



The Storfirst Gateway Storage Operating System: Cloud-as-a-Tier ILM

Release Notes – Version 4.9

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What's New

INTRODUCTION

Storfirst Gateway is archiving software that provides a Windows file system interface to various storage technologies. By providing CIFS/NFS access to disk, cloud, CAS, NAS, object store, tape or VTL, any application can read/write to these devices alone or in a multi-tiered configuration. Managing replication, migration, and retention through automated policy, Storfirst Gateway ensures the most cost effective and secure home for your data.

NEW FEATURES IN STORFIRST GATEWAY V4.9

- Support for EMC DiskXtender (DX) take-over and migrations.
 - Existing support for DX C-Clip versions 6.0+. For other versions please contact customer support.

System Requirements

Platforms

- Physical Windows Server or VMware ESXi Server Host
- VMware Supported Versions: ESXi 4.0 through 5.5.

Operating Systems - Dedicated Windows Server O/S¹

- Windows Server 2012 R2
- Windows Server 2012
- Windows Server 2008 R2

CPU

- Speed: 2.4+ GHz server class CPU
- Cores
 - Minimum: 4 cores
 - Recommended: 8 cores²

Memory

- Capacity: Minimum 8GB, Recommended 16GB

Disk

- Capacity: 1TB of free disk space³
- Speed⁴:
 - Minimum: 10K RPM SATA/SAS (4 Gbps fibre channel / 3 Gbps direct attached SAS.)
 - Recommended: 15K RPM SAS (8 Gbps fibre channel / 6 Gbps direct attached SAS.)
 - Best: Enterprise Flash (8 Gbps fibre channel / 6 Gbps direct attached SAS.)
- Disk Contents: The installation directory includes:
 - Storfirst Database (1 GB initial space. Add 1GB per 1 million files and directories added to the Storfirst Gateway file system.)
 - Storfirst Cache (Configurable from 5GB to 2TB)
 - Software, System Logs and Job Logs

Network:

- Minimum 2 x GigE Network LAN ports

Power:

- Fully Redundant Power Supply

¹ Dedicated is defined as no other applications are installed on the Windows O/S.

² Recommended if Encryption at REST is enabled for any volumes.

³ Actual minimum requirements are much less. The 1 TB number is scaled to fit a 500 GB cache and 500 million file system entries.

⁴ Installations that will be inventorying or migrating/replicating large numbers of files (high 10's to 100's of millions of files or more) should use Flash or Hybrid Flash disk for Storfirst *database* storage to significantly enhance inventory and replication/migration performance.

UPGRADE CONSIDERATIONS

Centera Volumes

Centera Volumes now have a new application type field option: EMC DiskXtender. Selecting this option will allow the user to select a path to a temporary file containing media GUIDS associated with the DX volume.

Supported Upgrade Paths

Storfirst can be upgraded from any version 3.5 or later to this version.

COMPATIBILITY

For files which contain non-ASCII characters, only partial support is given to Atmos environments. Storfirst Gateway will be able to contain fully Unicode characters and it will correctly send those objects to Atmos using a UTF-8 encoded scheme. However, if inventorying Atmos, Storfirst Gateway will NOT correctly recognize UTF-8 encoded file names.

Storfirst Gateway no longer shares the root of the file system automatically. Please make sure to check the share and permissions of the root file system after the upgrade.

Microsoft Windows NT and 2000 clients, when creating a folder, cause a hidden file to be added to the folder and not deleted. This means that this new folder cannot be renamed after created due to Storfirst Gateway rename rules. Therefore, Storfirst Gateway does not support creating folders in the drive share using NT and 2000 clients. However, NT and 2000 users can drag an existing folder into Storfirst Gateway without issue.

If configuring STK libraries in VTL and your VTL software allows you to specify bar codes, only use bar codes that are 6 characters or less in length.

Storfirst Gateway uses its own device drivers for the libraries and drives. Please DO NOT load the vendor drivers for libraries and drives that will be used with Storfirst Gateway.

When using disk volumes, do **not** use Storfirst Gateway in conjunction with Windows Dynamic Disk or any other features within Disk Management. In particular, do not click "initialize" under Windows Disk Management on any LUNs managed by Storfirst.

Moving data, using Windows Explorer or the dos "move" command, from one tiered storage volume to another is not supported in Storfirst. You must *copy* data to another volume, and then *delete* the original copy.

The Storfirst Gateway file system does not support alternate data streams (aka resource forks).

Storfirst Gateway supports a maximum path length of 256 characters (including the file name).

Windows Messenger Service is no longer supported by Windows 2008. Seven10 has removed broadcast alerts from the program. You must use SMTP alerts from now on.

CACHING

When using tape, Centera, cloud, object stores or NAS, make sure that the files to be cached are not bigger than the size of the cache file. Refer to Administrator's Guide for information on configuring the cache. File sizes can't exceed the size of the Storfirst Gateway cache file. When streaming multiple files the write speed into the cache and the flush to the backend storage device need to be considered as not to run out of disk space in the cache.

The drive that the cache resides on must be formatted NTFS and assigned a drive letter by the Windows operating system on the Storfirst Gateway server. The drive can be internal disk on the server or SAN disk assigned to the server, but cannot be a network drive.

In the event you would like to change the cache size make sure that there is no unflushed data and applications are not actively archiving. The unflushed amount is located in the cache tab at the bottom left hand side of the GUI. This should say 0 bytes.

MISCELLANEOUS

For generic OpenStack deployments, it's possible to enter in multiple IP addresses. However, at this time, only the first address is used for authentication and the others are not validated as to whether they are OK or not.

For generic OpenStack deployments, Storfirst Gateway only supports the Keystone Authentication Service. The OpenStack Administrator can tell you what flavor is used. Storfirst Gateway S supports SWAUTH for Rackspace. If SWAUTH is required, choose Rackspace Cloud Files as the volume type and change the URL endpoint to match your cloud.

When using multiple tiered storage volumes, Storfirst Gateway supports map to folder *or* map to root. Configuring and using both options at the same time is not supported.

When inventorying Centera by date range and you want to include the current day, don't select an end date.

With a large Storfirst file system, it may take a long time to enter Add/Remove Programs. This is because Windows will iterate the file system looking for installed programs. In this case, stop the Gateway service before opening Add/Remove Programs.

Windows O/S processes tend to consume physical memory during operation, but not all processes release memory when completed. Even if they do, there's no guarantee that Windows will reclaim memory previously allocated.

The resolution to this problem lies in deploying the Windows Server O/S Windows Dynamic Cache Service.

- The Microsoft Windows Dynamic Cache Service will manage the working set size of the Windows System File Cache. For 64 bit systems this service helps to address the problem of excessive cached read I/O that could eventually consume all of physical memory.

For more info see this link: <http://www.microsoft.com/en-us/download/details.aspx?id=9258>

If using ACSLS with tape libraries, the user must ensure that the drive(s) and media selected all reside within the same Automated Cartridge System (ACS). The location of the drives and media can be viewed in the Storfirst UI 'Description' column, and in the ACSLSDriveInfo.txt and ACSLSMediaInfo.txt files. (Technically: An ACSLS or LibraryStation server can manage one or more ACSs. An ACS is a collection of one or more

libraries; and a library is a collection of one or more Library Storage Module's (LSM) (i.e., robots). Tape cartridges can move between LSMs using Pass-Thru Ports (PTP's), but can not move between ACSs.)

Storfirst Gateway supports 1 Storfirst file system (drive letter) per server. However, you can have multiple volumes per file system.

Recovery Time (Reinventory) is ~ 30 minutes for every 500,000 files.

When using tape or MAID, if you have more clients than drives (tape) or power budget (MAID) and the data is not in the cache, we have found improved concurrent performance by adding the following to the registry:

```
HKEY_LOCAL_MACHINE\CurrentControlSet\Services\Lanmanworkstation\parameters
```

Sesstimeout (Hexadecimal value = 240 and Decimal value = 576)

When using Atmos CAS, use the Centera configuration wizard. You will configure just like you would Centera, with an IP address and a PEA file.

For EMC Atmos, users must enter in the full Token ID in the format [Subtenant ID]/[UID].

The quota property of a cloud volume is the total amount of space that will be reported back to the O/S as the size of that volume. This quota is not enforced and can be exceeded. The quota is used to issue free space warnings if the percentage of free space exceeds the configured volume threshold. Additionally, an application may not attempt to write to the drive if the free space is less than the size of the file it wants to write. Therefore, size the quota to report sufficient free space for your workload.

When performing large database backups using a Windows 2008 R2 server, you may see the physical memory percentage climb and not be released. This will not affect the functionality or performance of Storfirst Gateway.

For S3 Cloud Volumes hosted by AWS, the Cloud Target Name MUST be the name of the AWS Region that hosts the bucket specified. Please see the Administration Guide or Amazon documents for examples.

For S3 Cloud Volumes, Storfirst reserves the right to use a top level directory in the namespace named .STORFIRST_METADATA. Contained in this directory is a volume level attribute file and another directory called .STORFIRST_SECURITY. Contained in this directory is a listing of unique Windows Security Descriptors. Everything in this directory is used for Inventory functions either for DR or SmartSync™ and should NEVER be deleted unless fully removing the namespace from Storfirst.

For S3 Cloud Volumes, as of this writing, only Amazon Web Services (AWS) supports Signature Version 4. All other variants, such as EMC ViPR Object Data Services, support Signature Version 2.

For Hitachi Content Platform (HCP) Cloud Volumes, Storfirst reserves the right to use a top level directory in the namespace named .STORFIRST_METADATA. Contained in this directory is a volume level attribute file and another directory called .STORFIRST_SECURITY. Contained in this directory is a listing of unique Windows Security Descriptors. Everything in this directory is used for Inventory functions either for DR or SmartSync™ and should NEVER be deleted unless fully removing the namespace from Storfirst.

For Hitachi Cloud Service for Content Archiving (HCS-CA) Cloud Volumes, as of this writing, an error may occur that there was a failure getting the retention classes; this is a known issue being addressed by HDS and does not adversely impact Storfirst, select OK to continue the configuration.

SECURITY

Windows ACLS

When browsing the Storfirst file system using the local drive or a CIFS/SMB share, if a user tries to modify any security settings of group or users names, the settings may be grayed out. If the settings are inherited from a parent folder, they are supposed to be grayed out

If the settings are not inherited from a parent folder, or this is the root folder, occasionally, two file handles can be opened on the same file or folder whose share permissions in terms WRITE_DAC and/or WRITE_OWNER conflict. Restart the Storfirst Gateway service to resolve this issue.

In order to copy file-level security from one file system to another (including the Storfirst file system), please make sure to use a utility that copies security attributes, also known as security descriptors.

- The following operations do NOT copy security attributes:
 - o Windows Explorer Copy and Paste operation does NOT copy security descriptors.
 - o MS-DOS "copy" command does NOT copy security descriptors.
- The following operations do copy security attributes:
 - o MS-DOS "xcopy" command using the /O switch does copy security descriptors.
 - o ROBOCOPY using the /COPY:S command does copy security descriptors.

Mixed Mode Access

Storfirst Gateway provides a generalized version of a mixed-mode file system that includes both Unix-like POSIX attributes (including UID/GID and MODE) and Windows-like Security Descriptors (including file or directory Owner, SACL, and/or DACL.)

When accessing the file system through an NFS connection, authentication and access is accomplished using the AUTH_SYS flavor which includes the UID/GID of the process or user on the remote client system. From here on out, this method of access will be called NFS.

When accessing the file system through the local or CIFS/SMB connection, authentication and access is accomplished by using the Windows local or active directory account of the process or users on the local system or remote client system respectively. However, in order to provide some initial support, these users are also always mapped to the anonymous UID and GID of -1. From here on out, this method of access will be called Windows.

When a file or directory is created through NFS, the UID/GID is set to the UID/GID of the calling process OR the UID/GID that the calling process explicitly sets on the file. Also, the MODE is set to 775 OR the MODE that the calling process explicitly sets on the file. Finally, the file is given a default Windows Security Descriptor as inherited from its parent's directory. When a file or directory is created by a Windows user, the UID/GID is always set to -1 and the MODE is always set to 777. Finally, the file is given a default Windows

Security Descriptor as inherited from its parent's directory OR is assigned the Windows Security Descriptor that the calling process explicitly sets on the file.

The main problem often reported when running in a mixed mode is that Windows users are unable access files written by NFS users. The only known workaround currently is to make sure to set the OTHER MODE bits to at least 4 (READ) or to make the UID or GID of the files -1, both through NFS.

SPACE REQUIREMENTS

Storfirst Gateway v4.x takes up 6GB (5GB default cache file size + 1GB initial database size) of disk space upon initial installation. Through testing of the Storfirst Gateway database it has been determined that you will need an additional 1GB of disk space for every 1 million files added to the Storfirst Gateway file system.

Please note: In the examples below we are using the default 5GB cache file. If you are using a cache file large than 5GB you need to account for that in your calculations.

- Example #1:
Storfirst Gateway file system with 100,000,000 files = 106GB of hard disk space for the Storfirst Gateway database
(5GB cache + 1GB initial database size + 100GB for the 100,000,000 files = 106GB)
- Example #2:
Storfirst Gateway file system with 1,000,000,000 files = 1006GB (1TB) of hard disk space for the Storfirst Gateway database (5GB cache + 1GB initial database size + 500GB for the 1,000,000,000 files = 1006GB (1TB)).