

COMPARING DELL COMPELLENT NETWORK-ATTACHED STORAGE TO AN INDUSTRY-LEADING NAS SOLUTION

Dell™ Compellent™ FS8600 NAS
powered by Intel® Xeon® processor provided

UP TO

17.1% HIGHER DISK TRANSFER RATE



using Quest NetVault backup jobs compared to an industry-leading NAS solution

Traditionally, it has taken various types of storage platforms to meet an organization's needs. Now, with network-attached storage (NAS) solutions, companies can address diverse storage requirements with a single solution. NAS solutions can do work as varied as hosting virtual machines and production databases, storing and sharing files, and even work as backup solutions. NAS solutions are not just flexible; they are highly scalable as well and can grow as business does. With NAS, administrators can add controllers and disks or even new types of disks as workloads increase. However, not all NAS solutions deliver the same performance.

In the Principled Technologies labs, we tested the performance of two NAS solutions, the Intel Xeon processor-based Dell Compellent FS8600 and an industry-leading NAS solution, by backing up large volumes of data. We found the Dell Compellent FS8600 was up to 17.1 percent faster than a similarly configured, industry-leading NAS solution when backing up server files. This means that selecting the Dell Compellent FS8600 could deliver superior performance however you choose to use it.



Dell Compellent FS8600 NAS delivered superior backup performance

We compared the performance of an industry-leading NAS solution and a Dell Compellent FS8600 NAS solution using a Dell M1000e chassis and 20 Dell PowerEdge M420 server blades. We created two file corpuses: 1) a set of 12.2 million unique smaller files, each sized between 10 and 200 KB, and 2) a set of 12 thousand unique larger files, each sized between 10 and 200 MB. Both file corpuses were spread evenly across the 20 servers blades. Each of the 20 server blades was assigned exclusive read/write access to a NetVault virtual library hosted on each NAS. We ran backup jobs on all 20 servers on both large and small corpuses for both storage solutions. We found that for both corpuses, the Dell Compellent FS8600 yielded higher file transfer rates, and higher average transfer speeds per host than the industry-leading NAS solution.

As Figure 1 shows, the Dell Compellent FS8600 NAS had a 15.9 percent higher total transfer rate for the small files backup test.

Figure 1: The Dell Compellent FS8600 NAS solution achieved higher transfer rates for small file backups.

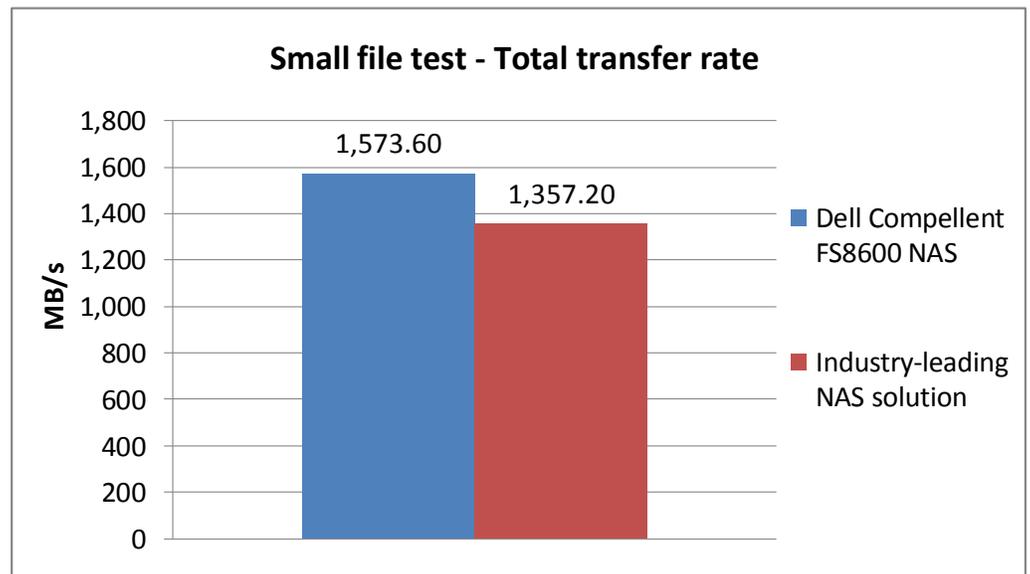
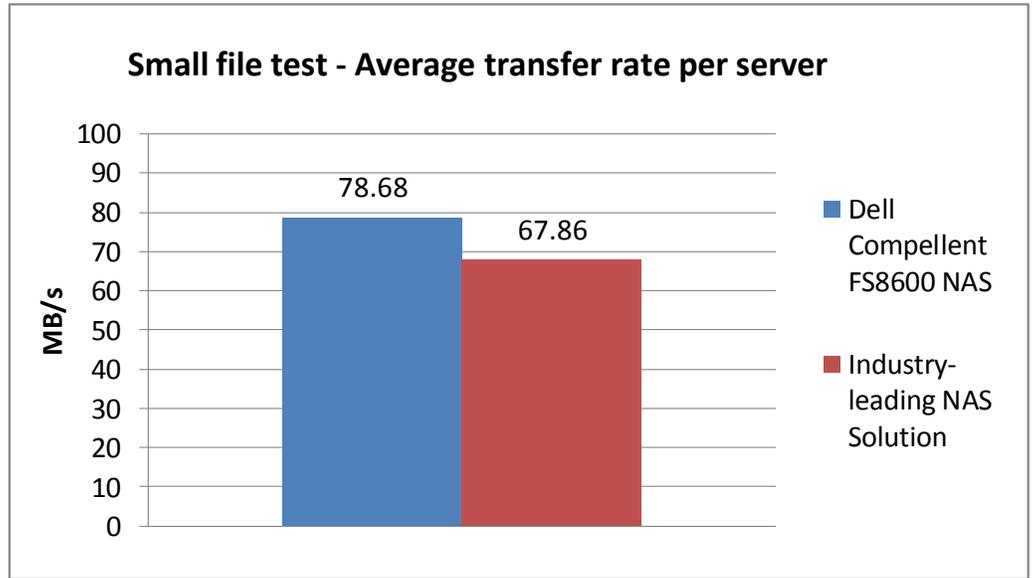


Figure 2 shows the average transfer rate per client for each solution during the small files backup test.

Figure 2: The Dell Compellent FS8600 NAS provided servers with faster transfer rates during the small files backup test when compared to the industry-leading NAS solution.



Similarly, the Dell Compellent solution outperformed its competitor in our large file backup tests. As Figure 3 shows, the Dell Compellent FS8600 NAS had a 17.1 percent higher total transfer rate for the large files backup test.

Figure 3: The Dell Compellent FS8600 solution achieved higher transfer rates in large file backup tests compared to the industry-leading NAS solution.

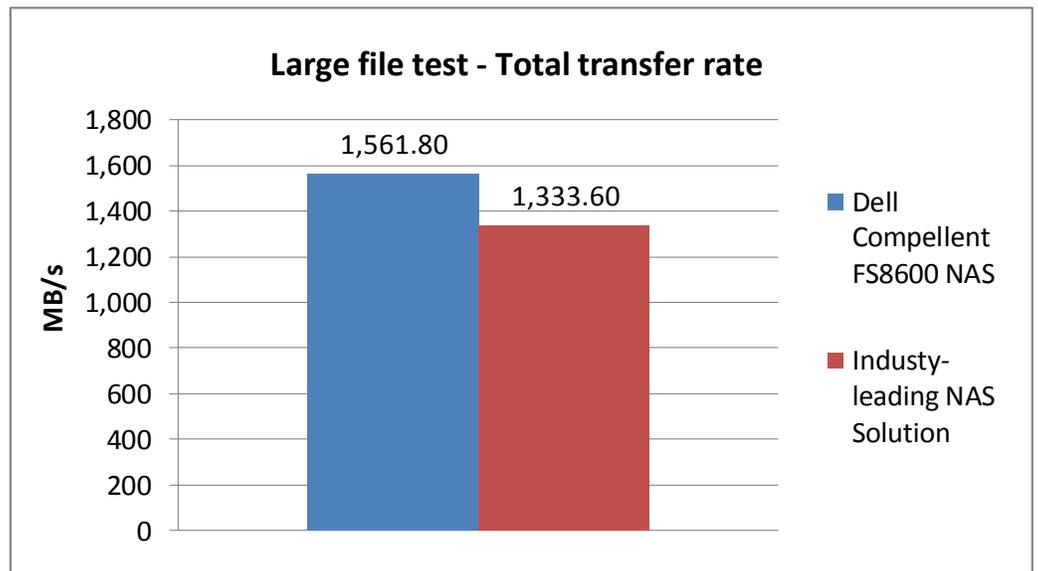
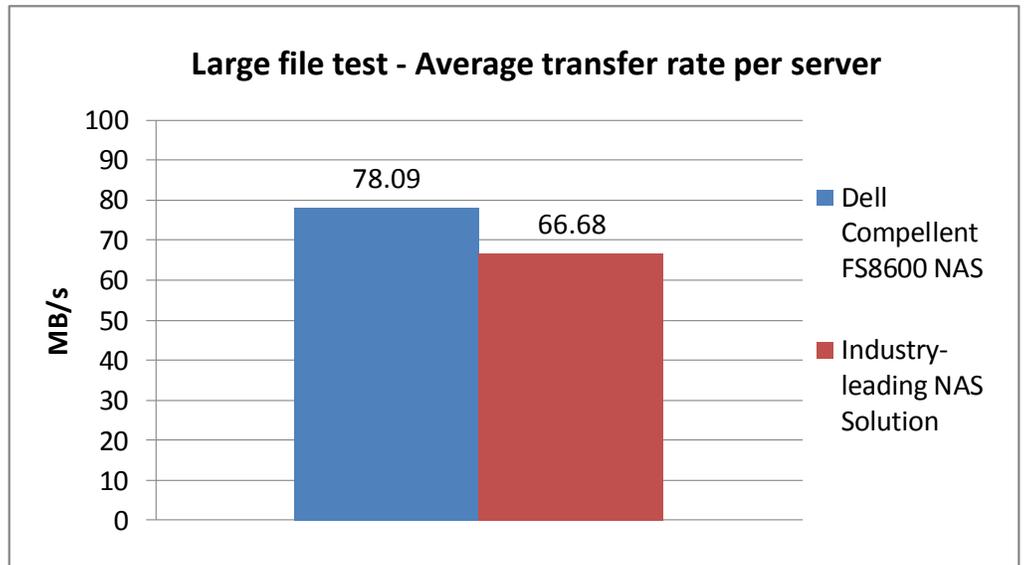


Figure 4 shows the average client transfer rate for each solution during the large file backup tests.

Figure 4: The Dell Compellent FS8600 NAS provided servers with faster transfer rates during the large files backup test when compared to the industry-leading NAS solution.



For step-by-step details on how we tested, see [Appendix B](#).

THE DELL COMPELLENT FS86000 NAS

The Dell Compellent FS8600 scale-out NAS is powered by the Dell Fluid File System, providing scalable Common Internet File System (CIFS) and Network File System (NFS) access along with seamless security integration into existing LDAP and Active Directory infrastructures. The Fluid File System is a virtualized, distributed file system implementing an active-active design. Access to the file system is simplified through single or multiple virtual IP addresses, allowing for robust fault tolerance and advanced and automatic load balancing. The scale-out file system features advanced load balancing algorithms which take advantage of Intel Xeon multicore architecture to dynamically and intelligently balance incoming writes across all FS8600 controllers in the cluster and across all cores on the processors. Each Dell Compellent FS8600 NAS can provision up to two HA pairs of SC8000 storage controllers for maximum performance and scale. A single file namespace means data does not need to be shared or siloed into individual file sets as additional FS8600 appliances or clients are added to the environment. While legacy storage solutions may need complex tuning for achieving optimal performance, the intelligence in Dell Fluid File System eliminates the need for planning or guess work to size and tune the system based on workload characteristics. Furthermore, administrators have direct access to FC and iSCSI storage resources through Enterprise Manager, making the Dell Compellent FS8600 a truly unified storage platform.

For more information about the Dell Compellent FS8600 NAS, visit www.dellstorage.com/compellent/nas/.

Dell Compellent SC8000 Storage Center Controller

The Dell Compellent SC8000 Storage Center Controller, powered with Intel Xeon processors, offers a flexible, clustered, highly available block-based storage platform. Using Dell Compellent Enterprise Manager, storage administrators can provision iSCSI and Fibre Channel LUNs to servers specifying a wide variety of RAID and disk types. For users with mixed file and block (FC/iSCSI/FCoE) needs, the FS8600/SC8000 combination enables both needs to be met by a single storage platform. Dell Compellent SC8000 controller utilizes the Dell Compellent SC200, SC220 and SC280 enclosures. Each controller can have up to 40 Dell Compellent 2U 6Gb SAS SC220 expansion enclosures for maximum scalability.

For more information about the Dell Compellent SC8000 Storage Center controller, visit www.dell.com/us/business/p/dell-compellent-sc8000/pd/.

Dell Compellent SC220 Enclosure

The Dell Compellent SC220 enclosure offers flexibility and agility to Dell Compellent Storage Center environments. Because the Dell Compellent SC220 enclosure supports 2.5" SAS, and both MLC and SLC SSD disks, administrators can offer different tiers of storage to suit changing business needs. The scale-out architecture provisioning storage requires reduced planning, so organizations can start with any amount of storage capacity and expand as needed. Adding new enclosures and faster disks, administrators can easily build a storage solution around a changing business without being locked into a rip-and-replace model that is typical of traditional storage solutions.

The Data Progression feature makes intelligent decisions based on historical data usage to determine which drive type or protection scheme is optimal. For example, depending on the storage profile, write data is ingested in the high performing RAID-10 tier using the faster drives, and the cold data migrates to RAID-5/-6 protected tiers that use lower performing but more cost effective drives. For organizations with limited rack space, the SC280 enclosure is also available. It provides 84 3.5" HDDs in five rack units.

For more information about the Dell Compellent SC220 enclosure, visit www.dell.com/us/business/p/dell-compellent-sc200/pd/.

Dell PowerEdge M1000e Blade Enclosure

The Dell PowerEdge M1000e blade chassis and its supported fabric interconnects are designed for dense computing situations. Features of the PowerEdge M1000e include:

- **Management.** Reduces administrative demand by providing a secure centralized management interface for the chassis and blades within, using proven Web (SSL-encrypted) and CLI (SSH/Telnet) technologies.

- **Simplified configuration.** The Chassis Management Controller allows administrators to control up to nine enclosures and 144 server blades, including BIOS/firmware change management and updates, thermal monitoring, and power threshold configuration.
- **Flexible I/O.** Six interconnect sockets with the capability to support three fully-redundant fabrics, a passive midplane with more than 8Tbps in I/O bandwidth capacity, and FlexIO support provide a number of connectivity options for an organization's servers.
- **Reliability and efficiency.** Six power supplies and nine fans, all hot-swappable, allowing for no-downtime maintenance of key chassis components. All components are tuned for maximum power efficiency to reduce data center power consumption.

For more information about the Dell PowerEdge M1000e Blade Enclosure, visit www.dell.com/us/enterprise/p/poweredge-m1000e/pd.

Dell PowerEdge M420 blade server

The new Intel Xeon processor E5-2420-based Dell PowerEdge M420 blade server sets a new standard for computing density in a blade environment, and uses existing Dell PowerEdge M1000e blade enclosures. Features include:

- **Double the computing power per rack unit.** Quarter-height blades capable of handling eight-core Intel Xeon processor E5-2400-series units in a two-socket configuration allow organizations to use rack space to its maximum potential; 32 blades per enclosure.
- **Cost-efficient upgrade.** The PowerEdge M420 utilizes the same M1000e chassis as previous Dell blades, taking advantage of the existing power, cooling, and network infrastructure already in a data center.
- **Management.** The OpenManage™ suite of tools from Dell, combined with the Integrated Dell Remote Access Controller (iDRAC7), give organizations maximum flexibility in administering their computing infrastructure.
- **Connectivity.** Snap-in FlexIO technology provides the backbone for a flexible, high-speed interconnect fabric. With options including 1Gb and 10Gb Ethernet, Fibre Channel, InfiniBand, and the new Dell Force10 MXL 10/40GbE blade switches, connectivity options are flexible.
- **Power efficiency.** Dell PowerEdge M420 servers implement leading industry power-efficiency standards, and are designed to optimize performance while maintaining low power consumption, saving energy and money.

- **Virtualization-ready.** The M420 contains two SD card slots for hypervisor, redundant hypervisor, and/or vFlash media support, and supports various hypervisor software.

For more information about the Dell PowerEdge M420 server, visit www.dell.com/us/business/p/poweredge-m420/pd.

Quest NetVault Backup

NetVault Backup is a backup and recovery software solution that utilizes disk-based data backup and deduplication to maximize storage efficiency. Administrators can perform backup operations for both bare-metal and virtual environments from a single console. NetVault Backup features bare metal recovery capabilities to help you recover servers faster through a heavily automated rebuilding process. With NetVault Backup, organizations can store their backups using disk-based devices, virtual tape libraries, third-party deduplication appliances, physical tape libraries, and more.

For more information about NetVault Backup, visit www.quest.com/netvault-backup/.

DETAILED TEST RESULTS

We were able to determine that the Dell Compellent FS8600 was faster than the industry-leading NAS solution in both types of tests we conducted.

The first set of tests involved backing up a large body of data consisting of primarily small files; each file was unique and was between 10 and 200 KB, and the files in the corpus totaled 12.2 million. This is representative of the types of data found on a multi-user file-and-print server. The Dell Compellent FS8600 NAS delivered faster transfer rates than the industry-leading NAS solution (see Figure 6).

Small file backup testing – Transfer rates in MB/s		
	Dell Compellent FS8600 NAS	Industry-leading NAS solution
Total	1,573.60	1,357.20
Average per client	78.68	67.86

Figure 6: Small file backup test results. (Note: We did not use deduplication technology in our testing.)

In our second set of tests, we created a body of data consisting of larger files; each file was unique, between 10 and 200 MB, and the files in the corpus totaled 12 thousand. This was roughly equivalent to larger graphic files or databases. As with our first set of tests, the Dell Compellent FS8600 NAS outperformed the industry-leading NAS solution, enabling higher data transfer rates (see Figure 7).

Large file backup testing – Transfer rates in MB/s		
	Dell Compellent FS8600 NAS	Industry-leading NAS solution
Total	1,561.80	1,333.60
Average per client	78.09	66.68

Figure 7: Large file backup test results. (Note: We did not use deduplication technology in our testing.)

CONCLUSION

A flexible NAS solution addresses many organizational challenges from server backup to hosting production applications and databases. Advanced NAS solutions such as the Intel Xeon processor-based Dell Compellent FS8600 NAS provide flexibility and scalability, allowing various use options as well as drive options throughout its lifecycle. This scale and flexibility enables an organization to alleviate performance bottlenecks anywhere in the organization simply by reallocating or adding more disk resources.

We found that the Intel Xeon processor-based Dell Compellent FS8600 NAS solution backed up a small-file corpus up to 15.9 percent faster and a large-file corpus up to 17.1 percent faster than a similarly configured, industry-leading NAS solution. This means that selecting the Dell Compellent FS8600 NAS has the potential to help optimize an organization’s infrastructure.

APPENDIX A– HARDWARE CONFIGURATION

Figure 8 contains configuration information about the Dell PowerEdge M420 servers we used in our testing.

System	Dell PowerEdge M420 (DC1)	Dell PowerEdge M420 (NetVault)
Power supplies (in the Dell PowerEdge M1000e Blade Enclosure)		
Total number	6	6
Vendor and model number	Dell A236P-00	Dell A236P-00
Wattage of each (W)	2,360	2,360
Cooling fans (in the Dell PowerEdge M1000e Blade Enclosure)		
Total number	9	9
Vendor and model number	Dell YK776 Rev. X50	Dell YK776 Rev. X50
Dimensions (h x w) of each	3.1" x 3.5"	3.1" x 3.5"
Volts	12	12
Amps	7	7
General		
Number of processor packages	2	2
Number of cores per processor	8	8
Number of hardware threads per core	2	2
System power management policy	Balanced	Balanced
CPU		
Vendor	Intel	Intel
Name	Xeon	Xeon
Model number	E5-2420	E5-2420
Stepping	2S	2S
Socket type	FCLGA1356	FCLGA1356
Core frequency (GHz)	1.9	1.9
Bus frequency	7.2	7.2
L1 cache	32 KB + 32 KB (per core)	32 KB + 32 KB (per core)
L2 cache	256 KB (per core)	256 KB (per core)
L3 cache (MB)	15	15
Platform		
Vendor and model number	Dell PowerEdge M420	Dell PowerEdge M420
Motherboard model number	OMN3VC	OMN3VC
BIOS name and version	1.2.4	1.2.4
BIOS settings	Default, Performance profile	Default, Performance profile
Memory module(s)		
Total RAM in system (GB)	96	16
Vendor and model number	Samsung M393B2G70BH0-YH9	Hynix HMT31GR7BFR4A
Type	PC3L-10600R	PC3L-10600R
Speed (MHz)	1,333	1,333
Speed running in the system (MHz)	1,333	1,333

System	Dell PowerEdge M420 (DC1)	Dell PowerEdge M420 (NetVault)
Timing/Latency (tCL-tRCD-tRP-tRASmin)	9-9-9-36	9-9-9-36
Size (GB)	16	8
Number of RAM module(s)	6	2
Chip organization	Double-sided	Double-sided
Rank	Dual	Dual
Operating system		
Name	Windows Server 2008 R2 SP1	Windows Server 2012
Build number	7601	9200
File system	NTFS	NTFS
Kernel	6.1.7601.17835	6.2.9200.16581
Language	English	English
Graphics		
Vendor and model number	Matrox® G200eR	Matrox G200eR
Graphics memory (MB)	16	16
RAID controller		
Vendor and model number	Dell PERC H310 Embedded	Dell PERC H310 Embedded
Firmware version	20.10.1-0084	20.10.1-0084
Driver version	5.1.112.64 (6/12/2011)	5.1.112.64 (6/12/2011)
Cache size (MB)	0	0
Hard drive		
Vendor and model number	Dell SG9XCS1	Dell SG9XCS1
Number of disks in system	2	2
Size (GB)	50	50
Buffer size (MB)	N/A	N/A
RPM	N/A	N/A
Type	SSD	SSD
Ethernet adapters		
Vendor and model number	2 x Broadcom® BCM57810 NetXtreme® II 10 GigE	2 x Broadcom BCM57810 NetXtreme II 10 GigE
Type	LOM	LOM
USB ports		
Number	2 external	2 external
Type	2.0	2.0

Figure 8: Detailed configuration information for the test servers.

Figure 9 provides detailed configuration information about the Dell Compellent FS8600 NAS.

Dell Compellent FS8600 NAS	
Number of FS8600 nodes	2
FS8600 system version	2.0.7170 SP - 2.0.7170
Number of SC8000 storage controllers	2
SC8000 system version	6.3.2.16
Number of SC220 enclosures	4
SC220 enclosure type/model	SAS EBOD 6G/EN-SC220
Firmware version	1.00
RAID level	1/0
Number of drives active (hot spares)	88 (8)
Model number	ST93000653SS
Firmware	YEOA
Drive size (GB)	300
Drive RPM	15K
Drive type	6Gb SAS 2.5"

Figure 9: Detailed configuration information for the Dell Compellent FS8600 NAS.

Figure 10 provides detailed configuration information about the industry-leading NAS solution.

Industry-leading NAS solution	
Number of storage controllers per array	2
Number of NAS compute nodes	2
RAID level	1/0
Numbers of enclosures	7
Number of drives active (hot spares)	88 (8)
Drive size (GB)	300
Drive RPM	15K
Drive type	6Gb SAS 3.5"

Figure 10: Configuration information for the industry-leading NAS solution.

APPENDIX B – HOW WE TESTED

Figure 11 provides a diagram of the test bed used in our lab tests. We installed a Dell PowerEdge M1000e Blade Enclosure and 21 Dell PowerEdge M420 blades. We installed Microsoft Windows Server 2008 R2 on a Dell PowerEdge M420 and created an Active Directory Domain, installed Microsoft Windows Server 2012 on the remaining 20 Dell PowerEdge M420 blades, and joined all servers to our test domain. We created a file corpus of unique files and distributed files evenly across the local storage of all 20 servers. We installed NetVault on all 20 servers and created a NetVault management domain, to which we added all the servers.

We connected all components via 10Gb network links. We setup a Compellent FS8600 NAS array and created a CIFS file system and four VIPs (virtual IP addresses). We created a share on each VIP pointing to the same file system and using Quest NetVault created 20 200GB virtual libraries on the Dell Compellent NAS. We duplicated the configuration on an industry-leading NAS array creating a CIFS file system, four VIPs and 20 identical NetVault virtual libraries. Each NetVault Server had direct read and write access to its respective NetVault Virtual library on the LAN. We then ran file-based backup jobs on the servers and compared NetVault backup job reports for performance data.

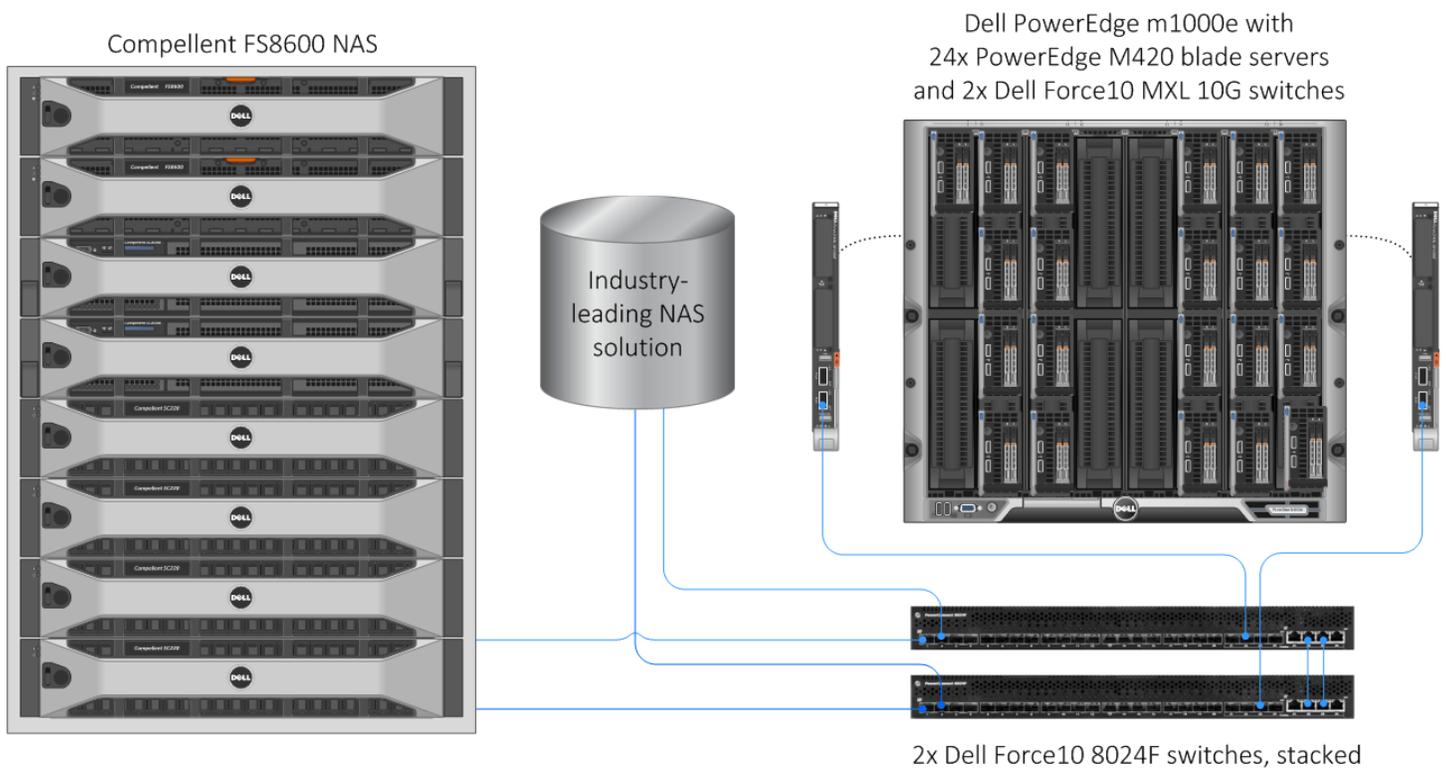


Figure 11: Test bed diagram.

Figure 12 shows the backup job overview, this process was identical for each NAS tested. After our file corpus was distributed across each of the 20 blade servers (S01-S20), each blade server ran a NetVault job to back up corpus files on the server DAS (direct-attached-storage) across our LAN to its respective NetVault virtual library (VL01-VL20) hosted on the NAS under test

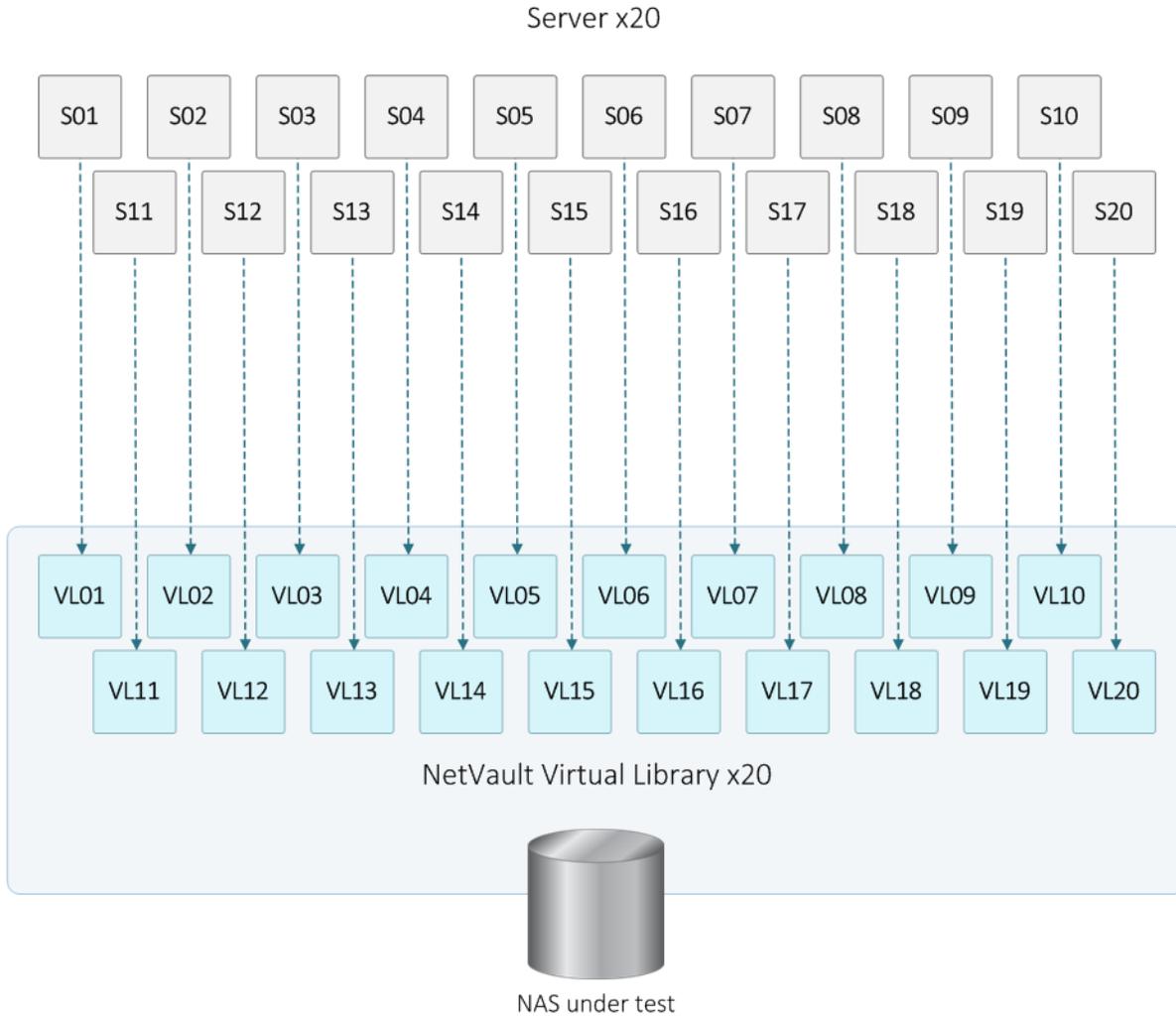


Figure 12: NetVault backup job overview.

Figure 13 provides details about the NetVault virtual library mappings associated with each server. Multiple Virtual IP addresses were created to demonstrate the flexibility and portability of the solutions under test.

M1000e slot number	Hostname	Role	FS8600 NAS VL path	Industry leading NAS solution VL path
1a	DC1	Active Directory Domain controller	N/A	N/A
2a	S05	NetVault Server	\\Nasvip1\VTL	\\Nas2vip1\VTL
2b	S06	NetVault client	\\Nasvip1\VTL	\\Nas2vip1\VTL
2c	S07	NetVault client	\\Nasvip1\VTL	\\Nas2vip1\VTL
2d	S08	NetVault client	\\Nasvip1\VTL	\\Nas2vip1\VTL
3a	S09	NetVault client	\\Nasvip1\VTL	\\Nas2vip1\VTL
3b	S10	NetVault client	\\Nasvip2\VTL	\\Nas2vip2\VTL
3c	S11	NetVault client	\\Nasvip2\VTL	\\Nas2vip2\VTL
3d	S12	NetVault client	\\Nasvip2\VTL	\\Nas2vip2\VTL
6a	S13	NetVault client	\\Nasvip2\VTL	\\Nas2vip2\VTL
6b	S14	NetVault client	\\Nasvip2\VTL	\\Nas2vip2\VTL
6c	S15	NetVault client	\\Nasvip3\VTL	\\Nas2vip3\VTL
6d	S16	NetVault client	\\Nasvip3\VTL	\\Nas2vip3\VTL
7a	S17	NetVault client	\\Nasvip3\VTL	\\Nas2vip3\VTL
7b	S18	NetVault client	\\Nasvip3\VTL	\\Nas2vip3\VTL
7c	S19	NetVault client	\\Nasvip3\VTL	\\Nas2vip3\VTL
7d	S20	NetVault client	\\Nasvip4\VTL	\\Nas2vip4\VTL
8a	S21	NetVault client	\\Nasvip4\VTL	\\Nas2vip4\VTL
8b	S22	NetVault client	\\Nasvip4\VTL	\\Nas2vip4\VTL
8c	S23	NetVault client	\\Nasvip4\VTL	\\Nas2vip4\VTL
8d	S24	NetVault client	\\Nasvip4\VTL	\\Nas2vip4\VTL

Figure 13: Physical server to virtual library mappings, please note each client directly accesses its respective virtual library.

Setting up the Active Directory server (DC1)

Installing the Microsoft Windows Server 2008 R2 SP1 operating system on the Dell PowerEdge M420

1. Boot the server from the installation media.
2. Choose the language, time and currency, and keyboard input. Click Next.
3. Click Install Now.
4. Choose Windows Server 2008 R2 Enterprise (Full Installation), and click Next.
5. Accept the license terms, and click Next.
6. Click Custom.
7. Click the Disk, and click Drive options (advanced).
8. Click New→Apply→Format, and click Next.
9. After the installation completes, click OK to set the Administrator password.
10. Enter the administrator password twice, and click OK.
11. Connect the machine to the Internet, and install all available Windows updates. Restart as necessary.
12. Enable remote desktop access.

13. Change the hostname to DC1 and reboot when prompted.
14. Set up networking for the data network:
 - a. Click Start→Control Panel, right-click Network Connections, and choose Open.
 - b. Right-click the Broadcom SLB , and choose Properties.
 - c. Uncheck TCP/IP (v6).
 - d. Select TCP/IP (v4), and choose Properties.
 - e. Set the IP address information.
15. Reboot the server.
16. Run Windows Update to patch DC1 to current Microsoft support levels.

Installing Active Directory and DNS services on DC1

1. Click Start→Run, type `dcpromo` and click OK.
2. At the Active Directory Domain Services Installation Wizard welcome screen, check the Use advanced mode installation option, and click Next.
3. In the Choose a Deployment Configuration dialog box, select Create a new domain in a new forest, and click Next.
4. At the FQDN page, type `NV.local` and click Next.
5. At the NetBIOS name prompt, leave the name NV, and click Next.
6. At the Forest Functionality level, select Windows Server 2008 R2, and click Next.
7. At the additional Domain Controller Options, leave DNS server selected, and click Next.
8. At the System Folder Location screen, leave the default options, and click Next.
9. Assign a Directory Services Restore Mode Administrator account password, and click Next.
10. At the Summary screen, review your selections, and click Next.
11. Once Active Directory Domain Services finishes installing, click Finish, and restart the system.
12. Run `dnsmgmt.msc`.
13. Create a reverse lookup zone for DC1.
14. Close DNS manager.

Configuring the Windows time service on DC1

To ensure reliable time, we pointed our Active Directory server to a physical NTP server.

1. Open a command prompt.
2. Type the following:


```
w32tm /config /syncfromflags:manual /manualpeerlist:"<ip address of a NTP server>"
W32tm /config /reliable:yes
W32tm /config /update
W32tm /resync
Net stop w32time
Net start w32time
```

Setting up DHCP services on DC1

1. Click Start→Administrative Tools→Server Manager→Add Roles.
2. Select DHCP Server, and click Next.
3. At the Introduction to DHCP Server screen, click Next.
4. At the Specify IPv4 DNS Settings screen, type `NV.local` for the parent domain.
5. Type the preferred DNS server IPv4 address, and click Next.
6. At the Specify IPv4 WINS Server Settings screen, select WINS is not required for applications on the network, and click Next.

7. At the Add or Edit DHCP Scopes screen, click Add.
8. At the Add Scope screen, enter the name DHCP Scope.
9. In the next box, create an address range with sufficient address space.
10. Check the Activate This Scope box.
11. At the Add or Edit DHCP Scopes screen, click Next.
12. Click the Enable DHCP v6 Stateless Mode radio button, and click Next.
13. Leave the default IPv6 DNS Settings, and click Next.
14. At the Authorize DHCP server dialog box, select Use current credentials.
15. At the Confirm Installation Selections screen, click Next. If the installation is set up correctly, a screen displays saying that DHCP server install succeeded.
16. Click Close.
17. Click Start→Run and type DHCPmgmt . msc
18. DHCP→dc1.NV.local→IPv4→Server Options.
19. Right-click Server Options, and select Configure options for DNS.
20. Add the DNS server and router information, click OK.

Setting up the Windows 2012 servers for NetVault

Installing the Microsoft Windows Server 2012 operating system on the Dell PowerEdge M420

1. Boot the server from the installation media.
2. Choose the language, time and currency, and keyboard input. Click Next.
3. Click Install Now.
4. Enter the 25-digit product key. Click Next.
5. Select Windows Server 2012 Datacenter (Server with a GUI). Click next.
6. Check the box for I accept the license terms. Click next.
7. Click Custom: Install Windows Only.
8. Select the installation target. Click next.
9. After the system reboots and completes the installation, type the password for Administrator twice. Click Finish.
10. Press Ctrl+Alt+Delete to sign in.
11. Type the password for the Administrator account, and press Enter.
12. Connect the machine to the Internet, and install all available Windows updates. Restart as necessary.
13. Enable remote desktop access.
14. Add the server to the NV.local domain.
15. Reboot the server.

Installing NetVault Backup Server and Client

We installed the NetVault backup server role on the host named S05.

1. Log into S05 as the domain administrator.
2. Navigate to the NetVault Backup installation media.
3. Launch Setup.exe.
4. At the welcome screen, click Next.
5. At the License Agreement screen, select I Agree, and click Next.
6. At the Choose installation type screen, select Server.
7. At the Machine Name, provide an appropriate name for the machine, and click Next.
8. At the Choose machine password screen, provide an appropriate password and retype it, and click Next.
9. At the Select Installation Folder screen, provide an appropriate path for the installation, and click Next.
10. Select NetVault Backup Database Folder, provide an appropriate path for the database directory, and click Next.
11. At the Confirm Installation screen, click Next.

12. At the Installation Complete screen, click Close.

We installed NetVault backup, server role on the hosts named S06 through S24.

1. Log into a client as the domain administrator.
2. Navigate to the NetVault Backup installation media.
3. Launch Setup.exe.
4. At the welcome screen, click Next.
5. At the License Agreement screen, select I Agree, and click Next.
6. At the Choose installation type screen, select client
7. At the Machine Name, provide an appropriate name for the machine, and click Next.
8. At the Choose machine password screen, provide an appropriate password and retype it, and click Next.
9. At the Select Installation Folder screen, provide an appropriate path for the installation, and click Next.
10. At the Confirm Installation screen, click Next.
11. At the Installation Complete screen, click Close.
12. Repeat steps 1 through 12 for S07 through S24.

NetVault Backup Server configuration

1. Log onto S05.
2. In the server on which you installed the Server version of NetVault Backup, launch the NVBU Console.
3. In the NetVault Backup window, click Client Management.
4. In the Available NVBU Client Management window, locate the server on which you installed the Client version of NetVault Backup in the Available NVBU Machines list.
5. Right-click host name S06, and click Add As Client.
6. Enter the machine password in the Password Required window that pops up, and click OK. In the System Access Passed window that pops up afterward, click OK.
7. The Client server will now appear in the Clients list on the left, along with the Server.
8. Repeat the steps above to add S07-S24 to the client list

Configuring the library and drives

1. We configured each host to have a NetVault Library on both NAS solutions.
2. Log into S05 and launch the NVBU Console.
3. Click Device Management.
4. In the NVBU Device Management window, click Add → Add Library.
5. In the Add Library window, in the Choose Library field, right-click the hostname of the client, and select Create virtual library.
6. In the Add new virtual library window, enter the virtual library path for the FS8600 NAS for the current host.
7. In the Library name field, provide an appropriate name. For number drives type 1, for number of slots type 1, and for media capacity, type 204800 MB. Click OK.
8. Click OK.
9. Expand the appropriate Server, expand Robotic Libraries, and select the library created in steps 6 and 7.
10. Click the Drive Selection tab, and expand the host icon. Expand Disk, and double-click the disk you want to use.
11. At the Configure tab, confirm that your drive/bay ordering is correct and click the Save icon in the top left of the window.
12. In the pop-up that appears, click OK.
13. Repeat steps 1 through 11 for the industry leading NAS solution.
14. Repeat steps 1 through 12 to configure S05-S24 to have a Virtual library on both NAS platforms.

Configuring the backup jobs

1. Log into host S05.
2. In the server on which you installed the Server version of NetVault Backup, launch the NVBU Console.
3. In the NetVault Backup window, click backup.
4. Name the backup job, and select a host to back up, click → File system → Fixed Drives, and check the box next to c:\corpus.
 - Click the Backup Schedule tab, and select Triggered.
 - Click the Target tab, and select Any for the Reuse Media option.
 - Click the Advanced tab, and deselect Enable Deduplication.
5. Repeat step 4 for all 20 servers (S05-24) to create jobs for all servers.

Running backups

To execute backups, we used the command line tools in the NetVault Backup\until directory. Before running jobs we ran a blank job to ensure each virtual library was completely blank, and then ran all 20 jobs using a nvjobstart.exe .bat file. When the jobs completed, we collected performance data from the NetVault report manager.

For more information on running back up jobs, visit [US-downloads.quest.com/Repository/support.quest.com/NetVault%20Backup/8.6.1/Documentation/NetVault_Backup_Administrators_Guide_English.pdf](https://downloads.quest.com/Repository/support.quest.com/NetVault%20Backup/8.6.1/Documentation/NetVault_Backup_Administrators_Guide_English.pdf).

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