IOA™ ROLLS OUT THE RED CARPET FOR ENTERTAINMENT MEDIA CLOUD ECOSYSTEM

AN EQUINIX WHITE PAPER IN PARTNERSHIP WITH INTACLOUD

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EXECUTIVE SUMMARY

Online video content is exploding. By 2021, it would take an individual over 5 million years to watch the amount of video that will cross global IP networks each month—an estimated 89.2 exabytes per month.[1] And the demand for this content is high, with the average adult watching 36 hours of television programming per week in the U.S. alone.[2]

The media and entertainment (M&E) industry is being disrupted not only by the massive amounts of media content being consumed, but also by the "technology evolution" of new digital media formats and iterations of TV-top and handheld devices. These changes impact both CAPEX and OPEX spending as M&E companies try to adapt their workflow processes and IT infrastructures to support them. Digital storage capacity requirements are also exploding in the M&E industry—and by 2020, it is expected that nearly five times more storage capacity will be needed.[3]

This white paper explores a new interconnection-driven paradigm to help M&E companies improve media content creation, management and distribution workflow efficiencies, develop higher quality products faster, scale their global reach and give the viewing public what they want, when they want it—all at reduced costs. Interconnection is the deployment of IT traffic exchange points integrating direct private connections among counterparties, hosted in carrier-neutral data center campuses, with distributed IT components colocated. This approach will help these companies capture the limitless opportunities unfolding within this evolving industry by building more open, flexible and agile interconnected IT infrastructures that readily facilitate the adoption of new digital technologies, methodologies and business practices.

This paper also describes how M&E companies can make this transformation leveraging an Interconnection Oriented Architecture™ (IOA™) strategy, which offers a blueprint to becoming an interconnected enterprise. An IOA strategy enables enterprises to directly and securely connect people, locations, clouds and data by shifting the fundamental IT delivery architecture from siloed and centralized to interconnected and distributed. When harnessed in combination with the Equinix Media Cloud Ecosystem for Entertainment (EMCEE™), an IOA strategy optimizes the production and distribution of content, giving M&E companies the ability to deliver high-quality content to a global audience of omnichannel consumers for higher returns.

[1]Cisco, "Visual Networking Index: Forecasting and Methodology 2014–2019," 2015.
[2]Nielsen, "National Television Household Universe Estimates," 2015.
[3]Coughlin Associates, "2015 Digital Storage for Media and Entertainment Report," 2015.

MEDIA AND ENTERTAINMENT: OVERCOMING BARRIERS TO UNLEASH LIMITLESS POTENTIAL

Digital transformation is clearly within reach for the media and entertainment industry. By 2019, nearly a million minutes of video content will cross over IP networks every second.[5] By 2020, "Over the Top" (OTT) TV subscriptions from providers like Netflix are predicted to soar to nearly 200 million.[6]

According to the National Association of Broadcasters (NAB), "Dynamic innovation and cutting-edge technologies are shattering the boundaries of content and opening up limitless opportunities." Advances in interconnection, such as software-defined networking (SDN) and cloud computing, are bringing new efficiencies to media creation, management and distribution workflow processes. In fact, due to the increased role that cloud computing is playing in enabling more collaborative workflows, cloud storage for the M&E industry is expected to grow 24-fold by 2020 to 18,224 petabytes.[7]

However, these technologies are evolving faster than many industry players can adopt them, and the need for greater compute, storage and network resources to manage the growing volume of media content is only increasing. M&E companies can no longer afford to reinvest in new technologies every few years, nor can they replicate the compute and storage resources of public cloud giants such as Amazon or Microsoft. According to Erik Weaver, project manager at the Entertainment Technology Center (ETC), studio heads must make a decision: "Are they compute companies or are they creative companies?"

The stakes have never been higher for the players in the global M&E industry. From the studios and creative partners that perform the production and post-production to the content delivery networks (CDNs) and OTTs that distribute the final product, the opportunities in this increasingly competitive market are, as NAB says, "limitless."

- The mobile and online entertainment industry expects to see annual revenues in excess of $300 billion by 2019[8]
- Smartphone connections are expected to rise to 3.85 billion globally in 2019, opening up new opportunities (and challenges) for video content providers[9]
- Global film entertainment revenue growth will be particularly strong in markets such as the U.S., China and Latin America[10]

However, capturing these opportunities means media and entertainment players must embrace cloud computing and increase interconnection among global partners to streamline their traditional media content delivery processes. It means they need to seek out new IT infrastructures that give them the flexibility and agility they need to adopt new technologies, reduce costs, scale media creation and distribution capabilities and meet the evolving requirements of their voracious consumers. It also means that M&E supply chain partners must "shorten the distance" between themselves, media assets and data, applications and tools, systems and storage, and network and cloud services. There are significant hurdles to clear on the road to a future without limits.

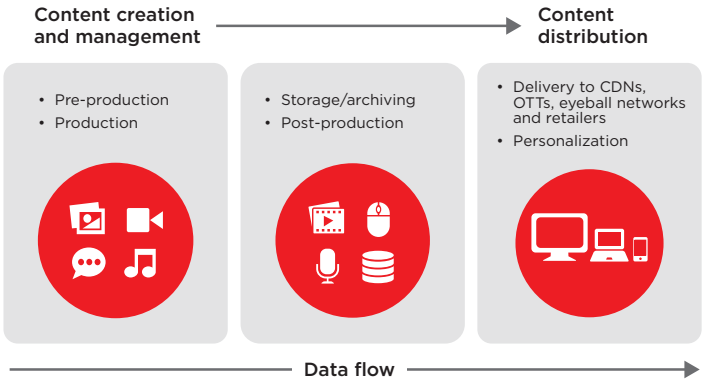
Shorten the Distance

Placing IT and interconnection at the edge, closer to where media content is created and distributed, and where users/customers can access it, is critical to the success of M&E companies. Direct, high-speed and low-latency connections increase the performance of media supply chain partners and enable them to deliver higher quality products to a global marketplace faster.

[5]Cisco, "Visual Networking Index: Forecasting and Methodology 2014–2019," 2015.
[6]Juniper Research, "OTT: A Threat Networks Can't Shake Off," 2015.
[7]Coughlin Associates, "2015 Digital Storage for Media and Entertainment Report," 2015.
[8]Juniper Research, "Digital Content: Now That's Entertainment," 2015.
[9]PwC, "Global Entertainment and Media Outlook 2015–2019," 2015.
[10]PwC, "Global Entertainment and Media Outlook 2015–2019," 2015.

CHALLENGES FOR THE MEDIA AND ENTERTAINMENT INDUSTRY

Many of the business challenges faced by today's media content creation, management and distribution supply chains stem from the dire need for digital transformation. For example, antiquated day-to-day work processes, such as FedExing film media to each player in the media asset workflow, have yet to be universally reinvented to enable timely digital media transport. Many media creation and management workflow processes are still siloed between traditional and digital IT infrastructures, creating a seemingly impenetrable barrier for M&E companies looking for new ways to efficiently and cost-effectively develop media content and bring it to market more quickly.



Content Creation and Management Challenges

Content creation and management include multiple stages and processes, such as pre-production (e.g., scripting, location scouting, auditions, workflow planning), production (e.g., filming, ingest, transcoding), storage/archiving and post-production (e.g., editing, rich indexing, special effects, metadata development). The interrelationships within these processes are dependent on fast access to digital assets (regardless of format or location) for all participants in the workflow. Some of the business goals media creators and their creative partners are having difficulty achieving today due to existing IT limitations include:

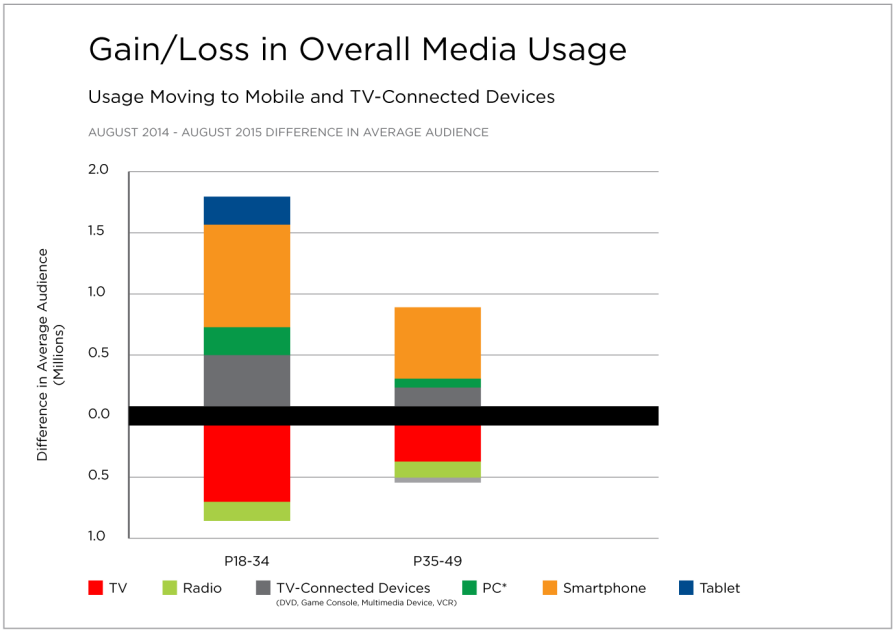
- Gaining the ability to leverage new digital media services, cloud computing and SDN without making huge investments to rebuild legacy IT infrastructures
- Increasing productivity and reducing inefficiencies and costs by giving each player in the supply chain easier and more proximate access to media assets
- Housing and securing the huge amount of digital media files and metadata being created

Content creation companies need a new IT approach that will enable them to interconnect media assets, partners and the cloud globally to drive inefficiency, latency, cost and risk out of their workflows.

Content Distribution Challenges

Today's content distributors, which include CDNs, eyeball networks (e.g., mobile, Wi-Fi broadband) and OTT vendors, are facing a number of business-critical challenges. Chief among them: the need to scale their IT and network infrastructures, expand their global reach and deliver a high-quality viewer experience in multiple formats to any device anywhere in the world via any channel (e.g., social, mobile, cloud, retail). The need to remove these hurdles is growing more urgent as industry pressures mount:

- By 2019, 72% of all internet video traffic will cross over CDNs.[11] This puts a huge strain on existing CDNs and their network infrastructures
- Network peering is critical to efficiently and cost-effectively scale CDN reach, but getting access to the right partners can take time and resources
- When it comes to media usage, millennial consumers are looking for more choices, control and personalized service, and their preferences are often changing. The figure below depicts media usage by age/device. Smartphones and connected devices experienced the largest increases[12]



Source: Nielsen

To respond to these escalating trends and remove the challenges obstructing business success, content distributors need high-performance, scalable and secure interconnection to content creators, clouds, networks and customers worldwide. Transformative interconnection extends to the edge, where content gets created and consumed.

[11]Cisco, "Visual Networking Index: Forecasting and Methodology 2014–2019," 2015.
[12]Nielsen, "The Comparable Metrics Report: Q3 2015," 2016.

HOW INTERCONNECTION CAN TRANSFORM MEDIA CONTENT DELIVERY

Content Distribution Challenges

Many of the challenges facing M&E businesses can be addressed by putting interconnection first in their IT strategies.

Greater interconnection provides:

- **Streamlined Workflows:** Proximate access to hosted equipment, network service providers, cloud services and creative and production partners shortens the distance and enables next-generation workflows to bring higher quality products to market faster
- **Integration of New Technologies:** Harnessing cloud computing and SDN, as well as evolving M&E technologies, enables new efficiencies and possibilities in digital media creation and distribution
- **Interactive Ecosystems:** A digital ecosystem made up of content creation supply chain partners can be produced on the fly from a multiplicity of production and post-production vendors interconnected together on demand in the same data center. In addition, proximate connection to media content distribution channels and advertising ecosystems at the edge enables high-performance delivery and successful targeted ad buys
- **Local Data Access:** Fast and secure local object storage access at the edge enables greater workload integration, regional caching and protection for critical digital assets, as well as data sovereignty
- **Scalable Resources:** A directly interconnected cloud fabric delivers greater resources and scalability in housing digital assets and metadata, as well as in developing, transposing and testing all digital media formats for all types of devices
- **Fast, Global Connectivity:** Direct and secure, high-performance, low-latency connectivity to global interconnection hubs enables a faster network fabric with more available bandwidth for digital media creation and distribution worldwide
- **Omnichannel User Experience:** Global reach to interactive users and their devices puts media content closer to regional consumers for lower latency, greater personalization and quality of user experience
- **Secure Interactions:** Direct, private connectivity between digital media assets, systems, storage, partners, peering networks and clouds reduces risk
- **Lower CAPEX and OPEX:** A pay-as-you-use model for cloud-based applications and services, and for compute and storage resources, lowers upfront capital costs and operating costs

Digital Ecosystems

Digital ecosystems are communities of interest that directly and securely interconnect on Platform Equinix. Once there, they create "vertical ecosystems" of industry markets (e.g., financial services, media and entertainment) that accelerate and amplify value creation and "horizontal ecosystems" of industry segments (e.g., cloud, Internet of Things) that, in turn, create gravity for other segments.

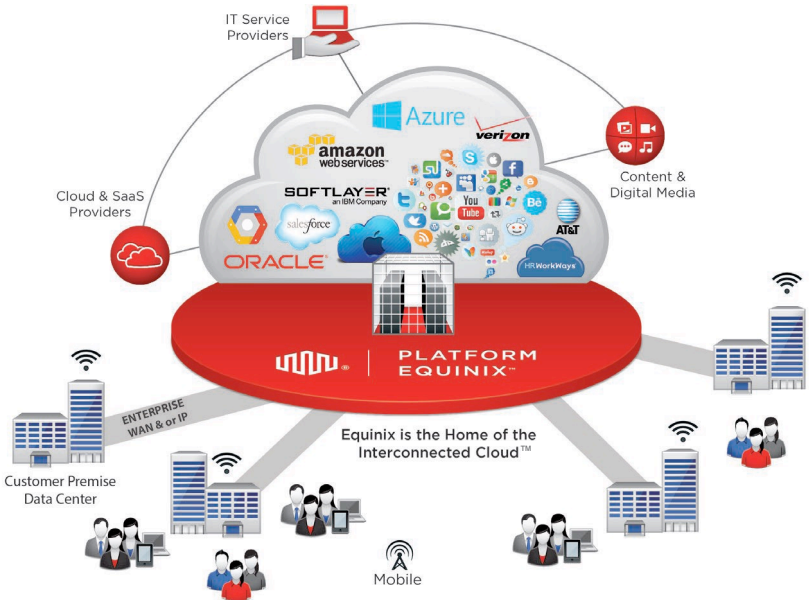
Interconnection is vital to obtaining the efficiencies required by the M&E industry, and companies should look to proven interconnection approaches to deliver the greatest benefits. An Interconnection Oriented Architecture (IOA) strategy enables M&E companies to instantly tap the power of high-performance, secure and scalable supply chain and connectivity ecosystems to respond to current and future global media content delivery demands.

HOW TO ADOPT AN INTERCONNECTION ORIENTED ARCHITECTURE STRATEGY FOR THE M&E INDUSTRY

The M&E industry is facing significant business and technology disruptions that span its content delivery processes, IT infrastructures and customer consumption trends. A more open, flexible and agile platform is required to help these companies develop next-gen business practices and IT infrastructures capable of capitalizing on the infinite opportunities today's M&E industry offers.

An IOA strategy offers a blueprint that enables M&E companies to become interconnected enterprises. It is a proven and repeatable engagement model that both enterprises and service providers can leverage to directly and securely connect people, locations, clouds and data.

An IOA approach has several foundational components that can be customized to meet the needs of M&E businesses and their partners, as well as cloud service providers (CSPs) and network service providers (NSPs) that serve those businesses.



An Interconnection Oriented Architecture Strategy–A Distributed Hub-Based Architecture

Platform Equinix: A Direct, Secure Interconnection Home Base

M&E companies need to re-architect their IT infrastructures to realize greater efficiencies and scale their resources; however, it is not cost-effective for them to do this on their own. They need a vendor-neutral platform that enables them to directly and securely interconnect their communications, ecosystems and data. Platform Equinix™ provides the critical building blocks and services required for enterprises, CSPs and NSPs to do this through an IOA strategy. It allows M&E enterprises to access cloud and network services via optimized interconnection with dense cloud, network and industry ecosystems that help the M&E supply chain bring a higher quality product to market faster on a more global scale.

IOA Nodes: Prepare Your Organization to Respond to Custom Interconnection Needs

Flexibility and agility are critical in an industry where media technologies and formats are evolving every few years. IOA nodes are a customizable set of interconnection hubs within Platform Equinix that enable interconnection use cases, such as hybrid cloud, on-demand storage access and business continuity/disaster recovery. IOA nodes can be placed in strategic neutral data center locations—in proximity to customers, networks, clouds and business partners—for greater performance, lower latency and more cost-effective network bandwidth consumption.

Following are examples of how IOA nodes can help M&E businesses address their key challenges:

- **Improve the M&E User Experience Through a Communications Hub:**
  To improve performance, M&E players must shorten the distance and proximately connect partners, applications, cloud services, data and media content. They need a choice of network aggregation points that can be strategically placed in any location globally. Communication hubs, such as the Equinix Performance Hub™, extend M&E enterprises' global cloud access over high-throughput, low-latency connections and bypass the public internet, resulting in direct and secure interconnection for an optimized and enhanced user experience at a lower cost.

  For example, interconnecting between global shoot locations and production resources via the Equinix Performance Hub™ greatly reduces the time to get dailies to reviewers and enables faster, more economical on-location reshooting and transfer of digital assets. It enables access to more than 1,600 network providers and delivers, on average, <10ms latency to top global markets. M&E companies benefit by gaining time to work on digital assets in the production and post-production process, resulting in the ability to produce a higher quality product in less time. When the completed product is ready to distribute, CDNs and OTTs can stream or download digital media content to a global, omnichannel consumer base on demand via these high-speed connections.

- **Scale M&E Capabilities and Resources Through an Ecosystem Exchange:**
  The cloud has become the norm in the M&E industry for harnessing new services and resources, while avoiding ripping and replacing existing IT infrastructures. Ecosystem exchanges like the Equinix Cloud Exchange™ provide M&E players with virtual connections for automated one-to-many or many-to-many interconnections between multiple clouds via a single physical port. Based on a more flexible and agile SDN approach, it allows M&E companies to easily and quickly migrate applications and compute and storage resources to cloud services through direct connections for higher throughput, lower latency and greater security at lower costs.

  M&E businesses can scale their compute and storage resources, while moving cost from a CAPEX model to a more cost-effective OPEX pay-as-you-go model. By quickly interconnecting to cloud-based services, applications and partners via the Equinix Cloud Exchange™, studios and their partners can create supply chains on the fly and reduce connectivity provisioning time from months to minutes. Hybrid cloud services create a secure yet flexible environment for storing and accessing growing amounts of media assets and metadata. And by creating more agile and scalable cloud-based environments, M&E businesses can expand their testing of new technologies and multiple formats, which can support the growing need for hundreds of different finished media types.

- **Enrich M&E Collaboration Through a Data Hub:**
  An extension of the Equinix Performance Hub, the Equinix Data Hub™ enables "data capacity housing" at the edge where media content data is created for improved real-time digital asset and metadata development. Customer data and analytical applications can also be directly and securely connected for greater insights into consumer trends and personalization. The Equinix Data Hub provides a larger footprint and higher density to increase storage capacity, allowing M&E companies to leverage high-performance, low-latency access to large data repositories. Remote storage locations can also be interconnected and optimized via the Equinix Performance Hub, enabling remote work and reduced data movement while facilitating collaboration via a work-in-progress archive. Finally, the Equinix Data Hub enables seamless data protection and replication by strategically placing data backups and snapshots in secure locations.

  By bringing the M&E supply chain to digital assets, instead of the other way around, companies can more efficiently and effectively collaborate on media content creation and distribution. Proximate, high-speed, low-latency connections reduce time in transporting large amounts of digital assets and metadata to various remote content creation and distribution partners, and improve performance within collaboration tools and applications.

Lock Down Security With Direct, Private Connections

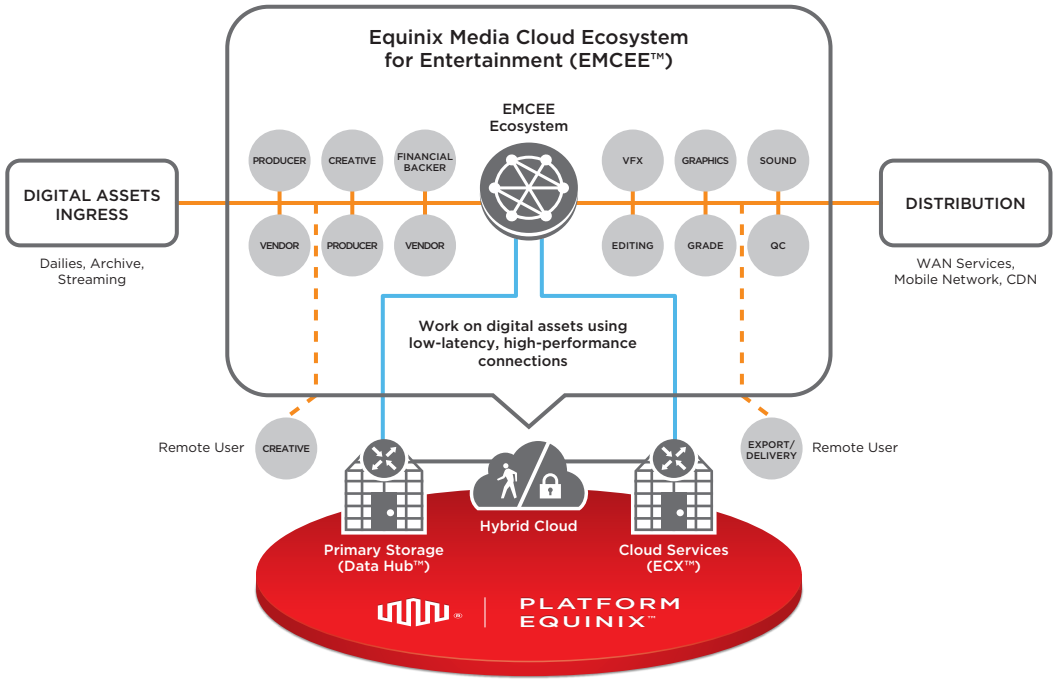
Whereas data breaches and cybersecurity are a great concern within the M&E industry, the creation of secure cloud environments that forge direct, private connections (bypassing the public internet) pave a protected path between media assets and content creators and distributors. An IOA strategy on Platform Equinix enables organizations to apply global security policies from a centralized point, as well as deploy local security policies at the edge to meet industry-specific security standards (i.e., the Motion Picture Association of America) and country-specific data compliance regulations.

Tap Into the Power of an M&E Industry Ecosystem

The M&E industry is brimming with opportunity, but these possibilities can be realized only by companies that are prepared to tap into strong, value-added interconnections among content creators, industry partners, and network and cloud providers. An IOA strategy on Platform Equinix provides the foundation for a vendor-neutral marketplace, the Equinix Media Cloud Ecosystem for Entertainment (EMCEE™), which gives M&E companies direct and secure interconnection to partners and customers for greater value and opportunity.

THE INTERCONNECTED EQUINIX MEDIA CLOUD ECOSYSTEM FOR ENTERTAINMENT IN ACTION

The EMCEE enables M&E companies to achieve breakthrough innovations and unleash new revenue opportunities. It is a transformative reference model for optimizing the creation and distribution of content for the media and entertainment industry. Leveraging an IOA strategy on Platform Equinix delivers reliable, secure and instantaneous connectivity to clouds, networks and ecosystems of value chain partners to streamline workflow processes and quickly brings media content to a worldwide, omnichannel consumer market.



The Equinix Media Cloud Ecosystem for Entertainment Workflow

Here are some of the many benefits that content creators and distributors can realize from participating within the EMCEE:

- Increased global reach at higher capacity and lower cost through direct connectivity to more than 1,600 global network providers enables network scalability and prevents “vendor lock-in”
- High-performance, secure virtual connections to more than 2,750 cloud and IT service providers enables fast scale-up and teardown of resources, and creates more cost-effective CAPEX and OPEX business models
- Access to more than 800 content and media providers worldwide, including leading multisystem operators and social media platforms, facilitates fast media content delivery and global exposure
- Proximity to potential customers (more than 9,500 in Equinix alone) enables a higher quality user experience, and faster access to consumer data and analytics for greater consumer personalization
- More than 180 physically secure, global data centers in 44 metro areas with greater than 99.9999% global uptime increases security and reliability

REAL-WORLD MEDIA CONTENT DELIVERY

The following Equinix customer success stories demonstrate how an IOA strategy and EMCEE are transforming the M&E industry and helping businesses differentiate their value.

Transforming Media Content Production in the Cloud

Founded in 1993 with the help of George Lucas, the Entertainment Technology Center (ETC) at the University of Southern California is a think tank and research center that helps drive collaborative projects to understand the impact of emerging technology on all aspects of the entertainment industry.

The ETC's Project Cloud brings together a core group of key media and cloud-resource leaders to develop guidelines and accelerate innovation and adoption of next-gen cloud-based content creation tools and processes. The ETC is leveraging the Equinix Solution Validation Center in El Segundo, CA, to model how media and entertainment companies can transform the media production and post-production processes using a hybrid cloud environment.

Project Cloud addresses many of the issues described in this paper that plague media content creation, such as siloed production workflow processes and the growing amount of compute- and storage-intensive media assets and metadata. To meet these challenges, the cloud environment must promote interconnection and interoperability among partners, systems, processes and digital assets. It also must support low-latency, high-performance connections to cloud resources, increased security, a private storage system with access to Amazon Web Services in a hybrid cloud and those systems that are not in the cloud (i.e., the Avid editing system).

An IOA strategy and EMCEE are vital to addressing the ETC's goals in modeling potential architectures and solutions. Deployed on Platform Equinix, they provide direct, secure and proximate access to multiple clouds, networks, partners, applications, systems and private storage. As a vendor-neutral platform, Platform Equinix also supports ETC's Cinema Content Creation Cloud (C4), an open source framework that enables interoperability among humans, organizations, databases, software applications and networks. This is essential to managing globally-distributed workflows and maintaining consistency in media production.

By using Platform Equinix in conjunction with its C4 technology to create a collaborative workflow, ETC was able to reduce latency significantly and reduce cloud egress costs by 80%. It decreased latency from the studio to <2 ms, and decreased latency from the cloud to <10 ms.

With Equinix, the ETC can quickly leverage new technologies, such as containers, to access multicloud environments for greater collaboration; harness "data gravity," by placing data lakes can be placed closer to production and post-production resources; and ultimately save time and money.

"By putting us in direct connection with edge networks, pivotal multicloud service points and supply chain partners, Equinix gives us the launching pad we need to access all of these resources."

Erik Weaver, Project Manager
Entertainment Technology Center

Robust, Scalable Interconnection Transforms Digital Supply Chain Business

ContentBridge is a leading provider of digital supply chain solutions for the media and entertainment industry. Through its direct involvement with major studios, independent distributors and leading consumer services, such as iTunes and Netflix, ContentBridge has developed automation software and best practices for efficiently managing and distributing digital content among business partners. ContentBridge is an approved encoding vendor for major digital retailers worldwide.

The company was rapidly outgrowing its existing data center and "owned infrastructure" strategy, and international business volumes were growing quickly. Server maintenance and uptime were major issues, as were reliability, scale and global reach. Driven by these factors, ContentBridge soon recognized the opportunity to create the first truly cloud-based digital content distribution solution by leveraging platform and infrastructure providers such as Microsoft Azure and Google Cloud Platform.

To achieve this vision, ContentBridge needed an interconnection partner that would provide top-tier data center facilities, an extensive global presence, direct interconnect access to major cloud service providers and the ability to house client service teams within the same highly secure facility.

ContentBridge implemented an IOA strategy to address its demanding business requirements. The EMCEE gives the company a robust and flexible foundation to build and scale on demand, and the Equinix Cloud Exchange enables seamless access to top cloud providers, including leading vendors such as AWS and Azure. And the IT team oversees it all, 24x7x365, thanks to the Equinix IBXflex™ office and storage solutions, which instantly give them a mission-critical operation center.

ContentBridge believes that its relationship with Equinix will enable a fundamental transformation in digital content distribution. By establishing Equinix as the "point of orchestration" for owned infrastructure and leading cloud providers, ContentBridge will be capable of offering the lowest cost, most secure and highest performing digital supply chain solution for the entertainment industry. The company can eliminate an aging, proprietary and costly-to-maintain hardware infrastructure, create a more reliable and secure link between its client services team and its "factory," and improve responsiveness by consolidating operations under one roof. Ultimately, the relationship with Equinix will allow ContentBridge to bring advanced digital supply chain solutions directly to the content, wherever the content owner chooses to maintain the digital library.

CONCLUSION

As digital transformation breathes new possibilities into the media and entertainment industry, M&E companies have the opportunity to step up and seize unprecedented opportunities for revenue growth and global expansion. At the same time, they need to overcome barriers to capitalize on this promise. They require a new IT paradigm that will accelerate their path to become interconnected, equipped to fluidly streamline their workflow processes, incorporate new technologies, house and protect an exploding volume of digital assets and metadata, support new media formats and user devices, and deliver a standout global customer experience. Equinix is the destination for leading M&E companies seeking this new level of competitive advantage.

The powerful combination of an Interconnection Oriented Architecture strategy and EMCEE, all built on Platform Equinix, positions M&E companies to unleash their potential. With Equinix powering their journey, they can forge interconnected supply chains that fuel the rapid creation and distribution of high-quality media content to global, omnichannel consumers. Not only can they increase their supply chain performance and productivity, they are positioned to seamlessly integrate cloud, SDN and emerging technologies to scale their compute, storage, app and testing resources, extend their global reach, and reduce their CAPEX and OPEX costs.