Dell Fluid File System
Version 5.0 Support Matrix

Notes, Cautions, and Warnings

NOTE: A NOTE indicates important information that helps you make better use of your computer.

CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

Contents

About This Manual

This document provides information about supported software and hardware configurations as well as usage requirements and recommendations for Dell FluidFS v5.x products.

This document is valid as of FluidFS version 5.0.400014.

Revision History

Document Number: 680-116-001

Revision	Date	Changes from previous revision
A	January 2016	Initial release of FluidFS v5.0
B	March 2016	FluidFS maintenance release 5.0.100128 • Software update paths
C	April 2016	FluidFS maintenance release 5.0.200081 • Software update paths • AD encryption types • Fixed number of quota directories
D	May 2016	• Changed the Dell Storage Management communication port to 13033 in Services and Ports table • Removed Sophos from the Antivirus Support table and added Kaspersky
E	July 2016	FluidFS maintenance release 5.0.300109 • Updated AV supported versions for Symantec and McAfee • Corrected minimum file size for data reduction • Updated VIPs per subnet (Supported Subnets and VLANs table) • Updated maximum NAS pool size per Storage Center • Updated Ethernet network port type for 10GbE
F	August 2016	Updated feature descriptions
G	September 2016	FluidFS maintenance release 5.0.400014 • Added supported Tape Libraries (Table 21) to Section 15 (renumbered all subsequent tables).

Contacting Dell Support

Dell Technical Support is available to answer your questions about FluidFS and FS8600 systems.

- For technical support, email the Copilot team at support@compellent.com or see the Copilot support page for direct phone access. Have your HSN/SSN number, case number, or service tag available to validate support coverage.
- If you have an Express Service Code, have it ready. The code helps the Dell automated support telephone system direct your call more efficiently.

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Introduction

FluidFS version 5.0.400014 supports FS8600 systems.

Glossary

Table 1. Glossary of Terms defines the terms used in this document.

Table 1. Glossary of Terms

Term	Definition
FluidFS (FluidFS firmware)	A special-purpose, Dell-proprietary operating system providing enterprise-class NAS services using SAN storage systems
FluidFS controller	A Dell hardware device capable of running the FluidFS firmware
NAS (FluidFS) appliance	A Dell hardware product containing two FluidFS controllers in a single enclosure
FluidFS system / cluster	Multiple FluidFS controllers appropriately connected and configured together into a single functional unit
NAS pool	The Storage Center system LUNs (and their aggregate size) allocated and provisioned to a FluidFS system
NAS volume	File system (single-rooted directory/folder and file hierarchy), defined using FluidFS management functions over a portion of the NAS pool
SMB share	A file system sub-hierarchy available to SMB clients via the SMB protocol
NFS export	A file system sub-hierarchy available to NFS clients via the NFS protocol

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FluidFS Models and Platforms

The tables in this topic list the platforms, features, and configurations supported by the Storage Center systems.

Storage Center Models

Table 2. Supported Platforms and Configurations lists the supported platforms and configurations.

Table 2. Supported Platforms and Configurations

Feature	FS8600 FC		FS8600 iSCSI
Client interface and speed	**1GbE**	**10GbE**	**10GbE**
Memory per controller (GB)	24	24 or 48	24 or 48
Client ports – per appliance	8	4	4
SAN storage interface and speed	FC 8Gb		iSCSI 10GbE
SAN ports – per appliance	4		4
Ethernet network port type	RJ45	SFP+ (Intel modules only)	
Storage Center version	6.3.10 or later		
Dell Storage Manager version	2015 R3 or later		
Storage Center models	SCv2080, SC40, SC4020, SC8000, SC9000		
Maximum NAS appliances (per system)	4 appliances (8 controllers)		
Maximum Storage Center systems in a NAS pool	8		
Maximum NAS pool size	4 PB		

> **NOTE:**
>
> - Storage Center v6.5.10 or later is required to support FluidFS unmap functionality.
> - Dell recommends running the latest supported Storage Center Operating System version for each connected Storage Center. See the Storage Center documentation for the latest version information.

Table 3. Maximum NAS Pool Size lists the maximum sizes supported in the NAS pool and the global namespace. Note that the actual limits per Storage Center system depend on the Storage Center models, configurations, and firmware versions.

Table 3. Maximum NAS Pool Size

Feature	Maximum Size
Per Storage Center	3 PB (depends on Storage Center model)
NAS pool capacity	4 PB
FluidFS global namespace	20 PB

NOTE: The total capacity of the NAS pool is 4 PB. The global namespace can reach 20 PB with five FluidFS clusters using redirection folders.

Supported Hardware Upgrades

Note the information in the following sections about hardware upgrades.

1GbE FC to 10GbE FC Controller Upgrade

FS8600 1GbE FC configurations can be upgraded to 10GbE FC by replacing the network interface cards (NICs). Contact Dell Technical Support for details about this upgrade.

24-GB and 48-GB Appliances

The 48-GB FS8600 appliance supports 48-GB controllers only. The 24-GB FS8600 appliance supports 24-GB and 48-GB controllers; however, 48-GB controllers in a 24-GB appliance are limited to 24 GB.

Appliance Replacement

A 24-GB FS8600 appliance can be replaced with a 24-GB or 48-GB appliance.

A 48-GBFS8600 appliance can be replaced with a 48-GB appliance only.

All appliances in the system must be equal in terms of client connectivity type (1GbE or 10GbE), storage connectivity type (FC or iSCSI), and port count.

System Expansion (Add Appliance)

An FS8600 FluidFS system can be expanded with either a 24-GB or 48-GB appliance.

All appliances in the system must be equal in terms of client connectivity type (1GbE or 10GbE), storage connectivity type (FC or iSCSI), and port count.

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Software Update Path

Table 4. Supported Update Paths lists the supported update paths for FS8600 systems, following the release of version 5.0.300109.

Table 4. Supported Update Paths

Current (Base) Version	Next Supported Version
2.0.5110 or 2.0.5120	2.0.7680
2.0.6110	2.0.7680
2.0.6730	2.0.7680 or 3.0.920760
2.0.6940	2.0.7680
2.0.7040	2.0.7680
2.0.7170	2.0.7680 or 3.0.920760
2.0.7630	3.0.920760 or 3.0.940120
2.0.7680	3.0.920760 or 3.0.940120
3.0.8690	3.0.920760 or 3.0.940120
# 3.0.8700 or 3.0.8701	3.0.920760
3.0.910390	3.0.920760
3.0.911021	3.0.920760 or 3.0.940120
3.0.920760	3.0.940120 or 4.0.300098
# 3.0.921013 or 3.0.922022	3.0.930714
3.0.930714	3.0.940120
3.0.940120	4.0.300098
# 3.0.941005 or 3.0.942004	4.0.300098
4.0.003214	4.0.300098
4.0.100714	4.0.300098
# 4.0.110064 or 4.0.120016	4.0.210020
4.0.200700	4.0.300098
4.0.210020	5.0.400014
# 4.0.220058	4.0.230030 or 5.0.400014

Current (Base) Version	Next Supported Version
4.0.230030	5.0.400014
4.0.300098	5.0.400014
5.0.002821	5.0.400014
5.0.100128	5.0.400014
5.0.200081	5.0.400014
5.0.300109	5.0.400014

NOTE:

- \# - Limited availability version. If you are running one of these versions, contact Dell Technical Support for assistance in updating your FluidFS system.
- Before updating, ensure that the SAN storage firmware version supports the target FluidFS version as specified in Table 4. Supported Update Paths.

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FluidFS File-System Metrics

Table 5. FluidFS System Metrics and Table 6. FluidFS NAS Volume Metrics list the maximum supported configurations.

NOTE: The system will not always prevent you from or warn you about exceeding these numbers.

Table 5. FluidFS System Metrics

Feature	Maximum per FluidFS System
NAS volumes	1024
Cloned volumes from a volume	1000
Files and/or directories (per appliance)	10 billion
Files in a directory	1,000,000
Directory depth levels	1000
Open files (per appliance)	250,000 (24-GB appliance) / 800,000 (48-GB appliance)
File size	16 TB
Number of local ACLs	180 per file
Cloned files from single file	1,048,576
Minimum file size for file cloning	4 KB
Minimum file size for data reduction	64 KB
Snapshot creation/expiration rate	60 per hour
Local users	100
Local groups	100
Maximum number of ADS entries per file	5000
Maximum number of file-access notification policies	1024

Table 6. FluidFS NAS Volume Metrics

Feature	Maximum per NAS Volume / System
NAS volume size	Available NAS pool (minimum 20 MB)
Snapshots	10,000 / 100,000
Snapshot schedules	1024 / 1024

FluidFS File-System Metrics

Feature	Maximum per NAS Volume / System
Redirection folders	1024

Client Network Capabilities

[Table 7. Supported Subnets and VLANs](#) lists the supported subnets and VLANs.

Table 7. Supported Subnets and VLANs

Feature	Maximum
Subnets / VLANs	400
VIPs per subnet	100
Static routes	400
Flat (non-routed) clients	1000

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Customer Environment Management Protocols

Table 8. Identity Management Servers and Table 9. Maximum Identity, DNS, and Time Servers list the supported levels for identity management servers and interfaces.

Identity Management Servers

Table 8. Identity Management Servers

Functionality	Service Provider	Supported Functionality
Active Directory / Native	Microsoft AD Windows 2003 / 2008R2 / 2012R2	Directory service Kerberos5 authentication Domain trusts
Active Directory / LDAP	Microsoft AD Windows 2003 / 2008R2 / 2012R2	Directory service Kerberos5 authentication
Active Directory	Samba	Not supported
OpenLDAP / LDAP	OpenLDAP 2.4	Directory service
NIS2	Linux / UNIX Microsoft AD Windows 2003 / 2008R2 / 2012R2	Directory service
NIS3 (NIS+)	Any	Not supported

> **NOTE:**
> - Encryption types AES128_HMAC_SHA1 and AES256_HMAC_SHA1 are not supported for Active Directory authentication from FluidFS.
> - Authenticated bind to an LDAP server requires Domain or OU Administrator credentials and must be allowed by the LDAP server.

Maximum Identity, DNS, and Time Servers

Table 9. Maximum Identity, DNS, and Time Servers

Functionality	Service Provider	Maximum Servers
Active Directory preferred controller	Microsoft AD Windows 2003 / 2008R2 / 2012R2	10
LDAP / NIS server	Any Linux or UNIX server	10
DNS server	Any	10
NTP server	Any	10

Customer Environment Management Protocols

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SMB Support

FluidFS version 5 supports SMB1, SMB2, SMB2.1, and SMB3 protocols. Note that SMB3.02 clients (such as Windows 8.1 and Windows Server 2012R2) are negotiated to SMB3.

NOTE:

- Lower-than-maximum SMB level connections are also supported.
- Setting ACL from Linux SMB clients is not supported.

Supported SMB Configurations

Each appliance can support a certain number of concurrent (active) SMB connections, even if one of the controllers is not available. Table 10. Supported SMB Configurations lists the supported SMB configurations.

Table 10. Supported SMB Configurations

Feature	Maximum Value
SMB share name	80 bytes[1]
SMB shares	1024 per volume / 1024 per system
Concurrent connections	10,000 per 24-GB appliance / 30,000 per 48-GB FS8600 appliance
Concurrent active connections	5000 per appliance
Large MTU (up to 256 KB) connections	50 per 24-GB controller / Unlimited per 48-GB FS8600 controller
Maximum file size for branch cache hash calculations	256 MB

[1] Share names are kept as UTF-8 characters, which might, depending on the character set used, consume multiple bytes. Therefore, the actual maximum length depends on the character set used.

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NFS Support

FluidFS version 5.x supports NFSv3, NFSv4, and NFSv4.1 protocols only. NFSv2 clients are not supported.

NOTE:

- Lower-than-maximum NFS level connections are also supported.
- For NFSv4 clients, only Active Directory authentication is currently supported. See Customer Environment Management Protocols.
- For NFSv4 clients, AUTH_SYS, Krb5, Krb5i, and Krb5p modes are supported.

Table 11. Supported NFS Configurations

Client OS	Maximum per NAS Volume / System
NFS exports	1024 / 1024
NFS ACLs per export	100
NFS connections (per appliance)	16,000

FTP Support

FluidFS version 5.x supports anonymous FTP configurations (user name=anonymous, password=*email_address*).

Each appliance can support the following number of concurrent (active) FTP connections, even if one of the nodes or controllers is not available.

Table 12. Supported FTP Configurations

Feature	Maximum Value
Concurrent FTP connections	800 per appliance

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User and Group Quotas

Table 13. Supported Quota Configurations lists the maximum number of supported quota rules per NAS volume for each system.

Table 13. Supported Quota Configurations

Feature	Maximum per NAS Volume / System
Quota rules	1024 / 1024
Quota usage entries	100,000
Quota directories	10,000/10,000

NOTE:

- Quotas for Active Directory (AD) and NIS/LDAP users are independent of each other, even if users are mapped automatically or manually. For NAS volumes with mixed security styles, separate quotas should be set for AD and NIS/LDAP users.

- For NAS volumes with NTFS or UNIX style permissions, one unique quota should be set for each user. For mapped users, the usage and limits are applied using the target identity and will be shared with the native Windows or UNIX account.

- In general, Dell recommends using the NTFS security style in mixed environments.

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FluidFS Replication

Note the following information regarding FluidFS replication:

- Replication can be performed from FluidFS v4.x to FluidFS v5.x. As a best practice, replication between systems running different major versions should be performed only for short-term update scenarios and is not recommended as a normal operating state.
- Replication partners can differ in network interface speeds (1GB or 10GB) or in memory size (24 GB or 48 GB).
- The FluidFS version determines the way replication is performed, specifically the TCP ports that are used to communicate between the replication partners. See Table 15. FluidFS Replication TCP Ports by Source System FluidFS Version for the TCP ports used by each replication protocol level.

Table 14. Supported FluidFS Replication Features lists replication-compatible systems, assuming they satisfy all other conditions

Table 14. Supported FluidFS Replication Features

Attribute	Support
Maximum number of replication partners	100
Maximum number of replicated NAS volumes	1024
Maximum number of concurrent replications (rest are queued)	10 outgoing and 100 incoming
Maximum replication schedules (as source)	1024
Maximum number of replication bandwidth limiter policies	1023
Single NAS volume to single NAS volume	Yes
Single NAS volume to multiple NAS volumes	No
Cascading replication of a NAS volume	No

FluidFS replication requires that the target-system TCP ports listed in Table 15. FluidFS Replication TCP Ports by Source System FluidFS Version be accessible, through the firewall, from the source system.

> **NOTE:** For FluidFS v5.x systems replicating to FluidFS v5.x systems, only one TCP port (10560 or 3260) needs to be opened in the firewall for all replication functions.

Table 15. FluidFS Replication TCP Ports by Source System FluidFS Version lists the supported FluidFS replication TCP ports.

Table 15. FluidFS Replication TCP Ports by Source System FluidFS Version

Functionality	FluidFS v4.x	FluidFS v5.x
Partnership setup	26, 10560, 9445	10560 or 3260 (configured during partnership setup)
Management	10500, 10551	
Data	10560–10568	

VMware and the FluidFS VAAI Plugin

The FluidFS VAAI plugin supports the following VAAI NAS Primitives and allows offloading them to the underlying FluidFS system:

- **Full File Clone** — Offloads the creation of a virtual disk full clone
- **Fast File Clone** (Native Snapshot) — Offloads the creation of virtual machine snapshots
- **Extended Statistics** — Enables visibility into space usage on FluidFS datastores

The FluidFS VAAI plugin supports ESXi versions 5.5, 5.5U1, and 5.5U2.

NOTE: The FluidFS VAAI NAS plugin supports single-level native snapshots only.

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Antivirus Support

lists the supported antivirus applications.

Table 16. Antivirus Application Support

Vendor	Product
Symantec	Protection Engine for NAS 7.5, 7.8
McAfee	VirusScan Enterprise for Storage 1.1.0
TrendMicro	InterScan Web Security Virtual Appliance (IWSVA) 6.x
Kaspersky	Antivirus 8.0 for Windows Servers Enterprise Edition

lists the maximum number of supported antivirus server configurations.

Table 17. Maximum Antivirus Server Configurations per System

Feature	Maximum Value per FS8600 System
Antivirus servers	10

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Space Pre-Allocation

Table 18. Reserved Space by Function and Table 19. Reserved Space by Pool Size provide an estimation of the pre-allocated (reserved) space for various file-system functions. These calculations can help you estimate disk space requirements and space growth of FluidFS systems.

Table 18. Reserved Space by Function

Allocation per	Reserved space
Cluster	30.4 GB
Appliance	425.5 GB
LUN	4 GB
Total space	0.5%

The amount of reserved space can also be estimated using Table 19. Reserved Space by Pool Size.

Table 19. Reserved Space by Pool Size

NAS Pool Size	Percentage of Reserved Space
10 TB − 20 TB	2.5% − 4.5%
20 TB − 128 TB	1% − 2.5%
> 128 TB	< 1 %

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Backup and Restore – NDMP

Table 20. Backup and Restore Applications lists the supported backup and restore applications.

Table 20. Backup and Restore Applications

Application	Supported Version
CommVault Simpana	10.x, 11.x
Dell Quest NetVault	10.x, 11.x
EMC Networker	8.x
IBM Tivoli Storage Manager	6.3
Symantec BackupExec	2014, 2015
Symantec NetBackup	7.x

Refer to the application documentation for the minimal revision/service pack supporting Dell FluidFS systems.

Table 21. Supported Tape Libraries lists the supported tape libraries for 2−way NDMP backup (Fibre Channel connections only).

Table 21. Supported Tape Libraries

Supplier	Models
Dell	TL-2000, TL-4000, ML-6000

Table 22. NDMP Agent Characteristics lists the supported range for each of the NDMP characteristics.

Table 22. NDMP Agent Characteristics

Functionality	Supported Range
NDMP version	v2, v3, v4
DMA address type	IPv4 only
DMA servers configured	Up to 10
Concurrent NDMP sessions	Up to 10
DMA user-name length	1–63 bytes (accepts Unicode)
DMA password length	1–32 characters
Maximum number of *include* paths for an NDMP job	32

Functionality	Supported Range
Maximum number of *exclude* paths for an NDMP job	32

NOTE: Your environment should allow ICMP (ping) traffic between the FluidFS controllers' private IP addresses (not the access VIPs) and the backup server.

Table 23. Supported NDMP Environment Variables describes the NDMP environmental variables that are supported by FluidFS. Refer to the Data Management Application (DMA) documentation for a listing of the variables supported by DMA. If DMA does not set any of the variables, the NDMP server operates with the default value.

Table 23. Supported NDMP Environment Variables

Variable Name	Description	Default
TYPE	Specifies the type of backup/restore application. Valid values are `dump` and `tar`, and are case sensitive. `dump` – NDMP server generates inode-based file history. `tar` – NDMP server generates file-based file history.	dump
FILESYSTEM	Specifies the path to be used for backup. The path must be a directory.	Not applicable
LEVEL	Specifies the dump level for the backup operation. Valid values are `0` to `9`.	`0`
HIST	Specifies how file history is to be generated. The supported values are `d`, `f`, `y`, and `n`. `d` specifies that node/dir format file history will be generated. `f` specifies that file-based file history will be generated. `y` specifies that the default file history type (which is the node/dir format) will be generated. `n` specifies that no file history will be generated.	`Y`
DIRECT	Specifies whether the restore is a Direct Access Retrieval. Valid values are `Y` and `N`.	`Y`
UPDATE	Specifies whether the dump level and dump time for a backup operation should be updated on the NDMP server so that subsequent backups can reference the dump level from previous backups. Valid values `Y` and `N`.	`Y`
EXCLUDE	Specifies a pattern for file or directory names that are not to be backed up. The pattern is a comma-separated list of file or directory names, up to 32. Each name will be used to match to nodes encountered during backup. A name can contain an asterisk (*)as the wildcard character. The comma (,) or	No default

Variable Name	Description	Default
	backslash (\ )characters in a name should be escaped with a backslash.	
RECURSIVE	Specifies whether the restore should be recursive or not. Valid values are `Y` and `N`. If this variable is set to `N`, only the files that are the immediate children of the restore target are restored.	`Y`
RESTORE_OVERWRITE	Specifies whether the restore operation should overwrite existing files with the backup data. Valid values are `Y` and `N`.	`Y`
LISTED_INCREMENTAL	Controls behavior similar to the `listed incremental` option of the tar application. This variable specifies whether an additional directory listing is added to the backup stream during incremental backup so that the recovery operation can handle files and directories deleted between the incremental backups. During backup, if this variable is set, an additional directory listing is added to the backup data stream. Because of the additional process required, this addition could affect the backup data stream size and performance. During recovery, if this variable is set and if the backup data stream was generated with this variable turned on, the NDMP server handles deleting files and directories that are deleted between incremental backups. Setting this variable requires additional processing time and enlarges the backup data stream size (how much it changes depends on the number of elements in the backup data set). If this feature is not important to the end user, it should not be set.	`N`
BASE_DATE	Used by TSM for token-based backup, as an alternative to using the LEVEL environment variable. When BASE_DATE is set to `00`, a full backup is performed. After a full backup completes, a token can be retrieved by retrieving the DUMP_DATE environment variable. This token can then be passed in later backups as the value of BASE_DATE. The backup performed in this case is an incremental backup relative to the time when the token was generated. When BASE_DATE is set to `-1`, token-based backup is disabled.	`-1`
DEREF_HARD_LINK	Controls whether hard link files data content are backed up for all instances of the same file. Valid values are `Y` and `N`.	`N`

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Services and Ports

FluidFS systems provide and access services through the ports listed in the following tables. Firewall settings should allow communication to and from these ports. Actual ports used depend on the enabled protocols and features. All port numbers are fixed unless specified otherwise.

The services and ports listed in Table 24. Services Provided by FluidFS and Table 25. Services Accessed by FluidFS are accessed by FluidFS systems on the client network.

Table 24. Services Provided by FluidFS

Port Number	Protocol	Function / Service Name
21	TCP and UDP	File Transfer Protocol (FTP)
22	TCP	Support Access (SSH)
111	TCP and UDP	RPC portmapper
161	UDP	SNMP agent
162	UDP	SNMP trap
427	TCP and UDP	Server Location Protocol (SLP)
445	TCP and UDP	SMB
2049 – 2057	TCP and UDP	NFS
4000 – 4007	TCP and UDP	NFS statd
4050 – 4057	TCP and UDP	Network lock manager (NLM)
5001 – 5008	TCP and UDP	NFS mount
5051 – 5058	TCP and UDP	NFS quota
9445	TCP	Replication trust setup from v4 systems
10000	TCP	Network Data Management Protocol (NDMP)
10550-10551, 10560-10568	TCP	Replication from v4 systems
10560 or 3260	TCP	Replication between v5 systems
13033	TCP	Dell Storage Manager communications
44421	TCP	File Transfer Protocol (FTP)
44430 – 44439	TCP	Passive FTP

Table 25. Services Accessed by FluidFS

Port Number	Protocol	Function / Service Name
53	TCP	Domain Name Service (DNS)
88	TCP and UDP	Kerberos
111	TCP and UDP	RPC portmapper
123	UDP	Network Time Protocol (NTP)
135	TCP	Active Directory
138	UDP	NetBIOS datagram service
139	TCP	NetBIOS session service
389	TCP and UDP	Lightweight Directory Access Protocol (LDAP)
464	TCP and UDP	Kerberos
543	TCP	Kerberos login
544	TCP	Kerberos shell
RPC/portmapper dependent	UDP	Network Information Service (NIS)
636	TCP and UDP	LDAP over TLS/SSL
749	TCP and UDP	Kerberos administration
1344	TCP	Antivirus – Internet Content Adaptation Protocol (ICAP)
3268	TCP	LDAP global catalog
3269	TCP	LDAP global catalog over TLS/SSL
8443	TCP	Copilot access (reverse tunnel SSH)
10000	TCP	Network Data Management Protocol (NDMP)

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Management

This section provides management information about FluidFS systems.

Events

FluidFS can store up to 10 million system and SACL events. The actual amount depends on the amount of storage space configured by the administrator to hold event data.

SNMP

FluidFS supports SNMP version 2c. It also provides a custom MIB for integration with SNMP-based management frameworks. The interface/MIB provides read access to the following data:

- System and controller status
- CPU utilization
- I/O statistics
- NFS statistics

The maximum number of SNMP recipients per system is 10.

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Internationalization

This section provides information about supported Unicode characters and potential compatibility issues.

NAS Access

FluidFS v5.x supports the Unicode /UTF-8 encoding, allowing concurrent access from any UTF-8 compatible client. All NAS interfaces expect UTF-8 characters for file, folder/directory, share, and other names.

Consequently, all names are internally maintained and managed in UTF-8 format. While individual file and directory names are each limited to 255 bytes, the number of characters might be further limited, due to the variable-width nature of the UTF-8 encoding.

Management Access

Management data items, such as volume names, share names, directory names, user names, description fields, and so on, are all maintained in UTF-8 format.

For CLI access, UTF-8 terminal applications, such as XTERM, should be used. Terminal applications that do not support UTF-8 characters, such as KTERM, are not recommended.