Cloud Migration Strategies for Media & Entertainment

Teradici Cloud Access Software

Executive Summary

The Media and Entertainment (M&E) industry is evolving fast - production and delivery landscapes are pressurized by growing demand, increased content complexity and new delivery models. However, the economic disruption of cloud computing is providing creative and media enterprises a unique opportunity to gain advantage by centralizing remaining workstation infrastructure and adjusting IT expenditure from CAPEX towards more flexible operational models. The benefits are widespread; from improved security, agility, and disaster risk mitigation, to better use of expensive downtown real estate and broader access to crucial artistic talent.

Eminent post-production facilities worldwide have already upgraded thousands of artists from traditional deskside workstations to private cloud solutions underpinned by the Teradici PCoIP® remote computing protocol; a broad industry-wide adoption that commenced some 10 years ago. Many studios, already leveraging public and private clouds for rendering services and asset storage are now seeking additional benefits from a rapidly growing range of cloud workstation offerings.

This whitepaper outlines mounting challenges facing traditional creative workload delivery and paves a migration blueprint for M&E enterprises at any phase in the cloud migration journey; from those still reliant on traditional deskside computing today to those already using PCoIP Zero Clients connected to rack-mounted workstations or Teradici Cloud Access Software on private virtualized workstations.

M&E Industry Facing New Challenges

Heightened Consumer Expectations

Nowadays, creative directors seem limited only in imagination, one shaped by four decades of advancements in graphics workstation technology and creative tool developments. The evidence of industry success is found in current consumer expectations - not only a revitalized taste for immersive content, but new delivery models such as over-the-top (OTT) schemes have increased content accessibility and fueled an insatiable appetite for visual media. In consequence, the technical directors of today's studios face squeezed production schedules constrained by the availability of skilled artistic talent and access to large-scale compute resources needed to support the creative imagination.

M&E Industry Facing New Challenges

Traditional workstations are disadvantaged

While many modern studios have long adopted graphics workload delivery from centralized rack-mounted workstations as a means for resolving security, environmental and content accessibility issues, a few continue to deploy traditional deskside workstations - these are subject to various limitations:

- Data compliance challenges associated with protected assets stored on local hard drives
- Large vulnerability footprint of the deskside endpoint compared to inherently secure endpoints
- Uncomfortable artist environment due to cluttered desk, noisy fans and unstable air conditioning
- Poor performance caused by slow access to centralized storage
- Decreased productivity due to creative applications separated from remote render farms

- High maintenance cost of complex endpoint devices compared to zero clients
- Cost and environmental impact of inefficient office-wide air conditioning

Teradici Cloud Access Software and remote workstation solutions overcome these barriers and, in conjunction with hybrid- or public cloud architectures, enable a variety of added benefits. However, IT leadership and technical directors with a long-term infrastructure view are increasingly concerned over future compromises related to on-premises remote workstation deployments.

Rack-mounted workstations are short on flexibility

Studios have realized many security, efficiency and management rewards using centralized graphics workloads delivered to secure zero client endpoints via private clouds or on-premises data centers. As they look ahead to future capabilities, they seek to extend these benefits while addressing the compromises posed by rack-mounted workstations:

- Existing infrastructure is inflexible against volatility in industry production schedules
- Real estate prices in centers with artistic talent are at a premium; downtown data centers are a liability
- Ongoing CAPEX commitments to feed increased storage demands and server refresh cycles
- Cost barriers to extending existing data centers; servers, real-estate, power budgets all contribute to costs
- Seeking flexible staffing options – access to cross-border talent and increased workplace flexibility
- IT staffing impact; increased compliance burden associated with added on-premises hardware
- Complexity of disaster recovery (DR) plans
- Start tooling up workflows for Ultra High Definition (UHD) and High Dynamic Range (HDR) content formats

Once cloud compliance policies are in place, short-term flexibility challenges can be mitigated by augmenting on-premises storage and render hardware with comparative on-demand public cloud resources. Similarly, rack-mounted workstations fitted with Teradici Remote Workstation Cards can be augmented with cloud workstations configured with Cloud Access Software described below.

Cloud Adoption - Evolution or Revolution?

Motivated in part by the broad appeal of operational-centric infrastructure financing, studios have commenced initiatives that leverage public cloud storage and compute resources for asset storage and burst capacity for render pipelines. In due course, these public cloud resources will become fully integrated into production workflows and the workstations hosting creative application software will naturally follow suit. This presents exciting opportunities, particularly for studios seeking to add talent, leverage tax incentives or extend workplace flexibility by adjusting their geographic footprint – for example, a Los Angeles studio might instantiate a temporary London annex by leasing a small office space paired with a near-proximity public cloud data center of their choice, no private infrastructure required.

The timeline and nature of this shift from on-premises data centers to private or public cloud infrastructure will vary dependent on studio objectives. Established companies with existing large server investments and complex turnkey pipelines will take an evolutionary approach that continues to deliver on existing production capabilities until sunken CAPEX has been amortized. The rate at which cloud infrastructure will be adopted is based on upstream security compliance certifications, production volatility and need to recruit remote talent.

Smaller studios and startups stand to realize large capability gains by prioritizing OPEX in the near term. Not only does a cloud first approach manifest instant access to storage, render and workstation capabilities (either as discrete services or as commercially available integrated pipelines),but costs are readily managed by winding resources up and down as needed.

In the longer term, studios of all sizes will need to decide whether capabilities are best fulfilled using hybrid architectures or whether to retire on-premises infrastructure and adopt an all-in public cloud approach.

PCoIP Technology Options for Workstation Delivery

From Private Data Centers to Public Clouds

Currently, thousands of creative professionals have migrated away from traditional Linux and Windows creative workstations shown leftmost in Figure 1 and are experiencing near-native performance over PCoIP networks via any of three configurations shown to the right.

- Individual rack-mount workstations in private data centers configured with PCoIP Remote Workstation Cards, popularly nicknamed 'Host Cards'
- Virtualized workstations in private data centers configured with Teradici Cloud Access Software
- Public cloud workstations configured with Teradici Cloud Access Software

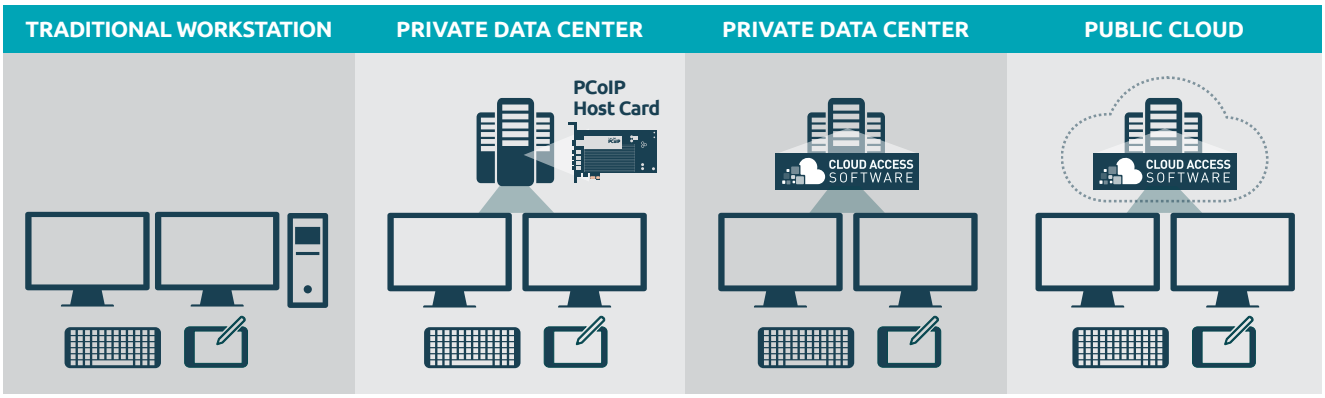


FIGURE 1

In any of the above right configurations, the PCoIP protocol delivers a highly responsive color-accurate desktop at high frame rates, supporting essential peripherals such as Wacom pen tablets needed by many artists. While most studios prefer to deploy highly secure zero client endpoints due in large part to ease of management and power dissipation benefits, the protocol is also supported by Windows or Linux software clients, thin clients and mobile clients alike.

The general interoperability between PCoIP client devices and PCoIP data center technologies ensures seamless migration of existing clients to a Cloud Access Software solution, either on-premises or in a public cloud such that PCoIP clients can readily be reconfigured to connect with private or public cloud workstations without the need to disrupt or change endpoint stations. Alternatively, existing deployments of traditional local workstations or PCoIP remote workstations can be incrementally augmented with one of the Cloud Access Software solutions in Figure 1, providing a variety of viable hybrid options on the progression to an all-in public cloud solution. The architectural end-goal will vary dependent on corporate mandate – a private cloud solution, a public cloud solution or a hybrid mix.

Which PCoIP Solution is the Ultimate Objective?

While the three PCoIP solutions depicted in Figure 1 share underling protocol-related benefits, they differ in attributes associated with pricing, performance and flexibility.

All solutions offer the following benefits:

- Simplify content security compliance by using the PCoIP protocol to isolate centralized media assets from users and endpoints
- PCoIP Zero Clients ensure highly secure endpoints with fractional vulnerability
- Enable a high productivity remote workstation architecture
  - PCoIP protocol ensures the highest fidelity remote user experience over any network
  - Creative applications may be co-located with storage and render nodes
  - Support for Wacom pen tablets on both Windows and Linux platforms
  - Quiet and low power deskside environment

To assist your assessment of migration options, TABLE 1 below compares key considerations related to pricing, performance and flexibility:

	PCoIP Remote Workstation Card (Private Cloud)	**Cloud Access Software** (Private Cloud)	**Cloud Access Software** (Public Cloud)
DESCRIPTION	• Rack-mount dedicated Linux or Windows workstations • On premises, on-campus or data center hub • Workstation Access licensing	• Virtual Linux or Windows workstations on VMware ESXi (VMware Horizon not required) • Windows Bare metal workstation GPUs supporting Nvidia Capture SDK • On premises, on-campus or data center hub • Cloud Access Plus licensing	• Public cloud Linux or Windows virtual workstations • Deployment regions vary by public cloud vendor • Cloud Access Plus licensing
ATTRIBUTES	• Hardware accelerated PCoIP encoder • To dual 2560 x 1600 or quad 1920 x 1200 display topologies per PCIe card • 2560 x 1600 frame rate up to 60 FPS	• CPU-based PCoIP encoder • To 4K/UHD quad display topology • HD frame rate up to 60 FPS • Upgrade path to HDR and 4K HFR • Brokered by Teradici Cloud Access Manager, including hybrid cloud support	• CPU-based PCoIP encoder • To 4K/UHD quad display topology • HD frame rate up to 60 FPS • Upgrade path to HDR and 4K HFR • Brokered by Teradici Cloud Access Manager across all public clouds; provisioning and cost management support on Azure • Available as an Amazon Machine Instance (AMI) on AWS
M & E STUDIO CONSIDERATIONS	• Broadest range of GPUs supported • Workstation productivity optimized by re-allocating to render farm during downtime • Older model workstations benefit from hardware accelerated PCoIP encoder • Remote access requires VPN solution	• Wide range of AMD* and Nvidia GPUs supported • Workstation productivity optimized by re-allocating to render farm during downtime • Virtualized workstations brokered by Teradici Cloud Access Manager offers simple management and user consolidation • Secure and simple access from anywhere via Security Gateway	• Latest public cloud GPUs supported • High scalability in user capacity • Workstation productivity simply optimized using power management • Cloud workstations brokered by Teradici Cloud Access Manager offers simple management • On-demand access fits OPEX budgeting model • International geographic reach • Secure and simple access from anywhere via Security Gateway

HD: Display format of 1920 x 1080 **4K/UHD:** Display formats including DCI-4K and Ultra High Definition 3840 x 2160 TABLE 1

FPS: Frames Per Second **HDR:** High Dynamic Range **HFR:** High Frame Rate

* Cloud Access Software for AMD GPUs in Technical Preview at date of publication

Automation of Deployments using Cloud Access Manager

Teradici Cloud Access Manager is a cloud service that simplifies and automates Cloud Access Software remote workstation deployments – delivering a highly-scalable and cost-effective solution. From a single console you can manage your cloud compute costs and broker PCoIP connections to virtualized Windows or Linux workstations whether on-premises or on any public cloud.

- **Improve administrative efficiency** and minimize manual tasks by automatically provisioning Windows or Linux remote workstations
- **Scale with your business** - Align OPEX with business demands by effortlessly scaling resources up or down
- **Manage cloud consumption** and optimize costs by automatically turning off unused machines
- **Broker secure connections** with multi-factor authentication (MFA) and alleviate any need for users to remember machine names or IP addresses

Cloud Access Manager is compatible with existing on-premises Microsoft Active Directory Services which aids rapid machine-user assignment and management of security groups. It is built to the highest security standards, including integrated Multi-Factor Authentication (MFA) support.

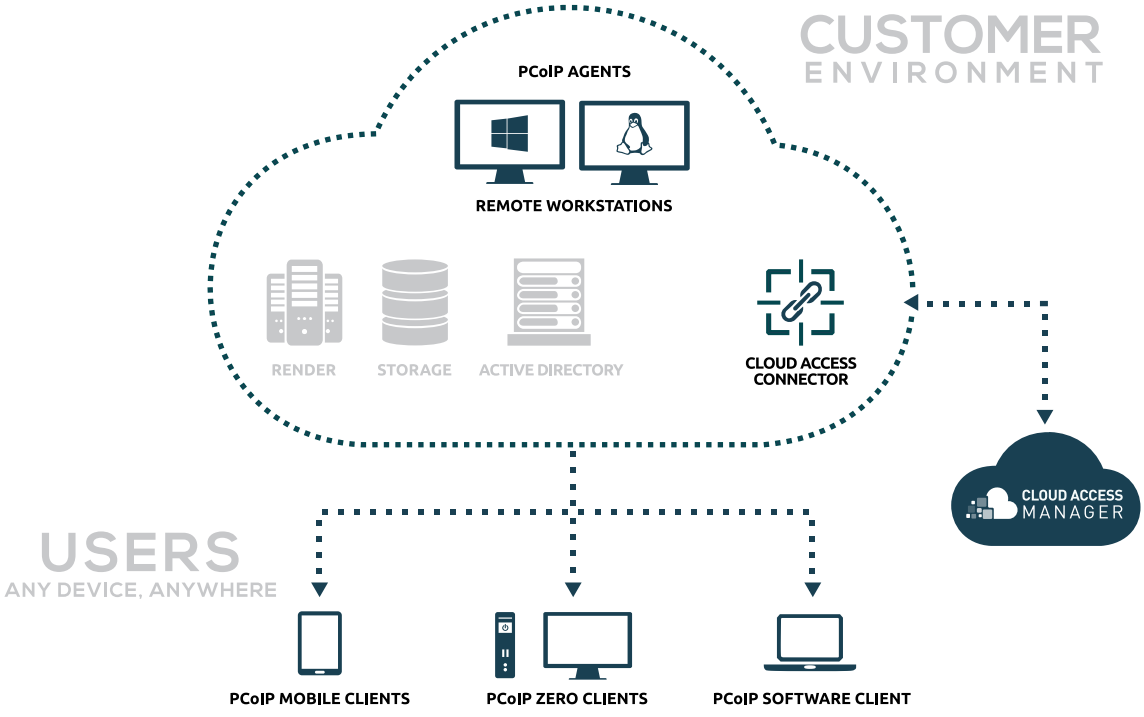


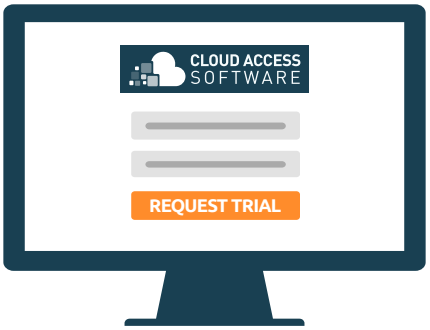
FIGURE 2

Cloud Access Manager is part of the **Cloud Access** and **Cloud Access Plus** subscription plans and is currently available for enterprise Microsoft Azure subscriptions. Brokering of Amazon Web Services (AWS) and Google Cloud Platform (GCP) public cloud workstations or on-premises VMware ESXi virtualized workstations is also supported.

Professional Services

Less complex creative workflows might be extended from on-premises to private or public cloud infrastructure relatively easily; other workflows will likely benefit from network and endpoint planning or protocol tuning to ensure optimum user experience. Teradici has an experienced Professional Services team available for consultation with customers in the Media and Entertainment industry on topics such as network planning and system health checks. Visit **teradici.com/professional-services** or contact your Teradici sales executive for additional information.

Get Started with a Demo or a Free Trial



Teradici Cloud Access Software is available for download with 60-day free licenses for Windows or Linux platforms. You can install the trial on physical, virtualized or cloud-based remote workstations. Cloud Access Manager is part of Cloud Access Software and included in any trial of Cloud Access and Cloud Access Plus subscription plans.

Follow the link below to sign up for your free trial today!
connect.teradici.com/cas-demo

To learn more about Teradici solutions for Media and Entertainment, visit: **teradici.com/media-entertainment**