



**Hewlett Packard**  
Enterprise

# **HPE StoreEasy 1000 Storage Administrator Guide**

## **Abstract**

This document describes how to install, configure, and maintain all models of HPE StoreEasy 1000 Storage running WSS2012 R2 and WSS2016 and is intended for system administrators. For the latest version of this guide, go to <https://support.hpe.com/hpesc/public/home>.

Part Number: P37531-001  
Published: July 2020  
Edition: 7

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# HPE StoreEasy 1000 Storage

The HPE StoreEasy 1000 Storage system provides multi-protocol file sharing and application storage for a range of business environments. The 14x0 and 15x0 platforms are ideal for small businesses or workgroups or a remote office. The 16x0 and 18x0 can accommodate medium and large IT environments.

## NOTE:

This guide provides information on all models within the StoreEasy 1000 Storage product family. The product name is listed generically where the same information is applicable to different models. For example, if the same information applies to 1450 and 1650, the model is listed as 1x50.

## Features

The HPE StoreEasy 1000 Storage provides the following advantages:

- Efficiently maximizing resources through file and data management without increasing costs.
- Hewlett Packard Enterprise and Microsoft management integration, including Microsoft Server Manager and System Center and HPE Systems Insight Manager and iLO (Integrated Lights Out).
- Each system ships from the factory with preintegrated hardware and preloaded software to significantly reduce the time and complexity of installation.

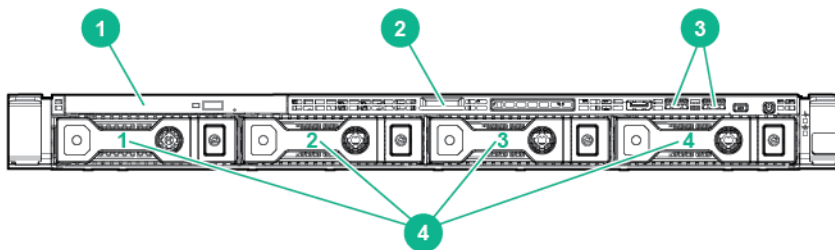
For more information about HPE StoreEasy 1000 Storage features, go to: <http://www.hpe.com/info/StoreEasy1000-manuals>.

## Hardware components

This section provides illustrations of the HPE StoreEasy 1000 Storage hardware components.

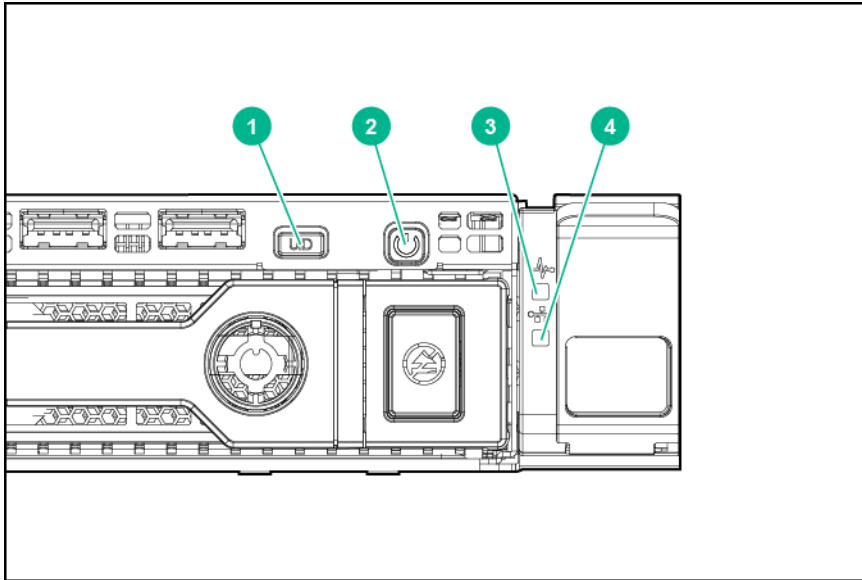
### StoreEasy 1450 Storage hardware components

The following figures show components and LEDs located on the front and rear panels of the StoreEasy 1450 Storage.



**Figure 1: StoreEasy 1450 Storage front panel components**

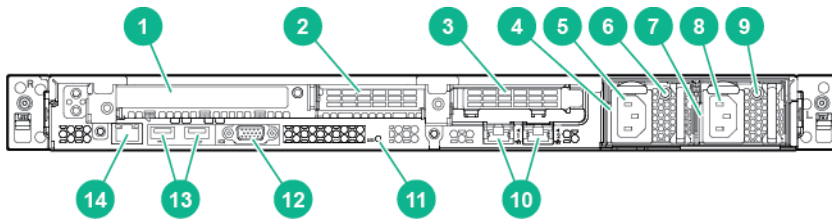
- |                             |                          |
|-----------------------------|--------------------------|
| 1. Optical drive (optional) | 2. Serial label pull tab |
| 3. USB connectors           | 4. LFF drives            |



**Figure 2: StoreEasy 1450 Storage front panel LEDs and buttons**

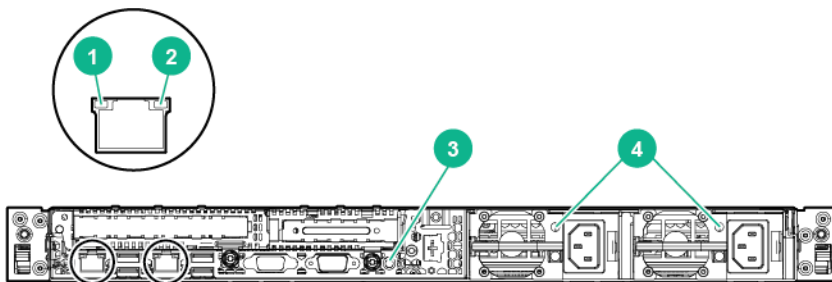
Item	Description	Status
1	UID LED/button	Blue = Identification is activated Flashing blue = System is being managed remotely Off = Identification is deactivated
2	Power On/Standby button and system power LED	Green = System is on Flashing green = Waiting for power Amber = System is in standby, but power is still applied Off = Power cord is not attached or power supply failed
3	Health LED	Green = System is on and system health is normal Flashing amber = System health is degraded Flashing red = System health is critical Off = System is off.
4	NIC status LED	Green = Linked to network Flashing green = Network activity Off = No network link





**Figure 3: StoreEasy 1450 Storage rear panel components**

1. PCIe3 slot 1 (primary, associated with processor 1)
2. PCIe3 slot 2 (primary, associated with processor 1)
3. PCIe3 slot 3 (secondary, associated with processor 2)
4. Power supply 1 bay
5. Power supply 1 power connector (optional)
6. Power supply 1 LED (optional)
7. Power supply 2 bay
8. Power supply 2 power connector
9. Power supply 2 LED
10. Embedded 2x1GbE network adapter
11. Unit ID LED
12. Video connector
13. USB 3.0 connectors
14. Dedicated iLO connector



**Figure 4: StoreEasy 1450 Storage rear panel LEDs and buttons**

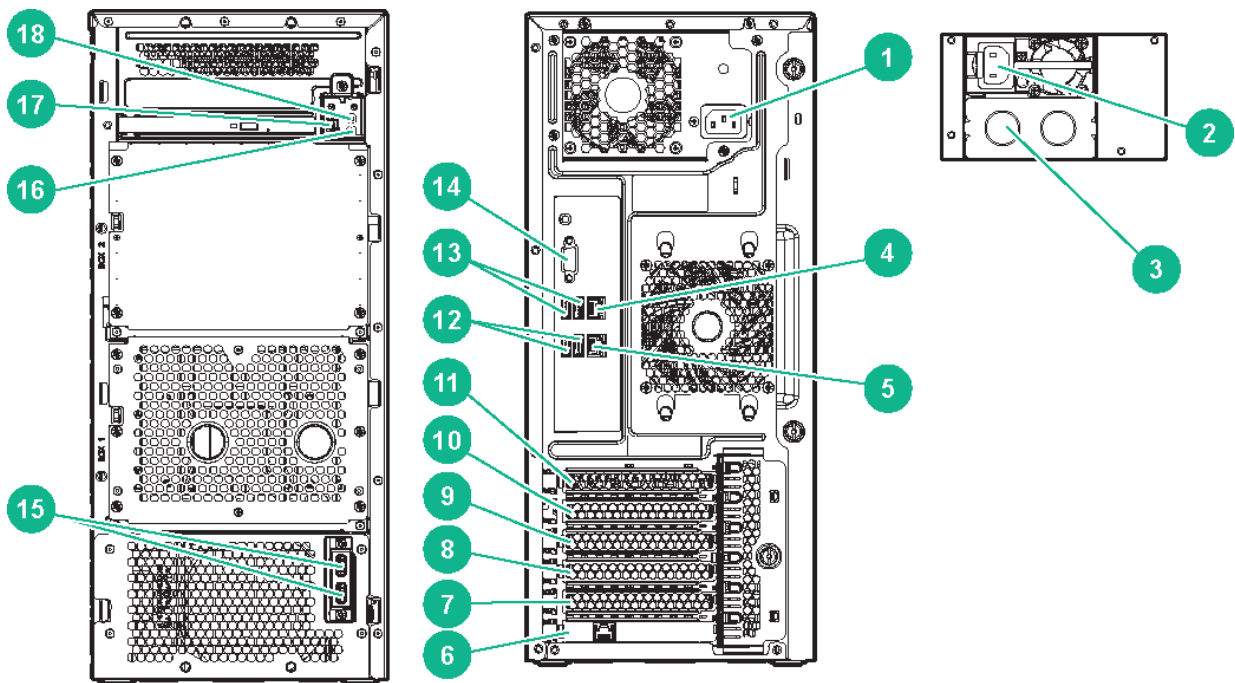
Item	Description	Status
1	NIC link LED	Green = Link exists Off = No link exists
2	NIC status LED	Green = Activity exists Flashing green = Activity exists Off = No activity exists

*Table Continued*

Item	Description	Status
3	UID LED/button	Blue = Activated Flashing blue = System is being managed remotely Off = Deactivated
4	Power supply LEDs	Green = Normal Off = One or more of the following conditions exist: <ul style="list-style-type: none"> <li>• Power is unavailable</li> <li>• Power supply failed</li> <li>• Power supply is in standby mode</li> <li>• Power supply exceeded current limit</li> </ul>

## StoreEasy 1550 Storage hardware components

This section illustrates the components and LEDs located on the front and rear panels of the StoreEasy 1550 Storage.



**Figure 5: StoreEasy 1550 Storage front panel and rear panel components**

1. 750W non-hot-plug power supply

2. Power supply bay 1 of the hot-plug 750W power supply (optional)

3. Power supply bay 2 of the 750W hot-plug power supply (optional)

4. NIC connector 1

*Table Continued*

- 5. NIC connector 2
- 7. Slot 5 PCIe3x8 (8, 4, 1)
- 9. Slot 3 PCIe3x8 (8, 4, 1)
- 11. Slot 1 PCIe3x16 (16, 8, 4, 1)
- 13. USB 3.0 connectors
- 15. USB 3.0 (2) connectors
- 17. NIC status LED
- 6. Dedicated iLO port
- 8. Slot 4 PCIe3x4 (4, 1)
- 10. Slot 2 PCIe3x4 (4, 1)
- 12. USB 2.0 connectors
- 14. Video connector
- 16. Power button/LED
- 18. Health LED

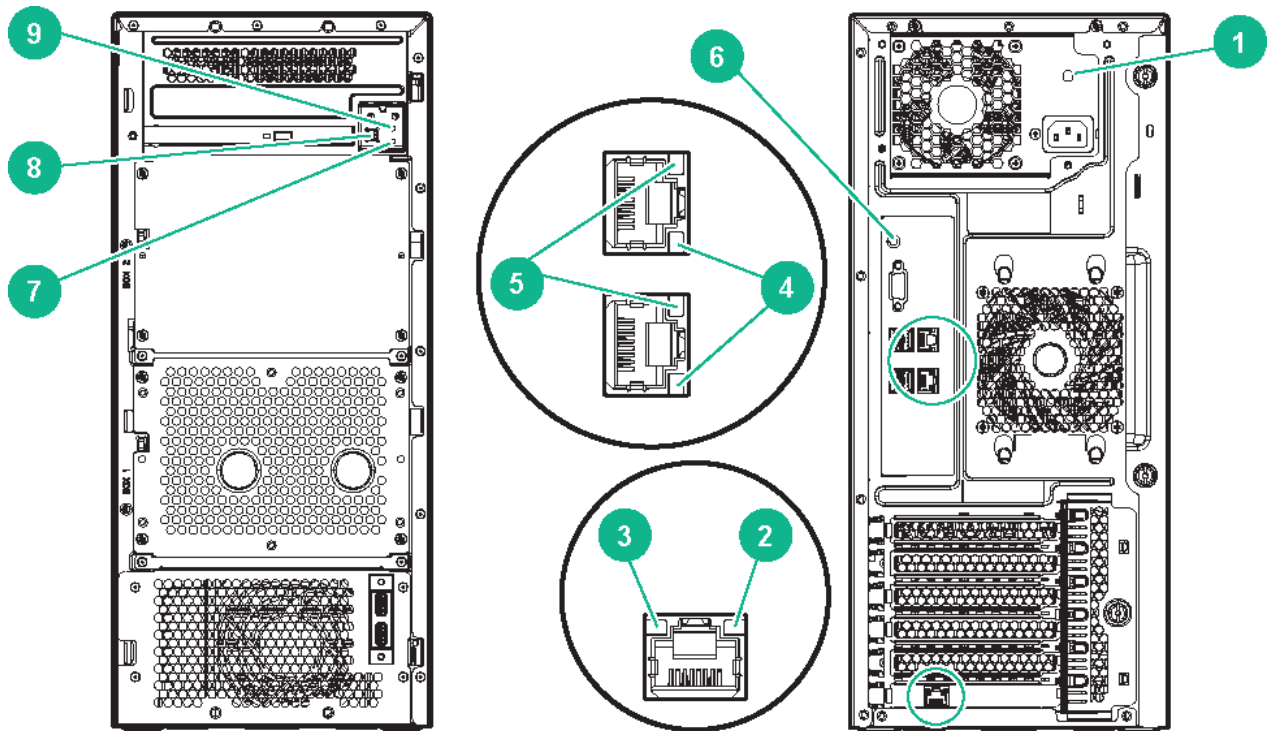


Figure 6: StoreEasy 1550 Storage front panel and rear panel LEDs and buttons

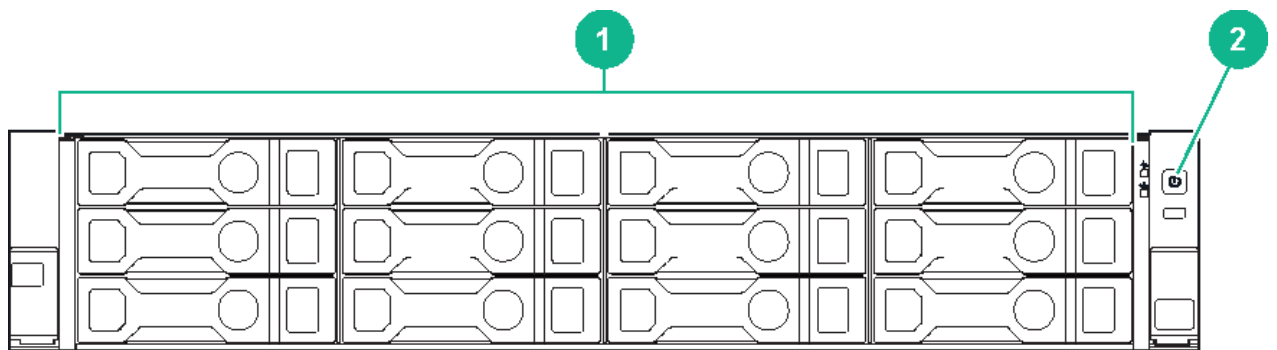
Item	Description	Status
1	Power supply LED	<p>Solid green = Normal</p> <p>Off = One or more of the following conditions exist:</p> <ul style="list-style-type: none"> <li>• AC power is unavailable</li> <li>• Power supply failed</li> <li>• Power supply is in standby mode</li> <li>• Power supply error</li> </ul>
2	iLO link LED	<p>Green = Linked to network</p> <p>Off = No network connection</p>
3	iLO activity LED	<p>Green or flashing green = Network activity</p> <p>Off = No network activity</p>
4	NIC activity LED	<p>Green or flashing green = Network activity</p> <p>Off = No network activity</p>
5	NIC link LED	<p>Green = Linked to network</p> <p>Off = No network connection</p>
6	UID button/LED	<p>Solid blue = Activated</p> <p>Flashing blue:</p> <ul style="list-style-type: none"> <li>• 1 Hz/cycle per sec = Remote management or firmware upgrade in progress</li> <li>• 4 Hz/cycle per sec = iLO manual reboot sequence initiated</li> <li>• 8 Hz/cycle per sec = iLO manual reboot sequence in progress</li> </ul> <p>Off = Deactivated</p>
7	NIC status LED**	<p>Solid green = Link to network</p> <p>Flashing green (1 Hz/cycle per sec) = Network active</p> <p>Off = No network activity</p>
8	Health LED**	<p>Solid green = Normal</p> <p>Flashing green (1 Hz/cycle per sec) = iLO is rebooting.</p> <p>Flashing amber = System degraded</p> <p>Flashing red (1 Hz/cycle per sec) = System critical*</p>

*Table Continued*

Item	Description	Status
9	Power On/Standby button and system power LED**	Solid green = System on Flashing green (1 Hz/cycle per sec) = Performing power on sequence Solid amber = System in standby Off = No power present***
<p>* If the health LED indicates a degraded or critical state, review the system IML or use iLO to review the system health status.</p> <p>** When all three LEDs described in this table and the UID button/LED on the rear panel flash simultaneously, a power fault has occurred.</p> <p>*** Facility power is not present, power cord is not attached, no power supplies are installed, power supply failure has occurred, or the power button cable is disconnected.</p>		

## StoreEasy 1650 Storage hardware components

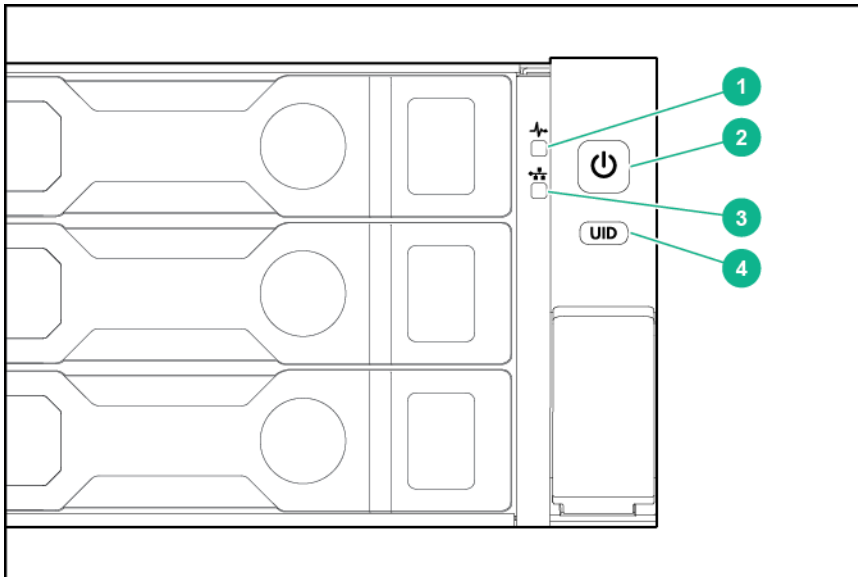
The section illustrates the components and LEDs located on the front and rear panels of the StoreEasy 1650 Storage.



**Figure 7: StoreEasy 1650 Storage front panel components**

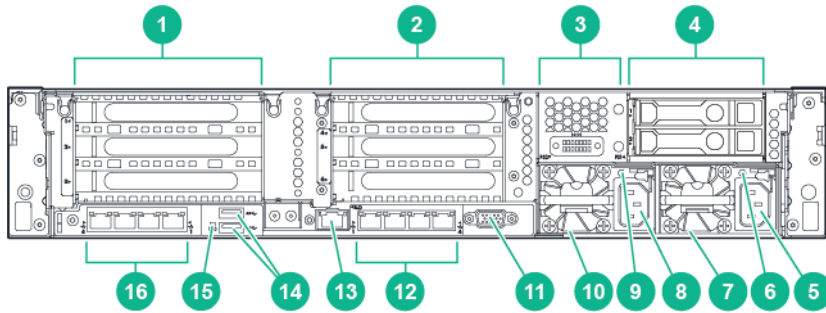
1. LFF drives

2. Power LED



**Figure 8: StoreEasy 1650 Storage front panel LEDs and buttons**

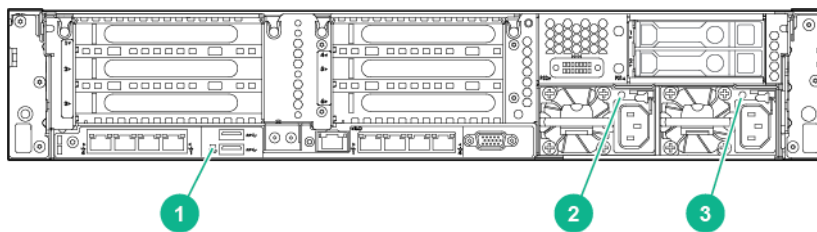
Item	Description	Status
1	Health LED	Green = System is on and system health is normal Flashing amber = System health is degraded Flashing red = System health is critical Off = System is off
2	Power On/Standby button and system power LED	Green = System is on Flashing green = Waiting for power Amber = System is in standby, but power is still applied Off = Power cord is not attached or power supply failed
3	NIC status LED	Green = Linked to network Flashing green = Network activity Off = No network link
4	UID LED/button	Blue = Identification is activated Flashing blue = System is being managed remotely Off = Identification is deactivated



**Figure 9: StoreEasy 1650 Storage rear panel components**

- |  |  |
|--|--|
| 1. PCI slots (Slots 1–3 top to bottom, riser shipped standard) | 2. PCI Slots (Slots 4–6 top to bottom, requires second riser card, and second processor) |
| 3. Optional serial port  | 4. Rear 2 SFF HDD*   |
| 5. HPE Flexible slot power supply bay 1                        | 6. Power supply power LED  |
| 7. Power supply power connection                               | 8. HPE Flexible slot power supply bay 2  |
| 9. Power supply power LED                                      | 10. Power supply power connection  |
| 11. VGA connector  | 12. Embedded 4 x 1GbE network adapter  |
| 13. Dedicated iLO connector                                    | 14. USB 3.0 connectors (2)   |
| 15. Unit ID LED  | 16. Optional FlexibleLOM ports (Shown: 4 x 1GbE)   |

\*For the StoreEasy 1650 90TB SATA model (sku M0S97A), the rear panel contains 3 LFF drives instead of 2 SFF drives. With 3 LFF drives, the second PCI riser cannot be added, but a second processor can still be installed.



**Figure 10: StoreEasy 1650 Storage rear panel LEDs**

Item	Description	Status
1	Unit ID LED	Blue = Activated Flashing blue = System is being managed remotely Off = Deactivated
2	Power supply Power LED	Off = System is off or power supply has failed Solid green = Normal
3	Power supply Power LED	Off = System is off or power supply has failed Solid green = Normal

## StoreEasy 1650 Expanded Storage hardware components

This section illustrates the components and LEDs located on the front and rear panels of the HPE StoreEasy 1650 (Expanded Storage).

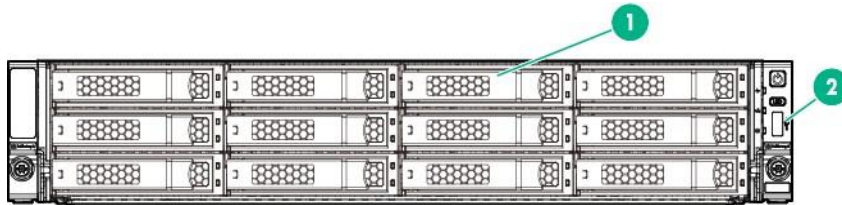


Figure 11: StoreEasy 1650 Expanded Storage front panel components

Item	Description
1	LFF hot-plug drives
2	USB 2.0 connector

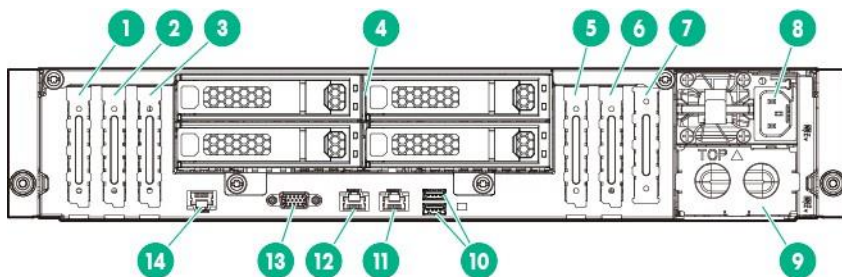


Figure 12: StoreEasy 1650 Expanded Storage rear panel components

Item	Description
1	PCIe3 x16 (16, 8, 4, 1) slot 7 for low-profile, standup expansion board*
2	PCIe3 x 8 (8, 4, 1) slot 6 for low-profile, standup expansion board*

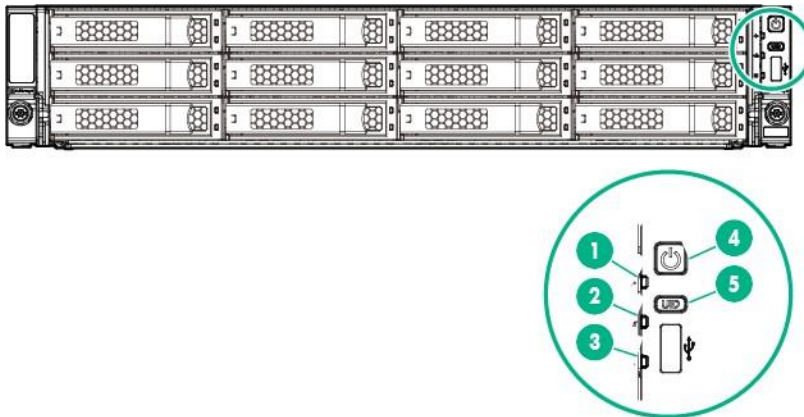
Table Continued



Item	Description
3	PCIe3 x16 (16, 8, 4, 1) slot 5 for low-profile, standup expansion board*
4	LFF hot-plug drives
5	PCIe3 x16 (16, 8, 4, 1) slot 2 for low-profile, standup expansion board or riser cage options**
6	PCIe3 x 8 (8, 4, 1) slot 1 for low-profile, standup expansion board**
7	FlexibleLOM slot**
8	Hot-plug power supply bay 1
9	Hot-plug power supply bay 2
10	USB 3.0 connectors
11	NIC 1/shared iLO connector
12	NIC connector 2
13	Video connector
14	Dedicated iLO management connector

\* The PCIe expansion slots 5-7 are associated with processor 2.

\*\* The PCIe expansion slots 1-4 and the FlexibleLOM slot are associated with processor 1.



**Figure 13: StoreEasy 1650 Expanded Storage front panel LEDs**

Item	Description	Status
1	Health LED*	Solid green = Normal Flashing green (1 Hz/cycle per sec) = iLO is rebooting Flashing amber = System degraded** Flashing red (1 Hz/cycle per sec) = System critical**
2	NIC status LED*	Solid green = Link to network Flashing green (1 Hz/cycle per sec) = Network active Off = No network activity
3	Front drive health/thermal LED	Solid green = Drives supported by the SAS expander are functional. Solid amber = Failure or predictive failure of one or more drives supported by the SAS expander.*** Flashing amber (1 Hz/cycle per sec) = The temperature sensor in one or more front drives is about to reach the thermal threshold. Immediately slide the front drive cages back into the chassis and keep them there until the LED turns green.**** Off = No power present*****
4	Power On/Standby button and system power LED*	Solid green = System on Flashing green (1 Hz/cycle per sec) = Performing power on sequence Solid amber = System in standby Off = No power present*****

*Table Continued*

Item	Description	Status
5	UID button/LED*	Solid blue = Activated Flashing blue: <ul style="list-style-type: none"> <li>• 1 Hz/cycle per sec = Remote management or firmware upgrade in progress</li> <li>• 4 Hz/cycle per sec = iLO manual reboot sequence initiated</li> <li>• 8 Hz/cycle per sec = iLO manual reboot sequence in progress</li> </ul> Off = Deactivated

\* When these four LEDs flash simultaneously, a power fault has occurred.

\*\* If the health LED indicates a degraded or critical state, review the system IML or use iLO to review the system health status.

\*\*\* This LED behavior applies to all front drives, and to the rear drives connected to the front drive cage 2 backplane.

\*\*\*\* This LED behavior depends on the iLO 08-HD Max sensor reading.

\*\*\*\*\* Facility power is not present, power cord is not attached, no power supplies are installed, power supply failure has occurred, or the front I/O cable is disconnected.

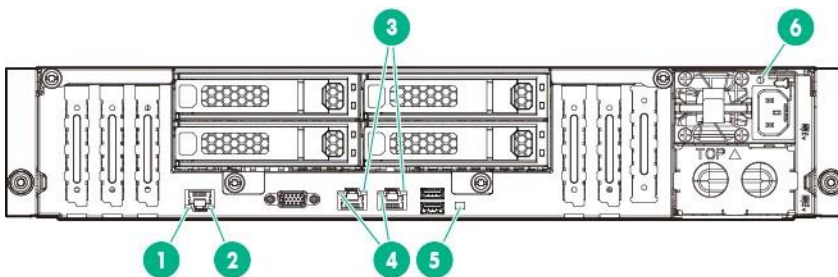


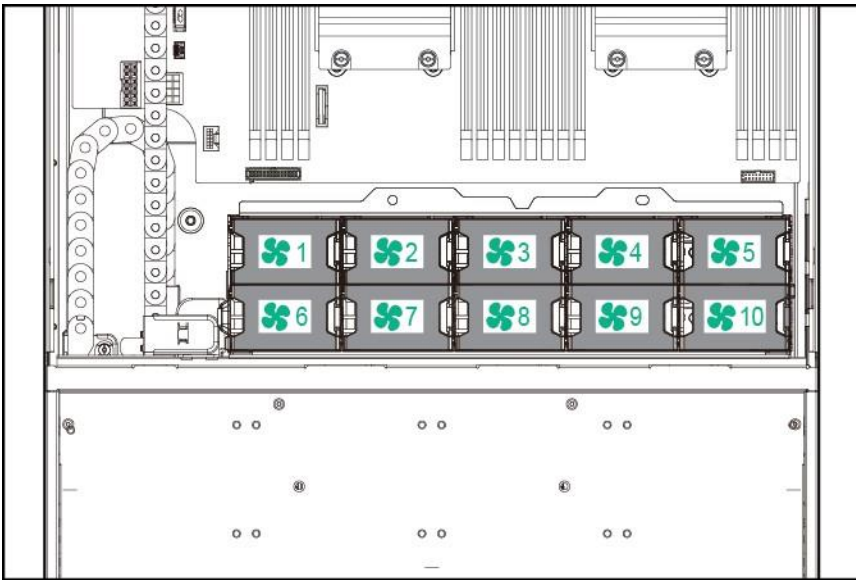
Figure 14: StoreEasy 1650 Expanded Storage rear panel LEDs

Item	Description	Status
1	Dedicated iLO activity LED	Solid green = Link to network Flashing green = Network active Off = No network activity
2	Dedicated iLO link LED	Green = Network link Off = No network link

Table Continued

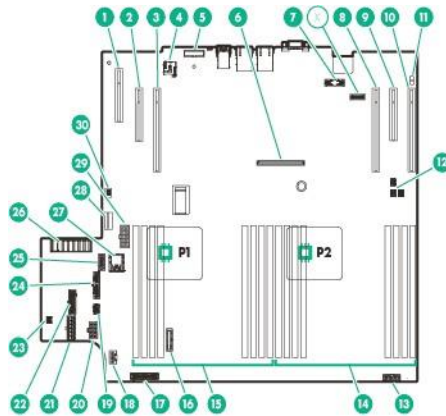
Item	Description	Status
3	NIC activity LED	Solid green = Link to network Flashing green = Network active Off = No network activity
4	NIC link LED	Green = Network link Off = No network link
5	UID LED	Solid blue = Activated Flashing blue: <ul style="list-style-type: none"> <li>• 1 Hz/cycle per sec = Remote management or firmware upgrade in progress</li> <li>• 4 Hz/cycle per sec = iLO manual reboot sequence initiated</li> <li>• 8 Hz/cycle per sec = iLO manual reboot sequence in progress</li> </ul> Off = Deactivated
6	Power supply LED	Solid green = Normal Off = One or more of the following conditions exists: <ul style="list-style-type: none"> <li>• Power is unavailable</li> <li>• Power supply failed</li> <li>• Power supply is in standby mode</li> <li>• Power supply error</li> </ul>

## Fan locations



## System board components

The components shown in this section are associated with the HPE ProLiant XL420 Gen9 Server system board.



Item	Description
1	FlexibleLOM slot
2	PCIe3 x 8 (8, 4, 1) slot 1 for low-profile, standup expansion board1
3	PCIe3 x16 (16, 8, 4, 1) slot 2 for low-profile, standup expansion board or riser cage options1
4	MicroSD slot
5	TPM connector

*Table Continued*

<b>Item</b>	<b>Description</b>
6	HPE Flexible Smart Array Controller slot
7	Dedicated iLO management module connector
8	PCIe3 x16 (16, 8, 4, 1) slot 5 for low-profile, standup expansion board*
9	PCIe3 x8 (8, 4, 1) slot 6 for low-profile, standup expansion board*
10	PCIe3 x16 (16, 8, 4, 1) slot 7 for low-profile, standup expansion board*
11	NMI header
12	Storage backup power connectors for expansion slots 3–7
13	Front I/O connector
14	Processor 2 DIMM slots
15	Processor 1 DIMM slots
16	System battery
17	Fan signal connector
18	Smart Storage Battery connector
19	Rear SFF drive backplane detection connector
20	Fan power connector
21	Front drive cage 2 backplane power connector
22	Front drive cage 1 backplane power connector
23	Storage backup power connector for expansion slots 1–2
24	SATA 6Gb/s connector 4
25	SATA 6Gb/s connector 5
26	Power pass-through board connector
27	Internal USB 3.0 connector
28	SATA x4 connector 1

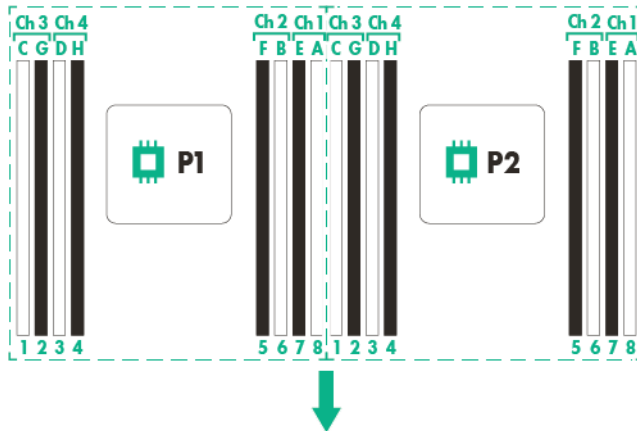
*Table Continued*

Item	Description
29	Rear drive cage backplane power connector
30	Front USB 2.0 connector
X	System maintenance switch

\* The PCIe expansion slots 5-7 are associated with processor 2.

## DIMM slot locations

DIMM slots are numbered sequentially (1 through 8) for each processor. The supported AMP modes use the letter assignments for population guidelines.



The arrow points to the front of the server.

## System maintenance switch

Position	Default	Function
S1	Off	Off = iLO 4 security is enabled. On = iLO 4 security is disabled.
S2	Off	Off = System configuration can be changed. On = System configuration is locked.
S3	Off	Reserved
S4	Off	Reserved
S5	Off	Off = Power-on password is enabled. On = Power-on password is disabled.

*Table Continued*

Position	Default	Function
S6	Off	Off = No function On = ROM reads system configuration as invalid.
S7	Off	Off = Set default boot mode to UEFI. On = Set default boot mode to legacy.
S8	–	Reserved
S9	–	Reserved
S10	–	Reserved
S11	–	Reserved
S12	–	Reserved

To access the redundant ROM, set S1, S5, and S6 to on.

When the system maintenance switch position 6 is set to the On position, the system is prepared to erase all system configuration settings from both CMOS and NVRAM.

**⚠ CAUTION:**

Clearing CMOS or NVRAM or both deletes configuration information. Be sure to properly configure the server, if not data loss could occur.

**ⓘ IMPORTANT:**

Before using the S7 switch to change to Legacy BIOS Boot Mode, be sure the HPE Dynamic Smart Array B140i Controller is disabled. Do not use the B140i controller when the server is in Legacy BIOS Boot Mode. Do not change the BIOS from UEFI to Legacy BIOS mode on the StoreEasy 1650 Expanded Storage system. The operating system M.2 SSDs are connected to the B140i. The B140i is only accessible when the system is in UEFI mode.

## NMI functionality

An NMI crash dump creates a crash dump log before resetting a system which is not responding.

Crash dump log analysis is an essential part of diagnosing reliability problems, such as failures of operating systems, device drivers, and applications. Many crashes freeze a system, and the only available action for administrators is to restart the system. Resetting the system erases any information which could support problem analysis, but the NMI feature preserves that information by performing a memory dump before a system reset.

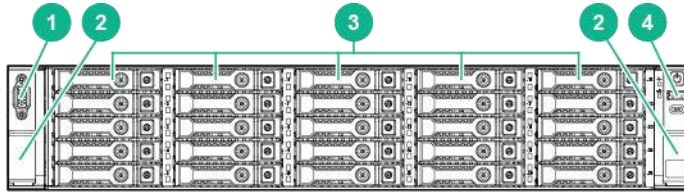
To force the system to invoke the NMI handler and generate a crash dump log:

- Use the iLO Virtual NMI feature.
- Short the NMI header (**System board components**).



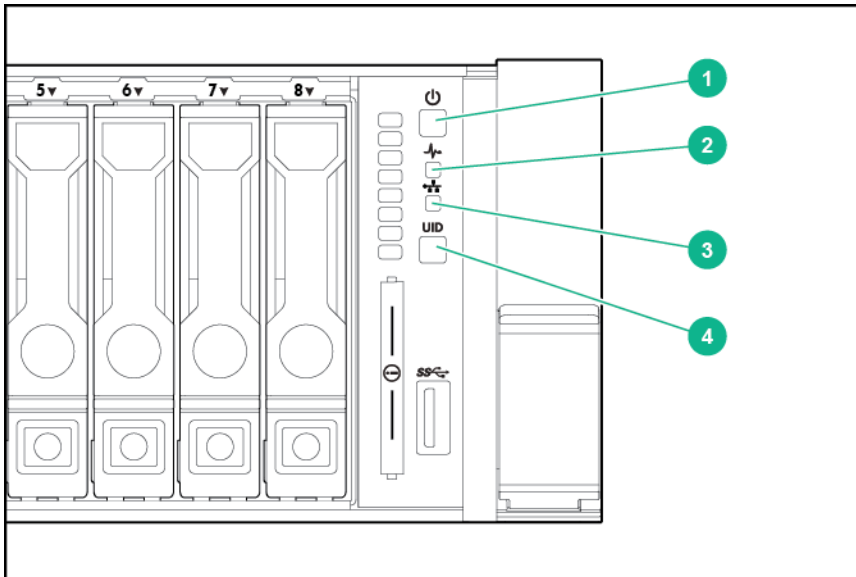
## StoreEasy 1850 Storage hardware components

This section illustrates the components and LEDs located on the front and rear panels of the StoreEasy 18x0 Storage



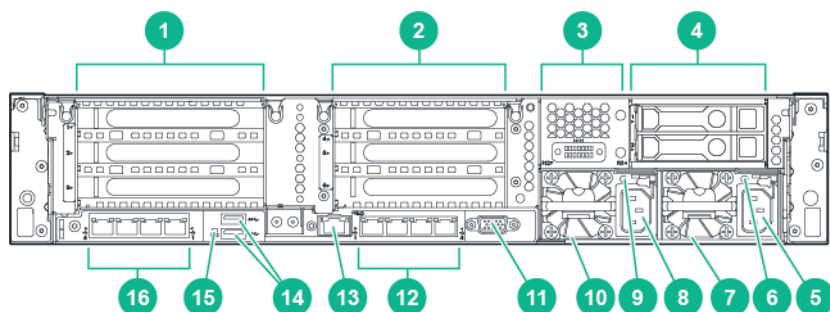
**Figure 15: StoreEasy 1850 Storage front panel components**

- |                    |                             |
|--------------------|-----------------------------|
| 1. Video connector | 2. Quick release levers (2) |
| 3. Drive bays      | 4. USB connector            |



**Figure 16: StoreEasy 1850 Storage front panel LEDs and buttons**

Item	Description	Status
1	Power On/Standby button and system power LED	Off = Power cord not attached or power supply failure Solid Amber = System is in standby; Power On/Standby Button service is initialized Flashing Green = Power On/Standby Button has been pressed; system is waiting to power on Solid Green = System on
2	System health LED	Green = Normal Flashing amber = System degraded Flashing red = System critical To identify components in degraded or critical state, see <a href="#">Systems Insight Display LED combinations</a>
3	NIC status LED	Off = No network link Solid green = Link to network Flashing green = Network activity
4	UID LED and button	Solid blue = Activated Flashing blue = System being remotely managed Off = Deactivated

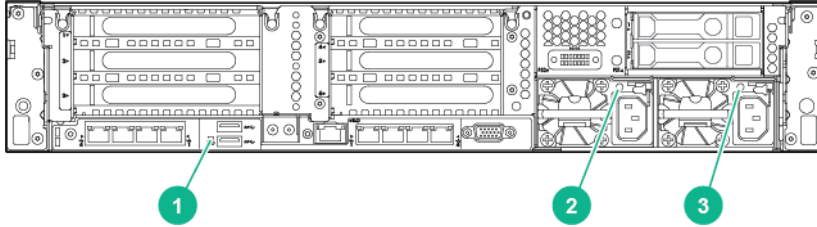


**Figure 17: StoreEasy 1850 Storage rear panel components**

- |  |  |
|--|--|
| 1. PCI slots (Slots 1–3 top to bottom, riser shipped standard) | 2. PCI slots (Slots 4–6 top to bottom, requires second riser card, and second processor) |
| 3. Optional serial port  | 4. Rear 2 SFF HDD  |
| 5. HPE Flexible slot power supply bay 1                        | 6. Power supply power LED  |
| 7. Power supply power connection                               | 8. HPE Flexible slot power supply bay 2  |
| 9. Power supply power LED                                      | 10. Power supply power connection  |

*Table Continued*

- 11. VGA connector
- 12. Embedded 4 x 1GbE network adapter
- 13. Dedicated iLO connector
- 14. USB 3.0 connectors (2)
- 15. Unit ID LED
- 16. Optional FlexibleLOM ports (Shown: 4 x 1GbE)



**Figure 18: StoreEasy 1850 Storage rear panel LEDs**

Item	Description	Status
1	Unit ID LED	Blue = Activated Flashing blue = System is being managed remotely. Off = Deactivated
2	Power supply Power LED	Off = System is off or power supply has failed Solid green = Normal
3	Power supply Power LED	Off = System is off or power supply has failed Solid green = Normal

## Drive LED definitions

SFF Drive LEDs shows the drive LEDs. These LEDs are located on all HPE hot-plug hard drives.

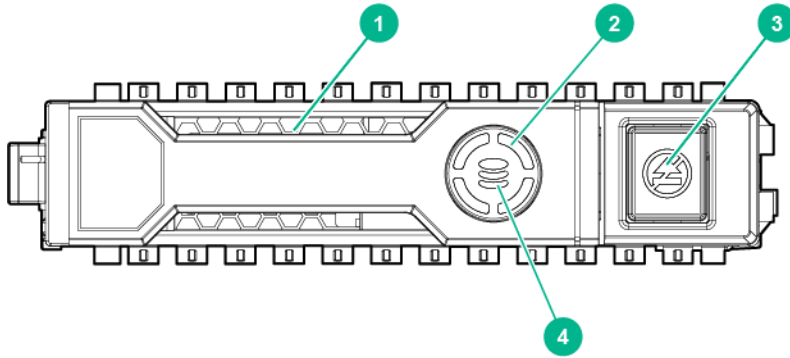
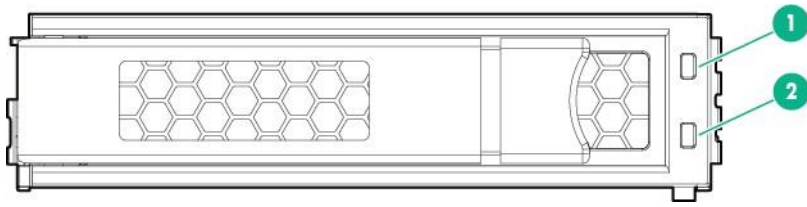


Figure 19: SFF Drive LEDs

Table 1: SFF Drive LEDs

Item	LED	Status	Definition
1	Locate	Solid blue	The drive is being identified by a host application.
		Flashing blue	The drive carrier firmware is being updated or requires an update.
2	Activity ring	Rotating green	Drive activity
		Off	No drive activity
3	Do not remove	Solid white	Do not remove the drive. Removing the drive causes one or more of the logical drives to fail.
		Off	Removing the drive does not cause a logical drive to fail.
4	Drive status	Solid green	The drive is a member of one or more logical drives.
		Flashing green	The drive is rebuilding or performing a RAID migration, stripe size migration, capacity expansion, or logical drive extension, or is erasing.
		Flashing amber/ green	The drive is a member of one or more logical drives and predicts the drive will fail.
		Flashing amber	The drive is not configured and predicts the drive will fail.
		Solid amber	The drive has failed.
		Off	The drive is not configured by a RAID controller.



**Figure 20: LFF Drive LEDs**

Item	Description
1	Fault/UID (amber/blue)
2	Online/Activity (green)

Online/Activity LED (green)	Fault/UID LED (amber/blue)	Definition
On, off, or flashing	Alternating amber and blue	One or more of the following conditions exist: <ul style="list-style-type: none"> <li>The drive has failed.</li> <li>A predictive failure alert has been received for this drive.</li> <li>The drive has been selected by a management application.</li> </ul>
On, off, or flashing	Solid blue	One or both of the following conditions exist: <ul style="list-style-type: none"> <li>The drive is operating normally.</li> <li>The drive has been selected by a management application.</li> </ul>
On	Amber, Flashing (1 Hz)	A predictive failure alert has been received for this drive. Replace the drive as soon as possible.
On	Off	The drive is online but is not currently active.
Flashing (1 Hz)	Amber, Flashing (1 Hz)	Do not remove the drive. Removing the drive might terminate the current operation and cause data loss.  The drive is part of an array that is undergoing capacity expansion or stripe migration, but a predictive failure alert has been received for this drive. To minimize the risk of data loss, do not remove the drive until the expansion or migration is complete.

*Table Continued*

Online/Activity LED (green)	Fault/UID LED (amber/blue)	Definition
Flashing (1 Hz)	Off	Do not remove the drive. Removing the drive might terminate the current operation and cause data loss. The drive is rebuilding, erasing, or is part of an array that is undergoing capacity expansion or stripe migration.
Flashing (4 Hz)	Amber, Flashing (1 Hz)	The drive is active but a predictive failure alert has been received for this drive. Replace the drive as soon as possible.
Flashing (4 Hz)	Off	The drive is active and is operating normally.
Off	Solid amber	A critical fault condition has been identified for this drive and the controller has placed it offline. Replace the drive as soon as possible.
Off	Amber, Flashing (1 Hz)	A predictive failure alert has been received for this drive. Replace the drive as soon as possible.
Off	Off	The drive is offline, a spare, or not configured as part of an array.

## Power fault LEDs

The following table provides a list of power fault LEDs and the subsystems that are affected. Not all power faults are used by all servers.

Subsystem	LED behavior
System board	1 flash
Processor	2 flashes
Memory	3 flashes
Riser board PCIe slots	4 flashes
FlexibleLOM	5 flashes
Removable HPE Flexible Smart Array controller/ Smart SAS HBA controller	6 flashes
System board PCIe slots	7 flashes
Power backplane or storage backplane	8 flashes
Power supply	9 flashes

## Front drive thermal LED

The thermal warning function of the front drive health/thermal LED depends on the iLO 08-HD Max sensor reading. This function is disabled under these conditions:

- There are no drives in the front drive cages 1 and 2.
- The temperature sensor in one or more front drives has failed.

Under these conditions, iLO shows the 08-HD Max sensor reading as N/A. To view temperature sensor data, log in to iLO 4 web interface and navigate to the Information → System Information → Temperatures page.

If the 08-HD Max sensor reading shows N/A, observe the following when extending the front drive cage:

- Do not keep the drive cages out of the chassis for more than 140 sec.
- Keep the drive cages inside the chassis for at least 300 sec before extending them out again.

## Systems Insight Display LED combinations

When the health LED on the front panel illuminates either amber or red, the server is experiencing a health event. Combinations of illuminated Systems Insight Display LEDs, the system power LED, and the health LED indicate system status.

**Table 2: Systems Insight Display LEDs and internal health LED combinations**

Systems Insight Display LED and color	Health LED	System power LED	Status
Processor (amber)	Red	Amber	One or more of the following conditions might exist: <ul style="list-style-type: none"> <li>• Processor in socket X has failed.</li> <li>• Processor X is not installed in the socket.</li> <li>• Processor X is unsupported.</li> <li>• ROM detects a failed processor during POST.</li> </ul>
	Amber	Green	Processor in socket X is in a pre-failure condition.
DIMM (amber)	Red	Green	One or more DIMMs have failed.
	Amber	Green	DIMM in slot X is in a pre-failure condition.
Over temp (amber)	Amber	Green	The Health Driver has detected a cautionary temperature level.
	Red	Amber	The server has detected a hardware critical temperature level.
PCI riser (amber)	Red	Green	The PCI riser cage is not seated properly.

*Table Continued*

Systems Insight Display LED and color	Health LED	System power LED	Status
Fan (amber)	Amber	Green	One fan has failed or is removed.
	Red	Green	Two or more fans have failed or are removed.
Power supply (amber)	Red	Amber	One or more of the following conditions may exist: <ul style="list-style-type: none"> <li>• Only one power supply is installed and that power supply is in standby.</li> <li>• Power supply fault.</li> <li>• System board fault.</li> </ul>
	Amber	Green	One or more of the following conditions may exist: <ul style="list-style-type: none"> <li>• Redundant power supply is installed and only one power supply is functional.</li> <li>• AC power cord is not plugged into redundant power supply.</li> <li>• Redundant power supply fault.</li> <li>• Power supply mismatch at POST or power supply mismatch through hot-plug addition.</li> </ul>
Power cap (off)	—	Amber	Standby
Power cap (green)	—	Flashing green	Waiting for power
	—	Green	Power is available

**NOTE:**

For more information on troubleshooting, refer to the hardware platform information. The following list identifies the ProLiant model for each HPE StoreEasy 1000 Storage product:

- 1450—ProLiant DL160 Gen9 server
- 1550—ProLiant ML110 Gen9 server
- 1650—ProLiant DL380 Gen9 server
- 1650 Expanded—Apollo 4200 Gen9 server
- 1850—ProLiant DL380 Gen9 server

The ProLiant documentation is available at:

<http://www.hpe.com/support/proliantgen9/docs>



# Installing an M.2 SSD Enablement Board in the StoreEasy 1650 Expanded Storage System

## Procedure

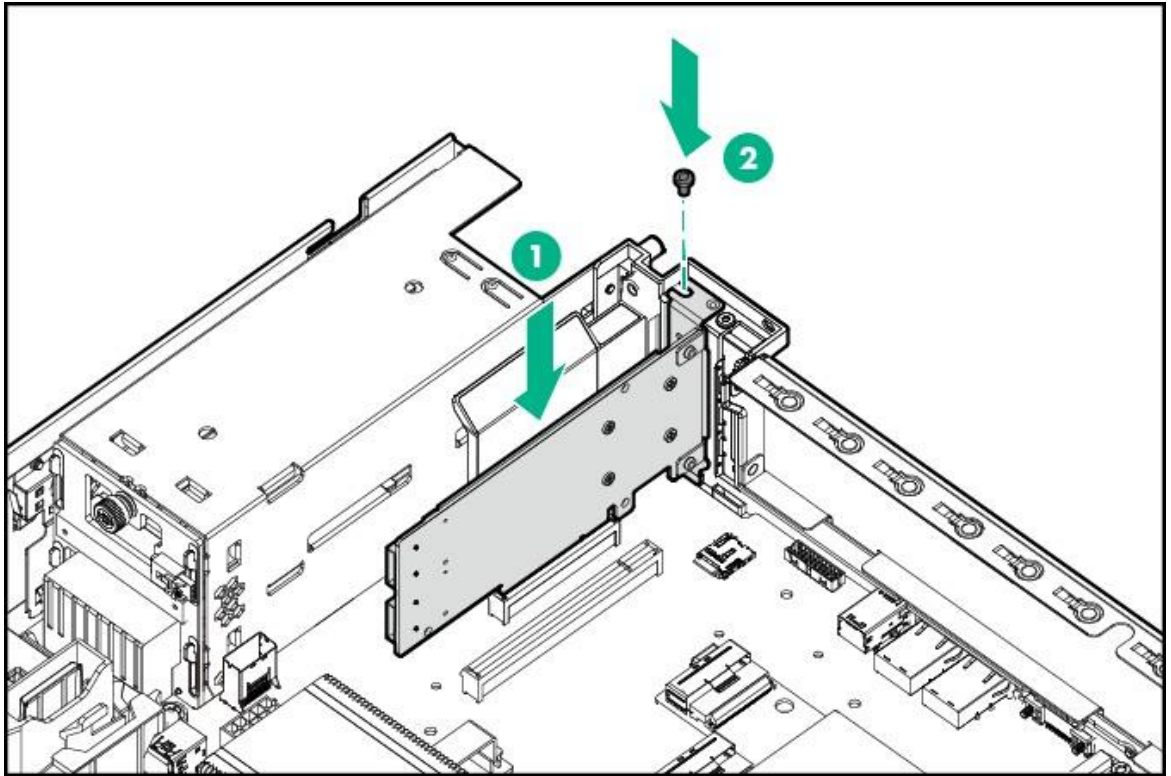
1. Power down the server.
2. Remove all power:
  - Disconnect each power cord from the power source.
  - Disconnect each power cord from the server.
3. Extend the server from the rack.
4. Remove the access panel.
5. Remove the PCIe riser cage.
6. Remove the M.2 SSD Enablement Board slot cover.
7. Install the M.2 SSD Enablement Board.



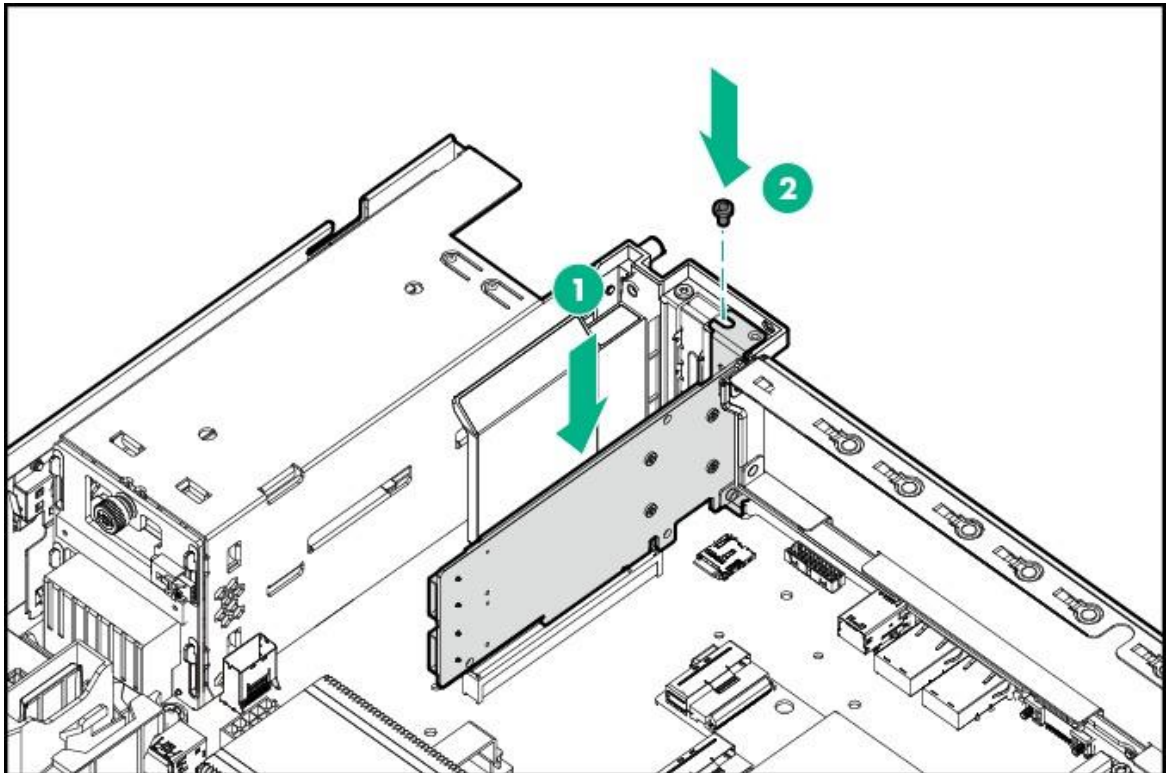
### **IMPORTANT:**

The PCIe M.2 SSD Enablement Board does not connect to an array controller.

- Insert one end of each SATA cable into one of the SATA connectors on the M.2 SSD Enablement Board, and then insert the other end of the SATA cable into one of the data ports on the server.
- Firmly seat the M.2 SSD Enablement Board into the x4 PCIe slot on the server.
  - M.2 SSD enablement board installed in the onboard PCIe3 x8 expansion slot 1



- M.2 SSD enablement board installed in the onboard PCIe3 x16 expansion slot 2



**IMPORTANT:**

Your M.2 SSD Enablement Board might either be a full-length or a half-length M.2 SSD Enablement Board. For information on installing either a full-length or a half-length M.2 SSD Enablement Board, see the server user guide on the HPE website (<http://www.hpe.com/support/proliantgen9/docs>).

8. Install the M.2 SSD Enablement Board slot cover.
9. Install the PCIe riser cage.
10. Install the access panel.
11. Install the server into the rack.
12. Connect each power cord to the server.
13. Connect each power cord to the power source.
14. Power up the server.

The installation is complete.

## Removing an M.2 SSD Enablement Board from the StoreEasy 1650 Expanded server

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**WARNING:**

To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.

---

**CAUTION:**

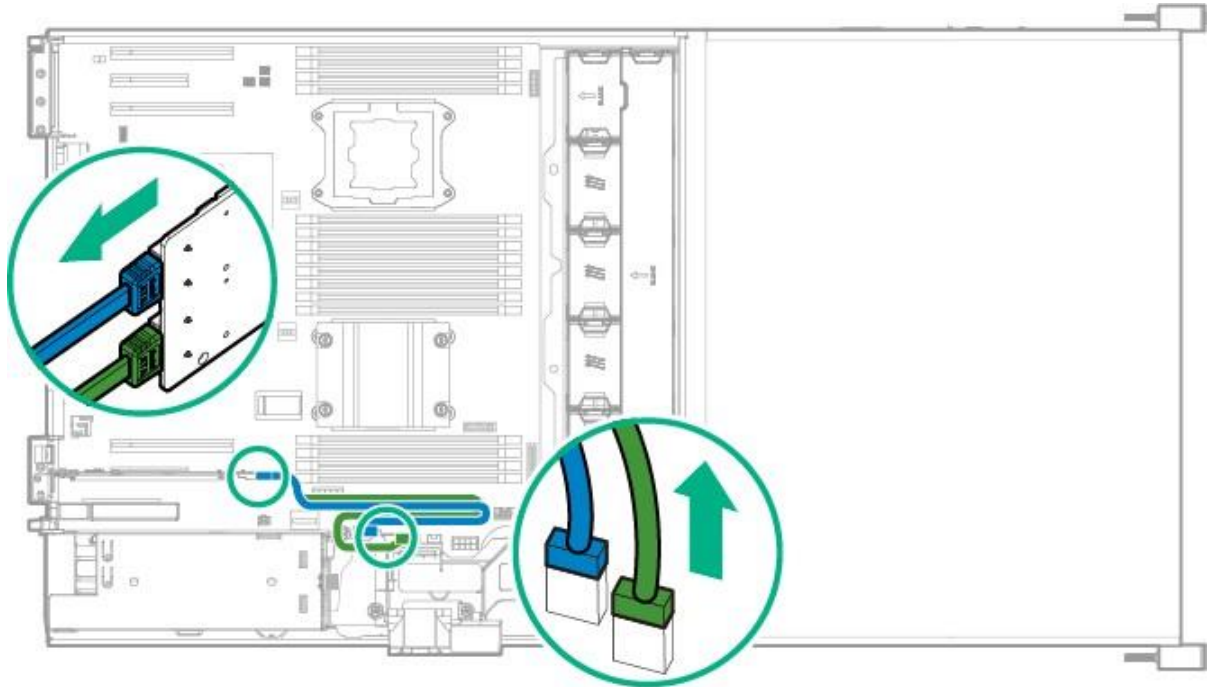
To prevent damage to electrical components, take the appropriate antistatic precautions before beginning any installation, removal, or replacement procedure. Improper grounding can cause electrostatic discharge.

To remove the component:

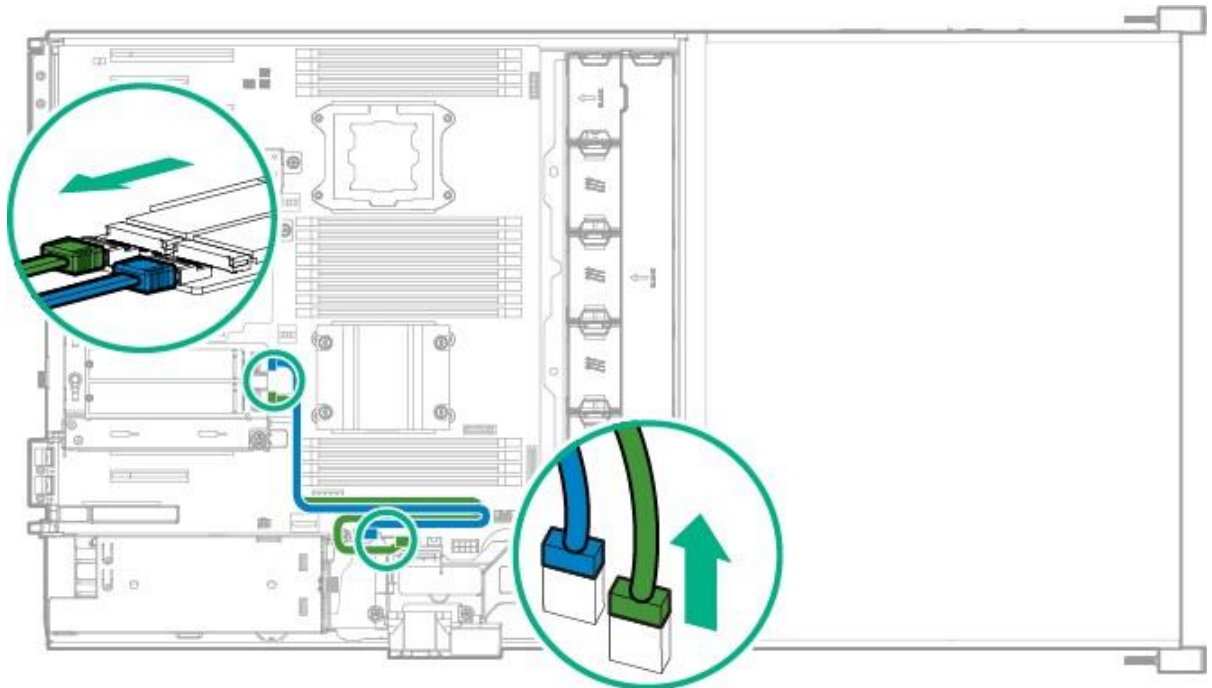
**Procedure**

1. Power down the server.
2. Remove all power:
  - Disconnect each power cord from the power source.
  - Disconnect each power cord from the server.
3. Remove the server from the rack.
4. Remove the access panel.
5. Remove the air baffle.
6. Open the cable management holder.
7. Disconnect the SATA cables from the M.2 SSD enablement board and the system board.

- M.2 SSD SATA cable disconnection when the enablement board is installed in the onboard PCIe expansion slot 1 or 2.



- M.2 SSD SATA cable disconnection when the enablement board is installed in the PCI riser cage.



8. If the M.2 SSD enablement board is installed in the PCI riser cage, remove the riser cage.
9. Remove the M.2 SSD enablement board.

For detailed instructions on the removal and replacement procedures, see the *HPE Apollo 4200 Gen9 Server Maintenance and Service Guide* available at <http://www.hpe.com/support/proliantgen9/docs>.

## Software components

Depending on your model, either Windows Storage Server 2012 R2 or 2016 Standard Edition comes preinstalled and activated on the StoreEasy 1x50 Storage. The system configuration also includes the **Initial Configuration Tasks** window, StoreEasy tools, Windows Server Manager, which are used to set up and manage HPE StoreEasy 1000 Storage.

The **Windows Server Manager > Tools > StoreEasy** menu provides a collection of HPE and Microsoft utilities that are useful for managing HPE StoreEasy 1000 Storage. The **Initial Configuration Tasks** window assists during the initial out of box setup by configuring items, such as system settings, setting the network IP and domain of the HPE StoreEasy 1000 Storage, configuring email alerts, registering product, provisioning storage, and protecting your server. For more information on the ICT tasks, see **Configuring HPE StoreEasy 1000 Storage**. The Pool Manager is used to create storage pools and assign spare drives. For more information on Pool Manager, see [Using Pool Manager](#). Using **Windows Server Manager > File and Storage Services**, you can also create virtual disks and place volumes on the virtual disks.

# Installing HPE StoreEasy 1000 Storage

## Setup overview

The HPE StoreEasy 1000 Storage comes preinstalled with either the Microsoft Windows Storage Server 2012 R2 Standard Edition or 2016 operating system with Microsoft iSCSI Software Target included.

## Default roles

This section includes the list of roles that come preinstalled with HPE StoreEasy 1000 Storage. **Default roles** describes the default roles:

**Table 3: Default roles**

Role	Role service
File and Storage Services	<ul style="list-style-type: none"> <li>• <b>File and iSCSI Services</b> <ul style="list-style-type: none"> <li>◦ File Server</li> <li>◦ Branch Cache for Network Files</li> <li>◦ Data Deduplication</li> <li>◦ Distributed File System (DFS) Replication</li> <li>◦ File Server Resource Manager</li> <li>◦ File Server VSS Agent Service</li> <li>◦ iSCSI Target Server</li> <li>◦ iSCSI Target Storage Provider (VDS and VSS hardware providers)</li> <li>◦ Server for NFS</li> <li>◦ Work Folders</li> </ul> </li> <li>• <b>Storage Services</b></li> </ul>
Print and Document Services	<ul style="list-style-type: none"> <li>• Print Server</li> <li>• Internet Printing</li> <li>• Line Printer Daemon (LPD) Service</li> </ul>
Web Server (IIS)	<ul style="list-style-type: none"> <li>• <b>Web Server</b> <ul style="list-style-type: none"> <li>◦ Common HTTP Features                             <ul style="list-style-type: none"> <li>– Default Document</li> <li>– Directory Browsing</li> <li>– HTTP Errors</li> <li>– Static Content</li> <li>– HTTP Redirection</li> </ul> </li> <li>◦ <b>Health and Diagnostics</b> <ul style="list-style-type: none"> <li>– HTTP Logging</li> <li>– Logging Tools</li> </ul> </li> </ul> </li> </ul>

Role	Role service
	<ul style="list-style-type: none"> <li>– Request Monitor</li> <li>– Tracing</li> <li>◦ <b>Performance</b> <ul style="list-style-type: none"> <li>– Static Content Compression</li> </ul> </li> <li>◦ <b>Security</b> <ul style="list-style-type: none"> <li>– Request Filtering</li> <li>– Basic Authentication</li> <li>– Windows Authentication</li> </ul> </li> <li>◦ <b>Application Development</b> <ul style="list-style-type: none"> <li>– .NET Extensibility 4.6</li> <li>– ASP</li> <li>– ASP.NET 4.6</li> <li>– ISAPI Extensions</li> <li>– ISAPI Filters</li> </ul> </li> <li>• <b>Management Tools</b> <ul style="list-style-type: none"> <li>◦ IIS Management Console</li> <li>◦ IIS 6 Management Compatibility <ul style="list-style-type: none"> <li>– IIS 6 Metabase Compatibility</li> </ul> </li> </ul> </li> </ul>

## Verify the kit contents

Remove the contents, ensuring that you have all of the following components. If components are missing, contact technical support.

### Hardware

- HPE StoreEasy 1x60 Storage (with operating system preloaded)
- Power cords
- Rail kit

### Media and documentation



- *HPE StoreEasy 1x60 Storage Quick Start Guide*
- Safety and Disposal Documentation CD
- HPE System Recovery DVD (if ordered)
- End User License Agreement
- Certificate of Authenticity Card
- ProLiant Essentials Integrated Lights-Out Advanced Pack

## Locate the serial number, Certificate of Authenticity, and End User License Agreement

For technical support purposes, locate the serial number of HPE StoreEasy 1000 Storage WSS2016, Certificate of Authenticity (COA), and End User License Agreement (EULA). Record the serial number and COA product key and make a print copy of the EULA as needed.

The Certificate of Authenticity (COA) label is used to:

- Replace the main board/motherboard.
- Upgrade the factory-installed operating system using the Microsoft Upgrade program for license validation.
- Reinstall the operating system because of a failure that has permanently disabled it.

---

### NOTE:

It is important that you maintain the COA or a copy of the COA license information. In the event of a system board replacement the COA will be needed to re-establish the license of the operating system.

The serial number is located in several places:

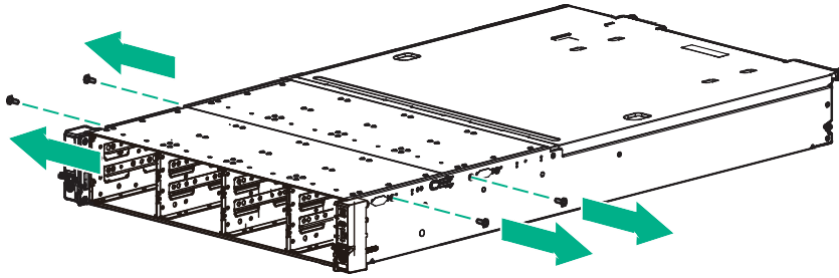
- Top of the HPE StoreEasy 1000 Storage WSS2016 system
- Back of the HPE StoreEasy 1000 Storage WSS2016 system
- Inside the HPE StoreEasy 1000 Storage WSS2016 system's shipping box
- Outside the HPE StoreEasy 1000 Storage WSS2016 system's shipping box

The COA card is located inside the shipping box. There is also a COA sticker with product key affixed to the top of the HPE StoreEasy 1000 Storage WSS2016 system. The electronic copy of the EULA installed with the system is available at `%SystemDrive%\Windows\System32\license.rtf`.

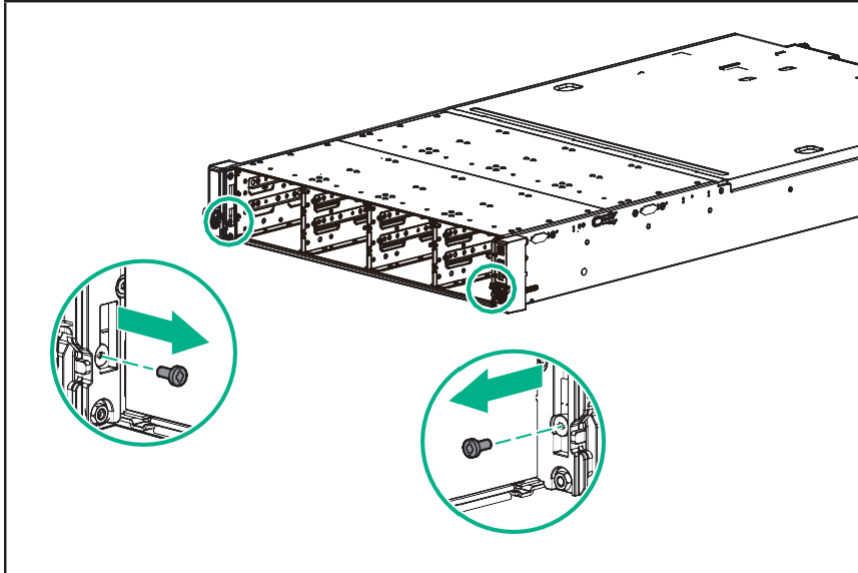
## Installing the HPE StoreEasy 1000 Storage hardware

If your HPE StoreEasy 1000 Storage system is fully racked and cabled, go to [Connecting to HPE StoreEasy 1000 Storage](#) on page 56.

For the 1450, 1650, 1650 Expanded, and 1850 systems, install the rail kit and insert and secure the storage system into the rack by following the *Rack Rail Kit Installation Instructions*.



**Figure 21: Shipping screw**



**Figure 22: Shipping screws on the rack ears**

The 1650E has shipping screws that need to be removed prior to installing the system in the rack. The removal of these screws will allow the front drive cage to be extended out of the rack providing access to the second drive cage. If you ordered the HPE Tower to Rack Conversion Tray Universal Kit for the purpose of installing the 1550 tower model in a rack, use the provided tower-to-rack conversion kit installation instructions to install the tower hardware into the rack.

## Validate network information

Complete the tests in **Validation tests (standalone system)** to verify network connectivity. Consult with your network administrator to confirm test results.

**Table 4: Validation tests**

Test	Command(s) to execute	Successful? (Y/N)
Ping the IP address of the system from another system on the same network.	ping <system address>	
Ping the IP address of the system from another system on the same network.	ping <system address>	
Ping the IP address of the system from another system on the same network.	ping <node 1 name> ping <node 1 fqdn>	
Ping the name of some other system on the same network form the system.	ping <node 1 name> ping <node 1 fqdn>	
If you will be adding the system to an Active Directory domain, some additional tests include:		
Ping the domain controller from the system.	ping <domain controller address> ping <domain controller name>	
Verify the network path to the domain controller and DNS servers is correct.	pathping <domain controller address> pathping <domain controller name> pathping <DNS server address> (Repeat for each DNS server) pathping <DNS server name> (Repeat for each DNS server)	

Additionally, HPE recommends that you also verify the iLO IP address and name resolution. However, this is not critical to support a file server.

## Cabling HPE StoreEasy 1000 Storage

The StoreEasy systems support both single domain and dual domain cabling using D2000, D3000, D6020, and D6000 disk enclosures, depending on the Smart Array RAID controller that is installed in the system. See **Controller, disk enclosure, and single/dual domain support** for details. In a single domain, external disk enclosures are connected, using a single data path, to the Smart Array controller1 in the StoreEasy system. In a dual domain, external disk enclosures are connected, using two data paths, to a single Smart Array RAID controller in the StoreEasy system. For more detailed information about single and dual domains, see the technology brief entitled, “Redundancy in enterprise storage networks using dual-domain SAS configurations” located at: <https://support.hpe.com/hpsc/doc/public/display?docId=c01451157>.

**Table 5: Controller, disk enclosure, and single/dual domain support**

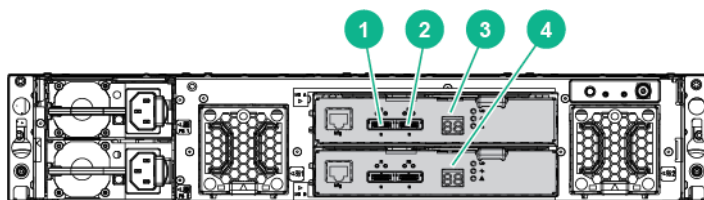
Controller model	Supported in StoreEasy systems	Disk enclosure supported	Single domain support	Dual domain support
P441	1450, 1550, 1650, 1650E, 1850	D2000	Y	Y
		D3000	Y	Y
		D6000 D6020	Y	N
P841	1450, 1550, 1650, 1650E, 1850	D2000, D3000, D6020, D6000	Y	Y

**NOTE:**

- The StoreEasy 1450 and 1550 systems come standard with a Smart Array P440 storage controller. The StoreEasy 1650 comes with P840ar and 1850 come standard with a Smart Array P440ar storage controller. These storage controllers are used to connect to the internal disk drives, including the OS drives.
- The HPE StoreEasy 1650 Expanded system comes standard with two controllers, P840ar and B140i. The B140i is connected to the operating system drives and supports only SATA drives. The P840ar controller is connected to the 28 storage drives.
- Optional P441 and P841 Smart Array controllers are used for connecting to external D2000, D3000, or D6000/D6020 disk enclosures.

**I/O modules**

The StoreEasy systems connect to the I/O modules on the D6000/D6020 and D2000/D3000 disk enclosures. **D3600 Disk Enclosure I/O module ports** shows the I/O module ports on the D3600 disk enclosure, **D2700/D3700 Disk Enclosure I/O module ports** shows the I/O module ports on the D2700 disk enclosure, and **D6000/D6020 I/O modules** shows the I/O module ports on the D6000 disk enclosure.



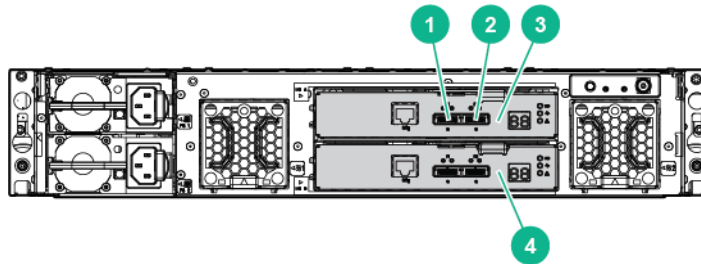
**Figure 23: D3600 Disk Enclosure I/O module ports**

1. Port 1
2. Port 2

*Table Continued*

3. I/O module A

4. I/O module B



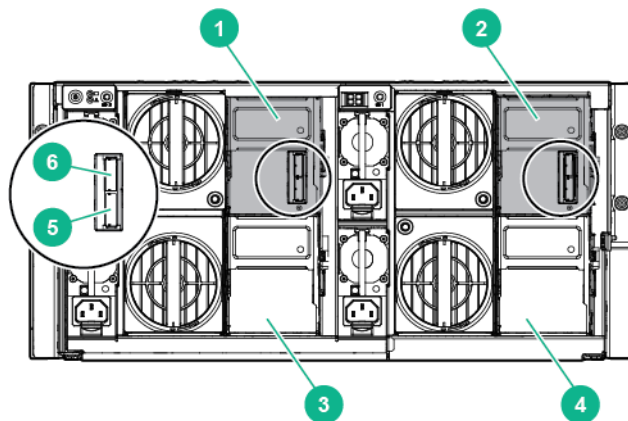
**Figure 24: D2700/D3700 Disk Enclosure I/O module ports**

1. Port 1

2. Port 2

3. I/O module A

4. I/O module B



**Figure 25: D6000/D6020 I/O modules**

1. Primary I/O module (Drawer 2)

2. Primary I/O module (Drawer 1)

3. Secondary I/O module or blank (Drawer 2)

4. Secondary I/O module or blank (Drawer 1)

*Table Continued*

5. SAS port 1 connector

6. SAS port 2 connector

## Cabling guidelines

This section provides information on the types of cables to be used with D3000/D6020 and D2000/D6000 disk enclosures supported by the P441/P841 controllers and the cabling guidelines.

The following are the types of cables that you can use with the D3000/D6020 disk enclosures:

- External 0.5m (1ft) Mini SAS HD 4x to Mini SAS HD 4x Cable
- External 1.0m (3ft) Mini SAS HD 4x to Mini SAS HD 4x Cable
- External 2.0m (6ft) Mini SAS HD 4x to Mini SAS HD 4x Cable
- External 4.0m (13ft) Mini SAS HD 4x to Mini SAS HD 4x Cable

The following are the types of cables that you can use with the D2000/D6000 disk enclosures:

- 0.5m External Mini SAS High Density to Mini SAS Cable
- 1.0m External Mini SAS High Density to Mini SAS Cable
- 2.0m External Mini SAS High Density to Mini SAS Cable
- 4.0m External Mini SAS High Density to Mini SAS Cable
- 6.0m External Mini SAS High Density to Mini SAS Cable

When connecting disk enclosures to the StoreEasy system, consider the following guidelines:

- In a single domain configuration, the secondary I/O modules on the D6000 are not used, so they might or might not be installed. The cabling diagrams in this section show the secondary I/O modules are not installed.
- For single domain configurations, the maximum number of disk enclosures supported by the P441 or P841 controller are 1 D6000, 8 D2000s, or 8 D3000s (up to 200 drives total).
- For dual domain configurations, the maximum number of disk enclosures supported by the P441 controller are 8 D2000 or 8 D3000s (up to 200 drives total).
- For dual domain configurations, the maximum number of disk enclosures supported by the P841 controller are 1 D6000, 8 D2000s, or 8 D3000s (up to 200 drives total).

---

**NOTE:**

- The maximums listed are based on the number of drives per controller. Any StoreEasy system could have additional or alternate controllers installed, which would affect the overall number of supported disk enclosures. The maximum number of enclosures that can be connected to a controller is eight.
- The P441 or P841 controllers support:
  - Up to 200 physical drives.
  - D2000 and D3000 disk enclosures; up to eight daisy chained in either single or dual domain configuration.
  - D6000 disk enclosure. Only one D6000 enclosure can be connected. Daisy chaining is not supported.
  - D6020 disk enclosures supports daisy chaining two D6020 enclosures together. You cannot mix the D6020 and D6000 enclosures together on the same SAS chain.
- In the cabling diagrams for the D2000/D3000 disk enclosure, the D3600 disk enclosure is used. Be aware that the cabling configuration is exactly the same for all D2000/D3000 disk enclosures.
- The D6000 disk enclosures does not support connecting the enclosures in a daisy chain arrangement. However, the D6020 disk enclosures does support a daisy chain configuration.

The D2000/D3000 disk enclosures supports SAS daisy chains. In a SAS daisy chain, the D2000/D3000 disk enclosures are connected to each other — I/O module A from each disk enclosure is connected together and I/O module B of each disk enclosure is connected together.
- Only supported, documented cabling configurations are shown. Only cabling configurations shown in this document or in related D2000/D3000 or D6000 documentation are supported configurations.

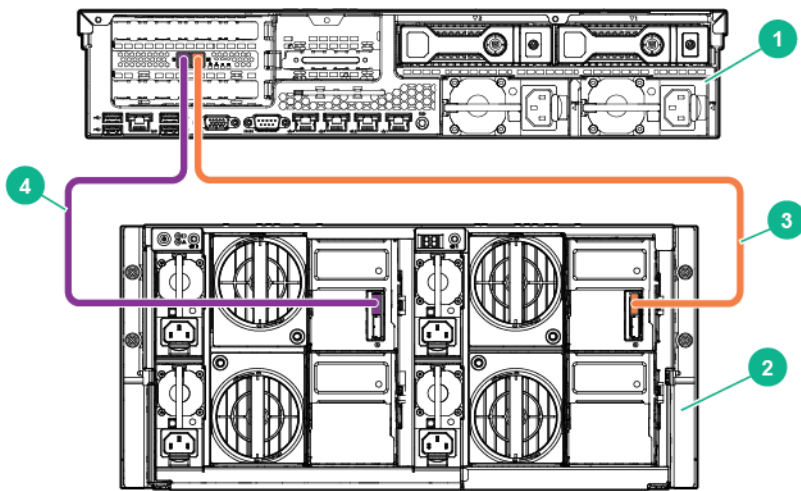
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**⚠ CAUTION:**

When cabling a dual domain configuration, ensure that you do not connect multiple controllers in the StoreEasy system to the same disk enclosure; this is an unsupported configuration and might result in data loss. If the StoreEasy system is configured incorrectly, and you attempt to use Pool Manager, Pool Manager will detect the configuration and display an error message. The controllers can be connected to different disk enclosures.

## Single domain cabling diagrams with D6000/D6020 Disk Enclosures

The following diagram shows StoreEasy systems in single domain configurations with D6000 disk enclosures.



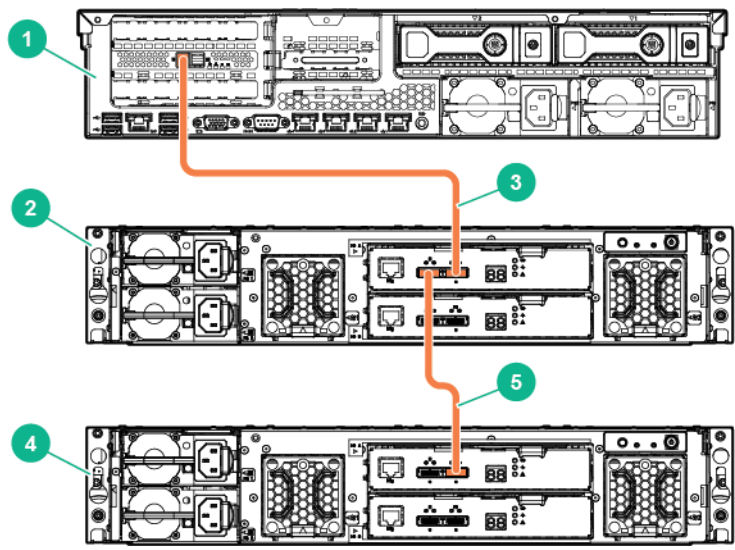
**Figure 26: StoreEasy 1x50 with the P441 Controller**

1. P441 controller
2. D6000 enclosure
3. Connection to SAS port 1 on the primary I/O module (left drawer) of D6000 enclosure
4. Connection to SAS port 1 on the primary I/O module (right drawer) of D6000 enclosure

## Single domain cabling diagrams with D2000/D3000 Disk Enclosures

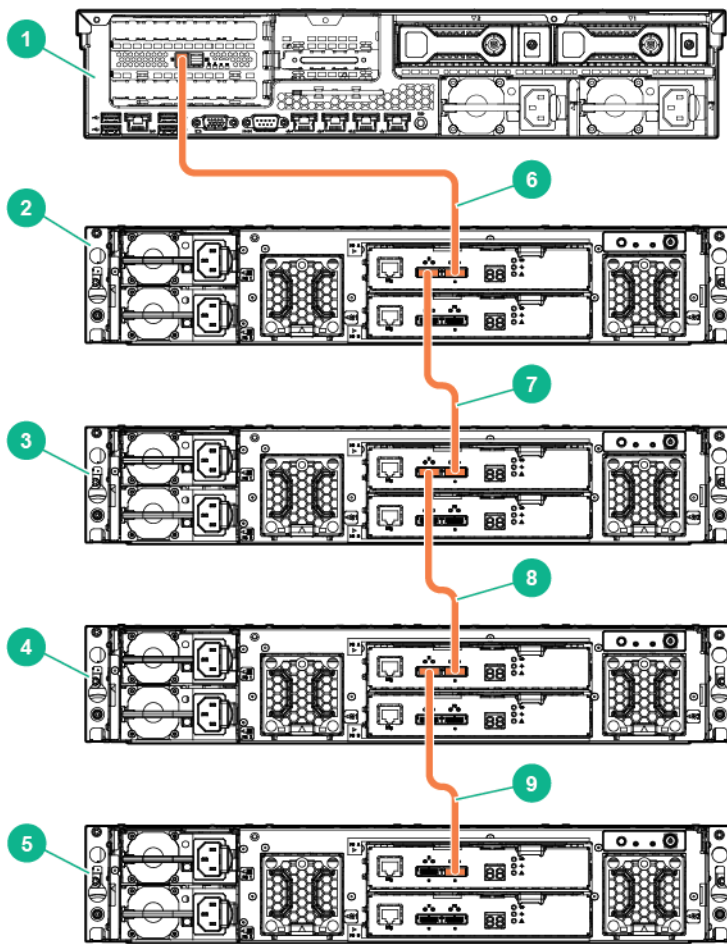
The following diagrams show different StoreEasy systems in single domain configurations with the D2000/D3000 disk enclosures. With these cabling diagrams, SAS daisy chains are used to connect the disk enclosures together. **StoreEasy 1x50 with the P441 controller** shows cabling configuration option while using multiple ports on the P441 controller to decrease latency to enclosures.





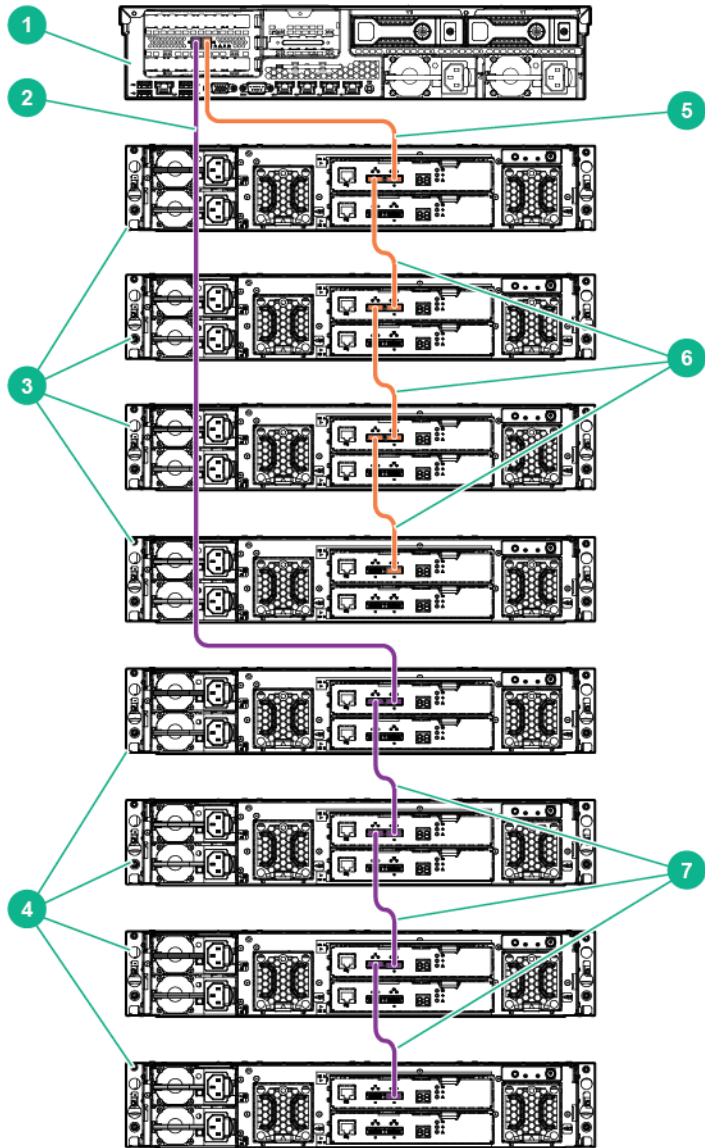
**Figure 27: StoreEasy 1x50 with the P441 controller**

- 1. P441 controller
- 2. D2000/D3000 enclosure 1
- 3. Connection between P441 controller and port 2 on I/O module A of D3600 enclosure
- 4. D2000/D3000 enclosure 2
- 5. Connection between port 1 of I/O module A of D3600 enclosure 1 and port 2 on I/O module A of D3600 enclosure2



**Figure 28: StoreEasy 1x50 with the P441 controller in a single domain configuration**

1. P441 controller
2. D2000/D3000 enclosure 1
3. D2000/D3000 enclosure 2
4. D2000/D3000 enclosure 3
5. D2000/D3000 enclosure 4
6. Connection from P441 controller to port 2 of I/O module A on disk enclosure 1
7. Connection from port 1 of I/O module A on disk enclosure 1 to port 2 of I/O module A on disk enclosure 2
8. Connection from port 1 of I/O module A on disk enclosure 2 to port 2 of I/O module A on disk enclosure 3
9. Connection from port 1 of I/O module A on disk enclosure 3 to port 2 of I/O module A on disk enclosure 4

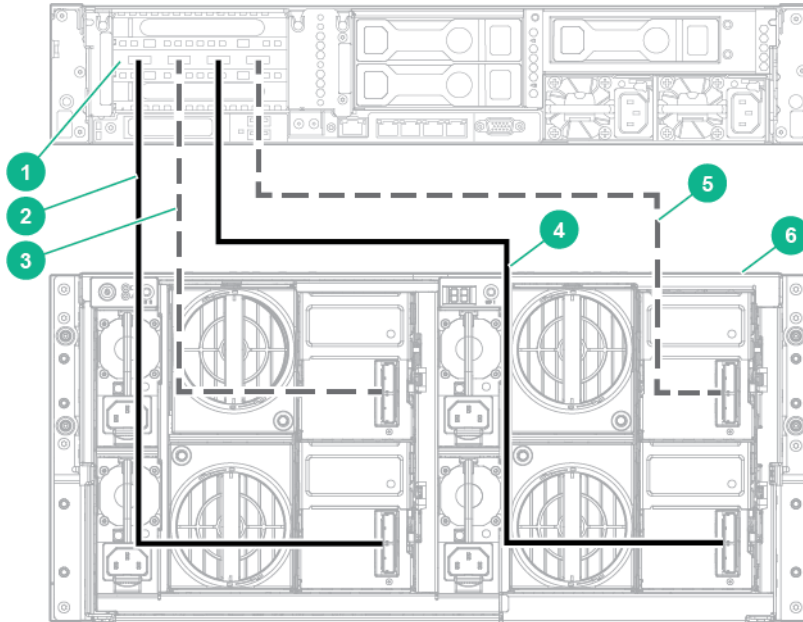


**Figure 29: StoreEasy 1x50 with the P441 controller utilizing multiple ports for better performance**

1. P441 controller
2. Connection from P441 controller to port 2 of I/O module A on top of the disk enclosures in Group 2
3. Group 1 of 4 D2000/D3000 enclosures
4. Group 2 of 4 D2000/D3000 enclosures
5. Connection from P441 controller to port 2 of I/O module A on top of the disk enclosures in Group 1
6. Connections between the disk enclosures in Group 1
7. Connections between the disk enclosures in Group 2

## Dual domain cabling diagrams with D6000/D6020 Disk Enclosures

StoreEasy 1x50 with the P841 controller in a dual domain configuration shows StoreEasy systems in dual domain configurations with D6000 disk enclosures.

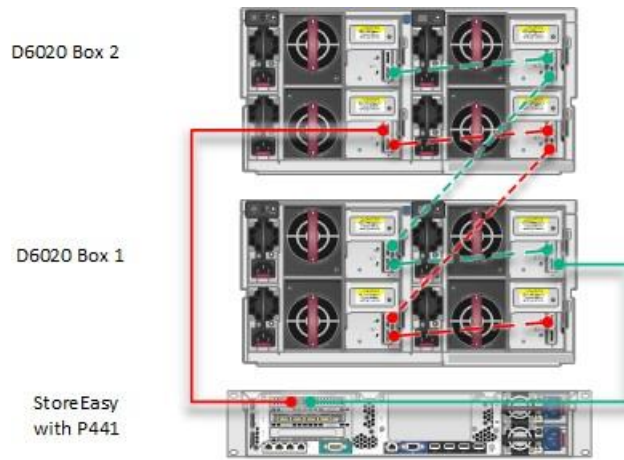


**Figure 30: StoreEasy 1x50 with the P841 controller in a dual domain configuration**

1. P841 controller
2. Connection to SAS port 1 on primary I/O module path 1 (right drawer) of D6000 enclosure
3. Connection to SAS port 1 on primary I/O module path 2 (right drawer) of D6000 enclosure
4. Connection to SAS port 1 on primary I/O module path 1 (left drawer) of D6000 enclosure
5. Connection to SAS port 1 on primary I/O module path 2 (left drawer) of D6000 enclosure
6. D6000 enclosure

### Daisy Chaining the D6020

The D6020 can be configured in a daisy chain configuration. There are cable length constraints that need to be adhered to when cabling in this configuration that need to be adhered to closely. The cables between the D6020 drawers should be no longer than 0.5m. The cables between the D6020 and the server should not be any longer than 1m.



**Daisy chaining drawers (within a D6020)**

- Long dashed cable = 0.5m

**Daisy chaining between D6020 chassis**

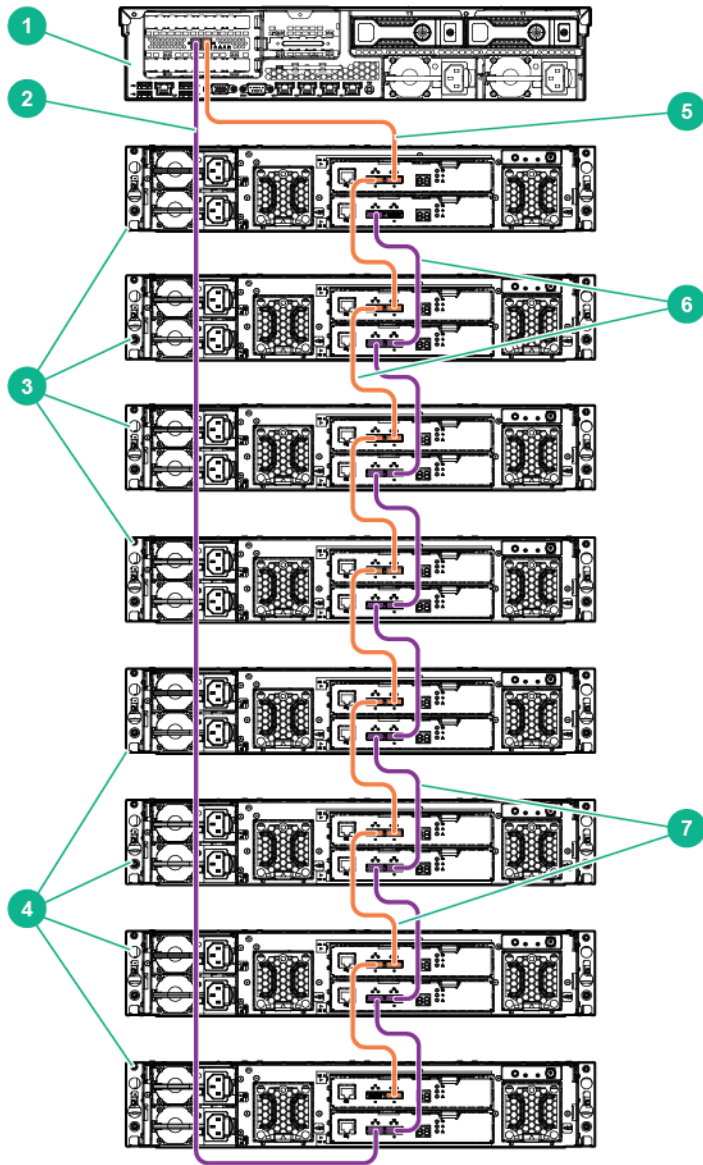
- Short dash cable
- Can use 0.5m cable if the D6020 are adjacent in the rack
- Can use 1m cable if they are not adjacent
- 2m cable is **NOT** supported

**Figure 31: Daisy Chain Connection of D6020 with P441 Controller**

## Dual domain cabling diagrams with D2000/D3000 Disk Enclosures

In dual domain configurations with the D2000/D3000 Disk Enclosures, you have the option of cabling for best fault tolerance or best performance.

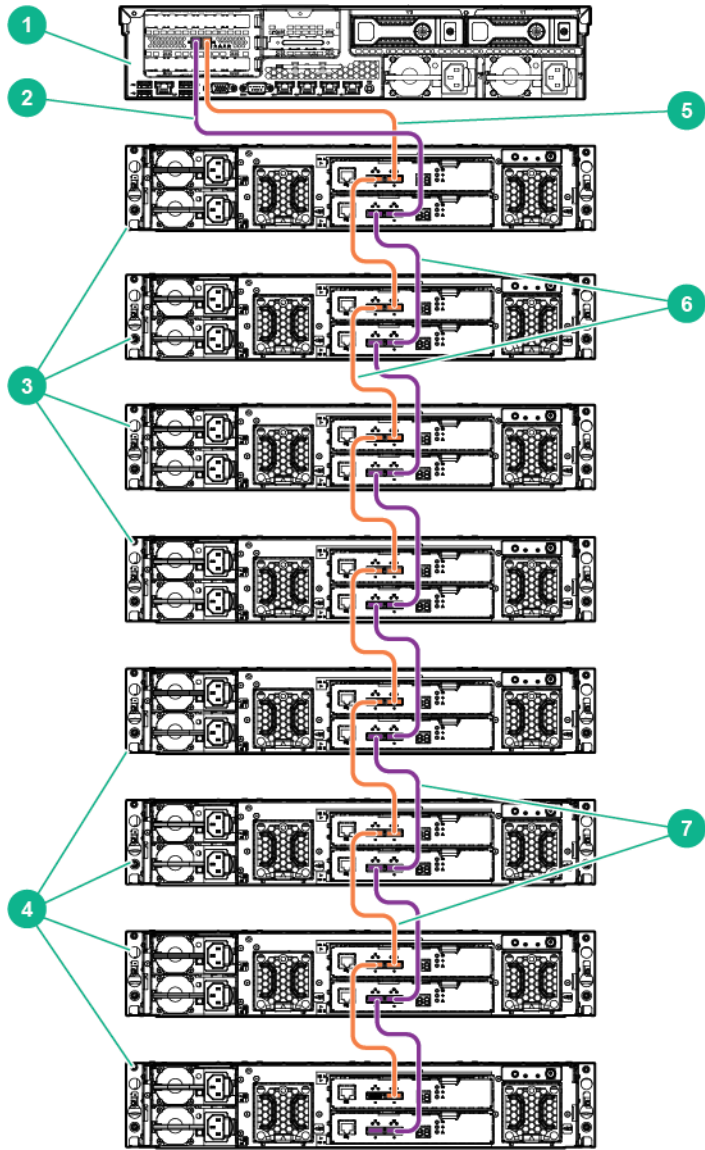
**StoreEasy 1x50 with the P441 controller in a dual domain configuration (best fault tolerance)** illustrates best fault tolerance, which provides the best data protection in the event of an I/O module failure. The disk enclosures are put into two groups of four disk enclosures each. There is always one path to the disk enclosure from the controller (from either the top disk enclosure in the group or the bottom disk enclosure in the group). The green path carries the data if the blue path is broken. Besides a controller failure, the worst case scenario is losing access to one I/O module if an I/O module fails. **StoreEasy 1x50 with the P441 controller in a dual domain configuration (best fault tolerance)** also illustrates the SAS daisy chain between disk enclosures.



**Figure 32: StoreEasy 1x50 with the P441 controller in a dual domain configuration (best fault tolerance)**

1. P441 controller
2. Connection from P441 controller to port 1 of I/O module B on bottom of the disk enclosures in Group 2
3. Group 1 of 4 D2000/D3000 enclosures
4. Group 2 of 4 D2000/D3000 enclosures
5. Connection from P441 controller to port 2 of I/O module A on top of the disk enclosures in Group 1
6. Connections between the disk enclosures in Group 1
7. Connections between the disk enclosures in Group 2





**Figure 33: StoreEasy 1x50 with the P441 controller in a dual domain configuration (best performance)**

1. P441 controller
2. Connection from P441 controller to port 2 of I/O module B on top of the disk enclosures in Group 1
3. Group 1 of 4 D2000/D3000 enclosures
4. Group 2 of 4 D2000/D3000 enclosures
5. Connection from P441 controller to port 2 of I/O module A on top of the disk enclosures in Group 1
6. Connections between the disk enclosures in Group 1
7. Connections between the disk enclosures in Group 2

# Connecting to HPE StoreEasy 1000 Storage

Use either the direct attach or iLO method to connect to HPE StoreEasy 1000 Storage.

❗ **IMPORTANT:**

Only the direct attach and iLO access methods can be used to install HPE StoreEasy 1000 Storage. When the installation process completes and the server's IP addresses have been assigned, you can then additionally use the remote desktop method to access HPE StoreEasy 1000 Storage.

- **Direct attach**—This access method is mandatory if your network does not have a DHCP (Dynamic Host Configuration Protocol) server. Connect the following cables to the back panel of HPE StoreEasy 1000 Storage in this sequence: keyboard, mouse, network cables, monitor cable, and power cable.

**NOTE:**

The keyboard, mouse, and monitor are not provided with HPE StoreEasy 1000 Storage.

- **iLO**—Access HPE StoreEasy 1000 Storage using the iLO remote management method:
  1. Connect a network cable to the iLO port located on the back of the HPE StoreEasy 1000 Storage system.
  2. Connect a power cable to HPE StoreEasy 1000 Storage.
  3. Locate the iLO Network Settings tag attached to the HPE StoreEasy 1000 Storage and record the default user name, password, and DNS name.
  4. From a remote computer, open a standard Web browser and enter the iLO management hostname of the HPE StoreEasy 1000 Storage.

**NOTE:**

By default, iLO obtains the management IP address and subnet mask from your network's DHCP server. The hostname found on the iLO tag is automatically registered with your network's DNS server. If the DHCP configuration is not possible or the system is not found in DNS, use the direct attach method to configure iLO with a static IP address.

5. Using the default user information provided on the iLO Network Settings tag, log on to iLO, and then launch a remote console to HPE StoreEasy 1000 Storage.

For detailed instructions on using iLO remote management software, see the *HPE iLO 4 User Guide*, which you can search for (by product name) at <https://www.hpe.com/support/manuals>.

## Power on the server and log on

### Procedure

1. Power on the system by pushing the power button on the front panel. If using iLO, click **Momentary Press** under the **Power Switch** menu of the remote console .

The HPE StoreEasy 1000 Storage system starts and displays the Setup Windows wizard.

2. Select the desired language, country or region, language settings, keyboard layout, and click **Next**.
3. Accept the license agreement and click **Accept**.



4. When prompted, enter a password of your choice and click Finish. The password that you enter must be the one you can remember.
5. When prompted, press `CTRL+ALT+DELETE` to log on to the system. If using iLO, click the **Ctrl-Alt-Del** menu item in the Keyboard menu of the remote console.
6. When prompted, enter the password that you set in **Step 4**.  
The installation process continues until complete, which takes approximately 10–15 minutes. When the installation completes, the server reboots.
7. Press `CTRL+ALT+DELETE` to log on to the system


# Configuring HPE StoreEasy 1000 Storage

## Initial Configuration Tasks

The Initial Configuration Task (ICT) window enables you to configure your system. After the initial configuration is complete, the ICT window launches automatically for a user who is a member of the local administrator group. You can open only one instance of the ICT at a time.

Use ICT to perform the following configuration tasks:

- Update system settings, such as changing the local administrator password, time zone, save reseller information, and so on.
- Launch Network Configuration wizard to configure and validate the network configuration.
- Configure email alerts and register product.
- Create storage pools and virtual disks.
- Enable software updates and enhancements directly from Windows update.
- Set up optional data protection solutions on the HPE StoreEasy 1000 Storage with cloud-based data backup by replicating data using Vision Solutions Double-Take Availability. Both of these data protection solutions require separate licensing, but are available to use for a limited time via a free trial license.

The online help is available for each configuration task in the ICT window. You can launch the online help by clicking  for each task or by pressing **F1**.

## Using Initial Configuration Tasks

Once the HPE StoreEasy 1000 Storage is connected to your network and to external storage enclosures (if present), powered up and logged on, the system needs to be configured for completing the installation. If you do not want to open the ICT window every time you logon, select the Do not show this window at the next logon check box in the window. You can also launch ICT by opening a command prompt and typing C :

```
\Windows\System32\OEMOOBE\OEMOOBE.EXE.
```

---

### NOTE:

The ICT refreshes periodically, as indicated by a message in the lower right corner of the window. If you select an ICT task while a refresh is in progress, there is a delay before the application for that task is launched. You can also refresh ICT by pressing **F5**.

The following tasks are included in the ICT:

- **System Settings**
- **Networking**
- **Notifications**
- **Storage Configuration**
- **Protect This Server**

## System Settings

This task group enables you to configure the system settings. The following tasks are included in this group:

- **Set local administrator password**—Enables you to change the administrator user password. The default password is the password that you entered during the initial setup of the server. To change the password, enter the new password in the **New password** and **Confirm password** fields and click **OK**.

 **IMPORTANT:**

HPE cannot assist with lost passwords.

- **Set time zone**—Enables you to change the date and time settings. You can change the time zone, date and time, and synchronize the date and time with an Internet time server.
- **Save reseller information**—Enables you to enter details of the reseller from whom you purchased the system and purchasing details for future reference. The asset serial number is added by default and you cannot change it. Enter the details in the respective fields and click **OK** to save the information.

You can also access the **Reseller Information Tool** using the following methods:

- Open Server Manager and click **Tools > StoreEasy > Save Reseller information**.
- Double-click the **System Tools** folder on the desktop and select **Save Reseller Information**.

The reseller information is also available on the **System > Overview** tab in the StoreEasy Dashboard.

## Networking

This task group enables you to set the network IP and domain of HPE StoreEasy 1000 Storage. The following tasks are included in this group:

- **Configure networking**—Enables you to configure the network interfaces using the Network Configuration Tool (NCT) wizard. For detailed information on NCT, see [Using the Network Configuration Tool](#).
- **Provide computer name and domain**—Enables you to specify the computer name and domain. After specifying the computer name and the domain, the system asks for a reboot (Windows Storage Server 2016 only). Windows Storage Server is installed with a randomly generated computer name and domain. You may find the server easier to access remotely and easier to recognize in reports and logs if you assign it a name that is meaningful to you and that fits with the naming scheme for computers in your organization.

Consider the following when assigning a computer name:

- The recommended length for most languages is 15 characters or fewer. For languages that require more storage space per character, such as Chinese, Japanese, and Korean, the recommended length is 7 characters or fewer.
- HPE recommends that you use only Internet-standard characters in the computer name. Standard characters are the numbers from 0 through 9, uppercase and lowercase letters from A through Z, and the hyphen (-) character. Computer names cannot consist entirely of numbers.
- If you are using DNS on the network, you can use a wider variety of characters. These include Unicode characters and other non-standard characters, such as the ampersand (&). Using nonstandard characters may affect the ability of non-Microsoft software to operate on the network.
- The maximum length for a computer name is 63 bytes. If the name is longer than 15 bytes (15 characters in most languages, 7 characters in some), computers that are running Windows NT 4.0 and

earlier will recognize this computer by the first 15 bytes of the name only. In addition, there are additional configuration steps for a name that is longer than 15 bytes.

- If a computer is a member of a domain, you must choose a computer name that differs from any other computer in the domain. To avoid name conflicts, the computer name should be unique on the domain, workgroup, or network.

In a Windows Active Directory Domain, passwords and permissions for computer objects and user accounts are easier to manage due to being stored in a centralized database that is replicated among the domain controllers.

To name the computer and join it to a domain, click **Provide computer name and domain** in the Initial Configuration Tasks window and then click **Change** on the Computer Name tab.

## Notifications

This task group enables you to configure e-mail alerts and register for proactive notifications.

The following tasks are included in this group:

- **Configure email alerts**—Enables you to configure the email accounts to receive alerts when significant events occur. Using the **Event Notifier Configuration** wizard, you can add SMTP server IP addresses and send a sample email to check if the email alerts have been configured properly. You can also access the **Event Notifier Configuration** wizard directly using the following methods:
  - Open Server Manager and select **Tools > StoreEasy > Configure e-mail alerts**.
  - Double-click the **System Tools** folder on the desktop and select **Configure Email Alerts**.
  - Click **Event Notifier Config** on the **Start** screen.
- **Register Product**—Opens a web browser to the HPE product registration page.

---

### **IMPORTANT:**

HPE strongly recommends registering the system so that you can receive proactive notifications of system updates, critical issues, and announcements of feature updates.

If your system is connected to a network that can access the Internet, you can perform the product registration from any other system. You can also access the Register Product link using the following methods:

- Double-click the **Register Product** icon on the desktop.
- Click **Register Product** on the Start screen.
- Open Server Manager and select **Tools > StoreEasy > Register Product**.

## Storage Configuration

This task group enables you to configure the system storage using Pool Manager. The following storage provisioning tasks are included in this group:

- **Create storage pools**—Opens the **Pool Manager** window. For WSS2012 R2, you can create one or more storage pools on the internal drives. For WSS2016, you can create one or more storage pools for all the corresponding disks greater than four on the internal drives of the StoreEasy system. If the first four disks are 4 TB and the next four drives are 6 TB, the pool manager creates two pools (WSS2016 only). Pool Manager is also used to create storage pools if any external storage enclosures are attached. On the

StoreEasy 1450 and 1550 systems, the internal disk drives are already configured in a storage pool and contain the operating system. The internal drives cannot be reconfigured with Pool Manager. Pool Manager is only used on the StoreEasy 1450 and 1550 systems to configure storage in external disk enclosures when attached. The pool manager supports any number of drives that are greater than 4 and less than 12 (WSS2016 only).

- **Create virtual disks**—Launches the **New Virtual Disk** wizard that enables you to create the virtual disk in an existing storage pool. The New Volume Wizard is started by default when you complete the new Virtual Disk Wizard. You can create a new volume in the virtual disk that you just created. For more information on creating virtual disks, see the StoreEasy online help.

## Protect This Server

This task group enables you to check that your HPE StoreEasy 1000 Storage system receives critical software updates and enhancements directly from the Microsoft website. The following tasks are included in this group:

- **Enable automatic updating**—Opens the **Windows Update Settings** dialog box that you can use to select the way Windows updates are downloaded and installed. The Windows Update feature simplifies the task of updating the operating system, and saves administrator's time. Features on the Windows Update dialog box are configurable by members of the administrators group on the local computer.

HPE recommends the following for updates:

- Under Important updates, select one of the following options:
  - **Download updates only, using Windows Update (default option) (WSS2016) or Download updates but let me choose whether to install them (default option) (WSS2012 R2)**
  - **Check for updates but let me choose whether to download and install them**

---

 **IMPORTANT:**

HPE recommends that you do not select **Install updates automatically (recommended)** to avoid unexpected system restarts after updates are applied.

- Under Recommended updates, select **Give me recommended updates the same way I receive important updates.**
  - Run **Download and Install Updates** immediately after system installation.
  - Subscribe to HPE customer advisories using Subscriber's choice for business. For more information, see **Subscription Service**. Ensure to check if firmware and related device drivers are up-to-date based upon information for your system at the **HPE Support & Drivers** website.
  - Apply regular HPE StoreEasy 1000 Storage Service Releases.
- **Vision Solutions Double-Take Availability Information**—Opens an HTML page that displays details about installing the trial version of the Double-Take Availability software. The trial version provides you an opportunity to evaluate the software in your environment. You can also access the HTML page directly by double-clicking the **Vision Solutions Double-Take Availability Information** icon on the desktop.

## Complete system configuration

After the HPE StoreEasy 1000 Storage is physically set up and you have completed all of the required tasks in the Initial Configuration Tasks window, you may want to complete additional setup tasks. Depending on the

deployment scenario of HPE StoreEasy 1000 Storage, these steps can vary. These additional steps can include:

- Running Microsoft Windows Update—HPE highly recommends that you run Microsoft Windows updates to identify, review, and install the latest, applicable, critical security updates on HPE StoreEasy 1000 Storage.
- Creating and managing users and groups—User and group information and permissions determine whether a user can access files. If the HPE StoreEasy 1000 Storage system is deployed into a workgroup environment, this user and group information is stored locally on the device. By contrast, if HPE StoreEasy 1000 Storage is deployed into a domain environment, user and group information is stored on the domain.
- Adjusting logging for system, application, and security events.
- Installing third-party software applications—For example, these might include an antivirus application that you install.
- Registering HPE StoreEasy 1000 Storage—To register, see the HPE registration website ([https://h41360.www4.hpe.com/promo-signup.php?jumpid=hpr\\_r1002\\_usen\\_link2](https://h41360.www4.hpe.com/promo-signup.php?jumpid=hpr_r1002_usen_link2)).

## Configuring failover properties for multi-site environments

You can configure failover properties for multi-site environments using DFS Management, which is available from the Tools menu in Windows Server Manager (**Tools > DFS Management**).

For detailed instructions, see the Microsoft TechNet article, DFS Step-by-Step Guide for Windows Server 2008, which is available at:

[http://technet.microsoft.com/en-us/library/cc732863\(v=ws.10\).aspx](http://technet.microsoft.com/en-us/library/cc732863(v=ws.10).aspx)

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### NOTE:

- The information in the article applies to Windows Storage Server 2012, Windows Storage Server 2012 R2 and Windows Storage Server 2016.
- The article provides instructions to configure both DFS Namespace and DFS Replication.
- The prerequisites listed in the article are already installed with the StoreEasy software.
- You can start at the section entitled, *Overview of the DFS Management Snap-in*.

## Additional access methods

After the HPE StoreEasy 1000 Storage installation process is complete and the system's IP address has been assigned, you can additionally use the Remote Desktop and Telnet methods to access the system.

### Using the Remote Desktop method

Remote Desktop provides the ability for you to log on to and remotely administer your server, giving you a method of managing it from any client. Installed for remote administration, Remote Desktop allows only two concurrent sessions. Leaving a session running takes up one license and can affect other users. If two sessions are running, additional users will be denied access.

To connect the HPE StoreEasy 1000 Storage system to a network using the Remote Desktop method:

## Procedure

- 1 On the PC client, select **Start > Windows PowerShell**. Type `mstsc` and press **Enter**.
- 2 Enter the IP address of the HPE StoreEasy 1000 Storage system in the **Computer** box and click **Connect**.
- 3 Log on to the HPE StoreEasy 1000 Storage system with the administrator user name and password.

## Using the Telnet method

Telnet is a utility that enables you to connect to machines, log on, and obtain a command prompt remotely. By default, Telnet server is not installed.

# Managing HPE StoreEasy 1000 Storage

After you have completed the initial setup of the system using the ICT window, use Windows Server Manager to manage the system. The Server Manager is automatically launched when you close ICT. You can also launch Server Manager from the Managing HPE StoreEasy 1000 Storage desktop by clicking the shortcut icon on the task bar. The local HPE StoreEasy 1000 Storage system as well as other Windows servers may be managed, as described in the [Manage Multiple, Remote Servers with Server Manager](#) article on Microsoft TechNet.

Windows Server Manager can also be used for remote management of HPE StoreEasy 1000 Storage by installing it on a Windows 8/10 client as part of Remote Server Administration tools. To download the tools, go to [Microsoft Download Center](#).

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## NOTE:

The **Tools** menu of Windows Server Manager is not applicable to a remote system under management. It applies only to the local system.

Many storage related tasks are accomplished with the **File and Storage Services** option in Server Manager. The **Tools** menu contains the common utilities familiar to Windows administrators. The **Tools > StoreEasy** menu group contains HPE-specific management tools as well as some of the commonly used Windows tools related to managing a HPE StoreEasy 1000 Storage system. The **Tools > StoreEasy** menu contains the following options:

- **Collect System Reports**—Launches the data collection and diagnostic tool. Collect System Reports is a data collection and diagnostic tool. This tool collects extensive data about the state of the HPE StoreEasy 1000 Storage system that is used by HPE Support to diagnose any problems. Data collection progress is shown, and when complete, Windows Explorer opens to the folder containing a time-stamped .cab archive with the collected information. The folder is C:\Windows\HPSReports\Enhanced\Report\cab. HPE Support will provide an FTP site to which the .cab file may be uploaded.
- **Configure Email Alerts**—Launches the **Event Notifier Configuration Wizard** that enables you to configure the email recipients that should be notified of hardware events.
- **Configure Networking**—Launches the Network Configuration Tool.
- **Documentation**—Launches the online help.
- **Evaluate Deduplication Savings**—Launches the Windows ddpeval.exe tool, which can be used to evaluate the storage space that would be saved by enabling deduplication on a particular volume.
- **File Share Snapshots**—Launches the Windows tool for scheduling and configuring storage for snapshots of a file share.
- **System Dashboard**—Launches the StoreEasy Dashboard.
- **iLO Settings**—Launches the **Lights-Out Online Configuration Utility**.
- **Manage Storage Pools**—Launches Pool Manager.
- **Register Product**—Launches the [HPE Product Registration](#) page to register the product.
- **Save reseller information**—Launches the **Reseller Information Tool** that enables you to enter the reseller and purchasing information.
- **View Logs**—Opens the StoreEasy log directory.

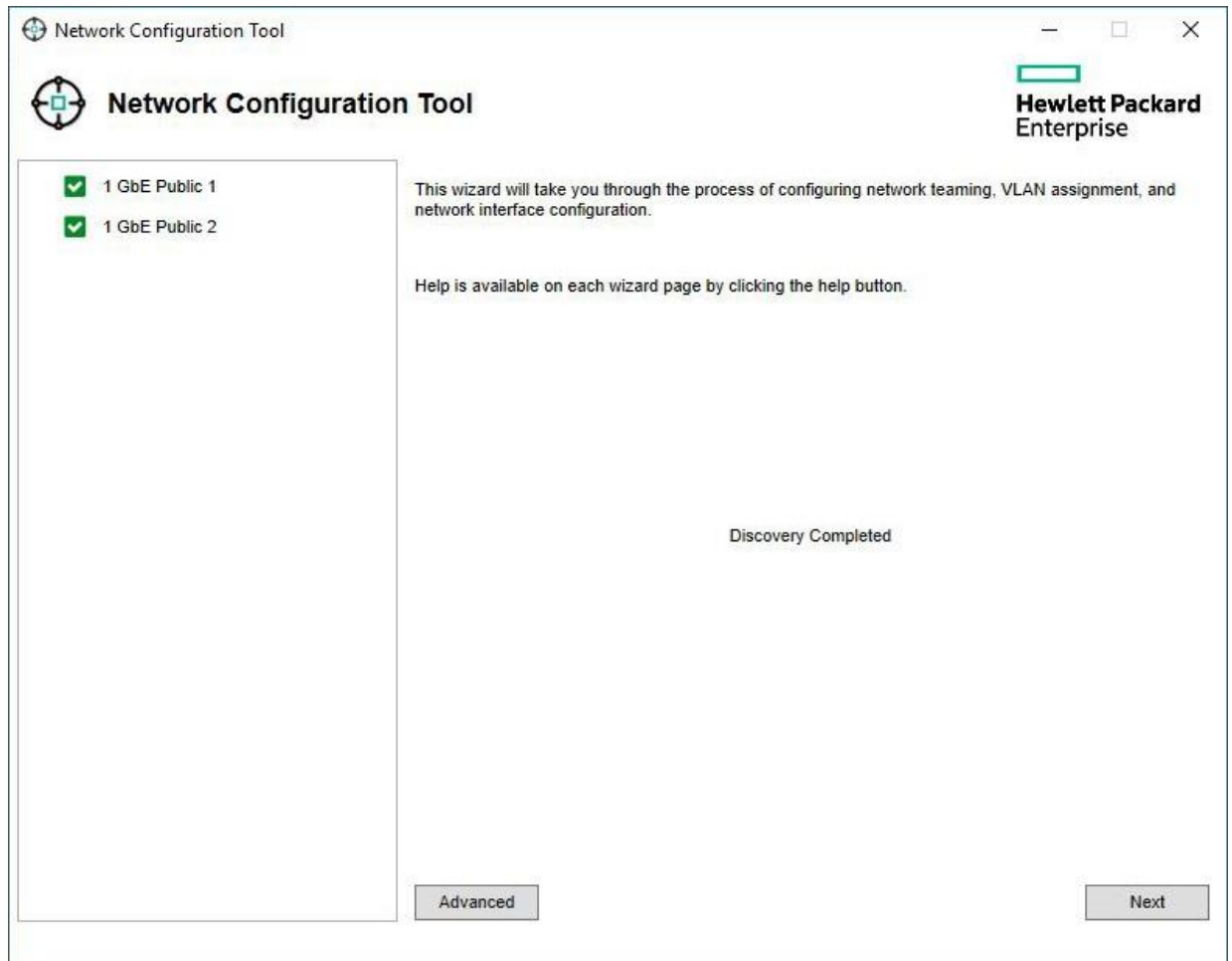


# Using the Network Configuration Tool

The NCT wizard enables you to configure the network interfaces on HPE StoreEasy 1000 Storage. The NCT analyzes all available network interfaces of the system and allows you to choose different network configurations to reduce the chances of any incorrect configuration. It also validates the configuration to help troubleshoot errors in the networking environment.

ⓘ **IMPORTANT:**

HPE strongly recommends you to use this tool for configuring network interfaces.



**Figure 34: Network Configuration Tool**

You can also import the network configuration using the network configuration file. For more information on the network configuration file, see [Managing the network configuration file](#) on page 72 and [Importing network configuration](#) on page 74.

You can launch the NCT directly using the following methods:

- Open a command prompt or PowerShell and type **NCT**.
- Open Server Manager and select **Tools > StoreEasy > Configure Networking**.
- Double-click the **System Tools** folder on the desktop and click **Configure Networking**.

- Click **Configure Networking** on the **Start** screen.
- Click the **Configure Networking** icon on the desktop.

The NCT is divided into two panes. When you launch NCT to configure network interfaces or validate the network configuration, the network configuration discovery is initiated. When the system discovery completes, the left pane or interface pane lists the discovered interfaces and their operational state. The right pane displays the current configuration step. Hovering over a network interface in the interface pane displays the device name, interface name, and status. For example, the interface might be disabled, disconnected, or enabled.

---

❗ **IMPORTANT:**

While using NCT, if you change the network configuration of the system using any other tool, the changes are reflected in NCT only when you close and relaunch it.

The NCT wizard includes the following sections:

- **Network Interfaces**
- **Network Team Configuration**
- **Network VLAN Configuration**
- **Network Interface IP Configuration**
- **Network Configuration Summary**
- **Network Validation**

## Network Interfaces

Network Interfaces enables you to configure the physical network interfaces to suit your environment.

To configure an interface:

### Procedure

1. Select the **Configure** check box for the interface that you want to configure. If you clear the check box, the interface is excluded from all configurations and is not modified.
2. Enter the new interface name. The new name that you enter must not contain special characters, such as `\/*? < >|` and `"`.
3. Click **Next** to proceed to the Network Team Configuration step.

The physical network interfaces that are part of a team or used for RDP cannot be configured. For such interfaces, the **Configure** check box is disabled.

## Network Team Configuration

Network adapter teaming is software-based technology used to increase a server's network availability and performance. Teaming enables the logical grouping of physical adapters in the same server (regardless of whether they are embedded devices or Peripheral Component Interconnect (PCI) adapters) into a virtual adapter. This virtual adapter is seen by the network and server-resident network-aware applications as a single network connection. For more information on Microsoft's implementation of Network Teaming, go to <https://technet.microsoft.com/en-us/library/hh831648.aspx>.

Network Team Configuration enables you to configure new teams. Teaming is used to increase available bandwidth, load balancing, and improving fault tolerance. The maximum number of teams that you can create

is equal to the number of physical network interfaces on the system. On clustered systems, the number of teams created on the local node is same as the number of teams created on the remote node. Team creation on the remote node is automatic.

---

**NOTE:**

- It is optional to configure a network team. If you do not want to create network teams, click **Next** to proceed to the Network VLAN configuration step. The **Do not configure network teams now** option is selected by default.
- The **Network Team Configuration (optional)** window is displayed only if there are no pre-existing teams.

To create network teams if there are no existing teams:

1. Select **Configure network teams now** and enter the number of teams you want to create in **Number of teams**.
2. Click **Next** to proceed to the Network VLAN configuration step.

To create network teams in the case of existing teams:

1. Select the physical network interfaces on the **Network Interfaces** window and click **Next**.
2. Select the **Create** check box and do the following:

---

**NOTE:**

The number of teams displayed for configuration or deletion depends on the number of physical network interfaces that you select. For example, if you select two interfaces for configuration, two rows will appear for team creation.

- Enter the team name.
  - Select the team type from **Type**. The default selection is Switch Independent/Dynamic.
3. Click **Next**.  
The network interfaces that are not included in any team are displayed.
  4. Select the network interfaces that you want to include in the new team.
  5. Click **Next** to proceed to the Network VLAN configuration step.

The **Network Team Configuration** window also enables you to delete an existing team by selecting the **Delete** check box. The **Delete** check box is enabled only if a team exists. When you delete an existing team, the physical network interface included in that team can be used for new teams.

---

**NOTE:** When a team is created, a default virtual network interface is also created. To remove the default virtual interface, assign one or more VLAN IDs on the **Network VLAN Configuration** window and select the **remove the default virtual network interface** check box.

While creating network teams, the interfaces claimed by one team cannot be added to any other team. The team that these interfaces belong to is displayed next to the interface name. If all adapters are already claimed by one or more teams, a warning message is displayed. You can either go back and remove some interfaces from the previously created teams or skip the creation of a team.

- If some of the physical network interfaces included in the team are disconnected while other interfaces are connected, the team status is displayed as `degraded`.
- If all physical network interfaces included in the team are disconnected, the team status is displayed as `disconnected`.

The network teams are displayed in the interface pane when you proceed to the IP Address Configuration step.

Use the network configuration tool to configuring network interfaces.

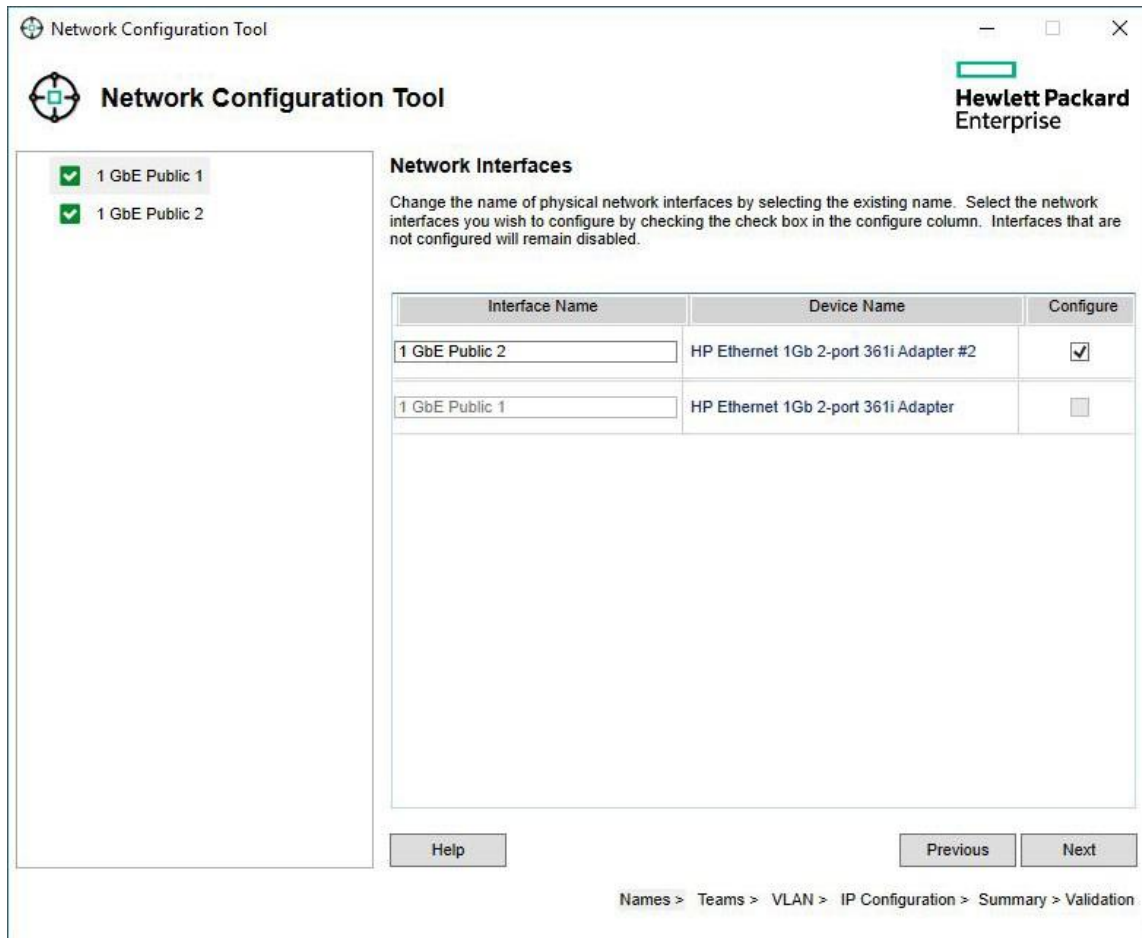


Figure 35: Network Interfaces

## Network VLAN Configuration

**NOTE:** It is optional to configure VLAN assignments. If you choose not to configure VLAN assignments, only the default team interface is created. Click **Next** to skip this step and go to the IP Address Configuration step.

Network VLAN Configuration enables you to configure VLAN assignments. A maximum of 32 network interfaces, consisting of both physical and virtual are allowed. The default VLAN ID is 0, but the VLAN IDs can have a value from 0 to 4094. Each VLAN ID assigned to a physical network interface or network team creates a virtual network interface. Both physical and virtual interfaces created for network teams can have VLAN IDs assigned to them. If a physical interface is assigned a VLAN ID, a team is created with a single physical interface. A virtual interface with the VLAN ID is then created in the team.

To assign VLAN IDs:

## Procedure

1. Select **Configure VLAN IDs now** and click **Next**.
2. Select one of the following options and enter the VLAN ID in the respective fields:
  - **Add a single VLAN ID**—Select to add a single VLAN ID.
  - **Add discrete VLAN IDs**—Select to add the VLAN IDs as comma separated values.
  - **Add a range of VLAN IDs**—Select to specify the VLAN IDs using a start and end value with an increment. For example, a start value of 2 and an end value of 20 with an increment of 5 would assign VLAN IDs 2, 7, 12, and 17.
3. Select the **Remove the default virtual network interface** check box to remove the default virtual interface from a team. This step is optional.

---

### NOTE:

If a default virtual interface is deleted, the system will not receive any packets on the team or physical NIC unless you assign one or more VLAN IDs.

4. Click **Next** to proceed to the Network Interface IP Configuration step.

The VLAN assignments are displayed in the interface pane when you proceed to the Network Interface IP Configuration step.

---

**NOTE:** If you select **Do not configure network interface VLAN identifiers now** after you assign VLAN IDs to teams and adapters, the assigned IDs are not removed. You must go through each VLAN page and select the **Do not add a VLAN ID to this team** implicitly for all teams and adapters.

## Network Interface IP Configuration

Network Interface enables you to begin the IP address configuration by selecting the interface on which you want to make changes using the interface pane. Each interface that can be configured is enabled on the system, even if no changes are made to the interface. The IP addresses that you assign can be static or dynamically assigned using DHCP.

To configure the IP information for an interface:

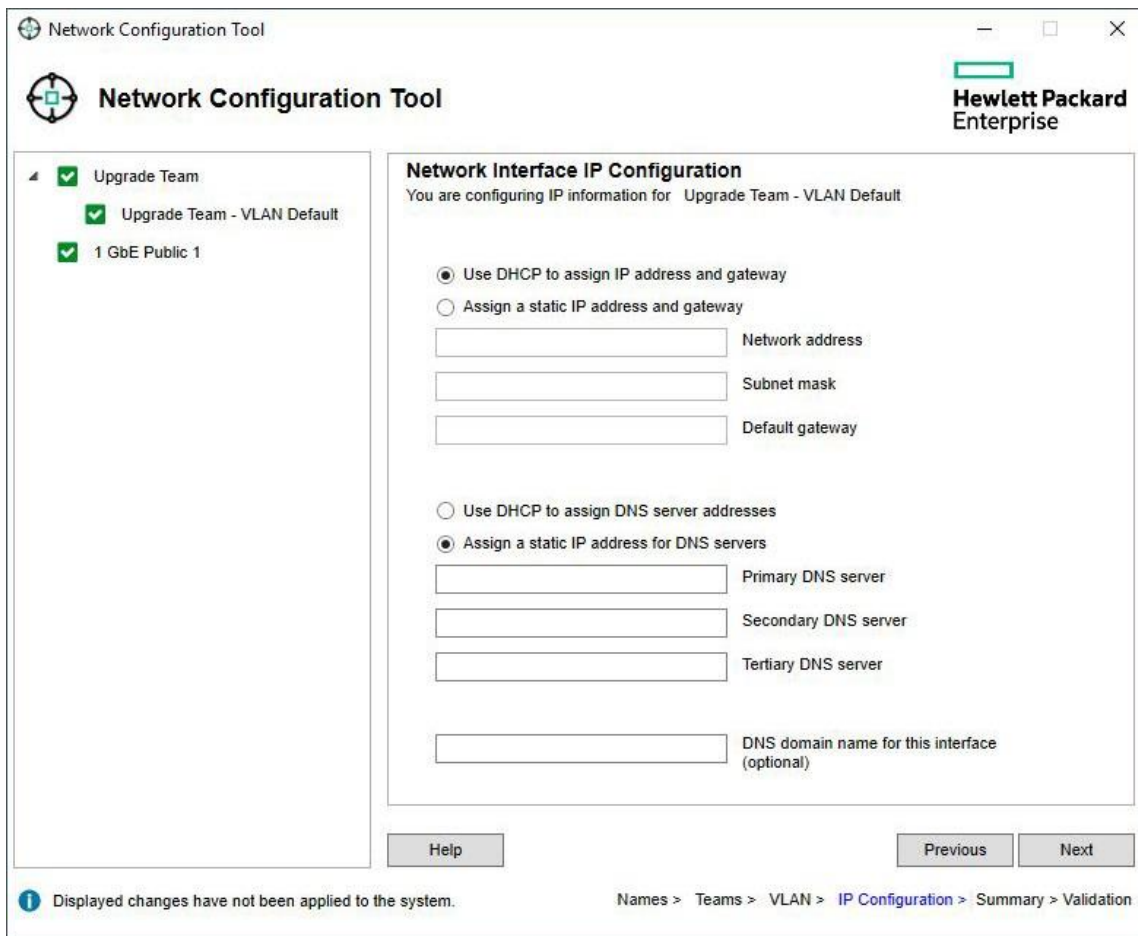
### Procedure

1. Select **Use DHCP to assign IP address and gateway** to dynamically assign an IP address using DHCP or select **Assign a static IP address and gateway** to assign a static IP address.



### IMPORTANT:

If you select **Assign a static IP address and gateway**, the DNS server address must also be static and you must also assign a network mask. Assigning a default gateway address is optional.



**Figure 36: Network Interface IP Configuration**

2. Select **Use DHCP to assign DNS server addresses** or **Assign a static IP address and gateway**. If you selected the **Assign a static IP address and gateway** option in the above step, the **Assign a static IP addresses for DNS** option is selected by default and you cannot change it.
3. Click **Next** to proceed to the Network Configuration Summary step.

**IMPORTANT:**  
HPE recommends that you check each interface before clicking **Next** on this window.

The network defined by the IP address and subnet mask is used to validate the gateway, if one is specified. If an interface is assigned a static address, its configuration is validated against other interface settings when a different interface is selected or when you click **Next**.

## Network Configuration Summary

Network Configuration Summary enables you to view a summary of all configuration changes that will take place on the system. Before proceeding, confirm that the changes are appropriate. If some configurations are not required or not valid, click **Previous** or use the navigation links at the bottom of the page to correct the errors. To apply the configuration changes, click **Apply**. When you click **Apply**, the details of each task configured is displayed on the interface pane. If some errors are encountered when the changes are applied, the same are displayed on the **Errors** tab. When you click **Apply**, the system automatically creates and saves the network configuration file (NCTConfig.xml) at C:\Program Files\HPE\StoreEasy NetworkConfiguration Wizard. For more information on the network configuration file, see [Managing the network configuration file](#) and [Importing network configuration](#).

## Network Validation

Network Validation enables you to validate and configure the network settings. Network validation requires that all network interfaces that you want to test be connected.

### NOTE:

- It is optional to validate the network settings. However, HPE recommends using the network validation system to confirm that your network settings are valid and to help diagnose environmental network issues.
- You can launch only the Network Validation section of NCT by executing the `NCT -validate` command in a command prompt or PowerShell.

To begin network validation:

### Procedure

1. Select **Validate the network configuration now**.
2. Enter the name of the domain controller for the domain that your system will be a part of and IP address of the domain controller in the respective fields. If you do not want to join the system to a domain, you can leave these fields blank.
3. Click **Validate**.

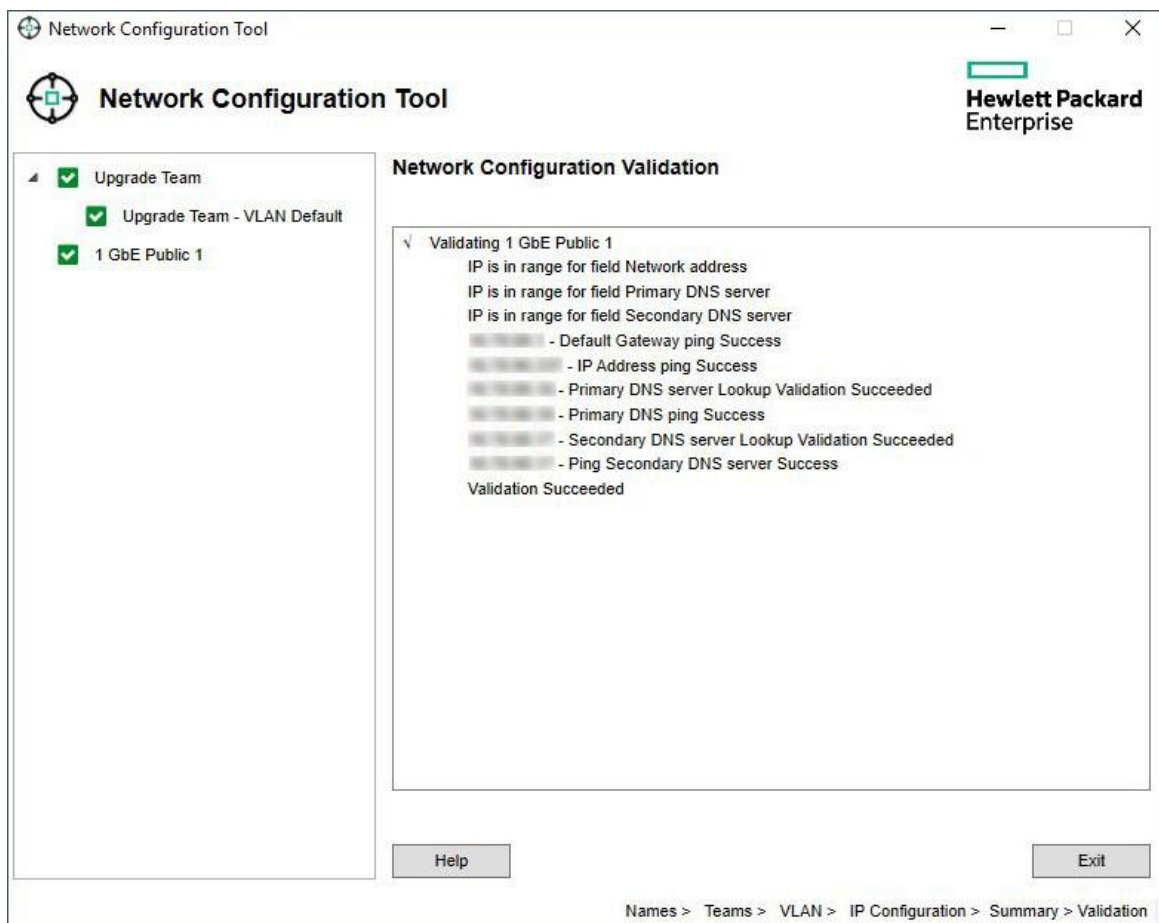


Figure 37: Network Configuration Validation

When the validation begins, the user interface may seem unresponsive. Each interface is tested in order and validation success or failure is noted in the output window. Validation results are also saved at `c:\nas\logs\NetworkConfigTool`. Each validation result is saved in a file named with the time and date the validation was performed.

## Managing the network configuration file

The `NCTConfig.xml` file is created when you apply the network configuration changes by clicking **Apply** on the **Network Configuration Summary** window. This file includes the network configuration details. Only a user who is a member of the local administrator group can modify the contents of this file. The system creates the `NCTConfig.xml` file depending on the sequence in which the NCT wizard completes the network configuration tasks successfully. For example, if the physical network interface configuration is successful, but the creation of teams or VLANs fails, then the `NCTConfig.xml` file is created with only the physical network interfaces listed in the file. The VLANs and teams are not listed. This is because in this case, the NCT wizard successfully completed the network interface task, even though the other tasks were unsuccessful. However, if the physical network interface task fails, then the `NCTConfig.xml` file is not created at all because the validation failed at the first task. When the file is created successfully, you can use it to import the configuration from one server to another. Important considerations while working with the `NCTConfig.xml` file are:

- Do not rename the XML tags in the file. Renaming the tags might lead to errors while applying the configuration.
- Do not rename the `NCTConfig.xml` file.
- Do not edit the contents of the `PciKey` tag. Editing this tag causes errors.
- If the `NCTConfig.xml` file is corrupt or the tags are invalid, a message is displayed on the screen indicating the same. You cannot reuse the same file. In such cases, NCT uses the system discovery state for further configurations.

### Sample network configuration file

```
<?xml version="1.0" encoding="utf-8"?>
<!--This XML file has been generated by the Network Configuration Tool after successful application of user settings-->
<!--Created - 10 Wed Dec 2014 04:50-->
<NetworkConfigurationTool>
<SystemSerialNumber-2M23330589>
  <Interfaces>
    <Interface ifIndex="16">
      <Name>Ethernet 41</Name>
      <Description>HP Ethernet 1Gb 4-port 331FLR Adapter #4</Description>
      <IsMediaConnected>>false</IsMediaConnected>
      <IsNetEnabled>>false</IsNetEnabled>
      <AdapterHWInformation>
        <BindingOrder>0</BindingOrder>
        <Bus>3</Bus>
        <Device>0</Device>
        <Function>3</Function>
        <InstanceID>{DABD5F10-C2A9-40ED-9701-F4EEE1FE6B60}</InstanceID>
        <PciKey>3:0:3</PciKey>
      </AdapterHWInformation>
      <AdapterIPConfiguration>
        <DefaultGateway>16.78.88.1</DefaultGateway>
        <DHCPEnabled>>false</DHCPEnabled>
        <IPAddress>16.78.88.20</IPAddress>
        <PrimaryDNS></PrimaryDNS>
        <SecondaryDNS></SecondaryDNS>
        <TertiaryDNS></TertiaryDNS>
        <StaticEnabled>>true</StaticEnabled>
        <SubnetMask>255.255.248.0</SubnetMask>
        <IsDHCPDNS>>false</IsDHCPDNS>
        <IsDHCPPIP>>false</IsDHCPPIP>
        <IsStaticDNS>>true</IsStaticDNS>
        <IsStaticIP>>true</IsStaticIP>
      </AdapterIPConfiguration>
      <DNSDomainName></DNSDomainName>
      <IsAvailableforTeam>>true</IsAvailableforTeam>
      <IsMemberofTeam>>false</IsMemberofTeam>
    </Interface>
  </Interfaces>
</SystemSerialNumber-2M23330589>
</NetworkConfigurationTool>
```



```

        <IsLocal>true</IsLocal>
        <IsVirtualLAN>>false</IsVirtualLAN>
    </Interface>
    <Teams>
        <Team>
            <Name>Team1</Name>
            <TeamingMode>SwitchIndependent</TeamingMode>
            <LoadBalancingAlgorithm>Dynamic</LoadBalancingAlgorithm>
            <TeamStatus>Down</TeamStatus>
            <IsLocal>>false</IsLocal>
            <VLANforTeam>
                <DefaultVLAN></DefaultVLAN>
                <DiscreteVLAN/>
                <SingleVLAN>45</SingleVLAN>
                <StepVLANRange></StepVLANRange>
                <IsProperStep>true</IsProperStep>
                <RangeVLAN/>
                <UpperRangeLimit></UpperRangeLimit>
                <LowerRangeLimit></LowerRangeLimit>
                <VLANType>SingleVLAN</VLANType>
                <VLANIDs>
                    <VLANID>45</VLANID>
                </VLANIDs>
                <CanMoveForward>true</CanMoveForward>
            </VLANforTeam>
            <TeamMembers>
                <TeamMember>Ethernet 3</TeamMember>
            </TeamMembers>
        </Team>
    </Teams>
</SystemSerialNumber-2M23330589>
</NetworkConfigurationTool>

```

In the `NCTConfig.xml` file, you can edit only the following tags:

- `<Name>`—Contains the physical network interface name.
- `<AdapterHWInformation>`—Contains the hardware information of the physical network interface. You can edit all subtags within this tag, such as `<BindingOrder>`, `<Bus>`, `<Device>`, and so on. However, you cannot edit the `<PciKey>` tag.
- `<AdapterIPConfiguration>`—Contains the IP configuration of the network interface. You can edit all subtags within this tag, such as `<DefaultGateway>`, `<DHCPEnabled>`, `<IPAddress>`, and so on.

The following table describes the sample values for these tags:

Tag	Sample value
<code>&lt;Name&gt;</code>	<b>Ethernet 3, 1 GbE Public 1</b> , and so on.
<code>&lt;DHCPEnabled&gt;</code>	<b>true</b> or <b>false</b> .
<code>&lt;IsDHCPPIP&gt;</code> and <code>&lt;IsDHCPDNS&gt;</code>	<ul style="list-style-type: none"> <li>• If <code>DHCPEnabled</code> is set to <b>true</b>, the value in this tag must be set to <b>true</b>.</li> <li>• If <code>DHCPEnabled</code> is set to <b>false</b>, the value in this tag must be set to <b>false</b>.</li> </ul>
<code>&lt;StaticEnabled&gt;</code>	<b>true</b> or <b>false</b> .

*Table Continued*

Tag	Sample value
<IsStaticIP> and <IsStaticDNS>	<ul style="list-style-type: none"> <li>If <code>StaticEnabled</code> is set to <code>true</code>, the value in this tag must be set to <code>true</code>.</li> <li>If <code>StaticEnabled</code> is set to <code>false</code>, the value in this tag must be set to <code>false</code>.</li> </ul>
<IPAddress>	16.78.90.32, 10.1.2.21, 128.90.34.123, and so on.
<SubnetMask>	255.255.248.0, 255.255.0.0, and so on.
<DefaultGateway>	16.78.88.1, 128.90.34.21, and so on.
<PrimaryDNS>	16.78.22.12, 128.89.23.12, and so on.
<SecondaryDNS>	16.78.22.12, 128.89.23.12, and so on.
<TertiaryDNS>	16.78.22.12, 128.89.23.12, and so on.

**ⓘ IMPORTANT:**

- If the `DHCPEnabled` or `StaticEnabled` tags are modified, the values in the `IsDHCPPIP`, `IsDHCPDNS`, `IsStaticIP`, and `IsStaticDNS` tags must be changed accordingly.
- If the `StaticEnabled`, `IsStaticIP`, and `IsStaticDNS` tags are set to `True` and no values are specified for `IPAddress`, `SubnetMask`, and `PrimaryDNS`, the setting of the IP configuration fails.
- The `StaticEnabled` and `DHCPEnabled` tags cannot be set to `true` at the same time.

## Importing network configuration

The `NCTConfig.xml` file enables you to directly import the network configuration settings from one server to another and apply the network configuration settings for all adapters at one instance. After successfully importing the settings, when you relaunch NCT, a confirmation message is displayed indicating if you want to use the last used network configuration settings. If you click **Yes**, the NCT wizard loads the network configuration details from the `NCTConfig.xml` file and displays the existing interface details along with the team details. You can reconfigure the desired network interface from the available interfaces and create new teams or delete existing teams.

**ⓘ IMPORTANT:**

While changing the interface name, you must change only the prefix associated with the default VLAN. For example, if the complete interface name is `Ethernet 2 Team -VLAN Default`, then you must change only the prefix, that is, `Ethernet 2 Team`. The default VLAN name, which is `VLAN Default` in this example, must not be changed.

To import the network configuration settings from the `NCTConfig.xml` file:

### Procedure

- 1 Open the `NCTConfig.xml` file and edit the IP configuration of the adapter in the `<AdapterIPConfiguration>` tag.
- 2 Edit the interface name, if required.

- 3 Save the file and copy it to C:\Program Files\HPE\StoreEasy NetworkConfiguration Wizard on the server on which you want to import the configuration.
- 4 Launch NCT and when prompted, click **Yes** to use the last saved configuration.  
The NCT wizard loads and displays the configuration details from the `NCTConfig.xml` file.
- 5 Click **Next** when the discovery completes.
- 6 Make required network configuration changes on the respective windows.
- 7 Click **Apply** on the **Network Configuration Summary** window to apply the changes.
- 8 Click **Validate** on the **Network Configuration Validation** window to validate the changes.

If the XML file import is unsuccessful, it could be due to one of the following reasons:

- The file is corrupt.
- The number of adapters in the XML file and the number of adapters on the system on which you want to import the file do not match.
- The file name is different from `NCTConfig.xml`.
- The file is copied to a different location or folder.
- The XML tags other than the ones you can edit are edited.

## Using Pool Manager

Use Pool Manager to create, edit, grow, and delete storage pools. A storage pool contains a set of physical disk drives that are grouped together and from which one or more Virtual Disks are created. A Virtual Disk is a logical disk created with a defined RAID level. Virtual Disks are sometimes called as LUNs. Using Windows Disk Management, Partitions and Volumes (or filesystems) are then created on the Virtual Disks. Any local or domain user may use Pool Manager to view the storage layout, but to make any modifications such as creating, deleting, or editing pools, you must be a member of the local administrators group on the StoreEasy system. In most cases, whether using Pool Manager locally on the StoreEasy system or from a browser on a remote machine, the credentials of the logged in Windows user are used and the browser does not prompt for credentials. If prompted for credentials, enter the username and password of a domain user that is a member of the local administrators group on the StoreEasy system. If the StoreEasy system is not in an Active Directory domain, provide the username and password of the local administrator account.

You can access Pool Manager using the following ways:

- In Windows Server Manager, select **Tools > StoreEasy > Manage Storage Pools**.
- In the **Storage Configuration** task group in the ICT window, click **Create storage pools**.

---

### NOTE:

When you launch Pool Manager from ICT, the only operation available is creating a storage pool and launch create pool wizard.

Clicking the **Custom Storage Pool Wizard** displays the message This will close the Pool Manager and will open the Smart Storage Administrator (SSA). Press OK to continue. The pool manager will close and SSA will open.

### Accessing Pool Manager remotely

Pool Manager is hosted on an IIS website on the StoreEasy system. The website is named *StoreEasy Web Management* and uses TCP port 49258 by default. The TCP port 49258 is not open in the Windows Firewall, so Pool Manager cannot be accessed remotely.

**NOTE:**

If changes are made to the storage configuration using a tool other than Windows Server Manager, Pool Manager, or PowerShell Cmdlet, it is necessary to update the storage cache. Update the storage cache using the following method:

Open PowerShell and run `Update-StorageProviderCache`.

**NOTE:**

You might see a message when using the Provision Storage wizard indicating RAID6 is not supported. The Smart Array controller that is used to control the operating system drives is not licensed for RAID6. A RAID6 license is included with the system that is shipped from the factory and the license key is delivered in printed form in the system packaging. If for some reason the Smart Array controller is replaced, you must re-enter the license key. For instructions, see *Installing the license key with SSA* in the *Configuring Arrays on Smart Array Controllers Reference Guide* at [http://h20565.www2.hp.com/hpsc/doc/public/display?docId=emr\\_na-c00729544&lang=en-us&cc=us](http://h20565.www2.hp.com/hpsc/doc/public/display?docId=emr_na-c00729544&lang=en-us&cc=us).

For replacement instructions, see the *Smart Array Controllers for HPE ProLiant Servers User Guide* at [http://h20566.www2.hp.com/hpsc/doc/public/display?docId=emr\\_na-c01608507&lang=en-us&cc=us](http://h20566.www2.hp.com/hpsc/doc/public/display?docId=emr_na-c01608507&lang=en-us&cc=us).

The following pool sets are available while creating storage pools:

**NOTE:**

The **Max drive size** column indicates the maximum size of each drive in a pool. All drives in a pool must be of the same size. For example, if the maximum drive size is 8 TB and the drives per pool is 4, then the selected pool can include all 4 drives of 8 TB each. You can also use drives smaller than 8 TB, for example, 4 drives of 6 TB or 4 drives of 2 TB each.

**Table 6: Pool sets**

Pool Set	# of pools	Drives Per Pool	Logical options			RAID	Max drive size	Drive types (Must be of same type per system)				
			6	10	60 (2)			SATA	SATA SSD	MDL SAS	SAS SSD	ENT SAS
<b>StoreEasy 1450 LFF-Maximum 4 Data Drives</b>												
1	1	4	-	✓	-	10 TB	✓	-	-	-	-	
2	1	4	-	✓	-	10 TB	-	-	✓	-	-	
4	1	4	-	✓	-	10 TB	-	-	✓	-	-	
5	1	4	-	✓	-	10 TB	-	✓	-	-	-	
6	1	4	-	✓	-	10 TB	-	-	-	✓	-	
<b>StoreEasy 1550 LFF-Maximum 4 Data Drives</b>												
1	1	4	✓	-	-	10 TB	✓	-	-	-	-	

*Table Continued*

Pool Set	# of pools	Drives Per Pool	Logical options			RAID	Max drive size	Drive types (Must be of same type per system)				
				drive								
2	1	4	-	✓	-	10 TB	-	-	✓	-	-	
3	1	4	-	✓	-	10 TB	-	✓	-	-	-	
4	1	4	-	✓	-	10 TB	-	-	-	✓	-	
<b>StoreEasy 1650 LFF-Maximum 12 Data Drives</b>												
1	1	12	✓	✓	✓	10 TB	✓	-	-	-	-	
2	1	12	✓	✓	✓	10 TB	-	-	✓	-	-	
3	1	12	✓	✓	✓	10 TB	-	✓	-	-	-	
4	1	12	✓	✓	✓	10 TB	-	-	-	✓	-	
<b>StoreEasy 1650 Expanded LFF - Maximum 12+12+4 Data Drives</b>												
1	1	12+12+4	✓	✓	✓	10 TB	✓	-	-	-	-	
2	1	12+12+4	✓	✓	✓	10 TB	-	-	✓	-	-	
3	1	12+12+4	✓	✓	✓	10 TB	-	✓	-	-	-	
4	1	12+12+4	✓	✓	✓	10 TB	-	-	-	✓	-	
<b>StoreEasy 1850 SFF - Maximum 12+12 Data Drives</b>												
1	1	12+12	✓	✓	✓	10 TB	-	-	✓	-	-	
2	1	12+12	✓	✓	✓	10 TB	-	-	-	-	✓	
3	1	12+12	✓	✓	✓	10 TB	✓	-	-	-	-	
4	1	12+12	✓	✓	✓	10 TB	-	✓	-	-	-	
5	1	12+12	✓	✓	✓	10 TB	-	-	-	✓	-	
<b>D3600 LFF-Maximum 12 Data Drives</b>												
1	1	12	✓	✓	✓	10 TB	✓	-	-	-	-	
2	1	12	✓	✓	✓	10 TB	-	-	✓	-	-	
3	1	12	✓	✓	✓	10 TB	-	✓	-	-	-	
4	1	12	✓	✓	✓	10 TB	-	-	-	✓	-	
<b>D2700 SFF-Maximum 12+12+1 Data Drives</b>												
1	1	12+12+1	✓	✓	✓	10 TB	-	-	✓	-	-	
2	1	12+12+1	✓	✓	✓	10 TB	-	-	-	-	✓	
3	1	12+12+1	✓	✓	✓	10 TB	-	✓	-	-	-	

Table Continued

Pool Set	# of pools	Drives Per Pool	Logical options	drive	RAID	Max drive size	Drive types (Must be of same type per system)				
4	1	12+12+1	✓	✓	✓	10 TB	-	-	-	✓	-
<b>D3700 SFF-Maximum 12+12+1 Data Drives</b>											
1	1	12+12+1	✓	✓	✓	10 TB	-	-	✓	-	-
2	1	12+12+1	✓	✓	✓	10 TB	-	-	-	-	✓
3	1	12+12+1	✓	✓	✓	10 TB	-	✓	-	-	-
<b>D6000 LFF-Maximum 12+12+11 Data Drives</b>											
1	1	12+12+11	✓	✓	✓	10 TB	-	-	✓	-	-
<b>D6020-Maximum 12+12+11 Data Drives</b>											
1	1	12+12+11	✓	✓	✓	10 TB	-	-	✓	-	-
2	1	12+12+11	✓	✓	✓	10 TB	-	-	-	✓	-

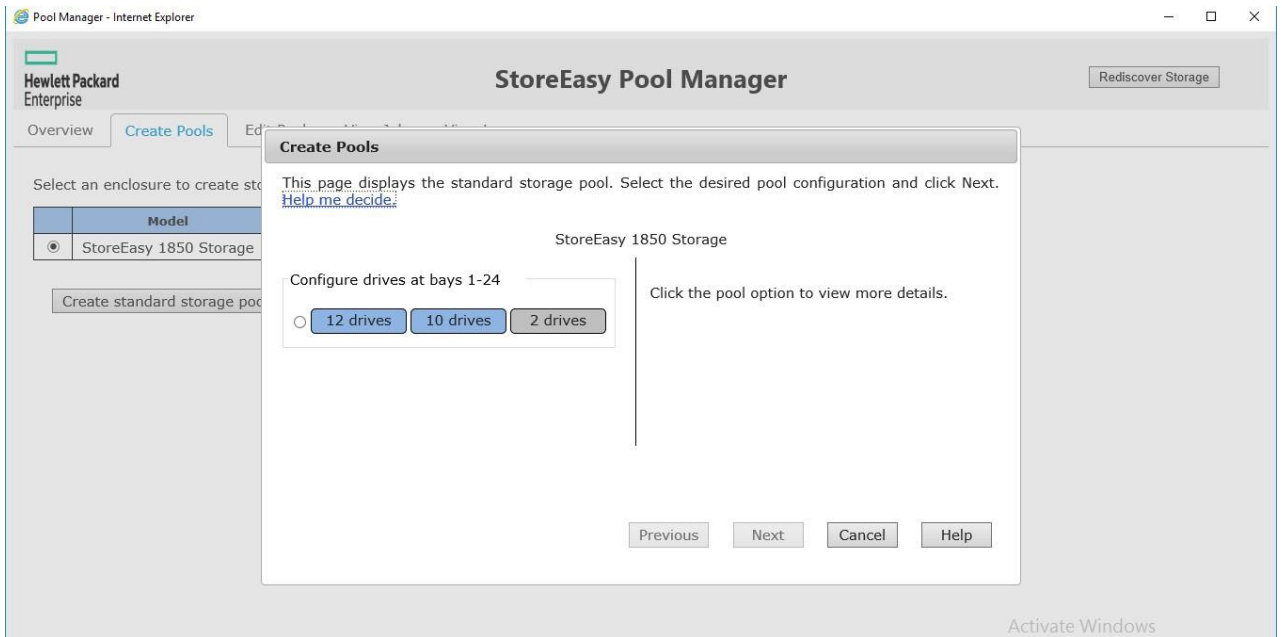
The Pool Manager wizard contains the following sections:

- **Overview**—Displays storage information, such as number of controllers, enclosures (internal and external), storage pools, and virtual disks. The system hardware and software configuration information is also displayed. You can also view additional details on the system configuration by clicking **System Management Homepage**.

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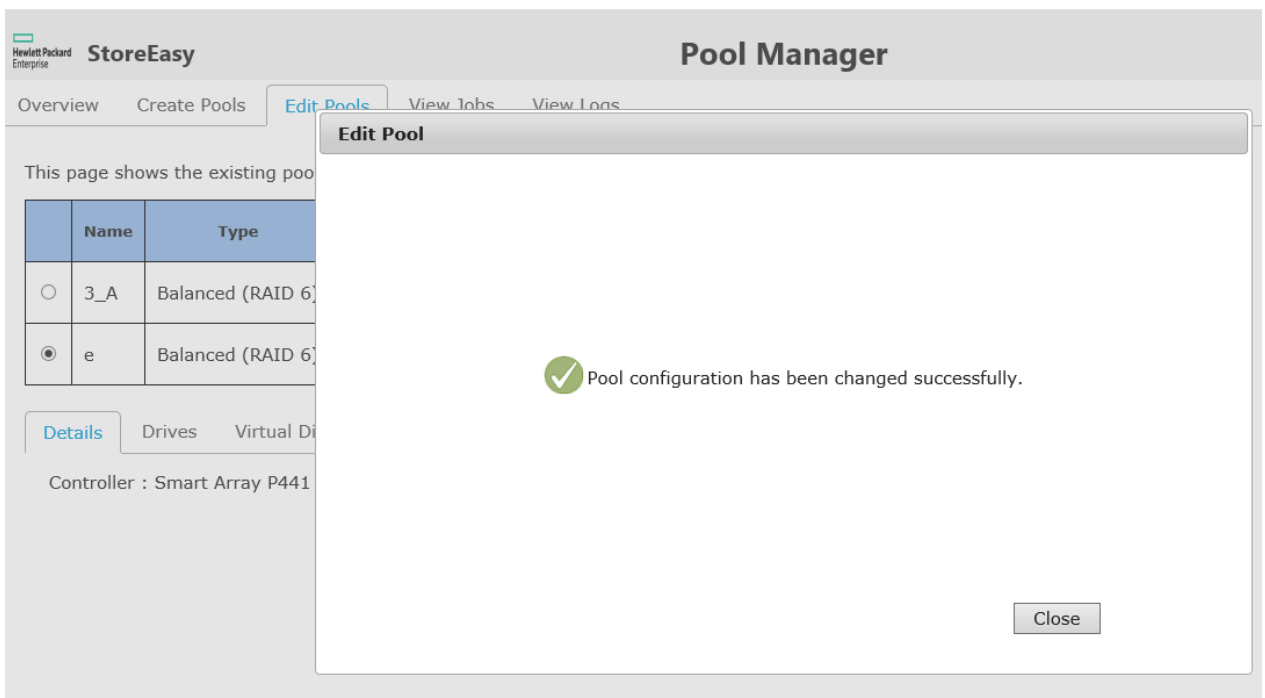
**NOTE:**

- The number and status of disks in an enclosure displayed on the **Create Pool** tab can be affected by removing or inserting new disks. If a physical disk is not currently assigned to a storage pool or it is removed and a new disk is inserted into an empty slot, the physical disk is not included in the list of disks that is displayed unless you refresh the storage. You can refresh the HPE StoreEasy 1000 Storage system by either opening a Windows PowerShell prompt and executing the `Update-StorageProviderCache` command or by clicking **Rediscover Storage** in Pool Manager.
- If an assigned physical disk is removed and re-inserted into a different slot, the pool status might be displayed as *Healthy* or *Degraded*. This depends on whether a physical drive from the global spare can be assigned to the virtual disks in the pool.
- Before opening HP Smart Storage Administrator, close Pool Manager, Dashboard, and SMP service.
- **Create Pools**—Enables you to create a new storage pool. Before selecting a pool option, evaluate the available options:



**Figure 38: Pool Manager — Create Pools**

- Click on each valid pool option (blue buttons) to view details about the option.
- Click on each invalid pool option (grey buttons) to view details about why this option is not available.
- Click on **Help me decide** for assistance is making your selection.
- **Custom Storage Pool** (WSS2016 only) — Enables you to create a new storage pool. Clicking on the **Custom Storage Pool** button will open the Smart Storage Administrator UI to create pools. This action will open the Create Pool wizard and close the pool manager.



**Figure 39: Pool Manager — Edit Pools**

- **Edit Pools**—Enables you to change the pool configuration or delete the pool. When you select a pool, additional pool information, such as drives, virtual disks, and spares is also displayed on the screen.
- **View Jobs**—Displays the storage jobs running on the system. You can view the information, such as name, description, state, and so on.
- **View Logs**—Displays the Pool Manager components and most recent log entries for each component. Use the **Select Component** list to select the components for which you want to view the logs. The available components are Pool Manager Provider, Management Web Service, and Storage Management Provider.

For detailed information on these tasks, click the respective help icon on the screen.

## Calculating pool size

When creating a storage pool, the capacity and free space is calculated based on a number of factors, including where the storage pool is created. Consider the following when creating pools:

- If a storage pool is created for a specific RAID level, the capacity is based on the specified RAID level. The free space is calculated based on the free space on the smallest of the physical disks in the pool to support the specified RAID level.
- If a storage pool contains a LUN which is greater than 20 MB and has the Logical Drive label as **Reserved**, the RAID level of the pool is set to the RAID level of the LUN. Any subsequent volume in the pool is created at the same RAID level. However, this might fail if a similar LUN already exists in the pool which is of an incompatible RAID level.
- A virtual disk in a storage pool is always striped across all physical disks in the pool.
- If the storage pool is created with a tool other than StoreEasy Pool Manager, the free space calculation is based on the recommended RAID level or it is derived from the reserved LUN in the pool. If the reserved LUN does not exist, it is automatically created (if there is space available in the pool) and based on the assumed RAID level. If the reserved LUN is deleted using a tool other than Windows Server Manager, the RAID level specified in Pool Manager is used. The chosen RAID level will be whichever offers the highest fault tolerance using the available set of physical disks in the pool.

As an example, a RAID 6 storage pool is created using StoreEasy Pool Manager that contains five 3 TB drives. The available space is 9 TB (3 x 3 TB, excluding the two parity drives). If the pool already contains a 2 TB RAID 1 LUN (virtual disk) using two of the five drives, the available space is 6 TB (3 x 2 TB, excluding the two parity drives and considering that the available space in the smallest drive is 2 TB (3-1)).

## Pool Manager best practices

The StoreEasy pool best practices provide:

- Preset configuration options (pool sets) calculated on a per enclosure basis. An enclosure may refer to the StoreEasy system and its internal drives or an attached external disk enclosure, such as the D2700, D3600/D3700, D6020, or D6000.
- Guidance to prevent pools from being too large (based on disk type and RAID level) or too small. Pools that are too large run the risk of data loss if there are multiple disk failures within the pool. Pools that are too small increase the chance of inefficient capacity utilization.
- HPE StoreEasy 1650 Expanded Storage and D3600/D3700 disk enclosures provide a new pool configuration to provide maximum capacity (WSS2012 R2 only).



- When you select the pool configuration, which has RAID 5 and no spare, the system displays the following message:

```
This configuration is not recommended as it may result in data loss due to drive failure. Do you want to continue?
```

In case of a drive failure, you must replace the failed drive immediately to prevent data loss.

- When you select a pool configuration that contains more than 12 drives, the system displays the following message:

```
Selected option is not a recommended pool configuration. Please select pool configuration with less than 12 drives for better data durability. For more information, see the administrator guide.
```

HPE recommends to keep 12 or less drives in a pool. When a drive fails in an array, all logical drives in that array are affected. After a drive failure, additional activities are required to rebuild the array and these activities might cause additional drive failures. With the number of drives in an array, the chances for drive failures increases.

---

**⚠ CAUTION:**

As data rebuild time operates at the rate of 200 GB/15 minutes, the system might be unprotected from a drive failure for an extended period during data recovery or a drive capacity upgrade. To avoid drive failure, you must perform rebuild operations only during periods of minimal system activity.

- When you select a pool configuration that has a usable capacity of more than 64 TB, the system displays the following message:

```
This configuration might result in NTFS volumes greater than 64 TB and affect the NTFS capabilities. Do you want to continue? For more information, see the administrator guide.
```

When you create NTFS volumes that are greater than 64 TB, a degradation of capabilities for managing the volume occurs. Deduplication and shadow copying support only up to a 64 TB NTFS volume.

## Pool Management Best Practices

- Pools cannot span enclosures due to the following factors:
  - During a drive failure, the chance for another drive failure increases due to the amount of additional activity on the drives during the transition to a spare. When the drive is replaced, the RAID controller has to touch each drive in the logical volume again to re-establish the RAID parity.
  - More drives in a pool increases the amount of time required to complete parity initialization. Until the parity initialization completes, the performance of the array is impacted due to the additional activities. During a drive failure, the chance of another drive failure increases due to the additional activities on the drives during the transition to a spare. Also, when the drive is replaced, the RAID controller has to touch each drive in the logical volume again to re-establish the RAID parity.
  - More drives in a pool increases the amount of time required to complete parity initialization. Until the parity initialization completes, the performance of the array is impacted due to the additional activities.
- Where applicable, the use of a hot spare is enforced (WSS2012 R2 only).

- When using midline SAS and SATA drives, use the recommended RAID levels, RAID 6 or RAID 60.
- The available pool sets vary depending on the type of enclosure. A pool set defines how the available physical drives may be used to form pools. For example, if an enclosure contains 23 available drives, one pool set may offer a single 22-drive pool with one drive designated as a spare. Another pool set may offer two 11-drive pools with drive designated as a spare, which is available to either pool.

### Array configuration best practices

When you build an array:

- All drives grouped in a logical drive must be of the same type. For example, all SAS or all SATA and all hard drives or all solid state drives.
- For the most efficient use of drive space, all drives within an array must have approximately the same capacity. Each configuration utility treats each physical drive in an array as if the drive has the same capacity as the smallest drive in the array. Any excess capacity of a particular drive cannot be used in the array and is unavailable for data storage.
- Increasing the number of drives configured in an array might result in a drive failure in the array during the given period.
- To guard against the data loss during a drive failure, configure all logical drives in an array with a suitable fault-tolerance (RAID) method.

A rebuild operation requires approximately 15 to 30 seconds per gigabyte for RAID 5 or RAID 6. Actual rebuild time depends on several factors, such as the amount of I/O activity that occurs during the rebuild operation, the number of disk drives in the logical drive, the rebuild priority setting, and the disk drive performance. You can view the rebuild progress and set the priority for the rebuild operation by using SSA.

Typically, using larger LUNs, which require larger pools simplifies storage management and namespace management, especially when using storage for file shares. However, the following factors can affect the use of larger LUNs:

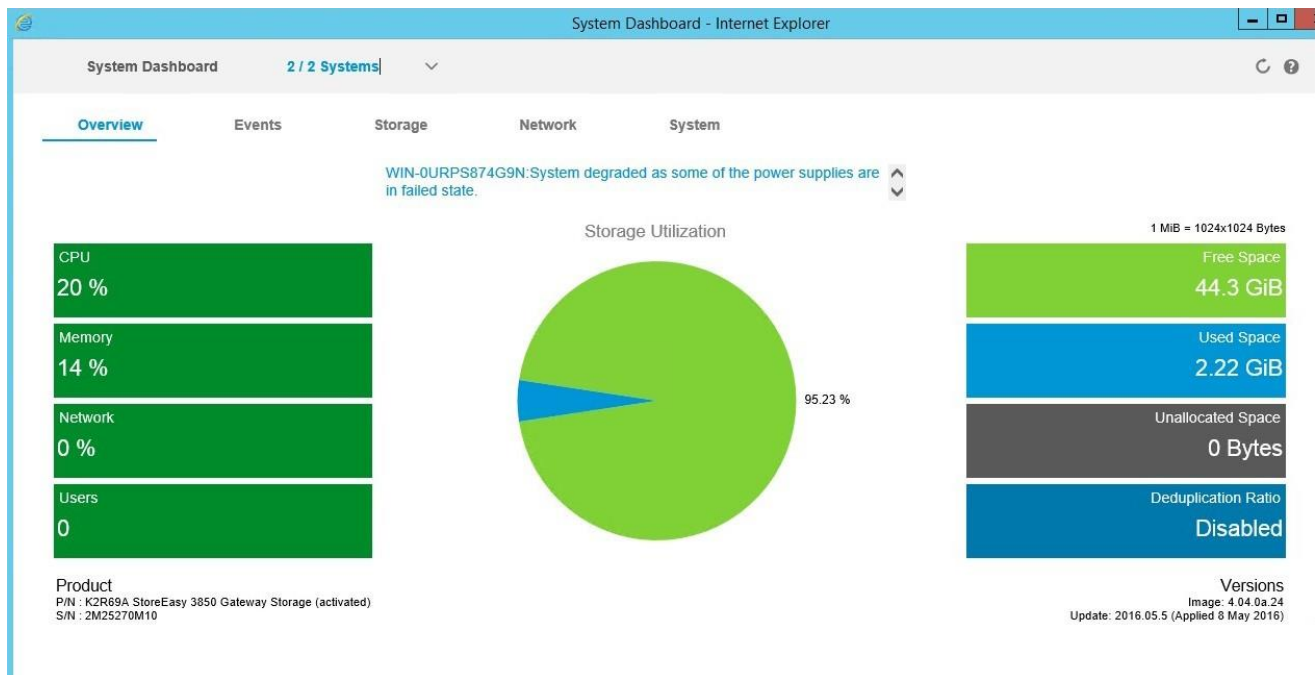
- Backup strategy
  - Larger LUNs require longer backup windows.
  - Multiple, smaller LUNs may be more efficient for backup and recovery scenarios.
- Performance requirements
  - If there are performance requirements for specific clients, segmenting groups of clients onto different LUNs might be useful.
- Drive availability
  - Starting with a full disk enclosure provides the most options for creating pools. A disk enclosure with a smaller number of drives has a smaller number of pooling options.
  - RAID migration is not allowed. For example, you start with a pool containing 13 drives that are configured with RAID 5 and then create a LUN (virtual disk) that fills the pool. Later, you decide to grow that LUN. Although a 22-drive pool set may be listed, you cannot grow a 13-drive pool into a 22-drive pool because the 22-drive pool requires RAID 50 or RAID 60. Migrating from RAID 5 to RAID 50 or RAID 60 is not supported.

The following table describes the three basic types of pools, their properties, and usage:

Pool type	Properties	Good for
Capacity	<ul style="list-style-type: none"> <li>Created with high capacity midline SAS and SATA drives (7.2K RPM).</li> <li>Always contain RAID6 or RAID 60 LUNs.</li> </ul>	<ul style="list-style-type: none"> <li>Archival storage (high capacity)</li> <li>General purpose file shares</li> <li>Sequential workloads</li> </ul>
Performance	<ul style="list-style-type: none"> <li>Created with enterprise SAS drives (10K or 15K RPM).</li> <li>Contain an even number of disk drives to support RAID10 LUNs.</li> </ul>	<ul style="list-style-type: none"> <li>Applications</li> <li>Clients with high performance needs</li> <li>Random I/O workloads</li> <li>Low capacity data sets</li> </ul>
Balanced	<ul style="list-style-type: none"> <li>Created with enterprise SAS drives (10K or 15K RPM).</li> <li>Contain RAID5/6 or RAID50/60 LUNs.</li> </ul> <hr/> <p><b>NOTE:</b> This storage will generally be of higher performance than Capacity pools and have better capacity utilization than Performance pools.</p>	<ul style="list-style-type: none"> <li>General purpose file shares</li> <li>Sequential workloads</li> </ul>

## Using the StoreEasy Dashboard

The StoreEasy Dashboard is a monitoring software that enables you to view information about the HPE StoreEasy 1000 Storage system, such as resource utilization, system details, storage configuration, and network configuration.



**Figure 40: StoreEasy Dashboard**



Use one of the following methods to launch the StoreEasy Dashboard:

- Double-click the **System Dashboard** icon on the desktop.
- Open Server Manager and click **Tools > StoreEasy > System Dashboard**.
- Click **System Dashboard** on the **Start** screen.
- Click the **System Dashboard** shortcut icon on the system toolbar (WSS2012 R2 only).

The StoreEasy Dashboard contains the following tabs that allow you to view the current system state and utilization:

- **Overview**—Displays system health, system utilization summary, and system properties.
- **Events**—Displays system event logs that include critical, warning, and informational messages.
- **Storage**—Displays storage overview, drives, volumes, and shares.
- **Network**—Displays network overview, interfaces, teams, and VLANs.
- **System**—Displays system overview, hardware, and software details.


The StoreEasy Dashboard menu bar contains the following buttons:

- **Systems**—Click to select the system for which you want to view the data.
- **Refresh**—Click 
- **Help**—Click 

You can also customize the menu bar display options and view information of the StoreEasy systems. To change the display options, click the drop-down arrow in the menu bar, and select the required option under **Display Options**.

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**!** **IMPORTANT:**

- If you refresh the web browser by pressing **F5** or by clicking the refresh button in the address bar, by default, the data on the dashboard is refreshed and reloaded for the current node, irrespective of previous selection. However, if you refresh the dashboard data by clicking the dashboard refresh button, that is,  on the menu bar, the data is refreshed only for the selected nodes.
- The data on the **Overview** screen is refreshed every three minutes. However, you can manually refresh the data by clicking the dashboard refresh button on the menu bar.

The data displayed on the dashboard is as per the sampling interval specified in the dashboard configuration file. If the data for a resource is displayed on more than one screen, the values differ based on the sampling interval. For example, the default sampling interval for network overview is one minute, whereas for other network screens, the interval is 15 minutes. Any change in the interface name or property is reflected under network overview after one minute and on other network screens, the change is reflected after 15 minutes.

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**NOTE:**

Depending on the number of disks attached to the system, the initial discovery after the dashboard services are installed might take several minutes.

## Viewing the dashboard overview

Click **Overview** on the dashboard to view the CPU, memory, and storage utilization summary. You can also view a graphical representation of the free space, used space, and unallocated space in the Storage Utilization pie chart. The **Overview** screen is the default screen that appears when you access the StoreEasy Dashboard. The values displayed on the **Overview** screen are an average of samples collected from all nodes in a cluster and reflect values for cluster resources.

The following table describes the fields that are available on this screen:

Field	Description
Action	<p>Warning or failure message related to the system health. This box is not displayed if the system health is normal.</p> <ul style="list-style-type: none"> <li>• If the system health degrades, an appropriate warning message is displayed. For example, The CPU utilization has crossed its warning threshold level.</li> <li>• If the system health degrades due to multiple causes, the following message is displayed: System health is degraded due to multiple causes.</li> <li>• If the system health fails, an appropriate failure message is displayed. For example, System failure as all enclosures are in failed state.</li> <li>• If the system health fails due to multiple reasons, the following message is displayed: System health is failed due to multiple causes.</li> </ul>
CPU	Average value of the CPU utilization over a period of time. The value displayed is the average of the number of samples collected at the time interval specified in configuration file.
Memory	Average value of the physical memory utilization over a period of time. The value displayed is the average of the number of samples collected at the time interval specified in configuration file.
Network	Average value of the network bandwidth utilization over a period of time. The value displayed is the average of the number of samples collected at the time interval specified in configuration file.
Users	Total number of users connected to SMB shares.
Free space	Free space available on the volume. The free space is the difference between the total presented virtual disk and total used space on each volume.
Used space	Sum of used space on each volume.
Unallocated space	Difference between the total size of all attached physical disk drives and the total of all created and presented storage pools.

*Table Continued*

Field	Description
Deduplication ratio	Average deduplication ratio of all volumes that have deduplication enabled. Deduplication ratio is the percentage amount of data savings with respect to the total size of the volume. If none of the volumes have deduplication enabled, <b>Disabled</b> is displayed in the box.
Product	Product name with activation status of the system on which you are accessing the StoreEasy Dashboard.
P/N	StoreEasy product number of the system on which you are accessing the StoreEasy Dashboard.
S/N	Serial number of the system on which you are accessing the StoreEasy Dashboard.
Versions	StoreEasy software version of the system on which you are accessing the StoreEasy Dashboard.

**NOTE:**

CPU, memory, network utilization, and number of users on the dashboard are the average values of samples collected over a period of time. Therefore, the values might not always match with the other applications where the data displayed is at different points in time.




For information on common issues and workarounds related to StoreEasy Dashboard, see [Known issues](#).

## Viewing event details

Click Events on the dashboard to view the event logs. A maximum of 60 events are displayed for the system. The Events tab contains three additional tabs:

- Critical
- Warning
- Information

The StoreEasy Dashboard uses the following icons to represent the events:

-  —Indicates critical
-  —Indicates warning
-  —Indicates information

### Critical

Click **Critical** to view critical events that are logged in the system. The **Critical** tab is divided into two panes. The left pane provides information on all critical events and the right pane provides detailed information of the event selected in the left pane. The following table describes the fields that are available on this screen:

Field	Description
State	Icon that represents the event.
Severity	Severity level of the event.
Date & Time	Date and time when the event was logged.
Source	Source of the log. For example, VSS, MSIInstaller, or Perflib.
ID	Event log ID.
System	Local name of the system.
User	Username from which the event is triggered.
Message	Detailed description of the message.

### Warning

Click **Warning** to view warning events logged in the system. The **Warning** tab is divided into two panes. The left pane provides information on all warning events and the right pane provides detailed information of the event selected in the left pane. The following table describes the fields that are available on this screen:

Field	Description
State	Icon that represents the event.
Severity	Severity level of the event log.
Date & Time	Date and time when the event was logged.
Source	Source of the log. For example, VSS, MSIInstaller, or Perflib.
ID	Event log ID.
System	Local name of the system.
User	Username from which the event is triggered.
Message	Detailed description of the message.

### Information

Click **Information** to view informational events logged in the system. The **Information** tab is divided into two panes. The left pane displays all informational events and the right pane provides detailed information of the event selected in the left pane. The following table describes the fields that are available on this screen:










Field	Description
State	Icon that represents the event.
Severity	Severity level of the message.
Date & Time	Date and time when the event was logged.
Source	Source of the log. For example, VSS, MSInstaller, or Perflib.
ID	Event log ID.
System	Local name of the system.
User	Username from which the event is triggered.
Message	Detailed description of the message.

## Viewing storage details

Click **Storage** on the dashboard to view storage details, such as the drives, volumes, and shares available in the system. The **Storage** tab contains four additional tabs:

- Overview
- Drives
- Volumes
- Shares

The StoreEasy Dashboard uses the following icons to display the state of an individual drive, volume, and share:

- —Indicates normal
- —Indicates information
- —Indicates warning
- —Indicates minor or degraded
- —Indicates major error
- —Indicates critical error
- —Indicates unknown state

## Overview

Click **Overview** to view a graphical representation of the space utilization for each volume available in the system. To view the utilization details, select the bar that represents the volume in the graph. The lower left pane displays the overall storage utilization of the system. The lower right pane displays the utilization of the selected volume bar graph.

---

### NOTE:

MV indicates Mounted Volume in the Storage Overview graph.

A mounted volume is a volume that does not have a drive letter, but is mounted to another volume.

## Drives

Click **Drives** to view details of the drives available in the system and the connected enclosures and arrays.

The **Drives** tab is divided into two panes. The left pane displays a list of all drives and the right pane provides a summary of the drive selected in the left pane. The following table describes the fields that are available on this screen:

Field	Description
State	Icons that represent the state of the individual drive.
Name	Name of the disk.
Drive location	Location of the drive. <ul style="list-style-type: none"><li>• For 3PAR StoreServ arrays, the location is in the <code>arrayname:cage:magazine:disk</code> format.</li><li>• For Modular Smart Arrays (MSA), the location is in the <code>arrayname:enclosure index:slot</code> format.</li><li>• For all other drives, the location is in the <code>location:bay</code> format.</li></ul>
Size	Size of the drive.
Type	Type of drive.
System	Local name of the system.
Alerts	Alert message about the drive. If no alert is applicable, an appropriate message is displayed.
Utilization	Usage of the drive.

*Table Continued*

Field	Description
Utilization (%)	Capacity utilization graph.
Properties	<p>Displays the following drive properties:</p> <ul style="list-style-type: none"> <li>• Serial number</li> <li>• Model</li> <li>• Firmware</li> <li>• Speed</li> <li>• Controller information</li> <li>• Number of volumes associated with the selected drive.</li> <li>• Number of shares associated with the selected drive.</li> </ul> <hr/> <p><b>NOTE:</b></p> <p>If the speed is displayed as zero for a specific disk, the disk drive firmware might need an update.</p>

## Volumes

Click **Volumes** to view details of the volumes created on the connected enclosures and arrays. All volumes available in the system, including operating system volumes are displayed.

The **Volumes** tab is divided into two panes. The left pane displays a list of all volumes and the right pane provides a summary of the volume selected in the left pane. The following table describes the fields that are available on this screen:

Field	Description
State	Icons that represent the state of the individual volume.
Name	Name of the volume.
Label	Label assigned to a specific volume.
Capacity	Total capacity of the volume.
Provisioning	Type of provisioning. For example, Thin or Fixed.
Resiliency	Raid level configuration of volume.
System	Local name of the system.
Alert	Alert message about the volume. If no alert is applicable, an appropriate message is displayed.

*Table Continued*

Field	Description
Utilization	Horizontal graph representing free, allocated, and total space. If deduplication is enabled, a bar graph for deduplication is also displayed.
Properties	Displays the following volume properties: <ul style="list-style-type: none"> <li>• Access path to the volume</li> <li>• Encrypted (Yes or No)</li> <li>• Clustered (true or false)</li> <li>• Deduplication (Enabled or Disabled)</li> <li>• Number of drives associated with the selected volume</li> <li>• Number of shares associated with selected volume</li> </ul>

## Shares

Click **Shares** to view details of all shares available in the system.

The **Shares** tab is divided into two panes. The left pane displays a list of all shares and the right pane displays a summary of the share selected in the left pane. To view additional details, click **Summary** and then click **Details**. The following table describes the fields that are available on this screen:

Field	Description
State	Icons that represent the state of a share.
Name	Name assigned to the share.
Protocol	Protocol used for the share.
Size	Size of the share.
System	Local name of the system.
Alert	Alert message about the share. If no alert is applicable, an appropriate message is displayed.
Utilization	Horizontal graph representing used space.

*Table Continued*





Field	Description
Properties	<p>Displays the following share properties:</p> <ul style="list-style-type: none"> <li>• Owning node name if clustered is <b>true</b>.</li> <li>• Local path of the share if clustered is <b>true</b>.</li> <li>• Clustered (true or false)</li> <li>• Drives</li> <li>• Volumes</li> </ul> <p>If you select <b>Details</b>, the access path is also displayed under <b>Properties</b>.</p>
Reports	<p>Provides the FSRM (File Server Resource Manager) reports. If the report is unavailable, <b>Not available</b> is displayed.</p>

## Viewing network details

Click **Network** on the dashboard to view the network interfaces, teams, and VLANs available in the system. The **Network** tab contains four additional tabs:

- Overview
- Interfaces
- Teams
- VLANs

The StoreEasy Dashboard uses the following icons to display the state of an individual interface, team, and VLAN:

- —Indicates connected
- —Indicates disconnected
- —Indicates degraded
- —Indicates disabled

### Overview

Click **Overview** to view a graphical representation of the network bandwidth utilization in percentage for each interface available in the system. A bar graph representing the utilization for all interfaces is displayed. To view the network bandwidth utilization, select the bar that represents the interface in the graph. The lower left pane displays the overall utilization of the system. The lower right pane displays the utilization of the selected interface.

### Interfaces

Click **Interfaces** to view a list of network interfaces available in the system. The interface details of the selected nodes are displayed.

The **Interfaces** tab is divided into two panes. The left pane displays a list of all network interfaces and the right pane displays a summary of the interface selected in the left pane. To view the IPV4 settings, click **Summary** and then click **IPV4**. The following table describes the fields that are available on this screen:

Field	Description
State	Icons that represent the state of an individual interface.
Name	Name assigned to the interface.
Status	Operational state of the network interface: <ul style="list-style-type: none"><li>• Disconnected</li><li>• UP</li><li>• Degraded</li><li>• Disabled</li></ul>
Primary IP	Primary IP address of the network interface. If the interface is in a team, <b>Teamed</b> is displayed.
System	Local name of the system.
Alerts	Alert message about the network interface. If no alert is applicable, an appropriate message is displayed.

*Table Continued*

Field	Description
Utilization	Horizontal graph for the network bandwidth utilization percentage.
Properties	<p>Displays the following network interface properties:</p> <ul style="list-style-type: none"> <li>• Interface description</li> <li>• Network category</li> <li>• Speed</li> <li>• Connectivity</li> <li>• Connection DNS name</li> <li>• Team</li> <li>• VLAN</li> </ul> <p>If you select <b>IPv4</b>, the following properties are displayed:</p> <ul style="list-style-type: none"> <li>• Primary IP</li> <li>• Network mask</li> <li>• Gateway</li> <li>• Primary DNS</li> <li>• Secondary DNS</li> <li>• Tertiary DNS</li> <li>• Alternate IP address</li> </ul>

## Teams

Click **Teams** to view a list of teams available in the system. The team details of the selected nodes are displayed.

The **Teams** tab is divided into two panes. The left pane displays a list of all teams and the right pane displays a summary of the team selected in the left pane. The following table describes the fields that are available on this screen:

Field	Description
State	Icons that represent the status of an individual team.
Name	Name assigned to the team.
Number of interfaces	Number of interfaces.
System	Local name of the system.

*Table Continued*

Field	Description
Alerts	Alert message about the network adapters included in the team. If no alert is applicable, an appropriate message is displayed.
Utilization	Horizontal graph indicating the bandwidth utilization of the network adapters.
Properties	Displays the following team properties: <ul style="list-style-type: none"> <li>• Teaming mode</li> <li>• Load balancing mode</li> <li>• Default interface name</li> <li>• List of all team members</li> <li>• Number of VLANs in a team</li> <li>• Team NICs</li> </ul>

## VLANs

Click **VLANs** to view a list of VLANs available in the system. The VLAN details of the selected nodes are displayed.

The **VLANs** tab is divided into two panes. The left pane displays a list of all VLANs and the right pane displays detailed information about the VLAN selected in the left pane. The following table describes the fields that are available on this screen:

Field	Description
State	Icons that represent the status of an individual VLAN.
Name	Name assigned to the VLAN.
VLAN ID	Unique identifier assigned to the VLAN.
System	Local name of the system.
Alerts	Alert summary about the selected VLAN. If no alert is applicable, an appropriate message is displayed.
Utilization	Horizontal graph indicating the bandwidth utilization of the VLAN.
Properties	Displays the following VLAN properties: <ul style="list-style-type: none"> <li>• Name of the interface that hosts the VLAN.</li> <li>• Name of the team that hosts the interface hosting the VLAN.</li> </ul>



## Viewing system details




Click **System** on the dashboard to view the system details of the selected nodes.

The **System** tab contains three additional tabs:

- Overview
- Hardware
- Software

### Overview

Click **Overview** to view the system information and properties of the selected nodes. The **Overview** tab is divided into two panes. The left pane displays the information and the right pane provides a summary of the system properties. To view additional details, click **Summary** and then click **Details**. The StoreEasy Dashboard uses the following icons to display the system state:

- —Indicates health OK
- —Indicates health warning
- —Indicates health degraded

The following table describes the fields that are available on this screen:

Field	Description
State	Icons that represent the status of the system.
Version	StoreEasy software version.
S/N	Product serial number of the system.
SR version	Version of the SR (Service Release). If no SR is installed, <b>None</b> is displayed.
Memory	Average value of the physical memory utilization percentage over a period of time. You can configure the period using the dashboard configuration file.
System	Local name of the system.

*Table Continued*

Field	Description
Up time	Time since the system was last restarted.
Properties	<p>Displays the following reseller details:</p> <ul style="list-style-type: none"> <li>• Asset details, such as asset name and asset serial number.</li> <li>• Contact details, such as contact name and contact phone.</li> <li>• Other details, such as PO number, purchase date, installation date, and support ID.</li> </ul> <p>The reseller details are extracted from the Reseller Information Tool.</p> <p>If you select <b>Details</b>, the following properties are displayed:</p> <ul style="list-style-type: none"> <li>• SR date and version.</li> <li>• IP address of the iLO.</li> </ul>

## Hardware

Click **Hardware** to view the hardware components in the system. The hardware details of the selected nodes are displayed.

The **Hardware** tab is divided into two panes. The left pane displays all hardware components and the right pane displays detailed information about the component that you select in the left pane. The following table describes the fields that are available on this screen:

Field	Description
State	Icons that represent the status of a component.
Name	Name of the hardware component.
Type	Type of component.
Model	Model number of the component.
Firmware version	Firmware version installed on the hardware component.
System	Local name of the system.
Alerts	Alert summary of the selected component. If no alert is applicable, an appropriate message is displayed.
Properties	Hardware properties, such as device name, manufacturer, and firmware version.

## Software

Click **Software** to view a list of software installed on the system. The software details of the selected nodes are displayed. The following table describes the fields that are available on this screen:

Field	Description
Name	Name of the installed software.
Publisher	Publisher of the software.
Installed on	Date when the software was installed.
Size	Size of the software.
Version	Version number of the installed software.
System	Local name of the system.

## Managing the dashboard configuration file

The dashboard configuration file named `configuration.xml` is located at `%PROGRAMFILES%\HP\HP StoreEasy Data Service\UserConfigurationFiles\`. This file is used to define and control the behavior of various user interface elements of the dashboard. Using the dashboard configuration file, you can set the warning and alert threshold parameters, data sampling parameters, and other properties. When you modify the dashboard configuration file and save the changes, the dashboard services update the data depending on the updated time interval that you specify in the file.

### NOTE:

Only a user who is a member of the local Administrator group can modify the contents and save the dashboard configuration file. A local or domain user cannot make any changes to the dashboard configuration file.

When the first `configuration.xml` file is created, the `LastKnownGood.xml` file is created simultaneously. This file is created every time the file is parsed successfully. The `LastKnownGood.xml` file is saved in the same location as the current file. If the `configuration.xml` file is corrupt or invalid, the `LastKnownGood.xml` is used by the dashboard services. If the `LastKnownGood.xml` file is also corrupt or invalid, the `FactoryConfig.xml` file is used by the dashboard services. You cannot edit the contents of the `FactoryConfig.xml` file.

The top-level element in the `configuration.xml` file is `<Dashboard>` that contains the following sub-elements:

- `<Overview>`
- `<Storage>`
- `<SystemTabs>`
- `<EventLogs>`
- `<Network>`

### Overview

The `<Overview>` sub-element defines the properties for the **Overview** tab. It contains the `<Thresholds>`, `<Sampling>`, and `<StorageUtilizationGraph>` elements.

### Thresholds

Use thresholds to set the warning and alert limits for the system utilization and performance. Thresholds affect the display color of various fields that are displayed on the dashboard. By default,

- Green indicates normal.
- Yellow indicates degraded.
- Red indicates failed.

### Overrides

Use the overrides to specify the sampling period and samples per average for a given property. The overrides are specified within the `<Thresholds>` sub-element.

- `SamplePeriodOverride`  
specifies the period in minutes that is different from the default period.
- `SampleCountOverride`  
specifies the number of samples that are different from the default period.

---

### NOTE:

You can override or edit the dashboard configuration file.

### Sampling

Use the `<Sampling>` sub-element to define the sampling rate and samples per average. The sampling rate and samples per average are used by the dashboard to display various properties, such as CPU, memory, and network that are calculated as an average over a period of time.

- `Period` specifies the sample rate in minutes. Valid sampling period values are from 1 to 1440 minutes .
- `SamplesPerAverage` specifies the number of samples to calculate the average. Valid sampling count values are from 1 to 100.

### Storage Utilization Graph

Use the `<StorageUtilizationGraph>` sub-element to define the threshold value for the labels in the storage utilization graph on the **Overview** tab. The value is entered in percentage.

`<NoDataLabelThreshold percentage>` specifies the value in percentage that indicates if the labels are displayed in the graph. For example, if the threshold value is 5% but the free space available in the system is 3%, then 3% is not displayed because it is less than the threshold value. The default value is 5% but you can change it to any value between 1% to 100%.

### Storage

The `<Storage>` sub-element defines the properties for the drives, volumes, and shares on the Storage tab.

- `<UpdateCache>` specifies the time for the storage provider cache update. The storage provider cache is updated with the latest storage configuration. By default, the cache is updated every 360 minutes. The minimum time that you can specify for cache update is 360 minutes.
- `<Discovery>` specifies the discovery time based on which the storage data is discovered and updated. By default, the storage data is discovered every 15 minutes. The minimum time that you can specify for storage data discovery is 15 minutes.

## System Tabs

The `<SystemTabs>` sub-element updates the data on the Hardware and Software tabs.

`<Discovery>` specifies the discovery time based on which the hardware health status is updated. The default value is 24 hours. The minimum value must be 30 minutes.

## Event Logs

The `<EventLogs>` sub-element updates the data on the Critical, Warning, and Informational tabs.

`<Discovery>` specifies the discovery time based on which the data is updated on the Critical, Warning, and Information tabs. The default value and minimum value is 5 minutes.

## Network

The `<Network>` sub-element defines the properties of the network interfaces, teams, and VLANs.

- `<NetworkTabOverview>` specifies the discovery time based on which the bandwidth of the interfaces is discovered and updated. By default, the bandwidth of the interfaces is discovered every minute. The minimum time that you can specify for the bandwidth of the interfaces is one minute.
- `<NetworkInterfaceTeamVLAN>` specifies the discovery time based on which the interface, team, and VLAN details are discovered and updated. By default, the interface, team, and VLAN details are discovered every 15 minutes. The minimum time that you can specify for this discovery is 15 minutes.

---

### **IMPORTANT:**

If you enter a value that is lower than the minimum required value in the dashboard configuration file, the StoreEasy Dashboard discards the new value and considers the default value to update and display the data.

The `<UserDetails>` sub-element defines Windows user details for node to node communication.

- `<UserName>` specifies the Windows user name that is created on all cluster nodes for node to node communication.
- `<Password>` specifies the password for the Windows user created by the dashboard for node to node communication.

---

### **IMPORTANT:**

If you enter a value that is lower than the minimum required value in the dashboard configuration file, the StoreEasy Dashboard discards the new value and considers the default value to update and display the data.

## Notification System

The Notification System feature enables you to set email alerts for various system parameters, such as free space, unallocated space, and used space. The email alerts are sent at a scheduled time based on the rules and notification parameters that you specify. For example, if you set the value of the Used Space parameter as 100 MB, an email alert is sent when the used space in the system reaches 100 MB.

You can access the Notification System dialog box using the following methods:

- Double-click the **StoreEasy Notification System** icon on the desktop.
- Open **Server Manager**, click **Tools > StoreEasy** and select **Notification System**.
- Click **Notification System** on the **Start** screen.

To set an email alert:

### Procedure

1. In the **Contact Information** group, enter the rule name, email address to and from which the alert must be sent, and SMTP server name.
2. Click **Test** for the SMTP server validation. This step is optional.

#### NOTE:

If the validation is successful, an email is sent to the specified email address and a confirmation message is displayed on the screen. If the validation fails, a message is displayed indicating that you must verify the SMTP server details.

3. In the **Notification Parameters** group, select a parameter and comparison, and then enter a value that must be compared against the parameter value.
4. When you select the **Notify Daily** check box, an email notification is sent daily. When you clear the **Notify Daily** check box, an email notification is sent only once. However, an email notification is sent if there is a change in the notification rule.

Parameter	Comparison	Value
<ul style="list-style-type: none"> <li>• <b>Free Space</b></li> <li>• <b>Unallocated Space</b></li> <li>• <b>Used Space</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>is equal to</b></li> <li>• <b>is not equal to</b></li> <li>• <b>is less than</b></li> <li>• <b>is less than or equal to</b></li> <li>• <b>is greater than</b></li> <li>• <b>is greater than or equal to</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>100 MB</b></li> <li>• <b>100 MiB</b></li> <li>• <b>5%</b> only for "freespace"</li> </ul>

#### NOTE:

While specifying the value for a parameter in the Notification System, if no unit is specified, the default unit is considered as byte. For example, for the Free Space parameter, if you enter the value as 100 without specifying the unit, such as GB, the default value is considered as 100 bytes.

5. While saving the "LowCapacityDefault" rule, if the default email address and SMTP are used, the Notification Tool displays the following error message: Please update the default email address.
6. Click **OK**.  
The Rule saved successfully message is displayed.
7. To delete an existing rule, click **Delete**.

# Administration tools

HPE StoreEasy 1000 Storage systems include several administration tools to simplify storage system management tasks.

## Microsoft Windows Storage Server administration tools

Microsoft Windows Storage Server operating systems provide a user interface for initial server configuration, unified storage system management, simplified setup and management of storage and shared folders, and iSCSI targets. It is specially tuned to provide optimal performance for network-attached storage. Windows Storage Server provides significant enhancements in share and storage management scenarios, as well as integration of storage system management components and functionality.

### Remote Administration

The following tools are available for remote management of the system:

- Remote Desktop
- Server Manager on a Windows 8/10 client via RSAT tools
- Remote PowerShell

### File and Storage Services

File and Storage Services includes technologies that help you set up and manage one or more file servers, which are servers that provide central locations on your network where you can store files and share them with users. If users need access to the same files and applications, or if centralized backup and file management are important to your organization, you should set up one or more servers as a file server by installing the File and Storage Services role and the appropriate role services.

Administrators can use the File and Storage Services role to setup and manage multiple file servers and their storage by using Server Manager or Windows PowerShell. Some of the specific applications include the following:

- Use Data deduplication to reduce the disk space requirements of your files, saving money on storage.
- Use iSCSI Target Server to create centralized, software-based, and hardware-independent iSCSI disk subsystems in storage area networks (SANs).
- Use Server Manager to remotely manage multiple file servers from a single window.
- Use Windows PowerShell to automate the management of the majority of administration tasks for file servers.

For more information, see the Windows Storage Server help.

### Data Deduplication

Data deduplication involves finding and removing duplication within data without compromising its fidelity or integrity. The goal is to store more data in less space by segmenting files into small variable-sized chunks (32–128 KB), identifying duplicate chunks, and maintaining a single copy of each chunk. Redundant copies of the chunk are replaced by a reference to the single copy. The chunks are compressed and then organized into special container files in the System Volume Information folder.

After a volume is enabled for deduplication and the data is optimized, the volume contains the following:

- **Unoptimized files**—For example, unoptimized files could include files that do not meet the selected file-age policy setting, system state files, alternate data streams, encrypted files, files with extended attributes, files smaller than 32 KB, other reparse point files, or files in use by other applications.
- **Optimized files**—Files that are stored as reparse points that contain pointers to a map of the respective chunks in the chunk store that are needed to restore the file when it is requested.
- **Chunk store**—Location for the optimized file data.
- **Additional free space**—The optimized files and chunk store occupy much less space than they did prior to optimization.

To enable data deduplication on a volume:

### Procedure

1. Open Windows Server Manager.
2. Select **File and Storage Services** and then select **Volumes**.
3. Right-click a data volume and select **Configure Data Deduplication**.  
The **Deduplication Settings** window is displayed.
4. Do the following:
  - a. Select the workload for the volume.
  - b. Enter the number of days that should pass between file creation and when files are deduplicated.
  - c. Identify any file type extensions that should not be deduplicated.
  - d. Click **Add** to browse to any folders containing files that should not be deduplicated.
5. Click **Apply** to apply these settings or click **Set Deduplication Schedule** to configure a deduplication schedule.

For more information, see the Windows Storage Server help.

## Print Management

Use Print Management to view and manage printers and print servers in your organization. You can use Print Management from any computer running Windows Storage Server 2012 R2 or Windows Storage Server 2016 and you can manage all network printers on print servers running Windows Storage Server 2008, Windows Storage Server 2008 R2, Windows Storage Server 2012, Windows Storage Server 2012 R2, or Windows Storage Server 2016.

Print Management provides details such as the queue status, printer name, driver name, and server name. You can also set custom views by using the Print Management filtering capability. For example, you can create a view that displays only printers in a particular error state. You can also configure Print Management to send e-mail notifications or run scripts when a printer or print server needs attention. The filtering capability also allows you to bulk edit print jobs, such as canceling all print jobs at once. You can also delete multiple printers at the same time.

Administrators can install printers remotely by using the automatic detection feature, which finds and installs printers on the local subnet to the local print server. Administrators can log on remotely to a server at a branch location, and then install printers remotely.

For more information, see the Windows Storage Server help.



## Network File System User Mapping

NFS (Network File System) is a network file sharing protocol that allows remote access to files over a network and is typically used in networks with computers running UNIX, Linux, or Mac OS operating systems. NFS is supported on all HPE StoreEasy 1000 Storage systems.

The following types of NFS account mapping are supported:

- Active Directory® Domain Services (AD DS) mapped user access
- Unmapped anonymous user access
- Unmapped UNIX user access

For more information about NFS, see the following Microsoft website:

**[The Storage Team at Microsoft – File Cabinet Blog](#)**

# Storage management overview

This chapter provides an overview of some of the components that make up the storage structure of HPE StoreEasy 1000 Storage systems.

## Storage management elements

Storage is divided into four major elements:

- Physical storage elements
- Logical storage elements
- File system elements
- File sharing elements

Each of these element is composed of the previous level's elements.

The following figure provides a high-level overview of a generic StoreEasy 1000 system, depicting the physical and logical components that are needed to enable reliable, flexible and performant file data storage services for user and application workloads.

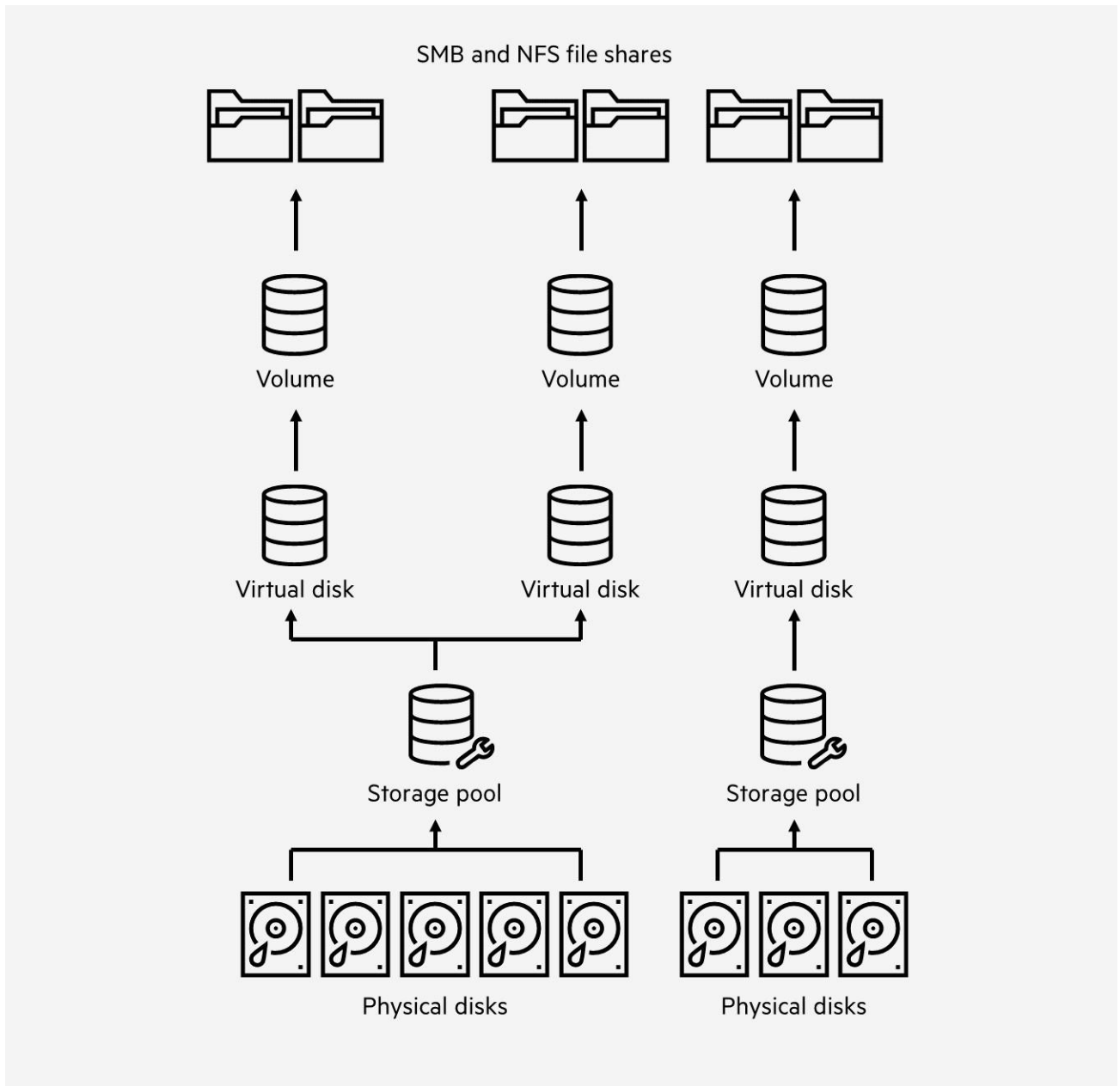


Figure 41: Storage elements in a StoreEasy 1000 system

## Physical storage elements

Each component in different layers of the system architecture serves a distinct function that higher-level components rely on. These properties are discussed in more detail in the following sections, starting from low-level components.

### Physical disks

Physical disks are the most granular physical components in the data path of the StoreEasy system architecture. Their main purpose is to provide persistence of data across power cycles. StoreEasy supports both hard drives (HDD) and solid-state drives (SSD) in both large form factor (LFF) and small form factor (SFF) as standard storage options.

## Physical disk types

The choice of physical disk type and their form factor for internal storage is determined by the specific StoreEasy model. The selection of physical disks for external disk enclosures (JBODs) is determined by the disk enclosure model and the SmartArray controller managing the enclosure. For more information about the supported physical disks (HDDs and SSDs) for various enclosure types, see [Hardware components](#) on page 7. You can choose one of the following distinct interface types:

- **Serial ATA (SATA):** Cost-effective and a high-capacity storage option for general purpose file data storage where performance is not the top consideration.
- **Serial-attached SCSI (SAS):** Used for greater performance than SATA disks. Delivers higher speed, reliability, and high availability that the file data services for more sophisticated application and user workloads require.

## Hard drives

Hard disk drives (HDD) are classified by workload and are divided into the following two categories:

- **Midline:** Medium workload (I/O) and generally used for high capacity and high availability storage, including backup, archive, and file services. The interface types used for this class are SAS 12GB and SATA 6GB in both SFF and LFF formats.
- **Enterprise:** Mission critical and demanding workload (I/O) and generally used by Email, Enterprise Resource Planning (ERP), Customer Relationship Management (CRM), and databases. The interface type used for this class is SAS 12GB for both SFF and LFF formats.

## Solid state drives

Solid State Drives (SSD) are classified by workload and are divided into the following three categories:

- **Read Intensive (RI):** Selected for boot/swap, read caching, web servers, bulk storage, active archiving, or analytics.
- **Mixed-Use (MU):** Selected when a balance is needed for both business intelligence and business transaction processing.
- **Write Intensive (WI):** Selected for OLTP or financial, business intelligence, big data analytics, virtualization, scientific, collaboration infrastructure, and enterprise business.

From the variety of available SSD interface types, HPE StoreEasy 1X60 supports SAS 12GB and SATA 6GB.

## RAID arrays

The StoreEasy 1000 Storage systems use the P-Class HPE Smart Array controllers to pool physical disks into a hardware-based redundant array of inexpensive drives (RAID). RAID delivers the flexible resiliency, performance, capacity and security that modern file servers need. The Windows Storage Server operating system of StoreEasy displays RAID arrays in the HPE StoreEasy management console or Windows Server Manager as storage pools.

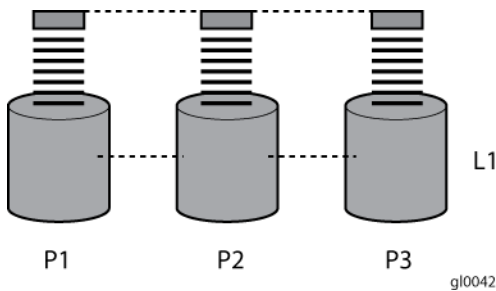
**! IMPORTANT:**

Using Windows Server Manager creates Storage Spaces RAID configuration, which is not supported by the HPE StoreEasy 1000 Storage systems. HPE recommends that you do not use Windows Server Manager to create new storage pools. The configuration options for RAID in storage pools are comprehensive and provide various levels of performance, capacity, and failure tolerance. The standard HPE StoreEasy management tools focus configuration options to best practices that are optimally balanced across these three dimensions.

For the full spectrum of Storage Pool configuration options that are not supported by the standard HPE StoreEasy management tools, you can use the HPE Smart Array Configuration Utility.

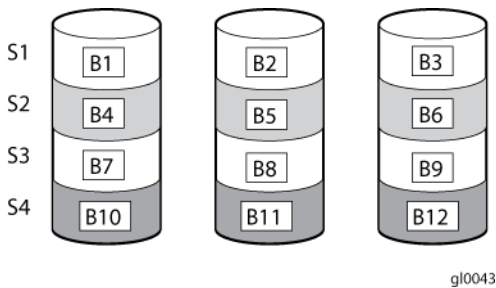
**NOTE:**

Depending on the HPE StoreEasy 1000 Storage model, array configuration may not be possible or necessary.



**Figure 42: Configuring arrays from physical drives**

Because the read/write heads are simultaneously active, the same amount of data is written to each drive during any given time interval. Each unit of data is termed a block. The blocks form a set of data stripes over all the hard drives in an array, as shown in **RAID 0 (data striping) (S1-S4) of data blocks (B1-B12)**.



**Figure 43: RAID 0 (data striping) (S1-S4) of data blocks (B1-B12)**

For data in the array to be readable, the data block sequence within each stripe must be the same. This sequencing process is performed by the Smart Array controller, which sends the data blocks to the drive write heads in the correct order.

A natural consequence of the striping process is that each hard drive in a given array contains the same number of data blocks.

**NOTE:**

If one hard drive has a larger capacity than other hard drives in the same array, the extra capacity is wasted because it cannot be used by the array.

## Fault tolerance

Drive failure, although rare, is potentially catastrophic. For example, using simple striping as shown in **RAID 0 (data striping) (S1-S4) of data blocks (B1-B12)**, failure of any hard drive leads to failure of all logical drives in the same array, and hence to data loss.

To protect against data loss from hard drive failure, HPE StoreEasy 1000 Storage must be configured with fault tolerance.

The following table summarizes the important features of the different kinds of RAID supported by the Smart Array controllers. The decision chart in the following table can help determine which option is best for different situations.

**Table 7: Summary of RAID methods**

	<b>RAID 0 Striping (no fault tolerance)</b>	<b>RAID 1+0 Mirroring</b>	<b>RAID 5 Distributed Data Guarding</b>	<b>RAID 6 (ADG)</b>	<b>RAID 50</b>	<b>RAID 60</b>
Maximum number of hard drives	N/A	N/A	14	Storage system dependent	14	Storage system dependent
Tolerant of single hard drive failure?	No	Yes	Yes	Yes	Yes	Yes
Tolerant of multiple simultaneous hard drive failures?	No	If the failed drives are not mirrored to each other	No	Yes (two drives can fail)	No	Yes (Two drives can fail)

## Online spares

Further protection against data loss can be achieved by assigning an online spare (or hot spare) to any configuration except RAID 0. This hard drive contains no data and is contained within the same storage subsystem as the other drives in the array. When a hard drive in the array fails, the controller can then automatically rebuild information that was originally on the failed drive onto the online spare. This quickly restores the system to full RAID level fault tolerance protection. However, unless RAID Advanced Data Guarding (ADG) is being used, which can support two drive failures in an array, in the unlikely event that a third drive in the array should fail while data is being rewritten to the spare, the logical drive still fails.

## Logical components

### Virtual disks

Virtual disks provide an abstraction layer on top of storage pools. This layer allows you to partition resilient storage pools for specific use, you can create virtual disks with specific capacity. The HPE StoreEasy operating system consumes these disks as raw disks and creates volumes. For more information, see "Creating virtual disks" in the online help.

### Volumes

Volumes are created on virtual disks and used to store files and folders. When a volume is created (for example, one volume per virtual disk), a file system layout that can be used for storing file information is established. You can use the NTFS and ReFS file system formats with HPE StoreEasy.

The NTFS format supports most features that are required for general purpose file storage. The following features introduced by the ReFS format eliminates the shortfalls of some traditional capabilities:

- Metadata integrity with checksums.
- Integrity streams for optional user data integrity.
- Allocate-on-write transactional model for robust disk updates (copy-on-write).
- Larger volume, file and directory sizes.
- Data striping for performance and redundancy in fault tolerance cases.
- Disk scrubbing for protection against latent disk errors.
- Resiliency to corruptions with salvage for maximum volume availability in all cases.

However, ReFS does not have all the features that may be of importance in your file data storage environment. NTFS may still be a more appropriate option. Before you select your file system format, ensure that you review the following feature availability table.

File System Feature	NTFS	ReFS
Case-sensitive filenames	Yes	Yes
Case of filenames preservation	Yes	Yes
Unicode in filenames	Yes	Yes
Preserves and enforces ACLs	Yes	Yes
Sparse files	Yes	Yes
Reparse points	Yes	Yes
Open By file ID	Yes	Yes
USN journal	Yes	Yes
Hard Links	Yes	No
File-based compression	Yes	No
Deduplication	Yes	No
Object identifiers	Yes	No
Encrypted file system	Yes	No
Named streams	Yes	No
Transactions	Yes	No
Extended attributes	Yes	No

### File Shares – SMB and NFS

The following file sharing protocols are available for remote accessing the files and folders stored in volumes:

- Server Message Block (SMB)
- Network File System (NFS)
- File Transfer Protocol (FTP)
- Hypertext Transfer Protocol (HTTP)

The most commonly used protocol for Windows and MAC OS clients is SMB; for Linux and UNIX operating systems, NFS is used. File shares are created on any directory tree level of a volume, including the root of the volume (for example, D:\).

## Using storage elements

The last step in creating the element is determining its drive letter or mount point and formatting the element. Each element created can exist as a drive letter, assuming one is available, and/or as mount points on an existing folder or drive letter. Either method is supported. However, mount points cannot be used for shares that will be shared using Microsoft Services for Unix. They can be set up with both but the use of the mount point in conjunction with NFS shares causes instability with the NFS shares.



# File server management

This chapter describes the tasks and utilities that play a role in file server management.

## File services management

Information about the HPE StoreEasy 1000 Storage system in a SAN environment is provided in the *HPE SAN Design Reference Guide*, located on the HPE web site at [www.hpe.com/info/SDGmanuals](http://www.hpe.com/info/SDGmanuals).

## Storage management utilities

The storage management utilities preinstalled on the HPE StoreEasy 1000 Storage system include the Smart Storage Administrator (SSA). Initially, you can use the Provision Storage tasks to configure storage. For more information, see [Storage Configuration](#) on page 60.

## Array management utilities

Storage devices for RAID arrays and LUNs are created and managed using the array management utilities mentioned previously. For Smart Arrays, use SSA.

---

**NOTE:**

The SSA is used to configure and manage array-based storage. Software RAID-based HPE StoreEasy 1000 Storage systems use Microsoft Disk Manager to manage storage. You need administrator or root privileges to run the SSA.

## Smart Storage Administrator

The SSA supports the Smart Array controllers and hard drives installed on the HPE StoreEasy 1000 Storage system.

To open SSA from the HPE StoreEasy 1000 Storage desktop:

---

**NOTE:**

If this is the first time you are running SSA, you will be prompted to select the Execution Mode for SSA. Selecting **Local Application Mode** allows you to run the SSA from a Remote Desktop, remote console, or HPE StoreEasy 1000 Storage web access mode. Remote service mode allows you to access the SSA from a remote browser.

1. For WSS2016, click **Start** and then scroll to **Windows System > Smart Storage Administrator**. For WSS 2012 R2, click **Start** and then click the down arrow. Then, select **System Tools > HP Smart Storage Administrator**.

---

**NOTE:**

Before launching SSA, close Pool Manager, the Dashboard, and the SMP service.

2. If the Execution Mode for SSA is set to Remote Service Mode, log on to the HPE System Management Homepage. The default user name is Administrator and the password is the Windows Storage Server 2012 R2 or 2016 administrator password that is set by the HPE StoreEasy 1000 Storage system administrator. The password is case-sensitive.

To open the SSA in browser mode:

---

**NOTE:**

Confirm that the SSA Execution Mode is set to Remote Service Mode.

1. Open a browser and enter the server name or IP address of the destination server. For example, `http://servername:2301` or `http://192.0.0.1:2301`.
2. Log on to the HPE System Management Homepage. The default user name is **Administrator** and the default password is the password that you created while initially setting up the server.
3. Click **Smart Storage Administrator** on the left side of the window. The SSA opens and identifies the controllers that are connected to the system.

Some SSA guidelines to consider:

- Do not modify the single logical drive of HPE StoreEasy 1000 Storage because it is configured for the operating system.
- Spanning more than 14 disks with a RAID 5 volume is not recommended.
- Designate spares for RAID sets to provide greater protection against failures.
- RAID sets cannot span controllers.
- A single array can contain multiple logical drives of varying RAID settings.
- Extending and expanding arrays and logical drives is supported based upon the current state of the array and availability of contiguous space. In some situations, it may be more advantageous to backup the logical drives and related volume(s), remove the logical drive array and recreate the array in the desired configuration. The time that it takes to extend or expand can take an extended period of time (days or weeks) depending on the current size and amount of data on the current volumes being modified.

The *Smart Storage Administrator User Guide* is available for download at <http://www.hpe.com/support/manuals>.

## Disk Management utility

The Disk Management tool is a system utility for managing hard disks and the volumes, or partitions, that they contain. Disk Management is used to initialize disks, create volumes, format volumes with the FAT, FAT32, or NTFS file systems, and create fault-tolerant disk systems. Most disk-related tasks can be performed in Disk Management without restarting the system or interrupting users. Most configuration changes take effect immediately. A complete online help facility is provided with the Disk Management utility for assistance in using the product.

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**NOTE:**

- When the Disk Management utility is accessed through a Remote Desktop connection, this connection can only be used to manage disks and volumes on the server. Using the Remote Desktop connection for other operations during an open session closes the session.
- When closing Disk Management through a Remote Desktop connection, it may take a few moments for the remote session to log off.

## Guidelines for managing disks and volumes

- A single logical drive is configured for the HPE StoreEasy 1000 Storage operating system and should not be altered in any manner. This is a reserved volume and must be maintained as it exists.
- HPE does not recommend spanning array controllers with dynamic volumes. The use of software RAID-based dynamic volumes is not recommended. The hardware-based RAID configuration capabilities of the Smart Array controllers should be utilized due to being more efficient than software-based RAID configurations.
- Use meaningful volume labels with the intended drive letter embedded in the volume label, if possible. (For example, volume e: might be named "Disk E:.") Volume labels often serve as the only means of identification.
- Record all volume labels and drive letters in case the system needs to be restored.
- When managing basic disks, only the last partition on the disk can be extended unless the disk is changed to dynamic.
- Basic disks can be converted to dynamic, but cannot be converted back to basic without deleting all data on the disk.
- Basic disks can contain up to four primary partitions (or three primary partitions and one extended partition).
- Format drives with a 16 K allocation size for best support of shadow copies, performance, and defragmentation.
- NTFS formatted drives are recommended because they provide the greatest level of support for deduplication shadow copies, encryption, and compression.
- The size of the NTFS volumes should be limited to 64 TB or smaller in size if you are wanting to use Deduplication or Volume Shadow Copy Service (VSS). Deduplication and VSS do not support volumes larger than 64 TB volumes. Also, writable snapshots or snapshots larger than 64 TB are not supported.
- Basic disks that are larger than 2 TB should be formatted in GUID partition table (GPT) style.
- For further information refer to the Disk Management help found in the utility.

## Disk quotas

Disk quotas track and control disk space use in volumes.

---

### NOTE:

To limit the size of a folder or share, see [Quota management](#) on page 139.

Configure the volumes on the server to perform the following tasks:

- Prevent further disk space use and log an event when a user exceeds a specified disk space limit.
- Log an event when a user exceeds a specified disk space warning level.

When enabling disk quotas, it is possible to set both the disk quota limit and the disk quota warning level. The disk quota limit specifies the amount of disk space a user is allowed to use. The warning level specifies the point at which a user is nearing his or her quota limit. For example, a user's disk quota limit can be set to 50 megabytes (MB), and the disk quota warning level to 45 MB. In this case, the user can store no more than 50 MB on the volume. If the user stores more than 45 MB on the volume, the disk quota system logs a system event.

In addition, it is possible to specify that users can exceed their quota limit. Enabling quotas and not limiting disk space use is useful to still allow users access to a volume, but track disk space use on a per-user basis. It is also possible to specify whether or not to log an event when users exceed either their quota warning level or their quota limit.

When enabling disk quotas for a volume, volume usage is automatically tracked from that point forward, but existing volume users have no disk quotas applied to them. Apply disk quotas to existing volume users by adding new quota entries on the Quota Entries page.

---

**NOTE:**

When enabling disk quotas on a volume, any users with write access to the volume who have not exceeded their quota limit can store data on the volume. The first time a user writes data to a quota-enabled volume, default values for disk space limit and warning level are automatically assigned by the quota system.

For more information about disk quotas, read the online help.

---

**NOTE:**

The quota information reported on a NFS file share when viewed from a Linux system will reflect the entire volume size. In order to provide each user with a notification of quota information for their NFS shares it is recommended that a quota template be created through the File Server Resource Manager. For more information, go to [https://technet.microsoft.com/en-us/library/hh831701\(v=ws.11\).aspx](https://technet.microsoft.com/en-us/library/hh831701(v=ws.11).aspx).

## Scheduling defragmentation

Defragmentation is the process of analyzing local volumes and consolidating fragmented files and folders so that each occupies a single, contiguous space on the volume. This improves file system performance. Because defragmentation consolidates files and folders, it also consolidates the free space on a volume. This reduces the likelihood that new files will be fragmented.

Defragmentation for a volume can be scheduled to occur automatically at convenient times. Defragmentation can also be done once, or on a recurring basis.

---

**NOTE:**

Scheduling defragmentation to run no later than a specific time prevents the defragmentation process from running later than that time. If the defragmentation process is running when the time is reached, the process is stopped. This setting is useful to ensure that the defragmentation process ends before the demand for server access is likely to increase.

If defragmenting volumes on which shadow copies are enabled, use a cluster (or allocation unit) size of 16 KB or larger during the format. Otherwise defragmentation registers as a change by the Shadow Copy process. This increase in the number of changes forces Shadow Copy to delete snapshots as the limit for the cache file is reached.

---

**⚠ CAUTION:**

Allocation unit size cannot be altered without reformatting the drive. Data on a reformatted drive cannot be recovered.

For more information about disk defragmentation, read the online help.

## Adding storage

Expansion is the process of adding physical disks to an array that has already been configured. Extension is the process of adding new storage space to an existing logical drive on the same array, usually after the array has been expanded.

Storage growth may occur in three forms:

- Extend unallocated space from the original logical disks or LUNs.
- Alter LUNs to contain additional storage.
- Add new LUNs to the system.

## Expanding storage

Expansion is the process of adding physical disks to an array that has already been configured. The logical drives (or volumes) that exist in the array before the expansion takes place are unchanged, because only the amount of free space in the array changes. The expansion process is entirely independent of the operating system.

---

### NOTE:

See your storage array hardware user documentation for further details about expanding storage on the array.

## Extending storage using Windows Storage Utilities

Volume extension grows the storage space of a logical drive. During this process, the administrator adds new storage space to an existing logical drive on the same array, usually after the array has been expanded. An administrator may have gained this new storage space by either expansion or by deleting another logical drive on the same array. Unlike drive expansion, the operating system must be aware of changes to the logical drive size.

You extend a volume to:

- Increase raw data storage
- Improve performance by increasing the number of spindles in a logical drive volume
- Change fault-tolerance (RAID) configurations

For more information about RAID levels, see the *Smart Array Controller User Guide*, or the document titled *Assessing RAID ADG vs. RAID 5 vs. RAID 1+0*. Both are available at the Smart Array controller web page or at <http://www.hpe.com/info/enterprise/docs>.

## Volume shadow copies

The Volume Shadow Copy Service provides an infrastructure for creating point-in-time snapshots (shadow copies) of volumes. Shadow Copy supports 64 shadow copies per volume.

A shadow copy contains previous versions of the files or folders contained on a volume at a specific point in time. While the shadow copy mechanism is managed at the server, previous versions of files and folders are only available over the network from clients, and are seen on a per folder or file level, and not as an entire volume.

The shadow copy feature uses data blocks. As changes are made to the file system, the Shadow Copy Service copies the original blocks to a special cache file to maintain a consistent view of the file at a particular point in time. Because the snapshot only contains a subset of the original blocks, the cache file is typically smaller than the original volume. In the snapshot's original form, it takes up no space because blocks are not moved until an update to the disk occurs.

By using shadow copies, an HPE StoreEasy 1000 Storage system can maintain a set of previous versions of all files on the selected volumes. End users access the file or folder by using a separate client add-on program, which enables them to view the file in Windows Explorer. Accessing previous versions of files, or shadow copies, enables users to:

- Recover files that were accidentally deleted. Previous versions can be opened and copied to a safe location.
- Recover from accidentally overwriting a file. A previous version of that file can be accessed.
- Compare several versions of a file while working. Use previous versions to compare changes between two versions of a file.

Shadow copies cannot replace the current backup, archive, or business recovery system, but they can help to simplify restore procedures. Because a snapshot only contains a portion of the original data blocks, shadow copies cannot protect against data loss due to media failures. However, the strength of snapshots is the ability to instantly recover data from shadow copies, reducing the number of times needed to restore data from tape.

## Shadow copy planning

Before setup is initiated on the server and the client interface is made available to end users, consider the following:

- From what volume will shadow copies be taken?
- How much disk space should be allocated for shadow copies?
- Will separate disks be used to store shadow copies?
- How frequently will shadow copies be made?

## Identifying the volume

Shadow copies are taken for a complete volume, but not for a specific directory. Shadow copies work best when the server stores user files, such as documents, spreadsheets, presentations, graphics, or database files.

---

### NOTE:

Shadow copies must not be used to provide access to previous versions of application or e-mail databases.

Shadow copies are designed for volumes that store user data such as home directories and My Documents folders that are redirected by using Group Policy or other shared folders in which users store data.

Shadow copies work with compressed or encrypted files and retain whatever permissions were set on the files when the shadow copies were taken. For example, if a user is denied permission to read a file, that user would not be able to restore a previous version of the file, or be able to read the file after it has been restored.

Although shadow copies are taken for an entire volume, users must use shared folders to access shadow copies. Administrators on the local server must also specify the `\\servername\sharename` path to access shadow copies. If administrators or end users want to access a previous version of a file that does not reside in a shared folder, the administrator must first share the folder.

---

### NOTE:

Shadow copies are available only on NTFS, not FAT or FAT32 volumes.

Files or folders that are recorded by using Shadow Copy appear static, even though the original data is changing.

## Allocating disk space

When determining the amount of space to allocate for storing shadow copies, consider both the number and size of files that are being copied, as well as the frequency of changes between copies. For example, 100

files that only change monthly require less storage space than 10 files that change daily. If the frequency of changes to each file is greater than the amount of space allocated to storing shadow copies, no shadow copy is created.

Administrators should also consider user expectations of how many versions they will want to have available. End users might expect only a single shadow copy to be available, or they might expect three days or three weeks worth of shadow copies. The more shadow copies users expect, the more storage space administrators must allocate for storing them.

Setting the limit too low also affects backup programs that use shadow copy technology because these programs are also limited to using the amount of disk space specified by administrators.

---

**NOTE:**

Regardless of the volume space that is allocated for shadow copies, there is a maximum of 64 shadow copies for any volume. When the 65th shadow copy is taken, the oldest shadow copy is purged.

The minimum amount of storage space that can be specified is 350 megabytes (MB). The default storage size is 10 percent of the source volume (the volume being copied). If the shadow copies are stored on a separate volume, change the default to reflect the space available on the **storage** volume instead of the **source** volume. Remember that when the storage limit is reached, older versions of the shadow copies are deleted and cannot be restored.

---

**⚠ CAUTION:**

To change the storage volume, shadow copies must be deleted. The existing file change history that is kept on the original storage volume is lost. To avoid this problem, verify that the storage volume that is initially selected is large enough.

## Identifying the storage area

To store the shadow copies of another volume on the same file server, a volume can be dedicated on separate disks. For example, if user files are stored on `H:\`, another volume such as `S:\` can be used to store the shadow copies. Using a separate volume on separate disks provides better performance and is recommended for heavily used HPE StoreEasy 1000 Storage systems.

If a separate volume will be used for the storage area (where shadow copies are stored), the maximum size must be changed to **No Limit** to reflect the space available on the storage area volume instead of the source volume (where the user files are stored).

Disk space for shadow copies can be allocated on either the same volume as the source files or a different volume. There is a trade-off between ease of use and maintenance versus performance and reliability that the system administrator must consider.

By keeping the shadow copy on the same volume, there is a potential gain in ease of setup and maintenance; however, there may be a reduction in performance and reliability.

---

**⚠ CAUTION:**

If shadow copies are stored on the same volume as the user files, note that a burst of disk input/output (I/O) can cause all shadow copies to be deleted. If the sudden deletion of shadow copies is unacceptable to administrators or end users, it is best to use a separate volume on separate disks to store shadow copies.

## Determining creation frequency

The more frequently shadow copies are created, the more likely that end users will get the version that they want. However, with a maximum of 64 shadow copies per volume, there is a trade-off between the frequency of making shadow copies and the amount of time that the earlier files will be available.



By default, the HPE StoreEasy 1000 Storage system creates shadow copies at 0700 and 1200, Monday through Friday. However, these settings are easily modified by the administrator so that the shadow copy schedule can better accommodate end user needs.

## Shadow copies and drive defragmentation

When running Disk Defragmenter on a volume with shadow copies activated, all or some of the shadow copies may be lost, starting with the oldest shadow copies.

If defragmenting volumes on which shadow copies are enabled, use a cluster (or allocation unit) size of 16 KB or larger. Using this allocation unit size reduces the number of copy outs occurring on the snapshot. Otherwise, the number of changes caused by the defragmentation process can cause shadow copies to be deleted faster than expected. Note, however, that NTFS compression is supported only if the cluster size is 4 KB or smaller.

---

### NOTE:

To check the cluster size of a volume, use the `fsutil fsinfo ntfsinfo` command. To change the cluster size on a volume that contains data, back up the data on the volume, reformat it using the new cluster size, and then restore the data.

## Mounted drives

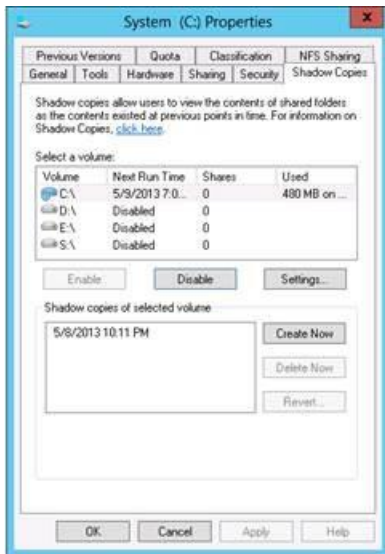
A mounted drive is a local volume attached to an empty folder (called a mount point) on an NTFS volume. When enabling shadow copies on a volume that contains mounted drives, the mounted drives are not included when shadow copies are taken. In addition, if a mounted drive is shared and shadow copies are enabled on it, users cannot access the shadow copies if they traverse from the host volume (where the mount point is stored) to the mounted drive.

For example, assume there is a folder `F:\data\users`, and the `Users` folder is a mount point for `G:\`. If shadow copies are enabled on both `F:\` and `G:\`, `F:\data` is shared as `\\server1\data`, and `G:\data\users` is shared as `\\server1\users`. In this example, users can access previous versions of `\\server1\data` and `\\server1\users` but not `\\server1\data\users`.

## Managing shadow copies

The `vssadmin` tool provides a command line capability to create, list, resize, and delete volume shadow copies. The system administrator can make shadow copies available to end users through a feature called “Shadow Copies for Shared Folders.” The administrator uses the **Properties** menu (see System administrator view of Shadow Copies for Shared Folders) to turn on the Shadow Copies feature, select the volumes to be copied, and determine the frequency with which shadow copies are made.

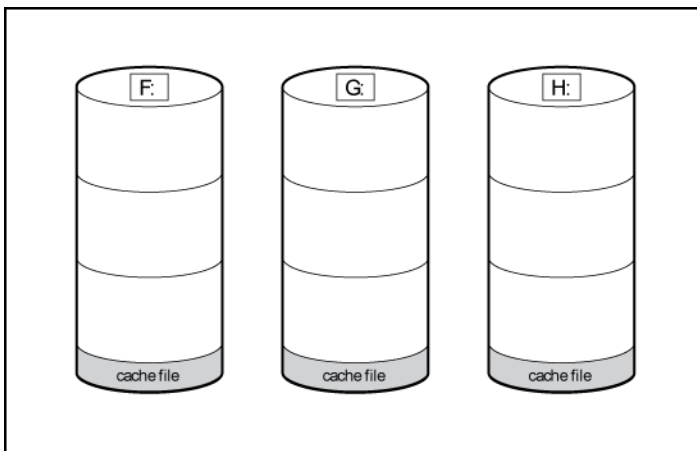




**Figure 44: System administrator view of Shadow Copies for Shared Folders**

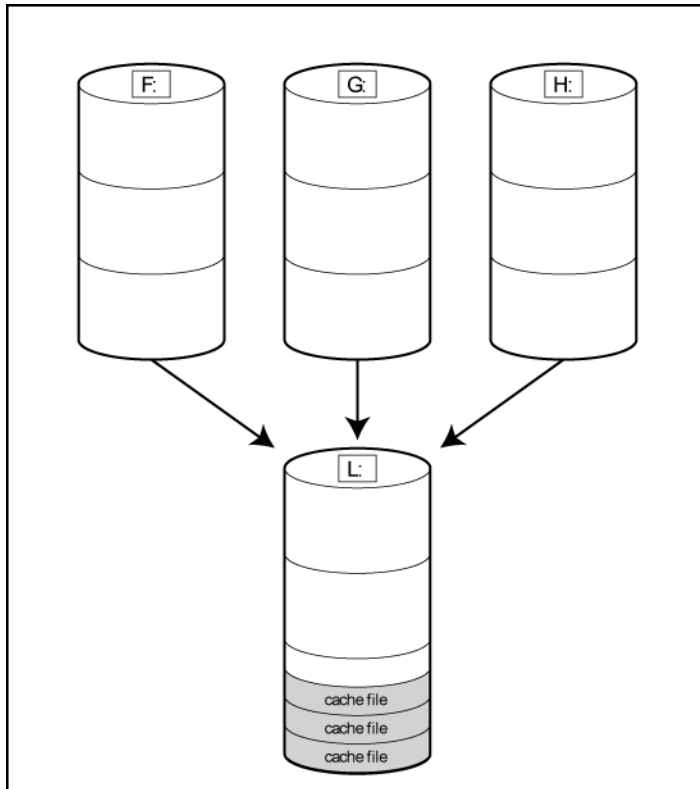
## The shadow copy cache file

The default shadow copy settings allocate 10 percent of the source volume being copied (with a minimum of 350 MB), and store the shadow copies on the same volume as the original volume. (See Shadow copies stored on a source volume). The cache file is located in a hidden protected directory titled “System Volume Information” off of the root of each volume for which shadow copy is enabled.



**Figure 45: Shadow copies stored on a source volume**

The cache file location can be altered to reside on a dedicated volume separate from the volumes containing files shares. (See Shadow copies stored on a separate volume).



**Figure 46: Shadow copies stored on a separate volume**

The main advantage to storing shadow copies on a separate volume is ease of management and performance. Shadow copies on a source volume must be continually monitored and can consume space designated for file sharing. Setting the limit too high takes up valuable storage space. Setting the limit too low can cause shadow copies to be purged too soon, or not created at all. By storing shadow copies on a separate volume space, limits can generally be set higher, or set to No Limit. See the online help for instructions on altering the cache file location.

---

**⚠ CAUTION:**

If the data on the separate volume L: is lost, the shadow copies cannot be recovered.

## Enabling and creating shadow copies

Enabling shadow copies on a volume automatically results in several actions:

- Creates a shadow copy of the selected volume.
- Sets the maximum storage space for the shadow copies.
- Schedules shadow copies to be made at 7 a.m. and 12 noon on weekdays.

---

**NOTE:**

- Creating a shadow copy only makes one copy of the volume; it does not create a schedule.
- After the first shadow copy is created, it cannot be relocated. Relocate the cache file by altering the cache file location under Properties prior to enabling shadow copy. See [Viewing shadow copy properties](#) on page 123.

## Viewing a list of shadow copies

To view a list of shadow copies on a volume:

### Procedure

1. Access Disk Management.
2. Select the volume or logical drive, then right-click on it.
3. Select **Properties**.
4. Select **Shadow Copies** tab.

All shadow copies are listed, sorted by the date and time they were created.

---

### NOTE:

It is also possible to create new shadow copies or delete shadow copies from this page.

## Set schedules

Shadow copy schedules control how frequently shadow copies of a volume are made. There are a number of factors that can help determine the most effective shadow copy schedule for an organization. These include the work habits and locations of the users. For example, if users do not all live in the same time zone, or they work on different schedules, it is possible to adjust the daily shadow copy schedule to allow for these differences.

Do not schedule shadow copies more frequently than once per hour.

---

### NOTE:

When deleting a shadow copy schedule, that action has no effect on existing shadow copies.

## Viewing shadow copy properties

The Shadow Copy Properties page lists the number of copies, the date and time the most recent shadow copy was made, and the maximum size setting.

---

### CAUTION:

Use caution when reducing the size limit for all shadow copies. When the size is set to less than the total size currently used for all shadow copies, enough shadow copies are deleted to reduce the total size to the new limit. A shadow copy cannot be recovered after it has been deleted.

---

### NOTE:

For volumes where shadow copies do not exist currently, it is possible to change the location of the cache file. Managing the cache files on a separate disk is recommended.

## Redirecting shadow copies to an alternate volume

### IMPORTANT:

Shadow copies must be initially disabled on the volume before redirecting to an alternate volume. If shadow copies are enabled and you disable them, a message appears informing you that all existing shadow copies on the volume will be permanently deleted.

To redirect shadow copies to an alternate volume:

## Procedure

1. Access Disk Management.
2. Select the volume or logical drive, then right-click on it.
3. Select **Properties**.
4. Select the **Shadow Copies** tab.
5. Select the volume that you want to redirect shadow copies from and ensure that shadow copies are disabled on that volume; if enabled, click **Disable**.
6. Click **Settings**.
7. In the **Located on this volume** field, select an available alternate volume from the list.

---

**NOTE:** To change the default shadow copy schedule settings, click **Schedule**.

8. Click **OK**.
9. On the **Shadow Copies** tab, ensure that the volume is selected, and then click **Enable**.

Shadow copies are now scheduled to be made on the alternate volume.

## Disabling shadow copies

When shadow copies are disabled on a volume, all existing shadow copies on the volume are deleted as well as the schedule for making new shadow copies.

---

### **CAUTION:**

When the Shadow Copies Service is disabled, all shadow copies on the selected volumes are deleted. Once deleted, shadow copies cannot be restored.

## Managing shadow copies from the HPE StoreEasy 1000 Storage system desktop

The HPE StoreEasy 1000 Storage desktop can be accessed by using Remote Desktop to manage shadow copies.

### Procedure

1. For WSS2016, select **Start > File Explorer**. For WSS2012 R2, select **Start > Computer**.
2. Right-click the volume name, and select **Properties**.
3. Click the **Shadow Copies** tab. See [Figure 47: Accessing shadow copies from My Computer](#) on page 125.

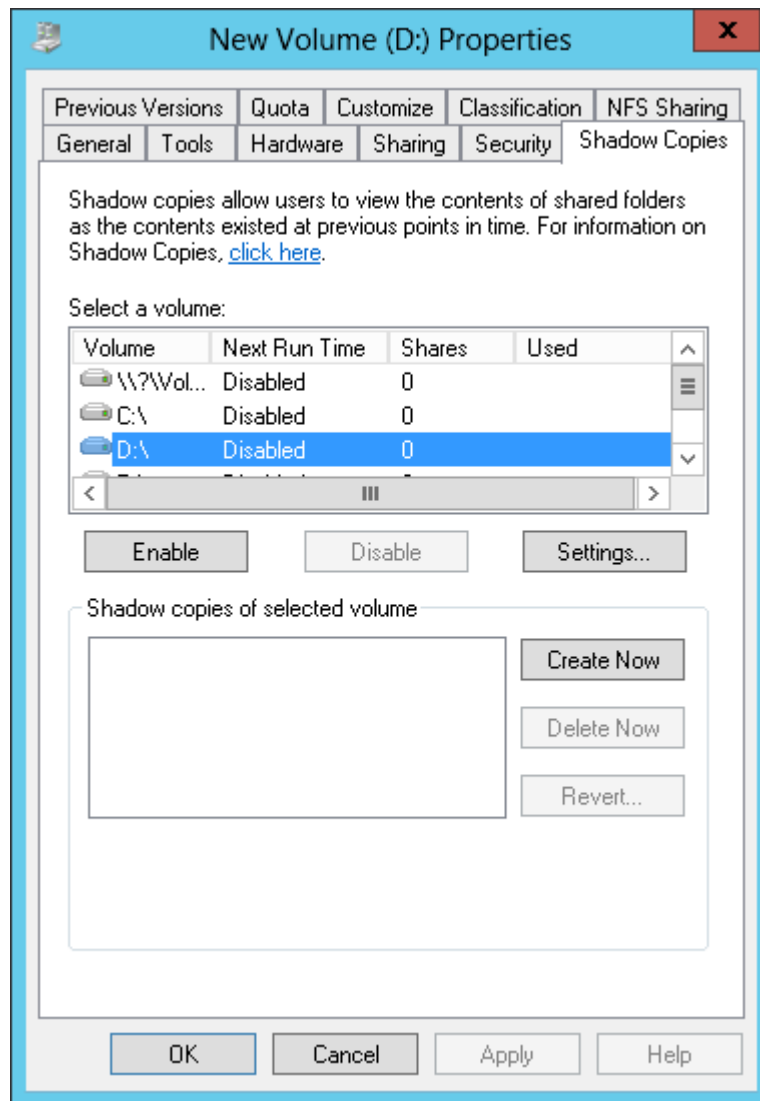


Figure 47: Accessing shadow copies from My Computer

## Shadow Copies for Shared Folders

Shadow copies are accessed over the network by supported clients and protocols. There are two sets of supported protocols, SMB and NFS. All other protocols are not supported, including HTTP, FTP, AppleTalk, and NetWare Shares. For SMB support, a client-side application denoted as Shadow Copies for Shared Folders is required. The client-side application is available for Windows XP, Windows 2000 SP3+, and later operating system versions.

No additional software is required to enable UNIX users to independently retrieve previous versions of files stored on NFS shares.

---

**NOTE:**

- Shadow Copies for Shared Folders supports retrieval only of shadow copies of network shares. It does not support retrieval of shadow copies of local folders.
- Shadow Copies for Shared Folders clients are not available for HTTP, FTP, AppleTalk, or NetWare shares. Consequently, users of these protocols cannot use Shadow Copies for Shared Folders to independently retrieve previous versions of their files. However, administrators can take advantage of Shadow Copies for Shared Folders to restore files for these users.

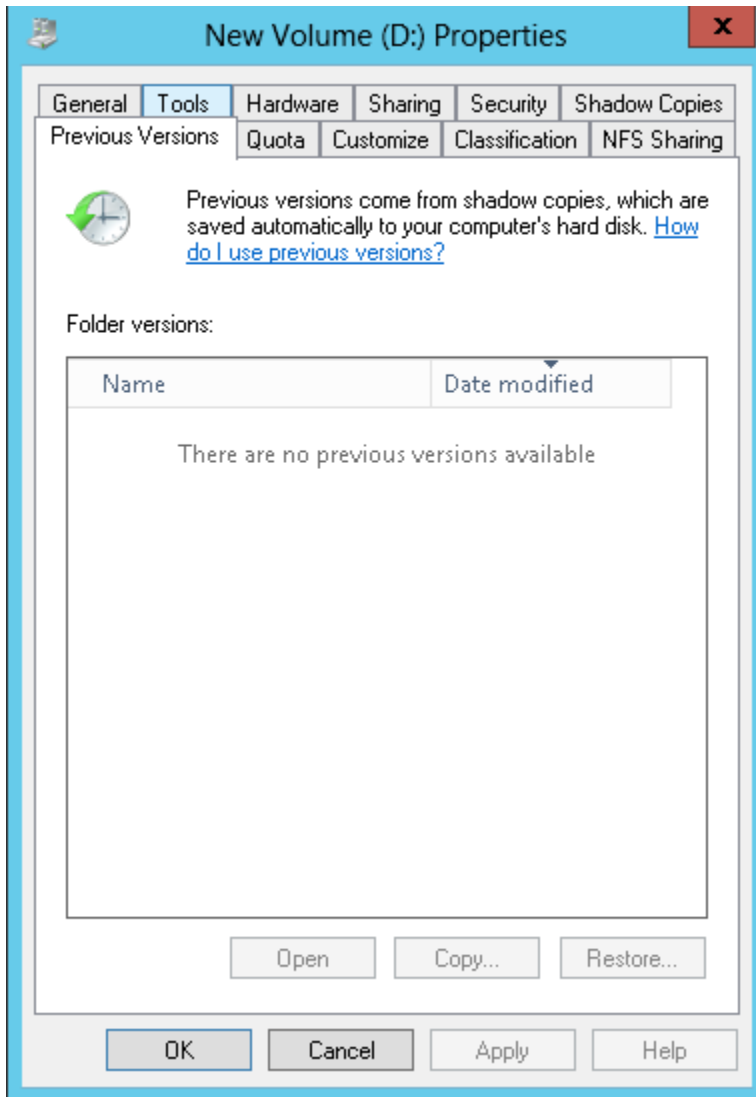
## SMB shadow copies

Windows users can independently access previous versions of files stored on SMB shares by using the Shadow Copies for Shared Folders client. After the Shadow Copies for Shared Folders client is installed on the user's computer, the user can access shadow copies for a share by right-clicking on the share to open its Properties window, clicking the **Previous Versions** tab, and then selecting the desired shadow copy. Users can view, copy, and restore all available shadow copies.

Shadow Copies for Shared Folders preserves the permissions set in the access control list (ACL) of the original folders and files. Consequently, users can only access shadow copies for shares to which they have access. In other words, if a user does not have access to a share, he also does not have access to the share's shadow copies.

The Shadow Copies for Shared Folders client pack installs a **Previous Versions** tab in the **Properties** window of files and folders on network shares.

Users access shadow copies with Windows Explorer by selecting **Open**, **Copy**, or **Restore** from the **Previous Versions** tab. (See **Figure 48: Client GUI** on page 127). Both individual files and folders can be restored.



**Figure 48: Client GUI**

When users view a network folder hosted on the HPE StoreEasy 1000 Storage system for which shadow copies are enabled, old versions (prior to the snapshot) of a file or directory are available. Viewing the properties of the file or folder presents users with the folder or file history—a list of read-only, point-in-time copies of the file or folder contents that users can then open and explore like any other file or folder. Users can view files in the folder history, copy files from the folder history, and so on.

## NFS shadow copies

UNIX users can independently access previous versions of files stored on NFS shares via the NFS client; no additional software is required. Server for NFS exposes each of a share's available shadow copies as a pseudo-subdirectory of the share. Each of these pseudo-subdirectories is displayed in exactly the same way as a regular subdirectory is displayed.

The name of each pseudo-subdirectory reflects the creation time of the shadow copy, using the format `.@GMT-YYYY.MM.DD-HH:MM:SS`. To prevent common tools from needlessly enumerating the pseudo-subdirectories, the name of each pseudo-subdirectory begins with the dot character, thus rendering it hidden.

The following example shows an NFS share named “NFSShare” with three shadow copies, taken on April 27, 28, and 29 of 2003 at 4 a.m.

```
NFSShare
```

.@GMT-2003.04.27-04:00:00

.@GMT-2003.04.28-04:00:00

.@GMT-2003.04.29-04:00:00

Access to NFS shadow copy pseudo-subdirectories is governed by normal access-control mechanisms using the permissions stored in the file system. Users can access only those shadow copies to which they have read access at the time the shadow copy is taken. To prevent users from modifying shadow copies, all pseudo-subdirectories are marked read-only, regardless of the user's ownership or access rights, or the permissions set on the original files.

Server for NFS periodically polls the system for the arrival or removal of shadow copies and updates the root directory view accordingly. Clients then capture the updated view the next time they issue a directory read on the root of the share.

## Recovery of files or folders

There are three common situations that may require recovery of files or folders:

- Accidental file deletion, the most common situation
- Accidental file replacement, which may occur if a user selects Save instead of Save As
- File corruption

It is possible to recover from all of these scenarios by accessing shadow copies. There are separate steps for accessing a file compared to accessing a folder.

### Recovering a deleted file or folder

To recover a deleted file or folder within a folder:

#### Procedure

1. Access to the folder where the deleted file was stored.
2. Position the cursor over a blank space in the folder. If the cursor hovers over a file, that file is selected.
3. Right-click, select **Properties** from the bottom of the menu, and then click the **Previous Versions** tab.
4. Select the version of the folder that contains the file before it was deleted, and then click **Open**.
5. View the folder and select the file or folder to recover. The view may be navigated multiple folders deep.
6. Click **Restore** to restore the file or folder to its original location. Click **Copy** to allow the placement of the file or folder to a new location.

### Recovering an overwritten or corrupted file

Recovering an overwritten or corrupted file is easier than recovering a deleted file because the file itself can be right-clicked instead of the folder. To recover an overwritten or corrupted file:

#### Procedure

1. Right-click the overwritten or corrupted file, and then click **Properties**.
2. Click **Previous Versions**.
3. To view the old version, click **Open**. To copy the old version to another location, click **Copy** to replace the current version with the older version, click **Restore**.



## Recovering a folder

To recover a folder:

### Procedure

1. Position the cursor so that it is over a blank space in the folder to be recovered. If the cursor hovers over a file, that file is selected.
2. Right-click, select **Properties** from the bottom of the menu, and then click the **Previous Versions** tab.
3. Click either **Copy** or **Restore**.

Clicking **Restore** enables the user to recover everything in that folder as well as all subfolders. Clicking **Restore** does not delete any files.

## Backup and shadow copies

Shadow copies are only available on the network via the client application, and only at a file or folder level as opposed to the entire volume. Hence, the standard backup associated with a volume backup will not work to back up the previous versions of the file system. To answer this particular issue, shadow copies are available for backup in two situations. If the backup software in question supports the use of shadow copies and can communicate with underlying block device, it is supported, and the previous version of the file system will be listed in the backup application as a complete file system snapshot. If the built-in backup application NTBackup is used, the backup software forces a snapshot, and then uses the snapshot as the means for backup. The user is unaware of this activity and it is not self-evident although it does address the issue of open files.

## Shadow Copy Transport

Shadow Copy Transport provides the ability to transport data on a Storage Area Network (SAN). With a storage array and a VSS-aware hardware provider, it is possible to create a shadow copy on one server and import it on another server. This process, essentially “virtual” transport, is accomplished in a matter of minutes, regardless of the size of the data.

A shadow copy transport can be used for a number of purposes, including:

- Tape backups

An alternative to traditional backup to tape processes is transport of shadow copies from the production server onto a backup server, where they can then be backed up to tape. Like the other two alternatives, this option removes backup traffic from the production server. While some backup applications might be designed with the hardware provider software that enables transport, others are not. The administrator should determine whether or not this functionality is included in the backup application.

- Data mining

The data in use by a particular production server is often useful to different groups or departments within an organization. Rather than add additional traffic to the production server, a shadow copy of the data can be made available through transport to another server. The shadow copy can then be processed for different purposes, without any performance impact on the original server.

The transport process is accomplished through a series of DISKRAID command steps:

1. Create a shadow copy of the source data on the source server (read-only).
2. Mask off (hide) the shadow copy from the source server.

3. Unmask the shadow copy to a target server.
4. Optionally, clear the read-only flags on the shadow copy.

The data is now ready to use.

## Folder and share management

The HPE StoreEasy 1000 Storage system supports several file-sharing protocols, including NFS, FTP, HTTP, and Microsoft SMB. This section discusses overview information as well as procedures for the setup and management of the file shares for the supported protocols. Security at the file level and at the share level is also discussed.

---

### NOTE:

Select servers can be deployed in a clustered or non-clustered configuration. This section discusses share setup for a non-clustered deployment.

## Folder management

Volumes and folders on any system are used to organize data. Regardless of system size, systematic structuring and naming conventions of volumes and folders eases the administrative burden. Moving from volumes to folders to shares increases the level of granularity of the types of data stored in the unit and the level of security access allowed.

Folders can be managed using Server Manager. Tasks include:

- Accessing a specific volume or folder
- Creating a new folder
- Deleting a folder
- Modifying folder properties
- Creating a new share for a volume or folder
- Managing shares for a volume or folder

### Managing file-level permissions

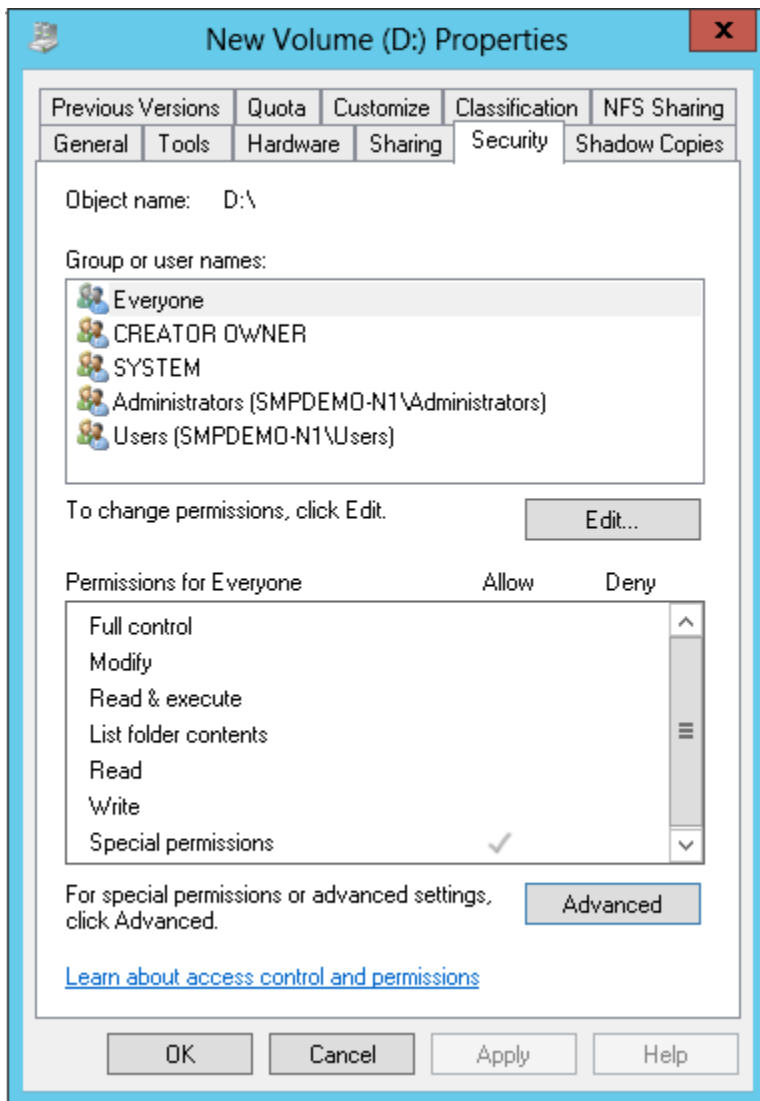
Security at the file level is managed using Windows Explorer.

File level security includes settings for permissions, ownership, and auditing for individual files.

To enter file permissions:

### Procedure

1. Using Windows Explorer, access the folder or file that needs to be changed, and then right-click the folder.
2. Click **Properties**, and then click the **Security** tab.

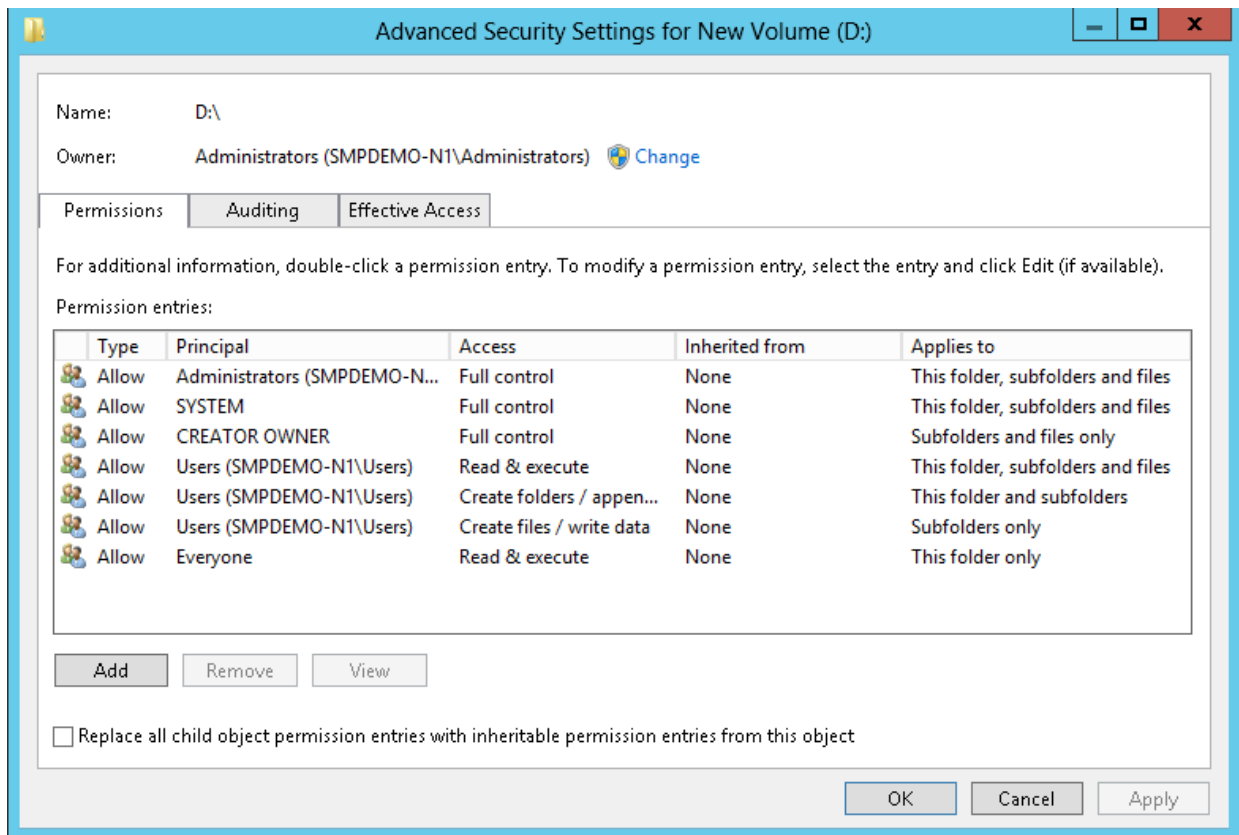


**Figure 49: Properties screen, Security tab**

Several options are available on the **Security** tab:

- To add users and groups to the permissions list, click **Add**. Follow the dialog box instructions.
  - To remove users and groups from the permissions list, highlight the desired user or group, and then click **Remove**.
  - The center section of the **Security** tab lists permission levels. When new users or groups are added to the permissions list, select the appropriate boxes to configure the common file-access levels.
3. To modify ownership of files, or to modify individual file access level permissions, click **Advanced**.

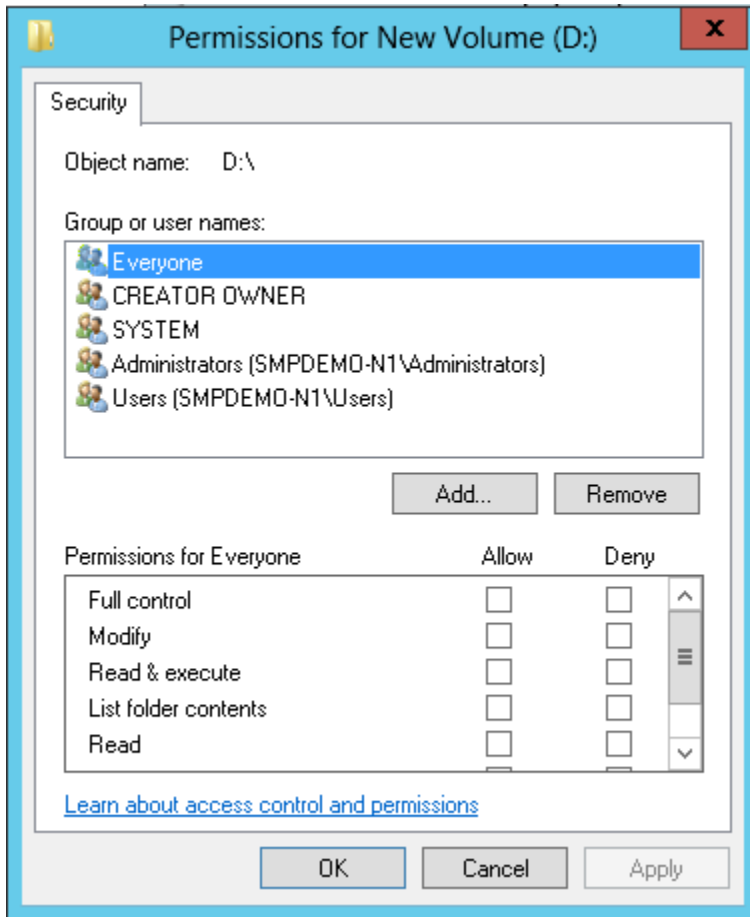
**Figure 50: Advanced Security settings screen, Permissions tab** on page 132 illustrates the properties available on the **Advanced Security Settings** screen.



**Figure 50: Advanced Security settings screen, Permissions tab**

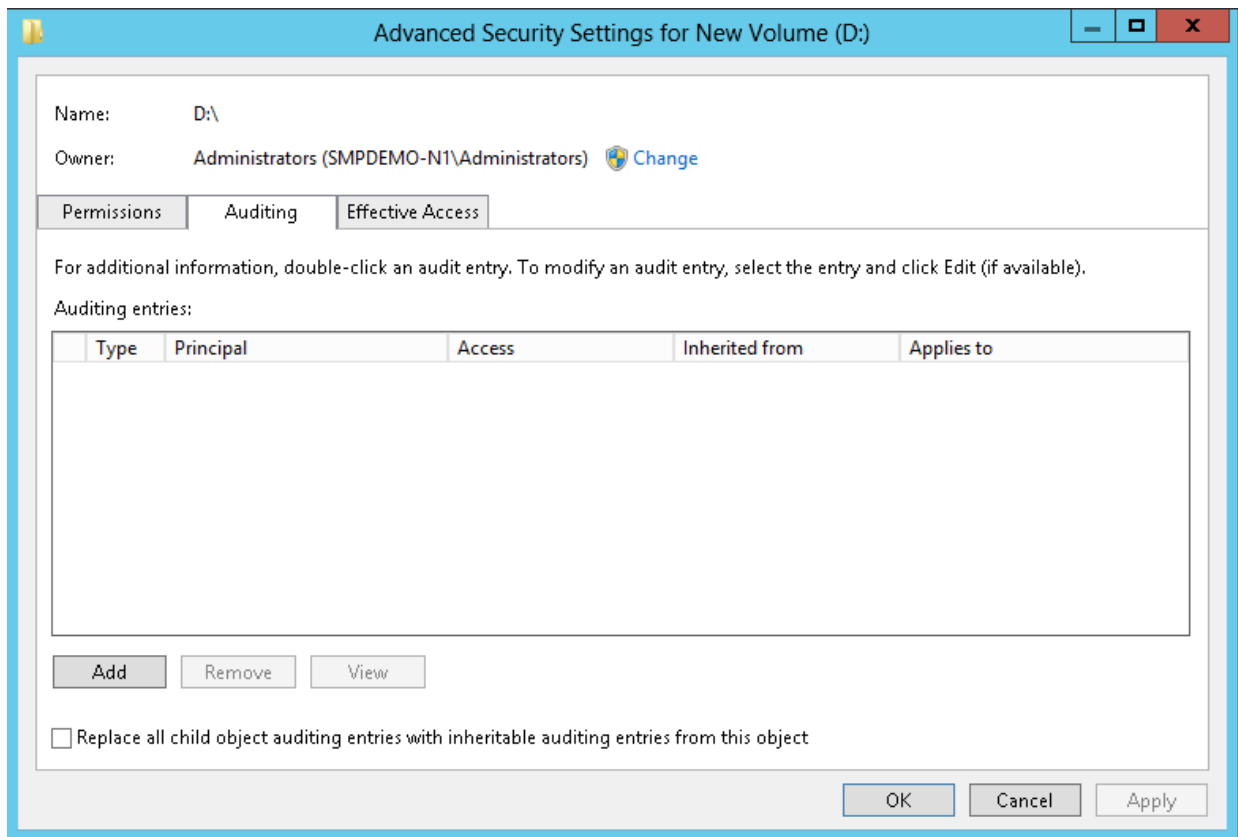
Other functionality available in the **Advanced Security Settings** screen includes:

- **Add a new user or group** —Click **Add**, and then follow the dialog box instructions.
  - **Remove a user or group** —Click **Remove**.
  - **Replace permission entries on all child objects with entries shown here that apply to child objects** —This allows all child folders and files to inherit the current folder permissions by default.
  - **Modify specific permissions assigned to a particular user or group** —Select the desired user or group, and then click **Edit**.
4. Enable or disable permissions by selecting the **Allow** box to enable permission or the **Deny** box to disable permission. If neither box is selected, permission is automatically disabled. **Figure 51: User or group Permission Entry screen** on page 133 illustrates the **Edit** screen and some of the permissions.



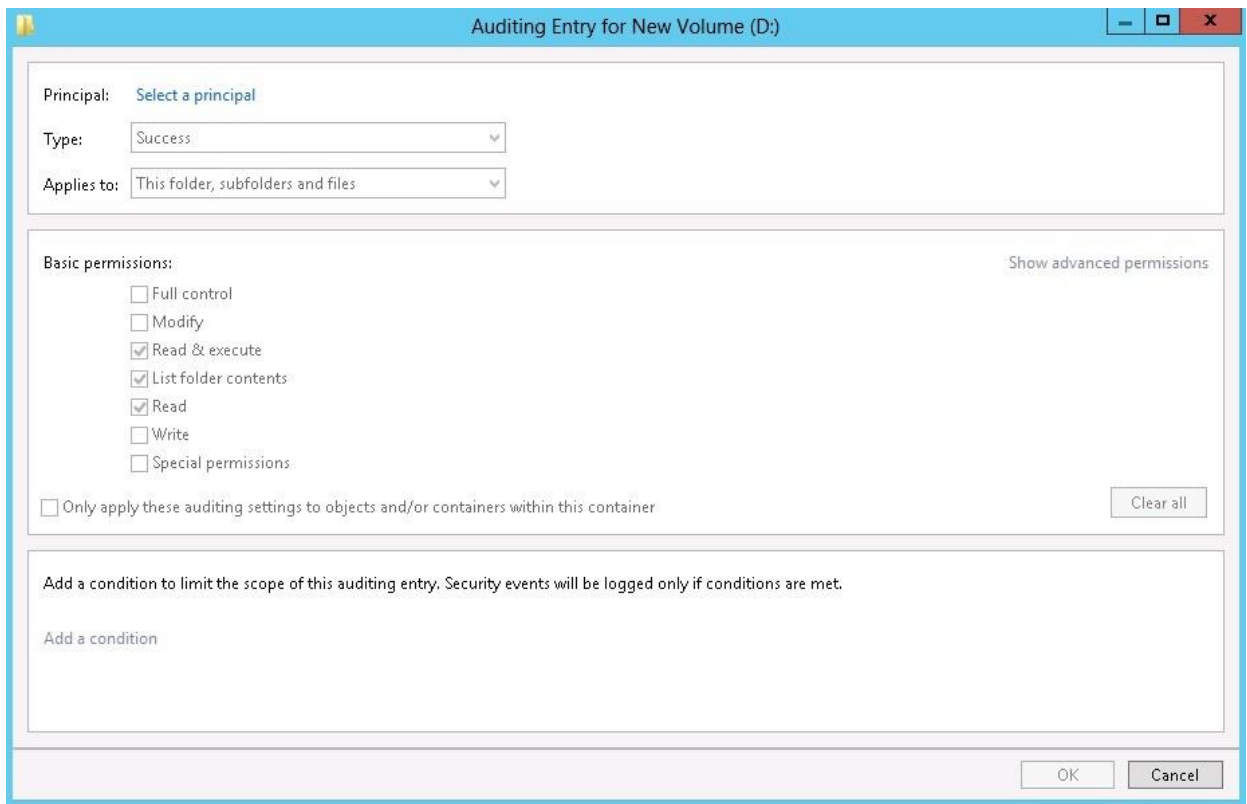
**Figure 51: User or group Permission Entry screen**

- Another area of the **Advanced Security Settings** is the **Auditing** tab. Auditing allows you to set rules for the auditing of access, or attempted access, to files or folders. Users or groups can be added, deleted, viewed, or modified through the **Advanced Security Settings Auditing** tab.



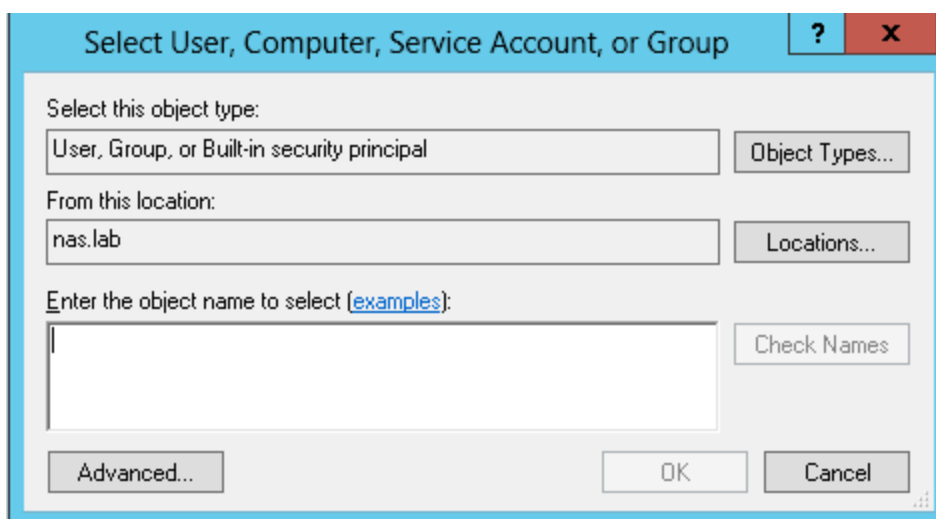
**Figure 52: Advanced Security Settings screen, Auditing tab**

Click **Add** to display the **Auditing Entry** screen.



**Figure 53: Auditing Entry for New Volume screen**

6. Click **Select a principal** to display the **Select User or Group** screen.

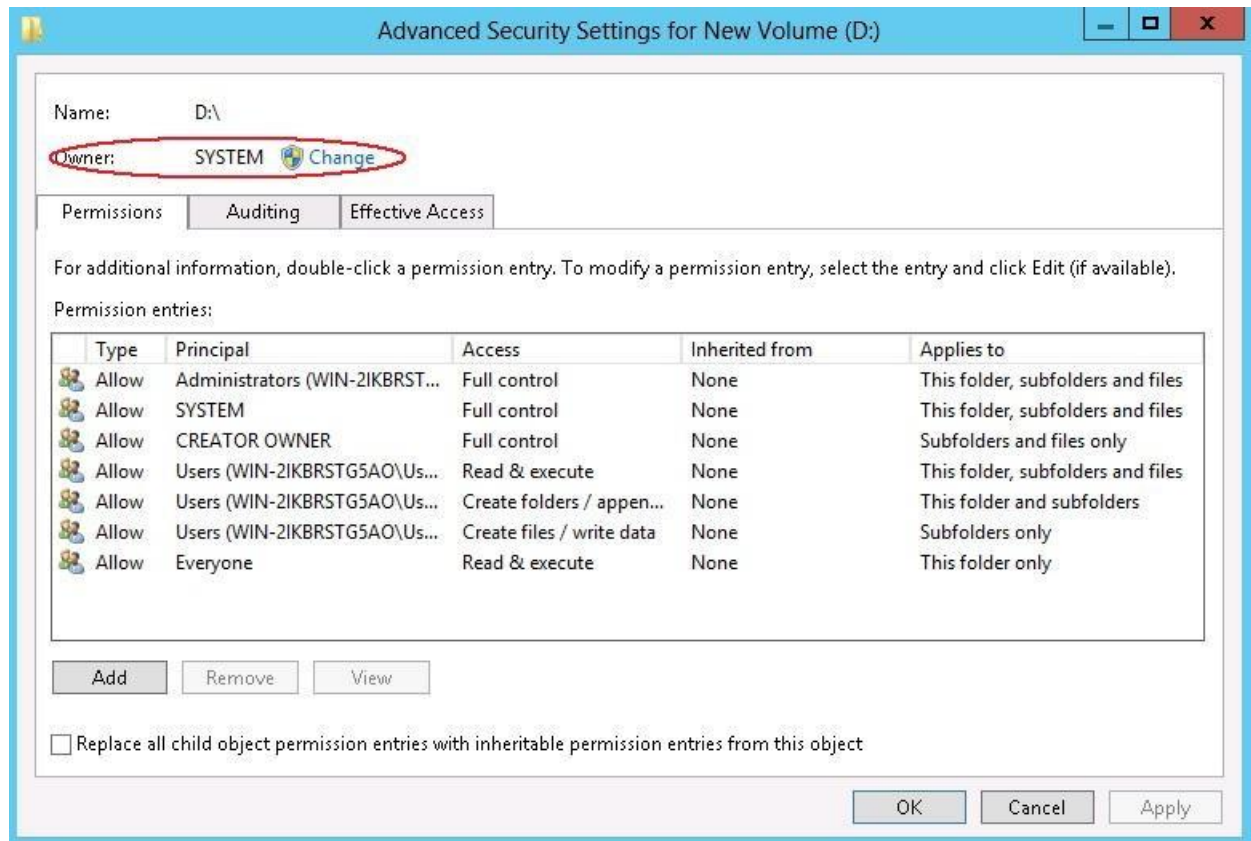


**Figure 54: Select User or Group screen**

7. Click **Advanced** to search for users or groups.
8. Select the user or group.
9. Click **OK**.
10. Select the desired **Successful** and **Failed** audits for the user or group.
11. Click **OK**.

**NOTE:** Auditing must be enabled to configure this information. Use the local Computer Policy Editor to configure the audit policy on HPE StoreEasy 1000 Storage.

12. The **Owner** tab allows taking ownership of files. Typically, administrators use this area to take ownership of files when the file ACL is incomplete or corrupt. By taking ownership, you gain access to the files, and then manually apply the appropriate security configurations.



**Figure 55: Advanced Security Settings screen**

The current owner of the file or folder is listed at the top of the screen. To take ownership:

- Click the appropriate user or group in the **Change owner to** list.
- If it is also necessary to take ownership of subfolders and files, enable the **Replace owner on subcontainers and objects** box.
- Click **OK**.

## Maintaining a large namespace

### Procedure

1. Distributed File System N (DFS N) and Distributed File System (DFS R): DFS Namespaces: It is a virtual view of shared folders in an organization. Shared folders located on different servers can be grouped together into one or more logically structured namespaces.

DFS Replication: It is a multimaster replication engine that enables users to synchronize folders on multiple servers across LAN or WAN network connections.



For more information, refer to the following link: <https://technet.microsoft.com/en-us/library/jj127250.aspx>

2. Volume mount points: For NFS, the Volume mount points are used as a workaround instead of DFS-N.

For more information, refer to <https://technet.microsoft.com/en-us/library/cc938934.aspx>

## Share management

There are several ways to set up and manage shares. Methods include using Windows Explorer, a command line interface, or Server Manger.

---

### NOTE:

Select servers can be deployed in a clustered as well as a non-clustered configuration. This chapter discusses share setup for a non-clustered deployment.

As previously mentioned, the file-sharing security model of HPE StoreEasy 1000 Storage is based on the NTFS file-level security model. Share security seamlessly integrates with file security. In addition to discussing share management, this section discusses share security.

## Share considerations

Planning the content, size, and distribution of shares on the HPE StoreEasy 1000 Storage system can improve performance, manageability, and ease of use.

The content of shares should be carefully chosen to avoid two common pitfalls: either having too many shares of a very specific nature, or of having very few shares of a generic nature. For example, shares for general use are easier to set up in the beginning, but can cause problems later. Frequently, a better approach is to create separate shares with a specific purpose or group of users in mind. However, creating too many shares also has its drawbacks. For example, if it is sufficient to create a single share for user home directories, create a “homes” share rather than creating separate shares for each user.

By keeping the number of shares and other resources low, the performance of HPE StoreEasy 1000 Storage is optimized. For example, instead of sharing out each individual user's home directory as its own share, share out the top-level directory and let the users map personal drives to their own subdirectory.

## Defining Access Control Lists

The Access Control List (ACL) contains the information that dictates which users and groups have access to a share, as well as the type of access that is permitted. Each share on an NTFS file system has one ACL with multiple associated user permissions. For example, an ACL can define that User1 has read and write access to a share, User2 has read only access, and User3 has no access to the share. The ACL also includes group access information that applies to every user in a configured group. ACLs are also referred to as permissions.

## Integrating local file system security into Windows domain environments

ACLs include properties specific to users and groups from a particular workgroup server or domain environment. In a multidomain environment, user and group permissions from several domains can apply to files stored on the same device. Users and groups local to the HPE StoreEasy 1000 Storage system can be given access permissions to shares managed by the device. The domain name of the storage system supplies the context in which the user or group is understood. Permission configuration depends on the network and domain infrastructure where the server resides.

File-sharing protocols (except NFS) supply a user and group context for all connections over the network. (NFS supplies a machine-based context.) When new files are created by those users or machines, the appropriate ACLs are applied.

Configuration tools provide the ability to share permissions out to clients. These shared permissions are propagated into a file system ACL, and when new files are created over the network, the user creating the file

becomes the file owner. In cases where a specific subdirectory of a share has different permissions from the share itself, the NTFS permissions on the subdirectory apply instead. This method results in a hierarchical security model where the network protocol permissions and the file permissions work together to provide appropriate security for shares on the device.

---

**NOTE:**

Share permissions and file-level permissions are implemented separately. It is possible for files on a file system to have different permissions from those applied to a share. When this situation occurs, the file-level permissions override the share permissions.

## Comparing administrative (hidden) and standard shares

SMB supports both administrative shares and standard shares.

- Administrative shares are shares with a last character of \$. Administrative shares are not included in the list of shares when a client browses for available shares on a SMB server.
- Standard shares are shares that do not end in a \$ character. Standard shares are listed whenever a SMB client browses for available shares on a SMB server.

The HPE StoreEasy 1000 Storage system supports both administrative and standard SMB shares. To create an administrative share, end the share name with the \$ character when setting up the share. Do not type a \$ character at the end of the share name when creating a standard share.

## Managing shares

Shares can be managed using Server Manager. Tasks include:

- Creating a new share
- Deleting a share
- Modifying share properties
- Publishing in DFS

---

**NOTE:**

These functions can operate in a cluster on select servers, but should only be used for non-cluster-aware shares. Use Cluster Administrator to manage shares for a cluster. The page will display cluster share resources.

---

**⚠ CAUTION:**

Before deleting a share, warn all users to exit that share and confirm that no one is using that share.

## File Server Resource Manager

File Server Resource Manager (FSRM) is a suite of tools that allows administrators to understand, control, and manage the quantity and type of data stored on their HPE StoreEasy 1000 Storage system. Some of the tasks you can perform are:

- Quota management
- File screening management
- Storage reports

Server Manager provides access to FSRM tasks.

For procedures and methods beyond what are described below, see the HPE StoreEasy 1000 Storage online help.

## Quota management

On the Quota Management node of the File Server Resource Manager snap-in, you can perform the following tasks:

- Create quotas to limit the space allowed for a volume or folder and generate notifications when the quota limits are approached or exceeded.
- Generate auto quotas that apply to all existing folders in a volume or folder, as well as to any new subfolders created in the future.
- Define quota templates that can be easily applied to new volumes or folders and that can be used across an organization.

## File screening management

On the File Screening Management node of the File Server Resource Manager snap-in, you can perform the following tasks:

- Create file screens to control the types of files that users can save and to send notifications when users attempt to save blocked files.
- Define file screening templates that can be easily applied to new volumes or folders and that can be used across an organization.
- Create file screening exceptions that extend the flexibility of the file screening rules.

## Storage reports

On the Storage Reports node of the File Server Resource Manager snap-in, you can perform the following tasks:

- Schedule periodic storage reports that allow you to identify trends in disk usage.
- Monitor attempts to save unauthorized files for all users or a selected group of users.
- Generate storage reports instantly.

# Management tools

## Update tool

The **Update Tool** is used to install hotfixes and updated HPE components on the HPE Storage system. The utility “Update Tool” is designed to provide an integrated, enhanced and seamless end user experience exploiting the cluster aware update (CAU) feature. It presents a uniform graphical user interface to upgrade standalone and cluster nodes from local and remote processors. In addition to that, this interface allows performing the complete operations with minimal number of clicks while keeping a provision for advanced parameter selection exploiting the underlying framework.

### Installing updates using the Update Tool Procedure

1. Double-click the Update Tool icon on the desktop to launch the tool. The available modes to install the updates appear.
2. Select a mode: Standalone, Co-ordinate or Cluster mode
3. Click Next.  
If you select:
  - Standalone mode, the system navigates to the Update Tool Summary page.
  - Cluster mode or Co-ordinator mode, the system navigates to the Update Tool Input page.
4. On the Update Tool Input page, enter the required settings and click Next. The Update Tool Summary page appears.
5. Click Install. The installation starts and the tool navigates to the Update Tool Result page, which provides the status of the installation.  
NOTE: For Standalone mode, you cannot cancel the installation after the installation starts.
6. Click Open Log to view the log files that the system generates during the update installation.  
NOTE: For a cluster system, you must select individual nodes and then click Open Log to view the logs for that particular node.
7. The update will complete installation after you reboot the system.  
Click OK to exit the tool.

If no component in the SR package requires reboot, the application closes.

## Systems Insight Manager

Systems Insight Manager (SIM) is a web-based application that allows system administrators to accomplish normal administrative tasks from any remote location, using a web browser. SIM provides device management capabilities that consolidate and integrate management data from HPE and third-party devices.

---

### ❗ **IMPORTANT:**

You must install and use SIM to benefit from the Pre-Failure Warranty for processors, SAS and SCSI hard drives, and memory modules.

For additional information, refer to the Management CD in the HPE ProLiant Essentials Foundation Pack or the SIM website (<http://www.hpe.com/info/hpesim>). For the latest version of SIM, refer to the HPE SPOCK website (<http://www.hpe.com/storage/spock>).

## Management Agents

Management Agents provide the information to enable fault, performance, and configuration management. The agents allow easy manageability of the server through HP SIM software, and third-party SNMP management platforms. Management Agents are installed with every SmartStart assisted installation or can be installed through the HPE PSP. The Systems Management homepage provides status and direct access to in-depth subsystem information by accessing data reported through the Management Agents. For additional information, refer to the Management CD in the HPE ProLiant Essentials Foundation Pack or the HPE website <https://www.hpe.com/us/en/servers/management.html>.

# Troubleshooting, servicing, and maintenance

## Cause

The HPE StoreEasy 1000 Storage system provides several monitoring and troubleshooting options. You can access the following troubleshooting alerts and solutions to maintain the system health:

- Notification alerts
- System Management Homepage (SMH)
- Hardware component LEDs
- HPE and Microsoft support websites
- HPE Insight Remote Support software
- Microsoft Systems Center Operations Manager (SCOM) and Microsoft websites
- Cluster Specific Troubleshooting
- HPE SIM 7.6 or later, which is required for proper HPE StoreEasy 1000 Storage/HPE SIM integration (7.4 or later for StoreEasy systems running WSS2012 R2).

---

## NOTE:

- For the latest version of HPE SIM, refer to the HPE SPOCK website (<http://www.hpe.com/storage/spock>).
- Integration with HPE SIM is only supported using the WBEM/WMI interfaces. Do not attempt to configure HPE SIM to use the ProLiant SNMP agents, because the configuration is untested and unsupported. The ProLiant SNMP agents are enabled on the HPE StoreEasy 1000 Storage system by default and must not be disabled as they are used for internal management functions. If they are enabled for external client consumption, HPE SIM must be configured so it does not attempt to communicate with these agents.

## Generic Windows event based troubleshooting

Event Viewer can be used for event analysis. When Event Viewer is opened, the left-hand pane displays a folder view, where you can find all of the different event logs, as well as the views that can be customized with events from many logs at once. For instance, the Administrative Events view in recent versions of Windows displays all of the Error, Warning, and Critical events whether they originated from the Application log or the System log. The middle pane displays a list of events, and clicking on it will display the details of the event in the preview pane – or you can double-click on any of them to pull it up in a separate window, which can be handy when you are looking through a big set of events and want to find all the important things before beginning an internet search. The right-hand pane gives you quick access to actions like creating custom views, filtering, or even creating a scheduled task based on a particular event.

## Maintaining HPE StoreEasy 1000 Storage

HPE recommends the following maintenance guidelines for upgrading your system components (operating system, software, firmware, and drivers), depending on your environment:

---

### **IMPORTANT:**

It is recommended that HPE StoreEasy Service Releases be installed as released. These service releases contain important Windows Updates and Hot Fixes.

- If security updates are important for your operating environment, you can:
  - Use Microsoft Windows Update to download updates.
  - Download and install specific security updates as needed from the Microsoft Security TechCenter website: <http://%20technet.microsoft.com/security/default.aspx>
- If your maintenance policy is to only update servers to the most current and tested versions of the system components, you can install the latest HPE service release. To find the latest service release, go to <https://www.hpe.com/support> and search for your specific product. You can also register your product on the HPE support and drivers page to receive notification of new service releases for your product.
 

Service releases are released periodically. The latest service release requires the previous service release as a prerequisite. For more information, see the latest service release notes.
- If your maintenance policy allows you to update servers to the most current versions of the system components for which HPE has not completed testing and bundled as a service release, then apply the latest HPE Service Pack for ProLiant (SPP) from [www.hpe.com/info/spp](http://www.hpe.com/info/spp). The latest firmware and driver updates can be retrieved for your specific product or the underlying server platform from <https://www.hpe.com/support> by selecting **HPE Server, Storage and Networking** and then searching for the server platform (for example, Apollo r2600 24SFF CTO Chassis with ProLiant XL190r Gen9 CTO Server, ProLiant DL380 Gen9 server) to find specific updates.
- HPE recommends updating the operating system, software, firmware, and NIC drivers simultaneously (in the same update window) to ensure proper operation of HPE StoreEasy 1000 Storage.

## Determining the current HPE StoreEasy 1000 Storage software version

You can find the current version using the HPE StoreEasy tools or the registry.

From the StoreEasy tools:

### Procedure

1. Open the StoreEasy tools from the **Tools** menu in Windows Server Manager.
2. Select **StoreEasy > Manage Storage Pools**.
3. On the **Overview** tab, locate the version listed in the HPE System Installation and Recovery.

---

### NOTE:

The versions shown in [Figure 56: Pool Manager Overview](#) on page 144 may differ from the version you are currently running.

**Hewlett Packard Enterprise** **StoreEasy Pool Manager**

**Overview** | Create Pools | Edit Pools | View Jobs | View Logs

---

**Storage Information**

Controllers	:	2
Enclosures	:	1
Storage Pools	:	2
Virtual Disks	:	2

---

**WIN-95IJVKDE0HC**

Microsoft Windows Storage Server 2016 Standard	:	Version 10.0.14393 Build 14393
System Installation and Recovery	:	5.00.0b.15
Service Release	:	
Product ID	:	K2R19A
Product Description	:	StoreEasy 1850 Storage
Management Agents	:	7.6.0
System Processors	:	Intel(R) Xeon(R) CPU E5-2609 v4 @ 1.70GHz
Total Physical Memory	:	16.0 GB

View [System Management Homepage](#) for more details.

**Figure 56: Pool Manager Overview**

4. Log in to the server blade.
5. Open a command window.
6. Enter the `reg query` command as shown in the following example:

```
C:\> reg query HKLM\Software\Wow6432Node\Hewlett-Packard Enterprise
\StorageWorks /s
```

The following information appears:

```
HKEY_LOCAL_MACHINE\Software\Wow6432Node\Hewlett-Packard Enterprise\StorageWorks\QuickRestore
BASE REG_SZ 5.00.0.4
QRVersion REG_SZ 5.00.0a.145
```

The `QRVersion` field lists the version.

## HPE System Management Homepage

The HPE System Management Homepage (SMH) is a web-based interface that consolidates and simplifies single system management for HPE servers and storage. The SMH is the primary tool for identifying and troubleshooting hardware issues in HPE StoreEasy 1000 Storage. You may choose this option to diagnose a suspected hardware problem. Go to the **SMH main page** and open the **Overall System Health Status** and the **Component Status Summary** sections to review the status of the HPE StoreEasy 1000 Storage hardware.



By aggregating the data from HPE web-based agents and management utilities, the SMH provides a common, easy-to-use interface for displaying the following information:

- Hardware fault and status monitoring
- System thresholds
- Diagnostics
- Software and firmware version control for an individual server

The SMH Help menu provides documentation for using, maintaining, and troubleshooting the application. For more information about the SMH software, go to <https://www.hpe.com/support/manuals> and enter **System Management Homepage** in the Search box. A list of documents and advisories is displayed. To view SMH user guides, select **User Guide**.

## Starting the System Management Homepage application

To start the application, double-click the System Management Homepage desktop shortcut or enter `https://hostname:2381/` in Internet Explorer. The *hostname* can be `localhost` or the IP address of the server you want to monitor. To log into SMH, enter the same username and password you use to log in to the server. Users who have administrative privileges on the server have the same privileges in the SMH application.

To view the SMH of one server from another server, you must modify the Windows firewall settings as follows:

### Procedure

1. Open the Control Panel and select **System Security > Windows Firewall > Allowed Programs**.
2. Select **Allow another program** and click **Browse** in the **Add a Program** dialog box.
3. Navigate to `C:\hp\hpsmh\bin` and select **hpsmhd**. Click **Open** and then click **Add**. The System Management Homepage displays in the **Allowed Programs and Features** window.
4. Select **Home/work (Private)** and **Public** and click **OK**.
5. To access the SMH on another server, enter the following URL: `https://<server IP address>:2381`.

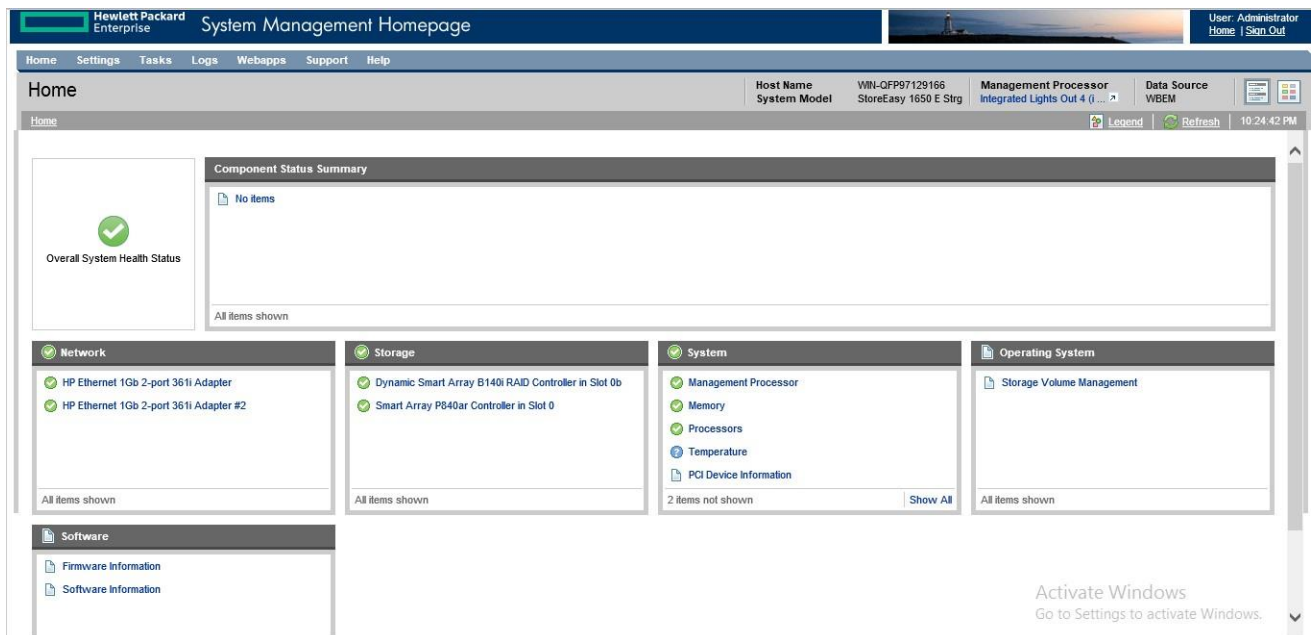
---

### NOTE:

Port 2381 might need to be opened in the system's firewall, if applicable.

## System Management Homepage main page

**Figure 57: System Management Homepage main page** on page 146 shows the SMH main page, which provides system, subsystem, and status views of the server and displays groupings of systems and their status.



**Figure 57: System Management Homepage main page**

**NOTE:**

- NICs will display with a failed status (red icon) if they are unplugged. To remove unused NICs from the system status, you can disable them by selecting **Control Panel > Hardware > Device Manager**, right-click on the specific NIC, and then select **Disable**.
- When you remove a disk or disconnect a cable, the SMH interface might not display alerts when you click the **Refresh** button. You can force a hard refresh by clicking the **Home** button or by navigating to the problem area. The default refresh interval is two minutes. To change the interval in the **Settings** menu, select **Autorefresh**, and then select **Configure Page refresh settings**. The minimum interval is five seconds and the maximum is 30 minutes.

**Overall System Health Status**

A webapp sets the value of the **Overall System Health Status** icon by using a predefined heuristic. If no webapp can determine the status, the worst possible status is displayed in the **Component Status Summary** section.

**Component Status summary**

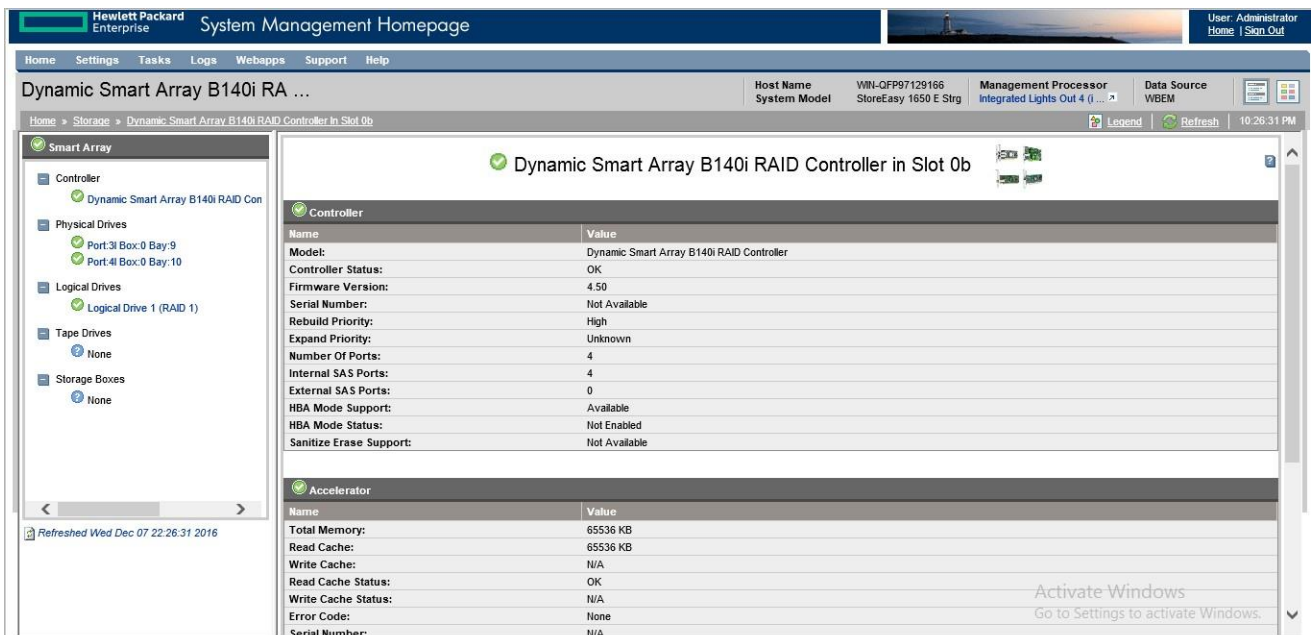
The **Component Status Summary** section displays links to all subsystems that have a critical, major, minor, or warning status. If there are no critical, major, minor or warning items, the **Component Status Summary** section displays no items.

**Network**

This section shows the status of the network connections.

**Storage**

This section displays information about the Smart Array and storage controllers within HPE StoreEasy 1000 Storage. The **Storage System** page is organized as a left panel and a main page:



**Figure 58: Storage system**

The left panel provides links to information about the following items:

- **Controller**

Select a storage controller to view its type, status, firmware version, and serial number.

- **Physical Drives**

This section provides an overview of all disk drives attached to the controller. Drives are identified and grouped as assigned, unassigned, and spare drives. Each physical drive is listed as a separate entry in the Storage System submenu. Select any of the physical drives to display more information about the drive.

**NOTE:**

Spare drives are only used when a disk drive fails. Until a spare drive is used, it remains offline and its LEDs will remain off.

- **Logical Drives**

A list of logical drives associated with the controller appears in the left panel tree view. Select one of the logical volume entries to display the status of the volume, fault tolerance (RAID level), and capacity (volume size). A link to the logical volume storage pool is also displayed.

- **Tape Drives**

This section provides information about tape drives, if they are included.

- **Storage Boxes**

This section provides an overview of the disk drives that are listed individually in the Physical Drives section.

## System

This section displays status for various system components.

## Version Control

This section provides information about the Version Control Agent.

### **Operating system**

This section provides information about the operating system storage volumes.

### **Software**

This section provides information about system firmware and software.

## **StoreEasy Dashboard**

This section provides troubleshooting steps for the StoreEasy Dashboard.

### **StoreEasy Dashboard does not launch or display data**

To resolve this issue, perform the following steps:

1. Go to **Control Panel > Programs > Programs and Features > Uninstall a program** and verify that StoreEasy Dashboard Service, Management Web Services, and StoreEasy Dashboard are installed on the system.
2. Do one of the following:
  - If the above mentioned software are not installed with version mentioned in the Release Notes, then install the service release for StoreEasy Dashboard.
  - If the above mentioned software are installed, enter `services.msc` in the **Run** dialog box and verify that the following services are running:
    - HPE Network Discovery Service
    - HPE Storage Discovery Service
    - HPE System Health Discovery Service
    - HPE Storage Management Service

If a service is not running, select the service, and then click **Start** or **Restart**.

### **StoreEasy Dashboard services are not installed**

If any of the dashboard services are not installed on the server, then install the service with the same version mentioned in the Release Notes. Check if the **StoreEasy Dashboard Services** component is installed. If it is not installed, then install this component.

### **Management web services are not installed**

Check if the **Management Web Services** component is installed. If it is not installed, then install this component with the same version as mentioned in the Release Notes.

### **StoreEasy Dashboard user interface is not installed**

Check if the **StoreEasy Dashboard** component is installed. If it is not installed, install this component with the same version as mentioned in the Release notes.

### **StoreEasy Dashboard service is paused or stopped**

If a dashboard service is paused or stopped, restart the service to discover the data. Verify if the following services are running:

- HPE Storage Discovery Service
- HPE System Health Discovery Service
- HPE Network Discovery Service
- HPE Storage Management Service

To start or restart a service:

- 1 Enter `services.msc` in the **Run** dialog box.
- 2 Select the service that is not running and click **Start** or **Restart**.

### CPU utilization is high continuously

If the CPU utilization is high, increase the value in the <Discover> tag under <Eventlogs> and <Storage>sub elements in the dashboard configuration file. For more information on the configuration file, see [Managing the dashboard configuration file](#).

## Known issues

**Table 8: Known issues** on page 149 identifies known issues with HPE StoreEasy 1000 Storage since this guide was last published and provides workarounds to mitigate them.

**Table 8: Known issues**

Issue	Resolution
A warning appears during Cluster validation.	Install the driver component for <a href="#">HPE Intel E1R Network Adapter</a> .
UAC popup seen at times on launching ArrayRegistration.exe.	Accept the same to proceed with registration
In case of two or more existing pools in a system, if a pool is deleted and try to recreate it, then a warning message associated with spare disk is thrown. This warning message is not thrown while deleting and recreating every pool.	This message can be ignored.
Create virtual disk for file server wizard is not visible on top of ICT at times, but the wizard launches.	Minimize ICT, the wizard is opened behind ICT window.
Default cluster ICT opens post installation for standalone system.	Do not use the Initial Configuration Task started in background the installation will launch the correct ICT that needs to be used
HPS Reports 9.8 execution crashes in NFS RPC info.	Run RPC locator services from <code>services.msc</code> and then run HPSReports again.

*Table Continued*

Issue	Resolution
<p>In HPE Notification System, while editing the value for a parameter, comparison, or name in an existing rule, a new rule is created with the same data. The changes made to the existing rule are not saved.</p>	<p>Manually delete the older rule.</p>
<p>If you are logged in to the storage system as a domain user and open the Event Notifier Configuration Wizard, the following error message is displayed: Unable to restart the Event Notification service. Check the Event Log for more detailed information about this error.</p>	<p>Log in to the system as a local administrator (not a domain user) and open the wizard.</p>
<p>If you attempt to change the desktop background, it is blocked due to a group policy on the system.</p>	<p>To change the desktop background, you must change the group policy settings:</p> <ul style="list-style-type: none"> <li>• Log in to the system as a user in the local administrators group.</li> <li>• Open a PowerShell or Command window and enter the <code>gpedit.msc</code> command in the command line.</li> <li>• In the Local Group Policy editor, select User Configuration→Administrative Templates→Desktop, and click Desktop.</li> <li>• Double-click the Desktop Wallpaper setting.</li> <li>• Select Disabled and then apply the setting change.</li> <li>• Log off and log in for the changes to be effective.</li> </ul>
<p>Cluster creation needs the cluster service to be running. If the domain user does not have admin privilege, the service remains in disabled state, causing the cluster creation to fail.</p>	<p>Domain user needs to be added to admin group for creating cluster.</p>
<p>On some HPE StoreEasy 1000 Storage systems, a momentary press of the power button results in an operating system shutdown.</p>	<p>Confirm that the power settings for the HPE StoreEasy 1000 Storage system ignore the power button or disable the power button in the system BIOS.</p>

*Table Continued*

Issue	Resolution
There may be errors from DFS and NFS logged in the Event Viewer after the HPE StoreEasy 1000 Storage system is configured.	These errors can be ignored.
Mounted data volumes are not remounted after performing a system recovery. These data volumes are not damaged or destroyed but they are not visible after a system recovery operation.	<p>To restore the mount points to their original locations, you must record them prior to running system recovery.</p> <ol style="list-style-type: none"> <li>1. Using Windows Disk Manager, record the mount points of the volumes within the root directory of each volume.</li> <li>2. After running system recovery, scan the system to find data volumes that are not assigned drive letters.</li> <li>3. Temporarily mount the volumes that are not assigned drive letters.</li> <li>4. Locate the recorded list of mount points and remount the temporarily mounted volumes to the correct locations according to the record.</li> </ol>
Network interfaces that are configured to use DHCP might not retrieve a DHCP address immediately if the configuration and network validation fails for these interfaces in the Network Configuration Tool.	<p>Perform the following steps to restart the network interface:</p> <ol style="list-style-type: none"> <li>1 Open a command prompt and enter <code>ncpa.cpl</code> to open the network control panel.</li> <li>2 Right-click on the interface that is configured for DHCP and does not have an address, and then select <b>Disable</b>.</li> <li>3 Right-click on the interface that is configured for DHCP and does not have an address, and then select <b>Enable</b>.</li> </ol>
When starting the System Management Homepage, you may see a message that there is an error with the security certificate.	You can safely continue and log in. Once logged in, see the Local Server Certificate topic in the System Management Homepage online help to set up a trusted certificate.
The New Volume option is not enabled after extending a virtual disk.	<p>After extending a virtual disk, the New Volume option (visible when you right-click the virtual disk) is disabled in Windows Server Manager. This can occur if the space on the virtual disk was fully utilized (the Capacity and Allocated Space columns display the same value) before extending the virtual disk. To enable the New Volume option, do one of the following:</p> <ul style="list-style-type: none"> <li>• In Disk Management, select <b>Rescan Disks</b>.</li> <li>• From the HPE StoreEasy folder on the desktop, select <b>Rediscover Storage</b>.</li> <li>• Open a Windows PowerShell command prompt and execute the <code>Update-StorageProviderCache</code> command.</li> </ul>

*Table Continued*


Issue	Resolution
<p>Status column on Storage Pools window in Windows Server Manager is blank.</p>	<p>When viewing details about storage pools on the Storage Pools window in the Windows Server Manager, the Status column is always blank. However, you can view the health status and operational status. Health status is indicated by the icon to the left of the Name column. Operational status is a separate column. You can hide the Status column by right-clicking the column name and selecting <b>Status</b>, which removes Status from the list of column headings that display.</p>
<p>Windows Server Manager indicates there are zero (0) storage pools but does not display any kind of error message about it.</p>	<p>This issue can be caused by one of the following actions:</p> <ul style="list-style-type: none"> <li>• The cache is out of date.</li> <li>• The discovery operation times out.</li> <li>• An operation fails because it requires a service restart or cache update.</li> <li>• The HPE Storage Management Service has stopped running.</li> </ul> <p>To resolve the issue, restart the HPE Storage Management Service using one of the following methods:</p> <ul style="list-style-type: none"> <li>• From the desktop, navigate to the Services window (services.msc) and locate <b>HPE Storage Management Service</b>. Right-click the service and select <b>Start</b>.</li> <li>• Open a Windows PowerShell prompt and enter the following cmdlet:  <code>net start hpstormsvc</code></li> </ul>
<p>When creating a storage pool on a StoreEasy 1000 system, the following warning message may appear:</p> <p>The storage pool was created, but spare drives could not be added. Edit the pool to add spare drives.</p>	<p>This can occur if the pool being created is not the last pool being managed by the controller. For example, you have Pool A, Pool B, and Pool C. You delete Pool B and then create a new storage pool. The new storage pool is considered “out of order” and its creation requires all storage pools to be re-ordered. The new pool is created successfully, but without a spare drive. You can add a spare drive using the Grow option on the Edit Pools tab of Pool Manager.</p> <hr/> <p><b>NOTE:</b></p> <p>This warning message is not thrown while deleting and re-creating every pool.</p>

*Table Continued*



Issue	Resolution
<p>The Storage Management Provider displays the following error message: 0x26005054 The service failed to subscribe for events.</p>	<ol style="list-style-type: none"> <li>1. Open Add/Remove Programs and verify that HPE Insight Management Agents is installed.</li> <li>2. If it is installed, open the <b>Run</b> dialog box and enter <code>WBEMTEST</code> and click <b>Connect</b>.</li> <li>3. Enter <code>root\hpq</code> as the namespace. Wait to see if the namespace connects. If it does not connect, the WBEM installation is corrupt.</li> <li>4. Navigate to the <code>C:\nas\components\PSP</code> directory, which contains the WBEM installer.</li> <li>5. Open the batch script file and search for “HPE Insight Management Agents for Windows Server x64 Editions” and identify its executable name.</li> <li>6. Run the executable to re-install the agents.</li> </ol>
<p>On an HPE StoreEasy 1000 system, if you are logged in as a local administrator and the system has been joined to a domain, the Initial Configuration Tasks (ICT) window displays “None” for Available Disks, Storage Pools, and Volumes.</p>	<p>To resolve this issue, you must log in as a domain user.</p>
<p>Storage topology is not displayed properly in other tools after making changes using the HP Smart Storage Administrator.</p>	<p>When using HP Smart Storage Administrator to make storage configuration changes, the changes might not be displayed in Windows Server Manager, Pool Manager, or the Windows Server Manager API. To resolve this issue, perform the following steps before using one of these tools after making changes from the HP Smart Storage Administrator:</p> <ol style="list-style-type: none"> <li>1. Close the HP Smart Storage Administrator after making the changes.</li> <li>2. Update the storage cache using the following method: <p style="margin-left: 40px;">Open PowerShell and run <code>Update-StorageProviderCache</code>.</p> </li> </ol> <p>The changes made using the HP Smart Storage Administrator will now be displayed.</p>

*Table Continued*

Issue	Resolution
<p>The Actual Drive ID does not match what is expected message is displayed during system installation and recovery.</p>	<p>When the logical drive configuration of the system does not match with the system recovery configuration file, this message is displayed on the screen. This usually occurs when you delete the logical drive on which the operating system is installed.</p> <ul style="list-style-type: none"> <li>If a recent backup exists, the system can be restored after removing all logical drives in logical array A using HP Smart Storage Administrator. Start Intelligent Provisioning during system boot and remove all logical drives from array A and then boot from the System Recovery media. Restore the backup when the system recovery process completes and appropriate storage is configured.</li> <li>If a recent backup does not exist, use the System Recovery media to access and capture the data from the remaining logical drives in array A by copying the files to a network share. When the data is copied, use the System Recovery media to restore the system after removing the logical drives in array A using Intelligent Provisioning.</li> </ul> <hr/> <p> <b>IMPORTANT:</b> This issue only affects logical drives in array A. Do not delete logical drives in any other logical array.</p> <p>For information on using the System Recovery DVD, see .</p>
<p>In a dual domain configuration, the loss of a redundant path intermittently displays the controller as Loading in Pool Manager.</p>	<p>To resolve this issue, open a Windows PowerShell command prompt and execute the <code>Update-StorageProviderCache</code> command.</p>
<p>Windows Server Manager does not display correct capacity details of the logical drive that is extended using SSA.</p>	<p>To resolve this issue:</p> <ul style="list-style-type: none"> <li>Open a Windows PowerShell command prompt and execute the <code>Update-StorageProviderCache</code> command.</li> <li>Click <b>Storage Pools</b> or any other section in the left pane of Windows Server Manager, and then click <b>Disks</b>.</li> </ul>
<p>If all drive letters are consumed, the New Volume Wizard fails while assigning the access path.</p>	<p>To resolve this issue:</p> <ol style="list-style-type: none"> <li>Open Server Manager and click <b>File and Storage Services &gt; Volumes</b>.</li> <li>Right-click on the volume and select <b>Manage Drive Letter and Access Paths</b>.</li> <li>Select a drive letter from the list and click <b>OK</b>.</li> </ol>

*Table Continued*

Issue	Resolution
System health discovery fails on the StoreEasy Dashboard	Install StoreEasy Dashboard on a system that is Quick Restored in one of the 8 languages that are supported. For information on supported languages, see the StoreEasy 1000 Storage release notes.
StoreEasy Dashboard displays the Application load timeout error.	This issue occurs when the log files are locked and inaccessible due to number of discoveries. To resolve this issue, delete the log files located at C:\nas\logs\rest.
The <b>Information</b> tab under <b>Events</b> on the StoreEasy Dashboard displays events related to service termination.	This is an expected behavior because the StoreEasy Dashboard services restart everyday at 3:00 AM.
After initial installation or a system recovery, the connection status for the second node is listed as "The second node is not accessible".	<p>You will need to obtain the Cluster Internal IP address and add it manually to the registry:</p> <ol style="list-style-type: none"> <li>1. Use iLO or Remote Desktop to log in to the second node and retrieve the Cluster Internal IP address.</li> <li>2. Open a Command Prompt or PowerShell on the first node.</li> <li>3. Enter the following command, replacing &lt;ClusterInternalIP&gt; with the IP address obtain in step 1:</li> </ol> <pre>reg add HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\OEMOOBE /v RemoteNodeIpAddress /t REG_SZ /d &lt;ClusterInternalIP&gt; /f</pre>
The message "Display will be complete when the storage inventory has finished..." appears in Server Manager and pool data does not display.	This issue occurs if the server has been added to the domain and a cluster has been created. Local administrators cannot view this information. Once a server is added to a domain and a cluster is created, you must log in to Server Manager as a domain user.
Network teaming cannot be configured during initial system configuration.	Do not create network teams until after the initial configuration tasks have been completed. If a system is to be connected to a network where specific VLANs with VLAN tagging enabled (for example, for connecting to a domain controller), it is recommended that the network switch be temporarily configured to pass untagged network packets on the specific VLAN or to configure the network interface properties to operate using the specific VLAN ID. Configuring VLAN settings is accomplished by opening the properties dialog for the network interface and then configuring the network adapter by clicking <b>Configure</b> .

*Table Continued*

Issue	Resolution
<p>During initial system configuration, the Initial Configuration Tasks window may display the following message:</p> <pre>Connecting to remote server 169.254.2.111 failed with the following error message: The WinRM client cannot process the request. If the authentication scheme is different from Kerberos, or if the client computer is not joined to a domain, then HTTPS transport must be used or the destination machine must be added to the TrustedHosts configuration setting. Use winrm.cmd to configure TrustedHosts. Note that computers in the TrustedHosts list might not be authenticated.</pre>	<p>This may be caused by having multiple interfaces on the same network subnet as that used by the network interface names "Cluster Internal". By default, the Cluster Internal network uses an APIPA address (169.254.0.0/16). This is the default subnet used by other network interfaces that are connected and there is no DHCP server. This results in multiple network routes between nodes.</p> <p>Disable or disconnect network interfaces that are connected to networks where no DHCP server is available. During the initial configuration you will be given the opportunity to assign network addresses to other network interfaces. After addresses are assigned the network interfaces can be reconnected or enabled.</p>
<p>When attempting to use Failover Cluster Manager to add a File Share to an HA File Server on the cluster, the Add Share wizard will not start.</p> <p>Also, attempting to use Failover Cluster Manager to view any existing shares on file servers in the cluster, just results in a perpetual "Loading" message. This happens when a system level HTTP proxy server is set. Some users will require a system level proxy to make Cluster Aware Updating work, but if one is set, it is important to explicitly prevent access to your HA file servers from using the proxy.</p>	<p>Set the system level proxy to explicitly bypass the HA file servers. For example, instead of using the following command:</p> <pre>netsh winhttp set proxy myproxy.fabrikam.com:80 "&lt;local&gt;"</pre> <p>set the proxy using a command like the following:</p> <pre>netsh winhttp set proxy myproxy.fabrikam.com:80 "&lt;local&gt;;*.fabrikam.com"</pre> <p>In this example, "*.fabrikam.com" is the client access point used on the HA file servers.</p>


*Table Continued*

Issue	Resolution
<p>The SMI-S provider registration with HPE StoreEasy 1000 Storage might fail due to the following reason:</p> <p>No network connectivity existing between the array and node.</p>	<p>To register SMI-S provider, ensure that the array is reachable from the node. Perform the following steps on all nodes:</p> <ol style="list-style-type: none"> <li>1. Open an elevated PowerShell command prompt.</li> <li>2. Enter the following commands for HTTP and HTTPs SMI-S provider: <ol style="list-style-type: none"> <li>a. <code>Register-SmisProvider -ConnectionUri http://&lt;ipadress&gt;:&lt;port-no&gt;.</code></li> </ol> <hr/> <p><b>NOTE:</b></p> <p>For HTTPs port SMI-S provider, enter <code>Register-SmisProvider -ConnectionUri https://&lt;ipadress&gt;:&lt;port-no&gt;.</code></p> <ol style="list-style-type: none"> <li>b. <code>Update-StorageProviderCache -DiscoveryLevel 3 -PassThru.</code></li> </ol> </li> <li>3. Enter <code>Get-StorageProvider</code> to verify the registration of SMI-S provider.</li> </ol> <p>If the registration is successful, SMI-S provider is displayed as registered on the system.</p>

*Table Continued*

Issue	Resolution
<p>While validating a cluster, the following message might be displayed for each cluster node: Failed to find or allocate arbitration sectors for physical disk {7982b78f-ad42-4120-91a4-caf967f7825c} from node [server node name]. These sectors are used to test reads and writes to the disk. On a GPT disk, these sectors are located within the Cluster Metadata Partition, and this partition may need to be created from the Microsoft Reserved Partition so that the storage will validate. Please ensure that all GPT disks have a Microsoft Reserved Partition (MSR) present. Error: 0x80070022</p>	<p>To resolve this issue, create MSR (Microsoft Reserved Partition) on the disks that you want to use in the cluster. Enter the following PowerShell command at an elevated PowerShell command prompt to determine the disks that require a new MSR partition: <code>Get-disk   where {\$_.PartitionStyle -eq "GPT"}   get-partition</code></p> <p>When you execute this command, the partitions on all GPT disks in the system are listed. In addition to other partitions, each disk that is included in the cluster must have a 32 MB or 128 MB reserved partition. The MSR partition is created automatically when the disk is initialized, but it might be accidentally removed when you use diskpart, PowerShell, or Device Manager. If a disk included in the cluster is missing the reserved partition, use the following methods to create the missing partition:</p> <p><b>Method 1—Irrecoverable removal of all partitions on the disk</b> To create the missing partition using PowerShell:</p> <ol style="list-style-type: none"> <li>1. Open an elevated PowerShell command shell.</li> <li>2. Enter the following commands to create MSR and data partition using the disk number found in the output of the <code>Get-disk   where {\$_.PartitionStyle -eq "GPT"}   get-partition</code> command: <ol style="list-style-type: none"> <li>a. <code>Get-partition -DiskNumber &lt;disk number from above&gt;   remove-Partition -Confirm</code></li> <li>b. <code>New-partition -DiskNumber &lt;disk number from above&gt; -Size 128MB -GptType '{e3c9e316-0b5c-4db8-817d-f92df00215ae}'</code></li> <li>c. <code>New-partition -DiskNumber &lt;disk number from above&gt; -Size &lt;size&gt; -AssignDriveLetter   Format-Volume -Force</code></li> </ol> </li> <li>3. Enter the <code>Get-partition -DiskNumber &lt;disk number from above&gt;</code> command to verify the new partitions.</li> </ol> <p>To create the missing partition using diskpart, perform the following steps:</p> <ol style="list-style-type: none"> <li>1. Open an elevated PowerShell command shell.</li> <li>2. Enter <code>diskpart.exe</code> , and then execute the following commands: <ol style="list-style-type: none"> <li>a. <code>rescan</code></li> <li>b. <code>list disk</code></li> </ol> </li> </ol> <hr/> <p><b>NOTE:</b></p> <p>Note the disk number that corresponds to the disk that you want to add to the cluster.</p>

*Table Continued*

Issue	Resolution
	<p>c. <code>select disk</code></p> <p>d. <code>clean</code></p> <p>e. <code>create partition msr size=128</code></p> <p>f. <code>create partition primary size=&lt;size in MB&gt;</code></p> <hr/> <p><b>NOTE:</b></p> <p>This size parameter is optional. If you do not enter a value, the complete remaining space is used.</p> <p>g. <code>format fs=ntfs quick label="&lt;disk label&gt;"</code></p> <p>h. <code>exit</code></p> <p>3. Enter the <code>Get-partition -DiskNumber &lt;disk number from above&gt;</code> command to verify the new partitions.</p> <p><b>Method 2—Non-destructive partition creation</b></p> <hr/> <p> <b>IMPORTANT:</b></p> <p>To use this method, you must have at least 128 MB of unpartitioned space on the disk.</p> <p>To create the missing partition using PowerShell, perform the following steps:</p> <ol style="list-style-type: none"> <li>1. Open an elevated PowerShell command shell.</li> <li>2. Enter the following command to create MSR and data partition using the disk number found in the output of the <code>Get-disk   where {\$_.PartitionStyle -eq "GPT"}   get-partition</code> command: <code>New-partition -DiskNumber &lt;disk number from above&gt; -Size 128MB -GptType '{e3c9e316-0b5c-4db8-817d-f92df00215ae}'</code></li> <li>3. Execute the <code>Get-partition -DiskNumber &lt;disk number from above&gt;</code> command to verify the new partitions.</li> </ol> <p>To create the missing partition using diskpart, perform the following steps:</p> <ol style="list-style-type: none"> <li>1. Open an elevated PowerShell command shell.</li> <li>2. Enter <code>diskpart.exe</code>, and then execute the following commands: <ol style="list-style-type: none"> <li>a. <code>rescan</code></li> <li>b. <code>list disk</code></li> </ol> </li> </ol> <hr/> <p><b>NOTE:</b></p>

*Table Continued*

Issue	Resolution
	<p>Note the disk number that corresponds to the disk that you want to add to the cluster.</p> <ul style="list-style-type: none"> <li>c. <code>select disk &lt;disk number&gt;</code></li> <li>d. <code>create partition msr size=128</code></li> <li>e. <code>exit</code></li> </ul> <p>3. Enter the <code>Get-partition -DiskNumber &lt;disk number from above&gt;</code> command to verify the new partitions.</p>
<p>The B140i RAID controller gets disabled in case of downgrading the BIOS or reconfiguring hardware and access to all drives (including OS drive) is lost until the dynamic smart array configuration is enabled.</p>	<p>To enable the B140i RAID controller:</p> <ol style="list-style-type: none"> <li>1. Reboot the server. <ul style="list-style-type: none"> <li>The server starts up and the HP ProLiant POST screen appears within a few minutes.</li> </ul> </li> <li>2. Press <b>F9</b>. <ul style="list-style-type: none"> <li>The System Utilities screen appears.</li> </ul> </li> <li>3. Select <b>System Configuration &gt; BIOS/Platform Configuration (RBSU) &gt; System Options &gt; SATA Controller Options &gt; Embedded SATA Configuration &gt; Enable Dynamic HP Smart Array RAID Support</b> and press <b>Enter</b>.</li> </ol>

## Virus Scanning Recommendation

Using Virus scanning might lead to instability in a system in specific conditions. For Microsoft Virus scanning recommendation, refer to [Virus scanning recommendations](#).

## Verifying services are running

If an issue occurs and other troubleshooting efforts do not resolve it, verify that the following services are always running:

- Insight Event Notifier
- Insight Foundation Agents
- Insight NIC Agents
- Insight Server Agents
- Insight Storage Agents
- ProLiant Agentless Management Service
- ProLiant Health Monitor Service
- ProLiant System Shutdown Service
- Smart Array SAS/SATA Event Notification Service



- System Management Homepage
- Version Control Agent
- Storage Management Service
- WMI Storage Providers
- HPE Network Discovery Service
- HPE Storage Discovery Service
- HPE System Health Discovery Service
- HPE Storage Management Service

Additionally, verify that the user interfaces for REST and Pool Manager are installed and running:

1. Open IIS using one of the following methods:

- In Windows Server Manager, select **IIS** in the left navigation pane. In the list of servers that display in the main content pane, right-click the applicable server and select **Internet Information Services (IIS) Manager**.
- Select **Internet Information Services (IIS) Manager** from the Tools menu in Windows Server Manager.
- Press **Windows + R** to open the Run window. Enter `inetmgr` and click **OK**.

2. Verify that the StoreEasy Management website contains the following entries:

- `aspnet_client`
- `help`
- `rest`
- `webui`

3. Right-click the **StoreEasy Management** website and select **Manage Website**. If it is running, the Start option will be disabled.

If these steps do not resolve the issue, contact HPE Technical Support.

## Error codes

This section contains the error codes that may occur.

### Storage Management Provider error codes

The Storage Management Provider error codes are listed in [Storage Management Provider errors](#).

**Table 9: Storage Management Provider errors**

<b>Error code</b>	<b>Error message</b>	<b>Recommended action</b>
0x24005001	Error during discovery.	Restart Storage Management Service.
0x24005003	Error while parsing CLI output.	Restart Storage Management Service.
0x20005003	Error while parsing CLI output.	Restart Storage Management Service.
0x25005008	The controller specified was not found.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x20005009	The specified RAID level is invalid.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x25005009	The specified RAID level is invalid.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x2300500B	The operation is not supported because the storage pool is unhealthy.	Retry the operation.
0x2300500C	The operation is not supported because the storage pool is transforming.	Retry the operation.
0x2300500D	The physical drive specified is already in use.	Retry the operation.
0x2300500E	Less than the minimum number of physical drives was specified.	Retry the operation.
0x2300500F	The specified physical drives are unsupported for this operation. They may either be in use or are a mismatch.	Retry the operation.
0x24005011	The physical disk was not found in the provider cache.	Restart Storage Management Service.
0x25005011	The physical disk was not found in the provider cache.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x24005012	No physical disks were found in the logical drive.	Restart Storage Management Service.
0x25005013	Failed to update pool in cache.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>

*Table Continued*

<b>Error code</b>	<b>Error message</b>	<b>Recommended action</b>
0x25005014	Failed to get the pool from the controller.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x25005015	Failed to delete the pool from cache.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x25005016	Failed to get the pool IDs for the subsystem from the controller.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x25005017	Failed to get the associated pool for the LUN from cache.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x25005018	Failed to update disk in cache.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x25005019	Failed to get the disk from the controller.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x2500501A	Failed to get associated disks for the LUN from cache.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x2500501B	Failed to get associated disks for the pool from cache.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x2000501C	Unknown type of storage object.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache</code>
0x2500501C	Unknown type of storage object.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x2400501D	Failed to get the associated subsystem for the storage object from cache.	Restart Storage Management Service.
0x2500501D	Failed to get the associated subsystem for the storage object from cache.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>

*Table Continued*

<b>Error code</b>	<b>Error message</b>	<b>Recommended action</b>
0x2500501E	Failed to get the storage object from cache.	Update the storage management provider cache by invoking Windows PowerShell command  Update-StorageProviderCache.
0x2500501F	Failed to update the storage object in cache.	Update the storage management provider cache by invoking Windows PowerShell command  Update-StorageProviderCache.
0x25005020	Failed to get the storage object from the controller.	Update the storage management provider cache by invoking Windows PowerShell command  Update-StorageProviderCache.
0x25005021	Failed to copy storage objects.	Update the storage management provider cache by invoking Windows PowerShell command  Update-StorageProviderCache.
0x20005022	Error creating Pool.	Update the storage management provider cache by invoking Windows PowerShell command  Update-StorageProviderCache
0x20005023	Error deleting LUN.	Update the storage management provider cache by invoking Windows PowerShell command  Update-StorageProviderCache
0x20005024	The Storage pool contains virtual disks	Storage pool containing virtual disks cannot be deleted. Delete the virtual disks from Server Manager and retry deleting the pool.
0x20005025	Failed to delete the reserved LUN.	Try to delete the LUN from SSA.
0x25005026	Failed to get the logical drive from the controller.	Update the storage management provider cache by invoking Windows PowerShell command  Update-StorageProviderCache.
0x25005027	Failed to convert from WCS to MBS.	Update the storage management provider cache by invoking Windows PowerShell command  Update-StorageProviderCache.
0x24005028	Failed to get proxy.	Restart Storage Management Service.
0x2500502A	Failed to update the logical drive in cache.	Update the storage management provider cache by invoking Windows PowerShell command  Update-StorageProviderCache.
0x2500502B	Failed to get volumes for the pool.	Update the storage management provider cache by invoking Windows PowerShell command  Update-StorageProviderCache.

*Table Continued*

<b>Error code</b>	<b>Error message</b>	<b>Recommended action</b>
0x2500502C	Failed to get the pool for the physical drive.	Update the storage management provider cache by invoking Windows PowerShell command  Update-StorageProviderCache.
0x2500502F	Failed to acquire the lock.	Update the storage management provider cache by invoking Windows PowerShell command  Update-StorageProviderCache.
0x25005030	Failed to add physical disk(s) to one of the LUNs in the pool.	Update the storage management provider cache by invoking Windows PowerShell command  Update-StorageProviderCache.
0x25005031	Failed to add physical disk(s) as data drive(s) to the pool.	Update the storage management provider cache by invoking Windows PowerShell command  Update-StorageProviderCache.
0x25005032	Failed to add physical disk(s) as spare drive(s) to the pool.	Update the storage management provider cache by invoking Windows PowerShell command  Update-StorageProviderCache.
0x25005033	The usage parameter is invalid.	Update the storage management provider cache by invoking Windows PowerShell command  Update-StorageProviderCache.
0x20005037	Access denied.	Update the storage management provider cache by invoking Windows PowerShell command  Update-StorageProviderCache
0x25005037	Access denied.	Update the storage management provider cache by invoking Windows PowerShell command  Update-StorageProviderCache.
0x24005038	The cache is out of date.	Restart Storage Management Service.
0x25005038	The cache is out of date.	Update the storage management provider cache by invoking Windows PowerShell command  Update-StorageProviderCache.
0x24005039	The logical drive was not found in cache.	Restart Storage Management Service.
0x25005039	The logical drive was not found in cache.	Update the storage management provider cache by invoking Windows PowerShell command  Update-StorageProviderCache.
0x2400503A	The storage pool was not found in cache.	Restart Storage Management Service.

*Table Continued*

Error code	Error message	Recommended action
0x2500503A	The storage pool was not found in cache.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x2400503B	The subsystem was not found in cache.	Restart Storage Management Service.
0x2500503B	The subsystem was not found in cache.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x2300503D	Incompatible <code>ResiliencySetting</code> for this operation.	Retry the operation.
0x23005040	Some of the parameter values supplied were invalid.	Retry the operation.
0x20005040	Some of the parameter values supplied were invalid.	Retry the operation.
0x25005040	Some of the parameter values supplied were invalid.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x24005041	Failed to get the logical drives in the pool.	Restart Storage Management Service.
0x25005041	Failed to get the logical drives in the pool.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x24005043	Failed to get physical disk in the pool.	Restart Storage Management Service.
0x25005045	Failed to get physical disk in the subsystem.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x24005046	Failed to get the pool for the physical drive.	Restart Storage Management Service.
0x24005047	Failed to get the physical disks in the enclosure.	Restart Storage Management Service.
0x20005048	Physical disks not supported as arguments to the method.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache</code>
0x25005049	The operation was successful, but it has resulted in the storage pools being renamed.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>

*Table Continued*

<b>Error code</b>	<b>Error message</b>	<b>Recommended action</b>
0x2500504A	Failed to get all pools from cache.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x2500504B	Failed to get the controller for the pool from cache.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x2500504C	Failed to get the disk(s) for the pool from the controller.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x2500504D	Failed to add an association to cache.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x2500504E	The physical disk is in use. It cannot be deleted from cache.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x2500504F	Invalid relation type.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x21005051	Failed to find the MI Main module.	Re-install Storage Management Provider.
0x21005052	Failed to initialize the MI Application.	Re-install Storage Management Provider.
0x21005053	The Storage Management Service is not able to host the SMP.	Re-install Storage Management Provider.
0x26005054	The service failed to subscribe for events.	Refer to the troubleshooting guide.
0x24005055	Failed to get the proxy object.	Restart HPE Storage Management Service.
0x21005056	Failed to load the SMPProvider DLL. Either it is not registered or is unable to load its dependencies.	Re-install Storage Management Provider.
0x25005059	Failed to get all LUNs for the disk from the controller.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x2500505A	Failed to remove association from the provider cache.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>

*Table Continued*

<b>Error code</b>	<b>Error message</b>	<b>Recommended action</b>
0x2500505B	The operation was successful, but it has resulted in the storage pools being renamed.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x2500505C	The operation was successful, but it has resulted in the storage pools being renamed.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x2000505D	The operation was successful, but it has resulted in the storage pools being renamed.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x2500505E	Failed to get all logical drives from cache.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache</code> .
0x2500505F	Failed to get the controller for the logical drive from cache.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x25005060	The disk(s) cannot be added to this pool because it contains at least one LUN requiring RAID level migration.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x21005061	Failed to remove partition data from the logical drive. You must manually clear the disk or delete the partition. Otherwise, subsequent volume creation requests might fail.	Re-install Storage Management Provider.
0x20005062	The format of the specified RAID level is invalid. Valid RAID levels are RAID 0, RAID 1, RAID 10, RAID 5, RAID 6, RAID 50, RAID 60, RAID 10 (ADM), RAID 50 (2), RAID 50 (3), RAID 50 (4), RAID 50 (5), RAID 1 (ADM), RAID 60 (2), RAID 60 (3), RAID 60 (4), RAID 60 (5).	Select valid RAID level.
0x20005063	The format of the specified RAID level is invalid. Valid RAID levels are RAID 0, RAID 1, RAID 10, RAID 5, RAID 6.	Select valid RAID level.
0x23005064	The length of the virtual disk friendly name exceeds the maximum supported length.	Retry the operation.
0x24005065	Failed to get the pool from the logical drive.	Restart Storage Management Service.

*Table Continued*



Error code	Error message	Recommended action
0x25005068	The virtual disk could not complete the operation because its health or operational status does not permit it.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x24005069	Enclosure not found in cache.	Restart Storage Management Service.
0x2500506A	Failed to update enclosure in cache.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x2400506B	Failed to get the enclosure for the physical disk.	Restart Storage Management Service.
0x2400506C	Failed to get WMI class names to subscribe.	Restart Storage Management Service.
0x2100506D	SMP assembly file not found.	Re-install Storage Management Provider.
0x2700506E	The registry key <code>HKLM\HARDWARE\Description\System\BIOS</code> was not found.	The system is in an invalid state. Contact HPE Support.
0x2700506F	The registry key <code>HKLM\HARDWARE\Description\System\BIOS\SystemProductName</code> was not found.	The system is in an invalid state. Contact HPE Support.
0x21005070	<code>SmartArray.dll</code> file not found.	Re-install Storage Management Provider.
0x21005072	Failed to get the library name to load.	Re-install Storage Management Provider.
0x25005073	Failed to release the lock.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x24005074	Failed to create the mutex.	Restart Storage Management Service.
0x24005075	Failed to get the proxy to the controller library.	Restart Storage Management Service.
0x25005076	The resiliency setting does not match the pool's resiliency setting.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>

*Table Continued*

Error code	Error message	Recommended action
0x25005077	The operation was successful but the storage provider cache is out of date. You must update the storage provider cache before proceeding further.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x25005078	The specified friendly name already exists.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x20005079	The Storage Pool could not complete the operation because its health or operational status does not permit it.	Check the health and operational status of the physical drives. Please retry the operation.
0x2500507A	One of the physical disks specified is assigned to other storage pool.	Update the storage management provider cache by invoking Windows PowerShell command <code>Update-StorageProviderCache.</code>
0x2300507B	This operation is supported only for spare drives.	Retry the operation.
0x2000507C	The physical drive could not complete the operation because its health or operational status does not permit it.	Check the health and operational status of the physical drives. Please retry the operation.
0x2000507D	One of the physical disks specified can not be configured by the subsystem.	Check the health and operational status of the physical drives. Please retry the operation.
0x2300507E	The specified pool does not contain witness lun and hence cannot be shrunk.	Retry the operation.
0x2300507F	This operation is not supported on primordial storage pools.	Retry the operation.

## Pool Manager Provider error codes

The Pool Manager Provider error codes are listed in [Pool Manager Provider errors](#).

**Table 10: Pool Manager Provider errors**

Error code	Error message
0x20006001	Pool Manager Provider has been unloaded from memory.
0x20006002	The Pool Manager Rule XML file is invalid.
0x20006003	Pool configuration is not supported for this enclosure.
0x20006004	Failed to initialize logger.
0x20006005	Could not find ROM Check Library ( <code>pssver.dll</code> ), which is required to find pool template for any enclosure.

*Table Continued*

<b>Error code</b>	<b>Error message</b>
0x20006006	Failed to use WMI to call the SMP Provider.
0x20006007	Failed to connect to the SMP Provider.
0x20006008	General WMI error in the Pool Manager Provider.
0x20006009	The first healthy disk size within the virtual enclosure exceeded the maximum drive capacity allowed for a pool by the virtual enclosure.
0x2000600A	The proposed spare disk slot is empty.
0x2000600B	The first healthy disk type within the virtual enclosure does not match the disk type supported by the virtual enclosure.
0x2000600C	An empty disk slot was found.
0x2000600D	The OS pool was not found in the expected location.
0x2000600E	The proposed spare disk is unhealthy.
0x2000600F	The proposed spare disk is already in use.
0x20006010	The existing pool type does not match the virtual enclosure type.
0x20006011	The proposed pool cannot be created or grown because one of the concrete pools within the pool set cannot be grown.
0x20006012	The existing pool contains disks of different sizes or types.
0x20006013	The existing pool has a RAID level that is not supported for the proposed pool.
0x20006014	The global spare used by this existing pool is not in the current virtual enclosure.
0x20006015	Some of the disks within the proposed pool are already part of another pool, which spans the current virtual enclosure.
0x20006016	Some of the disks within the proposed pool are unhealthy.
0x20006017	Some of the disks within the proposed pool are offline.
0x20006018	Some of the disks in the proposed pool are marked by the storage subsystem as cannot pool.
0x20006019	The number of existing pools exceeds the count specified in the rule file.
0x2000601A	The pool is unhealthy.
0x2000601B	Some of the disks in the proposed pool are a different type than the first disk of the virtual enclosure.

*Table Continued*

Error code	Error message
0x2000601C	Some of the disks in the proposed pool are a different size than the first disk of the virtual enclosure.
0x2000601D	Some of the disks in the proposed pool are a different spindle speed than the first disk of the virtual enclosure.
0x2000601E	Information on some of the disks in the proposed pool could not be read.
0x2000601F	The proposed spare disk is a different type than the first disk of the virtual enclosure.
0x20006020	The proposed spare disk is a different size than the first disk of the virtual enclosure.
0x20006021	The proposed spare disk is a different spindle speed than the first disk of the virtual enclosure.
0x20006022	Pool will be grown by adding spare disks only. No data disks will be added.
0x20006023	Some of the disks in the proposed pool are already used as spare(s).

## Management Web Service error codes

The Management Web Service error codes are listed in [Management Web Service errors](#).

**Table 11: Management Web Service errors**

Error code	Error message	Recommended action
0x2000A001	You are not authorized to access the resource.	Re-install Management Web Service.
0x2000A002	Received invalid input.	Re-install Management Web Service.
0x2000A003	Failed to access WMI.	Restart the WMI (Windows Management Instrumentation) service.
0x2000A004	File not found.	Re-install Management Web Service.
0x2000A005	Registry value not found.	Re-install Management Web Service.
0x2000A006	The web service encountered an exception while performing the request. Check the web service log for more detail.	Re-install Management Web Service.
0x2000A007	The storage pool was created, but spare drives could not be added. Edit the pool to add spare drives.	Edit the pool using HP SSA and add a spare drive.

*Table Continued*

Error code	Error message	Recommended action
0x2000A008	The operation on the storage pool failed because the storage provider cache was out of date. Please retry the operation.	Update the storage management provider cache by invoking Windows PowerShell command  <code>Update-StorageProviderCache</code>
0x2000A009	The operation cannot be performed because a storage provider discovery is in progress. Please try the operation later.	Update the storage management provider cache by invoking Windows PowerShell command  <code>Update-StorageProviderCache</code>
0x2000A00A	Failed to get the discovery status of the storage provider.	Update the storage management provider cache by invoking Windows PowerShell command  <code>Update-StorageProviderCache</code>
0x2300A00B	The storage subsystem has indicated that one or more of the physical disks cannot be used in a storage pool.	Check the health and operational status of the physical drives. Please retry the operation.
0x2300A00C	One or more of the physical disks provided in the request was not found or cannot be used in a storage pool.	Check the health and operational status of the physical drives. Please retry the operation.

## Hewlett Packard Enterprise Support websites

To troubleshoot problems with the HPE StoreEasy 1000 Storage, select **HPE Server, Storage and Networking** at the HPE Support & Drivers website (<https://www.hpe.com/support>). Enter HPE StoreEasy 1000 Storage or component information (for example, SAS I/O module). After entering the details, use the following links for troubleshooting information:

- Drivers, software & firmware. —Provides drivers and software for your operating system.
- Top issues & solutions—Provides a listing of customer notices, advisories, and bulletins applicable for the product or component.
- Manuals—Provides the latest user documentation applicable to the product or component. User guides can be a useful source for troubleshooting information. For HPE StoreEasy 1000 Storage, the following ProLiant server manuals may be useful for troubleshooting assistance:
  - 1450—*ProLiant DL160 Gen9 Server User Guide* or *ProLiant DL160 Gen9 Server Maintenance and Service Guide*
  - 1550—*ProLiant ML110 Gen9 Server User Guide* or *ProLiant ML110 Gen9 Server Maintenance and Service Guide*
  - 1650—*ProLiant DL380 Gen9 Server User Guide* or *ProLiant DL380 Gen9 Server Maintenance and Service Guide*
  - 1650E—*Apollo 4200 Gen9 Server User Guide* or *Apollo 4200 Gen9 Server Maintenance and Service Guide*
  - 1850—*ProLiant DL380 Gen9 Server User Guide* or *ProLiant DL380 Gen9 Server Maintenance and Service Guide*

The following guides contain specific troubleshooting information for the server.

- *ProLiant Gen9 Troubleshooting Guide, Volume I: Troubleshooting*
- *ProLiant Gen9 Troubleshooting Guide, Volume II: Error messages*

You can access these manuals at <http://www.hpe.com/support/proliantgen9/docs>.



**IMPORTANT:**

Some troubleshooting procedures found in ProLiant server guides may not apply to particular HPE StoreEasy 1000 Storage models. If necessary, check with your HPE Support representative for further assistance.

For HPE StoreEasy 1000 Storage manuals, go to <http://www.hpe.com/info/StoreEasy1000-manuals>.

For software-related components and issues, online help or user guide documentation may offer troubleshooting assistance. Known issues, workarounds and service releases are addressed in this guide or the release notes.

- Customer notices—Address informational topics about HPE StoreEasy 1000 Storage.
- Customer advisories—Address known issues and solutions or workarounds.

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**NOTE:**

You must register for Subscriber's Choice to receive customer advisories and notices.

## Microsoft Systems Center Operations Manager

Microsoft Systems Center Operations Manager (SCOM) provides comprehensive monitoring, performance management, and analysis tools to maintain Windows OS and application platforms. This solution allows you to monitor Microsoft Windows environments and HPE storage products through a common OpsMgr console. To download Hewlett Packard Enterprise management packs for Microsoft System Center Operations Manager, including installation, configuration, and usage documentation, visit the **Hewlett Packard Enterprise Management Packs for Microsoft Systems Center** site at: <https://h20392.www2.hpe.com/portal/swdepot/displayProductInfo.do?>

## Removing and replacing hardware components

For information on removing and replacing a hardware component, follow the component removal and replacement instructions in the appropriate ProLiant user guide.

The following list identifies the ProLiant model for each HPE StoreEasy 1000 Storage product:

- 1450—ProLiant DL160 Gen9 server
- 1550—ProLiant ML110 Gen9 server
- 1650—ProLiant DL380 Gen9 server
- 1650E—Apollo 4200 Gen9 server
- 1850—ProLiant DL380 Gen9 server

The ProLiant documentation is available at <http://www.hpe.com/support/proliantgen9/docs>.

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**NOTE:**

- After replacing the system board, you must ensure that the correct Product ID is reflected in the system BIOS and that the product name is installed on the replacement part. The correct product name is important for applications such as System Insight Manager and Insight Remote Support. To install the correct product name, browse to the C:\nas\components\support\naming folder. Locate and run the Smart Component that applies to your system. After running the Smart Component, you must shut down and then restart your system for the changes to take effect. On multi-node clusters, such as HPE StoreEasy 1000 Storage systems, HPE recommends that you move cluster resources to another node before shutting down the node that is being renamed. If you run the incorrect Smart Component, the product name will be set incorrectly, but it will not affect your system in any other way.
- There is a customer advisory available that provides the steps for re-activating the operating system after replacing a system board. Here is the link to the advisory:

[https://support.hpe.com/hpesc/public/docDisplay?docLocale=en\\_US&docId=c05257301](https://support.hpe.com/hpesc/public/docDisplay?docLocale=en_US&docId=c05257301)

## Surface Scan Analysis

Hewlett Packard Enterprise Smart Array controllers perform a background surface analysis during inactive periods, continually scanning all drives for media defects. Hewlett Packard Enterprise Smart Array controllers can also detect media defects when accessing a bad sector during busy periods. If an Hewlett Packard Enterprise Smart Array controller finds a recoverable media defect, the controller automatically remaps the bad sector to a reserve area on the disk drive. If the controller finds an unrecoverable media defect and you have configured a fault-tolerant logical drive, the controller automatically regenerates the data and writes it to the remapped reserved area on the disk drive. Surface Scan Analysis interval can be tuned from UI and it should be noted that, disabling Surface Scan Analysis will prevent the controller from proactively finding and correcting disk surface errors, which may lead to data loss.

## Serial Number

Use this option to re-enter the server serial number after replacing the system board. Consult a qualified IT service specialist for assistance in modifying this value.

### Re-entering a serial number

#### Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Advanced Options > Advanced System ROM Options > Serial Number** and press **Enter**.
2. Enter the serial number and press **Enter**.
3. Press **F10**.
4. Press **Enter**.

## Product ID

Use this option to re-enter the product ID after replacing the system board.

### Re-entering a product ID

#### Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration**

- (RBSU) > Advanced Options > Advanced System ROM Options > Product ID** and press **Enter**.
2. Enter the product ID and press **Enter**.
  3. Press **F10**.
  4. Press **Enter**.

## Recovering HPE StoreEasy 1000 Storage

This chapter describes how to restore the HPE StoreEasy 1000 Storage system to its factory default state. You can perform a system recovery using the System Recovery DVD (if ordered). If you have not ordered the System Recovery DVD, you can download the free System Recovery image from [HPE Software Depot](#) and save the image file in a USB flash drive or DVD to perform system recovery.

For information on creating a system recovery USB flash drive or DVD, see [Creating a USB flash drive with an image file from HPE Software Depot](#) and [Creating a DVD with an image file from HPE Software Depot](#).

### NOTE:

Disconnect any external storage from that server prior to booting the server to recover the image. Otherwise, you might experience a hang due to the system trying to enumerate the volumes in the external storage.

## System Recovery DVD

The System Recovery DVD can be ordered optionally with the HPE StoreEasy 1000 Storage system. Using the System Recovery DVD, you can install an image or recover from a catastrophic failure.

At any time, you may boot from the DVD and restore the server to the factory condition. This enables you to recover the system if all other means to boot the server fail.

While the recovery process makes every attempt to preserve the existing data volumes, you must have a backup of your data before recovering the system.

### **IMPORTANT:**

All data on the original OS logical drive is erased during the recovery process.





During system recovery, you can replace the existing drives with drives of the same size or larger. HPE recommends that the replacement drives be the same type as the original drives, but it is not required. However, drives in the same RAID group must all be the same type (you cannot mix drive types in a RAID group).

If you replace any disk drives and then perform a system recovery, you must ensure that the replacement drives do not contain a logical drive. Use the Option ROM Configuration for Arrays (ORCA) utility to delete logical drives. For more information about ORCA, see the *Configuring Arrays on HPE Smart Array Controllers Reference Guide*, which is available at:

<http://www.hpe.com/support/manuals>

## Using the System Recovery DVD to save system data

Boot the System Recovery DVD and when prompted, select **Windows Recovery Environment**. Perform the following steps:

### Procedure

1. Select the keyboard layout.
2. Select **Troubleshoot > Advanced Options > Command Prompt**.
3. Enter `WPEINIT` and wait for approximately ten seconds before proceeding.
4. Enter `IPCONFIG` at the command prompt to confirm that the network interface has an IP address.

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**NOTE:**

- If your network is not using DHCP, manually assign the IP address and DNS information. The following are some examples of the commands for manually assigning an IP address:

- `netsh interface ip set address "connection name" static 192.168.0.101 255.255.255.0 192.168.0.1`
- `netsh interface ip add dns "connection name" 208.67.222.222`
- `netsh interface ip add dns "connection name" 208.67.220.220 index=2`

For more information on using the `netsh` command, go to <https://technet.microsoft.com/en-us/library/bb490943.aspx>.

- Starting the network might take some time. Continue to the next step only after a valid IP address is assigned to the network interface.

5. Enter `NET USE Z: \\servername\sharename` at the command prompt, where `\\servername\sharename` is the UNC path to a network share where the data will be copied.
6. If prompted, enter the username and password for the share that you are accessing.

When the share is mapped to the `Z:` drive, you can use Robocopy to copy files from the system to the network share. For more information on Robocopy, see <https://technet.microsoft.com/library/cc733145.aspx>.

## Drive letters are not assigned after a restore

When a system that has existing data volumes (non-operating system volumes) is restored using the System Recovery DVD, the data volumes will not have drive letters assigned to them. This is by design. The volume labels are retained and can be used to identify the data volumes.

You can assign drive letters to volumes using `diskpart.exe` or Disk Management.

To use Disk Management:

1. Click **Start**→**Windows PowerShell**.

The Windows PowerShell window opens.

2. Enter `diskmgmt.msc` and press Enter.

The Disk Management window opens.

3. Right-click the disk and partition the one for which you want to assign a drive letter and select **Change Drive Letter and Paths**.

## Creating a system recovery USB flash drive using the System Recovery DVD

If you create a backup copy of the System Recovery DVD using a USB flash drive, you can also use it to restore the system.

To create a system recovery USB flash drive using the System Recovery DVD:

## Procedure

1. Obtain a blank 8 GB or larger USB flash drive.
2. Insert the USB flash device into your workstation or laptop.
3. Open an elevated command prompt with Administrator privileges.
4. At the command prompt, enter `diskpart`.
5. At the `diskpart` prompt, enter `list disk`.
6. Identify the disk number that corresponds to the flash drive. This is typically the last disk listed.
7. Enter `sel disk <USB drive number>` (for example, `sel disk 4`).
8. Enter `clean`. This deletes everything from the USB flash device, so ensure that you have the proper disk selected.
9. Enter `create par primary`.
10. Enter `sel par 1`.
11. Enter `format fs=fat32 quick`.
12. Enter `active` to mark the partition as active.
13. Enter `assign letter=<drive letter>` to assign a drive letter to the USB drive (for example, `assign letter=U`).
14. Enter `exit` to quit `diskpart` context commands.
15. Insert the System Recovery DVD into the computer.
16. Using Windows Explorer or a comparable utility, open the DVD so that all contents are visible, including hidden and system files.
17. Select all files (including `bootmgr`) on the DVD.
18. Copy all of the selected files to the root of the USB flash drive.

## Creating a USB flash drive with an image file from HPE Software Depot

To create a system recovery USB flash drive with an image file from [HPE Software Depot](#):

### Procedure

1. After downloading the image file you should mount the ISO locally so that you will have access to the files. Insert a USB flash drive into the system.
2. Open an elevated command prompt with Administrator privileges, type `diskpart`, and then press **Enter**.
3. Type `list disk` to determine the USB flash drive number or drive letter and press **Enter**.
4. Note the drive number or drive letter of the USB flash drive.
5. Type `select disk <x>`, where `<x>` is the drive number or drive letter of the USB flash drive and press **Enter**.
6. Type `clean` to delete the data from the USB flash drive and press **Enter**.

7. Type `create part pri` to create a new primary partition in the USB flash drive and press **Enter**.
8. Type `select part 1` to select the partition that you just created and press **Enter**.
9. To format the partition as FAT32, type `format fs=fat32 quick` and press **Enter**.



**IMPORTANT:**

Since the server platforms are configured with Unified Extensible Firmware Interface (UEFI), you must format the USB flash drive as FAT32 instead of NTFS. To format the partition as FAT32, type `3PAR File controllerformat fs=fat32 quick` and press **Enter**.

10. Type `active` to mark the partition as active and press **Enter**.
11. Type `Exit` to quit diskpart context commands and press **Enter**.
12. Copy the installation files included in the disc image file (ISO) to the root of the USB flash drive.

## Creating a DVD with an image file from HPE Software Depot

To create a system recovery DVD with an image file from [HPE Software Depot](#):

### Procedure

1. Insert a blank dual layer DVD in the drive.
2. Locate the ISO image file on your system and then double-click it.  
The **Windows Disk Image Burner** window appears.
3. Select the disk burner that you want to use. This is applicable only if you have more than one diskburners.
4. Select **Verify disc after burning** to verify that the ISO image has burned correctly.
5. Click **Burn**.

On completion, the appropriate status is displayed on the screen.

## Restoring the factory image with a DVD or USB flash device

### Procedure

1. Do one of the following:
  - a. For direct access, insert the System Recovery DVD or a bootable USB flash device (prepared with a System Recovery image).
  - b. For remote management access, connect to the server using iLO from a client PC. Insert the System Recovery DVD in the client PC or attach a bootable USB flash device that is prepared with a System Recovery image.
2. Reboot the server blade to either the USB flash device or USB DVD drive.

The system BIOS attempts to boot to the USB device first by default. Watch the monitor output during the boot as you may need to press a key to boot to the USB media.

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**NOTE:**

If directly connected, you may have to change the BIOS settings to ensure proper boot sequence. If connected remotely, you may have to change some iLO settings to ensure proper boot sequence.

**3. Click the option for the StoreEasy System Recovery.**

The recovery process completes with minimal user intervention required. The server automatically reboots more than once.

**! IMPORTANT:**

Do not interrupt the recovery process.

**4. Remove the directly connected DVD or flash device (or remotely connected iLO virtual DVD or flash device) from the server. Be sure to reconnect any external storage that was detached and reboot the server before proceeding.**

## Backing up and restoring HPE StoreEasy 1000 Storage with Windows Recovery Environment

To use Windows Recovery Environment, you must have created a system backup with the **Windows Server Backup** utility. You can either perform a single back up or schedule a regular back up.

Perform the following steps to create a one-time system backup using Server Manager:

**Procedure**

1. Open Server Manager and click **Tools > Windows Server Backup**.
2. In the **Local Backup** window, create one-time backup of the data by performing one of the following steps:
  - From the **Action** menu, select **Backup Once**.
  - In the left pane, right-click on **Local Backup** and select **Backup Once**.

The **Backup Once Wizard** is launched.

3. During one-time backup, the **Different options** option is selected by default. The **Schedule backup options** is unavailable. Click **Next** to continue.
4. Select **Full Server (recommended)** to backup all server data, applications, and system state and click **Next** to continue.
5. Select **Remote shared folder** as the destination type and click **Next** to continue.
6. Enter the path to the remote folder in **Location** and select the desired option in the **Access control** group. Click **Next** to continue.
7. Review the items selected for the backup and click **Backup**.

A backup of the items is created and saved at the specified destination. The backup activity is also displayed on the **Local Backup** window.

Perform the following steps to restore the system with Windows Recovery Environment:

1. Do one of the following:

- For direct access, connect the cable and insert the System Recovery DVD in the StoreEasy system or attach a bootable USB flash drive that is prepared with a System Recovery image.
- For remote management access, connect to the server using iLO from the client PC. Insert the System Recovery DVD in the StoreEasy system or attach a bootable USB flash device that is prepared with a System Recovery image.

2. Reboot the server to either the USB flash device or USB DVD drive.

The system BIOS attempts to boot to the USB device by default. Watch the monitor output during the boot as you may need to press a key to boot to the USB media.

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**NOTE:**

If directly connected, you might have to change the BIOS settings to ensure proper boot sequence. If connected remotely, you might have to change some iLO settings to ensure proper boot sequence.

3. In **Windows Boot Manager**, select **Windows Recovery Environment**.

The recovery environment is loaded and the **System Recovery Options** wizard opens.

4. Select the keyboard layout.
5. Select **Troubleshoot** to access the repair tools that allow you to recover or troubleshoot Windows.
6. Select **Advanced options** to access the advanced repair options.
7. Select **System Image Recovery** to restore the system using a previously created system recovery image.
8. Select the target operating system to be restored.

The **Re-image your computer** wizard is launched, which scans the computer for a system image. If it is unable to locate a system image, the following message is displayed:



9. Attach an external drive or insert a DVD that contains the backup files and click **Retry**. If you want to recover from the network, click **Cancel**.
10. Select one of the following options and click **Next**:
  - **Use the latest available image**—Select to use the backup image that was recently created. If you are restoring from the network, this option is unavailable.
  - **Select a system image**—Select to restore from the network.
11. If you are restoring from the network, click **Advanced**, and then select **Search for a system image on the network**.
12. Click **Yes** on the confirmation message to proceed with the network connectivity.
13. Enter the share path where the backup image is stored and click **OK**.

14. Enter the network login credentials for authentication and click **OK**.
15. Select the system image from the list and click **Next**.
16. Select the date and time of the system image that you want to restore and click **Next**.
17. Select **Format and repartition** disks to delete existing partitions and reformat all disks during the restore process and click **Next**. If you do not want to restore certain disks, click **Exclude Disks**.

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**NOTE:** If the **Format and repartition disks** option is unavailable, click **Install Drivers** to install the drivers for the disks that you want to restore.

18. Verify the system image details and click **Finish** to start the recovery process.
19. Click **Yes** on the confirmation message to proceed with Windows recovery.



**IMPORTANT:**

Do not interrupt the recovery process.

When the system recovery completes, the system reboots. If you had external storage that was detached as recommended then reattach the storage and reboot the server.

Proceed with reconfiguring the server, following the steps in this administrator guide for configuring the system.



# Product Feedback

The Product Feedback feature enables you to send your suggestions, ideas on product improvement, or feedback on HPE StoreEasy 1000 Storage to <mailto:storeeasyproductfeedback@hpe.com>. You can access the Product Feedback dialog box using the following methods:

- Double-click the **Product Feedback** icon on the desktop.
- Click **Product Feedback** on the **Start** screen.

# Iternity iCAS

Get open, flexible, and expandable long-term archiving using HPE StoreEasy with iTernity Compliant Archive Solution (iCAS). Now validated to meet SEC 17a-4(f) requirements. A shortcut to **iCAS** is provided on the desktop and Start screen. See the Iternity website for more information about iCAS and to sign up for a free trial.

# Support and other resources

## Accessing Hewlett Packard Enterprise Support

- For live assistance, go to the Contact Hewlett Packard Enterprise Worldwide website:  
<http://www.hpe.com/assistance>
- To access documentation and support services, go to the Hewlett Packard Enterprise Support Center website:  
<http://www.hpe.com/support/hpesc>

### Information to collect

- Technical support registration number (if applicable)
- Product name, model or version, and serial number
- Operating system name and version
- Firmware version
- Error messages
- Product-specific reports and logs
- Add-on products or components
- Third-party products or components

## Accessing updates

- Some software products provide a mechanism for accessing software updates through the product interface. Review your product documentation to identify the recommended software update method.
- To download product updates:  
**Hewlett Packard Enterprise Support Center**  
[www.hpe.com/support/hpesc](http://www.hpe.com/support/hpesc)  
**Hewlett Packard Enterprise Support Center: Software downloads**  
[www.hpe.com/support/downloads](http://www.hpe.com/support/downloads)  
**Software Depot**  
[www.hpe.com/support/softwaredepot](http://www.hpe.com/support/softwaredepot)
- To subscribe to eNewsletters and alerts:  
[www.hpe.com/support/e-updates](http://www.hpe.com/support/e-updates)
- To view and update your entitlements, and to link your contracts and warranties with your profile, go to the Hewlett Packard Enterprise Support Center **More Information on Access to Support Materials** page:  
[www.hpe.com/support/AccessToSupportMaterials](http://www.hpe.com/support/AccessToSupportMaterials)

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**!** **IMPORTANT:**

Access to some updates might require product entitlement when accessed through the Hewlett Packard Enterprise Support Center. You must have an HP Passport set up with relevant entitlements.

## Websites

### General websites

#### Hewlett Packard Enterprise Information Library

[www.hpe.com/info/EIL](http://www.hpe.com/info/EIL)

#### Single Point of Connectivity Knowledge (SPOCK) Storage compatibility matrix

[www.hpe.com/storage/spock](http://www.hpe.com/storage/spock)

#### Storage white papers and analyst reports

[www.hpe.com/storage/whitepapers](http://www.hpe.com/storage/whitepapers)

For additional websites, see [Support and other resources](#).

## Customer self repair

Hewlett Packard Enterprise customer self repair (CSR) programs allow you to repair your product. If a CSR part needs to be replaced, it will be shipped directly to you so that you can install it at your convenience. Some parts do not qualify for CSR. Your Hewlett Packard Enterprise authorized service provider will determine whether a repair can be accomplished by CSR.

For more information about CSR, contact your local service provider or go to the CSR website:

<http://www.hpe.com/support/selfrepair>

## Remote support

Remote support is available with supported devices as part of your warranty or contractual support agreement. It provides intelligent event diagnosis, and automatic, secure submission of hardware event notifications to Hewlett Packard Enterprise, which will initiate a fast and accurate resolution based on your product's service level. Hewlett Packard Enterprise strongly recommends that you register your device for remote support.

If your product includes additional remote support details, use search to locate that information.

### Remote support and Proactive Care information

#### HPE Get Connected

[www.hpe.com/services/getconnected](http://www.hpe.com/services/getconnected)

#### HPE Proactive Care services

[www.hpe.com/services/proactivecare](http://www.hpe.com/services/proactivecare)

#### HPE Proactive Care service: Supported products list

[www.hpe.com/services/proactivecaresupportedproducts](http://www.hpe.com/services/proactivecaresupportedproducts)

#### HPE Proactive Care advanced service: Supported products list

[www.hpe.com/services/proactivecareadvancedsupportedproducts](http://www.hpe.com/services/proactivecareadvancedsupportedproducts)

### Proactive Care customer information

#### Proactive Care central

[www.hpe.com/services/proactivecarecentral](http://www.hpe.com/services/proactivecarecentral)

Proactive Care service activation

[www.hpe.com/services/proactivecarecentralgetstarted](http://www.hpe.com/services/proactivecarecentralgetstarted)

## Documentation feedback

Hewlett Packard Enterprise is committed to providing documentation that meets your needs. To help us improve the documentation, send any errors, suggestions, or comments to Documentation Feedback ([docsfeedback@hpe.com](mailto:docsfeedback@hpe.com)). When submitting your feedback, include the document title, part number, edition, and publication date located on the front cover of the document. For online help content, include the product name, product version, help edition, and publication date located on the legal notices page.

# Operating system logical drives

The logical disks reside on physical drives as shown in [Table 12: HPE StoreEasy 1000 Storage RAID configurations](#) on page 188.

**!** **IMPORTANT:**

The first two logical drives are configured for the HPE StoreEasy 1000 Storage system operating system.

The Operating System volume default factory settings can be customized after the operating system is up and running. The OS logical drive size can be changed to 120 GB or higher.

If the Operating System volume is customized and the System Recovery DVD is run at a later time, the System Recovery process will maintain the custom settings as long as the above criteria are met (OS logical drive size of 120 GB or higher) and the OS volume is labeled **System**. If the storage system arrays are deleted and the System Recovery DVD is run, the System Recovery process will configure the HPE StoreEasy 1000 Storage using the factory default settings listed in [Table 12: HPE StoreEasy 1000 Storage RAID configurations](#) on page 188.

HPE StoreEasy 1000 Storage systems do not include preconfigured data volumes. The administrator must configure data storage for HPE StoreEasy 1000 Storage.

The system reserved partition contains the operating system boot loader and allows you to enable BitLocker Drive Encryption for the Operating System volume.

**Table 12: HPE StoreEasy 1000 Storage RAID configurations**

Server model	Logical Disk 1
HPE StoreEasy 1450 Storage	<ul style="list-style-type: none"><li>• Operating System Volume (100 GB)</li><li>• RAID 10</li><li>• Physical Drives 1–4</li></ul>
HPE StoreEasy 1550 Storage	<ul style="list-style-type: none"><li>• Operating System Volume (120 GB)</li><li>• RAID 10</li><li>• Physical Drives 1–4</li></ul>
HPE StoreEasy 1650 Storage	<ul style="list-style-type: none"><li>• Operating System Volume (120 GB)</li><li>• RAID 1</li><li>• Physical Drives Rear Drives Cage bays 1–2</li></ul>

*Table Continued*

Server model	Logical Disk 1
HPE StoreEasy 1650 Expanded Storage	<ul style="list-style-type: none"> <li>• Operating System Volume (120 GB)</li> <li>• RAID 1</li> <li>• M.2 Physical SSDs 9 and 10 bays Installed in PCIe slot 2</li> </ul>
HPE StoreEasy 1850 Storage	<ul style="list-style-type: none"> <li>• Operating System Volume (120 GB)</li> <li>• RAID 1</li> <li>• Physical Drives 25–26</li> </ul>

**NOTE:**

In Smart Storage Administrator, mapping of logical disks begins at 1. In Microsoft Disk Manager, mapping begins at 0.

If the operating system has a failure that might result from corrupt system files, a corrupt registry, or the system hangs during boot, see [Recovering HPE StoreEasy 1000 Storage](#) on page 176.

# Network ports

The following table provides information on the local and remote network ports that are used by various HPE StoreEasy 1000 Storage applications.

**Table 13: Local and remote ports**

Application	Local port number	Remote port number	Enable
NetBIOS TCP Port 49258	49258	Any	Yes
Network Storage System- HTTPS-3202	3202	Any	Yes
Network Storage System- HTTP-3201	3201	Any	Yes
Microsoft iSCSI Software Target Service-UDP-138	138	Any	Yes
Microsoft iSCSI Software Target Service-TCP-135	135	Any	Yes
Microsoft iSCSI Software Target Service-TCP-3260	3260	Any	Yes
OEM OOBE Discovery Service (WSD-IN)	3702	Any	Yes
OEM OOBE Discovery Service (WSD-OUT)	Any	3702	Yes
LPD Service	515	Any	Yes
Windows Standards- Based Storage Management CIM-XML indications inbound	5990	Any	Yes
Windows Standards- Based Storage Management SLP outbound	427	Any	Yes
Failover Clusters (DCOM-RPC-EPMAP-In)	135	Any	Yes
Failover Clusters — Named Pipes (NP-In)	445	Any	Yes
Failover Clusters (UDP- Out & In)	3343	3343	Yes

*Table Continued*



<b>Application</b>	<b>Local port number</b>	<b>Remote port number</b>	<b>Enable</b>
Failover Clusters (TCP-In)	3343	Any	Yes
SNMP Service (UDP Out)	Any	161	Yes
SNMP Service (UDP In)	161	Any	Yes
DFS Management (SMB-In)	445	Any	Yes
DFS Management (DCOM-In)	135	Any	Yes
File Server Remote Management (SMB-In)	445	Any	Yes
File Server Remote Management (DCOM-In)	135	Any	Yes
Server for NFS (NFS-UDP-In)	2049	Any	Yes
Portmap for UNIX-based Software (TCP-In)	111	Any	Yes
Windows Sync Share (HTTPS-In)	443	Any	Yes
Windows Sync Share (HTTP-In)	80	Any	Yes
World Wide Web Services (HTTPS Traffic-In)	443	Any	Yes
World Wide Web Services (HTTP Traffic-In)	80	Any	Yes
Messaging System-HTTP-3202	3202	Any	Yes
Messaging System-HTTP-3201	3201	Any	Yes
Remote Desktop - User Mode (TCP-In)	3389	Any	Yes
Remote Desktop - User Mode ((UDP-In)	3389	Any	Yes

*Table Continued*

<b>Application</b>	<b>Local port number</b>	<b>Remote port number</b>	<b>Enable</b>
Core Networking - Dynamic Host Configuration Protocol for IPv6(DHCPV6-Out)	546	547	Yes
Core Networking - Dynamic Host Configuration Protocol for IPv6(DHCPV6-In)	546	547	Yes
Core Networking - Dynamic Host Configuration Protocol (DHCP-Out)	68	67	Yes
Core Networking - Dynamic Host Configuration Protocol (DHCP-In)	68	67	Yes
Remote Desktop - User Mode (UDP-In)	3389	Any	Yes
Remote Desktop - User Mode (TCP-In)	3389	Any	Yes
File and Printer Sharing (LLMNR-UDP-Out)	Any		Yes
File and Printer Sharing (LLMNR-UDP-In)	5355	Any	Yes
Windows Remote Management (HTTP-In)	5985	Any	Yes
File and Printer Sharing (NB-Session-In)	139	Any	Yes
File and Printer Sharing (NB-Session-Out)	Any	139	Yes
File and Printer Sharing (SMB-In)	445	Any	Yes
File and Printer Sharing (SMB-Out)	Any	445	Yes
File and Printer Sharing (NB-Name-In)	137	Any	Yes
File and Printer Sharing (NB-Name-Out)	Any	137	Yes

*Table Continued*

<b>Application</b>	<b>Local port number</b>	<b>Remote port number</b>	<b>Enable</b>
File and Printer Sharing (NB-Datagram-In)	138	Any	Yes
File and Printer Sharing (NB-Datagram-Out)	Any	138	Yes