IP Roundtable

Regardless of how you do television, everyone agrees:
We need industry-wide and universally accepted IP standards ... now

Three leading industry technologists talk with NewsCheckStudio about the TV industry’s IP transition.

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NewsCheckStudio
Roundtable Participants

Steve Fastook
Senior Vice President of Operations
CNBC

An award-winning media production executive who began his professional broadcast career at NBC in 1986, Steve Fastook is responsible for production and operations at CNBC. In this role, he launched the first ever totally digital process at CNBC. He also negotiated and implemented the first ever use of wireless cameras on the floor of the New York Stock Exchange and oversaw the creation of the network’s popular Mad Money with Jim Cramer show.

Steve founded CNBC HD+, an innovative approach to high definition which has been adopted by many other sports and news networks. He also created “Post 9,” a new stage on the floor of the New York Stock Exchange and, with his team, created a groundbreaking production tool called 4D.

Matthew Holcombe
Vice President, Production Broadcast Engineering
Turner Broadcasting System

Based in Atlanta, Georgia, Matthew Holcombe is responsible for all broadcast technology related strategies and infrastructure for the U.S. based Turner networks and engineering for CNN in Atlanta. His duties include leadership of engineering and broadcast IT resources, technology installations, support and maintenance, and satellites and transmissions for Turner.

Previously, as VP of Engineering at CNN, Holcombe directed the launch of CNN's HD network, the first 24-hour news network in high definition. Earlier, as VP of International Engineering for CNN, he was responsible for Engineering for the Atlanta, London and Hong Kong bureaus as well as CNN en Español.

Holcombe began his tenure with CNN in 1989 as an Operations Engineer for Turner Entertainment. He was promoted in 1991 to Maintenance Engineer. In 1993, he joined CNN International as Assistant Engineering Manager and was promoted to Manager of Engineering for CNN International in 1995.

Del Parks
Senior Vice President and Chief Technology Officer
Sinclair Broadcast Group

Delbert R. Parks, III has held various operations and engineering positions with Sinclair over the last 43 years, moving up through the ranks since he began in the engineering department of Sinclair’s flagship station, WBFF-TV in Baltimore. In addition, he is a retired US Army Lieutenant Colonel, who has held various commands during his 26-year reserve career.

In his current position, Del is responsible for planning, organizing, and implementing operational and engineering policies and strategies as they relate to television operations, Internet activity, information management systems and infrastructure. He is a SMPTE Fellow, as well as a member of the Society of Broadcast Engineers.
Scale and Flexibility are Key Drivers for the IP Transition

The transition from baseband SDI video to IP in television is underway at many high-profile broadcast operations.

From live contribution and signal routing to studio production, playout and distribution, broadcasters increasingly are turning to IP to enable new workflow efficiencies, produce more content and position themselves to take advantage of unfolding business opportunities, such as over-the-top, mobile and next-gen TV transmission.

Even so, undertaking forklift IP upgrades at existing broadcast plants is rare, and greenfield sites — while better suited to an ambitious, all-at-once IP rollout — are the exception, not the rule, and generally take years to bring to fruition.

The three broadcasters interviewed come at IP in television from different angles. Matthew Holcombe, VP, Turner Production Broadcast Engineering, is looking to IP in the short term to support core routing at three major Turner operations and longer term as the routing and transport backbone for a major greenfield site in New York City.

Steve Fastook, SVP of Technical and Commercial Operations at CNBC, sees IP as a way to get more live remote interviews on air without driving up costs and as a means to serve up custom tickers and financial news to subscribers of its digital properties through increased IP metadata.

Del Parks, SVP and CTO of the Sinclair Broadcast Group, views IP as essential technology to meet the field contribution demands of news-producing stations and as a cost-effective way to distribute a DTV subchannel to its stations across the country for final transmission to viewers. In the longer term, he believes the successful rollout of ATSC 3.0 features, such as targeted advertising and content, are utterly dependent upon an IP technology at the station.

While each differs on some of the specifics, all agree the successful evolution of television into a 21st century medium depends in large part on IP as an enabling technology.

How far along are you on your IP transition?

Steve Fastook
I have a little bit different strategy for IP. I started on the fringes, so I am using IP for outbound bureau connections, inbound bureau connections and global connectivity. We are working our way from the outside to the center.

For me, it’s a little about timing. I only invested in my HD-SDI plant about three years ago. I want to run that out a couple of more years. There isn’t a huge value to taking that out and replacing it. So, I am going to start at the fringes.

I am using [it] mostly [to] transport graphics and [for] edited content. We have a large installation of Grass Valley with a global connect where we are able to transfer content around.

Matthew Holcombe
On the Turner side, we actually just completed an RFI [request for information] with a number of vendors around a big IP project that we are considering for Turner. So here in Atlanta, we have three major facilities. We have CNN Center, we have Net Ops, which is really our master control playout area, and we also have Turner Studios.

We are going to replace the core SDI routing with IP routing for all three. That’s really our first big project. We just completed the RFI, and we just selected a vendor. We haven’t publicized that yet. And we are just about to start the design phase.

We are really replacing the backend router where all of the incomings come in. We also will connect the routers together to share content more easily across campus.

Del Parks
We look at IP a little differently because we are multiple television stations across the network. The strength of IP is in the transport, and so we have invested heavily for news gathering – in our case in LiveU. I think we have close to 200 LiveU units across our 65 stations that do news.

We are seeking to have more content on the air and an easier way to do it. So we have been very creative. In some of our markets we have created the traffic car that has five or six cameras pointing in different directions.

It also has allowed us — because it can be routed — to have a camera with LiveU shooting the Baltimore riots, and we could ship that out to every one of our news-producing stations via [our] IP network. We have a big MPLS [Multiprotocol Label Switching] that connects all of our stations. So that is one way.

We also use IP for distribution of our newly created digital sub-channel Comet TV, a sci-fi channel. Instead of using satellite to deliver that, we’ve contracted with a company called LTN Global Communications, which a lot of people use. Their network delivers Comet 24/7 to all of our affiliates.

We just started that back in September, and it has worked out really well for us because IP distribution enabled us to keep the costs in line. In addition, because it is IP, we can have an East Coast feed and a West Coast feed at no additional cost.
Fastook

Actually, the last thing I am worried about is 4K, because I am in news. I see a couple of benefits in my first fringes of IP, including global workflow. That is being able to transfer content quickly across locations without feed lines, without using traditional fiber transport. That is probably the biggest benefit of IP.

I don’t like to use the words “cost savings” because I am not looking to take cost out. What I am looking to do is take my transport dollars and increase capability. For CNBC, it’s all about guests and being able to have more guests on the air.

So if I can reduce my transport cost from location to location, I can take that budget and apply it to more locations and more content. I think it is a little bit of cost, it is a little bit of capability and workflow and a lot of transport.

Holcombe

Similarly transport, there are obvious benefits there. We’re doing a lot of transport over big OC-192 pipes [Optical Carrier 192, capable of carrying 9.952 Gb/s] between cities.

But I think what we are focused on at least for this initial investment is scale, flexibility and really being able to have seamless integration into the cloud.

When you think about scale, we have huge routers in big facilities here that aren’t connected as well as they should be. Certainly we use tielines, but SDI transport for that is cumbersome and expensive. We would really like to be more connected with our routers across facilities. So that is something we hope to enjoy out of an IP infrastructure.

Flexibility, we are going to build the big router — IP core routing — first. Then we are going to move quickly into our broadcast operations center or master control where we want to be able to move quickly and flexibly spin up channels to take advantage of customer data or some special event we want to do. Perhaps it’s an election special or something around NCAA coverage. We really want to be more flexible in how we can spin up channels and the speed with which we can do that. And we certainly want to be flexible with opportunities that the cloud might present us in the next year or so.

So is the growth of IP in your operations going to be organic where the changeover is gradual as needs arise or more of a forklift replacement of SDI infrastructure and in greenfield installs?

Fastook

We are in a very similar situation to Sinclair, where we are probably two-thirds of the way into it with the last piece of it being our core.

My gut feeling is that with things like LiveU, we are going to quadruple our usage of IP newsgathering. With things like LTN, Fujitsu encoders, I would say we are two-thirds of the way in to the implementation. It’s gradual for us.

It will be done on a needs basis. For example, I opened a bureau in San Francisco last year in an office tower. I was able to get my transport on the Comcast backbone — that is one of the nice things about being part of the Comcast family.

I can transport six to eight cameras and a couple of return feeds back and forth to San Francisco without a single piece of traditional connectivity in the building. So I’m letting the needs dictate the implementation.

If I was to go out in my long-term plan, I have money set aside for IP for whatever the business brings to me. Let’s use it as a way to spin up channels, spin up digital products and put cameras in places I probably wouldn’t have been able to before.

Holcombe

It is both. We have existing facilities. I think the initial strategy is to stand up this IP core in addition to our SDI routing. We have a big investment in SDI, which will be around for years to come.

So our strategy is to stand up IP alongside it. The facilities are so large we just can’t do it all at once. Once we get this stood up, we can go through control rooms and studios and replace master controls, and we will swing them over to IP as we go.

But it’s not going to be a big bang, and all of a sudden Turner is all IP. We are going to have core routing that is IP alongside our SDI technology, and as it is time to replace SDI, we will convert those systems to IP.

Parks

Honestly, in our situation the SDI plant we have today actually works well for us, and the interchange between the stations is certainly IP. But do we actually have an IP standard yet? Are we lining up with AIMS or ASPEN in terms of a studio standard? So I just am not sure about making a commitment to studio.

For us, we are looking at a transition to ATSC 3.0, which is a pretty big deal. To that end, we believe — and I think a lot of the industry believes — that 1080p60 HDR is probably a pretty good target to aim at.

So for me, I am really focused on how I can get all of our stations as quickly as I can to 1080p60 HDR, which, by the way, fits into a 3G router and a 3G switcher. So for me, that’s really kind of our goal.

“As long as there are competing standards...if you pick wrong, you walk away from the roulette wheel with your pockets turned inside out.”

— Sinclair’s Del Parks

Now, if in the next two, three years or four years, standards get established and everyone agrees on a standard, we will look at IP in the studio for major pieces of production equipment.

So, the question for me is number 1, how does IP fit in with the transition? Number 2, how can I use it to facilitate the features we want to offer in ATSC 3.0?

If you saw our CES demo of ATSC 3.0, the new standard is a very Internet-like experience. That is really where my head is. Not so much putting in the IP router and IP cameras end-to-end. That’s great, and we will get there eventually, maybe. But that’s not my near-term focus.
As far as IP at your operations, do you see this popping up as islands in the workflow that need SDI-to-IP and IP-to-SDI gateways?

**Parks**
Yes, that’s the only way.

**Fastook**
My editing system is a perfect example. When I built it two years ago, it was about 50% IP connectivity and about 50% SDI broadcast connectivity. That scale is tipping completely in the direction of IP now.

I manage probably three times the IP connections going into and out of the system and haven’t changed the SDI connections. So these kinds of systems now are enabling me to make the morphing move from broadcast so I can actually create streams into and out of the same system that’s creating SDI video. So I am bridging that gap.

**Holcombe**
Yes, I think both will be stood up alongside each other, and there will absolutely be links back and forth between the IP and SDI environments. The one caveat to that is our long-term plan with a greenfield in New York. We are going to move CNN in New York to Hudson Yards at a new building in New York that is going up as we speak.

That will be completely IP based and IP throughout that facility. That’s years away. Here in Atlanta, it will be SDI and IP and links back and forth for the foreseeable future.

What about standards for IP-based transport and production? How do you go about selecting a standard, and will it be the same across the entire operation?

**Holcombe**
Honestly, we are looking for open standards. We are looking at TR-03 and what they are doing on the AIMS side. I think that is where we would like to see the vendors and the industry go. We’ve got a pretty tight timeline to get some stuff implemented by the end of the year. Whether we can actually get that up and running as a standard, we will see. But ultimately that is what we want.

I think you are right. The industry is all over the place — everything from SMPTE 2022 to ASPEN to TR-03, and we need to get to a point where everything is interoperable. I don’t think we want multiple standards around the facility. That’s not what we strive for. We have something in front of us that we have to make a decision on pretty quickly, but ultimately we want to get to an open standard that is interoperable between all of the vendors.

**Fastook**
That is another reason why as much as I possibly can I am waiting in the wings because I do want an interoperable standard. I will be an adopter of what NBCU adopts, so I will be led a little in that direction.

But I have the luxury of time. I am getting the benefits of IP with the edit systems, the transport systems and I have a new plant, so I don’t have a ton of pressure to replace that.

The biggest thing I would like to have is fewer lash-ups between our digital properties. I am waiting in the wings for an interoperable standard. I haven’t even paid attention to them yet because there are so many of them out there.

**Parks**
The real question is: Will IP infrastructure take off unless there is a single open, interoperable standard?

As long as there are competing standards, when you look at Turner, CNBC, NBC and any other big organization, we have to go to boards of directors and ask for tens of millions — and in some cases hundreds of millions — of dollars. I don’t feel comfortable doing that based on not knowing what it is going to be.

Boy, if you pick wrong, you walk away from the roulette wheel with your pockets turned inside out.

So, the vendors have to sort this out. We can’t do it for them. You know CNN is going to build this huge facility in Hudson Yards, by the way I was there last night watching it being built and it’s going to be gorgeous.

Think about how much money you guys are going to spend on an IP infrastructure and hopefully by the time you do it, the vendors will get their act together.

What sort of Ethernet infrastructure do you anticipate — 10Gig today with an eye towards 25Gig? 100Gig? Fiber?

**Fastook**
The answer is yes. We have a little of everything right now. We have a lot of 10Gig Ethernet, trying to get as generic a connection scheme as we can, single-mode fiber wherever we can and simple runs. Generic runs with cleanly marked panels so we can pull things in and out. It’s a little bit of everything, and I think it is going to be that way for a while.

**Holcombe**
Ten Gig is what we are looking at, at least right away. Forty Gig and 100Gig at some point that’s bonded 10Gig or bonded 25Gig, all fiber at least for the IP side.

**Parks**
We are 10Gig and will probably wind up going to 40Gig. But that will be driven by the cost of routers. Fortunately, we don’t have to make the 40Gig or 100Gig decision yet. We still have some time to see where this all shakes out.

“Without a standard, the risk of making a bad decision is great, and I don’t want to make it.”
— CNBC’s Steve Fastook
**What steps have you taken or anticipate taking to educate your technical staff on dealing with IP support and maintenance?**

**Holcombe**

That is a key one actually. We do have to adapt our skillset, and it is a change. One of the key parts of our design is I challenged the team, and we are going to deliver not only a design but also a comprehensive training plan for our team.

We have already done some online SMPTE training and Cisco training, but as we flesh out our design, we will have a full-on training plan for our teams as we transition to a very different skillset. We will make sure we have the training and the tools in place to be able to follow the flows and see where these paths go.

We are all going to be living in a new world. No more patch cables; no more patch panels in the back to find where a signal is getting lost. We’ve got to have the right tools in place. We’ve got to be able to find where we dropped a frame or where we have some bandwidth issues. So I think training and tools are keys for success at Turner.

**Parks**

It’s funny. I was out at Tektronix in Oregon about a month ago, and we’re talking about IP measurement and test. Quality of service is one thing, but quality of the bits inside it, you can’t get a scope and see the quality of video. You really can’t see it.

I think once we get to that point where we start using IP in our plant to replace SDI, I think the test and measurement tool will be there.

Now, the question is: Are we going to be able to have people who are capable enough to use these tools? And that is a good one because as a rule, at least speaking for Sinclair, it’s very hard to attract young IT people into our business these days because they can make so much more money and be so much more challenged working in the computer field. There are so many other things out there for them to do.

It’s not sexy to be in television anymore, so we try very hard to solve that problem.

**Fastook**

We are pretty lucky with our staffing. Most of my team are very IT agile because of the nature of having so much data running through the plant. Our transition to that is very smooth. I am actually ahead of it on the manpower and staffing side of the equation.

**Is there anything else you would like to add?**

**Parks**

There’s never been a more exciting time to be in our business. And everybody I talk to is super excited about the IP transition. This transition of our industry is scary, but it’s also exciting.

**Holcombe**

I will just reiterate how important it is for the industry and vendors to come together and come up with a standard that works for live production and gives us the ability to have low latency, discrete audio, video and data paths and viable non-blocking switching. But it’s got to be an open standard that works across vendors.

So, our industry inventors really need to come together to make that a reality, and the sooner the better. Right now I think it is really hampering IP taking off in the broadcast industry.

**Fastook**

I agree. It’s commoditization, and I love commoditization. I love to see simple off-the-shelf products used more and more. But I am also concerned about latency.

Without a standard, the risk of making a bad decision is great, and I don’t want to make it. I want to know I am getting into something that is going to work for a long time because I like to run my gear out to its full life. I am being very cautious right now.

**One last thing, do broadcasters need to get tough with vendors and demand they build to a certain industry-adopted standard?**

**Holcombe**

I fully support that, and we at Turner certainly are doing that every chance we get. I made a huge point of that in our RFI, really pushing the vendors to think about interoperability and being able to work across vendors and not just work for their island of equipment but what works across the industry. I think we should all do more of that, and certainly that’s what Turner is doing by getting in this fairly early. We hope to guide some of this forward.

**Fastook**

For me, Comcast-NBCU will be leading that. I will be watching in the wings a little bit, but probably should get a little more active in it, and I will. But I do think it is tough because our needs are very different. Networks have very different production schemes, very different distribution schemes, and very different monetary schemes. I am looking at what SMPTE and other groups are doing to come to a consensus.

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“*The industry and vendors [must] come together and come up with a standard that works for live production and gives us the ability to have low latency, discrete audio, video and data paths, and viable non-blocking switching. But it’s got to be an open standard that works across vendors.*”

— Turner’s Matthew Holcombe