



## M2 SATA Module

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## M2 SATA Module on Cisco Catalyst 9400 Series Supervisor

Cisco Catalyst 9400 is a next generation modular switch that lets you host applications for packet collection and analysis, testing, monitoring, and so on. To support the storage needs for these applications, the Cisco Catalyst 9400 Series Supervisor has an M2 connector that hosts a 22x88mm M2 SATA flash card. SATA configuration ranges from 240GB, 480GB to 960GB.

## File System and Storage on M2 SATA

The default file system format of SATA is EXT4. However, SATA supports all extended file systems-EXT2, EXT3 and EXT4.

The SATA device has the following characteristics:

- Files stored on the M2 SATA partition are compatible with files stored on other devices.
- You can copy, or, store files between M2 SATA and other types of devices such as USB, eUSB, flash, and other IOS-XE file-system or storage.
- You can also read, write, delete, and format the SATA device.

## Limitations of M2 SATA

- Non-EXT based file systems are not supported on M2 SATA.
- You cannot remove the M2 SATA device without powering off the Supervisor.
- You cannot use M2 SATA to boot images from rommon.
- You cannot upgrade the firmware on the M2 SATA drive.
- You cannot use M2 SATA to execute emergency install of images.

## Self-Monitoring, Analysis and Reporting Technology System (S.M.A.R.T.) Health Monitoring

Cisco Catalyst IOS XE Release 16.9.1 gives you the ability to monitor the health of the device through CLIs. You can monitor internal hot-spots, flash wear-outs, and hardware failure of the SATA device and alert your users about a SATA failure. These users can then backup data and obtain a new SATA device.

A linux daemon smartd starts when the SATA is inserted into the Supervisor. By default, the polling interval is set to 2 days for offline test, 6 days for short test and 14 days for long test. The warnings and error messages are saved in /crashinfo/tracelogs/smart\_errors.log and are also sent to the IOSd console.

The S.M.A.R.T. feature and smartd daemon are enabled by default when the SATA device is detected by the switch.




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**Note** If the SATA is not detected after insertion, check the existing file system on the device. If it is not EXT based, SATA will not be detected. In that case, change the filesystem to EXT and reinsert the SATA.

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The following CLI shows the logs from the smartd daemon:

```
Switch# more crashinfo:tracelogs/smart_errors.log
%IOSXEBOOT-4-SMART_LOG: (local/local): Mon Jan 4 00:13:10 Universal 2016
INFO: Starting SMART daemon
```

You can monitor the overall health of the device through the following CLI:

```
Switch# more flash:smart_overall_health.log
smartctl 6.4 2015-06-04 r4109 [x86_64-linux-4.4.131] (local build)
Copyright (C) 2002-15, Bruce Allen, Christian Franke, www.smartmontools.org

=== START OF READ SMART DATA SECTION ===
SMART overall-health self-assessment test result: PASSED
```

## Accessing File System on M2 SATA

The mounted file system from the SATA flash card is accessed at disk0:. Use the **show file systems** command to view the details of each type of available filesystem.

Copying files to and from bootflash: or usbflash0: is supported.

## Formatting the M2 SATA Flash Disk

To format a new Flash Disk, use the **format disk0:** command.

The format command recursively deletes all files on the device. This command fails if any file is open during its execution.

```
Switch#format disk0: ? <cr> <cr>
      ext2    ext2 filesystem type
      ext3    ext3 filesystem type
      ext4    ext4 filesystem type
      secure  Securely format the file system
<cr> <cr>
```

```
Switch# format disk0:
Format operation may take a while. Continue? [confirm]
Format operation will destroy all data in "disk0:". Continue? [confirm] Format of disk0:
complete
```

## Operations on the SATA Module

The following are some of the operations that you can perform on the SATA:

Command	Description
<b>dir</b> <i>filesystem</i>	Displays the directories on the specified file system.
<b>copy</b> <i>source-file destination-url</i>	Copies files from specified source to a specified destination.
<b>delete</b>	Deletes a specified file
<b>format</b>	Formats the filesystem on the disk.
<b>show disk0:</b>	Displays the content and details of disk0:
<b>show file information</b> <i>file-url</i>	Displays information about a specific file.
<b>show file systems</b>	Displays the available file system on your device.
<b>show inventory raw</b>	Displays the details of the existing modules on the switch.

Following are sample outputs of the operations:

```
Switch# dir disk0:
Directory of disk0:/
 11  drwx                16384  May 11 2018 16:06:14 +00:00  lost+found
10747905  drwx                4096  May 25 2018 13:03:43 +00:00  test
236154740736 bytes total (224072925184 bytes free)
```

View the status of RP on a particular chassis:

```
Switch# dir disk0-1-1:
Directory of disk0-1-1:/
```

```

    11 drwx          16384   Feb 1 2018 12:43:40 -08:00  lost+found
944994516992 bytes total (896892141568 bytes free)

```

### Copy a file from the disk0: to USB

```

Switch# copy disk0:test.txt usbflash0:
Destination filename [test.txt]?
Copy in progress...C
17866 bytes copied in 0.096 secs (186104 bytes/sec)

Switch# dir usbflash0:
Directory of usbflash0:/
    12 -rw-          33554432   Jul 28 2017 10:12:58 +00:00  nvram_config
    11 drwx          16384     Jul 28 2017 10:09:46 +00:00  lost+found
    13 -rw-          17866     Aug 11 2017 09:52:16 +00:00  test.txt
189628416 bytes total (145387520 bytes free)

```

### Delete the file test.txt from disk0:

```

Switch# delete disk0:test.txt
Delete filename [test.txt]?
Delete disk0:/test.txt? [confirm]

Switch# dir disk0:
Directory of disk0:/
No files in directory
118148280320 bytes total (112084135936 bytes free)

```

### Copy file test.txt from USB to disk0:

```

Switch# copy usbflash0:test.txt disk0:
Destination filename [test.txt]?
Copy in progress...C
17866 bytes copied in 0.058 secs (308034 bytes/sec)

Switch# dir disk0:
Directory of disk0:/
    11 -rw-          17866     Aug 11 2017 09:53:03 +00:00  test.txt
118148280320 bytes total (112084115456 bytes free)

```

### Format the disk

To format the ext4 filesystem, use the following command:

```
Switch#format disk0:ext4
```

### Show commands

```

Switch# show disk0:
-#- --length-- -----date/time----- path
    2      17866 Aug 11 2017 09:54:06.0000000000 +00:00 test.txt
112084115456 bytes available (62513152 bytes used)

```

```

Switch# show file information disk0:test.txt
disk0:test.txt:
  type is image (elf64) []
  file size is 448 bytes, run size is 448 bytes
Foreign image, entry point 0x400610

```

```
Switch# show file systems
```

```

File Systems:

          Size(b)      Free(b)      Type  Flags  Prefixes
-
          -
* 11250098176  9694093312  disk   rw     bootflash: flash:
    1651314688  1232220160  disk   rw     crashinfo:
    118148280320 112084115456  disk   rw     disk0:

```

```

189628416      145387520      disk      rw      usbflash0:
7763918848    7696850944      disk      ro      webui:
-              -              opaque    rw      null:
-              -              opaque    ro      tar:
-              -              network   rw      tftp:
33554432      33532852      nvram     rw      nvram:
-              -              opaque    wo      syslog:
-              -              network   rw      rcp:
-              -              network   rw      http:
-              -              network   rw      ftp:
-              -              network   rw      scp:
-              -              network   rw      https:
-              -              opaque    ro      cns:

```

Switch#**show disk0: fileys**

```

Filesystem: disk0
Filesystem Path: /vol/disk0
Filesystem Type: ext4
Mounted: Read/Write

```

Switch#**show inventory raw**

```

NAME: "Slot 5 SATA Container", DESCR: "SATA Container"
      PID:                , VID:                , SN:

```

## Feature History and Information for M2 SATA Module

Release	Modification
Cisco IOS XE Everest 16.6.1	This feature was introduced.
Cisco IOS XE Fuji 16.9.1	Introduced support for application hosting storage needs.

