



Configure audit client access

StorageGRID

NetApp
July 19, 2022

Table of Contents

- Configure audit client access 1
 - Configure audit clients for CIFS 1
 - Configure the audit client for NFS 11

Configure audit client access

The Admin Node, through the Audit Management System (AMS) service, logs all audited system events to a log file available through the audit share, which is added to each Admin Node at installation. For easy access to audit logs, you can configure client access to audit shares for both CIFS and NFS.

The StorageGRID system uses positive acknowledgment to prevent loss of audit messages before they are written to the log file. A message remains queued at a service until the AMS service or an intermediate audit relay service has acknowledged control of it.

For more information, see [Review audit logs](#).



Audit export through CIFS/Samba has been deprecated and will be removed in a future StorageGRID release. If you have the option to use CIFS or NFS, choose NFS.

Configure audit clients for CIFS

The procedure used to configure an audit client depends on the authentication method: Windows Workgroup or Windows Active Directory (AD). When added, the audit share is automatically enabled as a read-only share.



Audit export through CIFS/Samba has been deprecated and will be removed in a future StorageGRID release.

Configure audit clients for Workgroup

Perform this procedure for each Admin Node in a StorageGRID deployment from which you want to retrieve audit messages.

What you'll need

- You have the `Passwords.txt` file with the root/admin account password (available in the SAID package).
- You have the `Configuration.txt` file (available in the SAID package).

About this task

Audit export through CIFS/Samba has been deprecated and will be removed in a future StorageGRID release.

Steps

1. Log in to the primary Admin Node:
 - a. Enter the following command: `ssh admin@primary_Admin_Node_IP`
 - b. Enter the password listed in the `Passwords.txt` file.
 - c. Enter the following command to switch to root: `su -`
 - d. Enter the password listed in the `Passwords.txt` file.

When you are logged in as root, the prompt changes from `$` to `#`.

2. Confirm that all services have a state of Running or Verified: `storagegrid-status`

If all services are not Running or Verified, resolve issues before continuing.

3. Return to the command line, press **Ctrl+C**.
4. Start the CIFS configuration utility: `config_cifs.rb`

Shares	Authentication	Config	

add-audit-share	set-authentication	validate-config	
enable-disable-share	set-netbios-name	help	
add-user-to-share	join-domain	exit	
remove-user-from-share	add-password-server		
modify-group	remove-password-server		
	add-wins-server		
	remove-wins-server		

5. Set the authentication for the Windows Workgroup:

If authentication has already been set, an advisory message appears. If authentication has already been set, go to the next step.

- a. Enter: `set-authentication`
- b. When prompted for Windows Workgroup or Active Directory installation, enter: `workgroup`
- c. When prompted, enter a name of the Workgroup: `workgroup_name`
- d. When prompted, create a meaningful NetBIOS name: `netbios_name`

or

Press **Enter** to use the Admin Node's hostname as the NetBIOS name.

The script restarts the Samba server and changes are applied. This should take less than one minute. After setting authentication, add an audit client.

- e. When prompted, press **Enter**.

The CIFS configuration utility is displayed.

6. Add an audit client:

- a. Enter: `add-audit-share`



The share is automatically added as read-only.

- b. When prompted, add a user or group: `user`

- c. When prompted, enter the audit user name: *audit_user_name*
- d. When prompted, enter a password for the audit user: *password*
- e. When prompted, re-enter the same password to confirm it: *password*
- f. When prompted, press **Enter**.

The CIFS configuration utility is displayed.



There is no need to enter a directory. The audit directory name is predefined.

7. If more than one user or group is permitted to access the audit share, add the additional users:

- a. Enter: `add-user-to-share`

A numbered list of enabled shares is displayed.

- b. When prompted, enter the number of the audit-export share: *share_number*

- c. When prompted, add a user or group: *user*

or group

- d. When prompted, enter the name of the audit user or group: *audit_user* or *audit_group*

- e. When prompted, press **Enter**.

The CIFS configuration utility is displayed.

- f. Repeat these substeps for each additional user or group that has access to the audit share.

8. Optionally, verify your configuration: `validate-config`

The services are checked and displayed. You can safely ignore the following messages:

```
Can't find include file /etc/samba/includes/cifs-interfaces.inc
Can't find include file /etc/samba/includes/cifs-filesystem.inc
Can't find include file /etc/samba/includes/cifs-custom-config.inc
Can't find include file /etc/samba/includes/cifs-shares.inc
rlimit_max: increasing rlimit_max (1024) to minimum Windows limit
(16384)
```

- a. When prompted, press **Enter**.

The audit client configuration is displayed.

- b. When prompted, press **Enter**.

The CIFS configuration utility is displayed.

9. Close the CIFS configuration utility: `exit`

10. Start the Samba service: `service smb start`

11. If the StorageGRID deployment is a single site, go to the next step.

or

Optionally, if the StorageGRID deployment includes Admin Nodes at other sites, enable these audit share as required:

- a. Remotely log in to a site's Admin Node:
 - i. Enter the following command: `ssh admin@grid_node_IP`
 - ii. Enter the password listed in the `Passwords.txt` file.
 - iii. Enter the following command to switch to root: `su -`
 - iv. Enter the password listed in the `Passwords.txt` file.
- b. Repeat the steps to configure the audit share for each additional Admin Node.
- c. Close the remote secure shell login to the remote Admin Node: `exit`

12. Log out of the command shell: `exit`

Configure audit clients for Active Directory

Perform this procedure for each Admin Node in a StorageGRID deployment from which you want to retrieve audit messages.

What you'll need

- You have the `Passwords.txt` file with the root/admin account password (available in the SAID package).
- You have the CIFS Active Directory username and password.
- You have the `Configuration.txt` file (available in the SAID package).



Audit export through CIFS/Samba has been deprecated and will be removed in a future StorageGRID release.

Steps

1. Log in to the primary Admin Node:
 - a. Enter the following command: `ssh admin@primary_Admin_Node_IP`
 - b. Enter the password listed in the `Passwords.txt` file.
 - c. Enter the following command to switch to root: `su -`
 - d. Enter the password listed in the `Passwords.txt` file.

When you are logged in as root, the prompt changes from `$` to `#`.

2. Confirm that all services have a state of Running or Verified: `storagegrid-status`

If all services are not Running or Verified, resolve issues before continuing.

3. Return to the command line, press **Ctrl+C**.
4. Start the CIFS configuration utility: `config_cifs.rb`

Shares	Authentication	Config
add-audit-share	set-authentication	validate-config
enable-disable-share	set-netbios-name	help
add-user-to-share	join-domain	exit
remove-user-from-share	add-password-server	
modify-group	remove-password-server	
	add-wins-server	
	remove-wins-server	

5. Set the authentication for Active Directory: `set-authentication`

In most deployments, you must set the authentication before adding the audit client. If authentication has already been set, an advisory message appears. If authentication has already been set, go to the next step.

- When prompted for Workgroup or Active Directory installation: `ad`
- When prompted, enter the name of the AD domain (short domain name).
- When prompted, enter the domain controller's IP address or DNS hostname.
- When prompted, enter the full domain realm name.

Use uppercase letters.

- When prompted to enable winbind support, type `y`.

Winbind is used to resolve user and group information from AD servers.

- When prompted, enter the NetBIOS name.
- When prompted, press **Enter**.

The CIFS configuration utility is displayed.

6. Join the domain:

- If not already started, start the CIFS configuration utility: `config_cifs.rb`
- Join the domain: `join-domain`
- You are prompted to test if the Admin Node is currently a valid member of the domain. If this Admin Node has not previously joined the domain, enter: `no`
- When prompted, provide the Administrator's username: `administrator_username`

where `administrator_username` is the CIFS Active Directory username, not the StorageGRID username.

- When prompted, provide the Administrator's password: `administrator_password`

where `administrator_password` is the CIFS Active Directory password, not the StorageGRID password.

password.

- f. When prompted, press **Enter**.

The CIFS configuration utility is displayed.

7. Verify that you have correctly joined the domain:

- a. Join the domain: `join-domain`

- b. When prompted to test if the server is currently a valid member of the domain, enter: `y`

If you receive the message “Join is OK,” you have successfully joined the domain. If you do not get this response, try setting authentication and joining the domain again.

- c. When prompted, press **Enter**.

The CIFS configuration utility is displayed.

8. Add an audit client: `add-audit-share`

- a. When prompted to add a user or group, enter: `user`

- b. When prompted to enter the audit user name, enter the audit user name.

- c. When prompted, press **Enter**.

The CIFS configuration utility is displayed.

9. If more than one user or group is permitted to access the audit share, add additional users: `add-user-to-share`

A numbered list of enabled shares is displayed.

- a. Enter the number of the audit-export share.

- b. When prompted to add a user or group, enter: `group`

You are prompted for the audit group name.

- c. When prompted for the audit group name, enter the name of the audit user group.

- d. When prompted, press **Enter**.

The CIFS configuration utility is displayed.

- e. Repeat this step for each additional user or group that has access to the audit share.

10. Optionally, verify your configuration: `validate-config`

The services are checked and displayed. You can safely ignore the following messages:

- Can't find include file `/etc/samba/includes/cifs-interfaces.inc`
- Can't find include file `/etc/samba/includes/cifs-filesystem.inc`
- Can't find include file `/etc/samba/includes/cifs-interfaces.inc`
- Can't find include file `/etc/samba/includes/cifs-custom-config.inc`

- Can't find include file `/etc/samba/includes/cifs-shares.inc`
- `rlimit_max`: increasing `rlimit_max` (1024) to minimum Windows limit (16384)



Do not combine the setting 'security=ads' with the 'password server' parameter. (by default Samba will discover the correct DC to contact automatically).

- When prompted, press **Enter** to display the audit client configuration.
- When prompted, press **Enter**.

The CIFS configuration utility is displayed.

11. Close the CIFS configuration utility: `exit`

12. If the StorageGRID deployment is a single site, go to the next step.

or

Optionally, if the StorageGRID deployment includes Admin Nodes at other sites, enable these audit shares as required:

- Remotely log in to a site's Admin Node:
 - Enter the following command: `ssh admin@grid_node_IP`
 - Enter the password listed in the `Passwords.txt` file.
 - Enter the following command to switch to root: `su -`
 - Enter the password listed in the `Passwords.txt` file.
- Repeat these steps to configure the audit shares for each Admin Node.
- Close the remote secure shell login to the Admin Node: `exit`

13. Log out of the command shell: `exit`

Add a user or group to a CIFS audit share

You can add a user or group to a CIFS audit share that is integrated with AD authentication.

What you'll need

- You have the `Passwords.txt` file with the root/admin account password (available in the SAID package).
- You have the `Configuration.txt` file (available in the SAID package).

About this task

The following procedure is for an audit share integrated with AD authentication.



Audit export through CIFS/Samba has been deprecated and will be removed in a future StorageGRID release.

Steps

- Log in to the primary Admin Node:

- a. Enter the following command: `ssh admin@primary_Admin_Node_IP`
- b. Enter the password listed in the `Passwords.txt` file.
- c. Enter the following command to switch to root: `su -`
- d. Enter the password listed in the `Passwords.txt` file.

When you are logged in as root, the prompt changes from `$` to `#`.

2. Confirm that all services have a state of Running or Verified. Enter: `storagegrid-status`

If all services are not Running or Verified, resolve issues before continuing.

3. Return to the command line, press **Ctrl+C**.
4. Start the CIFS configuration utility: `config_cifs.rb`

```

-----
| Shares                | Authentication          | Config                  |
-----
| add-audit-share       | set-authentication      | validate-config        |
| enable-disable-share  | set-netbios-name        | help                   |
| add-user-to-share     | join-domain             | exit                   |
| remove-user-from-share| add-password-server     |                         |
| modify-group          | remove-password-server  |                         |
|                       | add-wins-server         |                         |
|                       | remove-wins-server      |                         |
-----

```

5. Start adding a user or group: `add-user-to-share`

A numbered list of audit shares that have been configured is displayed.

6. When prompted, enter the number for the audit share (audit-export): `audit_share_number`

You are asked if you would like to give a user or a group access to this audit share.

7. When prompted, add a user or group: `user or group`
8. When prompted for the user or group name for this AD audit share, enter the name.

The user or group is added as read-only for the audit share both in the server's operating system and in the CIFS service. The Samba configuration is reloaded to enable the user or group to access the audit client share.

9. When prompted, press **Enter**.

The CIFS configuration utility is displayed.

10. Repeat these steps for each user or group that has access to the audit share.
11. Optionally, verify your configuration: `validate-config`

The services are checked and displayed. You can safely ignore the following messages:

- Can't find include file /etc/samba/includes/cifs-interfaces.inc
- Can't find include file /etc/samba/includes/cifs-filesystem.inc
- Can't find include file /etc/samba/includes/cifs-custom-config.inc
- Can't find include file /etc/samba/includes/cifs-shares.inc
 - a. When prompted, press **Enter** to display the audit client configuration.
 - b. When prompted, press **Enter**.

12. Close the CIFS configuration utility: `exit`

13. Determine if you need to enable additional audit shares, as follows:

- If the StorageGRID deployment is a single site, go to the next step.
- If the StorageGRID deployment includes Admin Nodes at other sites, enable these audit shares as required:
 - a. Remotely log in to a site's Admin Node:
 - i. Enter the following command: `ssh admin@grid_node_IP`
 - ii. Enter the password listed in the `Passwords.txt` file.
 - iii. Enter the following command to switch to root: `su -`
 - iv. Enter the password listed in the `Passwords.txt` file.
 - b. Repeat these steps to configure the audit shares for each Admin Node.
 - c. Close the remote secure shell login to the remote Admin Node: `exit`

14. Log out of the command shell: `exit`

Remove a user or group from a CIFS audit share

You cannot remove the last user or group permitted to access the audit share.

What you'll need

- You have the `Passwords.txt` file with the root account passwords (available in the SAID package).
- You have the `Configuration.txt` file (available in the SAID package).

About this task

Audit export through CIFS/Samba has been deprecated and will be removed in a future StorageGRID release.

Steps

1. Log in to the primary Admin Node:

- a. Enter the following command: `ssh admin@primary_Admin_Node_IP`
- b. Enter the password listed in the `Passwords.txt` file.
- c. Enter the following command to switch to root: `su -`
- d. Enter the password listed in the `Passwords.txt` file.

When you are logged in as root, the prompt changes from `$` to `#`.

2. Start the CIFS configuration utility: `config_cifs.rb`

Shares	Authentication	Config	

add-audit-share	set-authentication	validate-config	
enable-disable-share	set-netbios-name	help	
add-user-to-share	join-domain	exit	
remove-user-from-share	add-password-server		
modify-group	remove-password-server		
	add-wins-server		
	remove-wins-server		

3. Start removing a user or group: `remove-user-from-share`

A numbered list of available audit shares for the Admin Node is displayed. The audit share is labeled `audit-export`.

4. Enter the number of the audit share: `audit_share_number`

5. When prompted to remove a user or a group: `user` or `group`

A numbered list of users or groups for the audit share is displayed.

6. Enter the number corresponding to the user or group you want to remove: `number`

The audit share is updated, and the user or group is no longer permitted access to the audit share. For example:

```
Enabled shares
 1. audit-export
Select the share to change: 1
Remove user or group? [User/group]: User
Valid users for this share
 1. audituser
 2. newaudituser
Select the user to remove: 1

Removed user "audituser" from share "audit-export".

Press return to continue.
```

7. Close the CIFS configuration utility: `exit`

8. If the StorageGRID deployment includes Admin Nodes at other sites, disable the audit share at each site as required.

9. Log out of each command shell when configuration is complete: `exit`

Change a CIFS audit share user or group name

You can change the name of a user or a group for a CIFS audit share by adding a new user or group and then deleting the old one.

About this task

Audit export through CIFS/Samba has been deprecated and will be removed in a future StorageGRID release.

Steps

1. Add a new user or group with the updated name to the audit share.
2. Delete the old user or group name.

Related information

- [Add a user or group to a CIFS audit share](#)
- [Remove a user or group from a CIFS audit share](#)

Verify CIFS audit integration

The audit share is read-only. Log files are intended to be read by computer applications and verification does not include opening a file. It is considered sufficient verification that the audit log files appear in a Windows Explorer window. Following connection verification, close all windows.

Configure the audit client for NFS

The audit share is automatically enabled as a read-only share.

What you'll need

- You have the `Passwords.txt` file with the root/admin password (available in the SAID package).
- You have the `Configuration.txt` file (available in the SAID package).
- The audit client is using NFS Version 3 (NFSv3).

About this task

Perform this procedure for each Admin Node in a StorageGRID deployment from which you want to retrieve audit messages.

Steps

1. Log in to the primary Admin Node:
 - a. Enter the following command: `ssh admin@primary_Admin_Node_IP`
 - b. Enter the password listed in the `Passwords.txt` file.
 - c. Enter the following command to switch to root: `su -`
 - d. Enter the password listed in the `Passwords.txt` file.

When you are logged in as root, the prompt changes from `$` to `#`.

2. Confirm that all services have a state of Running or Verified. Enter: `storagegrid-status`

If any services are not listed as Running or Verified, resolve issues before continuing.

3. Return to the command line. Press **Ctrl+C**.
4. Start the NFS configuration utility. Enter: `config_nfs.rb`

```
-----  
| Shares                | Clients                | Config                |  
-----  
| add-audit-share       | add-ip-to-share        | validate-config      |  
| enable-disable-share  | remove-ip-from-share   | refresh-config       |  
|                       |                       | help                 |  
|                       |                       | exit                 |  
-----
```

5. Add the audit client: `add-audit-share`
 - a. When prompted, enter the audit client's IP address or IP address range for the audit share:
`client_IP_address`
 - b. When prompted, press **Enter**.
6. If more than one audit client is permitted to access the audit share, add the IP address of the additional user: `add-ip-to-share`
 - a. Enter the number of the audit share: `audit_share_number`
 - b. When prompted, enter the audit client's IP address or IP address range for the audit share:
`client_IP_address`
 - c. When prompted, press **Enter**.

The NFS configuration utility is displayed.
 - d. Repeat these substeps for each additional audit client that has access to the audit share.
7. Optionally, verify your configuration.
 - a. Enter the following: `validate-config`

The services are checked and displayed.
 - b. When prompted, press **Enter**.

The NFS configuration utility is displayed.
 - c. Close the NFS configuration utility: `exit`
8. Determine if you must enable audit shares at other sites.
 - If the StorageGRID deployment is a single site, go to the next step.
 - If the StorageGRID deployment includes Admin Nodes at other sites, enable these audit shares as required:

- a. Remotely log in to the site's Admin Node:
 - i. Enter the following command: `ssh admin@grid_node_IP`
 - ii. Enter the password listed in the `Passwords.txt` file.
 - iii. Enter the following command to switch to root: `su -`
 - iv. Enter the password listed in the `Passwords.txt` file.
- b. Repeat these steps to configure the audit shares for each additional Admin Node.
- c. Close the remote secure shell login to the remote Admin Node. Enter: `exit`

9. Log out of the command shell: `exit`

NFS audit clients are granted access to an audit share based on their IP address. Grant access to the audit share to a new NFS audit client by adding its IP address to the share, or remove an existing audit client by removing its IP address.

Add an NFS audit client to an audit share

NFS audit clients are granted access to an audit share based on their IP address. Grant access to the audit share to a new NFS audit client by adding its IP address to the audit share.

What you'll need

- You have the `Passwords.txt` file with the root/admin account password (available in the SAID package).
- You have the `Configuration.txt` file (available in the SAID package).
- The audit client is using NFS Version 3 (NFSv3).

Steps

1. Log in to the primary Admin Node:
 - a. Enter the following command: `ssh admin@primary_Admin_Node_IP`
 - b. Enter the password listed in the `Passwords.txt` file.
 - c. Enter the following command to switch to root: `su -`
 - d. Enter the password listed in the `Passwords.txt` file.

When you are logged in as root, the prompt changes from `$` to `#`.

2. Start the NFS configuration utility: `config_nfs.rb`

Shares	Clients	Config
add-audit-share	add-ip-to-share	validate-config
enable-disable-share	remove-ip-from-share	refresh-config
		help
		exit

3. Enter: `add-ip-to-share`

A list of NFS audit shares enabled on the Admin Node is displayed. The audit share is listed as:
`/var/local/audit/export`

4. Enter the number of the audit share: `audit_share_number`

5. When prompted, enter the audit client's IP address or IP address range for the audit share:
`client_IP_address`

The audit client is added to the audit share.

6. When prompted, press **Enter**.

The NFS configuration utility is displayed.

7. Repeat the steps for each audit client that should be added to the audit share.

8. Optionally, verify your configuration: `validate-config`

The services are checked and displayed.

a. When prompted, press **Enter**.

The NFS configuration utility is displayed.

9. Close the NFS configuration utility: `exit`

10. If the StorageGRID deployment is a single site, go to the next step.

Otherwise, if the StorageGRID deployment includes Admin Nodes at other sites, optionally enable these audit shares as required:

a. Remotely log in to a site's Admin Node:

- i. Enter the following command: `ssh admin@grid_node_IP`
- ii. Enter the password listed in the `Passwords.txt` file.
- iii. Enter the following command to switch to root: `su -`
- iv. Enter the password listed in the `Passwords.txt` file.

b. Repeat these steps to configure the audit shares for each Admin Node.

c. Close the remote secure shell login to the remote Admin Node: `exit`

11. Log out of the command shell: `exit`

Verify NFS audit integration

After you configure an audit share and add an NFS audit client, you can mount the audit client share and verify that the files are available from the audit share.

Steps

1. Verify connectivity (or variant for the client system) using the client-side IP address of the Admin Node hosting the AMS service. Enter: `ping IP_address`

Verify that the server responds, indicating connectivity.

2. Mount the audit read-only share using a command appropriate to the client operating system. A sample Linux command is (enter on one line):

```
mount -t nfs -o hard,intr Admin_Node_IP_address:/var/local/audit/export  
myAudit
```

Use the IP address of the Admin Node hosting the AMS service and the predefined share name for the audit system. The mount point can be any name selected by the client (for example, *myAudit* in the previous command).

3. Verify that the files are available from the audit share. Enter: `ls myAudit /*`

where *myAudit* is the mount point of the audit share. There should be at least one log file listed.

Remove an NFS audit client from the audit share

NFS audit clients are granted access to an audit share based on their IP address. You can remove an existing audit client by removing its IP address.

What you'll need

- You have the `Passwords.txt` file with the root/admin account password (available in the SAID package).
- You have the `Configuration.txt` file (available in the SAID package).

About this task

You cannot remove the last IP address permitted to access the audit share.

Steps

1. Log in to the primary Admin Node:
 - a. Enter the following command: `ssh admin@primary_Admin_Node_IP`
 - b. Enter the password listed in the `Passwords.txt` file.
 - c. Enter the following command to switch to root: `su -`
 - d. Enter the password listed in the `Passwords.txt` file.

When you are logged in as root, the prompt changes from `$` to `#`.

2. Start the NFS configuration utility: `config_nfs.rb`

Shares	Clients	Config	

add-audit-share	add-ip-to-share	validate-config	
enable-disable-share	remove-ip-from-share	refresh-config	
		help	
		exit	

3. Remove the IP address from the audit share: `remove-ip-from-share`

A numbered list of audit shares configured on the server is displayed. The audit share is listed as:
`/var/local/audit/export`

4. Enter the number corresponding to the audit share: `audit_share_number`

A numbered list of IP addresses permitted to access the audit share is displayed.

5. Enter the number corresponding to the IP address you want to remove.

The audit share is updated, and access is no longer permitted from any audit client with this IP address.

6. When prompted, press **Enter**.

The NFS configuration utility is displayed.

7. Close the NFS configuration utility: `exit`

8. If your StorageGRID deployment is a multiple data center site deployment with additional Admin Nodes at the other sites, disable these audit shares as required:

a. Remotely log in to each site's Admin Node:

i. Enter the following command: `ssh admin@grid_node_IP`

ii. Enter the password listed in the `Passwords.txt` file.

iii. Enter the following command to switch to root: `su -`

iv. Enter the password listed in the `Passwords.txt` file.

b. Repeat these steps to configure the audit shares for each additional Admin Node.

c. Close the remote secure shell login to the remote Admin Node: `exit`

9. Log out of the command shell: `exit`

Change the IP address of an NFS audit client

Complete these steps if you need to change the IP address of an NFS audit client.

Steps

1. Add a new IP address to an existing NFS audit share.
2. Remove the original IP address.

Related information

- [Add an NFS audit client to an audit share](#)
- [Remove an NFS audit client from the audit share](#)

Copyright Information

Copyright © 2022 NetApp, Inc. All rights reserved. Printed in the U.S. No part of this document covered by copyright may be reproduced in any form or by any means-graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system- without prior written permission of the copyright owner.

Software derived from copyrighted NetApp material is subject to the following license and disclaimer:

THIS SOFTWARE IS PROVIDED BY NETAPP "AS IS" AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED. IN NO EVENT SHALL NETAPP BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

NetApp reserves the right to change any products described herein at any time, and without notice. NetApp assumes no responsibility or liability arising from the use of products described herein, except as expressly agreed to in writing by NetApp. The use or purchase of this product does not convey a license under any patent rights, trademark rights, or any other intellectual property rights of NetApp.

The product described in this manual may be protected by one or more U.S. patents, foreign patents, or pending applications.

RESTRICTED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.277-7103 (October 1988) and FAR 52-227-19 (June 1987).

Trademark Information

NETAPP, the NETAPP logo, and the marks listed at <http://www.netapp.com/TM> are trademarks of NetApp, Inc. Other company and product names may be trademarks of their respective owners.