Infortrend EonStor DS/GS Series

Media & Entertainment Solutions

Best Practices

Version: 2.3

Updated: Feb., 2023

Abstract:

Focused on media editing, this document describes the design models of media storage solutions and the typical service solutions to highlight the unique characteristics of Infortrend's storage products and customer benefits.

Legal Information

All Infortrend products, including the product/s that customers have purchased from Infortrend, are subject to the latest Standard Warranty Policy available on the Infortrend website:

https://www.infortrend.com/global/Support/terms_conditions

Infortrend may from time to time modify, update or upgrade the software, firmware or any accompanying user documentation without any prior notice. Infortrend will provide access to these new software, firmware, or documentation releases from certain download sections of our website or through our service partners. Customer will be responsible for maintaining updated version of the software, firmware, or other documentation by downloading or obtaining from Infortrend, and installing designated updated code, including but not limited to firmware, microcode, basic input/out system code, utility programs, device drivers, and diagnostics delivered with Infortrend product.

Before installing any software, applications or components provided by a third party, customer should ensure that they are compatible and interoperable with Infortrend product by checking in advance with Infortrend. Customer is solely responsible for ensuring the compatibility and interoperability of the third party's products with Infortrend product. Customer is further solely responsible for ensuring its systems, software, and data are adequately backed up as a precaution against possible failures, alternation, or loss.

For any questions of hardware/ software compatibility, and the update/ upgrade code, customer should contact Infortrend sales representative or technical support for assistance.

To the extent permitted by applicable laws, Infortrend will NOT be responsible for any interoperability or compatibility issues that may arise when (1) products, software, or options not certified and supported by Infortrend are used; (2) configurations not certified and supported by Infortrend are used; (3) parts intended for one system are installed in another system of different make or model.

Trademarks

Infortrend, the Infortrend logo, SANWatch, EonOne and EonStor are registered trademarks of Infortrend Technology, Inc. Other names prefixed with "IFT", "DS", "GS" are trademarks of Infortrend Technology, Inc.

All other names, brands, products or services are trademarks or registered trademarks of their respective owners.

Contact Information

Website	For more information of Infortrend's products and services, visit: https://www.infortrend.com/global/Home
Customer Support	Contact your system vendor or visit the following support site. http://www.infortrend.com/global/Support/Support

Contents

Preface

The purpose of this document is to provide you the knowledge of media & entertainment and the best practices of M&E solutions on EonStor DS/GS storage systems. Infortrend continues to develop the best storage solutions to meet the requirements and expectations of our customers, and provides support with releases of online hardware and software updates from time to time. Visit our official website to check the latest news and customer support system for the latest firmware and software. In case of problems encountered when using our products, contact our technical support.

Audience

This document is intended for Infortrend customers, partners, and employees using EonStor DS/GS systems and M&E purpose.

What's in This Guide

This guide contains the following topics:

- **Overview:** Explains the properties of Media and Entertainment and the key challenges.
- **Infortrend M&E Solutions:** Introduces the advantages and suggested configurations for Media and Entertainment application.
- **Simulation Test:** Shows the results of M&E simulation tests.

What You Should Know Before Reading

This document expects that you are familiar with basic server, storage, and networking concepts and configurations.

Overview

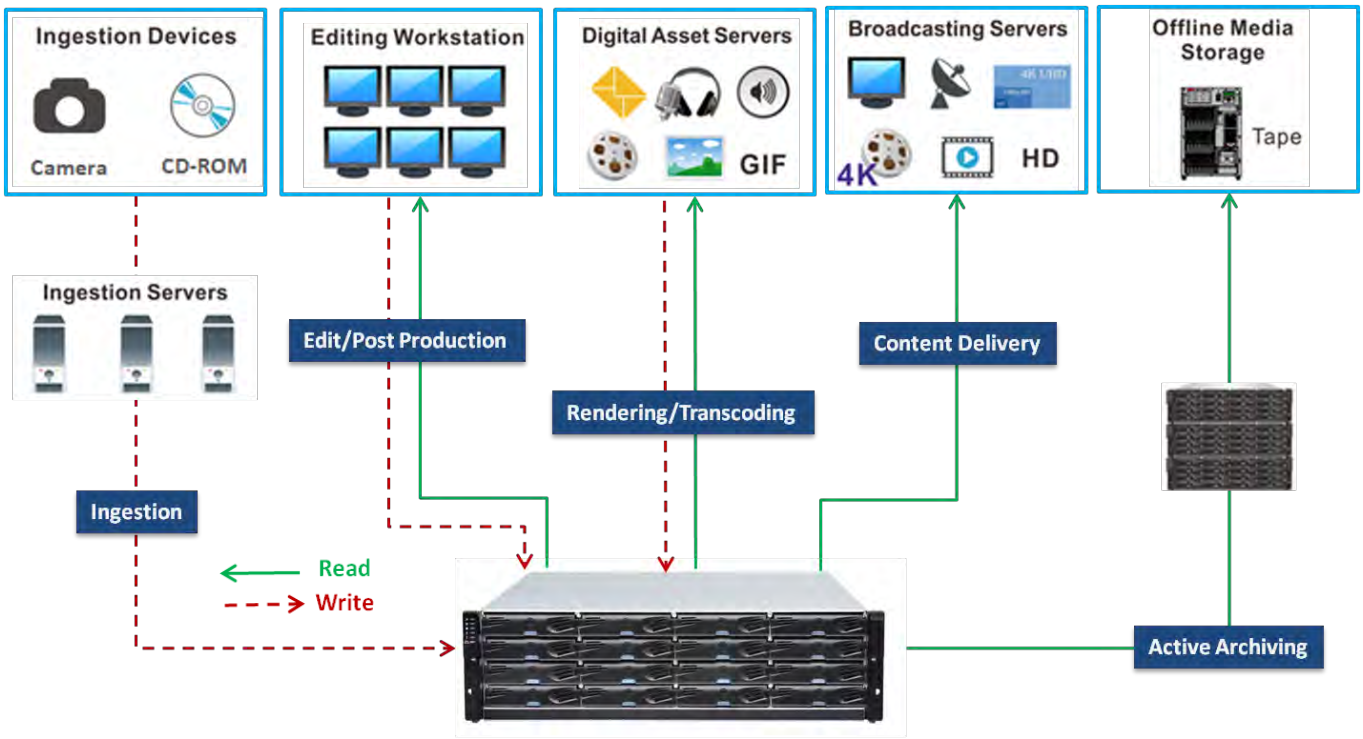
What is Media & Entertainment (M&E)?

The companies in media industry are mainly categorized in three: video production, TV stations, and network streaming services. Video production service providers such as Pinewood or Time Warner offer advertising productions, film post-processing, animation productions, and others. TV stations include local and nationwide TV such as China Central Television (CCTV), American Broadcasting Company (ABC), and more. Network streaming is a new media category that is commonly used in network televisions, VOD, and social streaming platforms such as Facebook and YouTube.

Media Service System

This section introduces the media workflow used by the M&E industry and their corresponding details.

The list below states the operations and requirements that are always involved in the M&E industry: **Ingestion**, **Edit/Post Production**, **Rendering/Transcoding**, **Digital Asset**, **Content Delivery**, and **Active Archiving**.



Media service system and workflow with EonStor DS series

Ingestion

The ingestion process involves everything from image capture to ingesting videos to local computers via upper-layer software programs and migrating those materials into a storage system. Ingest performance may vary depending on upper-layer software behavior and video type. Video ingestion types have changed from a single channel of SD to multiple channels of HD, UHD, and even 4K and 5K streams, which require more storage write-bandwidth and reliability. Infortrend storage solutions provide the high write-performance required to ingest these streams, which not only saves processing time, but also gives customers more time for their editing and creative processing.

Edit/Post Production

Currently, non-linear editing is more popular than traditional tape editing. With their non-linear editing capabilities, Infortrend storage systems are compatible with most of the major third-party editing software programs, allowing you to edit and design with stable performance and high availability thanks to their redundant core components. These systems provide a smooth video ingest in multiple high-resolution streams with no single point of failure. As an added value, Infortrend storage systems have builds that provide maximum scalability to ensure all your video materials are stored and retrieved without any problems, as your storage capacity requirements change.

Rendering/Transcoding

Whether you are transcoding clips to multiple formats or rendering images, high-performance and low-latency storage are the keys to all processes. Infortrend delivers excellent performance to meet the needs of critical IOPS-intensive and latency-sensitive operations, as well as the latest drive technology to maximize SSDs utilization within a storage system.

Digital Asset

Digital asset storage must provide a huge capacity for long-term archive of massive video, image, and audio files, while allowing those media assets to be accessed frequently and efficiently. TV stations call digital asset storage a media asset management (MAM) service system. Infortrend storage systems help users to store a variety of media materials with flexible and scalable expansion enclosures, providing satisfaction of the demands from different editing groups.

Content Delivery

With increasing demand for cost-efficient high-resolution content, many editing groups are looking for a critical system to support the massive uptake in users of multi-stream delivery services, such as studio broadcasting and master control broadcasting. Media workload in video production mainly processes sequential read behaviors with some random read I/O blocks. With multiple data-intensive audio and video

playbacks, throughput and latency are the key performance evaluation indicators and critical components of successful distribution by traditional broadcast, satellite, Internet video or social media. Infortrend storage systems provide multiple effective streaming and high-quality media playback with the best price performance in the market.

Active Archiving

To help the media industry produce creative and inspiring media, Infortrend storage systems deliver a more stable high-bandwidth performance so users can optimize their workflow and quickly access the archived content, which traditional tape storage cannot do. With flexible and scalable capacity, active archives are deployed using cost-effective expansions to store huge media data.

Regardless of whether editing groups focus on all or just some of these six media workflows, Infortrend storage systems provide performance, capacity, and reliability to fit any demands from any type of media and ensure your workflows run smoothly and safely.

Key Challenges for M&E Storage Solution

Once the media is ingested via the cameras or CD-ROMs and saved into local servers, media groups can edit and render those materials as digital assets or in different video formats, after the finished file is broadcasted and archived. Storage systems will face several key challenges for M&E application:

➢ Excellent Storage Performance for Improved Efficiency

Storage performance throughput must support multiple streams in editing and simultaneous delivery. Video format resolutions, frames per second (fps), and compression rate will lead to different demands of bandwidth (see Table 1: Bandwidth demand). Infortrend storage systems can be configured for all kinds of media operations from corporate media and studio broadcasting to 4K post-production and master control broadcasting services. Since media data contains a variety of video stream services formed by huge data blocks, high throughput is a must. When it comes to continuous video recording and playback, low latency and stable throughput ensure that no frames are lost or interrupted. Infortrend storage systems provide excellent performance when it comes to stability and low latency.

Resolution	FPS	Compression	Video Throughput (MB/s)
(4K) 4096 x 2160	24 fps (cinema)	Uncompressed 10-bit RGB	796.0
		BluRay H.264	28.7
		ProRes422	113.0
	30 fps (TV/NTSC)	Uncompressed 10-bit RGB	994.0
		BluRay H.264	35.8
		ProRes422	141.0
(2K) 2048 x 1556	24 fps (cinema)	Uncompressed 10-bit RGB	287.0
		BluRay H.264	10.3
		ProRes422	40.6
	30 fps (TV/NTSC)	Uncompressed 10-bit RGB	358.0
		BluRay H.264	12.9
		ProRes422	50.7

Table 1 Bandwidth demand

➢ Flexible Storage Capacity for Improved Media Workflow

Infortrend's disk enclosures support SSD, SAS, NL-SAS, or a combination of different drive types. The 12 Gb/s SAS technology boosts performance, thus doubling the 6 Gb/s speed transfer. To meet the needs of the editing groups in a larger scale, we provide a variety of form factors for our customers to select from: the standard 2U12/3U16/4U24-bays to the high-density models such as 4U48 and 4U60 bays, which are ideal for capacity-hungry media applications. Also, the cloud gateway feature enables a storage pool to be configured as a cache while massive media materials are stored in a cloud provided by the supported cloud services like, Amazon S3, Microsoft Azure, Alibaba Cloud, and OpenStack Swift.

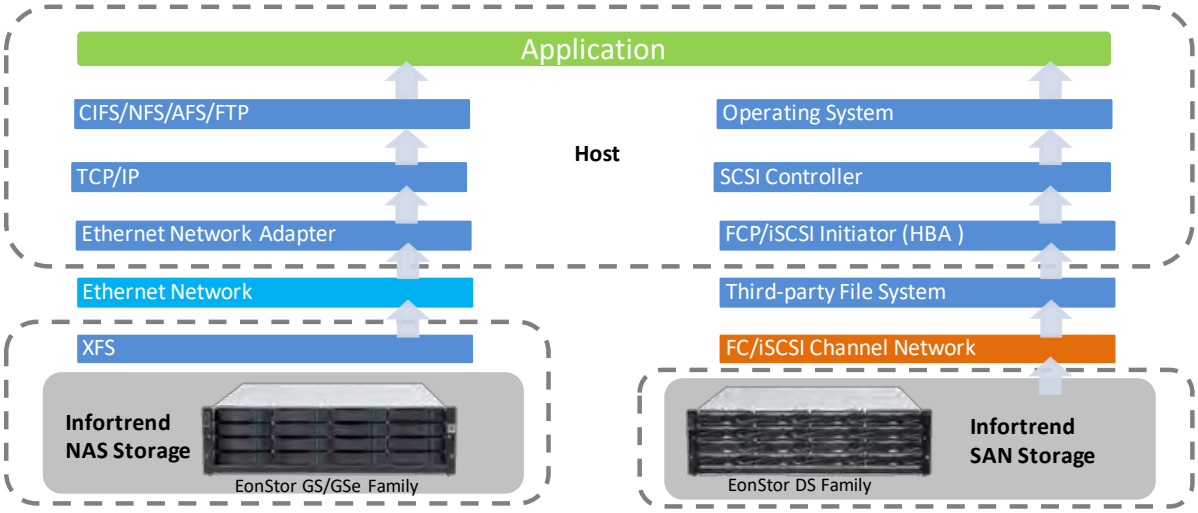
➢ Compatibility with File Sharing Systems and Video Editing Software

The file systems supported in SAN or NAS storage architectures, whether built-in file sharing systems or third-party file engines such as Xsan and Stornext, ensure that all editing groups can access media materials simultaneously. In addition, compatibility with media editing software such as Apple Final Cut Pro and Adobe Creative Cloud is important to support non-linear editing and heavy stream processing.

Infortrend M&E storage solutions facilitate media production procedures from **uploading, downloading and editing video,** to **audio processing, media rendering, content delivering and active archiving.** These media production procedures are detailed in section Infortrend M&E Solutions.

Infortrend M&E Solutions

Infortrend's typical SAN storage solutions use FC/iSCSI architectures, which provide block-level storage. The NAS storage solutions use IP-based network architectures, which provide file–level storage. The diagram below shows FC SAN and IP-based network architectures. See section Infortrend Solutions for solutions of different architectures.

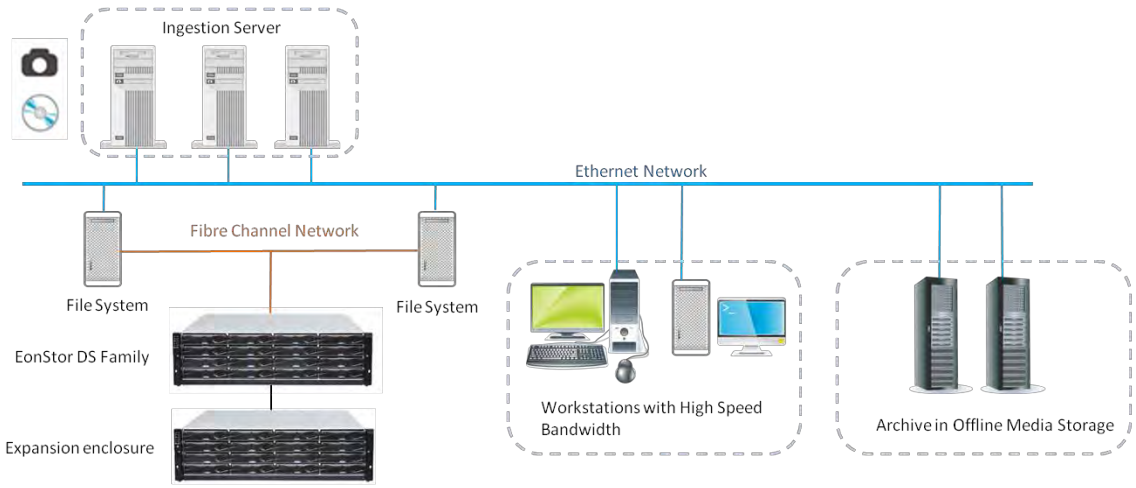


SAN and NAS storage architecture

Infortrend Solutions

I. SAN Architecture Solution

The SAN architecture solution offers high bandwidth and low latency without TCP/IP network fluctuation and packet conflict problems to **support uncompressed 2K/4K/5K high resolution video editing**.

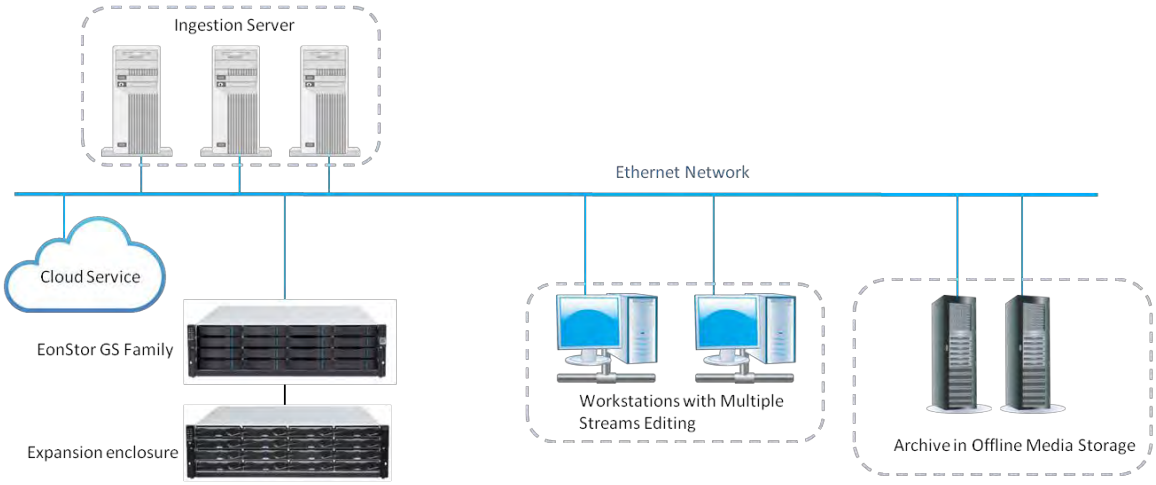


SAN architecture solution

Key Component	EonStor DS families
Iometer Performance (Block)	Total Max. IOPS: 750K IOPS Total Max. Read/Write: 11,000/5,500 MB/s
Capacity Expansion	Infortrend JBOD: JB 3000 series
File Sharing	Third-party file system: Xsan, StorNext, … etc

II. NAS Architecture Solution

The NAS architecture solution **meets the needs of massive multi-stream broadcasting and editing**. The unified storage with full-IP network provides the convenience and compatibility with most network structures.

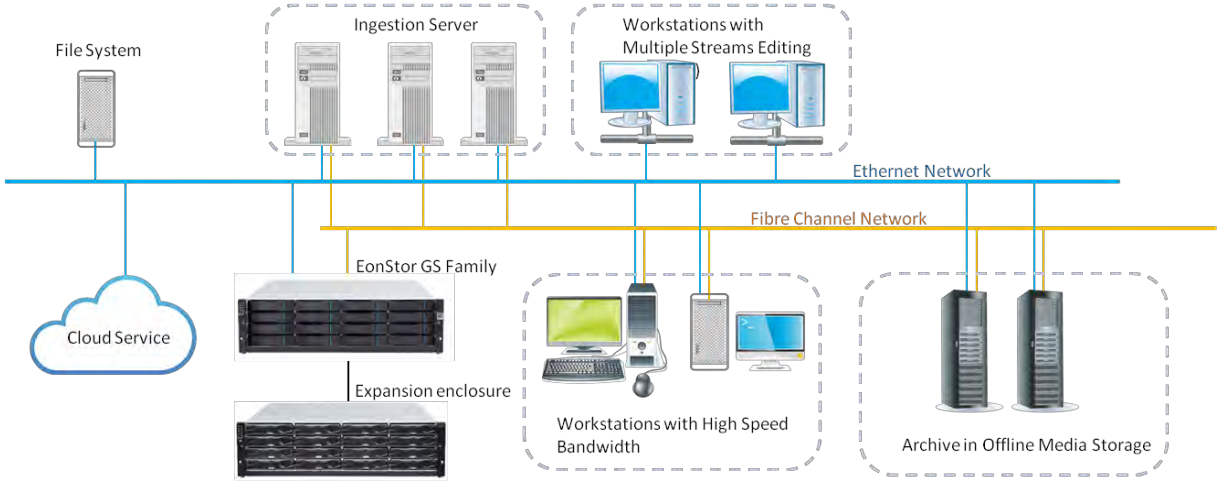


NAS architecture solution

Key Component	EonStor GS families
Iometer Performance(File)	Total Max. read/write: 6,700/3,500 MB/s
Iometer Performance(Block)	Total Max. IOPS: 450K IOPS Total Max. Read/Write: 11,000/6,400 MB/s
Capacity Expansion	1. Infortrend JBOD: JB 3000 series 2. Cloud service: e.g. Amazon S3, Microsoft Azure, Alibaba Cloud, OpenStack Swift
File Sharing	Built-in file system: XFS

III. Unified(SAN+NAS) Architecture Solution

The hybrid SAN+NAS architecture provides optimum flexibility to fit media groups' requirements for **high resolution video retouching** and **multiple small streams editing**.



SAN+NAS architecture solution

Key Component	EonStor GS families
Capacity Expansion	1. Infortrend JBOD: JB 3000 series 2. Cloud service: e.g. Amazon S3, Microsoft Azure, Alibaba Cloud, OpenStack Swift
File Sharing	1. Third-party file system: Xsan, StorNext 2. Built-in file system: XFS

Solution Advantages

➢ Infortrend Storage Properties

EonStor GS Family – Unified High-specification NAS/SAN Storage for Media Industry

Infortrend EonStor GS Family

Infortrend EonStor GS Family

- ✧ **Block & File Storage System (CIFS, NFS, AFS)**
- ✧ **450K random read IOPS (block)**
- ✧ **11,000 MB/s seq. read, 6,400 MB/s seq. write (block)**
- ✧ **6,700 MB/s seq. read, 3,500 MB/s seq. write (file)**
- ✧ **Supports both 16 Gb/s FC and 10 Gb/s iSCSI technologies**
- ✧ **Dual host board design**
- ✧ **Supports up to 900 drives for huge capacity**
- ✧ **Max. 256 GB memory per RAID**

The EonStor GS Family consolidates SAN and NAS with Infortrend's newly-developed RAID Platform Virtualization (IRPV) technology, which supports file-level protocols such as CIFS/SMB, NFS, AFP, FTP, and block-level protocols like fiber channel, iSCSI, and SAS. The interchangeable 16 Gb/s fiber channel and 10

GbE iSCSI host connectivity can support applications with massive I/O streams such as VOD or multiple simultaneous 4K media streams.

EonStor GS 3000 is designed to meet demanding requirements of any media workflow environments and offer the ultimate user experience. It supports hot-pluggable expansion up to 444 drives and a cloud cache, which uses the local capacity as a cache and archive heavy media materials on the cloud for a maximum flexibility, scalability, and availability.

EonStor DS Family – Best for High Bandwidth Workstations in SAN Structure

Infortrend EonStor DS 4000 series

EonStor DS 4000 series

- **750K random read IOPS**
- **11,000 MB/s seq. read, 5,500 MB/s seq. write**
- **10 Gb/s iSCSI and 16 Gb/s FC Technology**
- **Dual host board design**
- **Supports up to 444 drives for huge capacity**
- **Max. 256 GB memory per RAID**

Infortrend EonStor DS 3000 series

EonStor DS 3000 series

- **350K random read IOPS (450K for DS 3000U)**
- **5,500 MB/s seq. read, 2,200 MB/s seq. write (6,500/3,200 MB/s for DS 3000U)**
- **Supports 16 Gb/s FC technology**
- **High density 4U48/4U60 bays RAID and JBOD**
- **Supports up to 360 drives (444 drives for DS 3000U)**
- **Max. 32 GB memory per RAID (128 GB for DS 3000U)**

Infortrend's EonStor DS family features 12 Gb/s SAS and 16 Gb/s fiber connectivity. It is ideal for high power multimedia workstations, offering a consistent throughput as well as flexible and highly scalable storage capacity. It supports simultaneous operations on multiple 4K media streams, while allowing editors to go on with their usual tasks. When extra storage capacity is needed, EonStor DS family can expand online and uninterrupted, and can support up to 444 (DS 4000)/444 (DS 3000U) drives, through high density JBODs. With these features, Infortrend EonStor DS 4000 is the leading solution for the media & entertainment industry.

➢ Video Stream Performance Optimization Function: AV Optimization Mode

AV Optimization Mode is a media enhancement feature of Infortrend EonStor DS/GS family designed to optimize high resolution media applications such as 5K, 4K, 2K, UHD, HD video and multiple streaming applications such as VOD (Video on demand) and MOD (Multimedia on demand) with two major parameters: **read-ahead** and **maximum drive response time**. **Read-ahead** not just automatically detects multiple sequential I/O operations, but also sets up the size of pre-read cache for each stream appropriately, prompting caching of essential media data, and providing a stable high throughput without frame drop.

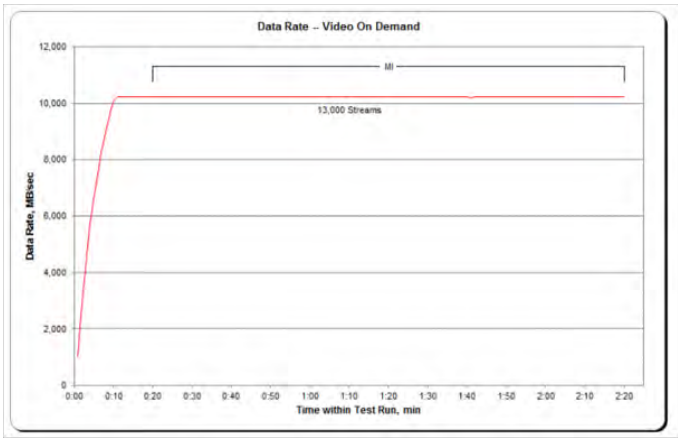
Maximum drive response time ensures that every drive responds to each I/O request immediately. If one (RAID5) or two (RAID6) drives experience delays in their I/O response, the read-ahead feature will read parities in cache, allowing the Infortrend storage system to use parities to compute the needed data instead of waiting for the delayed I/O to provide a smooth video streaming in any ingestion or production.

Video Format	Read Throughput Improvement (%) *
(5K) 5120 x 2700 10-bit RGB	25%-31%
(4K) 4096 x 3112 10-bit RGB	32%-38%
(4K) 4096 x 2160 10-bit RGB	28%-34%
(4K) 3840 x 2160 10-bit RGB	33%-39%
(2K) 2048 x 1556 10-bit RGB	30%~40%

* The performance improvement percentages shown are only guaranteed in specific configurations with AJA benchmark tool.
** Tested with EonStor DS 4000 Gen2 model.

To validate our improved performance, we tested AV Optimization with AJA benchmark tool and used SPC-2's method with RAID 5. The results speak for themselves: using one Infortrend RAID system with 5 JBODs delivers 25%-39% improvement in broadcasting 5K/4K video and nearly 10,223 MB/s read throughput performance with support for up to 13,000 simultaneous VOD streams.

SPC-2-VOD	Test Result
Number of Streams	13,000
Average Data Rate, MB/sec	10,223.60
Per Stream Data Rate, MB/sec	0.79
Average Response Time, ms	1.97



Stable Throughput with EonStor DS 4000 Gen2 in SPC-2 VOD Result

AV Optimization Recommended Settings:

Fewer Streaming Mode

✓ Large resolution video playback or AJA Benchmark tool testing

Multiple Streaming Mode

✓ Media editing software such as Autodesk Flame

✓ VOD/MOD or small block size testing with SPC-2's method

➢ Solution Highlights

Solutions of SAN Configuration

Family	EonStor GS Family (Unified Storage)			EonStor DS Family (Block Storage)	
Position	Mid-Range			Entry to Mid-Range	Mid-Range
Model	GS 1000	GS 2000	GS 3000 G3	DS 3000	DS 4000 Gen2
Iometer Read/write (MB/s)	5,700/2,400	9,800/4,300	16,500/9,000	5,500/2,200 6,500/3,200 (DS 3000U)	11,000/5,500
Host Connectivity	Fibre Channel: 16 Gb/s, 32 Gb/s iSCSI Channel: 10 Gb/s, 25 Gb/s (Optical & Copper)				
Third-party File System	Xsan (Mac) StorNext (Windows and Linux)				

Solution of NAS Configuration

Family	EonStor GS Family (Unified Storage)		
Position	Mid-Range		
Model	GS 1000	GS 2000	GS 3000 G3
Read/write (MB/s) (CIFS)	570/470	5,900/2,600	13,000/4,100
Read/write (MB/s) (NFS)	700/370	2,200/2,000	12,000/4,100
Host Connectivity	IP-based Network (10 Gb/s & 25 Gb/s)		
Third-party File System	N/A (Built in File System)		
File Level Protocol	CIFS/SMB, NFS, AFP, FTP		
Cloud Service for archive	Public Cloud: Amazon S3, Microsoft Azure, Alibaba Cloud Private Cloud: OpenStack Swift		

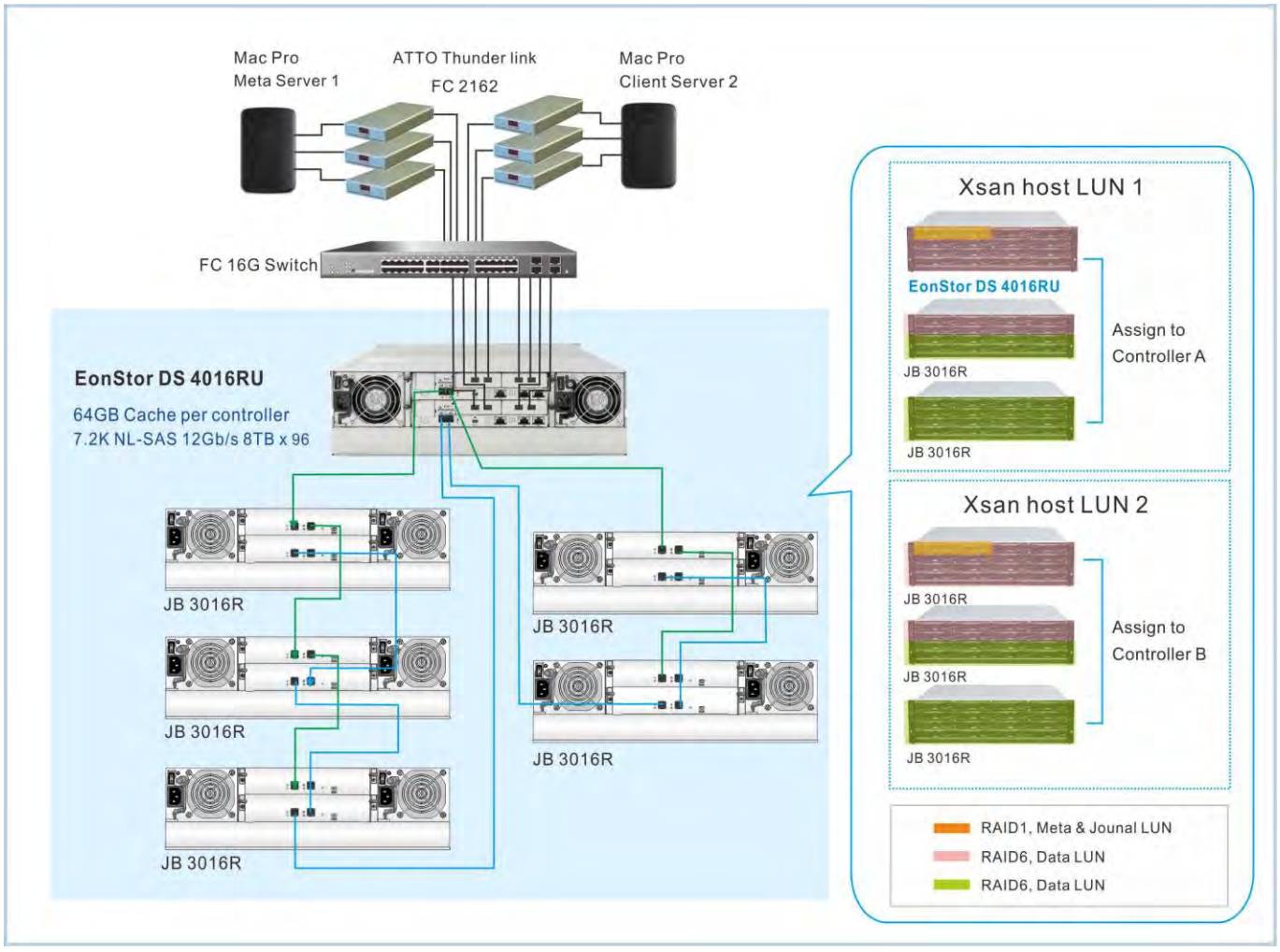
Simulation Test

With the media content workflows in mind, Infortrend carried out simulation tests with EonStor DS 4000/3000 series based on the following configurations:

Test Case 1: GS 3000/DS 4000 Stream Test with Mac OS

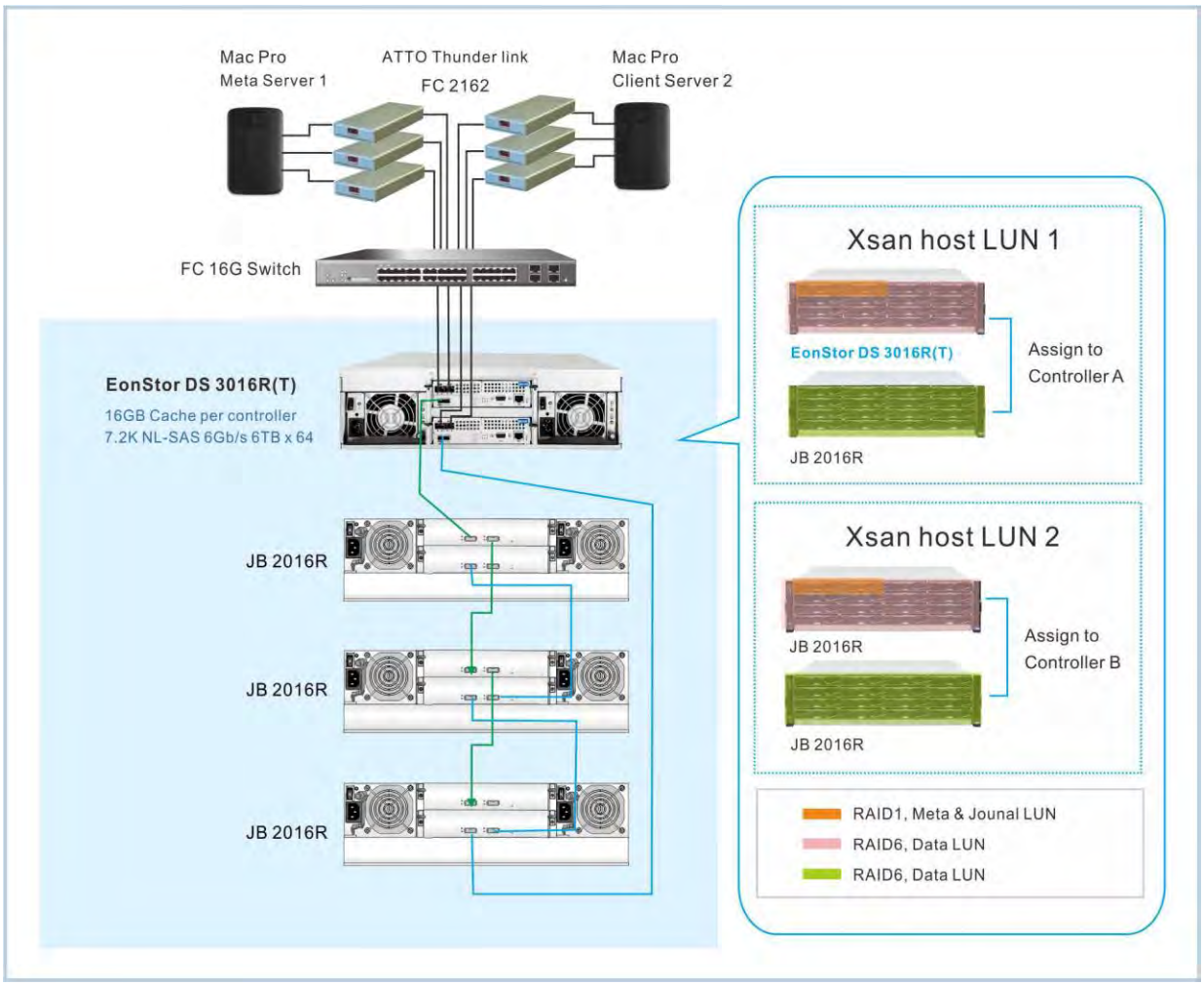
➢ Configuration

EonStor GS 3000/DS 4000 Stream Test Configuration - Wiring Diagram & LUN Configuration



Wiring diagram & RAID configuration of EonStor DS 4000 stream performance test

EonStor DS 3000 Stream Test Configuration - Wiring Diagram & LUN Configuration



Wiring diagram & RAID configuration of EonStor DS 3000 stream performance test

SANWatch Setting

In *System Settings > Disk Array > AV Optimization Mode*, two modes can be enabled.

Fewer Streaming Mode: Editing streams including 5K, 4K, 2K, UHD, HD, and SD video resolutions

Multiple Streaming Mode: Editing streams including VOD and MOD stream type

AJA Benchmark Tool

The AJA disk benchmark is a common benchmark in the video industry which provides performance data. These numbers were run from 2 separate MAC Pros simultaneously, and the results were combined to illustrate overall throughput to the storage. The results are presented for both read and write activity using a variety of video formats.

➢ Performance Results

M&E Read/Write Throughput Performance (MB/s)				
Codec	**Resolution**	**EonStor GS 3000**	**EonStor DS 4000 Gen2**	**EonStor DS 3000(T)**
RAW 10-bit RGB	(5K) 5120 x 2700	7,487/4,215	7,729/4,467	-
	(4K) 4096 x 3112	7,547/4,244	7,753/4,516	-
	(4K) 4096 x 2160	7,298/4,124	7,569/4,387	5,100/1,877
	(4K) 3840 x 2160	7,314/4,063	7,529/4,338	5,038/1,792
	(2K) 2048 x 1556	7,120/3,589	7,040/3,717	4,864/1,639

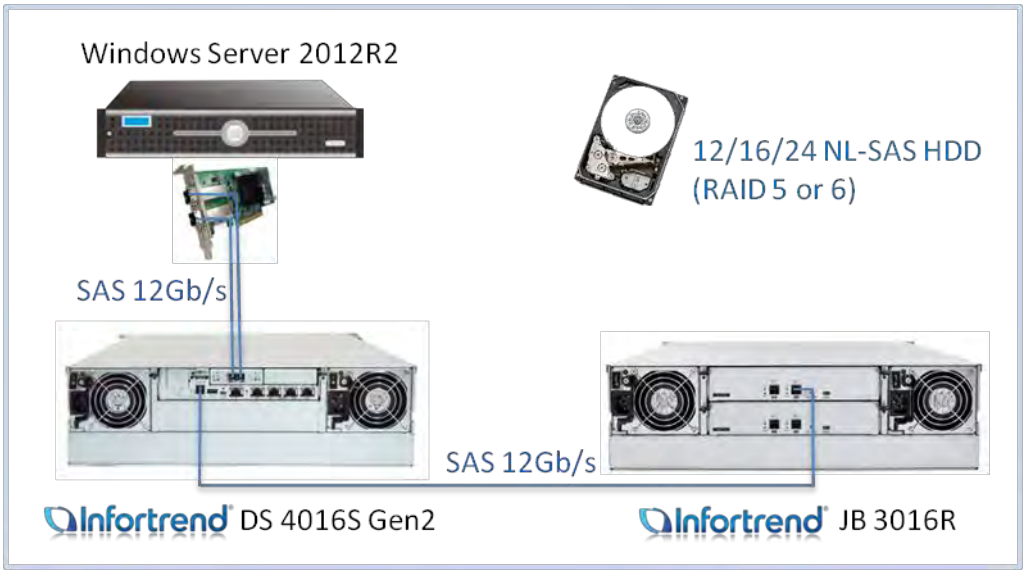
M&E Read/Write Stream Performance (Stream Number)				
Codec	**Resolution**	**EonStor GS 3000**	**EonStor DS 4000 Gen2**	**EonStor DS 3000(T)**
RAW 10-bit RGB	(5K) 5120 x 2700	5/3	6/3	-
	(4K) 4096 x 3112	6/3	6/3	-
	(4K) 4096 x 2160	9/5	9/5	6/2
	(4K) 3840 x 2160	9/5	10/5	6/2
	(2K) 2048 x 1556	24/12	24/12	16/5

Test Case 2: DS 4016S Stream Test with Windows

➢ Configuration

DS 4016S Gen2 Stream Test Configuration

HGST Ultrastar 7K6000 6TB drives are used and recommended for M&E solution. SAS 12 Gb/s channel is deployed. When using 24 HDDs, JB 3016R is arranged. **GPT** is used to format the disk.



Drive	RAM	Controller Assignment	Stripe size	Logical Drive	Logical Volume	Partition	Host LUN Mapping
12	4 GB	Ctrl A	256 KB	1	1	1	Ctrl A - CH4, 5
16	8 GB	Ctrl A	256 KB	1	1	1	Ctrl A - CH4, 5
24	16 GB	Ctrl A	256 KB	2 (12 drives/LD)	1	1	Ctrl A - CH4, 5

SANWatch Setting

In *System Settings > Disk Array > AV Optimization Mode,* **Fewer Streaming Mode** is enabled.

AJA Benchmark Tool

One server with Windows Server 2012R2 ran the results, yielding a stable throughput.

➢ Performance Results

M&E Read/Write Throughput Performance (MB/s) – RAID 5			
12 drives (4 GB RAM per controller)			
Codec Type	**Test File Size**	**Resolution**	**EonStor DS 4000 Gen2**
8-bit RGBA	4 GB	(HD) 1920 x 1080	2,161/2,000
10-bit RGB	16 GB	(4K) 4096 x 3112	2,178/1,988
		(2K) 2048 x 1556	2,176/1,984
	64 GB	(5K) 5120 x 2700	2,177/1,977
		(4K) 4096 x 3112	2,178/1,979
16 drives (8 GB RAM per controller)			
Codec Type	**Test File Size**	**Resolution**	**EonStor DS 4000 Gen2**
8-bit RGBA	4 GB	(HD) 1920 x 1080	2,642/2,572
s10-bit RGB	16 GB	(4K) 4096 x 3112	2,905/2,703
		(2K) 2048 x 1556	2,703/2,693
	64 GB	(5K) 5120 x 2700	2,911/2,700
		(4K) 4096 x 3112	2,905/2,701
24 drives (16 GB RAM per controller)			
Codec Type	**Test File Size**	**Resolution**	**EonStor DS 4000 Gen2**
8-bit RGBA	4 GB	(HD) 1920 x 1080	4,041/3,352
10bit RGB	16 GB	(4K) 4096 x 3112	3,905/4,091
		(2K) 2048 x 1556	3,729/3,570
	64 GB	(5K) 5120 x 2700	3,915/4,146
		(4K) 4096 x 3112	3,959/4,093

10-bit RGB, 16 GB file size, 4K Resolution, with 12 drives and 16 drives in RAID 5

M&E Read/Write Throughput Performance (MB/s) – RAID 6			
12 drives (4 GB RAM per controller)			
Codec Type	**Test File Size**	**Resolution**	**EonStor DS 4000 Gen2**
8-bit RGBA	4 GB	(HD) 1920 x 1080	1,957/1,822
10-bit RGB	16 GB	(4K) 4096 x 3112	1,980/1,806
		(2K) 2048 x 1556	1.979/1,805
	64 GB	(5K) 5120 x 2700	1,971/1,795
		(4K) 4096 x 3112	1,976/1,800
16 drives (8 GB RAM per controller)			
Codec Type	**Test File Size**	**Resolution**	**EonStor DS 4000 Gen2**
8-bit RGBA	4 GB	(HD) 1920 x 1080	2,669/2,437
10-bit RGB	16 GB	(4K) 4096 x 3112	2,762/2,527
		(2K) 2048 x 1556	2,715/2,523
	64 GB	(5K) 5120 x 2700	2,766/2,521
		(4K) 4096 x 3112	2,763/2,521
24 drives (16 GB RAM per controller)			
Codec Type	**Test File Size**	**Resolution**	**EonStor DS 4000 Gen2**
8-bit RGBA	4 GB	(HD) 1920 x 1080	4,059/2,973
10-bit RGB	16 GB	(4K) 4096 x 3112	3,925/3,786
		(2K) 2048 x 1556	3,704/3,513
	64 GB	(5K) 5120 x 2700	3,931/3,788
		(4K) 4096 x 3112	3,888/3,747

10-bit RGB, 16 GB file size, 4K Resolution, with 16 drives and 24 drives in RAID 6

[Note]

Due to every disk's own composition, the performance tolerance may vary in benchmark tool test.

Test Conclusion

Infortrend EonStor DS 4000/3000 Series are compatible with the latest 12 Gb/s SAS drive side and 16 Gb/s FC host side connectivity. In order to test how the system reacts to multiple users accessing media at the same time, we integrated Apple Xsan, a file system that provides a smooth and stable file sharing function. Also, we combined two MAC Pros with ATTO 16 Gb/s FC Thunderlink as editing clients to deliver high-speed host connectivity. The AJA figures show the system stability without intense frame dropping and yields a great throughput.

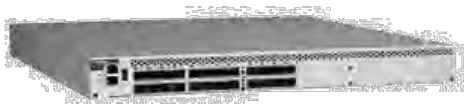
Conclusion

Infortrend is dedicated in providing storage solutions of the highest quality and caliber to our customers who are in M&E industry. We offer pure SAN and unified storages to meet their diverse requirements. With our unique technology incorporated in our M&E solutions, it enhances the performance and stability to speed up the developing process of media-related procedures such as editing, storing, or streaming multimedia files. Simulation tests show the outstanding results in different use cases. For more details about Infortrend products, services, and success stories, visit us at www.infortrend.com or contact our representatives near you.

Appendix

Components in Infortrend Video Test Environment

✓ Fibre Channel Switching



In the SAN storage structures, the network requires the deployment of one or more Fibre Channel switches to satisfy the throughput demands from multiple users' access. Be sure to use Fibre Channel switches with the correct settings, such as 16 Gb/s FC, 8 Gb/s FC or 10 Gb/s iSCSI (SFP+).

✓ ATTO Thunderlink FC 16 Gb/s

MAC Pro does not support Fibre Channel HBA card. ATTO Thunderlink 16 Gb/s FC is the recommended bridge to connect client servers to Infortrend storage system via the Fibre Channel switches to support high stream throughput. Thunderlink can be replaced if client servers support Fibre channel HBA card without affecting the SAN architecture.

✓ Connections

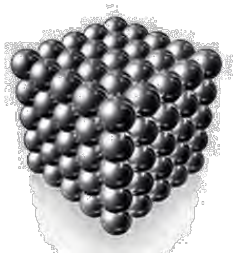
Fibre Channel Cable

Thunderbolt Cable

SAS Channel Cable

The Fibre cable needed is the LC-LC, which is available in different lengths to fit your racks or system deployments. LC-LC is used to connect ATTO Thunderlink FC or HBA cards to Fibre Channel switches in the storage subsystems. Thunderbolt cables are used to connect MAC Pro to ATTO Thunderlink. The speed of each Thunderbolt cable is 10 Gb/s. SAS cables support up to 12 Gb/s speed and are used to connect from server to storage or storage to expansion enclosure.

✓ File Sharing System



The Xsan file system allows access to video files from multiple workstations and users. Also, the distributed file system can be replaced by any other third-party software, such as StorNext, Sanergy, metaSAN, etc.

✓ Client Workstations

Apple Mac Pro

Dell PowerEdge R610

The Apple Mac Pro Workstation is commonly used for video editing. In an editing group, more than one client editing server is used to work in the same storage pools. Also, other servers can be employed to install editing software such as Apple Final Cut Pro and Adobe Creative Cloud, allowing you to enjoy working on a video content. Dell PowerEdge R610 is equipped with Windows Server 2012R2 operating system. For Windows users, AJA benchmark tool testing results can be the reference for M&E purpose.