REIMAGINE MEDIA & ENTERTAINMENT

CLOUD INNOVATION SERIES

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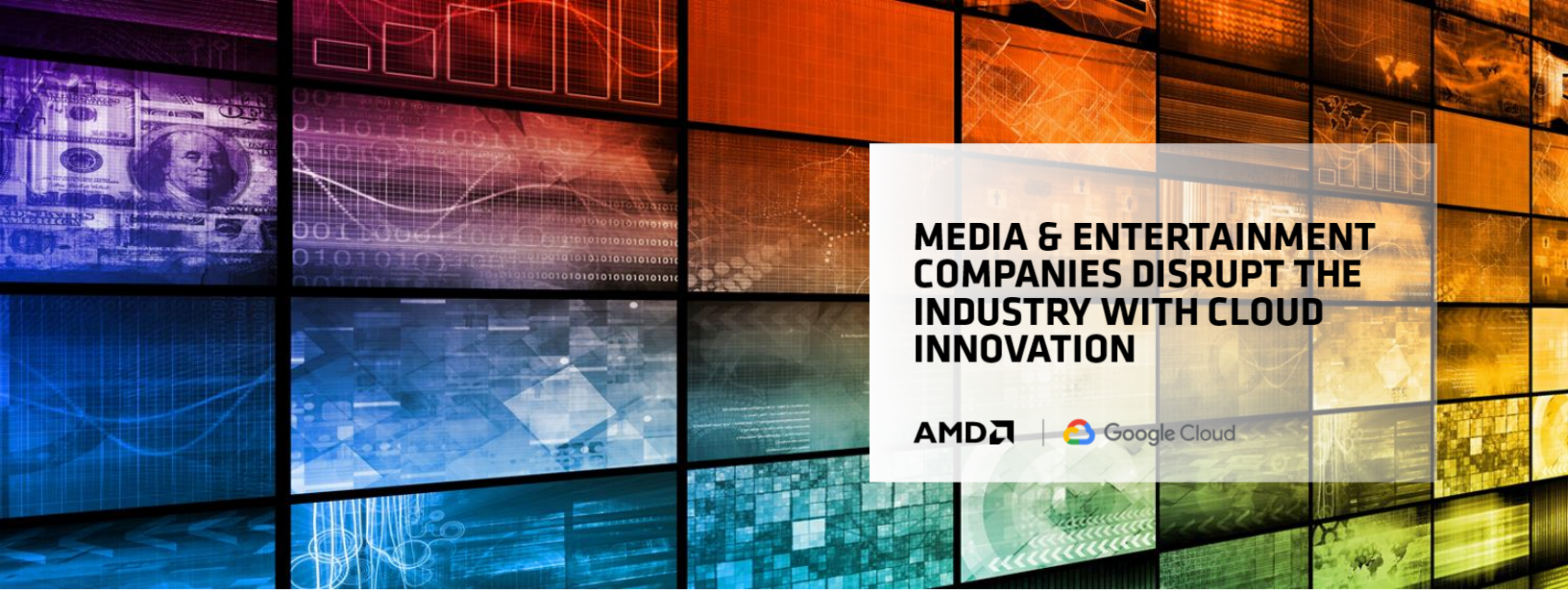


The Media & Entertainment (M&E) sector has a mounting burden on its shoulders: Create ongoing content rapidly, cost-effectively, and securely—then distribute the highest-quality final products to sophisticated and content-hungry viewers around the world. With these challenges in mind, M&E companies of all sizes are looking to the cloud to dramatically transform their operations.

Media production is becoming increasingly complicated as rendering, pre-/post-production, and processing tasks require extreme capacity and bandwidth. This has fueled an escalating demand for high-performance technologies to simplify data management and contain costs. To overcome these pain points, M&E companies are pursuing cloud adoption to accelerate their data-heavy, compute-intensive workloads and allow teams of remote directors, artists, and editors to efficiently collaborate from any location. Working in the cloud provides a major boost in speed and flexibility, without compromising the privacy of highly sensitive intellectual property. These groundbreaking innovations give M&E companies the greatest advantage of all: more time to perfect their work while still hitting deadlines and budgets.

The “look” of the modern enterprise is increasingly off-prem, with a strong shift to virtual workstations. More companies than ever are reaping the benefits of the cloud, harnessing its extreme agility and scalability to execute numerous workflows and support geographically dispersed teams. Cloud for M&E can handle anything from everyday compute requirements to the most demanding workloads—including data wrangling, cloud rendering, cloud video processing, and streaming—so that artists and viewers have more time to produce and consume what they love.

Cloud innovation is vital for companies to compete and thrive in this volatile marketplace. Yet some are struggling to make the leap to cloud computing. Legacy infrastructures, non-virtualized environments, and other outdated processes pose major obstacles, both digitally and culturally. Many companies also lack the expertise to select and implement the right cloud solution with confidence.

Best-in-class cloud capabilities for M&E

Google Cloud and AMD are making digital transformation easier than ever, offering breakthrough technologies to help M&E companies function more efficiently, drive productivity, and adapt to new challenges. Our solutions are designed to help you modernize content production and distribution operations while creating the most compelling and memorable experiences for your audiences.

Google Cloud Confidential Virtual Machines (VMs) powered by AMD EPYC™ 7002 series processors ensures peak performance with exceptional levels of security. Google Cloud Confidential VMs make it possible for companies to scale their pipelines with ease, using tools that artists are already familiar with to complete jobs on time and under budget. Now, users can create private virtual workspaces which enable teams to access and collaborate on media assets quickly and securely. To power the latest Google Cloud Confidential VMs, AMD has introduced a new breed of server processors, which are expertly designed to manage new deployments and changing workloads. AMD EPYC ranks #1 in performance across a variety of industry standard benchmarks, making it an ideal companion for a revolutionary cloud infrastructure.

Building on industry-leading performance, data security is also our top priority. We know that great content must be protected. That's why Google Cloud and AMD solutions offer a key differentiator: encrypting data while it is in use. We do this by utilizing AMD Secure Encrypted Virtualization and the unparalleled security features of Google Cloud Confidential VMs to preserve your assets. These innovations can safeguard the most sensitive data with multilayered protective measures, even while that data is being processed in the cloud, so your intellectual property remains safe.

Our joint mission is to help M&E companies reimagine how they manage infrastructure, how remote teams collaborate, and how to effectively solve problems across the entire content supply chain. We make it simple to transform your computing environment by removing the constraints of legacy systems, so you can create the ideal solution for any workload. With a wide range of compute and memory configurations, Google Cloud Confidential VMs powered by AMD EPYC processors are compatible with virtually any M&E application.

M&E companies must embrace the cloud in order to succeed. Those that do will build highly engaged creative environments and produce the highest-quality content.

Don't miss your opportunity to innovate in new ways. Visit us online to get started.

In the Media & Entertainment (M&E) sector, success is determined by two key factors: quality and speed. Today's viewers are growing ever more sophisticated, demanding a range of high-quality content that can be accessed on-demand, no matter where they are in the world. These requirements are leading M&E companies to dramatically accelerate the creation and distribution of media content. But the limitations of outdated technologies pose a major obstacle for organizations looking to evolve and transform.

The responsibility to meet escalating viewer expectations falls largely on teams of remote directors, artists, and editors, who use troves of media data to inform and refine their content. Processes like rendering, pre-production, and post-production involve increasingly data-heavy workloads that zap technical resources and put traditional computing environments to the test. At the same time, the number of remote employee users is surging, which has made superior IT capacity, agility, and scalability critical for M&E companies. Many organizations are shifting to cloud computing in order to improve overall performance with faster processing and scalability on demand and equip geographically dispersed workforces for greater collaboration, creativity, and productivity.

Cloud innovations are blazing a new path for the M&E industry. As data management becomes an ever-rising concern, companies are racing toward digital transformation to accelerate workloads, help employees work more efficiently, and drive end-to-end performance. By adopting the cloud, companies see vast improvements in each of these areas, which allows creative teams to spend more time with their art while reducing time-to-completion. Suddenly, processes that once took exorbitant amounts of time and compute power are now executed off-prem—quickly, securely, and more affordably.

Today, Google Cloud and AMD are helping customers take media production to the next level. Our vision for the modern M&E enterprise combines world-class cloud infrastructure, modernized applications, and data-driven innovation. Our cutting-edge

cloud solutions allow companies to tackle real-world needs and reach peak performance to accelerate today's processes and prepare for tomorrow's challenges.

Google Cloud Confidential Virtual Machines (VMs) powered by AMD EPYC™ 7002 series processors deliver high processing capabilities, pairing the capacity and flexibility of the cloud with groundbreaking processor performance featuring AMD Secure Encrypted Virtualization (SEV). Together, these powerhouse solutions provide extreme speed and data processing, plus enhanced security, for your most intensive workloads. Google Cloud Confidential VMs enable M&E companies to iterate on as many cores as needed to speed up productivity, keep sensitive data safe, and produce better-quality content.

The AMD EPYC™ processor-based N2D family has the greater memory bandwidth and larger VMs compared to the N1 family. Its high core count offers up to 70% more platform memory bandwidth as well as a 100%+ performance improvement on a variety of benchmarks compared to N1 instances. AMD processors make CPU computing even faster and much more affordable than GPUs, so you can achieve high-end compute on virtual desktops or on-prem. With up to 224 CPUs and 212 cores, N2D is taking the market by storm.

When M&E companies move to the cloud, their employees and customers both win. Employees can dedicate more time to their creative work, and viewers get to experience higher-quality content. Additionally, with AMD SEV features, we keep your intellectual property safe so that contributors around the globe can perfect and secure assets while they're in use.

Google Cloud and AMD are committed to making cloud adoption simple and game-changing. With our cloud solutions, you can now reimagine how your teams work, prioritize constant innovation, and stay steps ahead of the competition.

Don't miss your opportunity to transform! Visit us online today.

Media & Entertainment (M&E) is evolving rapidly as rising viewer expectations, production challenges, and technology requirements leave companies searching for more efficient and effective ways to operate. Media production workflows can be incredibly time-consuming for companies that rely on legacy infrastructure. When it's time to deliver content, their teams are working overtime to compensate for technology that isn't robust enough to execute data-heavy jobs.

The pressure has only intensified during the coronavirus pandemic. Right now, the industry is experiencing a major upswing in content demand—for more variety, quality, and quantity—as companies hurry to equip teams in geographically dispersed locations. To combat these issues, the global M&E industry is undergoing a massive shift from on-prem desktops to virtual workspaces, moving a number of creative and distribution workflows to the cloud.

M&E companies that have embraced the cloud see it as an opportunity to make their operations more efficient and productive, while supporting their increasingly remote workforces in meeting deadlines and satisfying budgets. Cloud computing provides the superior capacity and bandwidth M&E companies need to tackle complex workloads. This increase in compute power translates to time saved on projects, increased flexibility, and higher efficiency across all media workflows. Remote contributors, such as artists and editors, can accelerate rendering, pre/post-production, video processing, and other intensive tasks, which lets them spend more time perfecting their content.

The clear benefits of cloud agility and performance are inspiring many organizations to make the leap. But others find themselves struggling to pursue cloud adoption due to limited IT expertise or security concerns.

Google Cloud and AMD have teamed up to help companies capitalize on cloud innovation, delivering world-class cloud infrastructure to boost productivity for remote users and ease the challenges of data management, while providing "Hardened at the Core" protection for your data. Google Cloud Confidential Virtual Machines powered by

AMD EPYC™ 7002 series processors is expertly engineered to achieve extreme flexibility, high memory bandwidth, encrypted data security, and the ideal level of performance to fuel IT innovation. Our industry-leading cloud platforms optimize even the most challenging M&E workloads, so users can accomplish more work in less time, all at a lower cost to production companies.

These capabilities are streamlining key stages of media production:

- **Rendering -** Scale your pipeline with secure and performant cloud-native and hybrid rendering, using tools artists already know.
- **Virtual post-production -** Empower your artists to create and collaborate seamlessly in the cloud.
- **Video processing -** Process, transcode, and encode live and on-demand video assets, quickly and securely.

With these robust solutions, Google Cloud and AMD are positioning customers to create more compelling content—and to do it more efficiently than ever. In addition, our growing ecosystem of trusted partners can make cloud implementation simple and effective, offering solutions that are compatible with virtually any application. Now, M&E companies have the compute performance they need to harness the full power of cloud productivity and to thrive in this dynamic climate.

It’s time to reimagine your potential. The cloud is waiting.

The Media & Entertainment (M&E) industry is undergoing a major transformation, in an effort to support remote workforces that produce and distribute content on a global scale. In today's volatile climate, M&E companies must find ways to improve performance from any location, at every stage of operations. Escalating technology requirements and the demand for diverse, high-quality content make innovation essential to success.

Modern M&E enterprises are rapidly shifting to cloud-based systems, including virtual workstations to support teams of remote producers, artists, and editors. The superior agility and flexibility of the cloud allows M&E companies to accelerate data-intensive workloads—from rendering and pre-production to post-production and video processing. Organizations are already moving workflows to the cloud in order to streamline day-to-day processes as well as reallocate compute resources to optimize their biggest jobs. Investing in a new breed of technology is critical to improve data management, maximize productivity today, and tackle tomorrow's challenges.

Legacy infrastructure is the biggest roadblock to M&E modernization. Many companies rely on outdated technologies to execute immense media workloads, which costs exorbitant amounts of time, labor, and compute. Strained IT environments lack the high capacity and optimum memory bandwidth necessary to drive higher levels of efficiency. This poses major issues for organizations looking to improve data organization and transmission so that remote teams can work and collaborate effectively to produce the highest-quality content.

Adopting a cloud platform is essential to overcome these pain points. However, limited IT expertise and mounting security concerns leave many organizations standing in their own way. Google Cloud and AMD are enabling M&E customers to overcome these problems by reimagining how they operate.

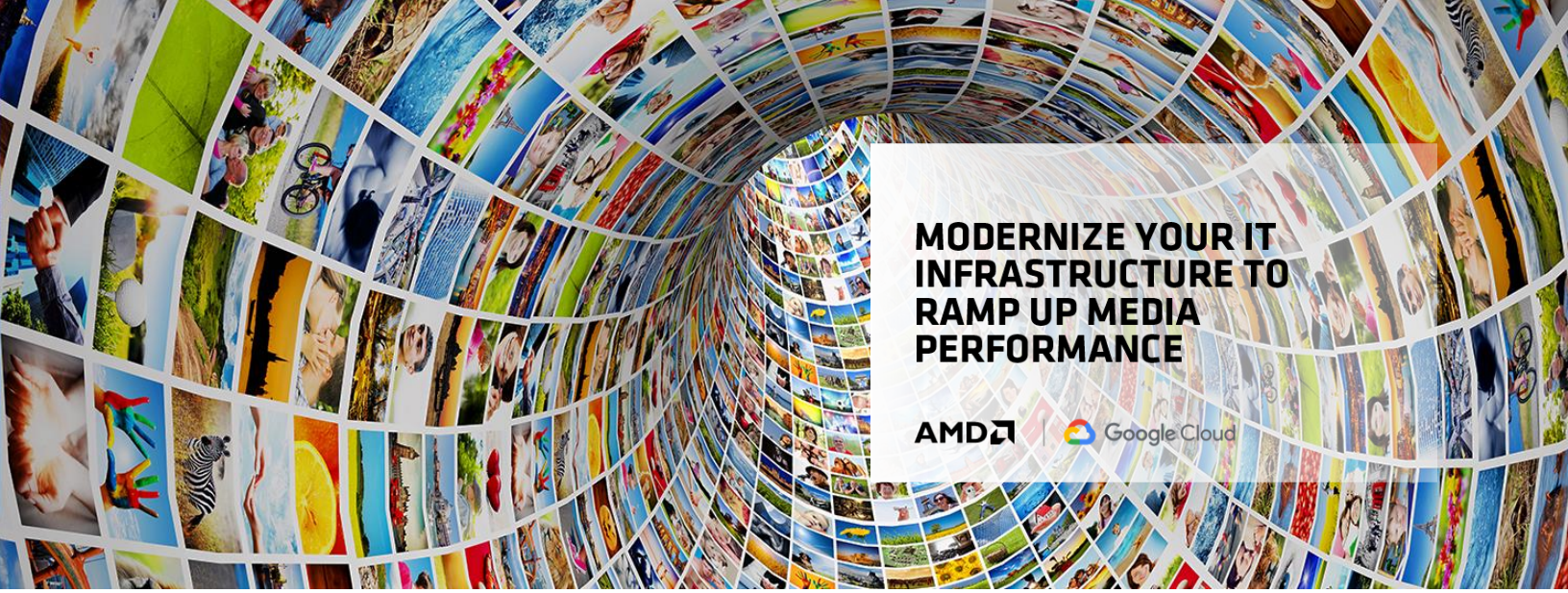
Google Cloud Confidential Virtual Machines (VMs) powered by AMD EPYC™ 7002 series processors deliver peak compute performance with industry-leading security, so M&E companies can innovate with the utmost confidence. AMD EPYC processors top the charts across a variety of industry standard performance benchmarks, making it the

ideal companion for Google Cloud's revolutionary cloud platforms. These robust machines feature up to 224 CPUs and 212 cores, which provide 70% more platform memory bandwidth and over 100% performance improvement compared to previous N-series instances.

Google Cloud Confidential VMs run on N2D instances to make it simpler for companies to scale their pipelines, with easy-to-use tools to help remote teams complete jobs quickly and securely. Together, Google Cloud Confidential VMs and AMD EPYC processors ensure extreme processing power for intensive M&E workloads, enhanced data security through AMD Secure Encrypted Virtualization, and overall cost-efficient computing performance.

These groundbreaking solutions empower modernization on an unprecedented scale, so organizations can drive productivity in every stage of media production. Now, M&E companies can harness the full value of cloud agility and productivity by creating private virtual workspaces supported by leading-edge technologies.

Visit Google Cloud and AMD online to unlock unparalleled cloud performance.



In the fast-paced world of Media & Entertainment (M&E), finding new ways to ramp up operating performance is chief priority. Media workloads are increasing in complexity as production teams collaborate from a variety of locations to complete data-heavy tasks like rendering, pre-production, post-production, and video processing. Legacy infrastructure is no longer adequate to execute these intensive jobs which require extreme levels of compute power, speed, and flexibility. To remain competitive, M&E companies must transform their technology landscape.

Cloud computing solutions are positioning many organizations to overcome the industry's greatest challenges, by driving efficiencies across their environments:

- **Unmatched agility –** Helping organizations adapt to evolving changes and requirements with ease.
- **Increased productivity –** Empowering teams to work and collaborate seamlessly.
- **Visibility and control –** Gaining valuable insight into M&E spend and cost-effectiveness.
- **Culture –** Revolutionizing how geographically dispersed teams work, from numerous locations and workstations.

M&E companies that pursue cloud adoption can dramatically improve performance at each stage of production and distribution. A growing number of innovators is migrating end-to-end operations to the cloud in order to accelerate daily processes and optimize their most demanding workloads. As a result, organizations throughout the industry are modernizing their IT infrastructure and applications to enhance media output cost-efficiently.

Google Cloud and AMD are fueling this transformation, with world-class cloud solutions to deliver high-quality content at reduced time-to-completion, while offsetting costs. This powerful collaboration streamlines cloud innovation, so customers can increase productivity, simplify data management, and heighten data security. Our cutting-edge offerings harness greater compute capacity and higher memory bandwidth, so teams

can quickly create and refine their content. With remote performance and viewer satisfaction on the line, harnessing the extensive processing capacity and on-demand scalability of the cloud is essential to evolve and grow in the M&E space.

Google Cloud Confidential Virtual Machines (VMs) powered by the AMD EPYC™ 7002 series processors offer the unmatched performance M&E companies need to support a growing remote workforce. These solutions lead the market in compute power and data security. Confidential VMs offer computing capabilities that were previously impossible, such as enabling multi-party computation, limiting data exposure, and restricting access by encrypting media data while it is in use. AMD Secure Encrypted Virtualization provides an extra layer of security by using one key per VM to isolate guests and the hypervisor from one another. Guest changes allow the VM to indicate which pages in memory should be encrypted, equipping remote teams to securely access sensitive data.

The AMD EPYC™ series makes it even faster and more affordable to execute M&E workflows using CPUs, compared to GPU computing. With more cores and superior platform memory bandwidth, the latest N2D VMs built on AMD EPYC processors offer 70% higher platform memory bandwidth and over 100% performance improvement on a variety of benchmarks over N1 instances.

Cloud for M&E is engineered to make innovation easy—from optimizing operational processes to modernizing major jobs on next-generation infrastructure.

It's your turn to lead the industry. Visit Google Cloud and AMD online to start your journey today.

For media and entertainment (M&E) companies, enhancing audience engagement is a top priority for boosting viewer satisfaction and loyalty. However, industry changes such as new methods of distribution and rising competition make it difficult to keep pace with viewer expectations.

Today's viewers want a broad range of entertainment options that are compelling, easy to access, and constantly updated. The COVID-19 crisis has caused a massive spike in consumption, as audiences around the globe demand content with even greater availability, on a variety of devices and applications. M&E companies are working overtime to meet these requirements, striving to anticipate and respond to viewer needs while searching for faster, more reliable, and secure ways to deliver content. To meet these goals, companies leverage vast amounts of data in order to provide seamless access to entertainment, personalized experiences, and immediate support.

Effective data management is crucial in this new age of M&E. The ability to execute compute-intensive workloads not only impacts the speed of delivery, but it also affects content quality—and, therefore, viewer satisfaction. Organizations built on dated infrastructure are struggling to reach the high levels of performance necessary to facilitate complex tasks, such as executing streaming and on-demand services. In order to succeed, companies must adopt ways of efficiently transmitting and hosting their data. These environments require a new breed of technology with extreme agility and flexibility to improve media applications and drive audience engagement.

Cloud computing is transforming the M&E landscape, creating greater efficiencies for content hosting and distribution. By migrating data-heavy applications to the cloud, companies can simplify data management and streamline operations. This enables companies to adapt quickly to evolving requirements and support a growing number of viewers in dispersed locations.

World-class cloud solutions from Google Cloud and AMD are empowering M&E companies to provide industry-leading entertainment. Our comprehensive technologies offer the ideal combination of capacity and speed to optimize diverse applications. As a

result, our customers have the competitive edge to deliver rich content to numerous streaming platforms.

Google Cloud Confidential Virtual Machines (VMs) powered by AMD EPYC™ 7002 series processors achieve high processing speeds and memory bandwidth to accelerate the most demanding media workloads. Built on a resilient global infrastructure, Google Cloud Confidential VMs provide groundbreaking performance, with up to 224 vCPUs on the latest N2D instances. Our cloud platforms also leverage AMD Secure Encrypted Virtualization (SEV) for advanced data security. SEV is a feature of 2nd Gen AMD EPYC™ CPUs, which encrypt data even while it is in use. Now, M&E companies can operate with confidence, knowing their content and applications are secure.

Google Cloud and AMD are ready to help you expand your audiences worldwide. Visit us online to learn how cloud technologies can transform your business today.

ENHANCING MEDIA PRODUCTION WITH SPEED AND SECURITY IN THE CLOUD

AMD | Google Cloud

For companies in the media and entertainment (M&E) industry, speed and security are the driving forces of innovation. Some M&E companies feel that on-prem architectures provide the safest and simplest way to operate. However, if these companies don't modernize their physical workstations, their infrastructure will be overwhelmed by a deluge of data-heavy tasks. Although this approach worked in the past, new trends in media consumption and delivery have put a major strain on traditional on-prem environments.

Rising audience expectations, explosive demand for content, and growing remote workforces are causing a paradigm shift across M&E. These challenges require companies to move vast amounts of data between numerous locations and devices. Outdated technologies are creating bottlenecks in media production that are both costly and time-consuming. In order to succeed, companies must invest in a different type of infrastructure to execute increasingly complex workloads and accelerate media processes everywhere.

Cloud adoption is bringing massive changes to the way M&E companies work and make decisions. Cloud technologies eliminate the constraints of on-prem technologies, unleashing superior agility, flexibility, and intelligence. These critical capabilities make it easier to manage, use, and protect sensitive and proprietary data. As a result, more companies are leveraging their data for advanced applications—like cloud analytics, streaming, and artificial intelligence (AI)—to drive increased productivity, reduced time-to-completion, higher-quality content, and greater viewer satisfaction.

Google Cloud and AMD make transformation fast and effective, with groundbreaking cloud innovations to help you lead the next wave of M&E. Migrating to the cloud enables companies to enhance each stage of media production by unlocking vital insights and optimizing the creation and distribution of content. Google Cloud and AMD solutions are robust and secure to help you reach the right level of performance, regardless of your requirements.

Google Cloud Confidential Virtual Machines (VMs) powered by AMD EPYC™ 7002 series processors deliver immense processing capacity and memory bandwidth for a

wide range of media workloads. A new breed of server processor, 2nd Gen AMD EPYC™, sets a higher standard for data management, holding 170+ world records for its groundbreaking efficiency. By combining them with Google Cloud Confidential VMs, M&E companies can harness superior compute power, extreme flexibility, and enhanced data security at a lower cost.

Our powerful technologies feature AMD Secure Encrypted Virtualization (SEV) to help keep your data safe. AMD SEV protects data even while it is in use, so M&E companies can collaborate, stream insights, and fuel business growth from anywhere in the world.

Google Cloud and AMD remove the guesswork from cloud computing. Our technologies are expertly engineered to help you achieve game-changing performance. Visit us online to learn how you can transform your business.