



Understanding Enterprise Video Distribution

Enterprise video distribution technology helps companies stream live video across their corporate networks. There are a range of challenges in addressing this need: the ability to deliver live video into the corporate network in a safe way (while providing a good experience to all viewers) and a method to minimize network congestion once the video is inside the network.

ON-DEMAND VIDEO CHALLENGES

The Corporate Firewall

Customers can overcome the issue of network constraints with an enterprise delivery network (eCDN), which can pre-position assets on servers closer to the end user. It's important to consider a solution with smart caching capabilities that does not push assets to remote edge nodes once they're published in the view portal. This helps avoid outdated content and remote edge nodes, only caching a starter when requested.

Streaming Outside of the Firewall

Caching solutions for internal and external viewers can be a challenge. Companies don't want external users to access the internal network due to bandwidth and security concerns. This is why customers should consider video on-demand, which helps enable caching and pre-positioning on internal nodes and internet content delivery networks.

DISTRIBUTION DELIVERY METHODS

Unicast:

- This delivery system sends a separate stream to each viewer

- May run into network saturation problems, depending on the number of viewers and bandwidth

HTTP split-streaming:

- Sends a few unicast streams to each branch office, from either a data center or an external CDN
- From there, streams can be split and sent to viewers inside a branch office
- Dramatically lowers the footprint on a wide area network

IP multicast:

- Leverages existing network infrastructure so a single shared stream can be used by all viewers
- Needs to be multicast-enabled
- Requires a plugin installed on the viewer's machine

Peer-to-peer:

- Sends a single stream to a branch office
- Each viewer needs an agent installed on their machine

Users should select a solution that's flexible enough to scale and adapt quickly to the changing network conditions in an enterprise. Is the firewall proxy friendly? It's important that there's a flexible way to deliver the correct streams to the correct locations or users. It's critical to have automatic failovers built into secondary streams. There may also be multiple stream formats, or even different bitrates of the same format. It's also important to have the flexibility to create rules that allow the user to divide which streams go to which location.

mediaplatform

DISTRIBUTION ARCHITECTURE

In order to define distribution architecture, it's crucial to gain deep insight into the network.

- What to know:
 - The number of locations
 - Is an optimization in place?
 - The amount of users in each location
 - The available bandwidth
 - The connection types
 - Failover connections
 - Required bit rates
 - Concurrent viewers expected.

Offices are usually divided into different location types. It's important to analyze each location and its parameters, as well as the primary and failover source. This increases the quality of experience during a live event. The final design should be the future-proofed to support a growing demand and user spikes in usage. The architecture should also be able to accommodate new requirements in a distribution network with less workload.

A GOOD USER EXPERIENCE

These two questions are the most critical for an optimal user experience, "Are viewers having a good experience watching the video?" and "Is the network handling it the way it was designed?"

These benchmarks are important, because it's necessary to have measurable metrics of success. The network team whose jobs may be on the line during the CEO town hall do not want to rely on anecdotal evidence; they want to point to concrete facts. It's crucial to have video quality experience solution data points to measure factors such as the following:

- The number of buffers the user had
- The total number of buffers over time
- The number of failovers that happened during the event
- How long it took for the video to start playing
- A QoE solution that is flexible enough to measure success during and after an event



HOW DOES ENTERPRISE YOUTUBE HELP GAIN INSIGHT INTO VIDEO CONSUMPTION?

Organizations invest a lot of money into video solutions and the production of video assets. They want to make sure the tools they provide are utilized by employees. Some metrics the enterprise portal user can use to track effectiveness include: number of views by employees, user count, total asset plays, average view time, device-related data, by device type, browser, and operating system type.

QoE (quality of experience) data allows companies to understand the effectiveness of their content. By analyzing the consumption of video with particular channels and assets, users can identify most-viewed channels.

Real-time monitoring also allows users to see how the webcast is doing while it airs live. This is beneficial because you can instantly react to small-scale or large-scale issues as they occur. The second benefit of QoE data is the ability to analyze an event after it occurs. You can also share the results of the event with shareholders to showcase a metrics, as well as those responsible for network delivery.

ABOUT MEDIAPLATFORM

MediaPlatform is an enterprise video platform and webcasting solution provider for global enterprises and digital media producers.



Why Video Storage Is Different: Understanding the Unique Requirements for Video Workflows

Video workflows are very different from the enterprise applications that IT organizations are accustomed to deploying and supporting. Large video files and the demand for fast access and real-time performance result in the need for highly scalable storage systems with high throughput capabilities, consistently low latency, and the ability to effectively support highly specialized video applications.

IT organizations in the enterprise world may be accustomed to focusing on applications such as CRM, ERP, and email, as well as core elements such as databases and virtualization technologies. Though unstructured content is gaining in importance, in the enterprise world data is often block-oriented, and the relevant performance measure is frequently transactions per second.

In the video world, the focus is on workflows, where various specialized applications are utilized almost like stations of an assembly line to process and distribute video content. In such an environment it's critical to quickly access concurrently large video files between different systems in the workflow. Thus the key performance metrics are around latency and bandwidth, not transactions per second.

Previously, video workflows were based on analog media. Moving images were captured on film or analog videotape, and clips were physically spliced together to create new film or video materials in final form (e.g., TV shows, movies, commercials, etc.). Digital, film and video media production workflows are now predominantly file-based. As with many IT applications, the video processing infrastructure may initially use islands of direct attached storage (DAS).

However, with workflows requiring that video files be shared across different applications and by different users, the ideal approach is to have **high-performance shared storage at the heart of file-based video workflows.**

UNIQUE STORAGE REQUIREMENTS FOR VIDEO WORKFLOWS

There are unique, challenging requirements for shared storage to support a video workflow:

1. Predictable, Real-Time Performance: Many video productions must run at 24, 25, 30, 50, or 60 frames per

second, and storage must be able to reliably support the consistently high bandwidth required to deliver these frame rates to the requesting application without excessive latency. There's no extra credit for running faster (except for file-based processing), but running slower is unacceptable.

- 2. High Bandwidth:** Accessing and ingesting many large video files places enormous demands on throughput. Storage systems for video workflows are often required to support gigabytes per second of bandwidth.
- 3. Media Application Support:** Media applications involve workflow functions such as ingest, editing, transcoding, and playout, and the storage system that works well with Microsoft® Exchange™ or SAP® ERP™ may flounder when tasked with handling these capabilities.
- 4. Effectively Support Hundreds of Terabytes of Large Files:** General-purpose IT storage is often optimized for transaction processing performance with small files, in environments where storage capacity is measured in terabytes or perhaps tens of terabytes. In contrast, throughput-oriented video applications use large files and storage capacities measured in hundreds of terabytes—or even multiple petabytes. This different type of workload can put unique strains on shared storage.
- 5. Continuous Operations:** If storage goes down, the workflow grinds to a halt. In the best case this means that a lot of skilled people have to take a long break, but in the worst case it means that the video that thousands or millions of people wanted to watch is not available. Shared storage for video workflows is mission-critical: If the data is unavailable, revenue is lost.
- 6. Easy Scaling:** The ongoing rollout of HD content, and now Ultra HD, is just the latest in a continuing series of advancements in video technology. Though higher-resolution formats may provide a better viewing experience, they also result in larger video files to process and store. As these continuing advancements are adopted, requirements



for bandwidth are continually growing within a video workflow, such that it is important that the storage system's bandwidth, as well as its capacity, can easily be increased without disrupting users or applications.

7. **Edit Growing Files:** Some workflows have very specific, and very critical, functionality requirements. For example, when broadcasting live events such as sports, the ability to create a highlights package while the event is still ongoing is crucial, and this translates into a requirement for the storage system to be able to edit a file while it is still being written.
8. **Enterprise Integration:** In addition to the above unique requirements for video workflows, the storage system must meet some of the basic requirements of enterprise storage:
 - Comply with enterprise requirements for security
 - Integrate with enterprise management frameworks
 - Be easy to manage
 - Simple to deploy
 - Be cost-effective

	Storage for Enterprise Apps	Storage for Video Workflows
Paradigm	Applications	Workflows
Key applications	Email, ERP, CRM, etc.	Ingest, video editing, playout, etc.
Data types	Block and file	File
Performance metrics	Transactions per second	Gigabytes per second; latency
Key pricing metric	Price per GB of capacity	Price per MB/s of bandwidth
File sizes	Often in KB	Often multiple MB or GB
Consistent performance	Highly desired	Critical
Scale	TBs, or tens of TB	Hundreds of TB, or petabytes

Enterprise storage vs. video storage

HARMONIC MEDIAGRID

Highly scalable, shared storage system optimized for digital media workflows

Harmonic MediaGrid storage accelerates file-based workflows and provides the ability to manage the entire asset lifecycle. It's designed for digital media applications requiring

shared, real-time storage, such as ingest, playout, archive, edit-in-place, collaborative editing, transcoding, and over-the-top (OTT) adaptive bitrate streaming. This system reduces the cost of storing media nearline, making it practical to economically deploy multi-petabyte digital media libraries and archives for video on demand (VOD) and other applications.



Unlike competing clustered NAS (network-attached storage) systems, which can only access data through one path at a time, the Harmonic file system driver (FSD) enables MediaGrid to deliver maximum performance through true parallel access across many storage nodes and network connections.

Benefits of Using Media Shared Storage:

- High scalability
- Simple and cost-effective
- Superior, consistent performance for media workflows
- Reliable and available
- High density, up to 504 TB of raw capacity in 5 RU

ABOUT HARMONIC

Harmonic is the worldwide leader in video delivery infrastructure for emerging television and video services. Harmonic enables customers to produce, deliver and monetize amazing video experiences, with unequalled business agility and operational efficiency, by providing market-leading innovation, high-quality service, and compelling total-cost-of-ownership.

Our software-based OTT solutions provide the tools to prepare, manage and monetize high-quality live and VOD content to every screen. Installed on premise or in the cloud, or provided through a software-as-a-service (SaaS) offering, Harmonic solutions support the media processing and delivery chain, simplifying the delivery of revenue-generating, next-generation OTT streaming services.

More information is available at www.harmonicinc.com.



5 Ways Your Company Should Be Using Live Video

Whether you're making widgets, making software, or helping people, live video streaming is something your company needs to do. Without it, you are missing out opportunities to connect, engage, and reach new markets.

While there are easily a dozen ways you can use live video, here are the five most important ones to help you lead your company to success.

1. GET MORE FOR LESS WITH STREAMED TRAINING AND TEACHING SESSIONS

When it comes to training, it's perhaps obvious that you can save time and money by offering video training instead of traveling for in-person meetings. Unfortunately, video training can be time consuming to create, quickly becomes obsolete, and doesn't deliver the same personal touch and interactivity as an in-person visit.

You can remedy these issues with a live stream. You may even find live streaming lets you offer training where you simply didn't have the time or budget before.

Your teaching staff can be more effective by eliminating time spent on travel. Course material can always be up to date. And trainees can engage with the instructor through the commenting system built into live streaming portals like YouTube or Facebook. Furthermore, you'll even get a video-on-demand for easy review by participants after the training event.

Tip: For professional results, use a real video camera, such as a Canon VIXIA G20 instead of your webcam. Capture your live video with the award-winning family of Epiphan AV.io™ capture cards, or Epiphan Pearl-2™, a full live streaming system. Epiphan's professional-quality video capture and streaming products make it easy to achieve outstanding live video results.

2. SHARE MORE EFFECTIVELY WITH YOUR EMPLOYEES AND INVESTORS

Traditionally, all-employee meetings and investor updates were done in person or by telephone conference. But what if there was a better way to reach all the right people (and none of the wrong ones)? There is—with a live stream.

Epiphan Video offers unique products that make it easy to stream live to a local streaming server, like a Wowza Streaming Server, or stream live to your company's collaboration tool,



such as Workplace by Facebook. Depending on your needs and budget, you can stream anything from a single professional HDMI camera to a fully switched, live production.

With live streaming, there's no need to give the same town hall meeting more than once. Everyone, regardless of geographical location, gets the same on-target message. And your senior staff is free to work on the next important project.

Tip: Keep viewers engaged by using picture in picture layouts to show the speaker and his slides. When a new segment starts or the speaker changes, apply a lower third to inform viewers. Get the most from a one-camera setup by using a 4K camera to shoot a wide view, then use Pearl-2 to crop out multiple scenes to show your online viewers.

3. HOST PROFESSIONAL MEETINGS, VIRTUALLY

There's a good chance you're already doing this! Using Skype for Business, GoToMeeting, or any number of collaboration and communication tools, you may already be hosting video meetings. So, let's look at how to get the most from them.

When someone new comes to your boardroom, how easy is it to have them connect to your videoconference system? When you want to share a video output like a document camera with your meeting, how do you accomplish that? Do you need a recording of certain meetings, for IP protection or governance reasons?

VIDEOGUYS



Using Epiphan AV.io HD™, a portable video capture card, you can capture video from just about any input and share it on your computer as though it is a webcam. And there's no need to install anything on the source, so newcomers just need to plug in their computer and you can share it!

For recording, streaming, and sharing our meetings, Videoguys.com uses an Epiphan Video Pearl-2 in our boardrooms. This lets us record important meetings, share any device in the meeting, and even switch to picture-in-picture layouts or stream multiple views at once.

Tip: Turn on your webcam and check to see whether you're presenting a professional impression with good focus, lighting, and angle, or if you're showing an "up the nose" or other distorted angle. Improve your image by using a professional camera with AV.io HD!

4. DON'T MISS OUT ON THE MOST IMPORTANT DIGITAL MEDIUM: SOCIAL

Trusted Media Brands recently surveyed more than 300 agency and marketing decision makers about the best partners for digital video campaigns (go2sm.com/tmb). Not surprisingly, Social media came out on top, with 68% of respondents choosing social sites like Facebook and Snapchat, with video platforms like YouTube and Vimeo close behind.

With Epiphan Pearl-2™ you can stream to Facebook Live while simultaneously streaming to YouTube. Perfect for live shows, like Epiphan's own *Live @ Epiphan* weekly show, streaming to multiple locations at once lets you take advantage of both your existing YouTube subscriber base and your Facebook audience.

For simple single-camera setups, use Epiphan Webcaster X2™. This purpose-built and dedicated social media streaming device makes it effortless to live stream any HDMI camera or video source. Simply pair the device with your account and press the button to start your live stream. You can even use Facebook's continuous stream option to have a long-running or 24x7 stream (like an all-day corporate event or a fundraiser).

Most social networks help you by building an online audience for you when you go live. They let your fans and

subscribers know you're there, and they generally create a video-on-demand version for after your broadcast. So even if you're going live last minute, you can still have an enormous impact.

Tip: Not sure what to stream live to social? Try a behind the scenes look at your company, interviews with lead customers, employee insights on a project, or socially responsible actions that help build your brand.

5. BRILLIANT PRODUCT LAUNCHES AND NEW FEATURE DEMONSTRATIONS

When your company is launching a new product or service, share it with your social media fan base, your employees, or with your partners using a live stream.

For physical products, connect a high-quality video camera to Epiphan AV.io 4K™, AV.io HD, or Pearl-2 and show off the product! For software, live stream a product demo that highlights the new features. If you work at a service-based organization, consider the impact you can make with a pre-recorded highlight reel paired with a live presenter to talk introduce and close out the clips.

When you think about it, it's hard to see why you wouldn't live stream launches and new feature demonstrations. Not only will you have people who watch live, you'll have a video on demand that will continue to generate buzz well after your stream.

Tip: If streaming publicly on YouTube or Facebook Live, be sure to tag and describe your video well. This will help drive organic search traffic to your video, even after the live stream is concluded. And if you have the bandwidth available, use Pearl-2 to stream to YouTube in 4K!

FIND SUCCESS WITH LIVE STREAMING AT YOUR ORGANIZATION

These five tips have highlighted where you can use live streaming today to increase engagement with your employees and create new opportunities for customer interaction.

Go forth and start streaming today!

For more information and help with live streaming gear contact Videoguys.com at 800-323-2325. We have the complete Epiphan Video product line as well as live streaming software like Telestream Wirecast. Plus, we offer free technical advice, system recommendations and support to help get you started.

ABOUT VIDEOGUYS.COM

Videoguys.com is a reseller of all epiphan Video products including the new Pearl 2 4K production system, Webcaster X2 social media streaming appliance and all of the AV.io video grabbers. Please contact us at 800-323-2325 for help setting up your production system and for the best prices available.

RECOMMENDED READING AND VIEWING

FEATURE ARTICLES

BUYERS' GUIDE TO UNIFIED COMMUNICATIONS 2017

By Tim Siglin

Simply being able to connect enterprise devices isn't the real goal. In the march to HEVC, could UCC interoperability issues become a thing of the past?

go2sm.com/061701

BUYERS' GUIDE TO ENTERPRISE VIDEO PLATFORMS 2017

By Tim Siglin

The questions companies need to answer: Build vs. buy? Cloud, on-premises, or hybrid? Here's what to decide before starting a search.

go2sm.com/061702

THE STATE OF ENTERPRISE VIDEO 2017

By Tim Siglin

In an exciting period of revival, new features and new formats stemming from last year's entertainment solutions bring significant changes to the enterprise. Here are seven areas to watch.

go2sm.com/061703

STREAMING MEETS UNIFIED COMMUNICATIONS: CONVERGENCE IS ON THE WAY

By Tim Siglin

Social media, online video platforms, and knowledge management systems are coming together to create the future of enterprise communications.

go2sm.com/061704

INTERNAL VIDEO SUPPORT IMPORTANT TO 90% OF ENTERPRISE CUSTOMERS

By Troy Dreier

Organizations create and watch internally-focused video at a much higher rate than they did in 2015, and see desktop and mobile video support as essential.

go2sm.com/061705

THINKING ABOUT LOAD TESTING: IT'S NOT JUST FOR THE ENTERPRISE

By Robert Reinhardt

Even SMBs need to think about load testing these days to ensure they can serve audience demand. Here are three questions to consider.

go2sm.com/061706

THE TOP TEN ENTERPRISE VIDEO TRENDS: WHERE BUSINESS IS IN 2016

By Nadine Krefetz

User-generated content, moving to the cloud, and going live: Here are the ten biggest issues impacting corporate video strategy today.

go2sm.com/061707

HOW TO USE DATA TO DRIVE ONLINE VIDEO SUCCESS

By Nadine Krefetz

From content creation to subscriber retention, video publishers are embracing Big Data in a big way. These are the most important trends and challenges behind the video data revolution.

go2sm.com/061708

Want to find out more
about enterprise video?

Check out these articles and videos
from *Streaming Media*.

STREAMING MEDIA CONFERENCE VIDEOS & SHORT CUTS

HOW TO KEEP YOUR WEBCASTS FROM FAILING

Microsoft Production Studios' Travis Petershagen looks at the signal flow for large-scale webcasts, where and how failures happen, and how to be ready for them and keep your content streaming.

go2sm.com/061709

IS HLS OR DASH THE NEXT VIDEO DELIVERY STANDARD?

Viacom's Jeff Tapper, Comcast's Rustam Khashimkhodjaev, Akamai's Will Law, and Microsoft's Araj Sodogar discuss the pros and cons of HLS as the next industry-standard video-delivery protocol in this clip from Streaming Media West 2016.

go2sm.com/061710

CHALLENGES OF MIGRATING FROM FLASH TO HTML5

Disney's Mark Arana and Wowza's Chris Knowlton discuss the challenges content owners face in migrating their video from Flash to HTML5, and the importance of knowing where their video will land before planning their migration strategy.

go2sm.com/061711

HOW TO BUILD AN INTERNAL STREAMING SOLUTION

Howard & Associates' Andy Howard explains how to assemble an effective internal solution for enterprise streaming in this excerpt from a Streaming Media West 2016 panel.

go2sm.com/061712

4 WAYS TO FUTURE-PROOF YOUR ENTERPRISE VIDEO PLATFORM

EastBanc's Eric Hoffman offers 4 essential insights on how to make your enterprise video infrastructure more reliable, versatile, and capable for meeting the requirements of current and future large-scale video events.

go2sm.com/061713

CLOUD VS ON-PREM FOR LIVE ENCODING AND ENTERPRISE VIDEO

Yorktel's Joe Arena makes the case for on-prem encoding, storage, and management when choosing an enterprise video platform, and having a strong support model in place

go2sm.com/061714

WHY STREAMING VIDEO METRICS MATTER

Real Story Group's Theresa Regli explains you can leverage targeted metrics and media asset management to improve your streaming ROI.

go2sm.com/061715

IS MARKETING VIDEO CONTENT CREATION TRENDING DIY?

Vimeo's Anjali Sud, StreamVPG's Scott Farb, and CME Group's Scott Szczurek discuss the latest marketing and branding content creation trends at Streaming Media East 2016.

go2sm.com/061716

SPONSORED BY



MEDIAPLATFORM

8383 Wilshire Blvd
Suite #460
Beverly Hills, CA 90211
USA
Phone: (310) 909-8410
mediaplatform.com

For more information and articles about MediaPlatform,
see go2sm.com/mediaplatform.



TELESTREAM

848 Gold Flat Road
Nevada City, CA 95959
USA
Phone: (530) 470-1300
telestream.net

For more information and articles about Telestream,
see go2sm.com/telestream.



HARMONIC

4300 North First Street
San Jose, CA 95134
USA
Phone: 1 (800) 788-1330
harmonicinc.com

For more articles and information about Harmonic,
see go2sm.com/harmonic.



VIDEOGUYS.COM

10-12 Charles St.
Glen Cove, NY 11542
USA
Phone: (800) 323-2325
www.videoguys.com

For more information and articles about Videoguys.com,
see go2sm.com/videoguys.



HIVE STREAMING

Fatbursgatan 1
118 28 Stockholm
SWEDEN
Phone: +46-8-6670300
hivestreaming.com

For more articles and information about
Hive Streaming, see go2sm.com/hivestreaming.