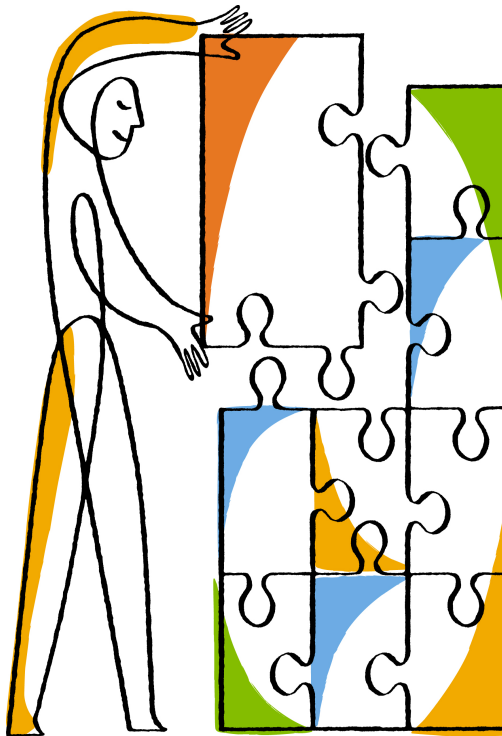




Mars™ OS 1.0.2

Release Notes



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Scope of Release Notes for Mars OS Release 1.0.2

What is covered in this document

Information in this document supersedes other FlashRay and Mars OS documents and online help in FlashRay System Manager. It includes last-minute changes that are not included in the rest of the documentation library and covers the following topics:

- [About FlashRay and Mars OS on page 4](#)
- [Best practices and command changes on page 5](#)
- [Limitations on page 7](#)
- [Known problems on page 8](#)
- [Mars OS software installation on page 15](#)
- [Additional documentation on page 23](#)

ATTENTION: This release addresses the vulnerabilities introduced by bash, referred to as “shellshock” and tracked by the following: CVE-2014-6271, CVE-2014-7169, CVE-2014-6277, CVE-2014-6278, CVE-2014-7186, CVE-2014-7187. For additional details about this vulnerability please refer to our [Product Security Advisory](#).

Important installation information

If you are a new customer, FlashRay systems are shipped to you installed with the latest software and firmware.

If you are an existing customer, the Mars OS Release 1.0.2 installation is a disruptive process that will result in the system configuration and data being lost. All data stored on the FlashRay system must be backed up prior to performing the installation. For complete software installation and firmware update instructions, see [Mars OS software installation on page 15](#).

All installations should be done with the assistance of technical support through a support case.

About FlashRay and Mars OS

FlashRay is an all-flash array platform, targeting environments that need high IOPS with very low, predictable latency. Mars OS is a purpose-built operating system for FlashRay, designed to deliver storage efficiency and enterprise-level availability and reliability.

For additional FlashRay and Mars OS information and documentation, refer to the FlashRay page on the NetApp Support Site: <http://mysupport.netapp.com/flashray>.

Platform and hardware features

A FlashRay system is comprised of one FlashRay controller and one fully populated DS2246 disk shelf. FlashRay system hardware is described in the *FlashRay Controller Installation and Service Guide* and in the *DS2246 Disk Shelf Installation and Service Guide*.

Software features

Mars OS features and operation are fully described in the *Mars OS 1.0.2 System Administration Guide*.

Best practices and command changes

This section provides best practices for operating and managing the FlashRay system with Mars OS. It also provides a list of command changes in this release.

Best practices

- To improve Mars OS space efficiency, create LUNs in sizes that are multiples of 128GiB. LUNs that are not close to a multiple of 128GiB in size do not make efficient use of storage space.
- The system generates an event message when it is low on space. If your system is low on space, wait until more space is available before you create additional LUNs.
- While it is not necessary to configure a DNS server for the FlashRay system to operate, you must configure the DNS server to enable the AutoSupport feature to communicate with NetApp or send messages to other configured AutoSupport destinations.

Additionally, if DNS is not configured, SSH connections to the system will take longer to connect. If you are using scripts to make connections to the system, increase the timeout value to account for the delay.

- The FlashRay system starts a discovery process for specific SSD, I/O module (IOM), and disk shelf installation and maintenance activities. You must wait at least 30 seconds between each activity for the discovery process to complete. This allows time for Mars OS to detect and properly manage the change. Refer to the *DS2246 Disk Shelf Installation and Service Guide* for specific instructions.

Also, if you are using the `storage disk power` command to power on, power off, or power cycle an SSD, you must wait at least 30 seconds between each operation for the system to fully process the change.

- The FlashRay system starts a discovery process for each SAS cable connection. It is recommended that you wait 60 seconds between each port offline/online, or cable connect/disconnect sequence before attempting the next connection. This provides time for the discovery process to complete. Otherwise, it is possible that a new connection event can interfere with the current discovery process and crash the system.
- Reboot or reset the Service Processor (SP) only after the FlashRay system has completely shut down. To shut down the system, enter the `cluster shutdown` command and wait for Mars OS to shut down before rebooting the SP.
- FlashRay Setup Wizard and FlashRay System Manager support multiple languages. Select your language preference at the FlashRay Setup Wizard or System Manager sign-on page.

Command changes

The following table lists command changes introduced in Mars OS Release 1.0.2:

Existing Command	Changed or New Command	Description of Change
cluster shutdown	--	The <code>-override-startup</code> parameter is added to this operational mode command.
loadgen2 create	--	The <code>-start-offset</code> , <code>-start-seqnum</code> , and <code>-lba-size</code> parameters have been added in this release.
lun consistency check	--	This command is removed in this release.
--	lun set	This is a new operational mode command.
--	security certificate modify	This is a new operational mode command.
--	security certificate show	This is a new operational mode command.
storage port state modify	--	The <code>-time</code> parameter is removed from this operational mode command.
storage disk updatefirmware	--	The <code>-uid</code> parameter is added to this maintenance mode command.
storage shelf updatefirmware	--	The <code>-shelf-id</code> parameter is added to this maintenance mode command.

Limitations

This section provides information about system limitations in this release.

- While System Manager labels and online help are localized in several languages, all input fields accept only English characters.
- The LUN maximum extent size option is used for performance tuning. Do not change its default setting unless technical support instructs you to do so. Contact technical support for guidance.
- Mars OS Release 1.0.2 supports only IPv4 addressing.
- Public key support is not available for admin login, meaning no support is provided for SSH password-less authentication using public keys. To log in, enter the admin name and password.
- Some command line interface (CLI) commands do not support the pipe (`|`) or `-format` filter (to format the output as JSON). This applies to commands in both operational and maintenance mode. In these cases, copy the output into an editor for processing.
- Maintaining host-level application backups and checkpointing is recommended to help manage unplanned events such as system power failures or resets.
- Mars OS can take more than five minutes to boot and complete startup operations following a crash. After a crash, wait for the system to start up and enter the `cluster startup show` command at the Mars OS prompt to verify startup is successful before starting any tasks.

If you have problems with the FlashRay system after a crash, contact technical support.

Known problems

This section provides a list of known issues in this release. For assistance with system-related issues or questions, contact technical support. Bug numbers provided in this document are not available through the NetApp Support Site (NSS). Reference these numbers when working with technical support.

User interface (GUI) issues

- FlashRay System Manager polls the system every minute, so changes to capacity as shown in the Capacity pane are not reflected immediately. To see the change immediately, refresh the browser and log in to FlashRay System Manager again.
- The System Manager provides check boxes to use in selecting multiple LUNs and initiator groups (igroups) for modification, but only one LUN or igroup modification at a time is allowed. Use the CLI to modify all the igroups with a single operation. (bug 17326)
- Setup Wizard might fail to discover a new controller. Certain race conditions during boot of Mars OS might cause Setup Wizard not to find the controller during Setup Wizard's discovery process.

Reboot the controller and re-run Setup Wizard's discovery step. To reboot the controller, power it off, wait a few seconds, and then power it on again. (bug 18487)

CLI issues

- Before you create a cluster on your FlashRay controller, the Fibre Channel symbolic name returned to the FC switch is not set. You can safely disregard the messages indicating that the cluster is unnamed. After you create the cluster, the appropriate cluster name is used.

The following messages are sample messages after you boot the FlashRay system for the first time: (bug 12176)

```
symbolic-port-name :NetApp Mars OS FC Target Port (8324) Unnamed
Cluster:default vserver:lif_0f
symbolic-node-name :NetApp Mars OS FC Target Device Unnamed
Cluster:default vserver
```

- The `system image get` command takes a long time to complete, and does not show a progress indicator. The `system image get` command downloads the Mars OS install image onto the controller. Because Mars OS install images are very large, the download may take several minutes on slow networks to complete. Mars OS does not display the progress of the download.

No workaround is available at this time. Use the `system image package show` command to check that the image has been downloaded. (bug 14915)

- Pressing Ctrl-C to interrupt a running command does not cancel that command. You will get the prompt back, but the processing of the command continues in the background. For example, when using the `system image get` command to download a Mars OS image, pressing Ctrl-C does not cancel the download. Use the `show` version of a command to check for changes due to a command entry that could not be interrupted, and make changes as appropriate.

For image downloads, remove unwanted images using the `system image package destroy` command. (bug 16272)

- Running the `cluster reboot -maintenance` command before the controller has finished initialization might cause the controller to boot back to operational mode rather than maintenance mode.

To get information about controller initialization, use the `cluster startup show` command. To work around this issue, during the reboot, press Ctrl-C when prompted to enter maintenance mode. (bug 17449)

- While Mars OS is in the process of shutting down, whether due to a shutdown or reboot, you can still access the command line interface, but the system and commands progressively become unavailable. Error messages can appear during this phase in response to command entries. This is expected, but the errors might seem unrelated to the shutdown. Examples of these messages include the following:

```
Cannot connect to Mars
Connection Error[[Errno 111] Connection refused]
Command unavailable. Mars OS is in the process of starting up or shutting
down
```

Avoid entering commands when the system is shutting down or restarting. (bug 16583)

- An inconsistency can exist between the output of the `system led show` and `system health show` commands when there is either a CPU or DIMM configuration error or a power supply fault. While the system is correctly identifying a fault condition, the outputs will not agree.

In the case of a CPU or DIMM alert, the `system led show` command will indicate that both the System Attention LED and the Controller Attention LED are lit, but the `system health show` command will indicate that only the controller has a warning, and that the chassis (controller plus other system components) is still OK.

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In the case of a power supply alert, the `system health show` command will indicate that both the chassis and controller have a warning. The `system led show` command will indicate that only the System Attention LED is on, and the Controller Attention LED is still off.

Check the output of the `system health alert show` command, and address any CPU-, DIMM-, or power-related alerts. (bug 18019)

- The `system service-processor network show` command occasionally does not display network interface information for the SP. Entering the `system service-processor network show -force` command forces Mars OS to query the service processor (SP) to obtain network attributes, such as IP address, netmask, and gateway information. In some cases, after rebooting the SP, the network information is not reported and is displayed as “-“ in the command output.

To work around this issue, reboot the SP one more time, and enter the `system service-processor network show -force` command again. (bug 18177)

- All environmental issues displayed through the `system health alert show` command are listed as WARNING.

The FlashRay system constantly monitors environmental conditions associated with various system components and generates event messages for each component. The severity level of event messages can range from informational to emergency. When viewed through the `system health alert show` command, all environmental alerts are listed as WARNING severity. In fact, some of the underlying environmental issues cause the controller to shutdown (for example, critical over-temperature) and should instead be listed as CRITICAL severity.

Regardless of the severity level displayed by the `system health alert show` command, the FlashRay system will take the appropriate action to protect system components and data. Use the `system environment show` command to display the appropriate severity level for environmental alerts. (bug 17885)

System issues

- If you change the state of a LUN back to online after a Mars OS `out of space` error is generated, the next write to the LUN can change its state back to offline if no space has been freed up on the system.

Use the `lun show` command to verify that LUN status is normal. (bug 16711)

- The `cluster destroy` command does not destroy the SP's IP settings. For example, if you were to return your controller back to NetApp, it might retain the SP IP settings you have assigned it. To clear the SP's IP settings, run the `system service-processor network modify -ipv4-enable false -ipv6-enable false` command before or after destroying the cluster. (bug 17254)

- The Service Processor daemon (SPD) may crash during clean controller shutdown. During a clean controller shutdown, the SPD may crash and create a core file. At next boot, a core file from the SPD will be available with `spd` in the core file name. This has no impact on system operation, and it is safe to continue. For assistance removing the file, contact technical support. (bug 17537)
- Some storage commands like `storage disk power` might not seem to be working because the CLI prompt reappears immediately after they are issued. Run the `storage disk show` command to determine the progress of the command or the status of the SSD. (bug 17409)
- The space savings counter listed under `stats show -object capacity` shows 0 instead of 1 before LUNs are created. In Mars OS, space savings is calculated as the ratio of the space needed for client write operations to the space actually consumed to store the client data. With LUNs, the space savings ratio is usually much greater than 1 due to compression and deduplication. Without LUNs, the ratio of written space to stored space is 1; however, it should not be 0.

Space savings will be calculated and reported correctly after LUNs have been configured on the system. (bug 17553)

- The `storage disk show` command continues to show an SSD as faulted after it has been removed and replaced. In some circumstances, the `storage disk show` command continues to show an SSD removed from the drive shelf as a faulted drive, even after a new drive is swapped into the slot. In this case, the drive is not assimilated into the RAID group. To clear the SSD information, reboot Mars OS using the `cluster reboot` command.

For assistance, contact technical support. (bug 17780)

- Mars OS reports an incorrect login when you use the proper credentials. Attempts to access the management interface using SSH during system startup, shutdown, or when the system is in maintenance mode will fail with the message `Login Incorrect`.

Wait for the system to finishing starting up or shutting down before attempting to log in. If the problem persists, connect to the console using the Service Processor (SP), or directly through the serial port. No login is necessary on the console when Mars OS is in maintenance mode. (bug 17097)

- The `system configuration show` command might display stale information if the controller is unconnected to an FC fabric when an SFP is removed from the target adapters (0e through 0h). Because the driver loads and clears SFP information only on boot/link up or link down, no link down event is generated if there is no link to an FC fabric, so notification does not occur.

To update information after replacing the SFP transceiver, connect it to a Fibre Channel fabric to trigger a read operation. (bug 15383)

- The `system configuration show` command reports the wrong controller part number. The

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FlashRay controller part number is hard-coded into the system and is reported incorrectly by the `system configuration show` command.

Use the `system fru show` command to get the correct controller part number. (bug 17643)

- Admin password changes initiated during a Service Processor (SP) reboot might not get synced with the SP. When you log in to the SP, you are required to enter admin credentials. If the admin user password is changed while an SP reboot is in progress, the password might not get synced with the SP. In this case, you will not be able to log in to the SP with changed password.

No workaround is available at this time. Change the password only after the SP is up. (bug 17522)

- Controller Attention and System Attention LEDs can remain lit after a controller reboot. System errors identified by the `system health alert show` command that have their `tagfield` set to `sys_cfg_led` will light the Controller and System Attention LEDs. If the faults causing those errors are corrected after a cluster shutdown or during a cluster reboot, then the Controller and System attention LEDs will remain lit. If the fault condition is cleared prior to shutting down or rebooting, the system the LEDs will be extinguished correctly.

This issue only occurs when the underlying condition is corrected while the controller is powered off. If possible, attempt to clear the condition prior to rebooting the system. (bug 17884)

- A powered-down FCP initiator is still shown as logged in. After powering down a Fibre Channel SAN initiator, the initiator is still shown as logged in to the storage system as indicated in the `fc initiator show` command. This issue has no negative impact on the system operation. (bug 18181)
- FlashRay System Manager `Lost Connection` dialog does not always appear in Mac OS Safari. When FlashRay System Manager cannot communicate with a Mars OS system (such as when the Mars OS system is rebooting), it normally indicates the problem with a `Lost Connection` dialog while it tries to reconnect. In some cases, the Mac OS Safari browser will instead show a `Safari can't open the page` error instead of the usual dialog.

To work around this issue, reload the System Manager in your browser after Mars OS has finished booting. (bug 18218)

- SMART data reports higher temperatures on an SSD after upgrading to firmware version NA01. After upgrading an SSD with firmware version NA01, the `storage disk smart show` command output shows the SSD temperature as 40C. This is a transient condition that occurs only following an update to firmware version NA01. The temperature reading will settle down to the actual temperature within approximately 30 minutes. (bug 17926)
- I/O module (IOM) firmware version is not displayed correctly after hot swapping an IOM that has a different firmware version. Mars OS might not report the correct firmware version of a hot

swapped IOM. Mars OS might continue to display the firmware version of the swapped IOM. This does not impact system operation. (bug 19009)

- I/O module (IOM) status is not shown as missing when it is removed. The `storage shelf fault show` command continues to show the status of both expander 0 and 1 (IOM 0 and 1) as OK after one of the modules has been removed. The status of the missing module should appear as missing. This does not impact system operation. (bug 19013)
- Mars OS generates event messages related cluster memory usage. As part of normal operation, Mars OS allocates memory to various system components, or processes. In some cases, Mars OS generates event messages indicating that the clustering component is owning more memory than what is required. This issue does not impact system operation. (bug 19083)
- LUN size might not display correctly on a Linux initiator for a resized LUN after power-cycling the FlashRay system. In some cases, power-cycling the FlashRay system after resizing a LUN can cause a Linux initiator mapped to that LUN to not recognize the new LUN size. Even after a rescan by the Linux initiator for attached devices, the resized part of LUN fails to be shown. This causes Linux I/O operations to the newly resized portion of the LUN to fail, while I/O operations in the old space succeed.

To work around this issue, at the `mars>` prompt, enter the `lun modify -state offline` and then `lun modify -state online` commands to the resized LUN. Following that, enter the `fcg stop` and `fcg start` commands.

On the Linux initiator, scan for LUNs with the Linux `rescan-scsi-bus.sh --forcerescan` and `echo "- - -" > /sys/class/scsi_host/host<id>/scan` commands. Verify that the newly sized LUN is showing up in the results. (bug 19436)

- A SAS HBA can become unresponsive following frequent disk power operations. Each time an SSD is subjected to power-cycling (power on/off), it can cause the SAS host bus adapter (SAS HBA) to start a device discovery operation. In rare cases where a disk is subjected to frequent power cycling, this can cause the SAS HBA to become unresponsive, causing the command to time out. To work around this issue, limit power cycling of the SSDs. (bug 19696)
- A system crash can occur when moving a service disk between controllers that are on different release levels. Service disks should not be moved between controllers that are on different release levels. This can put the controllers into an unusable state and crash the FlashRay system. Contact technical support for assistance replacing a service disk. (bug 19813)
- The `lun delete -force` command is disabled. Using the `-force` parameter with the `lun delete` command can cause a problem that might lead to a system crash. To avoid this, the `-force` parameter has been disabled. To delete a LUN that is mapped to an initiator group (igroup), take it off-line using the `lun modify -state` command, and then destroy it using the

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`lun delete` command. (bug 19357)

- Drive fault LED is on after drive insertion. On a physical drive removal, the drive's fault LED is sometimes turned on before it gets fully removed from the slot. When a drive is inserted into that same slot later on, the fault LED remains on even though the newly inserted drive is working properly.

To work around this issue, use the `storage disk show` command to verify that newly inserted drive is working correctly (ready state); then use the `storage disk set-led -action led-off -name <disk-name>` command to turn off the fault LED. (bug 20428)

Mars OS software installation

This section provides instructions for installing Mars OS Release 1.0.2 on FlashRay systems running Mars OS Release 1.0 or Mars OS Release 1.0.1. It includes firmware update requirements and procedures.

Installation overview

The Mars OS Release 1.0.2 installation is a disruptive process that will result in losing the on-disk configuration. You must back up all data stored on the FlashRay system before proceeding with the installation. In addition to backing up data for the cluster, volume, volume mappings and initiator group, record all configuration information so that it can be used to reconfigure the system after installation. For more information, refer to NetApp Knowledge Base article KB [3014456](#).

All installations should be done with the assistance of technical support through a support case.

NOTE: If AutoSupport was enabled prior to installation, technical support can assist you in retrieving system configuration information.

The Mars OS installation process has two phases:

- Downloading and updating FlashRay SP firmware

The Service Processor (SP) is a hardware component on the FlashRay controller that serves as a remote management device. The SP, in collaboration with Mars OS, helps to monitor and maintain FlashRay system health. The FlashRay system can operate only when the SP functions properly. You cannot use the system without the SP.

The SP firmware update is a manual procedure that must be done before installing Mars OS software.

- Downloading and installing Mars OS software

The Mars OS Release 1.0.2 software download package brings the latest features and functionality to the system, along with the latest firmware updates to the system BIOS, Loader, Host Bus Adapter (HBA), and solid-state drives (SSDs).

With the exception of the SSD firmware, all firmware updates provided in this package are installed automatically with the software installation. The SSD firmware update is a manual process that is done immediately following Mars OS installation.

The following table summarizes the firmware update requirements for systems installing Mars OS Release 1.0.2:

FlashRay Firmware	Version required for Mars OS Release 1.0.2	Installation Requirements
Service Processor (SP)	3.0.2	Manual update required prior to installing Mars OS Release 1.0.2.
BIOS	9.3	None. Firmware is updated automatically with installation of Mars OS software.
Loader	5.3	None. Firmware is updated automatically with installation of Mars OS software.
Serial attach SCSI host bus adapter (SAS HBA)	1.12.06.00	None. Firmware is updated automatically with installation of Mars OS software.
SM843T Shelf SSD	NA01	Manual update required following installation of Mars OS software.

Installing Mars OS

Installing Mars OS Release 1.0.2 requires both downloading and upgrading SP firmware, and downloading and installing Mars OS software.

Downloading SP firmware

1. Locate the SP firmware package by using the Mars OS software downloads and updates link on the FlashRay support page:

<http://mysupport.netapp.com/flashray>

2. Download the image to an HTTP server.

Access to the HTTP server must not be password protected. If your environment does not have an HTTP server, instructions to bring up a temporary server can be found in NetApp Knowledge Base article KB1014846: [How to setup a Simple HTTP Server for downloading code to Mars OS](#).

This completes the SP firmware download procedure.

Updating SP firmware

Updates must be done at the SP command line interface (CLI).

1. For systems running either Mars OS Release 1.0 or Mars OS Release 1.0.1, log in to the SP.

From the console port:

- a. Attach a console to the FlashRay console port.
- b. Press `Ctrl-G` to access the SP login prompt.
- c. When you are prompted for the password, enter the admin password. The `SP>` prompt appears.

From the system management port:

- a. Connect to the SP using SSH. For example, if the SP's IP address is 198.51.100.123, enter the following command:

```
ssh admin@198.51.100.123
```

- b. When prompted, enter the admin password. The `SP>` prompt appears.

2. To update the SP, enter the `sp update` command along with the path to the SP firmware on the HTTP server. For example:

```
sp update http://web_server_name/path/SP_FW.tar.gz
```

The system displays message similar to the following:

```
Downloading package...
Uncompressing package...
Unarchiving package...
Inspecting firmware...
Installing package...
Reprocessing configuration state...
Cleaning up...
SP FW Update Successful
```

At the end of the SP firmware update process, the system asks you to confirm the SP reboot:

```
Do you want to reboot the SP now? (y/n):
```

3. To reboot the SP and complete the firmware update, type `y` and press `Enter`. This will reboot the SP with the newly updated firmware and return you to the console.
4. Press `Ctrl-G` at the console to access the SP login prompt. When prompted, enter the admin password. The `SP>` prompt appears.
5. To verify the SP firmware version information, enter the `sp status` command. The output includes the system status information, similar to the following:

```
Firmware Version: 3.0.2
```

If the firmware has not been updated, stop here and contact technical support for assistance. If the SP firmware shown is the current version, press `Ctrl-D` to exit the SP.

This completes the SP firmware update.

Downloading Mars OS

- 1. Locate the Mars OS software package by using the Mars OS software downloads and updates link on the FlashRay support page:

<http://mysupport.netapp.com/flashray>

- 2. Download the image to an HTTP server that is accessible from FlashRay’s management port (e0M).

Access to the HTTP server must not be password protected. If your environment does not have an HTTP server, instructions to bring up a temporary server can be found in NetApp Knowledge Base article KB1014846: [How to setup a Simple HTTPServer for downloading code to Mars OS](#).

- 3. Copy the downloaded software package into a folder accessible from the HTTP server, and extract the contents of the package.

The following files must be present in the folder:

File name	Description
vmlinuz	Linux kernel installation files and image
initrd.img	Initial ramdisk file that loads the image
rootrd.img	Root ramdisk file that loads the root
mars.tgz	Mars OS image

This completes the Mars OS software download procedure.

Installing Mars OS Software

- 1. Halt all I/O operations to the system and unmount any volumes, if still mapped to the initiators.
- 2. Log in to the Service Processor (SP), either from the console or system management port.

From the console port:

- a. Attach a console to the FlashRay console port.
- b. Press `Ctrl-G` at the console to access the SP login prompt.
- c. When prompted, enter the admin password. The `SP>` prompt appears.

From the system management port (e0M):

- a. Connect to the SP using SSH. For example, if the SP's IP address is 198.51.100.123, enter the following command:

```
ssh admin@198.51.100.123
```

- b. When you are prompted for the password, enter the admin password. The `SP>` prompt appears.
3. Enter the `system console` command. The `mars>` prompt appears, allowing you to enter any Mars OS commands. At this point, you stop communicating with the SP command line interface (CLI), which means that another user can establish an SP session to access the SP CLI. To return to the SP prompt, type `Ctrl-D`.
 4. At the `mars>` prompt, enter the `cluster shutdown` command. The system prompts you to confirm the shutdown operation.
 5. Enter `Yes` to confirm your selection.

This starts a clean shutdown of the system, meaning that Mars OS flushes data from memory to the SSDs. The shutdown process can take several minutes. When it is complete, the system console displays the `LOADER-A>` prompt.

6. From the loader prompt, configure the system management port (e0M). This must be done every time you install software using the netboot process. The interface configuration process depends on whether your network is running DHCP.

- a. With DHCP, enter the following command:

```
ifconfig e0M -auto
```

- b. Without DHCP, use previously recorded configuration information to manually configure the interface. For example, to use IP address 198.51.100.110, netmask 255.255.255.0, gateway address 198.51.100.1, and DNS address 203.0.113.13 on the domain my.domain.com, you would enter the following command:

```
ifconfig e0M -addr=198.51.100.110 -mask=255.255.255.0 -gw=198.51.100.1 -  
dns=203.0.113.13 -domain=my.domain.com
```

7. After configuring the interface, enter the `netboot` command, along with the path to the `vmlinuz` file extracted from the Mars OS 1.0.2 release package.

For example, if the HTTP server is running on a system named `bootserver.my.domain.com`, and the Mars OS 1.0.2 release package was extracted to the folder `/mars_image` of the root of the HTTP server, you would enter the following command:

```
netboot http://bootserver.my.domain.com/mars_image/vmlinuz
```

The system boots from the kernel image and displays a prompt welcoming you to the Mars OS installation process.

```
Welcome to the Mars Installation Process
Please choose one of the following:
  1 - Fresh install (reformat)
  2 - Update (retain configuration information from current system)
  q - Cancel install/update and reboot the system
Enter 1 or 2 (default is 2):
```

NOTE: Any data not backed up prior to selecting option 1 will be lost. To cancel the installation, press `q` to quit. Back up the data after the system reboots, and repeat the installation procedure from Step 1.

8. To continue with the installation, select option 1, `Fresh install (reformat)`. Option 2 is not supported when installing from Mars OS Release 1.0.2.

The system will prompt you to enter the location of the Mars OS installation package.

9. Verify the default path to the `mars.tgz` package is pointing to the correct target and press `enter` to accept it, or type in the correct path to `mars.tgz` and press `Enter`.

The system will boot Mars OS. If it fails, ensure the `mars.tgz` file is in the same folder as the `vmlinuz` file, and select option 1 again.

The installation process runs automatically. It is normal to encounter extended pauses during this process. If the pauses extend for longer than 15 minutes, do not power off or attempt to interrupt the installation. Work with your technical support representative to identify next steps and resolve any issues with the installation.

NOTE: Once installation is complete, a prompt will appear instructing you to press `Enter` and `reboot` to run the new installation. Do not press `Enter` at this time.

Go to the next step to update the SSD firmware version to NA01. This is done in maintenance mode, which you enter during the boot process.

10. Press `Enter`.

Carefully watch the boot process and press `Ctrl-C` when the following prompt appears.

```
#####
^C to start into maintenance mode.
#####
```

The system boots into maintenance mode, displaying the `mars - maintenance>` prompt. If the prompt does not appear, work with technical support to boot the system into the maintenance mode.

11. From the maintenance prompt, enter the `set -privilege diag` command

The `mars - maintenance(diag)>` diagnostic prompt appears.

12. Enter the `storage disk show` command and check for installed SSDs that require a firmware update. To operate with Mars OS Release 1.0.2, all drives with model number X435-SG843480ASY and firmware revision NA00 require a firmware update to version NA01.

Make a note of the disk names that require an update. For example: 0a.0.4, 0b.0.3, 0d.0.2, and so on.

If all disks are already at version NA01, skip to step 15 to continue booting the system.

13. Using the list of disk names, enter the following command to update the SSD firmware:

```
storage disk updatefirmware -disk-list <diskname1>,<diskname2>,...,<disknameN>
-firmware-filename X435_SG843480ASY.NA01.LOD
```

The system displays messages similar to the following:

```
Command is in progress.
Updating disk firmware for disk: 0d.0.2
Update complete for disk 0d.0.2
Updating disk firmware for disk: 0b.0.3
Update complete for disk 0b.0.3
Updating disk firmware for disk: 0a.0.4
Update complete for disk 0a.0.4
```

Observe the output for errors.

14. To confirm that all SSDs are now at version NA01, enter the `storage disk show` command.

If SSDs with model number X435-SG843480ASY are not at version NA01, or errors were encountered during the update process, stop here and contact technical support for assistance finalizing the installation.

15. At the `mars - maintenance>` prompt, enter the `reboot` command to reboot the system normally.

The admin user account is reset as part of the installation process. To log in as the admin user, enter the default password, `changeme`.

16. After the system has booted, enter the `system configuration show` command to confirm the BIOS firmware is version 9.3 and Loader firmware is version 5.3.

If the firmware has not been updated, stop here and contact technical support for assistance.

17. Enter the `storage port show` command to confirm the SAS HBA firmware is version 01.12.06.00.

If the firmware has not been updated, stop here and contact technical support for assistance.

The Mars OS installation process is now complete, and you can reconfigure Mars OS using the previously recorded information.

Additional documentation

For FlashRay and Mars OS information and documentation, including FlashRay Setup Wizard, refer to the FlashRay page on the NetApp Support Site: <http://mysupport.netapp.com/flashray>.

To learn more about using Fibre Channel fabrics with NetApp products refer to the following publications:

- *Mars OS 1.0.2 System Administration Guide*
- Fibre Channel SAN Best Practices: <http://www.netapp.com/us/system/pdf-reader.aspx?m=tr-4017.pdf&cc=us>

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