

Data Networking for Digital Media

Quality to Match Your Content

The media, broadcasting, and entertainment industry is ever changing. Media is the most visible aspect of the recent transformation that digital has made in our lives, with new technologies boldly attacking what was once the exclusive domain of broadcasters.

New market players and content creators are generating unexpected channels, content, demand, and usage. Social media platforms continue to force adaptations to business models as they encroach on traditional broadcast territory and experiment with concert and sporting event distribution.

Engineering departments are on the front line when it comes to the digital demands of media; they have to make major investments in data transport, studio, production, and post-production during an ongoing period of major technological change.

The default format of all media has become digital, but workflows in many cases are rigid, with every step in the process defined by the system it passes through. And these systems are now being supplemented, or even replaced by applications running in a software-based cloud. Managing workflows in software allows processes to run in parallel, and for the seamless integration of a variety of applications: media and production asset management, production tools, in-studio and contribution transport, post-production applications, media access, playout, and distribution, to name just a few.

What happens behind the scenes is changing radically, and the engineering department is at the forefront of this revolution. The way devices and applications talk to each other is being transformed but one thing is certain—they will continue to use an IP-based network.

What's Hot, What's Not

In the media environment, IP-based networks can generate both enthusiasm and concern, sometimes in equal measure.

There is considerable enthusiasm for IP's ability to flexibly transport essences around the studio, around the production complex, or around the world. Ethernet and IP switching provide an extremely attractive alternative to the complexity of Serial Digital Interface (SDI), which involves a single unidirectional coax cable for each flow, hundreds of such cables snaking around your facilities, and large switches/routers that must accommodate thousands of these cables. Not to mention the parallel flows of audio and management information.

All of these can be multiplexed via IP, substantially improving agility and reducing space (and weight) requirements in your studio environment. And that same IP is used for distribution networks to stations, cable headends, satellites, and playout, regardless of the end user's device. In post-production, which today is all about data manipulation, IP is the norm, as all resources are manipulated digitally.

However, there are concerns, too. SDI's single flows guarantee a very high level of quality and are inherently secure because of their physical isolation on separate coax cables. Broadcast engineers are right to ask whether the benefits provided by IP can be matched by a level of quality and security equivalent to what they have known with SDI.

However, there are concerns, too. SDI's single flows guarantee a very high level of quality, and are inherently very secure because of their physical isolation on separate coax cables. Broadcast engineers are right to ask whether the benefits provided by IP—better resource utilization and integration—can be matched by a level of quality equivalent to what they have known with SDI.

The short answer is “yes, but . . .”

Not All IP Networks Are Equal

All IP switches connect multiple points and allow multiple flows on a single Ethernet cable. But there the similarities end. The real differences are the way they handle large amounts of data, multiple simultaneous flows, and very high speeds. In situations where high performance is crucial, some switches will start to drop data, or slow it down, if too many devices are sending too much data. This is fine for many applications; they simply resend what is missing. Video, however, is a very unforgiving medium. Missing data means dropped frames, pixilation, bad synchronization, poor quality, unhappy users, and angry subscribers. It's all about the viewer experience, plain and simple.

Similarly, just as the railroads of the Old West were often held up by outlaws, IP networks can be tempting targets for hackers, malware, and cybercriminals. This is especially true where almost everything of value is intellectual property stored in digital formats.

Solutions are available that address all of these issues and can adapt IP data networks perfectly to the strict requirements of the media and broadcasting world, but only if the equipment uses them. Not all do.

As the industry transforms and shifts to software-based platforms with orchestrated workflows that enable greater agility, the right IP network will make all the difference. A network that is conceived and built for high performance. One that is highly reliable and has comprehensive security inherently built in. And one that is not only easy to deploy and use, but one that is fit-for-purpose for all uses in the media and broadcasting environment.

For more than 20 years, Juniper has been implementing networks with these types of stringent requirements, and helping companies upscale their networks as they transition from previous generations of technology. And for Juniper, it isn't just about hardware and software products, we are there at your side with consulting and education as well.

Juniper builds networks for the media and broadcasting industry based on fundamental design principles such as:

- Zero-touch provisioning and Juniper Mist™ cloud managed services, powered by AI
- Open interfaces based on industry standards, including media bodies such as the Alliance for IP Media Solutions (AIMS), Advanced Media Workflow Association (AMWA), and the Society of Motion Picture and Television Engineers (SMPTE), allowing you complete interoperability with other IP devices and transport technologies
- Full redundancy of all components, so a single failure will not impact your business
- Connected security integrated into the network itself, not just in firewalls, so no matter where a threat appears, it can be identified, isolated, and stopped automatically
- Support for SMPTE ST 2110 digital media standards, precision timing protocol support, and SMPTE ST 2022-7 seamless protection across wide area networks
- Tools for scheduling and sharing bandwidth to maximize the utilization of your connections

Conclusion

Organizations want to build more than an IP network. They want to create a safe, reliable, and fast environment that protects their digital assets while at the same time distributing them efficiently to authorized partners, users, and subscribers. Juniper builds data networks that have high performance, high reliability, and security embedded in their foundations. We are known for our work in the largest and most demanding networks in the world.

With Juniper, you will find a partner whose concerns are the same as yours: ensuring you deliver your media content to the right places, at the right time, cost-effectively and securely.

About Juniper Networks

At Juniper Networks, we are dedicated to dramatically simplifying network operations and driving superior experiences for end users. Our solutions deliver industry-leading insight, automation, security and AI to drive real business results. We believe that powering connections will bring us closer together while empowering us all to solve the world's greatest challenges of well-being, sustainability and equality.

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