tagged". Media VLAN traffic (iSCSI) does not go over the trunk.

17. Click the **VLAN Configuration** tab.

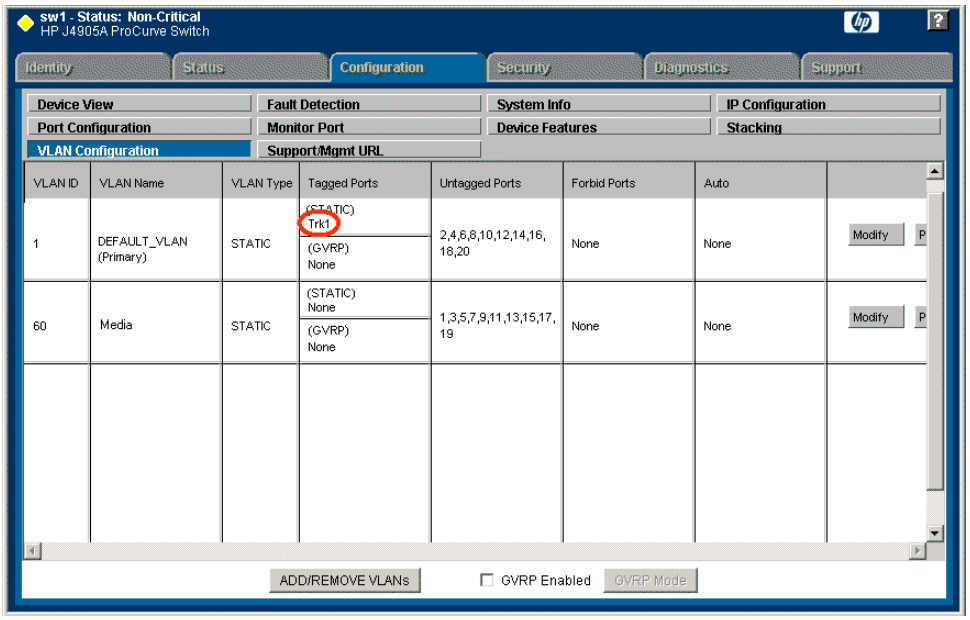
18. If you have a trunk, configure the default (Control) VLAN as follows:

    a. In the DEFAULT_VLAN row, click **Modify**.

    b. In the Current Mode list box, scroll down and select the trunk.

    c. In the Mode drop-down list, select **Tagged**, then click **Apply**. This allows default VLAN traffic (non-iSCSI) to go over the trunk.

19. Click the **VLAN Configuration** tab.



20. If you have a trunk, verify that for the default VLAN the trunk is displayed in the Tagged Ports column.
21. If you have two switches, repeat this procedure for the other switch.
22. Close the switch configuration application.

Configuring QOS on the GigE switch

Prerequisites for this procedure are as follows:

- The switch is HP ProCurve switch 29xx series.
- Trunks, VLANs and all other configuration is complete.
- The switch has an IP address
- You have network access to the switch

Use this procedure to make the Quality of Service (QOS) setting on the HP ProCurve switch 29xx series.

1. If you have not already done so, from a network connected PC open the MS-DOS command prompt and login to the switch as administrator, as follows:
   a. Telnet to the switch. For example, if the switch's IP address is 192.168.40.12, you type the following, then press **Enter**.

      ```
      telnet 192.168.40.12
      ```

   b. Press **Enter** one or more times until the switch's username prompt appears.
   c. Type the switch's administrator username and press **Enter**, then type the switch's administrator password and press **Enter**. The switch console command (CLI) prompt appears.
2. Type the following, then press **Enter**:

   ```
   config
   ```

   You are now in configuration mode.
3. Type the following, then press **Enter**:

   ```
   show qos vlan
   ```

   The screen displays VLAN information. Note the ID number of the Media (iSCSI) VLAN. It should be 60, as follows:

   ```
   VLAN priorities

     VLAN ID Apply rule   | DSCP   Priority
     ------- ------------ + ------ ------------
     1       No-override  |        No-override
     60      No-override  |        No-override
   ```

   a. Assign the Media VLAN the QOS priority of 3. For example, if the VLAN ID is 60, you type the following, then press **Enter**.

```
vlan 60 qos priority 3
```

4. Type the following, then press **Enter**:

   ```
   show qos vlan
   ```

   The screen displays VLAN information. Make sure that the Priority column reports that the Media VLAN has a value of 3.

Verifying the flow control setting on the GigE switch

Prerequisites for this procedure are as follows:

- The switch is HP ProCurve switch 29xx series.
- Trunks, VLANs, QOS, and all other configuration is complete.
- The switch has an IP address
- You have network access to the switch

Use this procedure to check flow control settings, and if necessary, configure flow control to “off” (disabled) for all ports.

1. If you have not already done so, from a network connected PC open the MS-DOS command prompt and login to the switch as administrator, as follows:
   a. Telnet to the switch. For example, if the switch’s IP address is 192.168.40.12, you type the following, then press **Enter**.

      ```
      telnet 192.168.40.12
      ```

   b. Press **Enter** one or more times until the switch’s username prompt appears.
   c. Type the switch’s administrator username and press **Enter**, then type the switch’s administrator password and press **Enter**. The switch console command (CLI) prompt appears.
2. Type the following, then press **Enter**:

   ```
   config
   ```

   You are now in configuration mode.
3. Type the following, then press **Enter**:

   ```
   show interface brief
   ```

   The screen displays setting for all ports. In the Flow Ctrl column (at the right) idenfity settings for ports and proceed as follows:
   - If all ports are set to “off”, no further configuration is necessary. Do not proceed.
   - If one or more ports are set to “on”, continue with this procedure.
4. Set ports to flow control “off” as necessary. You can set a range of ports. For example, to set ports 1 - 21 to off, you type the following, then press **Enter**.

   ```
   no int 1-21 flow-control
   ```
5. Type the following, then press **Enter**:

   ```
   show interface brief
   ```

   Verify that all ports have flow control set to off.

Setting up the control point PC

To set up the Control Point PC, you have the following options:

- Use the Grass Valley Control Point PC that comes from the factory with software pre-installed.
- Use a PC that you own and install the required software.

For either option, you must do the following for the Control Point PC that runs the K2 System Configuration application:

- Assign a control network IP address to the PC. Refer to "Networking tips" on page 112.
- Connect the PC to the GigE control network.

To use your own PC, you must additionally do the following:

- Verify that the PC meets system requirements, as specified in "Control Point PC system requirements" in the Specifications section.
- Install the K2 Control Point software.
- Install SiteConfig software.
- Install other supporting software. Refer to the *K2 System Guide*.
- Install and license NetCentral server software. This can be on the K2 SAN control point PC or on a separate NetCentral server PC that monitors the K2 SAN.

Also refer to "Control point PC description" on page 372.

To fix the screen resolution problem seen with NetCentral on the Grass Valley Control Point PC, do the following:

1. Go to Display properties (right mouse selection of properties on the display area)
2. Select Settings tab
3. Select the Advanced button
4. In the General tab, set the DPI setting to Normal size (96 DPI)
5. Restart the PC

Installing SiteConfig on the control point PC

Pre-requisites for this procedure are as follows:

- The control point PC must meet minimum system requirements.

1. Procure the SiteConfig software installation file on the SiteConfig software CD, via download, or other method.
2. Insert the SiteConfig software CD or otherwise provide the control point PC access to the software installation file.

3. If a previous version of SiteConfig is installed, uninstall it using Windows Add/ Remove Programs.
4. Run the SiteConfig *setup.exe* file.
5. Follow on-screen instructions.

Chapter 5

Planning and implementing a K2 SAN with SiteConfig

Use this chapter to plan and implement systems and networks for your K2 SAN.

This chapter includes the following topics:

- "About developing a system description"
- "Importing a system description"
- "About device and host names"
- "Modifying a device name"
- "Modifying the control network"
- "Modifying the FTP/streaming network"
- "Modifying a media (iSCSI) network"
- "About IP configuration of network interfaces on devices"
- "Modifying K2 client unassigned (unmanaged) interface"
- "Modifying K2 Media Server unassigned (unmanaged) interface"
- "About SiteConfig support on K2 devices"
- "Discovering devices with SiteConfig"
- "Assigning discovered devices"
- "Modifying K2 client managed network interfaces"
- "Modifying K2 Media Server managed network interfaces"
- "Making the host name the same as the device name"
- "Pinging devices from the control point PC"
- "About hosts files"
- "Generating host tables for devices"

About developing a system description

You use SiteConfig to create or modify a system description for the K2 SAN. You can do this in your planning phase, even before you have devices installed or cabled. Your goal is to have the SiteConfig system description accurately represent all aspects of your devices and networks before you begin actually implementing any networking or other configuration tasks.

There are several task flows you can take to develop a system description, as follows:

- Obtain the sales tool system description. This is the system description that was developed for your specific K2 SAN as part of the sales process. It should be a very accurate representation of the K2 SAN that is to be installed at the customer site. Import the system description into SiteConfig and then make final modifications.
- Obtain a similar K2 SAN's system description, import it into SiteConfig, and then modify it until it matches your K2 SAN.
- In SiteConfig, use the New Site Wizard to create a new system description. The wizard has models based on the pre-defined K2 SAN levels. You can enter much of your site-specific information as you work through the wizard, and then do final modifications using other SiteConfig features.

The topics in this manual follow the task flow for the sales tool system description. If you are using a different taskflow, use the topics in this manual as appropriate and refer to the *SiteConfig User Manual* or *SiteConfig Help Topics* for additional information.

Importing a system description

Prerequisites for this task are as follows:

- The SiteConfig PC has access to the system description file you are importing.

1. Open SiteConfig and proceed as follows:
   - If a dialog box opens that gives you the choice of creating or importing a system description, it means SiteConfig does not have access to a system description file. Click **Import**.
   - If the SiteConfig main window opens, click **File | Import**.

   The Import System Description dialog box opens.
2. Browse to and select a system description file (**.scsd*) and click **Open**.

The current system description is closed and the system description you are importing is displayed in SiteConfig.

About device and host names

In SiteConfig, a device can have different names, as follows:

- Device name — This is a name for display in SiteConfig only. It is stored in the SiteConfig system description, but not written to the actual device. It is displayed in the device tree view and in the device list view. It can be a different name than the device's host name.
- Host name — This is the network name of the device. SiteConfig has a default naming convention for host names which you can use or override with your own host names.

In most cases it is recommended that the Device name and Host name be the same. This avoids confusion and aids troubleshooting.

The Device name can serve as a placeholder as a system is planned and implemented. During the install/commission process, when you reconcile a device's current and planned network interface settings, the Host name as configured in the system description can be overwritten by the host name on the actual device. However, the Device name configured in the system description is not affected. Therefore it is recommended that in the early planned stages, you configure the Device name to be the desired name for the device, but do not yet configure the Host name. Then, after you have applied network interface settings, you can change the Host name to be the same as the Device name. This changes the host name on the actual device so that then all names are in sync.

SiteConfig does not allow duplicate device names or host names.

Items in the tree view are automatically sorted alphabetically, so if you change a name the item might sort to a different position.

Modifying a device name

1. In the **Network Configuration | Devices** tree view, right-click a device and select **Rename**.
2. Type in the new name.

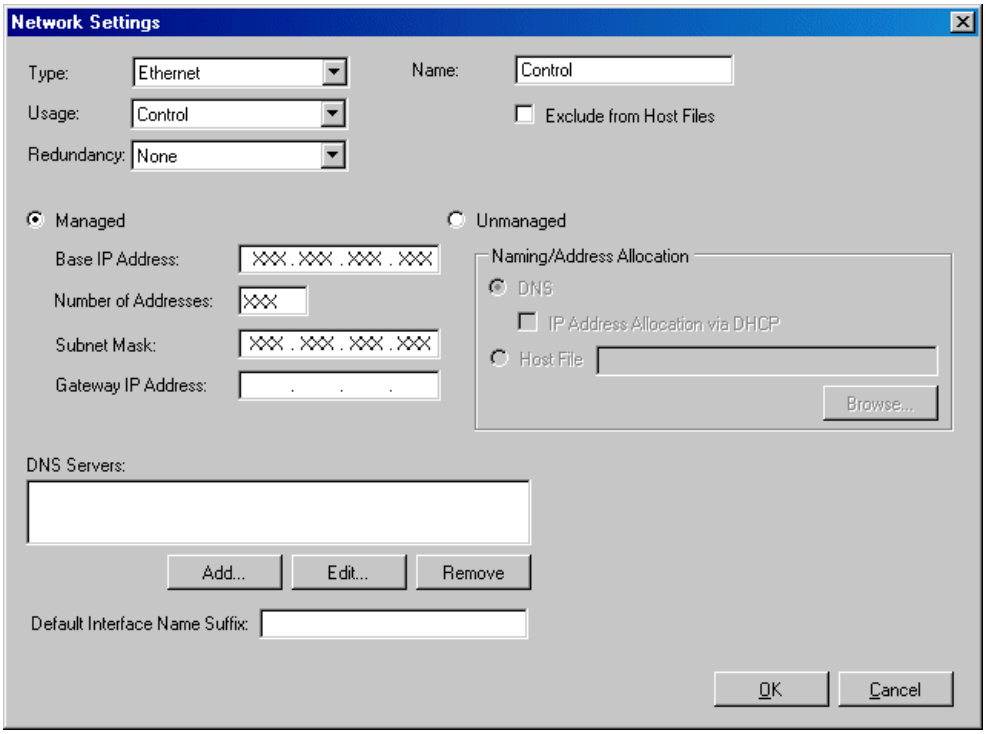
   Note that this does not change the hostname on the physical device. If you want the hostname to match the device name, you must also modify the hostname.

Modifying the control network

1. In the **Network Configuration | Networks** tree view, select the K2 SAN's Site node.

   The networks under that node are displayed in the list view.
2. Proceed as follows:
   - In the list view, right-click the Control network and select **Details**.

   The Network Settings dialog box opens.



3. Configure the settings for the network as follows:

Setting...	For control network
Type	*Ethernet* is required
Usage	*Control* is required
Redundancy	*None* is required. This is true even on a redundant K2 SAN. (Only the iSCSI network is redundant on a redundant K2 SAN.)
Name	*Control* is recommended
Exclude from Host Files	*Unselected* is required
Managed	*Selected* is required
Base IP Address	The first (lowest) IP address in the range of IP addresses managed by SiteConfig. Required.
Number of Addresses	The number of IP addresses in the range managed by SiteConfig. Required.
Subnet Mask	The network's subnet mask. Required.
Gateway IP Address	Additional network settings managed by SiteConfig. Allowed.
Unmanaged	*Unselected* is required. Related settings are disabled.
DNS Servers	Servers providing DNS for name resolution. Allowed.
Default Interface Name Suffix	Not allowed

4. Click **OK** to save settings and close.

Modifying the FTP/streaming network

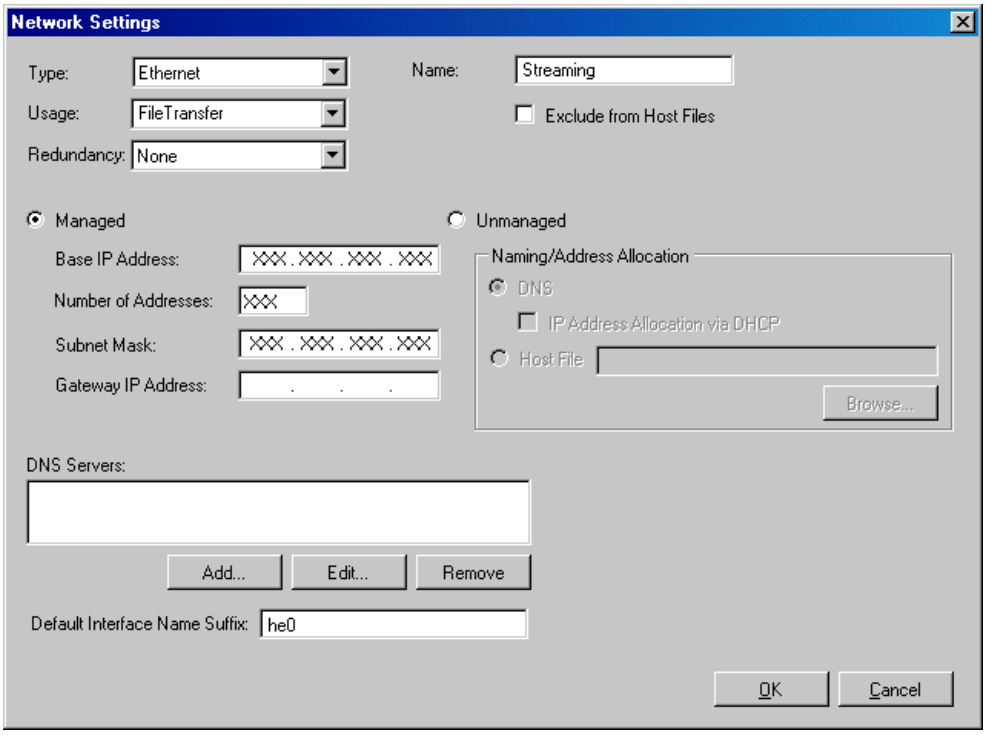
1. In the **Network Configuration | Networks** tree view, select the K2 SAN's Site node.

   The networks under that node are displayed in the list view.

2. Proceed as follows:

   - In the list view, right-click the Streaming network and select **Details**.

   The Network Settings dialog box opens.



3. Configure the settings for the network as follows:

Setting...	For FTP/streaming network
Type	*Ethernet* is required
Usage	*FileTransfer* is required
Redundancy	*None* is required. This is true even on a redundant K2 SAN. (Only the iSCSI network is redundant on a redundant K2 SAN.)
Name	*Streaming* is recommended
Exclude from Host Files	*Unselected* is required
Managed	*Selected* is required
Base IP Address	The first (lowest) IP address in the range of IP addresses managed by SiteConfig. Required.
Number of Addresses	The number of IP addresses in the range managed by SiteConfig. Required.
Subnet Mask	The network's subnet mask. Required.
Gateway IP Address	Additional network settings managed by SiteConfig. Allowed.
Unmanaged	*Unselected* is required. Related settings are disabled.
DNS Servers	Servers providing DNS for name resolution. Allowed.
Default Interface Name Suffix	*_he0* is required

4. Click **OK** to save settings and close.

Modifying a media (iSCSI) network

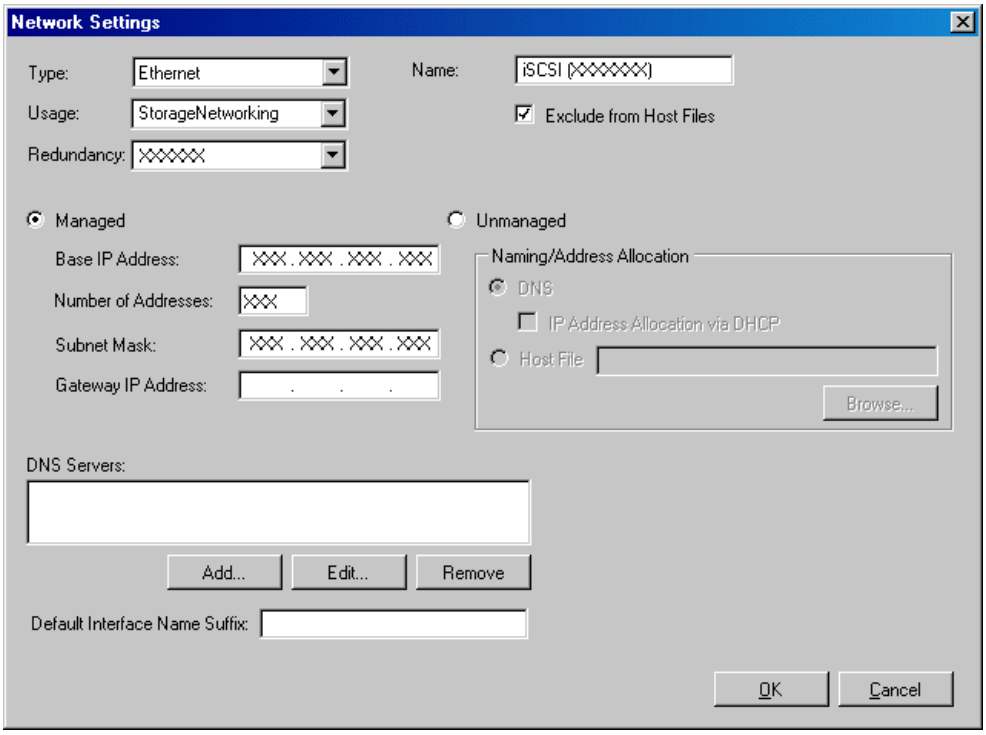
1. In the **Network Configuration | Networks** tree view, select the K2 SAN's Site node.

   The networks under that node are displayed in the list view.

2. Proceed as follows:

   - If the K2 SAN is basic (non-redundant), in the list view, right-click the iSCSI network and select **Details**.
   - If the K2 SAN is redundant, in the list view, first right-click the primary iSCSI network and select **Details**. Then proceed to modify the primary iSCSI network. After the primary iSCSI network is modified, repeat these steps and modify the secondary iSCSI network.

   The Network Settings dialog box opens.



3. Configure the settings for the network as follows:

Setting...	For media (iSCSI) network
Type	*Ethernet* is required
Usage	*StorageNetworking* is required
Redundancy	*None* is required for a basic (non-redundant) K2 SAN
	Primary is required for a redundant K2 SAN media network A
	Secondary is required for a redundant K2 SAN media network B
Name	*iSCSI (non-Redundant)* is recommended for a basic (non-redundant) K2 SAN
	iSCSI (Primary Redundant) is recommended for a redundant K2 SAN media network A
	iSCSI (Secondary Redundant) is recommended for a redundant K2 SAN media network B
Exclude from Host Files	*Selected* is required
Managed	*Selected* is required
Base IP Address	The first (lowest) IP address in the range of IP addresses managed by SiteConfig. Required.
Number of Addresses	The number of IP addresses in the range managed by SiteConfig. Required.
Subnet Mask	The network's subnet mask. Required.
Gateway IP Address	Not allowed
Unmanaged	*Unselected* is required. Related settings are disabled.
DNS Servers	Not allowed
Default Interface Name Suffix	Not allowed

4. Click **OK** to save settings and close.

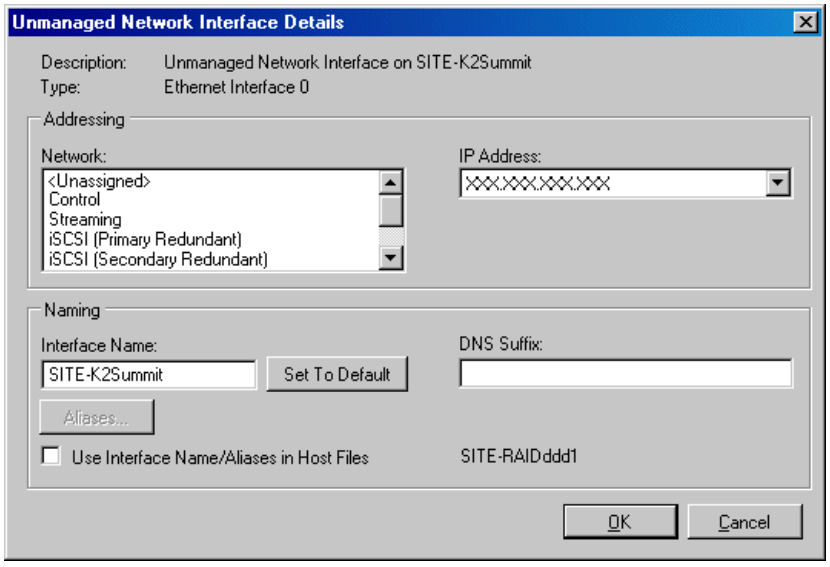
About IP configuration of network interfaces on devices

You can perform IP configuration of network interfaces when working with a placeholder device prior to discovery. When you add a device and choose a particular model, the model defines the number, type and usage characteristics of network interfaces to expect on such a device.

You can view and edit each network interface and set up IP configuration selecting an appropriate IP from the network to which each interface connects. The process for editing IP configuration varies, depending on the device's phase.

Placeholder device IP configuration

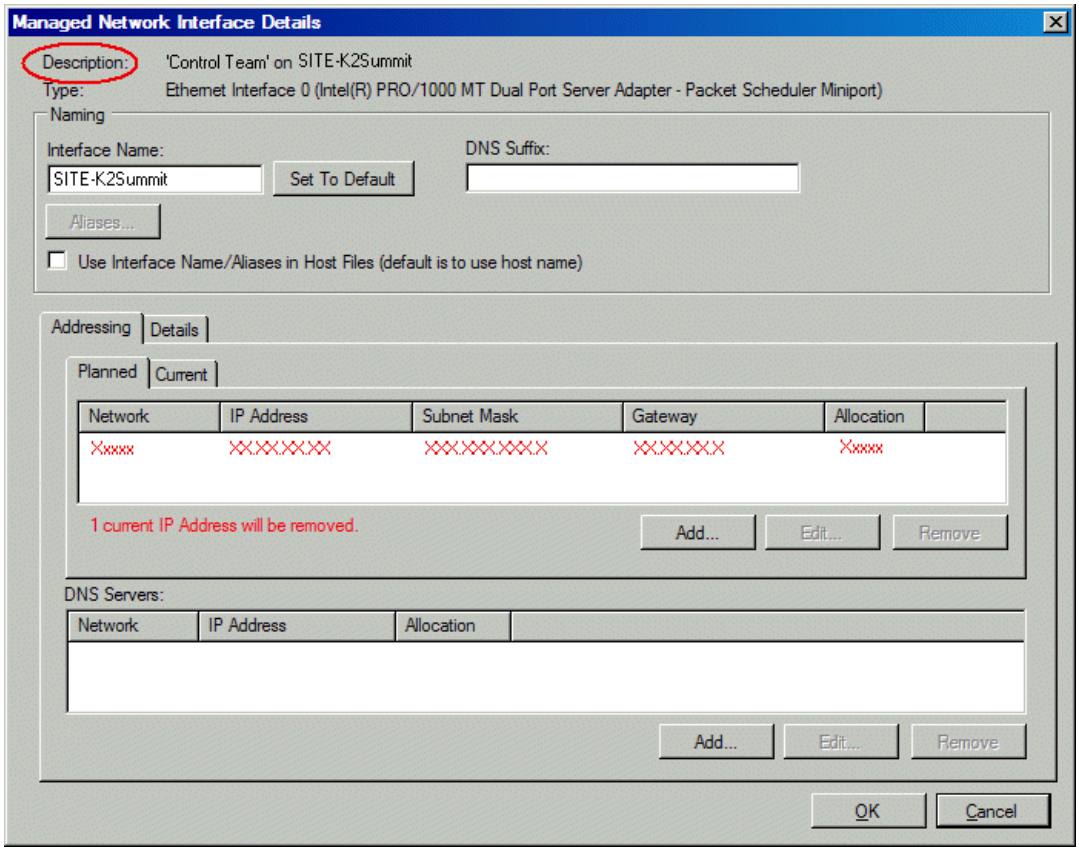
On a placeholder device, you edit network interfaces using the Unmanaged Network Interfaces dialog box.



The Unmanaged Network Interfaces dialog box allows you only to save changes to the system description.

Discovered device IP configuration

On a discovered device, you edit network interfaces using the Managed Network Interfaces dialog box.



The Managed Network Interfaces dialog box allows you to edit and save changes to the device.

Modifying K2 client unassigned (unmanaged) interface

Prerequisites for this task are as follows:

- The system description has a SAN K2 client that is a placeholder device.
- The placeholder device has a one or more unmanaged network interfaces.

Use this task to modify unmanaged network interfaces on a K2 SAN device as follows:

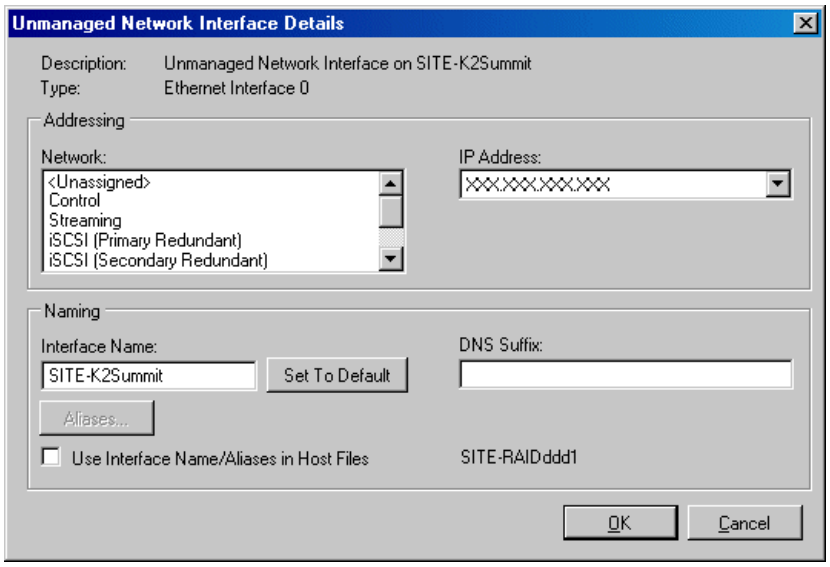
- K2 Summit Production Client

1. In the **Network Configuration | Devices** tree view, select a SAN K2 client placeholder device.

   The interfaces for that device are displayed in the interfaces list view.

2. In the interfaces list view, right-click an interface and select **Edit**.

The Unmanaged Network Interface Details dialog box opens.



3. Configure the settings for the interface as follows:

Setting...	For control network interface
Network	*Control* is required
IP Address	The IP address for this interface on the network. Required.
Interface Name	The device host name. Required.
Set to Default	Not recommended. Sets the interface name to SiteConfig default convention, based on the root Site name and device-type.
Use Interface Name/Aliases in Host Files	*Unselected* is required. Since not selected, the default behavior occurs, which is to use the device host name in the hosts file.
Aliases	Not allowed
DNS Suffix	Allowed, if applicable to the network. The DNS suffix is added to the interface name.

Setting...	For media (iSCSI) network interface
Network	*iSCSI (non-Redundant)* is required for one iSCSI interface on a K2 client on a basic K2 SAN. The other iSCSI interface is unused.
	iSCSI (Primary Redundant) is required for one iSCSI interface on a K2 client on a redundant K2 SAN.
	iSCSI (Secondary Redundant) is required for the other iSCSI interface on a K2 client on a redundant K2 SAN
IP Address	The IP address for this interface on the network. Required.
Interface Name	Disabled, since names are excluded from the hosts file. Disregard.
Set to Default	Disabled, since names are excluded from the hosts file. Disregard.
Use Interface Name/Aliases in Host Files	Disabled, since names are excluded from the hosts file. Disregard.
Aliases	Disabled, since names are excluded from the hosts file. Disregard.
DNS Suffix	Disabled, since names are excluded from the hosts file. Disregard.

NOTE: There is no FTP/streaming network for a SAN K2 client. On the K2 SAN, FTP/streaming goes to the K2 Media Server.

4. Click **OK** to save settings and close.

Modifying K2 Media Server unassigned (unmanaged) interface

Prerequisites for this task are as follows:

- The system description has a K2 Media Server that is a placeholder device.
- The placeholder device has a one or more unmanaged network interfaces.

Use this task to modify managed network interfaces on a K2 SAN device as follows:

- GS K2 Media Server
- LS K2 Media Server
- NH K2 Media Server

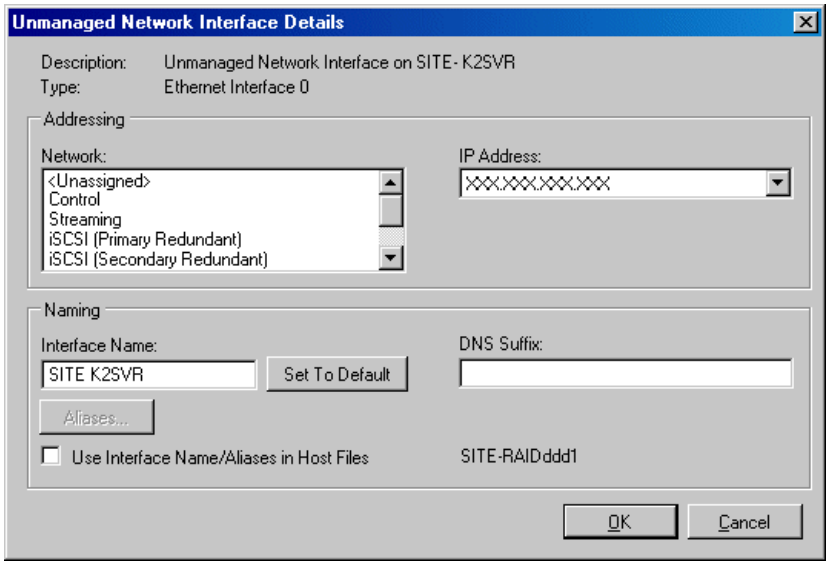
For the K2 Media Server, do not configure the Fibre Channel interface. SiteConfig does not manage this interface. It is represented in SiteConfig only to complete the description of the K2 Media Server.

1. In the **Network Configuration | Devices** tree view, select a K2 Media Server placeholder device.

The interfaces for that device are displayed in the interfaces list view.

2. In the interfaces list view, right-click an interface and select **Edit**.

   The Unmanaged Network Interface Details dialog box opens.



3. Configure the settings for the interface as follows:

Setting...	For control network interface
Network	*Control* is required
IP Address	The IP address for this interface on the network. Required.
Interface Name	The device host name. Required.
Set to Default	Not recommended. Sets the interface name to SiteConfig default convention, based on the root Site name and device-type.
Use Interface Name/Aliases in Host Files	*Unselected* is required. Since not selected, the default behavior occurs, which is to use the device host name in the hosts file.
Aliases	Not allowed
DNS Suffix	Allowed, if applicable to the network. The DNS suffix is added to the interface name.

Setting...	For FTP/streaming network interface
Network	*Streaming* is required
IP Address	The IP address for this interface on the network. Required.

Setting...	For FTP/streaming network interface
Interface Name	The device host name with the " _he0" suffix added is required. For example, if the host name is *K2prod01*, then *K2prod01_he0* is required here.
Set to Default	Not recommended. Sets the interface name to SiteConfig default convention, based on the root Site name and device-type.
Use Interface Name/Aliases in Host Files	*Selected* is required
Aliases	Not allowed
DNS Suffix	Allowed, if applicable to the network. The DNS suffix is added to the interface name.

Setting...	For media (iSCSI) network interface
Network	*iSCSI (non-Redundant)* is required on K2 Media Server for all interfaces of type iSCSI on basic K2 SAN.
	iSCSI (Primary Redundant) is required on K2 Media Server A for all interfaces of type iSCSI on redundant K2 SAN
	iSCSI (Secondary Redundant) is required on K2 Media Server B for interfaces of type iSCSI on redundant K2 SAN
IP Address	The IP address for this interface on the network. Required.
Interface Name	Disabled, since names are excluded from the hosts file. Disregard.
Set to Default	Disabled, since names are excluded from the hosts file. Disregard.
Use Interface Name/Aliases in Host Files	Disabled, since names are excluded from the hosts file. Disregard.
Aliases	Disabled, since names are excluded from the hosts file. Disregard.
DNS Suffix	Disabled, since names are excluded from the hosts file. Disregard.

4. Click **OK** to save settings and close.

About SiteConfig support on K2 devices

Before SiteConfig can be used to discover or manage a device, the device must meet the following requirements:

- The device must be a Microsoft Windows operating system device.
- The device must have Microsoft .NET version 2.0 installed, as reported in the Windows Add/Remove Programs control panel.
- The ProductFrame Discovery Agent service must be running on the device, as

reported in the Windows Services control panel.

For K2 clients and K2 Media Servers shipped new from Grass Valley with K2 software version 7.0 or higher, these requirements are pre-installed. These requirements are pre-installed on recovery images for these K2 systems as well. Therefore, if you suspect a problem with these requirements, do not attempt to install SiteConfig support requirements. If you must restore SiteConfig support requirements, re-image the K2 system.

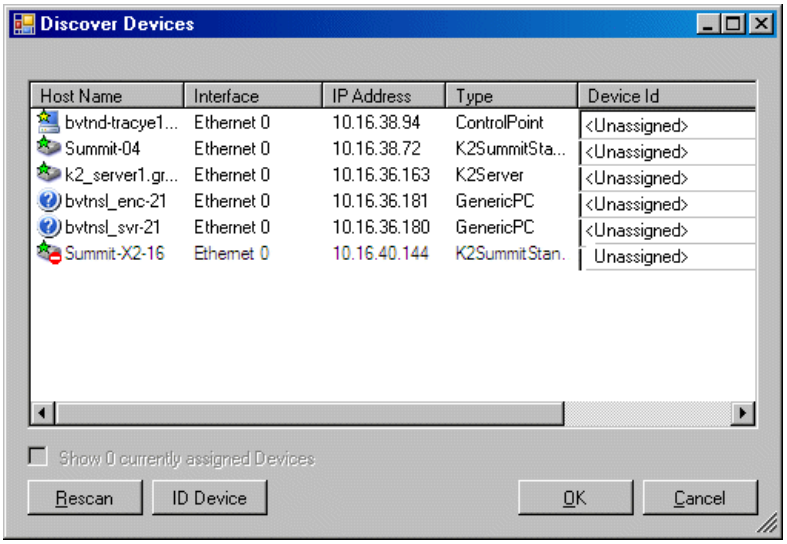
Discovering devices with SiteConfig

Prerequisites for this task are as follows:

- The Ethernet switch or switches that the support the control network are configured and operational. If multiple switches, ISLs are connected and trunks configured.
- The control point PC is communicating on the control network.
- There are no routers between the control point PC and the devices to be discovered.
- Devices to be discovered are Windows operating system devices, with SiteConfig support installed.
- Devices are cabled for control network connections.

1. Open SiteConfig on the control point PC.
2. In the toolbar, click the discover devices button.

   The Discover Devices dialog box opens.



   A list of discovered devices is displayed.

3. Click **Rescan** to re-run the discovery mechanism. You can do this if a device that you want to discover has its network connection restored or otherwise becomes available. Additional devices discovered are added to the list.

Assigning discovered devices

Prerequisites for this task are as follows:

- Devices have been discovered by SiteConfig
- Discovered devices are not yet assigned to a device in the system description
- The system description has placeholder devices to which to assign the discovered devices.

1. If the Discovered Devices Dialog box is not already open, click the discover devices button .

   The Discover Devices dialog box opens.

2. Identify discovered devices.
   - If a single device is discovered in multiple rows, it means the device has multiple network interfaces. Choose the interface that represents the device's currently connected control connection. This is typically Ethernet ... 0.
   - If necessary, select a device in the list and click **ID Device**. This triggers an action on the device, such as flashing an LED or ejecting a CD drive, to identify the device.
3. To also view previously discovered devices that have already been assigned to a device in the system description, select **Show … currently assigned devices**.

   The currently assigned devices are added to the list. Viewing both assigned and unassigned devices in this way can be helpful to verify the match between discovered devices and placeholder devices.
4. In the row for each discovered device, view items on the Device Id drop-down list to determine the match with placeholder devices, as follows:
   - If SiteConfig finds a match between the device-type discovered and the device-type of one or more placeholder devices, it displays those placeholder devices in the list.
   - If SiteConfig does not find a match between the device-type discovered and the device-type of a placeholder device, no placeholder device is displayed in the list.
5. In the row for a discovered device, click the Device Id drop-down list and select the placeholder device that corresponds to the discovered device.

   If there is no corresponding placeholder device currently in the system description, you can select **Add** to create a new placeholder device and then assign the discovered device to it.
6. When discovered devices have been assigned, click **OK** to save settings and close.
7. In the **Network Configuration | Devices** tree view, select each of the devices to which you assigned a discovered device.

Modifying K2 client managed network interfaces

Prerequisites for this task are as follows:

- The physical device you are configuring has been discovered and is assigned to a device in the SiteConfig system description.
- SiteConfig has communication with the device.
- The device is defined in the system description with an appropriate network interface.

Use this task to modify managed network interfaces on a K2 SAN device as follows:

- K2 Summit Production Client

1. In the tree view select a K2 client, then in the Interfaces list view, identify interfaces as follows:
   - The SAN K2 client's control interface is a team. Modify the control team interface first. The control team is comprised of two individual interfaces, one for Control Connection #1 and one for Control Connection # 2. Do not modify these two individual interfaces.
   - For a SAN K2 client on a basic (non-redundant) K2 SAN, identify the iSCSI (non-Redundant) interface. After the control team, modify this interface as instructed in this procedure. Do not configure any other iSCSI interface, as only one iSCSI interface is used for a basic K2 SAN.
   - For a SAN K2 client on a redundant K2 SAN, identify the iSCSI (Primary Redundant) interface and the iSCSI (Primary Secondary) interface. After the control team, modify these interfaces as instructed in this procedure.
   - The SAN K2 client has no interface for FTP/streaming. All FTP/streaming goes to the K2 Media Server.
2. In the Interfaces list view determine the interface to configure, as follows:
   - Identify the interface with which SiteConfig is currently communicating, indicated by the green star overlay icon. This should be the control network interface.
   - Verify that the interface over which SiteConfig is currently communicating is in fact the interface defined for the control network in the system description. If this is not the case, you might have the control network cable connected to the wrong interface port.
   - Configure the control network interface first before configuring any of the other interfaces.
   - After you have successfully configured the control network interface, return to this step to configure each remaining interface.
3. In the Interfaces list view, check the icon for the interface you are configuring.

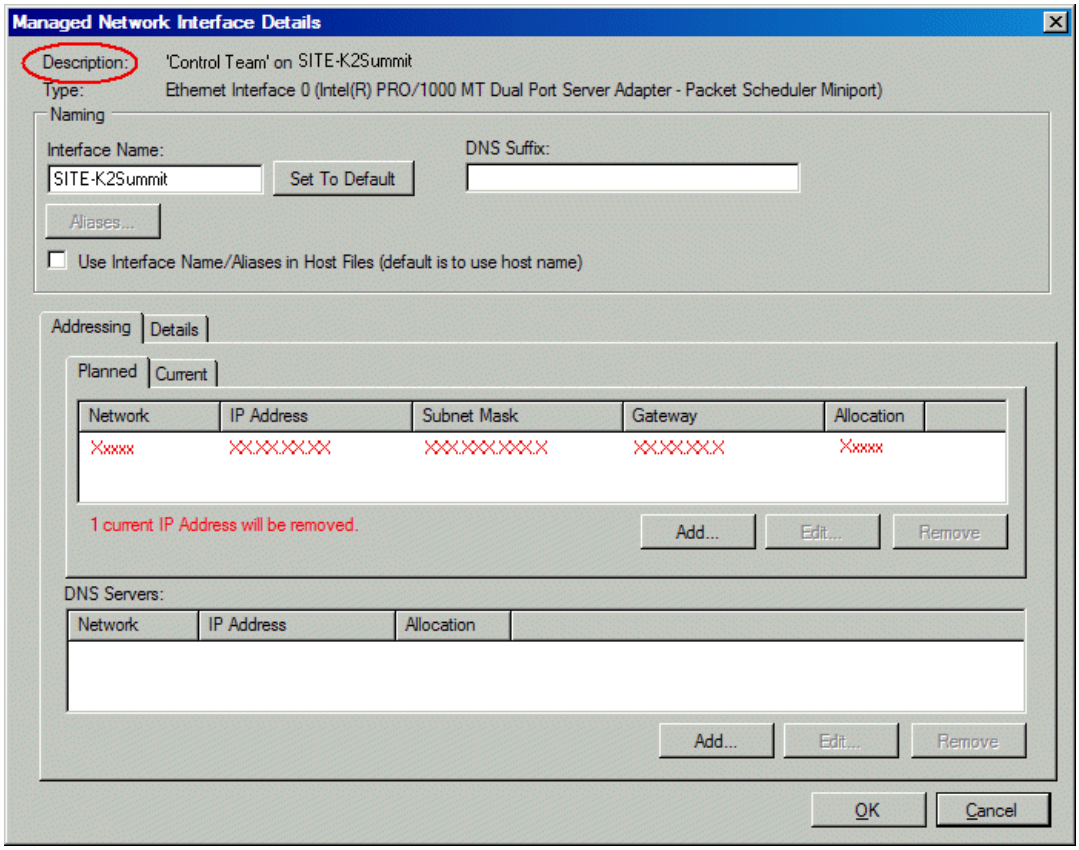
   If the icon has a red stop sign overlay, it indicates that current settings and planned settings do not match or that there is some other problem. Hover over the icon to

read a tooltip with information about the problem.

NOTE: For the K2 Summit Production Client, make sure that the device is unlocked in SiteConfig before proceeding. This disables the write filter.

4. In the Interfaces list view, right-click the interface you are configuring and select **Edit**.

   The Managed Network Interface Details dialog box opens.



5. Identify the interface on the discovered device that you are configuring.
   - Identify Ethernet LAN adapters by their "Description" name. This is the Windows connection name. SiteConfig reads this name from the device and displays it at the top of this dialog box. This is the most accurate way to identify the network adapter on the discovered device that you are configuring.
6. Configure naming settings as follows:

Setting...	For network interface Control Team
Interface Name	The device host name. Required.
Set To Default	Not recommended
DNS Suffix	Allowed, if applicable to the network. The DNS suffix is added to the interface name.

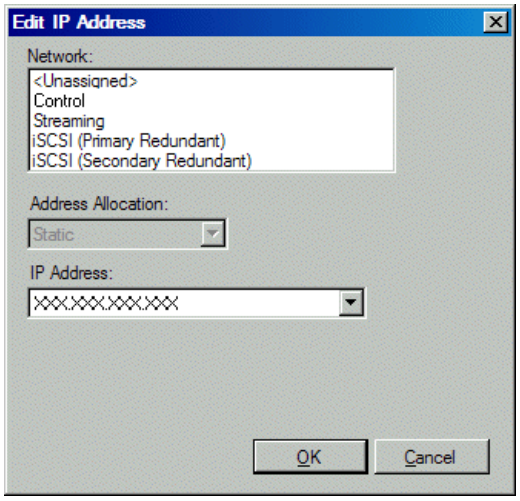
Setting...	For network interface Control Team
Aliases	Not allowed
Use Interface Name/Aliases in Host Files	*Unselected* is required. Since not selected, the default behavior occurs, which is to use the device host name in the hosts file.

Setting...	For any network interface of type iSCSI
Interface Name	"Unused" is recommended. Displaying this text here serves as an aid in understanding SAN networks.The iSCSI network has no name resolution via the hosts file or otherwise, so the text you enter here is not actually use for name resolution.
Set To Default	Not recommended
DNS Suffix	Not allowed
Aliases	Not allowed
Use Interface Name/Aliases in Host Files	*Selected* is recommended. Since this interface's network has its names excluded from the hosts file, this setting has no affect. The interface name is excluded from the hosts file, regardless of settings here.

NOTE: There is no FTP/streaming network for a SAN K2 client. On the K2 SAN, FTP/streaming goes to the K2 Media Server.

7. Evaluate settings on the Planned tab and change if necessary.
   - Compare settings on the Planned tab with settings on the Current tab.
   - If you want to keep the current settings as reported in the Current tab, click **Remove** to remove the planned settings.
   - Do not specify multiple IP addresses for the same interface. Do not use the Add button.
8. To modify planned settings, do the following:
   a. Select the network settings and click **Edit**.

      The Edit IP Address dialog box opens.



b. Edit IP address settings as follows:

Setting...	For network interface Control Team
Network	*Control* is required
Address Allocation	*Static* is recommended.
IP Address	The IP address for this interface on the network. Required.

Setting...	For basic SAN network interface Media Connection #1
Network	*iSCSI (non-Redundant)* is required
Address Allocation	*Static* is required.
IP Address	The IP address for this interface on the network. Required.

Setting...	For redundant SAN network interface Media Connection #1
Network	*iSCSI (Primary Redundant)* is required
Address Allocation	*Static* is required.
IP Address	The IP address for this interface on the network. Required.

Setting...	For redundant SAN network interface Media Connection #2
Network	*iSCSI (Secondary Redundant)* is required
Address Allocation	*Static* is required.
IP Address	The IP address for this interface on the network. Required.

The networks listed in the Edit IP Address dialog box are those currently defined in the system description, with available settings restricted according to the network definition. If you require settings that are not available, you can close dialog boxes and go to the **Network Configuration | Networks** tab to modify network settings, then return to the Edit IP Address dialog box to continue.

9. When you have verified that the planned settings are correct, click **OK**, then **Yes** to apply settings to the device and close.

   A Contacting Device message box reports progress.

10. After configuring control network settings, do the following

    a. If a message informs you of a possible loss of communication, click **OK**.

       This message is normal, since this is the network over which you are currently communicating.

    b. In the Device list view, observe the device icon and wait until the icon displays the green star overlay before proceeding.

       The icon might not display the green star overlay for several seconds as settings are reconfigured and communication is re-established.

    c. In the Interface list view, right-click the interface and select **Ping**.

       The Ping Host dialog box opens.

       If ping status reports success, the interface is communicating on the control network.

NOTE: For the K2 Summit Production Client, when configuration is complete, make sure you lock the device in SiteConfig. This enables the write filter.

Modifying K2 Media Server managed network interfaces

Prerequisites for this task are as follows:

- The physical device you are configuring has been discovered and is assigned to a device in the SiteConfig system description.
- SiteConfig has communication with the device.
- The device is defined in the system description with an appropriate network interface.

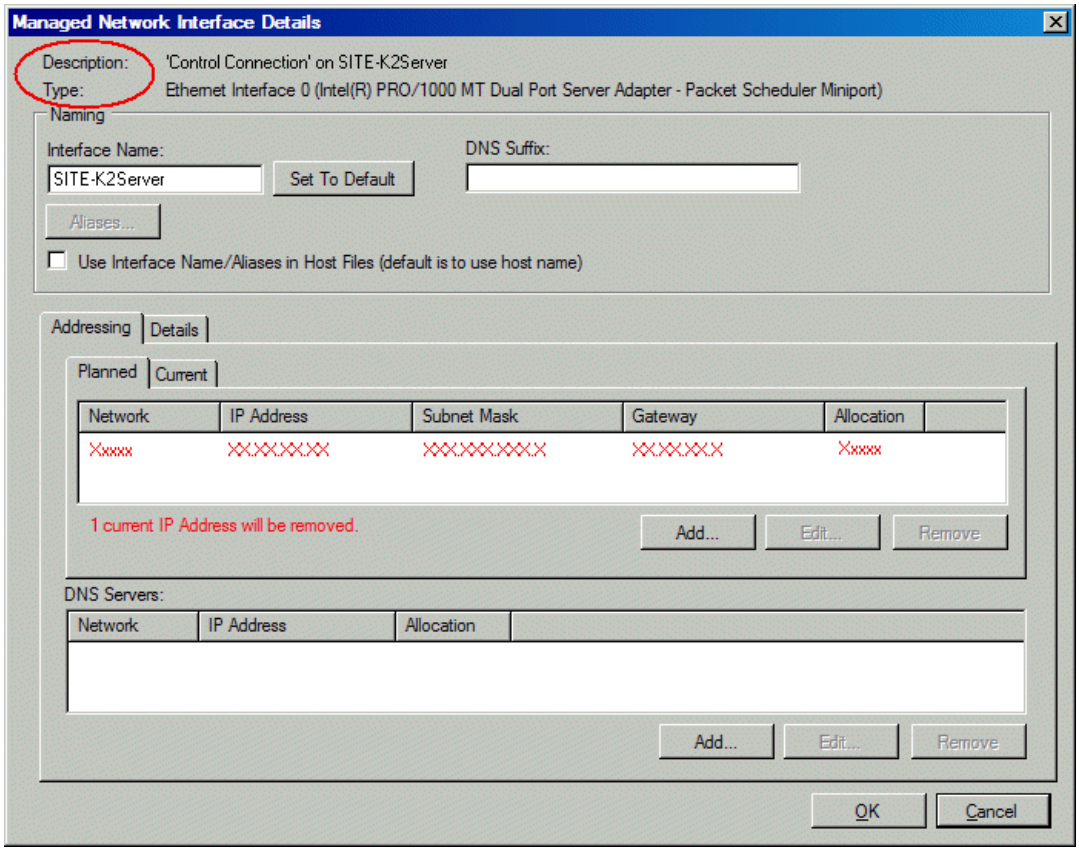
Use this task to modify managed network interfaces on a K2 SAN device as follows:

- GS K2 Media Server
- LS K2 Media Server
- NH K2 Media Server

1. In the Interfaces list view determine the interface to configure, as follows:
   - Identify the interface with which SiteConfig is currently communicating, indicated by the green star overlay icon. This should be the control network interface.
   - Verify that the interface over which SiteConfig is currently communicating is in fact the interface defined for the control network in the system description. If this is not the case, you might have the control network cable connected to the wrong interface port.
   - Configure the control network interface first before configuring any of the other interfaces.
   - After you have successfully configured the control network interface, return to this step to configure each remaining interface.
   - For the K2 Media Server, do not configure the Fibre Channel interface, which is a non-IP interface. SiteConfig does not manage this interface. It is represented in SiteConfig only to complete the description of the K2 Media Server.
2. In the Interfaces list view, check the icon for the interface you are configuring.

   If the icon has a red stop sign overlay, it indicates that current settings and planned settings do not match or that there is some other problem. Hover over the icon to read a tooltip with information about the problem.
3. In the Interfaces list view, right-click the interface you are configuring and select **Edit**.

   The Managed Network Interface Details dialog box opens.



4. Identify the interface on the discovered device that you are configuring.
   - Identify Ethernet LAN adapters by their "Description" name. This is the Windows connection name. SiteConfig reads this name from the device and displays it at the top of this dialog box. This is the most accurate way to identify the network adapter on the discovered device that you are configuring.
   - Identify iSCSI adapters by their "Type".
5. Configure naming settings as follows:

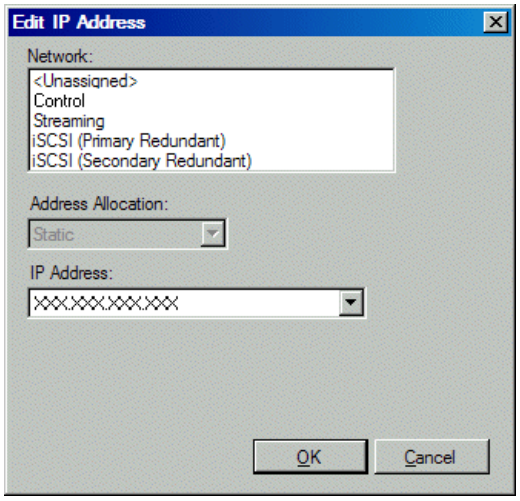
Setting...	For network interface Control Connection
Interface Name	The device host name. Required.
Set To Default	Not recommended
DNS Suffix	Allowed, if applicable to the network. The DNS suffix is added to the interface name.
Aliases	Not allowed
Use Interface Name/Aliases in Host Files	*Unselected* is required. Since not selected, the default behavior occurs, which is to use the device host name in the hosts file.

Setting...	For network interface FTP Connection
Interface Name	The device host name with the "_he0" suffix added is required.
Set To Default	Not recommended
DNS Suffix	Allowed, if applicable to the network. The DNS suffix is added to the interface name.
Aliases	Not allowed
Use Interface Name/Aliases in Host Files	*Selected* is required

Setting...	For any network interface of type iSCSI
Interface Name	The text "Unused" is recommended. Displaying this text here serves as an aid in understanding SAN networks.The iSCSI network has no name resolution via the hosts file or otherwise, so the text you enter here is not actually use for name resolution.
Set To Default	Not allowed
DNS Suffix	Not allowed
Aliases	Not allowed
Use Interface Name/Aliases in Host Files	*Selected* is recommended. Since this interface's network has its names excluded from the hosts file, this setting has no affect. The interface name is excluded from the hosts file, regardless of settings here.

6. Evaluate settings on the Planned tab and change if necessary.
   - Compare settings on the Planned tab with settings on the Current tab.
   - If you want to keep the current settings as reported in the Current tab, click **Remove** to remove the planned settings.
   - Do not specify multiple IP addresses for the same interface. Do not use the Add button.
7. To modify planned settings, do the following:
   a. Select the network settings and click **Edit**.

      The Edit IP Address dialog box opens.



b. Edit IP address settings as follows:

Setting...	For network interface Control Connection
Network	*Control* is required
Address Allocation	*Static* is recommended.
IP Address	The IP address for this interface on the network. Required.

Setting...	For network interface FTP Connection
Network	*Streaming* is required
Address Allocation	*Static* is required.
IP Address	The IP address for this interface on the network. Required.

Setting...	For basic SAN K2 Media Server any network interface of type iSCSI
Network	*iSCSI (non-Redundant)* is required
Address Allocation	*Static* is required.
IP Address	The IP address for this interface on the network. Required.

Setting...	For redundant SAN K2 Media Server A any network interface of type iSCSI
Network	*iSCSI (Primary Redundant)* is required
Address Allocation	*Static* is required.
IP Address	The IP address for this interface on the network. Required.

Setting...	For redundant SAN K2 Media Server B any network interface of type iSCSI
Network	*iSCSI (Secondary Redundant)* is required
Address Allocation	*Static* is required.
IP Address	The IP address for this interface on the network. Required.

The networks listed in the Edit IP Address dialog box are those currently defined in the system description, with available settings restricted according to the network definition. If you require settings that are not available, you can close dialog boxes and go to the **Network Configuration | Networks** tab to modify network settings, then return to the Edit IP Address dialog box to continue.

8. When you have verified that the planned settings are correct, click **OK**, then **Yes** to apply settings to the device and close.

   A Contacting Device message box reports progress.

9. After configuring control network settings, do the following

   a. If a message informs you of a possible loss of communication, click **OK**.

      This message is normal, since this is the network over which you are currently communicating.

   b. In the Device list view, observe the device icon and wait until the icon displays the green star overlay before proceeding.

      The icon might not display the green star overlay for several seconds as settings are reconfigured and communication is re-established.

   c. In the Interface list view, right-click the interface and select **Ping**.

      The Ping Host dialog box opens.

      If ping status reports success, the interface is communicating on the control network.

Making the host name the same as the device name

1. Verify that the current device name, as displayed in the SiteConfig tree view, is the same as your desired host name.

2. In the **Network Configuration | Devices | Device** list view, right-click the device and select **Edit**.

   The Edit Device dialog box opens.

3. If the host name is currently different than the device name, click **Set to Device Name**.

   This changes the host name to be the same as the device name.

4. Click **OK**.

Pinging devices from the control point PC

You can send the ping command to one or more devices in the system description over the network to which the control point PC is connected. Typically this is the control network.

1. In the **Network Configuration** | **Networks** tree view, select a network, site, or system node.
2. In the Devices list view, select one or more devices. Use Ctrl + Click or Shift + Click to select multiple devices.
3. Right-click the selected device or devices and select **Ping**.

   The Ping Devices dialog box opens and lists the selected device or devices.

The Ping Devices dialog box reports the progress and results of the ping command per device.

About hosts files and SiteConfig

SiteConfig uses the network information in the system description to define a hosts file and allows you to view the hosts file. SiteConfig can manage this hosts file on Windows operating system devices that are in the system description and that are part of a SiteConfig managed network.

When you have successfully assigned devices and applied planned network settings to interfaces, it is an indication that host table information, as currently captured in the system description, is valid and that you are ready to have SiteConfig assemble the host table information into a hosts file. Your options for placing this host table information on devices are as follows:

- If you do not want SiteConfig to manage your host table information, you can manage it yourself. This is typically the case if your facility has an existing hosts file that contains host table information for devices that are not in the SiteConfig system description. In this case, you can have SiteConfig generate a single hosts file that contains the host table information for the devices in the system description. You can then copy the desired host table information out of the SiteConfig hosts file and copy it into your facility hosts file. You must then distribute your facility hosts file to devices using your own mechanisms.
- If you want SiteConfig to manage all information in hosts files on devices, you can have SiteConfig copy its hosts file to devices. In so doing, SiteConfig overwrites

the existing hosts files on devices. Therefore, this requires that all devices that have name resolution through the hosts file be configured accordingly in the SiteConfig system description.

If you choose to have SiteConfig write hosts files to devices, the process consumes system resource and network bandwidth. Therefore you should wait until you have verified the information for all devices/interfaces in the host file, rather than updating hosts files incrementally as you discover/assign devices.

SiteConfig does not automatically deploy hosts files to managed devices as you add or remove devices. If you add or remove devices from the system description, you must re-deploy the modified hosts file to all devices.

Generating host tables for devices with SiteConfig

Prerequisites for this task are as follows:

- Planned control network settings are applied to control network interfaces and devices are communicating on the control network as defined in the system description.
- Interfaces for networks that require name resolution via the hosts file, such as the FTP/streaming network, have settings applied and are communicating.
- You have viewed host names, as currently defined in the system description, and determined that they are correct.
- The control point PC is added to the system description so that it is included in the host tables generated by SiteConfig.

1. In the **Network Configuration | Networks** tree view, select a network, site, or system node.
2. Click **View Hosts file**.

   A Hosts File Contents window opens that displays the contents of the hosts file as currently defined in the system description.
3. Verify the information in the hosts file.
4. Do one of the following:

   - If you are managing host table information yourself, click **Save As** and save a copy of the hosts file to a location on the control point PC. Then open the copy of the hosts file, copy the desired host table information from it, and paste it into your facility hosts file as desired. Then you can use your own process to distribute the facility hosts file to devices. Remember to distribute to the control point PC so that SiteConfig and other management applications such as K2Config can resolve network host names.
   - If SiteConfig is managing hosts files, do the following:

   NOTE: Writing hosts files to multiple devices consumes system resource and network bandwidth. Therefore it is recommended that you wait and do this after the system is complete and fully implemented, rather than updating hosts files incrementally as you discover/assign devices.

a. In the **Network Configuration | Devices | Devices** list view, right-click a device to which you intend to write the hosts file and select **View Current Host File**.

   A Host File Contents window opens that displays the contents of the hosts file that is currently on that actual device.

b. Verify that there is no information that you want to retain in the device's current hosts file that is not also in the hosts file as currently defined in the system description. If you need to save the device's current hosts file, click **Save As** and save to a different location.

c. In the **Network Configuration | Devices | Devices** list view, right-click a device or use Ctrl + Click to select multiple devices, and select **Update Host File**.

   The current hosts file is overwritten with the hosts file as defined in the system description.

Chapter 6

Managing K2 software

This chapter provides information and procedures for the software components of the K2 SAN. Topics include the following:

- "Configuring K2 software deployment"
- "Backup and recovery strategies"

Configuring K2 software deployment

Take the following into consideration when using SiteConfig to deploy K2 SAN software.

- You typically configure one deployment group for K2 clients and one deployment group for K2 Media Servers. This allows you to target and sequence software deployment tasks to the different types of devices.
- You typically upgrade K2 Media Servers first, then K2 Media Clients.
- Always follow detailed steps in *K2 Release Notes* for the version of software to which you are upgrading.

Use the following topics to manage software deployment on a K2 SAN.

Configuring deployment groups

Prerequisites for this procedure are as follows:

- The device is assigned in the SiteConfig system description and network connectivity is present.

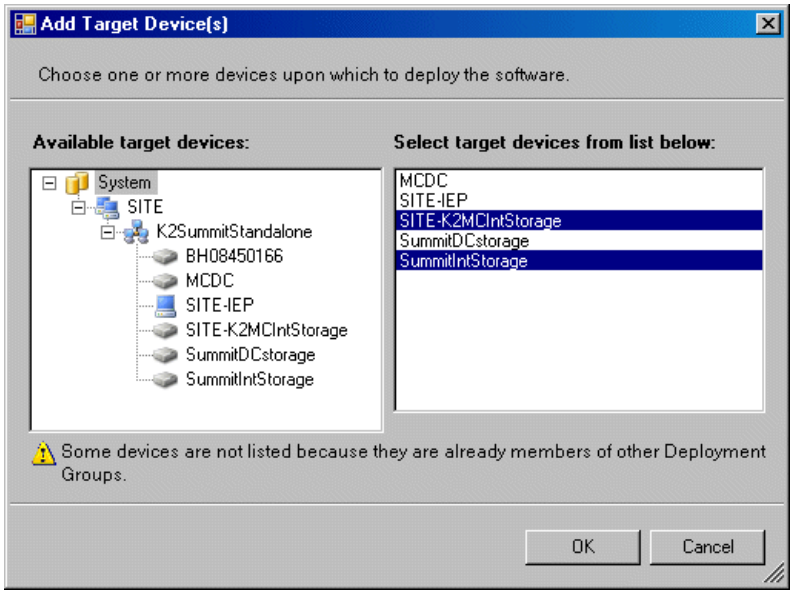
1. In the **Software Deployment | Deployment Groups** tree view, right-click the top node and select **Add Deployment Group**.

   A deployment group appears in the tree view.

2. Right-click the deployment group, select **Rename**, and enter a name for the deployment group.

3. Right-click the deployment group and select **Add Target Device**.

   The Add Target Device(s) wizard opens.



4. In the Available Target Devices tree view, select the node that displays the devices that you are combining as a deployment group.
5. In the right-hand pane, select the devices that you are combining as a deployment group.

   To select multiple devices, you can drag through the devices, use Ctrl + Click, or use Shift + Click.
6. Click **OK**.

The devices appear in the Deployment Groups tree view under the deployment group. Before you perform a software deployment, you must check software on the devices that will be receiving new software. If you have already added packages to the group, on the Deployment Groups tab you will also see deployment tasks generated for every device with roles that match the package contents.

Adding a software package to a deployment group

1. In the **Software Deployment | Deployment Groups** tree view, select a deployment group.
2. Click the **Add** button.

   The Add Package(s) dialog box opens.
3. Do one of the following to select the software package:
   - Select from the list of packages then click **OK**.
   - Click **Browse**, browse to and select the package, then click **Open**.
4. If one or more EULAs are displayed, accept them to proceed. If you do not accept a EULA, the associated software is not assigned to the deployment group.

   SiteConfig adds the package to the deployment group.

The package appears in the Managed Packages list for the selected deployment group. SiteConfig creates new software deployment tasks for the package and displays them in the Tasks list view.

Checking all currently installed software on devices

Prerequisites for this task are as follows:

- The device is assigned in the SiteConfig system description and network connectivity is present.
- SiteConfig is able to log in to the device using the username/password credentials assigned to the device.
- The SiteConfig control point PC does not have a network drive mapped to an administrative share (such as C$) on a device on which you are checking software.

1. In the **Software Deployment | Deployment Groups** tree view, right-click the top-most node for the group or any individual device and select **Check Software**.

   NOTE: If you have access problems, verify that the adminstrator account on the device has credentials as currently configured in SiteConfig. By default credentials

on the device should be administrator/adminGV! for Aurora devices and Administrator/adminK2 for K2 devices.

The Check Software dialog box appears. SiteConfig searches for software on the selected device or devices and gathers information. Progress is reported.

2. When the check is complete for the selected device or devices, close the Check Software dialog box.

An updated list of all currently installed software is displayed in the **Software Deployment | Devices | Installed Software** list view. If software is a SiteConfig managed software package, information is displayed in the Managed Package and Deployment Group columns.

About deploying software for the K2 SAN

You must control the sequence of software deployment tasks and device restarts as you upgrade software across the K2 SAN. The general sequence is to upgrade K2 Media Servers first then SAN K2 clients. The exact steps can vary from software version to version. Make sure you follow the task flow in the *K2 Release Notes* for the version of software to which you are upgrading.

Backup and recovery strategies

Procedures in this section are as follows:

- "About the recovery disk image process" on page 139
- "Creating a recovery disk image for storing on E:" on page 141
- "Creating a recovery disk image CD set" on page 142
- "Restoring from a system-specific recovery disk image on E:" on page 144
- "Restoring from the generic recovery disk image on E:" on page 145
- "Restoring from a recovery disk image CD set" on page 149
- "Activating the Windows operating system" on page 151

About the recovery disk image process

On the K2 Media Server, there are three partitions on the system drive to support backup and recovery strategies as follows:

- The C: drive is for the Windows operating system and applications.
- The D: drive is for the media file system (SNFS) and database. This allows you to restore the Windows operating system on the C: drive, yet keep the files on the D: drive intact. You can also restore the D: drive itself, however your backup and recovery strategy is different for non-redundant and redundant systems, as follows:
  - On non-redundant servers the media file system program, metadata, and journal files are on the D: drive. Also the media database program is on the D: drive. Therefore if you ever have a D: drive fault and you need to recover the data files (metadata, journal, and database), you can only restore them to the "snap-shot" contained in the most recent disk image you created. When you do this you restore the program files as well.
  - For redundant K2 SANs, the media file system program is on the D: drive, but the metadata and journal files are stored on the shared RAID storage. Also the media database program is on the D: drive, but the database data files are stored on the shared RAID storage. Therefore, if you ever have a D: drive fault, you can restore the media file system and database programs from a recovery disk image, and then access the data files (metadata, journal, database) from the shared RAID storage.
- The E: drive is for storing a system image of the other partitions. From the E: drive you can restore images to the C: and D: drives.

When you receive a K2 Media Server from the factory, the machine has a generic image on the E: drive. This image is not specific to the individual machine. It is generic for all machines of that type.

You receive a recovery CD with your K2 Media Server. This recovery CD does not contain a disk image. Rather, the recovery CD is bootable and contains the Acronis True Image software necessary to create and restore a disk image. You also receive a similar recovery CD for K2 Media Clients, but it is specifically for the desktop Windows operating system (Windows XP), rather than for the server Windows

operating system (Windows 2003 server) which runs on the K2 Media Server. Do not interchange these recovery CDs. Refer to *K2 Release Notes* for compatible versions of the recovery CD.

After your K2 Media Server is installed, configured, and running in your system environment, you should create new recovery disk images for the machine to capture settings changed from default. These “first birthday” images are the baseline recovery image for the machine in its life in your facility. You should likewise create new recovery disk images after completing any process that changes system software or data, such as a software upgrade. In this way you retain the ability to restore to a recent “last known good” state.

For the highest degree of safety, you should create a set of disk image recovery CDs, in addition to storing disk images on the E: partition. Since system drives are RAID protected, in most failure cases the disk images on the E: partition will still be accessible. But in the unlikely even of a catastrophic failure whereby you lose the entire RAID protected system drive, you can use your disk image recovery CDs to restore the system.

NOTE: Recovery disk images do not back up the media files themselves. You must implement other mechanisms, such as a redundant storage system or mirrored storage systems, to back up media files.

The recommended recovery disk image process is summarized in the following steps.

At the K2 Media Server first birthday…

1. Boot from the Recovery CD.
2. Create a set of disk image recovery CDs. These CDs contain the C:, D:, and E: partitions.
3. Create a disk image, writing the disk image to the E: partition. This disk image contains the C: and D: partitions.
4. Copy the disk image from the E: partition to another location, such as a network drive.

At milestones, such as after software upgrades…

1. Boot from the Recovery CD.
2. Create a disk image, writing the disk image to the E: partition. This disk image contains the C: and D: partitions.
3. Copy the disk image from the E: partition to another location, such as a network drive.

If you need to restore the K2 Media Server…

1. Boot from the Recovery CD.
2. If the E: partition is accessible, read the image from the E: partition to restore the C: partition, restore the D: partition, or restore both partitions.
3. If the E: partition is not accessible, do the following:
   a. Read the disk image from your set of CDs and restore all three partitions.
   b. Restart into Windows.
   c. Copy your most recent disk image to the E: partition.
   d. Boot from the Recovery CD.
   e. Read the image from the E: partition to restore the C: partition, restore the D: partition, or restore both partitions.

Plan a recovery strategy that is appropriate for your facility, then refer to the following procedures as necessary to implement your strategy.

Creating a recovery disk image for storing on E:

Do the following at the local K2 Media Server to create a disk image of the C: partition and the D: partition and store the image file on the E: partition:

1. Make sure that media access is stopped and that the K2 Media Server on which you are working is out of service.
2. If you have not already done so, connect keyboard, monitor, and mouse to the K2 Media Server.
3. Insert the Recovery CD and restart the machine.

   The machine boots from the disc. The Acronis True Image program loads.
4. At the startup screen, select **True Image Server (Full Version)**.

The Acronis True Image program loads.

The Acronis True Image main window appears.

5. In the Acronis True Image main window, click **Backup**.

   The Create Backup Wizard opens.

6. On the Welcome page, click **Next**.

   The Select Backup Type page opens.

7. Select **The entire disk contents or individual partition** and then click **Next**.

   The Partitions Selection page opens.

8. Select the **System (C:)** and the **Database (D:)** partitions and then click **Next**.

   The Backup Archive Location page opens.

9. In the tree view select the **Backup (E:)** partition and then enter the name of the image file you are creating. Create the file name using the K2 Media Server hostname and the date. Name the file with the .tib extension. For example, if the hostname is K2Server1, in the File name field you would have `E:\K2Server1_20051027.tib`. Click **Next**.

   The Backup Creation Options page opens.

10. Do not change any settings on this page. Click **Next**.

    The Archive Comment page opens.

11. If desired, enter image comments, such as the date, time, and software versions contained in the image you are creating. Click **Next**.

    The "…ready to proceed…" page opens.

12. Verify that you are creating images from the C: and D: partitions and writing to the E: partition. Click **Proceed**.

    The Operation Progress page opens and displays progress.

13. When a "Backup archive creation has been successfully completed" message appears, click **OK**.

14. Click **Operations | Exit** to exit the Acronis True Image program.

    The K2 Media Server device restarts automatically.

15. Remove the Recovery CD while the K2 Media Server device is shutting down.

16. Upon restart, log on to Windows.

17. Open Windows Explorer and find the image file on the E: partition.

Creating a recovery disk image CD set

Do the following at the local K2 Media Server to create a disk image of the entire system drive, which includes the C:, D:, and E: partitions, and store the image file on a set of CDs:

1. Make sure that media access is stopped and that the K2 Media Server on which you are working is out of service.

2. If you have not already done so, connect keyboard, monitor, and mouse to the K2 Media Server.
3. Insert the Recovery CD and restart the machine.

   The machine boots from the disc. The Acronis True Image program loads.
4. At the startup screen, select **True Image Server (Full Version)**.

   The Acronis True Image program loads.

   The Acronis True Image main window appears.
5. In the Acronis True Image main window, click **Backup**.

   The Create Backup Wizard opens.
6. On the Welcome page, click **Next**.

   The Select Backup Type page opens.
7. Select **The entire disk contents or individual partition** and then click **Next**.

   The Partitions Selection page opens.
8. Select **Disk 1** to select the System (C:), the Database (D:), and the Backup (E:) partitions and then click **Next**.

   The Backup Archive Location page opens.
9. In the tree view select **CD-RW Drive (F:)** and then enter the name of the image file you are creating. Create the file name using the K2 Media Server hostname and the date. Name the file with the .tib extension. For example, if the hostname is K2Server1, in the File name field you would have `F:\K2Server1_20051027.tib`. Click **Next**.

   The Backup Creation Options page opens.
10. Do not change any settings on this page. Click **Next**.

    The Archive Comment page opens.
11. If desired, enter image comments, such as the date, time, and software versions contained on the image you are creating. Click **Next**.

    The "…ready to proceed…" page opens.
12. Remove the Recovery CD and insert a blank CD.
13. Verify that you are creating an image from Disk 1 and writing to the CD-RW Drive (F:). Click **Proceed**.

    The Operation Progress page opens and displays progress.
14. Remove and insert CDs as prompted. As you remove each burned CD make sure you label it correctly to show the sequence of CDs.
15. When a "Backup archive creation has been successfully completed" message appears, click **OK**.
16. Click **Operations | Exit** to exit the Acronis True Image program.

    The K2 Media Server restarts automatically.
17. Remove any CD that is still in the CD drive while the K2 Media Server is shutting

down.

Restoring from a system-specific recovery disk image on E:

The following procedure can be used on a K2 Media Server that needs its image restored, if the image was made from that specific machine. If the image is the generic factory-default image, refer to the next procedure "Restoring from the generic recovery disk image on E:"

1. Make sure that media access is stopped and that the K2 Media Server on which you are working is out of service.
2. If you have not already done so, connect keyboard, monitor, and mouse to the K2 Media Server.
3. Insert the Recovery CD and restart the machine. If there is a problem restarting, hold the standby button down for five seconds to force a hard shutdown. Then press the standby button again to startup.

   The machine boots from the disc. The Acronis True Image program loads.
4. At the startup screen, select **True Image Server (Full Version)**.

   The Acronis True Image program loads.

   The Acronis True Image main window appears.
5. In the Acronis True Image main window, click **Recovery**.

   The Restore Data Wizard opens.
6. On the Welcome page, click **Next**.

   The Archive Selection page opens.
7. In the tree view expand the node for the E: partition and select the image file, then click **Next**:

   The Verify Archive Before the Restoring page opens.
8. Leave the selection at **No, I don't want to verify** and then click **Next**.

   The Partition or Disk to Restore page opens.
9. Select **System (C:)** and then click **Next**.

   The Restored Partition Location page opens.
10. Select **System (C:)** and then click **Next**.

    The Restored Partition Type page opens.
11. Leave the selection at **Active** and then click **Next**.

    The Restored Partition Size page opens.
12. Leave settings at their defaults. The size reported in the upper pane is the size detected of the actual C: partition. This should be the same as that reported in the Partition size field in the middle of the page. Free space before and Free space after should both be reported at 0 bytes. Click **Next**.

    The Next Selection page opens.
13. Depending on the partitions you are restoring, do one of the following:

- If you are restoring only the C: partition, select **No, I do not** and then click **Next**.

  The "…ready to proceed…" page opens.

  Skip ahead to step 20.

- If you are also restoring the D: partition, select **Yes, I want to restore another partition or hard disk drive** and then click **Next**.

  The Partition or Disk to Restore page opens. Continue with the next step in this procedure.

14. Select **Database (D:)** and then click **Next**.

    The Restored Partition Location page opens.

15. Select **Database (D:)** and then click **Next**.

    The Restored Partition Type page opens.

16. Leave the selection at **Primary** and then click **Next**.

    The Restored Partition Size page opens.

17. Leave settings at their defaults. The size reported in the upper pane is the size detected of the actual D: partition. This should be the same as that reported in the Partition size field in the middle of the page. Free space before and Free space after should both be reported at 0 bytes. Click **Next**.

    The Next Selection page opens.

18. Select **No, I do not** and then click **Next**.

    The Restore Operation option page opens.

19. Do not make any selections. Click **Next**.

    The "…ready to proceed…" page opens.

20. Verify that you are restoring the correct partition or partitions. Click **Proceed**.

    The Operation Progress page opens and displays progress.

21. When a "The data was successfully restored" message appears, click **OK**.

22. Click **Operations | Exit** to exit the Acronis True Image program.

    The K2 Media Server restarts automatically.

23. Remove any CD currently in the CD drive while the K2 Media Server is shutting down.

Restoring from the generic recovery disk image on E:

There can be multiple versions of the generic recovery disk image on the K2 Media Server's E: partition. Refer to *K2 Release Notes* to determine which version you should use.

This procedure can be used on a K2 Media Server that needs to be restored to its factory default state. For example, if you neglected to make a first birthday image, you might need to use this procedure. If the image from which you are restoring was made from the specific machine, refer to the previous procedure "Restoring from a system-specific recovery disk image on E:".

NOTE: This procedure restores the K2 Media Server (both C: and D: partitions) to its factory default condition. Passwords and other site-specific configurations are reset to factory defaults.

1. Make sure that media access is stopped and that the K2 Media Server on which you are working is out of service.
2. If you have not already done so, connect keyboard, monitor, and mouse to the K2 Media Server.
3. Insert the Recovery CD and restart the machine. If there is a problem restarting, hold the standby button down for five seconds to force a hard shutdown. Then press the standby button again to startup.

   The machine boots from the disc. The Acronis True Image program loads.
4. At the startup screen, select **True Image Server (Full Version)**.

   The Acronis True Image program loads.

   The Acronis True Image main window appears.
5. In the Acronis True Image main window, click **Recovery**.

   The Restore Data Wizard opens.
6. On the Welcome page, click **Next**.

   The Archive Selection page opens.
7. In the tree view expand the node for the E: partition and select the image file, then click **Next**:

   The Verify Archive Before the Restoring page opens.
8. Leave the selection at **No, I don't want to verify** and then click **Next**.

   The Partition or Disk to Restore page opens.
9. Select **System (C:)** and then click **Next**.

   The Restored Partition Location page opens.
10. Select **System (C:)** and then click **Next**.

    The Restored Partition Type page opens.
11. Leave the selection at **Active** and then click **Next**.

    The Restored Partition Size page opens.
12. Leave settings at their defaults. The size reported in the upper pane is the size detected of the actual C: partition. This should be the same as that reported in the Partition size field in the middle of the page. Free space before and Free space after should both be reported at 0 bytes. Click **Next**.

    The Next Selection page opens.
13. Depending on the partitions you are restoring, do one of the following:

    - If you are restoring only the C: partition, select **No, I do not** and then click **Next**.

      The "…ready to proceed…" page opens.

      Skip ahead to step 20.

- If you are also restoring the D: partition, select **Yes, I want to restore another partition or hard disk drive** and then click **Next**.

  The Partition or Disk to Restore page opens. Continue with the next step in this procedure.

14. Select **Database (D:)** and then click **Next**.

    The Restored Partition Location page opens.

15. Select **Database (D:)** and then click **Next**.

    The Restored Partition Type page opens.

16. Leave the selection at **Primary** and then click **Next**.

    The Restored Partition Size page opens.

17. Leave settings at their defaults. The size reported in the upper pane is the size detected of the actual D: partition. This should be the same as that reported in the Partition size field in the middle of the page. Free space before and Free space after should both be reported at 0 bytes. Click **Next**.

    The Next Selection page opens.

18. Select **No, I do not** and then click **Next**.

    The Restore Operation option page opens.

19. Do not make any selections. Click **Next**.

    The "…ready to proceed…" page opens.

20. Verify that you are restoring the correct partition or partitions. Click **Proceed**.

    The Operation Progress page opens and displays progress.

21. When a "The data was successfully restored" message appears, click **OK**.

22. Click **Operations | Exit** to exit the Acronis True Image program.

    The K2 Media Server restarts automatically.

23. Remove any CD currently in the CD drive while the K2 Media Server is shutting down.

24. Upon restart the Windows Setup Wizard automatically opens. Do Windows setup as follows:

    a. Enter in Windows Product Key and click **Next**.

       The Product Key is on a sticker on the top of the machine near the front right corner.

    b. Enter the name of the machine.

       For a K2 Media Server name, enter the Serial Number (located at right side and rear).

       The password is pre-set to the factory default. Leave the password as is.

    c. Click **Next**

    d. Set Time and click **Next**.

    Windows loads network components and restarts the K2 Media Server.

Upon restart, a Found New Hardware wizard and/or messages about services/ drivers can be displayed.

25. Install the Fibre Channel card driver. Refer to "Installing the Fibre Channel card driver" on page 414.
26. Set the Rx/Tx Descriptors value on both Ethernet adapters as follows:
    a. On the Windows desktop, right-click **K2 Media Server** (My Computer) and select **Manage**. The Computer Management window opens.
    b. In the left pane select **Device Manager**. Device Manager opens in the right pane.
    c. In the right pane, expand **Network Adapters**.
    d. Highlight and right-click the **Intel® PRO/1000 MT Dual Port Server Adapter**.
    e. Select **Properties**. The Properties dialog box opens.
    f. Click **Advanced** tab.
    g. In the Settings list, select **Performance Options**, then click the **Properties** button. The Performance Options dialog box opens.
    h. In the Property list, select **Receive Descriptors**.
    i. In the Values field, use the up/down arrows to set the value to **1024**. If 1024 is not available, select a different entry in the settings list, then select back to Receive Descriptors. This resets the values available in the Values field.
    j. In the Settings list, select **Transmit Descriptors**.
    k. In the Values field, set the value to **1024**.
    l. Click **OK** to save settings and close dialog boxes.
    m. Repeat this step and set the Rx/Tx Descriptors value on the remaining Ethernet adapter.
27. Close the Computer Management window.
28. Re-order network connections as follows:
    a. On the Windows desktop right-click **My Network Places** and select **Properties**.

       The Network Connections window opens.
    b. On the menu bar at the top of the window, select **Advanced**, then **Advanced Settings…**
    c. Select **Control Connection** in Connections field.
    d. Use the up arrow button, move the **Control Connection** to the top of the list (TOP priority - 1st).
    e. Ensure that FTP Connection is below the Control Connection.
       If not, select FTP Connection, and move it below the Control Connection.
    f. Click **OK** to save settings and close.
29. Set power management settings as follows:
    a. On the Windows desktop right-click **My Network Places** and select **Properties**.

The Network Connections window opens.

b. Right-click a network connection and select **Properties**.

The …Connection Properties dialog box opens.

c. Click **Configure**.

The …Properties dialog box opens.

d. On the **Power Management** tab, uncheck all checkboxes, if they are not already unchecked.

e. On a K2 Media Server, on the **Advanced** tab, select **Power Server Option | Properties** and uncheck all checkboxes, if they are not already unchecked, then click **OK**.

f. On the …Properties dialog box, click **OK**.

g. Repeat these steps on the remaining network connections in the Network Connections window.

30. Install K2 Media Server software. Also install related software, such as SNFS, if required for the latest upgrade. Refer to your latest *K2 Release Notes* for detailed instructions.

31. You must active the Windows operating system within 30 days. Refer to "Activating the Windows operating system" on page 151

The K2 Media Server is now restored to its factory-default state. However, you can complete its configuration as part of a K2 SAN by using the K2 System Configuration application.

Restoring from a recovery disk image CD set

The following procedure can be used on a K2 Media Server that needs all three partitions on the system drive restored.

This procedure assumes that the image on the CD set is the system-specific image, for the particular machine that you are restoring.

NOTE: At any step in this procedure if a message appears asking for disc/volume, insert CDs as prompted until you can proceed to the next step.

1. Make sure that media access is stopped and that the K2 Media Server on which you are working is not being used.

2. If you have not already done so, connect keyboard, monitor, and mouse to the K2 Media Server.

3. Insert the Recovery CD and restart the machine. If there is a problem restarting, hold the standby button down for five seconds to force a hard shutdown. Then press the standby button again to startup.

   The machine boots from the disc. The Acronis startup screen appears.

4. At the startup screen, select **True Image Server (Full Version)**.

   The Acronis True Image program loads.

   The Acronis True Image main window appears.

5. Insert the last CD (volume) in your recovery disk image CD set. For example, if there are three CDs that make up the disk image, insert the third CD.
6. In the Acronis True Image main window, click **Recovery**.

   The Restore Data Wizard opens.
7. On the Welcome page, click **Next**.

   The Archive Selection page opens.
8. In the tree view expand the node for the CD ROM drive and select the image file, then click **Next**:

   The Restoration Type Selection page opens.
9. Select **Restore disks or partitions** and then click **Next**.

   The Partition or Disk to Restore page opens.
10. Select **Disk 1**. This selects all three partitions to be restored.

    If you do not want to restore all three partitions, refer to similar steps in "Restoring from a system-specific recovery disk image on E:" on page 144.

    Click **Next**.

    The Restored Partition Sizing page opens.
11. Select **No, I don't want to resize source partitions** and then click **Next**.

    The Restored Hard Disk Drive Location page opens.
12. Select **Disk 1** and then click **Next**.

    The Non-Empty Destination Hard Disk Drive page opens.
13. Select **Yes…delete all partitions…** and then click **Next**.

    If messages appear asking for disks, insert CDs sequentially and click **Retry** until you can proceed to the next step.

    The Next Selection page opens.
14. Select **No, I do not** and then click **Next**.

    The Restore Operation option page opens.
15. Do not make any selections. Click **Next**.

    The "…ready to proceed…" page opens.
16. Verify that you are restoring partitions. Click **Proceed**.

    The Operation Progress page opens and displays progress.
17. Insert CDs as prompted. As messages appear asking for disks, insert CDs sequentially and click **Retry**.
18. When a "The data was successfully restored" message appears, click **OK**.
19. Click **Operations | Exit** to exit the Acronis True Image program.

    The K2 Media Server restarts automatically.
20. Remove the Recovery CD while the K2 Media Server is shutting down.

Activating the Windows operating system

If a K2 Media Server is restored to its factory default state or otherwise has the Windows operating system re-applied, you might need to activate the operating system. This procedure provides instructions for doing this while the machine is connected to the Internet. The Activation wizard provides other options, which you can also choose if desired.

To active the Windows operating system on a K2 device, do the following:

1. Make sure the machine is connected to the Internet.
2. From the Windows desktop, in the system tray double-click on the key symbol icon. The Activate window opens.
3. Select **Yes, let's activate Windows over the Internet now** and click **Next**.
4. When prompted, “If you want to register with Microsoft right now.”, select **No**.
5. Wait for the connection. If the system times out, you are prompted for entering information in the Internet Protocol Connection dialog. Enter the proxy address and port number as appropriate for your facility’s connections.
6. Ensure that “You have successfully activated your copy of Windows” message appears in Activate Windows.
7. Click **OK** to close the Activate Windows.

Chapter 7

Configuring the K2 SAN

This chapter provides instructions for configuring K2 SANs:

- "Importing a SiteConfig system description"
- "Configuring the Level 10R K2 SAN"
- "Configuring the Level 20 K2 SAN"
- "Configuring the Level 20R K2 SAN"
- "Configuring the Level 30 K2 SAN"
- "Configuring the Level 30R K2 SAN"
- "Configuring the Nearline 10 K2 SAN"

Use the appropriate section to configure your K2 SAN.

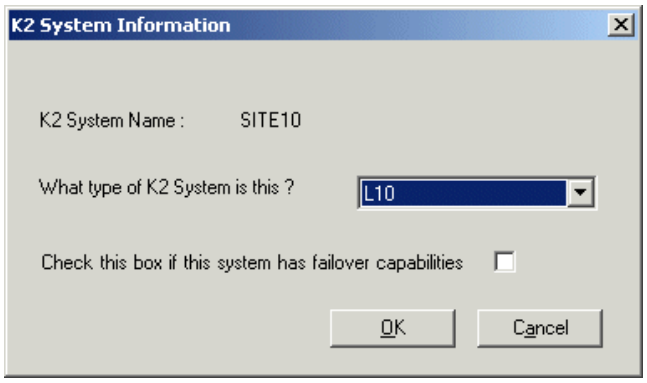
Importing a SiteConfig system description

You can import a SiteConfig system description that contains a K2 SAN into the K2 System Configuration (K2Config) application. You should do this only after the K2 SAN is fully complete and implemented in SiteConfig, as changes are not automatically synchronized between SiteConfig and K2Config after the import.

When you import a SiteConfig system description, K2Config identifies your SAN devices, defines the SAN, and displays the unconfigured SAN in the tree view. Therefore you do not need to define the K2 SAN in K2Config. You can skip this task and instead begin your work in K2Config by configuring the first K2 Media Server.

1. In the K2 System Configuration application, click **File | Import SiteConfig**.
2. Browse to and select the system configuration file.

   A K2 System Information dialog box opens.



3. In the drop-down list, select the K2 SAN level for the K2 SAN that you are importing.
4. If a redundant K2 SAN, select "…**failover capabilities**…"
5. Click **OK**.
6. The SAN appears in the K2 System Configuration application.

Configuring the Level 10 K2 SAN

Work through the topics in this section sequentially to do the initial configuration of the Level 10 K2 SAN.

- "Prerequisites for initial configuration" on page 154
- "Defining a new K2 SAN" on page 155
- "Configuring the server - Part 1" on page 157
- "Configuring RAID" on page 159
- "Creating a new file system" on page 164
- "Configuring the server - Part 2" on page 166

Prerequisites for initial configuration

Before beginning your initial configuration, make sure the devices of the K2 SAN meet the following prerequisites. Refer to sections earlier in this manual for detailed information. Also refer to Chapter 10, "Description of K2 SAN Devices".

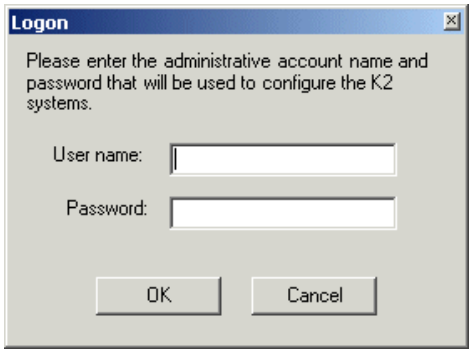
Devices	Prerequisite for Level 10 configuration
Control point PC	Ethernet cable connected Control Point software installed Control network IP address assigned Network communication over the control network with all other K2 devices Power on
Ethernet switch	Ethernet cables connected Control network IP address assigned VLANs set up Trunks set up Power on
K2 Media Server	Ethernet cables connected Fibre Channel cable connected Software installed, as from the factory, including QuickTime 7 Control network IP address assigned Power on
L10 RAID chassis	Fibre Channel cable(s) connected Ethernet cable(s) connected Power on
L10 RAID Expansion chassis (optional)	Fibre channel cable(s) connected Power on

Defining a new K2 SAN

If you import a SiteConfig system description file, you do not need to define a new K2 SAN. You can skip this task and instead start by configuring the first K2 Media Server.

Define a Level 10 K2 SAN as follows:

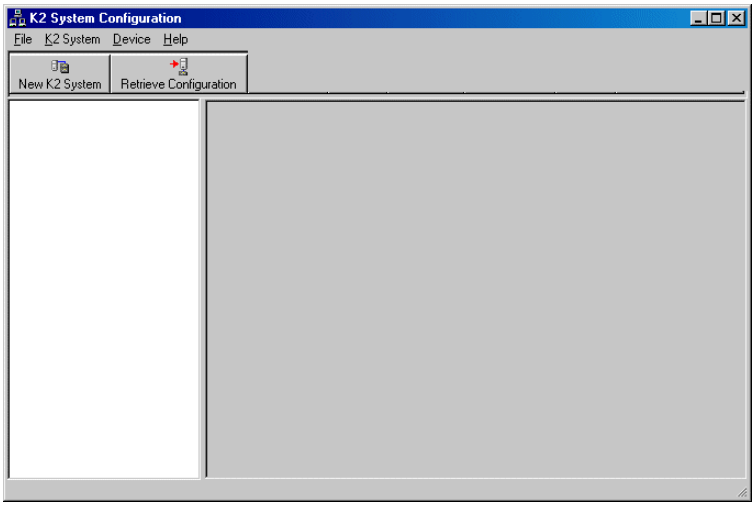
1. On the control point PC, open the K2 System Configuration application. A login dialog box opens.



2. Log in to the K2 System Configuration application with the Windows administrator account. By default this as follows:

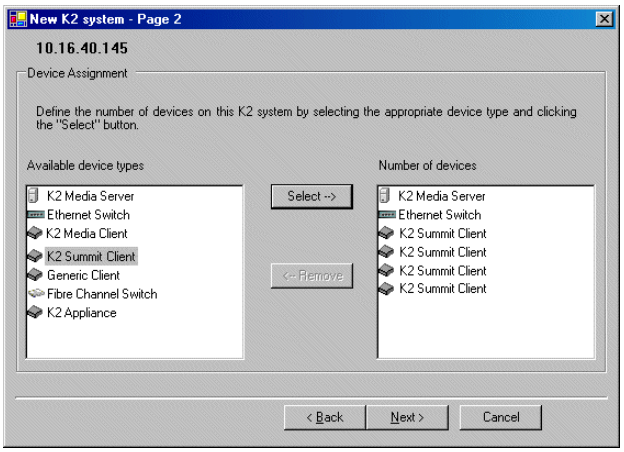
   - Username: Administrator
   - Password: adminK2

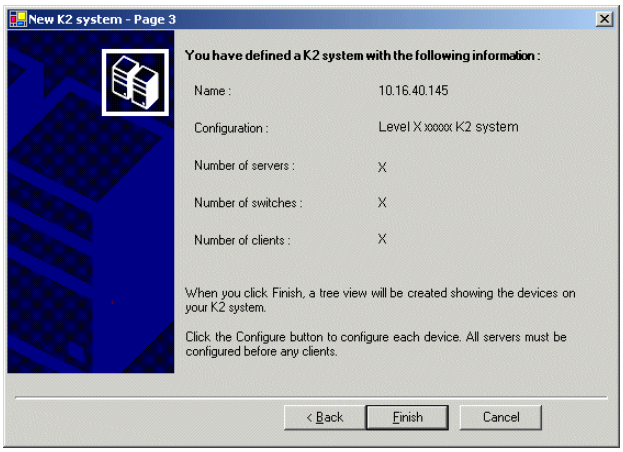
   Refer to "Setting up application security" on page 393 for more information about administrator accounts and logging in to applications.



3. Click **New K2 System**. The New K2 System wizard opens.

4. Follow the on-screen text to define your Level 10 K2 SAN, as described in the following table.

On this page…	Do this…
Page 1	 Create a name for your Level 10 K2 SAN and type it in the Name box. Select **Level 10**. If so designed, select **Enable Live Production mode**. Do not select the Server redundancy option. Click **Next**
Page 2	 Move the following into the Number of Devices Box: • One K2 Media Server • One Ethernet switch • K2 clients as appropriate for your system. • (Optional) Other devices as appropriate for your system. Click **Next**.

On this page...	Do this...
Page 3	 Review the information on this page and verify that you have correctly defined your K2 SAN. For a Level 10 K2 SAN you should have the following: • One Gigabit Ethernet switch • One K2 Media Server • The number and type of clients appropriate for your system. Click **Finish**. The Define New K2 Storage System wizard closes.

Your K2 SAN appears in the tree view of the K2 System Configuration application.

5. Continue with the next procedure.

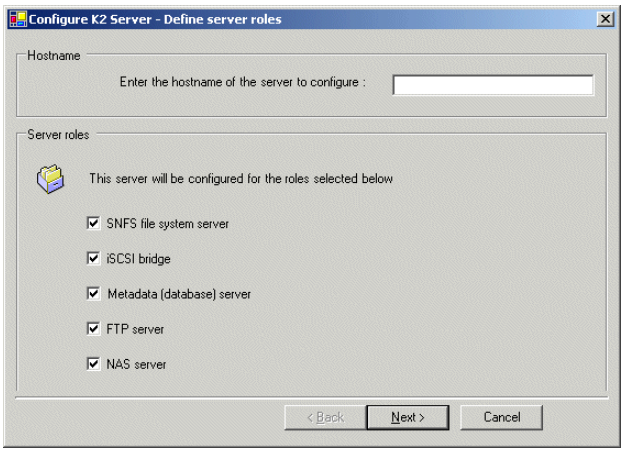
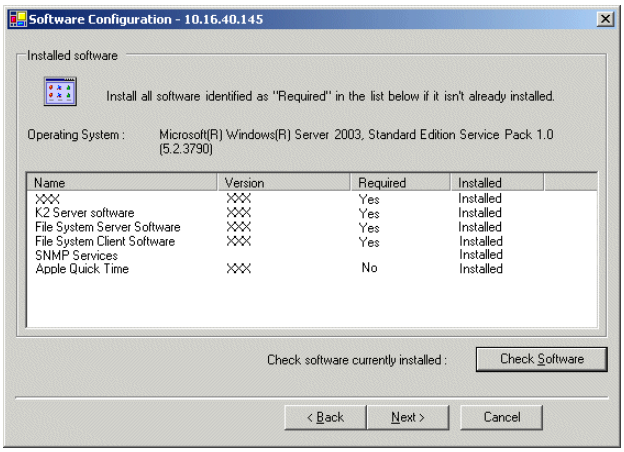
Configuring the server - Part 1

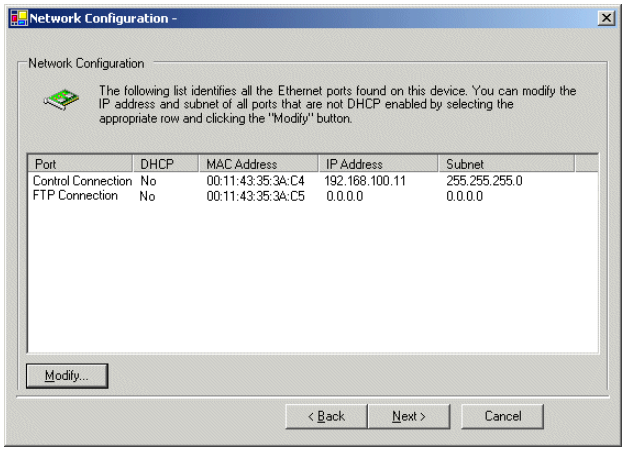
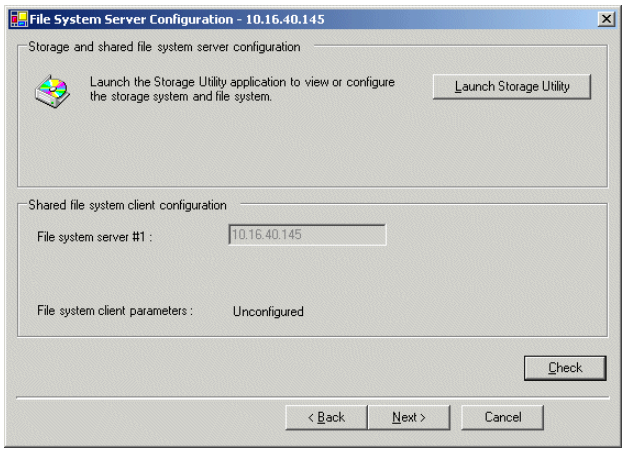
1. In the K2 System Configuration application tree view, select [**K2Server1]**.

2. Click the **Configure** button.

The Configure K2 Server wizard opens. Follow the on-screen text to configure the for a Level 10 K2 SAN, as described in

the following table:

On this page…	Do this…
Define server roles	 Enter the name for the K2 Media Server, as currently configured on the machine. For Level 10, select all roles. Click **Next**
Software Configuration This page checks for the software required to support the roles you selected on the previous page.	 If software with *Yes* in the Required column reports as *Not Installed*, you must first install it on the before continuing. After installing the software, click **Check Software**. When all required software reports as *Installed*, click **Next**.

On this page…	Do this…
Network Configuration This page displays the control network Ethernet port, and allows you to configure the FTP/ Streaming network Ethernet port. ***NOTE: This page does not configure the iSCSI interface (media network) ports.***	 The top port is the port over which the K2 System Configuration application is communicating. If correctly configured, it is already assigned the control network IP address, as displayed on this page. If the server has the role of FTP server, if the other port is not already configured correctly, select the other port and click **Modify**. A network configuration dialog box opens. Enter the FTP/Streaming IP address and the subnet mask and click **Apply**. Click **Next**.
File System Server Configuration	 Click **Launch Storage Manager**. Storage Utility opens.

3. Continue with the next procedure to use Storage Utility to configure the storage and file system.

   Leave the Configure K2 Server wizard open while you are using Storage Utility. When you are done with Storage Utility, you continue with the wizard.

Configuring RAID

Use Storage Utility to complete the configuration of the L10 RAID chassis, as explained in the following topics:

- "Configuring RAID network and SNMP settings"

- "Binding disk modules"

Refer to "Prerequisites for initial configuration" on page 154 to confirm that the RAID storage is ready for configuration.

Configuring RAID network and SNMP settings

Use the Storage Utility to configure the following settings for the Level 10 RAID controller:

- IP address
- Subnet mask
- Gateway Address
- SNMP trap destinations

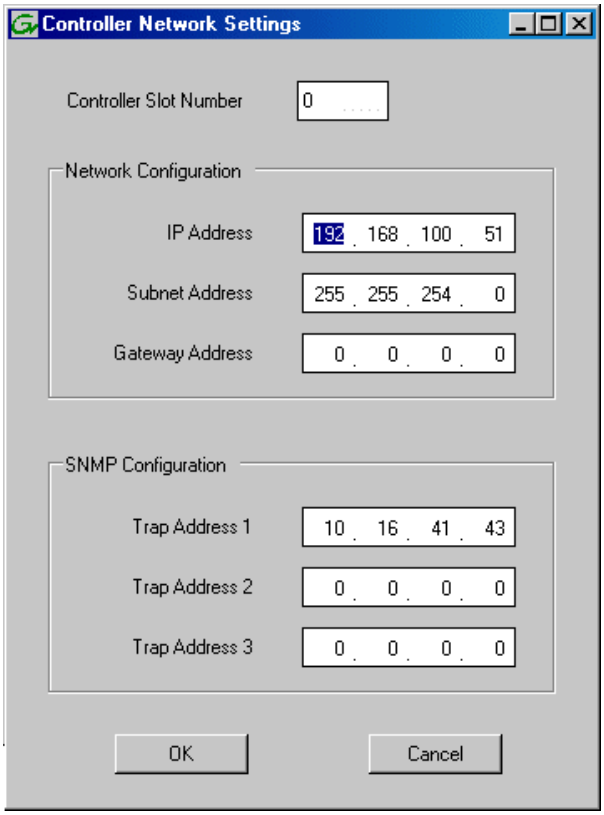
For L10 RAID, network and SNMP settings are set and stored on the RAID controller module, so the combined RAID storage devices, including the optional Expansion chassis, exist as a single entity on the control network.

The RAID storage device is configured by default for the SNMP community name "public". If your site's policies require using a different SNMP community name, contact your Grass Valley representative.

To configure these settings, do the following:

1. Launch Storage Utility from the K2 System Configuration application as in the previous procedure.
2. As prompted, wait while Storage Utility gathers system information, then Storage Utility opens.
3. In Storage Utility tree view, expand the node for the L10 RAID, right-click the icon for a L10 RAID controller, and select **Configuration | Network Properties**.

   The Controller Network Settings dialog box opens.



4. In the Controller Slot Number field enter **0** and then press **Enter**. The settings from controller 0 are loaded into the Controller Network Settings dialog box and are available for you to modify.
5. Enter the control network IP address and other network settings.
6. You want SNMP trap messages go to the NetCentral server PC, so for SNMP Configuration enter the IP address of the NetCentral server PC. You can also enter IP addresses for other SNMP managers to which you want to send SNMP trap messages.
7. Click **OK** to save settings and close.
8. In Storage Utility click **View | Refresh**. Continue with the next procedure "Binding disk modules".

Binding disk modules

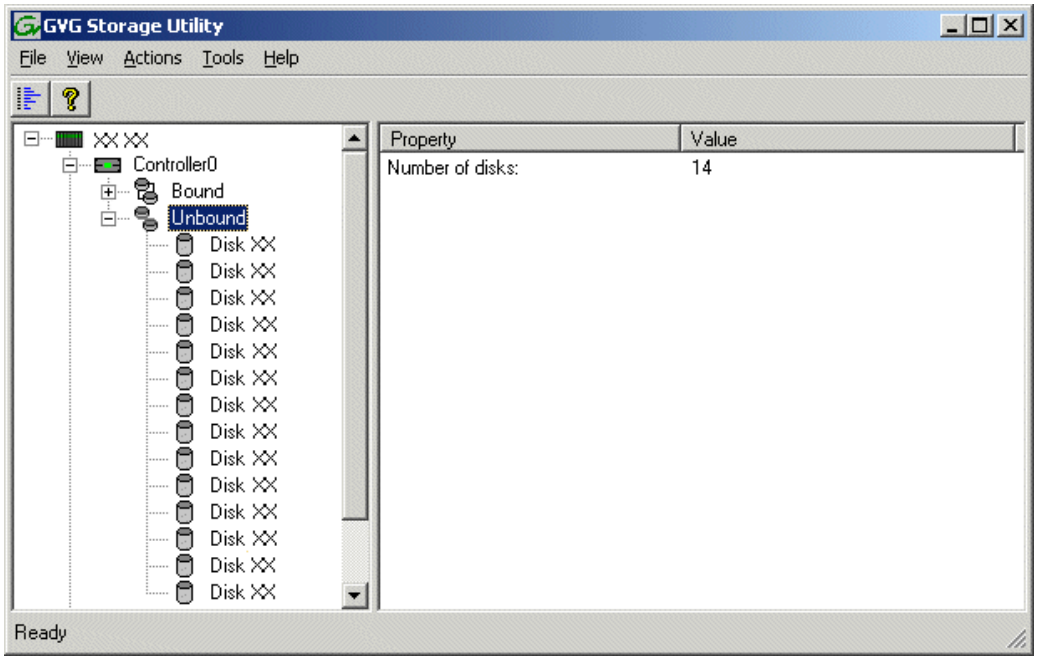
Use the following procedure to bind disk modules as required for the Level 10 K2 SAN.

Also refer to "About RANKs and LUNs in Storage Utility" in the chapter *Overview of K2 Storage Tools*.

NOTE: Binding destroys all user data on the disks.

1. In the Storage Utility main window, identify bound RANKs and unbound disks by

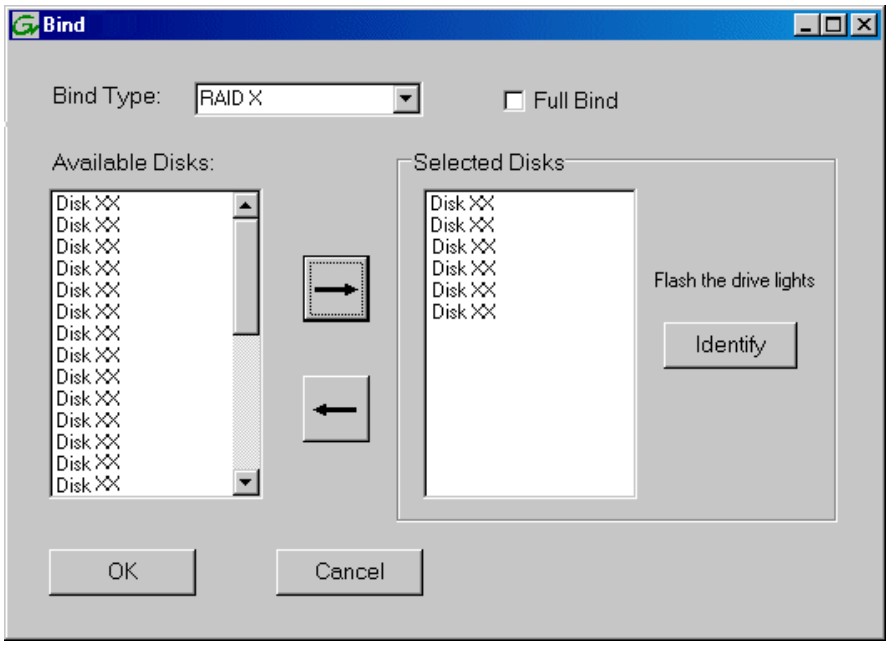
their placement in the hierarchy of the tree view. In the following illustration, disk numbers are represented by “XX”. Refer to “Identifying disks” on page 451 for an explanation of how disks are actually numbered in Storage Utility.



2. To bind unbound disks for media storage, do the following:

   a. Right-click the **Unbound** node for a controller, then select **Bind** in the context menu. (If the RAID chassis has two controllers, both controllers are represented by the single “Controller” node)

      The Bind dialog box opens showing all unbound disks for the controller listed in the Available Disk list.



b. Leave Full Bind unchecked. Refer to "About full/background bind" on page 455.

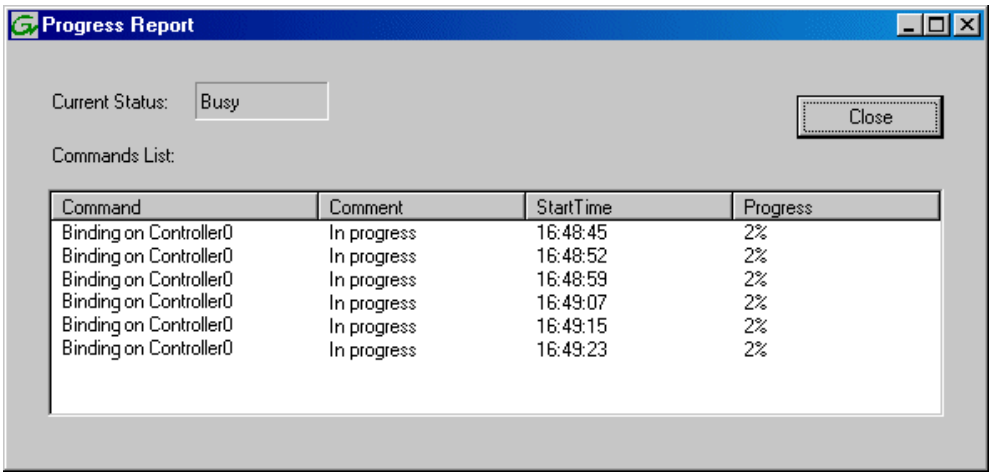
c. In the **Bind Type** drop down box, select **RAID 5** or **RAID 6**, as specified by your system design.

d. In the Available Disks box, select six contiguous disks at the top of the list. (TIP: Use 'shift-click' or 'control-click' to select disks.).

e. Click the add (arrow) button to add disks to the Selected Disks list.

NOTE: As an aid in identifying a disk module's physical location, select it in the Selected Disks list, then click* Identify Disks. *This causes the disk drive light to flash.

f. Click **OK** to close the Bind dialog box and begin the binding process. The Progress Report dialog box opens, showing the status of the binding process.



g. Close the Progress Report and repeat these steps for other unbound disks. If specified by your system design, you can bind some disks as Hot Spares, as explained in "Binding Hot Spare drives" on page 457. When you are done, if you did not bind any extra Hot Spares, you should have the following results:

   For L10 storage you should have two RAID 5 or RAID 6 RANKs of six disks each on the primary RAID storage device. For each optional Expansion chassis, you would have an additional one or two RAID 5 or RAID 6 RANKs of six disks each.

h. Click **Close** in Progress Report window.

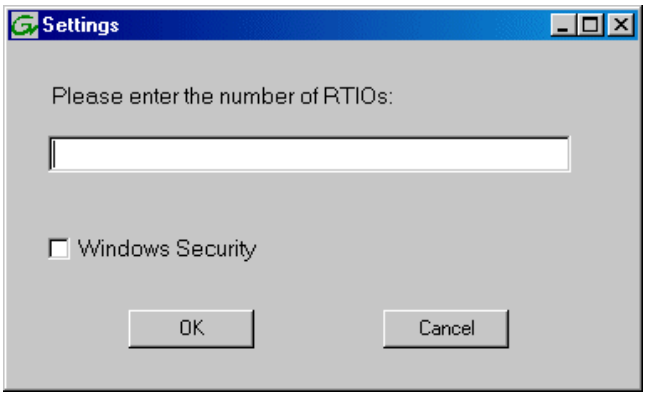
3. Restart the K2 Media Server.

NOTE: Make sure start up processes on the K2 Media Server are complete before proceeding.

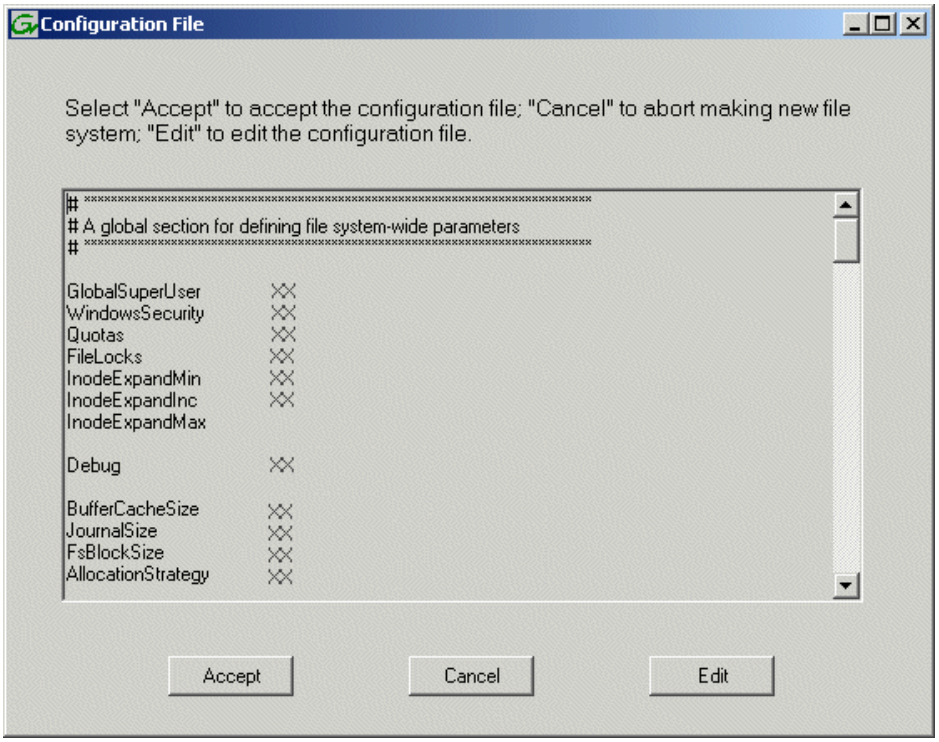
4. Continue with the next procedure "Creating a new file system".

Creating a new file system

1. In Storage Utility, click **Tools | Make New File System**. The Setting dialog box opens.



2. For the Real Time Input/Output (RTIO) rate, enter the value specified by your system design. If you do not know this value, contact your Grass Valley representative.
3. If the K2 SAN is to be accessed by only K2 clients you can leave Windows Security unchecked. If accessed by Aurora Edits, refer to the *Aurora Edit Installation and Configuration Guide* for instructions.
4. Click **OK**. The Configuration File dialog box opens.



The configuration file for the media file system is displayed. You can verify media file system parameters by viewing this file. Do not edit this file. Click **Accept**.

A "…Please wait…" message box displays progress and a "…succeeded…" message confirms the process is complete.

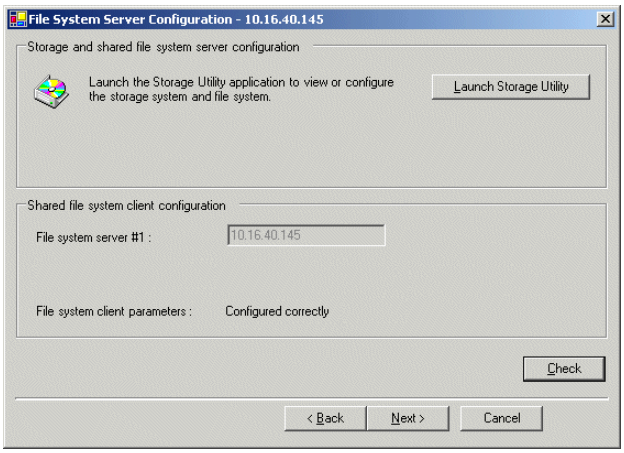
5. A message informs you that you must restart the K2 Media Server, however the restart at the end of the Configure K2 Server wizard suffices, so you do not need to restart now.
6. Close the Storage Utility.

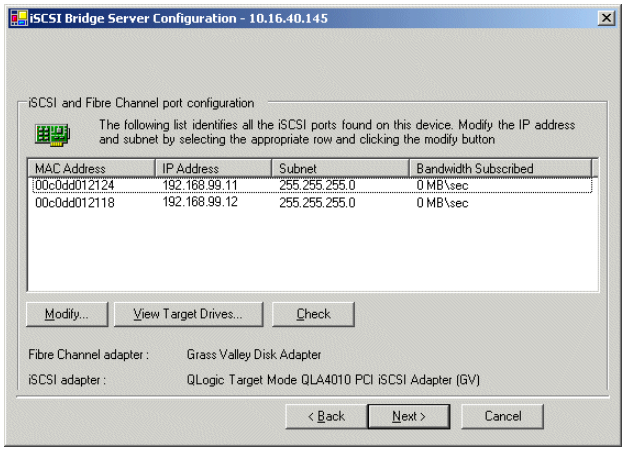
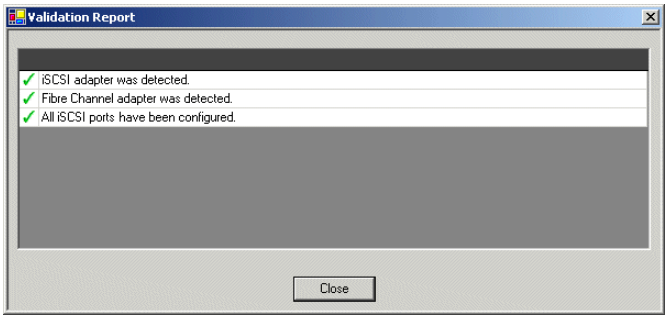
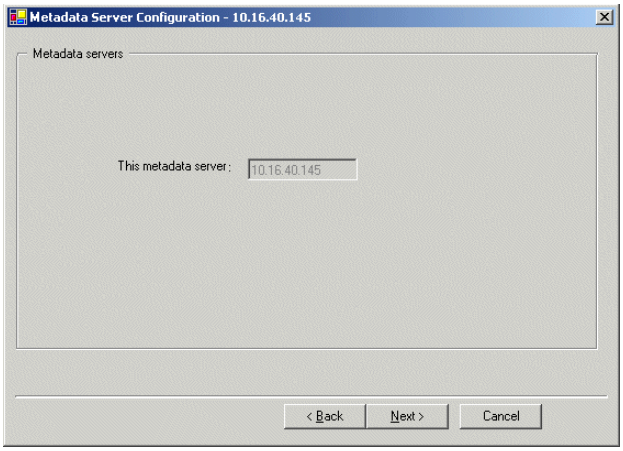
NOTE: Do not attempt to start K2 clients or otherwise bring the K2 SAN online until instructed to do so later in this chapter.

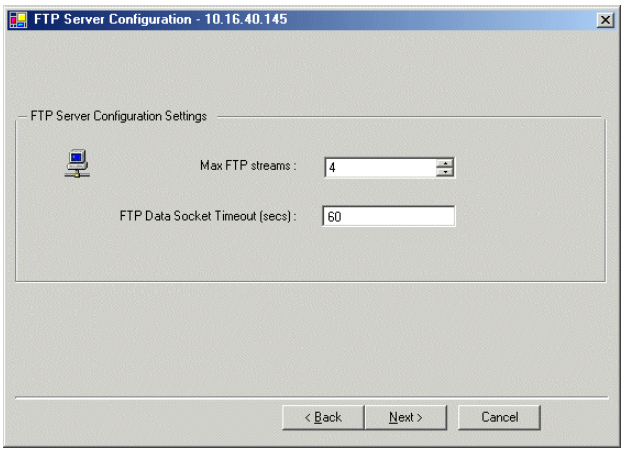
7. Continue with the next procedure.

Configuring the server - Part 2

1. Return to the Configure K2 Server page from which you launched Storage Utility and proceed as described in the following table:

On this page…	Do this…
File System Server Configuration This page checks on the configuration of the server in one of its main roles as a file system server. The server also functions as a file system client, which is also checked from this page.	 Click **Check**. When the wizard reports that the configuration is correct, click **Next**. If you get a "The V: will not be available until this device is rebooted…" message, you can safely continue with this procedure and follow the instructions related to this message later in the procedure.

On this page…	Do this…
iSCSI Bridge Server Configuration This page manages the components that bridge between iSCSI (the GigE media network) and the Fibre Channel connection to the RAID storage. You configure network settings on the iSCSI adapters and the page validates that the Fibre Channel adapter is in place and that the media RANKs are visible as iSCSI targets.	 Select an iSCSI adapter and click **Modify**. A network configuration dialog box opens. Verify or enter the media network IP address and the subnet mask and click **Apply**. Do the same for the other iSCSI adapter. You must verify or configure the second iSCSI adapter, even though it is not used on a L10 system. Click **Check**. The Validation Report opens.  Confirm that the iSCSI configuration is successful. Close the Validation Report and then click **Next**.
Database Server Configuration	 You do not need to enter or configure anything on this page. Click **Next**.

On this page…	Do this…
FTP Server Configuration This page appears only if the server has the role of FTP server.	 Do not modify these settings. Leave at default values of Max FTP streams = 4 and FTP Data Socket Timeout = 60. Only qualified Grass Valley personnel should specify other values, as these settings are intended for use only with custom systems designed by Grass Valley. Click **Next**
Completing the Configuration Wizard	Click **Finish**. The wizard closes. The server restarts. Wait until all startup processes have completed before continuing.

Next, configure K2 clients and/or other iSCSI clients on the K2 SAN.

Configuring the Level 10R K2 SAN

Work through the topics in this section sequentially to do the initial configuration of the Level 10R K2 SAN.

- "Prerequisites for initial configuration" on page 169
- "Defining a new K2 SAN" on page 170
- "Configuring server A - Part 1" on page 172
- "Configuring RAID" on page 174
- "Creating a new file system" on page 180
- "Configuring server A - Part 2" on page 182
- "Configuring the redundant server B" on page 185

Prerequisites for initial configuration

Before beginning your initial configuration, make sure the devices of the K2 SAN meet the following prerequisites. Refer to sections earlier in this manual for detailed information. Also refer to Chapter 10, "Description of K2 SAN Devices".

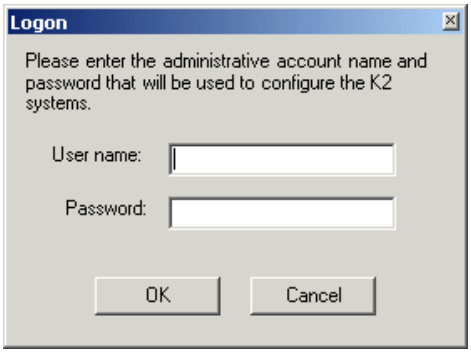
Devices	Prerequisite for Level 10R configuration
Control point PC	Ethernet cable connected Control Point software installed Control network IP address assigned Network communication over the control network with all other K2 devices Power on
Ethernet switch	Ethernet cables connected Control network IP address assigned VLANs set up Trunks set up Power on
K2 Media Server	Ethernet cables connected Fibre Channel cable connected Redundant servers connected by serial cable Software installed, as from the factory, including QuickTime 7 Control network IP address assigned Power on for all servers
L10R RAID chassis	Fibre Channel cable(s) connected Ethernet cable(s) connected Power on
L10R RAID Expansion chassis (optional)	Fibre channel cable(s) connected Power on

Defining a new K2 SAN

If you import a SiteConfig system description file, you do not need to define a new K2 SAN. You can skip this task and instead start by configuring the first K2 Media Server.

Define a Level 10R K2 SAN as follows:

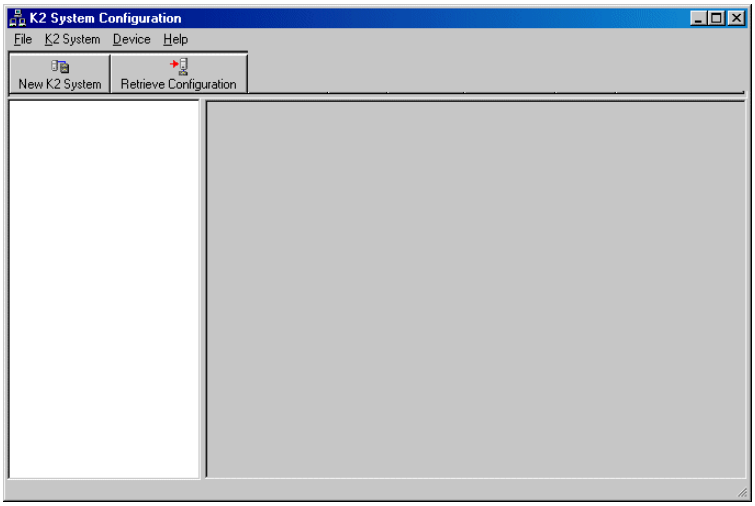
1. On the control point PC, open the K2 System Configuration application. A login dialog box opens.



2. Log in to the K2 System Configuration application with the Windows administrator account. By default this as follows:

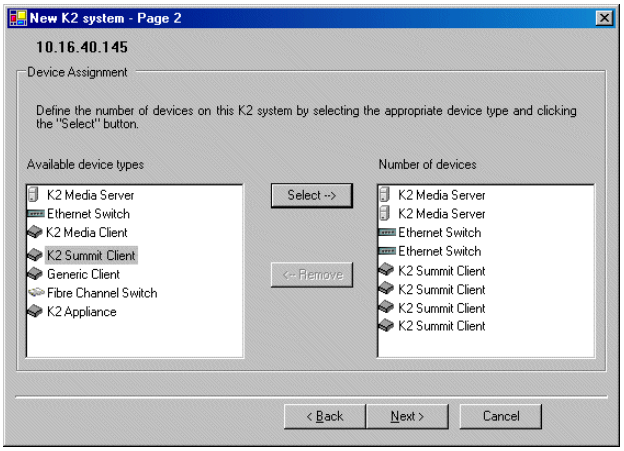
   - Username: Administrator
   - Password: adminK2

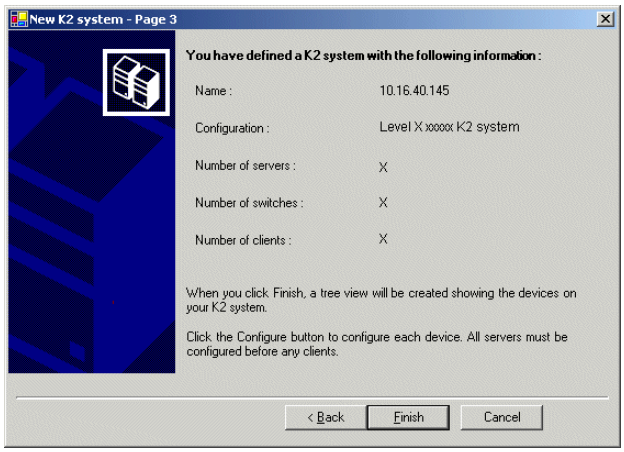
   Refer to "Setting up application security" on page 393 for more information about administrator accounts and logging in to applications.



3. Click **New K2 System**. The New K2 System wizard opens.

4. Follow the on-screen text to define your Level 10R K2 SAN, as described in the following table.

On this page...	Do this...
Page 1	 Create a name for your Level 10R K2 SAN and type it in the Name box. Select **Level 10**. If so designed, select **Enable Live Production mode**. Select the **Server redundancy** option. Click **Next**
Page 2	 Move the following into the Number of Devices Box: • Two K2 Media Servers • Two Ethernet switches • K2 clients as appropriate for your system. • (Optional) Other devices as appropriate for your system. Click **Next**.

On this page…	Do this…
Page 3	 Review the information on this page and verify that you have correctly defined your K2 SAN. For a Level 10R K2 SAN you should have the following: • Two Gigabit Ethernet switches • Two K2 Media Servers • The number and type of clients appropriate for your system. Click **Finish**. The Define New K2 Storage System wizard closes.

Your K2 SAN appears in the tree view of the K2 System Configuration application.

5. Continue with the next procedure.

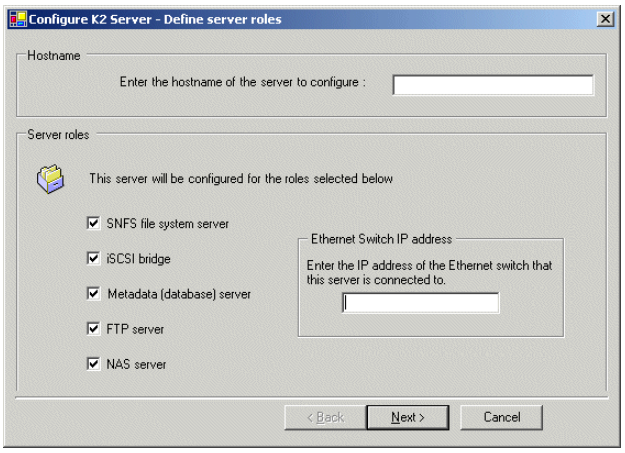
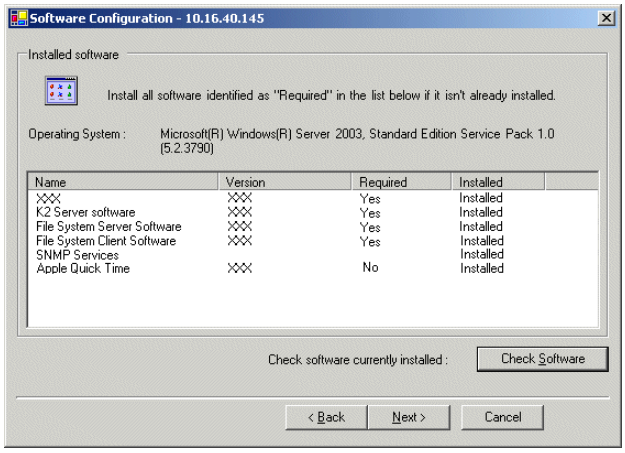
Configuring server A - Part 1

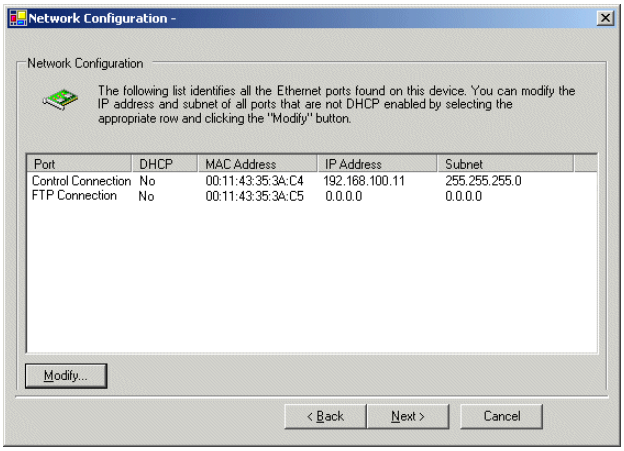
1. In the K2 System Configuration application tree view, select [**K2Server1]**.

2. Click the **Configure** button.

   The Configure K2 Server wizard opens. Follow the on-screen text to configure the for a Level 10R K2 SAN, as described

in the following table:

On this page...	Do this...
Define server role	 Enter the name for the K2 Media Server, as currently configured on the machine. Enter the name or IP address of the Ethernet switch, as currently configured on the switch, to which the K2 Media Server is connected. For Level 10R redundant, select all roles. Click **Next**
Software Configuration This page checks for the software required to support the roles you selected on the previous page.	 If software with *Yes* in the Required column reports as *Not Installed*, you must first install it on the before continuing. After installing the software, click **Check Software**. When all required software reports as *Installed*, click **Next**.

On this page…	Do this…
Network Configuration This page displays the control network Ethernet port, and allows you to configure the FTP/ Streaming network Ethernet port. ***NOTE: This page does not configure the iSCSI interface (media network) ports.***	 The top port is the port over which the K2 System Configuration application is communicating. If correctly configured, it is already assigned the control network IP address, as displayed on this page. If the server has the role of FTP server, if the other port is not already configured correctly, select the other port and click **Modify**. A network configuration dialog box opens. Enter the FTP/Streaming IP address and the subnet mask and click **Apply**. Click **Next**.
File System Server Configuration	Enter the name or IP address of the redundant K2 Media Server (server B). Do not yet click Next. Do not yet enter anything in the File System Server #2 box. Click **Launch Storage Manager**. Storage Utility opens.

3. Continue with the next procedure to use Storage Utility to configure the storage and file system.

   Leave the Configure K2 Server wizard open while you are using Storage Utility. When you are done with Storage Utility, you continue with the wizard.

Configuring RAID

Use Storage Utility to complete the configuration of the L10R RAID chassis, as explained in the following topics:

- "Configuring RAID network and SNMP settings"
- "Binding disk modules"

Refer to "Prerequisites for initial configuration" on page 169 to confirm that the RAID storage is ready for configuration.

Configuring RAID network and SNMP settings

Use the Storage Utility to configure the following settings for the Level 10R RAID controllers:

- IP address
- Subnet mask

- Gateway Address
- SNMP trap destinations

For L10R RAID, network and SNMP settings are set and stored on the RAID controller module. For the RAID chassis with two controllers, each controller has its own network settings and the RAID chassis exists as two entities on the control network.

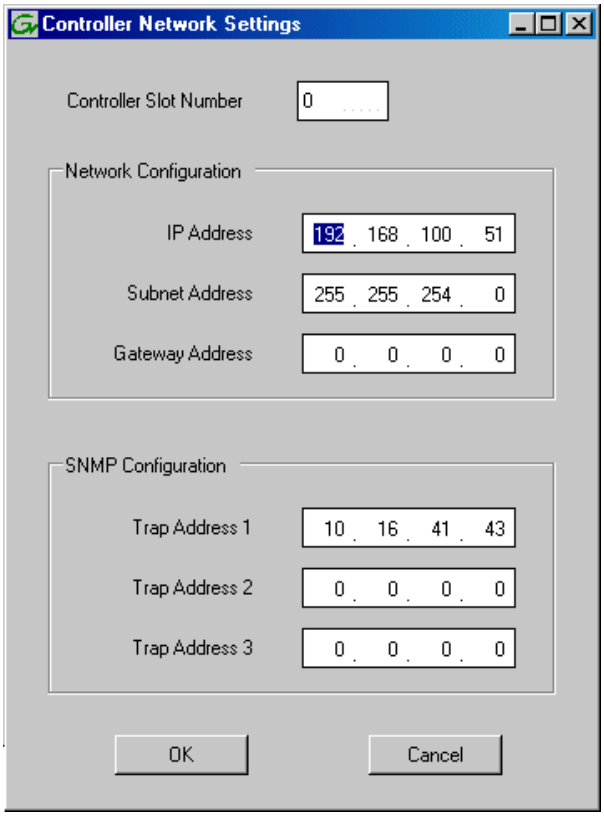
The RAID storage device is configured by default for the SNMP community name “public”. If your site’s policies require using a different SNMP community name, contact your Grass Valley representative.

To configure these settings, do the following:

1. Launch Storage Utility from the K2 System Configuration application as in the previous procedure.
2. As prompted, wait while Storage Utility gathers system information, then Storage Utility opens.
3. In Storage Utility tree view, expand the node for the L10R RAID, right-click the icon for a L10R RAID controller, and select **Configuration | Network Properties**.

   The Controller Network Settings dialog box opens.

   For a L10R RAID chassis with two controllers, you can make settings on both controllers using this dialog box.



4. In the Controller Slot Number field enter **0** and then press **Enter**. The settings from controller 0 are loaded into the Controller Network Settings dialog box and are available for you to modify.
5. Enter the control network IP address and other network settings.
6. You want SNMP trap messages go to the NetCentral server PC, so for SNMP Configuration enter the IP address of the NetCentral server PC. You can also enter IP addresses for other SNMP managers to which you want to send SNMP trap messages.
7. For the RAID chassis with two controllers, in the Controller Slot Number field enter **1** and then press **Enter**. The settings from controller 1 are loaded into the Controller Network Settings dialog box and are available for you to modify. Repeat the previous steps to configure controller 1.
8. Click **OK** to save settings and close.
9. In Storage Utility click **View | Refresh**. Continue with the next procedure "Binding disk modules".

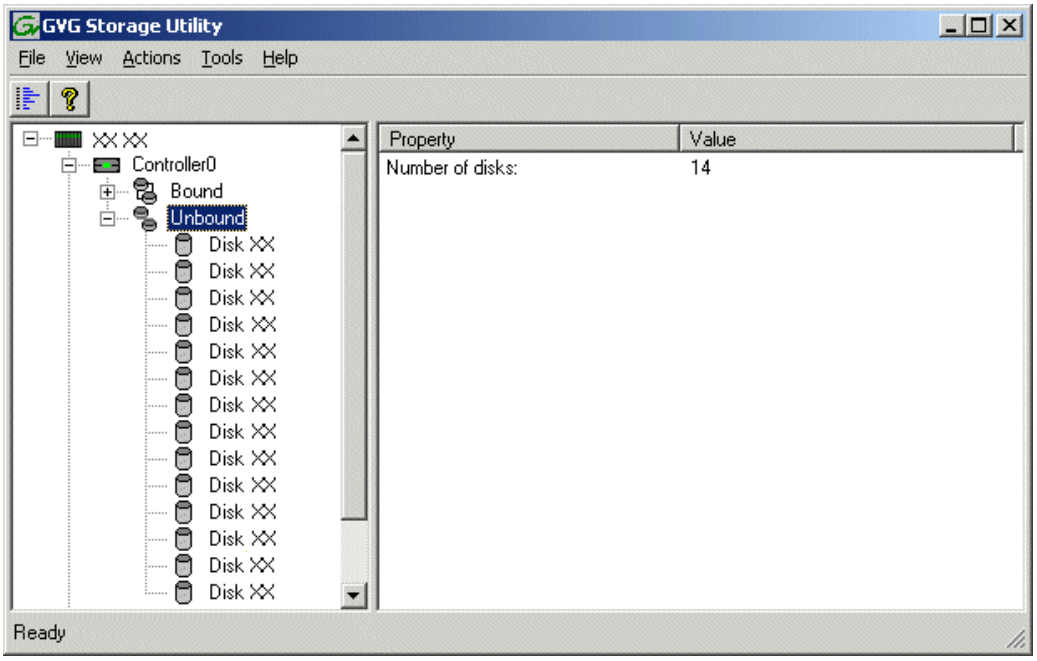
Binding disk modules

Use the following procedure to bind disk modules as required for the Level 10R K2 SAN.

Also refer to "About RANKs and LUNs in Storage Utility" in the chapter *Overview of K2 Storage Tools*.

NOTE: Binding destroys all user data on the disks.

1. In the Storage Utility main window, identify bound RANKs and unbound disks by their placement in the hierarchy of the tree view. In the following illustration, disk numbers are represented by "XX". Refer to "Identifying disks" on page 451 for an explanation of how disks are actually numbered in Storage Utility.



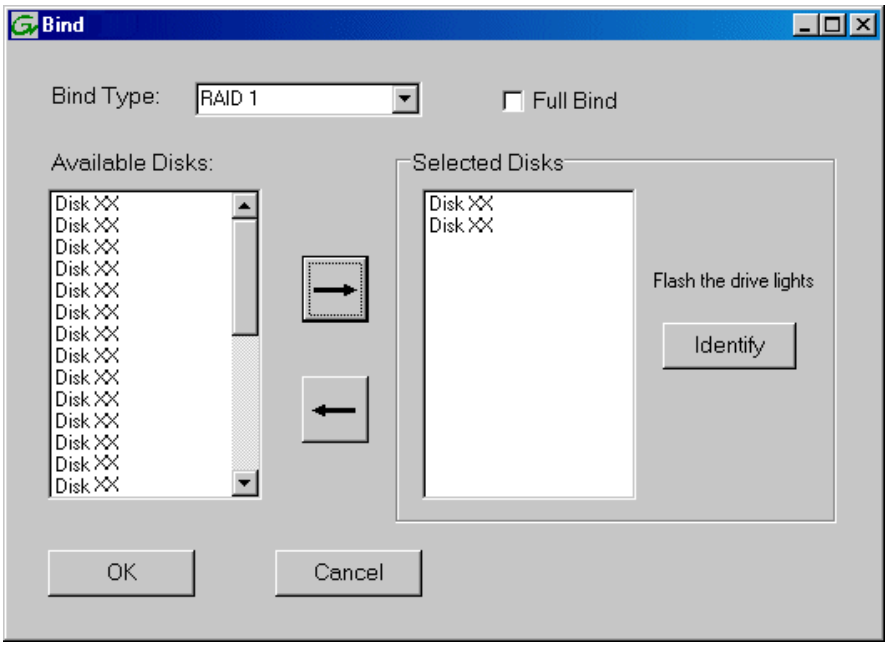
Redundant systems store metadata files and journal files on the primary RAID chassis. The first six disk slots in the chassis are dedicated for metadata/journal files. In the first five slots are five metadata/journal disks. The sixth slot is filled with a blank. Two disks are bound as a RAID 1 RANK for metadata storage and two disks are bound as a RAID 1 RANK for journal storage. The fifth disk is bound as a Hot Spare for the other four metadata/journal disks. The remaining six disks in the primary RAID chassis and all disks in Expansion chassis are for media storage. Media storage disks are bound as RAID 5 or RAID 6 in RANKs consisting of six disks each.

View disk properties and identify the four disks you will use for the metadata/journal RAID 1 RANKs, the one metadata/journal Hot Spare disk, any other disks that you intend to use for Hot Spares, and the remainder of the disks that are available for media storage. Make sure you select disks appropriately as you bind disks in the remainder of this procedure.

2. For systems that use RAID 1 RANKs, you must now create the separate RAID 1 storage for metadata files and journal files. To bind unbound disks for metadata and journal storage, do the following:

   a. Right-click the **Unbound** node for the controller, then select **Bind** in the context menu. (If the RAID chassis has two controllers, both controllers are represented by the single “Controller” node)

      The Bind dialog box opens showing all unbound disks for the controller listed in the Available Disk list.



b. Leave **Full Bind** unchecked. Refer to "About full/background bind" on page 455.

c. In the **Bind Type** drop down box, select **RAID 1**.

d. In the Available Disks box, select two contiguous disks at the top of the list. These should be the first two disks in the primary RAID chassis. (TIP: Use 'shift-click' or 'control-click' to select disks.) This creates a RAID 1 RANK for metadata storage.

e. Click the add (arrow) button to add disks to the Selected Disks list.

NOTE: As an aid in identifying a disk module's physical location, select it in the Selected Disks list, then click* Identify Disks. *This causes the disk drive light to flash.

f. Click **OK** to close the Bind dialog box and begin the binding process. The Progress Report dialog box opens, showing the status of the binding process.

g. Close the Progress Report and repeat the previous steps, selecting two more contiguous disks to create another RAID 1 RANK for journal storage. These should be the next two disks in the primary RAID chassis.

h. Make the fifth disk in the primary RAID chassis a Hot Spare. In the **Bind Type** drop down box, select **Hot Spare**.

i. In the Available Disks box, select the fifth disk in the primary RAID chassis.

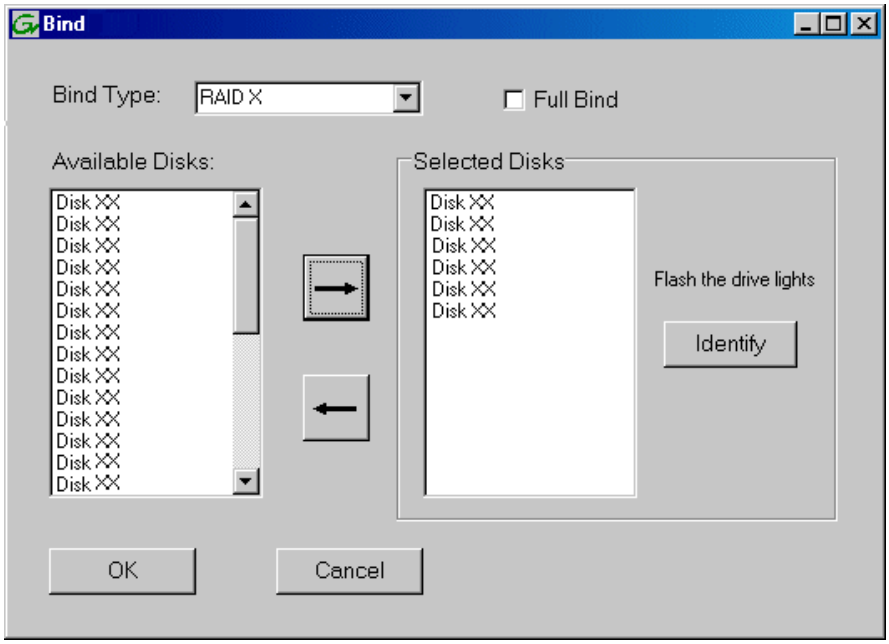
j. Click the add (arrow) button to add the disk to the Selected Disks list.

k. Click **OK** to close the dialog box and begin the binding process.

3. To bind unbound disks for media storage, do the following:

a. Right-click the **Unbound** node for a controller, then select **Bind** in the context menu. (If the RAID chassis has two controllers, both controllers are represented by the single "Controller" node)

The Bind dialog box opens showing all unbound disks for the controller listed in the Available Disk list.



b. Leave Full Bind unchecked. Refer to "About full/background bind" on page 455.

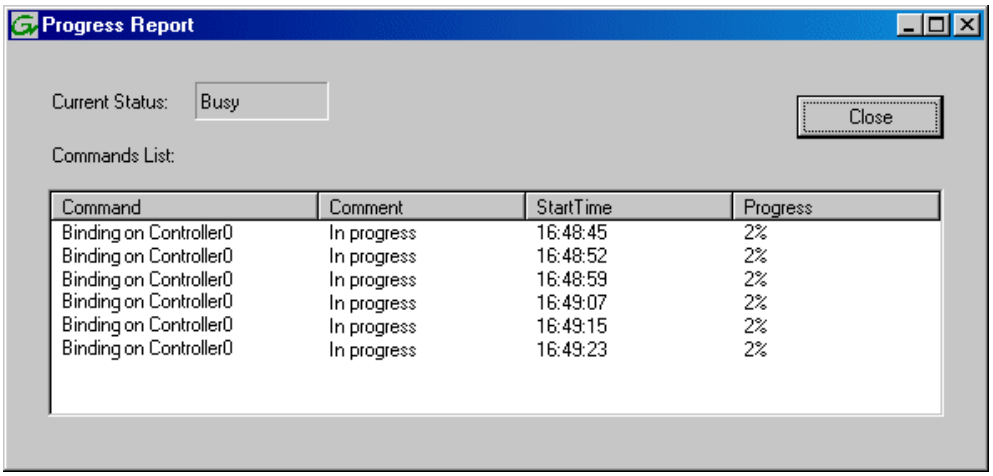
c. In the **Bind Type** drop down box, select **RAID 5** or **RAID 6**, as specified by your system design.

d. In the Available Disks box, select six contiguous disks at the top of the list. (TIP: Use 'shift-click' or 'control-click' to select disks.).

e. Click the add (arrow) button to add disks to the Selected Disks list.

NOTE: As an aid in identifying a disk module's physical location, select it in the Selected Disks list, then click* Identify Disks. *This causes the disk drive light to flash.

f. Click **OK** to close the Bind dialog box and begin the binding process. The Progress Report dialog box opens, showing the status of the binding process.



g. Close the Progress Report and repeat these steps for other unbound disks. If specified by your system design, you can bind some disks as Hot Spares, as explained in "Binding Hot Spare drives" on page 457. When you are done, if you did not bind any extra Hot Spares, you should have the following results:

   For L10R storage, on the primary RAID chassis you should have two RAID 1 RANKs of two disks each, one Hot Spare Disk, and one RAID 5 or RAID 6 RANK of six disks. For each optional Expansion chassis, you would have an additional one or two RAID 5 or RAID 6 RANKs of six disks each.

h. Click **Close** in Progress Report window.

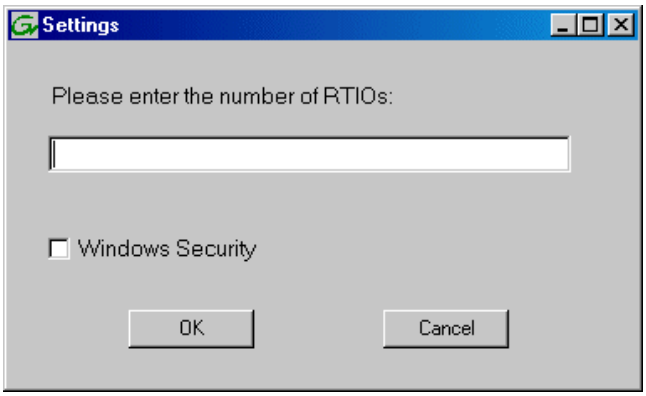
4. Restart the K2 Media Server.

NOTE: Make sure start up processes on the K2 Media Server are complete before proceeding.

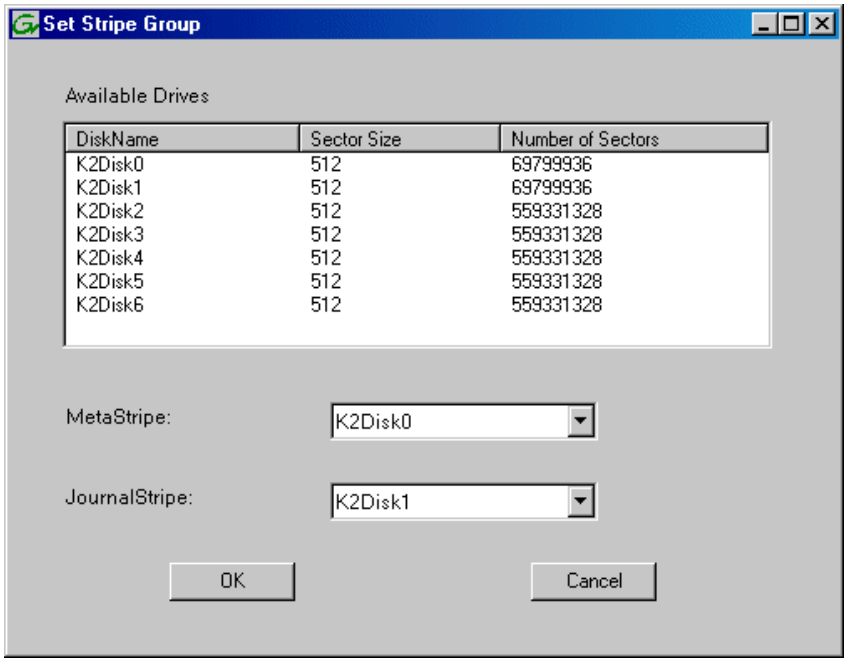
5. Continue with the next procedure "Creating a new file system".

Creating a new file system

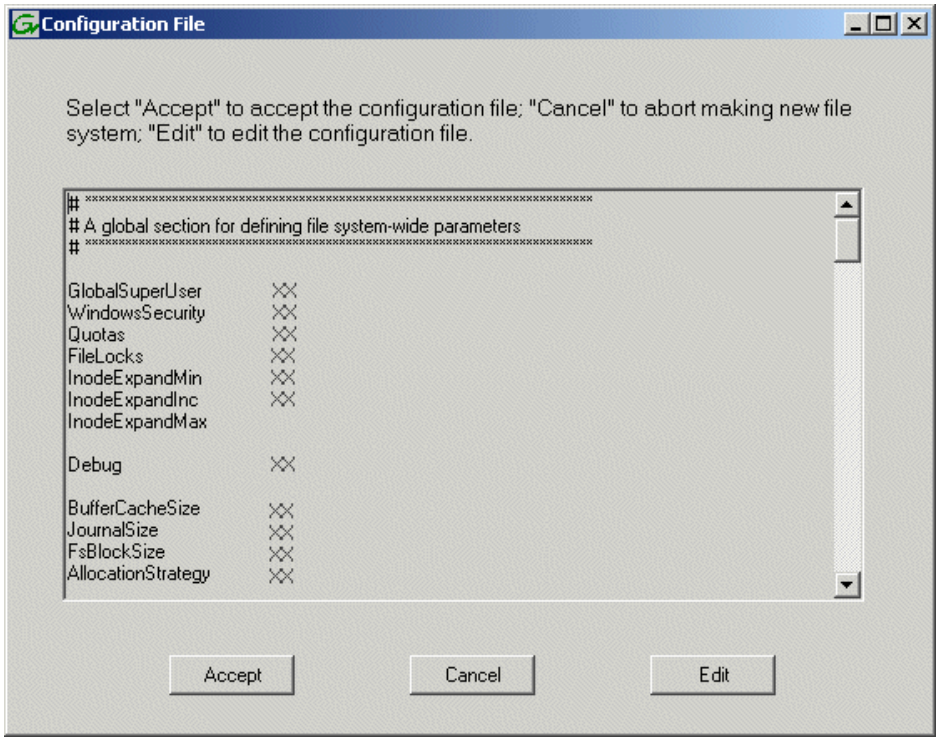
1. In Storage Utility, click **Tools | Make New File System**. The Setting dialog box opens.



2. For the Real Time Input/Output (RTIO) rate, enter the value specified by your system design. If you do not know this value, contact your Grass Valley representative.
3. If the K2 SAN is to be accessed by only K2 clients you can leave Windows Security unchecked. If accessed by Aurora Edits, refer to the *Aurora Edit Installation and Configuration Guide* for instructions.
4. Click **OK**. The Set Stripe Group dialog box opens.



5. If you have RAID 1 RANKS, assign a RAID 1 RANK as a metadata stripe and another RAID 1 RANK as a journal stripe. You can distinguish RAID 1 RANKs from media RANKs by the value in the Number of Sectors column.
6. Click **OK**. The Configuration File dialog box opens.



The configuration file for the media file system is displayed. You can verify media file system parameters by viewing this file. Do not edit this file. Click **Accept**.

A "…Please wait…" message box displays progress and a "…succeeded…" message confirms the process is complete.

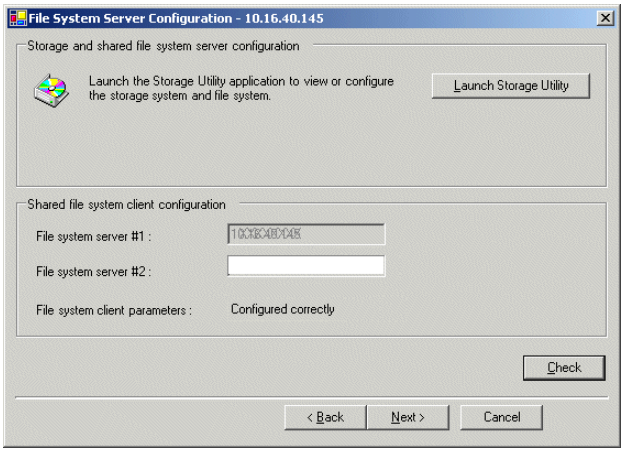
7. A message informs you that you must restart the K2 Media Server, however the restart at the end of the Configure K2 Server wizard suffices, so you do not need to restart now.
8. Close the Storage Utility.

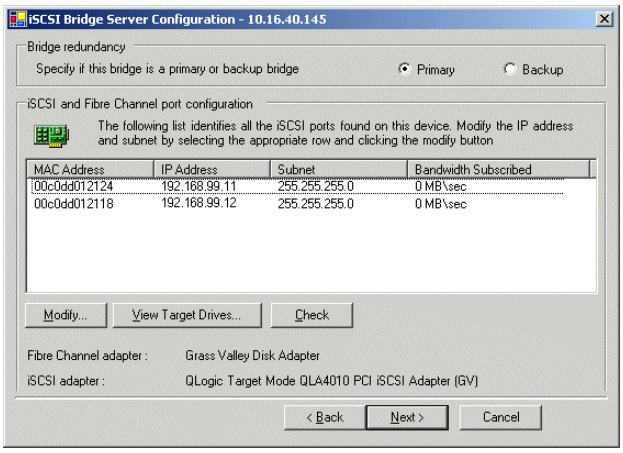
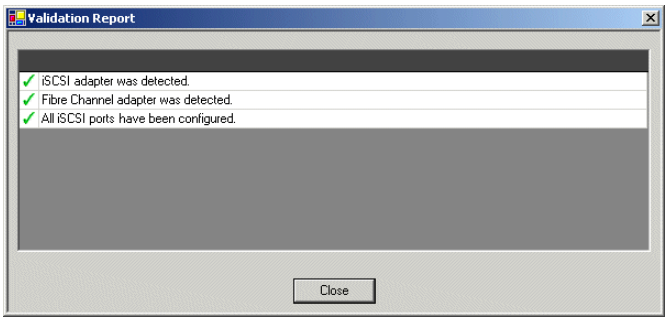
NOTE: Do not attempt to start K2 clients or otherwise bring the K2 SAN online until instructed to do so later in this chapter.

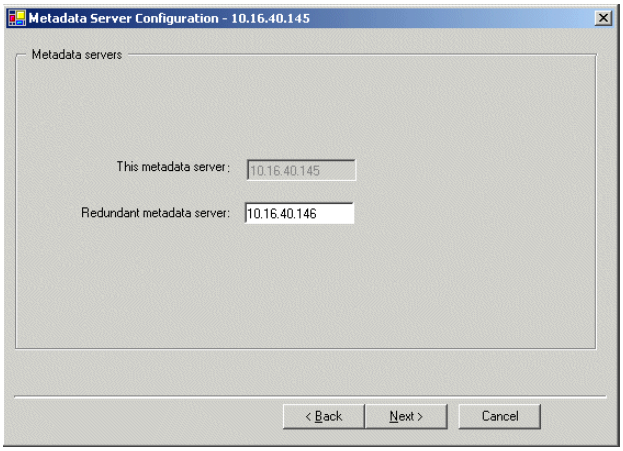
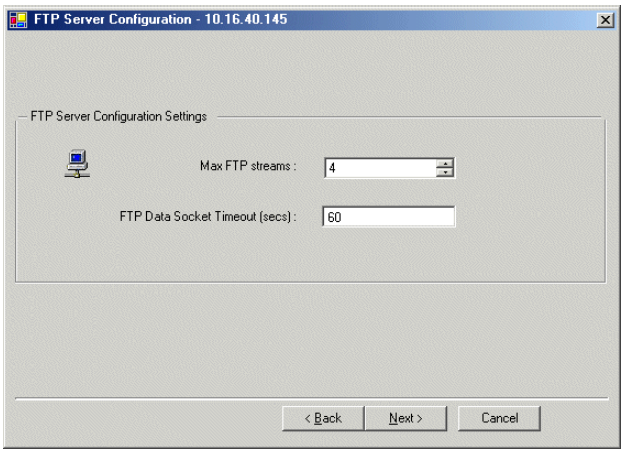
9. Continue with the next procedure.

Configuring server A - Part 2

1. Return to the Configure K2 Server page from which you launched Storage Utility and proceed as described in the following table:

On this page…	Do this…
File System Server Configuration This page checks on the configuration of the K2 Media Server in one of its main roles as a file system server. The K2 Media Server also functions as a file system client, which is also checked from this page.	 If you have not already done so, enter the name or IP address of the redundant K2 Media Server (server B). Click **Check**. When the wizard reports that the configuration is correct, click **Next**. If you get a "The V: will not be available until this device is rebooted…" message, you can safely continue with this procedure and follow the instructions related to this message later in the procedure.

On this page…	Do this…
iSCSI Bridge Server Configuration This page manages the components that bridge between iSCSI (the GigE media network) and the Fibre Channel connection to the RAID storage. You configure network settings on the iSCSI adapters and the page validates that the Fibre Channel adapter is in place and that the media RANKs are visible as iSCSI targets.	 Select **Primary**. Select an iSCSI adapter and click **Modify**. A network configuration dialog box opens. Verify or enter the media network IP address and the subnet mask and click **Apply**. Do the same for the other iSCSI adapter. You must verify or configure the second iSCSI adapter, even though it is not used on a L10R system. Click **Check**. The Validation Report opens.  Confirm that the iSCSI configuration is successful. Close the Validation Report and then click **Next**.

On this page…	Do this…
Metadata Server Configuration	 Enter the name or IP address of K2 Media server B. This is the redundant partner of the server you are now configuring. Click **Next**.
FTP Server Configuration This page appears only if the server has the role of FTP server.	 Do not modify these settings. Leave at default values of Max FTP streams = 4 and FTP Data Socket Timeout = 60. Only qualified Grass Valley personnel should specify other values, as these settings are intended for use only with custom systems designed by Grass Valley. Click **Next**
Completing the Configuration Wizard	Click **Finish**. The wizard closes. The server restarts. Wait until all startup processes have completed before continuing.

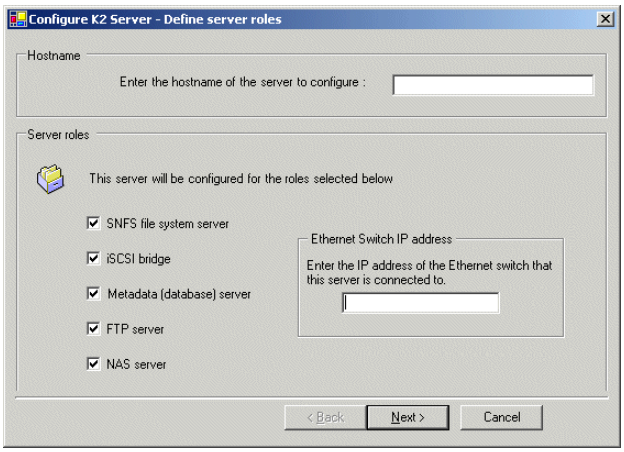
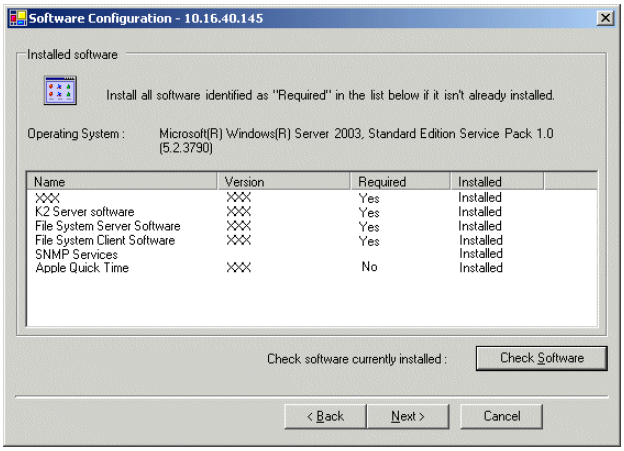
Configuring the redundant server B

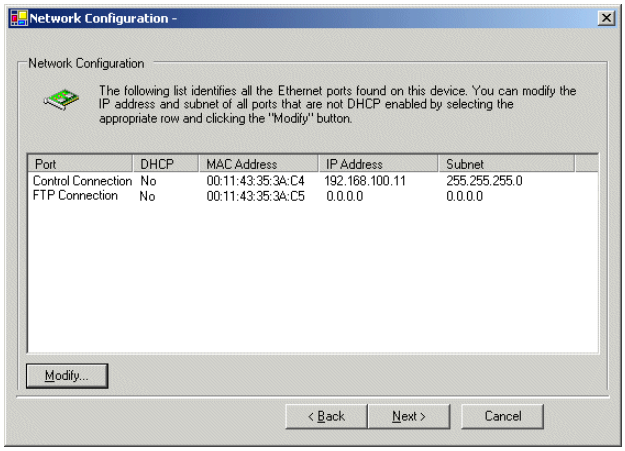
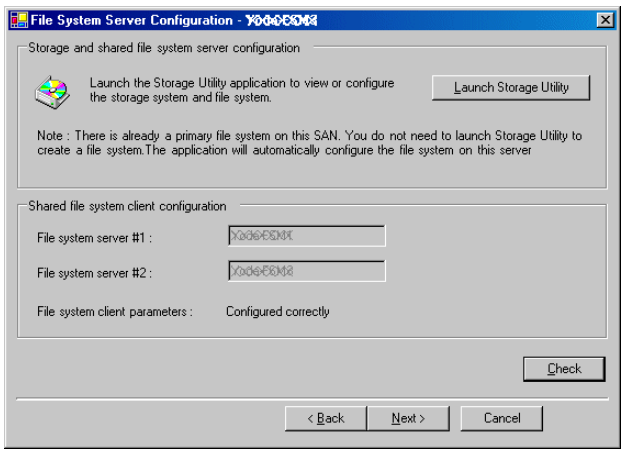
You must wait for the primary K2 Media Server to restart before continuing. To verify, from the control point PC open the MS-DOS command prompt and use the “ping” command.

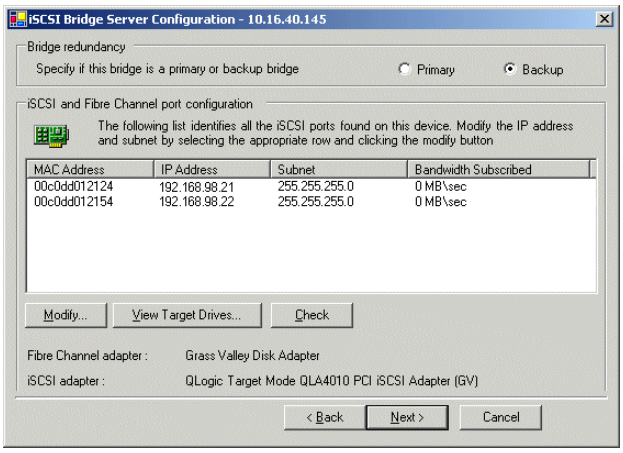
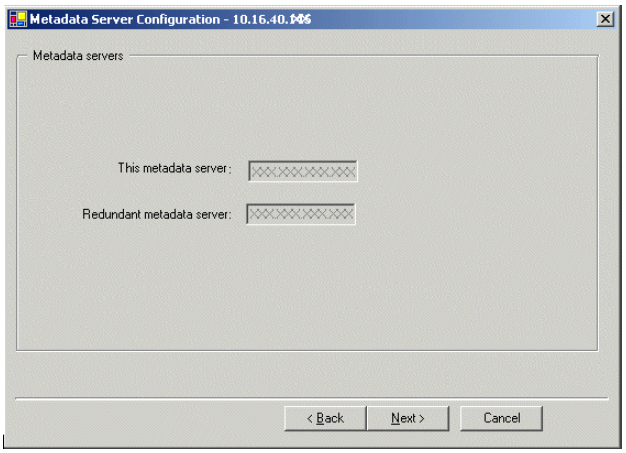
After you have configured the first K2 Media Server (server A) you next configure the redundant K2 Media Serer (server B).

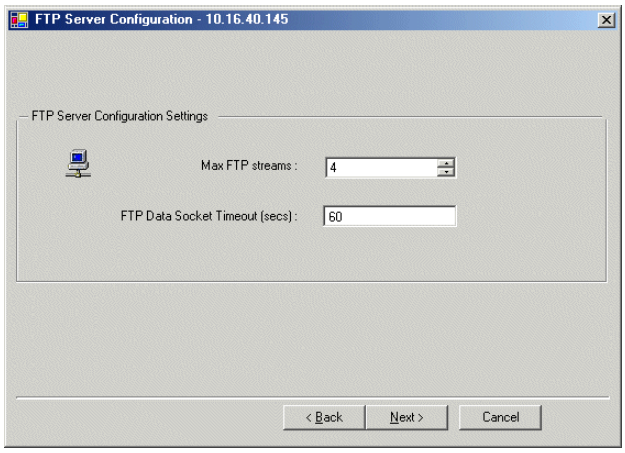
1. In the K2 System Configuration application tree view, select the K2 Media Server you are configuring as server B.

2. Click the **Configure** button. The Configure K2 Storage System Server wizard opens. Follow the on-screen text to configure the server for a Level 10R K2 SAN, as described in the following table. Some screens require no input from you, as they are based on the configurations already completed on a previously configured K2 Media Server.

On this page…	Do this…
Define server roles	 Enter the name for the K2 Media Server. This should be the current network name of the machine. Enter the name or IP address of the Ethernet switch, as currently configured on the switch, to which the K2 Media Server is connected. Select all roles. Click **Next**
Software Configuration This page checks for the software required to support the roles you selected on the previous page.	 If software with *Yes* in the Required column reports as *Not Installed*, you must first install it on the K2 Media Server before continuing. After installing the software, click **Check Software**. When all required software reports as *Installed*, click **Next**.

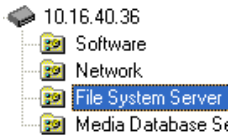
On this page…	Do this…
Network Configuration This page displays the control network Ethernet port, and allows you to configure the FTP/ Streaming network Ethernet port. ***NOTE: This page does not configure the iSCSI interface (media network) ports.***	 The top port is the port over which the K2 System Configuration application is communicating with the K2 Media Server. If correctly configured, it is already assigned the control network IP address, as displayed on this page. If the server has the role of FTP server, if the other port is not already configured correctly, select the other port and click **Modify**. A network configuration dialog box opens. Enter the FTP/Streaming IP address and the subnet mask and click **Apply**. Click **Next**.
File System Server Configuration This page checks on the configuration of the K2 Media Server in one of its main roles as a file system server. The K2 Media Server also functions as a file system client, which is also checked from this page. It is not necessary to bind RANKs or create a file system, since this task was completed when you configured the previous K2 Media Server.	 Click **Next**. Confirm messages about copying the file system configuration file to the other server. If you get a “The V: will not be available until this device is rebooted…” message, you can safely continue with this procedure and follow the instructions related to this message later in the procedure.

On this page…	Do this…
iSCSI Bridge Server Configuration This page manages the components that bridge between iSCSI (the GigE media network) and the Fibre Channel connection to the RAID storage. You configure network settings on the iSCSI adapters and the page validates that the Fibre Channel adapter is in place and that the media RANKs are visible as iSCSI targets. ***NOTE: The iSCSI adapters on this server must be on a different subnet than those on its redundant server partner.***	 Select **Backup**. Select an iSCSI adapter and click **Modify**. A network configuration dialog box opens. Verify or enter the media network IP address and subnet mask and click **Apply**. Do not configure the second iSCSI adapter. It is not used on a L10R system. To verify drives, click **Check** then **View Target Drives**. You should see all your media drives listed. Click **Next**.
Metadata Server Configuration	 You do not need to enter or configure anything on this page. Click **Next**.

On this page…	Do this…
FTP Server Configuration This page appears only if the server has the role of FTP server.	 Do not modify these settings. Leave at default values of Max FTP streams = 4 and FTP Data Socket Timeout = 60. Only qualified Grass Valley personnel should specify other values, as these settings are intended for use only with custom systems designed by Grass Valley. Click **Next**
Completing the Configuration Wizard	Click **Finish**. The wizard closes. The K2 Media Server restarts. Do not proceed until restart processes are finished.

3. If you got a “The V: will not be available until this device is rebooted…” message on the File System Server Configuration page, after the K2 Media Server restarts, do the following:

   a. In the K2 System Configuration application tree view, under the K2 Media Server select the File System Server node.



   The File System Server Configuration page appears.

   b. Click **Check** and verify that the V: drive is shared. This is required for NAS server functionality.

Next, configure K2 clients and/or other iSCSI clients on the K2 SAN.

Configuring the Level 20 K2 SAN

Work through the topics in this section sequentially to do the initial configuration of the Level 20 K2 SAN.

- "Prerequisites for initial configuration" on page 190
- "Defining a new K2 SAN" on page 191
- "Configuring the server - Part 1" on page 193
- "Configuring RAID" on page 195
- "Creating a new file system" on page 200
- "Configuring the server - Part 2" on page 202
- "Configuring optional NH servers" on page 204

Prerequisites for initial configuration

Before beginning your initial configuration, make sure the devices of the K2 SAN meet the following prerequisites. Refer to sections earlier in this manual for detailed information. Also refer to Chapter 10, "Description of K2 SAN Devices".

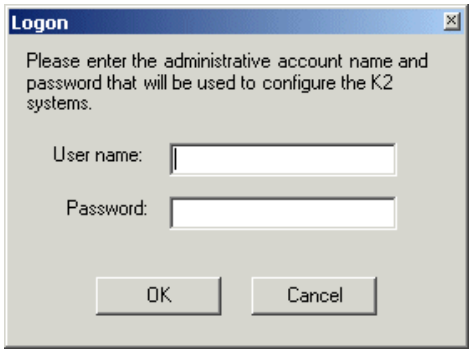
Devices	Prerequisite for Level 20 configuration
Control point PC	Ethernet cable connected Control Point software installed Control network IP address assigned Network communication over the control network with all other K2 devices Power on
Ethernet switch	Ethernet cables connected Control network IP address assigned VLANs set up Trunks set up Power on
K2 Media Server	Ethernet cables connected Fibre Channel cable connected Software installed, as from the factory, including QuickTime 7 Control network IP address assigned Power on for all servers
L20 RAID chassis	Fibre Channel cable(s) connected Ethernet cable(s) connected Power on
L20 RAID Expansion chassis (optional)	Fibre channel cable(s) connected Power on

Defining a new K2 SAN

If you import a SiteConfig system description file, you do not need to define a new K2 SAN. You can skip this task and instead start by configuring the first K2 Media Server.

Define a Level 20 K2 SAN as follows:

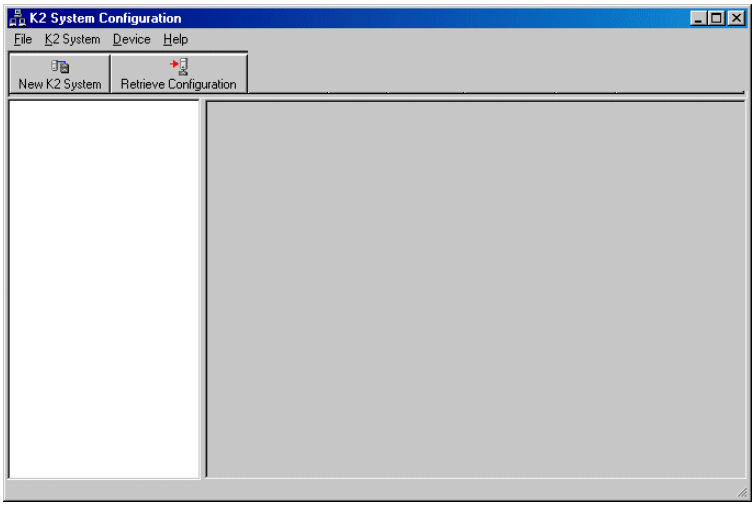
1. On the control point PC, open the K2 System Configuration application. A login dialog box opens.



2. Log in to the K2 System Configuration application with the Windows administrator account. By default this as follows:

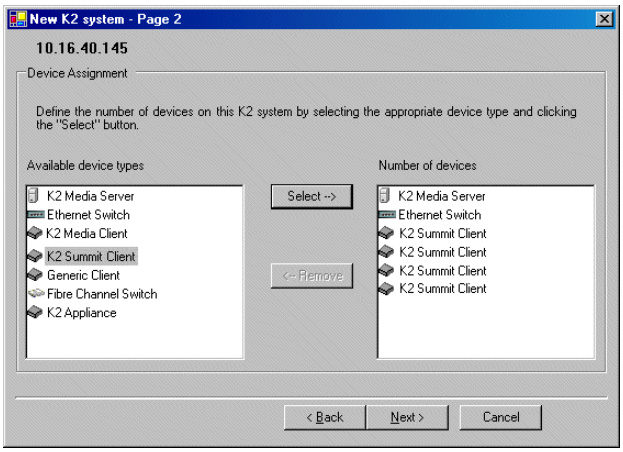
   - Username: Administrator
   - Password: adminK2

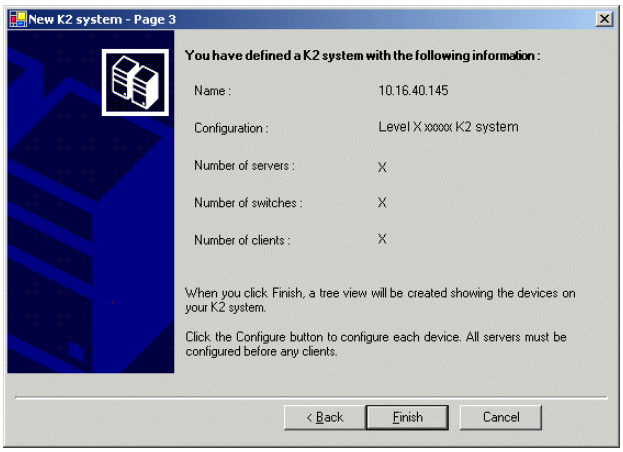
   Refer to "Setting up application security" on page 393 for more information about administrator accounts and logging in to applications.



3. Click **New K2 System**. The New K2 System wizard opens.

4. Follow the on-screen text to define your Level 20 K2 SAN, as described in the following table.

On this page…	Do this…
Page 1	 Create a name for your Level 20 K2 SAN and type it in the Name box. Select **Level 20**. If so designed, select **Enable Live Production mode**. Do not select the Server redundancy option. Click **Next**
Page 2	 Move the following into the Number of Devices Box: • One K2 Media Server • One Ethernet switch • K2 clients as appropriate for your system. • (Optional) One or more K2 Media Servers to represent each NH K2 Media Server on your system. • (Optional) Other devices as appropriate for your system. Click **Next**.

On this page...	Do this...
Page 3	 Review the information on this page and verify that you have correctly defined your K2 SAN. For a Level 20 K2 SAN you should have the following: • One Gigabit Ethernet switch • One K2 Media Server • Optionally, one or more NH K2 Media Servers • The number and type of clients appropriate for your system. Click **Finish**. The Define New K2 Storage System wizard closes.

Your K2 SAN appears in the tree view of the K2 System Configuration application.

5. Continue with the next procedure.

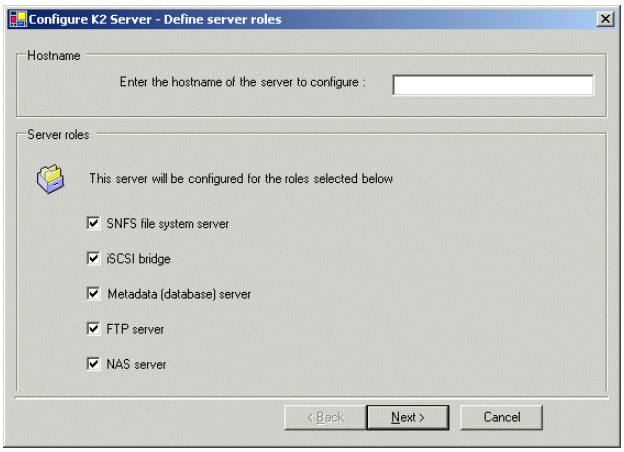
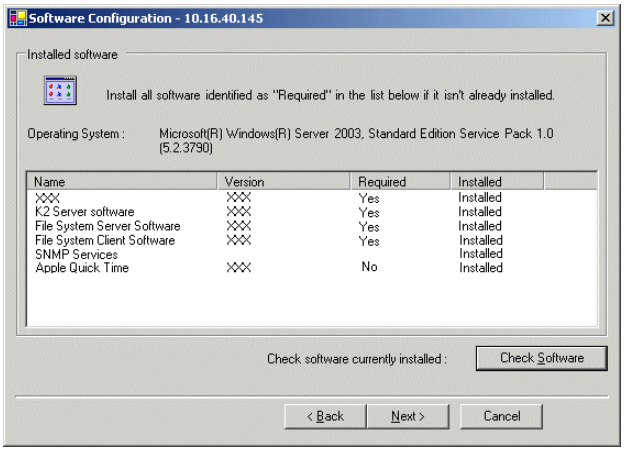
Configuring the server - Part 1

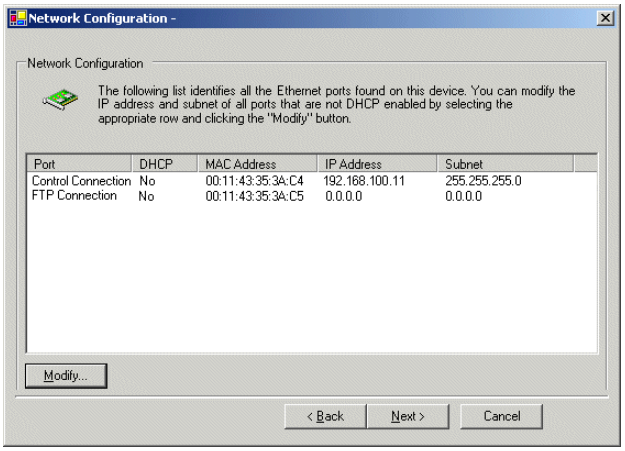
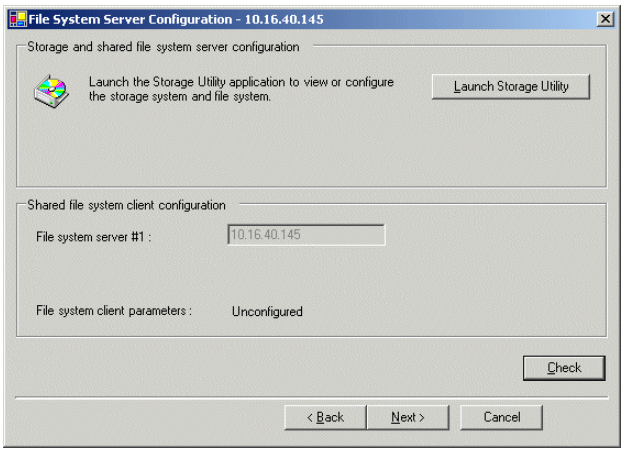
1. In the K2 System Configuration application tree view, select [**K2Server1]**.

2. Click the **Configure** button.

The Configure K2 Server wizard opens. Follow the on-screen text to configure the for a Level 20 K2 SAN, as described in

the following table:

On this page…	Do this…
Define server roles If the K2 SAN has one or more optional NH servers, then FTP traffic should go to the NH server, not the K2 Media Server you are now configuring. In this case, do not select the FTP server role or the NAS server role..	 Enter the name for the K2 Media Server, as currently configured on the machine. For Level 20, select all roles, except if NH server is present do not select FTP server or NAS server. Click **Next**
Software Configuration This page checks for the software required to support the roles you selected on the previous page.	 If software with *Yes* in the Required column reports as *Not Installed*, you must first install it on the before continuing. After installing the software, click **Check Software**. When all required software reports as *Installed*, click **Next**.

On this page…	Do this…
Network Configuration This page displays the control network Ethernet port, and allows you to configure the FTP/ Streaming network Ethernet port. ***NOTE: This page does not configure the iSCSI interface (media network) ports.*** For systems with an optional NH (FTP) server, the server you ar now configuring does not take the role of FTP server, so configuring the second port here for the FTP/ streaming network is not required.	 The top port is the port over which the K2 System Configuration application is communicating. If correctly configured, it is already assigned the control network IP address, as displayed on this page. If the server has the role of FTP server, if the other port is not already configured correctly, select the other port and click **Modify**. A network configuration dialog box opens. Enter the FTP/Streaming IP address and the subnet mask and click **Apply**. Click **Next**.
File System Server Configuration	 Click **Launch Storage Manager**. Storage Utility opens.

3. Continue with the next procedure to use Storage Utility to configure the storage and file system.

   Leave the Configure K2 Server wizard open while you are using Storage Utility. When you are done with Storage Utility, you continue with the wizard.

Configuring RAID

Use Storage Utility to complete the configuration of the L20 RAID chassis, as explained in the following topics:

- "Configuring RAID network and SNMP settings"

- "Binding disk modules"

Refer to "Prerequisites for initial configuration" on page 190 to confirm that the RAID storage is ready for configuration.

Configuring RAID network and SNMP settings

Use the Storage Utility to configure the following settings for the Level 20 RAID controller:

- IP address
- Subnet mask
- Gateway Address
- SNMP trap destinations

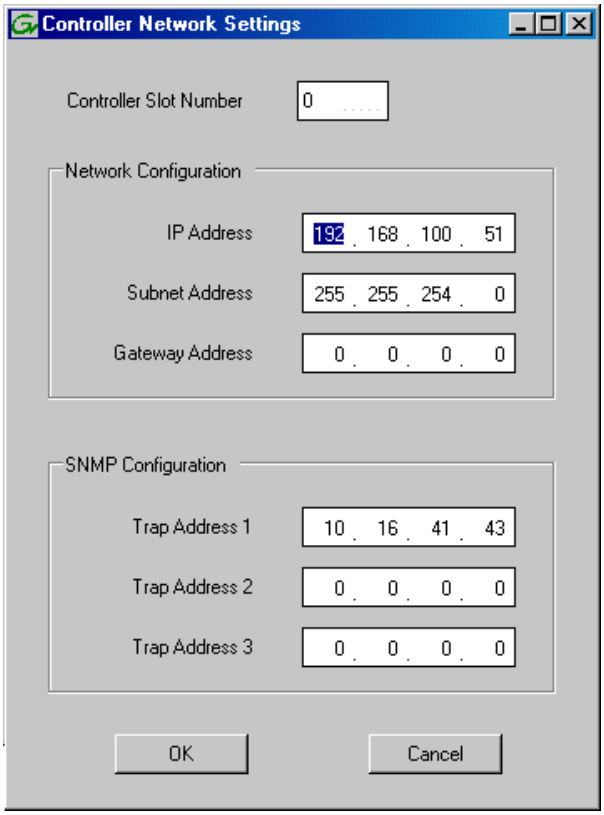
For L20 RAID, network and SNMP settings are set and stored on the RAID controller module, so the combined RAID storage devices, including the optional Expansion chassis, exist as a single entity on the control network.

The RAID storage device is configured by default for the SNMP community name "public". If your site's policies require using a different SNMP community name, contact your Grass Valley representative.

To configure these settings, do the following:

1. Launch Storage Utility from the K2 System Configuration application as in the previous procedure.
2. As prompted, wait while Storage Utility gathers system information, then Storage Utility opens.
3. In Storage Utility tree view, expand the node for the L20 RAID, right-click the icon for a L20 RAID controller, and select **Configuration | Network Properties**.

   The Controller Network Settings dialog box opens.



4. In the Controller Slot Number field enter **0** and then press **Enter**. The settings from controller 0 are loaded into the Controller Network Settings dialog box and are available for you to modify.
5. Enter the control network IP address and other network settings.
6. You want SNMP trap messages go to the NetCentral server PC, so for SNMP Configuration enter the IP address of the NetCentral server PC. You can also enter IP addresses for other SNMP managers to which you want to send SNMP trap messages.
7. Click **OK** to save settings and close.
8. In Storage Utility click **View | Refresh**. Continue with the next procedure "Binding disk modules".

Binding disk modules

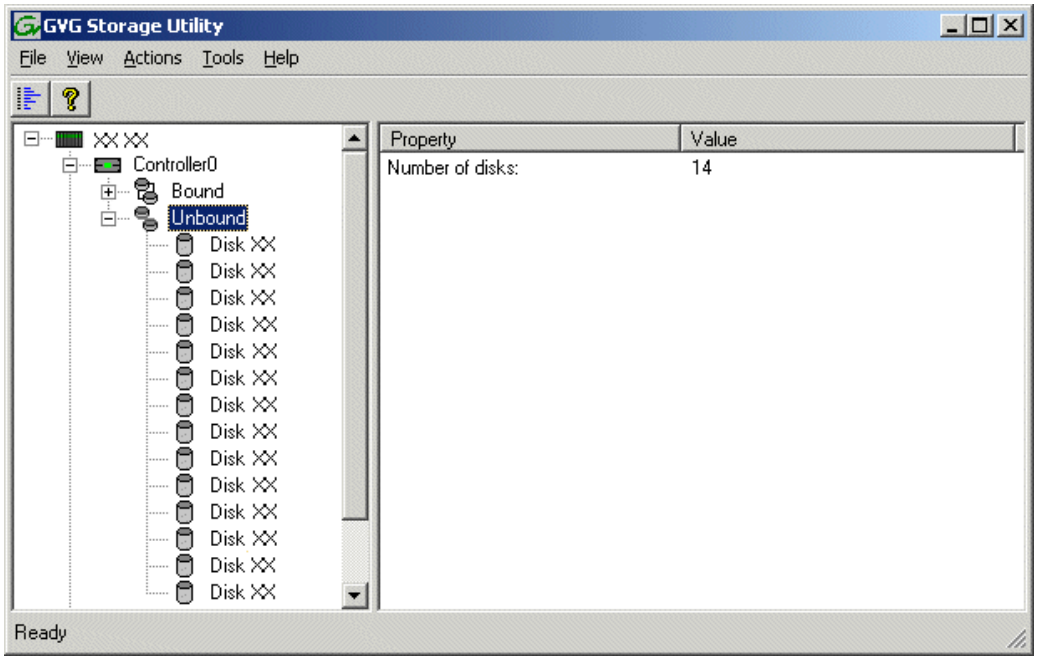
Use the following procedure to bind disk modules as required for the Level 20 K2 SAN.

Also refer to "About RANKs and LUNs in Storage Utility" in the chapter *Overview of K2 Storage Tools*.

NOTE: Binding destroys all user data on the disks.

1. In the Storage Utility main window, identify bound RANKs and unbound disks by

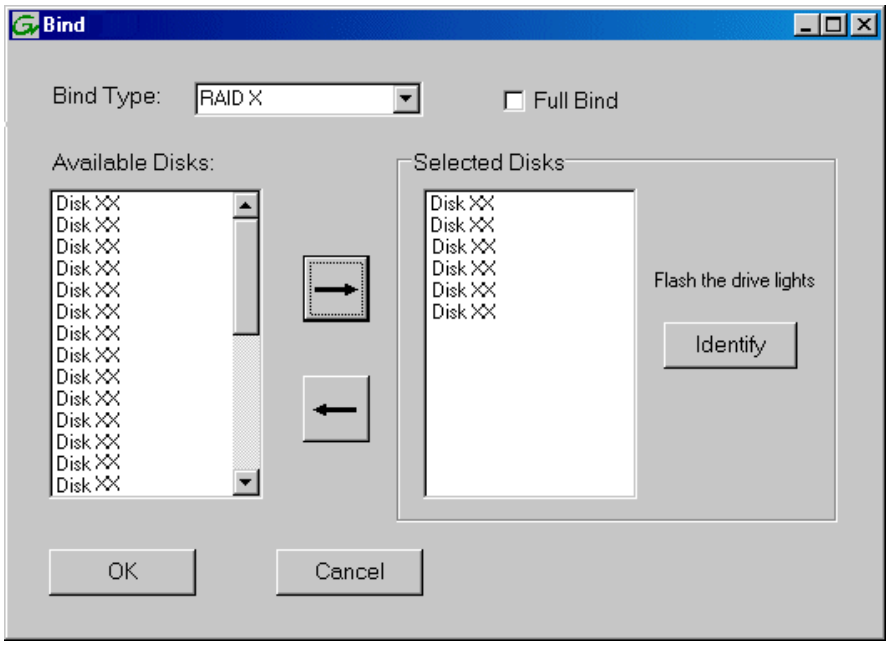
their placement in the hierarchy of the tree view. In the following illustration, disk numbers are represented by “XX”. Refer to “Identifying disks” on page 451 for an explanation of how disks are actually numbered in Storage Utility.



2. To bind unbound disks for media storage, do the following:

   a. Right-click the **Unbound** node for a controller, then select **Bind** in the context menu. (If the RAID chassis has two controllers, both controllers are represented by the single “Controller” node)

      The Bind dialog box opens showing all unbound disks for the controller listed in the Available Disk list.



b. Leave Full Bind unchecked. Refer to "About full/background bind" on page 455.

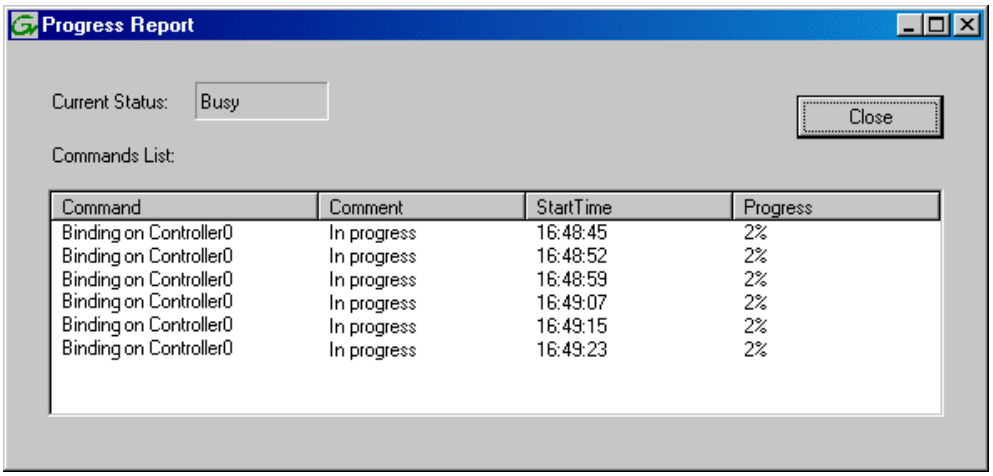
c. In the **Bind Type** drop down box, select **RAID 5** or **RAID 6**, as specified by your system design.

d. In the Available Disks box, select six contiguous disks at the top of the list. (TIP: Use 'shift-click' or 'control-click' to select disks.).

e. Click the add (arrow) button to add disks to the Selected Disks list.

NOTE: As an aid in identifying a disk module's physical location, select it in the Selected Disks list, then click* Identify Disks. *This causes the disk drive light to flash.

f. Click **OK** to close the Bind dialog box and begin the binding process. The Progress Report dialog box opens, showing the status of the binding process.



g. Close the Progress Report and repeat these steps for other unbound disks. If specified by your system design, you can bind some disks as Hot Spares, as explained in "Binding Hot Spare drives" on page 457. When you are done, if you did not bind any extra Hot Spares, you should have the following results:

   For L20 storage you should have two RAID 5 or RAID 6 RANKs of six disks each on the primary RAID storage device. For each optional Expansion chassis, you would have an additional one or two RAID 5 or RAID 6 RANKs of six disks each.

h. Click **Close** in Progress Report window.

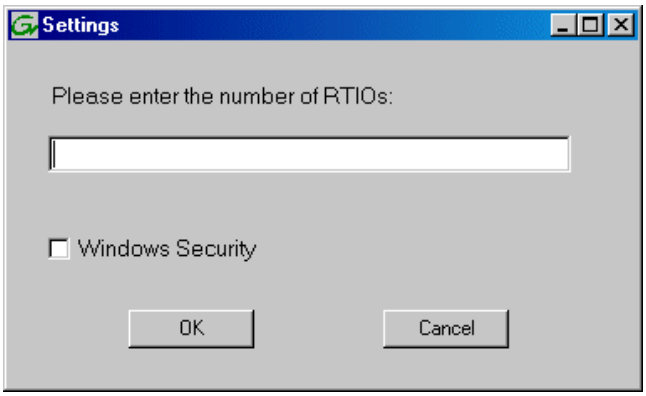
3. Restart the K2 Media Server.

NOTE: Make sure start up processes on the K2 Media Server are complete before proceeding.

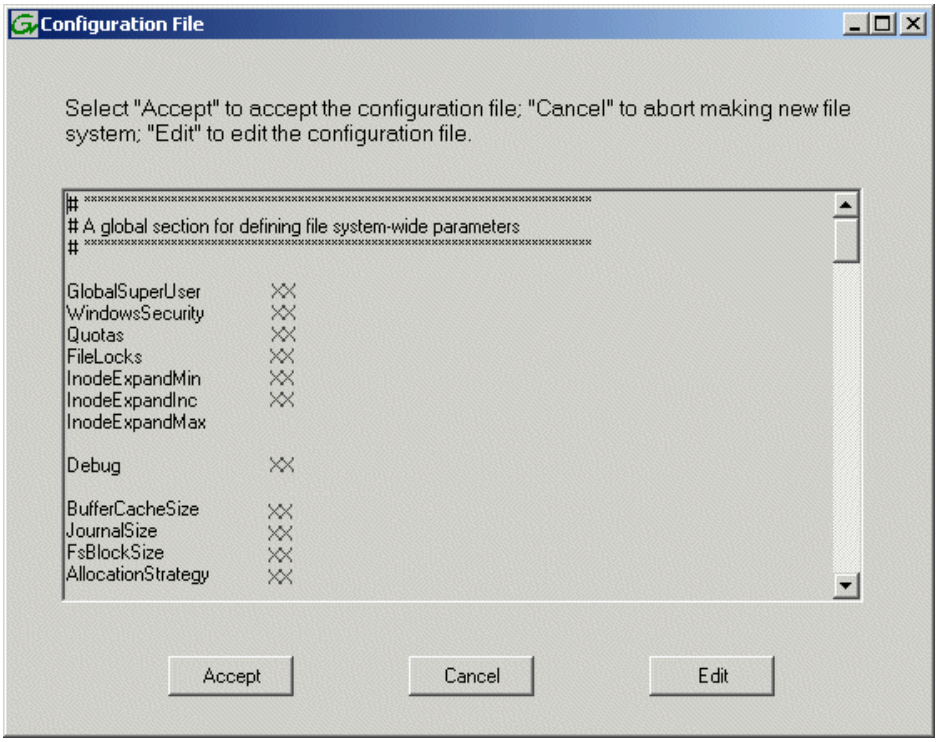
4. Continue with the next procedure "Creating a new file system".

Creating a new file system

1. In Storage Utility, click **Tools | Make New File System**. The Setting dialog box opens.



2. For the Real Time Input/Output (RTIO) rate, enter the value specified by your system design. If you do not know this value, contact your Grass Valley representative.
3. If the K2 SAN is to be accessed by only K2 clients you can leave Windows Security unchecked. If accessed by Aurora Edits, refer to the *Aurora Edit Installation and Configuration Guide* for instructions.
4. Click **OK**. The Configuration File dialog box opens.



The configuration file for the media file system is displayed. You can verify media file system parameters by viewing this file. Do not edit this file. Click **Accept**.

A "…Please wait…" message box displays progress and a "…succeeded…" message confirms the process is complete.

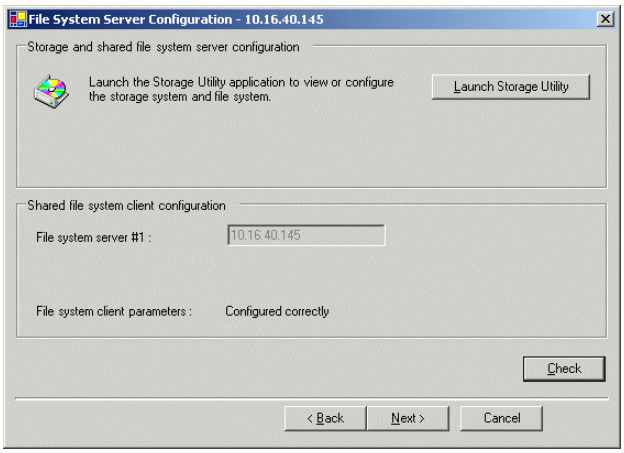
5. A message informs you that you must restart the K2 Media Server, however the restart at the end of the Configure K2 Server wizard suffices, so you do not need to restart now.
6. Close the Storage Utility.

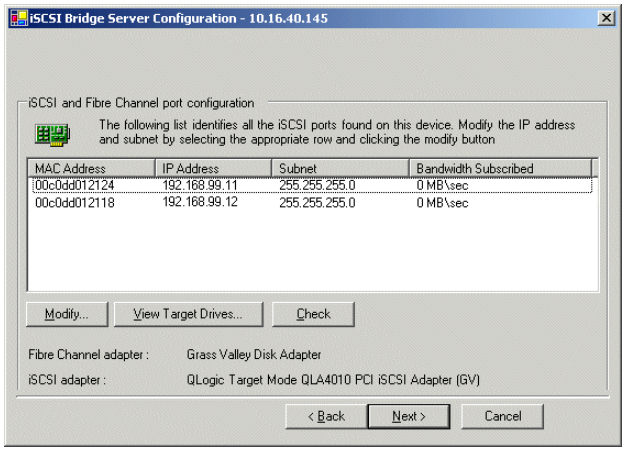
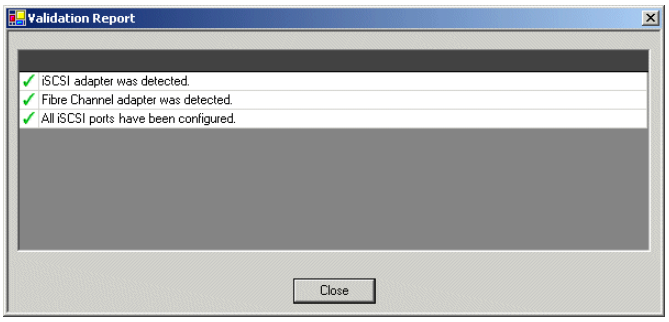
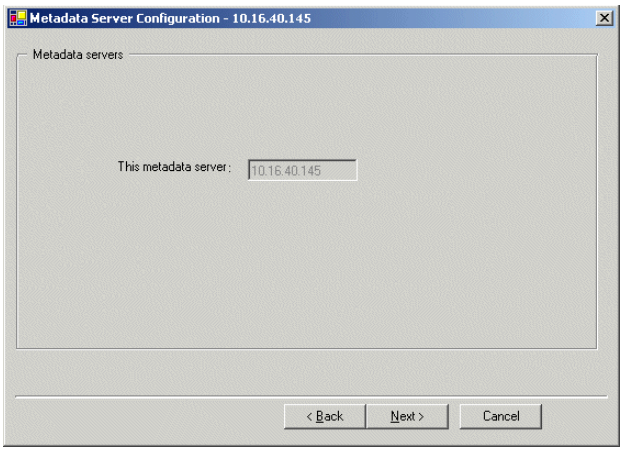
NOTE: Do not attempt to start K2 clients or otherwise bring the K2 SAN online until instructed to do so later in this chapter.

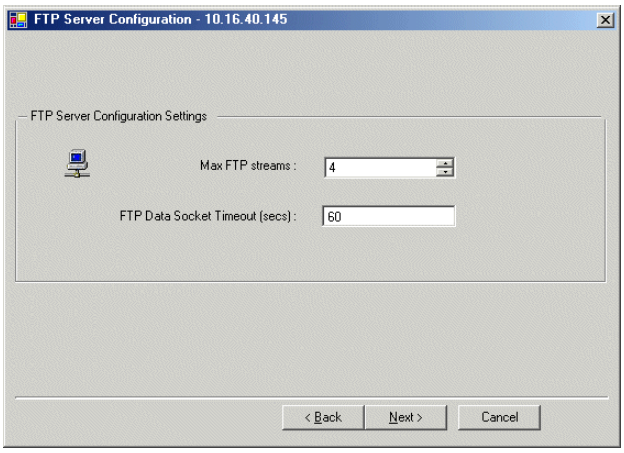
7. Continue with the next procedure.

Configuring the server - Part 2

1. Return to the Configure K2 Server page from which you launched Storage Utility and proceed as described in the following table:

On this page…	Do this…
File System Server Configuration This page checks on the configuration of the server in one of its main roles as a file system server. The server also functions as a file system client, which is also checked from this page.	 Click **Check**. When the wizard reports that the configuration is correct, click **Next**. If you get a "The V: will not be available until this device is rebooted…" message, you can safely continue with this procedure and follow the instructions related to this message later in the procedure.

On this page…	Do this…
iSCSI Bridge Server Configuration This page manages the components that bridge between iSCSI (the GigE media network) and the Fibre Channel connection to the RAID storage. You configure network settings on the iSCSI adapters and the page validates that the Fibre Channel adapter is in place and that the media RANKs are visible as iSCSI targets.	 Select an iSCSI adapter and click **Modify**. A network configuration dialog box opens. Verify or enter the media network IP address and the subnet mask and click **Apply**. Do the same for the other iSCSI adapter. Click **Check**. The Validation Report opens.  Confirm that the iSCSI configuration is successful. Close the Validation Report and then click **Next**.
Database Server Configuration	 You do not need to enter or configure anything on this page. Click **Next**.

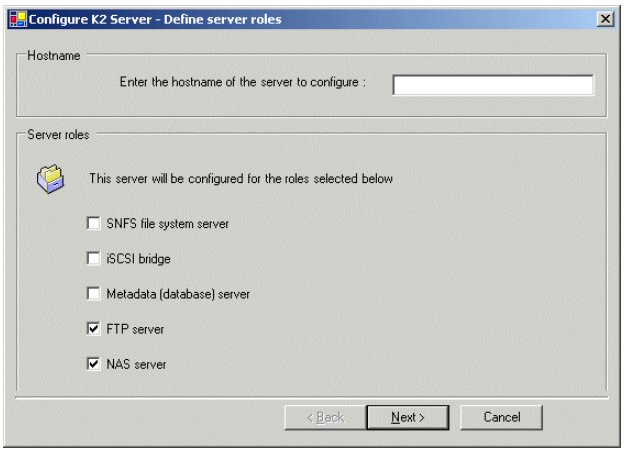
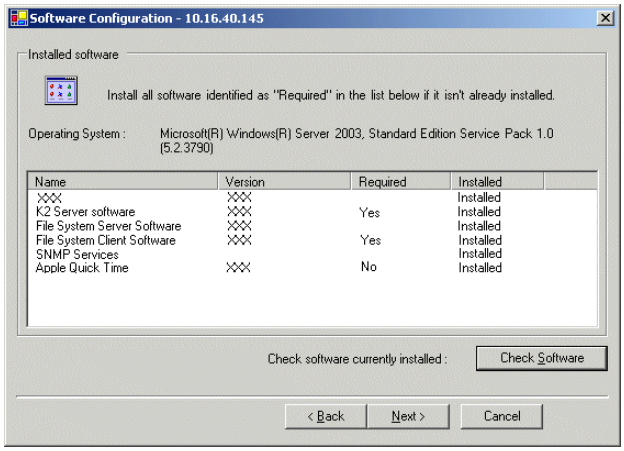
On this page…	Do this…
FTP Server Configuration This page appears only if the server has the role of FTP server.	 Do not modify these settings. Leave at default values of Max FTP streams = 4 and FTP Data Socket Timeout = 60. Only qualified Grass Valley personnel should specify other values, as these settings are intended for use only with custom systems designed by Grass Valley. Click **Next**
Completing the Configuration Wizard	Click **Finish**. The wizard closes. The server restarts. Wait until all startup processes have completed before continuing.

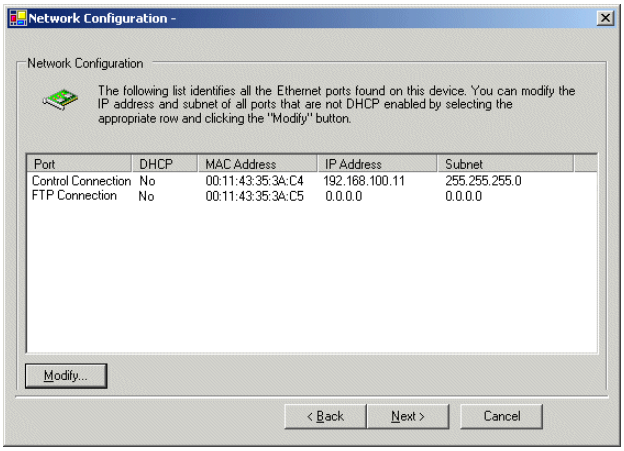
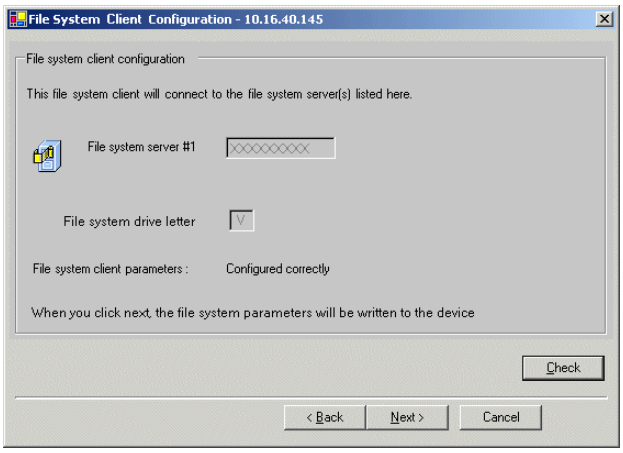
Configuring optional NH servers

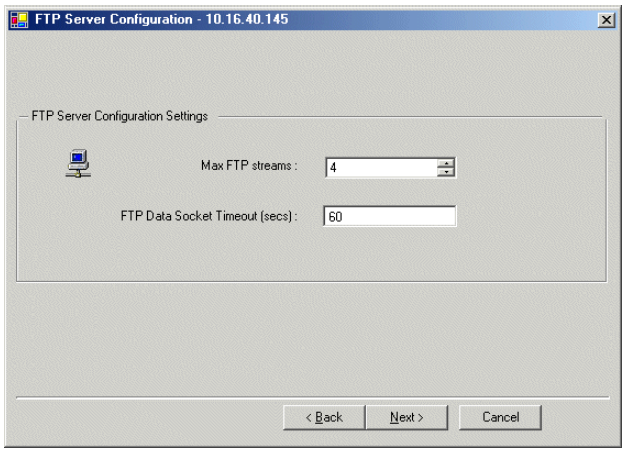
If you have one or more optional NH K2 Media Servers, you next configure those servers. This section applies to both NH1 (1 Gig FTP) servers and NH1-10GE (10 Gig FTP) servers.

NOTE: Multiple NH servers on a K2 SAN must be of the same type, either all NH1 or all NH1-10GE.

1. In the K2 System Configuration application tree view, select the K2 Media Server you are configuring.
2. Click the **Configure** button. The Configure K2 Server wizard opens. Follow the on-screen text to configure the server for a Level 20 K2 SAN, as described in the following table. Some screens require no input from you, as they are based on the configurations already completed on a previously configured K2 Media Server.

On this page…	Do this…
Define server roles	 Enter the name for the K2 Media Server. This should be the current network name of the machine. Select FTP server and NAS server. Click **Next**
Software Configuration This page checks for the software required to support the roles you selected on the previous page.	 If software with *Yes* in the Required column reports as *Not Installed*, you must first install it on the K2 Media Server before continuing. After installing the software, click **Check Software**. When all required software reports as *Installed*, click **Next**.

On this page…	Do this…
Network Configuration This page displays the control network Ethernet port, and allows you to configure the FTP/ Streaming network Ethernet port.	 The top port is the port over which the K2 System Configuration application is communicating with the K2 Media Server. If correctly configured, it is already assigned the control network IP address, as displayed on this page. If the other port is not already configured correctly, select the other port and click **Modify**. A network configuration dialog box opens. Enter the FTP/Streaming IP address and the subnet mask and click **Apply**. Click **Next**.
File System Client Configuration This K2 Media Server does not function as a file system server. It does function as a file system client, which is validated from this page.	 Click **Check**. When the wizard reports that the configuration check is successful, click **Next**.

On this page…	Do this…
FTP Server Configuration	 Do not modify these settings. Leave at default values of Max FTP streams = 4 and FTP Data Socket Timeout = 60. Only qualified Grass Valley personnel should specify other values, as these settings are intended for use only with custom systems designed by Grass Valley. Click **Next**
Completing the Configuration Wizard	Click **Finish**. The wizard closes. The K2 Media Server restarts. Do not proceed until restart processes are finished.

3. Repeat this procedure for remaining NH K2 Media Servers, if any.

Next, configure K2 clients and/or other iSCSI clients on the K2 SAN.

Configuring the Level 20R K2 SAN

Work through the topics in this section sequentially to do the initial configuration of the Level 20R K2 SAN.

- "Prerequisites for initial configuration" on page 208
- "Defining a new K2 SAN" on page 209
- "Configuring server A - Part 1" on page 211
- "Configuring RAID" on page 213
- "Creating a new file system" on page 219
- "Configuring server A - Part 2" on page 221
- "Configuring the redundant server B" on page 224
- "Configuring optional NH servers" on page 228

Prerequisites for initial configuration

Before beginning your initial configuration, make sure the devices of the K2 SAN meet the following prerequisites. Refer to sections earlier in this manual for detailed information. Also refer to Chapter 10, "Description of K2 SAN Devices".

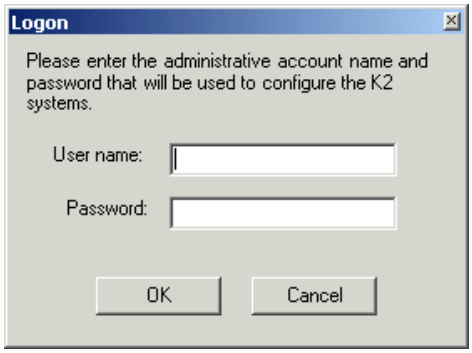
Devices	Prerequisite for Level 20R configuration
Control point PC	Ethernet cable connected Control Point software installed Control network IP address assigned Network communication over the control network with all other K2 devices Power on
Ethernet switch	Ethernet cables connected Control network IP address assigned VLANs set up Trunks set up Power on
K2 Media Server	Ethernet cables connected Fibre Channel cable connected Redundant servers connected by serial cable Software installed, as from the factory, including QuickTime 7 Control network IP address assigned Power on for all servers
L20R RAID chassis	Fibre Channel cable(s) connected Ethernet cable(s) connected Power on
L20R RAID Expansion chassis (optional)	Fibre channel cable(s) connected Power on

Defining a new K2 SAN

If you import a SiteConfig system description file, you do not need to define a new K2 SAN. You can skip this task and instead start by configuring the first K2 Media Server.

Define a Level 20R K2 SAN as follows:

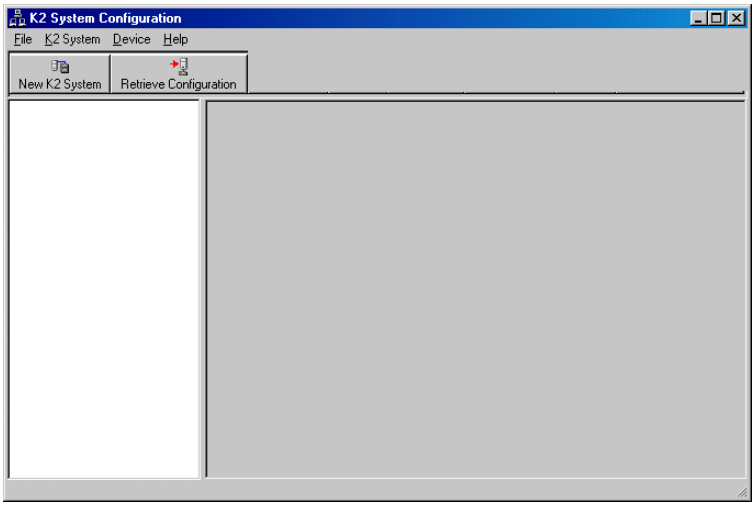
1. On the control point PC, open the K2 System Configuration application. A login dialog box opens.



2. Log in to the K2 System Configuration application with the Windows administrator account. By default this as follows:

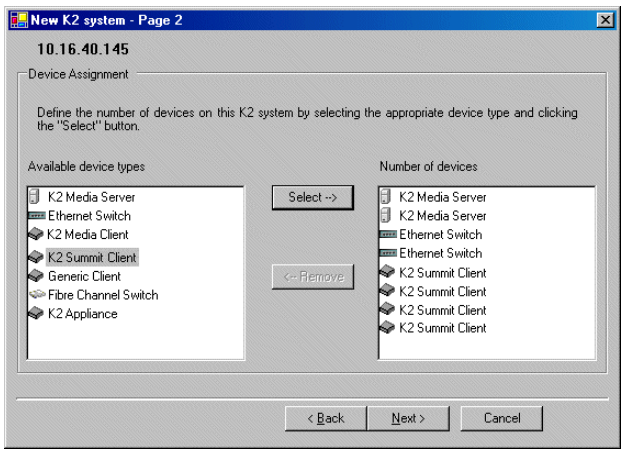
   - Username: Administrator
   - Password: adminK2

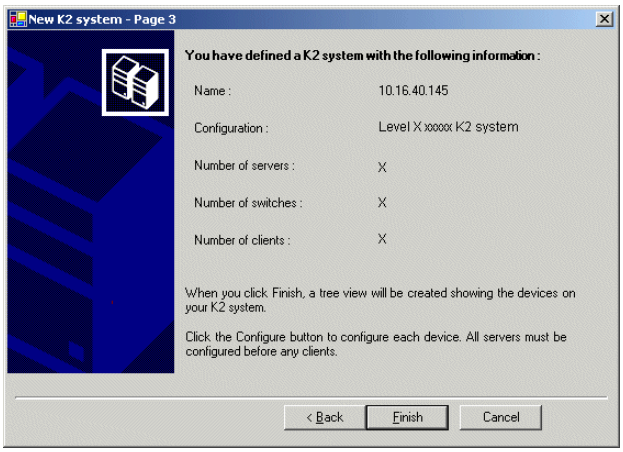
   Refer to "Setting up application security" on page 393 for more information about administrator accounts and logging in to applications.



3. Click **New K2 System**. The New K2 System wizard opens.

4. Follow the on-screen text to define your Level 20R K2 SAN, as described in the following table.

On this page…	Do this…
Page 1	 Create a name for your Level 20R K2 SAN and type it in the Name box. Select **Level 20**. If so designed, select **Enable Live Production mode**. Select the **Server redundancy** option. Click **Next**
Page 2	 Move the following into the Number of Devices Box: • Two K2 Media Servers • Two Ethernet switches • K2 clients as appropriate for your system. • (Optional) One or more K2 Media Servers to represent each NH K2 Media Server on your system. • (Optional) Other devices as appropriate for your system. Click **Next**.

On this page...	Do this...
Page 3	 Review the information on this page and verify that you have correctly defined your K2 SAN. For a Level 20R K2 SAN you should have the following: • Two Gigabit Ethernet switches • Two K2 Media Servers • Optionally, one or more NH K2 Media Servers • The number and type of clients appropriate for your system. Click **Finish**. The Define New K2 Storage System wizard closes.

Your K2 SAN appears in the tree view of the K2 System Configuration application.

5. Continue with the next procedure.

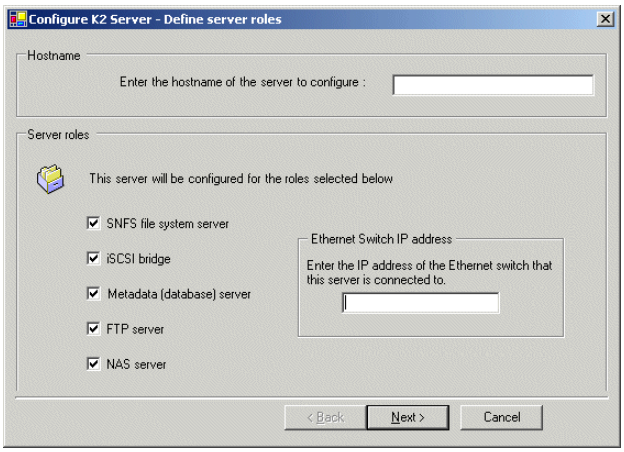
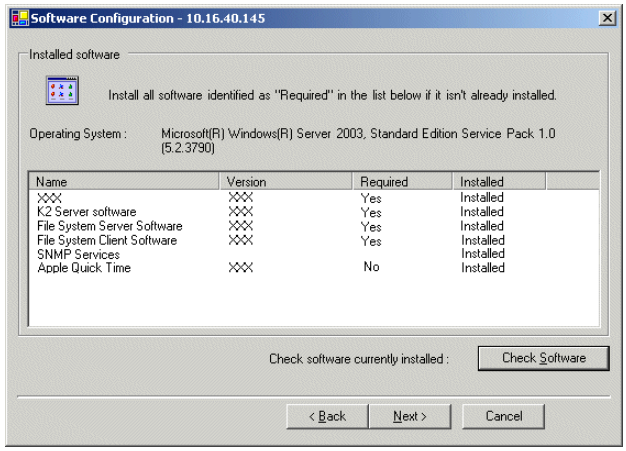
Configuring server A - Part 1

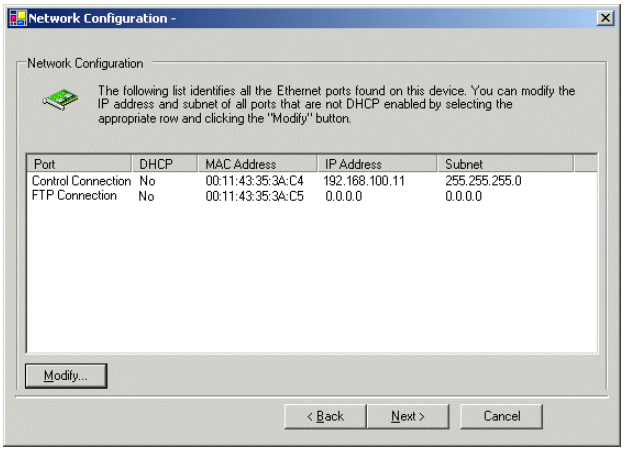
1. In the K2 System Configuration application tree view, select [**K2Server1]**.

2. Click the **Configure** button.

The Configure K2 Server wizard opens. Follow the on-screen text to configure the for a Level 20R K2 SAN, as described

in the following table:

On this page…	Do this…
Define server roles If the K2 SAN has one or more optional NH servers, then FTP traffic should go to the NH server, not the K2 Media Server you are now configuring. In this case, do not select the FTP server role or the NAS server role.	 Enter the name for the K2 Media Server, as currently configured on the machine. Enter the name or IP address of the Ethernet switch, as currently configured on the switch, to which the K2 Media Server is connected. For Level 20R redundant, select all roles, except if NH server is present do not select FTP server or NAS server. Click **Next**
Software Configuration This page checks for the software required to support the roles you selected on the previous page.	 If software with *Yes* in the Required column reports as *Not Installed*, you must first install it on the before continuing. After installing the software, click **Check Software**. When all required software reports as *Installed*, click **Next**.

On this page…	Do this…
Network Configuration This page displays the control network Ethernet port, and allows you to configure the FTP/ Streaming network Ethernet port. ***NOTE: This page does not configure the iSCSI interface (media network) ports.*** For systems with an optional NH (FTP) server, the server you ar now configuring does not take the role of FTP server, so configuring the second port here for the FTP/ streaming network is not required.	 The top port is the port over which the K2 System Configuration application is communicating. If correctly configured, it is already assigned the control network IP address, as displayed on this page. If the server has the role of FTP server, if the other port is not already configured correctly, select the other port and click **Modify**. A network configuration dialog box opens. Enter the FTP/Streaming IP address and the subnet mask and click **Apply**. Click **Next**.
File System Server Configuration	Enter the name or IP address of the redundant K2 Media Server (server B). Do not yet click Next. Do not yet enter anything in the File System Server #2 box. Click **Launch Storage Manager**. Storage Utility opens.

3. Continue with the next procedure to use Storage Utility to configure the storage and file system.

   Leave the Configure K2 Server wizard open while you are using Storage Utility. When you are done with Storage Utility, you continue with the wizard.

Configuring RAID

Use Storage Utility to complete the configuration of the L20R RAID chassis, as explained in the following topics:

- "Configuring RAID network and SNMP settings"
- "Binding disk modules"

Refer to "Prerequisites for initial configuration" on page 208 to confirm that the RAID storage is ready for configuration.

Configuring RAID network and SNMP settings

Use the Storage Utility to configure the following settings for the Level 20R RAID controllers:

- IP address
- Subnet mask

- Gateway Address
- SNMP trap destinations

For L20R RAID, network and SNMP settings are set and stored on the RAID controller module. For the RAID chassis with two controllers, each controller has its own network settings and the RAID chassis exists as two entities on the control network.

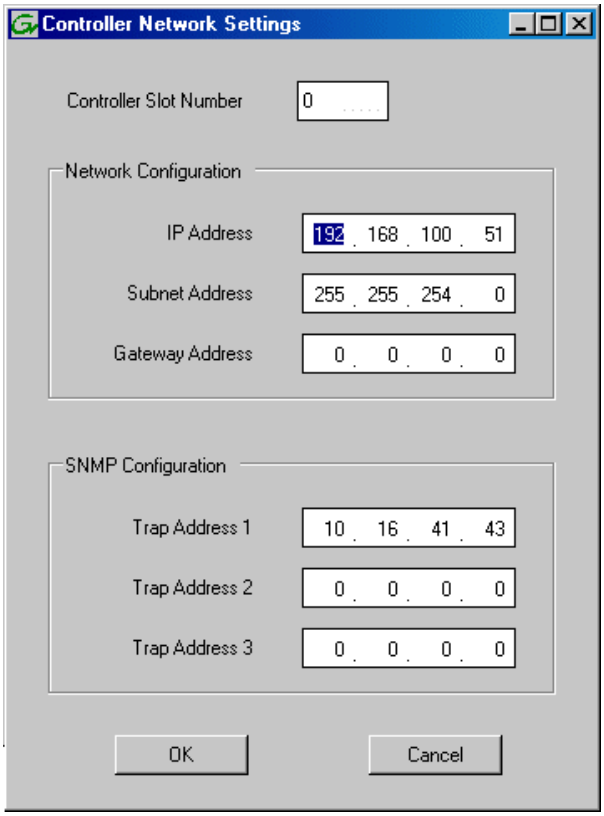
The RAID storage device is configured by default for the SNMP community name “public”. If your site’s policies require using a different SNMP community name, contact your Grass Valley representative.

To configure these settings, do the following:

1. Launch Storage Utility from the K2 System Configuration application as in the previous procedure.
2. As prompted, wait while Storage Utility gathers system information, then Storage Utility opens.
3. In Storage Utility tree view, expand the node for the L20R RAID, right-click the icon for a L20R RAID controller, and select **Configuration | Network Properties**.

   The Controller Network Settings dialog box opens.

   For a L20R RAID chassis with two controllers, you can make settings on both controllers using this dialog box.



4. In the Controller Slot Number field enter **0** and then press **Enter**. The settings from controller 0 are loaded into the Controller Network Settings dialog box and are available for you to modify.
5. Enter the control network IP address and other network settings.
6. You want SNMP trap messages go to the NetCentral server PC, so for SNMP Configuration enter the IP address of the NetCentral server PC. You can also enter IP addresses for other SNMP managers to which you want to send SNMP trap messages.
7. For the RAID chassis with two controllers, in the Controller Slot Number field enter **1** and then press **Enter**. The settings from controller 1 are loaded into the Controller Network Settings dialog box and are available for you to modify. Repeat the previous steps to configure controller 1.
8. Click **OK** to save settings and close.
9. In Storage Utility click **View | Refresh**. Continue with the next procedure "Binding disk modules".

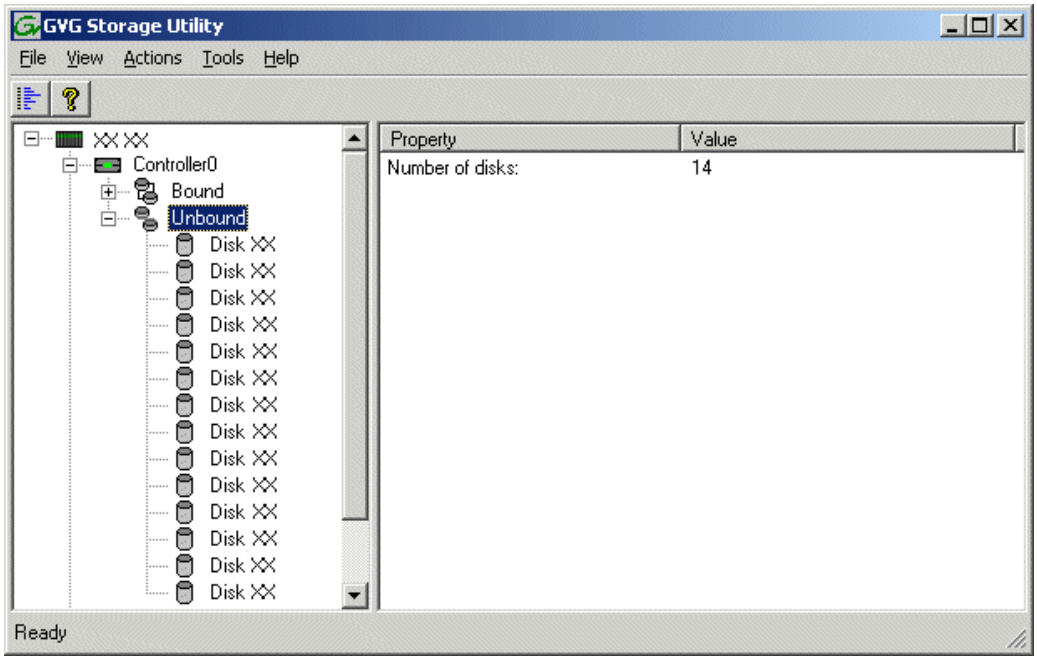
Binding disk modules

Use the following procedure to bind disk modules as required for the Level 20R K2 SAN.

Also refer to "About RANKs and LUNs in Storage Utility" in the chapter *Overview of K2 Storage Tools*.

NOTE: Binding destroys all user data on the disks.

1. In the Storage Utility main window, identify bound RANKs and unbound disks by their placement in the hierarchy of the tree view. In the following illustration, disk numbers are represented by "XX". Refer to "Identifying disks" on page 451 for an explanation of how disks are actually numbered in Storage Utility.



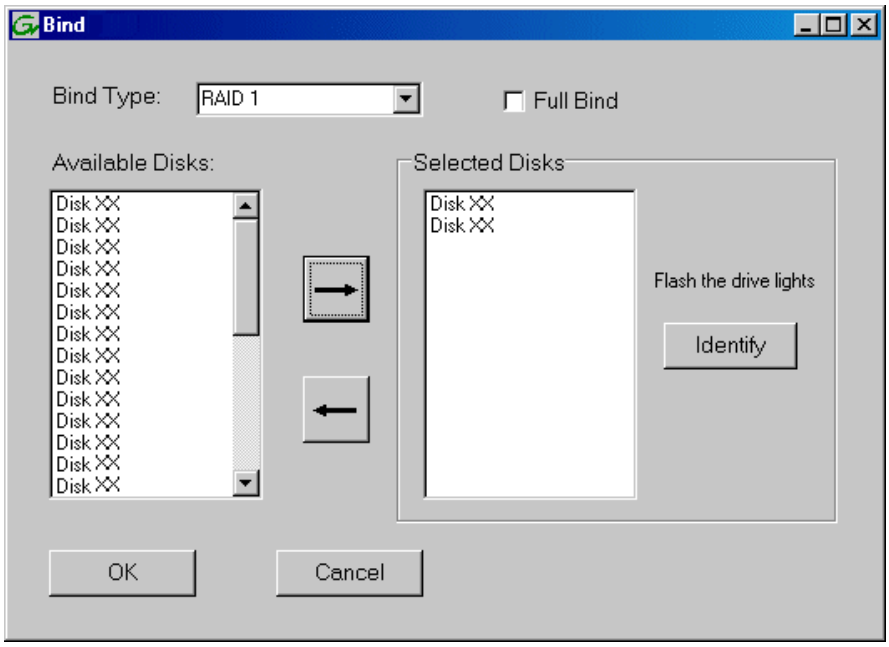
Redundant systems store metadata files and journal files on the primary RAID chassis. The first six disk slots in the chassis are dedicated for metadata/journal files. In the first five slots are five metadata/journal disks. The sixth slot is filled with a blank. Two disks are bound as a RAID 1 RANK for metadata storage and two disks are bound as a RAID 1 RANK for journal storage. The fifth disk is bound as a Hot Spare for the other four metadata/journal disks. The remaining six disks in the primary RAID chassis and all disks in Expansion chassis are for media storage. Media storage disks are bound as RAID 5 or RAID 6 in RANKs consisting of six disks each.

View disk properties and identify the four disks you will use for the metadata/journal RAID 1 RANKs, the one metadata/journal Hot Spare disk, any other disks that you intend to use for Hot Spares, and the remainder of the disks that are available for media storage. Make sure you select disks appropriately as you bind disks in the remainder of this procedure.

2. For systems that use RAID 1 RANKs, you must now create the separate RAID 1 storage for metadata files and journal files. To bind unbound disks for metadata and journal storage, do the following:

   a. Right-click the **Unbound** node for the controller, then select **Bind** in the context menu. (If the RAID chassis has two controllers, both controllers are represented by the single “Controller” node)

      The Bind dialog box opens showing all unbound disks for the controller listed in the Available Disk list.



b. Leave **Full Bind** unchecked. Refer to "About full/background bind" on page 455.

c. In the **Bind Type** drop down box, select **RAID 1**.

d. In the Available Disks box, select two contiguous disks at the top of the list. These should be the first two disks in the primary RAID chassis. (TIP: Use 'shift-click' or 'control-click' to select disks.) This creates a RAID 1 RANK for metadata storage.

e. Click the add (arrow) button to add disks to the Selected Disks list.

NOTE: As an aid in identifying a disk module's physical location, select it in the Selected Disks list, then click* Identify Disks. *This causes the disk drive light to flash.

f. Click **OK** to close the Bind dialog box and begin the binding process. The Progress Report dialog box opens, showing the status of the binding process.

g. Close the Progress Report and repeat the previous steps, selecting two more contiguous disks to create another RAID 1 RANK for journal storage. These should be the next two disks in the primary RAID chassis.

h. Make the fifth disk in the primary RAID chassis a Hot Spare. In the **Bind Type** drop down box, select **Hot Spare**.

i. In the Available Disks box, select the fifth disk in the primary RAID chassis.

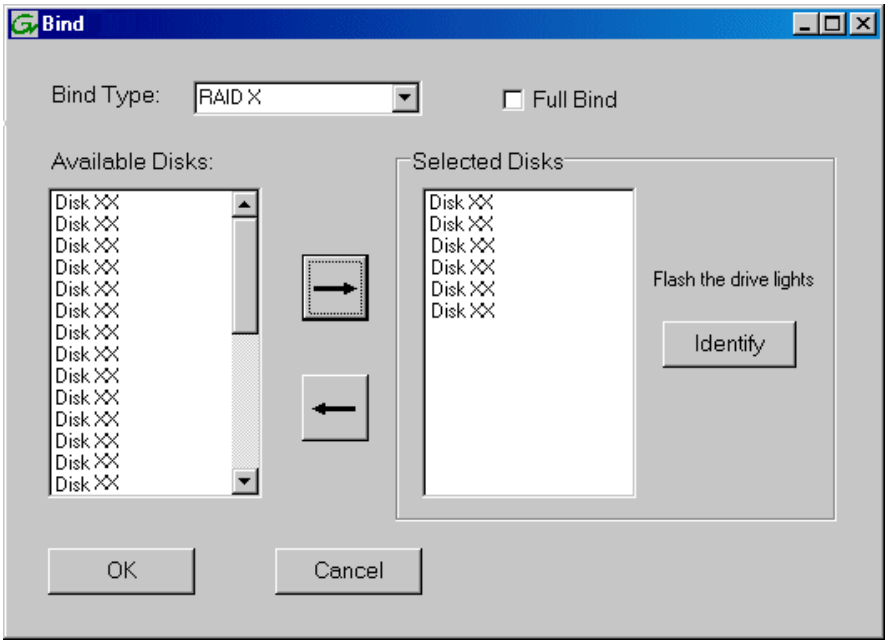
j. Click the add (arrow) button to add the disk to the Selected Disks list.

k. Click **OK** to close the dialog box and begin the binding process.

3. To bind unbound disks for media storage, do the following:

a. Right-click the **Unbound** node for a controller, then select **Bind** in the context menu. (If the RAID chassis has two controllers, both controllers are represented by the single "Controller" node)

The Bind dialog box opens showing all unbound disks for the controller listed in the Available Disk list.



b. Leave Full Bind unchecked. Refer to "About full/background bind" on page 455.

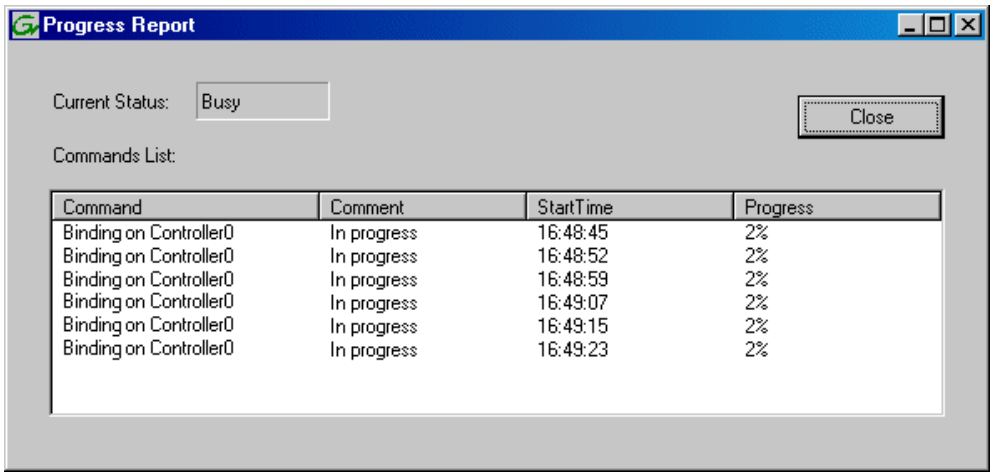
c. In the **Bind Type** drop down box, select **RAID 5** or **RAID 6**, as specified by your system design.

d. In the Available Disks box, select six contiguous disks at the top of the list. (TIP: Use 'shift-click' or 'control-click' to select disks.).

e. Click the add (arrow) button to add disks to the Selected Disks list.

NOTE: As an aid in identifying a disk module's physical location, select it in the Selected Disks list, then click* Identify Disks. *This causes the disk drive light to flash.

f. Click **OK** to close the Bind dialog box and begin the binding process. The Progress Report dialog box opens, showing the status of the binding process.



g. Close the Progress Report and repeat these steps for other unbound disks. If specified by your system design, you can bind some disks as Hot Spares, as explained in "Binding Hot Spare drives" on page 457. When you are done, if you did not bind any extra Hot Spares, you should have the following results:

   For L20R storage, on the primary RAID chassis you should have two RAID 1 RANKs of two disks each, one Hot Spare Disk, and one RAID 5 or RAID 6 RANK of six disks. For each optional Expansion chassis, you would have an additional one or two RAID 5 or RAID 6 RANKs of six disks each.

h. Click **Close** in Progress Report window.

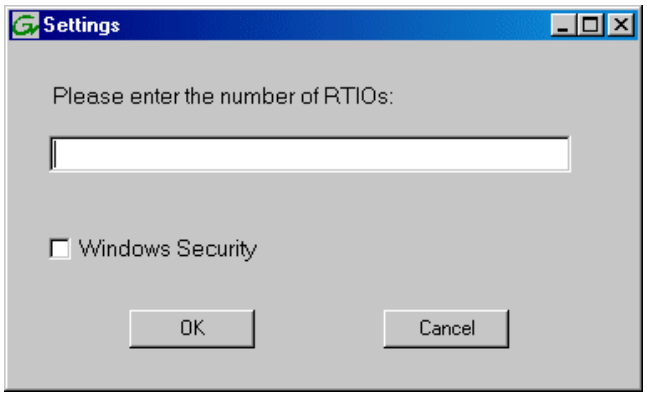
4. Restart the K2 Media Server.

NOTE: Make sure start up processes on the K2 Media Server are complete before proceeding.

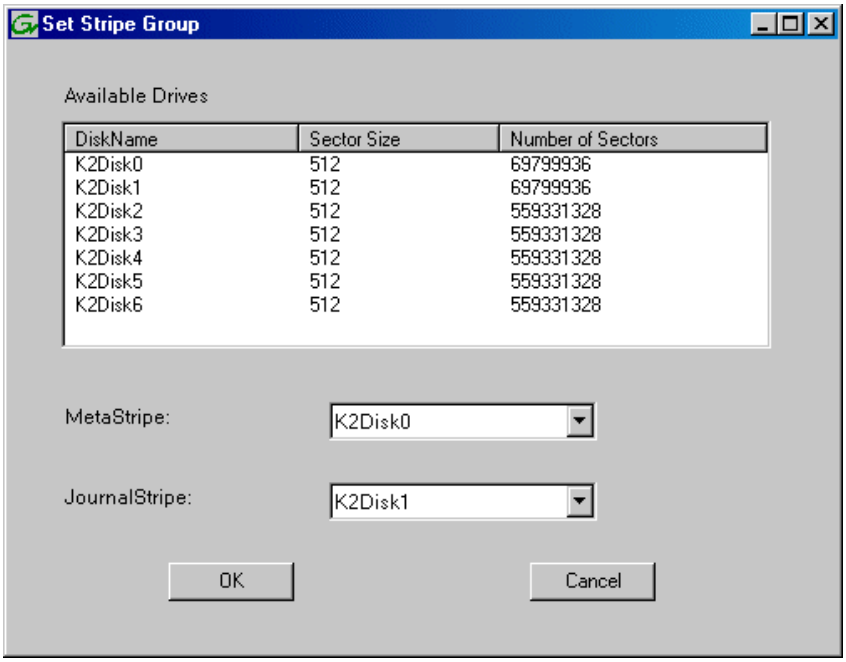
5. Continue with the next procedure "Creating a new file system".

Creating a new file system

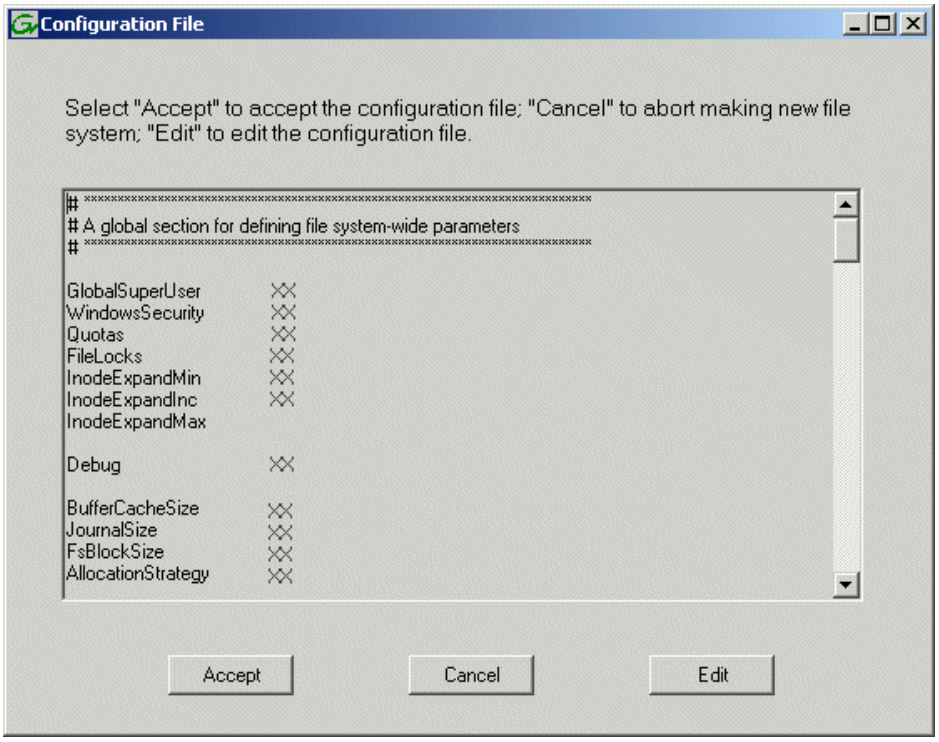
1. In Storage Utility, click **Tools | Make New File System**. The Setting dialog box opens.



2. For the Real Time Input/Output (RTIO) rate, enter the value specified by your system design. If you do not know this value, contact your Grass Valley representative.
3. If the K2 SAN is to be accessed by only K2 clients you can leave Windows Security unchecked. If accessed by Aurora Edits, refer to the *Aurora Edit Installation and Configuration Guide* for instructions.
4. Click **OK**. The Set Stripe Group dialog box opens.



5. If you have RAID 1 RANKS, assign a RAID 1 RANK as a metadata stripe and another RAID 1 RANK as a journal stripe. You can distinguish RAID 1 RANKs from media RANKs by the value in the Number of Sectors column.
6. Click **OK**. The Configuration File dialog box opens.



The configuration file for the media file system is displayed. You can verify media file system parameters by viewing this file. Do not edit this file. Click **Accept**.

A "…Please wait…" message box displays progress and a "…succeeded…" message confirms the process is complete.

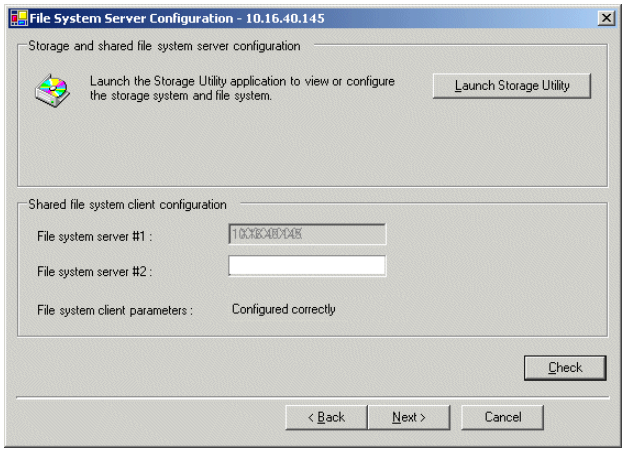
7. A message informs you that you must restart the K2 Media Server, however the restart at the end of the Configure K2 Server wizard suffices, so you do not need to restart now.
8. Close the Storage Utility.

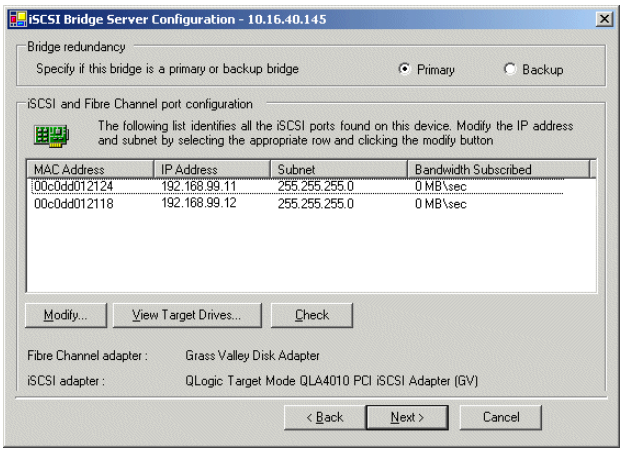
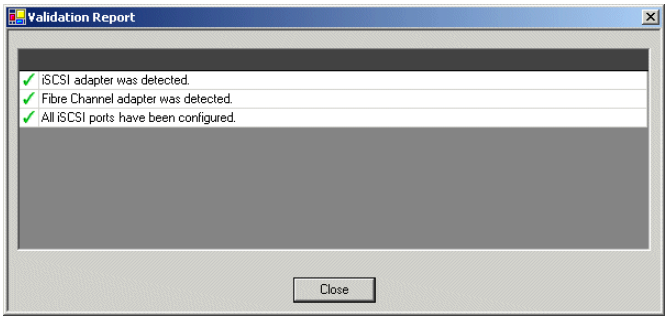
NOTE: Do not attempt to start K2 clients or otherwise bring the K2 SAN online until instructed to do so later in this chapter.

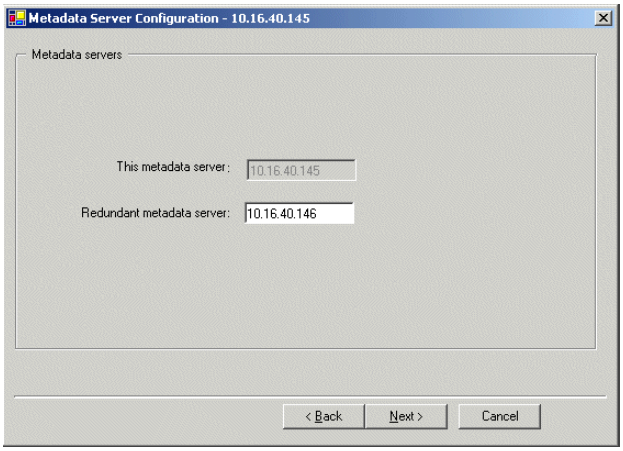
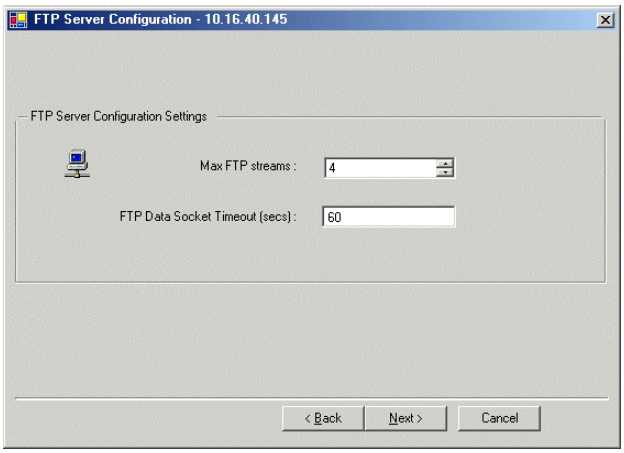
9. Continue with the next procedure.

Configuring server A - Part 2

1. Return to the Configure K2 Server page from which you launched Storage Utility and proceed as described in the following table:

On this page…	Do this…
File System Server Configuration This page checks on the configuration of the K2 Media Server in one of its main roles as a file system server. The K2 Media Server also functions as a file system client, which is also checked from this page.	 If you have not already done so, enter the name or IP address of the redundant K2 Media Server (server B). Click **Check**. When the wizard reports that the configuration is correct, click **Next**. If you get a "The V: will not be available until this device is rebooted…" message, you can safely continue with this procedure and follow the instructions related to this message later in the procedure.

On this page…	Do this…
iSCSI Bridge Server Configuration This page manages the components that bridge between iSCSI (the GigE media network) and the Fibre Channel connection to the RAID storage. You configure network settings on the iSCSI adapters and the page validates that the Fibre Channel adapter is in place and that the media RANKs are visible as iSCSI targets.	 Select **Primary**. Select an iSCSI adapter and click **Modify**. A network configuration dialog box opens. Verify or enter the media network IP address and the subnet mask and click **Apply**. Do the same for the other iSCSI adapter. Click **Check**. The Validation Report opens.  Confirm that the iSCSI configuration is successful. Close the Validation Report and then click **Next**.

On this page…	Do this…
Metadata Server Configuration	 Enter the name or IP address of K2 Media server B. This is the redundant partner of the server you are now configuring. Click **Next**.
FTP Server Configuration This page appears only if the server has the role of FTP server.	 Do not modify these settings. Leave at default values of Max FTP streams = 4 and FTP Data Socket Timeout = 60. Only qualified Grass Valley personnel should specify other values, as these settings are intended for use only with custom systems designed by Grass Valley. Click **Next**
Completing the Configuration Wizard	Click **Finish**. The wizard closes. The server restarts. Wait until all startup processes have completed before continuing.

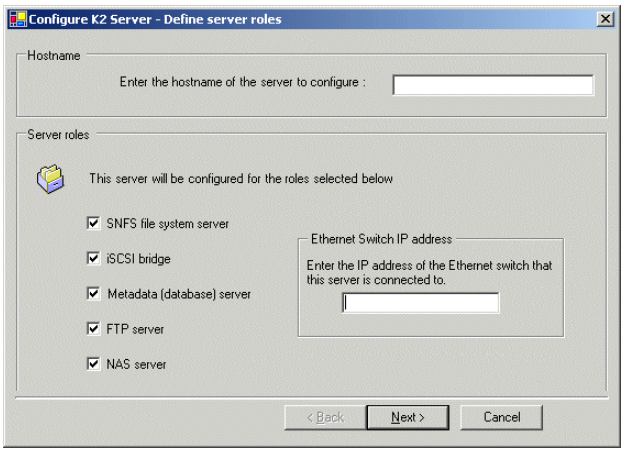
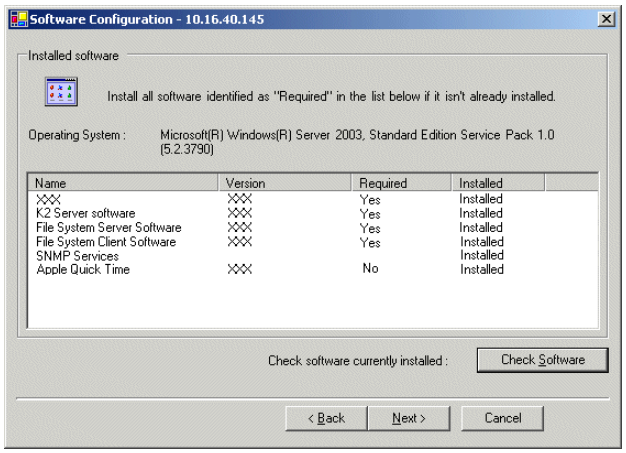
Configuring the redundant server B

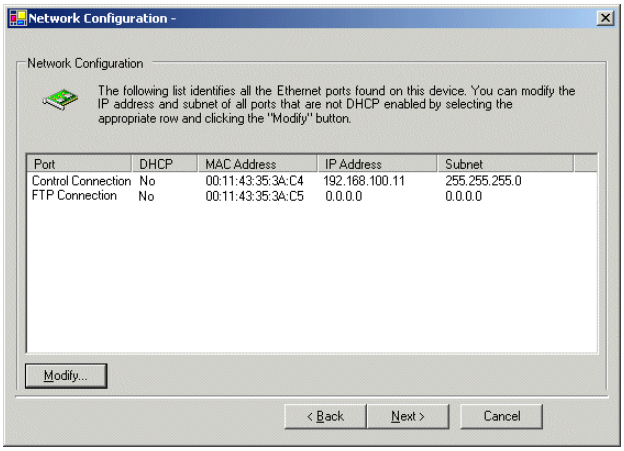
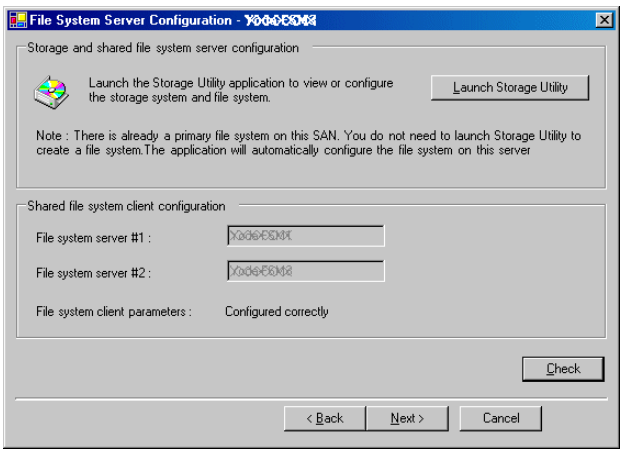
You must wait for the primary K2 Media Server to restart before continuing. To verify, from the control point PC open the MS-DOS command prompt and use the “ping” command.

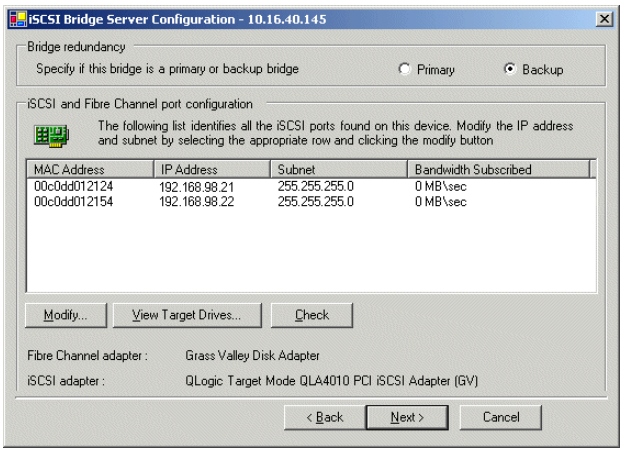
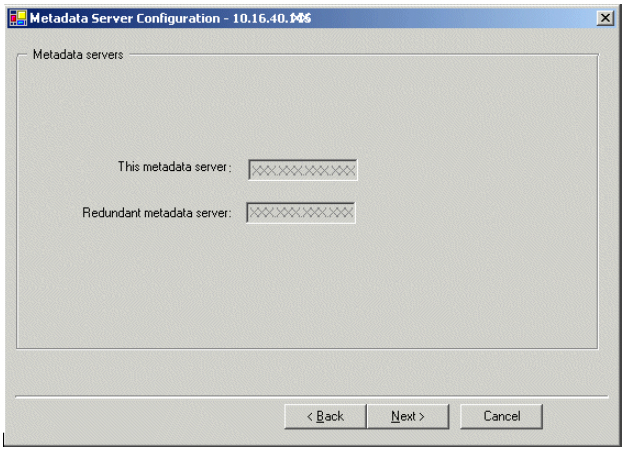
After you have configured the first K2 Media Server (server A) you next configure the redundant K2 Media Serer (server B).

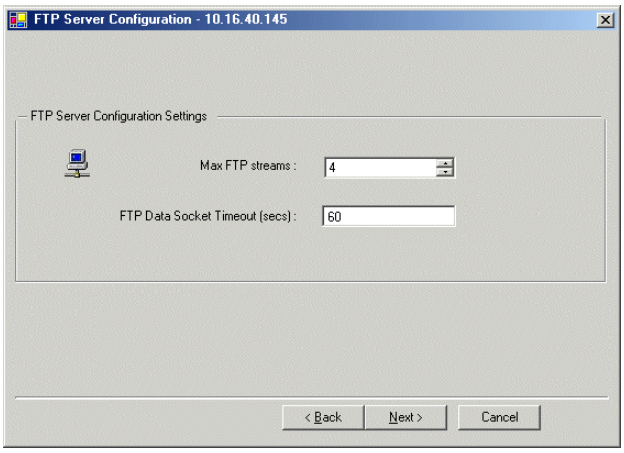
1. In the K2 System Configuration application tree view, select the K2 Media Server you are configuring as server B.

2. Click the **Configure** button. The Configure K2 Storage System Server wizard opens. Follow the on-screen text to configure the server for a Level 20R K2 SAN, as described in the following table. Some screens require no input from you, as they are based on the configurations already completed on a previously configured K2 Media Server.

On this page…	Do this…
Define server roles If the K2 SAN has one or more optional NH servers, then FTP traffic should go to the NH server, not the K2 Media Server you are now configuring. In this case, do not select the FTP server role or the NAS server role.	 Enter the name for the K2 Media Server. This should be the current network name of the machine. Enter the name or IP address of the Ethernet switch, as currently configured on the switch, to which the K2 Media Server is connected. Select all roles, except if NH server is present do not select FTP server or NAS server. Click **Next**
Software Configuration This page checks for the software required to support the roles you selected on the previous page.	 If software with *Yes* in the Required column reports as *Not Installed*, you must first install it on the K2 Media Server before continuing. After installing the software, click **Check Software**. When all required software reports as *Installed*, click **Next**.

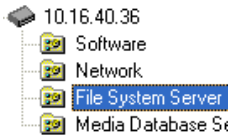
On this page…	Do this…
Network Configuration This page displays the control network Ethernet port, and allows you to configure the FTP/ Streaming network Ethernet port. ***NOTE: This page does not configure the iSCSI interface (media network) ports.*** For systems with an optional NH server, this server does not take the role of FTP server, so configuring the second port here for the FTP/ streaming network is not required.	 The top port is the port over which the K2 System Configuration application is communicating with the K2 Media Server. If correctly configured, it is already assigned the control network IP address, as displayed on this page. If the server has the role of FTP server, if the other port is not already configured correctly, select the other port and click **Modify**. A network configuration dialog box opens. Enter the FTP/Streaming IP address and the subnet mask and click **Apply**. Click **Next**.
File System Server Configuration This page checks on the configuration of the K2 Media Server in one of its main roles as a file system server. The K2 Media Server also functions as a file system client, which is also checked from this page. It is not necessary to bind RANKs or create a file system, since this task was completed when you configured the previous K2 Media Server.	 Click **Next**. Confirm messages about copying the file system configuration file to the other server. If you get a “The V: will not be available until this device is rebooted…” message, you can safely continue with this procedure and follow the instructions related to this message later in the procedure.

On this page…	Do this…
iSCSI Bridge Server Configuration This page manages the components that bridge between iSCSI (the GigE media network) and the Fibre Channel connection to the RAID storage. You configure network settings on the iSCSI adapters and the page validates that the Fibre Channel adapter is in place and that the media RANKs are visible as iSCSI targets. ***NOTE: The iSCSI adapters on this server must be on a different subnet than those on its redundant server partner.***	 Select **Backup**. Select an iSCSI adapter and click **Modify**. A network configuration dialog box opens. Verify or enter the media network IP address and subnet mask and click **Apply**. Do the same for the other iSCSI adapter. To verify drives, click **Check** then **View Target Drives**. You should see all your media drives listed. Click **Next**.
Metadata Server Configuration	 You do not need to enter or configure anything on this page. Click **Next**.

On this page…	Do this…
FTP Server Configuration This page appears only if the server has the role of FTP server.	 Do not modify these settings. Leave at default values of Max FTP streams = 4 and FTP Data Socket Timeout = 60. Only qualified Grass Valley personnel should specify other values, as these settings are intended for use only with custom systems designed by Grass Valley. Click **Next**
Completing the Configuration Wizard	Click **Finish**. The wizard closes. The K2 Media Server restarts. Do not proceed until restart processes are finished.

3. If you got a "The V: will not be available until this device is rebooted…" message on the File System Server Configuration page, after the K2 Media Server restarts, do the following:

   a. In the K2 System Configuration application tree view, under the K2 Media Server select the File System Server node.



   The File System Server Configuration page appears.

   b. Click **Check** and verify that the V: drive is shared. This is required for NAS server functionality.

Configuring optional NH servers

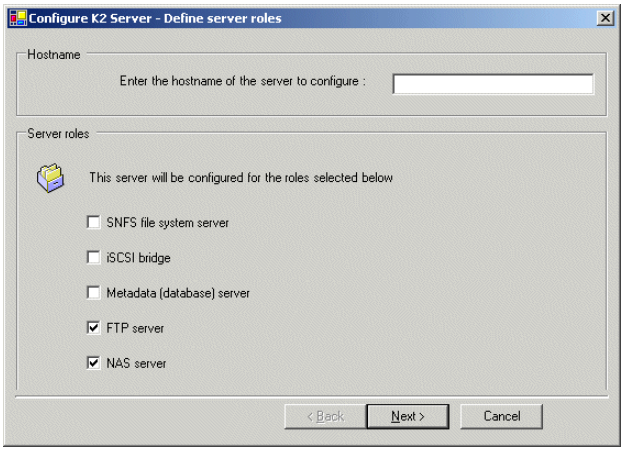
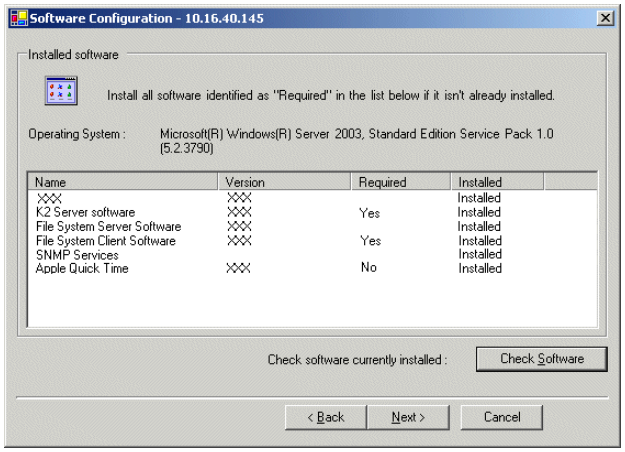
If you have one or more optional NH K2 Media Servers, you next configure those servers. This section applies to both NH1 (1 Gig FTP) servers and NH1-10GE (10 Gig FTP) servers.

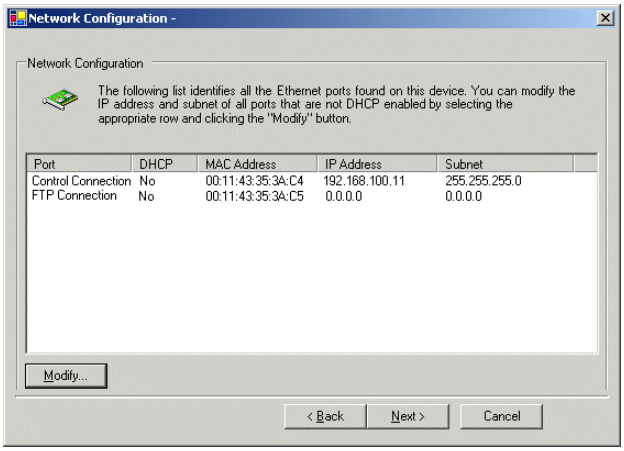
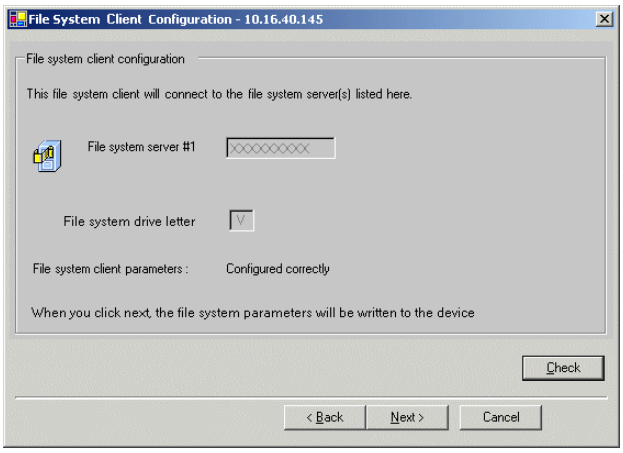
NOTE: Multiple NH servers on a K2 SAN must be of the same type, either all NH1 or all NH1-10GE.

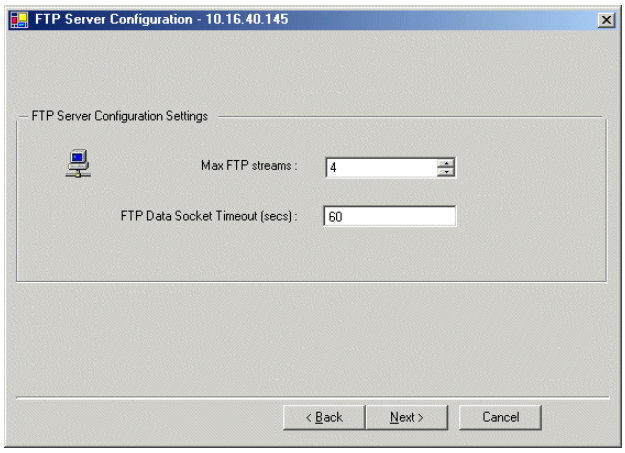
1. In the K2 System Configuration application tree view, select the K2 Media Server

you are configuring.

2. Click the **Configure** button. The Configure K2 Server wizard opens. Follow the on-screen text to configure the server for a Level 20R K2 SAN, as described in the following table. Some screens require no input from you, as they are based on the configurations already completed on a previously configured K2 Media Server.

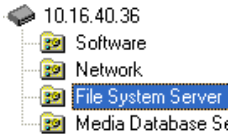
On this page…	Do this…
Define server roles	 Enter the name for the K2 Media Server. This should be the current network name of the machine. Select FTP server and NAS server. Click **Next**
Software Configuration This page checks for the software required to support the roles you selected on the previous page.	 If software with *Yes* in the Required column reports as *Not Installed*, you must first install it on the K2 Media Server before continuing. After installing the software, click **Check Software**. When all required software reports as *Installed*, click **Next**.

On this page…	Do this…
Network Configuration This page displays the control network Ethernet port, and allows you to configure the FTP/ Streaming network Ethernet port.	 The top port is the port over which the K2 System Configuration application is communicating with the K2 Media Server. If correctly configured, it is already assigned the control network IP address, as displayed on this page. If the other port is not already configured correctly, select the other port and click **Modify**. A network configuration dialog box opens. Enter the FTP/Streaming IP address and the subnet mask and click **Apply**. Click **Next**.
File System Client Configuration This K2 Media Server does not function as a file system server. It does function as a file system client, which is validated from this page.	 Click **Check**. When the wizard reports that the configuration check is successful, click **Next**.

On this page…	Do this…
FTP Server Configuration	 Do not modify these settings. Leave at default values of Max FTP streams = 4 and FTP Data Socket Timeout = 60. Only qualified Grass Valley personnel should specify other values, as these settings are intended for use only with custom systems designed by Grass Valley. Click **Next**
Completing the Configuration Wizard	Click **Finish**. The wizard closes. The K2 Media Server restarts. Do not proceed until restart processes are finished.

3. If you got a “The V: will not be available until this device is rebooted…” message on the File System Server Configuration page, after the K2 Media Server restarts, do the following:

   a. In the K2 System Configuration application tree view, under the K2 Media Server select the File System Server node.

   The File System Server Configuration page appears.

   b. Click **Check** and verify that the V: drive is shared. This is required for NAS server functionality.

4. Repeat this procedure for remaining NH K2 Media Servers, if any.

Next, configure K2 clients and/or other iSCSI clients on the K2 SAN.

Configuring the Level 30 K2 SAN

Work through the topics in this section sequentially to do the initial configuration of the Level 30 K2 SAN.

- "Prerequisites for initial configuration" on page 232
- "Defining a new K2 SAN" on page 233
- "Configuring the server - Part 1" on page 235
- "Configuring RAID" on page 237
- "Creating a new file system" on page 242
- "Configuring the server - Part 2" on page 244
- "Configuring optional NH servers" on page 246

Prerequisites for initial configuration

Before beginning your initial configuration, make sure the devices of the K2 SAN meet the following prerequisites. Refer to sections earlier in this manual for detailed information. Also refer to Chapter 10, "Description of K2 SAN Devices".

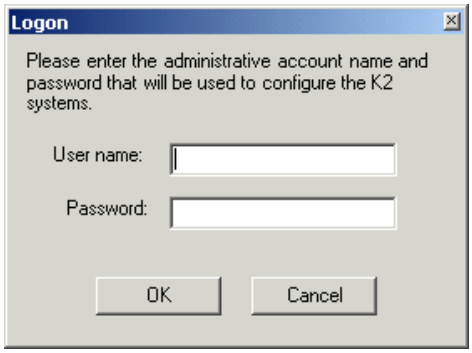
Devices	Prerequisite for Level 30 configuration
Control point PC	Ethernet cable connected Control Point software installed Control network IP address assigned Network communication over the control network with all other K2 devices Power on
Ethernet switch	Ethernet cables connected Control network IP address assigned VLANs set up Trunks set up Power on
K2 Media Server	Ethernet cables connected Fibre Channel cable connected Software installed, as from the factory, including QuickTime 7 Control network IP address assigned Power on for all servers
L30 RAID chassis	Fibre Channel cable(s) connected Ethernet cable(s) connected Power on
L30 RAID Expansion chassis (optional)	Fibre channel cable(s) connected Power on

Defining a new K2 SAN

If you import a SiteConfig system description file, you do not need to define a new K2 SAN. You can skip this task and instead start by configuring the first K2 Media Server.

Define a Level 30 K2 SAN as follows:

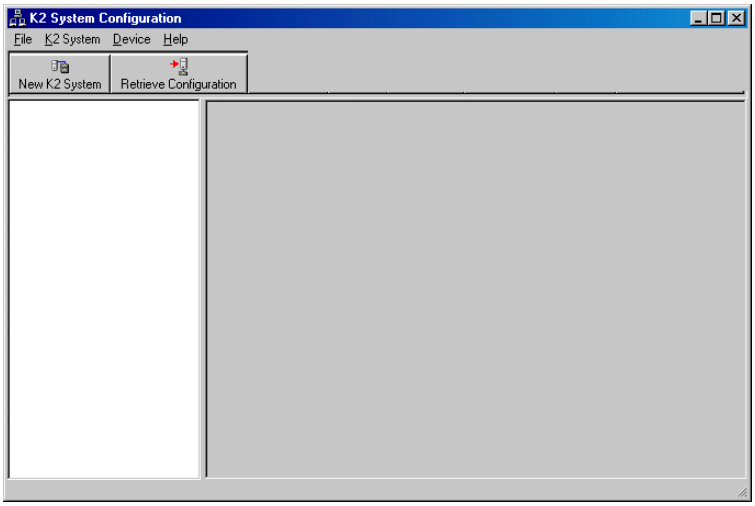
1. On the control point PC, open the K2 System Configuration application. A login dialog box opens.



2. Log in to the K2 System Configuration application with the Windows administrator account. By default this as follows:

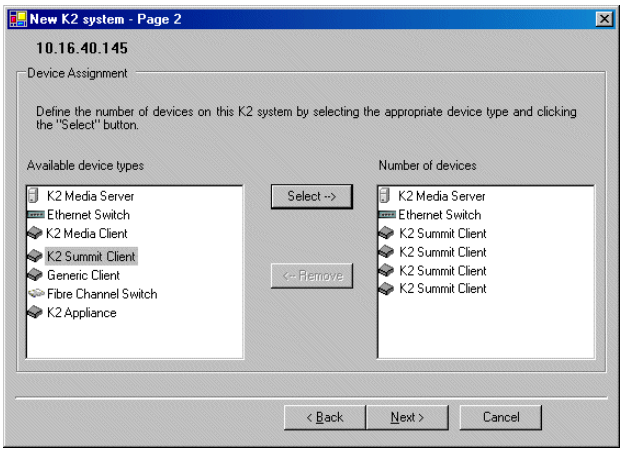
   - Username: Administrator
   - Password: adminK2

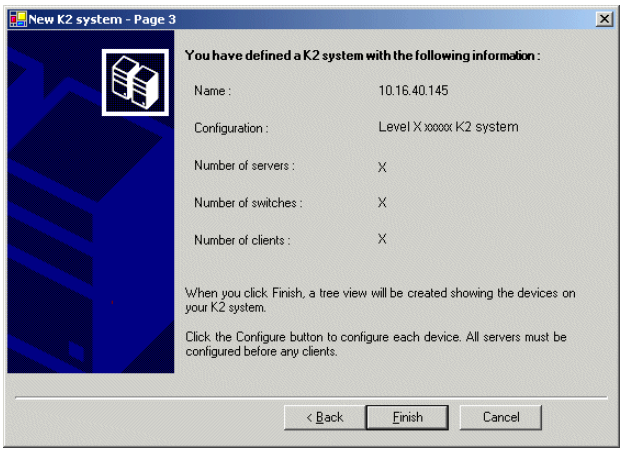
   Refer to "Setting up application security" on page 393 for more information about administrator accounts and logging in to applications.



3. Click **New K2 System**. The New K2 System wizard opens.

4. Follow the on-screen text to define your Level 30 K2 SAN, as described in the following table.

On this page…	Do this…
Page 1	 Create a name for your Level 30 K2 SAN and type it in the Name box. Select **Level 30**. If so designed, select **Enable Live Production mode**. Do not select the Server redundancy option. Click **Next**
Page 2	 Move the following into the Number of Devices Box: • One K2 Media Server • One Ethernet switch • K2 clients as appropriate for your system. • (Optional) One or more K2 Media Servers to represent each NH K2 Media Server on your system. • (Optional) Other devices as appropriate for your system. Click **Next**.

On this page...	Do this...
Page 3	 Review the information on this page and verify that you have correctly defined your K2 SAN. For a Level 30 K2 SAN you should have the following: • One Gigabit Ethernet switch • One K2 Media Server • Optionally, one or more NH K2 Media Servers • The number and type of clients appropriate for your system. Click **Finish**. The Define New K2 Storage System wizard closes.

Your K2 SAN appears in the tree view of the K2 System Configuration application.

5. Continue with the next procedure.

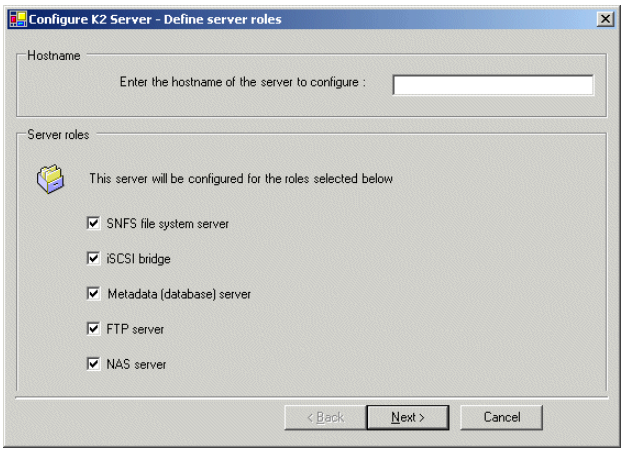
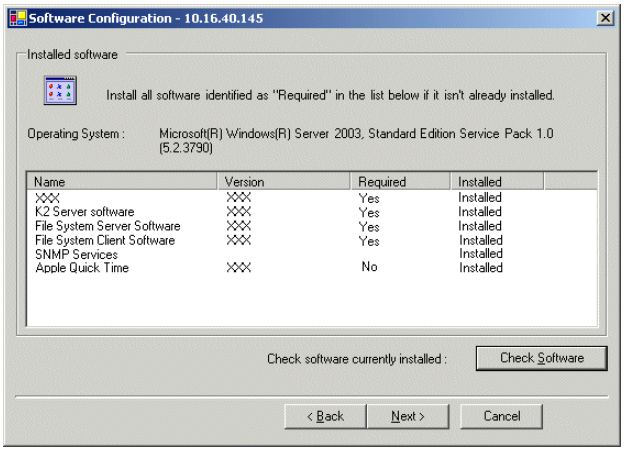
Configuring the server - Part 1

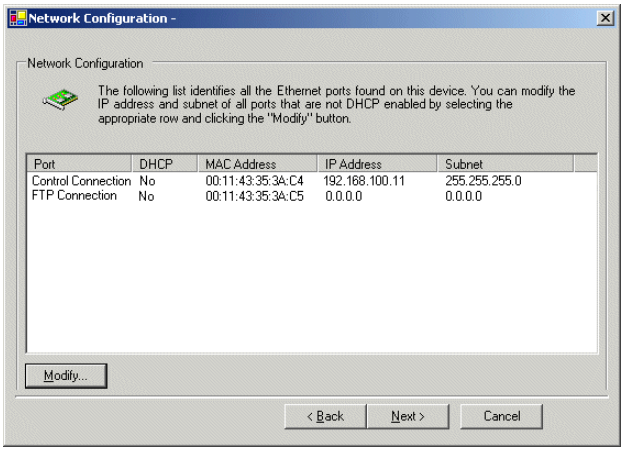
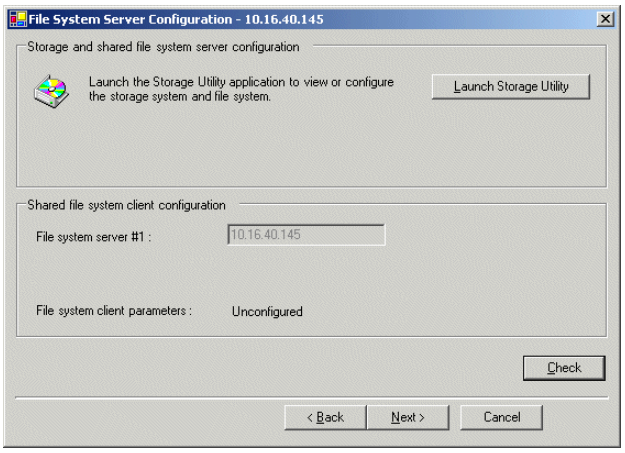
1. In the K2 System Configuration application tree view, select [**K2Server1]**.

2. Click the **Configure** button.

The Configure K2 Server wizard opens. Follow the on-screen text to configure the for a Level 30 K2 SAN, as described in

the following table:

On this page…	Do this…
Define server roles If the K2 SAN has one or more optional NH servers, then FTP traffic should go to the NH server, not the K2 Media Server you are now configuring. In this case, do not select the FTP server role or the NAS server role..	 Enter the name for the K2 Media Server, as currently configured on the machine. For Level 30, select all roles, except if NH server is present do not select FTP server or NAS server. Click **Next**
Software Configuration This page checks for the software required to support the roles you selected on the previous page.	 If software with *Yes* in the Required column reports as *Not Installed*, you must first install it on the before continuing. After installing the software, click **Check Software**. When all required software reports as *Installed*, click **Next**.

On this page…	Do this…
Network Configuration This page displays the control network Ethernet port, and allows you to configure the FTP/ Streaming network Ethernet port. ***NOTE: This page does not configure the iSCSI interface (media network) ports.*** For systems with an optional NH (FTP) server, the server you ar now configuring does not take the role of FTP server, so configuring the second port here for the FTP/ streaming network is not required.	 The top port is the port over which the K2 System Configuration application is communicating. If correctly configured, it is already assigned the control network IP address, as displayed on this page. If the server has the role of FTP server, if the other port is not already configured correctly, select the other port and click **Modify**. A network configuration dialog box opens. Enter the FTP/Streaming IP address and the subnet mask and click **Apply**. Click **Next**.
File System Server Configuration	 Click **Launch Storage Manager**. Storage Utility opens.

3. Continue with the next procedure to use Storage Utility to configure the storage and file system.

   Leave the Configure K2 Server wizard open while you are using Storage Utility. When you are done with Storage Utility, you continue with the wizard.

Configuring RAID

Use Storage Utility to complete the configuration of the L30 RAID chassis, as explained in the following topics:

- "Configuring RAID network and SNMP settings"

- "Binding disk modules"

Refer to "Prerequisites for initial configuration" on page 232 to confirm that the RAID storage is ready for configuration.

Configuring RAID network and SNMP settings

Use the Storage Utility to configure the following settings for the Level 30 RAID controller:

- IP address
- Subnet mask
- Gateway Address
- SNMP trap destinations

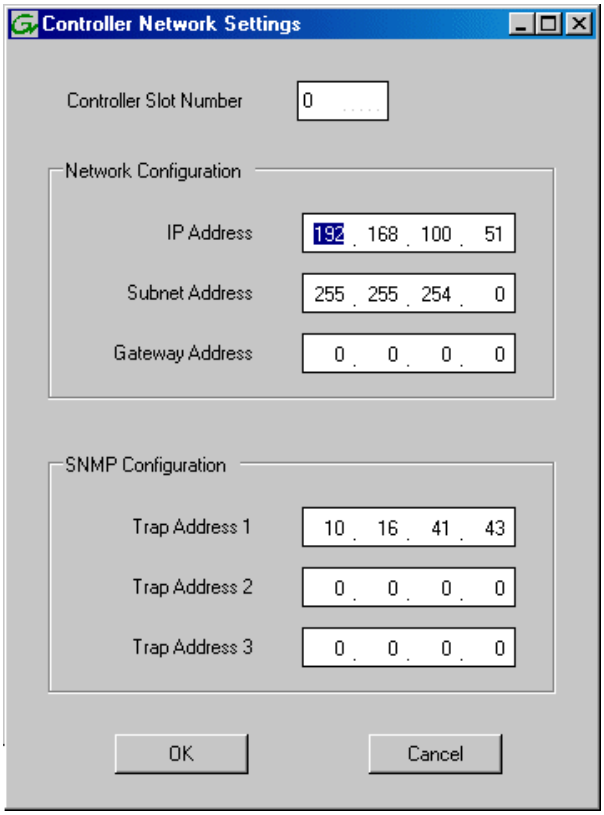
For L30 RAID, network and SNMP settings are set and stored on the RAID controller module, so the combined RAID storage devices, including the optional Expansion chassis, exist as a single entity on the control network.

The RAID storage device is configured by default for the SNMP community name "public". If your site's policies require using a different SNMP community name, contact your Grass Valley representative.

To configure these settings, do the following:

1. Launch Storage Utility from the K2 System Configuration application as in the previous procedure.
2. As prompted, wait while Storage Utility gathers system information, then Storage Utility opens.
3. In Storage Utility tree view, expand the node for the L30 RAID, right-click the icon for a L30 RAID controller, and select **Configuration | Network Properties**.

   The Controller Network Settings dialog box opens.



4. In the Controller Slot Number field enter **0** and then press **Enter**. The settings from controller 0 are loaded into the Controller Network Settings dialog box and are available for you to modify.
5. Enter the control network IP address and other network settings.
6. You want SNMP trap messages go to the NetCentral server PC, so for SNMP Configuration enter the IP address of the NetCentral server PC. You can also enter IP addresses for other SNMP managers to which you want to send SNMP trap messages.
7. Click **OK** to save settings and close.
8. In Storage Utility click **View | Refresh**. Continue with the next procedure "Binding disk modules".

Binding disk modules

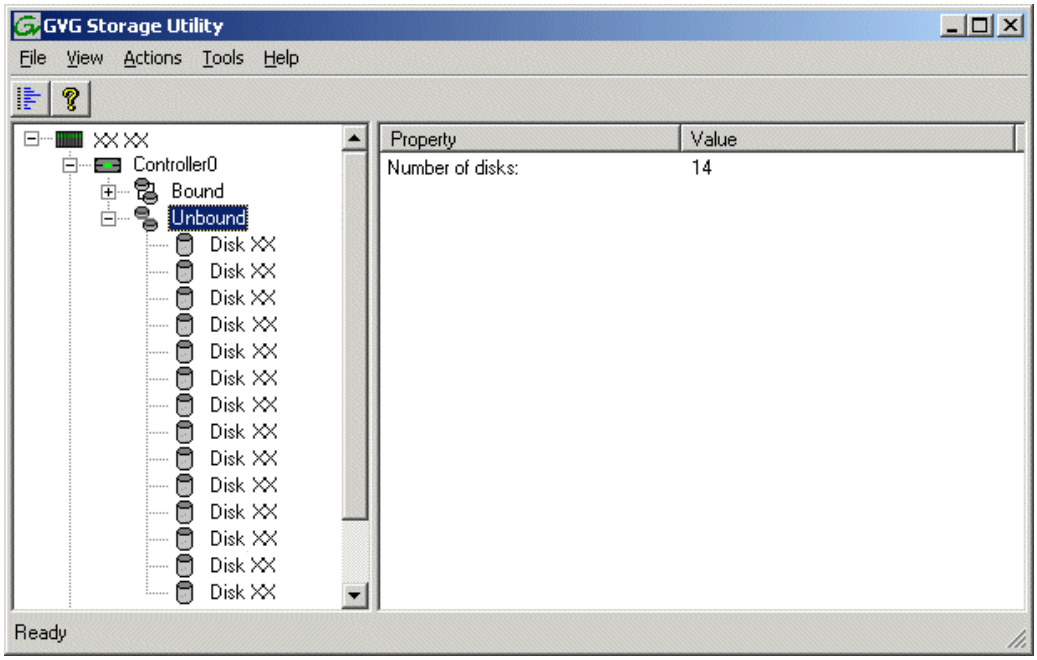
Use the following procedure to bind disk modules as required for the Level 30 K2 SAN.

Also refer to "About RANKs and LUNs in Storage Utility" in the chapter *Overview of K2 Storage Tools*.

NOTE: Binding destroys all user data on the disks.

1. In the Storage Utility main window, identify bound RANKs and unbound disks by

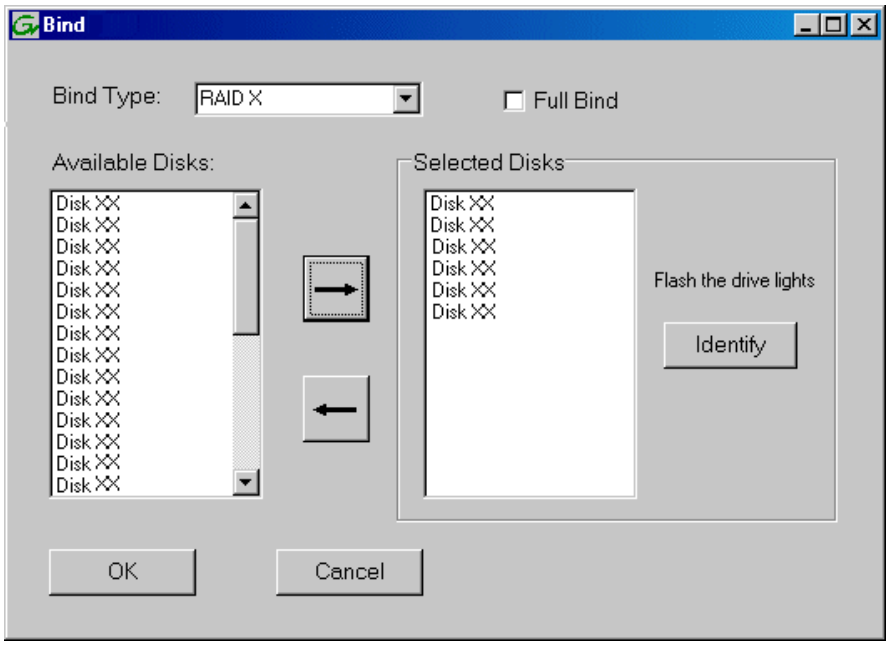
their placement in the hierarchy of the tree view. In the following illustration, disk numbers are represented by “XX”. Refer to “Identifying disks” on page 451 for an explanation of how disks are actually numbered in Storage Utility.



2. To bind unbound disks for media storage, do the following:

   a. Right-click the **Unbound** node for a controller, then select **Bind** in the context menu. (If the RAID chassis has two controllers, both controllers are represented by the single “Controller” node)

      The Bind dialog box opens showing all unbound disks for the controller listed in the Available Disk list.



b. Leave Full Bind unchecked. Refer to "About full/background bind" on page 455.

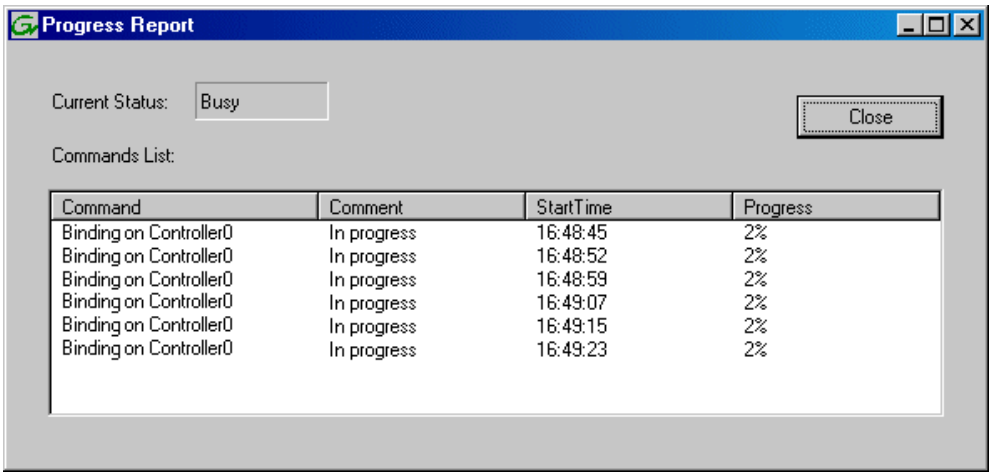
c. In the **Bind Type** drop down box, select **RAID 5** or **RAID 6**, as specified by your system design.

d. In the Available Disks box, select six contiguous disks at the top of the list. (TIP: Use 'shift-click' or 'control-click' to select disks.).

e. Click the add (arrow) button to add disks to the Selected Disks list.

NOTE: As an aid in identifying a disk module's physical location, select it in the Selected Disks list, then click* Identify Disks. *This causes the disk drive light to flash.

f. Click **OK** to close the Bind dialog box and begin the binding process. The Progress Report dialog box opens, showing the status of the binding process.



g. Close the Progress Report and repeat these steps for other unbound disks. If specified by your system design, you can bind some disks as Hot Spares, as explained in "Binding Hot Spare drives" on page 457. When you are done, if you did not bind any extra Hot Spares, you should have the following results:

   For L30 storage you should have two RAID 5 or RAID 6 RANKs of six disks each on the primary RAID storage device. For each optional Expansion chassis, you would have an additional one or two RAID 5 or RAID 6 RANKs of six disks each.

h. Click **Close** in Progress Report window.

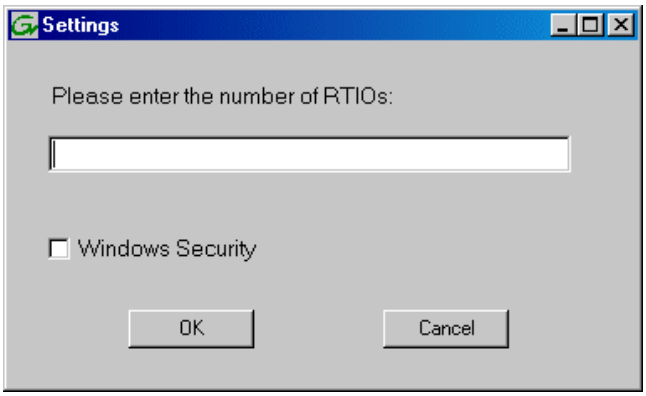
3. Restart the K2 Media Server.

NOTE: Make sure start up processes on the K2 Media Server are complete before proceeding.

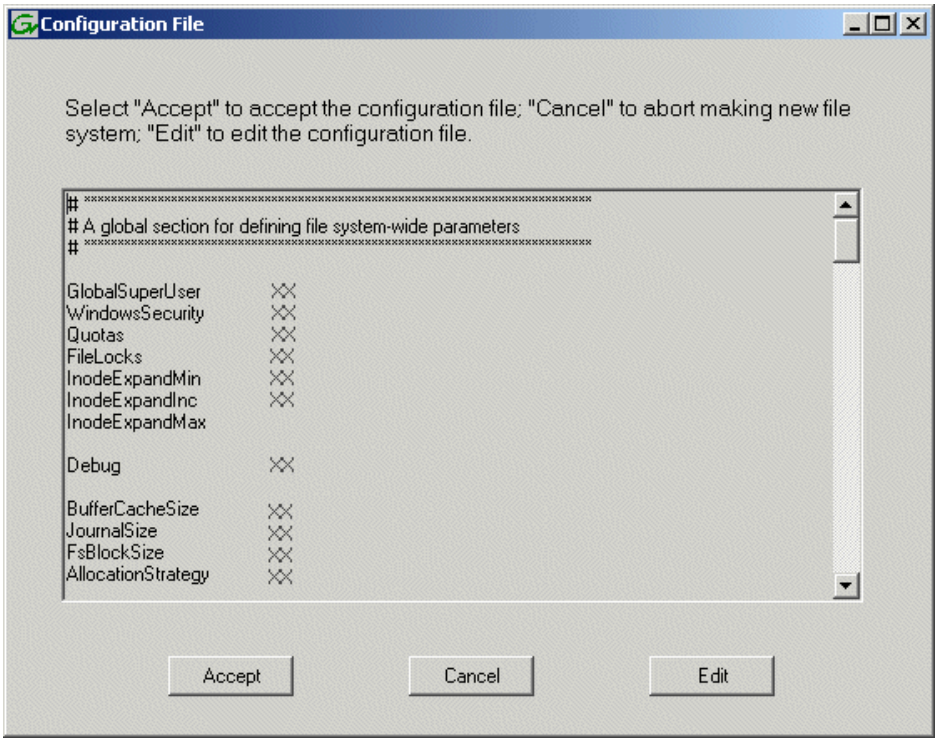
4. Continue with the next procedure "Creating a new file system".

Creating a new file system

1. In Storage Utility, click **Tools | Make New File System**. The Setting dialog box opens.



2. For the Real Time Input/Output (RTIO) rate, enter the value specified by your system design. If you do not know this value, contact your Grass Valley representative.
3. If the K2 SAN is to be accessed by only K2 clients you can leave Windows Security unchecked. If accessed by Aurora Edits, refer to the *Aurora Edit Installation and Configuration Guide* for instructions.
4. Click **OK**. The Configuration File dialog box opens.



The configuration file for the media file system is displayed. You can verify media file system parameters by viewing this file. Do not edit this file. Click **Accept**.

A "…Please wait…" message box displays progress and a "…succeeded…" message confirms the process is complete.

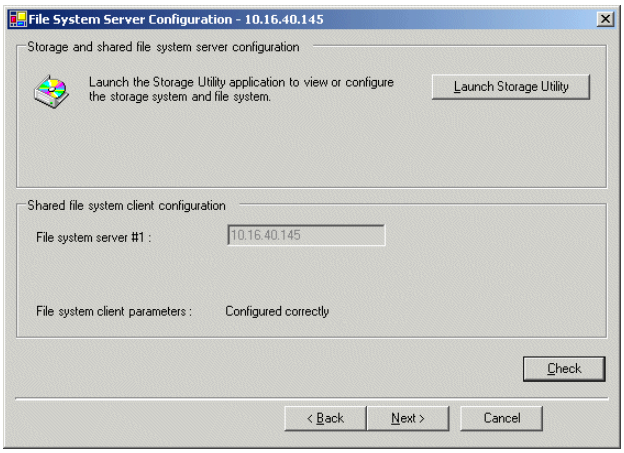
5. A message informs you that you must restart the K2 Media Server, however the restart at the end of the Configure K2 Server wizard suffices, so you do not need to restart now.
6. Close the Storage Utility.

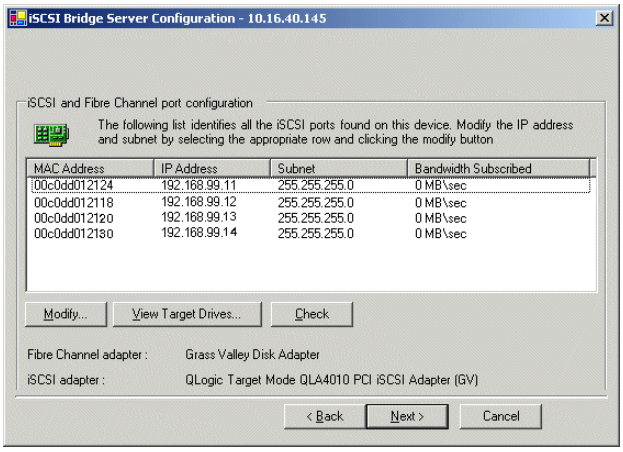
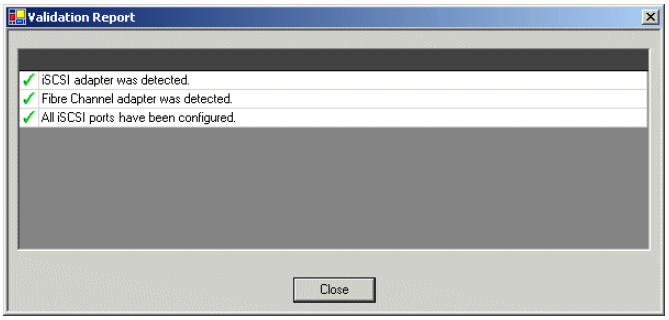
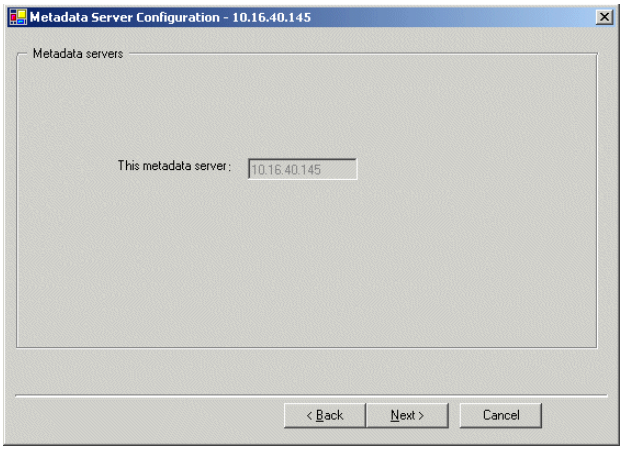
NOTE: Do not attempt to start K2 clients or otherwise bring the K2 SAN online until instructed to do so later in this chapter.

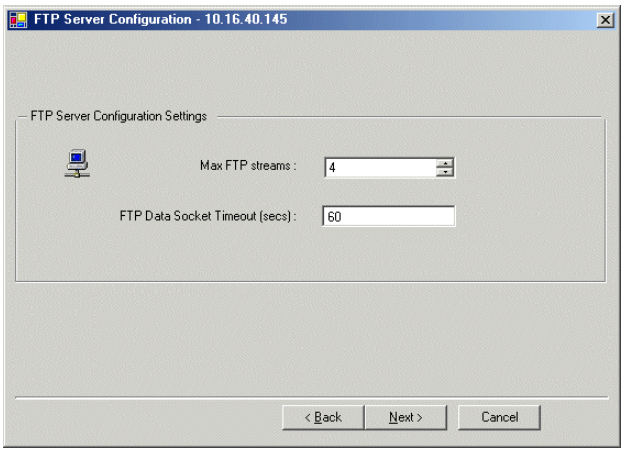
7. Continue with the next procedure.

Configuring the server - Part 2

1. Return to the Configure K2 Server page from which you launched Storage Utility and proceed as described in the following table:

On this page…	Do this…
File System Server Configuration This page checks on the configuration of the server in one of its main roles as a file system server. The server also functions as a file system client, which is also checked from this page.	 Click **Check**. When the wizard reports that the configuration is correct, click **Next**. If you get a "The V: will not be available until this device is rebooted…" message, you can safely continue with this procedure and follow the instructions related to this message later in the procedure.

On this page…	Do this…
iSCSI Bridge Server Configuration This page manages the components that bridge between iSCSI (the GigE media network) and the Fibre Channel connection to the RAID storage. You configure network settings on the iSCSI adapters and the page validates that the Fibre Channel adapter is in place and that the media RANKs are visible as iSCSI targets.	 Select an iSCSI adapter and click **Modify**. A network configuration dialog box opens. Verify or enter the media network IP address and the subnet mask and click **Apply**. Do the same for the other iSCSI adapters. Click **Check**. The Validation Report opens.  Confirm that the iSCSI configuration is successful. Close the Validation Report and then click **Next**.
Database Server Configuration	 You do not need to enter or configure anything on this page. Click **Next**.

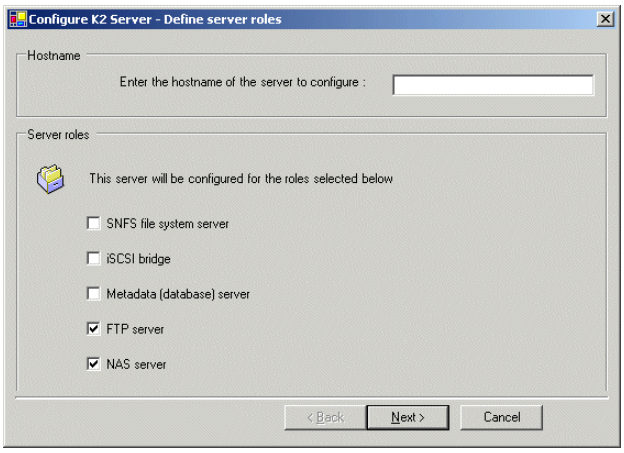
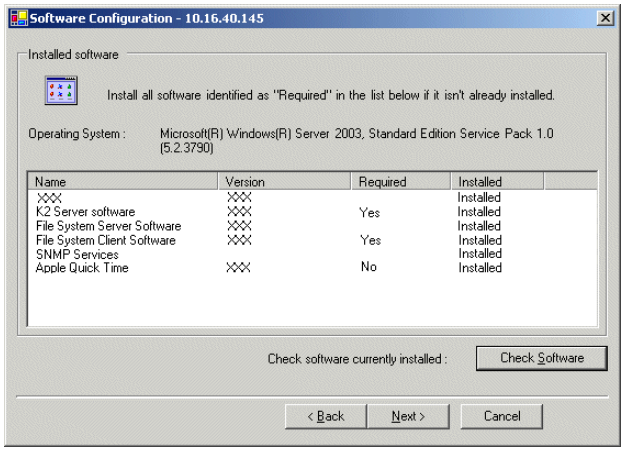
On this page…	Do this…
FTP Server Configuration This page appears only if the server has the role of FTP server.	 Do not modify these settings. Leave at default values of Max FTP streams = 4 and FTP Data Socket Timeout = 60. Only qualified Grass Valley personnel should specify other values, as these settings are intended for use only with custom systems designed by Grass Valley. Click **Next**
Completing the Configuration Wizard	Click **Finish**. The wizard closes. The server restarts. Wait until all startup processes have completed before continuing.

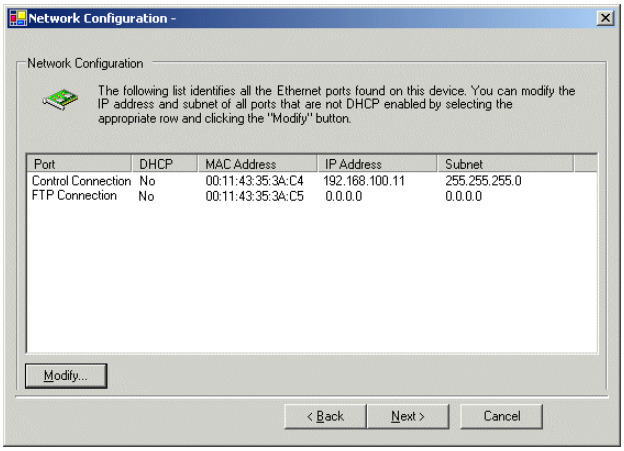
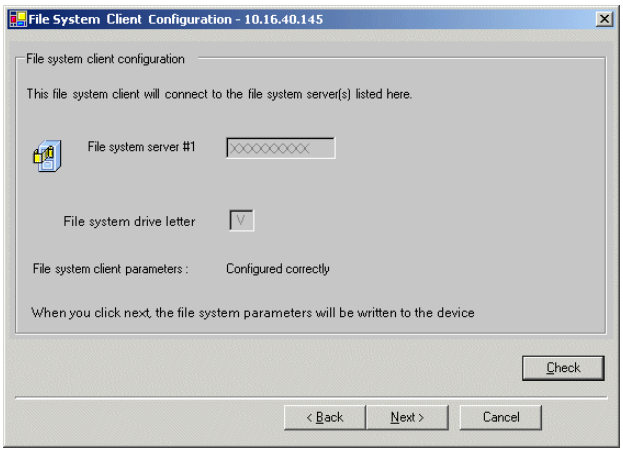
Configuring optional NH servers

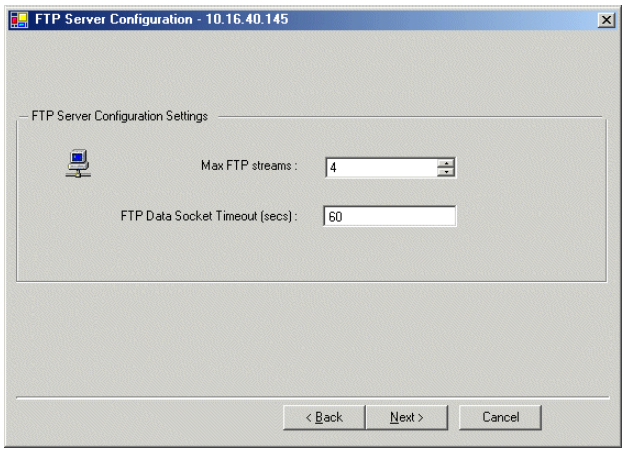
If you have one or more optional NH K2 Media Servers, you next configure those servers. This section applies to both NH1 (1 Gig FTP) servers and NH1-10GE (10 Gig FTP) servers.

NOTE: Multiple NH servers on a K2 SAN must be of the same type, either all NH1 or all NH1-10GE.

1. In the K2 System Configuration application tree view, select the K2 Media Server you are configuring.
2. Click the **Configure** button. The Configure K2 Server wizard opens. Follow the on-screen text to configure the server for a Level 30 K2 SAN, as described in the following table. Some screens require no input from you, as they are based on the configurations already completed on a previously configured K2 Media Server.

On this page…	Do this…
Define server roles	 Enter the name for the K2 Media Server. This should be the current network name of the machine. Select FTP server and NAS server. Click **Next**
Software Configuration This page checks for the software required to support the roles you selected on the previous page.	 If software with *Yes* in the Required column reports as *Not Installed*, you must first install it on the K2 Media Server before continuing. After installing the software, click **Check Software**. When all required software reports as *Installed*, click **Next**.

On this page…	Do this…
Network Configuration This page displays the control network Ethernet port, and allows you to configure the FTP/ Streaming network Ethernet port.	 The top port is the port over which the K2 System Configuration application is communicating with the K2 Media Server. If correctly configured, it is already assigned the control network IP address, as displayed on this page. If the other port is not already configured correctly, select the other port and click **Modify**. A network configuration dialog box opens. Enter the FTP/Streaming IP address and the subnet mask and click **Apply**. Click **Next**.
File System Client Configuration This K2 Media Server does not function as a file system server. It does function as a file system client, which is validated from this page.	 Click **Check**. When the wizard reports that the configuration check is successful, click **Next**.

On this page…	Do this…
FTP Server Configuration	 Do not modify these settings. Leave at default values of Max FTP streams = 4 and FTP Data Socket Timeout = 60. Only qualified Grass Valley personnel should specify other values, as these settings are intended for use only with custom systems designed by Grass Valley. Click **Next**
Completing the Configuration Wizard	Click **Finish**. The wizard closes. The K2 Media Server restarts. Do not proceed until restart processes are finished.

3. Repeat this procedure for remaining NH K2 Media Servers, if any.

Next, configure K2 clients and/or other iSCSI clients on the K2 SAN.

Configuring the Level 30R K2 SAN

Work through the topics in this section sequentially to do the initial configuration of the Level 30R K2 SAN.

- "Prerequisites for initial configuration" on page 250
- "Defining a new K2 SAN" on page 251
- "Configuring server A - Part 1" on page 253
- "Configuring RAID" on page 255
- "Creating a new file system" on page 261
- "Configuring server A - Part 2" on page 263
- "Configuring the redundant server B" on page 266
- "Configuring optional NH servers" on page 270

Prerequisites for initial configuration

Before beginning your initial configuration, make sure the devices of the K2 SAN meet the following prerequisites. Refer to sections earlier in this manual for detailed information. Also refer to Chapter 10, "Description of K2 SAN Devices".

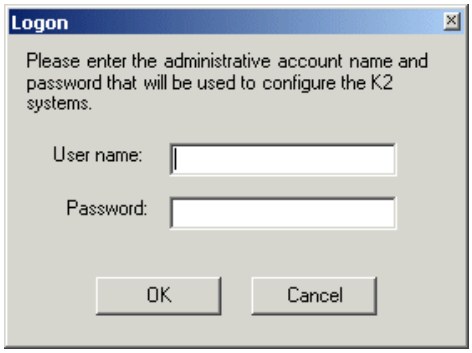
Devices	Prerequisite for Level 30R configuration
Control point PC	Ethernet cable connected Control Point software installed Control network IP address assigned Network communication over the control network with all other K2 devices Power on
Ethernet switch	Ethernet cables connected Control network IP address assigned VLANs set up Trunks set up Power on
K2 Media Server	Ethernet cables connected Fibre Channel cable connected Redundant servers connected by serial cable Software installed, as from the factory, including QuickTime 7 Control network IP address assigned Power on for all servers
L30R RAID chassis	Fibre Channel cable(s) connected Ethernet cable(s) connected Power on
L30R RAID Expansion chassis (optional)	Fibre channel cable(s) connected Power on

Defining a new K2 SAN

If you import a SiteConfig system description file, you do not need to define a new K2 SAN. You can skip this task and instead start by configuring the first K2 Media Server.

Define a Level 30R K2 SAN as follows:

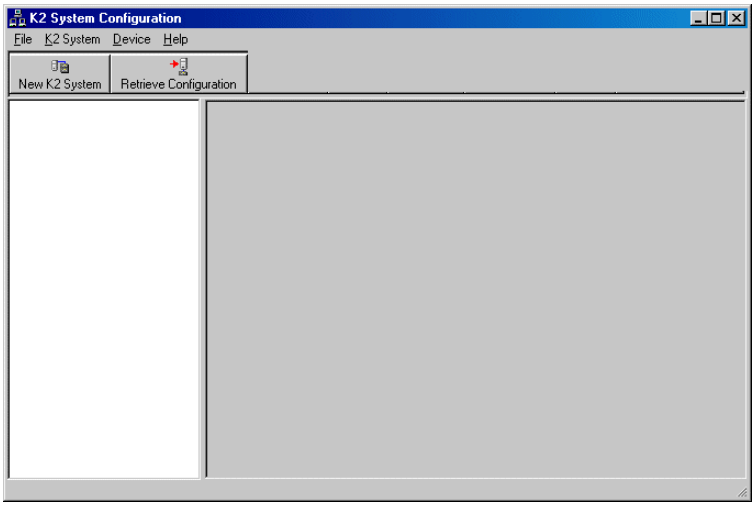
1. On the control point PC, open the K2 System Configuration application. A login dialog box opens.



2. Log in to the K2 System Configuration application with the Windows administrator account. By default this as follows:

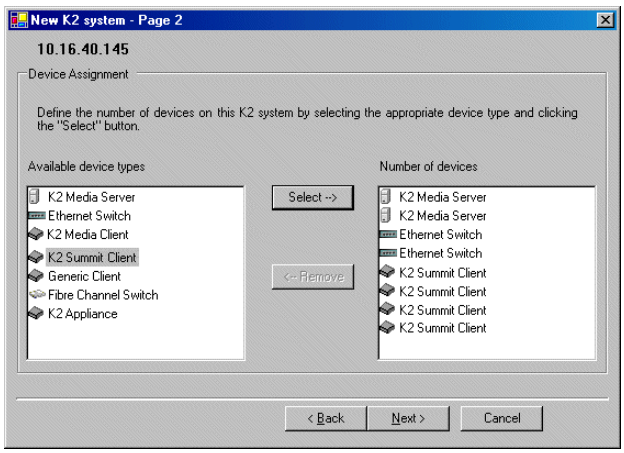
   - Username: Administrator
   - Password: adminK2

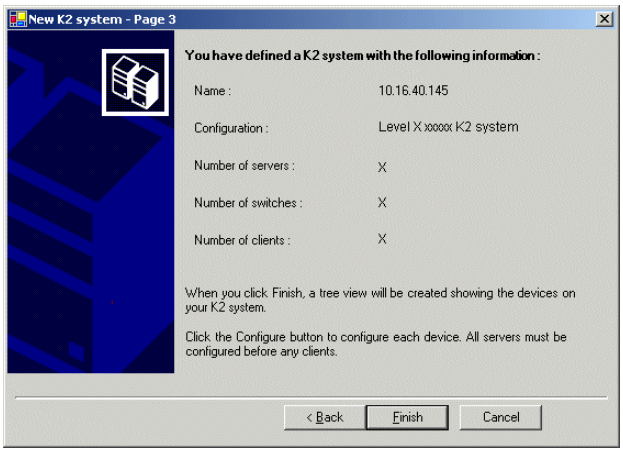
   Refer to "Setting up application security" on page 393 for more information about administrator accounts and logging in to applications.



3. Click **New K2 System**. The New K2 System wizard opens.

4. Follow the on-screen text to define your Level 30R K2 SAN, as described in the following table.

On this page…	Do this…
Page 1	 Create a name for your Level 30R K2 SAN and type it in the Name box. Select **Level 30**. If so designed, select **Enable Live Production mode**. Select the **Server redundancy** option. Click **Next**
Page 2	 Move the following into the Number of Devices Box: • Two K2 Media Servers • Two Ethernet switches • K2 clients as appropriate for your system. • (Optional) One or more K2 Media Servers to represent each NH K2 Media Server on your system. • (Optional) Other devices as appropriate for your system. Click **Next**.

On this page...	Do this...
Page 3	 Review the information on this page and verify that you have correctly defined your K2 SAN. For a Level 30R K2 SAN you should have the following: • Two Gigabit Ethernet switches • Two K2 Media Servers • Optionally, one or more NH K2 Media Servers • The number and type of clients appropriate for your system. Click **Finish**. The Define New K2 Storage System wizard closes.

Your K2 SAN appears in the tree view of the K2 System Configuration application.

5. Continue with the next procedure.

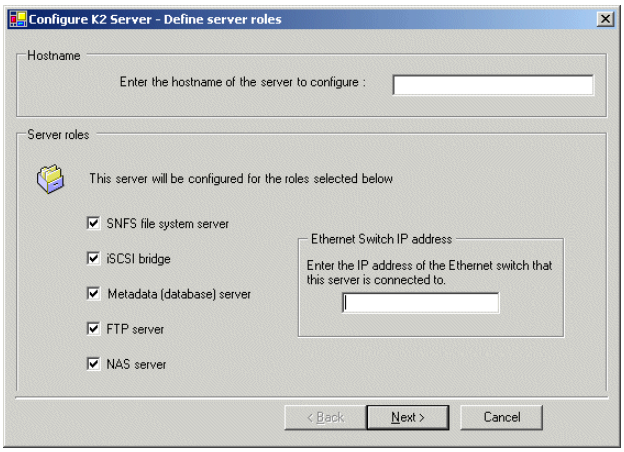
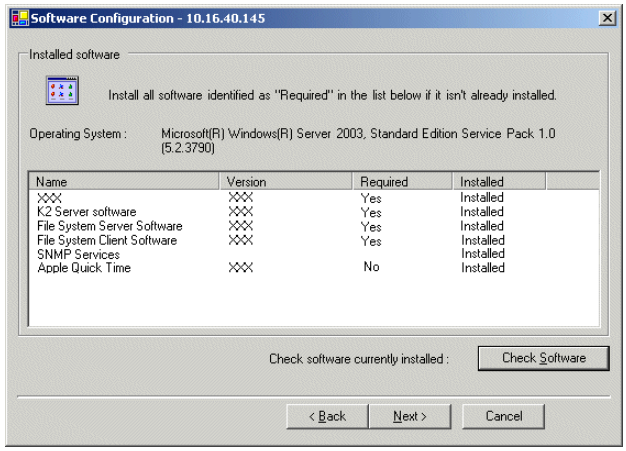
Configuring server A - Part 1

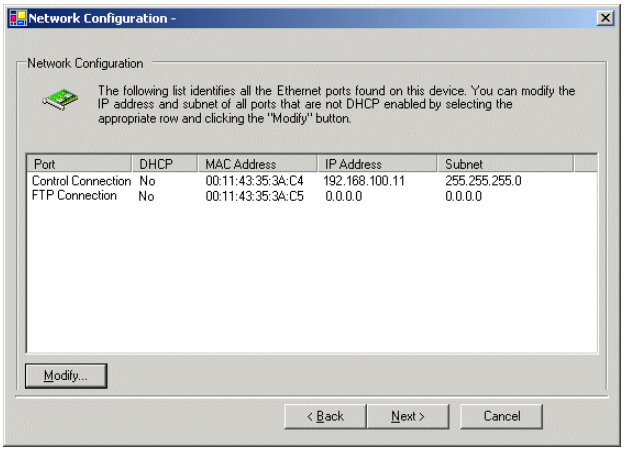
1. In the K2 System Configuration application tree view, select [**K2Server1]**.

2. Click the **Configure** button.

The Configure K2 Server wizard opens. Follow the on-screen text to configure the for a Level 30R K2 SAN, as described

in the following table:

On this page…	Do this…
Define server roles If the K2 SAN has one or more optional NH servers, then FTP traffic should go to the NH server, not the K2 Media Server you are now configuring. In this case, do not select the FTP server role or the NAS server role.	 Enter the name for the K2 Media Server, as currently configured on the machine. Enter the name or IP address of the Ethernet switch, as currently configured on the switch, to which the K2 Media Server is connected. For Level 30R redundant, select all roles, except if NH server is present do not select FTP server or NAS server. Click **Next**
Software Configuration This page checks for the software required to support the roles you selected on the previous page.	 If software with *Yes* in the Required column reports as *Not Installed*, you must first install it on the before continuing. After installing the software, click **Check Software**. When all required software reports as *Installed*, click **Next**.

On this page…	Do this…
Network Configuration This page displays the control network Ethernet port, and allows you to configure the FTP/ Streaming network Ethernet port. ***NOTE: This page does not configure the iSCSI interface (media network) ports.*** For systems with an optional NH (FTP) server, the server you ar now configuring does not take the role of FTP server, so configuring the second port here for the FTP/ streaming network is not required.	 The top port is the port over which the K2 System Configuration application is communicating. If correctly configured, it is already assigned the control network IP address, as displayed on this page. If the server has the role of FTP server, if the other port is not already configured correctly, select the other port and click **Modify**. A network configuration dialog box opens. Enter the FTP/Streaming IP address and the subnet mask and click **Apply**. Click **Next**.
File System Server Configuration	Enter the name or IP address of the redundant K2 Media Server (server B). Do not yet click Next. Do not yet enter anything in the File System Server #2 box. Click **Launch Storage Manager**. Storage Utility opens.

3. Continue with the next procedure to use Storage Utility to configure the storage and file system.

   Leave the Configure K2 Server wizard open while you are using Storage Utility. When you are done with Storage Utility, you continue with the wizard.

Configuring RAID

Use Storage Utility to complete the configuration of the L30R RAID chassis, as explained in the following topics:

- "Configuring RAID network and SNMP settings"
- "Binding disk modules"

Refer to "Prerequisites for initial configuration" on page 250 to confirm that the RAID storage is ready for configuration.

Configuring RAID network and SNMP settings

Use the Storage Utility to configure the following settings for the Level 30R RAID controllers:

- IP address
- Subnet mask

- Gateway Address
- SNMP trap destinations

For L30R RAID, network and SNMP settings are set and stored on the RAID controller module. For the RAID chassis with two controllers, each controller has its own network settings and the RAID chassis exists as two entities on the control network.

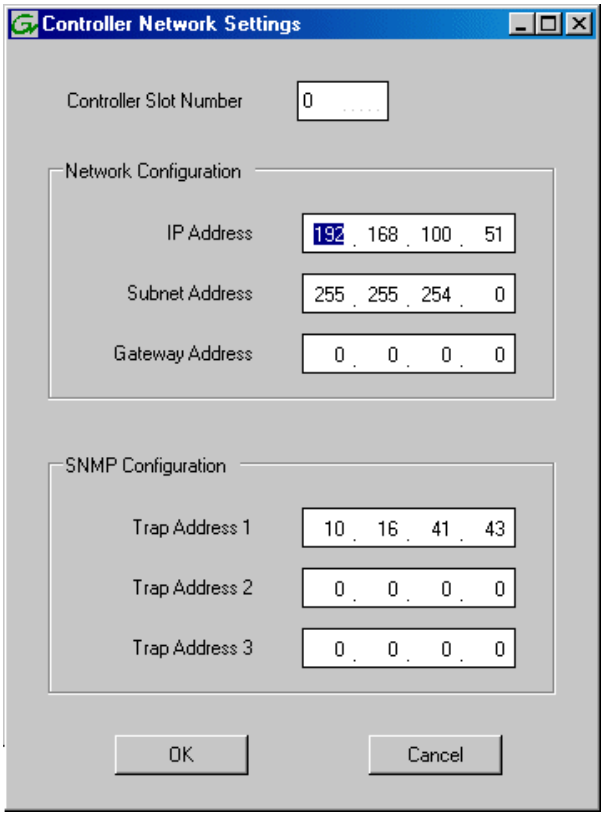
The RAID storage device is configured by default for the SNMP community name “public”. If your site’s policies require using a different SNMP community name, contact your Grass Valley representative.

To configure these settings, do the following:

1. Launch Storage Utility from the K2 System Configuration application as in the previous procedure.
2. As prompted, wait while Storage Utility gathers system information, then Storage Utility opens.
3. In Storage Utility tree view, expand the node for the L30R RAID, right-click the icon for a L30R RAID controller, and select **Configuration | Network Properties**.

   The Controller Network Settings dialog box opens.

   For a L30R RAID chassis with two controllers, you can make settings on both controllers using this dialog box.



4. In the Controller Slot Number field enter **0** and then press **Enter**. The settings from controller 0 are loaded into the Controller Network Settings dialog box and are available for you to modify.
5. Enter the control network IP address and other network settings.
6. You want SNMP trap messages go to the NetCentral server PC, so for SNMP Configuration enter the IP address of the NetCentral server PC. You can also enter IP addresses for other SNMP managers to which you want to send SNMP trap messages.
7. For the RAID chassis with two controllers, in the Controller Slot Number field enter **1** and then press **Enter**. The settings from controller 1 are loaded into the Controller Network Settings dialog box and are available for you to modify. Repeat the previous steps to configure controller 1.
8. Click **OK** to save settings and close.
9. In Storage Utility click **View | Refresh**. Continue with the next procedure "Binding disk modules".

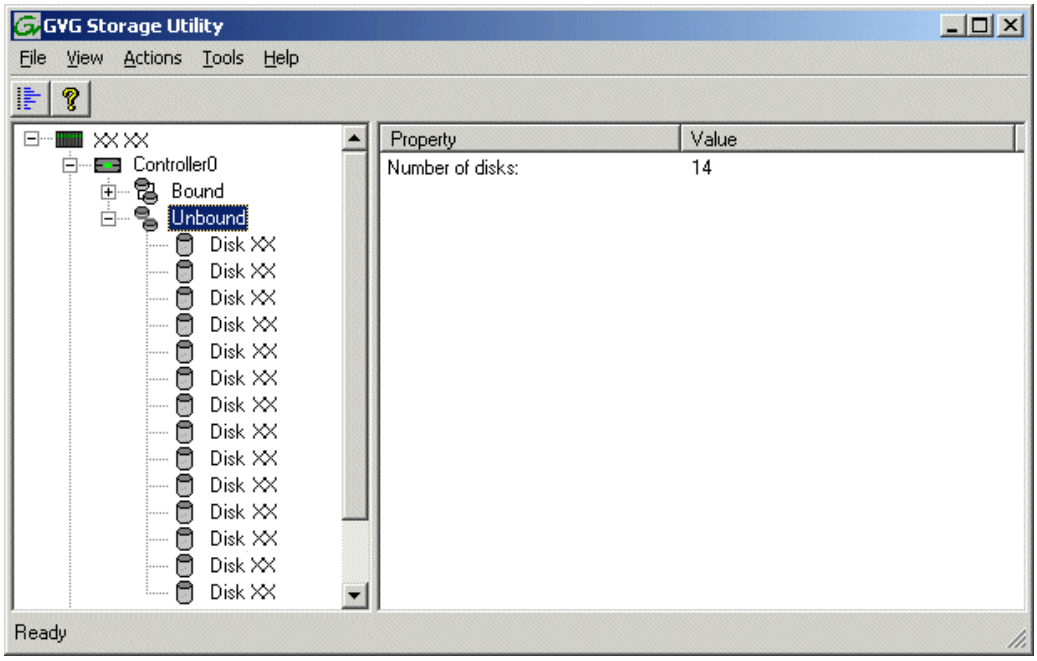
Binding disk modules

Use the following procedure to bind disk modules as required for the Level 30R K2 SAN.

Also refer to "About RANKs and LUNs in Storage Utility" in the chapter *Overview of K2 Storage Tools*.

NOTE: Binding destroys all user data on the disks.

1. In the Storage Utility main window, identify bound RANKs and unbound disks by their placement in the hierarchy of the tree view. In the following illustration, disk numbers are represented by "XX". Refer to "Identifying disks" on page 451 for an explanation of how disks are actually numbered in Storage Utility.



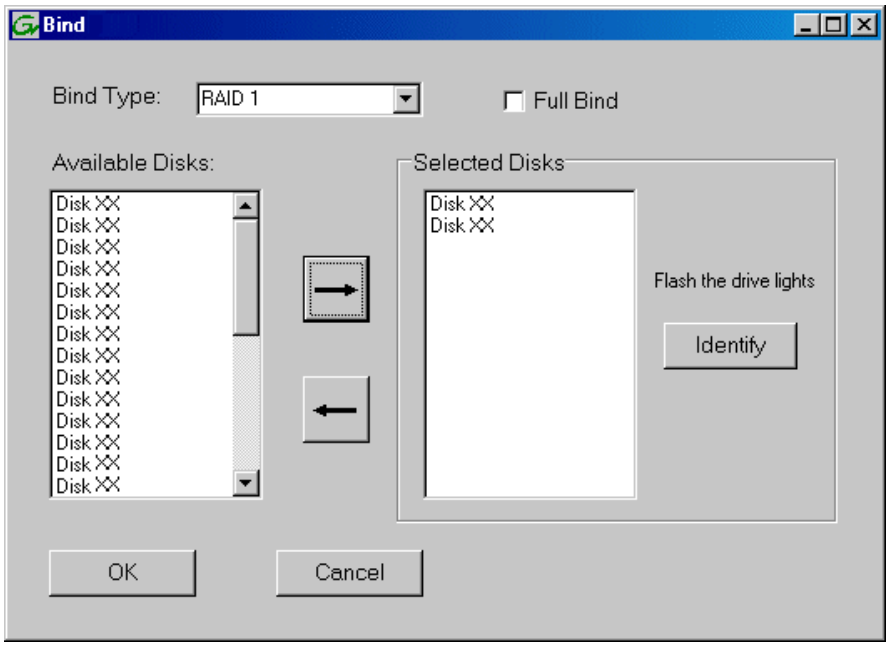
Redundant systems store metadata files and journal files on the primary RAID chassis. The first six disk slots in the chassis are dedicated for metadata/journal files. In the first five slots are five metadata/journal disks. The sixth slot is filled with a blank. Two disks are bound as a RAID 1 RANK for metadata storage and two disks are bound as a RAID 1 RANK for journal storage. The fifth disk is bound as a Hot Spare for the other four metadata/journal disks. The remaining six disks in the primary RAID chassis and all disks in Expansion chassis are for media storage. Media storage disks are bound as RAID 5 or RAID 6 in RANKs consisting of six disks each.

View disk properties and identify the four disks you will use for the metadata/journal RAID 1 RANKs, the one metadata/journal Hot Spare disk, any other disks that you intend to use for Hot Spares, and the remainder of the disks that are available for media storage. Make sure you select disks appropriately as you bind disks in the remainder of this procedure.

2. For systems that use RAID 1 RANKs, you must now create the separate RAID 1 storage for metadata files and journal files. To bind unbound disks for metadata and journal storage, do the following:

   a. Right-click the **Unbound** node for the controller, then select **Bind** in the context menu. (If the RAID chassis has two controllers, both controllers are represented by the single “Controller” node)

      The Bind dialog box opens showing all unbound disks for the controller listed in the Available Disk list.



b. Leave **Full Bind** unchecked. Refer to "About full/background bind" on page 455.

c. In the **Bind Type** drop down box, select **RAID 1**.

d. In the Available Disks box, select two contiguous disks at the top of the list. These should be the first two disks in the primary RAID chassis. (TIP: Use 'shift-click' or 'control-click' to select disks.) This creates a RAID 1 RANK for metadata storage.

e. Click the add (arrow) button to add disks to the Selected Disks list.

NOTE: As an aid in identifying a disk module's physical location, select it in the Selected Disks list, then click* Identify Disks. *This causes the disk drive light to flash.

f. Click **OK** to close the Bind dialog box and begin the binding process. The Progress Report dialog box opens, showing the status of the binding process.

g. Close the Progress Report and repeat the previous steps, selecting two more contiguous disks to create another RAID 1 RANK for journal storage. These should be the next two disks in the primary RAID chassis.

h. Make the fifth disk in the primary RAID chassis a Hot Spare. In the **Bind Type** drop down box, select **Hot Spare**.

i. In the Available Disks box, select the fifth disk in the primary RAID chassis.

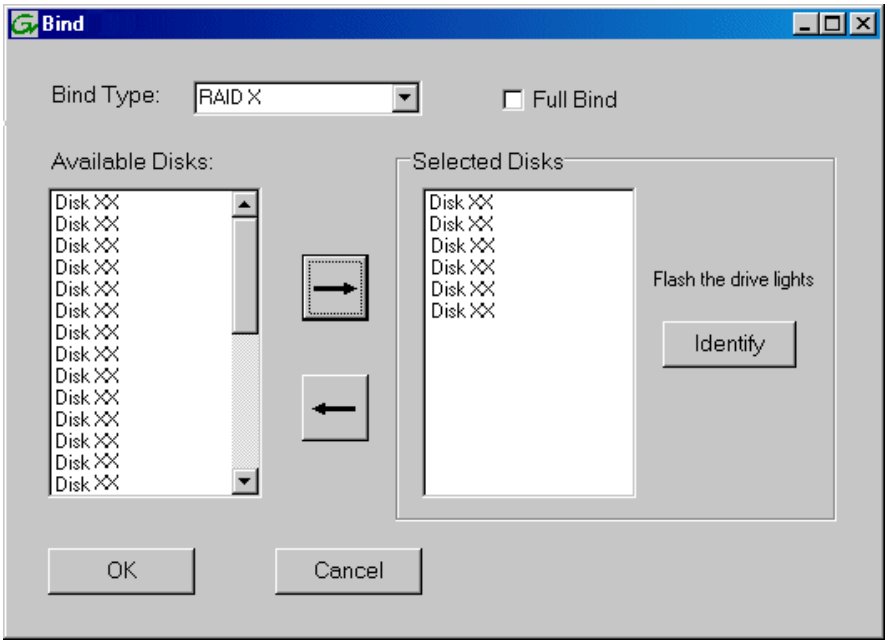
j. Click the add (arrow) button to add the disk to the Selected Disks list.

k. Click **OK** to close the dialog box and begin the binding process.

3. To bind unbound disks for media storage, do the following:

a. Right-click the **Unbound** node for a controller, then select **Bind** in the context menu. (If the RAID chassis has two controllers, both controllers are represented by the single "Controller" node)

The Bind dialog box opens showing all unbound disks for the controller listed in the Available Disk list.



b. Leave Full Bind unchecked. Refer to "About full/background bind" on page 455.

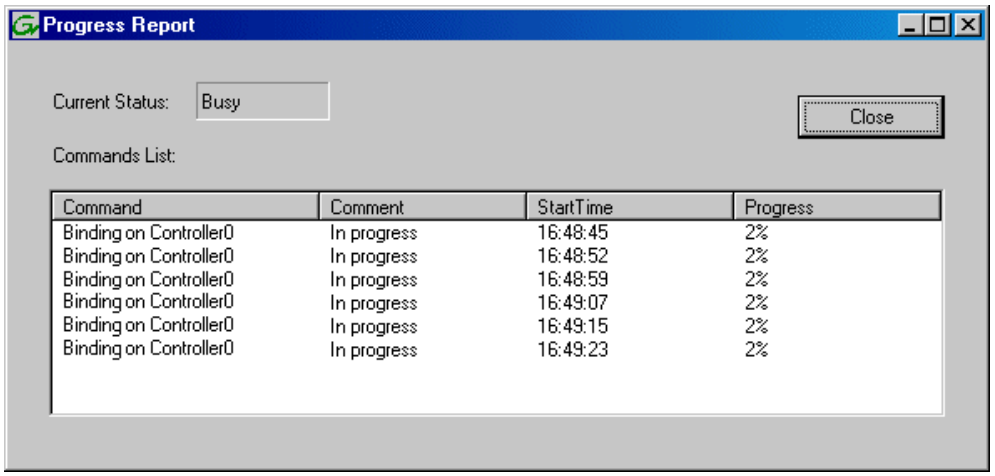
c. In the **Bind Type** drop down box, select **RAID 5** or **RAID 6**, as specified by your system design.

d. In the Available Disks box, select six contiguous disks at the top of the list. (TIP: Use 'shift-click' or 'control-click' to select disks.).

e. Click the add (arrow) button to add disks to the Selected Disks list.

NOTE: As an aid in identifying a disk module's physical location, select it in the Selected Disks list, then click* Identify Disks. *This causes the disk drive light to flash.

f. Click **OK** to close the Bind dialog box and begin the binding process. The Progress Report dialog box opens, showing the status of the binding process.



g. Close the Progress Report and repeat these steps for other unbound disks. If specified by your system design, you can bind some disks as Hot Spares, as explained in "Binding Hot Spare drives" on page 457. When you are done, if you did not bind any extra Hot Spares, you should have the following results:

   For L30R storage, on the primary RAID chassis you should have two RAID 1 RANKs of two disks each, one Hot Spare Disk, and one RAID 5 or RAID 6 RANK of six disks. For each optional Expansion chassis, you would have an additional one or two RAID 5 or RAID 6 RANKs of six disks each.

h. Click **Close** in Progress Report window.

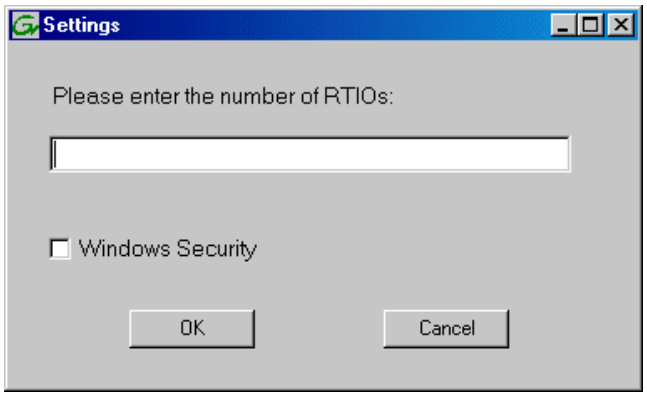
4. Restart the K2 Media Server.

NOTE: Make sure start up processes on the K2 Media Server are complete before proceeding.

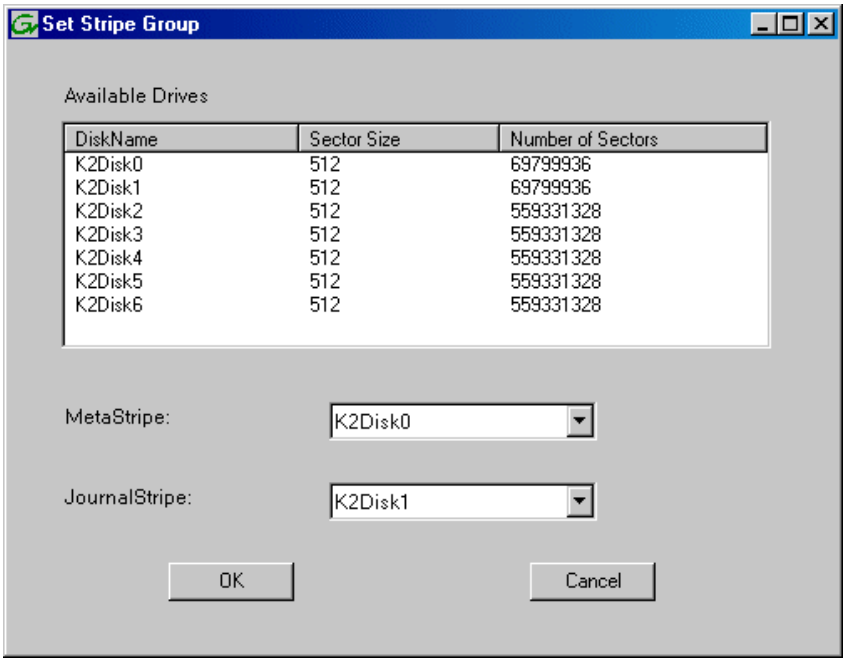
5. Continue with the next procedure "Creating a new file system".

Creating a new file system

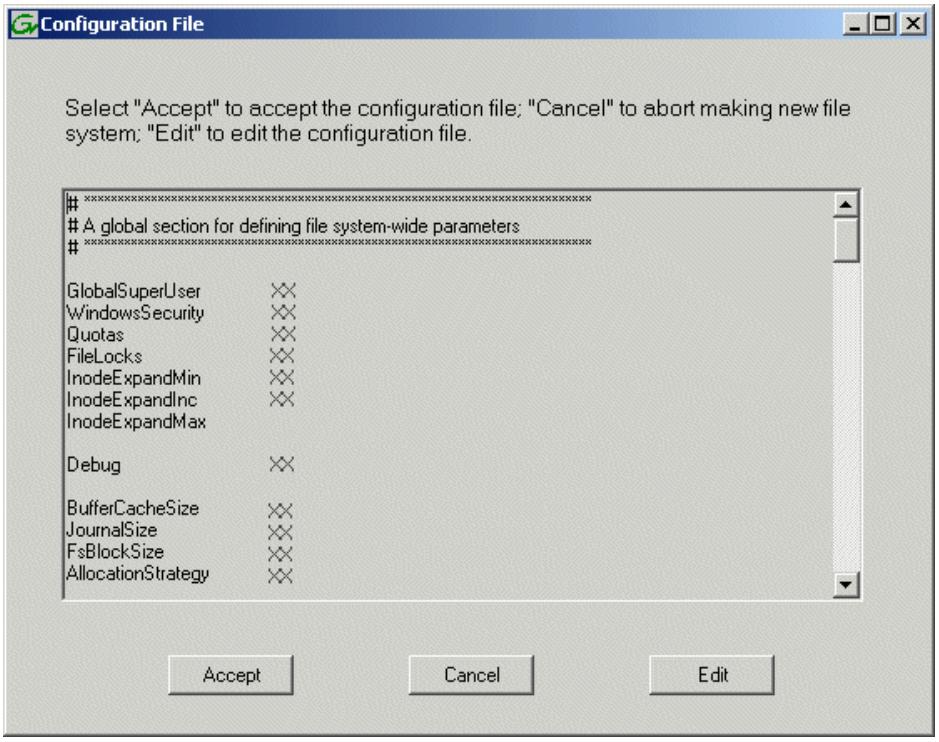
1. In Storage Utility, click **Tools | Make New File System**. The Setting dialog box opens.



2. For the Real Time Input/Output (RTIO) rate, enter the value specified by your system design. If you do not know this value, contact your Grass Valley representative.
3. If the K2 SAN is to be accessed by only K2 clients you can leave Windows Security unchecked. If accessed by Aurora Edits, refer to the *Aurora Edit Installation and Configuration Guide* for instructions.
4. Click **OK**. The Set Stripe Group dialog box opens.



5. If you have RAID 1 RANKS, assign a RAID 1 RANK as a metadata stripe and another RAID 1 RANK as a journal stripe. You can distinguish RAID 1 RANKs from media RANKs by the value in the Number of Sectors column.
6. Click **OK**. The Configuration File dialog box opens.



The configuration file for the media file system is displayed. You can verify media file system parameters by viewing this file. Do not edit this file. Click **Accept**.

A "…Please wait…" message box displays progress and a "…succeeded…" message confirms the process is complete.

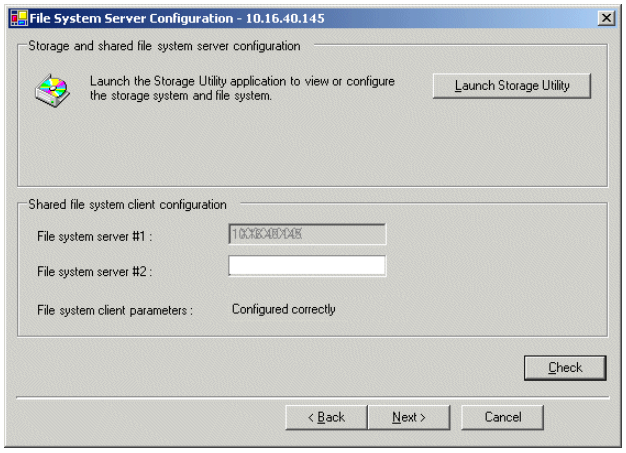
7. A message informs you that you must restart the K2 Media Server, however the restart at the end of the Configure K2 Server wizard suffices, so you do not need to restart now.
8. Close the Storage Utility.

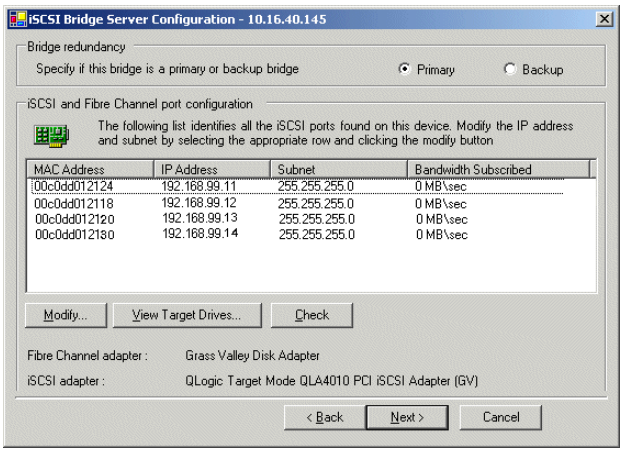
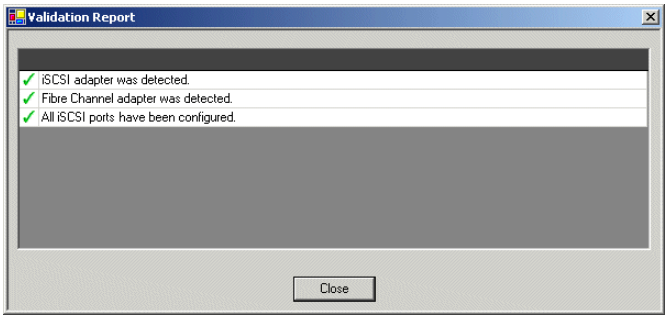
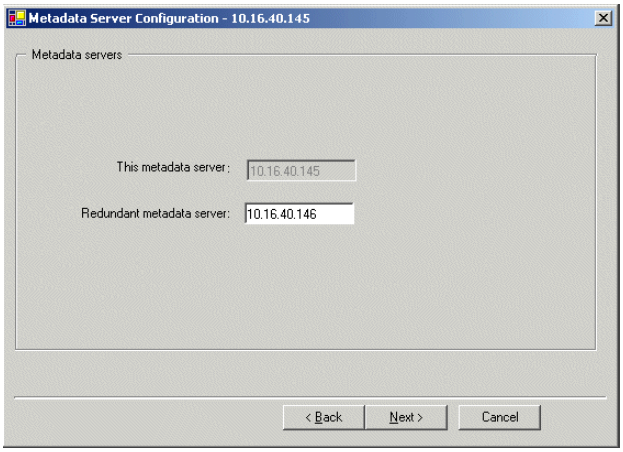
NOTE: Do not attempt to start K2 clients or otherwise bring the K2 SAN online until instructed to do so later in this chapter.

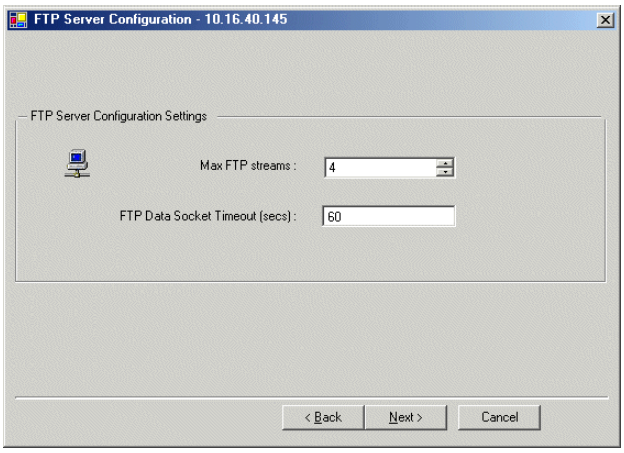
9. Continue with the next procedure.

Configuring server A - Part 2

1. Return to the Configure K2 Server page from which you launched Storage Utility and proceed as described in the following table:

On this page…	Do this…
File System Server Configuration This page checks on the configuration of the K2 Media Server in one of its main roles as a file system server. The K2 Media Server also functions as a file system client, which is also checked from this page.	 If you have not already done so, enter the name or IP address of the redundant K2 Media Server (server B). Click **Check**. When the wizard reports that the configuration is correct, click **Next**. If you get a "The V: will not be available until this device is rebooted…" message, you can safely continue with this procedure and follow the instructions related to this message later in the procedure.

On this page…	Do this…
iSCSI Bridge Server Configuration This page manages the components that bridge between iSCSI (the GigE media network) and the Fibre Channel connection to the RAID storage. You configure network settings on the iSCSI adapters and the page validates that the Fibre Channel adapter is in place and that the media RANKs are visible as iSCSI targets.	 Select **Primary**. Select an iSCSI adapter and click **Modify**. A network configuration dialog box opens. Verify or enter the media network IP address and the subnet mask and click **Apply**. Do the same for the other iSCSI adapters. Click **Check**. The Validation Report opens.  Confirm that the iSCSI configuration is successful. Close the Validation Report and then click **Next**.
Metadata Server Configuration	 Enter the name or IP address of K2 Media server B. This is the redundant partner of the server you are now configuring. Click **Next**.

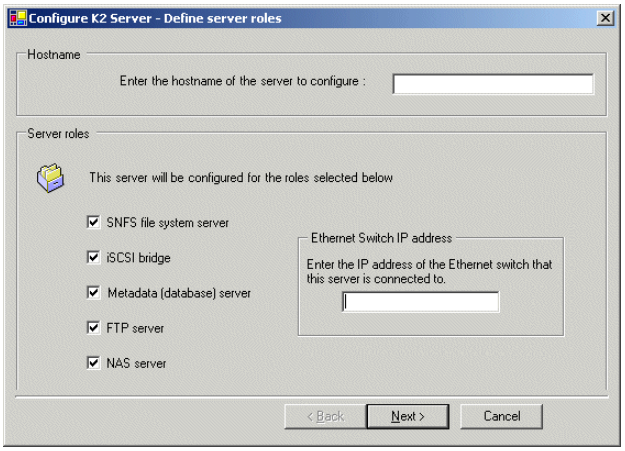
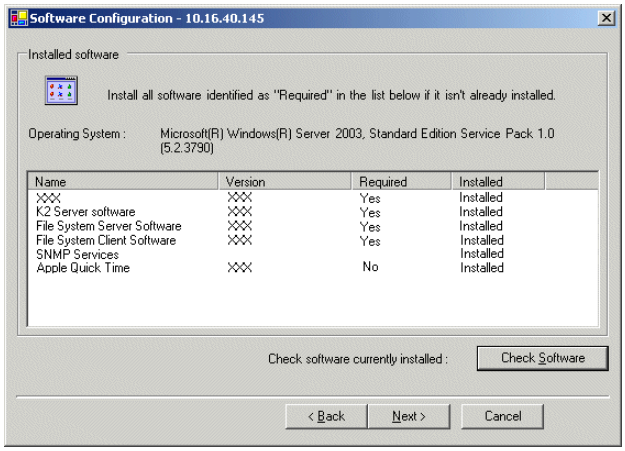
On this page…	Do this…
FTP Server Configuration This page appears only if the server has the role of FTP server.	 Do not modify these settings. Leave at default values of Max FTP streams = 4 and FTP Data Socket Timeout = 60. Only qualified Grass Valley personnel should specify other values, as these settings are intended for use only with custom systems designed by Grass Valley. Click **Next**
Completing the Configuration Wizard	Click **Finish**. The wizard closes. The server restarts. Wait until all startup processes have completed before continuing.

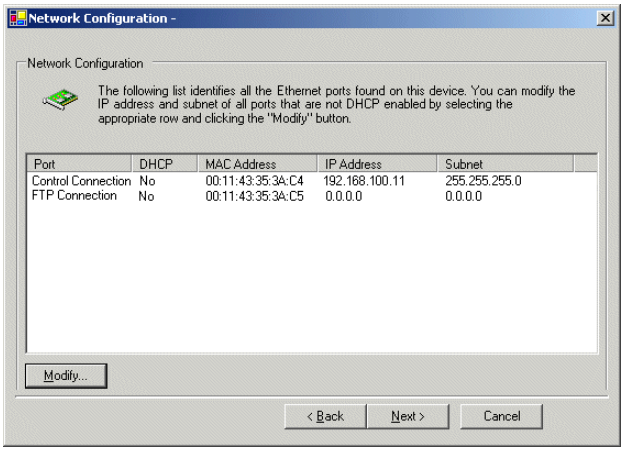
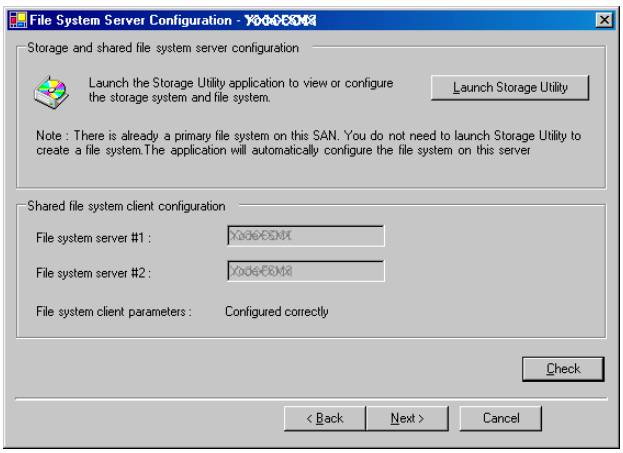
Configuring the redundant server B

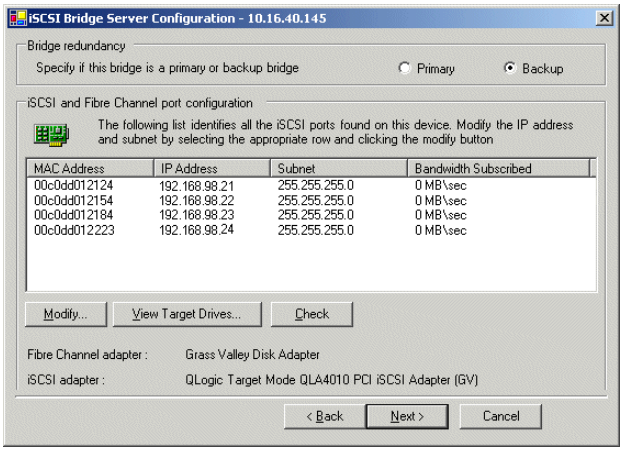
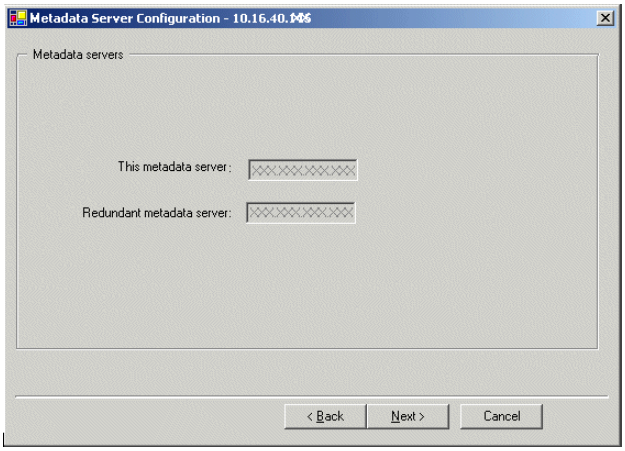
You must wait for the primary K2 Media Server to restart before continuing. To verify, from the control point PC open the MS-DOS command prompt and use the "ping" command.

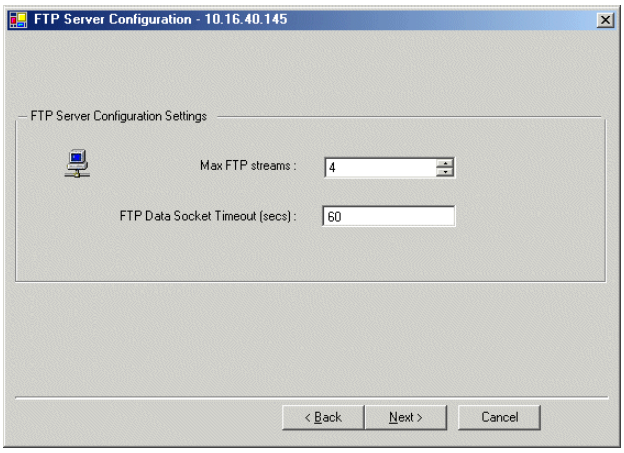
After you have configured the first K2 Media Server (server A) you next configure the redundant K2 Media Serer (server B).

1. In the K2 System Configuration application tree view, select the K2 Media Server you are configuring as server B.
2. Click the **Configure** button. The Configure K2 Storage System Server wizard opens. Follow the on-screen text to configure the server for a Level 30R K2 SAN, as described in the following table. Some screens require no input from you, as they are based on the configurations already completed on a previously configured K2 Media Server.

On this page…	Do this…
Define server roles If the K2 SAN has one or more optional NH servers, then FTP traffic should go to the NH server, not the K2 Media Server you are now configuring. In this case, do not select the FTP server role or the NAS server role.	 Enter the name for the K2 Media Server. This should be the current network name of the machine. Enter the name or IP address of the Ethernet switch, as currently configured on the switch, to which the K2 Media Server is connected. Select all roles, except if NH server is present do not select FTP server or NAS server. Click **Next**
Software Configuration This page checks for the software required to support the roles you selected on the previous page.	 If software with *Yes* in the Required column reports as *Not Installed*, you must first install it on the K2 Media Server before continuing. After installing the software, click **Check Software**. When all required software reports as *Installed*, click **Next**.

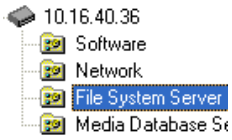
On this page…	Do this…
Network Configuration This page displays the control network Ethernet port, and allows you to configure the FTP/ Streaming network Ethernet port. ***NOTE: This page does not configure the iSCSI interface (media network) ports.*** For systems with an optional NH server, this server does not take the role of FTP server, so configuring the second port here for the FTP/ streaming network is not required.	 The top port is the port over which the K2 System Configuration application is communicating with the K2 Media Server. If correctly configured, it is already assigned the control network IP address, as displayed on this page. If the server has the role of FTP server, if the other port is not already configured correctly, select the other port and click **Modify**. A network configuration dialog box opens. Enter the FTP/Streaming IP address and the subnet mask and click **Apply**. Click **Next**.
File System Server Configuration This page checks on the configuration of the K2 Media Server in one of its main roles as a file system server. The K2 Media Server also functions as a file system client, which is also checked from this page. It is not necessary to bind RANKs or create a file system, since this task was completed when you configured the previous K2 Media Server.	 Click **Next**. Confirm messages about copying the file system configuration file to the other server. If you get a “The V: will not be available until this device is rebooted…” message, you can safely continue with this procedure and follow the instructions related to this message later in the procedure.

On this page…	Do this…
iSCSI Bridge Server Configuration This page manages the components that bridge between iSCSI (the GigE media network) and the Fibre Channel connection to the RAID storage. You configure network settings on the iSCSI adapters and the page validates that the Fibre Channel adapter is in place and that the media RANKs are visible as iSCSI targets. ***NOTE: The iSCSI adapters on this server must be on a different subnet than those on its redundant server partner.***	 Select **Backup**. Select an iSCSI adapter and click **Modify**. A network configuration dialog box opens. Verify or enter the media network IP address and subnet mask and click **Apply**. Do the same for the other iSCSI adapters. To verify drives, click **Check** then **View Target Drives**. You should see all your media drives listed. Click **Next**.
Metadata Server Configuration	 You do not need to enter or configure anything on this page. Click **Next**.

On this page…	Do this…
FTP Server Configuration This page appears only if the server has the role of FTP server.	 Do not modify these settings. Leave at default values of Max FTP streams = 4 and FTP Data Socket Timeout = 60. Only qualified Grass Valley personnel should specify other values, as these settings are intended for use only with custom systems designed by Grass Valley. Click **Next**
Completing the Configuration Wizard	Click **Finish**. The wizard closes. The K2 Media Server restarts. Do not proceed until restart processes are finished.

3. If you got a “The V: will not be available until this device is rebooted…” message on the File System Server Configuration page, after the K2 Media Server restarts, do the following:

   a. In the K2 System Configuration application tree view, under the K2 Media Server select the File System Server node.



   The File System Server Configuration page appears.

   b. Click **Check** and verify that the V: drive is shared. This is required for NAS server functionality.

Configuring optional NH servers

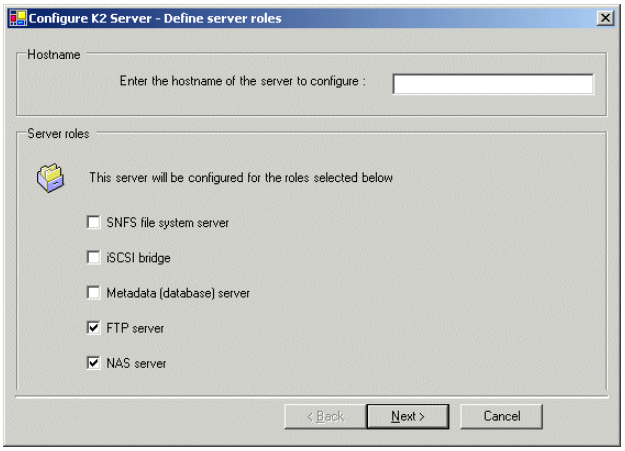
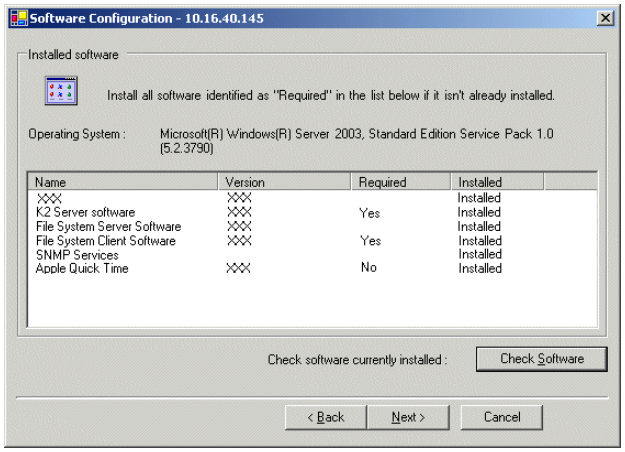
If you have one or more optional NH K2 Media Servers, you next configure those servers. This section applies to both NH1 (1 Gig FTP) servers and NH1-10GE (10 Gig FTP) servers.

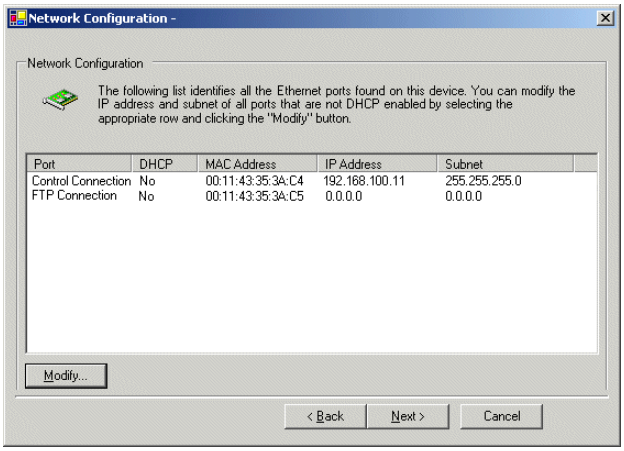
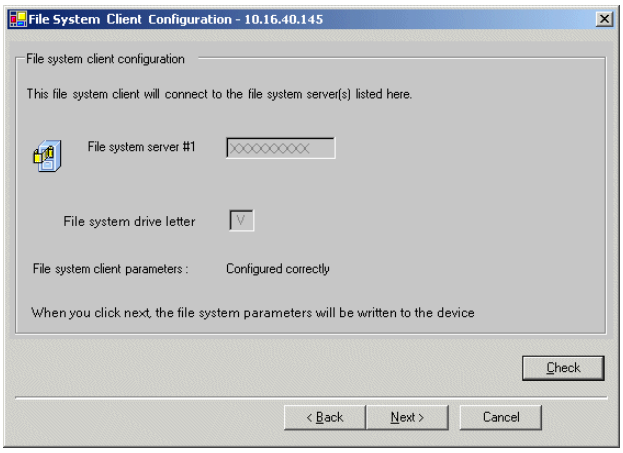
NOTE: Multiple NH servers on a K2 SAN must be of the same type, either all NH1 or all NH1-10GE.

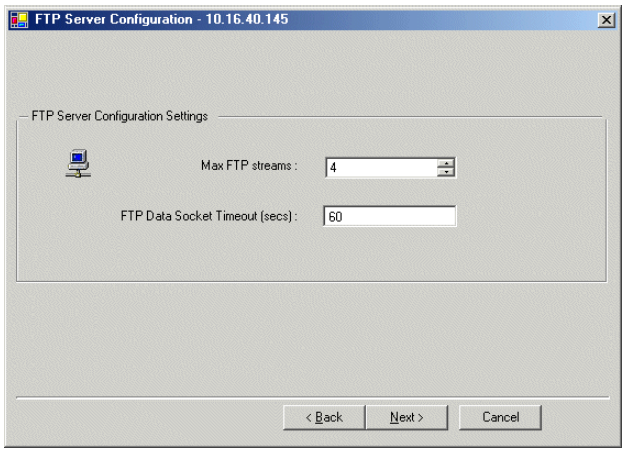
1. In the K2 System Configuration application tree view, select the K2 Media Server

you are configuring.

2. Click the **Configure** button. The Configure K2 Server wizard opens. Follow the on-screen text to configure the server for a Level 30R K2 SAN, as described in the following table. Some screens require no input from you, as they are based on the configurations already completed on a previously configured K2 Media Server.

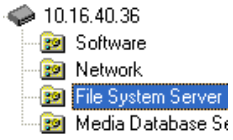
On this page…	Do this…
Define server roles	 Enter the name for the K2 Media Server. This should be the current network name of the machine. Select FTP server and NAS server. Click **Next**
Software Configuration This page checks for the software required to support the roles you selected on the previous page.	 If software with *Yes* in the Required column reports as *Not Installed*, you must first install it on the K2 Media Server before continuing. After installing the software, click **Check Software**. When all required software reports as *Installed*, click **Next**.

On this page…	Do this…
Network Configuration This page displays the control network Ethernet port, and allows you to configure the FTP/ Streaming network Ethernet port.	 The top port is the port over which the K2 System Configuration application is communicating with the K2 Media Server. If correctly configured, it is already assigned the control network IP address, as displayed on this page. If the other port is not already configured correctly, select the other port and click **Modify**. A network configuration dialog box opens. Enter the FTP/Streaming IP address and the subnet mask and click **Apply**. Click **Next**.
File System Client Configuration This K2 Media Server does not function as a file system server. It does function as a file system client, which is validated from this page.	 Click **Check**. When the wizard reports that the configuration check is successful, click **Next**.

On this page…	Do this…
FTP Server Configuration	 Do not modify these settings. Leave at default values of Max FTP streams = 4 and FTP Data Socket Timeout = 60. Only qualified Grass Valley personnel should specify other values, as these settings are intended for use only with custom systems designed by Grass Valley. Click **Next**
Completing the Configuration Wizard	Click **Finish**. The wizard closes. The K2 Media Server restarts. Do not proceed until restart processes are finished.

3. If you got a “The V: will not be available until this device is rebooted…” message on the File System Server Configuration page, after the K2 Media Server restarts, do the following:

   a. In the K2 System Configuration application tree view, under the K2 Media Server select the File System Server node.



   The File System Server Configuration page appears.

   b. Click **Check** and verify that the V: drive is shared. This is required for NAS server functionality.

4. Repeat this procedure for remaining NH K2 Media Servers, if any.

Next, configure K2 clients and/or other iSCSI clients on the K2 SAN.

Configuring the Level 35 K2 SAN

Work through the topics in this section sequentially to do the initial configuration of the Level 35 K2 SAN.

- "Prerequisites for initial configuration" on page 274
- "Defining a new K2 SAN" on page 275
- "Creating a new file system" on page 284

Prerequisites for initial configuration

Before beginning your initial configuration, make sure the devices of the K2 SAN meet the following prerequisites. Refer to sections earlier in this manual for detailed information. Also refer to Chapter 10, "Description of K2 SAN Devices".

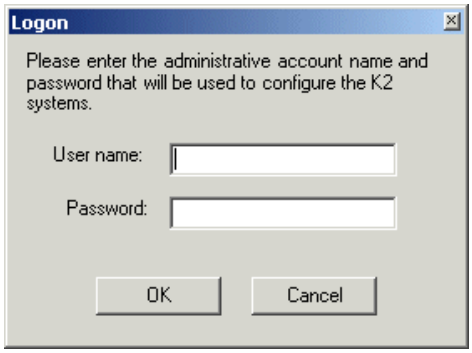
Devices	Prerequisite for Level 35 configuration
Control point PC	Ethernet cable connected Control Point software installed Control network IP address assigned Network communication over the control network with all other K2 devices Power on
Ethernet switch	Ethernet cables connected Control network IP address assigned VLANs set up Trunks set up Power on
K2 Media Server	Ethernet cables connected Fibre Channel cable connected Software installed, as from the factory, including QuickTime 7 Control network IP address assigned Power on
L30R RAID chassis	Fibre Channel cable(s) connected Ethernet cable(s) connected Power on
L30R RAID Expansion chassis	Fibre channel cable(s) connected Power on

Defining a new K2 SAN

If you import a SiteConfig system description file, you do not need to define a new K2 SAN. You can skip this task and instead start by configuring the first K2 Media Server.

Define a Level 35 K2 SAN as follows:

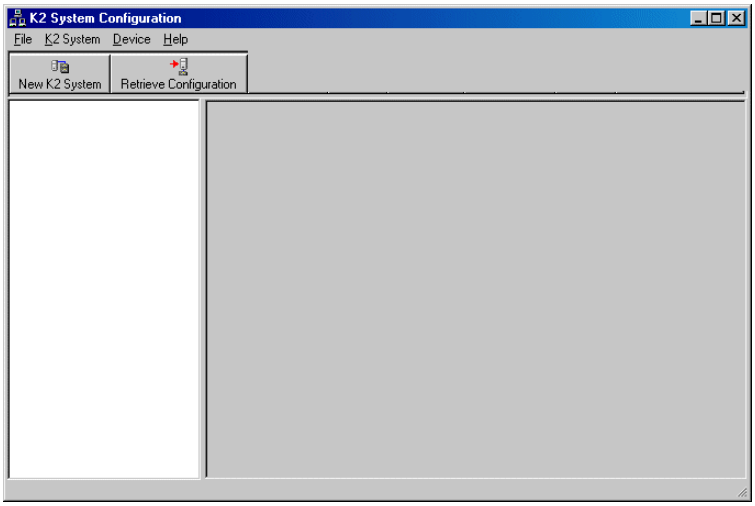
1. On the control point PC, open the K2 System Configuration application. A login dialog box opens.



2. Log in to the K2 System Configuration application with the Windows administrator account. By default this as follows:

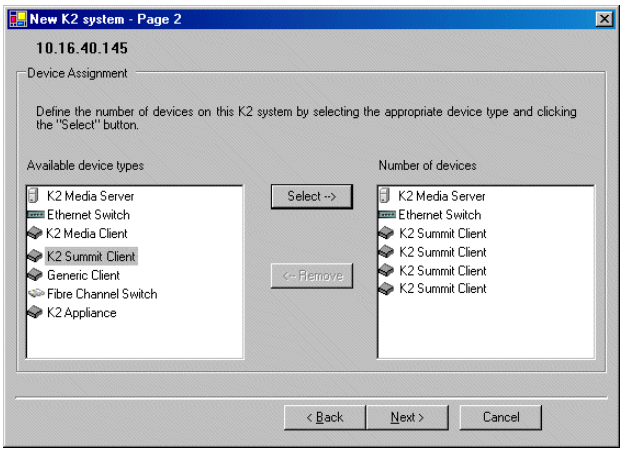
   - Username: Administrator
   - Password: adminK2

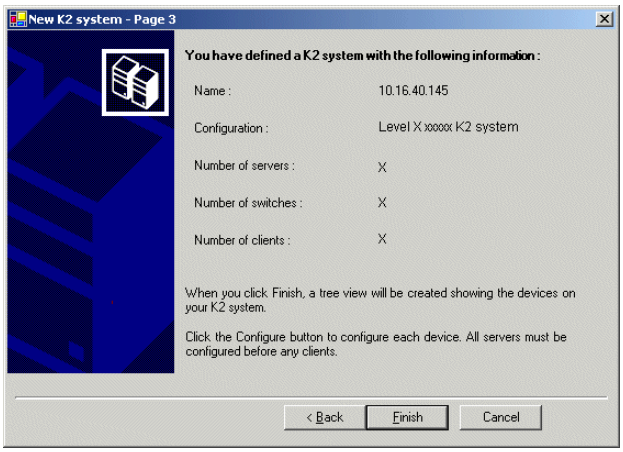
   Refer to "Setting up application security" on page 393 for more information about administrator accounts and logging in to applications.



3. Click **New K2 System**. The New K2 System wizard opens.

4. Follow the on-screen text to define your Level 35 K2 SAN, as described in the following table.

On this page…	Do this…
Page 1	 Create a name for your Level 35 K2 SAN and type it in the Name box. Select **Level 30** or **Level 35**. If so designed, select **Enable Live Production mode**. Do not select the Server redundancy option. Click **Next**
Page 2	 Move the following into the Number of Devices Box: • Two K2 Media Servers • One Ethernet switch • K2 clients as appropriate for your system. • (Optional) One or more K2 Media Servers to represent each NH K2 Media Server on your system. • (Optional) Other devices as appropriate for your system. Click **Next**.

On this page...	Do this...
Page 3	 Review the information on this page and verify that you have correctly defined your K2 SAN. For a Level 35 K2 SAN you should have the following: • One Gigabit Ethernet switch • Two K2 Media Servers • Optionally, one or more NH K2 Media Servers • The number and type of clients appropriate for your system. Click **Finish**. The Define New K2 Storage System wizard closes.

Your K2 SAN appears in the tree view of the K2 System Configuration application.

5. Continue with the next procedure.

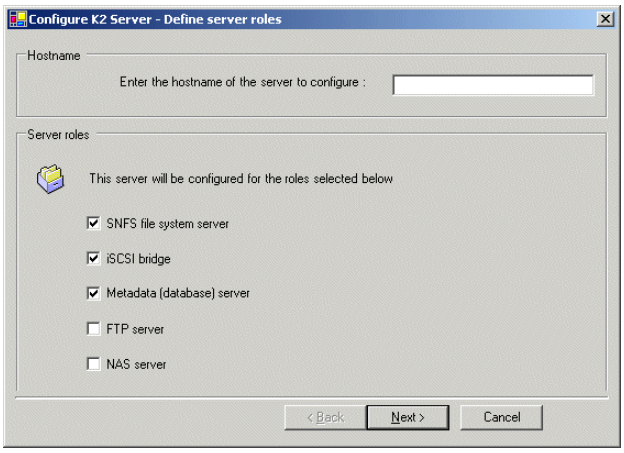
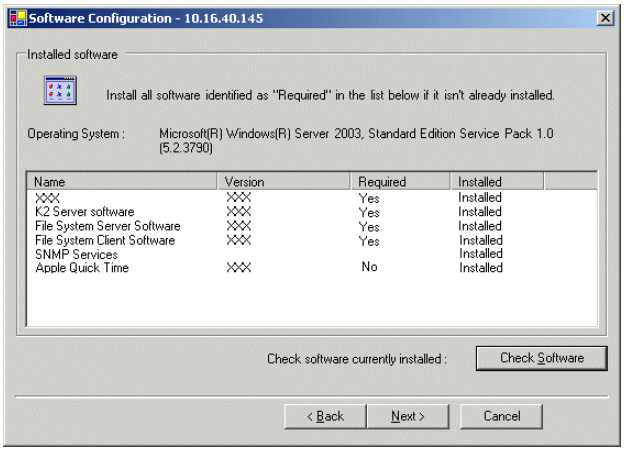
Configuring server 1 - Part 1

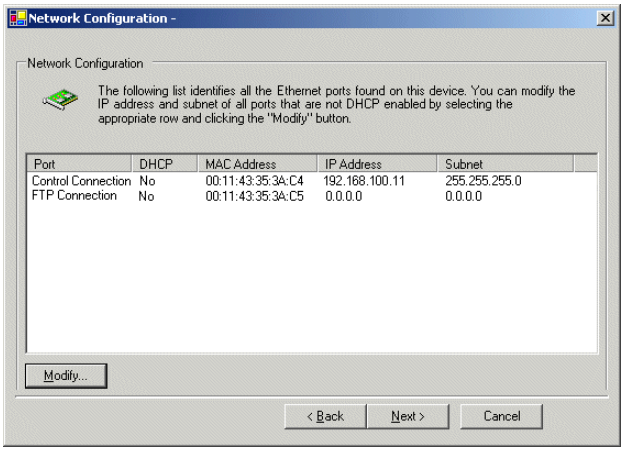
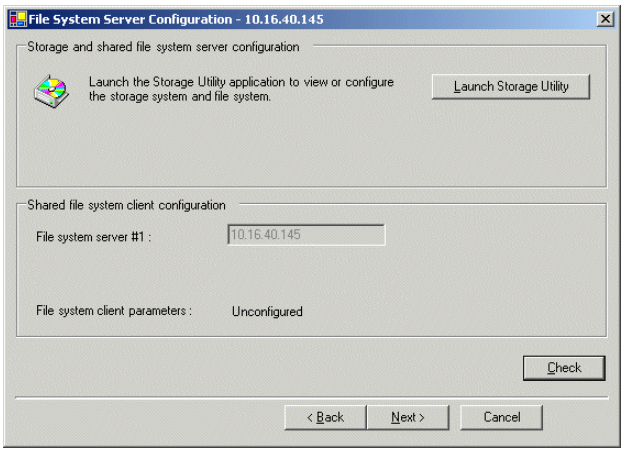
1. In the K2 System Configuration application tree view, select [**K2Server1]**.

2. Click the **Configure** button.

The Configure K2 Server wizard opens. Follow the on-screen text to configure the for a Level 35 K2 SAN, as described in

the following table:

On this page…	Do this…
Define server roles	 Enter the name for the K2 Media Server, as currently configured on the machine. For Level 35 server roles, select **SNFS file system server**, **iSCSI bridge,** and **Metadata server**. Click **Next**
Software Configuration This page checks for the software required to support the roles you selected on the previous page.	 If software with *Yes* in the Required column reports as *Not Installed*, you must first install it on the before continuing. After installing the software, click **Check Software**. When all required software reports as *Installed*, click **Next**.

On this page…	Do this…
Network Configuration This page displays the control network Ethernet port, and allows you to configure the FTP/ Streaming network Ethernet port. For Level 35, this server does not take the role of FTP server, so configuring the second port here for the FTP/ streaming network is not required.	 The top port is the port over which the K2 System Configuration application is communicating. If correctly configured, it is already assigned the control network IP address, as displayed on this page. Click **Next**.
File System Server Configuration	 Click **Launch Storage Manager**. Storage Utility opens.

3. Continue with the next procedure to use Storage Utility to configure the storage and file system.

   Leave the Configure K2 Server wizard open while you are using Storage Utility. When you are done with Storage Utility, you continue with the wizard.

Configuring RAID

Use Storage Utility to complete the configuration of the L30R RAID chassis, as explained in the following topics:

- "Configuring RAID network and SNMP settings"
- "Binding disk modules"

Refer to "Prerequisites for initial configuration" on page 274 to confirm that the RAID storage is ready for configuration.

Configuring RAID network and SNMP settings

Use the Storage Utility to configure the following settings for the Level 35 RAID controllers:

- IP address
- Subnet mask
- Gateway Address
- SNMP trap destinations

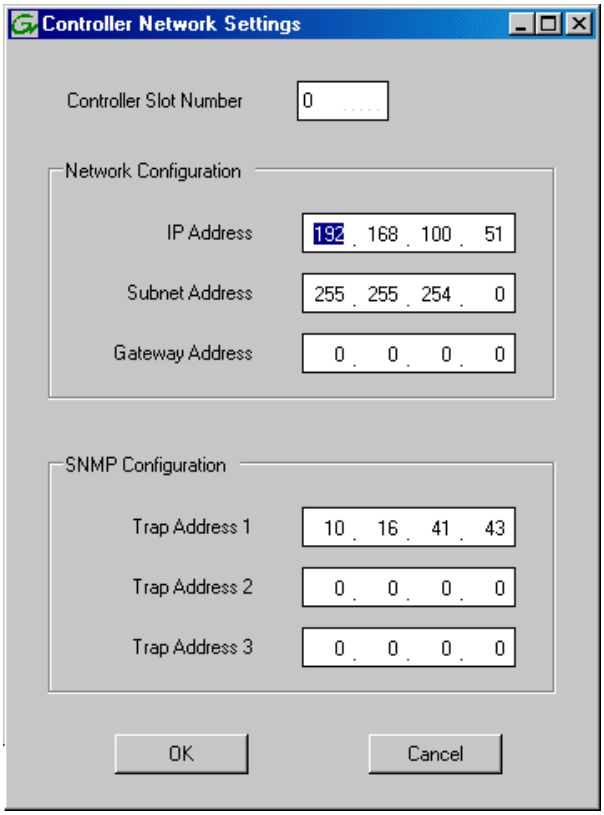
For L30R RAID, network and SNMP settings are set and stored on the RAID controller module, so the combined RAID storage devices, including the optional Expansion chassis, exist as a single entity on the control network.

The RAID storage device is configured by default for the SNMP community name "public". If your site's policies require using a different SNMP community name, contact your Grass Valley representative.

To configure these settings, do the following:

1. Launch Storage Utility from the K2 System Configuration application as in the previous procedure.
2. As prompted, wait while Storage Utility gathers system information, then Storage Utility opens.
3. In Storage Utility tree view, expand the node for the L30R RAID, right-click the icon for a L30R RAID controller, and select **Configuration | Network Properties**.

   The Controller Network Settings dialog box opens.



4. In the Controller Slot Number field enter **0** and then press **Enter**. The settings from controller 0 are loaded into the Controller Network Settings dialog box and are available for you to modify.
5. Enter the control network IP address and other network settings.
6. You want SNMP trap messages go to the NetCentral server PC, so for SNMP Configuration enter the IP address of the NetCentral server PC. You can also enter IP addresses for other SNMP managers to which you want to send SNMP trap messages.
7. Click **OK** to save settings and close.
8. In Storage Utility click **View | Refresh**. Continue with the next procedure "Binding disk modules".

Binding disk modules

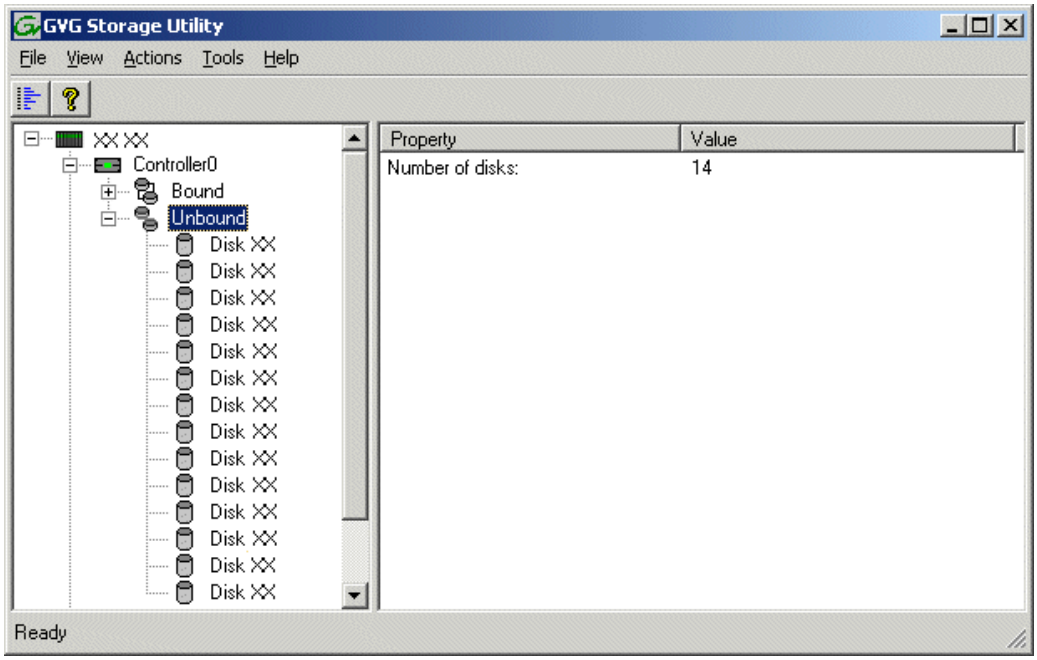
Use the following procedure to bind disk modules as required for the Level 35 K2 SAN.

Also refer to "About RANKs and LUNs in Storage Utility" in the chapter *Overview of K2 Storage Tools*.

NOTE: Binding destroys all user data on the disks.

1. In the Storage Utility main window, identify bound RANKs and unbound disks by

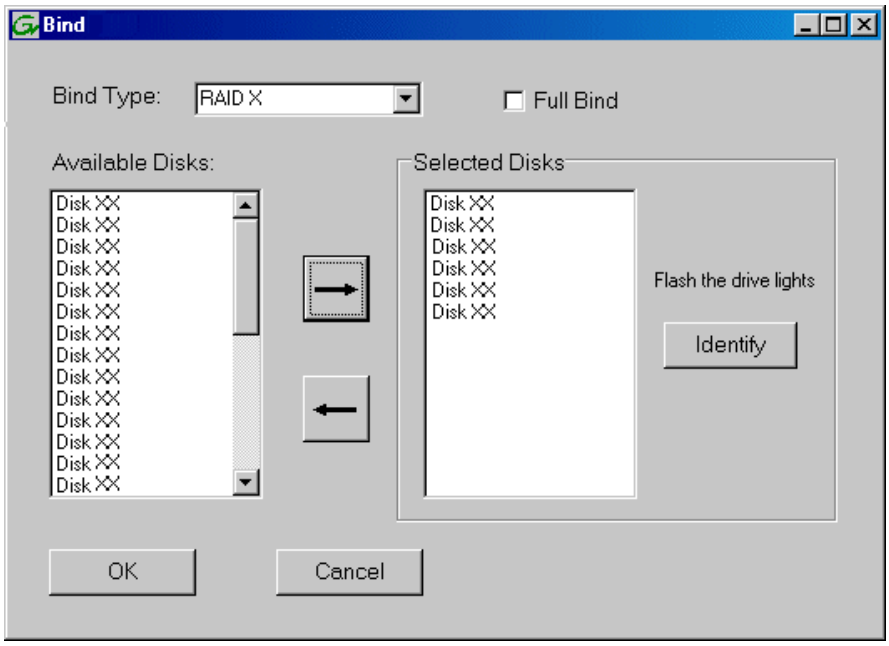
their placement in the hierarchy of the tree view. In the following illustration, disk numbers are represented by “XX”. Refer to “Identifying disks” on page 451 for an explanation of how disks are actually numbered in Storage Utility.



2. To bind unbound disks for media storage, do the following:

   a. Right-click the **Unbound** node for a controller, then select **Bind** in the context menu. (If the RAID chassis has two controllers, both controllers are represented by the single “Controller” node)

      The Bind dialog box opens showing all unbound disks for the controller listed in the Available Disk list.



b. Leave Full Bind unchecked. Refer to "About full/background bind" on page 455.

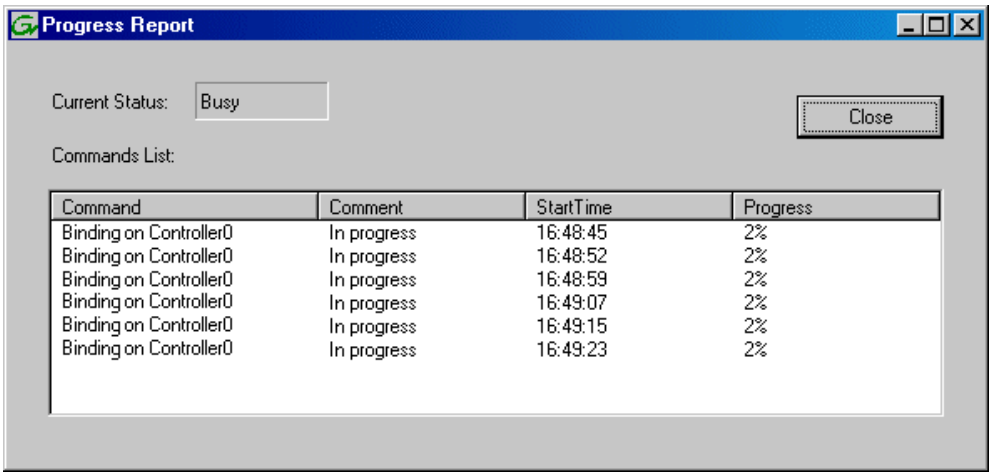
c. In the **Bind Type** drop down box, select **RAID 5** or **RAID 6**, as specified by your system design.

d. In the Available Disks box, select six contiguous disks at the top of the list. (TIP: Use 'shift-click' or 'control-click' to select disks.).

e. Click the add (arrow) button to add disks to the Selected Disks list.

NOTE: As an aid in identifying a disk module's physical location, select it in the Selected Disks list, then click* Identify Disks. *This causes the disk drive light to flash.

f. Click **OK** to close the Bind dialog box and begin the binding process. The Progress Report dialog box opens, showing the status of the binding process.



g. Close the Progress Report and repeat these steps for other unbound disks. If specified by your system design, you can bind some disks as Hot Spares, as explained in "Binding Hot Spare drives" on page 457. When you are done, if you did not bind any extra Hot Spares, you should have the following results:

L35 storage you should have two RAID 5 or RAID 6 RANKs of six disks each on the primary RAID storage device. For each optional Expansion chassis, you would have an additional one or two RAID 5 or RAID 6 RANKs of six disks each.

h. Click **Close** in Progress Report window.

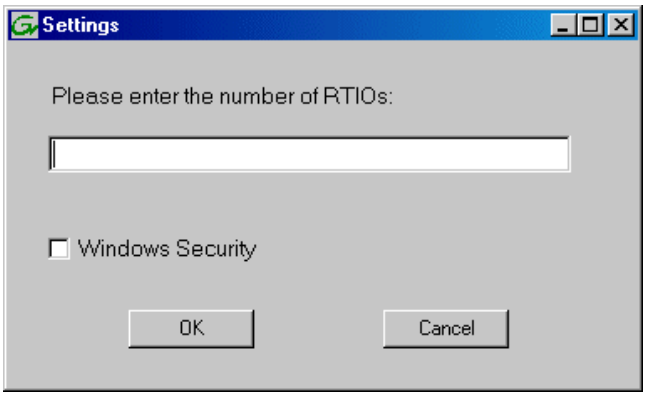
3. Restart the K2 Media Server.

NOTE: Make sure start up processes on the K2 Media Server are complete before proceeding.

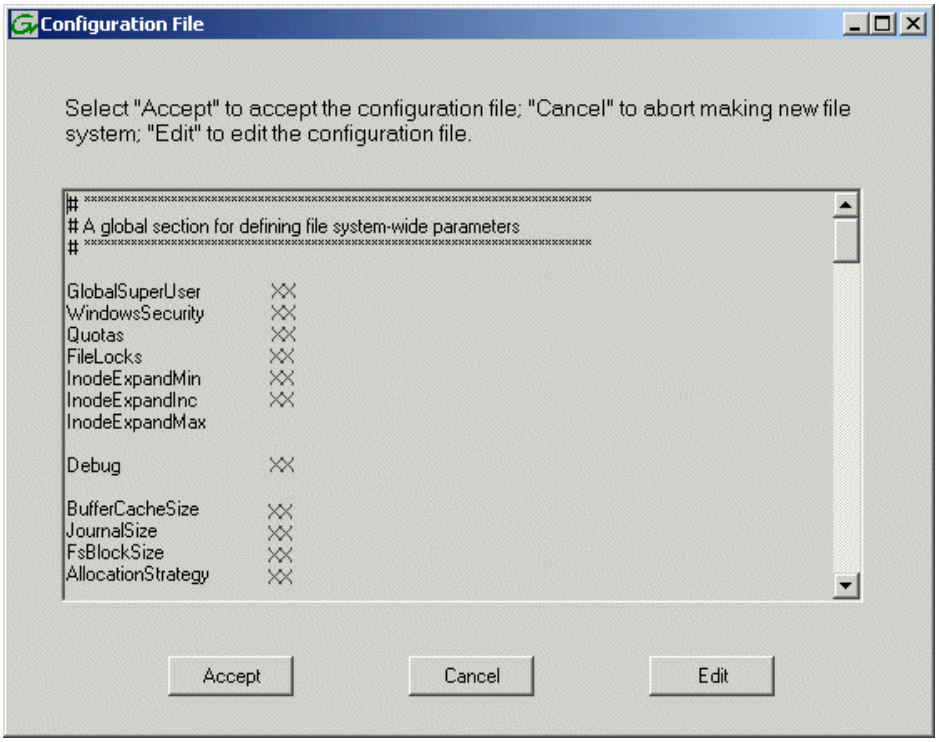
4. Continue with the next procedure "Creating a new file system".

Creating a new file system

1. In Storage Utility, click **Tools | Make New File System**. The Setting dialog box opens.



2. For the Real Time Input/Output (RTIO) rate, enter the value specified by your system design. If you do not know this value, contact your Grass Valley representative.
3. If the K2 SAN is to be accessed by only K2 clients you can leave Windows Security unchecked. If accessed by Aurora Edits, refer to the *Aurora Edit Installation and Configuration Guide* for instructions.
4. Click **OK**. The Configuration File dialog box opens.



The configuration file for the media file system is displayed. You can verify media file system parameters by viewing this file. Do not edit this file. Click **Accept**.

A "…Please wait…" message box displays progress and a "…succeeded…" message confirms the process is complete.

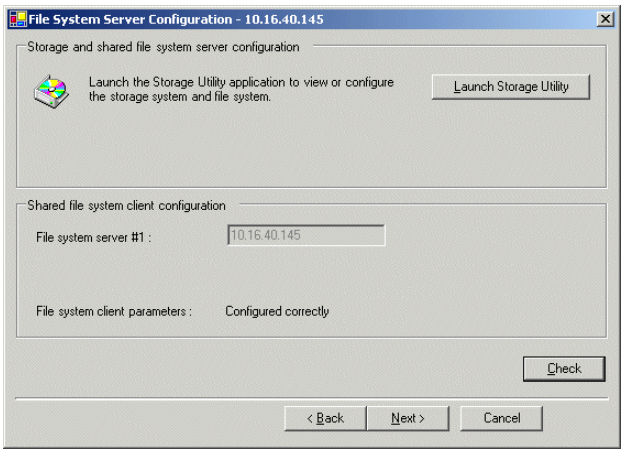
5. A message informs you that you must restart the K2 Media Server, however the restart at the end of the Configure K2 Server wizard suffices, so you do not need to restart now.
6. Close the Storage Utility.

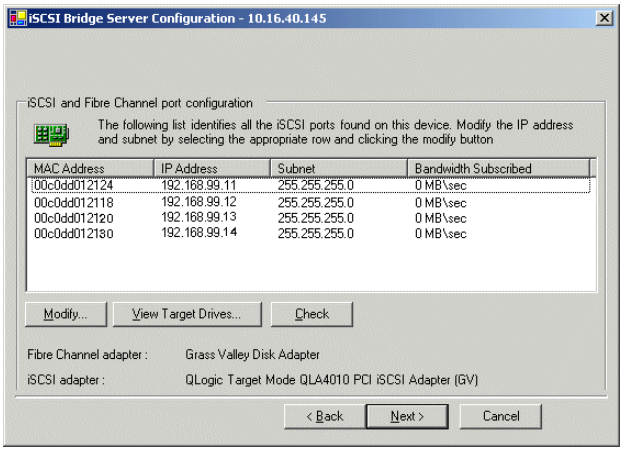
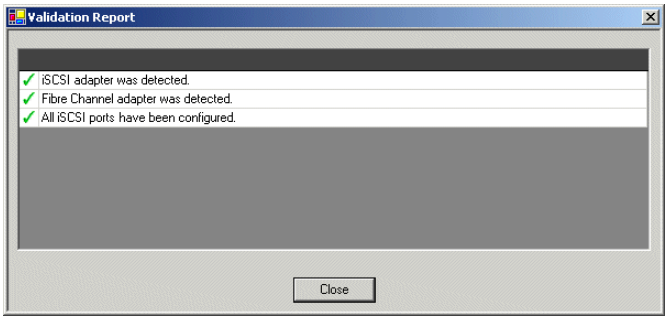
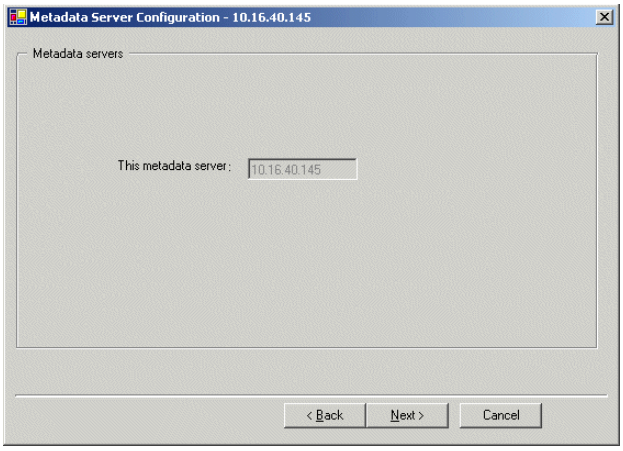
NOTE: Do not attempt to start K2 clients or otherwise bring the K2 SAN online until instructed to do so later in this chapter.

7. Continue with the next procedure.

Configuring server 1 - Part 2

1. Return to the Configure K2 Server page from which you launched Storage Utility and proceed as described in the following table:

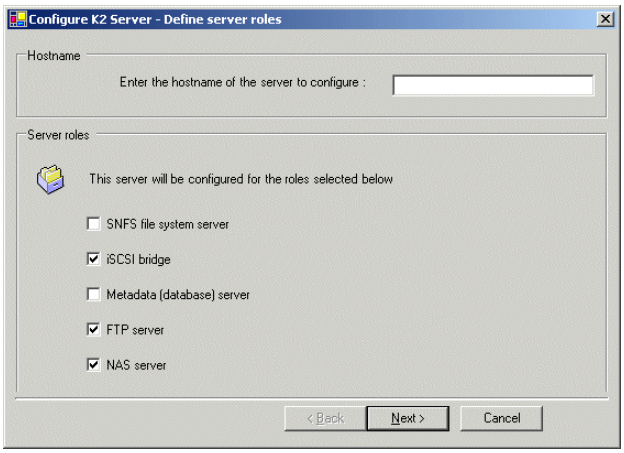
On this page…	Do this…
File System Server Configuration This page checks on the configuration of the server in one of its main roles as a file system server. The server also functions as a file system client, which is also checked from this page.	 Click **Check**. When the wizard reports that the configuration is correct, click **Next**. If you get a “The V: will not be available until this device is rebooted…” message, you can safely continue with this procedure and follow the instructions related to this message later in the procedure.

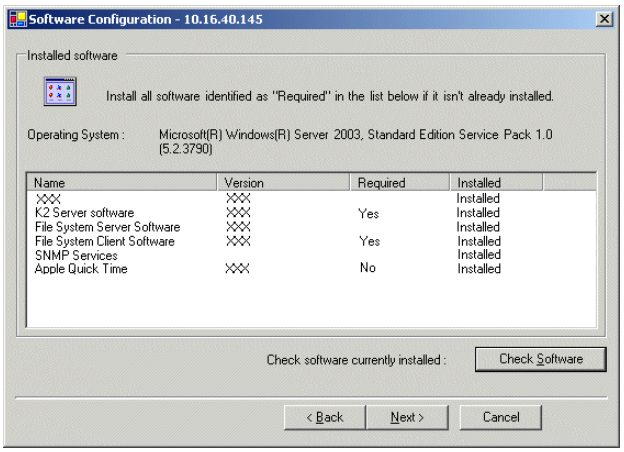
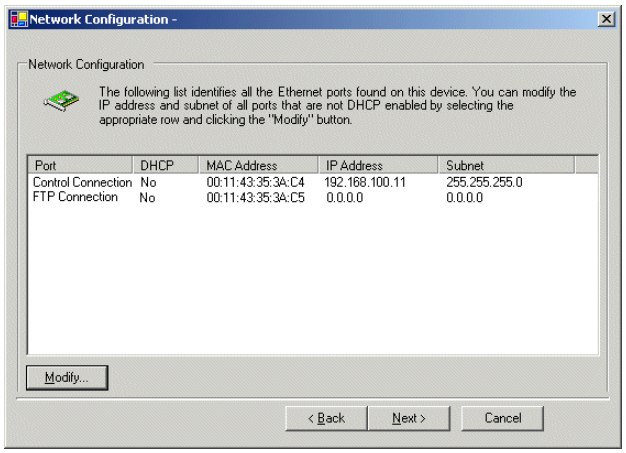
On this page…	Do this…
iSCSI Bridge Server Configuration This page manages the components that bridge between iSCSI (the GigE media network) and the Fibre Channel connection to the RAID storage. You configure network settings on the iSCSI adapters and the page validates that the Fibre Channel adapter is in place and that the media RANKs are visible as iSCSI targets.	 Select an iSCSI adapter and click **Modify**. A network configuration dialog box opens. Verify or enter the media network IP address and the subnet mask and click **Apply**. Do the same for the other iSCSI adapters. Click **Check**. The Validation Report opens.  Confirm that the iSCSI configuration is successful. Close the Validation Report and then click **Next**.
Database Server Configuration	 You do not need to enter or configure anything on this page. Click **Next**.
Completing the Configuration Wizard	Click **Finish**. The wizard closes. The server restarts. Wait until all startup processes have completed before continuing.

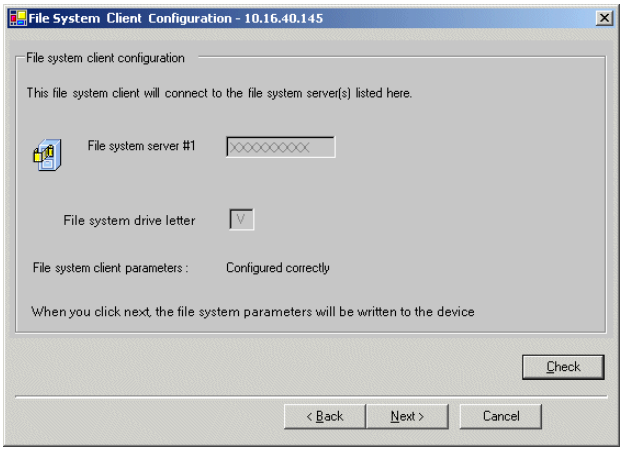
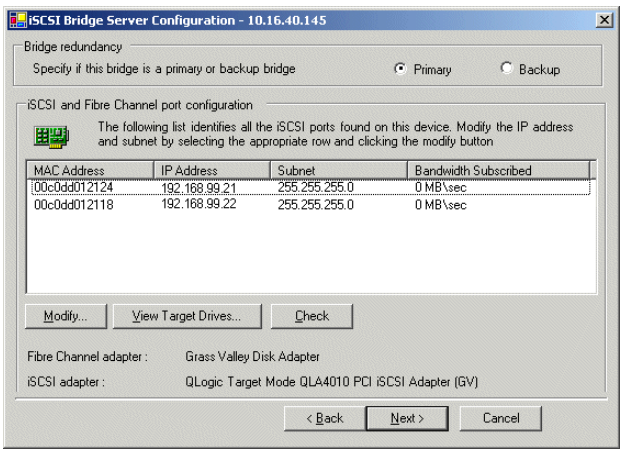
Configuring server 2

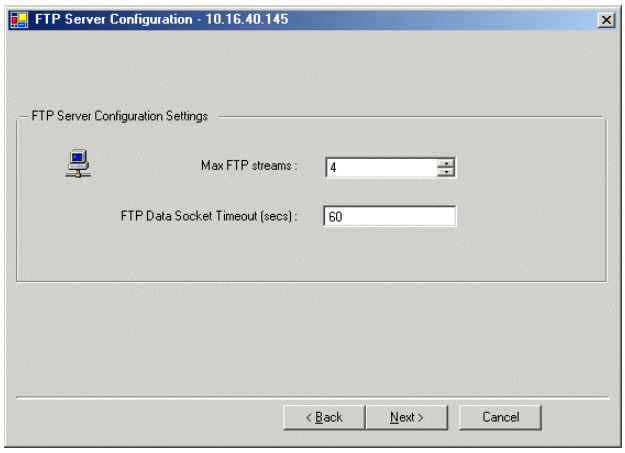
For Level 35, after you have configured your first K2 Media Server (server 1) you next configure the other K2 Media Server (server 2).

1. In the K2 System Configuration application tree view, select the K2 Media Server you are configuring as server 2.
2. Click the **Configure** button. The Configure K2 Server wizard opens. Follow the on-screen text to configure the server for a Level 35 K2 SAN, as described in the following table. Some screens require no input from you, as they are based on the configurations already completed on a previously configured K2 Media Server.

On this page…	Do this…
Define server roles **** If the K2 SAN has one or more optional NH servers, then FTP traffic should go to the NH server, not the K2 Media Server you are now configuring. In this case, do not select the FTP server role or the NAS server role.	 Enter the name for the K2 Media Server. This should be the current network name of the machine. For Level 35, select iSCSI bridge, FTP server, and NAS server. Click **Next**

On this page…	Do this…
Software Configuration This page checks for the software required to support the roles you selected on the previous page.	 If software with *Yes* in the Required column reports as *Not Installed*, you must first install it on the K2 Media Server before continuing. After installing the software, click **Check Software**. When all required software reports as *Installed*, click **Next**.
Network Configuration This page displays the control network Ethernet port, and allows you to configure the FTP/ Streaming network Ethernet port. For systems with an optional NH (FTP) server, the server you ar now configuring does not take the role of FTP server, so configuring the second port here for the FTP/ streaming network is not required.	 The top port is the port over which the K2 System Configuration application is communicating with the K2 Media Server. If correctly configured, it is already assigned the control network IP address, as displayed on this page. If the other port is not already configured correctly, select the other port and click **Modify**. A network configuration dialog box opens. Enter the FTP/Streaming IP address and the subnet mask and click **Apply**. Click **Next**.

On this page…	Do this…
File System Client Configuration This K2 Media Server does not function as a file system server. It does function as a file system client, which is validated from this page.	 Click **Check**. When the wizard reports that the configuration check is successful, click **Next**.
iSCSI Bridge Server Configuration This page manages the components that bridge between iSCSI (the GigE media network) and the RAID storage. You configure network settings on the iSCSI adapter and the page validates that the media RANKs are visible as iSCSI targets.	 Select **Primary**. Select an iSCSI adapter and click **Modify**. A network configuration dialog box opens. Verify or enter the media network IP address and subnet mask and click **Apply**. Do the same for the other iSCSI adapter. To verify drives, click **Check** then **View Target Drives**. You should see all your media drives listed. Click **Next**.

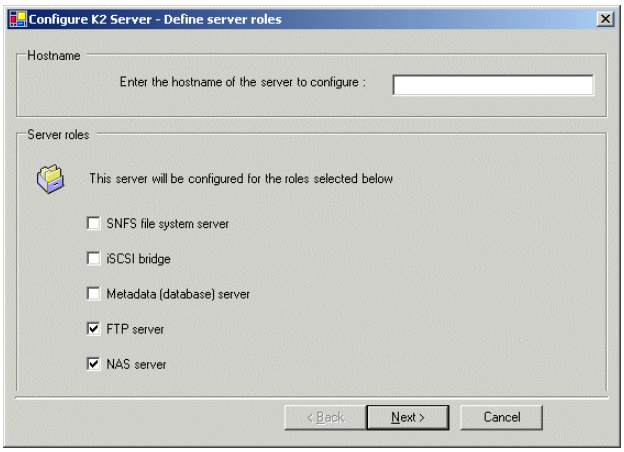
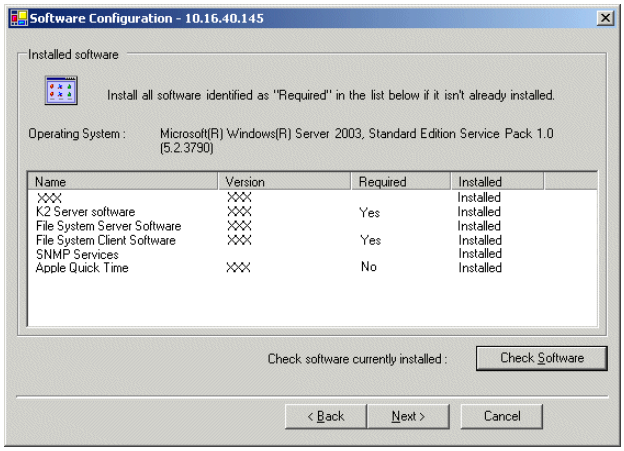
On this page…	Do this…
FTP Server Configuration This page appears only if the server has the role of FTP server.	 Do not modify these settings. Leave at default values of Max FTP streams = 4 and FTP Data Socket Timeout = 60. Only qualified Grass Valley personnel should specify other values, as these settings are intended for use only with custom systems designed by Grass Valley. Click **Next**
Completing the Configuration Wizard	Click **Finish**. The wizard closes. The K2 Media Server restarts. Do not proceed until restart processes are finished.

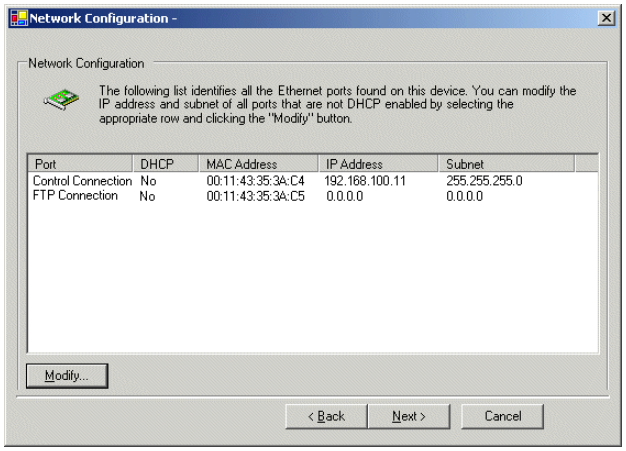
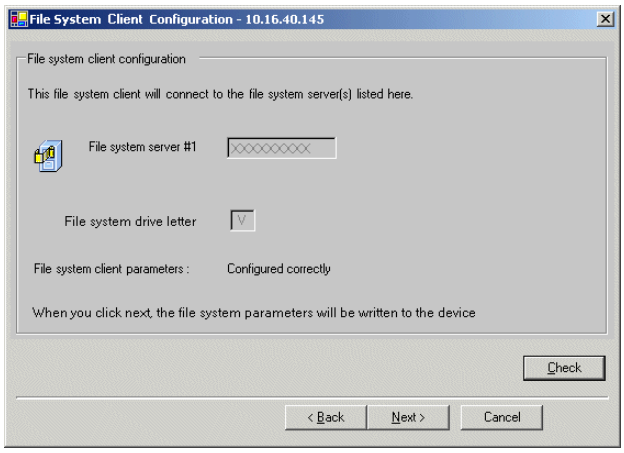
Configuring optional NH servers

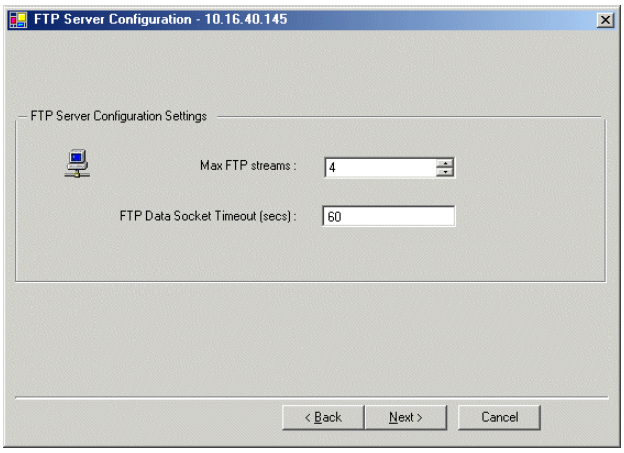
If you have one or more optional NH K2 Media Servers, you next configure those servers. This section applies to both NH1 (1 Gig FTP) servers and NH1-10GE (10 Gig FTP) servers.

NOTE: Multiple NH servers on a K2 SAN must be of the same type, either all NH1 or all NH1-10GE.

1. In the K2 System Configuration application tree view, select the K2 Media Server you are configuring.
2. Click the **Configure** button. The Configure K2 Server wizard opens. Follow the on-screen text to configure the server for a Level 35 K2 SAN, as described in the following table. Some screens require no input from you, as they are based on the configurations already completed on a previously configured K2 Media Server.

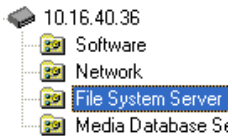
On this page…	Do this…
Define server roles	 Enter the name for the K2 Media Server. This should be the current network name of the machine. Select FTP server and NAS server. Click **Next**
Software Configuration This page checks for the software required to support the roles you selected on the previous page.	 If software with *Yes* in the Required column reports as *Not Installed*, you must first install it on the K2 Media Server before continuing. After installing the software, click **Check Software**. When all required software reports as *Installed*, click **Next**.

On this page…	Do this…
Network Configuration This page displays the control network Ethernet port, and allows you to configure the FTP/ Streaming network Ethernet port.	 The top port is the port over which the K2 System Configuration application is communicating with the K2 Media Server. If correctly configured, it is already assigned the control network IP address, as displayed on this page. If the other port is not already configured correctly, select the other port and click **Modify**. A network configuration dialog box opens. Enter the FTP/Streaming IP address and the subnet mask and click **Apply**. Click **Next**.
File System Client Configuration This K2 Media Server does not function as a file system server. It does function as a file system client, which is validated from this page.	 Click **Check**. When the wizard reports that the configuration check is successful, click **Next**.

On this page…	Do this…
FTP Server Configuration	 Do not modify these settings. Leave at default values of Max FTP streams = 4 and FTP Data Socket Timeout = 60. Only qualified Grass Valley personnel should specify other values, as these settings are intended for use only with custom systems designed by Grass Valley. Click **Next**
Completing the Configuration Wizard	Click **Finish**. The wizard closes. The K2 Media Server restarts. Do not proceed until restart processes are finished.

3. If you got a "The V: will not be available until this device is rebooted…" message on the File System Server Configuration page, after the K2 Media Server restarts, do the following:

   a. In the K2 System Configuration application tree view, under the K2 Media Server select the File System Server node.



   The File System Server Configuration page appears.

   b. Click **Check** and verify that the V: drive is shared. This is required for NAS server functionality.

4. Repeat this procedure for remaining NH K2 Media Servers, if any.

Next, configure K2 clients and/or other iSCSI clients on the K2 SAN.

Configuring the Level 35R K2 SAN

Work through the topics in this section sequentially to do the initial configuration of the Level 35R K2 SAN.

- "Prerequisites for initial configuration" on page 295
- "Defining a new K2 SAN" on page 296
- "Creating a new file system" on page 306

Prerequisites for initial configuration

Before beginning your initial configuration, make sure the devices of the K2 SAN meet the following prerequisites. Refer to sections earlier in this manual for detailed information. Also refer to Chapter 10, "Description of K2 SAN Devices".

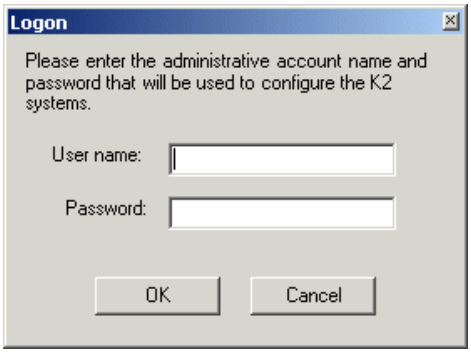
Devices	Prerequisite for Level 35R configuration
Control point PC	Ethernet cable connected Control Point software installed Control network IP address assigned Network communication over the control network with all other K2 devices Power on
Ethernet switch	Ethernet cables connected Control network IP address assigned VLANs set up Trunks set up Power on
K2 Media Server	Ethernet cables connected Fibre Channel cable connected Software installed, as from the factory, including QuickTime 7 Control network IP address assigned Power on
L30R RAID chassis	Fibre Channel cable(s) connected Ethernet cable(s) connected Power on
L30R RAID Expansion chassis	Fibre channel cable(s) connected Power on

Defining a new K2 SAN

If you import a SiteConfig system description file, you do not need to define a new K2 SAN. You can skip this task and instead start by configuring the first K2 Media Server.

Define a Level 35R K2 SAN as follows:

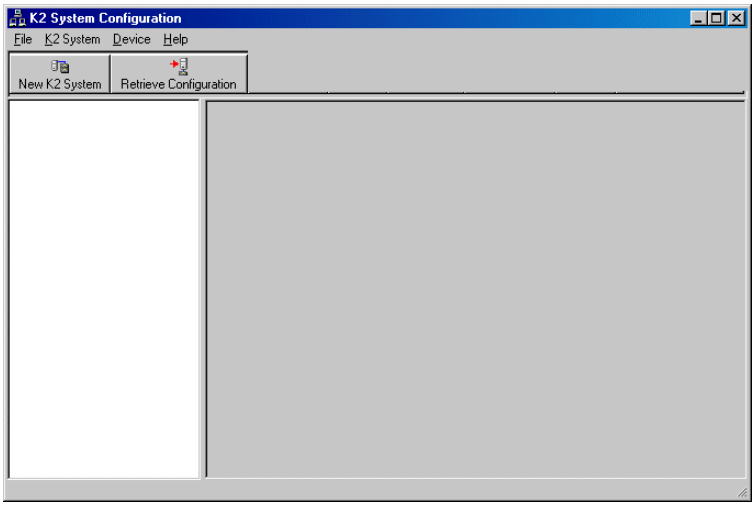
1. On the control point PC, open the K2 System Configuration application. A login dialog box opens.



2. Log in to the K2 System Configuration application with the Windows administrator account. By default this as follows:

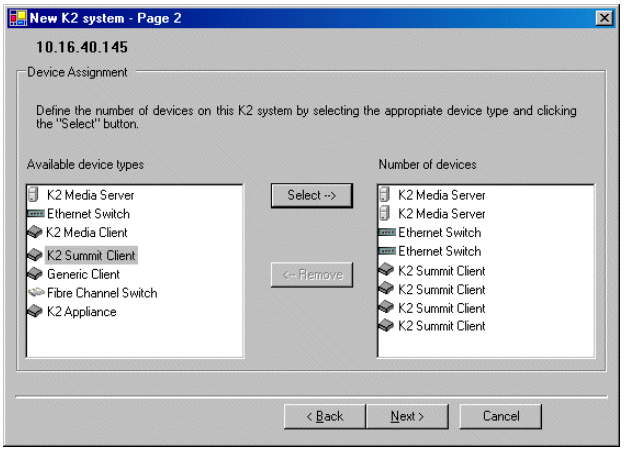
   - Username: Administrator
   - Password: adminK2

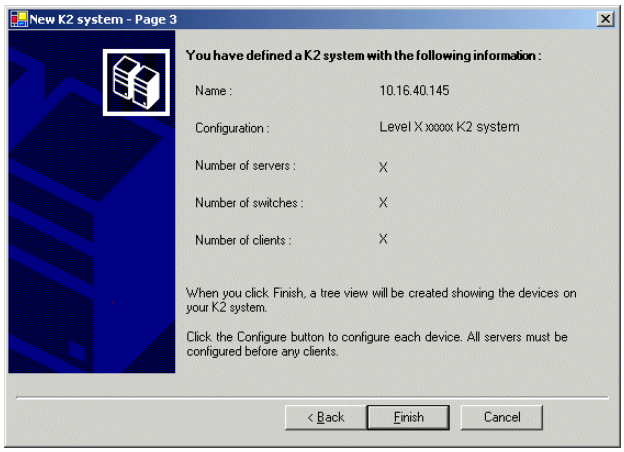
   Refer to "Setting up application security" on page 393 for more information about administrator accounts and logging in to applications.



3. Click **New K2 System**. The New K2 System wizard opens.

4. Follow the on-screen text to define your Level 35R K2 SAN, as described in the following table.

On this page...	Do this...
Page 1	 Create a name for your Level 35R K2 SAN and type it in the Name box. Select Select **Level 30** or **Level 35**. If so designed, select **Enable Live Production mode**. Select the **Server redundancy** option. Click **Next**
Page 2	 Move the following into the Number of Devices Box: • Four K2 Media Servers • Two Ethernet switches • K2 clients as appropriate for your system. • (Optional) One or more K2 Media Servers to represent each NH K2 Media Server on your system. • (Optional) Other devices as appropriate for your system. Click **Next**.

On this page…	Do this…
Page 3	 Review the information on this page and verify that you have correctly defined your K2 SAN. For a Level 35R K2 SAN you should have the following: • Two Gigabit Ethernet switches • Four K2 Media Servers • Optionally, one or more NH K2 Media Servers • The number and type of clients appropriate for your system. Click **Finish**. The Define New K2 Storage System wizard closes.

Your K2 SAN appears in the tree view of the K2 System Configuration application.

5. Continue with the next procedure.

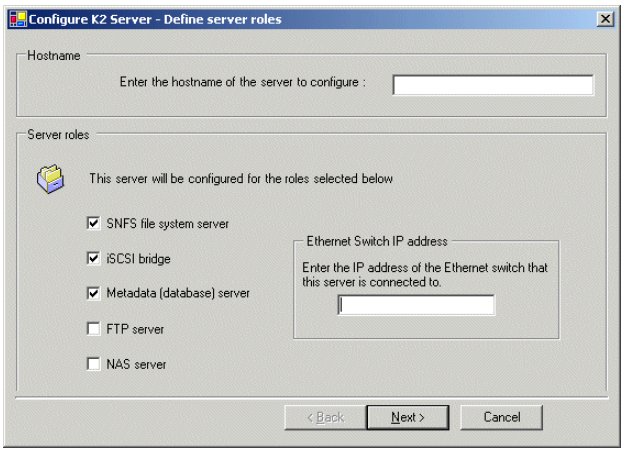
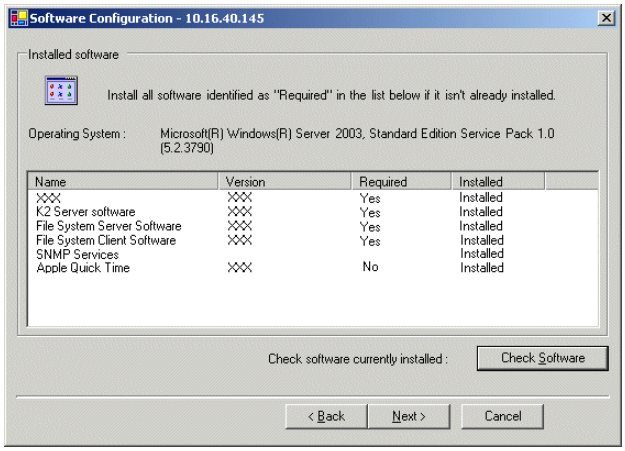
Configuring server 1A - Part 1

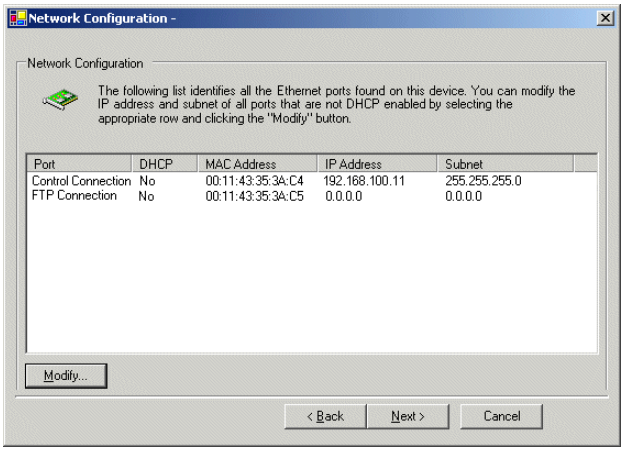
1. In the K2 System Configuration application tree view, select [**K2Server1]**.

2. Click the **Configure** button.

The Configure K2 Server wizard opens. Follow the on-screen text to configure the for a Level 35R K2 SAN, as described

in the following table:

On this page...	Do this...
Define server roles	 Enter the name for the K2 Media Server, as currently configured on the machine. Enter the name or IP address of the Ethernet switch, as currently configured on the switch, to which the K2 Media Server is connected. For Level 35 redundant server roles, select **SNFS file system server**, **iSCSI bridge**, and **Metadata server**. Click **Next**
Software Configuration This page checks for the software required to support the roles you selected on the previous page.	 If software with *Yes* in the Required column reports as *Not Installed*, you must first install it on the before continuing. After installing the software, click **Check Software**. When all required software reports as *Installed*, click **Next**.

On this page…	Do this…
Network Configuration This page displays the control network Ethernet port, and allows you to configure the FTP/ Streaming network Ethernet port. For Level 35R, this server does not take the role of FTP server, so configuring the second port here for the FTP/ streaming network is not required.	 The top port is the port over which the K2 System Configuration application is communicating. If correctly configured, it is already assigned the control network IP address, as displayed on this page. Click **Next**.
File System Server Configuration	Enter the name or IP address of the redundant K2 Media Server (server 1B). Do not yet click Next. Do not yet enter anything in the File System Server #2 box. Click **Launch Storage Manager**. Storage Utility opens.

3. Continue with the next procedure to use Storage Utility to configure the storage and file system.

   Leave the Configure K2 Server wizard open while you are using Storage Utility. When you are done with Storage Utility, you continue with the wizard.

Configuring RAID

Use Storage Utility to complete the configuration of the L30R RAID chassis, as explained in the following topics:

- "Configuring RAID network and SNMP settings"
- "Binding disk modules"

Refer to "Prerequisites for initial configuration" on page 295 to confirm that the RAID storage is ready for configuration.

Configuring RAID network and SNMP settings

Use the Storage Utility to configure the following settings for the Level 35R RAID controllers:

- IP address
- Subnet mask
- Gateway Address

- SNMP trap destinations

For L30R RAID, network and SNMP settings are set and stored on the RAID controller module. For the RAID chassis with two controllers, each controller has its own network settings and the RAID chassis exists as two entities on the control network.

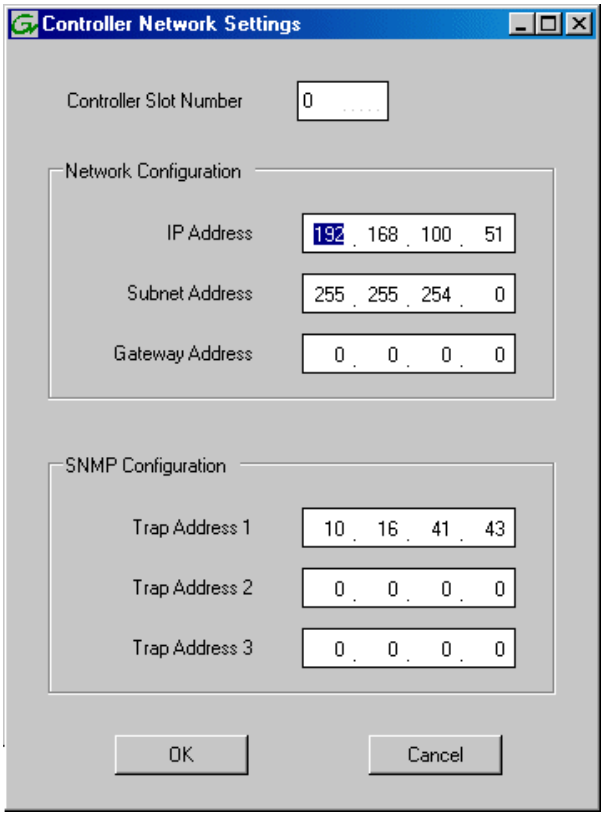
The RAID storage device is configured by default for the SNMP community name “public”. If your site’s policies require using a different SNMP community name, contact your Grass Valley representative.

To configure these settings, do the following:

1. Launch Storage Utility from the K2 System Configuration application as in the previous procedure.
2. As prompted, wait while Storage Utility gathers system information, then Storage Utility opens.
3. In Storage Utility tree view, expand the node for the L30R RAID, right-click the icon for a L30R RAID controller, and select **Configuration | Network Properties**.

   The Controller Network Settings dialog box opens.

   For a L30R RAID chassis with two controllers, you can make settings on both controllers using this dialog box.



4. In the Controller Slot Number field enter **0** and then press **Enter**. The settings from

controller 0 are loaded into the Controller Network Settings dialog box and are available for you to modify.

5. Enter the control network IP address and other network settings.
6. You want SNMP trap messages go to the NetCentral server PC, so for SNMP Configuration enter the IP address of the NetCentral server PC. You can also enter IP addresses for other SNMP managers to which you want to send SNMP trap messages.
7. For the RAID chassis with two controllers, in the Controller Slot Number field enter **1** and then press **Enter**. The settings from controller 1 are loaded into the Controller Network Settings dialog box and are available for you to modify. Repeat the previous steps to configure controller 1.
8. Click **OK** to save settings and close.
9. In Storage Utility click **View | Refresh**. Continue with the next procedure "Binding disk modules".

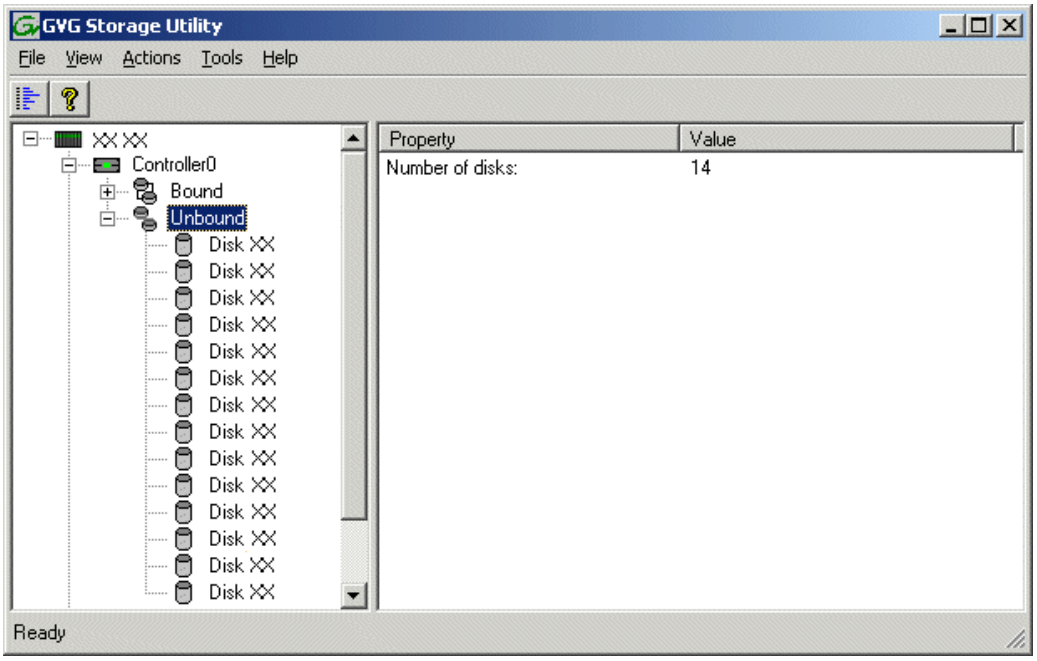
Binding disk modules

Use the following procedure to bind disk modules as required for the Level 35R K2 SAN.

Also refer to "About RANKs and LUNs in Storage Utility" in the chapter *Overview of K2 Storage Tools*.

NOTE: Binding destroys all user data on the disks.

1. In the Storage Utility main window, identify bound RANKs and unbound disks by their placement in the hierarchy of the tree view. In the following illustration, disk numbers are represented by "XX". Refer to "Identifying disks" on page 451 for an explanation of how disks are actually numbered in Storage Utility.



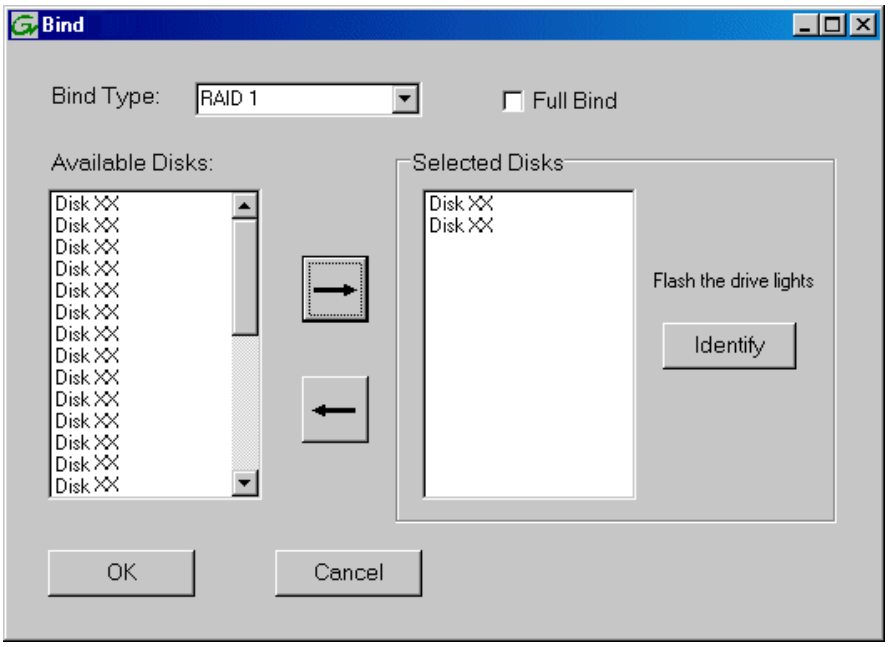
Redundant systems store metadata files and journal files on the primary RAID chassis. The first six disk slots in the chassis are dedicated for metadata/journal files. In the first five slots are five metadata/journal disks. The sixth slot is filled with a blank. Two disks are bound as a RAID 1 RANK for metadata storage and two disks are bound as a RAID 1 RANK for journal storage. The fifth disk is bound as a Hot Spare for the other four metadata/journal disks. The remaining six disks in the primary RAID chassis and all disks in Expansion chassis are for media storage. Media storage disks are bound as RAID 5 or RAID 6 in RANKs consisting of six disks each.

View disk properties and identify the four disks you will use for the metadata/journal RAID 1 RANKs, the one metadata/journal Hot Spare disk, any other disks that you intend to use for Hot Spares, and the remainder of the disks that are available for media storage. Make sure you select disks appropriately as you bind disks in the remainder of this procedure.

2. For systems that use RAID 1 RANKs, you must now create the separate RAID 1 storage for metadata files and journal files. To bind unbound disks for metadata and journal storage, do the following:

   a. Right-click the **Unbound** node for the controller, then select **Bind** in the context menu. (If the RAID chassis has two controllers, both controllers are represented by the single “Controller” node)

      The Bind dialog box opens showing all unbound disks for the controller listed in the Available Disk list.



b. Leave **Full Bind** unchecked. Refer to "About full/background bind" on page 455.

c. In the **Bind Type** drop down box, select **RAID 1**.

d. In the Available Disks box, select two contiguous disks at the top of the list. These should be the first two disks in the primary RAID chassis. (TIP: Use 'shift-click' or 'control-click' to select disks.) This creates a RAID 1 RANK for metadata storage.

e. Click the add (arrow) button to add disks to the Selected Disks list.

NOTE: As an aid in identifying a disk module's physical location, select it in the Selected Disks list, then click* Identify Disks. *This causes the disk drive light to flash.

f. Click **OK** to close the Bind dialog box and begin the binding process. The Progress Report dialog box opens, showing the status of the binding process.

g. Close the Progress Report and repeat the previous steps, selecting two more contiguous disks to create another RAID 1 RANK for journal storage. These should be the next two disks in the primary RAID chassis.

h. Make the fifth disk in the primary RAID chassis a Hot Spare. In the **Bind Type** drop down box, select **Hot Spare**.

i. In the Available Disks box, select the fifth disk in the primary RAID chassis.

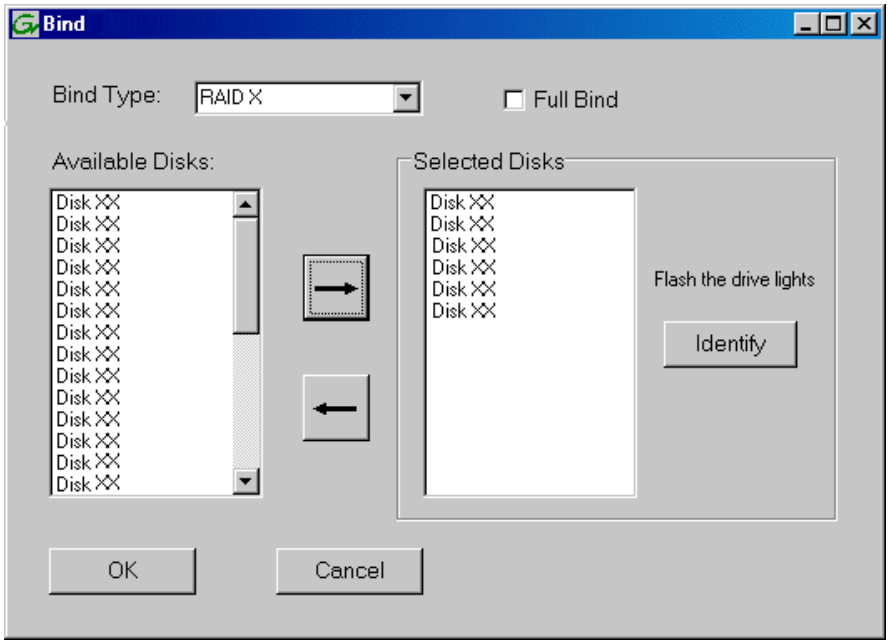
j. Click the add (arrow) button to add the disk to the Selected Disks list.

k. Click **OK** to close the dialog box and begin the binding process.

3. To bind unbound disks for media storage, do the following:

a. Right-click the **Unbound** node for a controller, then select **Bind** in the context menu. (If the RAID chassis has two controllers, both controllers are represented by the single "Controller" node)

The Bind dialog box opens showing all unbound disks for the controller listed in the Available Disk list.



b. Leave Full Bind unchecked. Refer to "About full/background bind" on page 455.

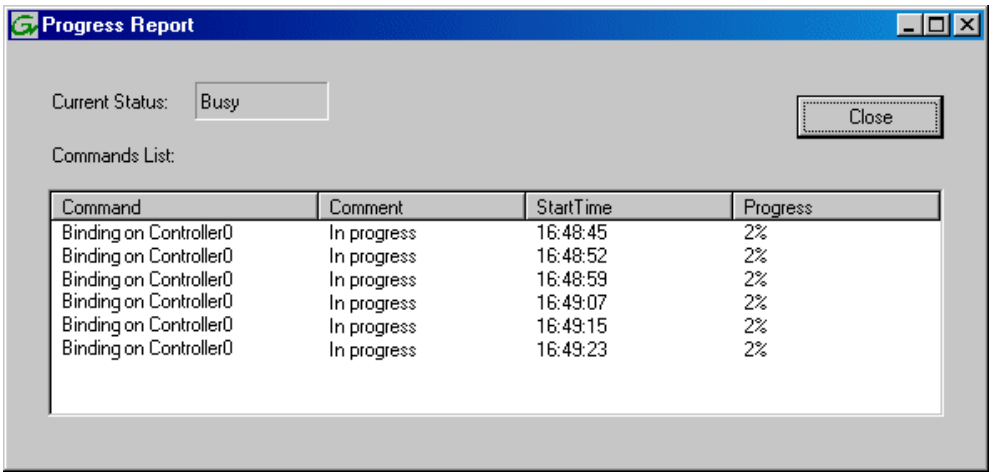
c. In the **Bind Type** drop down box, select **RAID 5** or **RAID 6**, as specified by your system design.

d. In the Available Disks box, select six contiguous disks at the top of the list. (TIP: Use 'shift-click' or 'control-click' to select disks.).

e. Click the add (arrow) button to add disks to the Selected Disks list.

NOTE: As an aid in identifying a disk module's physical location, select it in the Selected Disks list, then click* Identify Disks. *This causes the disk drive light to flash.

f. Click **OK** to close the Bind dialog box and begin the binding process. The Progress Report dialog box opens, showing the status of the binding process.



g. Close the Progress Report and repeat these steps for other unbound disks. If specified by your system design, you can bind some disks as Hot Spares, as explained in "Binding Hot Spare drives" on page 457. When you are done, if you did not bind any extra Hot Spares, you should have the following results:

   L35R storage, on the primary RAID chassis you should have two RAID 1 RANKs of two disks each, one Hot Spare Disk, and one RAID 5 or RAID 6 RANK of six disks. For each optional Expansion chassis, you would have an additional one or two RAID 5 or RAID 6 RANKs of six disks each.

h. Click **Close** in Progress Report window.

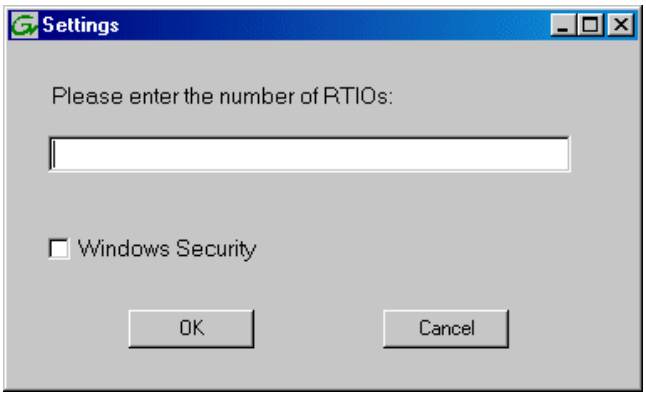
4. Restart the K2 Media Server.

NOTE: Make sure start up processes on the K2 Media Server are complete before proceeding.

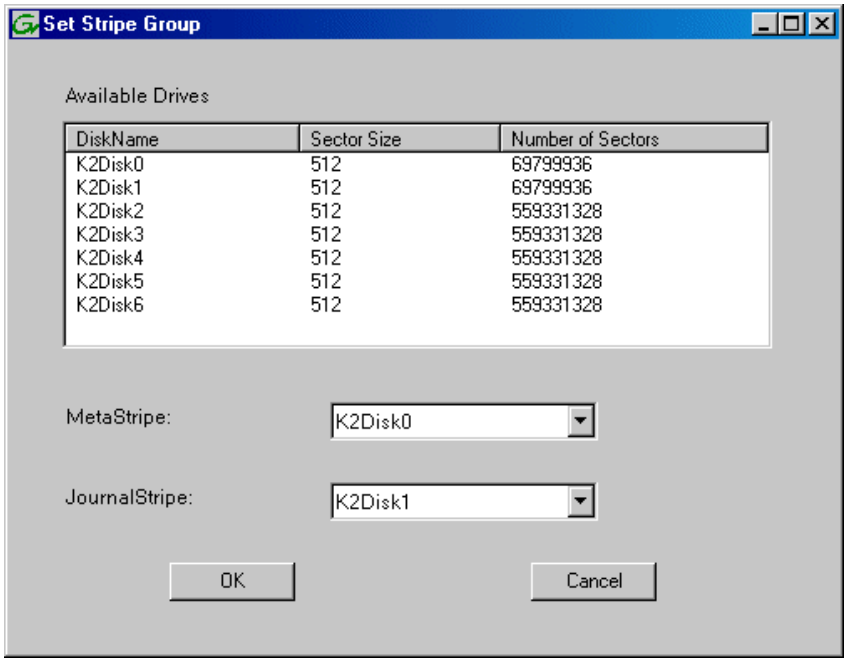
5. Continue with the next procedure "Creating a new file system".

Creating a new file system

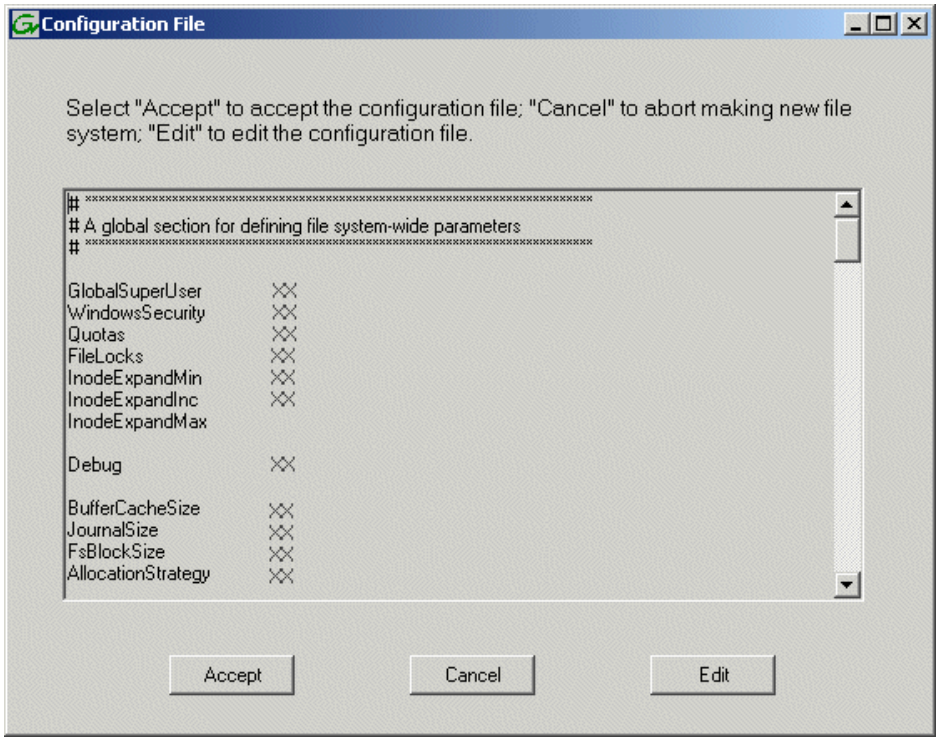
1. In Storage Utility, click **Tools | Make New File System**. The Setting dialog box opens.



2. For the Real Time Input/Output (RTIO) rate, enter the value specified by your system design. If you do not know this value, contact your Grass Valley representative.
3. If the K2 SAN is to be accessed by only K2 clients you can leave Windows Security unchecked. If accessed by Aurora Edits, refer to the *Aurora Edit Installation and Configuration Guide* for instructions.
4. Click **OK**. The Set Stripe Group dialog box opens.



5. If you have RAID 1 RANKS, assign a RAID 1 RANK as a metadata stripe and another RAID 1 RANK as a journal stripe. You can distinguish RAID 1 RANKs from media RANKs by the value in the Number of Sectors column.
6. Click **OK**. The Configuration File dialog box opens.



The configuration file for the media file system is displayed. You can verify media file system parameters by viewing this file. Do not edit this file. Click **Accept**.

A "…Please wait…" message box displays progress and a "…succeeded…" message confirms the process is complete.

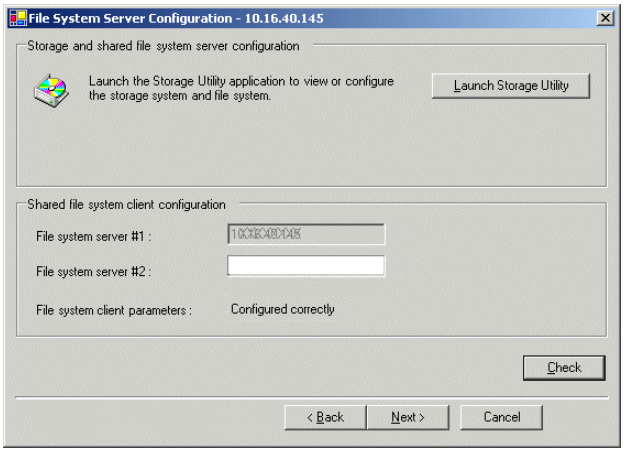
7. A message informs you that you must restart the K2 Media Server, however the restart at the end of the Configure K2 Server wizard suffices, so you do not need to restart now.
8. Close the Storage Utility.

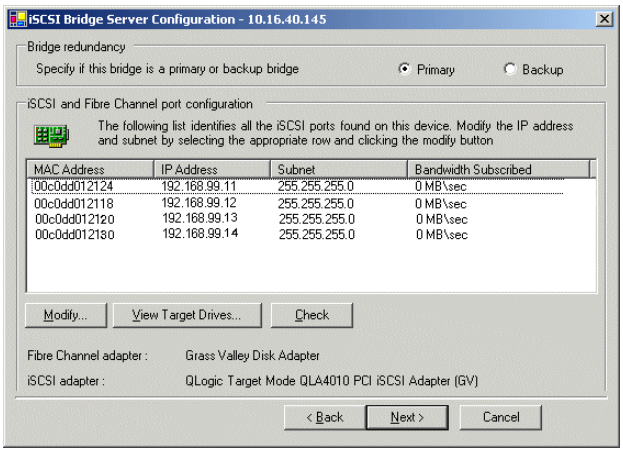
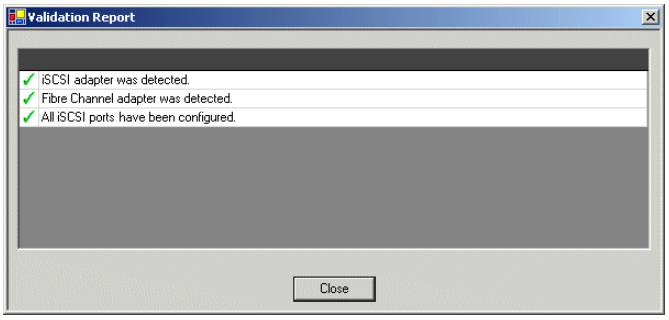
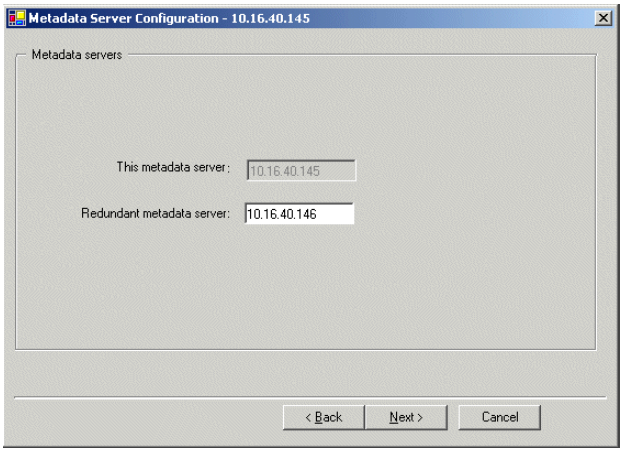
NOTE: Do not attempt to start K2 clients or otherwise bring the K2 SAN online until instructed to do so later in this chapter.

9. Continue with the next procedure.

Configuring server 1A - Part 2

1. Return to the Configure K2 Server page from which you launched Storage Utility and proceed as described in the following table:

On this page…	Do this…
File System Server Configuration This page checks on the configuration of the K2 Media Server in one of its main roles as a file system server. The K2 Media Server also functions as a file system client, which is also checked from this page.	 If you have not already done so, enter the name or IP address of the redundant K2 Media Server (server 1B). Click **Check**. When the wizard reports that the configuration is correct, click **Next**. If you get a "The V: will not be available until this device is rebooted…" message, you can safely continue with this procedure and follow the instructions related to this message later in the procedure.

On this page…	Do this…
iSCSI Bridge Server Configuration This page manages the components that bridge between iSCSI (the GigE media network) and the Fibre Channel connection to the RAID storage. You configure network settings on the iSCSI adapters and the page validates that the Fibre Channel adapter is in place and that the media RANKs are visible as iSCSI targets.	 Select **Primary**. Select an iSCSI adapter and click **Modify**. A network configuration dialog box opens. Verify or enter the media network IP address and the subnet mask and click **Apply**. Do the same for the other iSCSI adapters. Click **Check**. The Validation Report opens.  Confirm that the iSCSI configuration is successful. Close the Validation Report and then click **Next**.
Metadata Server Configuration	 Enter the name or IP address of K2 Media server 1B. This is the redundant partner of the server you are now configuring. Click **Next**.

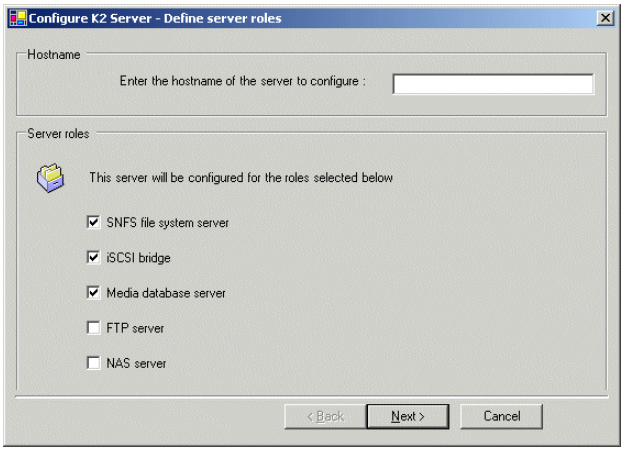
On this page…	Do this…
Completing the Configuration Wizard	Click **Finish**. The wizard closes. The server restarts. Wait until all startup processes have completed before continuing.

Configuring the redundant server 1B

You must wait for the primary K2 Media Server to restart before continuing. To verify, from the control point PC open the MS-DOS command prompt and use the "ping" command.

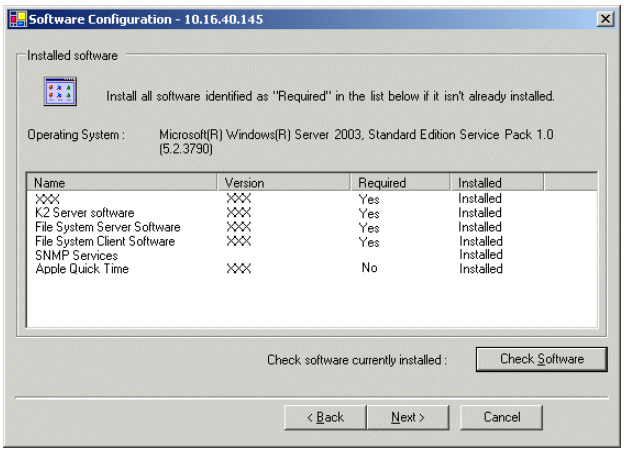
For Level 35 redundant, after you have configured the first K2 Media Server (server 1A) you next configure its redundant partner K2 Media Server (server 1B).

1. In the K2 System Configuration application tree view, select the K2 Media Server you are configuring as server IB.
2. Click the **Configure** button. The Configure K2 Storage System Server wizard opens. Follow the on-screen text to configure the server for a Level 35R K2 SAN, as described in the following table. Some screens require no input from you, as they are based on the configurations already completed on a previously configured K2 Media Server.

Define server roles	 Enter the name for the K2 Media Server. This should be the current network name of the machine. Enter the name or IP address of the Ethernet switch, as currently configured on the switch, to which the K2 Media Server is connected. For Level 35 redundant, select **SNFS file system server**, **iSCSI bridge**, and **Media database server**. Click **Next**

Software Configuration

This page checks for the software required to support the roles you selected on the previous page.



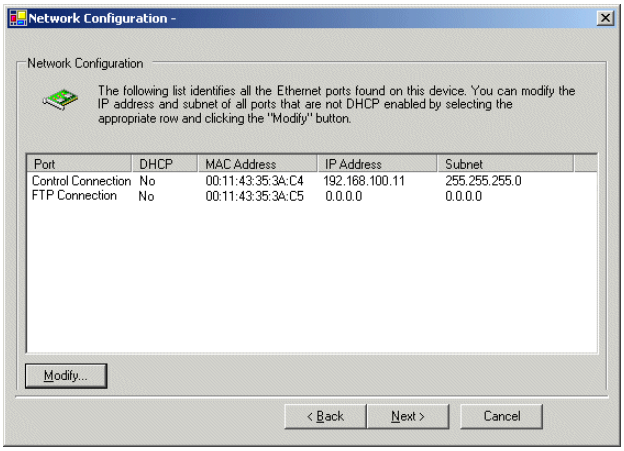
If software with *Yes* in the Required column reports as *Not Installed*, you must first install it on the K2 Media Server before continuing. After installing the software, click **Check Software**. When all required software reports as *Installed*, click **Next**.

Network Configuration

This page displays the control network Ethernet port, and allows you to configure the FTP/ Streaming network Ethernet port.

NOTE: This page does not configure the iSCSI interface (media network) ports.

For Level 35R, this server does not take the role of FTP server, so configuring the second port here for the FTP/ streaming network is not required.



The top port is the port over which the K2 System Configuration application is communicating with the K2 Media Server. If correctly configured, it is already assigned the control network IP address, as displayed on this page.

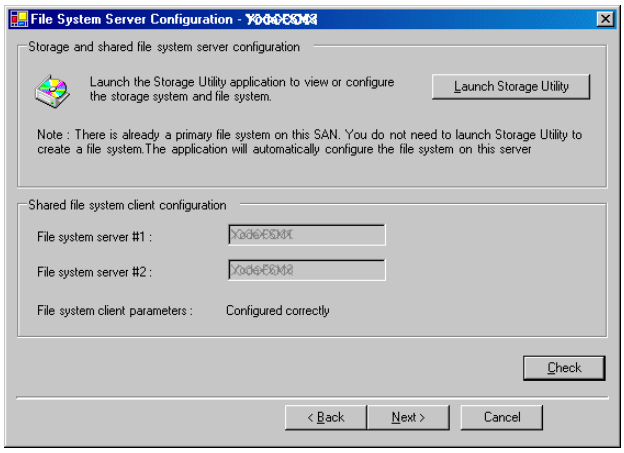
If the server has the role of FTP server, if the other port is not already configured correctly, select the other port and click **Modify**. A network configuration dialog box opens. Enter the FTP/Streaming IP address and the subnet mask and click **Apply**.

Click **Next**.

File System Server Configuration

This page checks on the configuration of the K2 Media Server in one of its main roles as a file system server. The K2 Media Server also functions as a file system client, which is also checked from this page.

It is not necessary to bind RANKs or create a file system, since this task was completed when you configured the previous K2 Media Server.

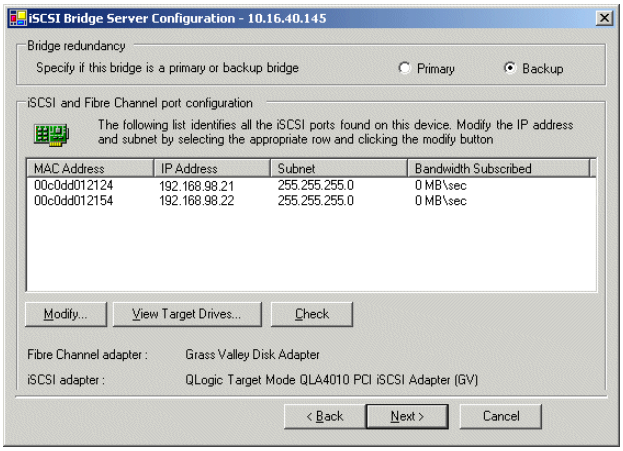


Click **Next**.
Confirm messages about copying the file system configuration file to the other server.
If you get a "The V: will not be available until this device is rebooted…" message, you can safely continue with this procedure and follow the instructions related to this message later in the procedure.

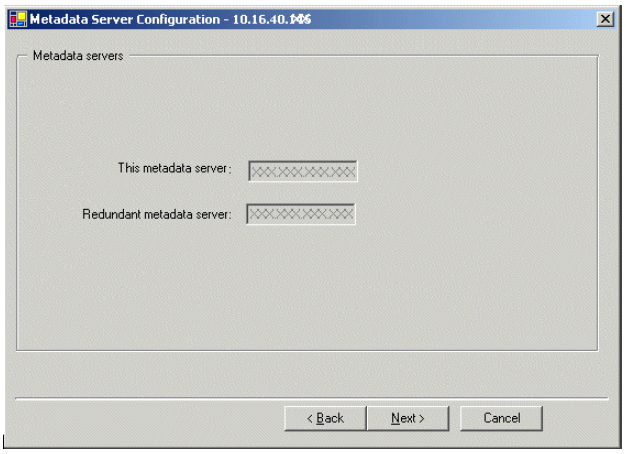
iSCSI Bridge Server Configuration

This page manages the components that bridge between iSCSI (the GigE media network) and the Fibre Channel connection to the RAID storage. You configure network settings on the iSCSI adapters and the page validates that the Fibre Channel adapter is in place and that the media RANKs are visible as iSCSI targets.

NOTE: The iSCSI adapters on this server must be on a different subnet than those on its redundant server partner.

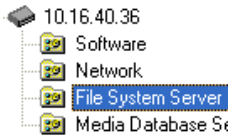


Select **Backup**.
Select an iSCSI adapter and click **Modify**. A network configuration dialog box opens. Verify or enter the media network IP address and subnet mask and click **Apply**.
Do the same for the other iSCSI adapter.
To verify drives, click **Check** then **View Target Drives**. You should see all your media drives listed.
Click **Next**.

Metadata Server Configuration	 You do not need to enter or configure anything on this page. Click **Next**.
Completing the Configuration Wizard	Click **Finish**. The wizard closes. The K2 Media Server restarts. Do not proceed until restart processes are finished.

3. If you got a "The V: will not be available until this device is rebooted…" message on the File System Server Configuration page, after the K2 Media Server restarts, do the following:

   a. In the K2 System Configuration application tree view, under the K2 Media Server select the File System Server node.



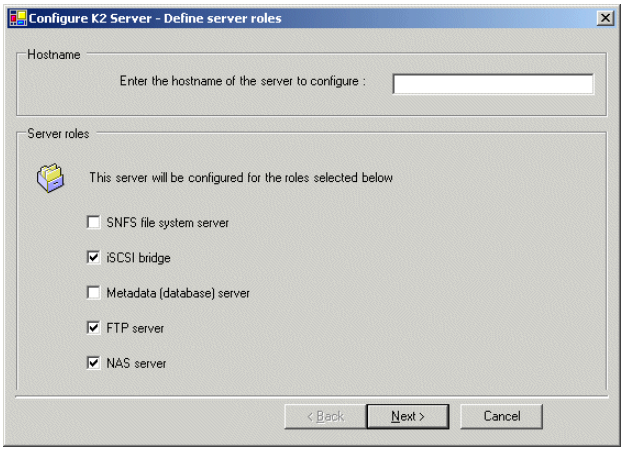
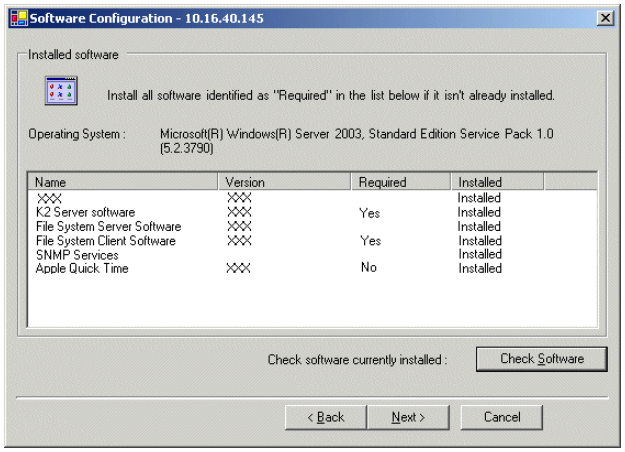
   The File System Server Configuration page appears.

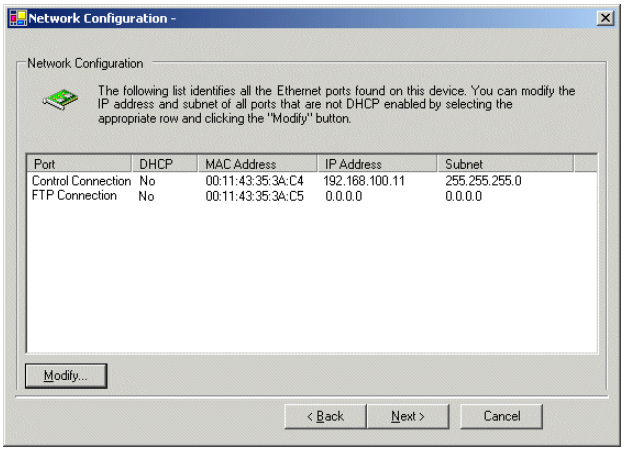
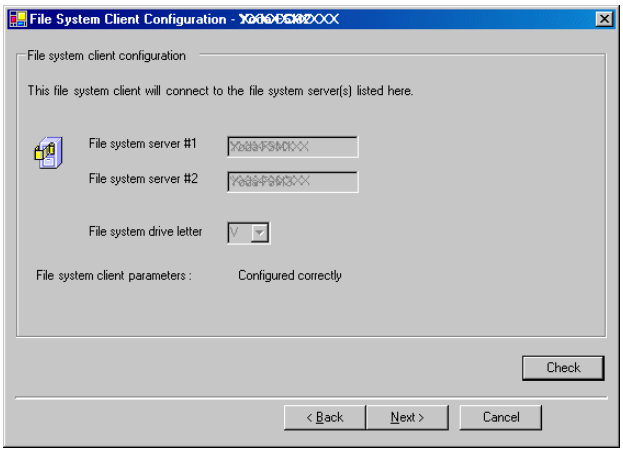
   b. Click **Check** and verify that the V: drive is shared. This is required for NAS server functionality.

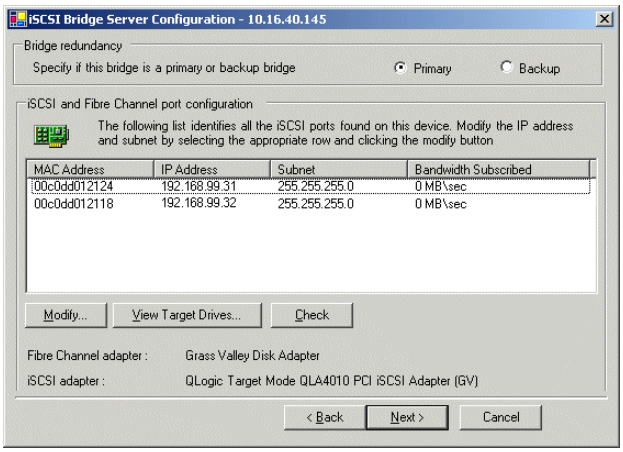
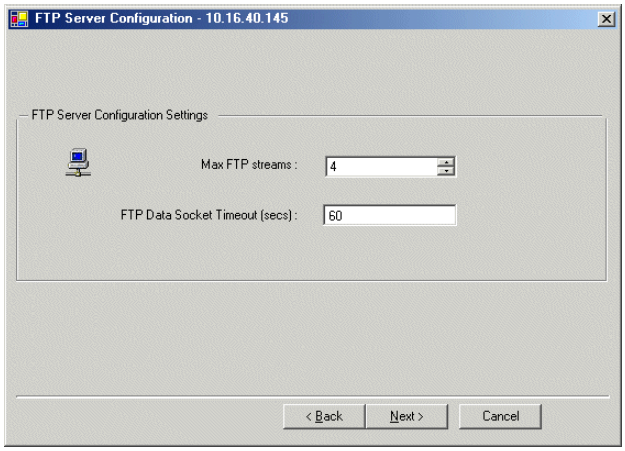
Configuring server 2A

For Level 35 redundant, after you have configured the first K2 Media Server (server 1A) and its redundant partner server (server 1B) you next configure the other "A" K2 Media Server (server 2A).

1. In the K2 System Configuration application tree view, select the K2 Media Server you are configuring as server 2A.
2. Click the **Configure** button. The Configure K2 Server wizard opens. Follow the on-screen text to configure the server for a Level 35R K2 SAN, as described in the following table. Some screens require no input from you, as they are based on the configurations already completed on a previously configured K2 Media Server.

On this page…	Do this…
Define server roles **** If the K2 SAN has one or more optional NH servers, then FTP traffic should go to the NH server, not the K2 Media Server you are now configuring. In this case, do not select the FTP server role or the NAS server role.	 Enter the name for the K2 Media Server. This should be the current network name of the machine. For Level 35 redundant, select iSCSI bridge, FTP server, and NAS server. Click **Next**
Software Configuration This page checks for the software required to support the roles you selected on the previous page.	 If software with *Yes* in the Required column reports as *Not Installed*, you must first install it on the K2 Media Server before continuing. After installing the software, click **Check Software**. When all required software reports as *Installed*, click **Next**.

On this page…	Do this…
Network Configuration This page displays the control network Ethernet port, and allows you to configure the FTP/ Streaming network Ethernet port. For systems with an optional NH (FTP) server, the server you ar now configuring does not take the role of FTP server, so configuring the second port here for the FTP/ streaming network is not required.	 The top port is the port over which the K2 System Configuration application is communicating with the K2 Media Server. If correctly configured, it is already assigned the control network IP address, as displayed on this page. If the other port is not already configured correctly, select the other port and click **Modify**. A network configuration dialog box opens. Enter the FTP/Streaming IP address and the subnet mask and click **Apply**. Click **Next**.
File System Client Configuration This K2 Media Server does not function as a file system server. It does function as a file system client, which is validated from this page.	 Click **Check**. When the wizard reports that the configuration check is successful, click **Next**.

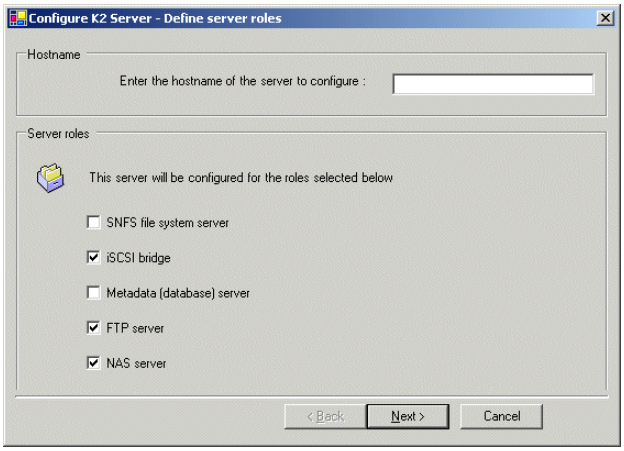
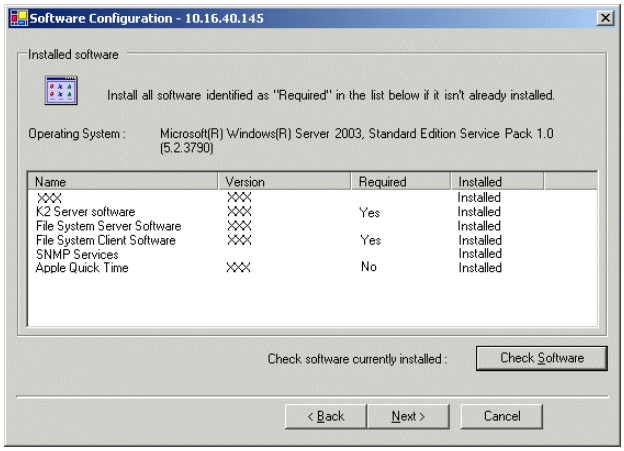
On this page…	Do this…
iSCSI Bridge Server Configuration This page manages the components that bridge between iSCSI (the GigE media network) and the RAID storage. You configure network settings on the iSCSI adapter and the page validates that the media RANKs are visible as iSCSI targets.	 Select **Primary**. Select an iSCSI adapter and click **Modify**. A network configuration dialog box opens. Verify or enter the media network IP address and subnet mask and click **Apply**. Do the same for the other iSCSI adapter. To verify drives, click **Check** then **View Target Drives**. You should see all your media drives listed. Click **Next**.
FTP Server Configuration This page appears only if the server has the role of FTP server.	 Do not modify these settings. Leave at default values of Max FTP streams = 4 and FTP Data Socket Timeout = 60. Only qualified Grass Valley personnel should specify other values, as these settings are intended for use only with custom systems designed by Grass Valley. Click **Next**
Completing the Configuration Wizard	Click **Finish**. The wizard closes. The K2 Media Server restarts. Do not proceed until restart processes are finished.

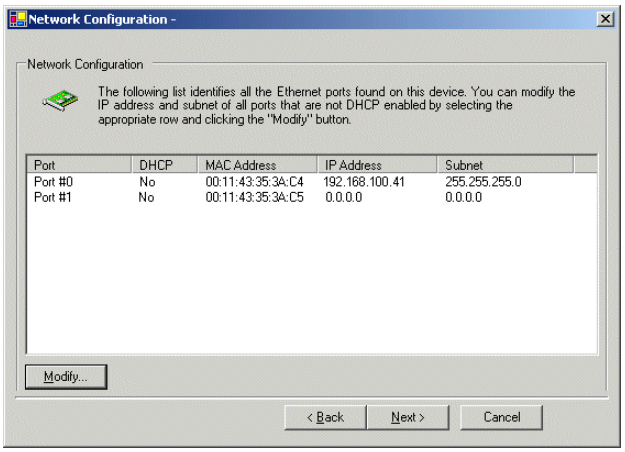
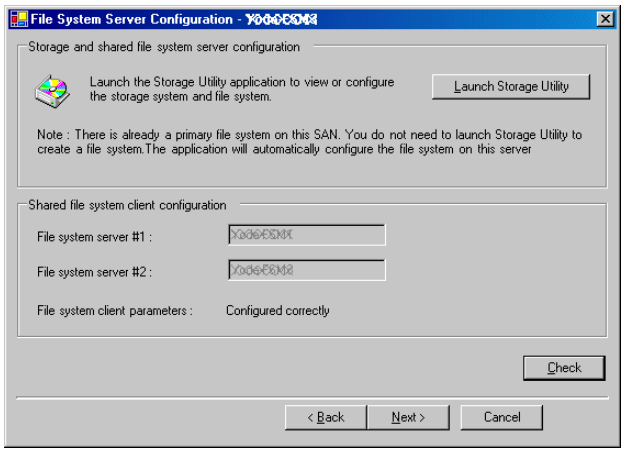
Configuring the redundant server 2B

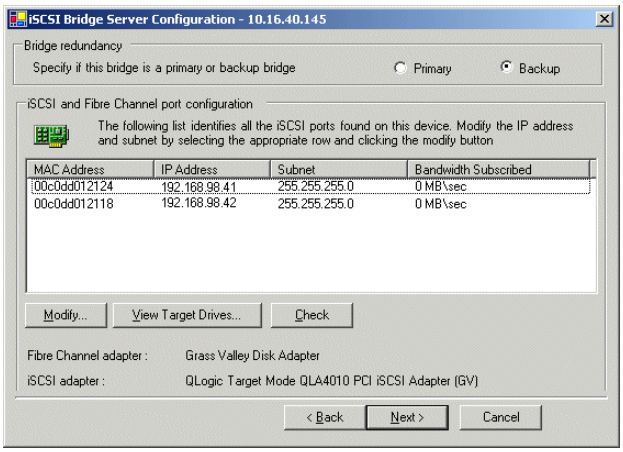
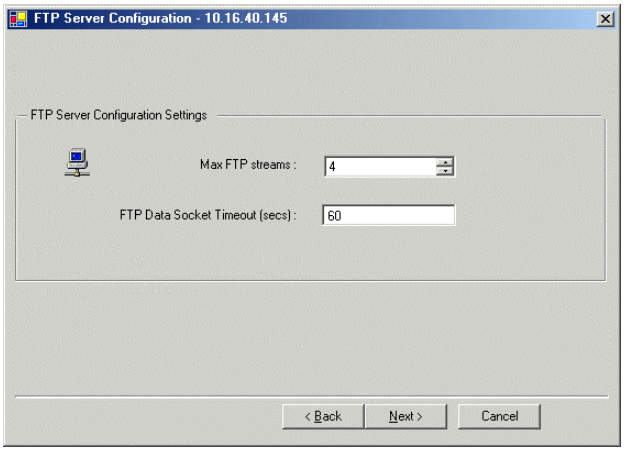
You must wait for server 2A to restart before continuing.

For Level 35 redundant, you next configure server 2B. It is the redundant partner to server 2A.

1. In the K2 System Configuration application tree view, select the K2 Media Server you are configuring as server 2B.
2. Click the **Configure** button. The Configure K2 Server wizard opens. Follow the on-screen text to configure the server for a Level 35R K2 SAN, as described in the following table. Some screens require no input from you, as they are based on the configurations already completed on a previously configured server.

On this page…	Do this…
Define server roles If the K2 SAN has one or more optional NH servers, then FTP traffic should go to the NH server, not the K2 Media Server you are now configuring. In this case, do not select the FTP server role or the NAS server role.	 Enter the name for the K2 Media Server. This should be the current network name of the machine. Select iSCSI bridge, FTP server, and NAS server. Click **Next**
Software Configuration This page checks for the software required to support the roles you selected on the previous page.	 If software with *Yes* in the Required column reports as *Not Installed*, you must first install it on the K2 Media Server before continuing. After installing the software, click **Check Software**. When all required software reports as *Installed*, click **Next**.

On this page…	Do this…
Network Configuration This page displays the control network Ethernet port, and allows you to configure the FTP/ Streaming network Ethernet port. ***NOTE: This page does not configure the iSCSI interface (media network) ports.*** For systems with an optional NH (FTP) server, the server you ar now configuring does not take the role of FTP server, so configuring the second port here for the FTP/ streaming network is not required.	 The top port is the port over which the K2 System Configuration application is communicating with the K2 Media Server. If correctly configured, it is already assigned the control network IP address, as displayed on this page. If the other port is not already configured correctly, select the other port and click **Modify**. A network configuration dialog box opens. Enter the FTP/Streaming IP address and the subnet mask and click **Apply**. Click **Next**.
File System Client Configuration This K2 Media Server does not function as a file system server. It does function as a file system client, which is validated from this page.	 Click **Check**. When the wizard reports that the configuration check is successful, click **Next**. If you get a “The V: will not be available until this device is rebooted…” message, you can safely continue with this procedure and follow the instructions related to this message later in the procedure.

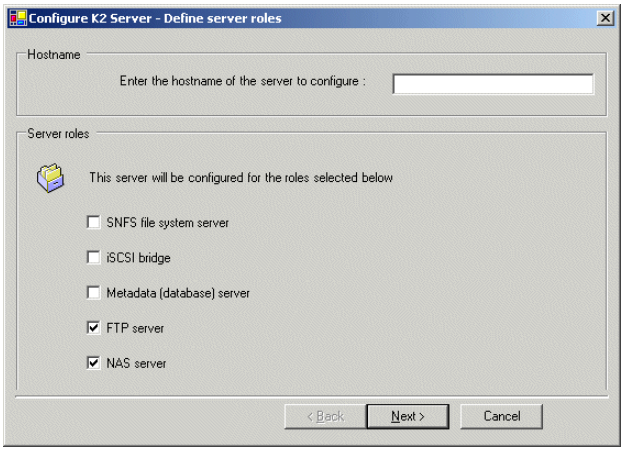
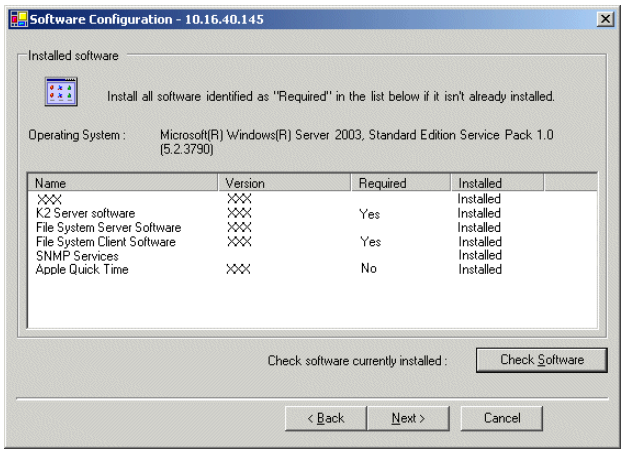
On this page…	Do this…
SCSI Bridge Server Configuration This page manages the components that bridge between iSCSI (the GigE media network) and the RAID storage. You configure network settings on the iSCSI adapter and the page validates that the media RANKs are visible as iSCSI targets.	 Select **Backup**. Select an iSCSI adapter and click **Modify**. A network configuration dialog box opens. Verify or enter the media network IP address and subnet mask and click **Apply**. Do the same for the other iSCSI adapter. Click **Next**.
FTP Server Configuration This page appears only if the server has the role of FTP server.	 Do not modify these settings. Leave at default values of Max FTP streams = 4 and FTP Data Socket Timeout = 60. Only qualified Grass Valley personnel should specify other values, as these settings are intended for use only with custom systems designed by Grass Valley. Click **Next**
Completing the Configuration Wizard	Click **Finish**. The wizard closes. The K2 Media Server restarts. Do not proceed until restart processes are finished.

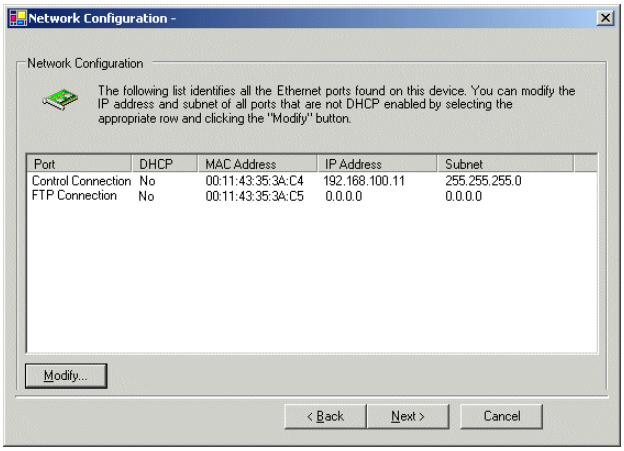
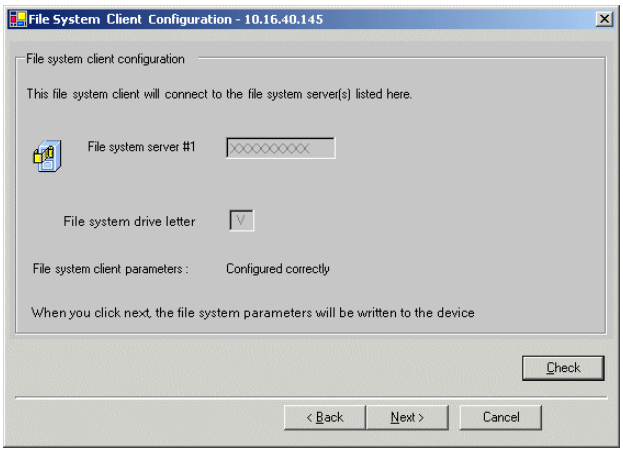
Configuring optional NH servers

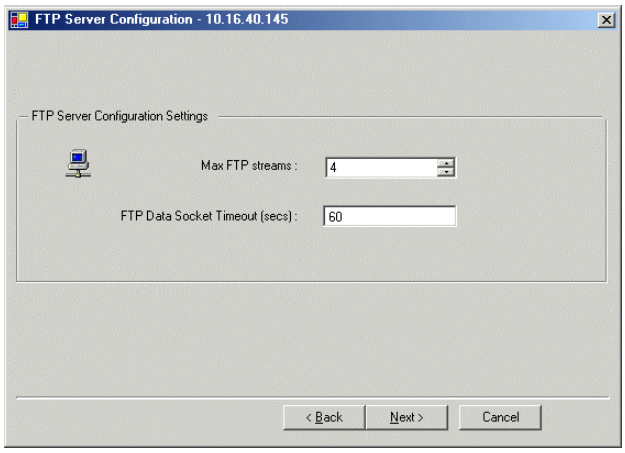
If you have one or more optional NH K2 Media Servers, you next configure those servers. This section applies to both NH1 (1 Gig FTP) servers and NH1-10GE (10 Gig FTP) servers.

NOTE: Multiple NH servers on a K2 SAN must be of the same type, either all NH1 or all NH1-10GE.

1. In the K2 System Configuration application tree view, select the K2 Media Server you are configuring.
2. Click the **Configure** button. The Configure K2 Server wizard opens. Follow the on-screen text to configure the server for a Level 35R K2 SAN, as described in the following table. Some screens require no input from you, as they are based on the configurations already completed on a previously configured K2 Media Server.

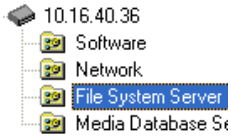
On this page...	Do this...
Define server roles	 Enter the name for the K2 Media Server. This should be the current network name of the machine. Select FTP server and NAS server. Click **Next**
Software Configuration This page checks for the software required to support the roles you selected on the previous page.	 If software with *Yes* in the Required column reports as *Not Installed*, you must first install it on the K2 Media Server before continuing. After installing the software, click **Check Software**. When all required software reports as *Installed*, click **Next**.

On this page…	Do this…
Network Configuration This page displays the control network Ethernet port, and allows you to configure the FTP/ Streaming network Ethernet port.	 The top port is the port over which the K2 System Configuration application is communicating with the K2 Media Server. If correctly configured, it is already assigned the control network IP address, as displayed on this page. If the other port is not already configured correctly, select the other port and click **Modify**. A network configuration dialog box opens. Enter the FTP/Streaming IP address and the subnet mask and click **Apply**. Click **Next**.
File System Client Configuration This K2 Media Server does not function as a file system server. It does function as a file system client, which is validated from this page.	 Click **Check**. When the wizard reports that the configuration check is successful, click **Next**.

On this page…	Do this…
FTP Server Configuration	 Do not modify these settings. Leave at default values of Max FTP streams = 4 and FTP Data Socket Timeout = 60. Only qualified Grass Valley personnel should specify other values, as these settings are intended for use only with custom systems designed by Grass Valley. Click **Next**
Completing the Configuration Wizard	Click **Finish**. The wizard closes. The K2 Media Server restarts. Do not proceed until restart processes are finished.

3. If you got a “The V: will not be available until this device is rebooted…” message on the File System Server Configuration page, after the K2 Media Server restarts, do the following:

   a. In the K2 System Configuration application tree view, under the K2 Media Server select the File System Server node.



   The File System Server Configuration page appears.

   b. Click **Check** and verify that the V: drive is shared. This is required for NAS server functionality.

4. Repeat this procedure for remaining NH K2 Media Servers, if any.

Next, configure K2 clients and/or other iSCSI clients on the K2 SAN.

Configuring the Nearline 10 K2 SAN

Work through the topics in this section sequentially to do the initial configuration of the Nearline 10 K2 SAN.

- "Prerequisites for initial configuration" on page 324
- "Defining a new K2 SAN" on page 325
- "Configuring the NH server - Part 1" on page 327
- "Configuring RAID" on page 329
- "Creating a new file system" on page 334
- "Configuring the NH server - Part 2" on page 335
- "Configuring the second NH server for NL10R" on page 336

Prerequisites for initial configuration

Before beginning your initial configuration, make sure the devices of the K2 SAN meet the following prerequisites. Refer to sections earlier in this manual for detailed information. Also refer to Chapter 10, "Description of K2 SAN Devices".

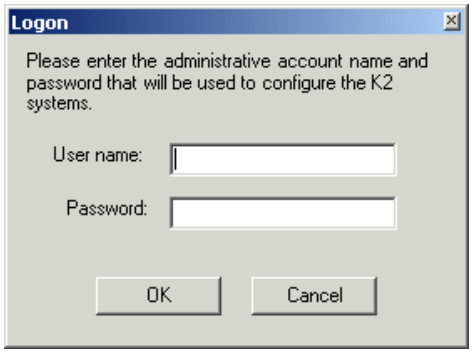
Devices	Prerequisite for Nearline 10 configuration
Control point PC	Ethernet cable connected Control Point software installed Control network IP address assigned Network communication over the control network with all other K2 devices Power on
Ethernet switch	Ethernet cables connected Control network IP address assigned Power on
K2 Media Server	Ethernet cables connected Fibre Channel cable connected Software installed, as from the factory, including QuickTime 7 For a redundant system, MPIO software installed. Control network IP address assigned Power on for all servers
Nearline 10 RAID chassis	Fibre Channel cable(s) connected Ethernet cable(s) connected Power on
Nearline 10 RAID Expansion chassis	Fibre channel cable(s) connected Power on

Defining a new K2 SAN

If you import a SiteConfig system description file, you do not need to define a new K2 SAN. You can skip this task and instead start by configuring the first K2 Media Server.

Define a Nearline 10 K2 SAN as follows:

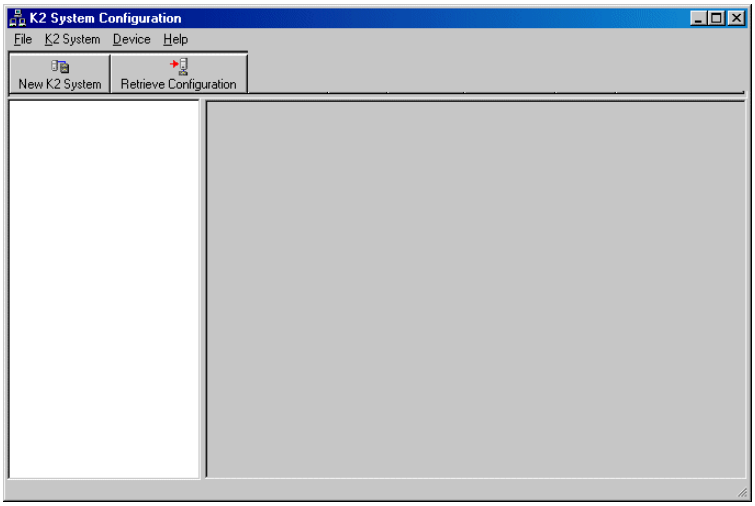
1. On the control point PC, open the K2 System Configuration application. A login dialog box opens.



2. Log in to the K2 System Configuration application with the Windows administrator account. By default this as follows:

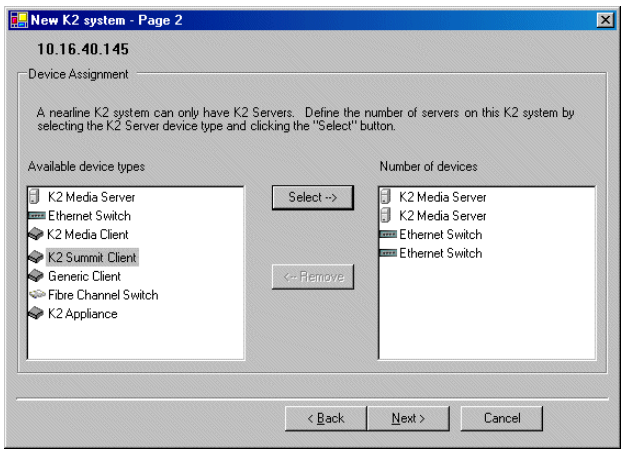
   - Username: Administrator
   - Password: adminK2

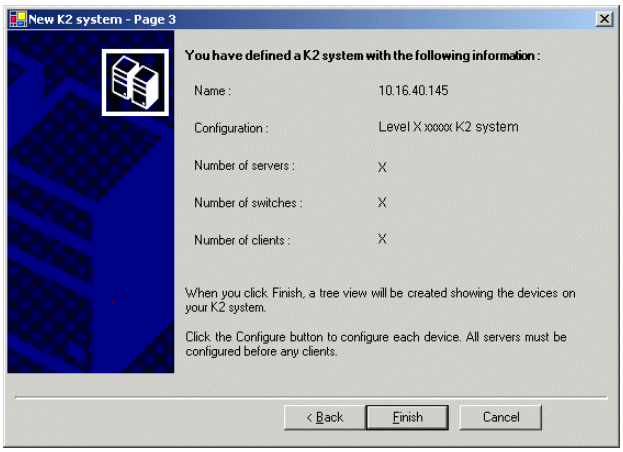
   Refer to "Setting up application security" on page 393 for more information about administrator accounts and logging in to applications.



3. Click **New K2 System**. The New K2 System wizard opens.

4. Follow the on-screen text to define your Nearline 10 K2 SAN, as described in the following table.

On this page…	Do this…
Page 1	 Create a name for your Nearline 10 K2 SAN and type it in the Name box. Select **Nearline**. The Server redundancy option is not selected and is disabled. This option applies to media database redundancy. Since the Nearline system has no media database, this setting is correct for both redundant and non-redundant Nearline systems. Click **Next**
Page 2	 For a NL10 system, move the following into the Number of Devices Box: • One K2 Media Server • One Ethernet switch For a NL10R system, move the following into the Number of Devices Box: • Two K2 Media Servers • Two Ethernet switches Click **Next**.

On this page...	Do this...
Page 3	 Review the information on this page and verify that you have correctly defined your K2 SAN. For a Nearline 10 K2 SAN you should have the following: • One K2 Media Server • One Ethernet switch For a Nearline 10R K2 SAN you should have the following: • Two K2 Media Servers • Two Ethernet switches Click **Finish**. The Define New K2 Storage System wizard closes.

Your K2 SAN appears in the tree view of the K2 System Configuration application.

5. Continue with the next procedure.

Configuring the NH server - Part 1

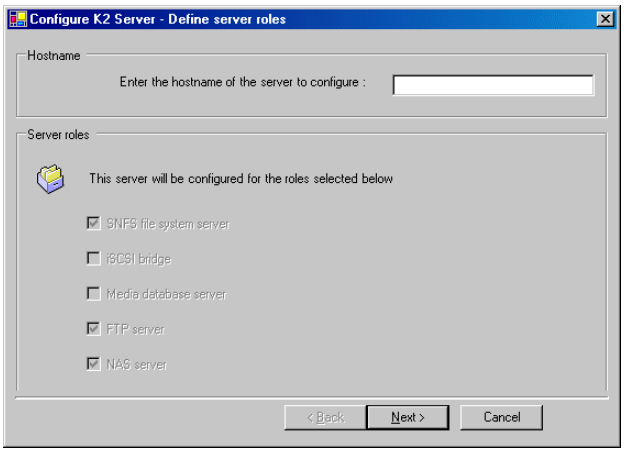
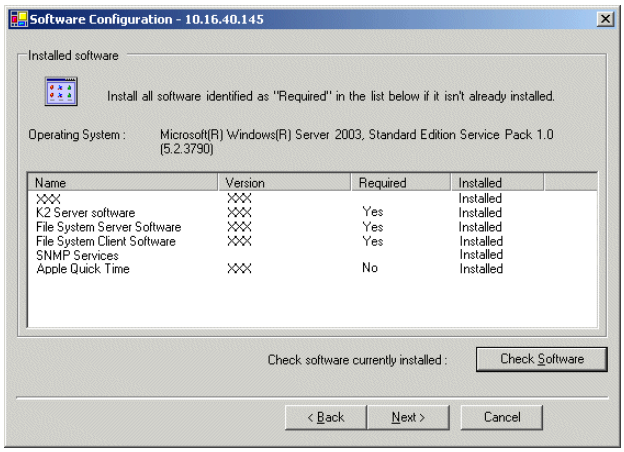
1. In the K2 System Configuration application tree view, select **[K2Server1]**.

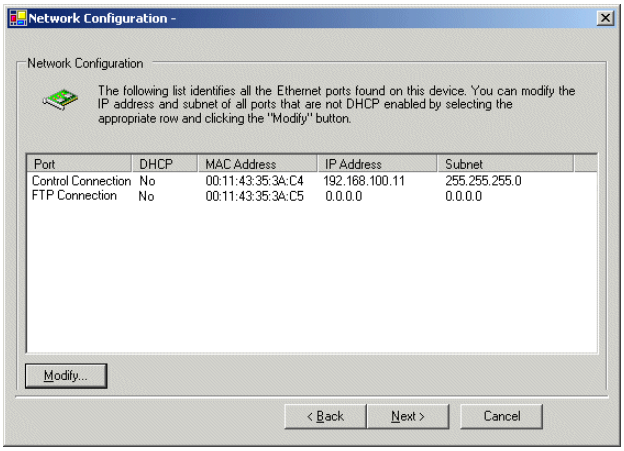
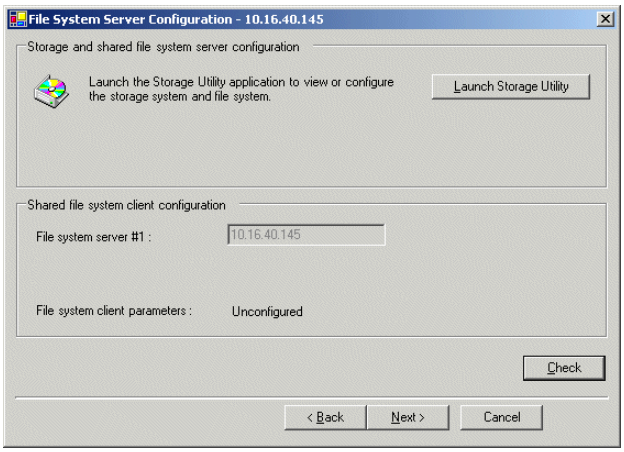
   For a NL10 system, this is the one NH server. For a NL10R system, this is NH server A

2. Click the **Configure** button.

   The Configure K2 Server wizard opens. Follow the on-screen text to configure the NH server for a Nearline 10 K2 SAN, as

described in the following table:

On this page…	Do this…
Define server roles	 Enter the name for the K2 Media Server, as currently configured on the machine. For Nearline server roles, selections are disabled. Leave **SNFS file system server**, **FTP server**, and **NAS server** selected. The wizard does not allow you to select Media Database Server. There is no Media Database Server in a nearline system. Click **Next**
Software Configuration This page checks for the software required to support the roles you selected on the previous page. ***MPIO software is required on K2 Media Servers in the NL10R system and in other nearline redundant systems.***	 If software with *Yes* in the Required column reports as *Not Installed*, you must first install it on the K2 Media Server before continuing. After installing the software, click **Check Software**. When all required software reports as *Installed*, click **Next**.

On this page…	Do this…
Network Configuration This page displays the control network Ethernet port, and allows you to configure the FTP/ Streaming network Ethernet port.	 The top port is the port over which the K2 System Configuration application is communicating. If correctly configured, it is already assigned the control network IP address, as displayed on this page. Click **Next**.
File System Server Configuration	 Click **Launch Storage Manager**. Storage Utility opens.

3. Continue with the next procedure to use Storage Utility to configure the file system.

   Leave the Configure K2 Server wizard open while you are using Storage Utility. When you are done with Storage Utility, you continue with the wizard.

Configuring RAID

Use Storage Utility to complete the configuration of the Nearline 10 RAID chassis, as explained in the following topics:

Configuring RAID network and SNMP settings

Use the Storage Utility to configure the following settings for the Nearline RAID controller or controllers:

- IP address
- Subnet mask
- Gateway Address
- SNMP trap destinations

For Nearline 10 RAID, network and SNMP settings are set and stored on the RAID controller module. For the RAID chassis with two controllers, each controller has its own network settings and the RAID chassis exists as two entities on the control network.

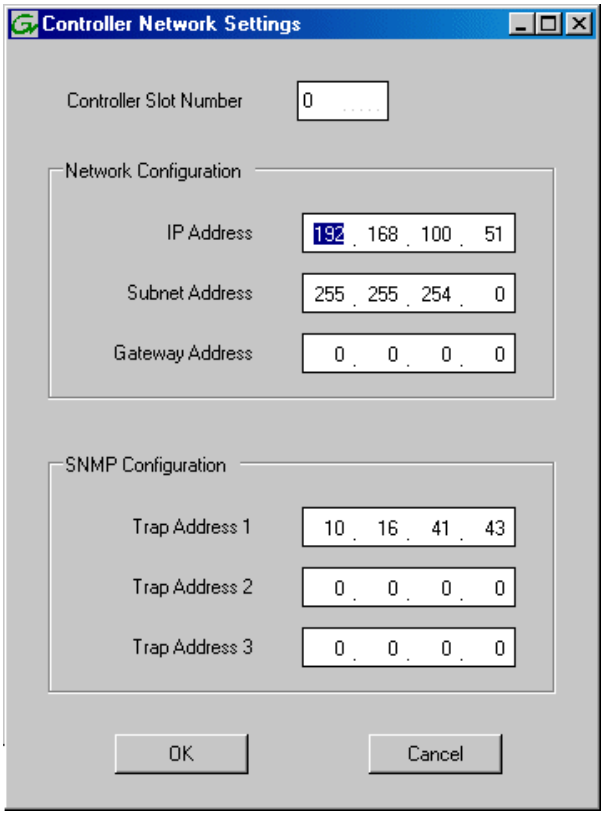
The RAID storage device is configured by default for the SNMP community name “public”. If your site’s policies require using a different SNMP community name, contact your Grass Valley representative.

To configure these settings, do the following:

1. Launch Storage Utility from the K2 System Configuration application as in the previous procedure.
2. As prompted, wait while Storage Utility gathers system information, then Storage Utility opens.
3. In Storage Utility tree view, expand the node for the Nearline 10 RAID, right-click the icon for a Nearline 10 RAID controller, and select **Configuration | Network Properties**.

   The Controller Network Settings dialog box opens.

   For a Nearline 10 RAID chassis with two controllers, you can make settings on both controllers using this dialog box.



4. In the Controller Slot Number field enter **0** and then press **Enter**. The settings from controller 0 are loaded into the Controller Network Settings dialog box and are available for you to modify.
5. Enter the control network IP address and other network settings.
6. You want SNMP trap messages go to the NetCentral server PC, so for SNMP Configuration enter the IP address of the NetCentral server PC. You can also enter IP addresses for other SNMP managers to which you want to send SNMP trap messages.
7. For the RAID chassis with two controllers, in the Controller Slot Number field enter **1** and then press **Enter**. The settings from controller 1 are loaded into the Controller Network Settings dialog box and are available for you to modify. Repeat the previous steps to configure controller 1.
8. Click **OK** to save settings and close.
9. In Storage Utility click **View | Refresh**. Continue with the next procedure "Binding disk modules".

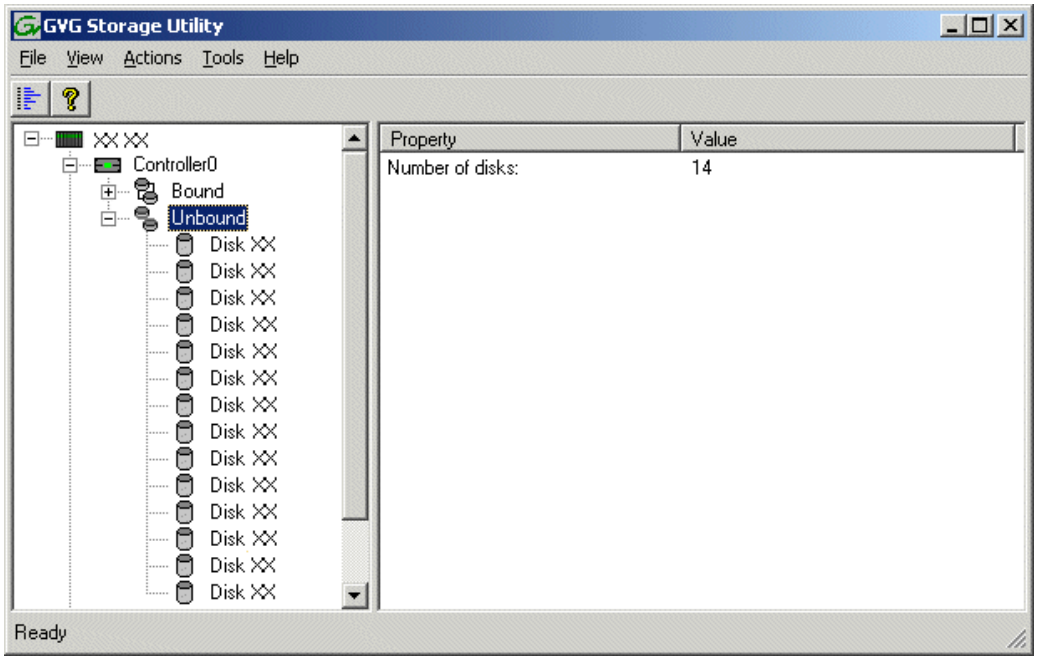
Binding disk modules

Use the following procedure to bind disk modules as required for the Nearline 10 K2 SAN.

Also refer to "About RANKs and LUNs in Storage Utility" in the chapter *Overview of K2 Storage Tools*.

NOTE: Binding destroys all user data on the disks.

1. In the Storage Utility main window, identify bound RANKs and unbound disks by their placement in the hierarchy of the tree view. In the following illustration, disk numbers are represented by "XX". Refer to "Identifying disks" on page 451 for an explanation of how disks are actually numbered in Storage Utility.



NL10 systems store media files across both the primary RAID chassis and the optional Expansion chassis.

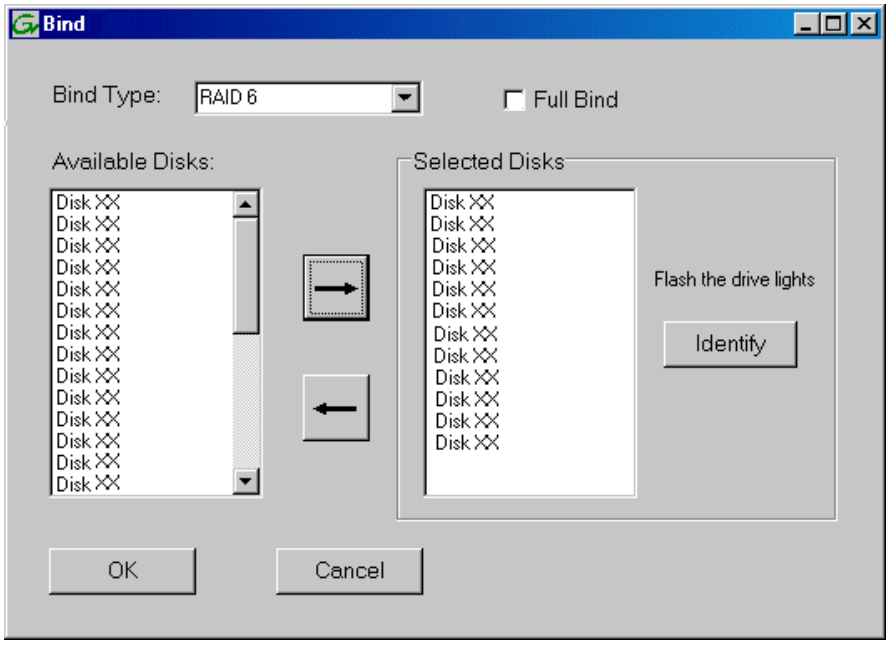
NL10R systems also store media files across both the primary RAID chassis and the optional Expansion chassis. In addition, metadata files and journal files are mixed in with the media files.

The RAID configuration is the same on all chassis. Each chassis contains SATA disks, which are bound as RAID 6 in a RANK of twelve disks. One twelve disk RANK fills one chassis.

2. To bind SATA disks for media file storage, do the following:

   a. Right-click the **Unbound** node for a controller, then select **Bind** in the context menu. (If the RAID chassis has two controllers, both controllers are represented by the single "Controller" node)

      The Bind dialog box opens showing all unbound disks for the controller listed in the Available Disk list.



b. Leave Full Bind unchecked. Refer to "About full/background bind" on page 455.

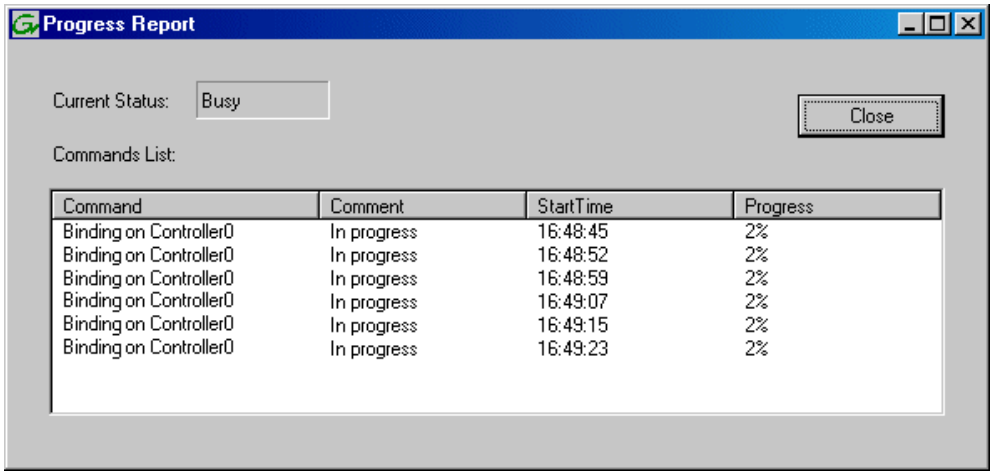
c. In the **Bind Type** drop down box, select **RAID 6**.

d. In the Available Disks box, select twelve contiguous disks at the top of the list. (TIP: Use 'shift-click' or 'control-click' to select disks.).

e. Click the add (arrow) button to add disks to the Selected Disks list.

NOTE: As an aid in identifying a disk module's physical location, select it in the Selected Disks list, then click* Identify Disks. *This causes the disk drive light to flash.

f. Click **OK** to close the Bind dialog box and begin the binding process. The Progress Report dialog box opens, showing the status of the binding process.



g. Close the Progress Report and repeat these steps for other unbound disks. If specified by your system design, you can bind some disks as Hot Spares, as explained in "Binding Hot Spare drives" on page 457. When you are done, if you did not bind any extra Hot Spares, you should have the following results:

   For a NL10 or a NL10R system, the disks in the primary RAID chassis and in optional Expansion chassis should be bound as RAID 6 RANKs, with twelve disks to a RANK.

h. Click **Close** in Progress Report window.

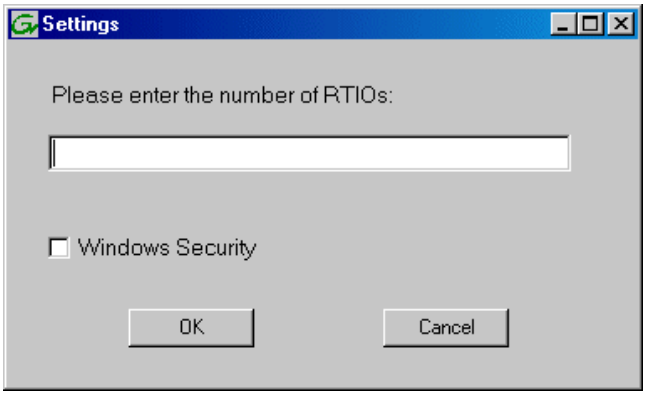
3. Restart the K2 Media Server.

NOTE: Make sure start up processes on the K2 Media Server are complete before proceeding.

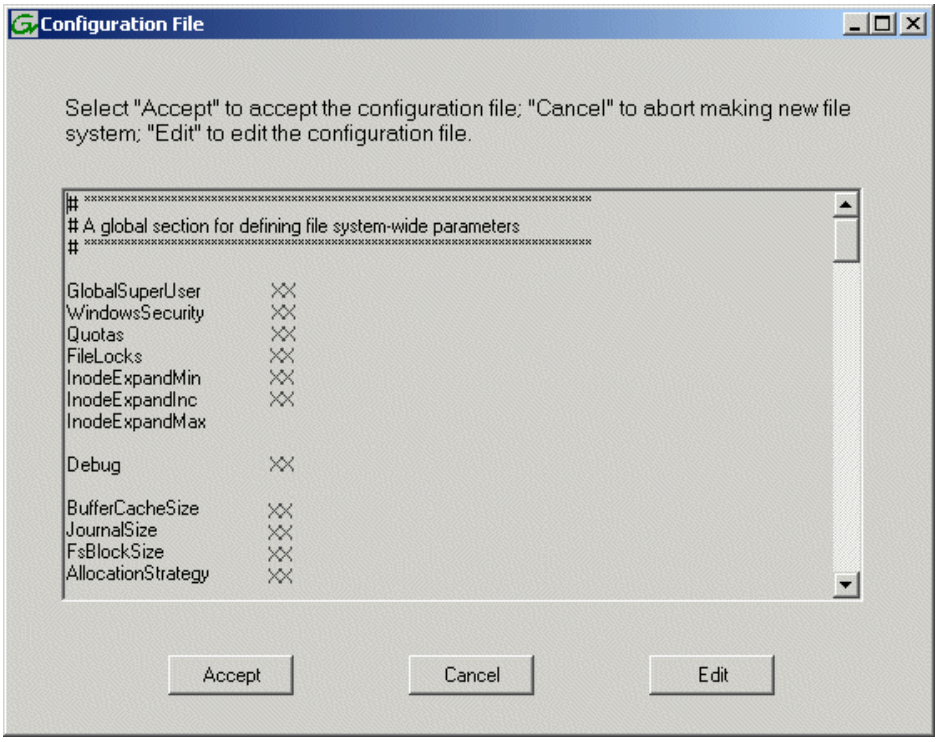
4. Continue with the next procedure "Creating a new file system".

Creating a new file system

1. In Storage Utility, click **Tools | Make New File System**. The Setting dialog box opens.



2. For a Nearline system, enter zero as the Real Time Input/Output (RTIO) rate.
3. Leave Windows Security unchecked.
4. Click **OK**. The Configuration File dialog box opens.



The configuration file for the media file system is displayed. You can verify media file system parameters by viewing this file. Do not edit this file. Click **Accept**.

A "…Please wait…" message box displays progress and a "…succeeded…" message confirms the process is complete.

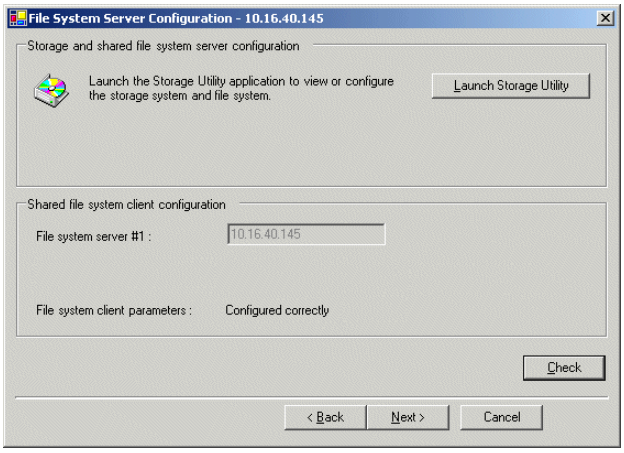
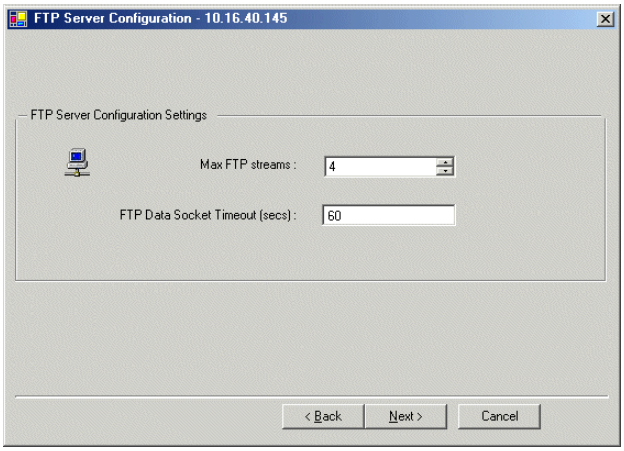
5. A message informs you that you must restart the K2 Media Server, however the restart at the end of the Configure K2 Server wizard suffices, so you do not need to restart now.
6. Close the Storage Utility.

NOTE: Do not attempt to bring the K2 SAN online until instructed to do so later in this chapter.

7. Continue with the next procedure.

Configuring the NH server - Part 2

1. Return to the Configure K2 Server page from which you launched Storage Utility and proceed as described in the following table:

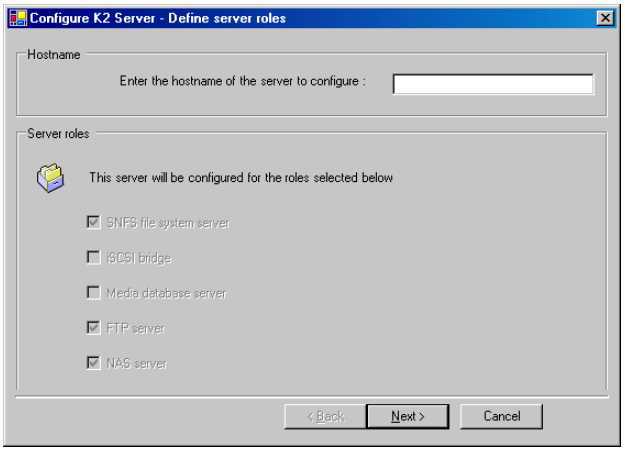
On this page…	Do this…
File System Server Configuration This page checks on the configuration of the server in one of its main roles as a file system server. The server also functions as a file system client, which is also checked from this page.	 Click **Check**. When the wizard reports that the configuration is correct, click **Next**. If you get a "The V: will not be available until this device is rebooted…" message, you can safely continue with this procedure and follow the instructions related to this message later in the procedure.
FTP Server Configuration This page appears only if the server has the role of FTP server.	 Do not modify these settings. Leave at default values of Max FTP streams = 4 and FTP Data Socket Timeout = 60. Only qualified Grass Valley personnel should specify other values, as these settings are intended for use only with custom systems designed by Grass Valley. Click **Next**
Completing the Configuration Wizard	Click **Finish**. The wizard closes. The server restarts. Wait until all startup processes have completed before continuing.

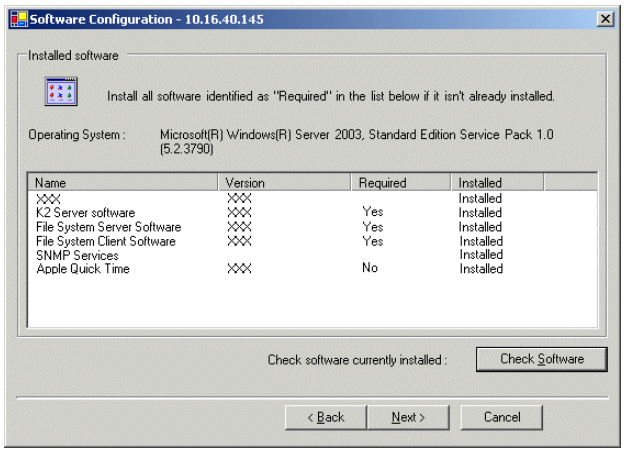
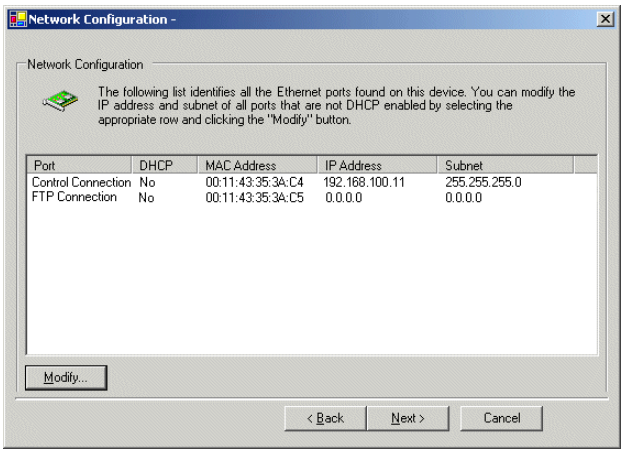
Configuring the second NH server for NL10R

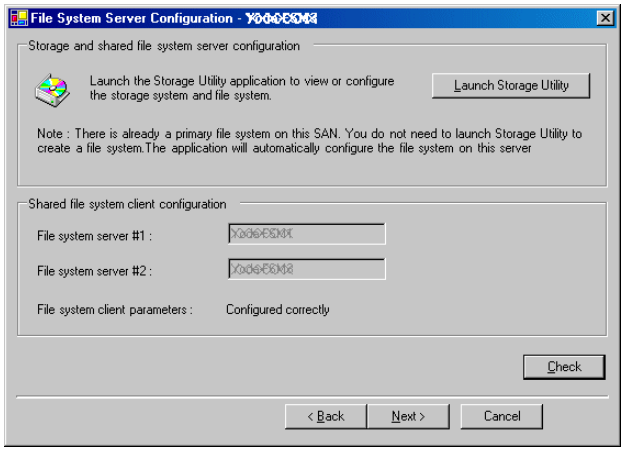
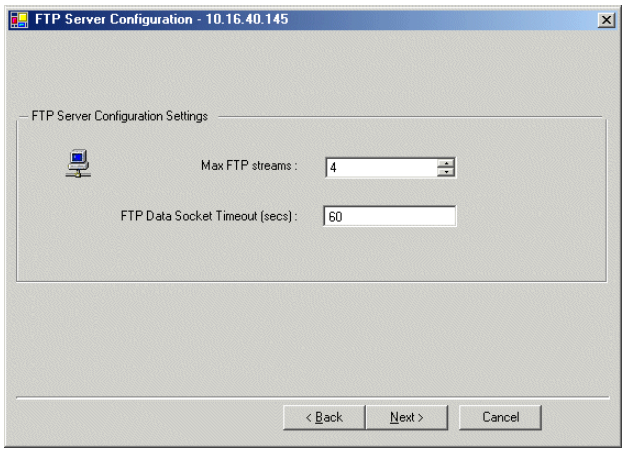
On NL10R systems, both NH K2 Media Servers are identical, with the exception that only one server can be the active media file system server at any time. For this reason the K2 System Configuration application embeds the configuration and start of the

media file system into the wizard when you configure the first NH K2 Media Server, as in the previous procedure. That server is now the acting media file system server. You can now configure the remaining server using the following procedure.

1. In the K2 System Configuration application tree view, select the K2 Media Server you are configuring.
2. Click the **Configure** button. The Configure K2 Server wizard opens. Follow the on-screen text to configure the server for a Nearline 10 K2 SAN, as described in the following table. Some screens require no input from you, as they are based on the configurations already completed on a previously configured K2 Media Server.

On this page...	Do this...
Define server roles	 Enter the name for theK2 Media Server, as currently configured on the machine. For Nearline server roles, selections are disabled. Leave **SNFS file system server**, **FTP server**, and **NAS server** selected. Click **Next**

On this page…	Do this…
Software Configuration This page checks for the software required to support the roles you selected on the previous page. ***NOTE: MPIO software is required on K2 Media Servers in the NL10R system and in other nearline redundant systems.***	 If software with *Yes* in the Required column reports as *Not Installed*, you must first install it on the K2 Media Server before continuing. After installing the software, click **Check Software**. When all required software reports as *Installed*, click **Next**.
Network Configuration This page displays the control network Ethernet port, and allows you to configure the FTP/ Streaming network Ethernet port.	 The top port is the port over which the K2 System Configuration application is communicating with the K2 Media Server. If correctly configured, it is already assigned the control network IP address, as displayed on this page. If the other port is not already configured correctly, select the other port and click **Modify**. A network configuration dialog box opens. Enter the FTP/Streaming IP address and the subnet mask and click **Apply**. Click **Next**.

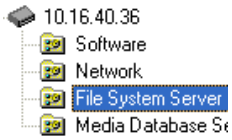
On this page…	Do this…
File System Server Configuration This page checks on the configuration of the K2 Media Server in one of its main roles as a file system server. The K2 Media Server also functions as a file system client, which is also checked from this page. It is not necessary to bind RANKs or create a file system, since those tasks were completed when you configured the first K2 Media Server.	 Click **Check**. Confirm a "… file copied…" message. When the wizard reports that the configuration check is successful, click **Next**. and **Yes** to confirm copying the file system configuration file to the server. If you get a "The V: will not be available until this device is rebooted…" message, you can safely continue with this procedure and follow the instructions related to this message later in the procedure.
FTP Server Configuration This page appears only if the server has the role of FTP server.	 Do not modify these settings. Leave at default values of Max FTP streams = 4 and FTP Data Socket Timeout = 60. Only qualified Grass Valley personnel should specify other values, as these settings are intended for use only with custom systems designed by Grass Valley. Click **Next**
Completing the Configuration Wizard	Click **Finish**. The wizard closes. The K2 Media Server restarts. Do not proceed until restart processes are finished.

NOTE: Multiple NH servers on a K2 SAN must be of the same type, either all NH1 or all NH1-10GE.

3. If you got a "The V: will not be available until this device is rebooted…" message

on the File System Server Configuration page, after the K2 Media Server restarts, do the following:

a. In the K2 System Configuration application tree view, under the K2 Media Server select the File System Server node.



The File System Server Configuration page appears.

b. Click **Check** and verify that the V: drive is shared. This is required for NAS server functionality.

4. Repeat this procedure for remaining NH K2 Media Servers, if any.

Next, configure K2 clients and/or other iSCSI clients on the K2 SAN.

Chapter 8

Configuring K2 clients on the K2 SAN

Work through the following topics to configure shared storage K2 clients on a K2 SAN:

- "About load balancing" on page 343
- "Determining K2 client bandwidth requirements" on page 344
- "Preparing the K2 SAN" on page 344
- "Adding K2 clients to the K2 SAN" on page 346
- "Assigning a K2 client to a different FTP server" on page 353
- "Basic operations for shared storage K2 clients" on page 354

About load balancing

When you purchase a K2 SAN to provide the shared storage for your K2 clients, your Grass Valley representative sizes the storage system based on your bandwidth requirements. These bandwidth requirements are based on how you intend to use the channels of your K2 clients. The bit rates, media formats, and ratio of record channels to play channels all effect your bandwidth requirements.

As you add your K2 clients to the K2 SAN, you must assign a bandwidth value to each K2 client. This value is based on your intended use of the channels of that K2 client. There is a page in the K2 System Configuration application on which you enter parameters such as channel count, bit rate, and track count per channel to calculate the bandwidth value for a K2 client. The K2 System Configuration application takes that bandwidth value and load balances it across the K2 SAN, so that the K2 client has adequate bandwidth for its intended media access operations. When the bandwidth values you enter in the K2 System Configuration application match the overall bandwidth requirements upon which your K2 shared storage is sized, you have sufficient bandwidth for all your K2 clients.

Load balancing is important for the K2 SAN because of the relative bandwidth constraints inherent in Gigabit Ethernet and the iSCSI protocol. The K2 SAN uses a mechanism called a TCP/IP Offload Engine (TOE) as a bridge across which all media must travel between the iSCSI/Gigabit world and the SCSI/Fibre Channel world. Each TOE has a limit as to how much bandwidth it can handle.

Depending on the level of your K2 SAN, you have one or more TOEs available for load balancing. A TOE is hosted by the iSCSI interface board, which also provides the Gigabit Ethernet connection.

As you configure your K2 SAN, the K2 System Configuration application assigns a K2 client to a specific TOE and keeps track of the bandwidth so subscribed to each TOE. A single K2 client can only subscribe to a single TOE. However, a single TOE can have multiple K2 clients subscribed to it. The K2 System Configuration application assigns K2 clients to TOEs, filling each TOE until its subscription is full.

You should add your highest bandwidth K2 clients first to the K2 SAN, so that the K2 System Configuration application can distribute them equally across the available TOEs. Then when you add the lower bandwidth K2 clients, the K2 System Configuration application can add them to the TOEs with bandwidth remaining.

It is important to realize that this load balancing does not adjust itself dynamically. If you change your intended use of a K2 client and increase its bandwidth requirements, you risk oversubscribing the TOE to which that K2 client is assigned. If this happens, media access fails on all the clients assigned to the TOE.

To prevent oversubscription problems you should load balance your K2 SAN again if you must increase the bandwidth requirements of a K2 client. Contact your Grass Valley representative for help with load balancing. To stay under the total bandwidth limit of the K2 SAN, you might have to decrease the bandwidth requirements of another K2 client. In any case you must again load balance.

The K2 System Configuration application provides a report of iSCSI assignments, which lists for each TOE the iSCSI clients assigned and their bandwidth subscription.

Determining K2 client bandwidth requirements

The K2 System Configuration application provides a page in the Configure K2 Client wizard that calculates the bandwidth requirement for a K2 client. On this page you enter information regarding the channel count, bit rate, and tracks per channel for your intended use of the K2 client. The page then calculates the bandwidth requirement and make it available for load balancing.

Preparing the K2 SAN

The following K2 SAN preparations are required to support K2 clients:

- All K2 Media Servers and/or K2 RAID storage devices must be installed and cabled.
- The control network must be operational with K2 devices communicating. At the command prompt, use the *ping* command to verify.
- For non-redundant K2 SANs, the media network must be operational. You can check this with the K2 System Configuration application.
- For redundant K2 SANs, media network A and media network B must be operational. You can check this with the K2 System Configuration application.
- K2 RAID devices must have disks bound and be configured as required for operation on the K2 SAN.
- K2 Media Servers must be configured such that an operational media file system is present.
- K2 Ethernet switches must be configured and have V-LANs set up.
- The SAN to which you are adding your K2 clients must be defined with the appropriate number and type of clients. In other words, in the K2 System Configuration application tree view you should see the K2 clients you are about to add represented as unconfigured devices.

NOTE: Do not run Storage Utility on a shared storage K2 client. For shared storage, run Storage Utility only via the K2 System Configuration application.

Preparing K2 clients

Do the following to each K2 client in preparation for its addition to the K2 SAN:

1. If you have not already done so, rack, cable, and provide power.
2. Power on the K2 client and log on to Windows as Windows administrator, which is username *Administrator* and password *adminK2* by default. Ignore startup messages referring to a missing media storage system.
3. Assign a control network IP address and configure other network settings for the K2 client. Use SiteConfig for this step. The two control ports are teamed, so even if are making a connection to port 1 only, you must configure network settings for the Control Team.
4. Optionally, use SiteConfig to configure media (iSCSI) networks at this time. You

can use either SiteConfig or K2Config to configure media networks. If you use SiteConfig, then you must open the relevant page in K2Config so that K2Config reads the settings in from the K2 client. This also allows you to verify the media network configuration in the context of K2Config.

5. Configure SNMP properties so the trap destination points to the NetCentral server PC. Use standard Windows procedures.
6. If the K2 client connects to the K2 SAN with a redundant Ethernet (iSCSI) fabric, install Multi-Path I/O software. Refer to the next procedure "Installing Multi-Path I/O Software".
7. Copy the K2 SAN *hosts* file onto the K2 client. You can use SiteConfig for this task.

Installing Multi-Path I/O Software

The following procedure is required for shared storage K2 clients that have their Gigabit Media ports connected to the two iSCSI Media networks. This configuration is used for redundant K2 SANs.

The installation files for the Multi-Path I/O software are copied on to the K2 client when the K2 Client software is installed.

To install Multi-Path I/O software, do the following:

1. Access the Windows desktop on the K2 system. You can do this locally with a connected keyboard, mouse, and monitor or remotely via the Windows Remote Desktop Connection.
2. Stop all media access. If AppCenter is open, close it.
3. Click **Start | Run**, type `cmd` and press **Enter**. The MS-DOS command prompt window opens.
4. From the command prompt, navigate to the *C:\profile\mpio* directory.
5. Type the following at the command prompt:

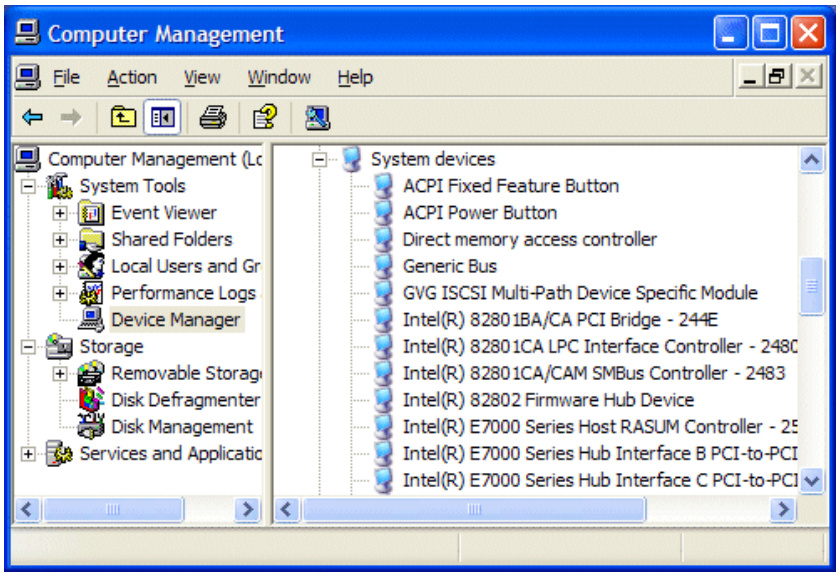
   ```
   gdsminstall.exe -i c:\profile\mpio gdsm.inf Root\GDSM
   ```

6. Press **Enter**. The software is installed. The command prompt window reports the following:

   ```
   Pre-Installing the Multi-Path Adapter Filter...
   Success

   Installing the Multi-Path Bus Driver...
   Success

   Installing the Device Specific Module...
   Success
   ```

```
Installing the Multi-Path Device Driver...
Success

Restarting all SCSI adapters...
Success (but need a reboot)
```

7. Restart the K2 client.
8. After restart, to verify that the software is installed, on the Windows desktop right-click **My Computer** and select **Manage**. The Computer Management window opens.



9. In the left pane select **Device Manager**.
10. In the right pane open the **System devices** node and verify that **GVG ISCSI Multi-Path Device Specific Module** is listed.

Adding K2 clients to the K2 SAN

For each of your K2 clients, use the procedures in this section to configure for operation using the K2 SAN as the shared media storage.

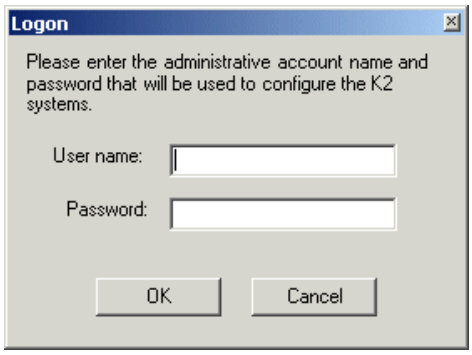
Before beginning with these procedures, make sure the K2 SAN and the K2 clients are prepared. Cabling must be complete, K2 clients must be communicating on the control network, and the K2 SAN must have a viable media file system.

Configuring a K2 client for the K2 Storage System

Configure a K2 client as follows:

1. On the K2 configuration control point PC, open the K2 System Configuration

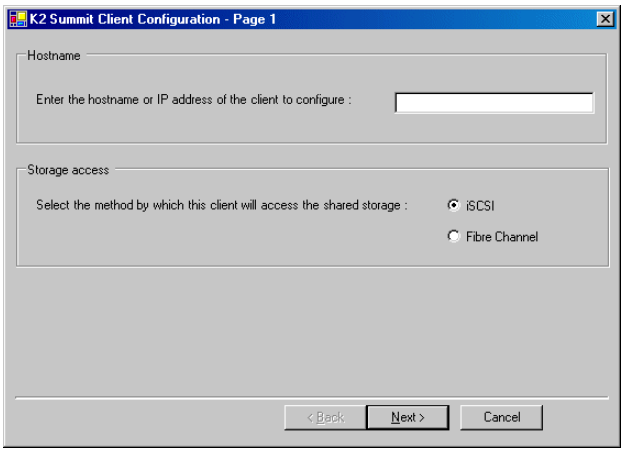
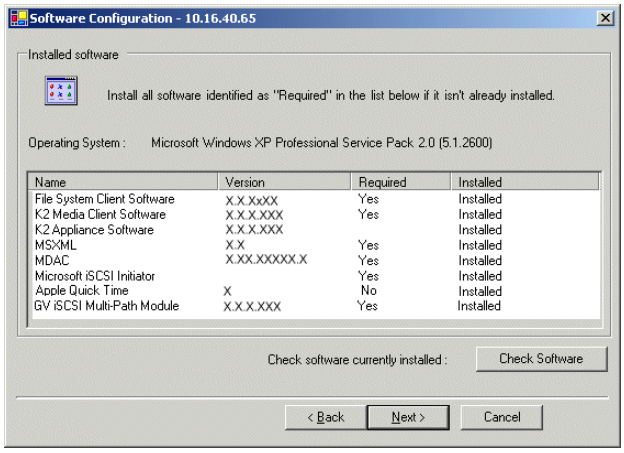
application. A login dialog box opens.

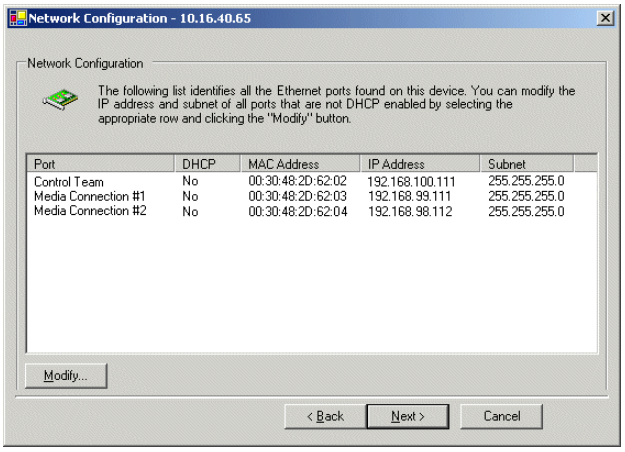


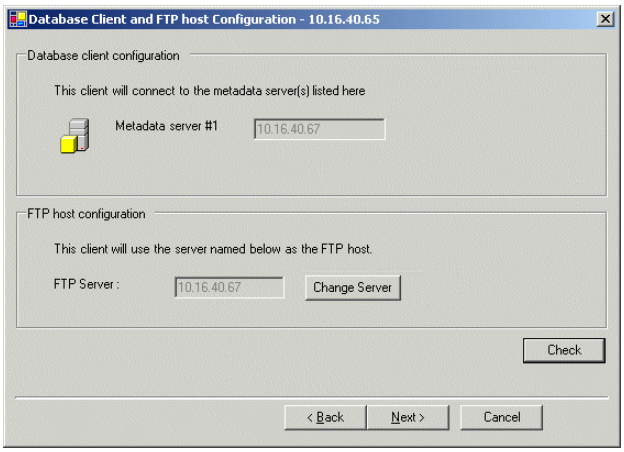
2. Log in to the K2 System Configuration application with the correct administrator account. By default this as follows:
   - Username: Administrator
   - Password: adminK2
3. In the K2 System Configuration application tree view, verify that the K2 SAN is correctly defined.You should see the correct number of K2 clients. If the correct number of K2 clients is not currently added to the K2 SAN, you can add or remove clients now (before clients are configured), as follows:
   - To add a client, select the top node of the storage system and click the **Add Device** button
   - To remove a client, select an unconfigured K2 client and click the **Remove** button.
4. Select the top K2 client.
5. Click the **Configure** button.

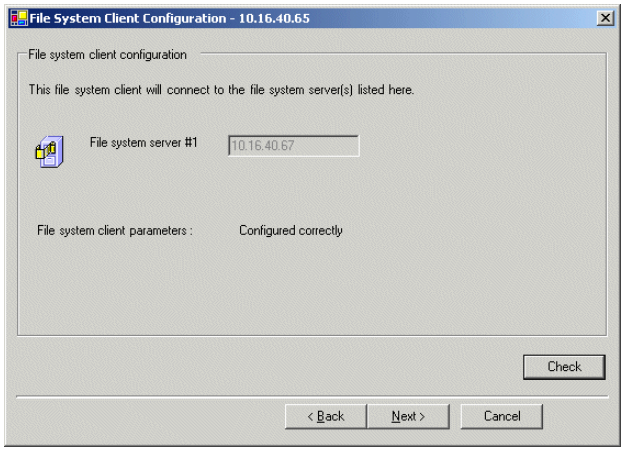
The Configuration wizard opens. Follow the on-screen text as described in the following table.:

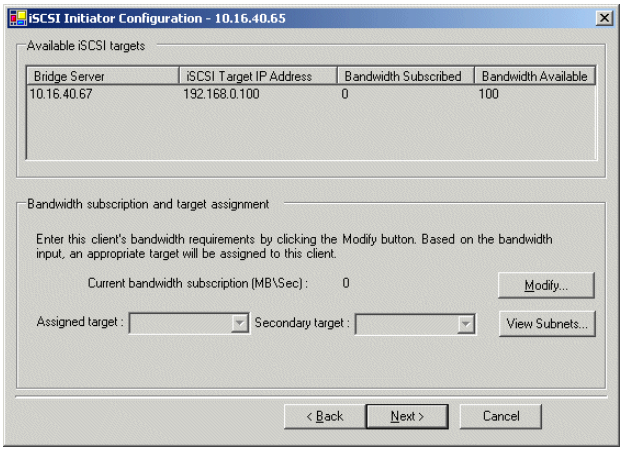
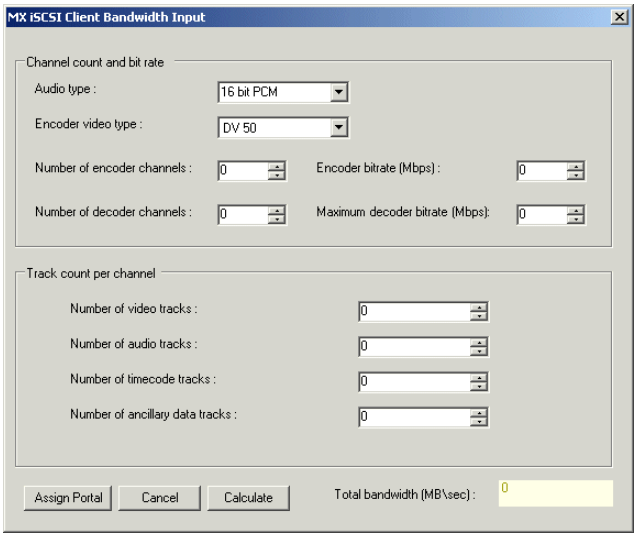
NOTE: If your system has a large number of K2 clients and other iSCSI clients, you are prompted to restart the K2 Media Server when you configure clients and cross the following thresholds: 64 clients; 80 clients; 96 clients.

On this page...	Do this...
Page 1	 Enter the IP address or network name for a K2 client, as currently configured on the K2 client. You should configure your highest bandwidth K2 clients first, as this ensures load balancing is correct. For the Storage Access settings, leave **iSCSI** selected. Click **Next**
Software Configuration This page checks the K2 client for required software. ***NOTE: Multi-Path I/O software must be installed on K2 clients connected to a redundant K2 SAN.***	 If software with *Yes* in the Required column reports as *Not Installed*, you must first install it on the K2 client before continuing. After installing the software, click **Check Software**. When all required software reports as *Installed*, click **Next**.

On this page…	Do this…
Network Configuration This page configures both control and media (iSCSI) network connections. The K2 client actually has four Gigabit Ethernet ports, but two ports are configured as a teamed pair (the control team), while the other two ports (the media connections) are individual. The teamed pair shares an IP address and appears on this page as a single port.	 The top port is the port (teamed) over which the K2 System Configuration application is communicating with the K2 client. If correctly configured, it is already assigned the control network IP address, which is displayed in the window. Select **Media Connection #1** and click **Modify**. A network configuration dialog box opens. Verify or configure as follows: • If a non-redundant K2 SAN, verify or enter the media network IP address. Also enter the subnet mask. • If a redundant K2 SAN, verify or enter an IP address for the “A” media (iSCSI) network. Also enter the subnet mask. If a non-redundant K2 SAN, do not configure Media Connection #2. If a redundant K2 SAN, select **Media Connection #2** and click **Modify**. A network configuration dialog box opens. Verify or enter an IP address for the “B” media (iSCSI) network. Also verify or enter the subnet mask. Click **Next**.

On this page…	Do this…
Database Client Configuration This page connects the K2 client as a media database client to the K2 Media Server taking the role of metadata (database) server. If there are redundant K2 Media Servers, both are listed on this page as database servers.	 Verify that the K2 client is connecting to the correct K2 Media Server or Servers, as follows: • For Levels 2, 10, 20, and 30, the client connects to the only server. • For Levels 2R, 10R, 20R,and 30R, the client connects to server A as database server 1 and sever B as database server 2. • For Level 3 and Level 35, the client connects to server 1. • For Level 3R and Level 35R, the client connects to server 1A as database server 1 and sever 1B as database server 2. If there are multiple FTP servers (such as the optional NH servers), the K2 System Configuration application automatically assigns the K2 client to a FTP server to provide optimum FTP bandwidth across the system. Do not attempt to change the assignment to a different FTP server as part of the initial configuration. Click **Check**. When the wizard reports that the configuration check is successful, click **Next**.

On this page…	Do this…
File System Client Configuration This page connects the K2 client as a media file system client to the K2 Media Server taking the role of media file system server. If there are redundant K2 Media Servers, both are listed on this page as file system servers.	 Verify that the K2 client is connecting to the correct K2 Media Server or Servers, as follows: • For Levels 2, 10, 20, and 30, the client connects to the only server. • For Levels 2R, 10R, 20R, and 30R, the client connects to server A as file system server 1 and server B as file system server 2. • For Level 3 and 35, the client connects to server 1. • For Level 3R and 35R, the client connects to server 1A as file system server 1 and server 1B as file system server 2. Click **Check**. When the wizard reports that the configuration check is successful, click **Next**.

On this page…	Do this…
iSCSI Initiator Configuration This page load balances the K2client's iSCSI connection to the K2 SAN. The iSCSI adapters on your K2 Media Server or servers are listed here as iSCSI targets. For pre-defined K2 SAN levels, the K2 System Configuration application determines the iSCSI target to which each K2 client subscribes, based on the bandwidth values that you enter. This enforces policies by which each K2 client has sufficient bandwidth for its intended use and no individual iSCSI target is oversubscribed. For custom K2 SANs (Level 4 or 40), qualified system designers can view subnets to help assign iSCSI targets.	 Click **Modify**. The Bandwidth Input dialog box opens.  Enter the channel count, bit rate, and track count per channel information according to your intended use of the K2 client. Click **Calculate** and verify that the total bandwidth is correct according to the system design for your shared storage system. You should be configuring your highest bandwidth K2 clients first, to ensure that they are distributed equally across iSCSI targets. To verify this, while you are on this page for your first K2 client, you can temporarily enter information and calculate the bandwidth for each of your K2 clients and compare bandwidth values. Click **Assign Portal**, then **OK** to confirm. If you have a redundant K2 SAN, the K2 System Configuration application makes the appropriate assignment to the redundant server, as reported in the Secondary target box. Click **Next**.
Completing the Configuration Wizard	Click **Finish**. The K2 client restarts and the wizard closes.

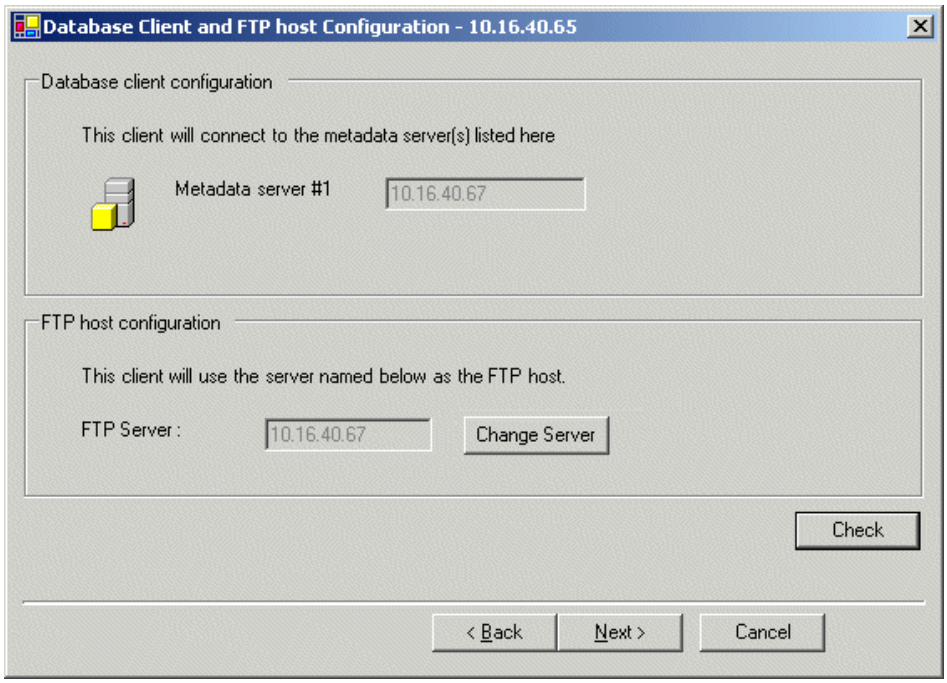
6. Repeat this procedure for each of your K2 clients.

Assigning a K2 client to a different FTP server

If your K2 SAN has multiple K2 Media Servers that take the role of FTP server, such as when you have one or more options NH servers, you can change the FTP assignment of a K2 client so that it uses a different FTP server. This is helpful if one of the FTP servers requires service work or otherwise becomes unavailable. In this case, you might want a K2 client assigned to that FTP server to use a different FTP server, so that its FTP access can continue.

To change the FTP assignment of a K2 client, do the following:

1. From the Control Point PC, open the K2 System Configuration application.
2. For each K2 client, open the Media Database page.



3. Identify the K2 clients assigned to the FTP server that is about to become unavailable.
4. For those K2 clients, click **Change Server**.

   A message box appears that asks if you are sure you want to change the FTP server.
5. In the message box, click **Yes**.

   The K2 System Configuration application finds the FTP server with the most available FTP bandwidth and re-assigns the K2 client to that FTP server.
6. On each K2 client for which you changed the FTP server assignment, restart AppCenter. This puts the change into effect, so that the next time the K2 client needs FTP access, it uses the newly assigned FTP server.

Basic operations for shared storage K2 clients

Use the following procedures as you operate your K2 clients with the K2 SAN:

- "Power on/off procedures"
- "Taking a K2 client offline"

Power on/off procedures

As long as the K2 SAN remains operational, you can use the standard power on and power off procedures for K2 clients. When a K2 client goes offline or comes online it does not disrupt the K2 SAN.

However, if you are powering down or otherwise taking the K2 SAN itself out of service, you must follow the correct SAN power down procedure. You must first stop all media access on your K2 clients to ensure that they do not cause error conditions. You can power off the K2 clients or take them offline using the K2 System Configuration application.

When powering up the K2 SAN, power on the K2 clients last so that they can verify their media storage as part of their start up processes.

Taking a K2 client offline

1. Stop all media operations on the device. This includes, play, record, and transfer operations.
2. Shut down the K2 client.

Chapter 9

Operating the K2 SAN

Use the following procedures as you work on your K2 level SAN:

- "Power on and power off procedures"
- "FTP on K2 SANs"
- "Failover behaviors"

For other procedures refer to Chapter 12, *Administering and maintaining the K2 SAN*.

Power on and power off procedures

Use the following procedures to do an orderly power off and power on of the complete K2 SAN.

- "K2 SAN power-off procedure"
- "Level 10, 20, 30, 35 system power-on procedure"
- "Level 10R, 20R, 30R, 35R system power-on procedure"
- "Nearline 10 system power-on procedure"
- "Powering on Level 10, 20, 30, and Nearline 10 RAID storage devices"
- "Powering on the HP ProCurve switch"
- "Powering on the control point PC"

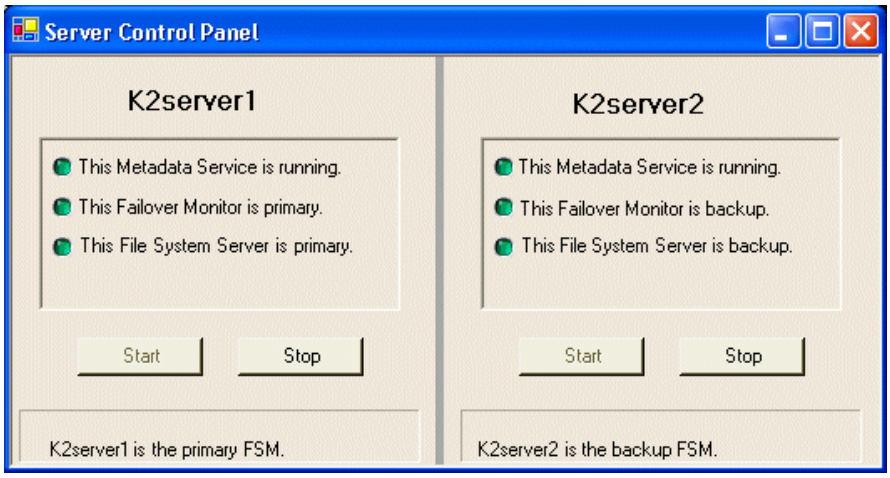
K2 SAN power-off procedure

Use the following sequence to power-off the K2 SAN.

1. Stop all media access as follows:
   - For nearline systems, stop all FTP streams or other media operations.
   - For online systems, power-off all K2 clients or other iSCSI clients.
2. Shut down K2 Media Servers as follows:
   - For nearline systems, shut down all K2 Media Servers.
   - For online non- redundant systems, shut down the K2 Media server that is the media file system and metadata server.
   - For online redundant systems, manage redundant server shutdown as follows:

   a. From the K2 System Configuration application, in the tree view select the name of the K2 SAN, which is the top node of the storage system tree. Then click the **Server Control Panel** button.

The Server Control Panel opens.



b. Take note of which is the primary K2 Media Server and which is the backup K2 Media Server.

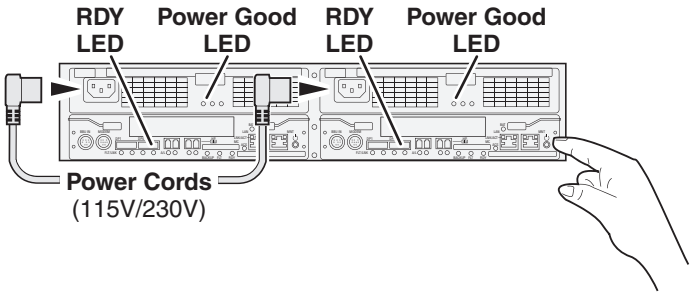
c. For the backup K2 Media Server, click **Stop**. This takes the server out of service.

d. Shut down the backup K2 Media Server, if it does not shut down automatically.

e. For the primary K2 Media Server, click **Stop**. This takes the server out of service.

f. Shut down the primary K2 Media Server, if it does not shut down automatically.

3. Shut down any remaining K2 Media Servers, such as NH FTP servers.
4. On the primary RAID chassis controller, identify the RDY LED. It blinks at a rate of 1 blink per second during normal operation.

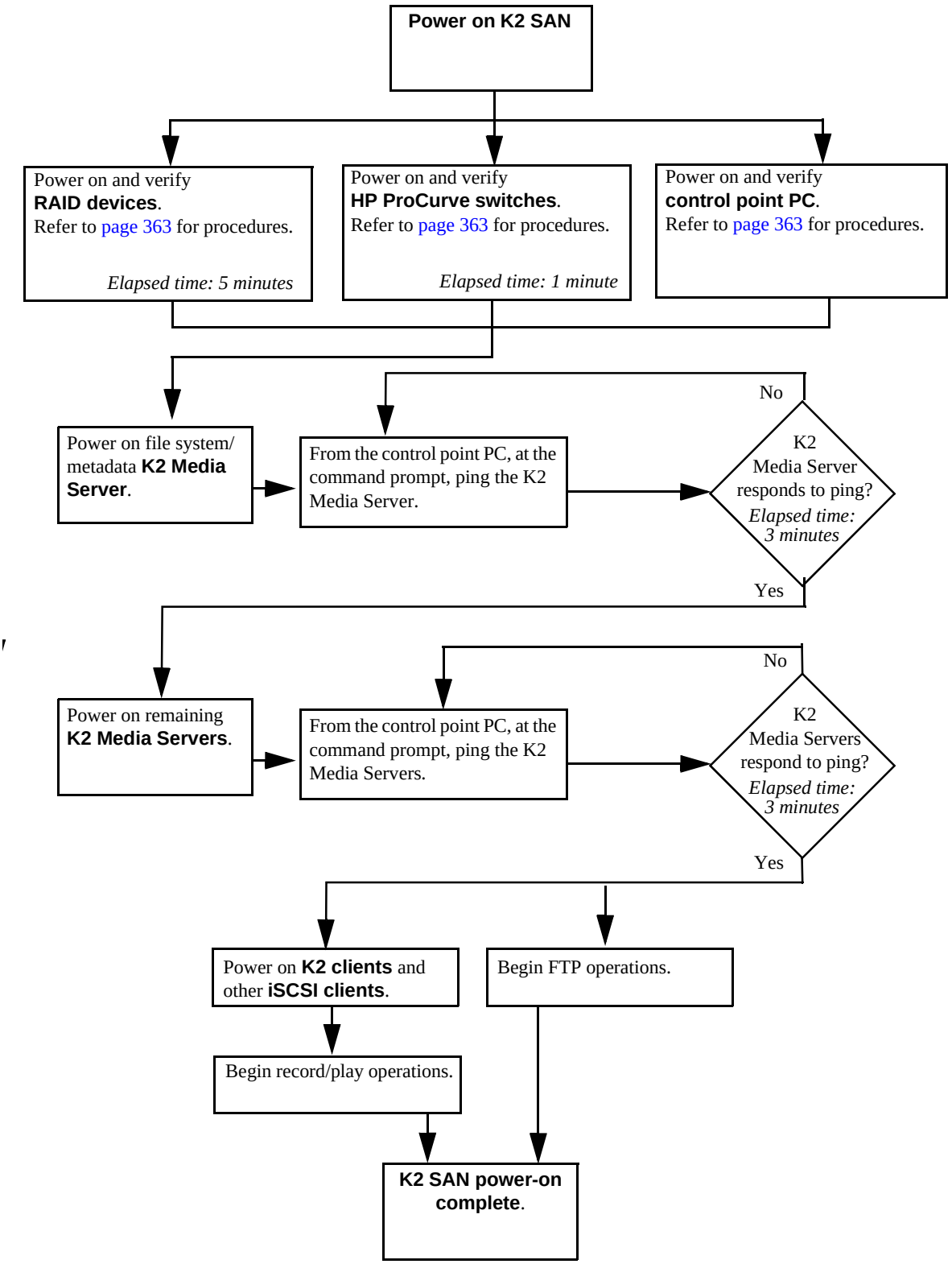


5. Press and hold down the power button on a RAID controller. If you have two controllers, you can press the power button on either RAID controller 0 or RAID controller 1.
6. Release the power button in about 5 seconds, when the RDY LED blinks more quickly, at a rate of about 2 blinks per second. Do not hold down the power button for longer than 15 seconds.

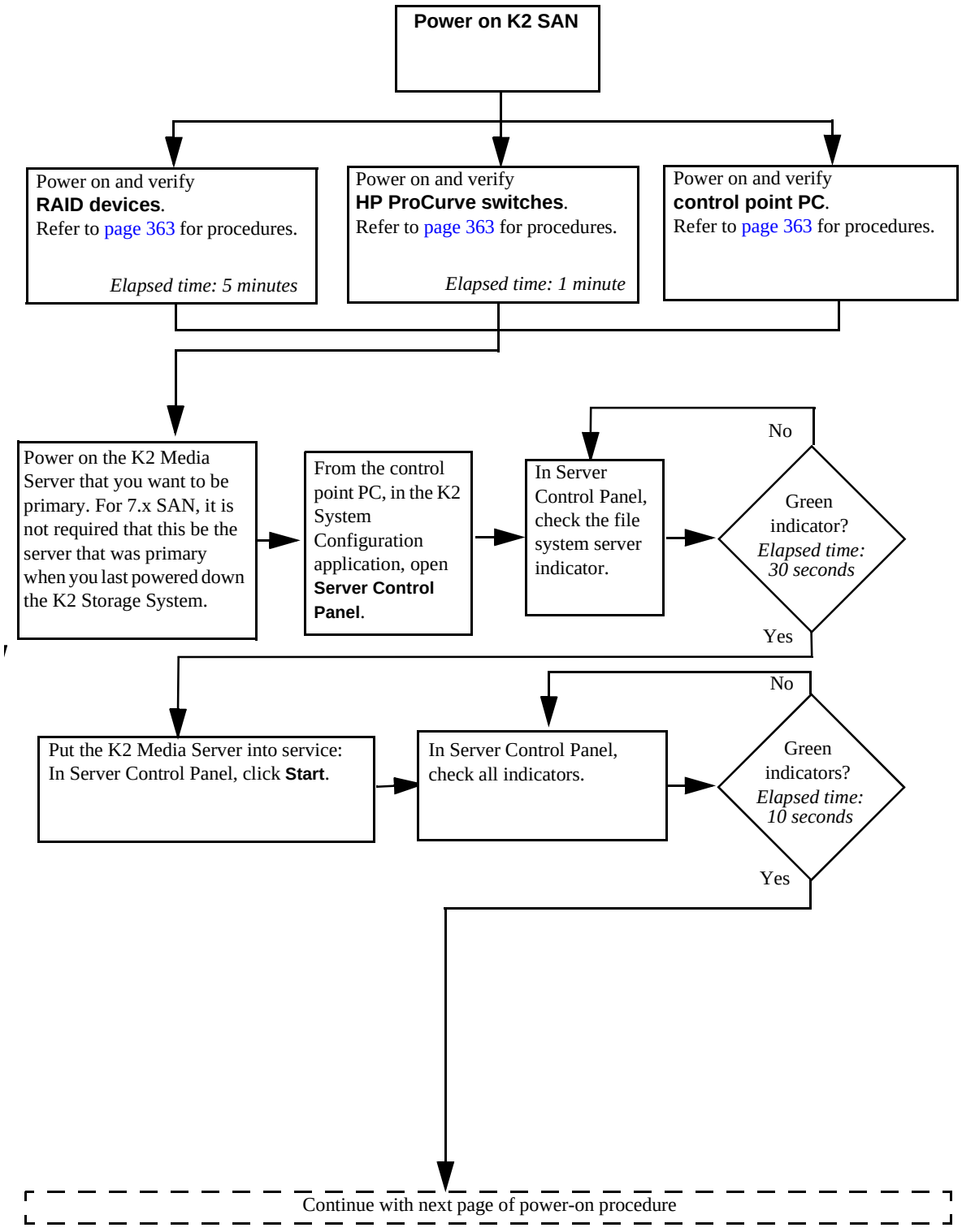
   The power button on the RAID controller turns off power for the primary RAID chassis and any connected Expansion chassis. Power-off normally occurs within 20 seconds and is indicated when LEDs other than those on the power supplies go off and the fans stop rotating.

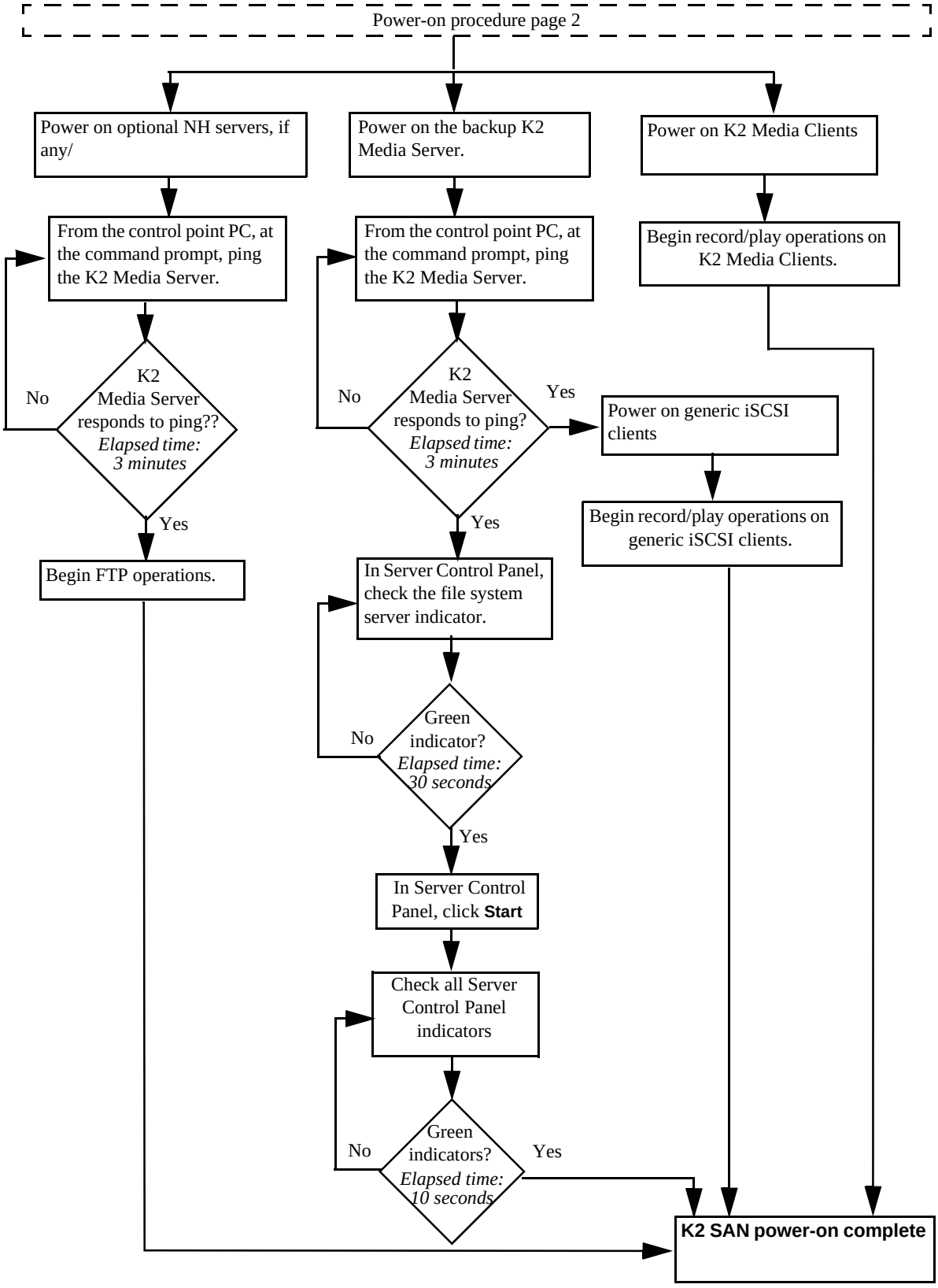
7. Wait for RAID power-off to complete before proceeding.
8. Power-off all Ethernet switches.
9. Power-off the control point PC and/or the NetCentral server PC, if necessary.

Level 10, 20, 30, 35 system power-on procedure

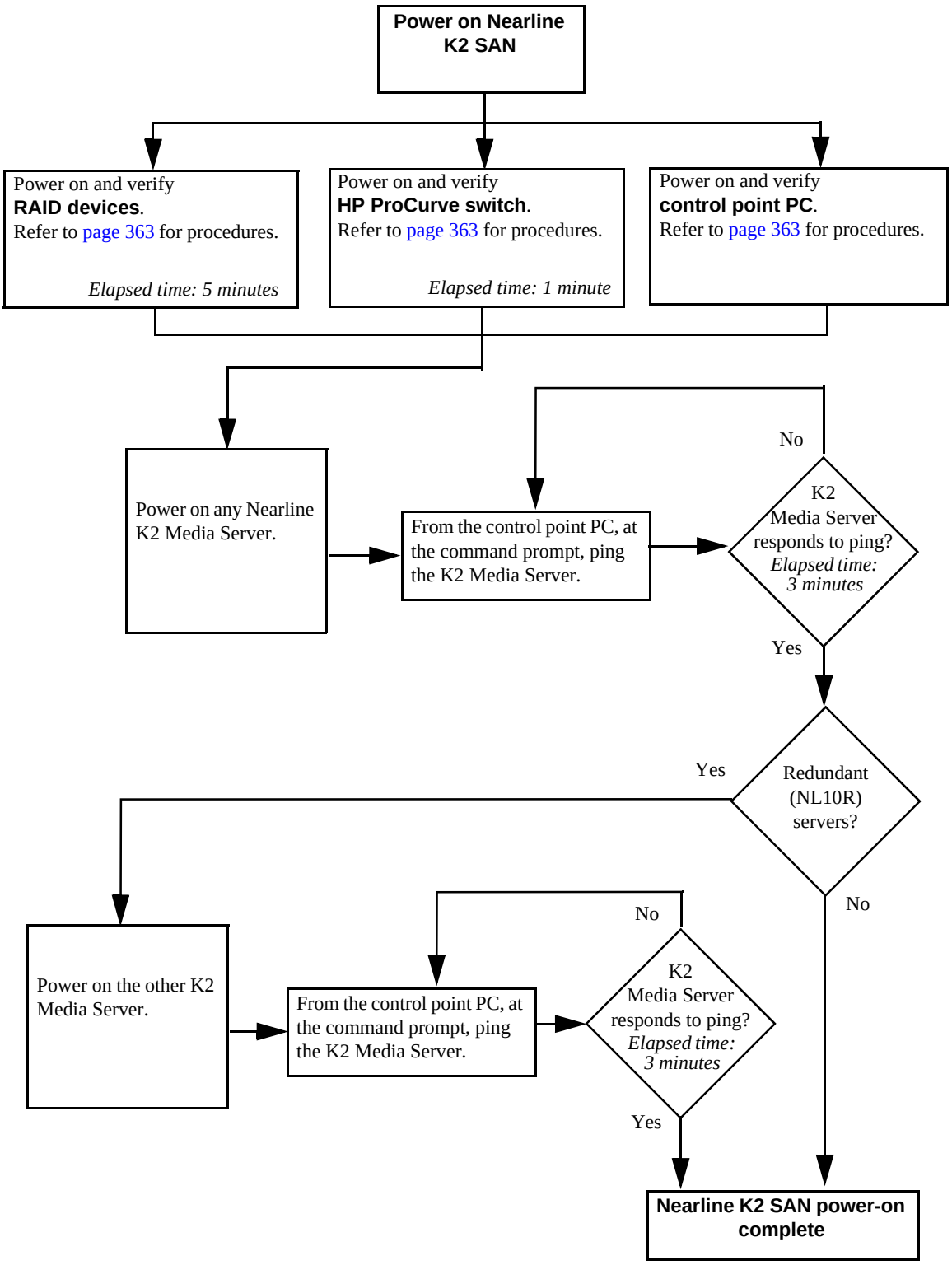


Level 10R, 20R, 30R, 35R system power-on procedure




Power-on procedure page 2
Power on optional NH servers, if any/
Power on the backup K2 Media Server.
Power on K2 Media Clients
From the control point PC, at the command prompt, ping the K2 Media Server.
From the control point PC, at the command prompt, ping the K2 Media Server.
Begin record/play operations on K2 Media Clients.
K2 Media Server responds to ping??
Elapsed time: 3 minutes
No
Yes
K2 Media Server responds to ping?
Elapsed time: 3 minutes
No
Yes
Power on generic iSCSI clients
Begin FTP operations.
In Server Control Panel, check the file system server indicator.
Begin record/play operations on generic iSCSI clients.
Green indicator?
Elapsed time: 30 seconds
No
Yes
In Server Control Panel, click Start
Check all Server Control Panel indicators
Green indicators?
Elapsed time: 10 seconds
No
Yes
K2 SAN power-on complete

Nearline 10 system power-on procedure



Powering on Level 10, 20, 30, and Nearline 10 RAID storage devices

Use the following procedure to power on and verify proper operation of RAID storage devices.

Powering on the HP ProCurve switch

Use the following procedure to power on and verify proper operation of the HP ProCurve switch.

1. Power up the switch.
2. Watch LEDs to verify proper operation. The diagnostic self test LED Behavior is as follows:
   - Initially, all the status, LED Mode and port LEDs are on for most of the duration of the test.
   - Most of the LEDs go off and then may come on again during phases of the self test. For the duration of the self test, the Test LED stays on.

   If the ports are connected to active network devices, the LEDs behave according to the LED Mode selected. In the default view mode (Link), the LEDs should be on.
   - If the ports are connected to active network devices, the LEDs behave according to the LED Mode selected. In the default view mode (Link), the LEDs should be on.
   - If the ports are not connected to active network devices, the LEDs will stay off.

Powering on the control point PC

Use the following procedure to power on K2 SAN's control point PC and verify proper operation during power up of the system.

1. Power up and log on to the PC using standard Windows procedures.
2. Start and log on to NetCentral.
3. NetCentral reports devices as offline. As each device of the K2 SAN is powered on, check NetCentral to verify the device's status

FTP on K2 SANs

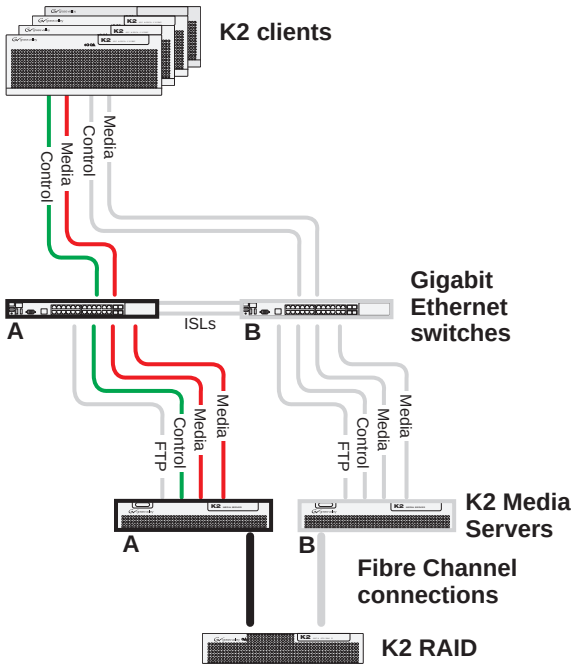
Refer to the *K2 System Guide* for FTP information.

Failover behaviors

If a fault occurs and one of the failover mechanisms is triggered, an online redundant iSCSI K2 SAN behaves as explained in the following sections.

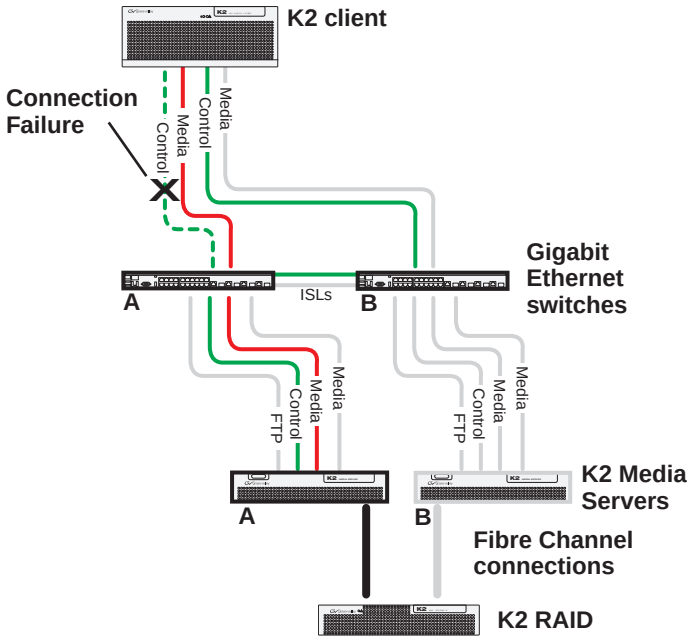
The diagrams that follow are representative of a generic redundant K2 SAN. Some details, such as the number of media connections, might not be the same as your K2 SAN. These diagrams illustrate the media (iSCSI) and control paths as they interact with the redundant K2 Media Servers in their role of media file system/metadata server and iSCSI bridge. Interactions of FTP traffic and/or paths involving K2 Media Servers with other roles are not illustrated.

Pre-failover behavior



The system operates initially with both media and control traffic on GigE switch “A” and K2 Media Server “A”. Media (iSCSI) traffic is using media network “A”. The iSCSI adapters (TOEs) on the “A” K2 Media Server provide access to the Fibre Channel connected RAID storage. K2 Media Server “A” is the media file system/metadata server.

Control team failover behavior



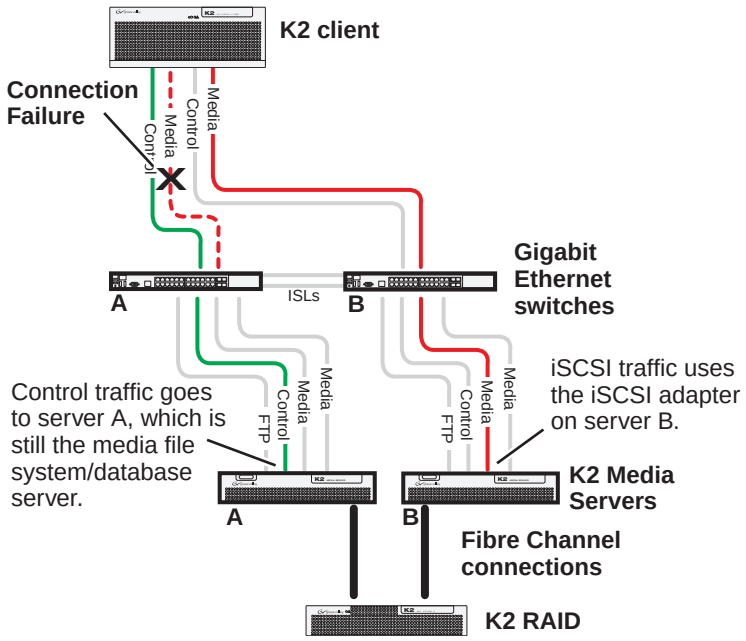
If the following system connection fails to respond to network communication:

- The control connection between a K2 client and GigE switch “A”.

Then the following failover behavior occurs:

1. The control team on the K2 client fails over and communication begins on the other control port.
2. The control communication finds a path through GigE “B” switch and across an ISL to GigE switch “A” to reach the same control port on the same K2 Media Server.
3. Media (iSCSI) traffic keeps using the same path.
4. K2 Media Server “A” is still the media file system/metadata server. The media file system (SNFS) and media database do not fail over.
5. The other K2 clients (not affected by the connection failure) keep using the same paths for media and control, as in the previous diagram “Pre-failover behavior”.

K2 client media (iSCSI) connection failover behavior



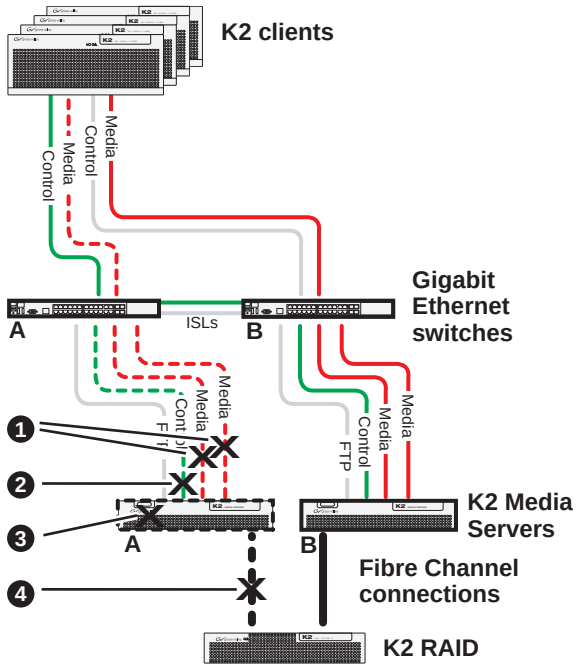
If the following system connection fails to respond to network communication:

- Media (iSCSI) network “A” connection between a K2 client and the GigE switch.

Then the following failover behavior occurs:

1. The K2 client drops communication on its “A” media port and begins using its “B” media port and the “B” media (iSCSI) network. The iSCSI adapter (TOE) on the “B” K2 Media Server provides access to the Fibre Channel connected RAID storage.
2. Control traffic keeps using the same path to K2 Media Server “A”.
3. K2 Media Server “A” is still the media file system/metadata server. The media file system (SNFS) and media database do not fail over.
4. The other K2 clients (not affected by the component failure) keep using the same paths for media and control, as in the previous diagram “Pre-failover behavior”. This means the K2 clients unaffected by the failover are using the iSCSI adapter (TOE) on the “A” K2 Media Server to provide access to the Fibre Channel connected RAID storage, while at the same time the affected K2 clients are using the iSCSI adapter (TOE) on the “B” K2 Media Server to provide access to the Fibre Channel connected RAID storage. In this case both RAID controller are simultaneously providing disk access.

K2 Media Server failover behavior

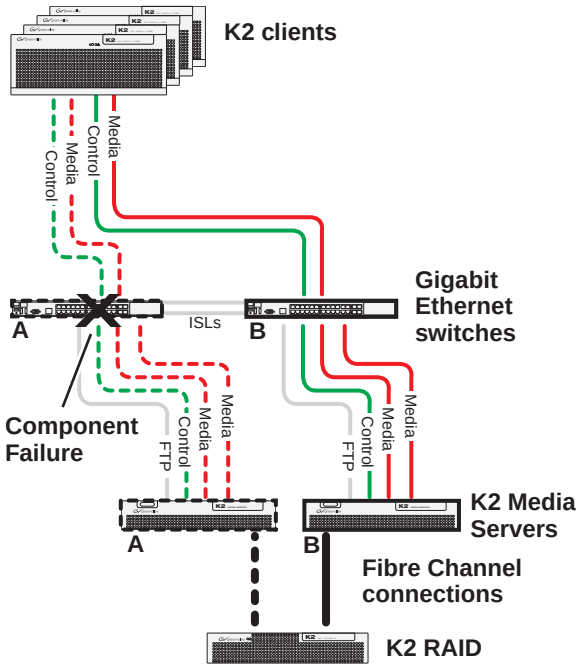


If the following system connection or component fails to respond to network communication:

Then the following failover behavior occurs:

1. The media file system (SNFS) and media database on K2 Media Server “A” fail over and K2 Media Server “B” becomes the active media file system/metadata server.
2. All K2 clients drop communication on the “A” media port and begin using the “B” media port, finding a path through GigE switch “B” to K2 Media Server “B”. All K2 clients use an iSCSI adapter (TOE) on the “B” K2 Media Server to provide access to the Fibre Channel connected RAID storage.
3. All K2 clients keep communicating on the same control port, finding a new path through GigE switch “A” and across an ISL to GigE switch “B” to reach K2 Media Server “B”.

K2 Media Server failover with Control team failover behavior



If the following system component fails to respond to system communication:

- The “A” GigE switch

Then the following failover behavior occurs:

1. The media file system (SNFS) and media database on K2 Media Server “A” fail over and K2 Media Server “B” becomes the active media file system/metadata server.
2. All K2 clients drop communication on the “A” media port and begin using the “B” media port, finding a path through GigE switch “B” to K2 Media Server “B”. All K2 clients use an iSCSI adapter (TOE) on the “B” K2 Media Server to provide access to the Fibre Channel connected RAID storage.
3. For all K2 clients, communication fails on the control port, so the control team fails over and communication begins on the other control port.
4. For all K2 clients, control communication finds a path through GigE switch “B” to K2 Media Server “B”.

Chapter 10

Description of K2 SAN Devices

This chapter contains descriptions of the devices that make up the K2 SAN, as follows:

- "Device terminology" on page 371
- "Control point PC description" on page 372
- "K2 Ethernet switch description" on page 373
- "K2 Media Server descriptions" on page 375
- "K2 RAID storage description" on page 383

Device terminology

K2 Media Client

The first generation K2 product, originally released with version 3.x K2 software. It can have internal storage, direct-connect storage, or shared (SAN) storage.

K2 Summit Production Client

The second generation K2 product, originally release with version 7.x K2 software. It can have internal storage, direct-connect storage, or shared (SAN) storage.

K2 client

Either a K2 Media Client or a K2 Summit Production Client. This term is used for K2 clients with internal storage, direct-connect storage, or shared (SAN) storage.

K2 SAN client

Any device that is an iSCSI or Fibre Channel client to the K2 SAN. This includes Grass Valley products such as the Aurora product family.

K2 appliance

A K2 SAN client that provides specific functionality to the K2 SAN. A K2 Coder is an example of a K2 appliance.

Control point PC description

A control point PC runs applications from which you operate, configure, and monitor the K2 SAN. You can have one or more PCs that provide control point functionality. You must have at least one control point PC on which you install and run the K2 System Configuration application.

The primary applications that run on a control point PC are as follows:

- The K2 System Configuration application
- SiteConfig
- Storage Utility
- AppCenter
- NetCentral

Refer to Chapter 11, *Overview of K2 Storage Tools* and the *K2 AppCenter User Guide* for descriptions of these applications.

In addition, you can use the control point PC for the following applications:

- QuickTime
- Adobe Acrobat Reader
- Windows Remote Desktop Connection

You can purchase a control point PC from Grass Valley. In this case the PC has all the above software pre-installed at the factory. When you receive the PC it is ready to install on the K2 SAN control network and begin using with minimal configuration.

You can also build your own control point PC by installing and configuring software on an existing PC. Refer to the *K2 System Guide* for specifications and instructions.

K2 Ethernet switch description

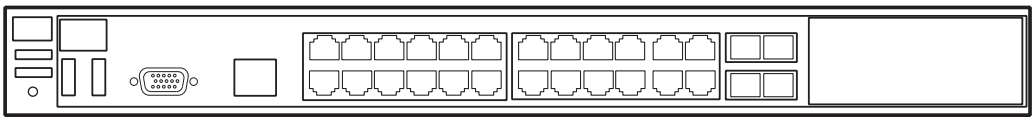
The K2 Ethernet switch provides the primary network fabric of the K2 SAN. The switch supports Gigabit Ethernet connections, which provides the bandwidth required for the iSCSI media traffic.

The HP ProCurve switch is qualified as the K2 Ethernet switch.

The 3400cl series switch was qualified and released with previous K2 SANs. Refer to previous versions of this manual for information about the 3400cl series switch.

The 2900 and 2910 series switch is qualified for all K2 SANs. This section provides information on the 2900 and 2910 series switch.

29xx series switch



The HP ProCurve switch is a store-and-forward device offering low latency for high-speed networking. In addition, the switch offers full network management capabilities.

You must use the HP ProCurve switch for iSCSI traffic. You can use a Cisco switch, such as the Cisco Catalyst 3750 Gigabit Ethernet switch, for control and FTP/ streaming traffic, if required by your site.

Refer to the manuals that you receive with the switch for more information.

Refer to the installation chapters earlier in this manual for connection and configuration instructions.

K2 Ethernet switch specifications

The K2 Ethernet switch is a HP ProCurve switch, with specifications as follows:

ProCurve switch 2900-24G:

Characteristic	Specification
Ports	20 RJ-45 10/100/1000 ports (IEEE 802.3 Type 10Base-T, IEEE 802.3u Type 100Base-TX, IEEE 802.3ab 1000Base-T Gigabit Ethernet) 2 CX4 10-GbE ports 2 X2 ports 1 RS-232C DB-9 console port 4 Dual Personality Ports each port can be used as either an RJ-45 10/100/1000 port (IEEE 802.3 Type 10Base-T; IEEE 802.3u Type 100Base-TX; IEEE 802.3ab 1000Base-T Gigabit Ethernet) or an open mini-GBIC slot (for use with mini-GBIC transceivers)
Dimensions	15.43 x 17.44 x 1.73 in. (39.2 x 44.3 x 4.4 cm) 1U height

Characteristic	Specification
Weight	14.11 lb (6.3 kg)
Input voltage	100-127/200-240 volts, 50/60 Hz
Power consumption	200 W
Temperature	Operating: 32 °F to 131 °F (0 °C to 55 °C) Non-operating: -40 °F to 158 °F (-40 °C to 70 °C)
Relative humidity: (non-condensing)	Operating: 15% to 95% at 104 °F (40 °C) Non-operating: 15% to 90% at 149 °F (65 °C)
Maximum altitude	up to 15091 ft (4.6 km)

K2 Media Server descriptions

The central component of the K2 SAN is the K2 Media Server.

The Dell 2850 and the Dell 2950 were qualified as the K2 Media Server with the 2 Gig K2 SANs previously released. Refer to previous versions of this manual for information about these K2 Media Servers.

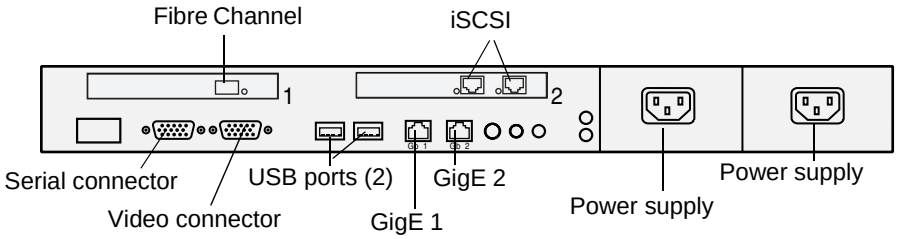
The 4 Gig K2 SANs have several types of K2 Media Servers available, as explained in the following sections:

- "GS K2 Media Server description"
- "LS K2 Media Server description"
- "NH K2 Media Server"

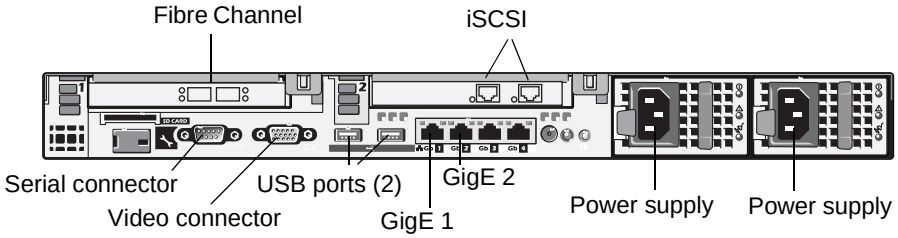
GS K2 Media Server description

The GS K2 Media Server is used on Level 10, 10R, 20, 20R, 25, and 35R K2 SANs. The Dell PowerEdge 1950 and R610 are qualified as the platform for the GS K2 Media Server.

Dell PowerEdge 1950 server



Dell PowerEdge R610 server



The following interfaces provide K2 SAN functionality:

- Two GigE ports on the motherboard. The R610 has four GigE ports, but only two are used.
- One dual port iSCSI interface card. Each port is also referred to as a TOE (TCP/IP Offload Engine).
- One single port Fibre Channel card.

GS K2 Media Server specifications

The GS K2 Media Server is built on a Dell PowerEdge 1950 or R610 server platform. Specifications that are unique to it purpose as a K2 Media Server are listed in the following table. For a complete list of specifications, refer to Dell documentation.

Dell 1950 PowerEdge server

Characteristic	Specification
Operating System	Microsoft® Windows® Server 2003, Standard Edition
Fibre Channel Adapter	LSI7104XP-LC single-channel 4Gb/s PCI-X Host Bus Adapter
iSCSI Adapter	Qlogic SANblade 1-Gbps iSCSI dual-TOE PCI-X Host Bus Adapter
Communications	Dual Embedded Broadcom NetXtreme II 5708 Gigabit Ethernet NIC
Form Factor	1U

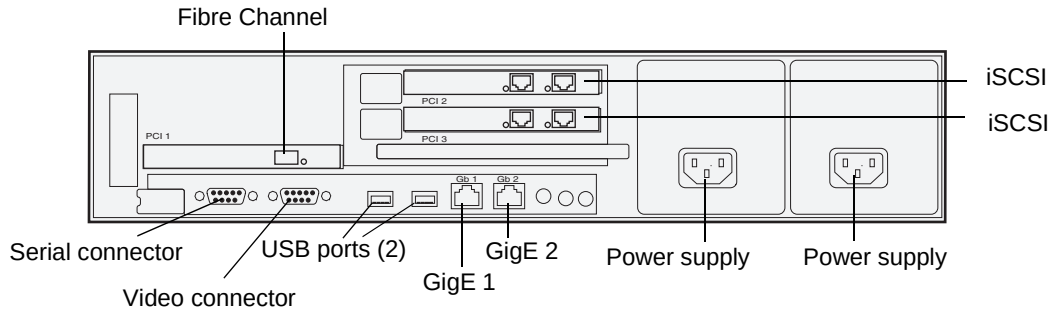
Dell R610 PowerEdge server

Characteristic	Specification
Operating System	Microsoft® Windows® Server 2003, Standard Edition
Fibre Channel Adapter	LSI LSI7104EP-LC Single-port, 4Gb/s Fibre Channel, PCI Express host bus adapter
iSCSI Adapter	QLogic QLE4062C Dual Port 1-Gbps iSCSI TOE to PCI Express HBA
Communications	Two dual port embedded Broadcom NetXtreme II 5709c Gigabit Ethernet NIC
Form Factor	1U

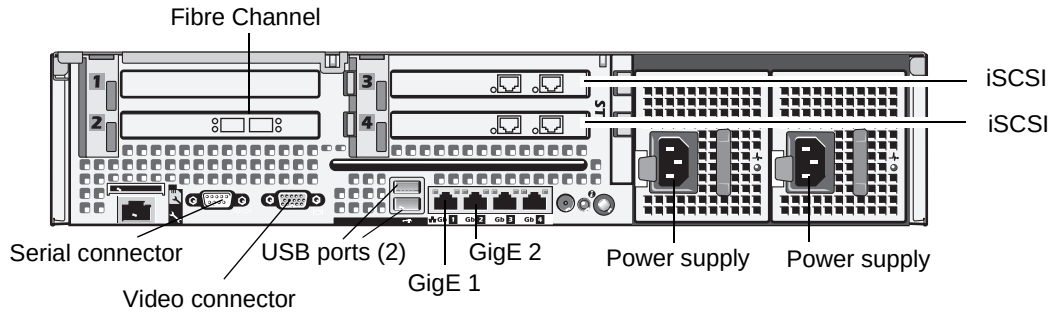
LS K2 Media Server description

The LS K2 Media Server is used on Level 30, Level 30R K2 SANs. The Dell PowerEdge 2950 and R710 are qualified as the platform for the LS K2 Media Server.

Dell PowerEdge 2950 server



Dell PowerEdge R710 server



The following interfaces provide K2 SAN functionality:

- Two GigE ports on the motherboard. The R710 has four GigE ports, but only two are used.
- Two dual port iSCSI interface card. Each port is also referred to as a TOE (TCP/IP Offload Engine).
- One single port Fibre Channel card.

LS K2 Media Server specifications

The LS K2 Media Server is built on a Dell PowerEdge 2950 or R710 server platform. Specifications that are unique to it purpose as a K2 Media Server are listed in the following table. For a complete list of specifications, refer to Dell documentation.

Dell 2950 PowerEdge server

Characteristic	Specification
Operating System	Microsoft® Windows® Server 2003, Standard Edition
Fibre Channel Adapter	LSI7104EP-LC single-channel 4Gb/s PCIe Host Bus Adapter
iSCSI Adapter	Qlogic SANblade 1-Gbps iSCSI dual-TOE PCI-X Host Bus Adapter

Characteristic	Specification
Communications	Dual Embedded Broadcom NetXtreme II5708 Gigabit Ethernet NIC
Form Factor	2U

Dell R710 PowerEdge server

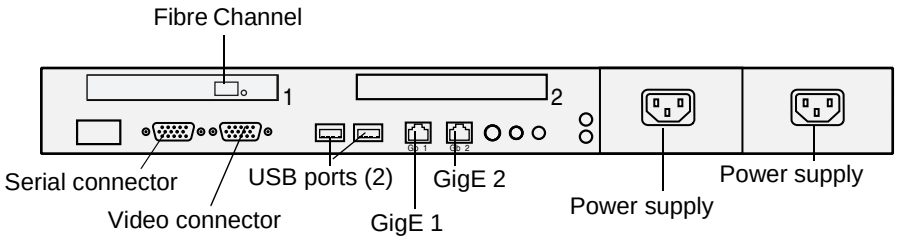
Characteristic	Specification
Operating System	Microsoft® Windows® Server 2003, Standard Edition
Fibre Channel Adapter	LSI LSI7104EP-LC Single-port, 4Gb/s Fibre Channel, PCI Express host bus adapter
iSCSI Adapter	QLogic QLE4062C Dual Port 1-Gbps iSCSI TOE to PCI Express HBA
Communications	Four embedded Broadcom NetXtreme II 5709c Gigabit Ethernet NIC
Form Factor	2U

NH K2 Media Server

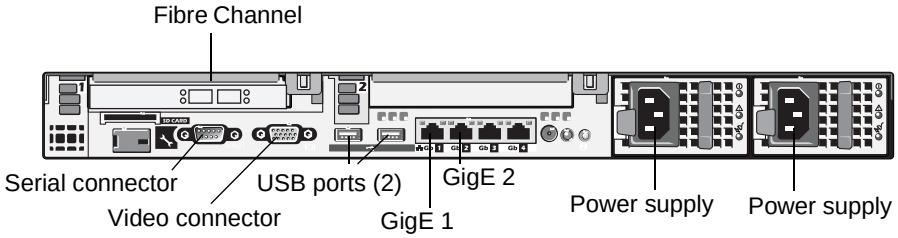
The NH K2 Media Server is an optional server that can be used on Level 20, 20R, 30, 30R, NL10, and NL10R K2 SANs. The Dell PowerEdge 1950 and R610 are qualified as the platform for the NH K2 Media Server.

Options are available to support variants of the NH K2 Media Server, as follows:

NH1 Dell PowerEdge 1950 server



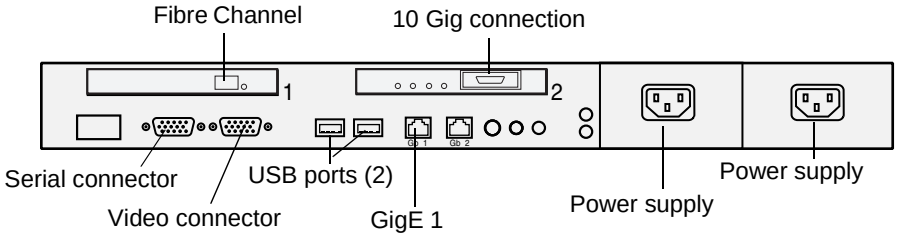
NH1 Dell PowerEdge R610 server



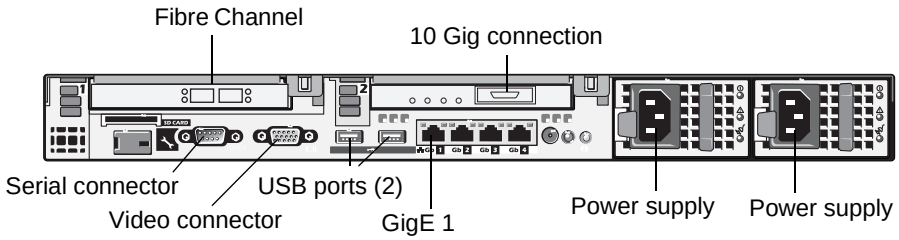
The NH1 K2 Media Server provides 1 Gig FTP available bandwidth. The following interfaces provide K2 SAN functionality:

- Two GigE ports on the motherboard. The R610 has four GigE ports, but only two are used.
- One single port Fibre Channel card. For Nearline systems, the Fibre Channel card has two ports.

NH1-10GE Dell PowerEdge 1950 server



NH1-10GE Dell PowerEdge R610 server



The NH1-10GE K2 Media Server provides I0 Gig FTP available bandwidth. The following interfaces provide K2 SAN functionality:

- One GigE port on the motherboard. The 1950 has two GigE ports and the R610 has four GigE ports, but the additional ports are used.
- One 10 Gig port.
- One Fibre Channel card.

NH K2 Media Server specifications

The NH K2 Media Server is built on a Dell PowerEdge 1950 or R1950 server platform. Specifications that are unique to it purpose as a K2 Media Server are listed in the following table. For a complete list of specifications, refer to Dell documentation.

Dell 1950 PowerEdge server

Characteristic	Specification
Operating System	Microsoft® Windows® Server 2003, Standard Edition
Fibre Channel Adapter	LSI7104XP-LC single-channel 4Gb/s PCI-X Host Bus Adapter for online systems LSI7204XP-LC dual-channel 4Gb/s PCI-X Host Bus Adapter for nearline systems.
Communications	Dual Embedded Broadcom NetXtreme II 5708 Gigabit Ethernet NIC Intel® PRO/10GbE CX4 Server Adapter for NH1-10GE
Form Factor	1U

Dell R610 PowerEdge server

Characteristic	Specification
Operating System	Microsoft® Windows® Server 2003, Standard Edition
Fibre Channel Adapter	LSI LSI7104EP-LC Single-port, 4Gb/s Fibre Channel, PCI Express host bus adapter for online systems LSI LSI7204EP-LC Dual-port 4Gb/s Fibre Channel, PCI Express host bus adapter for nearline systems.
Communications	Two dual port embedded Broadcom NetXtreme II 5709c Gigabit Ethernet NIC Intel® 10 Gigabit CX4 Dual Port Server Adapter
Form Factor	1U

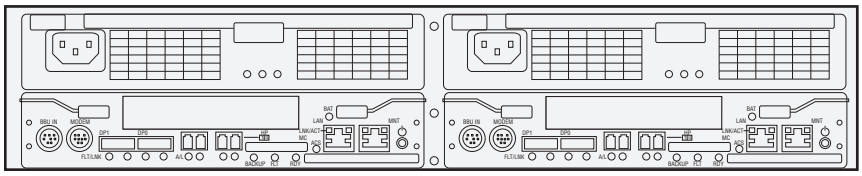
K2 RAID storage description

This section refers to K2 Lx0 RAID storage devices.

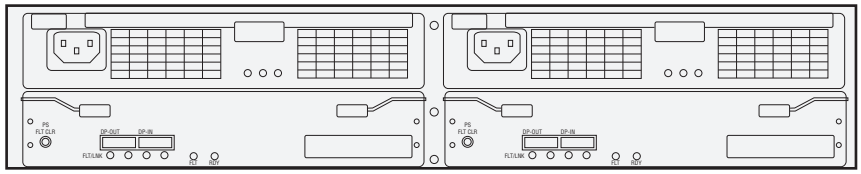
K2 Level 2 and K2 Level 3 RAID storage devices were released with previous versions of K2 SANs. Refer to previous versions of this manual for information about Level 2 and Level 3 RAID.

The K2 RAID Storage is used in Level 10, 10R, 20, 20R, 30, 30R 35, 35R, and Nearline K2 SANs. The RAID storage device is a high performance, high availability mass storage system. The RAID chassis 4Gb/s host interface supports industry standard Fibre Channel technology. K2 RAID is available with either SAS drives for online storage or SATA drives for nearline storage.

K2 RAID Chassis (primary)



K2 RAID Expansion Chassis



The RAID Expansion Chassis provides additional storage capacity. The Expansion Chassis has two Expansion Adapters installed.

Refer to the installation chapters earlier in this manual for connection and configuration instructions.

The K2 RAID is NEC models D1-10/D3-10. Level 10/20 has NEC D1-10 controller(s). Level 30/35 has NEC D3-10 controller(s). For specifications and servicing information, refer to the *K2 RAID Storage Instruction Manual*.

Chapter 11

Overview of K2 Storage Tools

Topics in this chapter include the following:

- "SiteConfig - a ProductFrame application"
- "K2 System Configuration"
- "Server Control Panel"
- "Storage Utility"
- "NetCentral"
- "Windows Remote Desktop Connection"

SiteConfig - a ProductFrame application

ProductFrame is an integrated platform of tools and product distribution processes for system installation and configuration. SiteConfig is a ProductFrame application and it is the recommended tool for network configuration and software deployment.

You can use SiteConfig as a stand-alone tool for planning and system design, even before you have any devices installed or cabled. You can define networks, IP addresses, hostnames, interfaces, and other network parameters. You can add devices, group devices, and modify device roles in the system.

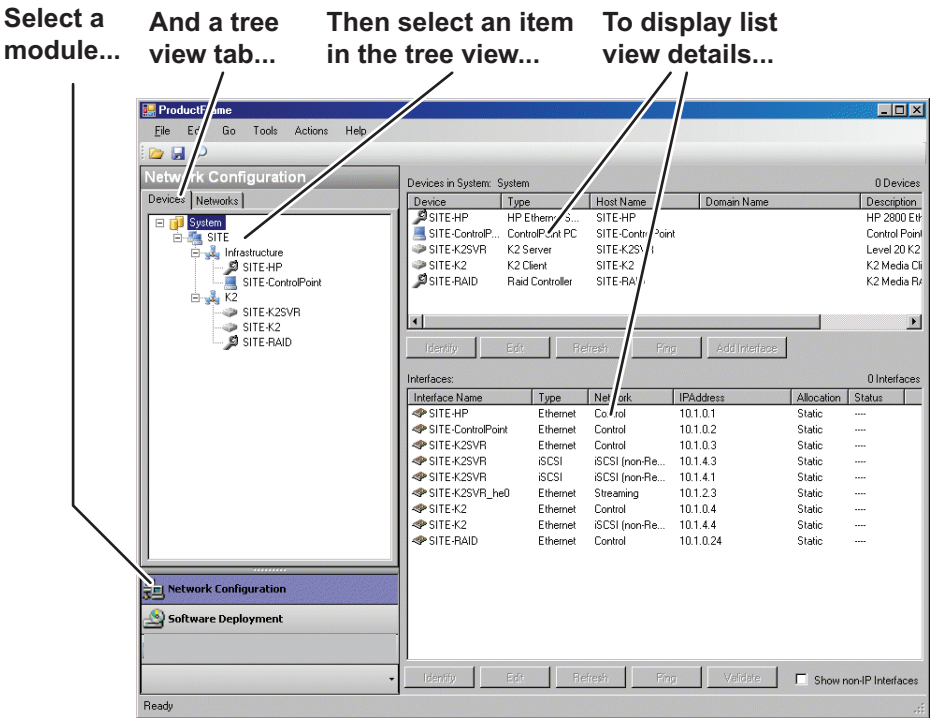
As you install and commission systems, SiteConfig runs on the control point PC. It discovers devices, configures their network settings, and manages host files. SiteConfig also manages software installations and upgrades and provides a unified software package for deployment across multi-product systems.

You should use SiteConfig for network configuration and software deployment at installation and throughout the life of the system in your factility. This enforces consistent policy and allows SiteConfig to capture changes, which makes the system easier to maintain and aids in troubleshooting should a problem arise.

To open SiteConfig, do the following:

1. On the control point PC open the SiteConfig shortcut on the desktop.

   The SiteConfig application opens.



SiteConfig displays information from a system description file, which is an XML file.

SiteConfig has different modules that correspond to a system's life-cycle phases, such as network configuration and software deployment. You can expand nodes and select elements in the tree view and the list view to view and modify networks, systems, individual devices, software deployment, and configuration settings.

K2 System Configuration

The K2 System Configuration application (K2Config) is the primary tool for configuring the K2 SAN software. Once the devices of the storage system are cabled and are communicating on the control network, you can do all the configuration required to create a working K2 SAN using the K2 System Configuration application. When you use SiteConfig for network configuration, you can import the SiteConfig system description file into K2Config to get you started with your SAN configuration.

After your K2 SAN is initially installed and configured, as instructed earlier in this manual in the installation and configuration chapters, if you need to reconfigure the system you should do so using SiteConfig and the K2 System Configuration Application. This enforces consistent policy and sequencing for configuration tasks, which makes the system easier to maintain and aids in troubleshooting should a problem arise.

The K2 System Configuration application runs on a control point PC and accesses the devices of the K2 SAN via the control network. You can configure the devices of the K2 SAN as follows:

- K2 client and K2 Media Server — These devices are configured directly by the K2 System Configuration application.
- K2 RAID storage devices — The K2 System Configuration application launches a remote instance of Storage Utility, which configures RAID storage devices. Storage Utility components run on the K2 Media Server and the configuration actually takes place via the Fibre Channel connection between the K2 Media Server and the RAID storage device.
- Ethernet switches — The K2 System Configuration application can launch a switch's web-based configuration application.

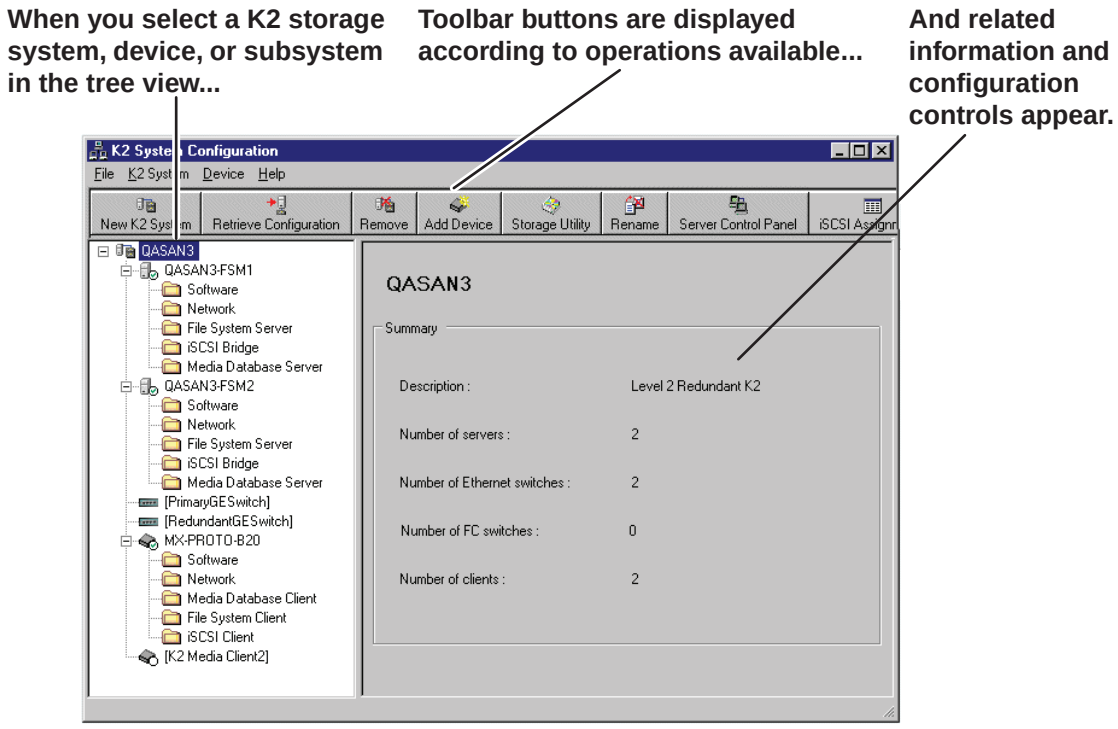
If necessary, you can install and run the K2 System Configuration application on multiple PCs in your facility. Refer to "Accessing a K2 SAN from multiple PCs" on page 399 for constraints and considerations.

To open the K2 System Configuration application do the following:

1. On the control point PC open the K2 System Configuration application shortcut on the desktop. The K2 System Configuration application log in dialog box opens.
2. Log in using the designated administrator account for configuring K2 SAN devices. By default this account is as follows:

   Username: Administrator

   Password: adminK2
3. The K2 System Configuration application opens.



If you have one or more K2 SANs currently configured, the K2 System Configuration application displays the systems in the tree view.

If you have not yet configured a K2 SAN, the K2 System Configuration application opens with the tree view blank. Refer to the installation and configuration chapters earlier in this manual to add and configure a new K2 SAN.

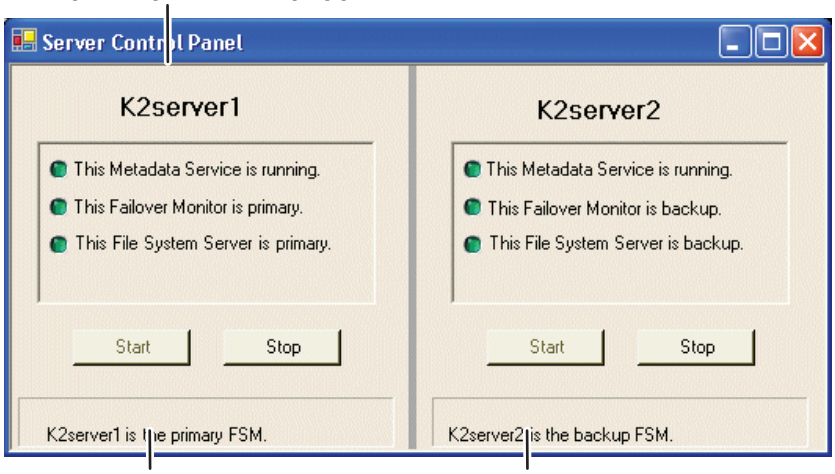
You can expand and select nodes in the tree view to view K2 SANs, individual devices, and configuration settings. When you do so, the K2 System Configuration application displays information as found in a configuration file, rather than continuously polling devices to get their latest information. The configuration file is saved on the V: drive, along with the media files in the shared storage system. The configuration file is updated and saved whenever you change a configuration using the K2 System Configuration application. That is why you must always use the K2 System Configuration application to change settings on the storage system, so the most recently changed configurations will always be stored in the configuration file and displayed.

Server Control Panel

Server Control Panel allows you to monitor and control the current status of a K2 Media Server in its roles as the media file system server and the metadata server. This is especially useful for redundant K2 SANs, as you must know if a server is currently acting as primary or as backup before attempting any troubleshooting or service work.

Server Control Panel displays information about the metadata service and the media file system server primary/redundant roles.

If your K2 SAN does not have redundant servers, only the left panel (one server) appears.



If your K2 SAN has redundant servers, both panels (two servers) appear.

NOTE: Do not click Stop or Start unless you intend to manually control the current primary/redundant roles. Using these buttons can trigger an automatic system recovery (failover) event.

To launch Server Control Panel, in the K2 System Configuration application, click the **Server Control Panel** button.

On the local K2 Media Server, you must log in with administrator-level privileges in order to use Server Control Panel.

Refer to procedures in Chapter 12, *Administering and maintaining the K2 SAN* to use Server Control Panel for maintenance, service, and other tasks.

Storage Utility

There are two versions of Storage Utility:

- Storage Utility for the K2 SAN
- Storage Utility for stand-alone K2 systems

This section explains Storage Utility for the K2 SAN. Refer to the *K2 System Guide* to learn about Storage Utility for stand-alone K2 clients.

NOTE: For shared storage, run Storage Utility only via the K2 System Configuration application.

The Storage Utility is your primary access to the media file system, the media database, and media disks of the K2 SAN for configuration, maintenance, and repair. It is launched from the K2 System Configuration application.

⚠ ***CAUTION: Use the Storage Utility only as directed by a documented procedure or by Grass Valley Support. If used improperly, the Storage Utility can render your K2 SAN inoperable or result in the loss of all your media.***

The Storage Utility's primary functionality is hosted by the K2 Media Server. The Storage Utility uses the Fibre Channel connection between the K2 Media Server and the RAID storage device for access and configuration. When you launch Storage Utility from the K2 System Configuration application on the control point PC, you use a Storage Utility remote interface to control the main application as it runs on the K2 Media Server.

The Storage Utility requires that the storage system be in an offline operating mode before it allows any configuration to take place. Take your K2 SAN devices offline before configuring with Storage Utility. This means all media access operations are disabled while you are using the Storage Utility.

NOTE: Do not run Storage Utility as a stand-alone application, separate from the K2 System Configuration application. To maintain a valid K2 SAN all configuration must be controlled and tracked through the K2 System Configuration application.

Refer to Chapter 12, *Administering and maintaining the K2 SAN* for procedures for using Storage Utility.

NOTE: Do not use the MegaRAID utility on a K2 system. This utility is for use by qualified Grass Valley Service personnel only. When this utility is opened it scans the SCSI bus and interferes with record and play operations.

About RANKs and LUNs in Storage Utility

With Storage Utility you bind disks into a group. This group is a logical unit recognized by the Windows operating system, the media file system, and other software.

Storage Utility labels this group of disks a RANK. This is different than previous versions of Storage Utility which labeled the group of disks a LUN. Storage Utility on the stand-alone storage K2 client also labels the group of disks a LUN:

This name change is necessary because the maximum disk size recognized by some Windows operating systems is relatively low, and in a K2 SAN with large capacity disks, a group of disks can exceed this maximum size. To solve the problem, Storage Utility binds disks as smaller size LUNs which can be recognized by the Windows operating system, but combines multiple LUNs into a larger size RANK, to support the K2 SAN.

In Storage Utility, there is no operational difference between what is currently labeled a RANK and what was previously labeled a LUN. The task you accomplish are identical. Storage Utility does report the number of LUNs in each RANK, which is useful information if you need to view disks from Windows operating system administrative tools.

NetCentral

NetCentral is Grass Valley's monitoring application. The NetCentral server component runs on a NetCentral server PC, which could also be a K2 system control point PC. Devices report status, primarily via Simple Network Management Protocol (SNMP), to NetCentral on the NetCentral server PC.

Refer to NetCentral manuals get the NetCentral system installed and operating. You must install a NetCentral device provider on the NetCentral server PC for each type of device you are monitoring.

NOTE: NetCentral is optional if you are using a stand-alone K2 system only. NetCentral is required if you are using a K2 SAN.

Windows Remote Desktop Connection

You can connect to a K2 client, K2 Solo Media Server, or a K2 Media Server remotely using the Microsoft Windows Remote Desktop Connection application. Do not use the Remote Desktop Connection to access the PC running the Control Point software or to access the AppCenter application; results may be unreliable. Also, take care when accessing an online K2 system on which media access is underway. The additional load on network and system resources could cause unpredictable results. You can use either the name or the IP address to access the K2 system.

NOTE: Before you can use the Remote Desktop Connection, you need network access and permissions to connect to the K2 system.

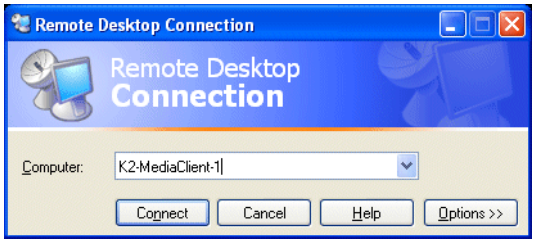
To access the Remote Desktop Connection, follow these steps:

1. Click the **Start** button on the Windows task bar

   —or—

   Press the Windows key on the keyboard.

2. Select **Programs | Accessories | Communications | Remote Desktop Connection**. The Remote Desktop dialog box displays.



3. Enter the name or IP address of the K2 system and click the **Connect** button. Alternately, you can click the down arrow of the text box and browse for the K2 system or select a previously entered computer.

Chapter 12

Administering and maintaining the K2 SAN

Topics in this chapter include the following:

- "Setting up application security" on page 393
- "Modifying K2 SAN settings" on page 394
- "Managing redundancy on a K2 SAN" on page 402
- "Working with K2 Media Servers" on page 406
- "Working with K2 clients" on page 418
- "Working with the K2 Coder" on page 423
- "Using Storage Utility" on page 437
- "Working on the media file system and database" on page 439
- "Working with RAID storage" on page 450
- "Working with Ethernet switches" on page 465

Setting up application security

The K2 System Configuration (K2Config) application and the Storage Utility application both require that you be logged in to the application with administrator privileges in order to modify any settings. These privileges are based on the Windows account that you use when you log in to the K2 System Configuration application. When you open Storage Utility from within the K2 System Configuration application, the account information is passed to Storage Utility, so you do not need to log in separately to Storage Utility.

In SiteConfig you configure global and/or device-type credentials for device access. These credentials are likewise based on Windows accounts.

You must use a Windows account that has local administrator privileges on the machine to be configured. For example, when you are on a control point PC and you run the K2 System Configuration application for the purpose of configuring a K2 Media Server, the account with which you log in to the K2 System Configuration application must be present on the K2 Media Server and must have administrator privileges on the K2 Media Server.

By default, all K2 SAN machines are set up with the following accounts:

Account	Username	Password	K2 Configuration permissions	Storage Utility permissions
Windows Administrator	Administrator	adminK2	Run/change	Run/change
K2 Administrator	K2Admin	K2admin	Run/change	Run/change
K2 User	K2User	K2user	No access	No access

For initial setup and configuration, you can use the default Windows Administrator username and password to log in to applications and machines as you work on your K2 SAN. However, for ongoing security you should change the username/password and/or create unique accounts with similar privileges. When you do this, you must ensure that the accounts are present locally on all K2 SAN machines, including control point PCs, K2 Media Servers, K2 Media Clients, K2 Summit Production Clients, and other iSCSI clients.

Refer to the *K2 System Guide* for information about media access security, channel access security, and protocol access security.

NetCentral also has accounts for security levels, as follows:

- NetCentral Administrator
- NetCentral Technician
- NetCentral User

Refer to the *NetCentral User Guide* for more information.

The NetCentral Administrator account maps to the K2 Administrator account, and the NetCentral User account maps to the K2 User account.

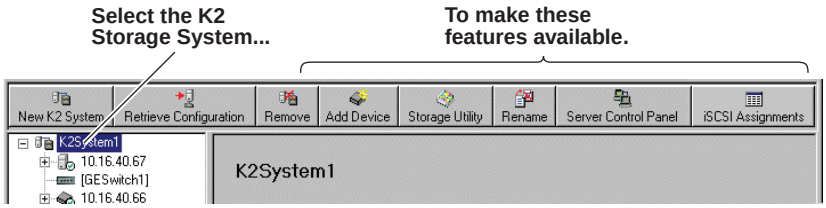
Modifying K2 SAN settings

Use the procedures in this section when changing or viewing settings on an existing K2 SAN. These are the settings that define the K2 SAN. Procedures are as follows:

- "Accessing K2 SAN features" on page 394
- "About SiteConfig and K2Config settings" on page 394
- "Renaming a K2 SAN" on page 396
- "Adding devices to a K2 SAN" on page 396
- "Removing a K2 SAN" on page 398
- "Accessing a K2 SAN from multiple PCs" on page 399
- "Reconnecting to a K2 SAN" on page 400
- "Taking a K2 SAN offline" on page 400
- "Bringing a K2 SAN online" on page 400
- "Viewing iSCSI assignments" on page 400

Accessing K2 SAN features

In the K2 Configuration Application, features for modifying K2 SAN settings are as follows:



About SiteConfig and K2Config settings

Many settings and operations, such as network settings, adding/removing devices, and software versions, are managed by both the SiteConfig application and the K2 System Configuration (K2Config) application. Each application has its own XML file in which information is stored. You can keep the applications in synch by using an orderly task flow as you configure the K2 SAN.

When doing initial installation and configuration tasks, you can export/import system information from one application's XML file to the other application's XML file. You can also merge from K2Config into an existing SiteConfig system description. These export/import/merge features support a one-time process in which a system as described in the XML file of one application is imported into the XML file in the other application. The target XML must not already contain the system being imported.

When you change a setting in one application, it is not automatically updated directly in the other application. The applications do not communicate dynamically with one another. However, both applications can read settings as currently configured on the actual physical device and update their XML file accordingly. This is the method you must use to keep the applications in synch.

When you change a setting that is managed by both applications, you should change it first in SiteConfig, as a general rule. This application gives you the best context for the system as a whole and provides features to identify and verify changes. Once the change is implemented on the actual physical device, you must then open the relevant page in the K2 System Configuration application. This causes the K2 System Configuration application to refresh its settings from the device and write the change to its XML file. It also allows you to verify your change within the context of the K2 System Configuration application.

The following table summarizes operations that involve interaction between SiteConfig and K2Config.

Operation	Task flow context and policies	Additional information
Import SiteConfig system description file into K2Config	Use this operation for initial install/commission (greenfield) sites. First define the site topology using SiteConfig and complete network configuration and software deployment. Then import the SiteConfig system description into K2Config and complete the K2 SAN configuration.	This operation creates a K2 SAN in K2Config with SiteConfig defined devices. Uses the site name to check if the K2 SAN already exists. The operation will not import if the K2 SAN exists with the same name. The operation can import all sites which are K2 SANs from a single system description file in a single import step.
Import K2Config XML into SiteConfig	Use this operation when you're running SiteConfig for the first time at a site with existing K2 SANs that have already been configured with K2Config. This allows you to seed the SiteConfig system description with device information that is already in the K2Config XML file. After you have done this operation for the first time, do not do it again.	This operation creates a SiteConfig site with K2Config defined devices. The operation removes all other sites.
Merge K2Config XML into SiteConfig system description	Use this operation when you've already defined some sites using SiteConfig and you later want to bring in another K2Config defined K2 SAN that doesn't exist in SiteConfig. Do not merge a K2Config XML that you've already merged. If you do so, it is likely that SiteConfig will create a new site with the same devices.	This operation creates a SiteConfig site with K2Config defined devices but leaves existing sites as is.
Rename Site\SAN	Rename first in SiteConfig. Then rename in K2Config. Do not import\merge into SiteConfig or K2Config.	—
Remove Site\SAN	Remove first in SiteConfig. Then remove in K2Config. Do not import\merge into SiteConfig or K2Config.	—
Remove device	Remove from both SiteConfig and K2Config.	—

Operation	Task flow context and policies	Additional information
Add device	Add in SiteConfig first, do network configuration and software deployment. Then, add in K2Config and configure using K2Config.	—
Create a new site\SAN	Use SiteConfig to create site, add devices, configure network and deploy software, then import into K2Config and configure each device	—
Change hostname	Perform hostname change using SiteConfig. Remove and re-add to K2Config. If changing the hostname of a media file system/metadata K2 Media Server, re-configure all clients on the K2 SAN using K2Config	—
Change IP address (except address of TOE on K2 Media Server)	Use SiteConfig for IP address changes. Then in K2Config, click on the changed device's network configuration node. This refreshes the K2Config view of IPs from the device.	—
Change IP address of TOE on K2 Media Server	For TOE IP changes and/or TOE card removal, use K2Config.	—
Modify K2 SAN redundancy - redundant to non-redundant or vice versa	Use SiteConfig to recreate the site using the appropriate redundancy models and configure network and deploy software. Remove K2 SAN from K2Config. Import site into K2Config. Configure using K2Config.	—

Renaming a K2 SAN

The requirements for renaming an existing K2 SAN are as follows:

- You must be logged in to the K2 System Configuration application with permissions equivalent to K2 administrator or higher.
- The devices of the K2 SAN do not need to be offline, and there is no restart of devices required.

To rename an existing K2 SAN, do the following:

1. In the K2 System Configuration application tree view, select the current name of the K2 SAN, which is the top node of the storage system tree.
2. Click **Rename**. The Rename dialog box opens.
3. Enter the new name of the SAN and click **Apply**.
4. If the SAN name is used similarly in SiteConfig, make the appropriate change in SiteConfig.

Adding devices to a K2 SAN

Refer to the following topics to add devices to an existing K2 SAN:

- “Adding a client device”
- “Adding an Ethernet switch”
- “Adding a K2 Media Server”

Adding a client device

The requirements for adding a client to an existing K2 SAN are as follows:

- You must be logged in to the K2 System Configuration application with permissions equivalent to K2 administrator or higher.
- The devices of the K2 SAN do not need to be offline, and there is no restart of devices required.

To add a client to an existing K2 SAN, do the following:

1. In SiteConfig, add the client device to the appropriate group and verify that it is communicating correctly on networks.
2. In the K2 System Configuration application tree view, select the name of the K2 SAN, which is the top node of the storage system tree.
3. Click **Add Device**. The Add Device dialog box opens.
4. Select the type of client you are adding.
5. Click **OK**. The new client appears in the tree view.
6. Configure the client as appropriate. Refer to the documentation for the device.

Adding an Ethernet switch

The requirements for adding a Gigabit Ethernet switch to an existing K2 SAN are as follows:

- You must be logged in to the K2 System Configuration application with permissions equivalent to K2 administrator or higher.
- The devices of the K2 SAN do not need to be offline, and there is no restart of devices required.

To add a Gigabit Ethernet switch to an existing K2 SAN, do the following:

1. In SiteConfig, add the switch to the appropriate group.
2. In the K2 System Configuration application tree view, select the name of the K2 SAN, which is the top node of the storage system tree.
3. Click **Add Device**. The Add Device dialog box opens.
4. Select **Ethernet Switch**.
5. Click **OK**. The new switch appears in the tree view.
6. Configure the switch as appropriate.

Adding a K2 Media Server

With Levels 2, 2R, 3, and 3R, the K2 System Configuration application enforces the number of K2 Media Servers, as pre-defined for the level of the system. The application does not allow you to add K2 Media Servers. Refer to the installation chapter for each level for more information.

With Levels 10, 10R, 20, 20R, 30, 30R, 35, 35R, NL10, and NL10R, the K2 System Configuration application does not enforce the number of K2 Media Servers. However, your system design must support any additional servers. Consult with qualified Grass Valley personnel before adding servers.

For all system levels and designs, adding a K2 Media Server with the role of media file system/metadata server to an existing K2 SAN is not supported as a customer procedure. Adding a server with these roles fundamentally changes the baseline design of the system, which means you must dismantle one or more pieces of the existing system and create a new system. This requires custom design and implementation services that should only be attempted by qualified Grass Valley personnel.

Also refer to "Replacing a K2 Media Server" on page 410.

On some Level 20, 20R, 30, 30R, 35, or 35R systems, the system design supports adding an optional NH K2 Media Server, as follows:

1. In SiteConfig, add the K2 Media Server to the appropriate group and verify that it is communicating correctly on networks.
2. In the K2 System Configuration application tree view, select the name of the K2 SAN, which is the top node of the storage system tree.
3. Click **Add Device**. The Add Device dialog box opens.
4. Select **K2 Media Server**.
5. Click **OK**. The new server appears in the tree view.
6. Configure the server as instructed in the installation chapter for the level of the K2 SAN.

Removing a K2 SAN

The requirements for removing a K2 SAN from the K2 System Configuration application and/or SiteConfig are as follows:

- You must be logged in to the K2 System Configuration application with permissions equivalent to K2 administrator or higher.
- The K2 SAN can continue operations while it is removed from the K2 System Configuration application. As long as you are removing only the complete K2 SAN and not removing any individual devices, there is no need to put devices offline or restart devices.
- For ongoing maintenance and support, you must always have at least one control point from which you can access the K2 SAN with SiteConfig and with the K2 System Configuration application. If you have installations of these applications on multiple control point PCs, do not remove the K2 SAN from all control point PCs at the same time.

1. In SiteConfig, remove the devices of the K2 SAN.
2. In the K2 System Configuration application tree view, select the name of the K2 SAN, which is the top node of the storage system tree.
3. Click **Remove**. The SAN is removed from the tree view.

Accessing a K2 SAN from multiple PCs

It is recommended that you install the SiteConfig application and the K2 System Configuration (K2Config) application on one PC only in your facility. This eliminates potential problems in the installation, configuration, and maintenance of your K2 SAN.

If you run SiteConfig and/or K2Config on multiple PCs in your facility, you must enforce an operational policy whereby you constrain your use of the applications as follows:

- Designate a control point PC as the configuration PC and then make changes from that PC only.
- On the other control point PCs, limit operations to view-only when accessing the K2 SAN. Do not make changes. With K2Config there is some basic protection, in that the first instance of the application in essence "locks out" any other instances. However, SiteConfig has no such protection and making changes on devices from multiple SiteConfig instances can result in configuration and software deployment errors.

SiteConfig has no features that are designed to support access from multiple instances. If you access systems from multiple instances of SiteConfig, you must define and enforce your own policy. For example, you can import system descriptions or otherwise create systems and discover devices in each instance of SiteConfig and then enforce policy whereby instances are kept in synch.

In K2Config, to access a K2 SAN from multiple control point PCs, do the following:

1. Install Control Point software on the designated K2 System Configuration control point PC and complete the initial system configuration. Close K2Config on that PC.
2. Install Control Point software on another control point PC and open the K2Config.
3. Select **Retrieve Configuration** and enter the name or IP address of the K2 Media Server for the K2 SAN. If the K2 SAN has multiple K2 Media Servers, you must enter the name or IP address of the server configured first.

   If there is another instance of the K2Config on a different control point PC currently accessing the K2 SAN, a message informs you of this and you are not allowed to access the system.

   If access is allowed, a Retrieving Configuration message box shows progress. It can take over 30 seconds to retrieve the configuration. When the configuration is retrieved, the K2 SAN appears in the tree view. Make sure that you only attempt view-only operations from this PC. Do not configure the K2 SAN from this PC.
4. Repeat the previous steps for other control point PCs from which you need access to the K2 SAN.

When you expand and select nodes in the tree view to view K2 SANs, individual devices, and configuration settings, K2Config displays information as found in a configuration file, rather than continuously polling devices to get their latest information. The configuration file is saved on the V: drive, along with the media files in the shared storage system. When you use the Retrieve Configuration feature, you are connecting to the configuration file.

Reconnecting to a K2 SAN

If you replace the K2 System Configuration control point PC or otherwise lose the connection to a K2 SAN from the K2 System Configuration application, you can reconnect. The requirements for reconnecting to a K2 SAN from the K2 System Configuration application are as follows:

- You must be logged in to the K2 System Configuration application with permissions equivalent to K2 administrator or higher.

To reconnect to a K2 SAN, select **Retrieve Configuration** and enter the name or IP address of the K2 Media Server for the K2 SAN. If the K2 SAN has multiple K2 Media Servers, you must enter the name or IP address of the server configured first, which is designated as server 1, server A, or server 1A, depending on the level of the system.

The K2 SAN appears in the tree view.

In SiteConfig, there are no features that support a system-wide reconnecting from a replacement control point PC. You can import a system description and discover devices.

Taking a K2 SAN offline

To take a K2 SAN offline, do the following:

1. Stop all media access.
2. Shut down all K2 clients and all generic clients. You can do this via SiteConfig.
3. Take all K2 Media Servers out of service. If you have redundant servers, make sure that you know which server is the current primary and which server is the current backup, and that you take primary/backup servers out of service in the proper order. Refer to "Taking a K2 Media Server out of service" on page 406.

Bringing a K2 SAN online

To bring a K2 SAN online, do the following:

1. Verify that RAID storage devices, Ethernet switches, and other supporting system are powered up. Refer to the section earlier in this manual for power on procedures.
2. If K2 Media Servers are powered down, power them up. Refer to the section earlier in this manual for power on procedures.
3. Place K2 Media servers in service. If you have redundant servers, make sure that you place primary/backup servers in service in the proper order. Refer to "Placing a K2 Media Server in service" on page 408.
4. Power on all K2 clients and all generic clients.

Viewing iSCSI assignments

You can review a report of clients and their iSCSI configuration on a K2 SAN as follows:

1. In the K2 System Configuration application tree view, select the name of the K2 SAN, which is the top node of the storage system tree.

2. Click **iSCSI Assignments**. The iSCSI Port Assignments report opens.

The report displays the following information.

- K2 Media Servers with the role of iSCSI bridge
- Each server's iSCSI ports, identified by IP address
- For each iSCSI port, the iSCSI clients assigned and their bandwidth subscription.

Managing redundancy on a K2 SAN

If you have a redundant K2 SAN, use the procedures in this section to control the primary/redundant roles of the K2 Media Servers. Procedures are as follows:

- "Identifying current primary/backup K2 Media Servers" on page 402
- "Triggering an intentional failover" on page 404
- "Recovering from a failover" on page 405

Identifying current primary/backup K2 Media Servers

Before attempting any configuration or service work on a redundant K2 Media Server, you must know if the server is the current primary server or the current backup server for the media file system and the metadata service. While most configuration and service work can be accomplished on a backup server without affecting the operation of the SAN, if you attempt configuration or service work on the operating primary server, it will likely result in record/play failures and/or a loss of media.

To identify the current primary/backup K2 Media Server, use one or more of the methods described in the following procedures:

Identifying primary/backup from NetCentral

While monitoring the K2 Media Server in NetCentral, do the following:

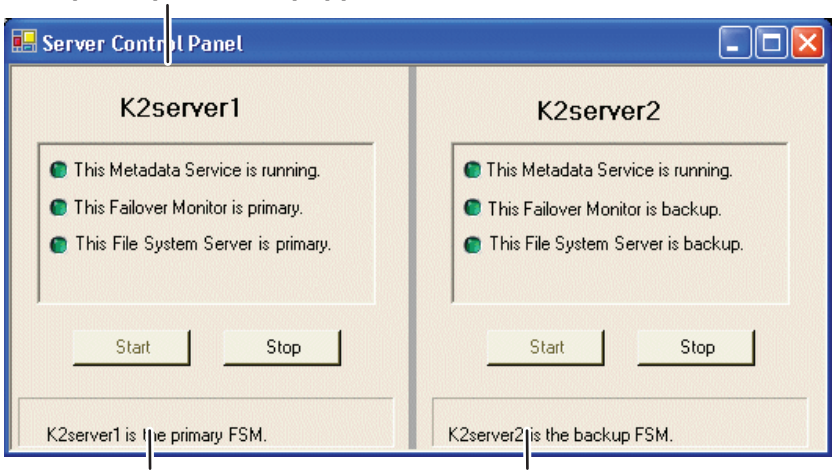
1. In the NetCentral tree view, select the K2 Media Server.
2. Click the **Facility** view control button
3. Open the **Roles** subsystem
4. Click the **Media Database Server** or **Metadata Server** link.

   The Media Database Server dialog box opens and reports the Failover Mode as either Primary or Backup.

Identifying primary/backup from the K2 System Configuration application

1. In the tree view, select the name of the K2 SAN, which is the top node of the storage system tree.
2. Click the **Server Control Panel** button. The Server Control Panel opens.

If your K2 SAN does not have redundant servers, only the left panel (one server) appears.



If your K2 SAN has redundant servers, both panels (two servers) appear.

3. Identify the primary K2 Media Server and the backup K2 Media Server.

If the K2 SAN does not have redundant servers, only one server (the left half of the Server Control Panel) is displayed.

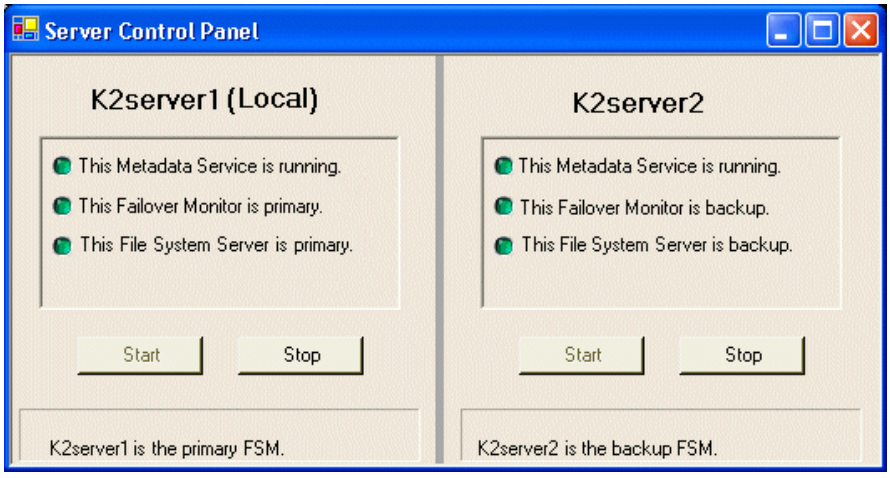
For Nearline K2 SANs, the Server Control Panel is not available from the K2 System Configuration application.

Identifying primary/backup from the local K2 Media Server

The following procedure assumes that you are at the local K2 Media Server and you need to check its status in its role of media file system/metadata server, especially regarding redundancy. The recommended mode for local operation of a K2 Media Server is to use a connected keyboard, monitor, and mouse. You can also use Windows Remote Desktop Connection from a network-connected PC to access the Windows desktop for "local" operation, but this is not recommended if the system is currently online with media access underway. The additional load on network and local system resources could cause unpredictable results.

To identify primary/backup from the local K2 Media Server, do the following:

1. If you have not already done so, connect keyboard, monitor, and mouse to the K2 Media Server and log on to Windows.
2. If Server Control Panel is not already open, on the Windows desktop, click **Start | Grass Valley | Server Control Panel**.
3. Log on to Server Control panel with administrator-level permissions. The Server Control Panel opens.



4. Determine if the local machine is currently the primary K2 Media Server or the backup K2 Media Server.

If the K2 SAN does not have redundant servers, only one server (the left half of the Server Control Panel) is displayed.

For the K2 Media Servers of a Nearline K2 SAN, Server Control Panel on the local K2 Media Server reports if the server is the current active media file system (SNFS) server. No metadata information is displayed, since the Nearline system does not have a media database.

Triggering an intentional failover

⚠ ***WARNING: Do not attempt this procedure except under the supervision of qualified Grass Valley personnel.***

The following procedure renders the primary K2 Media Server unqualified to carry out its role in managing the K2 SAN. The backup K2 Media Server detects this condition and triggers a failover in which it takes the primary server out of service and takes control of the K2 SAN. Therefore, before using these procedures, verify that the backup K2 Media Server is fully operational and qualified to take control of the K2 SAN. Be aware that the failover capabilities of the K2 SAN are degraded until you place the machine back into service as the backup K2 Media Server.

You should stop all media access before attempting this procedure. If media access is underway, there will be period of time in which media loss will occur.

In the following procedures, K2server1 and K2server2 represent your redundant K2 Media Servers. The procedure begins with K2server1 acting as the primary K2 Media Server.

1. Verify primary/backup roles and make sure K2server2 (the backup) is qualified and ready to become primary.
2. From the K2 System Configuration application, open **Server Control Panel**.
3. In Server Control Panel for K2server1 click **Stop**. This triggers the failover process.

K2server1 shuts down. K2server2 detects (via the absence of the heartbeat signal on the serial cable) that K2server1 is gone, so K2server2 takes over as primary.

4. Allow the failover process to complete, until K2server2 is operating correctly in its new role as the primary K2 Media Server for the K2 SAN.
5. Verify K2server2 as primary.
6. Start up K2server1. It is now out of service. If you need to do service work on K2server1, you can do it now. After your work is complete, proceed with the next step.
7. If there are K2 Media Servers with role of iSCSI bridge or Fibre Channel switches on the same redundant "side" as K2server1, start or restart them.
8. In Server Control Panel, for K2server1, click **Start**. This notifies K2server2 (via a heartbeat signal on the serial cable) that K2server1 is coming online as backup.
9. Verify K2server1 as backup.
10. All failover processes are complete. All media management mechanisms are now running and K2server1 is now qualified and acting as the backup.

Recovering from a failover

WARNING: Do not attempt this procedure except under the supervision of qualified Grass Valley personnel.

In the following procedures, K2server1 and K2server2 represent your redundant K2 Media Servers. The procedure begins with K2server1 being the server on the failed side of the SAN. K2server2 is acting as the primary K2 Media Server.

1. Verify primary/backup roles and make sure K2server2 is the primary.
2. Start up K2server1. It is now out of service.
3. Determine the cause of the failover and take corrective action as necessary. If you need to do service work on K2server1 or other devices on the failed side of the SAN, you can do it now. After your work is complete, proceed with the next step.
4. If there are K2 Media Servers with role of iSCSI bridge, Ethernet switches, or Fibre Channel switches on the same redundant "side" as K2server1, start or restart them. Make sure they have been started up at least once before putting K2server1 into service. Follow the power up sequence in "Power on and power off procedures" on page 357.
5. In Server Control Panel, for K2server1, click **Start**. This notifies K2server2 (via a heartbeat signal on the serial cable) that K2server1 is coming online as backup.
6. Verify K2server1 as backup.
7. All failover processes are complete. All media management mechanisms are now running and K2server1 is now qualified and acting as the backup.

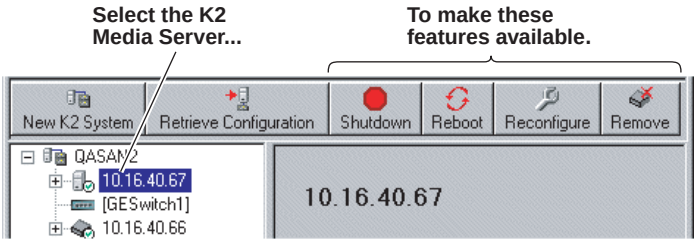
Working with K2 Media Servers

Use the procedures in this section when doing configuration or service work on a K2 Media Server that is part of an operational K2 SAN. Procedures are as follows:

- "Accessing K2 Media Server features in K2Config" on page 406
- "Taking a K2 Media Server out of service" on page 406
- "Using the Stop button in Server Control Panel" on page 408
- "Placing a K2 Media Server in service" on page 408
- "Shutting down or restarting a K2 Media Server" on page 409
- "Identifying K2 Media Server software versions" on page 409
- "Modifying K2 Media Server network settings" on page 409
- "Removing a K2 Media Server" on page 410
- "Replacing a K2 Media Server" on page 410
- "Replacing an iSCSI interface adapter (TOE card)" on page 412
- "Installing the Fibre Channel card driver" on page 414
- "Recovering from a failed K2 Media Server system battery" on page 415
- "Checking K2 Media Server services" on page 417

Accessing K2 Media Server features in K2Config

In the K2 Configuration Application (K2Config), features for working on a K2 Media Server are as follows:



Taking a K2 Media Server out of service

This procedure applies to K2 Media Servers that are taking the role of media file system and metadata server.

When you take a K2 Media Server out of service you stop services such that the K2 Media Server is prevented from functioning as a media file system and/or metadata server. In this state no media operations can take place.

If there is just one K2 Media Server in the role of media file system and metadata server, before you take the K2 Media Server out of service, you should stop all media access on the K2 SAN.

If there are redundant K2 Media Servers currently in service (both primary and backup) in the role of media file system and metadata server, take only the backup out of service. Do not take the primary out of service. If you take the primary out of service it will trigger a failover event. If the K2 Media Server that you want to take out of service is currently the primary, you have the following options:

- Make the current primary K2 Media Server the backup in an orderly fashion. Refer to "Triggering an intentional failover" on page 404. Then, when the K2 Media Server is the backup, you can take it out of service.
- Take the current backup out of service (shutdown) so that the primary K2 Media Server is the only file system/metadata server currently in service. You can then take the primary K2 Media Server out of service without triggering a failover event.

Also refer to "Using the Stop button in Server Control Panel" on page 408.

To take a media file system/metadata K2 Media Server out of service, do the following:

1. Stop all media access on the K2 SAN.
2. In the K2 System Configuration application tree view, select the K2 SAN.
3. Select **Server Control Panel**. The Server Control Panel opens.
4. Identify the K2 Media Server you intend to take out of service. If there are redundant K2 Media Servers, consider that you might trigger a failover event. Refer to the explanation earlier in this section and to "Triggering an intentional failover" on page 404.

   Also refer to the next section "Using the Stop button in Server Control Panel" to consider the action that you want to take.
5. When you are sure that you understand the implications of taking the K2 Media Server out of service, click the **Stop** button for that server.
6. Proceed as follows:
   - If the server shuts down automatically, allow the shutdown processes to complete. Then start the server. As specified in the next section "Using the Stop button in Server Control Panel", when a redundant server restarts, it comes up in an out of service state.
   - If the server continues to run, it is in an out of service state.

Using the Stop button in Server Control Panel

In Server Control Panel, the following behaviors occur when using the Stop button.

On a system with this configuration of media file system/ metadata K2 Media Servers…	With server(s) in this state…	When you click the Stop button on this server…	The following behavior occurs.
Redundant servers	Both primary and backup are in service (online)	Primary	The server automatically powers itself down. This causes a failover event to occur and the backup server becomes primary. When you restart the former primary server, it comes up out of service.
		Backup	The server automatically powers itself down. When you restart the server, it comes up out of service.
Redundant servers	Only the primary is in service. The other server is either shut down or it is powered on but out of service.	Primary	The media file system services stop, but the server continues to run. It does not automatically shut down. The server is now out of service.
One (non-redundant) server	The server is in service	Primary (the only server)	The media file system services stop, but the server continues to run. It does not automatically shut down. The server is now out of service.

For Nearline K2 SANs, the Server Control Panel is not available from the K2 System Configuration application.

Placing a K2 Media Server in service

This procedure applies to K2 Media Servers that have the role of media file system and metadata server.

When you put a K2 Media Server in service it is capable of taking the role of media file system and metadata server.

To place a K2 Media Server in service, do the following:

1. In the K2 System Configuration application tree view, select the K2 SAN.
2. Select **Server Control Panel**. The Server Control Panel opens.
3. For the K2 Media Server that you want to place in service, click the **Start** button.

Shutting down or restarting a K2 Media Server

To shut down or restart a K2 Media server that is in the role of media file system and metadata server, first put the server out of service, as explained in the procedures earlier in this section. Then you can shut down or restart the K2 Media Server.

To shut down or restart a K2 Media server that is not in the role of media file system and metadata server, consider that the K2 Media Server can host the iSCSI interface adapters (TOEs) by which clients access the shared storage. You should stop all media access before shutting down or restarting any K2 Media Server that hosts an iSCSI interface adapter.

Identifying K2 Media Server software versions

Your options for identifying K2 Media Server software versions are as follows:

- In NetCentral, select the **Facility** button, then in the tree view open the node for the K2 Media Server. This exposes the subsystems. You can find software version information on property pages for the **Software** subsystem and the **Roles** subsystem.
- In the K2 System Configuration application tree view, open the node for the K2 Media Server. This exposes the nodes for individual configuration pages. Select the **Software** configuration page to view software version information. To check for recent changes in software, click the **Check** button.
- Use SiteConfig software deployment features.

Modifying K2 Media Server network settings

Read the following sections for considerations and procedures for modifying network settings on a K2 Media Server.

Whenever you modify control network settings or FTP/streaming network settings on any device, you must then redeploy the hosts file if that is your name resolution mechanism.

Modifying K2 Media Server control network settings

If the K2 Media Server takes the role of media file system and metadata server, modifying its control network settings on an existing K2 SAN is not supported as a customer procedure. This is because the network identity of the K2 Media Server is embedded throughout the K2 SAN. To reconfigure this network identity, you must reconfigure the entire system from the start. Contact your Grass Valley representative for assistance.

Modifying K2 Media Server FTP network settings

You can modify the FTP network settings using SiteConfig without directly affecting the media file system or metadata service. However, you must be aware of the requirements of your site's FTP, file transfer, and streaming system design, as the FTP network settings will likely need to be changed elsewhere.

After modifying FTP network settings using SiteConfig, open the Network Configuration page in the K2 System Configuration application. The settings should automatically update. Verify that the settings are correct.

Modifying K2 Media Server media network settings

Use this procedure if you must change the IP address assigned to an iSCSI interface board on a K2 Media Server. This should not be necessary for a normally operating system and in fact it should be avoided if possible.

To change the IP address assigned to an iSCSI interface board, do the following:

1. Put all the devices of the K2 SAN in an offline or out of service state. Refer to the appropriate procedures in this chapter.
2. Open the K2 System Configuration (K2Config) application on the control point PC.
3. In K2Config, make sure you know the load balancing bandwidth parameters for each of the iSCSI clients, as you must re-enter these values later in this procedure.
4. In K2Config, remove all iSCSI clients from the K2 SAN. To do this, select each iSCSI client and click **Remove**.
5. Use SiteConfig to change the IP address. Make sure that the IP address is within the range designated for the network.
6. Restart the K2 Media Server.
7. In the K2Config tree view, expand the node for the media server that has the iSCSI interface adapter for which you need to change the IP address and click the **iSCSI Bridge** node. The iSCSI Bridge Server configuration page opens.
8. In K2Config, identify the iSCSI adapter for which you are changing the IP address. Since you changed it in SiteConfig, K2Config should now display the new IP address.
9. In K2Config, add each iSCSI client again and reconfigure. Make sure you add them in the correct order (highest bandwidth first) and enter the same bandwidth values (load balancing) for each client as the values originally configured.
10. Place the devices of the K2 SAN back online.

Removing a K2 Media Server

In a functioning K2 SAN, you should not permanently remove a K2 Media Server that takes the role of media file system/metadata server, as this changes system capabilities and results in the failure of some or all of the media operations for which the system was designed. Remove a K2 Media Server only under the direct supervision of qualified Grass Valley personnel.

If you are replacing a faulty server with a replacement server, use the next procedure "Replacing a K2 Media Server".

Replacing a K2 Media Server

Use this procedure if a K2 Media Server in a working system is faulty or otherwise needs to be replaced with a new K2 Media Server.

The requirements for replacing a K2 Media Server on an existing K2 SAN are as follows:

- You must be logged in to the K2 System Configuration application with

permissions equivalent to K2 administrator or higher.

NOTE: If you are replacing a non-redundant media file system/metadata server, you lose all media during the replacement process.

To replace a K2 Media Server, do the following:

1. If the server hosts an iSCSI interface adapter, copy down iSCSI bandwidth settings for K2 clients and other iSCSI clients that use the faulty server as their iSCSI target, as follows:
   a. In the K2 System Configuration application, select the K2 SAN in the tree view and then click the button in the toolbar to view client iSCSI assignments. A page opens that displays each client's primary and secondary iSCSI targets.
   b. In the tree view, select one of the clients that have the faulty server as a primary or secondary iSCSI target.
   c. Open the client's iSCSI Initiator Configuration page and click **Modify**. The Bandwidth Input dialog box opens.
   d. Copy down the bandwidth settings configured for that client and then close the Bandwidth Input dialog box.
   e. Repeat these steps for each client that has the faulty server as a primary or secondary iSCSI target.
2. If the server hosts an iSCSI interface adapter, in the K2 System Configuration application, for the faulty K2 Media Server, open the iSCSI bridge page and make a note of the IP addresses.
3. Copy down network and hostname settings for the faulty K2 Media Server. You can do this from SiteConfig or from the K2 System Configuration application Network Configuration page.
4. Save a copy of the host table from the faulty K2 Media Server. You can use SiteConfig hosts file features or you can find the host table at the following location on the K2 Media Server:

   C:\WINDOWS\system32\drivers\etc\hosts
5. If the server hosts an iSCSI interface adapter, in the K2 System Configuration application, remove the K2 clients and other iSCSI clients that use the faulty server as their iSCSI target, as determined earlier in this procedure.
6. Stop all media access and power down all K2 clients and other iSCSI clients.
7. If the faulty server is a media file system/metadata server, take the K2 Media Server out of service, as explained "Taking a K2 Media Server out of service" on page 406. If it is a redundant server, it must be the backup before you take it out of service.
8. In the K2 System Configuration application, remove the faulty K2 Media Server as follows:
   a. In the tree view, select the K2 Media Server
   b. Click **Remove** and **Yes** to confirm. The K2 Media Server is removed from the tree view.

9. In SiteConfig, remove the K2 Media Server.
10. Physically remove the faulty K2 Media Server and put the replacement server in its place. Reconnect all cables to the replacement server as they were to the faulty server.

NOTE: If the replacement server was previously configured on a K2 SAN, you must restart it before adding it to a K2 SAN or in any other way reconfiguring it for use.

11. In SiteConfig, add, discover, and assign the replacement server. Configure the hostname and all network settings on the replacement server to be the same as they were on the faulty server.
12. Copy the host table onto the replacement server. You can use SiteConfig for this task.
13. In the K2 System Configuration application, add and configure the replacement server. Refer to the installation chapter for the level of your system earlier in this manual for specific procedures, with the following special instructions:
    a. Add the server to the K2 SAN, using the **Add Device** button.
    b. Configure the replacement server so that its settings are all the same as they were on the faulty server.
        - On the Define Server Roles page, assign the same roles.
        - On the Network Configuration page, verify the same network settings for the FTP network.
        - If the server hosts an iSCSI interface adapter, on the iSCSI Bridge Server Configuration page, verify the same settings.
    c. After completing the configuration, restart the machine to put changes into effect.
14. If the server hosts an iSCSI interface adapter, in the K2 System Configuration application, add the clients that you removed in step 5 earlier in this procedure, with the following special instructions:
    a. Add the client with the highest iSCSI bandwidth first.
    b. On each client, configure iSCSI bandwidth settings so they are the same as they were before.
15. Power up all K2 clients and other iSCSI clients and test media access.

The replacing a server procedure is complete.

Replacing an iSCSI interface adapter (TOE card)

Prerequisites are as follows:

- The K2 SAN must be at K2 system software version 3.2.7 or higher before you begin this procedure.
- If the K2 Media Server has two single-port adapters and the replacement adapter is a dual port adapter, you must remove both single-port adapters, even though only one adapter is faulty, and replace them with the dual-port adapter.

1. In the K2 System Configuration application, for the K2 Media Server with the adapter or adapters you are replacing, open the iSCSI bridge page and identify the ports on the adapter or adapters.
2. For the ports on the adapter or adapters you are replacing, make a note of the IP addresses and subnet mask settings.

   Later in this procedure you must assign these same settings to ports on the replacement adapter.
3. Close the K2 System Configuration application.
4. Take the clients of the K2 SAN offline and take all K2 Media Servers out of service.
5. If you are replacing two single-port adapters with a dual-port adapter, uninstall K2 system software from the K2 Media Server.
6. Power down the K2 Media Server and replace the iSCSI interface adapter or adapters. Refer to the service documentation on the Dell Documentation CD for procedures. If you are replacing two single-port adapters with a dual-port adapter, install the dual-port adapter in slot 2. Leave slot 3 empty.
7. Power up the K2 Media Server.
8. If you are replacing two single-port adapters with a dual-port adapter, install the current versions of K2 system software (version 3.2.7 or higher is required) on the K2 Media Server and then restart the K2 Media Server.
9. In the K2 System Configuration application, open the iSCSI bridge page for that K2 Media Server. It displays iSCSI interface adapters on the K2 Media Server, identified by MAC address. Notice that on replacement adapter ports the MAC address is different than it was on the former adapter, the IP addresses is set to 0.0.0.0, and bandwidth subscription set to 0.
10. Do the following for the replacement iSCSI interface adapter or adapters on the K2 Media Server:

    a. Select each port and set it to the same IP addresses\subnet mask as formerly assigned.

    b. Apply the settings.

    When the IP address is set successfully, the K2 System Configuration application automatically applies the same bandwidth subscription that was previously assigned to that IP address. The iSCSI bridge page updates and displays the bandwidth subscription.
11. After making settings on the iSCSI interface adapter or adapters, on the iSCSI bridge page, click **Check**.

    A "…Replaced iSCSI port…" message and a "…Added iSCSI port…" message appears for each port on the adapter or adapters that you replaced.
12. If you are replacing iSCSI interface adapters on multiple K2 Media Servers, repeat this procedure on the remaining K2 Media Servers.
13. Place the devices of the K2 SAN back online. Refer to procedures earlier in this chapter as appropriate for your K2 SAN level and/or redundant server configuration.

Installing the Fibre Channel card driver

When you restore a K2 Media Server from the generic disk image, the 4Gb Fibre Channel card driver is not on the disk image. After restoring the disk image, you must install the Fibre Channel card driver as instructed in this procedure.

1. Make sure that you have access to the Fibre Channel card driver file. On the local K2 Media Server, look for *C:\profile\drivers\LSI_SCSIPORT_1.21.25.00*, then do one of the following:
   - If the file is present, continue with the next step in this procedure.
   - If the file is not present, procure the file from *ftp://ftp.thomsongrassvalley.com/pub/K2/Microcode_and _Drivers/LSI_SCSIPORT*. The filename is *LSI_SCSIPORT_1.21.25.00.zip*. Then continue with this procedure
2. After restoring the disk image and restarting the K2 Media Server, a Found New Hardware wizard opens for the Fibre Channel controller. Install the driver on the first FC port as follows:
   a. Select **Install from a list or specific location**. Click **Next**.
   b. Select **Don't search. I will choose the driver to install**. Click **Next**.
   c. Select **SCSI and Raid Controllers** and **Have Disk**.
   d. Browse to *C:\profile\drivers\LSI_SCSIPORT_1.21.25.00*. Click **Open** and **OK**.
   e. Start the driver install by selecting **Next**.
   f. On the Hardware Installation page, click **Continue Anyway**.
   g. Click **Finish**.
3. If the K2 Media Server has a dual port Fibre Channel card, on the Found New Hardware wizard, install the driver on the second FC port as follows:
   a. Select **Install from a list or specific location**. Click **Next**.
   b. Select **Don't search. I will choose the driver to install**. Click **Next**.
   c. Select **Have Disk**.
   d. Browse to *C:\profile\drivers\LSI_SCSIPORT_1.21.25.00*. Click **Open** and **OK**.
   e. Start the driver install by selecting **Next**.
   f. On the Hardware Installation page, click **Continue Anyway**.
   g. Click **Finish**.
4. On the Found New Hardware wizard, install the first LSI Pseudo Device as follows:
   a. Select **Install from a list or specific location**. Click **Next**.
   b. Select **Don't search. I will choose the driver to install**. Click **Next**.
   c. Select **Have Disk**.
   d. Browse to *C:\profile\drivers\LSI_SCSIPORT_1.21.25.00*. Click **Open** and **OK**.
   e. Start the driver install by selecting **Next**.

f. On the Hardware Installation page, click **Continue Anyway**.

g. Click **Finish**.

5. If the K2 Media Server has a dual port Fibre Channel card, on the Found New Hardware wizard, install the driver on the second LSI Pseudo Device port as follows:

a. Select **Install from a list or specific location**. Click **Next**.

b. Select **Don't search. I will choose the driver to install.** Click **Next**.

c. Select **Have Disk**.

d. Browse to *C:\profile\drivers\LSI_SCSIPORT_1.21.25.00*. Click **Open** and **OK**.

e. Start the driver install by selecting **Next**.

f. On the Hardware Installation page, click **Continue Anyway**.

g. Click **Finish**.

6. Make the following registry settings:

```
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Service
s\Lsi_fc\Parameters\Device]
"DriverParameter"="MPIOMode=2"
"MaximumSGList"=dword:000000ff
"NumberOfRequests"=dword:000000ff
```

Recovering from a failed K2 Media Server system battery

The following procedure applies to K2 Media Servers based on the Dell 2850/2950 platform. K2 Media Servers on other Dell models can have similar procedures. Refer to the service documentation on the Dell Documentation CD for specific procedures.

When the system battery in a K2 Media Server fails (non rechargeable) the system configuration is lost, and the system will not complete startup processes when the battery is replaced.

1. Restart the K2 Media Server.

   A startup screen displays the message "Invalid configuration information - Please run setup program. Time of day not set - Please run setup program."

2. Press **F2** to enter setup.

3. Set the system date and time

4. Select **System Setup | Integrated Devices**

5. Select **RAID**. This also sets ChA and ChB to RAID

6. Restart the K2 Media Server.

   A startup screen displays the message "Warning: Detected mode change from SCSI to RAID on ChA of the embedded RAID system."

7. Select **Yes**.

   A startup screen displays the message "Warning: Detected mode change from

SCSI to RAID on ChB of the embedded RAID system."

8. Select **Yes**.

   The K2 Media Server restarts as normal.

When startup completes, normal operation is restored.

Checking K2 Media Server services

The following table specifies the startup type of services that affect the machine's functionality as a K2 Media Server. Unless otherwise noted, services with startup type *Automatic* are started, while services with startup type *Manual* or *Disabled* are not started. You can use this table to check services if you suspect that they have been tampered with or for any reason are not set correctly.

To reset services, reconfigure the server with the K2 System Configuration application, starting at the beginning of the configuration wizard. Do not manually change the way services run on a configured K2 Media Server.

	Startup Type of service for K2 Media Server Roles				
Service	**SNFS file system server**	**iSCSI bridge**	**Metadata server**	**FTP server**	**NAS server**
*CvfsPM[a]	Automatic[b]	Automatic	Manual	Automatic	Automatic
Grass Valley AppService	Automatic	Automatic	Automatic	Automatic	Automatic
*Grass Valley FTP Dameon	Manual	Manual	Manual	Automatic[b]	Manual
Grass Valley Import Service	Manual	Manual	Manual	Manual	Manual
Grass Valley K2 Config	Automatic	Automatic	Automatic	Automatic	Automatic
Grass Valley MegaRaid Server[c]	Manual	Manual	Manual	Manual	Manual
Grass Valley MetaDataService	Automatic	Automatic	Automatic	Automatic	Automatic
Grass Valley Server Monitor	Automatic	Automatic	Automatic	Automatic	Automatic
Grass Valley Storage Utility Host	Automatic	Automatic	Automatic	Automatic	Automatic
ProductFrame Discovery Agent Service	Automatic	Automatic	Automatic	Automatic	Automatic
SabreTooth License Server	Manual	Manual	Manual	Manual	Manual
SabreTooth Protocol Service	Manual	Manual	Manual	Manual	Manual
SNMP Service	Automatic	Automatic	Automatic	Automatic	Automatic
SNMP Trap Service[d]	Automatic	Automatic	Automatic	Automatic	Automatic

a. With SNFS version 3.5, this is the only service. Previous versions had StorNext File System service and StorNext File System RPC Port Mapper service

b. This startup type is top priority for servers with this role. In other words, if a server has this role, then this is always the service's startup type, regardless of other roles that specify a different startup type.

c. This service has no purpose on a K2 Media Server. It is only used on a K2 client.

d. This service has no purpose on a K2 Media Server. It is only used for receiving traps on a SNMP manager.

*Startup type set by the K2 System Configuration application.

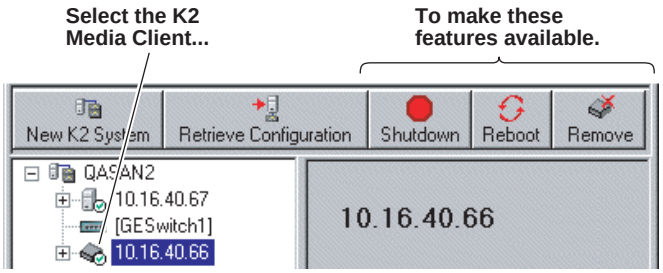
Working with K2 clients

Use the procedures in this section when doing configuration or service work on a shared storage K2 client that is part of an existing K2 SAN. Procedures are as follows:

- "Accessing K2 client features in K2Config" on page 418
- "Shutting down or restarting a K2 client" on page 418
- "Taking a K2 client offline" on page 419
- "Bringing a K2 client online" on page 419
- "Adding a K2 client" on page 419
- "Removing a K2 client" on page 420
- "Identifying K2 client software versions" on page 420
- "Modifying K2 client control network settings" on page 420
- "Modifying K2 client media (iSCSI) network settings" on page 421
- "Modifying load balancing" on page 422

Accessing K2 client features in K2Config

In the K2 Configuration Application (K2Config), features for working on a shared storage K2 client are as follows:



Shutting down or restarting a K2 client

Before you shut down or restart a K2 client, you should stop all media access.

Your options for shutting down a K2 client are as follows:

- Do a local shutdown/restart via AppCenter. Assuming a keyboard, monitor, and mouse is connected to the local K2 client, in AppCenter select **System | Shutdown**, then select **Shutdown** or **Restart** and **OK**. AppCenter exits, Windows shuts down and powers off the K2 client.
- Do a local shutdown/restart via Windows. Assuming a keyboard, monitor, and mouse is connected to the local K2 client, if AppCenter is not open, you can use the normal Windows procedure to shutdown. You can also do this type of shutdown/restart using the Windows Remote Desktop Connection.
- In the SiteConfig tree view right-click the K2 Client and select **Shutdown** or

Restart.

- Do a remote shutdown/restart via the K2 System Configuration application. In the tree view select the K2 client and then click **Shutdown** or **Reboot**.
- Do a local hard shutdown. Use this method only when there is a problem that prevents you from using one of the other methods for an orderly shutdown. To do a hard shutdown, hold down the standby button for approximately five seconds. To restart, press the standby button again.

Taking a K2 client offline

To take a K2 client offline, simply stop all media access and then shut down the K2 client.

Bringing a K2 client online

To bring a K2 client online, simply restart the K2 client. When the K2 client starts up, it is always in the online state.

Adding a K2 client

The requirements for adding a K2 client to an existing K2 SAN are as follows:

- You must be logged in to the K2 System Configuration application with permissions equivalent to K2 administrator or higher.
- The K2 SAN must have adequate bandwidth available to meet the bandwidth needs of the K2 client you are adding.
- The devices of the K2 SAN do not need to be offline, and there is no restart of devices required.
- The K2 client must be connected to appropriate networks and be powered up.
- If a K2 Summit Client, the write filter must be disabled.

To add a K2 client to an existing K2 SAN, do the following:

1. In SiteConfig, add the K2 client to the SAN as follows:
   a. In the Network Configuration tree view, add the client as a placeholder device next to existing clients.
   b. Discover devices.
   c. Identify the K2 client you are adding.
   d. Assign the discovered K2 client to placeholder K2 client.
   e. Verify that networks are assigned and planned network interface settings applied.
2. In the K2 System Configuration application tree view, select the name of the K2 SAN, which is the top node of the storage system tree.
3. Click **Add Device**. The Add Device dialog box opens.
4. Select the appropriate type of client.

5. Click **OK**. The new client device appears in the tree view.
6. Configure the K2 client as appropriate.
7. If a K2 Summit Client, enable the write filter. In SiteConfig, you can do this using the Lock feature.

Removing a K2 client

The requirements for removing a K2 client from an existing K2 SAN are as follows:

- You must be logged in to the K2 System Configuration application with permissions equivalent to K2 administrator or higher.
- Media access must be stopped on the K2 client you are removing.
- You can remove a K2 client without disrupting the operation of the rest of the SAN.

To remove a K2 client, do the following:

1. Stop media access on the K2 client.
2. In SiteConfig, remove the K2 client.
3. In the K2 System Configuration application tree view, select K2 client.
4. Click **Remove** and **Yes** to confirm. The K2 client is removed from the tree view.
5. You must restart the K2 client before re-adding it to a K2 SAN or in any other way reconfiguring it for use. If a K2 Summit Client, the write filter must be disabled before the restart.

Identifying K2 client software versions

Your options for identifying K2 client software version are as follows:

- In NetCentral, select the **Facility** button, then in the tree view open the node for the K2 client. This exposes the subsystems. You can find software version information on property pages for the **Software** subsystem.
- In the K2 System Configuration application tree view, open the node for the K2 client. This exposes the nodes for individual configuration pages. Select the **Software** configuration page to view software version information. To check for recent changes in software, click the **Check** button.
- Use SiteConfig software deployment features.

Modifying K2 client control network settings

To modify the hostname or IP address of a K2 client, use the following procedure. Refer to procedures elsewhere in this chapter for the details of individual steps.

Whenever you modify control network settings or FTP/streaming network settings on any device, you must then redeploy the hosts file if that is your name resolution mechanism.

1. Make sure you know the load balancing (bandwidth) parameters currently set for the K2 client in the K2 System Configuration application. You must reconfigure these parameters later in this procedure.

2. If a K2 Summit Client, disable the write filter. In SiteConfig, you can do this using the Unlock feature.
3. In SiteConfig, remove the K2 client.
4. In the K2 System Configuration application, remove the K2 client from the K2 SAN.
5. In SiteConfig, add the K2 client to a K2 SAN as follows:
   a. In the Network Configuration tree view, add the client as a placeholder device next to existing clients.
   b. Discover devices.
   c. Identify the K2 client you are adding.
   d. Assign the discovered K2 client to placeholder K2 client.
   e. Verify that networks are assigned and planned network interface settings applied.
6. Edit *hosts* files or other name resolution mechanisms for all the devices of the K2 SAN. You can use SiteConfig for this task.
7. In the K2 System Configuration application, add the K2 client as a new device to the K2 SAN, load balancing the K2 client just as it was previously. This is important, as you want the K2 System Configuration application to assign it to the same available bandwidth on the same iSCSI target as previously.
8. If a K2 Summit Client, enable the write filter. In SiteConfig, you can do this using the Lock feature.

Modifying K2 client media (iSCSI) network settings

If IP address to which you are changing is in a different subnet, do not use this procedure. Instead, remove, then add the K2 client.

If the iSCSI network address to which you are changing is within the same subnet and range as the current iSCSI network, use the following procedure.

1. Stop media access on the K2 client. In SiteConfig, you can do this using the Unlock feature.
2. If a K2 Summit Client, disable the write filter.
3. Use SiteConfig to change the IP address. Make sure that the IP address is within the subnet and range designated for the network.
4. In the K2 System Configuration application, open the Network configuration page for the K2 client.
5. Verify that the IP address updates correctly.
6. If a K2 Summit Client, enable the write filter. In SiteConfig, you can do this using the Lock feature.
7. Restart the K2 client.

Modifying load balancing

Modifying the iSCSI load balancing on an existing K2 SAN is not supported as a customer procedure. This is because the load balancing is a fundamental baseline for the design of the system. To change the load balancing specifications requires custom design and implementation services that should only be attempted by qualified Grass Valley personnel.

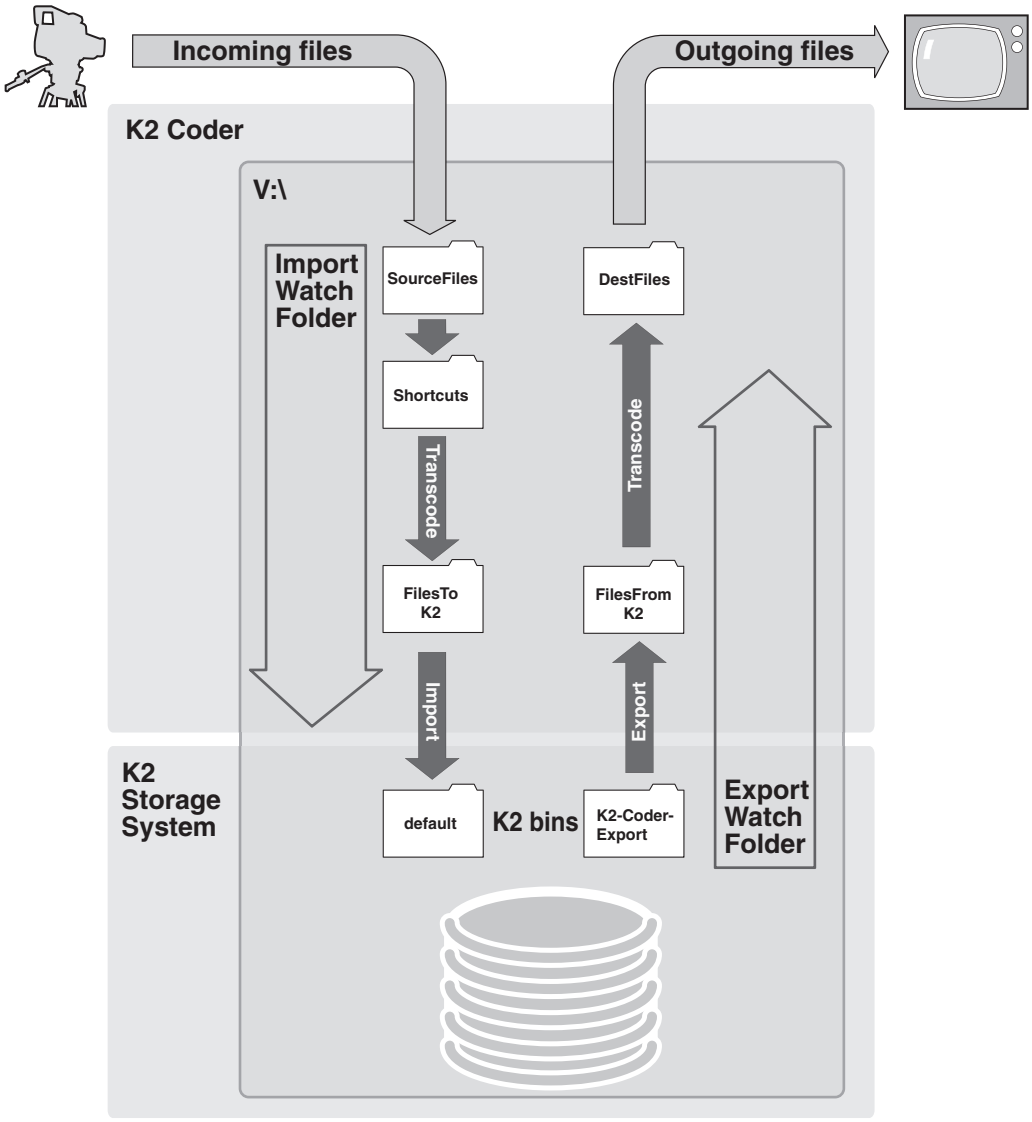
Working with the K2 Coder

This section contains the following topics:

- "About the K2 Coder"
- "Installing the K2 Coder"
- "Configuring the K2 Coder"
- "Using the K2 Coder"
- "Creating K2 Coder watch folders"

About the K2 Coder

The K2 Coder is a K2 appliance. No Grass Valley license is required for the K2 Coder to operate on a K2 SAN. The K2 Coder transcodes media formats not otherwise supported on the K2 system. The K2 Coder works in both directions. It transcodes files into the K2 SAN and it transcodes K2 clips out of the K2 SAN, as illustrated below.



The K2 Coder comes from Grass Valley with Import Watch Folder, Export Watch Folder, and Preset templates pre-configured. The following explanation is based on these templates.

For the Import Watch Folder, there are three K2 Coder folders that temporarily hold files for transcode processing and one K2 bin. The first folder, which is named *SourceFiles*, is monitored for new files. The K2 Coder checks this folder for new files every 10 seconds. When a new file arrives in total (the transfer completes), the K2 Coder automatically transcodes it via the *Shortcuts* folder into the *FilesToK2* folder as a temporary GXF file, and then imports the GXF file into K2 storage as a K2 clip. The Import Watch Folder puts the K2 clip in K2 bin *V:\GXF\default*. If the transcode/import is successful, files are deleted from *SourceFiles*, *Shortcuts* and *FilesToK2* folders. If the transcode/import fails, the files remain in these folders. There is no

periodic purge or cleanup of the files that remain after a failed transcode/import. If a file of the same name already exists, a newly named file is created, rather than overwriting the existing file. In all cases, the clip in the K2 bin remains.

For import, the K2 Coder supports SD to SD or HD to HD. The K2 Coder does not support SD to HD or HD to SD. If you transcode/import both SD and HD files, you must use two Import Watch Folders, one for SD and one for HD.

For the Export Watch Folder, there is one K2 bin and two K2 Coder folders. By default, the K2 bin is *K2-Coder-Export*. You must create a bin of this name for the Export Watch Folder to use or else configure the Export Watch Folder to use a different bin. The K2 Coder checks this bin for new clips every 60 seconds. When a new clip arrives in this bin, the K2 Coder automatically exports the clip to the *FilesFromK2* folder as a temporary GXF file and then transcodes the GXF file into the configured destination format, placing it in the *DestFiles* folder. If the transcode/export is successful, files are deleted from the *FilesFromK2* folder. If the transcode/export fails, the files remain. There is no periodic purge or cleanup of the files that remain after a failed transcode/export. If a file of the same name already exists, a newly named file is created, rather than overwriting the existing file. In all cases, the K2 clip remains in the bin and files remain in the *DestFiles* folder. External systems access the transcoded files in the *DestFiles* folder.

Installing the K2 Coder

Refer to topics elsewhere in this manual for general instructions for installing and configuring devices on a K2 SAN. Use Gigabit port 1 for the control network and Gigabit port 2 for the media (iSCSI) network.

When you first power up the K2 Coder, an error is displayed. This error is because the K2 Coder comes preconfigured for the V:\ drive. Since the V:\ drive is not present until the K2 Coder is added to the K2 SAN, the error is generated. You can dismiss the error and proceed with installation.

Configure the registry as follows:

In the registry, browse to the following key:

```
[HKLM\Software\Grass Valley Group\MAN\ServerRoles\]
```

For Valuename “1”, make the following setting:

```
"Data"=FTPServer
```

Configure network settings for the control network, including any considerations for name resolution via host files on the K2 SAN. The K2 Coder host file must contain the following:

```
localhost    127.0.0.1
```

The K2 Coder comes from the factory with all necessary software installed.

Use the K2 System Configuration application to add the K2 Coder to the K2 SAN. For iSCSI bandwidth, assign a value of **24 MB/sec**.

Configuring the K2 Coder

The K2 Coder is qualified as configured in the provided Import Watch Folder template, Export Watch Folder template, and K2 presets. Do not modify settings, folders, or bins except as specified in these instructions.

Configure SNFS

By default, the media file system (SNFS) is set with Fast Failover Detection enabled. You must disable this setting so that if one or more transcode operations consume all CPU processes for an extended length of time, a media file system failover is not triggered.

1. Click **Start | All Programs | StorNext File System | Client Configuration**.

   The StorNext File System Client Properties dialog box opens.

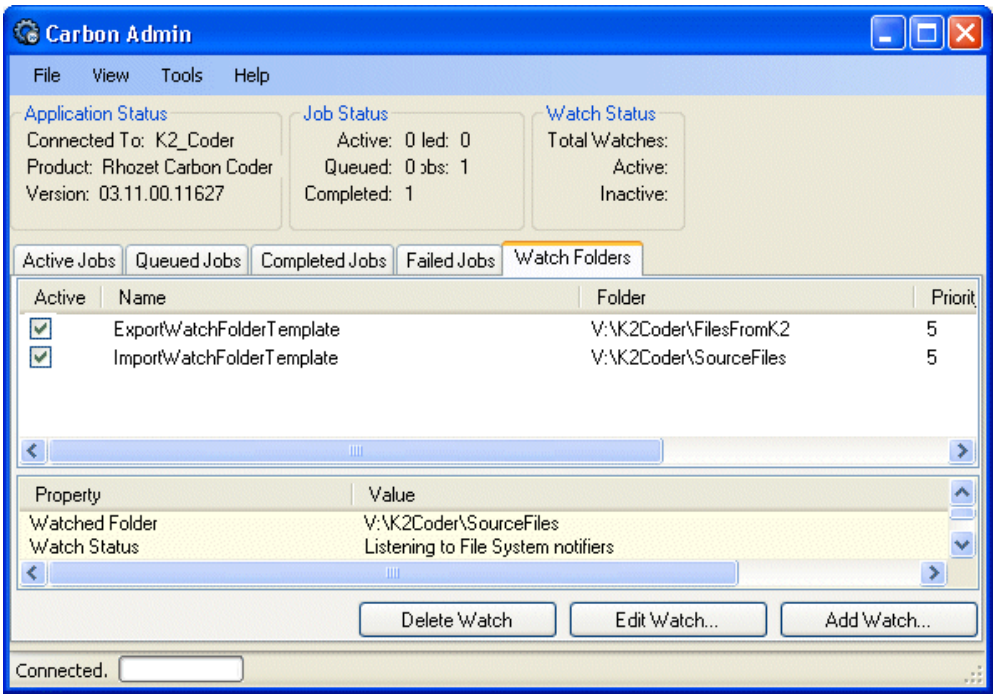
2. On the **Mount Options** tab, un-check **Fast Failover Detection**.

3. Click **OK** to save settings and close.

Testing default import

Before modifying default transcode configuration, you should do a short test of the default import functionality to verify that your installation so far is correct.

1. Open Carbon Admin and click the Watch Folders tab.



2. For *ImportWatchFolderTemplate* make sure that the check box in the Active column is checked.

3. Copy a SD file into V:\K2Coder\SourceFiles.

4. Open Carbon Admin and on the Active Jobs tab, monitor progress.
5. Verify that the file arrives in K2 bin *default*.

If you are not importing:

In Carbon Admin on the Watch Folders tab, for *ImportWatchFolderTemplate* un-check the check box in the Active column.

If you are importing:

1. Make a copy of the Import Watch Folder template, as follows:
   a. In Carbon Admin, on the Watch Folder tab, right-click **ImportWatchFolderTemplate** and select **Clone**.

      A copy of the template is created.

   b. Select the copy of the template and click **Edit Watch**.

      The Carbon Watch Folder Setup dialog box opens.

   c. In the Name field, remove "Copy of" and "Template" from the name as follows:

      `ImportWatchFolder`

      In steps later in this procedure, you configure and use this Watch Folder as the active Import Watch Folder.

   d. Click **OK** to save settings and close.

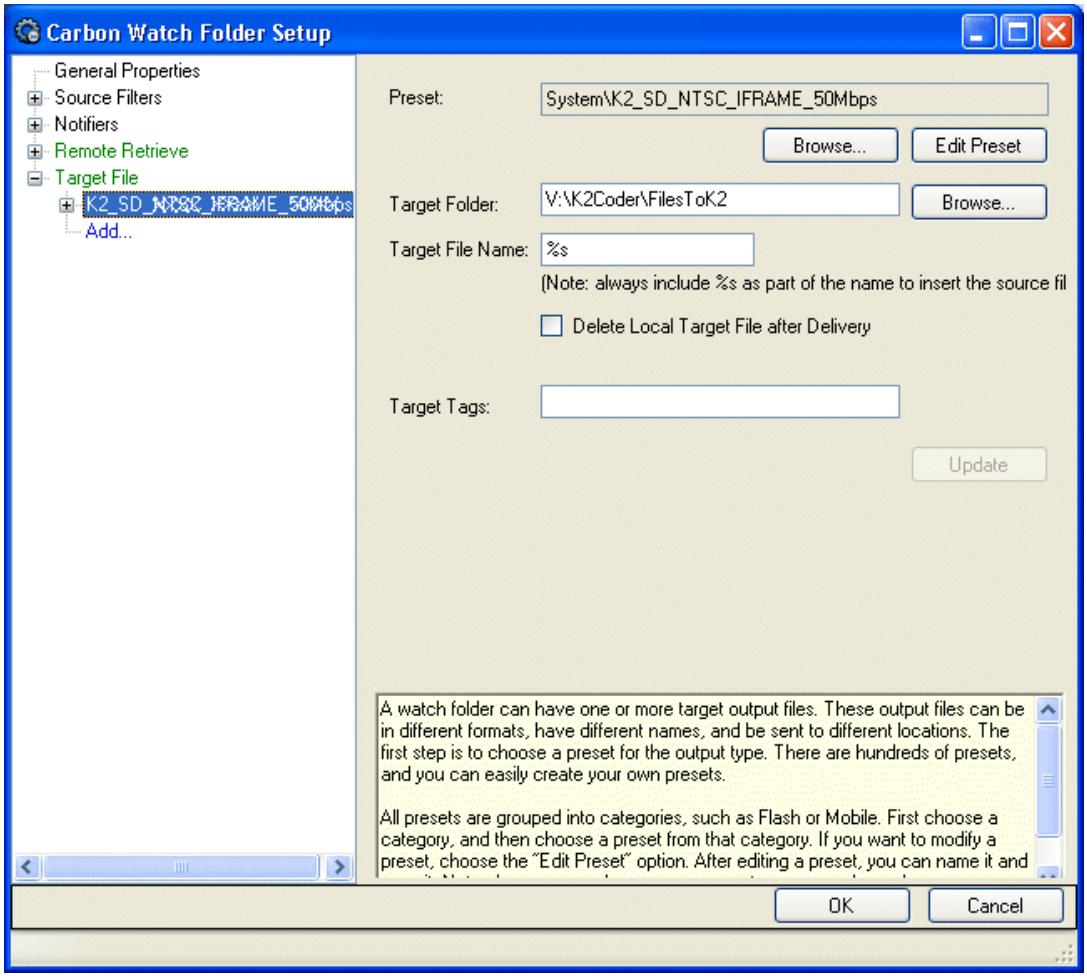
   e. On the Watch Folder tab for *ImportWatchFolderTemplate* un-check the check box in the Active column.

   f. On the Watch Folder tab for *ImportWatchFolder* make sure that the check box in the Active column is checked.

   Making a copy of the provided Import Watch Folder template in this way keeps the template with default settings intact for future reference.

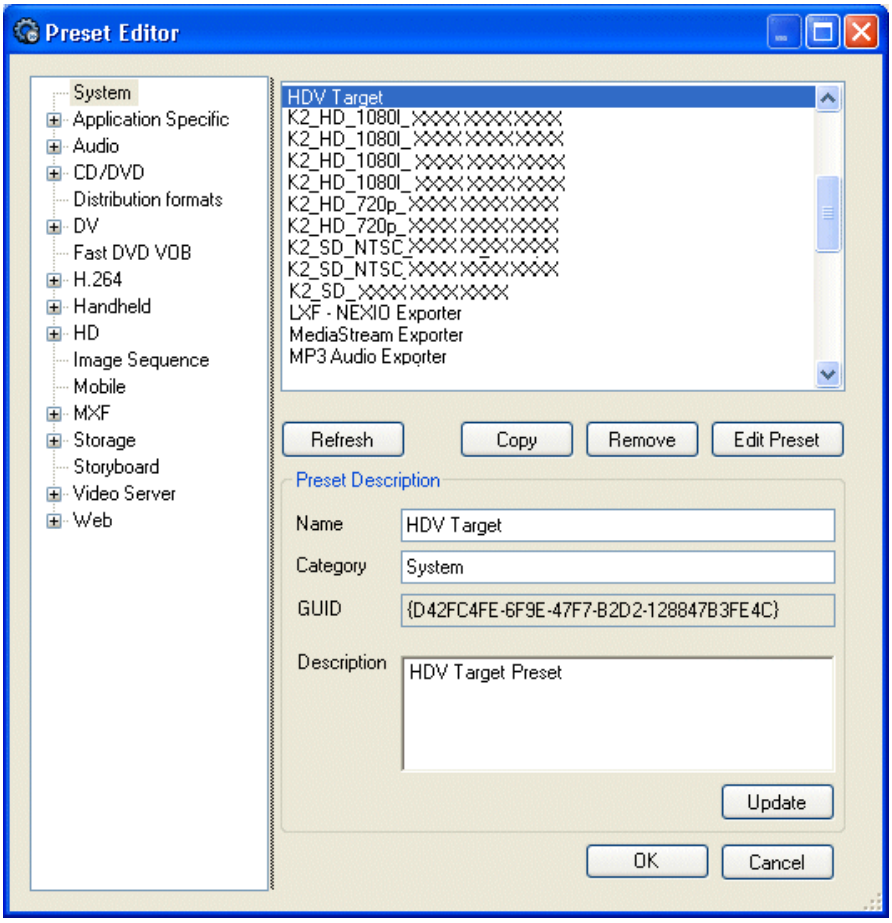
2. In Carbon Admin, on the Watch Folder tab select *ImportWatchFolder* and click **Edit Watch**.

   The Carbon Watch Folder Setup dialog box opens.



3. In the tree view under Target File, right-click the current preset and select **Delete**.
4. In the tree view under Target File click **Add**.
5. Under Preset, click **Browse**.

   The Preset Editor opens.



6. In the tree view, select **System**.

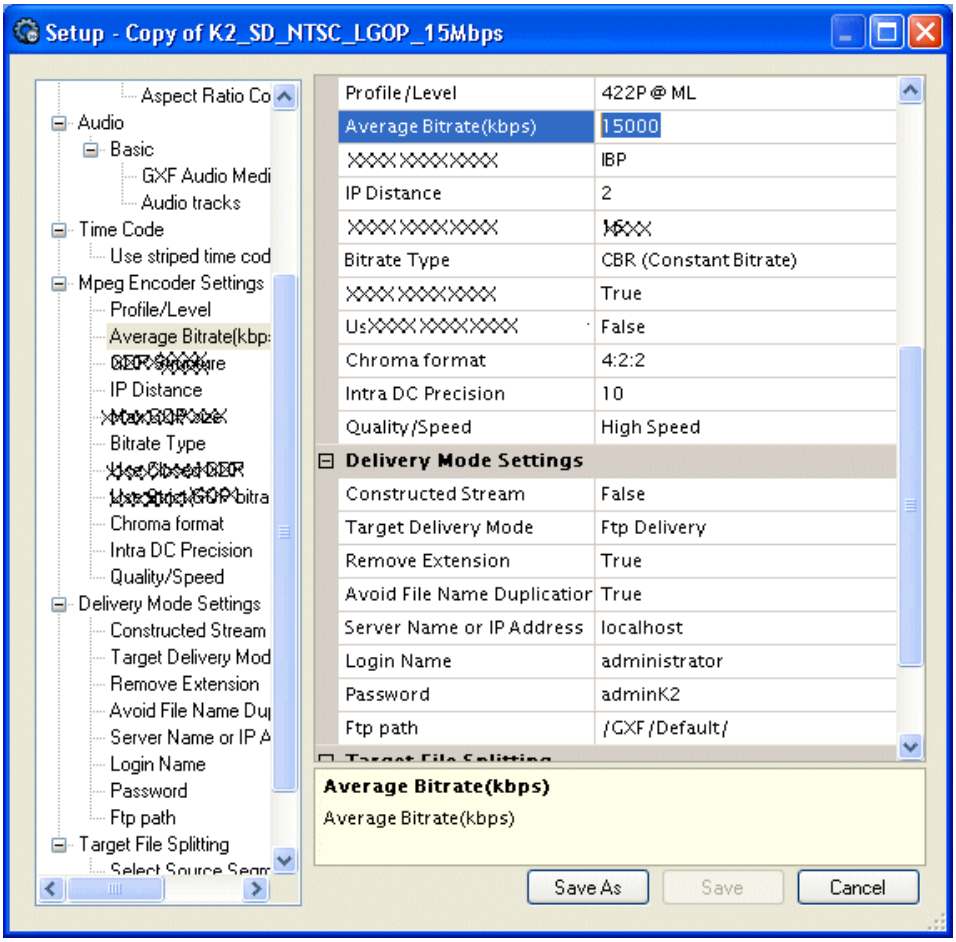
   A list of presets is displayed. Identify the presets that are appropriate for the formats supported on your K2 system.

7. In the list select the K2 preset you want to use, as follows:

   - If you import SD only, select a SD preset.
   - If you import HD only, select a HD preset.
   - If you import both SD and HD, select a SD preset. You configure an Import Watch Folder for HD later in this procedure.

8. Click **Edit Preset**.

   The Setup dialog box opens.



9. Locate the Average Bitrate setting. If desired, you can change the bitrate.
10. Locate the FTP path setting. This specifies the Import Watch Folder K2 bin, which is the bin that receives the incoming clips. By default this is set to bin *default*. If desired, you can set this to a different K2 bin.
11. Do one of the following:
    - If you did not change any settings and you are able to use the preset with all default settings intact, click **Cancel**.
    - If you changed a setting, click **Save As** and save the preset using a different name, but retain a similar naming convention. Making a copy of the provided K2 preset in this way keeps the original preset with default settings intact for future reference. Make sure the renamed preset is selected before proceeding.
12. Click **Update** and **OK**.
13. On the Setup dialog box, for Target Folder click **Browse** and then select **SourceFiles**.
14. Click **OK**, **Update**, and **OK** to save settings and close.
15. Do one of the following:

- If you import SD only or HD only, configuration is complete. Skip the remaining steps in this procedure.
- If you import both SD and HD, continue with this procedure.

In step 6 earlier in this procedure you configured the Import Watch Folder for SD. Now you must create a second Import Watch Folder and configure it for HD, as explained in the following steps.

16. Using Windows Explorer, create the following folder:

    V:\K2Coder\HDSourceFiles

17. Make a copy of the Import Watch Folder template, as follows:

    a. In Carbon Admin, on the Watch Folder tab, right-click **ImportWatchFolderTemplate** and select **Clone**.

       A copy of the template is created.

    b. Select the copy of the template and click **Edit Watch**.

       The Carbon Watch Folder Setup dialog box opens.

    c. In the Name field, remove "Copy of" and "Template" from the name and add "HD", as follows:

       `HDImportWatchFolder`

       In steps later in this procedure, you configure and use this Watch Folder as the active HD Import Watch Folder.

    d. Click **OK** to save settings and close.

    e. On the Watch Folder tab for *ImportWatchFolderTemplate* un-check the check box in the Active column.

    f. On the Watch Folder tab for *HDImportWatchFolder* make sure that the check box in the Active column is checked.

    Making a copy of the provided Import Watch Folder template in this way keeps the template with default settings intact for future reference.

18. In Carbon Admin, on the Watch Folder tab select *HDImportWatchFolder* and click **Edit Watch**.

    The Carbon Watch Folder Setup dialog box opens.

19. In the tree view under Target File, right-click the current preset and select **Delete**.

20. In the tree view under Target File click **Add**.

21. Under Preset, click **Browse**.

    The Preset Editor opens.

22. In the tree view, select **System**, then in the list select the HD K2 preset you want to use.

23. Click **Edit Preset**.

    The Setup dialog box opens.

24. Locate the Average Bitrate setting. If desired, you can change the bitrate.

25. Locate the FTP path setting. This specifies the Import Watch Folder K2 bin, which is the bin that receives the incoming clips. By default this is set to bin *default*. If desired, you can set this to a different K2 bin.

    It is allowed to use the same K2 bin for both SD import and HD import.

26. Do one of the following:

    - If you did not change any settings and you are able to use the preset with all default settings intact, click **Cancel**.
    - If you changed a setting, click **Save As** and save the preset using a different name, but retain a similar naming convention. Making a copy of the provided K2 preset in this way keeps the original preset with default settings intact for future reference. Make sure the renamed preset is selected before proceeding.

27. Click **Update** and **OK**.

28. On the Setup dialog box, for Target Folder click **Browse** and then select **HDSourceFiles**.

NOTE: Do not configure the same folder for both SD and HD source files. Doing so results in transcoding SD to HD or HD to SD, which is not supported on the K2 Coder.

29. Click **OK**, **Update**, and **OK** to save settings and close.

If you are not exporting:

In Carbon Admin on the Watch Folders tab, for *ExportWatchFolderTemplate* un-check the check box in the Active column.

If you are exporting:

1. Make a copy of the Export Watch Folder template, as follows:

   a. In Carbon Admin, on the Watch Folder tab, right-click **ExportWatchFolderTemplate** and select **Clone**.

      A copy of the template is created.

   b. Select the copy of the template and click **Edit Watch**.

      The Carbon Watch Folder Setup dialog box opens.

   c. In the Name field, remove “Copy of” and “Template” from the name, as follows:

      `ExportWatchFolder`.

      In steps later in this procedure, you configure and use this Watch Folder as the active Export Watch Folder.

   d. Click **OK** to save settings and close.

   e. On the Watch Folder tab for *ExportWatchFolderTemplate* un-check the check box in the Active column.

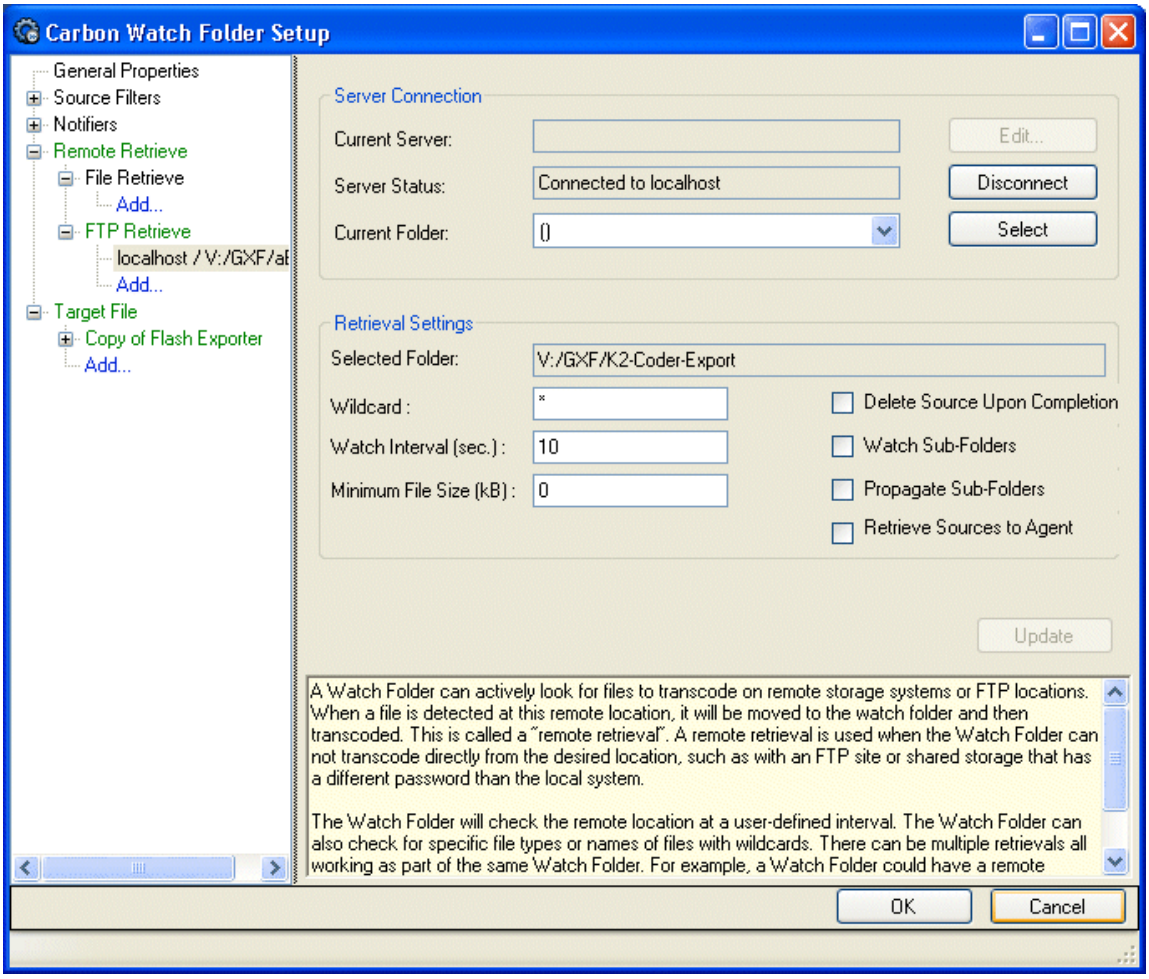
   f. On the Watch Folder tab for *ExportWatchFolder* make sure that the check box in the Active column is checked.

   Making a copy of the provided Export Watch Folder template in this way keeps the

template with default settings intact for future reference.

2. In Carbon Admin, on the Watch Folder tab select *ExportWatchFolder* and click **Edit Watch**.

   The Carbon Watch Folder Setup dialog box opens.



3. In the tree view expand Remote Retrieve and under FTP Retrieve select **V:/ localhost/GXF/K2-Coder-Export**.

4. In the Current Folder drop-down list, select the K2 bin that you want to use as your Export Watch Folder bin.

   This is the bin from which K2 clips are exported/transcoded.

   Alternatively, create a K2 bin name K2-Coder-Export and use it as your Export Watch Folder bin, in which case you leave this setting at K2-Coder-Export.

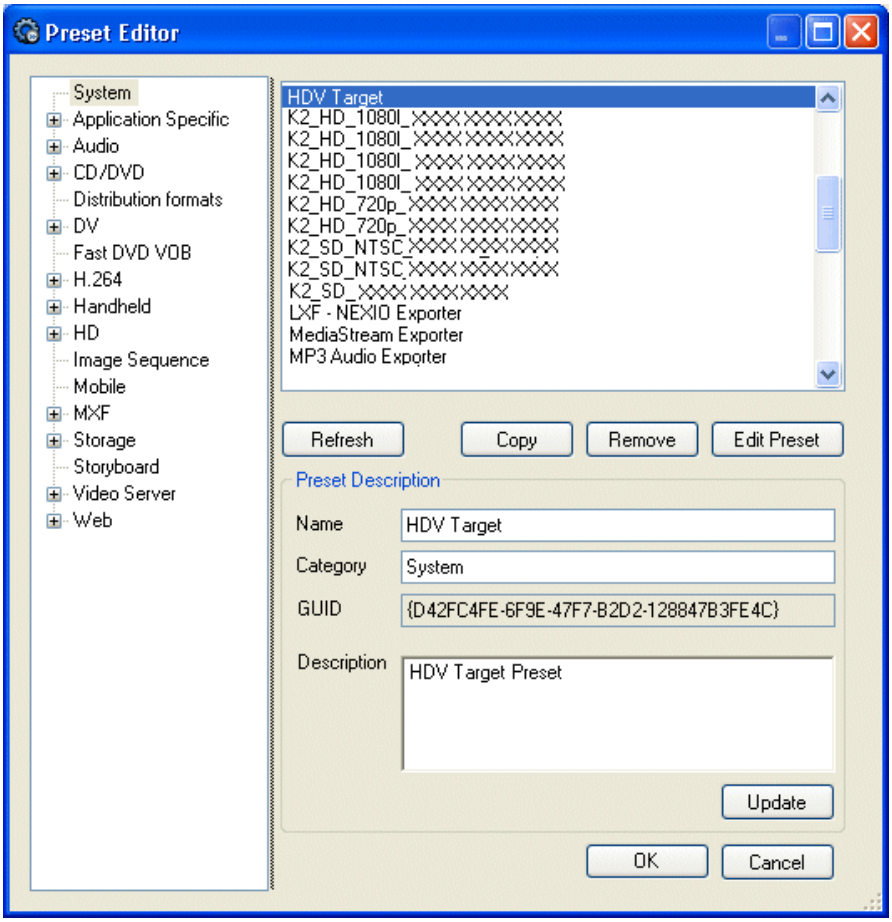
   It is not recommended to configure bin *default* as your Export Watch Folder K2 bin. Doing so causes all clips in the bin to be exported/transcoded. This can cause problems if you have a large number of current clips or a high rate of new clips that do not need to be exported/transcoded. In addition, do ***not*** configure bin *default* as your Export Watch Folder bin if you also use bin *default* as your Import Watch

Folder K2 bin. Doing so causes an import/export loop.

NOTE: Do not configure the same bin as both the Import Watch Folder bin and the Export Watch Folder bin.

5. In the tree view under Target File, right-click the current preset and select **Delete**.
6. In the tree view under Target File click **Add**.

   The Preset Editor opens.



7. Select the preset you want to use.

   This preset specifies the format of the files as exported/transcoded out of the K2 system. Select one of default presets provided by the Coder software. Do not select one of the default K2 presets provided by Grass Valley.

8. Click **Update**, **OK** and **OK** to save settings and close.

Using the K2 Coder

These instructions assume that you have configured the K2 Coder as directed by the configuration procedures earlier in this section.

On the K2 Coder you can find the pre-configured folders at *V:\K2Coder*. In this directory you will find the *SourceFiles* folder and the *DestFiles* folder. If you configured an Import Watch Folder for HD, you will also find the *HDSourceFiles* folder. These are the only folders that you need to access as you use the K2 Coder. Do not alter the names or locations of any of the folders in *V:\K2Coder*.

To import/transcode files into the K2 system, do one of the following:

- If you import SD only, place the SD files in the *SourceFiles* folder.
- If you import HD only, place the HD files in the *SourceFiles* folder.
- If you import both SD and HD, place SD files in the *SourceFiles* folder and place HD files in the *HDSourceFiles* folder.

Open Carbon Admin and on the Active Jobs tab, monitor transcode/import progress. Then find the K2 clip in the bin configured as the Import Watch Folder K2 bin.

To export/transcode clips out of the K2 system, in AppCenter place the clips in the bin configured as the Export Watch Folder K2 bin. Open Carbon Admin and on the Active Jobs tab, monitor progress. Then access the exported files in the *DestFiles* folder.

Only clips new to the bin are exported/transcoded. If there are clips in the Export Watch Folder K2 bin that were present prior to configuring the bin as the Export Watch Folder, those clips are not exported/transcoded.

Creating K2 Coder watch folders

The K2 Coder comes from Grass Valley pre-configured with watch folders. If you need to re-create these watch folders, use the topics in this section.

Creating the import watch folder

1. Run Carbon Coder Admin.
2. Select the **Watch Folders** tab.
3. Click the **Add Watch** button.
4. Select **General Properties** on the left pane.
5. Enter *ImportWatchFolderTemplate* as the name for the watch folder.

   The name is for display purposes only.
6. To set the Watch Folder location, select **Browse Folders** to *V:\K2Coder\SourceFiles*.
7. Select **Create New File** if target file exists.
8. Under **Advanced Settings**, select **Delete Local Source after Conversion**.
9. In the left pane expand **Remote Retrieve**, then **File Retrieve**, then under **File Retrieve** click **Add...**.
10. Select **Remote Patch (UNC)**. Browse and go to *V:\K2Coder\ShortCuts* and **OK**.

11. Select **Create Shortcut instead of Local Copy**.
12. In Retrieval Settings set Wildcard to *"*"*, Watch Interval (sec.) to *10*, Trigger File Size (kB) to *0*.
13. Click the **Update** button.
14. Expand **Target File** on the left pane, then click **Add...**.
15. On the right pane Preset Category, select **System**, then select a preset such as K2_SD_NYSD_IFRAME_50Mbps_Template from the list.
16. Click on the **Preset Editor** page.
17. Set the Target Folder to *V:\K2Coder\FilesToK2*.
18. Click the **Update** button.
19. Click **Save Watch** to save settings and close.

The new Watch folder is added to the Carbon Admin UI. Make sure that the check box for "Active" column is selected.

Creating the export watch folder

1. In AppCenter, create bin “K2-Coder-Export”.
2. Run Carbon Coder Admin.
3. Select **Watch Folder** tab.
4. Select **General Properties** on the left pane.
5. Enter *ExportWatchFolderTemplate* as the name for the Watch Folder.

   The name is for display purposes only.
6. Set the Watch Folder location to *V:\K2Coder\FilesFromK2*.
7. Select **Create New File** if the target file exists.
8. Expand **Remote Retrieve** and then **FTP Retrieve** on the left pane, then click **Add...**.
9. On the right pane, click the **Edit** button.
10. In the ServerConfig window that pops up, enter *localhost* for FTP Server Address, enter *movie* as username, *21* for FTP server port, leave Password and Use Passive FTP empty.
11. Click **Connect** button.

    The ServerConfig windows close automatically.

    In the Watch Folder setup window, the Server Status should show “Connected to XXX”.
12. Expand the Current Folder drop down list, select bin **K2-Coder-Export** then click the **Select** button.

    The Selected Folder should show “V:\GXF\K2-Coder-Export\”.
13. Enter “*” for Wildcard.
14. Enter *15* for Watch Interval (sec).

15. Click the **Update** button.
16. Select **Target File** on the left pane, then click **Add...**.
17. On the right pane, select **system** in the tree view, then select a preset such as **AVI Target**.
18. Set the Target Folder to **V:\K2Coder\DestFiles**.
19. Click the **Update** button.
20. Click **Save Watch** to save settings and close.

The new Watch Folder is added to the Carbon Admin UI. Make sure the check box for "Active" column is selected.

Using Storage Utility

When doing configuration or service work on the media file system, the media database, or the RAID storage devices of an existing K2 SAN, the primary tool is the Storage Utility. Refer to "Storage Utility" on page 388 for a general description.

CAUTION: Use the Storage Utility only as directed by a documented procedure or by Grass Valley Support. If used improperly, the Storage Utility can render your K2 SAN inoperable or result in the loss of all your media.

The installation chapters earlier in this document provide instructions for using Storage Utility as you initially set up and configure a K2 SAN. You should refer to those instructions for information that is specific to the level of your K2 SAN. Procedures in this section are as follows:

- "Accessing Storage Utility" on page 437
- "Overview of Storage Utility" on page 438

Accessing Storage Utility

To access the Storage Utility, you must open it from within the K2 System Configuration application. Access permissions are passed from the K2 System Configuration application to the Storage Utility as it opens, so make sure that you are logged in with sufficient permissions.

You open the Storage Utility from within the K2 System Configuration application in the following ways:

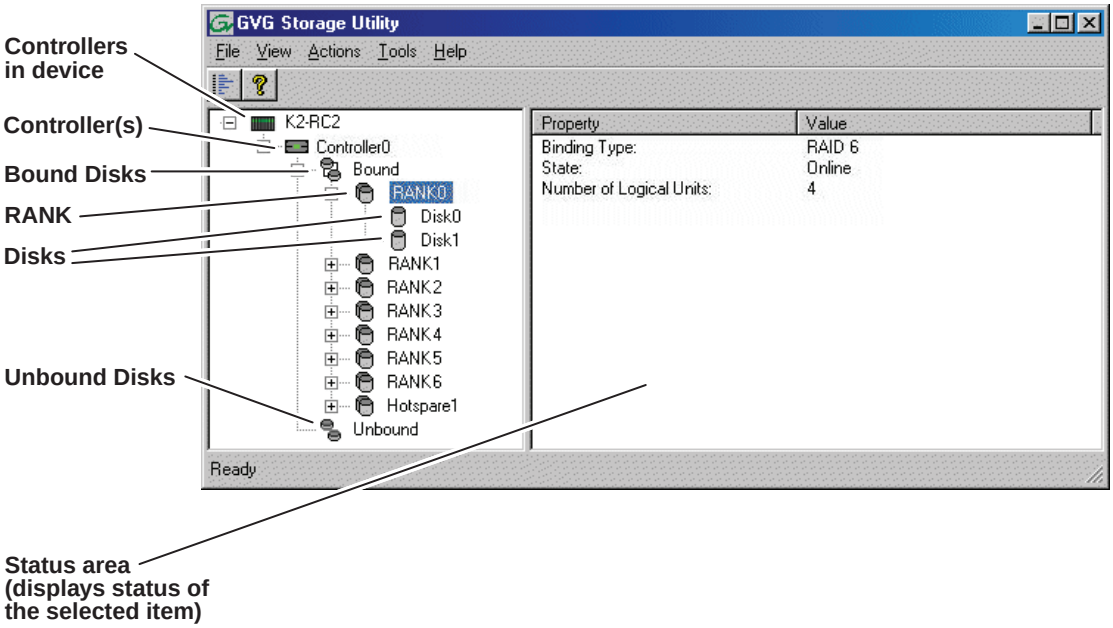
- In the K2 System Configuration application tree view, select the name of the K2 SAN, which is the top node of the storage system tree. Then click the **Storage Utility** button. Storage Utility opens. In this case the connection to the RAID storage devices is via the K2 Media Server first configured, which is designated as server 1, server A, or server 1A, depending on the level of the SAN.
- In the K2 System Configuration application tree view, open the node for a K2 Media Server and select the **File System Server** node to open its property page. On the property page click **Launch Storage Utility**. Storage Utility opens. In this case

the connection to the RAID storage devices is via the selected K2 Media Server. Use this method for nearline SANs.

NOTE: Do not run Storage Utility on a shared storage K2 client.

NOTE: Do not run Storage Utility as a stand-alone application, separate from the K2 System Configuration application. To maintain a valid K2 SAN all storage configuration must be controlled and tracked through the K2 System Configuration application.

Overview of Storage Utility



The Storage Utility user interface includes a tree view in the left-hand pane, and a status information area displayed in the right-hand pane. The tree view displays the hardware that make up the RAID storage system. The context menus in the tree view are used to configure storage. The right-hand status pane displays information about the item selected in the tree view. The tree view hierarchy is as follows:

Controllers in device - Provides a logical grouping of the RAID Controllers in a primary RAID chassis.

Controller - Represents the RAID Controllers found. These are numbered in the order discovered. The controller icon represents both RAID Controller A and, if installed, RAID Controller B. To determine if an optional RAID Controller B is installed, select the Controller icon in the tree view, then examine the status pane for peer status.

Bound Disks - Expanding the Bound node displays all bound disks.

RANK - Represents a bound RANK. Expanding the RANK node displays the disk modules that make up the RANK.

UnBound disks - Expanding the UnBound node, displays all unbound disk

modules.

Disks - Represents the disk modules.

The Storage Utility detects disks available and lists them on the opening screen.

Refer to "About RANKs and LUNs in Storage Utility" in Chapter 11, *Overview of K2 Storage Tools*.

Refer to the following procedures to use Storage Utility for maintenance and configuration tasks

Working on the media file system and database

Use the procedures in this section when doing configuration or service work on the media file system or the media database of an existing K2 SAN. Procedures are as follows:

- "Checking the media file system" on page 439
- "Cleaning unreferenced files and movies" on page 440
- "Making a new media file system" on page 440
- "Expanding the media file system by capacity" on page 442
- "Expanding the media file system by bandwidth" on page 444

Checking the media file system

This procedure checks the media file system but retains current media files. The requirements for this procedure are as follows:

- You must access Storage Utility (via the K2 System Configuration application login) with permissions equivalent to K2 administrator or higher.
- When you access Storage Utility, the K2 SAN must be offline.
- All iSCSI clients and K2 clients in the K2 SAN must be offline.
- K2 Media Servers with role of file system/metadata server, both primary and redundant, must be powered up but offline.

NOTE: This procedure can take 20 hours or more on a large SAN. Do not start this process unless you have adequate time set aside.

To check the media file system, do the following:

1. In Storage Utility, click **Tools | Check File System**.
2. A message box appears "Checking media file system. Please wait". Observe progress.

   If problems are discovered they are reported. If the check process passes, when the process is complete a message appears to confirm success.
3. Click **OK** to dismiss the results.

Your file system has been checked.

Cleaning unreferenced files and movies

These procedures allow you to keep the media database and the media files in sync. You can check the movies (clips) in the media database for the references to media files that should be currently stored on the media disks. Likewise, you can check for media files that are not referenced by a movie in the media database. If you find any unreferenced files or movies, you can delete them. The requirements for these procedures are as follows:

- You must access Storage Utility (via the K2 System Configuration application login) with permissions equivalent to K2 administrator or higher.
- When you access Storage Utility, the K2 SAN must be offline.
- All iSCSI clients and K2 clients in the K2 SAN must be offline.
- K2 Media Servers with role of file system/metadata server, both primary and redundant, must be powered up but offline.

To clean unreferenced files, do the following:

1. In Storage Utility, click **Tools | Clean Unreferenced Files**.
2. A message box appears "…searching…Please wait". Observe progress.
3. A message box reports results. Respond as follows:
   - If no unreferenced files are found, click **OK** to dismiss the results.
   - If unreferenced files are discovered, you are prompted to delete them. Click **Yes** to delete the files or **No** to leave the files intact.

To clean unreferenced movies, do the following:

1. In Storage Utility, click **Tools | Clean Unreferenced Movies**.
2. A message box appears "…searching…Please wait". Observe progress.
3. A message box reports results. Respond as follows:
   - If no unreferenced movies are found, click **OK** to dismiss the results.
   - If unreferenced movies are discovered, you are prompted to delete them. Click **Yes** to delete the movies or **No** to leave the movies intact.

Making a new media file system

The requirements for this procedure are as follows:

- You must access Storage Utility (via the K2 System Configuration application login) with permissions equivalent to K2 administrator or higher.
- When you access Storage Utility, the K2 SAN must be offline.
- All iSCSI clients and K2 clients in the K2 SAN must be shut down.

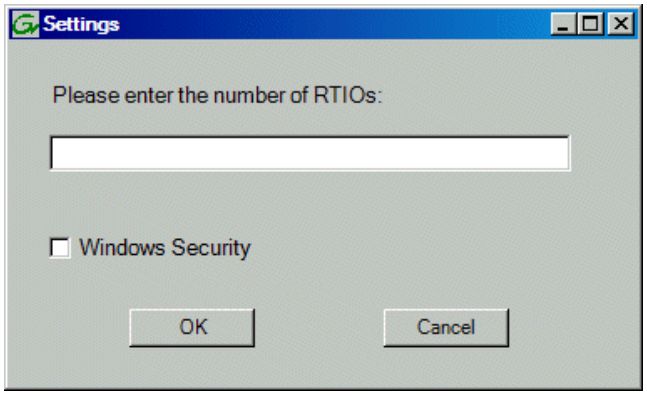
NOTE: You lose all media with this procedure.

If your SNFS file system name is currently “default”, when you make a new file system the name changes to “gvfs_hostname”, where hostname is the name of the primary FSM.

To make a new media file system, do the following:

1. In Storage Utility, click **Tools | Make New File System**.

   The Settings dialog box opens.



2. Configure the Settings dialog box as follows:

   - For Real Time Input Output (RTIOs), enter the number specified for the design of your K2 SAN. Contact your Grass Valley representative if you do not know this number.
   - For Windows Security on a K2 SAN with only K2 clients, leave this setting unchecked.
   - For Windows Security on a K2 SAN with Aurora Edits, refer to the *Aurora Edit Installation and Configuration Guide*.

   Click **OK**. The Configuration File dialog box opens.

3. On the Configuration File dialog box, you can view media file system settings, but do not attempt to change them. Click **Accept**.

   A “Making new file system. Please wait” message box displays progress.

4. When a message “Succeeded to make the new file system…” appears, click **OK**.

5. Restart the K2 Media Server.

6. You now have a blank (empty) file system. Proceed as follows:

   - On a 7.x SAN, you also have a blank database. Do not perform additional operations on the database. Skip to the next step in this procedure.
   - On a 3.x SAN, the media database still contains references to media files which are no longer present in the file system. To clear the media database do the following:

   a. In the K2 System Configuration application tree view, open the node for the K2 Media Server and select the **Database Server** node to open its property page.

b. On the Database Server property page click **Erase media database**.

A message box displays progress.

c. Wait until a message confirms that the process is complete. This can take several minutes.

d. If you have redundant K2 Media Servers, repeat these steps to clear the media database on the other (redundant) server.

7. Close Storage Utility.

8. If you have Macintosh systems accessing the K2 SAN, you should check that the SNFS file system volume is configured correctly on the Macintosh systems. Refer to procedures in Chapter 13, *K2 FCP Connect access for Final Cut Pro systems* on page 470.

9. Place the K2 SAN back online.

Expanding the media file system by capacity

NOTE: This procedure should only be attempted under the supervision of qualified Grass Valley support personnel. Contact your Grass Valley representative for assistance.

If you need to increase the storage capacity of your K2 SAN, you can do so by adding one or more Expansion Chassis, up to the maximum number of chassis allowed for your level of storage.

When expanding by capacity, the number of LUNs or RANKs added must be a multiple of the number of LUNs or RANKs currently in the system. For example, if the current system has four (4) RANKs, then you can add an additional four (4 X 1) RANKs, eight (4 X 2) RANKs, twelve (4 X 3) RANKs, etc.

The expansion chassis that you add to your K2 SAN must have unbound, unlabeled disks.

When you add an Expansion Chassis to increase storage capacity, use the following procedure:

1. Rack the Expansion Chassis.

2. If a redundant K2 SAN, do the following:

a. Verify that MPIO is updated to the latest version on all shared storage K2 clients. Refer to instructions in the *K2 System Guide*.

b. Put the system into an “original primary” state. This means that for all redundant devices (switches, servers, RAID controllers, etc.) the current device acting as primary is the one that was initially configured as primary when the system was originally installed.

3. On the K2 Media Server with the role of primary media file system/metadata server, save a copy of the following files to a different location:

D:\snfs\config\default.cfg (on some systems this file is named gv*fs_hostname.cfg*, where hostname is the name of the SNFS file system server.)

D:\snfs\config\cvlabels

4. Power down the K2 SAN, including RAID storage devices.
5. Power up the RAID storage devices. Verify that they stabilize in an operational state with no errors indicated.
6. Power down RAID storage devices.
7. Cable and configure the Expansion Chassis as instructed in the installation chapter for your level of K2 SAN.
8. Power up the RAID storage devices. Verify that they stabilize in an operational state with no errors indicated.
9. Startup the K2 SAN. Refer to the start up procedure in the installation chapter for your level of K2 SAN.
10. Bind the RANKs in the Expansions Chassis using Background Bind.
11. When binding is complete, put the K2 SAN in an offline state as follows:
    - You must access Storage Utility (via the K2 System Configuration application login) with permissions equivalent to K2 administrator or higher.
    - When you access Storage Utility, the K2 SAN must be offline.
    - All iSCSI clients and K2 clients in the K2 SAN must be shut down.
12. Restart all K2 Media Servers. Do not use the standard startup processes here. Just start up the server(s) and wait until the Windows desktop appears. Especially do not use Server Control Panel or start Failover Monitor.
13. In Storage Utility, select **Tools | Expand File System By Capacity**.

    The first of a series of informational screens opens.
14. Work through the informational screens to verify information. When the option to retry becomes available, if the new disks are not labeled correctly, retry to start the process. If you are not sure, you can retry to be sure. Doing so does not cause problems.
15. A message box reports progress. When a message reports success, the process is complete.
16. Restart the K2 SAN.
17. If a redundant K2 SAN, test failover capabilities.

Expanding the media file system by bandwidth

If you want to retain your media file system and yet expand the bandwidth of your K2 SAN, you must use the following procedures for dynamic bandwidth expansion. This process allows you to add RANKs to the stripe group, thereby expanding its width, without reinitializing the file system. This keeps the existing media intact. The additional RANKs can be made up of new disks in existing RAID chassis, disks in new Expansion Chassis, or disks in new primary RAID chassis.

After the file system is expanded, existing media is still striped across the original narrower stripe group, so it can not take advantage of the increased bandwidth. Also, if there is a significant portion of the storage pool occupied by this existing media, its presence reduces the extent to which new media can use the increased bandwidth. For this reason the dynamic bandwidth expansion process provides the Restripe Utility, which restripes the existing media across the new wider stripe group. This enables both the existing media and new media to get full benefit of the increased bandwidth. Refer to "Managing the Restripe Utility" on page 448 for more information.

If the media on your file system has a high turnover rate and you know existing media is to be deleted soon, you have the option of disabling the Restripe Utility. This saves the system resources and time required to restripe media.

The expansion chassis that you add to your K2 SAN must have unbound, unlabeled disks. If it currently has disks bound or labeled, connecting it to your system can cause errors.

Dynamic bandwidth expansion is supported only with K2 system software version 3.2 and higher.

NOTE: Adding RAID storage devices changes your system design and must be specified for your K2 SAN by Grass Valley. Do not attempt to add RAID storage devices without support from Grass Valley.

Dynamic bandwidth expansion checklist

Grass Valley personnel who have received K2 SAN training can use the following checklist to expand the bandwidth of an K2 SAN system.

Dynamic bandwidth expansion checklist

Task	Documentation	Tips
Prepare system		
❑ If a redundant K2 Storage System, verify that MPIO is updated to the latest version on all shared storage K2 clients.	*K2 System Guide*	—
❑ If a redundant K2 Storage System, put the system into an "original primary" state.	"Identifying current primary/backup K2 Media Servers" on page 402	This means that for all redundant devices (switches, servers, RAID controllers, etc.) the current device acting as primary is the one that was initially configured as primary when the system was originally installed.
❑ Back up configuration files from the primary K2 Media Server.	Save a copy of the following files to a different location: *D:\snfs\config\default.cfg*[a] *D:\snfs\config\cvlabels*	If there is a problem with the expansion process, contact Grass Valley Support for instructions on using these files to recover.
❑ If K2 storage contains Aurora media, do additional steps.	"Bandwidth expansion for Aurora products" on page 447	—
❑ Verify recovery disk images. Update if necessary.	"Backup and recovery strategies" in the Software chapter elsewhere in this manual.	—
Set up and configure RAID		
❑ Rack any new RAID equipment	—	—
❑ Stop all media access and power down K2 clients and other clients.	Refer to the power down procedure in the installation chapter for your level of K2 SAN.	—
❑ Clean unreferenced files and movies.	"Cleaning unreferenced files and movies" on page 440.	K2 Media Servers with role of file system/ metadata server, both primary and redundant, must be powered up but offline.
❑ Power down the remaining devices of the K2 SAN.	Refer to the power down procedure in the installation chapter for your level of K2 SAN.	—
❑ Add disks or RAID equipment to support the additional RANKs.	If adding new RAID equipment, rack, cable, and configure as instructed in the installation chapter for your level of K2 SAN.	As applicable, remember to set Fibre Channel addresses on RAID controllers and chassis addresses on Expansion Adapters.
❑ Startup the RAID equipment.	Refer to the start up procedure in the installation chapter for your level of K2 SAN.	—
❑ Start up the primary K2 Media Server.	Refer to the start up procedure in the installation chapter for your level of K2 SAN.	If there are multiple K2 Media Servers, this is the server that takes the role of media file system server. On a redundant K2 SAN, this is the server functioning as primary when the system was last powered down.
❑ From the control point PC, open the K2 System Configuration application and launch Storage Utility.	"Accessing Storage Utility" on page 437	Make sure that versions are correct and consistent on both new and existing RAID storage devices.

Task	Documentation	Tips
❑ Verify versions of controller microcode and disk firmware. Update if necessary.	Refer to *K2 Release Notes* and "Checking controller microcode" on page 451	Make sure that versions are compatible on both new and existing disks and RAID storage devices.
❑ Bind RANKs using the new disks. Wait for the binding process to complete.	"About full/background bind" on page 455	Do not unbind or bind existing RANKs. Doing so destroys all data. If in doubt, flash drive lights to identify disks.
❑ Close Storage Utility.	—	—
❑ Restart the primary K2 Media Server.	Do not use the standard startup processes here. Just start up the server and wait until the Windows desktop appears. On a redundant K2 SAN, do not use Server Control Panel or manually start.	Check the Windows Device Manager to verify that the server "sees" both the old RANKs and the new RANKs.
❑ Start up all remaining K2 Media Servers that are connected to the K2 SAN.	Do not use the standard startup processes here. Just start up the server(s) and wait until the Windows desktop appears. On a redundant K2 SAN, do not use Server Control Panel or manually start.	—
Configure media file system		
❑ If Aurora media is present, modify *VolumeConfig.xml*.	"Bandwidth expansion for Aurora products" on page 447	—
❑ From the control point PC, open the K2 System Configuration application and launch Storage Utility.	"Accessing Storage Utility" on page 437	In Storage Utility make sure both old RANKs and new RANKs are displayed.
❑ Using Storage Utility, expand the file system by bandwidth.	1. Select **Tools | Expand File System By Bandwidth** and answer **Yes** to confirm. A dialog box opens, asking if you want to restripe existing media after bandwidth expansion. 2. Click **Yes** to restripe media, **No** to skip restriping. The first of a series of informational screens opens. 3. Work through the informational screens . 4. The expansion process runs. A dialog box displays progress. The expansion process runs. A dialog box displays progress. 5. Wait for the process to complete. On a large system this can take over 30 minutes. 6. A "…succeeded…" message is displayed when done. Click **OK** and Storage Utility closes. 7. The K2 System Configuration application displays a message informing you to restart servers. Click **OK**.	When asked about restriping existing media, the typical response is to click Yes. In any case this does no harm. Click No only if you are sure you do not need to restripe existing media, such as in the following cases: • You have very little existing media so the fact that it cannot use the new stripe group does not impact future media operations or capacity. • Your existing media is to be deleted soon so you don't care if it uses the new stripe group. When prompted to retry, if you are not sure if the process started, you can retry to be sure. Doing so does not cause problems. Make sure Storage Utility is closed before proceeding.

Task	Documentation	Tips
❑ If directed, modify RTIOS.	Do this step only under the direction of Grass Valley Support. As directed, use a text editor to modify the SNFS configuration file on K2 Media Servers (both primary and backup) with the role of media file system/database server. ***NOTE: Don't use the SNFS configuration tool to modify the system configuration. Doing so causes unexpected changes in the configuration file, resulting in a failure of the expansion process.***	Depending on your use of the expanded file system, you might need to change the RTIOS value. This value can be calculated only by Grass Valley Support.
❑ Restart all K2 Media Servers.	Refer to the start up procedure in the installation chapter for your level of K2 SAN. Make sure to first start servers with the role of media file system/metadata server.	When the server that takes the role of FTP server starts, one of the following happens: • If you answered "Yes" to restripe existing media in the step above, the Restripe Utility automatically launches and begins restriping media. • If you answered "No" to restripe existing media in the step above, the Restripe Utility does not launch.
❑ Monitor the Restripe Utility,	"Managing the Restripe Utility" on page 448	On a file system with a large amount of existing media, this can take days. ***NOTE: Do not stop the FTP server once the restripe process begins.***
❑ Record system information	—	Make sure you keep diagrams and other on-site documentation up to date.

[a] On some systems this file is named g*vfs_hostname.cfg*, where hostname is the name of the SNFS file system server

Bandwidth expansion for Aurora products

The "Expansion by bandwidth" feature is supported on K2 Storage Systems that store media from both K2 products and Aurora products. If the storage system contains media from Aurora products and you want to retain that media, additional steps are required, as follows:

1. Before starting the file system expansion, using Notepad or another text editor, open the following file:

   V:\VolumeConfig.xml

2. To the existing XML content, add lines with XML tags `<MainFolder>` and `<AtticFolder>` to specify the main folder and attic folder for your Aurora media. For example, if the main folder is "VibrintAVFiles" and the attic folder is "VibrintAttic", the resulting XML content is as follows:

   ```
   <VolumeConfig>
   ```

```
    <Type>K2 Storage</Type>
    <Model>Grass Valley PFR700</Model>
    <StripeSize>512</StripeSize>
    <Security>Not Supported</Security>
    <MainFolder>V:\VibrintAVFiles</MainFolder>
    <AtticFolder>V:\VibrintAttic</AtticFolder>
</VolumeConfig>
```

3. Save and close the *VolumeConfig.xml* file.
4. Proceed with bandwidth expansion process.

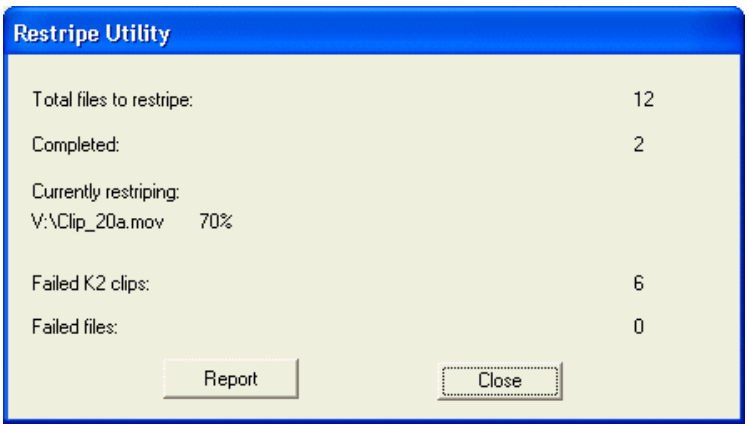
Managing the Restripe Utility

If you answer "Yes" to the dialog box that asks about restriping existing media, after the bandwidth expansion process completes, Storage Utility exits with a special code. On receiving the special exit code, the K2 System Configuration application sets the current date in the registry of the K2 Media Server that takes the role of FTP server.

When the FTP server restarts, the Restripe Utility automatically opens. The Restripe Utility reads the date set in the registry, finds clips and files created before that date, and restripes the clips and files, one at a time.

You can monitor the Restripe Utility in the following ways:

- While the Restripe Utility is running, it is represented by an icon in the system tray. You can right-click this icon and open the Restripe Utility window.



- The Restripe Utility window reports first on the progress of K2 clips being restriped, then on the progress of files being restriped.
- Click the Report button for a list of clips and files that failed to be restriped, if any.
- When the Restripe Utility completes its processes, it reports its results to *C:\profile\RestripeResult.txt*. Open this file in Notepad to verify successful results.

You can start and stop the Restripe Utility manually as follows:

- At any time while the Restripe Utility is in the process of restriping clips, you can right-click the icon in the system tray, and select **Abort**. This stops the restripe process and closes the Restripe Utility.

NOTE: Stopping the Restripe Utility before it completes its processes leaves some of your existing media still striped across the original narrower stripe group. Once the Restripe Utility is stopped, you cannot restripe that existing media.

Working with RAID storage

This section refers to K2 Lx0 RAID storage devices.

K2 Level 2 and K2 Level 3 RAID storage devices were released with previous versions of K2 SANs. Refer to previous versions of this manual for information about Level 2 and Level 3 RAID.

Use the procedures in this section when doing configuration or service work on the RAID storage devices of an existing K2 SAN. Procedures are as follows:

- "Checking RAID storage subsystem status" on page 450
- "Checking controller microcode" on page 451
- "Identifying disks" on page 451
- "Get controller logs" on page 454
- "Unbind RANK" on page 454
- "About full/background bind" on page 455
- "Bind RANK" on page 456
- "Binding Hot Spare drives" on page 457
- "Loading RAID controller and expansion chassis microcode" on page 458
- "Downloading disk drive firmware" on page 459
- "Replacing a disk module" on page 460
- "Replacing a controller" on page 461
- "Upgrading to L30 controllers" on page 462
- "Configuring Level 10/20/30/35 RAID chassis network and SNMP settings" on page 463

Checking RAID storage subsystem status

Some limited status information for storage subsystems is displayed in the Storage Utility. This can be helpful when configuring storage. You can view status information by selecting items in the tree view.

Item in tree view	Status information displayed
Controllers in Device	Number of Controllers
Controller	Peer Status Primary IP Serial Number Slot Peer Slot Microcode Version
Bound	Number of RANKS or LUNs
RANK	Binding Type, such as RAID 1 State (online or offline) Number of Logical Units

Item in tree view	Status information displayed
Disk	Firmware Vendor State Product ID Capacity
Unbound	Number of disks

Checking controller microcode

As explained in the previous section, to check controller microcode, in Storage Utility select the controller in the tree view and the microcode version is displayed.

Identifying disks

When you do maintenance or service work on your RAID storage, it is important for many tasks that you positively identify the disk or disks on which you are working. Your primary indicators for this are the numbering of the disks in Storage Utility and the ability to flash the disk LED on a physical disk or a group of disks.

Level 10 - 35 RAID disk numbering

In Storage Utility, Level 10 through 35 (SAS and SATA) RAID disks are numbered with a hexadecimal convention. Disk modules are identified based on the chassis address and physical location, as explained in the following sections.

Level 10, 20, and NL10 disk numbering

When Expansion chassis are all connected to DP0, as in Levels 10, 10R, 20, 20R, NL10, and NL10R, disks are numbered as follows:

Chassis...	Connects to...	With disk numbering as follows:			
Primary	DP0 (internal connection)	00	01	02	03
		04	05	06	07
		08	09	0A	0B
Expansion 1	DP0	10	11	12	13
		14	15	16	17
		18	19	1A	1B
Expansion 2	DP0	20	21	22	23
		24	25	26	27
		28	29	2A	2B
Expansion 3	DP0	30	31	32	33
		34	35	36	37
		38	39	3A	3B
Expansion 4	DP0	40	41	42	43
		44	45	46	47
		48	49	4A	4B

Chassis...	Connects to...	With disk numbering as follows:			
Expansion 5	DP0	50	51	52	53
		54	55	56	57
		58	59	5A	5B
Expansion 6	DP0	60	61	62	63
		64	65	66	67
		68	69	6A	6B
Expansion 7	DP0	70	71	72	73
		74	75	76	77
		78	79	7A	7B

Level 30, 35 disk numbering

When Expansion chassis are connected to DP0 and DP1 in an alternating pattern, the disk numbering is as follows. This is the connection pattern for Levels 30, 30R, 35, and 35R. With this pattern, the first Expansion chassis connected to DP1 always has a chassis address of 8, regardless of how many Expansion chassis are connected to DP0.

Chassis...	Connects to...	With disk numbering as follows:			
Primary	DP0 (internal connection)	00	01	02	03
		04	05	06	07
		08	09	0A	0B
Expansion 2	DP0	10	11	12	13
		14	15	16	17
		18	19	1A	1B
Expansion 4	DP0	20	21	22	23
		24	25	26	27
		28	29	2A	2B
Expansion 6	DP0	30	31	32	33
		34	35	36	37
		38	39	3A	3B
Expansion 8	DP0	40	41	42	43
		44	45	46	47
		48	49	4A	4B
Expansion 10	DP0	50	51	52	53
		54	55	56	57
		58	59	5A	5B

Chassis...	Connects to...	With disk numbering as follows:			
—	—	—			
Expansion 1	DP1	80	81	82	83
		84	85	86	87
		88	89	8A	8B
Expansion 3	DP1	90	91	92	93
		94	95	96	97
		98	99	9A	9B
Expansion 5	DP1	A0	A1	A2	A3
		A4	A5	A6	A7
		A8	A9	AA	AB
Expansion 7	DP1	B0	B1	B2	B3
		B4	B5	B6	B7
		B8	B9	BA	BB
Expansion 9	DP1	C0	C1	C2	C3
		C4	C5	C6	C7
		C8	C9	CA	CB

Flashing disk LEDs

Storage Utility's Identify feature allows you to flash the disk LEDs so that you can physically locate a specific disk module or group of disk modules that make up a RANK. Always use the disk identify feature before removing and replacing a failed disk module. Accidentally removing the wrong disk module can destroy data.

To identify RAID disks by flashing disk LEDs, do the following:

1. Open Storage Utility and in the tree view expand all nodes so that all disks are displayed.
2. Open the bezel on the RAID storage chassis or otherwise make sure you can see disk LEDs.
3. Identify the disks in a RANK or identify a single disk, as follows:
   a. In the Storage Utility tree view, right-click a RANK or right-click a single disk, then select **Identify RANK** or **Identify Disk** in the context menu. A message box opens with a message that informs you that a disk or disks are blinking.
   b. The LEDs for the disk or disks display a flashing pattern. Verify the location of

the disk or disks.

Get controller logs

1. In the Storage Utility tree view, select the controller.
2. Click **Actions | Get Controller Logs**.
3. A message informs you of the location of the logs.
4. Find the log files on the K2 Media Sever at *C:\logs*.

Unbind RANK

Unbinding reverses the bind process. Unbinding might be needed when reconfiguring a SAN.

CAUTION: Unbinding destroys all data stored on disk modules.

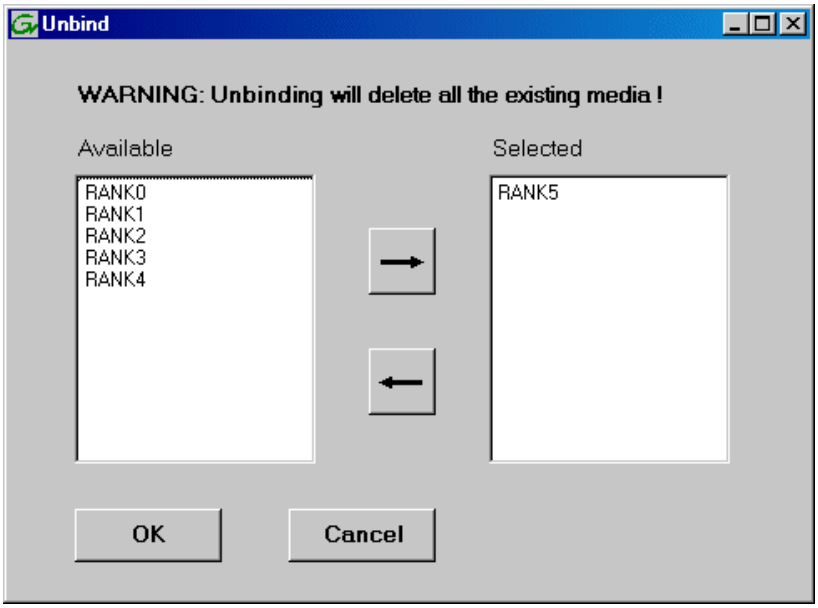
Refer to "About RANKs and LUNs in Storage Utility" in Chapter 11, *Overview of K2 Storage Tools*.

The requirements for this procedure are as follows:

- You must access Storage Utility (via the K2 System Configuration application login) with permissions equivalent to K2 administrator or higher.
- All iSCSI clients and K2 clients in the K2 SAN must be shut down.

To unbind a RANK, do the following:

1. In the tree view, right-click the RANK and select **Unbind**.
2. When warning messages appear "…destroy all existing media…" and "Are you sure?", click **OK** to continue. The Unbind dialog box opens.



3. Verify that the RANK or RANKs you intend to unbind is in the Selected box. If not, select RANKs and click the arrow buttons until the RANKs you intend to bind are in the Selected box and the RANKs you do not intend to unbind are in the Available box.

NOTE: As an aid in identifying a disk module's physical location, select it in the Selected Disks list, then click* Identify Disks. *This causes the disk drive LED to flash.

4. Click **OK** to close the Unbind dialog box and begin the unbinding process. The Progress Report dialog box opens, showing the status of the unbinding process.
5. When progress reports 100% complete, the RANK is unbound.
6. Restart the K2 Media Server.

About full/background bind

When binding RAID disks, you can choose to do either a full bind or a background bind. Background bind is recommended. These binding processes are described as follows:

- Full bind — During this process, the K2 SAN must be in the offline mode. While the full bind process is underway, disks are not available for data access of any kind. On a large SAN, the full bind process can take many hours, so you should plan ahead for this process. For example, binding 750 Gig SATA drives can take up to 3 days.
- Background bind — During this process, the K2 SAN can be in a restricted online mode. Disks are available for data access, but the overall performance of the RAID storage is significantly reduced. While the background bind process is underway, you can initiate media access on your SAN for limited testing of operations, such as record, play, and transfer, but do not run media access at full bandwidth. The background bind process is useful when doing initial system installation and

configuration, as it does not require the long wait time required for full bind. You can have RAID disks binding while you move on to other tasks that require RAID media access.

With either type of binding process, you should bind multiple RANKs simultaneously, to reduce the overall time required to bind disks.

Bind RANK

Binding disk modules formats them into a logical units called RANKs. The disks that make up a RANK are accessed as a contiguous disk space. Disk modules must be bound before they can be part of the video storage file system.

For simplicity, the Storage Utility only allows binding the first available (at the top of the Available Disks list) contiguous disk modules into RANKs. After binding, disk modules become slot specific and cannot be moved to other disk module slots.

Refer to "About RANKs and LUNs in Storage Utility" in Chapter 11, *Overview of K2 Storage Tools*.

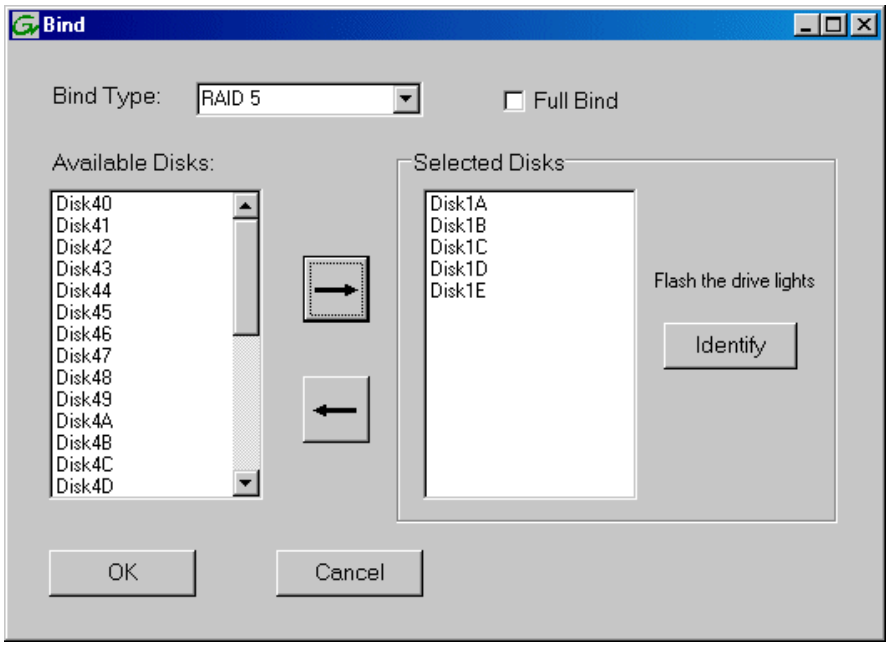
The requirements for this procedure are as follows:

- You must access Storage Utility (via the K2 System Configuration application login) with permissions equivalent to K2 administrator or higher.
- When you access Storage Utility, the K2 SAN must be offline.
- All iSCSI clients and K2 clients in the K2 SAN must be shut down.

To bind a RANK, do the following:

1. In the tree view, right-click the **Unbound** node and select **Bind**. (Peer controllers that share the same set of disks are automatically selected as a pair.)

The Bind dialog box opens showing all unbound disks for the controller listed in the Available Disk list.



2. Leave **Full Bind** unchecked. Refer to the previous section "About full/background bind".
3. In the **Bind TYPE** drop down box, select the RAID type. Refer to the installation chapter earlier in this document for your level of SAN for specific instructions.
4. In the Available Disks box, select contiguous disks at the top of the list as appropriate for the RAID type. (TIP: Use 'shift-click' or 'control-click' to select disks.)
5. Click the add (arrow) button to add disks to the Selected Disks list.

NOTE: As an aid in identifying a disk module's physical location, select it in the Selected Disks list, then click* Identify Disks. *This causes the disk drive LED to flash.

6. Click **OK** to close the Bind dialog box and begin the binding process. The Progress Report dialog box opens, showing the status of the binding process.
7. Close the Progress Report and repeat these steps for other unbound disks.
8. Upon 100% completion, click **Close** in Progress Report window.
9. Restart the K2 Media Server.

Binding Hot Spare drives

You can bind disks as hot spare drives. Hot spare drives are on standby and are used in the event of a drive failure in a RANK. If a drive fails, the RAID Controller automatically selects a hot spare drive to use in place of the failed drive. This prevents the system from operating in a degraded state.

If the drives you want to designate as hot spares are bound as part of a RANK, you must unbind the drives first, then bind them as hot spares. To function as a Hot Spare, the drive must be at least as fast and have at least as much capacity as the failed drive it replaces.

The requirements for this procedure are as follows:

- You must access Storage Utility (via the K2 System Configuration application login) with permissions equivalent to K2 administrator or higher.
- When you access Storage Utility, the K2 SAN must be offline.
- All iSCSI clients and K2 clients in the K2 SAN must be shut down.

To bind drives as hot spare drives, do the following:

1. In Storage Utility, right-click the **Unbound** node for a controller, then select **Bind** in the context menu. (Peer controllers that share the same set of disks are automatically selected as a pair.)

   The Binding dialog box opens showing all unbound disks for the controller listed in the Available Disk list.

2. Select **Hot Spare** using the BIND TYPE drop-down box.
3. In the Available Disks box, select the disk(s) to be used as hot spares, then click the add (arrow) button to add them to the Selected Disks list.

NOTE: As an aid in identifying a disk module's physical location, select it in the Selected Disks list, then click* Identify Disks. *This causes the disk drive LED to flash.

4. Click **OK** to close the Binding… dialog box and begin the binding process. The Progress Report dialog box opens, showing the status of the binding process.
5. Upon 100% completion, click **Close** in Progress Report window.
6. Restart the K2 Media Server.

Loading RAID controller and expansion chassis microcode

You might be instructed in *K2 Release Notes* to upgrade the RAID Controller microcode and/or expansion chassis on the RAID chassis. This allows you to take advantage of the RAID enhancements and benefit from improved reliability.

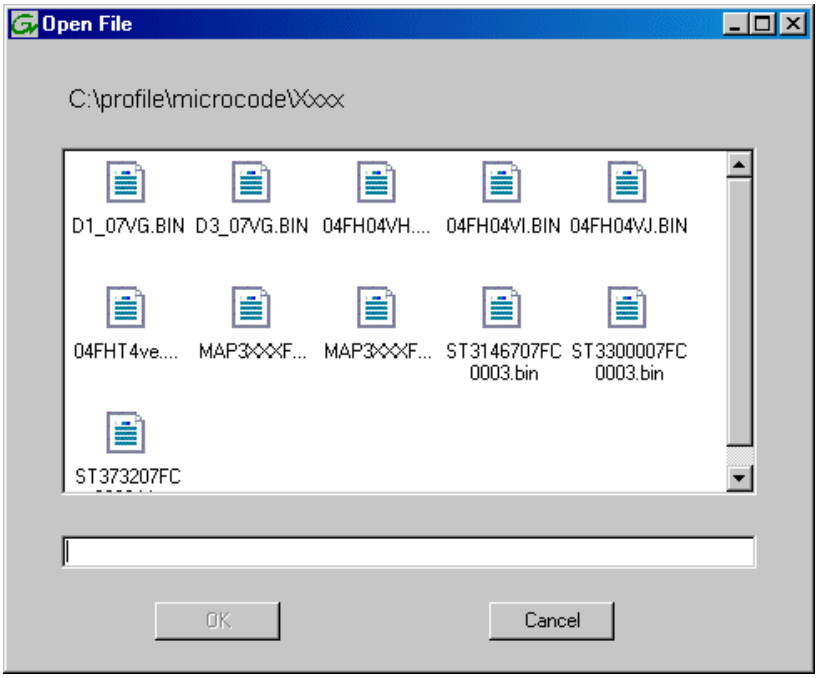
To upgrade microcode, do the following:

1. If upgrading expansion chassis microcode, take the RAID system offline.
2. In Storage Utility, right-click a controller in the tree view, then do one of the following:

   - To load controller microcode select **Advanced | Load Controller Microcode**
   - To load expansion chassis microcode select **Advanced | Load Disk Enclosure Microcode**

   Redundant controllers that share the same set of disks are automatically selected and upgraded as a pair.

   The Open File dialog box appears.



3. In the Open File dialog box, browse to the latest controller microcode file, select the file, and click **OK**.
4. The Progress Report window appears showing the microcode upgrade task and the percentage completion.
5. On 100% completion, proceed as follows:
   - If the RAID controller chassis has redundant controllers, no power cycle is required. The firmware download is complete.
   - If the RAID controller chassis does not have redundant controllers, power cycle the RAID controller chassis, then restart the K2 Media Server.

Downloading disk drive firmware

You might be instructed in *K2 Release Notes* to upgrade disk drive firmware. This allows you to take advantage of the disk drive enhancements and benefit from improved performance and reliability.

To determine your disk drive type and current firmware version, select a disk drive icon in the Storage Utility tree view, then note the drive properties reported in the right-hand pane. Use the following procedure if you need to download disk drive firmware.

NOTE: The disk drives on each controller are upgraded one at a time which can take as long as 2 minutes per drive. Take this into consideration when scheduling the upgrade.

Requirements for this procedure are as follows:

- All K2 clients and other clients must be powered down, or in some other way disconnected from the K2 SAN.
- The K2 Media Server through which Storage Utility is connected to the RAID Storage must be powered up.
- All other K2 Media Servers must be powered down.

To download disk drive firmware, do the following:

1. Refer to *K2 Release Notes* to determine firmware types, versions, files, and any other special instructions regarding the particular disk drive firmware you are downloading.
2. In the Storage Utility, right-click a controller in the tree view, then select **Advanced | Download Disk Firmware** in the context menu. The Open File dialog box opens.

NOTE: You can download firmware to a single disk by right-clicking a disk icon in the tree view.

3. In the Open File dialog box, browse to the desired firmware file for your disks, select the file, and click **OK**.

   As instructed by a message that appears, watch the lights on the drives. For each drive, one at a time, the lights flash as firmware loads. Wait until the lights on all the drives on which you are downloading firmware have completed their flashing pattern. This can take several minutes.

   The Progress Report window appears showing the disk firmware download task and the percentage complete.
4. When finished, restart the K2 Media Server.

Replacing a disk module

In the event of a disk drive failure, you'll repair the system by replacing the disk module as soon as possible. Refer to the Instruction Manual for your RAID storage chassis for information on removing and replacing disk modules.

NOTE: Always use Storage Utility to physically identify the failed disk module. Accidently removing the wrong disk module can destroy all media on the disk drives.

When the RAID controller detects that the disk module has failed, it automatically disables the disk module. This is reported in Storage Utility, and you should verify that the disk module is disabled before removing it.

In some cases you might suspect that the disk module is going bad, but the controller has not yet detected a failure and has therefore not yet disabled the drive. In this case you should manually disable the disk module before you remove it. This avoids momentary interruptions in signal output that can occur. The disabled state is persistent and the disk remains disabled even if the RAID chassis is restarted. After replacing the disabled disk module, the disk rebuild process starts automatically, which also enables the disk module.

To replace a disk module, do the following:

1. Open Storage Utility.
2. Expand the tree view to display bound disks.

NOTE: Disks modules may not be visible in the tree view if they are part of a newly bound RANK. You must restart your RAID chassis and the K2 Media Server to allow the drive modules to be seen in Storage Utility.

3. Identify the disk in question. Refer to "Identifying disks" on page 451.
4. Select the disk module icon and check its status, then proceed as follows:
   - If the disk module reports as disabled, proceed to the next step in this procedure.
   - If the disk module reports as online, right-click the disk module and select **Advanced | Disable Drive**, then click **OK** to continue. A message "…operation succeeded…" appears. The disk is disabled, as reported by the disk fault LED.

NOTE: If you accidentally disable the wrong disk module, you can enable it again by removing it and then replacing it in the chassis.

5. Remove and replace the disk module.

   Refer to procedures in the Instruction Manual for your RAID storage chassis.

   On inserting the replacement disk module, the RAID controller automatically starts rebuilding the drive. You can verify rebuild status by looking at the disk access LED on the front of the disk module, or by checking disk status in Storage Utility.
6. Wait approximately 1 minute for the disk to initialize.

   The disk ready LED is flashing.
7. To check rebuild status, do the following:
   - Select the replacement disk icon in Storage Utility, then view the disk status in the right-hand pane. You may need to refresh the Storage Utility display. On completion, the drive status changes from Rebuilding to Online.

Replacing a controller

If the RAID chassis has a single controller (non-redundant), you must take the K2 SAN offline before replacing a failed controller. Refer to procedures in the Instruction Manual for your RAID storage chassis. The remainder of this procedure does not apply to non-redundant systems.

If the RAID chassis has redundant controllers and is properly cabled and configured for a redundant K2 SAN, you can replace a failed controller while media access is underway, as described in this procedure. When a controller detects a fault on its redundant partner controller, the good controller disables the faulty controller automatically. In most cases an error message informs you of the fault and when you check the controller's status in Storage Utility it reports as disabled.

However, you can also manually disable a controller. In the event that one of the RAID controllers appears operational, but also reports faults through various log files and status indicators, you can choose to disable the controller and replace it. Disabling

the controller and removing it in this way avoids interruptions in signal output that can occur if the module fails or if it is simply hot swapped while it is the active controller. When the replacement RAID controller module is installed, it is automatically enabled and becomes the backup controller.

On a Level 10/20/30/35 primary RAID chassis with two controllers, if the replacement controller's firmware is not the same as the firmware on the redundant (currently installed) controller, the firmware on the replacement controller is automatically upgraded or downgraded to match the current system level firmware.

NOTE: Refer to the Instruction Manual for your RAID storage chassis for procedures on removing and replacing the RAID controller module.

To replace a controller, do the following:

1. Open the Storage Utility.
2. Expand the tree view to display the controllers.
3. Select the controller and check its status, then proceed as follows:
   - If the faulty controller reports as disabled, proceed to the next step in this procedure.
   - If the faulty controller reports as online, right-click the controller icon in the tree view, and select **Advanced | Disable Controller 0** or **Disable Controller 1**, then click **OK** to continue.

     The RAID controller is disabled. You can check controller status in the Storage Utility. You may need to refresh the display.

NOTE: If you accidentally disable the wrong controller, you can enable it again by removing it and then replacing it in the chassis.

4. Remove and replace the disabled RAID controller module.

   Refer to procedures in the Instruction Manual for your RAID storage chassis.
5. On inserting the replacement RAID controller, it initializes and is automatically enabled to become the "backup" RAID controller.

Upgrading to L30 controllers

NOTE: Do not attempt this procedure without first consulting Grass Valley Support.

You can upgrade your RAID chassis from Level 10/20 controllers (NEC D1-10) to Level 30/35 controllers (NEC D3-10). If this is part of expanding the media file system, refer to "Expanding the media file system by capacity" on page 442 and "Expanding the media file system by bandwidth" on page 444.

If you do not change the number of Expansion chassis or their cabling pattern, no special preparations are required before changing the controllers.

If you add Expansion chassis, you need to decide their cabling pattern before changing the controllers. With the Level 30/35 controller you have the DP1 port available, and Expansion chassis should be balanced between DP0 and DP1. If you can accomplish this by connecting the added Expansion chassis to DP1, no special preparations are required before changing the controllers.

If you decide you need to change the RAID topology and alter the cabling of existing Expansion chassis, you must unbind all existing RAID disks before shutting down the system. Failure to do so results in a configuration mismatch and controller faults.

NOTE: Refer to the Instruction Manual for your RAID storage chassis for procedures on removing and replacing the RAID controller module.

To upgrade controllers, do the following:

1. Power down the entire K2 SAN, including all RAID devices.
2. Remove cabling to controllers.
3. Remove the Level 10/20 controller or controllers.
4. Insert the Level 30/35 controller or controllers.
5. Re-cable controller or controllers. If you do not plan to rebind RAID disks, you must connect existing Expansion chassis just as they were before.
6. Connect added Expansion chassis, if any.
7. Power up the K2 SAN.
8. Download RAID controller microcode, as instructed in "Loading RAID controller and expansion chassis microcode" on page 458. Refer to *K2 Release Notes* for microcode version.
9. Proceed as follows:
   - If you did not add Expansion chassis or otherwise change the topology, the upgrade procedure is complete.
   - If you added or re-cabled Expansion chassis, depending on the changes you are making, do one or more of the following:
     - Bind disks
     - Make a new file system
     - Expand the file system

Configuring Level 10/20/30/35 RAID chassis network and SNMP settings

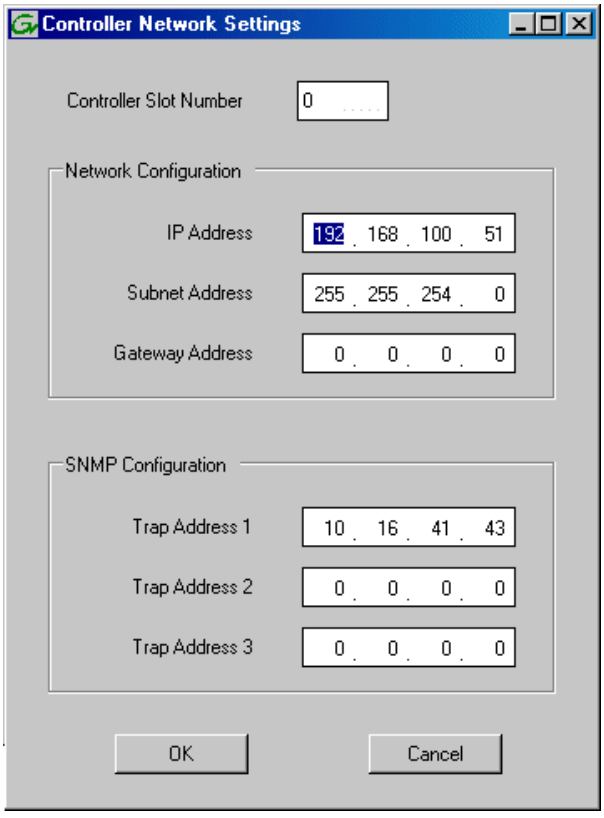
Through Storage Utility you can configure the following settings on a RAID chassis:

- IP address
- Subnet mask
- Gateway Address
- SNMP trap destinations

Whenever you modify control network settings or FTP/streaming network settings on any device, you must then redeploy the hosts file if that is your name resolution mechanism.

For the Level 10, 20, 30, or 35 RAID chassis, network and SNMP settings are set and stored on the RAID controller. Therefore, if the RAID chassis has two controllers, each controller must be configured separately, as in the following procedure.

1. In the K2 System Configuration application tree view, open the node for a K2 Media Server and select the **File System Server** node to open its property page. On the property page click **Launch Storage Utility**. Storage Utility opens. You can now configure the network settings on the controller connected to the selected K2 Media Server.
2. In the Storage Utility, right-click the icon for a RAID controller and select **Configuration | Network Properties**. The Network Settings dialog box opens.



3. In the Controller Slot Number field enter **0** and then press **Enter**. The settings from controller 0 are loaded into the Controller Network Settings dialog box and are available for you to modify.
4. Enter the control network IP address and other network settings.
5. You want SNMP trap messages go to the NetCentral server PC, so for SNMP Configuration enter the IP address of the NetCentral server PC. You can also enter IP addresses for other SNMP managers to which you want to send SNMP trap messages.

6. If the RAID chassis has two controllers, in the Controller Slot Number field enter **1** and then press **Enter**. The settings from controller 1 are loaded into the Controller Network Settings dialog box and are available for you to modify. Repeat the previous steps to configure controller 1.
7. Click **OK** to save settings and close.
8. Restart the RAID chassis to put SNMP configuration changes into effect.

Working with Ethernet switches

Use the following sections when designing, configuring, or servicing a Gigabit Ethernet switch that is part of an existing K2 SAN.

Design considerations for Ethernet switches

The following information was qualified using the HP ProCurve switch. You must use the HP ProCurve switch for iSCSI traffic. However, for control and FTP/ streaming traffic, it is allowed to use a different brand of switch, such as a Cisco Catalyst switch, if required by your site. If you are using a non-HP switch, apply the information accordingly. Refer to the documentation you received with the switch as necessary.

The primary factors that influence the number and configuration of switches on a K2 SAN are as follows:

- Redundancy — Non-redundant K2 SANs have only one media (iSCSI) network and can operate with a single switch. Redundant K2 SANs have an "A" media network and a "B" media network and require at least two switches, so that the A network and the B network never share the same switch. Media traffic does not cross between an "A" switch and a "B" switch, so if there are Inter-Switch Links (ISLs) between redundant switches, media traffic does not use these ISLs.
- Separation of iSCSI traffic — Media (iSCSI) traffic must be kept separate from control traffic, FTP/streaming traffic, and any other type of traffic. The recommended way to provide this separation is to configure each switch to have two VLANs, with half the switch's ports on each VLAN. The media (iSCSI) traffic uses one VLAN and all other traffic uses the other VLAN. This "other" traffic can include both FTP and control traffic, as it is allowed that they be on the same VLAN. On very large multiple switch systems, designers with sufficient knowledge can use other options for providing the separation of iSCSI traffic, such as using one switch or fabric exclusively for media traffic and another switch or fabric exclusively for non-media traffic. Also refer to "About networks and FTP" on page 366 and the "Networking for level …" section in the chapter for your level of K2 SAN elsewhere in this manual for more information about IP addresses, subnets, host tables, and other networking techniques required to keep traffic separate.
- FTP bandwidth — This is a consideration if using multiple switches that share the FTP traffic. In this case you must use sufficient ISLs to provide the bandwidth needed to support your FTP traffic load between switches. Only control traffic and FTP traffic use ISLs, but since FTP traffic is more variable and has potentially higher bandwidth needs, it is the primary consideration when designing ISLs. You do not need to consider iSCSI bandwidth on ISLs.

Using three 1 Gig ISLs to connect switches is the default configuration for all K2 SANs. This provides sufficient bandwidth for most FTP traffic loads and keeps the 10 Gig ports on the switch available for connection to the optional NH1-10GE server. Other ISL configurations are also available, as explained below.

Connect and configure ISLs only as specified in the following table, taking your FTP bandwidth into consideration:

Maximum FTP bandwidth	Trunk/ISLs required
Less than 100 MB/sec	A trunk with three 1 Gb/s ISLs
100 - 300 MB/sec	A trunk with five 1 Gb/s ISLs
More than 300 MB/sec	A trunk with two 10 Gb/s ISLs

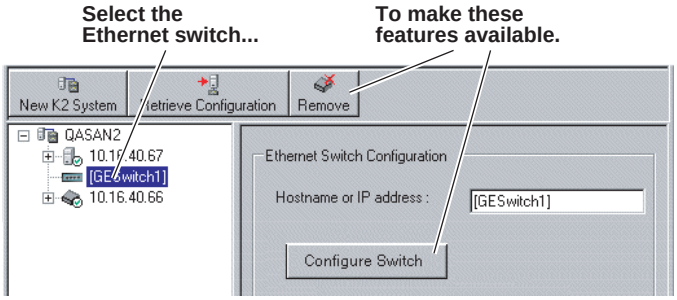
NOTE: One Gig ISLs must be an odd number (3 or 5).

- Port count — The number of client connections, server connections, FTP/streaming connections, and other connections determine how many ports are required. As the port count increases, you must use switches with more ports and/or multiple switches. When multiple switches are used, the port count assigned to each VLAN and the ports used for ISLs must be considered.

Based on these factors, determine the number of switches, the number of ports on each switch, and the ISLs required for your system needs. You can find procedures for configuring the HP ProCurve switch in the chapters elsewhere in this manual for installing each level. Adapt the procedures according to your switch design as you configure your switches.

Configuring a switch through the K2 Configuration application

In the K2 Configuration Application, features for working on a Ethernet switch are as follows:



From the K2 System Configuration application, you can click the **Configure Switch** button to open the switch's web configuration application. Refer to the installation procedures elsewhere in this document for switch configuration information.

Verifying spanning tree settings

Use the following procedures to check and (if necessary) set your HP ProCurve Ethernet switches to have the proper spanning tree settings. These procedures apply to both the 3400cl series switches and the 2900 series switches. Refer to installation chapters earlier in this manual for the complete switch configuration procedures.

Check the firmware version

You must have the proper version of firmware on the switch to be able to check and make the settings.

1. Telnet to the switch and login with the administrator username and password.
2. At the switch console command (CLI) prompt, type the following, then press **Enter**:

   ```
   menu
   ```

   If prompted to save the current configuration, answer no (press the n key) to proceed.

   The main menu opens.
3. From the main menu, tab to **Command Line (CLI)** and press **Enter**. The command prompt appears.
4. Type the following, then press **Enter**:

   ```
   show flash
   ```

   Information is displayed similar to the following example:

   ```
   HP_iSCSI_switch1# show flash
   Image            Size(Bytes)   Date   Version
   -----            ----------  -------- -------
   Primary Image    : 3287779   03/15/05 M.08.86
   Secondary Image  : 3287779   03/15/05 M.08.86
   Boot Rom Version: I.08.07
   Current Boot     : Primary
   ```
5. Check the Primary Image Version and proceed as follows:
   - If the version is not M.08.86, you must change to version M.08.86 before continuing. These procedures are qualified only with version M.08.86. Refer to the documentation you received with the switch for instructions to change the firmware. After you have changed the firmware, continue with the next procedure.
   - If the version is M.08.86, continue with the next procedure.

Check spanning tree settings

1. If you have not already done so, telnet to the switch and login with the administrator username and password.
2. At the switch console command (CLI) prompt, type the following and press **Enter**:

   ```
   show spanning-tree
   ```

Spanning tree information is displayed.

3. Check the spanning tree information and make sure that settings are correct, as follows:

   ```
   STP Enabled:  Yes
   Force Version:  RSTP-operation
   ```

4. If settings are correct, no further configuration is required.
5. If settings are not correct, you have the following options:
   - If you have one switch only and the switch is not connected to any other switches, these spanning tree settings are recommended, but not required. You should make the correct settings at your next opportunity when it is convenient.
   - If your switch is connected to another switch, either because you have a multi-switch K2 SAN or for any other reason, these spanning tree settings are required. You must correct your spanning tree settings as soon as possible.
6. Changing spanning tree settings requires a restart of the switch, so you must make the settings while the K2 SAN is offline. When you can take your system offline, continue with the next procedure.

Configure RSTP

1. Stop all media access on the K2 SAN.
2. If you have not already done so, telnet to the switch and login with the administrator username and password.
3. At the switch console command (CLI) prompt, type the following and then press **Enter**:

   ```
   configure
   ```

   You are now in configuration mode.

4. To set spanning tree to RSTP, type the following and then press **Enter**:

   ```
   spanning-tree force-version rstp-operation
   ```

   This configures spanning tree, but it does not turn spanning tree on.

5. Type the following, then press **Enter**:

   ```
   menu
   ```

   When prompted, save the configuration by pressing the y key.

   The main menu opens.

6. Proceed as follows, depending on the STP Enabled setting that you discovered when you checked spanning tree settings:
   - If STP Enabled is already set to Yes, no further configuration is required. Restart the switch to put changes into effect.
   - If STP Enabled is set to No, you must turn spanning tree on using the switch's Web interface. Continue with the next procedure.

Enable spanning tree

1. From the control point PC or another PC, make sure that you have a direct Ethernet cable connection to the switch, with no switches, routers, proxies, or other networking devices in between.
2. On the PC, open Internet Explorer and type the switch's IP address in the Address field, as in the following example.

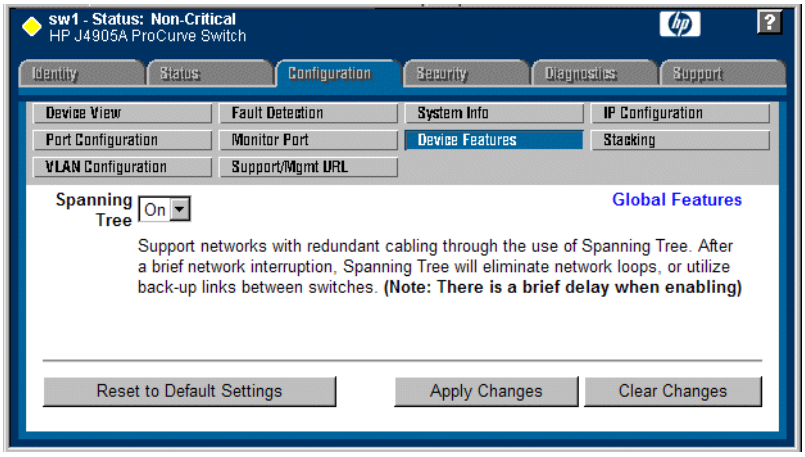
   ```
   http://192.168.100.61
   ```

   This should be the name or IP address as currently configured on the switch.
3. Press **Enter** to open the switch's configuration application.

NOTE: The configuration application for the HP ProCurve switch requires Java.

   You can also access the switch's configuration application from the K2 System Configuration application.

4. In the switch's configuration application, choose **Configuration**, then **Device Features**.



5. Set Spanning Tree to **On** and click **Apply Changes**. If prompted, log in with the switch's administrator username and password.
6. Close the configuration application.
7. Restart the switch to put changes into effect.

Chapter 13

K2 FCP Connect access for Final Cut Pro systems

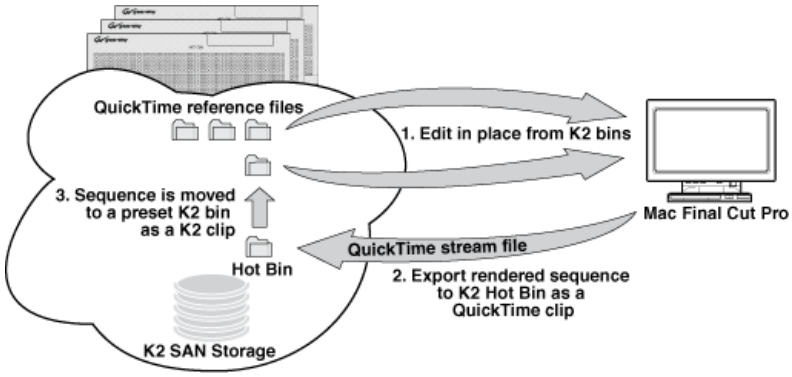
This chapter contains topics as follows:

- "About K2 FCP Connect"
- "Install and configure Macintosh Final Cut Pro systems on a K2 SAN"
- "Using Final Cut Pro on a K2 SAN"
- "Maintaining K2 FCP Connect"

About K2 FCP Connect

K2 FCP Connect enables an efficient workflow. You can quickly and easily locate QuickTime files on the K2 SAN and then edit the QuickTime files from the K2 SAN without a file transfer. This capability is called Edit in Place.

The workflow is illustrated as follows:



The K2 FCP Connect product includes the GV Connect plug-in for Final Cut Pro and the iSCSI connection license and software.

The K2 FCP Connect product has the following features:

- Seamless browsing of K2 content
- Support growing files editing
- Export/render/flattening of Final Cut Pro finished sequences on the K2 SAN for sharing or playout
- Final Cut Pro and Aurora sequence sharing

It is also possible to use a subset of the K2 FCP Connect features via CIFS mount to a stand-alone K2 client or a K2 Nearline SAN, but this is not the configuration that Grass Valley recommends. Contact your Grass Valley representative to evaluate your needs if you require a CIFS mount.

Install and configure Macintosh Final Cut Pro systems on a K2 SAN

Read the following topics to get systems connected and file interchange operational.

Final Cut Pro on K2 SAN quick start installation checklist

Use the following sequence of tasks to set up Final Cut Pro on a K2 SAN. This checklist assumes that the K2 SAN has been installed/commissioned and is fully operational.

Prerequisites

	Task	Comment
☐	Verify K2 SAN and Macintosh system requirements.	—

On all Macintosh client computers

	Task	Comment
☐	Install Final Cut Pro, if not already installed.	—
☐	Install Xsan software, if not already installed.	Xsan must be installed before K2 FCP Connect.
☐	Install K2 FCP Connect software.	The software install file is *K2FCPConnect.pkg*.
☐	Cable network connections.	—
☐	Configure for control network, if not already done.	—
☐	Configure the hosts file for networking.	Copy in host table information from the K2 SAN's hosts file.
☐	Configure Active Directory Domain, if desired.	This is optional. If you do this task, you must also enable Access Control Lists on the K2 Media Server (FSM).

On the K2 Media Server (FSM)

	Task	Comment
☐	Request a K2 FCP Connect license from Grass Valley for each K2 Media Server with role of media file system server (FSM) on the SAN.	Make the license request early to ensure that the license file is received and installed before configuring the Mac Client in K2Config.
☐	When the license XML is received, install it on the K2 Media Server (FSM).	—
☐	Configure hosts files on SAN devices.	Enter Macintosh devices in hosts files.
☐	Enable Access Control Lists, if desired.	This is optional. If you do this task, you must also configure Active Directory Domain on the Macintosh systems.

On the Control Point PC

	Task	Comment
☐	Configure hosts file.	Enter Macintosh devices in hosts file.
☐	In K2Config, add and configure Mac Client(s) onto K2 SAN.	The K2 FCP Connect license must be installed on K2 Media Server(s). K2Config can not proceed if the license is not installed.

On selected Macintosh computer(s)

	Task	Comment
☐	Test access to K2 SAN storage.	From the Macintosh system, create, modify, delete a text file.
☐	Verify bandwidth of SAN connection	—

Final tasks

	Task	Comment
☐	If used, verify Access Control Lists.	—
☐	If desired, configure K2 SAN HotBin to receive finished Final Cut Pro files.	Refer to the *K2 System Guide*.

K2 SAN System Requirements

To support K2 FCP Connect, your K2 SAN must meet requirements as follows. Products and versions listed are compatible at the time of this writing. Refer to compatibility information in release notes for updates.

- K2 SAN devices have K2 software version 3.3 or higher. Refer to your K2 product release notes for specific version compatibility information.
- On K2 SAN K2 Media Servers (FSMs), the SNFS configuration file is configured to *GlobalSuperUser Yes*.
- The K2 SAN has unused iSCSI (TOE) bandwidth sufficient to support the Mac clients.
- Storage is K2 Lx0 RAID (Condor). Level 1 and Level 2 RAID not supported.

Macintosh System Requirements

To support K2 FCP Connect for iSCSI connection to a K2 SAN, your Final Cut Pro Macintosh systems must meet the requirements as follows. Products and versions listed are compatible at the time of this writing. Refer to compatibility information in release notes for updates.

- Mac Pro
- Intel processor
- Two GigE ports
- Mac OS X 10.5.6
- Final Cut Pro version 6.0.5 or higher
- Apple Xsan 2.1

If using CIFS mount only for access to K2 SAN, Mac Book Pro with one GigE port is supported.

Install Xsan software

1. If you have not already done so, install Xsan software on each Macintosh system.

Install K2 FCP Connect software on Macintosh systems

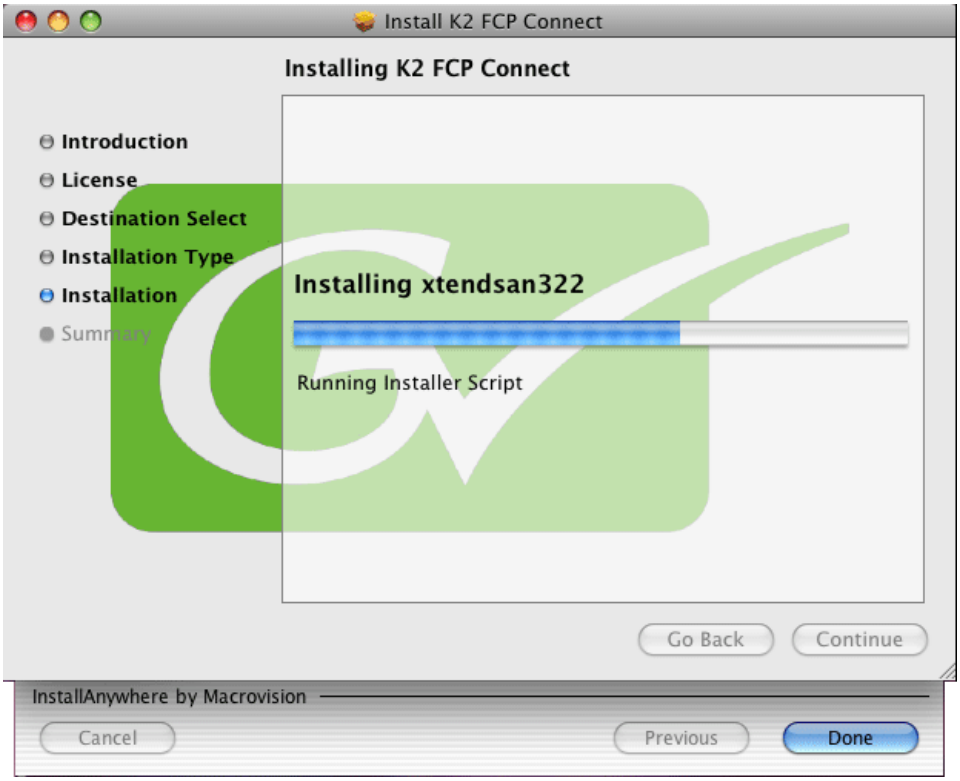
Before doing this task, procure the K2 FCP Connect installation files via download or CD distribution, as appropriate for your Grass Valley product.

1. From the Macintosh system , access the K2 FCP Connect installation files.
2. Double-click *K2FCPConnect.pkg*.

   The Installer opens.
3. Click **Continue**, agree to software license terms as appropriate, and accept default packages.
4. Click **Install** and when prompted enter the Macinstosh system's administrator

username and password.

Software installs.



5. On the Xtend SAN install screen, make sure you click **Done**. If you do not do so, the K2 FCP Connect installation stalls.

   NOTE: The Xtend SAN install screen can be partially obscured behind the K2 FCP Connect ***install screen.***

6. Click **Close** when the installation completes successfully.

Cable Macintosh systems

Connect each Macintosh system as follows. If you have mulitple Macintosh systems and a redundant K2 SAN, balance Macintosh systems between A and B switches.

1. Connect GigE port 1 to a control port on the K2 SAN Ethernet switch.
2. Connect GigE port 2 to a media port on the K2 SAN Ethernet switch.

   This connection is for the media (iSCSI) network.

Configure Macintosh systems for control network

Configure each Macintosh system as follows:

1. Open System Preferences, Network settings.

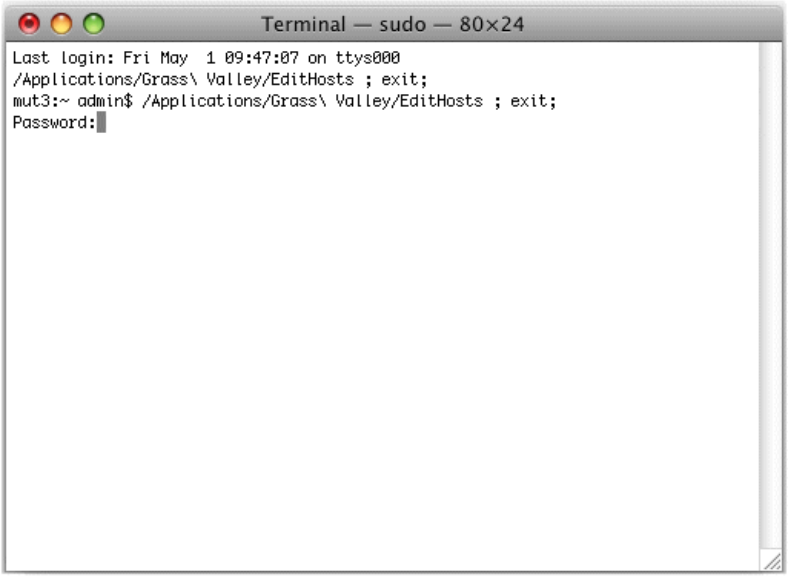
2. Set Ethernet 1 to configure manually (static IP).
3. Configure IP address, subnet mask, and other settings as required for the K2 SAN control network.

Configure Macintosh hosts files

On each Macintosh Final Cut Pro system, enter K2 SAN host table information as follows:

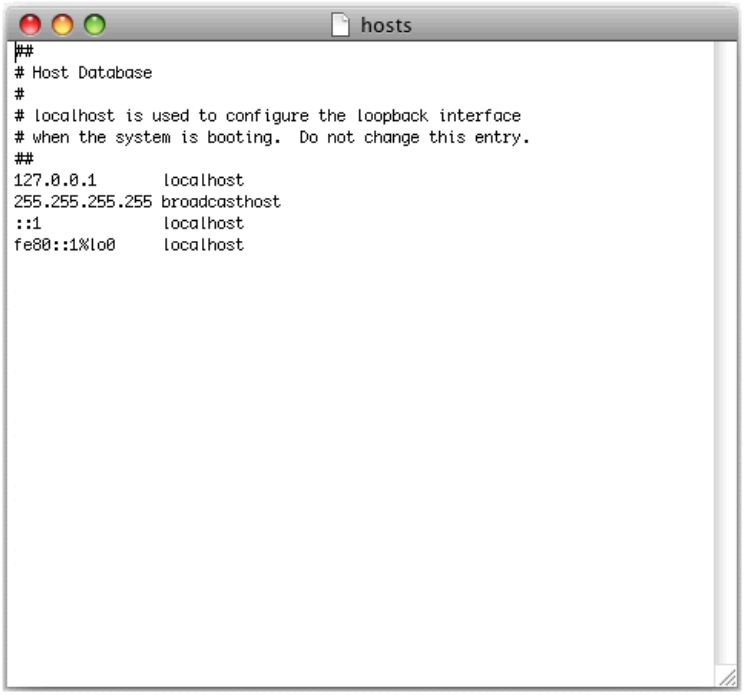
1. Open *Applications\Grass Valley\EditHosts*

   Terminal opens.



2. Enter the Macintosh system's administrator password.

   The hosts file opens in a text editor.



The following lines must remain in the Macintosh hosts file:

127.0.0.1 localhost

255.255.255 broadcasthost

::1 localhost

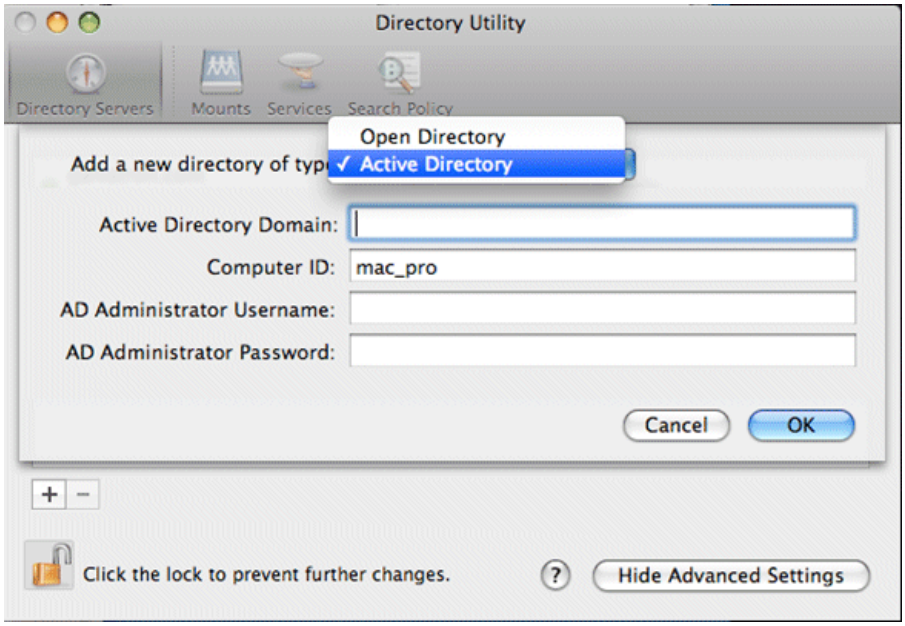
fe80::1%lo0 localhost

3. From the K2 SAN's hosts file, copy the host table information for all the K2 SAN devices and paste it into the Macintosh hosts file.
4. Save and close the hosts file.
5. Close the Terminal window.
6. Copy the new hosts file contents into hosts files on all the other Macintosh Final Cut Pro systems.

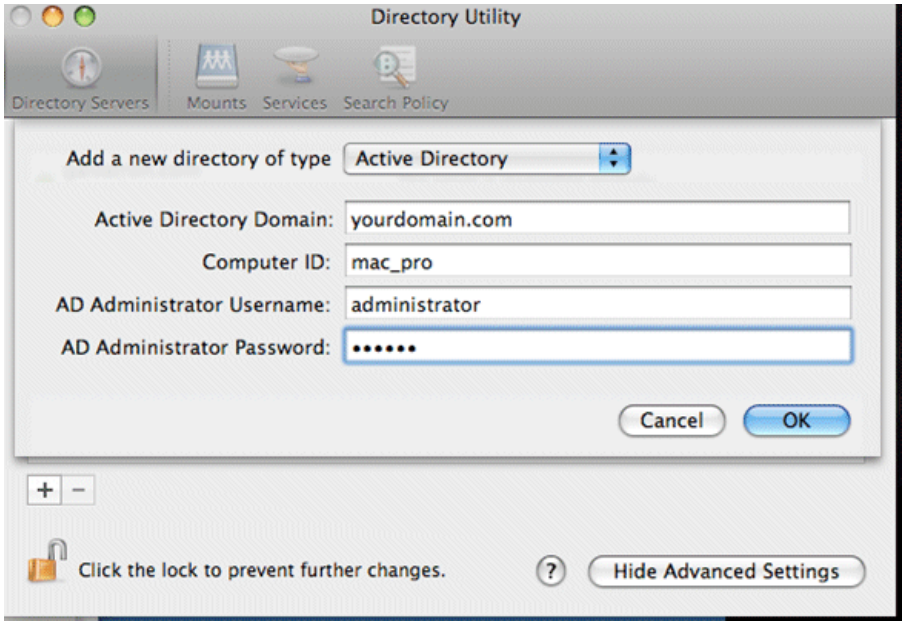
Configure Macintosh systems for Active Directory Domain

If desired, MAC OS X can be configured to use Active Directory (AD) resources such as users and groups. Once a computer is bound to an AD domain, users belonging to that domain may login to the Macintosh system at the main login prompt. If you do this task, you must also enable Access Control Lists on the K2 Media Server (FSM).

1. In the *Applications/Utilities* folder, open the **Directory Utility**.



2. Click the **Directory Servers** tab.
3. Click the **+** icon in the lower left, above the padlock icon, to add a new domain binding.
4. In the **Add a new directory of type** drop-down list, select **Active Directory**.



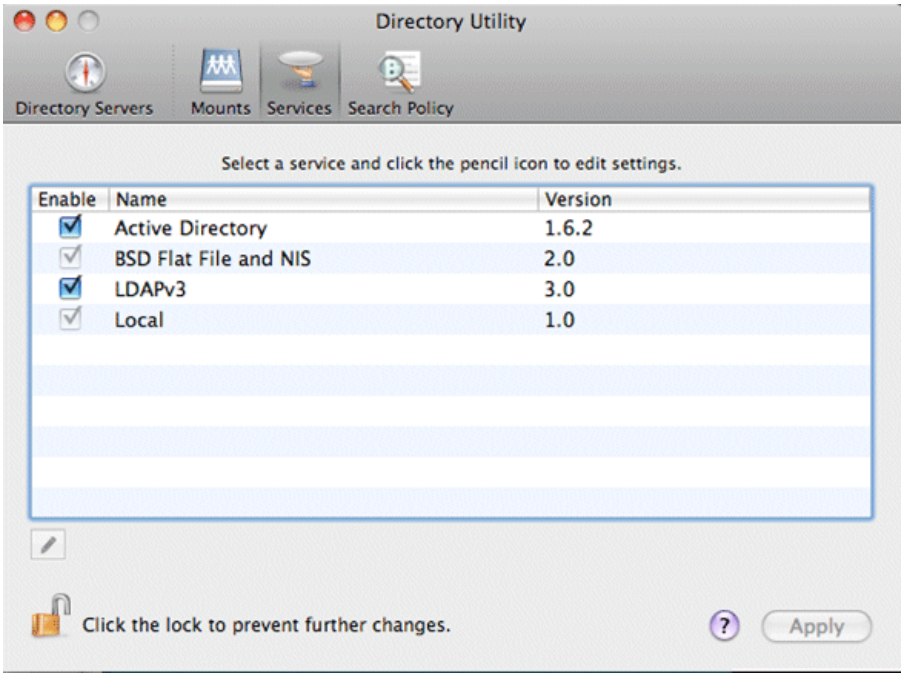
5. Fill in the Active Directory information for the domain administrator account.

   The administrator account is only needed at the time of binding. Once the computer is bound to a domain, all users of the domain can be used to log in to the Macintosh system.

6. Click **OK**.

   The Macintosh computer goes through the binding process. If successful, the domain name is listed with the status message, "This server is responding normally".

7. Click **Services**.



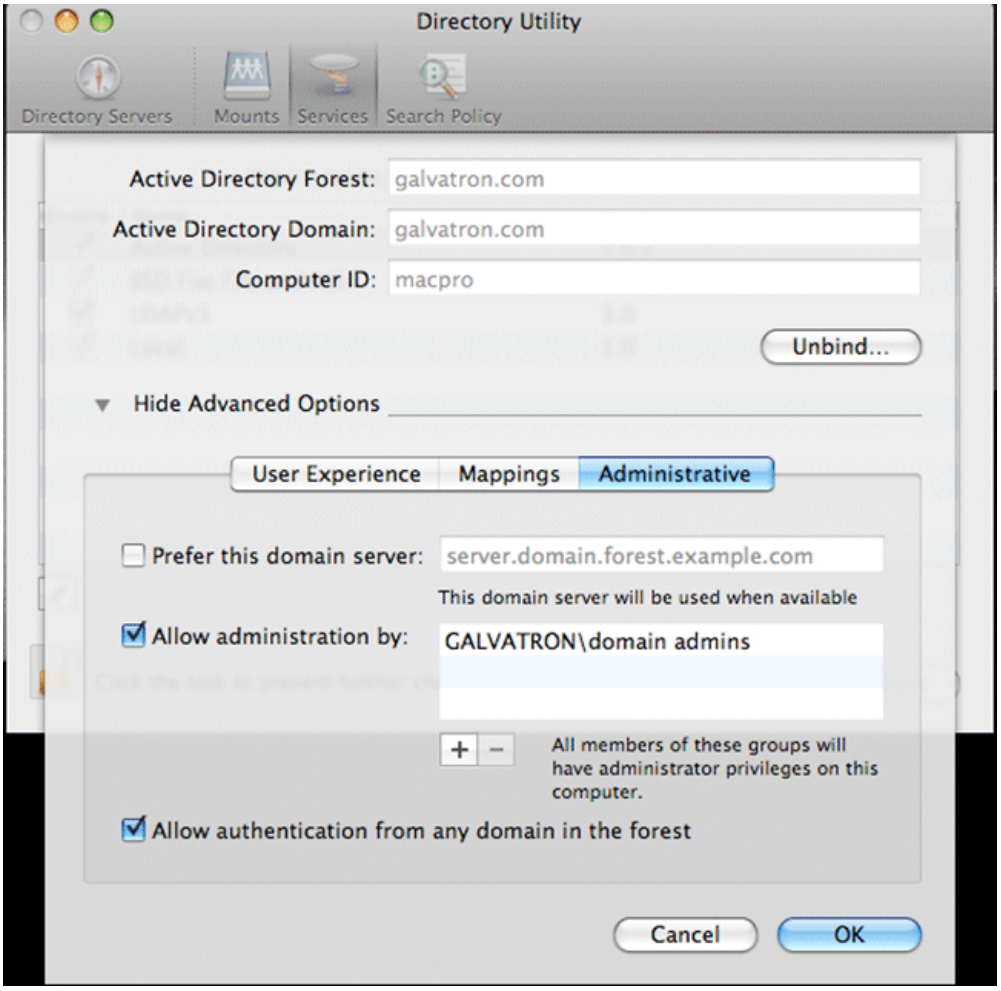
8. Verify that the Active Directory option is checked.

   If you need to change options, first double-click the padlock icon on the lower left hand corner and authenticate as administrator.

9. If desired, add AD accounts or groups as administrators of the Macintosh computer as follows:

   a. In the **Services** tab, double-click on the **Active Directory** name.

   b. Open the advanced options and click on the **Administrative** tab.



c. Verify that **Allow administration by:** checkbox is checked.

d. Add any AD user or group of the domain to the list.

You must type the user or group name, then a backslash, before the domain name.

Licensing K2 FCP Connect on the K2 SAN

The following sections contain instructions for managing the K2 FCP Connect license.

About K2 FCP Connect software licensing

K2 FCP Connect requires a license from Grass Valley. For iSCSI access, the license is installed on the K2 SAN's K2 Media Server that takes the role of file system server. If a redundant K2 SAN, the license is installed on primary and backup K2 Media Servers. The license is made available via a Grass Valley SabreTooth licensing service, so when the Macintosh system attempts to connect to the K2 SAN as an iSCSI client, the connection is verified with the service and either allowed or disallowed.

No Grass Valley license is required to be installed on the Macintosh system or on the control point PC.

Licenses are requested through the License Wizard and managed through the SabreTooth License Manager, which is installed on the Grass Valley product with the Grass Valley software. The License Wizard and SabreTooth License Manager must be located on the Grass Valley product.

For iSCSI access, The License Wizard and the SabreTooth License Manager are installed on the K2 SAN's K2 Media Server that takes the role of file system server. If a redundant K2 SAN, they are installed on primary and backup K2 Media Servers.

For CIFS mount access, the license, License Wizard and the SabreTooth License Manager are installed on the Grass Valley product with the CIFS mount, such as a K2 Summit Production Client. You must also manually enable the SabreToothWS webservice on the Grass Valley product with the CIFS mount.

License information is stored in text files that you can manage just like any other file on your system. Licenses are unique to the system for which they are requested and cannot be used on any other machine. You should back up the license text files to a separate drive or as part of a recovery image.

Licenses are based on your system's unique identifier, which is partially derived from your system's Media Access Control (MAC) address. If you change your system's MAC address by performing operations such as changing the System Processor card, you must obtain a new license based on the new MAC address.

Requesting a license

Software licenses are unique to the system for which they are purchased. They cannot be used on any other system. This requires that you provide a generated unique ID for the desired system to Grass Valley, which is then used to create your unique license.

1. Log on to the device that you want to license.

   You must log in as a Windows administrator with a local account, not a domain account.

2. Open the License Request Wizard.

   Find the License Request Wizard shortcut on the Windows desktop.

   The License Request Wizard displays.

3. Read the on-screen instructions, then click **Next**.

   The Customer dialog box displays.

4. Enter the information requested on this page then click **Next**.

   You must provide a valid email address to receive your license file.

   The Sales Number dialog box displays.

5. Enter the Sales Order Number in the field then click **Next**.

   Typically the Sales Order Number is found on the Software License sheet that you received with your Grass Valley product.

   The Summary dialog box displays.

6. Review the License Request information and click **Finish**.

   A License Request text file, *License_Request_<SalesNumber>.txt*, is generated and saved to the Windows Desktop.

NOTE: If you are requesting licenses for more than one application, be sure to modify the name of the first License Request text file before saving it to your desktop. (In Notepad, use the Save As command.) Otherwise, the second License Request text file will overwrite it.

7. If a K2 Summit Production Client or K2 Solo Media Server and if the write filter is currently enabled, be aware that files on the desktop are lost on restart. Therefore do one of the following:
   - Save the License Request text file(s) to a different location.
   - Keep the K2 system running (do not restart) until after you have requested the license(s).
8. Do one of the following:
   - Attach the License Request text file to an email.
   - Paste the text directly into an email message.

   You might want to keep a copy of the message for your records.
9. Send the email as instructed by the License Request Wizard.

   An email will be sent from Grass Valley to the return email address you specified; your SabreTooth software license will be provided as a text file.
10. Save this email in case you ever need to re-image this machine.

Next add the license to the SabreTooth License Manager.

Adding a license

Your software license, `Licenses_<SalesNumber>.txt`, is provided as a text file. Use the License Manager to add this file to your system and enable the desired feature.

1. Click on the License Manager icon on the Windows Desktop. The SabreTooth License Manager opens.

   The SabreTooth License Manager opens.
2. Do one of the following:
   - Choose **File | Import License** and navigate to the file location to open the text file.
   - Drag and drop the text file onto the License Manager.

   You will now see the permanent license in SabreTooth, as well as any other

licenses, permanent or temporary, that have been installed on this machine.

You should save the permanent license to a backup system.

Add Macintosh systems to SAN hosts file

1. On the K2 SAN's control point PC, open the hosts file in a text editor.
2. Following the convention in the hosts file, enter text in one line for each Final Cut Pro Macintosh system as follows:
   a. On a text line, type a Macinstosh system's control network IP address.
   b. Use the TAB key or Space bar to insert a few spaces.
   c. On that same text line after the space, type the machine name, such as MacClient01.

      The machine name cannot have any spaces in it.

   This sets up the host file for resolving the machine name on the control network.
3. Save the hosts file.
4. Similarly configure the hosts file on the other devices of the K2 SAN.
5. Copy the hosts file or otherwise make the hosts file accessible to each Final Cut Pro Macintosh system.

Enable Access Control Lists on the K2 Media Server (FSM)

Prerequisites for the K2 Media Server are as follows:

- Current compatible versions of the Windows operating system and SNFS software.
- Standard C:, D:, E: and V: disk volumes.
- SNFS has been configured with Grass Valley's Storage Utility.
- The SNFS configuration file is located in the *D:\SNFS\config* directory.

If desired, you can enable Access Control Lists (ACLs). If you do this task, you must also configure Active Directory Domain on the Macintosh systems.

1. If a redundant K2 SAN, take FSM K2 Media Servers out of service and manage redundancy as directed in documented procedures.
2. Navigate to *D:\SNFS\config* and open *gvfs_hostname.cfg* (where hostname is the name of the primary FSM) in a text editor.
3. Confirm/enter/modify text lines as necessary to configure as follows:

```
WindowsSecurity Yes
EnforceACLs Yes
UnixIdFabricationOnWindows Yes
UnixDirectoryCreationModeOnWindows 0700
UnixFileCreationModeOnWindows 0600
UnixNobodyGidOnWindows 60001
UnixNobodyUidOnWindows 60001
```

Avoid duplicate settings.

NOTE: Once ACLs are enabled on the K2 Media Server (WindowsSecurity set to Yes), they cannot be disabled.

4. Save the SNFS configuration file.
5. Restart the K2 Media Server.
6. If a redundant K2 SAN, repeat these steps on the redundant FSM K2 Media Server.
7. After restart of K2 Media Server(s) is complete, restart all clients of the K2 SAN.

Add Mac Client to K2 SAN

Prerequisites for this task are as follows:

- You must be logged in to the K2 System Configuration application with permissions equivalent to K2 administrator or higher.
- The devices of the K2 SAN do not need to be offline, and there is no restart of devices required.

1. In the K2 System Configuration application tree view, select the name of the K2 SAN, which is the top node of the storage system tree.
2. Click **Add Device**

   The Add Device dialog box opens.
3. Select **Mac Client**.
4. Click **OK**.

The new client appears in the tree view.

Next, configure the new client on the K2 SAN.

Configure Mac Client on K2 SAN

Use this procedure to configure each of your Macintosh Final Cut Pro systems on the K2 SAN as a SAN client device.

Prerequisites for this task are as follows:

- The K2 SAN's K2 Media Server(s) with role of file system server (FSMs) have the K2 FCP Connect license installed.
- You are logged in to the K2 System Configuration (K2Config) application with permissions equivalent to K2 administrator or higher.
- The client device is added to the K2 SAN and appears in the K2 System Configuration application tree view.
- The K2 SAN has adequate bandwidth available to meet the bandwidth needs of the client device you are adding.
- The client device is connected to appropriate networks and is powered up.
- The client device's IP address and other network properties are configured for the

control network.

- Host table information for K2 SAN devices, the control point PC, and the client device is in the hosts file on the client device.
- The devices of the K2 SAN do not need to be offline, and there is no restart of devices required.

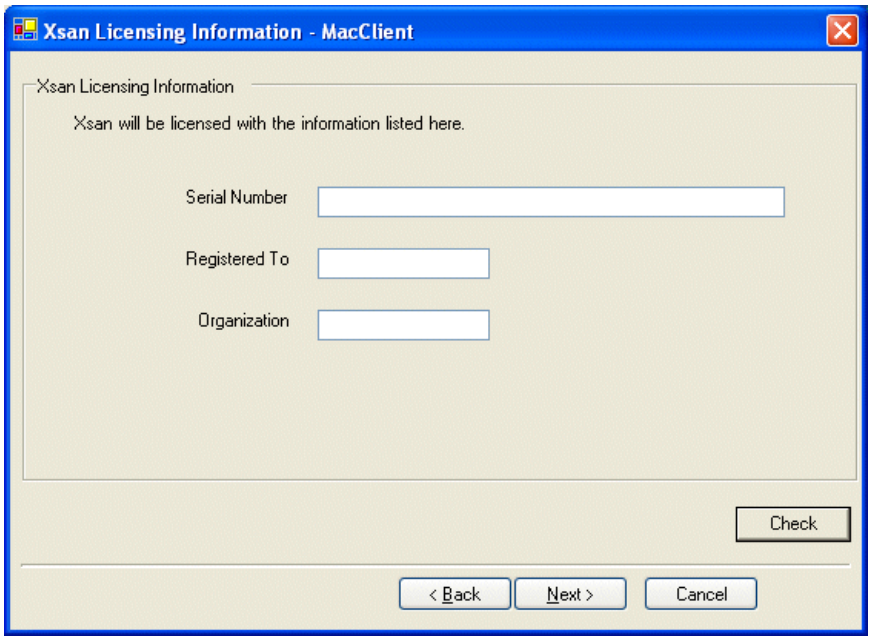
1. In the K2Config tree view, select the client device.
2. Click the **Configure** button.

   The Client Configuration wizard opens.

   NOTE: If your system has a large number of iSCSI clients, you are prompted to restart the K2 Media Server when you configure clients and cross the following thresholds: 64 clients; 80 clients; 96 clients.
3. Enter the network name for the client device, as currently configured on the device.

   If you have multiple client devices to configure, you should configure your highest bandwidth devices first, as this ensures load balancing is correct.
4. For Storage Access, leave **iSCSI** selected.
5. Click **Next**.

   The Xsan Licensing Information page opens.



6. Enter information exactly as received from Apple with your Xsan license. If you did not receive information for a field on this page, leave the field blank.

   For example, if a one-seat license, enter only the Serial number and leave the Registered To and Organization fields blank.
7. Click **Next**.

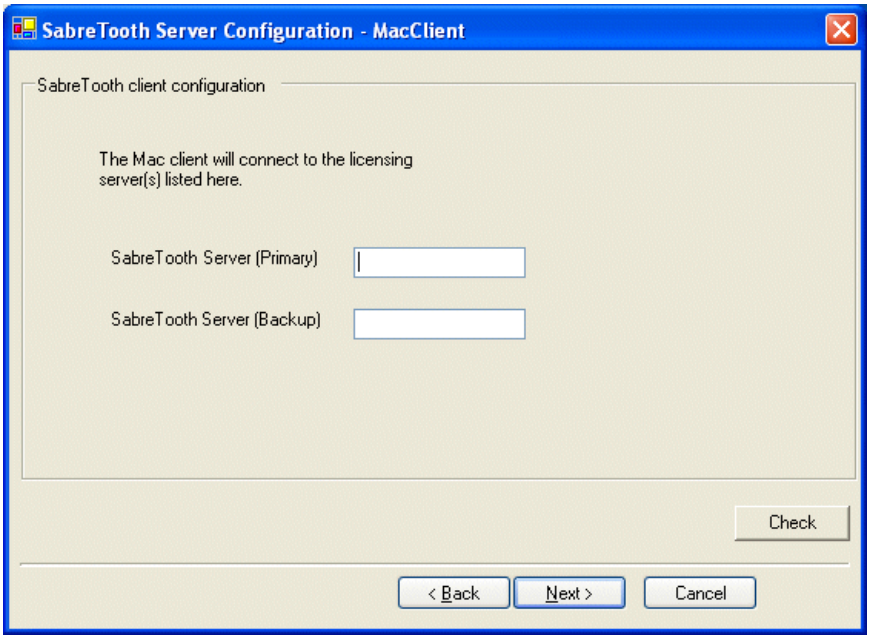
   The Software Configuration page opens.

This page checks the client device for required software.

8. Identify software installed on the client device and proceed as follows:
   - If any software with Yes in the Required column reports as Not Installed, you must install it on the client device. After installing the software, click Check Software.
   - If all software with Yes in the Required column reports as Installed, click Check Software.

   When all required software reports as Installed, continue with the next step in this procedure.
9. Click **Next**.

   The SabreTooth Server Configuration page opens.



10. Enter the K2 Media Server (FSM) as follows:
    - If a basic (non-redundant) K2 SAN, enter the media file system K2 Media Server as primary.
    - If a redundant K2 SAN, enter primary and backup media file system K2 Media Servers.
11. Click **Next**.

    The Network Configuration page opens.

    This page configures both control and media (iSCSI) network connections. The top port is the port over which the K2 System Configuration application is communicating with the client device. If correctly configured, it is already assigned the control network IP address, which is displayed in the window.
12. Select the media (iSCSI) port and click **Modify**.

    A network configuration dialog box opens.

13. Enter the media network IP address and subnet mask and then click **OK**.
14. Click **Check**.

    The iSCSI Initiator Configuration page opens.

    This page load balances the client device's iSCSI connection to the K2 SAN. The iSCSI adapters on your K2 Media Server or servers are listed here as iSCSI targets.

    On redundant systems, if you have multiple client devices, they should be balanced between A and B.

    For pre-defined K2 SAN levels, K2Config determines the iSCSI target to which each client device subscribes, based on the bandwidth values that you enter. This enforces policies by which each client device has sufficient bandwidth for its intended use and no individual iSCSI target is oversubscribed.

    For custom K2 SANs (Level 4 or 40), qualified system designers can view subnets to help assign iSCSI targets.
15. Click **Modify**.

    The Bandwidth Input dialog box opens.
16. Enter the bandwidth of the Mac Client. This is calculated according to your system design, and provided to you by your Grass Valley representative.
17. Click **Assign TOE**.

    K2Config automatically chooses an iSCSI target to assign to the client device. A message appears that specifies the chosen iSCSI target, but allows you to choose a different iSCSI target.
18. Respond to the message as follows:

    - In most cases you should accept the iSCSI target chosen by K2Config. Click **Yes**, then **OK** to continue.
    - If your system design specifies a different iSCSI target, click **No**, then select the iSCSI target on the iSCSI Initiator Configuration page.
19. When the wizard reports that the configuration check is successful, click **Next**.

    The File System Client Configuration page opens.

    This page connects the client device as a media file system client to the K2 Media Server taking the role of media file system server. If there are redundant K2 Media Servers, both are listed on this page as file system servers.
20. Verify that the client device is connecting to the correct K2 Media Server or Servers, as follows:

    - For non-redundant K2 Storage Systems, the client connects to the only server.
    - For iSCSI redundant K2 Storage Systems, the client connects to server A as file system server 1 and server B as file system server 2, so that if there is a problem with one server, the other server is available.
21. Click **Next**.

    The Completing the Configuration Wizard page opens.
22. Click **Finish**.

When prompted, restart the client device.

Test K2 SAN file access

From a Macintosh system, perform create, read, write, and delete operations on a file on the V: drive. This verifies the media file system.

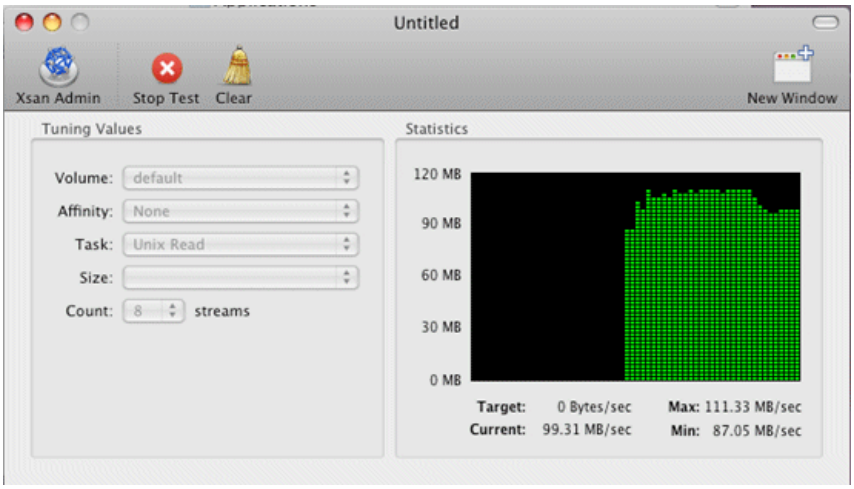
1. On the Macintosh desktop, verify that the GV hard drive icon is present.

This is the K2 SAN storage, also known as the V: drive.

2. From the Macintosh system, open a text editor, create a text file, enter text, and save it on the V: drive.
3. Close the text editor.
4. In Finder, browse to the V: drive and open the text file.
5. Make a change to the text in the text file and then save and close the text file.
6. Delete the text file.

Verify bandwidth of SAN connection

1. Install Xsan Tuner (distributed by Grass Valley) on the Macintosh by copying to */Applications/Server*.
2. Open Xsan Tuner under */Applications/Server/Xsan Tuner*.



3. Configure the Task field to **Unix Read** and the Count field to **8** streams.
4. Click **Start Test**.

   It might take several minutes to create the test files.
5. After test files are created click **Start Read Test**.

6. Let the Read test run for 1 minute. Report the min, max and current bandwidth.
7. Configure the Task field to **Unix Write** and Count field to **8** streams.
8. Click **Start Test**.

   It might take several minutes to create the test files.
9. After test files are created click **Start Write Test**.
10. Let the Write test run for 1 minute. Report the min, max and current bandwidth.

Verify Access Control Lists

Prerequisites:

- Two domain users
- A correctly configured K2 SAN
- At least one Macintosh SAN client attached

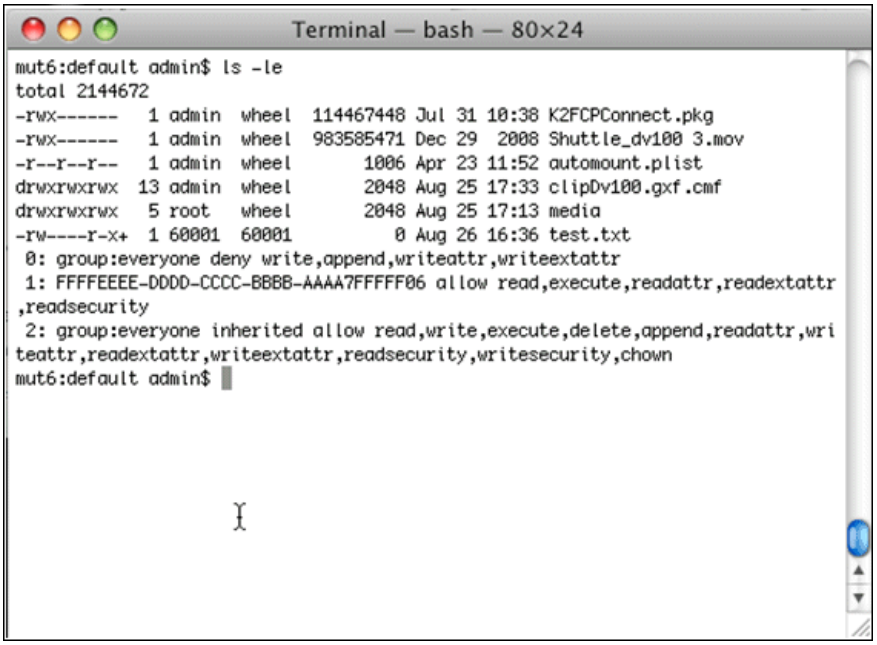
If you are using Access Control Lists on Macintosh OS X and the Windows operating system, use this task to verify.

1. On the FSM K2 Media Server, do the following:
   a. Create a new text file on the V: drive.
   b. Right-click on the text file and select **Properties**.
   c. Click the **Permissions** tab.
   d. Select **Everyone** and then for the **Write** permission select the **Deny** check box.
   e. Create a folder on the V: drive.
   f. Give full permissions to the first user (designated in this procedure as userA) on the domain.
   g. Give read only permissions to the second user (designated in this procedure as userB) on the domain.
2. On the Macintosh system, do the following:
   a. Login as userA.
   b. Right-click on the text file and select **Properties**.
   c. Open up **Terminal** and change directory to the volume, as follows:

      ```
      cd /Volumes/gvfs_hostname
      ```

      (Where hostname is the name of the primary FSM)
   d. Type the following command:

      ```
      ls -le
      ```



e. Verify that there is a "+" next the text file, plus a list of permissions below. If this is true then cross-platform ACLs are enabled.

f. Open the Finder, go to the default volume and try to edit the text file. This should fail as the file should not be writeable.

g. In the Finder, go to the folder you created earlier in this procedure and create a text file in the folder. This operation should be successful.

h. Log out and then log back in as userB.

i. In the Finder, go to the folder you created earlier in this procedure and try to create a text file in the folder. This operation should fail.

Configure HotBin

Configure a HotBin on the K2 SAN to receive the finished media from Final Cut Pro.

1. Set up SNFS as follows:

   Add "GlobalSuperUser = Yes" to the SNFS configuration file.

2. In K2 AppCenter, create a bin with an appropriate name, such as "dstBin".

3. Configure *dstBin* as a HotBin.

   Refer to the *K2 System Guide* for instructions.

4. When you configure a HotBin, in the Capture Services Utility you can adjust QuickTime Import Delay. The recommended setting is 15 seconds. Refer to the next topic for more information.

About QuickTime import delay

When you copy a file into a K2 HotBin, the HotBin watches for the file to close and the copy operation to stop, which should indicate the file is complete, before it begins to import the file into K2 storage. However, Final Cut Pro repeatedly opens and closes any QuickTime file as it exports the file, so it is possible that the K2 HotBin can detect a file closed event and begin to import the file before Final Cut Pro is done. If this occurs, the K2 HotBin import for that file fails.

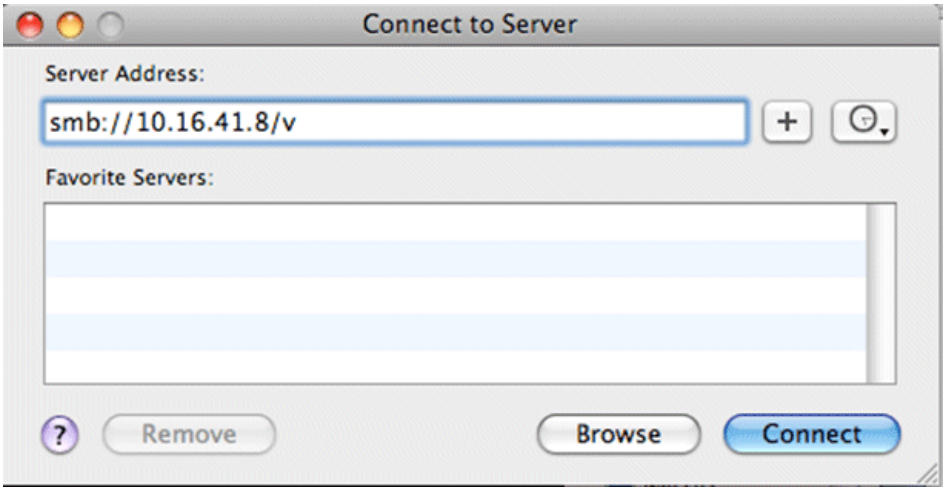
To avoid this problem, the QuickTime import delay allows you to adjust how long a QuickTime file must be idle (no data being written to the file) before the HotBin begins to import the file into K2 storage. The recommended default value is 15 seconds. If you have problems with failed imports and you suspect that Final Cut Pro is holding on to the file with pauses longer than 15 seconds, you should increase the QuickTime import delay time and re-try the import. The HotBin process constrains the QuickTime import delay range to between 10 and 60 seconds.

Connecting via SAMBA/CIFS

This is an alternative to connecting to the SNFS volume via iSCSI. Once the Macintosh computer has been bound to a domain it can then connect to any domain controlled, shared volume via SAMBA. If connecting via SAMBA, XSan and K2 FCP Connect software do not need to be installed or configured.

1. On the Macintosh computer open the Finder program and at the top menu click **Go | Connect to Server**.

   The Connect to Server dialog box opens.



2. In the Server Address field, type `smb://`, then type the IP or DNS name of the server to which you are connecting, then type `/v` (this is the volume name).
3. Click **Connect**.

   If the volume is shared and behind a domain, you are prompted to authenticate.

The volume should be mounted in the /Volumes directory and viewable in the Finder program. Rights to files and folders are enforced based on the security profile of the user you authenticated with when connecting with SAMBA, not the user you are logged in as on the Macintosh computer.

Using Final Cut Pro on a K2 SAN

Read the following topics to use access and edit K2 media with Final Cut Pro.

Operation guidelines

Take the following into consideration as you use Final Cut Pro on the K2 SAN.

- Do not use the K2 AppCenter "Erase Unused Media" operation on clips that you are accessing on the K2 SAN.

Media access

Access media on a K2 system as follows:

1. To open a QuickTime reference file, from the Macintosh system on which you are running Final Cut Pro, access K2 storage.

   For iSCSI access, this is the GV hard drive icon on the desktop. This is also known as the V: drive.

2. Browse to the location of the media in your bin structure. The QuickTime reference file is named according to the following convention:

   V:\Assets\<bin name>\<clip name>\<clip name>.mov

3. When you have finished material that you have created in Final Cut Pro, export it

to the K2 system.

Export to K2 SAN

When exporting media to a K2 SAN, Final Cut Pro export options must be constrained so that the resulting media is playable on a K2. The exported media must match the frame rate of movies supported on the K2 system. This is especially important in XDCAM where there are 25, 29.97/30, 50 and 59.94/60 rates.

1. Create the Final Cut Pro clip with a single track of video.
2. Save the Final Cut Pro clip with a *.mov* extension.
3. Use the Final Cut Pro "Using QuickTime Conversion" method to export the Final Cut Pro clip as a stream movie to the K2 HotBin.

   Make sure the frame rate is supported on the K2 system.

   For material originally recorded on a K2 system, supported frame rates are as follows:

   - If you are exporting 1080i material the frame rate must be "Current" or 29.97.
   - If you are exporting 720p material for 720p conversions the frame rate must be "Current" or 59.94.
   - If you are exporting 720p material for 1080i conversions the frame rate must be 29.97 or 59.94.

The HotBin imports the clip into the K2 system and then the K2 system creates a QuickTime reference file of the clip.

Maintaining K2 FCP Connect

Read the following topics to evaluate and maintain K2 FCP Connect operations.

About administrative and maintenance tools

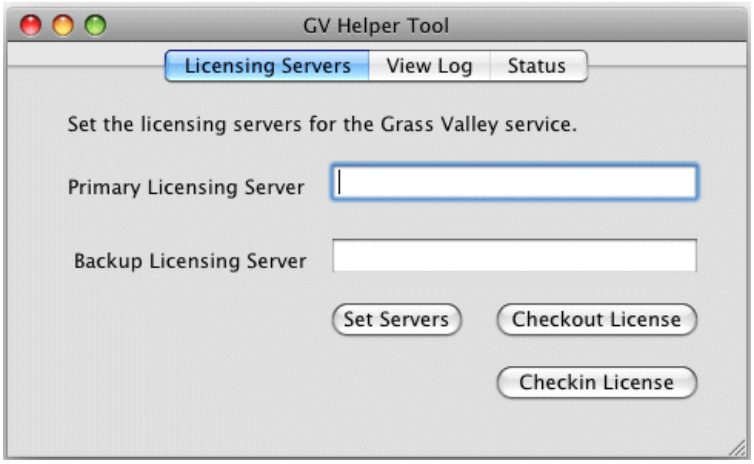
When you install K2 FCP Connect on your Macintosh system, the following tools are also installed:

- GV Helper Tool — You can open the GV Helper Tool from the *Applications\Grass Valley* directory. This utility provides features for maintaining K2 FCP Connect operations on the Macintosh system, as follows:
  - Check license in/out to manage licensing on multiple Final Cut Pro Macintosh systems.
  - Controls for stopping and starting the K2Config for Mac Daemon
  - Access to logs
- K2 FCP GV Connect System Preferences — You can open this from Macintosh System Preferences. It allows you to configure the SNFS file system volume to access.

Managing K2 FCP Connect licenses

You can drop the K2 FCP Connect license for a Final Cut Pro Macintosh system, and then later pick that license up again.

1. Open the GV Helper Tool.
2. Click the **Licensing Servers** tab.



3. For CIFS mount access, to drop the license currently used by the local Macintosh system to allow the iSCSI client connection to the K2 SAN, click **Checkin License**
4. For CIFS mount access, to assign an unused license to the local Macintosh system to allow it to make an iSCSI client connection to the K2 SAN, click **Checkout License**
5. You can also change the licensing server, which is the machine to which the Macintosh system looks to get its license, however take the following into consideration:

   You can change the licensing server in K2Config as well as here in the GV Helper Tool.

   Therefore it is recommended that you use K2Config, rather than the GV Helper Tool, to change the licensing server.

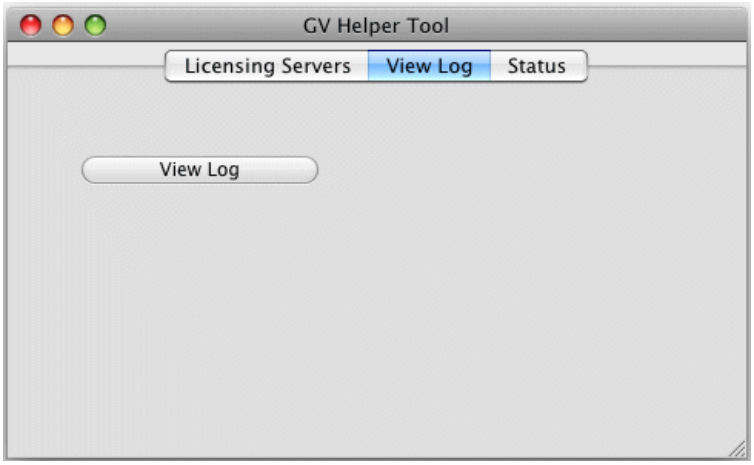
Stopping and starting the K2Config for Mac Daemon service

1. To start and stop the K2Config for Mac Daemon service, run scripts in the */Applications/Grass Valley* directory.

   When you stop the K2Config for Mac Daemon, the service is stopped permanently, even after the Macintosh system is restarted. Once you have stopped the service, you must re-start it using the scripts.

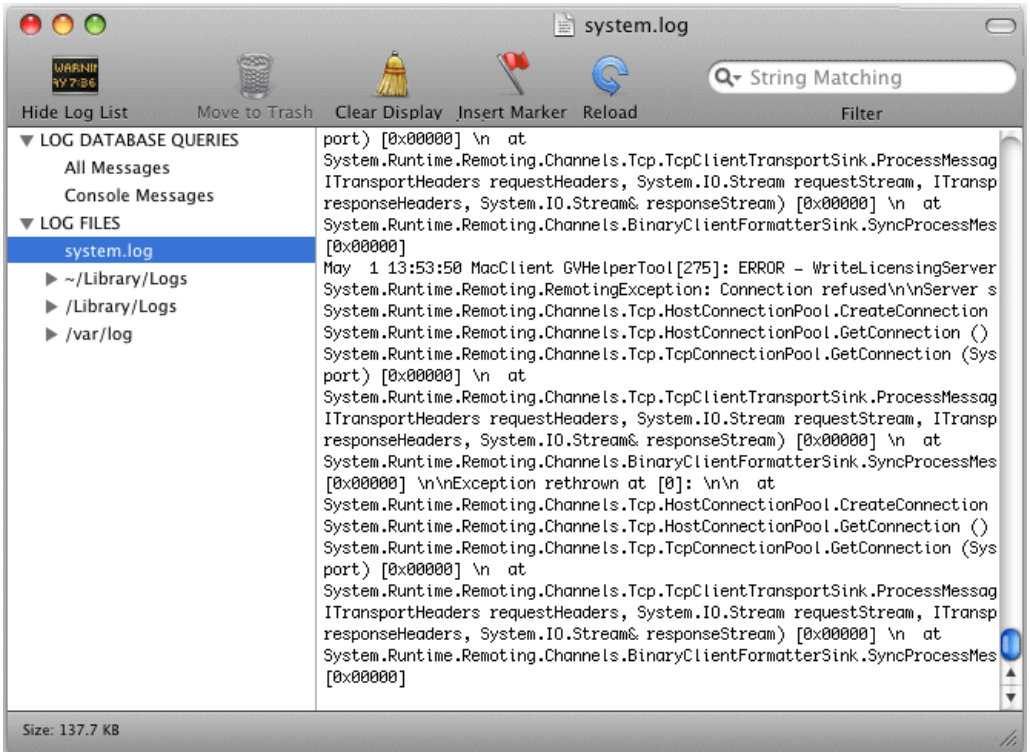
Accessing logs

1. Open the GV Helper Tool.
2. Click the **View Log** tab.



3. Click **View Log**.

   A Console window opens and displays logs.



4. Select **system.log**.

   The system log displays. This is the log that contains entries relevant to the iSCSI connection to the K2 SAN.

5. To send log information to Grass Valley for analysis, copy text from the Console window, paste it into a text file and send the text file.

Configuring the SNFS file system volume

You can configure the SNFS file system volume that you access for GV media. For example with some versions of K2 software, if you create a new file system on the K2 system, the name of the SNFS file system changes. In this case you should verify that the SNFS file system name is configured correctly and modify if necessary.

1. In **System Preferences** open **K2 FCP GV Connect**.
2. Select the SNFS file system you access for GV media.

Appendix **A**

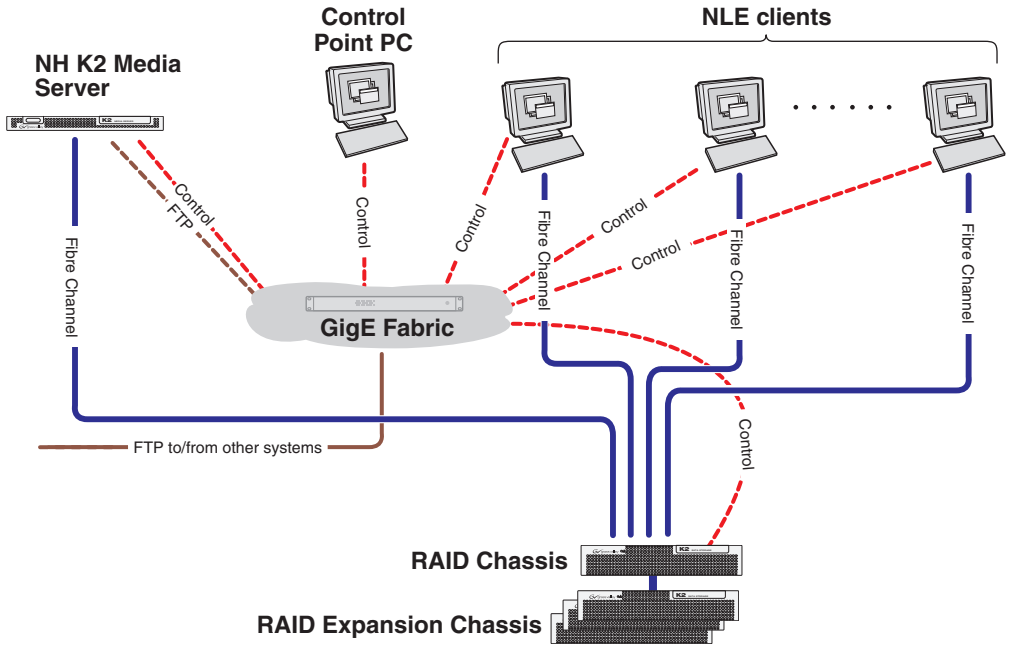
Workgroup storage

Sections in this appendix include the following:

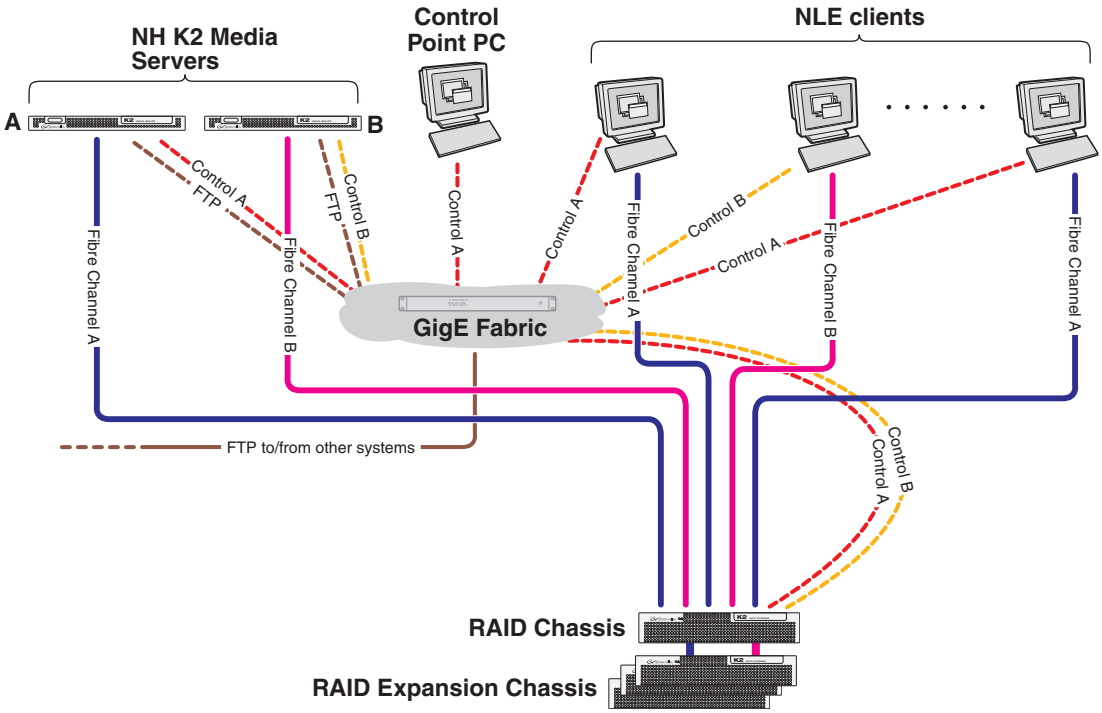
- "Workgroup storage system description"
- "Workgroup storage cabling"
- "Workgroup storage network configuration"
- "Workgroup storage configuration"

Workgroup storage system description

Basic (non-redundant) Workgroup storage



Redundant Workgroup storage



The purpose of K2 Workgroup storage is to provide a large pool of storage for files edited by Non-Linear Editors, such as Aurora Edit, Macintosh Final Cut Pro and/or Edius editors. K2 Workgroup storage can be basic (non-redundant) or redundant.

Basic Workgroup storage has one Gigabit Ethernet switch. Redundant Workgroup storage has two Gigabit Ethernet switches, connected by Inter-Switch Links (ISLs) to support a redundant Ethernet fabric.

Workgroup storage has one (basic) or two (redundant) NH K2 Media Servers. These can be NH1 (one Gig FTP bandwidth) or NH1-10GE (ten Gig FTP bandwidth) servers, but both NH servers on a system must be of the same type: either both NH1 or both NH1-10GE. The NH server for a Workgroup system provides connection for Fibre Channel. NH servers do not have media (iSCSI) ports.

A NH server on a Workgroup system is configured with roles of SNFS File System Server, FTP Server, and NAS Server. On a redundant system these roles are identical on both servers and provide redundancy as follows:

- SNFS File System Server — On a redundant system only one server is active at any one time in this role, and the media file system provides redundancy. If a fault occurs on the active server, one of the other servers automatically takes over as the active media file system server.
- FTP server — On a redundant system both servers are active in this role simultaneously. To provide FTP redundancy in the event of a server failure, your facility's FTP system must be able to access alternate FTP servers.

In the Workgroup system no K2 Media Servers take the role of iSCSI bridge or media database server.

The RAID chassis has two controllers. Each controller in the RAID chassis has two standard Fibre Channel ports plus four optional Fibre Channel expansion ports installed. This provides six Fibre Channel ports on each controller and a total of twelve Fibre Channel ports across both controllers. This allows the controllers to act in a limited way as a Fibre Channel switch. On each controller one port is available to connect a K2 Media Server and the remaining ports are available for client connections. Each controller in the RAID chassis is also connected to the GigE control network, which is required for SNMP (NetCentral) monitoring.

There must be one primary RAID chassis and may be up to six optional Expansion chassis. Primary chassis and Expansion chassis contain twelve drives. All disks in both primary and optional Expansion chassis are bound in sets of 6 as RAID 5.

The K2 configuration control point PC is connected to the GigE control network. The K2 System Configuration application runs on this PC for configuring the SAN. FTP/ streaming traffic accesses the K2 Storage System via the FTP GigE port on K2 Media Servers.

Workgroup storage cabling

Also refer to the *K2 Storage Cabling Guide*.

For a basic Workgroup storage system connect cables as follows:

- On the GigE switch connect cables the same as for a basic nearline K2 SAN
- On the NH K2 Media Server make one control network Ethernet connection, and one FTP network Ethernet connection. Also make a Fiber Channel connection to RAID Controller 0.
- On each NLE client make one Fibre Channel connection and one control network Ethernet connection.
- Cable K2 RAID using the Nearline 10 instructions.

For a redundant Workgroup storage system, connect cables as follows:

- On the GigE switch connect cables the same as for a redundant nearline K2 SAN
- On NH K2 Media Server A make one control network A Ethernet connection, and one FTP network Ethernet connection. Also make a Fibre Channel A connection to RAID controller 0.
- On NH K2 Media Server B make one control network B Ethernet connection, and one FTP network Ethernet connection. Also make a Fibre Channel B connection to RAID controller 1.
- On each NLE client make one control network Ethernet connection. Balance clients between control network A and control network B. Also make one Fibre Channel connection to a RAID controller. Balance clients between controller 0 (A) and controller 1 (B).
- Cable K2 RAID using the Nearline 10R instructions.

Workgroup storage network configuration

For basic Workgroup storage configure as follows:

- There are no Workgroup storage requirements for GigE switch configuration.
- On the NH K2 Media Server, configure GigE port 1 for the control network.

For redundant Workgroup storage configure as follows:

- Configure GigE switch configuration trunks, to support ISLs. VLANs are not required.
- On each NH K2 Media Server, configure GigE port 1 for the control network.

Use K2Config to configure GigE ports for the FTP network.

Workgroup storage configuration

For basic (non-redundant) Workgroup storage, use the K2 System Configuration application and follow the procedures for a Nearline 10 K2 SAN, with the following specifications:

1. For K2 System Type, select **Workgroup Storage**.
2. Define the system with the following:
   - One Gigabit Ethernet switch
   - One K2 Media Server
   - The number and type of clients appropriate for your system.
3. Configure the NH K2 Media Server, selecting the following roles:
   - SNFS File System Server
   - FTP Server
   - NAS Server
4. Check software on the NH K2 Media Server as prompted by K2Config. MPIO software is not required.
5. Configure the NH K2 Media Server's GigE port 2 for the FTP network
6. Configure RAID disks in sets of 6 as RAID 5.
7. When making the new file system, if Access Control Lists are desired, select **Windows Security**.
8. Configure File System Server the same as Nearline 10.
9. Configure FTP Server the same as Nearline 10.

For redundant Workgroup storage, use the K2 System Configuration application with the following specifications:

1. For K2 System Type, select **Workgroup Storage**.
2. Select the **Server redundancy** option.
3. Define the system with the following:
   - Two Gigabit Ethernet switches
   - Two K2 Media Servers
   - The number and type of clients appropriate for your system.
4. Configure each NH K2 Media Server, selecting the following roles:
   - SNFS File System Server
   - FTP Server
   - NAS Server
5. Check software on each NH K2 Media Server as prompted by K2Config. MPIO software is not required.
6. Configure each NH K2 Media Server's GigE port 2 for the FTP network
7. Configure RAID disks in sets of 6 as RAID 5.
8. When making the new file system, if Access Control Lists are desired, select **Windows Security**.

9. Configure File System Server the same as Nearline 10.

10. Configure FTP Server the same as Nearline 10.

Follow procedures for K2 FCP Connect to add any Macintosh clients to the Workgroup storage. If configuring for Access Control Lists, configure Macintosh clients for Active Directory Domain and enable Access Control Lists on K2 Media Server(s).

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