Lab Validation Report

Omneon MediaGrid

Content-Aware, Active Storage for the Enterprise

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May, 2008

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ESG Lab Reports

The goal of ESG Lab reports is to educate IT professionals about emerging technologies and products in the storage, data management and information security industries. ESG Lab reports are not meant to replace the evaluation process that should be conducted before making purchasing decisions, but rather to provide insight into these emerging technologies. Our objective is to go over some of the more valuable feature/functions of products, show how they can be used to solve real customer problems and identify any areas needing improvement. ESG Lab's expert third-party perspective is based on our own hands-on testing as well as on interviews with customers who use these products in production environments. This ESG Lab report was sponsored by Omneon.

Introduction

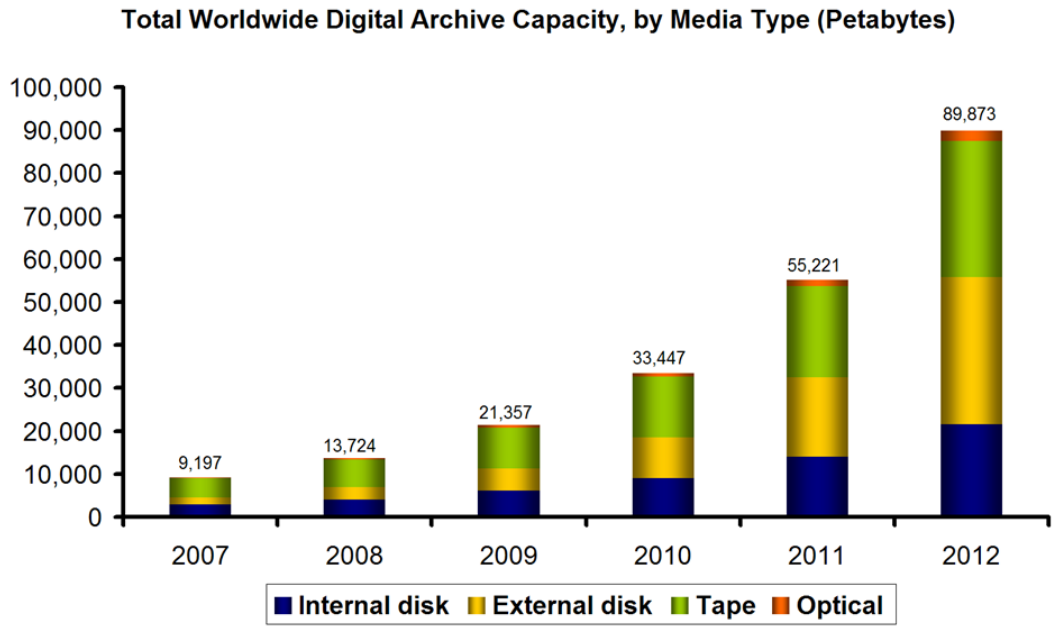
The MediaGrid storage system from Omneon combines industry standard server hardware, capacity-rich SATA drives and custom software to meet the performance and capacity needs of IT organizations faced with the unique capacity and performance challenges associated with the storage, editing and distribution of multi-media and video content. This report explores how the Omneon MediaGrid handles petabytes of capacity with near-linear performance scalability while reducing the management and reliability challenges typically associated with storing rich media on a traditional storage system.

Background

Multi-media and video editing and delivery—once a problem almost exclusive to movie and TV studios—is increasingly becoming a challenge for enterprises as they address internal and external media requests such as training videos and multi-media marketing materials. Furthermore, as the world of Web 2.0 moves from the consumer to the corporate worlds, enterprises are faced with the task of larger and larger file-based data requests. Like it or not, customers of even the most longstanding traditional enterprises are looking to leverage exploding stores of rich media content that are accessed through a corporate web portal. Whether it is customers accessing a shared knowledge base, gathering to form an online community or surfing for the next great marketing promotion, the delineation between the business and the customer is becoming fuzzier.

Unstructured content—essentially anything not stored inside a database, which includes audio, video and digital images—is driving an explosive wave of capacity growth. To quantify the enormity of the challenge, consider the results of a recent ESG research report.[1]

FIGURE 1. DIGITAL ARCHIVE CAPACITY PROJECTION



As shown in Figure 1, total worldwide digital archive capacity is projected to increase nearly tenfold between

[1] Source: ESG Research Report, *2007 File Archiving Survey*, January 2008

2007 and 2012. The projected world-wide capacity in 2012 is a staggering 90,000 petabytes (90 million terabytes). This doesn't take into account the growing stores of capacity being consumed for video editing as a growing number of organizations move from the legacy workflow of "tape to workstation for editing and then back to tape" to a new model of "let's keep it on shared disk for faster editing." Exploding capacity is only the tip of the iceberg when it comes to meeting the real-time demands of multi-media and video content. The extreme bandwidth requirements of high definition video and audio, as well as the complexity associated with always-on maintainability, are key concerns as well.

Omneon, Inc.

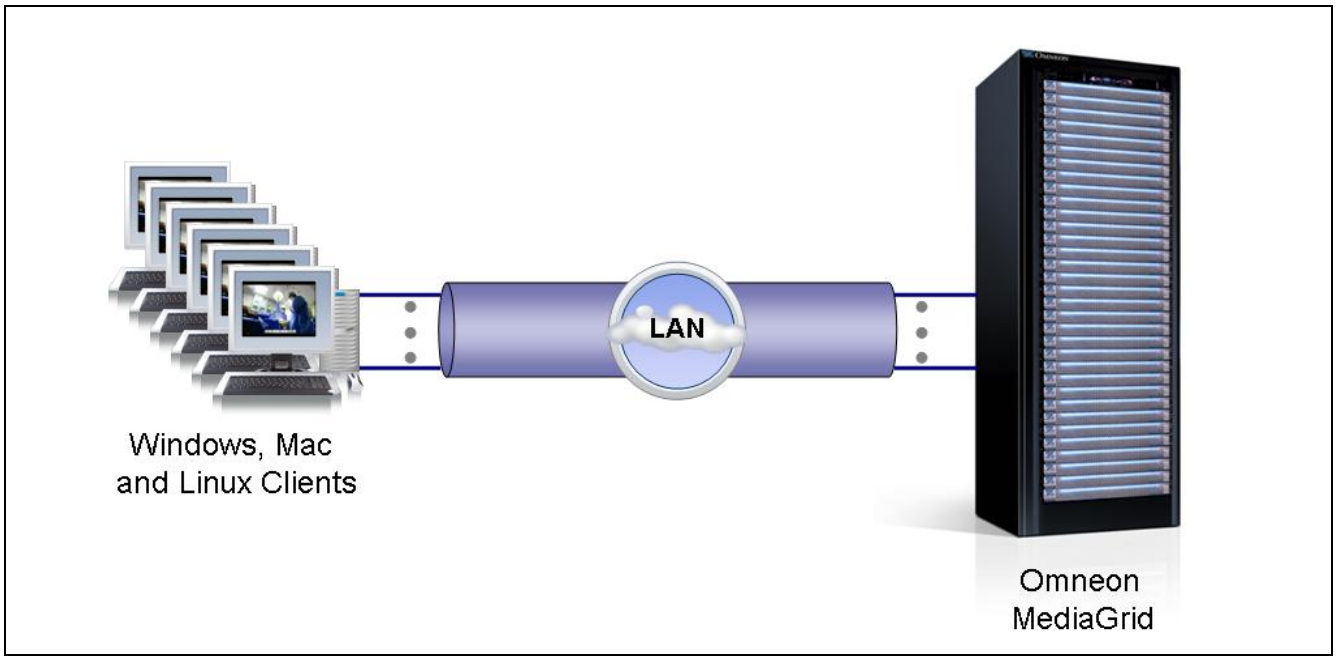
Since 1998, Omneon has been focused on the design and delivery of high capacity, high bandwidth video server infrastructure for companies that produce and distribute audio and video content for television and the Internet. Well known by media professionals with a need for speed and reliability, Omneon is a market leading provider of video server systems. Leveraging the latest in server and storage technologies and open advanced architecture, Omneon Spectrum video servers have been embraced by a number of leading broadcast networks including Turner and Discovery.

The Omneon MediaGrid

Leveraging the success of the Spectrum product line for video broadcasting, the Omneon MediaGrid was designed to reliably store and process very large data files. MediaGrid is ideally suited for rich-media applications including video ingest, video editing, video delivery and multi-media archival. It is also well suited for a number of other applications that deal with large files including unstructured file archival, backup to disk and grid computing.

This ESG Lab report presents the results of hands-on testing of an Omneon MediaGrid. The Omneon MediaGrid is a rack-mounted, self-contained, self-healing system built from industry-standard x86 servers and high capacity SATA hard drives. Windows, MAC or Linux clients access the MediaGrid over an Ethernet network using an Omneon file system driver or via industry standard network attached storage (NAS) protocols.

FIGURE 2. OMNEON MEDIAGRID



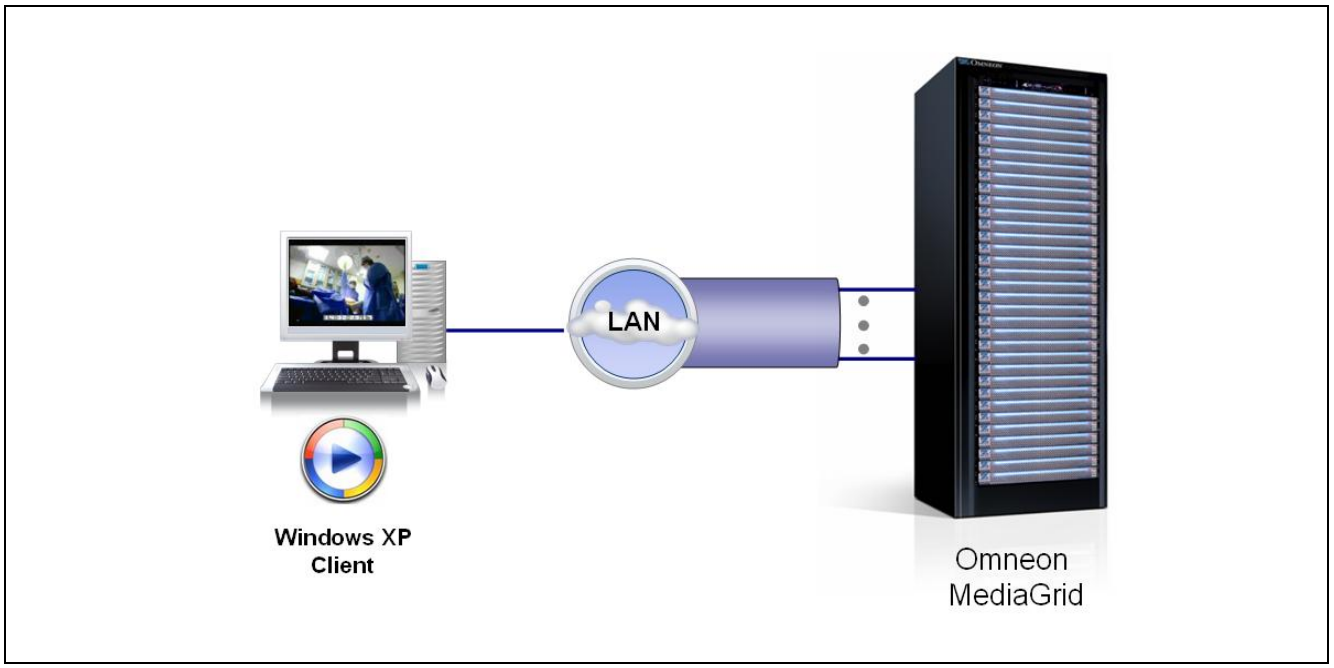
ESG Lab Validation

ESG Lab performed hands-on evaluation of the Omneon MediaGrid active storage system at Omneon's Sunnyvale, CA facility. Testing was designed to demonstrate the simplicity and ease of management of the Omneon system in addition to performance and capacity scalability and always-on high availability. ESG lab also looked into the benefits of running a CPU intensive application inside the MediaGrid.

Getting Started

ESG Lab testing began with a pre-racked and wired Omneon MediaGrid as shown in Figure 3. The Media Grid was accessed from a Windows XP client attached to the grid through a local area network (LAN) using an industry standard Gigabit Ethernet connection.

FIGURE 3. THE ESG LAB TEST BED



ESG Lab Testing

Omneon typically pre-configures and ships the complete system, including Ethernet switching, so that the first step is to plug the MediaGrid into the network and power it on. ESG Lab first powered one of the servers in the MediaGrid, which runs the System Manager application. The System Manager console, accessed from a web browser, was used to observe the MediaGrid as the balance of the MediaGrid servers were powered on.

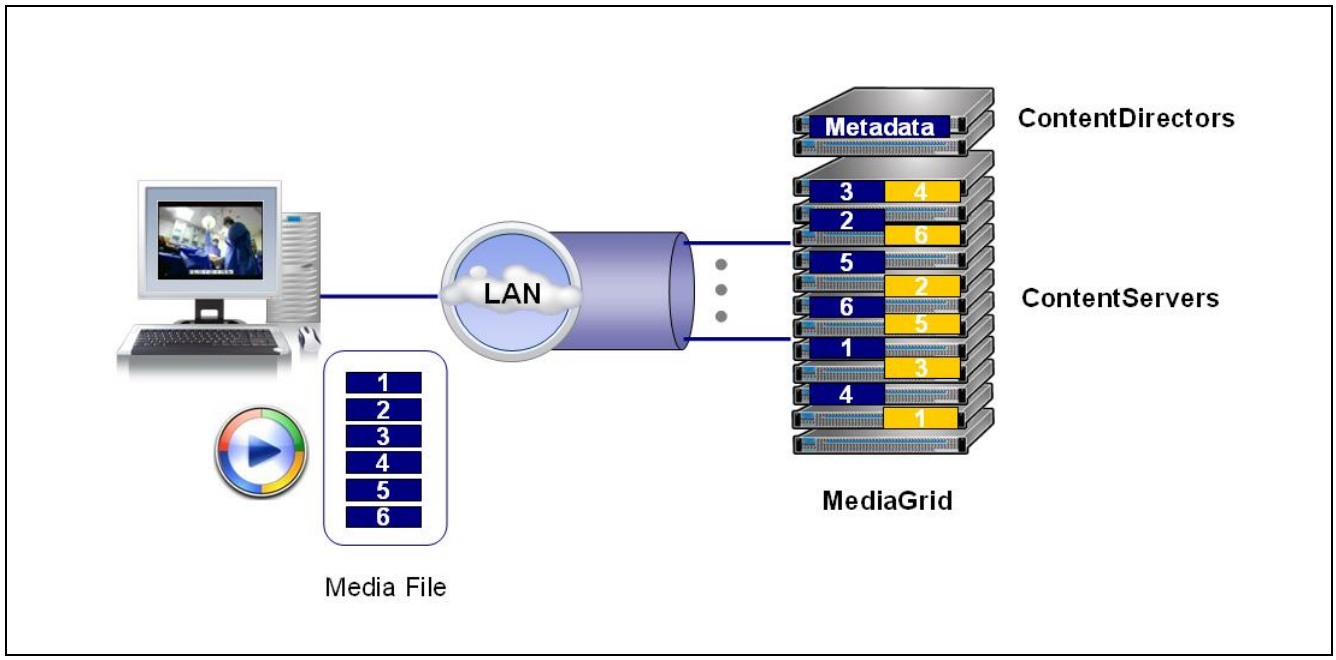
Why This Matters

Installing and configuring traditional large-scale file systems can be extremely complex. Whether it's a clustered file system in front of SAN-attached storage or a number of traditional dual controller NAS systems glued together with virtualization software, time and money can be wasted trying to deploy legacy systems for large-scale multi-media and video applications. The Omneon MediaGrid is sold and configured as a self-contained, always-on appliance. ESG Lab simply plugged it into the network and turned it on. Eight minutes later, the MediaGrid was ready for file services.

Managing the Grid

Files stored in a MediaGrid are divided into slices that are spread and replicated on different hard drives and servers within a MediaGrid. As shown in Figure 4, the metadata used to track the locations of file data (stored on ContentServers) is managed by ContentDirectors. In this example, a Windows workstation is storing a media file on an Ethernet-connected MediaGrid. The file is sliced into 6 chunks, though typically, files are divided into hundreds of slices. The slices are spread over multiple ContentServers and a duplicate copy of each slice is replicated on another node in the grid for high availability. Additional replicas can be specified on a system, folder or file basis to meet higher availability and performance requirements.

FIGURE 4. MEDIAGRID ARCHITECTURE



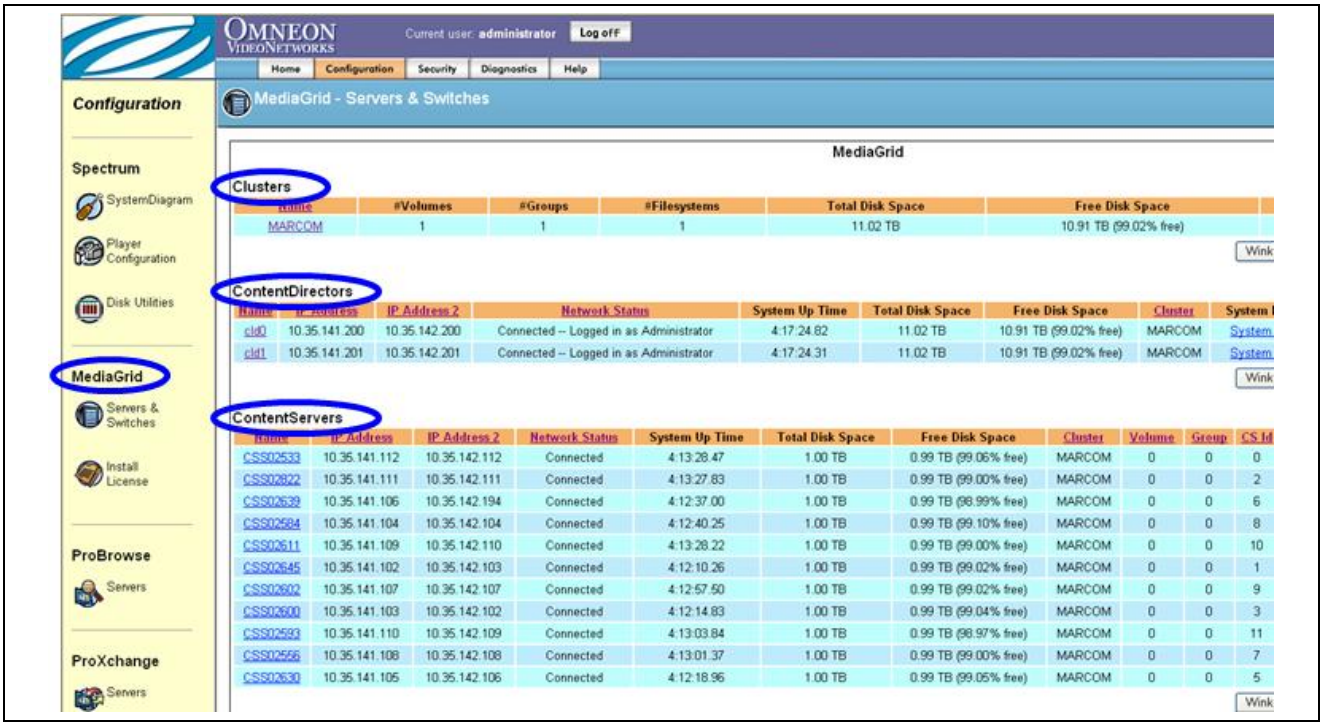
The distributed architecture shown in Figure 4 is designed for optimal performance and capacity scalability. ContentDirector and ContentServer software runs on industry standard x86 servers. As servers are added to the grid, the performance of the system grows to take advantage of additional CPU, memory and bandwidth. The capacity of the grid can be upgraded online by adding ContentServers full of high capacity SATA hard drives.

The distributed MediaGrid architecture and the transparent policy-based replication of file data is optimized for the always-on, no-downtime-permitted world of rich media production and delivery. Once installed, the system never needs to be turned off. All maintenance, upgrades and service operations can be performed with the system running. If and when a hard drive or server fails, self-healing replication of redundant copies of file data is performed automatically.

ESG Lab Testing

After turning on the MediaGrid, ESG Lab pointed a web browser at the IP address of the Omneon System Manager to examine the configuration and health of the grid. The System Manager is a single management application that can be used to manage all of Omneon's products. As shown in Figure 5, the *Servers and Switches* icon was clicked to view the MediaGrid system used during ESG Lab testing. As you can see, ESG Lab testing began on a single cluster with two ContentDirectors and eleven ContentServers.

FIGURE 5. OMNEON SYSTEM MANAGER



This home page view was used to view the total capacity of the system used during ESG Lab testing (11 TB) and the capacity provided by each ContentServer (1 TB). Administration of each component was accomplished by clicking on the highlighted *Clusters*, *ContentDirectors* and *ContentServers* labels circled in blue.

Why This Matters

Meeting the extreme performance, capacity and reliability requirements of multi-media and video applications can be difficult, expensive and risky with traditional storage systems. While legacy dual controller systems can be deployed in parallel to overcome the capacity and performance limitations of each individual array, the cost and complexity of the overall solution can quickly get out of hand. With a distributed clustered approach that leverages the latest advances in x86 server and SATA drive technology, an Omneon MediaGrid that's managed as a single system uses a distributed, clustered approach to overcome the limitations of traditional storage system architectures.

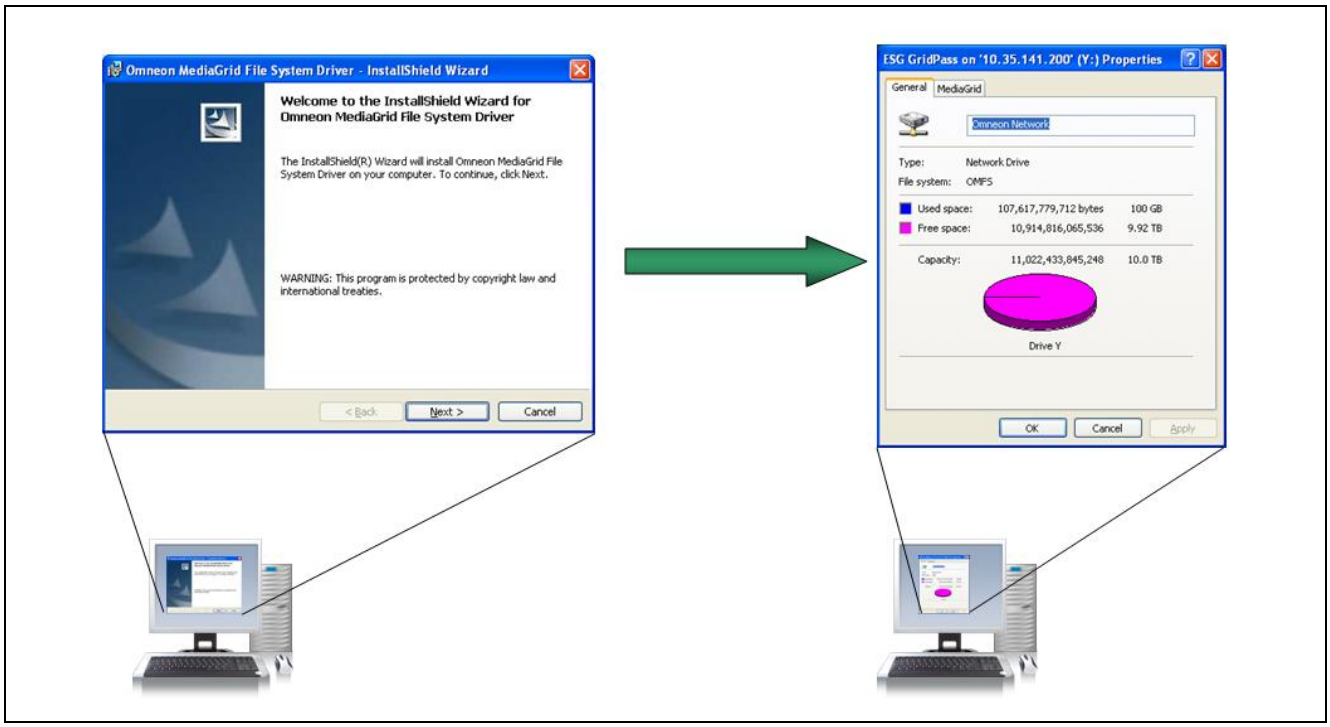
Accessing the Grid

Clients can access capacity in the MediaGrid using one of two methods: Through a thin file system driver installed on clients or through a ContentBridge using industry standard NFS and CIFS protocols. The Omneon file system driver provides high speed parallel access to a shared file system over an industry standard IP network. This access method is ideally suited for massively parallel workflows and high speed content editing, providing quick and easy access to shared files. It is also well suited for content reviewers and content delivery over low bandwidth networks.

ESG Lab Testing
ESG Lab installed the Omneon file system driver on a PC running Windows XP. The installation had the familiar look and feel of a Windows Install Shield wizard, with no user settable configuration options required. Four clicks and thirteen seconds later, the installation was complete and a required reboot of the Windows XP client was in progress. Nine minutes and thirty seconds after powering on the system, files were being copied to the MediaGrid.

The 11 TB MediaGrid volume was accessed as the Y: drive as shown in Figure 6. A directory on the client's local hard drive was copied to the Y: drive and compared via inspection. Large video files were dragged and dropped onto the Y: drive. From a user's perspective, the MediaGrid felt like an extremely large internal hard drive.

FIGURE 6. FILE SYSTEM DRIVER INSTALLATION



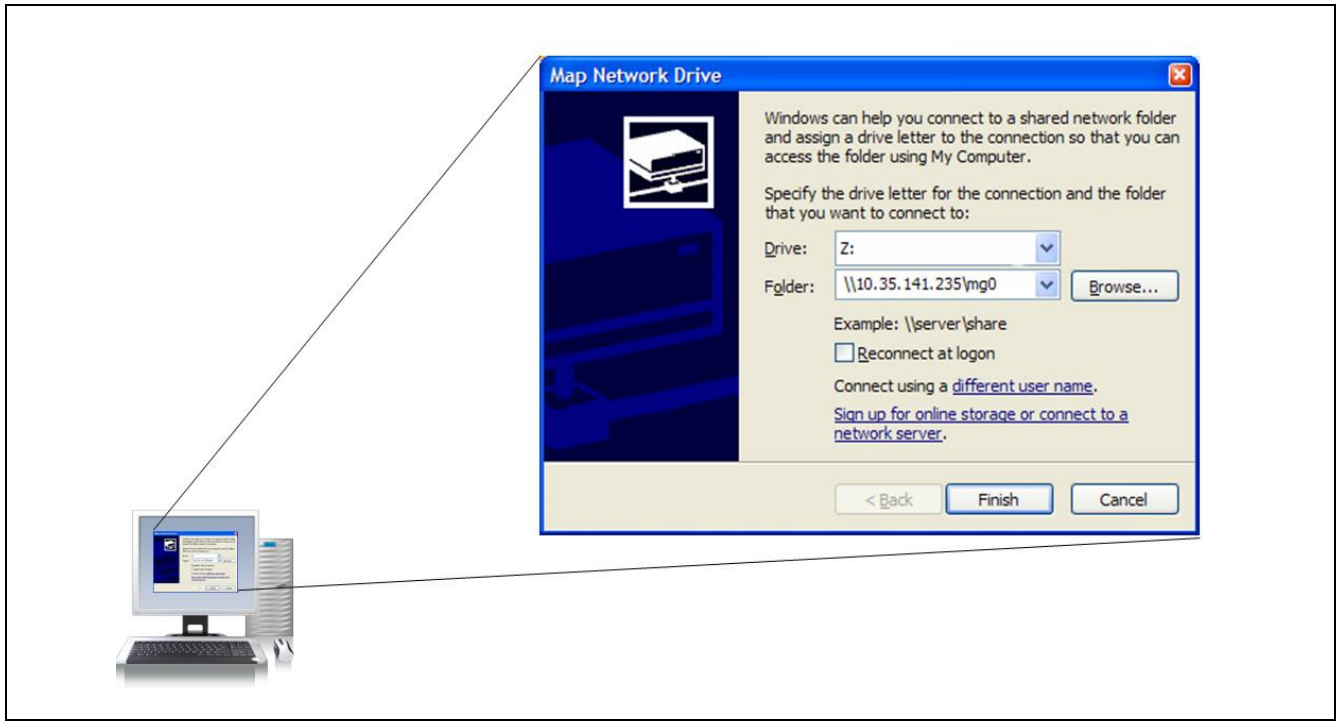
File System Driver Overhead Analysis
ESG Lab examined the memory footprint and CPU utilization of the file system driver on the Windows XP client. Windows Task Manager was used to monitor the system as large video files were copied to and from the MediaGrid. The file system driver service (omservice) consumed 2.9 MB of RAM before the copy. There was no change in RAM usage and CPU utilization remained at zero throughout the copies.

ContentBridge
While the file system driver enables distributed client access for optimal parallelism, scalability and performance, ContentBridges provides access for clients running an operating system that is not supported by the Omneon file

system driver or for clients that don't need a lot of parallelism. The ContentBridge supports a number of standard network protocols including NFS, CIFS, FTP and AFP.

A ContentBridge within the MediaGrid tested by ESG Lab was used to access the files created during the first stage of testing on the Y: drive as a CIFS-mounted Z: drive. The MediaGrid file system (mg0) was mapped a as Network drive on the Windows XP client as shown in Figure 7.

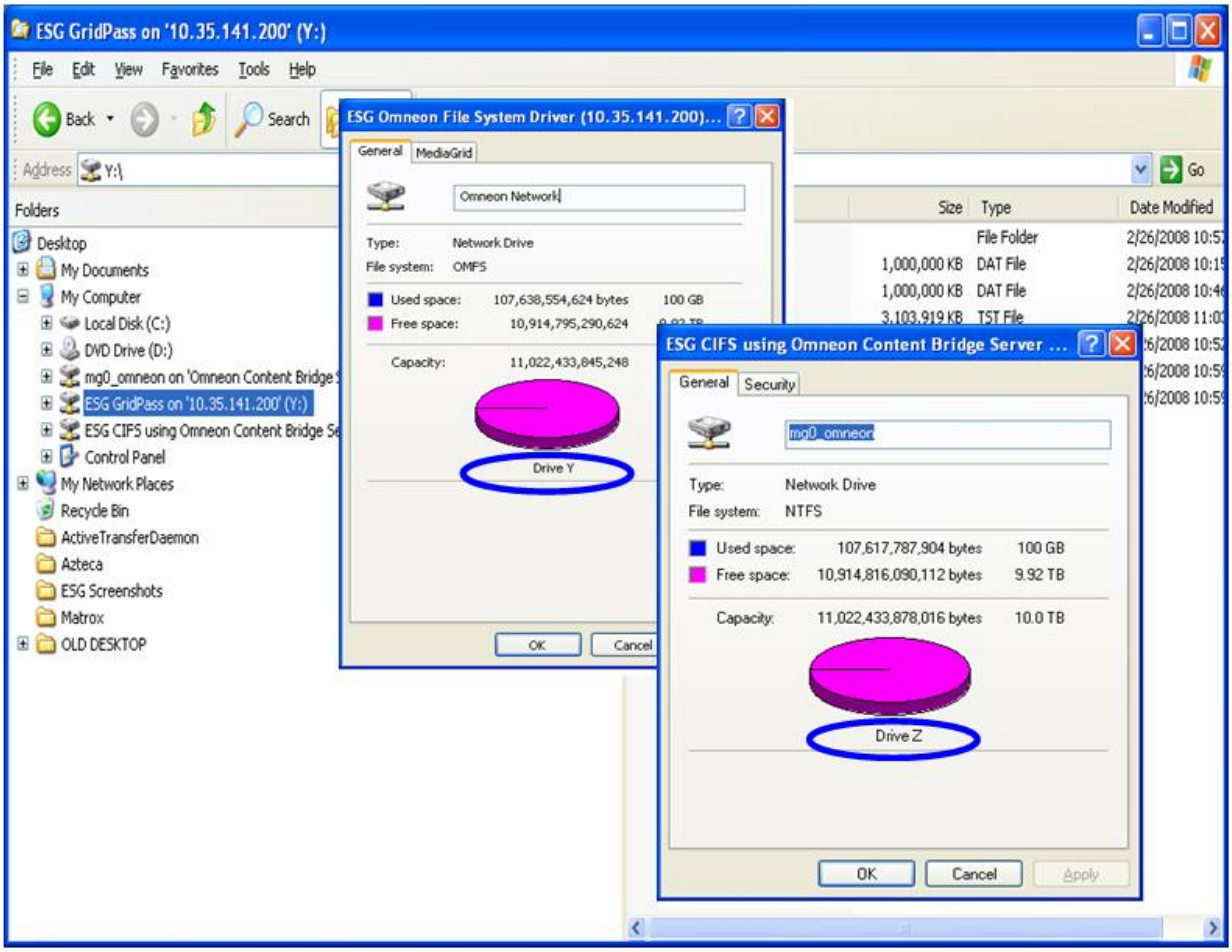
FIGURE 7. ACCESSING THE GRID THROUGH A CONTENTBRIDGE



The ContentBridge can be set to authenticate users against local usernames and passwords, or against a Windows Active Directory domain. File access is checked against an Access Control List (ACL) for each file. After clicking Finish and providing a user name and password, ESG lab confirmed that the X: drive was available for access using the CIFS protocol. The entire process—from the first mouse click to full access of the file system—was completed in two minutes and three mouse clicks.

Files were written, read and compared using the ContentBridge. Files were loaded onto the grid and retrieved using the FTP protocol. As shown in Figure 8, there was no perceivable difference between the Y: and Z: drive.

FIGURE 8. FLEXIBLE ACCESS TO SHARED FILES IN THE MEDIAGRID



Why This Matters

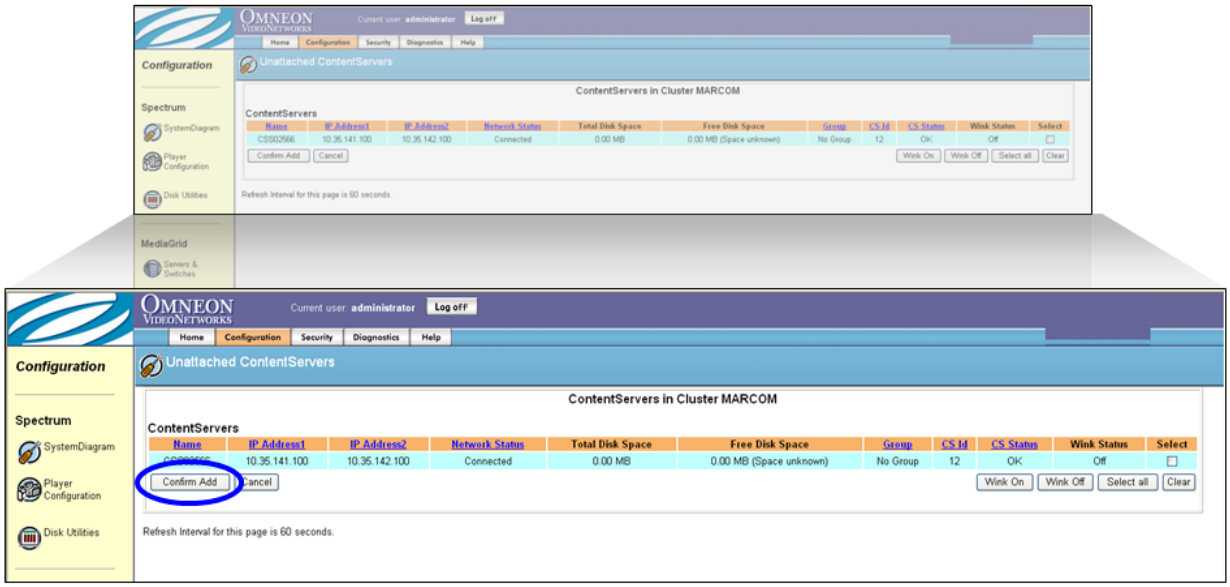
Parallel access to large files can be used to speed workflows, saving time and money. This is especially true for bandwidth intensive workflows like high definition video editing and delivery. Omneon's heritage of providing reliable, high speed delivery of large video and audio files to the broadcast industry has been cost effectively extended with the MediaGrid to any company requiring shared access to large files. Omneon MediaGrid provides a turbo charged file system driver for power users and universal access via a content bridge for everyone else. ESG Lab found that the Omneon file system driver and ContentBridge access methods were easy to configure and transparent from an end-user perspective.

Capacity Scalability

ContentServers can be added to a MediaGrid for additional storage capacity, network bandwidth, and processing power. Upgrades can be made online with no disruption to users and applications accessing the grid.

ESG Lab Testing
ESG Lab added a ContentServer to the grid while performing large file copy operations to assess the impact on users and applications during an upgrade. A ContentServer, which added one terabyte of capacity to the grid, was plugged into the built-in Ethernet switch and powered on. In less than two minutes, the new content server had fully booted and was visible to System Manager, as seen in Figure 9. ESG lab then clicked 'Confirm Add' to add the new Content Server to the cluster.

FIGURE 9. ADDING A CONTENTSERVER TO THE GRID



The server and its capacity were immediately added to the cluster with no perceivable disruption to file copy operations. ESG Lab confirmed that the capacity of the grid had grown using the System Manager console and the properties of the volume in the Windows client. Adding the new ContentServer was completed in less than two minutes and had a negligable impact on network utilization.

Why This Matters

ESG research has confirmed that organizations are struggling to meet the runaway capacity demands of growing volumes of unstructured file data. As the size and number of files that need to be kept online continues to grow, capital equipment and operating budgets are being stretched to the limit. Reconfiguring an application to recognize capacity in the next new storage array can lead to downtime, lost productivity and in some cases, lost revenue as legacy storage arrays are filled to capacity. ESG Lab has confirmed that adding capacity to an Omneon MediaGrid can be done online in less than two minutes.

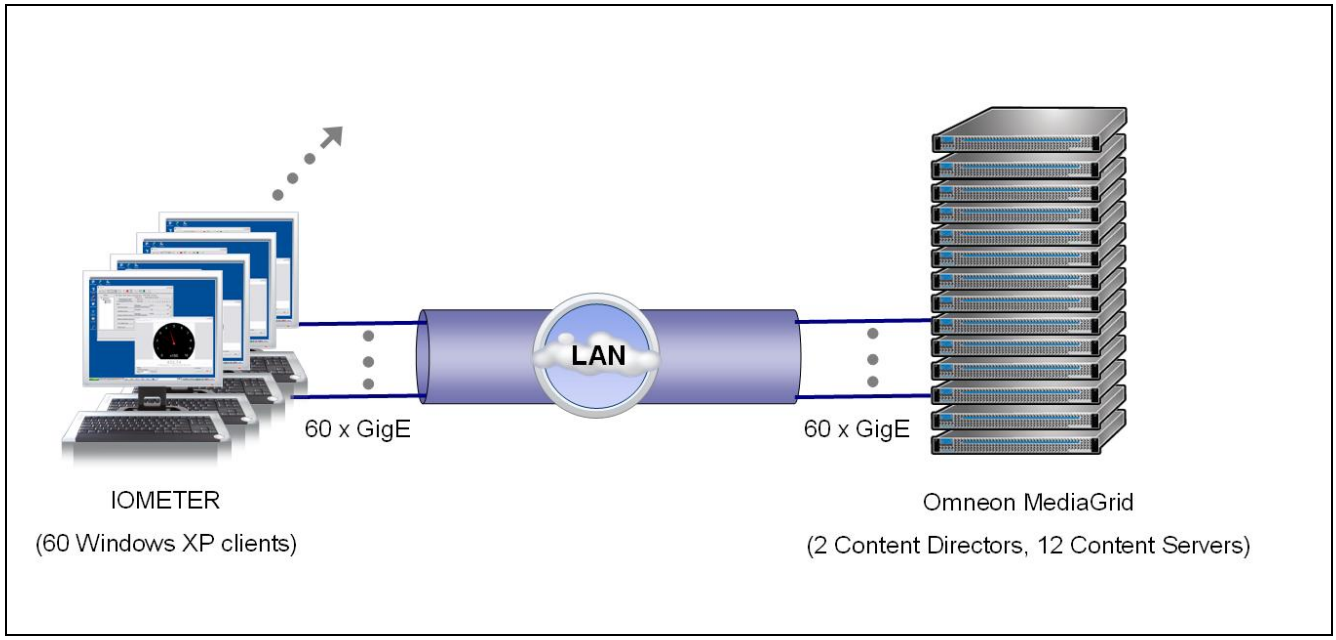
Performance Scalability

MediaGrid performance is optimized for applications that deal with the storage, manipulation and retrieval of large files including rich media ingest, archive and workflow applications. As ContentServers are added to a MediaGrid, aggregate throughput increases in a near linear fashion using the processing power, network throughput and disk actuators of each additional server.

ESG Lab Testing
ESG Lab analyzed the performance capabilities of the Omneon MediaGrid architecture through a combination of hands-on testing, an audit of a large-scale performance scalability benchmark and an examination of performance data collected during a recent customer evaluation. ESG Lab testing was designed to confirm that a MediaGrid system can deliver up to 95 MB/sec of throughput for each Windows client and up to 100 MB/sec of additional aggregate throughput for each ContentServer in a grid.

The performance scalability test bed is shown in Figure 10. Sixty Windows clients running Omneon WINFSD version 2.1 were connected via a GigE Ethernet local area network to an Omneon MediaGrid version 2.1SR1 with 12 TB of usable capacity. The MediaGrid was built using a pair of 1U Content Directors, twelve Content Servers, one ContentBridge, one High Bandwidth ContentBridge (ContentBridges were not used for this portion of testing), one HP 5406 switch with 120 GbE ports and four 10GbE ports. The switch configuration contained five (5) VLANS, two for the ContentDirectors private network, two for the MediaGrid public networks (subnet A & B) and one for the client network (subnet Client). All clients were directly connected to the switch.

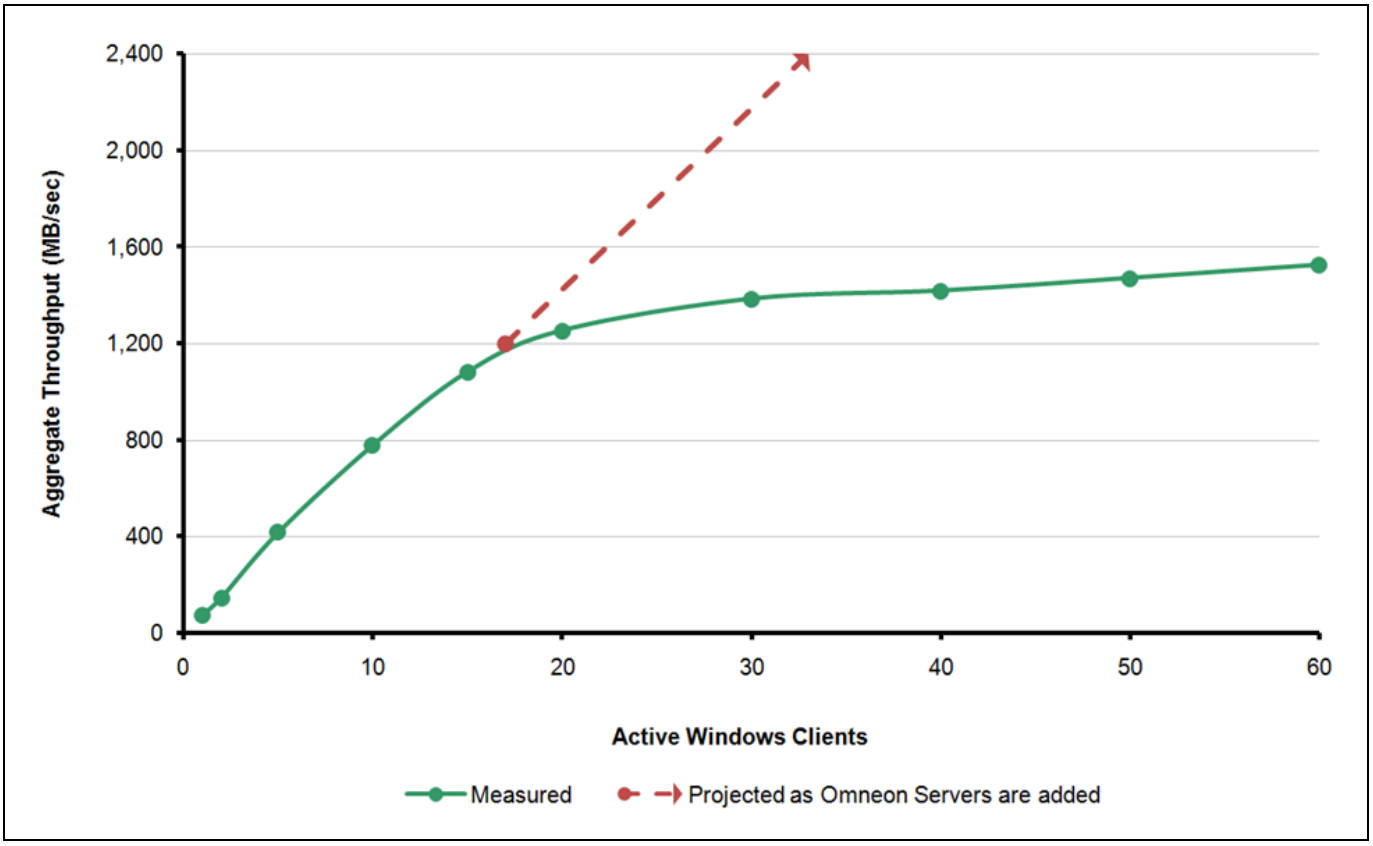
FIGURE 10. EVALUATING THE PERFORMANCE SCALABILTY OF A MEDIAGRID



A bandwidth intensive 64 KB sequential read workload was created using the industry standard IOMETER workload generator.[2] Each Windows client executed a single stream of 64 KB sequential read requests; the number of outstanding I/O requests per target was set to four in IOMETER. Aggregate performance was recorded as the number of clients was increased from one to sixty. Each of the results presented in Figure 11 represents the average of three 120 second test runs.

[2] http://www.iometer.org/doc/downloads.html, version 2006.07.27

FIGURE 11. MEDIA GRID PERFORMANCE SCALABILTY (60 WINFSD CLIENTS, 64 KB SEQ READS)

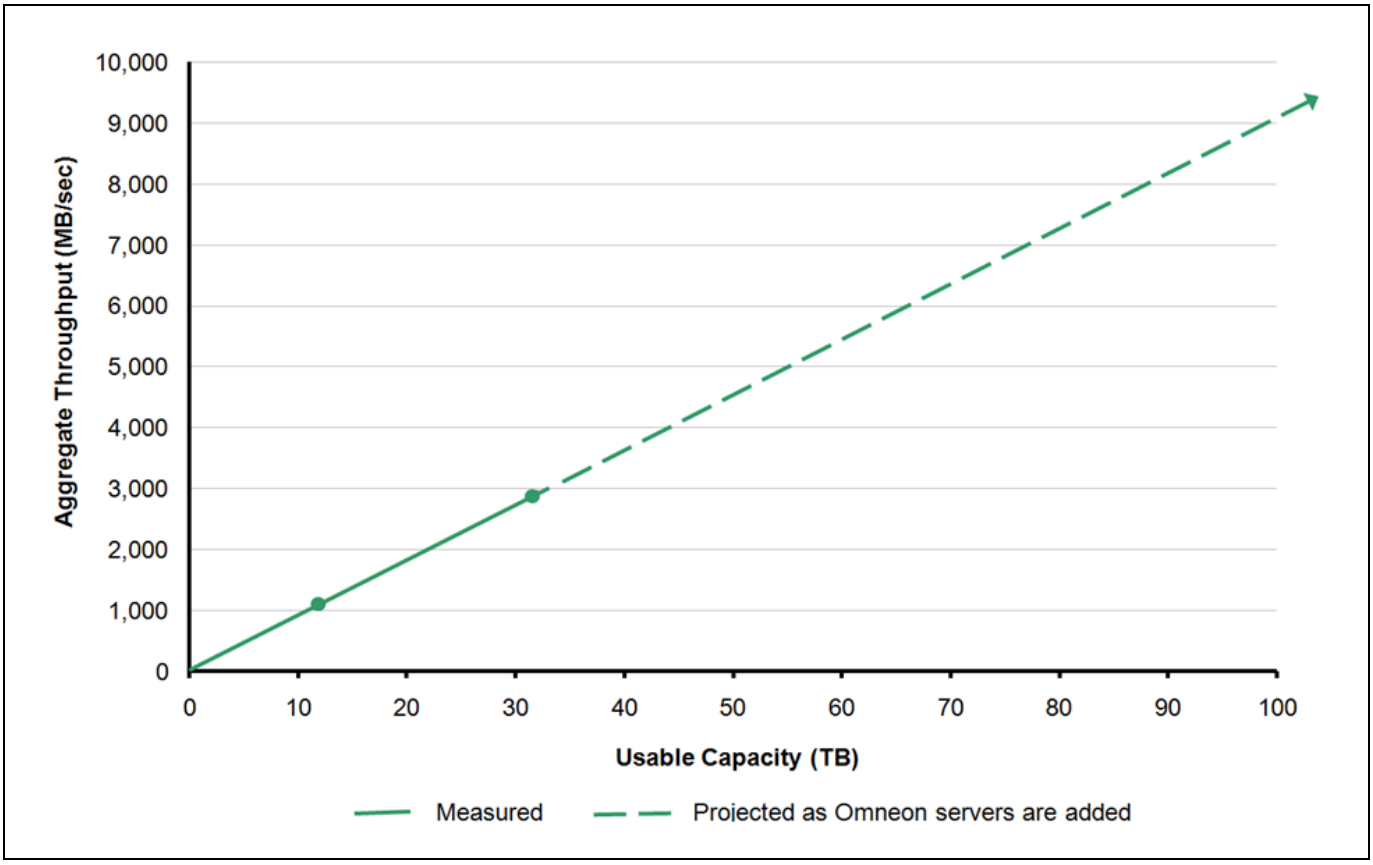


What the Numbers Mean

- As the number of clients and users accessing a shared Omneon file system increases, so too does the aggregate throughput. More aggregate throughput means more work can get done in parallel.
- A single Windows client achieved an impressive single stream throughput rate of 76.05 MB/sec over a single GigE interface.
- Aggregate throughput scales in a nearly perfect linear fashion up to the 1,200 MB/sec for a MediaGrid with 12 ContentServers. This confirms Omneon's claim that each ContentServer adds 100 MB/sec of aggregate throughput to the grid.
- To put the numbers into perspective, a MediaGrid with 1.2 GB/sec of aggregate throughput has the bandwidth required to deliver 76,800 Internet audio streams (MP3) or 22,768 Internet video streams (MPEG).
- Aggregate throughput flattened out as more than 20 clients accessed the grid in parallel, but continued to rise to maximum level of 1.5 GB/sec for the 60 client test.
- These results are based on an application that accesses files using a block size of 64 KB. A smaller block size will yield less aggregate throughput and a larger block size will yield more.
- The inflection point of the curve occurs when all clients consume the total aggregate system bandwidth. Based on observed performance, larger clusters should also scale nearly linearly to their maximum aggregate bandwidth.

To confirm that aggregate performance continues to rise as servers are added, the 1.2 GB/sec result measured on a 12 TB MediaGrid was compared to results collected during a recent customer evaluation of a 32 TB MediaGrid solution.. As expected, adding ContentServers increased the total aggregate performance of the system in a near linear fashion as shown in Figure 12. The customer test bed was composed of 22 PCs running the WINFSD driver with each PC accessing the grid through a pair of GigE interfaces.

FIGURE 12. SCALING CAPACITY AND PERFORMANCE WITH OMNEON MEDIAGRID



What the Numbers Mean

- Aggregate throughput increases in a near linear fashion as ContentServers are added to the grid.
- Omneon currently supports two versions of ContentServers: 1U ContentServers with four hard drives for performance sensitive applications (e.g., video workflow) and 4U ContentServers with 16 hard drives for applications that require more cost effective capacity (e.g., video archive). Regardless of the model used to build a grid, aggregate throughput increases as servers are added to the grid.

Why This Matters

Meeting the bandwidth-intensive performance demands of large file and rich media applications using traditional storage architectures can lead to over-provisioning, increased complexity and wasted capital costs. Leveraging the cost-effective processing power, bandwidth and memory of standards-based servers as they join together to form an Omneon MediaGrid, a single pool of Omneon storage can scale to meet the needs of applications with extreme aggregate throughput requirements.

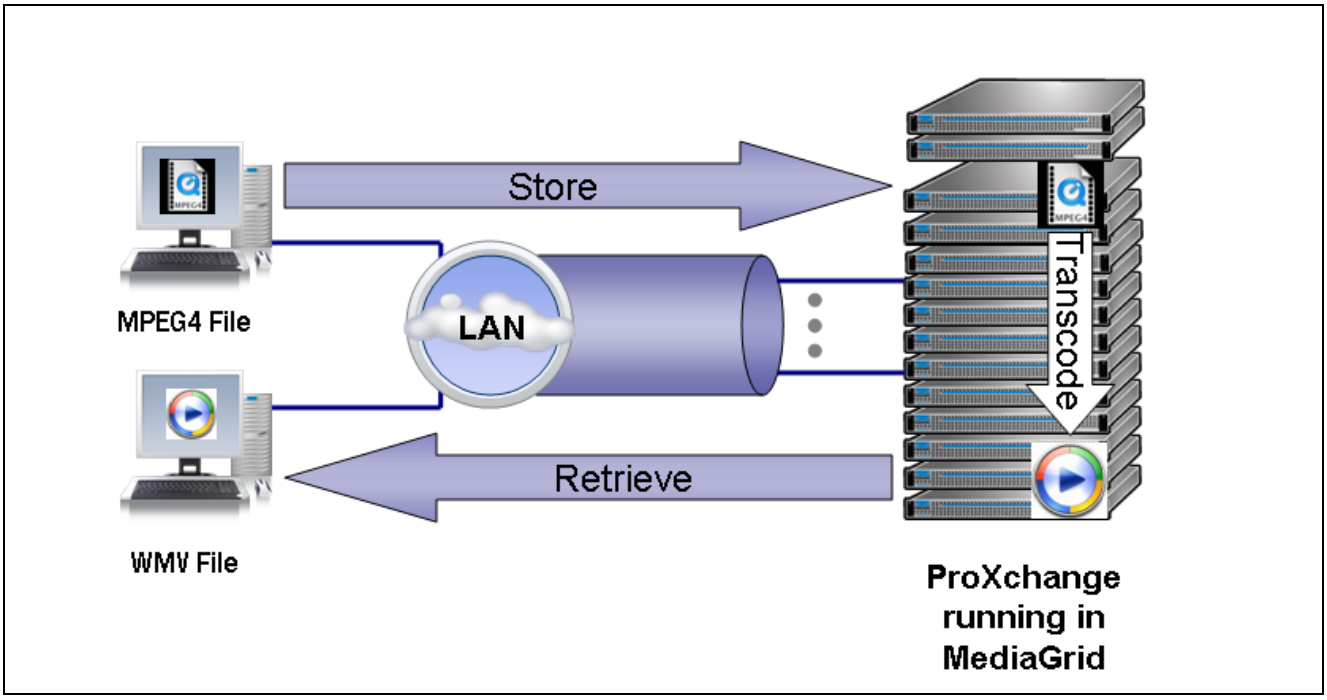
Content Aware

MediaGrid is an object-based storage system that can recognize the nature or essence of a file and perform actions based on that knowledge. MediaGrid is especially aware of the essence within a video file. Take, for example, an mpeg file. The format of an mpeg file includes a metadata map of the video and audio clips within a video sequence. MediaGrid software knows how to read that map and optimizes the storage, retrieval and processing of video files based on that knowledge.

A powerful example of the content awareness of a MediaGrid is its ability to run applications within the grid. Omneon publishes an API that customers are using to harness the spare CPU horsepower within the grid. ProXchange is one application that uses this API to transcode videos as files are being ingested by a MediaGrid.

ESG Lab Testing
ESG Lab Copied an MPEG4 video file into a folder being monitored by the ProXchange application running inside a MediaGrid. Upon detecting and recognizing the file, ProXchage immediately transcoded the file to Windows Media Video format and wrote the new file to a destination directory specified in the ProXchange policy.

FIGURE 13. OMNEON PROXCHANGE



Why This Matters

Storage systems have historically been unaware of the nature of the data being stored on them. A storage system that is aware of the essence of the information being stored can be used to offload processing that is normally performed by servers attached to a storage system. Taking advantage of spare CPU horsepower within the storage system can not only make file intensive operations run quicker, it can also be used to drastically reduce the amount of data moving over a network. Applications running directly in an essence aware storage system eliminates the need to move content between digital islands and speeds workflows. ESG Lab was extremely impressed by Omneon's unique ability to transcode video files into different formats as they land within a MediaGrid.

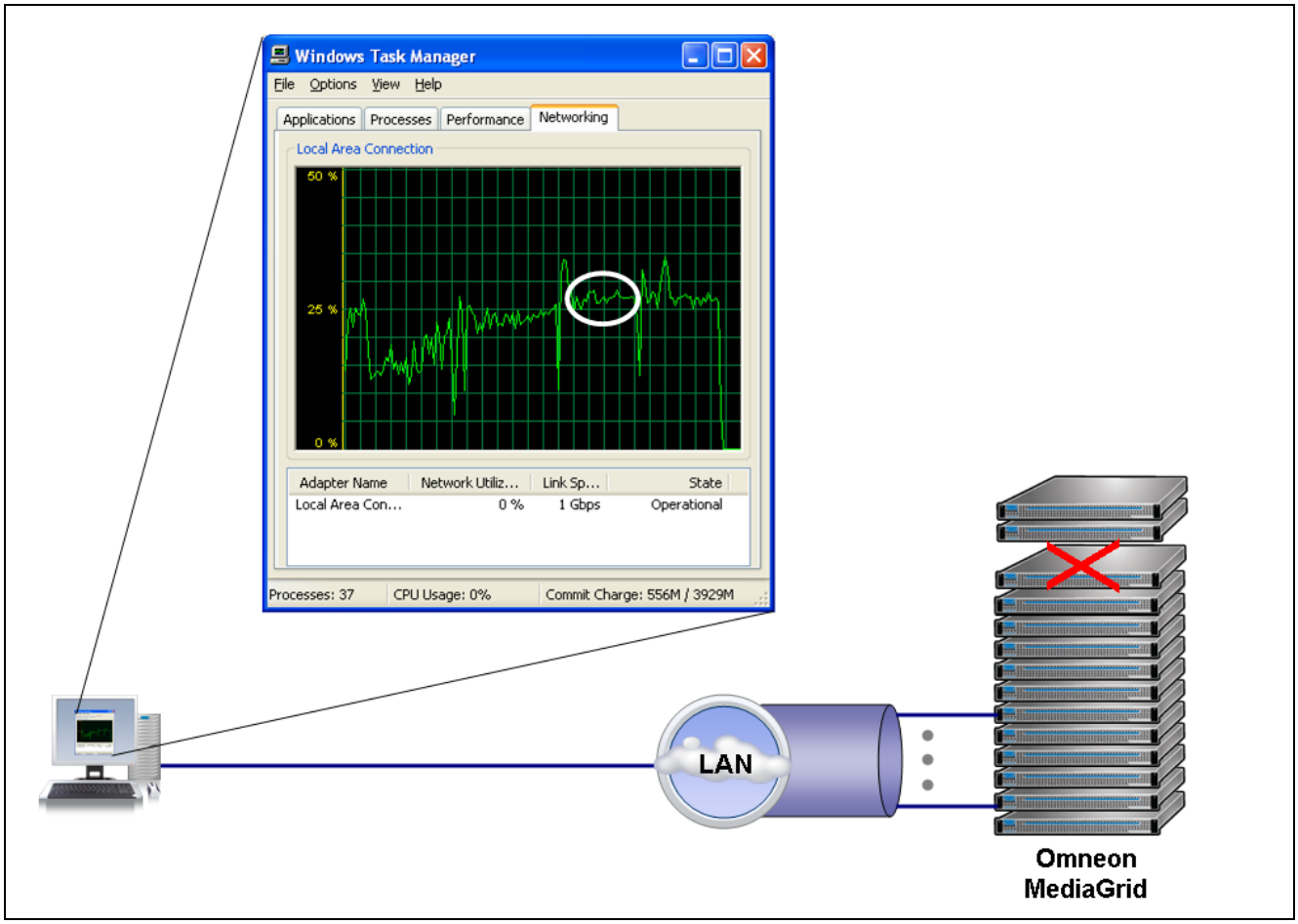
Highly Available

Omneon made its name in the broadcast industry delivering video servers into environments where fault tolerance is an absolute requirement. Omneon video servers are used to broadcast the images we see nightly on major news networks. A failure in one of these systems can not be tolerated. This heritage of always-on fault tolerance has been extended to the broader market in the MediaGrid architecture. The Omneon MediaGrid was designed to survive hardware failures and never be turned off. A massively parallel clustered architecture, redundant hardware and self-healing replication of file data is used to survive any type of failure or service event with no interruption in service.

ESG Lab Testing

A ContentServer and a hard drive were failed during ESG Lab testing. Testing began by copying a directory containing four gigabytes of large video files to a directory on the MediaGrid file system. While the copy was in progress, ESG Lab powered off one server as it was actively writing data. Figure 14 shows the Windows Task Manager with the period in time where the server was powered off circled. ESG observed that the copy process proceeded uninterrupted, with no decrease in performance.

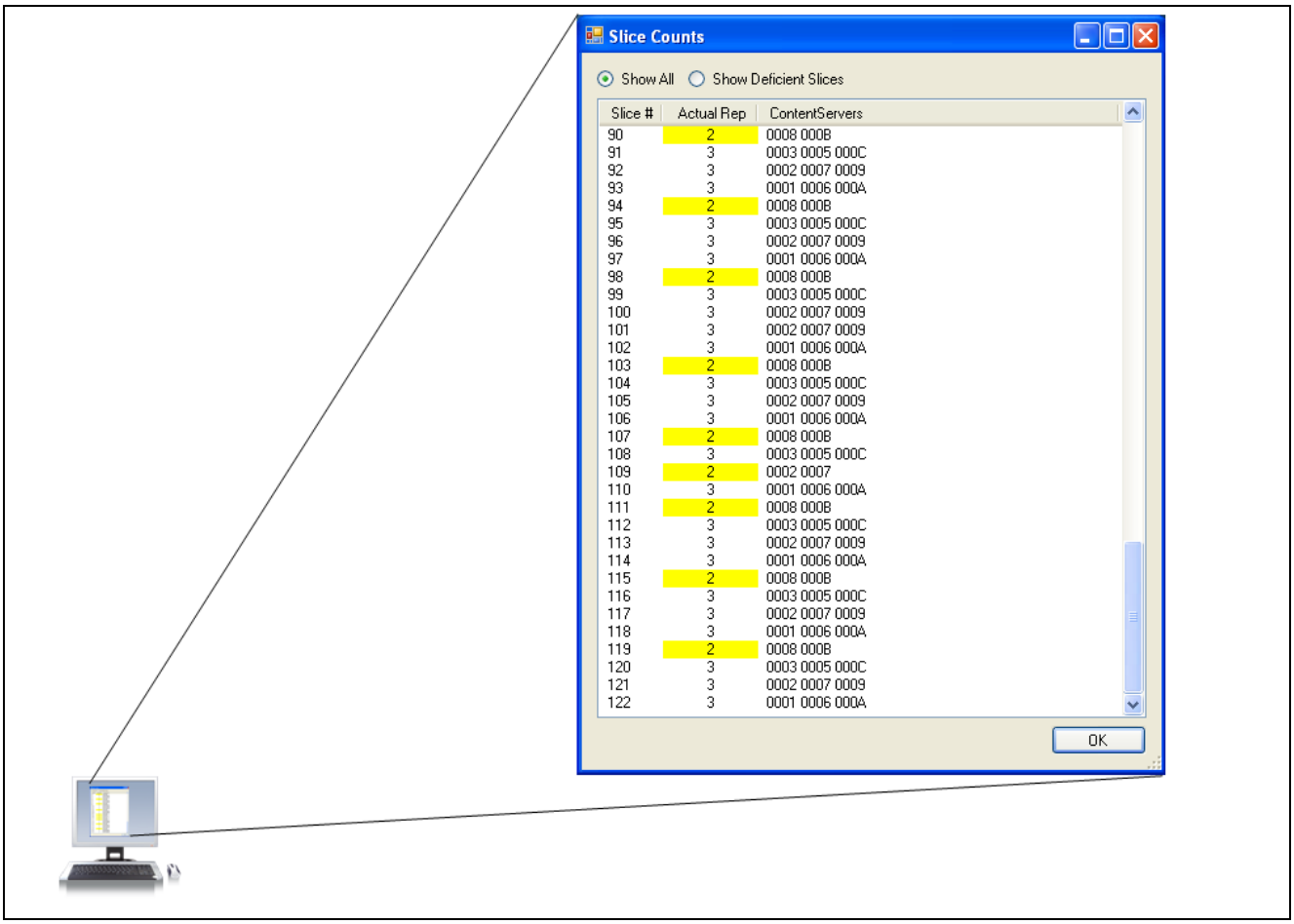
FIGURE 14. FAILING A SERVER



ESG Lab loaded the Content Manager and looked at a file that had been written to the powered off server. As can be seen in Figure 15, MediaGrid now identifies that file as having 'deficient slices.' What this means is that the redundancy of the file had dropped below a threshold set by the administrator. In this case, the file was set to redundancy level three, meaning that three copies of each slice were to be maintained by the MediaGrid. The deficient slices are highlighted in yellow. Once the MediaGrid had determined that a server or hard drive had

indeed failed, it re-copied all deficient slices to other servers to bring the total back up to the minimum required.

FIGURE 15. DEFICIENT SLICES



A similar test was performed with a simulated hard drive failure. ESG Lab was impressed with the customer friendly blue LEDs that are used to find a server in a rack and identify a failed drive to replace. Drives were packaged in a customer replaceable unit (CRU). Compared to some legacy storage arrays where it's easy to replace the wrong drive and cause data loss, replacing a failed drive in a MediaGrid was straightforward and intuitive.

Why This Matters

As storage systems grow in size and complexity, so too do the chances of things going wrong. Regardless of the number and types of hardware failures that may occur during the life of digital files on disk, managers, employees and customers expect that their files will always be available. ESG Lab has confirmed that Omneon has leveraged its heritage of always-on reliability in the broadcasting industry to provide a self-healing storage system that is easy to service and never needs to be turned off.

ESG Lab Validation Highlights

- ☑ Eight minutes after plugging a factory racked and configured Omneon system into an Ethernet LAN, files were being dragged and dropped from a Windows client.
- ☑ ESG Lab accessed a shared 11 TB pool of storage using the familiar look and feel of a Windows file system. Two methods were tested: The performance optimized Omneon file system driver and through a ContentDirector using the industry standard CIFS network attached file system protocol.
- ☑ Less than 3 MB of memory were used and no CPU overhead was noticed on a Windows client as it copied large files through the Omneon file system driver.
- ☑ Adding a new ContentServer to an existing MediaGrid for additional capacity and performance was fast, simple and non-disruptive.
- ☑ Aggregate large block sequential read performance scaled in a nearly perfect linear fashion up to 1.2 GB/sec and peaked at 1.5 GB/sec for a 12 node Omneon Media Grid.
- ☑ Omneon ProXchange, a video essence aware application that transcodes video content into different formats as it is being ingested, was observed running on spare processing power within the grid.
- ☑ ESG confirmed that the MediaGrid leverages the always-on heritage of Omneon's flagship video server line. Omneon server and drive failures were transparent to running applications and extremely easy to fix.

Issues to Consider

- ☑ While ideally suited for applications that use large files (e.g., video and audio), the performance of the Omneon MediaGrid has not yet been optimized for general purpose applications that tend to deal with relatively small files (e.g., spreadsheets and general purpose office documents).
- ☑ The aggregate performance of the Omneon MediaGrid gets better and better as the size of the grid is increased. From a price/performance perspective, the system is best suited for applications requiring 12 TB of more of usable capacity spread over 12 or more Omneon ContentServers.
- ☑ While an Omneon MediaGrid integrates well with Active Directory in Windows environments for centralized user account and authorization management, integration with LDAP for similar functionality in a UNIX environments is planned, but not yet supported.
- ☑ ESG is excited about the future possibilities for the object-based essence-aware architecture of the Omneon MediaGrid and its open API for running applications on the grid. Services like virus scanning or search could be ported to run inside a MediaGrid. Moving these data intensive services to the MediaGrid would free up valuable server and networking resources elsewhere in the data center.

ESG Lab's View

The days of the commercial IT entities exclusively creating and managing transactional systems ended with the advent of distributed computing. In the Internet computing era, digital content is created in every conceivable nook and cranny both inside and outside the "enterprise." This data is almost exclusively file-based and tends to be significantly larger than the files these enterprises have traditionally dealt with.

The attributes associated with this data are also changing versus traditional corporate data. Unlike the transactional era, where growth was somewhat predictable, the modern era has no such benefit. It is almost impossible to predict capacity requirements and even harder to predict "value." In the Internet computing era, the opportunity cost of not delivering data can be much higher than the cost of preparing for it.

Businesses moving forward have to prepare for a new reality in which a rich media experience will be demanded by employees, customers, prospects, and partners—and content can (and will) be created at any time at any point on the globe. It's difficult, if not impossible, to leverage legacy monolithic architectures to satisfy requirements of the new era, namely, infinite effective scale (in real-time, dynamically), self-managing, self-healing—built on commodity based components that ensure economic optimization.

The primary difference between the requirements of the known Web 2.0 players—the Facebooks and Googles of the world—and more traditional commercial endeavors are narrow and getting even narrower. The traditional business has all of the unknown requirements of the Web built business, but cannot afford to subject its users and customers to "build it yourself" infrastructures. They require all the same scale and dynamism, but in a supportable package.

Omneon grew up in the media world where delivering large files is the only thing that matters—and doing so on bullet-proof platforms since any downtime equates to a huge loss of revenue. Being able to apply these principals to the enterprise seems to be a completely natural next step.

ESG Lab was impressed with the simplicity, elegance and scale of the MediaGrid Architecture. Using industry standard components racked and ready to be plugged into a standard Ethernet network, an Omneon MediaGrid creates a huge pool of capacity that's as easy to use as a corporate home drive. With extreme levels of aggregate performance that scale in a near linear fashion as servers are added and the amazing capability of hosting video essence aware applications within the grid, ESG Lab believes that MediaGrid is ideally suited for the ingest, manipulation and archival of rich media.

Omneon's traditional product set was purpose built for a specialized market. In the world where Web 2.0 meets traditional business, every enterprise is becoming a media company. ESG believes that forward looking IT managers who can see a wave of Web 2.0 media washing up on the shores of the enterprise would be wise to consider the Omneon MediaGrid—a scalable, essence-aware, always-on storage system.

Appendix

TABLE 1. CONFIGURATION DETAILS

Hardware	Software
Omneon MediaGrid system: 2 ContentDirectors 12 ContentServers 2 ContentBridges	MediaGrid, version 2.0 SR4 Content Mgr, version 2.0.8 ProXchange, version TBD
Dell Optiplex GX745, 2 GB RAM 2 Ghz Intel e4400, Core2 Duo CPU 1Gigabit Ethernet connection	Windows XP Professional, Service Pack 2 File system driver version 2.1 IOMETER 2006.07.27
HP ProCurve GigE switch, 3x24 port modules	

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