

State of IP Technology within the Broadcast Industry

November 2015

Over the years, broadcasters have had to cope with huge technological change: the shift to colour, digital and high definition to name just a few. So why should the move to IP based technology be any more problematic? While IP is perhaps not the obvious format for video signals, the sheer power of computer hardware and equally powerful data compression can deliver advantages that mean that the transition to IP is inevitable. According to leading systems integrator dB Broadcast, the broadcast industry is in a state of confusion, hype and hesitancy around the direction of technology. It is clear that on many levels, such as engineering and operational aspects, new complex skill sets have to be adopted to move forward with the change to IP.

One of the main drivers behind IP adoption is cost reduction. Global investments in IT infrastructure are driving down the prices of large scale 10GbE network hardware, to the potential benefit of the broadcast sector. Broadcasters can utilise the economies of scale of both the hardware pricing from the IT industry, and the reduced need for physical cabling infrastructure and consequent cost of implementation.

The most exciting feature of a move to IP is the format-agnostic capability, believes dB Broadcast. So it is possible to provide a considerable degree of 'future proofing' infrastructure to cater for a plethora of formats such as: HD, 1080p, 4K, 8K etc., and not be concerned with yet another major technical refresh in the near future. A clear driver for IP-based systems is to allow 4K production. 10GbE can now be a viable replacement for SDI infrastructure, with vendors expected to show 25GbE in the next year or so. While four SDI cables are needed to handle a 4K signal, one 10GbE cable can manage with only slight compression. And unlike SDI, Ethernet is bidirectional, allowing signals in both directions.

Use of IP technology for broadcast systems is happening, but the question of absolute adoption is around emerging standards and confidence of the customers using these new systems in anger, in real world environments. As with any new technology within the broadcast industry, different vendors are backing various standards which makes integrating a 'best of breed' solution for the end user, utilising multiple vendors, a bit more tricky. Standardisation processes from professional bodies such as the Joint Task Force on Networked Media (JT-NM), SMPTE and the EBU aim to enable the transition from SDI to IP to run as smoothly as possible. AMWA's Network Media incubator was launched at IBC 2015 and also involved in providing a common approach for IP implementations. A

'plug fest' phase is due to take place in January 2016 with the aim of proving interoperability between members.

dB Broadcast is engaging in Proof of Concept work to prove and test the interoperability of stream exchange between multiple vendors. Not only does this give the customer and the integrator confidence in the system but it provides 'real-world' feedback for the hardware and software manufacturers to re-visit any designs or software code to enhance their solution.

IP standards to encapsulate video for transport over IP networks are in a state of flux. There are currently three approaches to consider: SMPTE 2022-6, Aspen and Sony NMI (Networked Media Interface). Each has benefits and drawbacks. SMPTE 2022 has a place in IP production as a 'stepping stone'. Even though the standard has evolved over the years and is gathering more momentum, the limitations of ST-2022-6 for live production use are worth noting. Aspen and NMI are possibly more likely to become established at least in the short term. Multiple vendors (and even the same ones) are backing both approaches which makes it harder to generate confidence in end users and integrators.

We must not paint end-users with the same brush in terms of technology adoption. A large international broadcaster may wish to fully migrate onto COTS (Commercial Off-the-shelf) IT hardware with bespoke software control and network management, where conversely, a production house may want to adopt IP in transitional stages at their own pace. Either approach is now feasible. By using SDI<>IP gateways, clients can use legacy endpoint equipment with a COTS switching fabric, and as they swap out legacy SDI equipment for IP, this scales within the core infrastructure. In essence, these gateways are 'bridging solutions' from the SDI world to the IP world.

dB expects the transition to IP to progress much more quickly than the conversion to HD for example. In a recent survey across 80 countries by Quantel and Snell, reported by the IABM, only 19% of respondents thought that SDI routers would be completely replaced by IP within two years, 42% within five years and 27% only seeing this happen within ten years. Overall, 91% of respondents thought that SDI would one day be completely replaced.

Delivering agile infrastructure which can be modified as a business evolves is key. With this new IP technology paradigm comes a greater level of scalability for the future. The broadcast industry, 'piggy-backing' on the ICT industry can benefit from lower cost COTS hardware.

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