



Performance Report

PAC Storage Scale-Out NAS Customer Demo Results

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Summary

This is the demo results report for a test project within the media and entertainment industry.



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1. Applicable Models

This document contains performance test results of PAC Storage PS 6460 with system configuration and network topology.

2. Audience

This performance report is intended for the PAC Storage partners, customers, and employees who are familiar with rich media applications and want to deploy PAC Storage Scale-Out NAS as their shared media storage.

3. Terminology

- **PAC Mgmt** – Management software for PAC Storage Scale-Out NAS.
- **Disk Pool** – A storage device with file system that can be accessed via file system shared protocols.
- **Shared folder** – A location for shared storage access via file system protocol.



4. Performance Results

Here we demonstrate the performance results of maximum system throughput tested by Vdbench benchmark tool and maximum number of playback streams tested by real-world media workloads with Final Cut Pro. For detailed storage configurations and network topology, please refer to the next section.

4.1 Maximum CIFS Throughput

We conducted the performance test by simulating 1MB sequential workloads with all-HDDs configurations. Each node has 2 data port IP, and we mount each client to the 2 data port of each node. There are 20 10GbE connections/mount points to the host in total.

Vdbench format thread = 1 means that number of concurrent threads for each client. For video playback and editing, we think 1 is the suitable setting.

Model	PS 6460	
FW version	1.42P.08	
Number of clients	10	
Internal/Front-end network	10GbE *2/10GbE *2	
Protection Level	Erasure code 4+1	
RAID mode	Optimal performance (RAID5)	
Vdbench 1MB Sequential Vdbench format thread = 1	Read	Write
NFS	19,539 MBPS	14,545 MBPS
SMB	18,351 MBPS	13,999 MBPS
RAID mode	Optimal performance (RAID6)	
Vdbench 1MB Sequential Vdbench format thread = 1	Read	Write
NFS	17,958 MBPS	11,618 MBPS
SMB	17,596 MBPS	11,390 MBPS



We create one mount point for each client to one node. There are 28 mount points in total.

Model	PS 6460	
FW version	1.42P.08	
Number of client	28	
Internal/Front-end network	10GbE *2/10GbE *2	
Protection Level	Erasure code 4+1	
RAID mode	Optimal protection (RAID6)	
Vdbench 1MB Sequential Vdbench format thread = 1	Read	Write
NFS	15,995 MBPS	10,930 MBPS

4.2 Maximum Stream Count

The following table shows the number of playback streams for PS 6460 by testing with common video formats and codecs. We also listed the corresponding video frame rate (FPS) and PS 6460 read throughput on the table for your reference. Using MAC servers to run 84 streams with the sample video provided by customer, since there are 84 streams in total in customer's environment.

The software we adopted is Final Cut Pro. With the MAC servers we have, playing 84 streams of video with Final Cut Pro is already reaching the limitation of our MAC servers. All the CPUs are fully loaded.

For Adobe Premiere, each MAC server of ours can only run 8 streams, and the CPU is fully loaded. The performance bottleneck is on the MAC server. 10 nodes cluster of PS 6460 is able to play 84 streams of full HD video simultaneously.

Note: The performance will slightly vary depending on your specific environment.

Material		Stream Count
Codec	FPS	PS 6460 300 HDD
HD ProRes 422 1920 x 1080	30	84

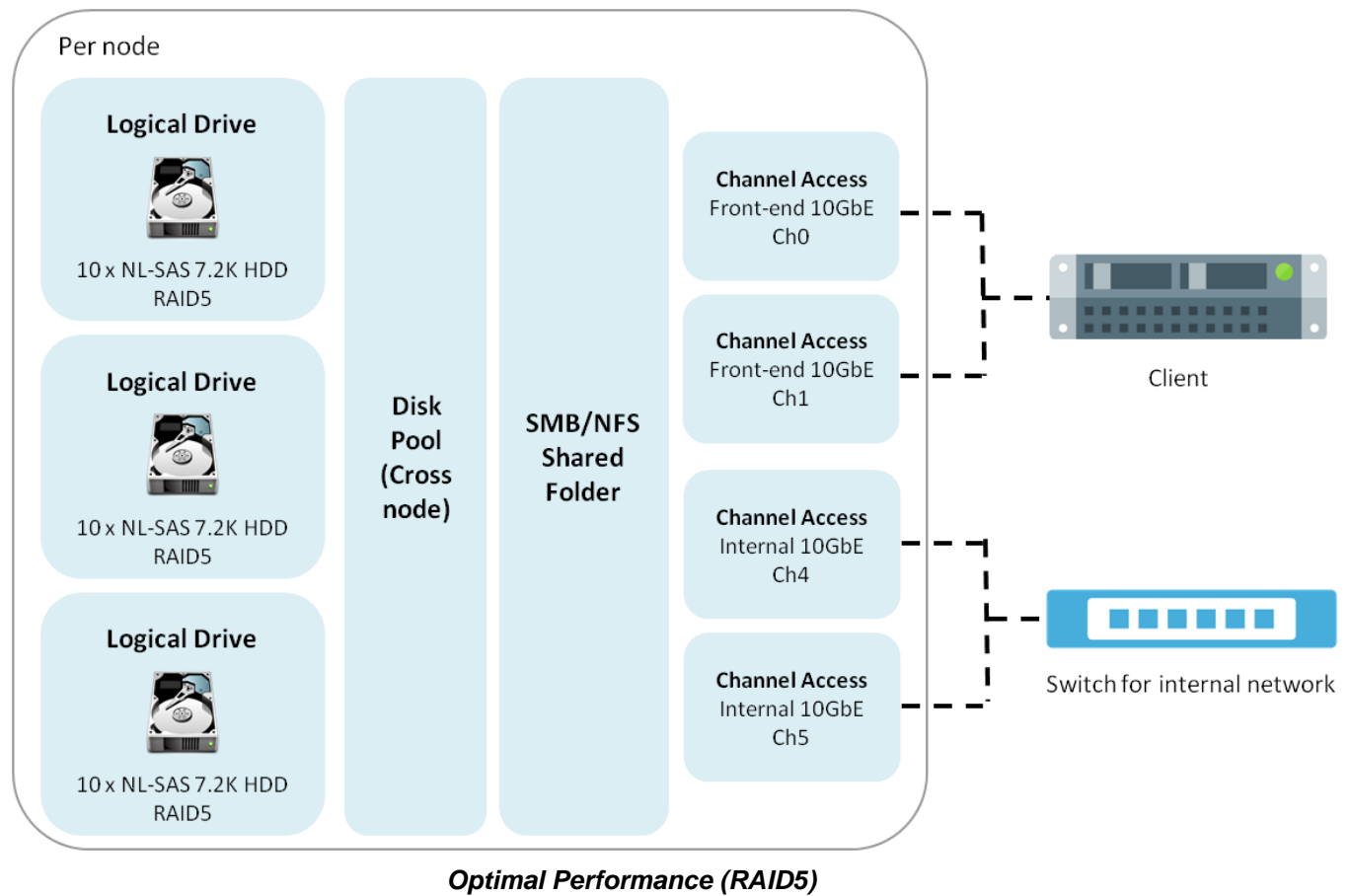
5 Topology

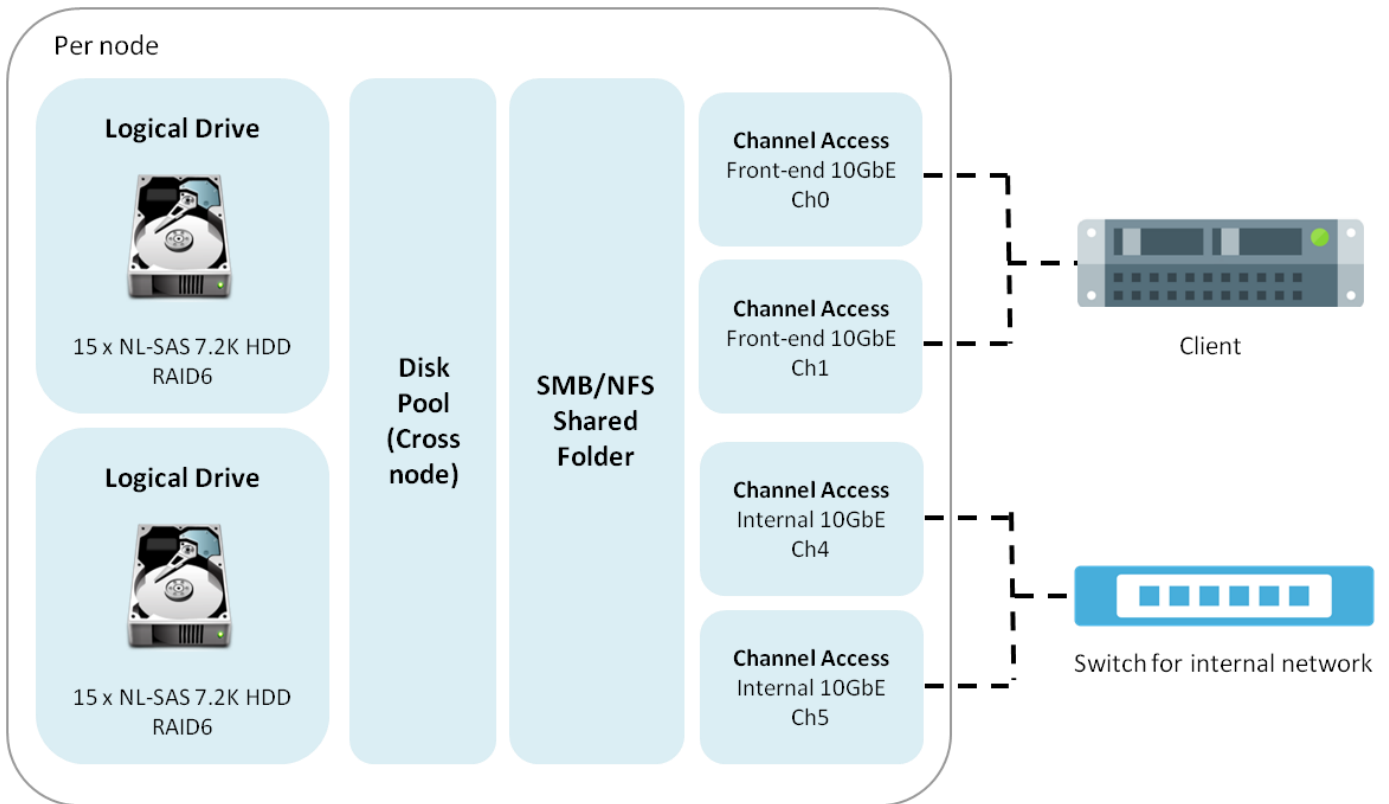
5.1 Maximum CIFS Throughput

The figure below illustrates the configuration we adopted in the POC test. The RAID mode is “Optimal Performance (RAID5)” and the internal and front-end network are both 10GbE (2 port for each network).

In order to leverage the multi-thread, we create multiple shared folders for each client, and map each folder to each client.

Note: Multiple shared folders are needed for high performance.

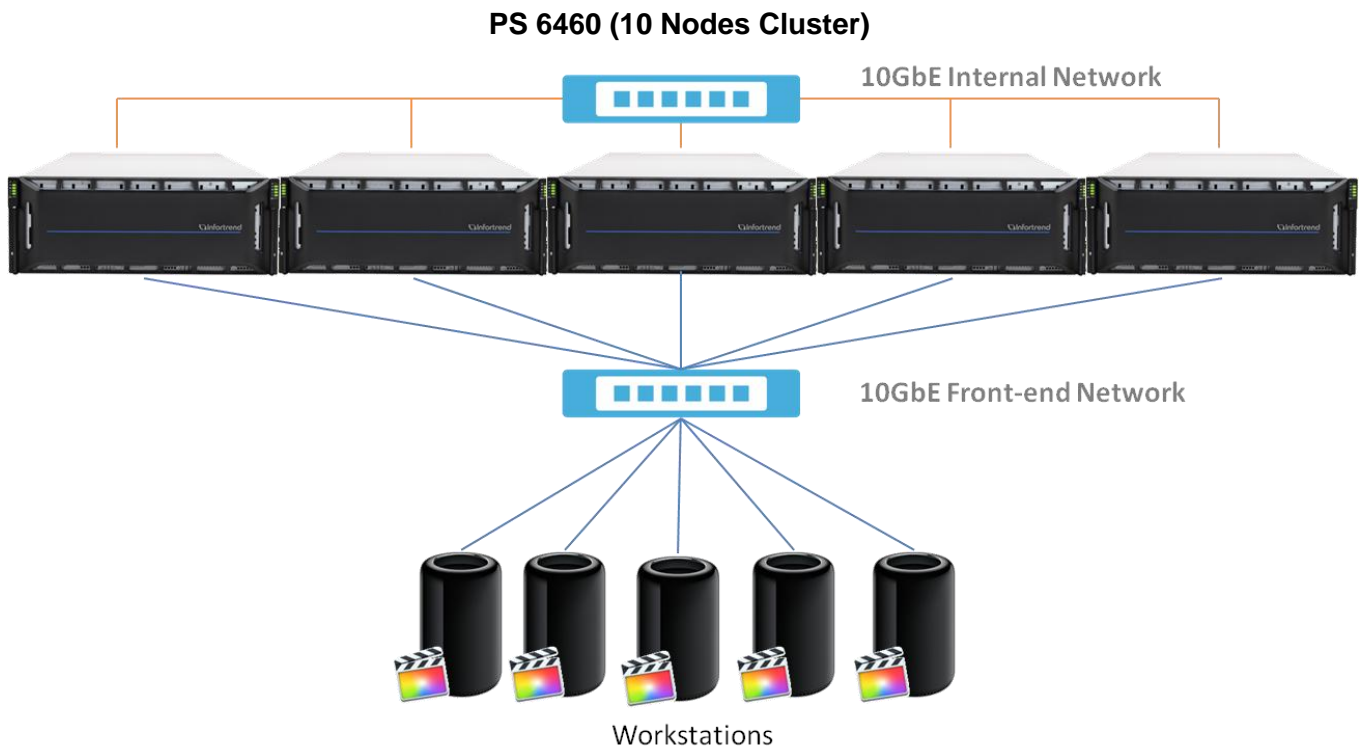




Optimal Protection (RAID6)

5.2 Maximum Stream Count

We adopted 5 MAC servers and ran 84 streams with the sample video provided by customer. The figure below illustrated the architecture of our test environment.



6 System Configurations

6.1 Storage Configuration Profile

The following table shows the configuration adopted from our ÚÀÀ I Ê best practice with a storage pool as a shared folder.

Model	# of Node	# of Drive	RAID mode	Erasure Code	# of Folder	# of Client
h6 60	10	300	Optimal Performance (RAID5)	4+1	10	10
h6 460	10	300	Optimal Protection (RAID6)	4+1	10	10/14

