



# EqualLogic FS7600 and FS7610 NAS Appliances

## Enhance your enterprise storage capabilities with scale-out unified storage

Improve productivity and streamline your IT infrastructure by storing block and file data on a single scale-out storage platform. The unique architecture behind the Dell™ EqualLogic™ PS Series arrays and the EqualLogic FS7600 and FS7610 NAS appliances helps you expand storage capacity and system performance non-disruptively as your needs evolve over time.

### Scale-out unified storage optimized for midrange deployments

Unstructured file data is a large part of IT storage environments, and it's growing faster and faster. Whether it's for documents, images or file-based workflows, the amount of capacity required for file data continues to increase with no end in sight. But just adding disks to support that mountain of file data won't help.

The EqualLogic FS7600 and FS7610 (FS7600 Series) are key components of the Dell storage architecture, which puts the right information in the right place at the right time — for the right cost. Unlike many unified storage solutions that only scale in capacity, the EqualLogic FS7600 and FS7610 with EqualLogic PS Series arrays can scale capacity and performance independently. As your needs grow and change, you can dynamically modify your block and file storage capacity without disrupting existing applications and storage systems. These systems support both 1Gb Ethernet (FS7600) and 10Gb Ethernet with either SPF+ or BASE-T (FS7610) connectivity to the SAN and client network; plus, the 1GbE is upgradeable to 10GbE.<sup>1</sup>

As you scale your unified EqualLogic storage, you can easily increase the capacity or performance of your storage environment. To expand capacity, simply add more PS Series arrays — the EqualLogic FS7600 Series supports all new and existing EqualLogic arrays. To improve frontend file performance, two FS7600 or FS7610 NAS appliances can be joined in the same EqualLogic storage pool, while still providing a single namespace.

### Next generation architecture provides an alternative to traditional file shares

The EqualLogic FS7600 Series appliances use the latest generation of Dell Fluid File System (FluidFS), a scale-out distributed file system implemented across Dell Storage product lines. FluidFS is designed to optimize file access performance and is built on proven hardware. Capacity can easily be expanded across the entire storage backend, all within a single namespace. Administration is easy and unified for file and block protocols. A core technology of Dell storage architecture, FluidFS is a high-performance, enterprise-class file system that does not have strict limits on file system size and share size inherent in other NAS solutions. With FluidFS v3, the capacity needed to store common enterprise data can be dramatically decreased. Savings of up to 48% are possible through policy-driven, variable-block deduplication and LZPS compression of the data.<sup>2</sup> These new features are available to existing customers as part of the FluidFS v3 upgrade; no extra hardware or licensing fees are required.

With the FS7600 Series, an EqualLogic group can serve up to 509TB of usable capacity for file storage, all within a single namespace. To help improve storage flexibility and utilization, the EqualLogic FS7600 Series features a virtualization layer that lets you expand NAS storage dynamically without any downtime.

Dell's NAS appliance provides a number of features including a highly available dual controller architecture in a single, 2U NAS appliance. This platform simplifies installation with less required cabling, enhances performance with a PCIe backplane for inter-controller communications, and improves dependability with cache mirroring and fully redundant hot-swappable primary components.

All FS7600 Series appliances in a FluidFS cluster support active I/O, providing high intrinsic performance without exotic protocols or the need to manually distribute application load across multiple filers. Load balancing automatically distributes client requests across all NAS controllers to optimize resource usage.

### Advanced features, EqualLogic family values

In addition to block storage management, NAS deployment and management functionality are fully integrated into EqualLogic Group Manager, including administration, monitoring and maintenance operations. Group Manager automates the initial setup and configuration of your FS7600 Series appliance, simplifying the process of creating volumes and shares. An FS7600 Series NAS appliance can be configured and added to an EqualLogic Group quickly and efficiently.

In addition to a range of data protection features for block storage, the EqualLogic FS7600 Series NAS appliances include advanced file data protection features such as snapshots, replication, NDMP backup and CIFS antivirus integration. End users can restore previous versions of files either from a snapshot directory, or through the familiar Previous Versions dialog box in Windows Explorer without IT assistance, freeing up administrators for more productive work. To keep the data on CIFS shares virus free, the appliances can be integrated with qualified anti-virus solutions, part of a growing ecosystem of solutions that are tested and supported by the FS7600 Series NAS appliance.

As with all EqualLogic products, the FS7600 Series NAS appliance's full feature set, software licensing and future firmware enhancements are included in the base price. This provides licensing simplicity, access to a comprehensive set of product features and ongoing value after initial purchase.

<sup>1</sup> Available early 2014.

<sup>2</sup> Based on May 2013 internal Dell analysis of the FS8600 NAS appliance with Fluid Data Reduction, using real-world home share environment comprised of Office files (21%), .GZ (19%) and .flite (19%) files, among others.

Feature	EqualLogic FS7600/FS7610 with FluidFS v3
<b>Cluster scalability</b>	Up to two FS7600/FS7610 appliances (four controllers) in a single NAS cluster
<b>File system capacity</b>	Up to 509TB
<b>1GbE configuration options</b>	Two Intel 1GbE four-port NICs per controller Client connectivity over Ethernet, SAN connectivity over iSCSI Ethernet switch is required; direct connect to the SAN is not supported
<b>10GbE configuration options</b>	Two Intel 10GbE dual-port NICs per controller, copper or optical, SFP+ or 10GBASE-T standards Client connectivity over Ethernet, SAN connectivity over iSCSI Ethernet switch is required; direct connect to the SAN is not supported
<b>Storage arrays supported</b>	Any EqualLogic group running version 7.0 or later firmware
<b>Management</b>	EqualLogic Group Manager
<b>NFS file protocol support</b>	NFSv3 and NFSv4 (for implementation detail, refer to the FluidFS support matrix)
<b>SMB file protocol support</b>	SMB 1.0, 2.0 and 2.1 (for implementation detail, refer to the FluidFS support matrix)
<b>NAS volumes</b>	Max NAS volumes per NAS cluster: 1,024; max NAS volume size: as large as the file system/namespace
<b>Shares/exports</b>	Max number of SMB shares per cluster: 1,024; max number of NFS mounts/exports per cluster: 1,024
<b>Concurrent active SMB connections</b>	Max for single appliance: 10,000; max for a 2-appliance cluster: 20,000 ("active" defined as clients engaging in I/O in the last 15 minutes)
<b>User authentication</b>	For SMB clients: Kerberos v5 and NTLM v2 on Microsoft Active Directory Server; for NFS v4 clients: Kerberos 5 on AD
<b>Directory services</b>	Windows SMB and NFS clients: Microsoft® Active Directory® 2003, 2003R2, 2008, 2008R2, 2012, 2012R2; Linux/UNIX clients: NIS and LDAP
<b>Quotas</b>	User and group quota rules per container: 1,000; max user quotas per cluster: 1,000
<b>Local users</b>	Max local users per cluster: 100; max local groups per cluster: 100
<b>Directories</b>	Max number of directories per cluster: 64 billion; max directory name length: 255 bytes
<b>Files</b>	Max file size: 10TB; max number of files per cluster: 64 billion; max file name length: 255 bytes
<b>Snapshots</b>	Redirect-on-write snapshots; max number of snapshots per container/cluster: 1,024/10,000; max number of snapshot policies per container/cluster: 512/1,024
<b>Replication</b>	Asynchronous to peer FS7600/FS7610 appliances, like-to-like cluster sizes only (client network speeds and array configurations can vary); max number of replication partners (or destinations): 16; max number of replication policies per cluster: 512; max number of simultaneous volume replications: 10 outgoing, 20 incoming; max containers enabled for replication: 100
<b>NDMP backup</b>	Remote or three-way NDMP over Ethernet ports Certified with Quest NetVault® Backup 8.6x and 9.x, CommVault® Simpana® 9.0, IBM® Tivoli® Storage Manager 6.3, Symantec™ NetBackup™ 7.0 and 7.5, Symantec Backup Exec™ 2010R3 and 2012, EMC Networker 8.0
<b>ICAP antivirus</b>	Certified with Symantec ScanEngine 5.2 and Protection Engine 7.0, McAfee® Virus Scan® Enterprise 8.8 and Enterprise for Storage 1.0.2, Sophos Endpoint Security and Control 10.0, TrendMicro™ InterScan Web Security Suite 3.1
<b>Data reduction</b>	Post-process policy-based variable block (128KB +/- 64KB) data deduplication and LZPS compression per NAS volume
<b>Memory</b>	24GB DDR3 1066MT/s per controller (48GB per appliance)
<b>Power supply</b>	Primary: two power supplies per appliance; backup: one battery per controller, two batteries per appliance
<b>Input voltage</b>	90-264 VAC; auto-ranging; this system is also designed to be connected to IT power systems with a phase to phase voltage not exceeding 230V.
<b>Output wattage</b>	717W
<b>Heat dissipation</b>	2446 BTU/hr
<b>Line frequency</b>	47-63 Hz
<b>Current</b>	10.5Amp at 90 VAC steady state, 5.2Amp at 180 VAC steady state
<b>Dimensions</b>	Form factor: 2U; width: 44.63 cm (17.6 in) (does not include rack flange); depth: 81.30 cm (32.0 in) (includes bezel and controllers installed); height: 8.64 cm (3.4 in); weight max configuration: 30.5 kg (67 lb)

## Global services and support

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[Learn More at Dell.com/FS7600.](http://Dell.com/FS7600)

