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White paper

# The entertainment industry goes digital

About three decades ago, the world of everyday communications entered the Information Age, with machines and systems of all kinds beginning their evolution from analog to digital technology. Rather than capturing, transmitting, storing and receiving information in analog's wave-like signals, communications devices and networks started to encode information in the on-and-off 0s and 1s, or "bits," of digital technology. Today, nearly every aspect of communications is "going digital," and nowhere is that transition more evident than in the entertainment industry.

From the filming process through post-production and on into distribution and projection, every facet of the entertainment industry is eager to obtain the artistic, operational and economic benefits of digital technology. Yet the migration from analog to digital presents several challenges, not the least of which is installing the interoperable networking equipment necessary to achieve those benefits. Although the applications of that technology come from the entertainment industry, the technology itself comes from the telecommunications industry. Consequently, the evolution of digital entertainment presents tremendous opportunities for organizations in both industries to work together, pool their skill sets and ultimately strengthen their individual positions in two highly-competitive industries.

This white paper addresses one area in which the creators and distributors of visual entertainment can leverage the expertise of the telecommunications industry: putting in place the interoperable or compatible networking equipment and connections required to move entertainment products in digital format, securely, quickly and reliably, from one location to another. By taking advantage of the telecommunications industry's more than 100 years of experience in design, manufacturing, standards-setting and development of best practices, the entertainment industry can lay the technology foundation required to support its long-term creative and financial objectives.

## The features of a high-quality digital distribution infrastructure

In its most basic form, a digital distribution system is made up of three components:

- Equipment, both hardware and software, that constitutes the "network nodes" where users create and manipulate content, i.e., information;
- The transport network itself which moves that information from one place to another, across town or across the world; and
- The engineers needed to build and maintain both.

A high-quality digital distribution infrastructure, if it is to do what the industry needs it to do, must be based on interoperable components, meaning, the equipment and software at each node can "talk" with the equipment and software at all other nodes, as well as with the network itself. Such interoperability demands the use of standard equipment/network interfaces.

Anyone who began using personal computers in the early years of the computing industry remembers getting caught between proprietary, i.e., incompatible, hardware and software platforms. IBM machines couldn't talk with Sun Microsystem machines and vice versa; PCs couldn't communicate with Apple computers; WordPerfect software was not compatible with Microsoft Word software, etc., etc. Attempting to share files within and between organizations was a frustrating, expensive and often futile experience. In the entertainment industry itself, similar conflicts arose; the competing video-recording formats of Beta and VHS left many consumers confused and irritated-and left many industry players with thinner margins than they would have enjoyed had they agreed on a standard format right from the start.

The emergence of a digital-distribution infrastructure offers the entertainment industry an opportunity to avoid another version of the compatibility wars that occurred in the 1970s and 1980s.

Unless motion-picture studios, post-production houses, distributors and theaters work closely together and with their equipment vendors to establish industry-wide technical standards, with specified interfaces, they inevitably will run into some serious and expensive problems. For example, creators and distributors of entertainment content will be restricted in their choice of suppliers and in the prices they pay for equipment. They also will risk stranding their significant investments in existing technology when newer generations of equipment emerge, as they inevitably will. Industry players will have little if any flexibility when it comes to accommodating operational and marketplace changes. Furthermore, they will be vulnerable to equipment or network downtime, corrupted files, inefficient and expensive operations and dissatisfied customers--all of which translates into weaker competitive positions and thinner margins.

## Tailoring existing standards for the entertainment industry

Within any motion-picture studio, post-production facility and distribution company, there is a wide variety of complex equipment, ranging from telecine devices, scanners, video recorders and storage devices to servers, computers and monitors. Collectively, this equipment constitutes "the nerve center" of that organization; it is the entertainment industry's analogy to a data center in telecommunications, financial, medical, and military organizations.

When it comes to building the appropriate environment to house this all-important equipment, as well as installing the high-speed network that links it to other organizations on the digital distribution chain, leading entertainment studios and distributors are beginning to recognize the importance of complying with technical standards and best-practices strategies. Specifically, their in-house engineering professionals are educating themselves in telecommunications-industry standards, or they are retaining the services of consultants and vendors already familiar with them. Equally important, studios and distributors are beginning to recognize that these standards and practices are a good place to start. They understand that all

relevant players, rather than adopting these standards and practices whole, must come together to tailor them to the workflows that are unique to the entertainment industry. Consequently, organizations such as the Video Services Forum and the Society of Motion Picture and Television Engineers (SMPTE) are leading the efforts to adapt standards. They are using as their starting points standards and practices that have been developed by several organizations, including but not limited to:

**Building Industry Consulting Service International, Inc. (BICSI)** A professional association dealing with voice, data and video transmission technologies around the globe, BICSI focuses on the design, integration and installation of fiber-, copper- and wireless-based systems and associated transmission infrastructures. Through courses, conferences, publications and professional registration programs, BICSI provides information, trains designers, installers and technicians and evaluates their skills for delivering critical products and services.

**Telecommunications Industries Association (TIA)** - a worldwide trade group for the information and communications technology sectors. Among its numerous activities, TIA, which is accredited by the American National Standards Institute (ANSI), develops voluntary industry standards for a wide variety of telecommunications products. These include equipment in the areas of premises cabling (both copper and fiber); terrestrial mobile multimedia multicast; satellites; customer-premises equipment (CPE); mobile communications systems; and others. Within TIA, representatives from manufacturers, service providers and end users serve on the formulating groups that propose and define industry standards. TIA also participates in international standards-setting activities, such as those in the International Telecommunication Union (ITU).

**IEEE**, formally known as the Institute of Electrical and Electronics Engineers, Inc., is a professional association for the advancement of technology. An authority on technologies ranging from aerospace, computers and telecommunications to biomedical engineering, electric power and consumer electronics, IEEE offers its members a wide variety of technical and professional information, resources and services. It is one of the primary developers of international standards in telecommunications, information technology and power generation and has defined about 900 active standards and currently is developing more than 400 standards.

## Make or buy the digital infrastructure expertise?

The realities of the business world dictate that studios and distributors typically do not have the in-house expertise to put in place a high-quality digital distribution infrastructure. Nor do their engineers have the time needed to acquire those skills; after all, they are focused on supporting the internal operations of creating and distributing entertainment content. Consequently, many studios and distributors are looking outside for the necessary expertise, either in the form of consultants or companies that can provide a turnkey solution. One such company is The Tajkowski Group, which operates as a technical planning and engineering firm and, through its relationships with fiber-infrastructure vendors such as CommScope, provides consulting services for digital distribution infrastructure initiatives.

With the expertise provided by these companies, studios and distributors can ensure they:

- Build-according to rigorous standards--the data-center environments they need to house and maintain their complex and business-critical equipment;
- Equip those environments with fiber-optic cables that provide the high-speed bandwidth required to transport huge files;
- Install those cables and associated equipment with industry-standard techniques which ensure flexibility, accommodate changing workflows, conserve physical space and allow ready access for testing and troubleshooting; and
- Obtain from telecommunications service providers the fiber-optic networks required to receive, work on, and distribute to consumers their creative content.

## The benefits of a digital distribution infrastructure

Compared with the use of analog technology, digital production and distribution make it possible to create, manipulate, duplicate and transmit information across town or around the globe-securely, quickly, reliably and cost-effectively. However, to achieve the artistic, operational and economic benefits of digital technology, the entertainment industry needs the right kind of digital-distribution infrastructure, one that is specifically designed and built-in compliance with tough standards-for interoperability, flexibility and maximum return on investment. By working closely together, the entertainment industry and the telecommunications industry are combining their skills and expertise to create that infrastructure.

Everyone communicates. It's the essence of the human experience. *How* we communicate is evolving. Technology is reshaping the way we live, learn and thrive. The epicenter of this transformation is the network—our passion. Our experts are rethinking the purpose, role and usage of networks to help our customers increase bandwidth, expand capacity, enhance efficiency, speed deployment and simplify migration. From remote cell sites to massive sports arenas, from busy airports to state-of-the-art data centers—we provide the essential expertise and vital infrastructure your business needs to succeed. The world's most advanced networks rely on CommScope connectivity.

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