Spectra Verde Array Family

Release Notes and Documentation Updates

Part Number

90990082 Revision AA

Revision History

Revision	Date	Description
O	December 2014	Updated for Verde 2.0 release.
P	March 2015	Updated for Verde 2.1 release.
Q	May 2015	Updated for Verde 2.1.1 release.
R	August 2015	Updated for Verde 2.1.2 release.
S	September 2015	Updated for Verde 2.1.3 release.
T	November 2015	Updated for Verde 2.1.4 release.
U	December 2015	Updated for Verde 2.2 release for Verde DPE.
V	January 2016	Updated for Verde 2.1.5 release.
W	March 2016	Updated for Verde 3.1 release.
X	April 2016	Updated for Verde 3.1.1 release.
Y	May 2016	Updated for Verde 3.1.2 release.
Z	July 2016	Updated for Verde 3.1.3 release.
AA	December 2016	Updated for Verde 3.1.4 release.
AB	December 2016	Updated for Verde 3.1.5 release.

Note: To make sure you have the release notes for the most current version of the Verde software, log into the Spectra Logic Technical Support portal at support.spectralogic.com. The release notes also include updates to the product documentation.

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Spectra Logic Corporation	Spectra Logic Europe Ltd.
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Boulder, CO 80301	Bracknell
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Phone: 1.800.833.1132 or 1.303.449.6400	United Kingdom
International: 1.303.449.6400	**Phone:** 44 (0) 870.112.2150
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Contents

ABOUT THIS GUIDE

These release notes give you the latest information available about the Spectra® Verde® array, its software, and firmware. They also serve as an addendum to the published documentation for the array.

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Site Preparation Guide Updates	page 56

> **Note:** To make sure you have the release notes for the most current version of the Verde software, log on to the Spectra Logic® Technical Support portal at support.spectralogic.com. The release notes also include updates to the product documentation.

INTENDED AUDIENCE

This guide is intended for data center administrators and operators who maintain and operate file storage systems. The information in this guide assumes a familiarity with computing terminology, RAID technology, SAS connectivity, and Ethernet networking. You also need to be familiar with installing, configuring, and using data file storage and archival software.

RELATED INFORMATION

This section contains information about this document and other documents related to the Spectra Verde array.

Verde User Interface Screens

The Verde interface changes as new features are added or other modifications are made between software revisions. Therefore, the screens you see in the Verde web interface may differ from those shown in this guide.

Related Publications

The following documents related to the Spectra Verde arrays are available from the Spectra Logic website at support.spectralogic.com/documentation/, and from the Documentation screen on the Verde web interface.

- The *Spectra Verde Array Family User Guide* provides information about configuring, using and maintaining your Verde array.

- The *Spectra Verde Array Family Network Setup Tips* provide helpful instructions for troubleshooting common connectivity problems.

- The *Spectra Verde Array Family Quick Start Guide* provides basic instructions for the essential installation and configuration steps.

- The *Spectra Verde Array Family Command Line Interface Guide* describes how to configure, monitor, and maintain the Verde arrays through the command line interface.

- The *Spectra Verde Array Family Site Preparation Guide* provides important information that you should know before installing a Verde or Verde DPE array in your storage environment.

- The *Spectra Verde Array Family Installation Guide* provides instructions for installing an Verde or Verde DPE array.

The following documents are available after logging into your Support portal account at: support.spectralogic.com.

- The *Spectra 12-, 36- & 45-Drive Chassis Drive Replacement Guide* and the *Spectra 96-Drive Chassis Drive Replacement Guide* provide instructions about replacing a failed data drive after the array is installed.

- The *Spectra 12-, 36- & 45-Drive Chassis Power Supply Replacement Guide* and the *Spectra 96-Drive Chassis Power Supply Replacement Guide* provide instructions about replacing a failed power supply after the array is installed.

- The *Spectra 12- & 36-Drive Chassis Boot Drive Replacement Guide* provides instructions about replacing a failed boot drive in the array.

- The *Spectra 12-, 36- & 45-Drive Chassis Fan Replacement Guide* and the *Spectra 96-Drive Chassis Fan Replacement Guide* provide instructions about replacing a failed fan in the array.

- The *Spectra 12-Drive Chassis HBA Replacement Guide* and *Spectra 36-Drive Chassis HBA Replacement Guide* provide instructions for replacing a failed HBA in the array.

- The *Spectra 96-Drive Chassis Fan Replacement Guide* provides instructions for replacing a failed fan in the ArcticBlue expansion node.

- The *Spectra 96-Drive Chassis Power Supply Replacement Guide* provides instructions for replacing a failed power supply in the ArcticBlue expansion node.

- The *Spectra 96-Drive Chassis I/O Module Replacement Guide* provides instructions for replacing a failed I/O module in the ArcticBlue expansion node.

TYPOGRAPHICAL CONVENTIONS

This guide uses the following conventions to highlight important information:

Note: Read text marked by "Note" for additional information or suggestions about the current topic.

Important Read text marked by the "Important" icon for information that helps you complete a procedure or avoid extra steps.

Caution Read text marked by the "Caution" icon for information you must know to avoid damaging the array, the disk drives, or losing data.

WARNING Read text marked by the "Warning" icon for information you must know to avoid personal injury.

WARNUNG Lesen Sie markierten Text durch die "Warnung"-Symbol für die Informationen, die Sie kennen müssen, um Personenschäden zu vermeiden.

These release notes use an arrow (⋯⋮) to describe a series of menu selections. For example:

Select **Configuration** ⋯⋮ **Network**.

— means —

Select **Configuration**, then select **Network**.

Important Information

This section provides information that is essential for ensuring optimal operation of your array and that your data is accessible at all times.

PROTECTING DATA ON THE VERDE

The features described in this section help protect data and keep the array in an optimal state.

Global Spare Drives

Any drives not configured in storage pools act as global spare drives. If a drive failure occurs on the Verde array, it immediately activates a global spare. Having one or more global spare drives in your array is suggested to ensure continued access to a storage pool if a data drive fails.

Volume Snapshots

Volume snapshots are images of a volume's configuration and data makeup as they were when the snapshot was generated. Restoring to a previously created snapshot allows you to go "back in time" and restore the volume to the state it was in when the snapshot was created. You can use a volume snapshot to restore an entire volume, or a single file that was accidentally deleted. Snapshots can be created manually or on a schedule. Volume snapshots are retained on the array until they are deleted.

For more information on creating snapshots, snapshot schedules, and restoring from snapshots, see the *Spectra Verde & Verde DPE Arrays User Guide*.

Verde Software Updates

This section provides instructions to update your Verde array, as well as an overview of the features and changes for each released software version.

UPDATING SOFTWARE

Some problems with the Verde arrays may be fixed by updating the array's software. Spectra Logic provides complete support for the most current release of software and one revision back. Customers using previously released software packages are asked to update to the current release as soon as possible.

> **Note:** You must have a current software upgrade key entered in the array you want to update. See the *Spectra Verde & Verde DPE Arrays User Guide* for more information.

If Automated Software Upload is enabled, when a new release of software is available from the Spectra Logic support website, the array sends an email to all users configured to receive Warning or Informational emails and posts a system message to the Messages screen. If configured to do so, the array also downloads the updated software.

The method used to update the array depends on if the Automated Software Upload feature is enabled or not, and if enabled, whether it is configured to download the update software.

- If the update package downloaded automatically, skip to Install the Update on page 18.

- If you were notified that an update is required, but the update did not download automatically, skip to Download and Stage the Updated Software on page 16.

- If you do not know if the array needs an update installed, continue with Check the Current Software Version on page 15.

Check the Current Software Version

Use the following steps to determine the current software version running on your Verde master node.

1. From the menu bar, select **Support ···⋮ Software.** The Software screen displays.

2. The current software version is listed next to **Current Version** in the Software Update pane.
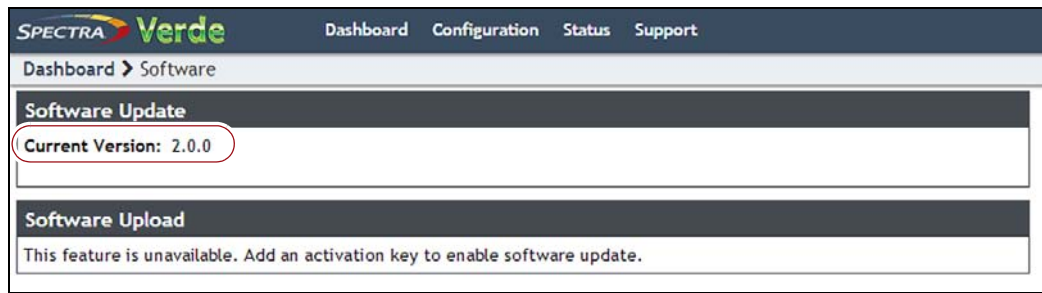
Figure 1 The current Verde software version.

Check the Currently Released Verde Software Version

Follow these steps to check the currently recommended Verde software version:

1. Log into your user account on the Technical Support portal at support.spectralogic.com.

   Note: See the *Spectra Verde & Verde DPE Arrays User Guide* for information about creating an account and accessing the Technical Support portal.

2. Select **Downloads ···⋮ Product Software**.

3. On the Product Software page, locate the Verde array in the **Spectra Product** column. The currently released Verde version is listed in the **Current Version** column.

Figure 2 The Product Software screen.

4. Compare the Current Version available for the Verde array to the version installed on the array.

Download and Stage the Updated Software

Use the instructions in this section to download and install the updated software for the Verde array.

1. Log into your account on the Technical Support portal at support.spectralogic.com.

2. Select **Downloads ⋯⟩ Product Software**. The Product Software Screen displays.

Figure 3 The Product Software screen.

3. Locate the Verde array in the **Spectra Product** column. The currently released Verde version is listed in the **Current Version** column.

4. Click the name of the Verde package. The package begins downloading through your web browser. Do not unzip the downloaded file.

5. From the menu bar, select **Support ⸭ Software** to display the Software screen. Click **Choose File.** Using your web browser, browse to the location of the update file and select the file to upload. The file is staged to the system.
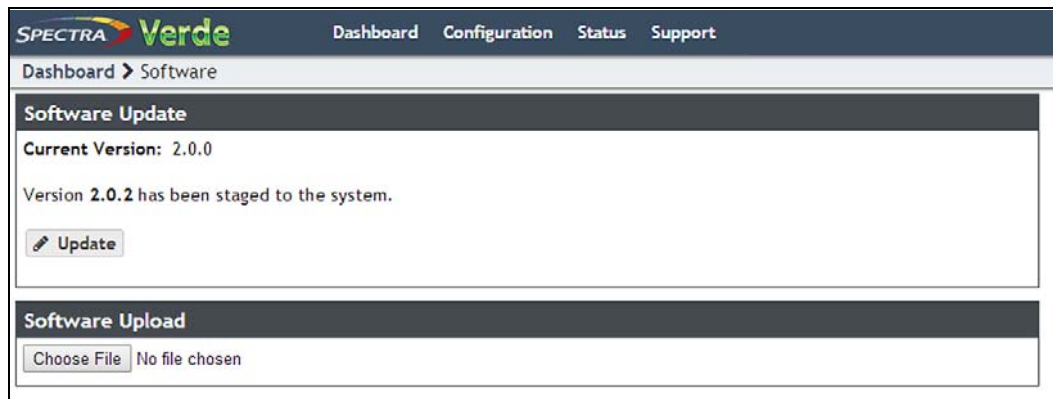
Figure 4 The Software Update screen with an available software package listed.

Install the Update

1. Discontinue all file storage operations on the Verde master and expansion nodes. The master node automatically reboots as part of the update process.

2. From the menu bar, select **Support ⸭ Software** to display the Software screen. The Software screen displays with the software upload file staged to the system.
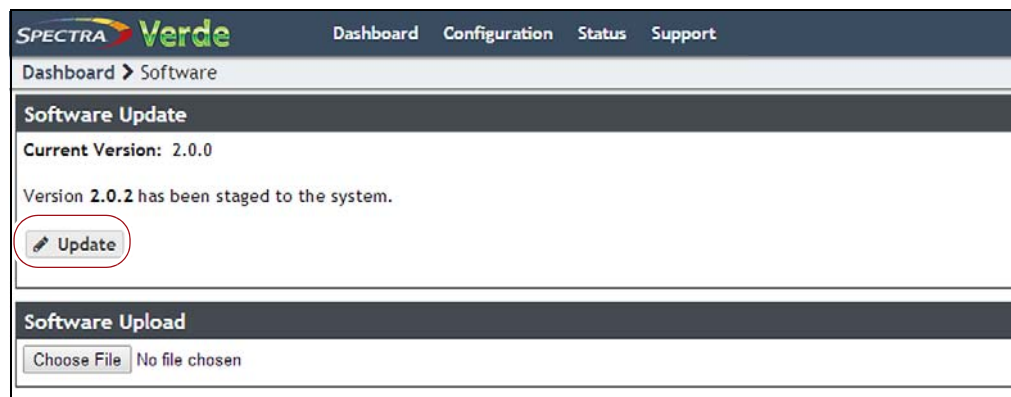
Figure 5 The Software Update screen with a software package staged to the system.

3. Click **Update**. A progress bar shows the progress of the update.
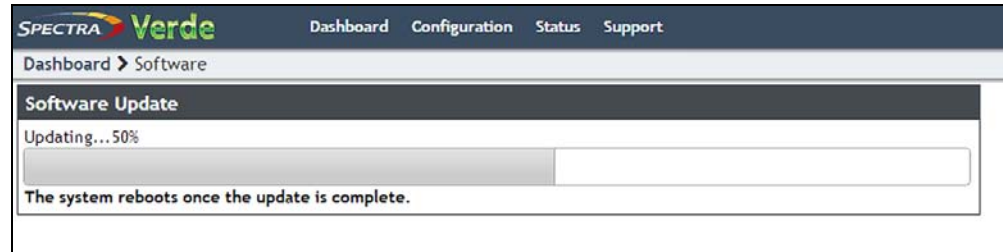
Figure 6 The Software Update screen showing the progress of an update.

4. When the update is complete, the Verde array automatically reboots to begin using the latest software.

5. Restart file storage operations.

PACKAGE HISTORY

The following sections list the Verde update packages that are released and provide information about new features and updates that affect the array and its components. The packages are listed in reverse chronological order, with the most recent release listed first.

⚠️ **Important** Unless otherwise stated, the known issues for a package remain active until moved to the resolved issues section. Always read the known issues section for each firmware release to make sure you are aware of any potential problems.

Verde 3.1.5

Security Updates. The Verde array's FreeBSD operating system includes all security updates as of December 7, 2016. For a complete list of the security updates, see the Knowledge Base article "*FreeBSD Security Updates in Verde*".

Resolved Issues

Issue	Resolution
If a data drive in a pool with a ZIL (ZFS Intent Log) attached fails, it is possible that a spare drive will not takeover.	The array now correctly uses spare data drives for pools with a ZIL attached.
SATA drives get deleted and then re-added after a controller rescan.	This issue no longer occurs.

Verde 3.1.4

Resolved Issues

Issue	Resolution
If the Replicated System Configuration feature fails to copy the system configuration from the boot drives to a storage pool, an error message displays every 5 minutes.	Error messages now display every 45 minutes.
A FreeBSD security check runs every night on all mounted file systems. Under certain circumstances, this may consume 100% of the CPU processing power and slow the system.	This security check is not needed and no longer runs once per day.
If the front bezel of the array fails to establish full connection with the array, the array may lock up.	This issue no longer occurs.
When the Verde array attempts to join an Active Directory domain, if the hostname is longer than 15 characters, the attempt fails, and no error message displays.	An error message now displays indicating that the hostname is too long to join an Active Directory domain.
When the array is configured to use NFI replication, if the combined length of the storage pool, volume, and snapshot name is greater than 88 characters, the replication fails.	NFI replication now limits the combined name to 26 characters.
During an NFI replication, if a single file fails to replicate to the BlackPearl gateway, the NFI replication continues, but the failed file can never be replicated to the gateway.	If a file fails to replicate to the BlackPearl gateway, the entire NFI replication job is cancelled so that the failed file can be replicated.
If NFI replication is configured to always keep the latest version of a file, NFI replications fail with an error message indicating that the file already exists.	This issue no longer occurs.
Passing a zero length share name to share information query API such as NetShareGetInfo() may result in a likewise service failure due to inadequate parameter validation.	This issue no longer occurs.

Verde 3.1.3

Resolved Issues

Issue	Resolution
Under certain circumstances, a share could be configured such that no user could access the share. If that share is deleted and a new share is created, the creation fails.	This issue no longer occurs.
If an NFI transfer is initiated before the target BlackPearl gateway data connection is configured, the NFI transfer fails, but reports as successful in the Verde user interface.	An error message now displays if the NFI target gateway does not have its data path configured.
If an NFI transfer gets stuck in a transferring state due to an internal failure, all subsequent NFI transfers fail.	This issue no longer occurs.
When generating a report on the Verde array, the report does not contain any information about chassis, storage pools, or data drives.	The reports generated by the array now contain information about storage pools.
The Verde array cannot share a completely full volume.	This issue no longer occurs.
The Verde CLI incorrectly lets you move a volume to the same storage pool on which it currently resides. This action deletes the volume.	You can no longer move a volume to the same storage pool using the CLI.
If a disk drive is added to the Verde array, the Verde user interface does not display any details for that drive, or attempt to use the drive as a hot spare, until the array is rebooted.	Drives added to the Verde array are now recognized immediately.
Under certain circumstances, shared volumes are not accessible following a reboot due to a process timeout error.	This issue no longer occurs.
Verde DPE expansion nodes connected to a 220 V power supply may display a critical status due to a hardware event.	The hardware issue is addressed and the event is now reported as an Informational message.
If the Verde replication target volume is shared by the target array and mounted by a host, replications fail.	This issue no longer occurs.

Known Issues

Issue	Workaround
Starting with the Verde 3.1.2 release, when creating a new NFS share, hosts configured with "rootsquash" permission are able to write files to the share, but are not able to delete, modify, or rename files written by other hosts. This change does not affect existing NFS shares.	A host configured with "norootsquash" permission can limit access to a share to specific users or groups.

Verde 3.1.2

Enhancements

LTFS Compatibility Mode for NFI Transfers   This release introduces a new LTFS compatibility mode on the Verde array that allows customers using the NFI service to transfer data to a BlackPearl gateway to be able to use the Object Name option for a storage domain. Enabling this feature allows customers to eject LTFS tapes and use them in a non-BlackPearl environment.

Previously, when a user attempted to copy Windows-based files with Alternate Data Stream metadata from the Verde array to a BlackPearl gateway configured to use the Object Name option for a storage domain, the transfer failed. Now, when the new LTFS compatibility mode on the Verde array is enabled, the NFI service suppresses the transfer of the ADS metadata to the BlackPearl gateway. If the Copy & Delete option is selected on the Verde array, these ADS metadata files are deleted when the file they are associated with is deleted.

Resolved Issues

Issue	Resolution
When an SSD drive configured in a ZIL pool fails and a hot spare SSD is present, the hot spare drive does not automatically take the place of the failed drive.	If present, a hot spare SSD now correctly takes the place of a failed drive in the ZIL pool.
After upgrading to Verde 3.1.1, the Hot Pair Daemon service running on the Verde array generates a core dump every time the array reboots.	This issue no longer occurs.

Verde 3.1.1

Enhancements

ZIL Support The Verde DPE array supports four or six RAID protected solid state drives as a ZIL (ZFS Intent Log). The ZIL drives increase write speed to shared NFS volumes on the array.

Resolved Issues

Issue	Resolution
Manual changes to core files on the Verde array may cause the array to ignore new versions of the changed files during an Automated Software Upgrade.	This issue no longer occurs.
If the processes running on the Verde array fail to shutdown within 90 seconds of the user selecting to reboot or shutdown the array, the reboot or shutdown operation is cancelled.	This issue no longer occurs.
If the array is rebooted while it is performing a data verification of a storage pool, the data verification status is not displayed following a reboot.	The array now displays the status of a data verification following a reboot of the array.
The system restarts the Verde file system due to frequent CIFS updates to the directory that RSC (Replicated System Configuration) monitors.	Log files now write to a different directory, reducing the chances of a filesystem restart.
If the name of a storage pool or volume used with NFI contains a space character, the initial NFI transfer succeeds, but all subsequent transfers fail.	This issue no longer occurs.

Known Issues

Issue	Workaround
If a ZIL drive fails but the replacement SSD drive is not placed in the same physical location as the failed drive, the replacement drive will not be automatically used to rebuild the ZIL RAID. Additionally, should a data drive fail, the replacement SSD drive may be used to rebuild the pool if no other spare drives exist in the array.	Make sure you install the replacement SSD drive in the same physical location of the failed SSD drive.
If the name of a storage pool or volume configured for replication contains a space character, replications fail.	Do not use the space character in the name of a storage pool or volume used for replication.

Issue	Workaround
The Verde web interface does not appear to update correctly.	The Verde array may have rebooted. If the array reboots, the Verde web interface is not being updated. Log out and then log back in to re-establish a connection with the array.

Verde 3.1

Note: The Verde software revision number jumped from version 2.2 to version 3.1. There were no interim releases between the two versions.

Enhancements

Replication. This release provides support for replication. If you have multiple Verde arrays, you can select one array to replicate data to another array. You can replicate data from one source array to multiple destination arrays, if desired.

Security Updates. The Verde array's FreeBSD operating system includes all security updates as of February 11th, 2016. For a complete list of the security updates, see the Knowledge Base article "*FreeBSD Security Updates in Verde*".

Verde DP Release. The Verde DP is a network attached storage (NAS) system modeled after Spectra's Verde DPE product. Built with archive grade 8TB Shingled Magnetic Recording (SMR) drives, the Verde DP provides an affordable entry point into long term disk storage. Verde DP delivers all the power and benefits of Verde DPE in a smaller 2U system.

Resolved Issues

Issue	Resolution
In rare cases, the CIFS service fails to automatically restart a failed process, and becomes unusable.	This issue no longer occurs.
If the Verde array encounters a fatal error when copying data to a BlackPearl gateway using NFI, the job is not automatically restarted after the Verde array reboots.	NFI jobs now automatically restart after a Verde array reboots following a fatal error.
If multiple clients attempt to modify the same file at the same time, the user may lose access to all CIFS shares, and the array must be rebooted.	This no longer occurs.

Issue	Resolution
If fewer than 23 drives are present in a Verde DPE expansion node, the Verde DPE web interface incorrectly allows the user to create a storage pool using fewer than 23 drives.	The Verde DPE array no longer allows the creation of storage pools on a Verde DPE expansion node with fewer than 23 drives.
After NFI Copy and Delete transfers complete on a Verde DPE array, the system incorrectly retains old snapshots on the volume.	Old snapshots on the volume are now deleted after being transferred using an NFI Copy and Delete operation.
If a pool is in the process of rebuilding and the Verde array is rebooted, after the reboot completes, the Verde web interface no longer shows the pool rebuild status.	The pool rebuild status is now displayed after a reboot.
If a Verde DPE array volume reaches maximum capacity while the array is transferring data to a BlackPearl gateway using NFI, the data transfer fails. Subsequent attempts to initiate a transfer fail.	The array now cleans up any NFI transfers if the NFI transfer fails midstream due to the volume size maximum being reached.
The NFI worker is always running, even on arrays that do not have a NAS key installed.	The NFI worker now only runs on arrays with a NAS key installed.
When a topology error is detected, the Topology screen does not display the severity of the error.	The error severity is now displayed when the array detects a topology error.
In the Verde DPE web interface, tape drives are incorrectly listed on the Performance screen.	Tape drives are only listed on the Performance screen if an S3 key is installed on the array.
In the Verde CLI, when attempting to configure the S3 service, the command incorrectly asks for the Authorization ID of the BlackPearl gateway, instead of the Access ID.	The Verde CLI now asks for the Access ID when configuring the S3 service.
If you attempt to use NFI to copy data to a bucket on a BlackPearl gateway that was not created by the user configured in the NFI service, the transfer fails with no error message.	Under these circumstances, an error message is now displayed indicating that the user configured in the NFI service must be the owner of the target bucket on the BlackPearl gateway.
If a user changes the system password to something other than the default, after upgrading the Verde software, the user may not be able to access the Verde web interface.	This no longer occurs.
If a file is downloaded to a Microsoft Windows® operating system host from an untrusted source, a Zone Identifier file is created on the host which is linked to the downloaded file. The zone identifier file is invisible to the user. If the user copies the original downloaded file to a Verde CIFS share, the zone identifier file is copied to the CIFS share as well. If the user then selects the CIFS share to be copied to a BlackPearl gateway using NFI, the transfer fails because the invisible zone identifier file contains a colon (:) character.	A BlackPearl gateway running software version 3.0 now accepts the colon character.

Issue	Resolution
If an error occurs when using NFI to transfer data to a BlackPearl gateway, no error message is generated in the Verde CLI.	An error message is now generated in the Verde CLI when an NFI replication fails.
If the Automated Software Upload feature failed to connect to the package server, an error message displayed that was not human readable.	The error message now contains information related to the failure.
If a volume on the array has no snapshots, the menu selection **Delete All Snapshots** is still available. When run, the system displays a dialog box with a spinner indicating that it is deleting snapshots, although no deletion occurs. The user must select **Cancel** on the dialog box to stop it from displaying.	The action **Delete All Snapshots** is greyed-out and is not selectable when there are no snapshots.
The CIFS service will increase its memory usage depending on the number of requests and not release memory if it is no longer needed. The system may stop responding to requests and must be rebooted.	The memory leak no longer occurs.
An authentication timing issue may prevent you from logging into the Verde web interface, or prevent replications from starting.	This issue no longer occurs.

Known Issues

Issue	Workaround
Replications occasionally fail with 'Remote system does not have any transfer ports available' system message.	Reboot the target Verde array.
Replications that fail to complete remain in progress indefinitely.	Reboot both the source and target arrays.
Verde replication target arrays do not display any information about the status of replications.	Use the source array to see the status of replications.
After upgrading to Verde 3.1, any previously generated snapshots do not display in the Verde web interface.	Reboot the Verde array.

Verde 2.2 - *Verde DPE Only*

Enhancements

Verde DPE Array Availability. This release provides support for the Verde DPE master node and Verde DPE expansion node.

The Verde DPE array is a Shingled Magnetic Recording (SMR)-based Network Attached Storage (NAS) disk platform that delivers high density bulk storage for digital preservation.

Known Issues

Issue	Workaround
Faulted power supplies in a Verde DPE expansion node remain in that state in the GUI even after the fault is cleared.	Ignore the icon if the power supply is working.
NFS and CIFS shares can be created on unmounted volumes using the web interface.	Do not create a share on an unmounted volume.

Verde 2.1.5

Resolved Issues

Issue	Resolution
Power supplies in the Verde master and expansion nodes can report errors when no error occurred.	The array now checks a power supply that reports an error three times to confirm there is an error before generating an error message.

Verde 2.1.4

Enhancements

The Verde 2.1.4 software includes changes to better support the SMB protocol by conforming to Windows behavior for *file_delete_on_close* when opening a directory, and to properly report renamed records.

Improved internal logging to AutoSupport Logs used for troubleshooting.

Resolved Issues

Issue	Resolution
Likewise service health checks can exceed their timeout value, which causes the process to fail and shares on the Verde array to disappear in a CommVault environment.	If a share disappears due to a Likewise service failure it is immediately restored.
A deadlock condition can occur where two processes try to obtain and hold operation lock and file lock mutexes, which causes shares on the Verde array to disappear, requiring a reboot of the array.	This issue no longer occurs.
The Likewise service incorrectly generates core dumps when not required which can disrupt access to Windows shares due to the excessive amount of time needed to generate the Likewise core dumps.	This issue no longer occurs.

Verde 2.1.3

Resolved Issues

Issue	Resolution
The connection to NFS shares may be lost and cannot be reestablished.	Lost connection to NFS shares is less likely to occur and connection can be reestablished by the clients if it does occur.
Using the Verde array over time may result in degraded array performance.	This issue no longer occurs.
If boot drives are removed and their locations are swapped, the array cannot boot.	The system can now boot correctly if the boot drive locations are swapped.
Verde 2.1.1 has a "TLS Diffie-Hellman Key Exchange Logjam Vulnerability" (CVE-2015-4000).	This issue has been corrected.

Verde 2.1.2

Enhancements

CIFS Improvements. This release provides improved CIFS oplock and lease handling in high throughput, multi-client Microsoft® Windows® operating system environments for SMB1 and SMB2 clients.

Resolved Issues

Issue	Resolution
When performing a package update using a USB device, the update fails because the array does not recognize the format of the USB device.	The array now recognizes the format of the USB device.
When a storage pool experiences a disk drive failure and uses a spare drive to replace the failed drive, the storage pool cannot be expanded.	You are able to expand a storage pool that is using a spare drive.
If you enable Automatic Software Download on an array and the target URL contains no update packages, an error message displays incorrectly stating that multiple update packages were found at the target URL.	This issue no longer occurs.
Running a vulnerability scan against an Verde array reveals a "TLS Diffie-Hellman Key Exchange Logjam Vulnerability".	This vulnerability has been corrected.
When moving a volume from one storage pool to another storage pool, the volume is listed as present on both storage pools. Any attempt to edit the volume(s) fails because the volume name is not unique.	During a volume move, the volume is correctly deleted from the original storage pool.
In a Microsoft Windows operating system environment, if you add multiple ACLs (Access Control Lists) to a file and then change the ACL list at a later date, the file may become inaccessible.	This issue no longer occurs.

Known Issues

Issue	Workaround
Expansion nodes do not show the status of power supplies in the Verde web interface.	Use the lights on the power supplies to determine the status of each power supply.

Verde 2.1.1

Enhancements

The maximum number of objects that can be transferred at a time for a data transfer job from the Verde array to a BlackPearl® gateway was increased from 100,000 to 500,000 objects to help prevent potential data transfer problems. Data transfer jobs involving object counts greater than 500,000 are broken up into transfer lists of 500,000, or less.

Resolved Issues

Issue	Resolution
With the bezel attached to an array, after a certain period of time, a user is unable to log into the Verde user interface. Data transactions are not affected.	This issue no longer occurs.
If a data transfer to a BlackPearl gateway, initiated by a Network File Interface, fails, and the automatically generated volume snapshot fails to delete, the data transfer job becomes stuck in a state of "transferring" and does not complete.	This issue no longer occurs.
The Chelsio 10 GigE card in the Verde array sometimes experiences intermittent data transfer problems due to packet loss.	New firmware for the Chelsio 10 GigE cards is included in the Verde 2.1.1 release.
Using SGL software to transfer data to the Verde array fails because the SMB command "Get File Security" is not supported.	The SMB command "Get File Security" is now supported.
Storage management software packages such as Veeam and Commvault create multiple sessions during file transfer operations which generate multiple requests for file leases. This can create a high traffic load which may cause the connection to drop.	This issue now occurs less frequently.

Verde 2.1

Enhancements

CIFS Share Creation Permissions. This release changes how the permissions are set when a CIFS share is created on the Verde array. Now, when a CIFS share is created on the array, the default permission is "Everyone". This allows a user creating the initial shares to easily set the proper permissions for additional users without requiring the Active Directory Domain administrator password. See "Create a CIFS Share" in the *Spectra Verde & Verde DPE Arrays User Guide* for more information.

CIFS Reliability. Several issues, related to handling multiple file requests from multiple clients simultaneously and properly keeping track of each client session and connection, were addressed in the CIFS service. Most of these issues resulted in a dropped connection to a Verde share when using CommVault and Veeam backup software services rather than standard Windows Explorer actions.

Network File Interface. The Spectra Network File Interface (NFI) allows you to automatically move data from your Verde array to one or more BlackPearl gateways, without the need to use a DS3 API. Data is transferred on a schedule and data copied from the Verde array to the gateway can be configured to be kept on the array or deleted. When a user needs access to data deleted from the Verde array, the BlackPearl gateway copies it back to the array.

Resolved Issues

Issue	Resolution
After configuring a client in the SNMP service, the client cannot be deleted as the "**-**" remove button is inaccessible.	The remove button is now accessible after configuring a client in the SNMP service.
When configuring network addresses for a HotPair configuration, the Network screen may display incorrectly.	This issue no longer occurs.

Known Issues

Issue	Workaround
The command line interface reports a storage pool that is finished rebuilding as "Rebuilding 100%".	Use the Verde web interface to see the status of a rebuilding storage pool.
During heavy data traffic to the Verde array, the array may take too long to respond to a write request from a Windows host. Windows interprets this as the volume no longer being accessible and closes the connection.	There is no workaround to this issue.

Verde 2.0

Enhancements

Hot Pair. Two Verde master nodes can be connected to multiple expansion nodes in a failover configuration. One master node acts as the primary controller, and the other acts as the secondary. In the event that the secondary controller detects a failure of the primary controller, it automatically takes over to provide uninterrupted operation, without administrative intervention.

Resolved Issues

Issue	Resolution
When an incorrect activation key is entered in the command line interface, the resulting error message displays twice.	The error message now displays once.
If you create an NFS share and enter information in the **Comment** field, the comment information does not display in the web interface.	The NFS share comment information now displays.
Activation keys disappear from the array after a system software update.	This issue no longer occurs.
If a Data Verification Check is cancelled before it completes, the command line interface incorrectly indicates the check completed successfully.	A cancelled data verification now shows as "Cancelled".
Changes to the session timeout setting do not take effect until the user logs out.	The session timeout setting now takes effect as soon as it is saved.
You can only change the system hostname once.	You can now change the hostname multiple times.
Moving a volume with snapshots to a different storage pool fails to complete.	Volumes with snapshots now correctly move to the new storage pool.
The command line interface fails to create a snapshot schedule when there is a value in the "Minutes" field.	This issue no longer occurs.
When a storage pool finishes rebuilding after a drive replacement, no message is emailed to configured mail recipients.	A message is emailed to configured mail recipients when a storage pool finishes rebuilding.
On the Hardware screen of the web interface, the graphics of the front and rear slots of the array overlap when viewed using the Google® Chrome™ browser.	This issue no longer occurs.
After configuring an NVR3® storage pool, the NVR3 service incorrectly lists the name of the NVR3 storage pool twice.	This issue no longer occurs.

Known Issues

Issue	Workaround
If you refresh the Hardware screen, the drive size and drive position labels may disappear from the Verde graphic on the Hardware screen.	Navigate to any other screen in the Verde web interface, then navigate back to the Hardware screen.
Topology errors do not display on the Messages screen.	From the menu bar, select **Support ⋯⋗ Tools ⋯⋗ Topology** to display the Topology screen. Any topology errors display.
Using the command line interface to create a link aggregation with DHCP addressing fails.	Use the Verde web interface to create a link aggregation with DHCP addressing.
When the SATA DOM boot drives reach their write threshold, an error message is generated but the drive health on the Hardware screen continues to show as good.	Contact Spectra Logic Technical Support for assistance (see Contacting Spectra Logic on page 7).
When attempting to join a Windows Active Directory Domain for the first time, a timeout error may display.	Repeat the process. All subsequent attempts to join a domain are successful.
Activation keys with no expiration date may incorrectly expire.	Contact Spectra Logic Technical Support for assistance (see Contacting Spectra Logic on page 7).
When the array has a SAS topology error, the details for that error cannot be viewed using the command line interface.	Use the Verde web interface to see the details of SAS topology errors.
The command line interface does not display the drive serial number or firmware level for drives installed in the array.	Use the Verde web interface to see a drive's serial number or firmware information.
System boot drives may not match their physical numbering. For example, the boot drive that is physically identified as 'Drive 1' may display as 'Drive 2' in the command line and web interfaces.	If you need to replace a failed boot drive, contact Spectra Logic Technical Support to ensure you are replacing the correct drive (see Contacting Spectra Logic on page 7).
The Verde web interface displays the fan layout for a master node in an incorrect order.	There is no resolution to this issue. Contact Spectra Logic Technical Support if you are unable to locate a failed fan in a master node (see Contacting Spectra Logic on page 7).
After joining an Active Directory domain, changes to the Verde system name do not update the FQDN (Fully Qualified Domain Name).	To change the system name after joining an Active Directory domain, first leave the domain. Change the system name, and then rejoin the domain.
If the number of failed drives in a storage pool is greater than the redundancy of the pool, and there is outstanding I/O to the pool, the pool cannot be deleted.	Reboot the array and delete the pool. If the pool still cannot be deleted, contact Spectra Logic Technical Support (see Contacting Spectra Logic on page 7).
Joining an Active Directory domain using the command line interface fails.	Use the Verde web interface to join an Active Directory domain.

Issue	Workaround
If a service fails, the Services screen will incorrectly display the service as running.	There is no workaround to this issue. Reboot the array to restart services. If the problem persists, contact Spectra Logic Technical Support (see Contacting Spectra Logic on page 7).
If the array is powered on without an Ethernet cable connected to the management port, the Verde user interface is not available, even if an Ethernet cable is later plugged in to the management port.	Connect an Ethernet cable to the management port and then reboot the array.

Verde 1.5

Enhancements

Spectra NVR3. The Verde array can now function as a Spectra NVR3 appliance for use as an integrated video recording server, VMS software solution, and a video storage platform in conjunction with a Spectra Logic tape library.

Resolved Issues

Issue	Resolution
Under certain circumstances, a user is unable to configure a data connection after configuring the management connection.	This issue no longer occurs.
On a large array spanning multiple nodes, the Erase Data command sometimes fails to erase data on a foreign drive.	This issue no longer occurs.
Several commands in the command line interface do not display the available, minimum, or maximum size of a volume.	This issue no longer occurs.
When attempting to reduce the minimum size of a volume, the web interface displays an incorrect message reading "Minimum size cannot exceed available space."	The web interface now displays the correct message informing the user that "Minimum volume size cannot be reduced."
If an email is sent to the root address of an array, the connection is correctly refused, but error messages related to this event repeatedly generate in the Messages screen.	Only one message is logged for this event.
When the master node is connected to multiple expansion nodes, deleting a storage pool succeeds, but displays an incorrect error message that the pool was not deleted.	The error message no longer displays.

Issue	Resolution
After upgrading to Verde 1.4.1, the web and command line interfaces can take several minutes to display the storage pools and volumes configured on the array.	This issue no longer occurs.
The web interface sometimes swaps the display order of the two system drives.	This issue no longer occurs.
When the array generates a scheduled log set, two notification emails are sent to configured mail recipients.	The array only sends one notification email when a scheduled log set is generated.
When a drive in a storage pool fails and is automatically replaced by a global spare drive, the original failed drive does not correctly become a global spare when it is physically replaced.	A failed drive replaced by a global spare drive now correctly becomes a global spare when physically replaced in the array.
Chassis fans in the 2U master node do not increase speed when the chassis temperature increases.	Chassis fans now run at full speed for maximum cooling.

Known Issues

Issue	Workaround
When the array is undergoing backup operations, software updates fail.	Stop all backup operations prior to performing a software update.
If the NVR3 Service crashes, the Verde web interface incorrectly reports the service as Running.	Reboot the array.
Renaming a volume shared by the CIFS service can cause CIFS errors.	Stop sharing the volume prior to renaming it.
If an expansion chassis is powered on several minutes after the master node was powered on, the status for all hardware components in the expansion chassis is Unknown.	To avoid this issue, power on all nodes at the same time. If you are experiencing this issue, power down all nodes and power them on at the same time.
In multi-node arrays, hardware failure messages do not indicate which node is experiencing the failure.	Use the Hardware page in the Verde web interface to determine the location of the failed component.
After stopping the NVR3 service, the service occasionally indicates that it cannot be restarted until a data connection is configured, even though a data connection is already configured.	Navigate away from the NVR3 service details screen, and then navigate back to the NVR3 service details screen. The NVR3 service can be restarted.
After configuring an NVR3 storage pool, the NVR3 service incorrectly lists the name of the NVR3 storage pool twice. **Note:** This issue is resolved in Verde 2.0.	Ignore the second entry, there is only one storage pool.
If you delete the NVR3 storage pool while performing backup operations, the NRV3 service may display incorrect status.	Contact Spectra Logic Technical Support for assistance (see Contacting Spectra Logic on page 7).

Issue	Workaround
On the media information panel of the NVR3 Phoenix RSM software, the number of drives listed is one less than the actual number of drives in the array.	None.
On the media information panel of the NVR3 Phoenix RSM software, you can only view details for drives on the first page of the drive list.	None.
The NVR3 Phoenix RSM software may fail to communicate with a camera using a default URL.	If the software cannot connect to the camera using the default URL, consult the camera manufacturer's *User Guide* for the updated URL.
Occasionally, when enabling the NVR3 service, a message is generated that the tape vault service cannot be started.	Contact Spectra Logic Technical Support for assistance (see Contacting Spectra Logic on page 7).

Verde 1.4.5

Resolved Issues

Issue	Resolution
The authenticated Likewise session context management table could become corrupted when multiple clients are attached and detaching from a Likewise share, which may result in a Likewise system failure.	This issue no longer occurs.

Verde 1.4.4

This release corrects SMB2.1 issues related to "credits" and "leases" in regards to Windows 2012 R2, Windows 2012, Windows 2008 R2, and Windows 2008. Additionally, CIFS performance has been further optimized to provide a significant increase in sequential read and write performance when using multiple streams.

Resolved Issues

Issue	Resolution
Occasionally, CIFS shares become inaccessible.	This issue no longer occurs.

Verde 1.4.2

Resolved Issues

Issue	Resolution
The read performance of a CIFS share, when multiple clients and multiple streams request to read the same file, can become very slow for extended periods of time.	This issue no longer occurs.
A user can log into the Verde web interface using the username **Administrator**, and no password.	It is no longer possible to log into the Verde web interface with the username **Administrator**.

Verde 1.4.1

The Verde 1.4.1 software fixes several memory leaks and improves internal logging to AutoSupport Logs used in troubleshooting.

Resolved Issues

Issue	Resolution
Under certain circumstances the CIFS service fails to respond to requests when sharing volumes on a network connection configured with SMB 2.1 large MTU support.	This issue no longer occurs.
If a client repeatedly connects and disconnects to a CIFS share over a long period of time, the Verde array may stop responding to all requests. This is due to a memory leak when the CIFS service disconnects.	This issue no longer occurs.

Verde 1.4

Resolved Issues

Issue	Resolution
The SNMP agent does not support `GetBulk` requests.	The SNMP agent now supports `GetBulk` requests.
If host machines lose access to a CIFS share on the array, the array must be power-cycled to access the share again.	The array no longer requires a power-cycle to access CIFS shares if the connection was temporarily lost.

Issue	Resolution
Immediately after logging into the Verde interface, the performance graph fails to display on the Dashboard screen.	The Dashboard now always displays the performance graph.
The **Time zone** setting is not saved when switching between performance graphs.	The **Time zone** setting is now maintained when switching between performance graphs.
Changing the default color of the Visual Status Beacon has no effect on the actual color of the LED.	The default color of the Visual Status Beacon can now be correctly changed.
If you use the command line interface to start a Data Integrity Check on a storage pool that is already undergoing a Data Integrity Check, the process fails with no error message.	An error message is now generated.
When manually configuring the time of day, the Time Settings dialog box continues to display after clicking **Save**.	The dialog box now correctly closes.
Attempting to create two CIFS shares with identical names generates an unexpected error.	The array now correctly informs you that each CIFS share name must be unique.
Network interface performance graphs display inaccurate transfer rates.	Network performance graphs now display correct transfer rates.
The array can generate logset files that are too large to be emailed.	Logset files are now always small enough to be emailed.
The legend on the Performance screen occasionally does not display.	The legend now consistently displays.
The maximum number of snapshots allowed for a given snapshot schedule does not display.	The maximum number of snapshots now displays for each snapshot schedule.
When an error occurs on the array, the error notification email sent by the array does not include a description of the error.	Error notification emails now include a description of the problem.
NFS shares allow "`rootsquash`" and "`norootsquash`" permissions on the same share.	It is no longer possible to create an NFS share with both "`rootsquash`" and "`norootsquash`" permissions.
If the first line of an NFS Access Control list is blank, an unexpected error message is generated.	The array now ignores any blank lines in the NFS Access Control list.
When creating a storage pool, the user is not notified that they may be using all available disks in the array and will have no available spares in the system to handle any drive failures.	Help text is displayed when creating a storage pool that informs the user there are no spare drives remaining in the array with the selected storage pool configuration.
The array cannot connect to a Windows Server 2012 R2 Active Directory domain.	The array can now successfully join a Windows Server 2012 R2 Active Directory domain.
Creating a volume with a space character in the volume name fails and causes the Verde interface to hang.	Volume creation with a space character in the volume name is now successful.

Issue	Resolution
On systems with a large number of storage pools, web browsers accessing the Verde interface may lock up.	Web browsers no longer experience issues when a system is configured with a large number of storage pools.
The Verde interface displays a blank page after generating a report on the power supplies in the array.	Reports on power supplies are now correctly displayed.
CommVault running on Windows Server 2012 cannot connect to a CIFS share on the Verde array.	CommVault on Windows Server 2012 can now connect to CIFS shares on the Verde array.

Known Issues

Issue	Workaround
When the front bezel is not installed, the Verde interface incorrectly displays the bezel status as good.	Install the bezel to determine the status of the bezel, otherwise ignore the incorrect status.
The list of required parameters displayed for the CLI command "`config snapshot schedule`" is incomplete. Using only the listed required parameters causes the command to fail.	Include the elective parameters when configuring a snapshot schedule using the command line interface.
When manually configuring DNS settings, the DNS and Search Domain settings will disappear when saving the configuration.	Wait up to 30 seconds for the DNS and Search Domain settings to display after saving the configuration.
If a Data Verification Check is cancelled before it completes, the command line interface will incorrectly indicate the check completed successfully. **Note:** This issue is resolved in Verde 2.0.	Ignore the incorrect status.
Running a Data Integrity Check on a storage pool that is in the Rebuilding state causes an unknown error to display.	This is not a supported feature. Ignore the error and run the Data Integrity Check after the storage pool finishes rebuilding.
If you configure a single GigE data port connection and then create a link aggregation of all GigE ports, only the previously configured port will be included in the resulting link aggregation.	Clear the configuration from any configured GigE data ports before creating a link aggregation.
Information entered into the Comments field when creating an NFS share is not visible in the Verde interface after the NFS share is created.	Use the command line interface to view the comment field for a specified NFS share.
You cannot create a CIFS share on a read only volume.	Edit the volume configuration so that it is no longer read only. Configure the CIFS share, then edit the volume configuration again to enable the read only setting.

Issue	Workaround
Activation Keys sometime fail to display in the Verde and command line interfaces.	The keys only fail to display, they are not deleted from the system. There is no resolution to this issue.
The command line interface does not show any network traffic during data transfer operations.	Use the Verde interface to view network performance data.
If you disconnect an expansion node from the master node, the Hardware screen in the Verde interface will continue to display the status of the expansion node.	There is no workaround for this issue.
If you change the name of a volume that is being shared by either NFS or CIFS, access to the shared volume is lost.	Do not change the name of a volume that is being shared. Alternatively, configure the volume so that it is not shared, change the name of the volume, and then reconfigure the share.
Rolling back to a previous snapshot does not indicate success or failure.	There is no workaround for this issue.
It is not possible to edit a CIFS share after it has been created.	Delete the existing share and create a new CIFS share with the desired settings.
The blue drive power and activity light on a data drive stops illuminating after a few hours of use.	The data drive is functioning normally. Use the Verde interface to determine the status of the drive. The red failure light is not affected and displays in the event of a drive failure.
Moving a volume that is currently undergoing a Data Verification Check causes an unexpected error.	Cancel or wait for the Data Verification Check to complete before moving a volume.

Verde 1.3.1

Resolved Issues

Issue	Resolution
Clients attached to CIFS shares may not see updates to directory contents.	This issue no longer occurs.
Replicated System Configuration (RSC) does not backup the array boot drives on storage pools that contain a space character in the pool name.	RSC now correctly backs up the boot drive configuration to storage pools with a space character in the name.
After upgrading to Verde 1.3, the Visual Status Beacon on the front bezel may display an abnormal pattern of lights for approximately one hour.	This issue no longer occurs.
The Verde interface does not show an error when a power supply fails.	A failed power supply now correctly displays as failed in the Verde interface.

Known Issues

Issue	Workaround
When creating a storage pool using drives in the 2U master node and two or more expansion nodes, a message displays indicating an unexpected error occurred during pool creation.	Ignore the message, the pool was created successfully.
When creating a storage pool using the command line interface, changes to the number of drives or protection level may take up to two minutes to display.	Wait while the information displays.
It may take up to two minutes for the Verde web interface or the command line interface to display a newly created storage pool, or to cease to display a recently deleted storage pool.	Wait while the interface is updated.
When a drive in a storage pool fails and is physically replaced, the information displayed on the Verde web interface may be incorrect.	Correct information displays when the pool rebuild completes.
When an expansion node experiences an error condition, the overall condition of the array continues to display as good.	Use the hardware screen of the Verde web interface to determine the status of expansion nodes.
The command line interface incorrectly displays two CPUs in the Verde 2U master node.	Ignore the error. Only one CPU is present.
If a host computer loses access to a share on the Verde array, the array must be power-cycled before the share is accessible again.	Power cycle the array to access the share.
After changing the system name, the System Name Edit button is unresponsive.	Log out, and re-login to the Verde interface to restore button functionality.

Verde 1.3

Enhancements

The Verde 1.3 software includes the following features:

Replicated System Configuration. The Verde master nodes mirror their boot drives on to an existing storage pool on the array's data disks. If one or both boot drives fail, the system automatically restores the system configuration when replacement boot drives are installed.

Data Integrity Verification. The Verde arrays feature an on-demand data integrity check for data drives configured in a storage pool. The check scans the drives for data corruption and corrects any errors found.

Verde 2U master node support. The Verde software now supports 2U master nodes.

Resolved Issues

Issue	Resolution
During a software upgrade, the Verde web interface appears to hang after uploading a software upgrade file.	The array now indicates it is verifying the software upgrade file after uploading.
A blank web page displays if you attempt to access the Verde web interface without logging in.	You are now directed to the login page if you attempt to access the web interface with out logging in.
When creating a new storage pool while data is being transferred to a different storage pool, an error message displays indicating that the creation of the new storage pool failed, even though the creation was successful.	The error message no longer appears.
When downloading a .csv file, the file extension is missing from the file name.	The downloaded file now has the .csv extension.
If you replace a failed drive when the array is powered off, the new drive is not recognized when the array is powered on.	The replacement drive is recognized when the array powers on.
Long volume names display past the border of their table.	This issue no longer occurs.
Navigating away from the Software Upgrade screen while an upgrade is in progress causes the upgrade to fail.	Software upgrades no longer fail if you navigate away from the Software Upgrade screen.
If the array has a failed component and a user manually refreshes the Verde web interface, an error displays indicating that some features are unavailable.	This issue no longer occurs.
There is no way to cancel a volume move once it is started.	In progress volume moves can now be cancelled from the Volume screen.
In the command line interface, running the command `config nfsshare list` results in an error.	The command now completes successfully.
When creating a new storage pool, the space character can be used for the pool name.	The space character is no longer accepted for storage pool names.
In the command line interface, if the command config pool expand is executed with an invalid ID, a non-human readable error message displays.	An error message indicating the ID is invalid displays when this occurs.
If a volume with a configured snapshot schedule is moved to a new pool, the old storage pool cannot be deleted.	This issue no longer occurs.

Issue	Resolution
When the password for the Local CIFS Admin account is changed, the session timeout value does not display for the account.	The session timeout value now correctly displays after a password change.
In the command line interface, the command `config account list` does not display the role for the Local CIFS Admin account.	The command now displays the role for the Local CIFS Admin account.
The Verde web interface does not show the status of a pool rebuild.	The status of pool rebuilds are now shown in the web interface.
The Verde web interface does not inform the user that the SATA DOM boot module needs to be replaced after reaching a usage threshold.	The web interface now notifies the user that a boot module needs to be replaced after excessive use.
The Verde web interface does not show the status of a volume move.	The web interface now shows the status of an in-progress volume move.
When the array is configured to use link aggregation, only one port is being utilized for outgoing data.	Link aggregation now uses all configured ports for outgoing data.
When using the command line interface to create storage pools, only certain stripe configurations were allowed.	You can now create a storage pool with any valid stripe configuration through the command line interface.

Known Issues

Issue	Workaround
The SNMP agent does not support GetBulk requests. **Note:** This issue is resolved in the Verde 1.4 release.	There is no resolution to this issue.
No message is generated when a expansion node is disconnected from a master node.	There is no resolution to this issue.
Users can change the high watermark setting of an existing pool to a value lower than the pool's current usage level.	Do not set the watermark below a storage pool's current usage level.
No message is generated when a storage pool is filled to capacity.	Use the Verde web interface to monitor storage pool usage.
The Verde web interface displays the fan layout for an expansion node in an incorrect order.	There is no resolution to this issue. Contact Spectra Logic Technical Support if you are unable to locate the failed fan in an expansion node.

Issue	Workaround
When the master node is cabled to multiple expansion nodes, deleting a storage pool succeeds, but displays an incorrect error message that the pool was not deleted. **Note:** This issue is resolved in the Verde 1.5 release.	Ignore the error message. The pool was deleted successfully.
After a software upgrade, the Verde web interface may not automatically redirect to the login screen as intended.	Wait approximately 10 minutes after the upgrade completes, and close the web session. Launch a new session and log in to the web interface.
The Verde array can occasionally generate logset files too large to be emailed from the array. **Note:** This issue is resolved in the Verde 1.4 release.	There is no resolution to this issue.
If you attempt to add an Verde array to a Windows Active Directory domain using a multi-homed domain controller, the array may fail to join the domain and does not generate an error.	Domains with a multi-homed domain controller must be properly configured to use DNS before the Verde array can be added. Contact Spectra Logic Technical support for assistance.

Verde 1.2.3

Resolved Issues

Issue	Resolution
When using the Computer Management feature in Windows Server 2008 R2 to connect to an Verde array and select a share, an error message displays indicating the administrator does not have permissions to list the share.	This issue no longer occurs.

Verde 1.2.2

Resolved Issues

Issue	Resolution
When using a Windows client, if the Read Only attribute is set for a file on removable media, you cannot copy it to a Verde share.	This issue no longer occurs.
A high frequency of writes to the SATA DOM boot modules may cause the modules to fail.	The frequency of writes to the SATA DOM boot modules has been reduced to increase module lifetime.

Verde 1.2.1

Resolved Issues

Issue	Resolution
Older Windows clients such as Windows XP or Windows 2003 cause the Verde array share access to no longer work in a Windows environment.	This issue no longer occurs.

Known Issues

Issue	Workaround
If an Verde array is in the process of rebuilding a number of drives equal to the storage pool's parity configuration and an additional drive fails, file storage operations to the array may be stopped.	Replace any failed drives and use the Verde web interface to reboot the Verde array to allow file storage operations.

Verde 1.2

Enhancements

The Verde 1.2 software includes the following feature:

Expansion Node Support. The Verde expansion node can be connected to the master node to provide up to an additional forty-four data drives. The expansion node connects to the master node using the four port SAS card installed in the master node.

Known Issues

Issue	Workaround
The Move *<volume>* window does not go away when a volume move is complete.	Close the Verde web interface and log back in.
In the command line interface, the system name of an expansion node has a space character preceding the name.	The space character exists as part of the system name of the expansion node. You need to include the preceding space character when entering the system name of an expansion node for any command that requires it.
In the command line interface, SAS topology errors display a question mark (?) in the description field instead of the problem description.	Use the Verde web interface to see the description of the SAS topology error.

Issue	Workaround
In the command line interface, the fans in positions 4-7 list generic IDs and incorrect RPM speeds.	Use the Verde web interface to determine the RPM speed of each fan.
Cannot edit NTP servers when the array is joined to an Active Directory domain.	None.

Verde 1.1

Enhancements

The Verde 1.1 software includes the following features:

Front Bezel Support. The Verde features a bezel mounted on the front of the array. The bezel includes an LED display that changes color and pattern to reflect the state of the system.

Command Line Interface. The Verde can be configured, used and maintained over a command line interface. See the *Verde Family Command Line Interface Guide* for more information.

Enhanced Dashboard Display. The dashboard of the Verde web interface now displays the status of more aspects of the system, including NTP, DNS, and SMTP.

Resolved Issues

Issue	Resolution
The Verde does not allow clearing a network interface configuration.	A **Clear** button is now provided to clear the configuration of a data interface.
Pool and volume information is unavailable during pool rebuilds and volume transfers.	This information is now available during pool rebuilds and volume transfers.
Cannot create a volume when the value for **Minimum Size** is the same as the total space available on a storage pool.	You can now create a storage pool when the value for **Minimum Size** is the same as the total space available on a storage pool.
Automated emails do not contain any information to help identify which array generated the email.	Emails sent from an Verde array now include the array hostname and IP address of the array.
When setting the system time manually, the user is logged out and returned to the login screen.	You are no longer logged out of the Verde web interface when you manually configure the system time.

Issue	Resolution
During a package update, you cannot upgrade to the same code level the array is already using.	It is now possible to perform a package update to the same code level that is currently installed on the array. Only perform this upgrade at the direction of Spectra Logic Technical Support.
If you are reading or writing data to one storage pool, and try to create a second storage pool, an error message is generated indicating that pool creation failed. In fact, the pool is created successfully.	The incorrect error message is no longer generated.
The Verde web interface may report the status of either the CIFS or NFS services as "starting", even though they are in the "running" state.	The CIFS and NFS service status now displays correctly.
The MTU setting on a link aggregation using 10 GigE ports resets to 1500 after a power cycle.	The MTU setting is now maintained through power cycles.
The gateway IP address does not display after configuring a 10 GigE link aggregation using DHCP.	The gateway IP address now correctly displays after configuring a link aggregation using the 10 GigE ports.
If you are joined to an Active Directory domain and configure the system time on the array manually, the time resets to the current Active Directory time after a power cycle.	The array now maintains the manually configured time when joined to an Active Directory domain.
In the Verde web interface, tables with multiple rows alternate background colors from grey to white. After an automatic page refresh, all rows appear with a grey background.	This issue no longer occurs.
Emails automatically generated by the array incorrectly listed the product name as "Strata".	Emails now correctly refer to the product as "Verde".
The 25-hour resolution setting for performance graphs only displays the last 12 hours of data.	Performance graphs set to the 25-hour resolution setting now correctly display the last 25 hours of data.
When a volume is configured to use compression and is filled to greater than 80% capacity, the storage pool the volume resides on cannot be deleted.	You can now successfully delete the storage pool under these conditions.

Known Issues

Moving a Volume. An issue exists in the Verde 1.1 release that can cause your array to become non-functional unless precautions are taken before moving a volume from one storage pool to another.

Before moving a pool, you must delete any snapshot schedule configured for that volume. See the *Spectra Verde & Verde DPE Arrays User Guide* for instructions on how to delete a snapshot schedule.

In addition, it is important that you do not generate a manual snapshot of the volume while it is being moved.

> ⚠️ **Caution** Failure to follow these precautions can cause the array to become non-functional.

Issue	Workaround
When link aggregation is configured using the two 10_GigE ports and one port fails, or a cable is unplugged, the connection is lost.	After the cabling or failed port is fixed, delete the link aggregation in the web interface, then reconfigure the link aggregation.
When changing the system name, access to the Verde management port is momentarily lost.	The connection is restored after a few seconds.
You cannot set the MTU value when creating a link aggregation using the command line interface.	Use the Verde web interface to create the link aggregation or create the link aggregation using the command line interface and then use the command `network datalagg update` to set the MTU value.
Full volumes cannot be moved, even if there is sufficient space on the move target.	Delete data from a full volume before attempting to move it to a different storage pool.
If you configure manual DNS settings on the array and then change the system name, the DNS settings are lost.	Configure the system name before manually configuring DNS settings.
Cannot manually configure the system time in the command line interface when NTP is disabled.	The help text instructions for setting the current time through the command line interface are incorrect. Specify the date and time using the format "DD/MM/YYYY" followed by the time in 24 hour format. For example: '30/01/2013 15:00'
No message is generated when installing a disk drive.	Use the hardware screen of the Verde web interface to confirm that the drive is recognized after installation.
The wrong pool name is temporarily displayed after a volume move is initiated.	Wait a few moments for the display to update, and confirm that you are moving the volume to the intended storage pool.
If you enter an invalid percentage for the high watermark during storage pool creation, the storage pool name is incorrectly flagged as "invalid".	Ignore the warning about the pool name. Enter a valid percentage for the high watermark.
At certain zoom levels and time resolution settings, the labels on the horizontal side of performance graphs may be unreadable.	There is no workaround for this issue.
If the array is experiencing an error condition for any device installed in the array and the Verde web interface is manually refreshed, an error message appears indicating that an error occurred during Verde initialization.	Ignore the message, the Verde web interface is functioning normally.

Issue	Workaround
A CIFS share cannot be created on an array that is at maximum data capacity.	Delete data from the array before creating a CIFS share.
The time zone setting on the performance screen is reset after changing the view settings. **Note:** This issue is resolved in the Verde 1.4 release.	Re-select the desired time zone setting each time you change the view settings.
If you delete all volumes and pools and immediately configure new pools and volumes, it may be possible to configure more than one NFS share per volume.	Only create one NFS share per volume.
If you navigate to the Software Update screen immediately after logging in to the Verde web interface, the screen indicates that no activation keys are entered, even if activation keys were previously entered. **Note:** This issue is resolved in the Verde 1.4 release.	Navigate to any other screen of the web interface, and then navigate back to the Software Update screen.
Performance graphs do not update if the system time is set to an earlier time.	Set the system time to any time after the timestamp when the performance graphs stopped updating.
Manually refreshing the Storage Pools screen disables the **New** button.	Navigate to any other screen of the web interface, and then navigate back to the Storage Pools screen.
Cannot increase a volumes size using units smaller than the current unit. (For example, if the size of the volume is 1 GB, you cannot increase its size by entering 1500 MB).	Use the same unit size, or greater, when increasing volume size. (For example, use 1.5 GB instead of 1500 MB to increase the volume size).
Cannot change user passwords in the command line interface.	Use the Verde web interface to change user passwords.
There is no indication that an update package is uploaded to the array when you navigate away from the Package Update screen and then back to the screen.	Do not navigate away from the Package Update screen when uploading a package. Wait several minutes for the package to upload.
The Pool capacity shows as a negative value after a drive failure.	Ignore the display. The value reverts to the proper value once the failed drive is replaced.
Cannot reduce the minimum size of a volume.	Delete the volume and recreate it with the desired minimum size.
Performance graphs do not automatically update.	Use your browser's refresh button to update the graphs.
Comma-separated value files (.csv) downloaded from the array do not have the file extension in the file name.	Edit the name of the file and add '.csv' to the end of the file name.

Verde 1.0

Description. Initial release.

Features

The Verde includes the following features:

Easy Network-Based Administration. The Verde is configured over an Ethernet network using a standard web browser.

File Sharing Connectivity for Major Operating Systems. The Network File System (NFS) and Common Internet File System (CIFS) protocols provide connectivity to most major operating systems, including Windows, Apple, UNIX, and Linux.

Gigabit Ethernet connectivity. Four onboard Gigabit Ethernet (GigE) ports provide Ethernet connectivity for the array with one dedicated port used to access the SpectraView web interface. This port cannot be used for data transfer.

Operating System Drive. Two dedicated Data On Module (DOM) mirrored drives provide the dedicated storage for the operating system.

Rack-Mount Hardware. The Verde is designed to mount in a standard 4-post, 19-inch rack using just 4U (7 inches or 17.8 cm) of rack space. Rack-mounting hardware is included with the Verde. Alternatively, the Verde can be placed on a level tabletop or other horizontal surface.

RAID-Protected Data Disks. The Verde includes up to thirty-six high-performance disk drives mounted on individual drive sleds. The drives provide the array's storage capacity. Disk drives are grouped into protected volumes with selectable parity options and automatic data integrity verification to protect against data corruption.

Redundant Components. The array features N+1 redundant power supplies and data drives that are hot-swappable for uninterrupted operation. Any data drives not configured in a storage pool act as global spares. The spare becomes active if a drive in the storage pool fails.

Verde Web Interface. The Verde web interface is used to perform configuration and management tasks on the Verde. It also lets you monitor the Verde hardware and view system messages.

10 Gigabit Ethernet. A dual port, 10 Gigabit Ethernet (10 GigE) network interface card is installed to provide high-speed data connections between hosts and the Verde.

Known Issues

Issue	Workaround
There is no way to delete messages on the messages screen.	There is no resolution to this issue.
Sets of disks that were configured as a storage pool in one array, do not display on the Storage Pools screen when moved into a different Verde array.	Do not move disks from one Verde array to another.
Performance graphs do not accurately report the write speed of compressible data streams at the Storage Pool and Drive level. This occurs because the data is compressed by the file system before it is written to disk.	There is no resolution to this issue.
The Verde console does not display the correct IP address for the Verde management port if the IP address was changed in the Verde web interface.	Press **CTRL-R** to refresh the console screen. The updated IP address displays.
Unable to move or alter volumes if the storage pool is full to capacity.	Delete data from the storage pool so that it is not full to capacity before moving a volume to a different pool.
Storage Pools at 80% or greater filled capacity take a long time to rebuild.	Maintain storage pools at 80% or less capacity, or understand that rebuilds take up to several days on very full pools.
Pool creation dialog times out when creating large storage pools.	The pool is created successfully. Force a page refresh by pressing **F5** or use the refresh button on your web browser to refresh the Verde web interface.
Configuring a storage pool with 6 drives, using the dual-parity option, does not have a **Capacity-Performance** slider.	None. Storage pools of 6 drives in a dual-parity configuration are created with the best possible capacity-performance ratio and do not require the slider.
The Verde does not allow clearing a network interface configuration. **Note:** This issue is resolved in the Verde 1.1 release.	To clear the configuration of a network interface, configure the interface to use a static IP address, then leave the **IP Address** field blank. Click **Save** to clear the configuration.
Pool and volume information is unavailable during pool rebuilds and volume transfers. **Note:** This issue is resolved in the Verde 1.1 release.	Wait until the storage pool stops rebuilding or the volume finishes transferring to another pool to view pool and volume information.
Cannot monitor performance of the array via SNMP.	There is no resolution for this issue.
When moving a volume that is a CIFS based share, the CIFS service momentarily stops and restarts.	If necessary, remount the CIFS share after the move is complete.

Issue	Workaround
Once created, you cannot rename a storage pool.	If possible, delete the storage pool and create a new pool with the desired name. If you cannot delete a storage pool, you can attempt to create another pool if drives are available with the desired name and transfer the data to the new pool. Otherwise, you must keep the original name.
Drives can be physically hard to remove from slots in the array.	Use caution when removing drives. If a drive does not slide easily by pulling on the sled handle, grasp the sides of the drive sled and pull the drive out of the enclosure.
Cannot create a volume when the value for **Minimum Size** is the same as the total space available on a storage pool. **Note:** This issue is resolved in the Verde 1.1 release.	To create a volume using all available space on the storage pool, leave the **Minimum Size** and **Maximum Size** fields blank.
If you are not logged in to the Verde web interface and attempt to go directly to a page inside the GUI, you are redirected to a blank page.	Always enter the URL address for the login screen of the array, which is the IP address of the Verde management port.
If a unit has a failed drive, it is correctly identified as failed in the Verde web interface. If you reboot the array under this condition, the web interface shows a good status for the drive.	Do not reboot the array with a failed drive. If you must reboot under this condition, physically mark the drive in some manner so you know which drive to replace when the replacement drive arrives.
In a single, dual, or triple parity storage pool, a second global spare drive does not automatically replace the initial global spare drive if the first global spare becomes degraded.	Replace any drives that fail as soon as possible to prevent this issue from occurring.
If many volumes, shares, and snapshots are created on an array, the array experiences a decrease in performance.	There is no resolution for this issue. Plan your storage usage accordingly. Spectra Logic recommends that you do not create more than 10 volumes on a single array. With 10 or less volumes configured on a array, the number of shares and snapshots possible for each volume is low enough to keep performance at an optimal level. This issue will be addressed in a subsequent release.
Automated emails do not contain any information to help identify which array generated the email. **Note:** This issue is resolved in the Verde 1.1 release.	By default, all Verde arrays are configured with the same information in the **From Address** field used when generating automated emails. If you have not changed this setting and receive an automated email, you are not able to tell which array generated the email. Login to each array and check the Messages screen to determine which array generated the message. To change this setting see the *Spectra Verde & Verde DPE Arrays User Guide*.

Issue	Workaround
The Volumes screen does not list the total or available size of the storage pool on which the volume resides.	If you want to change the size of a volume after it is created and do not know how much space is available on the storage pool on which the volume resides, click **Configuration ⋯⋗ Pools**. The Pools screen displays. The total size of each pool is listed on this page.
Cannot create an NFS or CIFS share when there is no data connection to the Verde.	Connect a cable to one of the data ports on the array and configure the port before creating any shares.
When setting the system time manually, the user is logged out and returned to the login screen. **Note:** This issue is resolved in the Verde 1.1 release.	System time is updated. Log back into the Verde web interface.
No message is generated when a login to the array fails.	There is no resolution to this issue.
Chrome and Safari web browsers, running on Mac OS X Lion, do not correctly display the Verde web interface.	Use the Firefox web browser on Mac OS X Lion, or upgrade to the most recent Macintosh operating system.
If the CIFS service hangs on the array, there is no way to restart the CIFS service.	To restart the CIFS service, do one of the following. ▪ Restart the Verde ▪ Restart the service on your Active Directory server ▪ Restart your Active Directory server
During a package update, you cannot upgrade to the same code level the array is already using. **Note:** This issue is resolved in the Verde 1.1 release.	Only attempt software upgrades to newer versions of software. Subsequent releases will provide the ability to revert to the previously installed version.
When you edit an existing service, volume, storage pool, share, network interface, etc, the Edit dialog box shows the state of the array when you click **Edit**. If changes to the array occur after you click **Edit**, these changes are not shown.	Refresh the screen by pressing **F5** or use the refresh button on your web browser to ensure you have the latest status of the particular object as other administrators may be making changes at the same time.
When moving a volume, clicking **Move** more than once causes error messages to display.	Only click **Move** once when moving a volume.
Rebooting the array while moving a volume to a different storage pool causes the move to fail.	Do not reboot the array during the move.
If you are manually creating a log set and an error occurs that would trigger automatic log generation, the second log is not generated.	There is no resolution for this issue.
When rebooting the array through the Verde web interface, the Firefox web browser does not automatically return to the login screen.	Allow the system to complete its initialization sequence. After a few minutes, enter the IP address of the Verde management port to return to the login screen.

User Guide Updates

The *Spectra Verde Array Family User Guide* is current as of the Verde 3.1.4 release.

There are no updates for the release of Verde 3.1.5.

Site Preparation Guide Updates

The *Spectra Verde Array Family Site Preparation Guide* is current as of the release of Verde 3.1.1.

There are no updates for the release of Verde 3.1.5.