

ContentShare²

WORKFLOW AND MEDIA ASSET MANAGEMENT

ContentShare² (CS²) is a software solution created to interconnect new and legacy IT-based systems, helping integrate your facility's digital workflow into a single, streamlined solution.



The Challenge

Typically, designing and building an IT-based media facility requires integrating new technologies within a legacy infrastructure. As these new technologies influence working practices in the form of new and improved workflows, businesses may realize greater efficiencies throughout their operation. As your business evolves, these efficiencies enable you to react more quickly to changing market conditions and offer your clients an enhanced experience.

A key challenge for state-of-the-art facilities is managing rich media (video, audio, and graphics) as well as its associated metadata. Today's content creation, distribution, and repurposing organizations are expected to support an increasing number of distribution channels, platforms, and styles. While struggling to meet these requirements, most facilities do not predict a return on their investment or an increase in revenue.

The media industry continues to transform towards a model of "packaging and publishing." The increased demand from consumers and the ability of media providers to generate content for a burgeoning variety of platforms directly correlate to advances in technology.

In this environment, workflow and media asset management systems are essential. Ideally, they should be based on an open architecture that supports the ability to change and introduce new business processes and workflows without interfering with day-to-day operations.

The Solution

CS² is a scalable workflow and media asset management software solution that integrates a robust asset management framework and a powerful, highly flexible workflow engine.

The asset management system provides interfaces to broadcast specific devices, such as video servers, and interfaces to IT-based storage systems. CS² initiates and controls the transfer of content between the different subsystems that exist within a broadcast facility. In addition, CS² provides an asset tracking subsystem to administer content, which may be available in different resolutions.

The CS² workflow management system provides interfaces to other important systems such as business systems (i.e., scheduling systems) and the technical infrastructure. CS² receives work orders from the business system and initiates and controls the technical workflow with status messages continuously sent back to the business system.

CS² interconnects the heterogeneous infrastructure common to most broadcast facilities by integrating traditional broadcast devices with standard IT technology and combining legacy systems with new ones.

KEY FEATURES

- A reliable asset management framework tracks ingest, movement, and manipulation of content
- Interfaces to a wide variety of devices and systems, both Grass Valley™ and third-party
- A powerful and highly flexible workflow engine interfaces with business systems
- Adapts easily to support business processes and operational rules
- Integrates fully-automated workflow capabilities with manual operator-driven jobs
- A revolutionary, task-based UI guides the operator's work by combining a task's description with the proper tools for each task, improving broadcast and rich media production and operations
- Flexible framework bridges the traditional gap between content creation and business applications, allowing you to optimize your workflows

CS² APPLICATIONS IN THE FIELD

Version 1.1 of CS² has been deployed for several Grass Valley customers covering a range of applications:

- CS² for ingest and playout
- CS² for digitizing and archiving
- CS² for VOD ingest and packaging

CS² for Ingest and Playout

A public service network of British commercial television broadcasters has outsourced its playout and transmission operations. Here, CS² manages the processes within the facility and organizes the quality control of the ingested material. CS² is deployed as a redundant system allowing for 24/7 operation without interruption.

The first step is checking media files using a file-based video quality analyzer whose results are presented to an operator in a second, manual QC step. The operator uses the CS² UI to control a Grass Valley K2 video server channel for high-resolution playback while also checking for potential problems indicated during the previous file-based QC step. This two-step process allows the broadcaster to enhance quality standards without adding staff. CS² also manages the file movement between the K2 video servers, the central storage systems, and the archive system.

With the help of CS², incoming containerized Material eXchange Format (MXF) files can be unwrapped and additional media such as supplemental language audio tracks can be attached to the file before it is re-wrapped and sent to play out.

This deployment is currently being extended. At the end of the next phase CS² will interface additional third-party video servers and provide QuickTime wrap and unwrap functionality.

CS² for Digitizing and Archiving

For a large-scale archive project, Grass Valley designed and implemented an archive system that will digitize 270,000 hours of material over the course of 18 months. The system was built to help preserve a country's entire audio-visual heritage.

In this instance, CS² manages and automates ingest operations, quality control, editing, creation of low-resolution proxy copies, and provisioning of material for archiving. The CS² workflow management system orchestrates and supervises all workflows. The workflows are specifically designed to meet the customer's unique requirements.

A total of 20 ingest stations control 26 Grass Valley K2 video server channels. The digitizing of the material is performed in three shifts, 24 hours per day. During ingest, the video is visually checked for quality. Operators determine whether individual clips require additional processing, such as editing, using Grass Valley EDIUS® systems. In addition to the high-volume ingest, CS² controls the regular cleanup on all attached devices according to complex, adjustable workflows.

CS² for VOD Content Ingest and Packaging

A large television network with two national broadcast channels is extending its services by adding a VOD platform. Grass Valley has provided the VOD platform as a complete, turnkey system.

CS² manages the ingest, preparation, quality control, and delivery of the VOD content. Tape ingest is performed using a Grass Valley Sapphire video server with ViBE encoders for both SD and HD material. Content providers can also send material as files to the CS² system via an FTP drop zone. The system seamlessly integrates that content into the workflow.

Following ingest, CS² initiates a file-based quality control using Grass Valley MPEG Scan video analysis software. A proxy for editorial review is generated and the high-resolution content is packaged with trailers, advertisements, and posters. As a final step, the complete VOD package is backed up to the archive system.

Once initiated by the traffic system, CS² hands off the VOD package to the SmartVision service platform for broadcast to set-top boxes.



THE CS² CONCEPT

Processes inside of CS² are initiated by a work order, which originates at the business system. The work order contains a job identifier and parameter for the job such as a material ID, transmission date, etc.

CS² provides a collection of Workpackage Templates. Each template describes a specific workflow dedicated to one type of job and its topology. The interface to the business system chooses the right Workpackage Template from the collection, inputs the parameters (such as the transmission date) and hands the Workpackage to the Workflow Engine for execution. Should workflows be changed, existing templates can be modified. New templates can also be added to execute new workflows.

When executing Workpackages, the CS² workflow engine differentiates between automated and manual tasks. The manual tasks are given to a group of operators who perform their work at their Workplaces. At their Workplaces, CS² provides an operator with a task description and the necessary tools to perform their job. If CS² does not provide the requisite tools, third-party tools may be integrated.

Once an operator has finished a task, he submits it to the system, thereby indicating to the workflow engine that this particular task has been completed. The workflow engine continues processing the workflow, and the Workpackage travels as a task from Workplace to Workplace.

Workpackage Template

The blueprint of a workflow. Describes the flow through the facility, the actions to be executed and their order. A Workpackage Template is independent of a specific piece of material. A Workpackage Template is created by identifying repetitive patterns of work and modelling them into a Workpackage Template. There can be virtually unlimited Workpackage Templates in CS² describing different workflows.

Workpackage

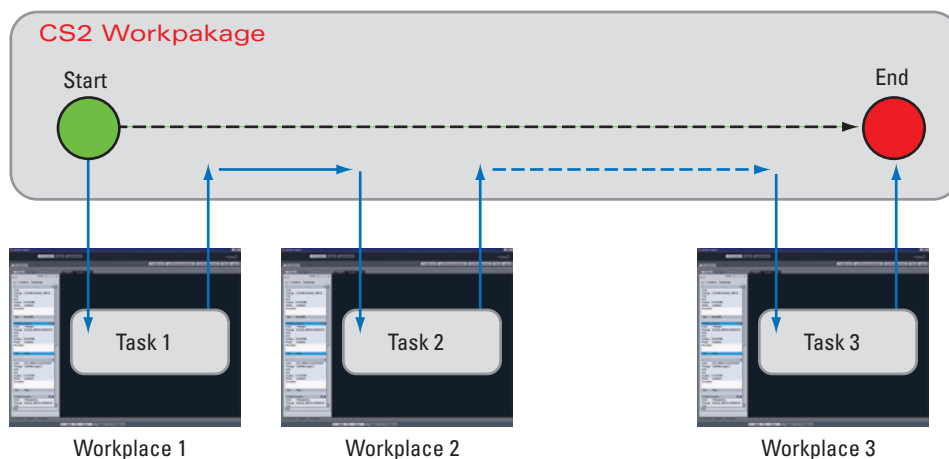
A Workpackage is created from a Workpackage Template. It has the same flow definition and is applied to a specific piece of material. To start a Workpackage, parameters must be given identifying the material to be worked on.

Workplace

A Workplace is where an operator works. This may be as simple as a computer with a CS² client, in which case no special infrastructure is needed. In more complex environments, this can be extended by the devices needed to fulfill a special task (e.g., ingest- where a VTR and other measurement equipment would complement the CS² client). At a Workplace, an operator receives a task with a description and the necessary tools he needs to complete his task.

Task

A logical step within a Workpackage. A task can be manual or automated. Manual tasks such as ingest are executed by operators at their Workplaces. Automated tasks, such as transcoding are handed over to CS² for execution.



Workplaces are grouped into categories. Below each category, there can be one or more Workplaces (i.e., a Workplace “VTR Ingest” below the category “Ingest”). Within the CS² environment, a Workplace is not necessarily a physical place of work. A Workplace could simply be a laptop where a journalist can research new material. A Workplace has only to be a specific, physical Workplace when extra infrastructure is needed—such as a VTR for ingest.

The task-based user interface displays only those tasks that belong to the respective user group. Each user belonging to this group can choose a task to work on which is then locked to him (pull model for

tasks). Alternatively, tasks can be pre-assigned to specific users (push model). For each task, the operator sees a related task description clearly outlining what needs to be done and the tools necessary to process the task.

In between manual tasks, the CS² workflow engine attends to any automated tasks so the operator has everything they need to complete their manual task. For example, the engine could initiate a task of transcoding a clip to a low-resolution before the manual task of an editorial review begins.

Building a CS² System

The first step in building a CS² system is analyzing workflows and identifying all of the business, functional, and technical requirements relevant to the project. In collaboration with the customer, the Grass Valley Systems Integration group conducts a detailed analysis of the organization to determine the requirements. From this analysis, together they design and implement a tailored CS² solution and the workflows that optimally suit the customer’s needs.



CS² MODULES

The CS² VTR Ingest module controls up to six VTRs and K2 video server channels. It offers simultaneous playback of the currently recorded clip (read after write) and accepts new metadata while the clip is being recorded. As an option, the system can be set up to interface with a barcode scanner.

The CS² hi-res QC module controls a K2 video server channel for playback of high-resolution media. An operator can check the quality of the material and create checkpoints to indicate issues or errors. Optionally the same module can display the results of a prior file-based QC performed by file-based QC analyzers. Depending on the QC status, different actions can be taken.

In the CS² Cataloging module* the operator can capture timecode-based metadata. Different types of information may be added to the asset (i.e., camera angles, audio tracks, or sport events). Metadata types can be configured and extended and are displayed in separate tracks. The view on the tracks can also be configured as templates to allow exposing different types of information to different users.

The CS² Trimming module* offers the ability to set new In and Out marks for clips on the K2 video server. An operator can also create new clips from a marked segment and initiate a new workflow based on the newly created clip.

The CS² web-based task panel* is compatible with all major browsers and makes CS² accessible on virtually any platform. It can be used to integrate third-party software such as NLEs into the task distribution of CS² without the need to install the full CS² UI.

The centralized Administration & Configuration module facilitates the installation of new software onto any machine and the configuration of the entire CS² system from a single point of contact. The system administrator can perform system updates with the click of a button. The module also provides a quick overview on system’s technical status at any time.

As a systems solution, CS² allows the quick and easy integration of new modules or third-party software on a project-to-project basis.

* Available soon.

CS² ARCHITECTURE

The CS² framework includes a flexible and extensible device layer. The device interfaces are kept lightweight so that the creation of interfaces to new devices becomes a less time-consuming task. The media asset management framework inside of CS² provides for service discovery, metadata management, search, and asset location tracking.

Designed expressly for the media industry, the CS² MAM infrastructure supports generic assets and content and includes extra features, which enable advanced broadcast operations. This concept allows the user to link virtually any essence type to an asset and handle it throughout the system. In this way, CS² is able to handle multiple resolutions and formats of the same content.

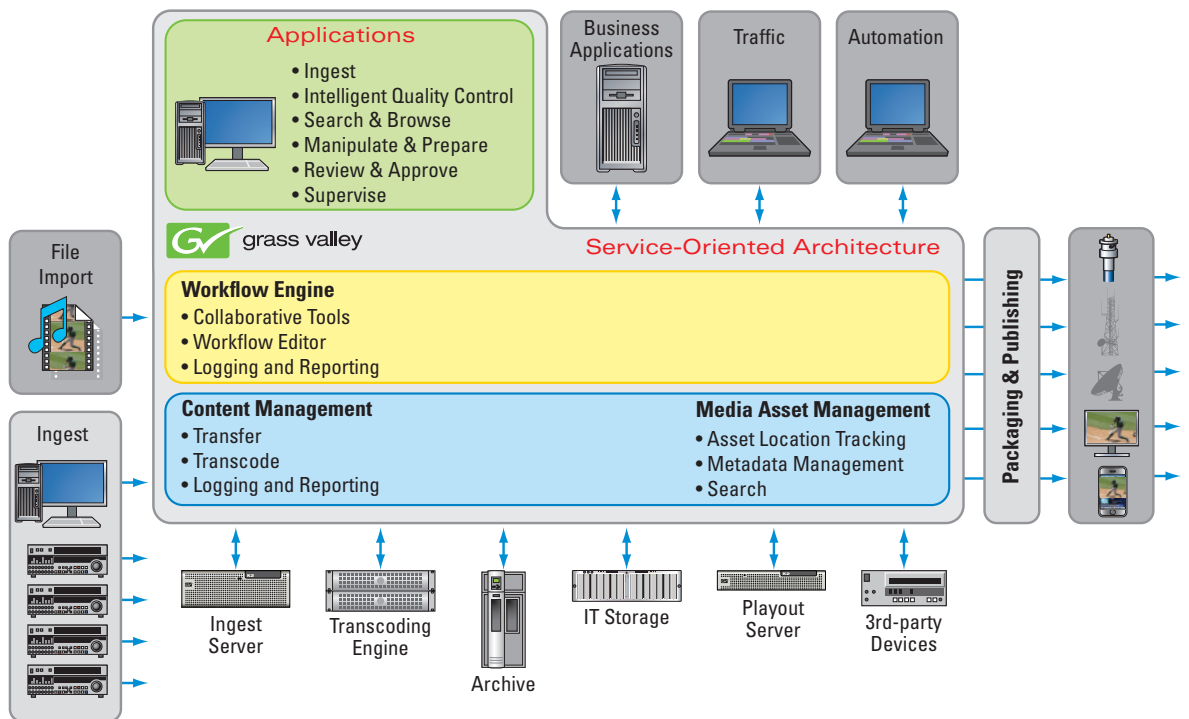
Multiple audio tracks, documents, spreadsheets, or any specific information may be attached to dedicated assets.

The CS² workflow engine is designed to bridge the gap between business workflows and technical operations by accepting work orders from the business system and orchestrating them on the technical level. The system then provides detailed status information and tracking tools so that the business system can monitor the execution of the technical processes.

The real-time monitoring capability provides a transparent view through all layers of the facility and allows users to quickly modify the technical processes based on the organization's business decisions.

The CS² system is agnostic in terms of ingest and playout. Existing ingest and playout systems can be interfaced and integrated into a seamless solution. For smaller deployments, CS² offers an ingest module for up to six ingests per workstation. In addition to the classic distribution channel playout, new distribution channels such as mobile TV and IPTV can be added to the packaging and publishing layer of CS².

The connection to business systems is established exchanging XML data via web services or flat files. The same connections can be used for status reporting back to the business systems.



SPECIFICATIONS

CS² Device Interfaces

- Video Servers (K2, Profile®, Sapphire, Omneon Spectrum, Quantel Clipbox Power)
- Transcoding engines (David Transcoder, Digital Rapids Stream, Rhozet Carbon Coder, IPV XCode, SuitcaseTV)
- Archive systems (Front Porch DIVArchive)
- Generic IT storage (via CIFS, FTP; also supports FXP transfers)
- Video quality analyzers (MPEG Scan, Tektronix Certify)
- Wrap and unwrap (MXF, QuickTime; support for language tagging)

CS² UI Modules

- Core UI (metadata display and editing, display of low-res video and keyframes, workflow monitoring, search, transfer, and transcode administration)
- VTR Ingest (up to six VTRs, read-after write, metadata input, barcode scanner interfacing)
- Hi-res QC (controls K2 or Omneon playback channel for playback of hi-res media, manual checkpoints, interfacing with file-based QC devices)
- Cataloging* (capture timecode-based metadata, work with tracks, expose different views for different operators)

- Trimming* (set new In and Out marks on the K2 server, create new clips based on marked segments)
- Web-based task panel* (task distribution compatible with all major browsers, integrate CS² with third-party software)
- Centralized administration and configuration (install new software to any machine, configure CS² from a single point of contact, receive a quick overview of the current system status)

CS² Core Features

- Metadata import and export via XML files
- Traffic system interface (XML based, file and web service interface, status reporting of workflows)
- Operation Workflow Engine (orchestrate processes with maximum flexibility, combine manual and automated tasks)
- Technical Workflow Engine (trigger actions based on events)
- Backup broker (cold-standby redundancy for device interfaces)
- Separate audit log repository* (store audit log messages securely, perform statistical analysis on operational processes)

* Available soon

ORDERING INFORMATION

Please contact your authorized Grass Valley representative.

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PROFESSIONAL SERVICES

Our professional services offerings ensure optimal system performance and maximize uptime. These services include call centers staffed around the clock; system planning, design, and commissioning; professional training courses; and technical maintenance programs and service agreements.

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