

Omneon MediaGrid™

ACTIVE STORAGE SYSTEM

Turbocharging the Digital Media Workflow

Omneon MediaGrid is the first content storage system that plays an active part in the broadcast workflow. More than just high-performance shared storage for all users within a facility, MediaGrid constantly adapts to the changing resiliency and bandwidth requirements of the broadcast workflow and actively performs media processing functions on stored content. MediaGrid also easily integrates with workflow and content management applications through open file protocols and APIs.

MediaGrid combines grid storage with grid computing through the use of multiple intelligent, interconnected-yet-independent content servers to create a system that scales in manageable increments of capacity, bandwidth and media processing power.

Combined with Omneon Spectrum™ media servers, MediaGrid enables television broadcasters and content providers to migrate from video tape to an all-digital, disk-based workflow and connect many disparate systems into a single shared storage environment. MediaGrid dramatically enhances the efficiency of digital media access across the entire production, storage, delivery and distribution chain.

With MediaGrid, gone are the system bottlenecks, proprietary file formats, metadata mismatches, format incompatibilities, manual dubbing, archiving complexities, and annoying wait times. Enter the new era of performance-driven shared storage, an optimized workflow environment with time-saving advances such as multi-channel automated ingest; direct file transfers to and from central storage; easy-to-find media clips; zero wait time to edit; and complete integration between central storage and playout.

Introducing Active Storage

Traditionally, storage systems have been static warehouses where data is kept until needed. External processing devices and data transfers were required to perform even the simplest of media processing tasks. With the introduction of MediaGrid, Omneon ushers in an era of integrated media processing. Tightly integrated nodes of storage, bandwidth and application processing connect to one another to become a single storage volume.

The MediaGrid architecture is designed to simultaneously protect media while providing maximum access to it. As data is transferred to the system, it is divided, replicated and distributed across the



› BENEFITS

Workflow Integration

By combining processing power, storage capacity and access bandwidth in every component, MediaGrid goes beyond other storage products that passively store bits to being a system that constantly adapts to the changing requirements of the broadcast workflow and actively performs media processing functions on stored content.

Grid Storage & Grid Computing

With an elegant grid-based architecture and simplified system management, MediaGrid achieves levels of performance, scalability and resiliency that cannot be matched by traditional SAN or NAS storage products.

Smart Scalability™

Based on the same modular design principles Omneon is known for, MediaGrid allows broadcasters to customize a system to meet their specific requirements for access bandwidth, storage capacity, file protection and media processing power. A system that starts at 5 terabytes can easily scale to multiple Petabytes in size without a rebuild or a partition.

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<http://www.omneon.com/solutions>

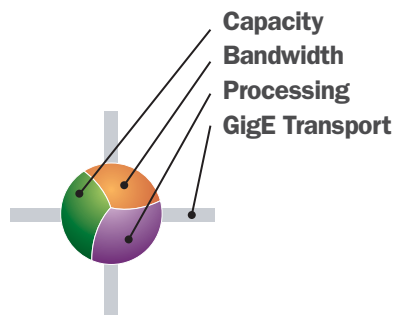
entire array of disks. This arrangement provides built-in data integrity by maintaining replicas of files stored in different locations of the storage pool. File availability is optimized by dynamically increasing the number of copies of high-demand content. MediaGrid instantly responds to data errors and automatically recovers without lengthy rebuilds and dangerous periods of vulnerability.

At another level, MediaGrid acts as a parallel computing platform for media processing applications that run directly within the system. Now processes such as quality control, transcoding, closed caption embedding and audio track tagging can all be executed within the grid, eliminating the need to move the data to separate digital islands and then back into storage.

Inside the Grid

The main components of a MediaGrid system are ContentDirectors and ContentServers. ContentDirectors act as the overall file system controllers, managing the distribution of data throughout the system and providing data maps to clients for retrieval of media from the system.

ContentServers are the engines that actually store and provide access to media. ContentServers, available in “high-bandwidth” and “high-capacity” configurations ranging in size depending on drive density, are individual storage servers that provide a certain amount of storage capacity, high-bandwidth network access, and processing power.



Each ContentServer in the MediaGrid is a tightly integrated combination of storage capacity, networking bandwidth and processing power.

ContentServers are smart nodes that communicate with clients or one another directly. These nodes are interconnected via redundant Gigabit Ethernet connectivity. This simple structure makes MediaGrid easily scalable, reliable and manageable.

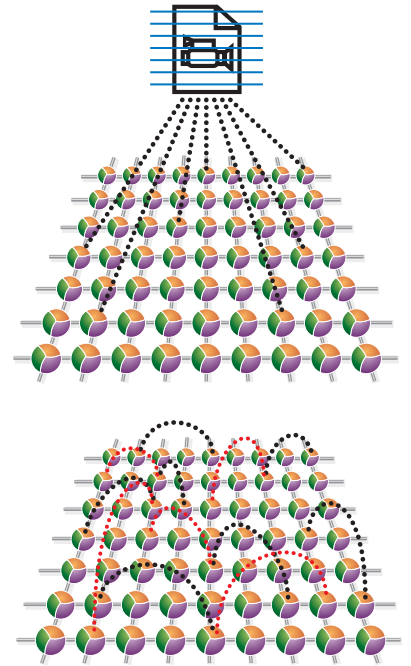
The highly scalable MediaGrid offers storage capacities from as little as a few terabytes to multiple petabytes. Bandwidth starts at multiple Gigabits per second and increases as additional ContentServers are added to many times that amount. Users can choose the amount of network bandwidth and redundancy that’s needed. By utilizing multiple Gigabit links, MediaGrid provides scaling across the entire system. Any single connection can communicate with any piece of stored content.

The Innovative MediaGrid File System

At the core of the MediaGrid architecture is a distributed file system designed to address the particular needs of managing large media files.

MediaGrid uses a file segmentation scheme which employs file slices as the atom of storage, instead of the traditional blocks used by conventional data storage systems. Every file is divided up into slices, and these slices are stored in multiple locations across the pool of ContentServers. Redundant ContentDirectors watch over the distribution of slices and maintain the database of slice locations. A slice on the MediaGrid—whose nominal size is 8MB—is stored and retrieved from the storage pool in an intelligent fashion which ensures both integrity and performance of the system.

As files are sliced and distributed throughout the system, multiple replicas of each slice are created and redistributed to other drives on other ContentServers based on an adjustable replication factor. This allows MediaGrid to provide greater resiliency and bandwidth for critical or high-demand content than for less-used aged content.

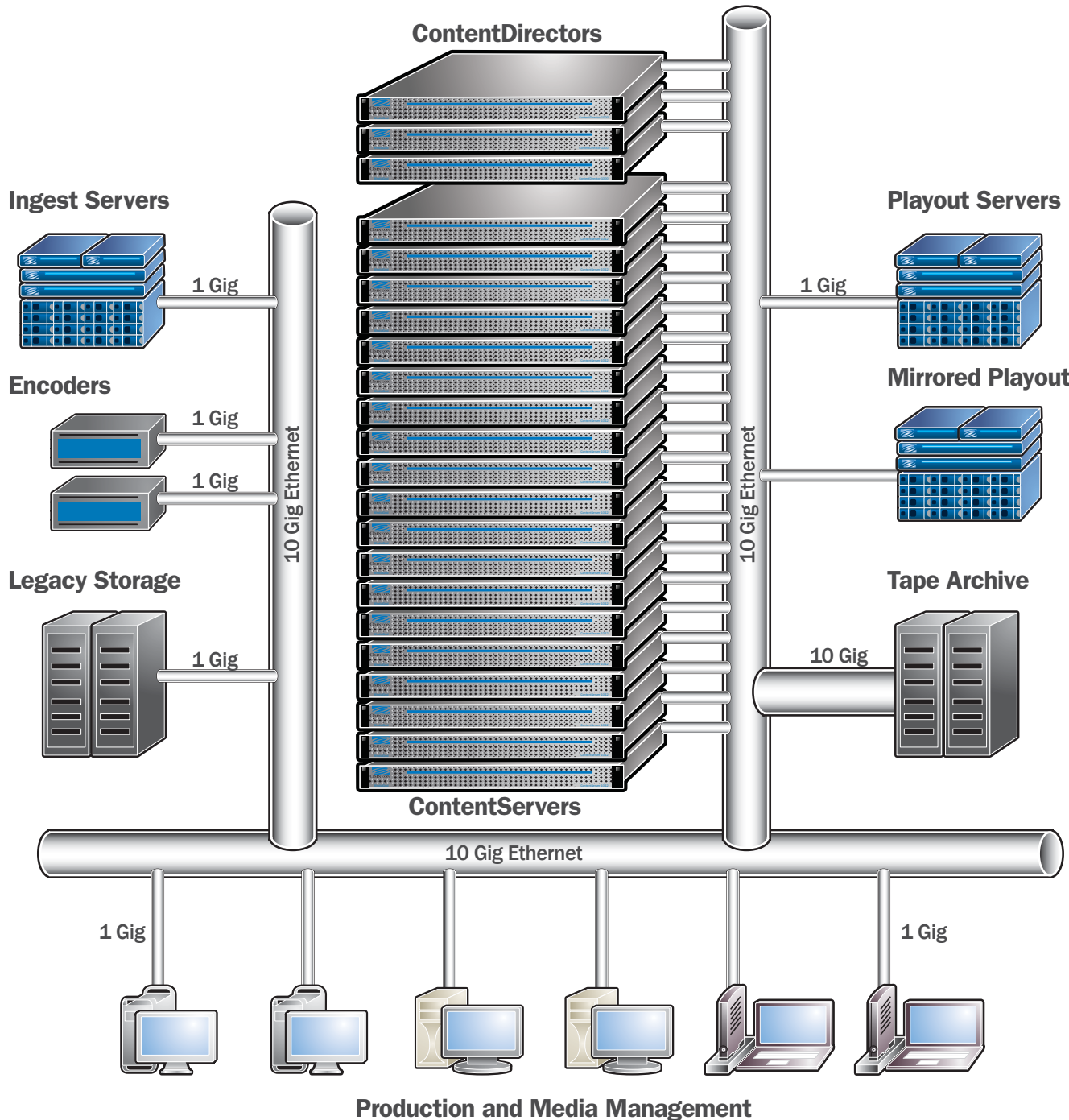


Slicing and replication of a file happen as the file is written to the MediaGrid. Intelligent processing power within each node ensures that the job is completed in the shortest possible time.

No slice and its replica reside on the same content server. This ensures that if any drive or ContentServer were to fail, all slices of all files still exist in the system and can be accessed with no interruption. Further, since the MediaGrid does not rely on older parity drive schemes for resiliency, lengthy RAID rebuilds no longer are needed. The ContentDirector knows which slices resided on the failed ContentServer and immediately direct all the ContentServers in the system to re-copy the missing replicas—automatically without administrator interaction.

Slices also allow active consistency monitoring, a benefit over current RAID systems that—due to bandwidth constraints—detect data loss only when a client attempts to access the data. MediaGrid reaches beyond RAID, actively monitoring the health of all slices in the system with no compromise to client access.

The Omneon MediaGrid System Architecture



The key to the Omneon MediaGrid is its unique modular design utilizing industry-standard components and connectivity to create a highly-configurable and reliable system. Multiple ContentServers and ContentDirectors communicate with one another through standard, high bandwidth Ethernet switches. This bandwidth is available to external clients of the system eliminating the bottlenecks associated with traditional shared storage environments.

To be kept up to date with all the latest Omneon developments, sign up for our newsletter at <http://www.omneon.com/update-me>.

A Mission-Critical System Built for 24/7 Reliability

A system with no single point of failure, the Omneon MediaGrid is designed for ultra-reliable, non-stop 24/7 operation. The modular design of the system supports not only the resiliency of the system, but also the scalability and flexibility. Because each ContentServer node is completely independent and can be added to the system at any time, MediaGrid provides for expansion of capacity, bandwidth and application processing power without shutting down or disrupting continuing facility operations.

Media stored on the MediaGrid is located on interconnected-yet-independent ContentServers, thus allowing for a loss of disks or servers without compromising valuable data. Moreover, because of its unique user-selectable replication-based file system, MediaGrid can eliminate the period of vulnerability associated with RAID-based file system rebuilds.

Active Applications

In many facilities, the power of media management and media processing applications is compromised. This is primarily due to network bottlenecks and versioning issues associated with copying files between proprietary storage islands. MediaGrid allows media applications to manage and process media files while they remain in place on the MediaGrid. These applications, in turn, become more active in the workflow, functioning in parallel with other activity and when they are most beneficial.

Grid Power

MediaGrid is the only storage system to enable essential media processing applications such as transcoding, file-flattening and file-based quality assurance to now be performed by the storage infrastructure itself. By developing an active storage system with scalable application processing power, Omneon has put the power right where it is most needed – with the content. Media processing applications can now become Grid Powered by running their functions in the MediaGrid, in parallel, on dozens of industry-standard, high-performance processors.

Innovation from a Company You Can Trust

As a respected industry leader in providing media servers to the broadcast industry, Omneon's groundbreaking products helped transform the economics of television production, playout and archiving. Now, with the Omneon MediaGrid, a new generation of media storage technology is poised to reshape the way digital media is created, managed, distributed and stored.

Using the most advanced IT technology available, Omneon has re-imagined the digital media facility and optimized its new system for every detail of the workflow from ingest to playout. As a result, the Omneon MediaGrid establishes a new bar for the handling and processing of digital media.

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