



Configuring USB 3.0 SSD

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USB 3.0 SSD

In Cisco IOS XE Fuji 16.9.1, support for USB 3.0 SSD is enabled on Cisco Catalyst 9500 Series Switches. USB 3.0 SSD provides extra 120 GB storage for application hosting. Applications can be hosted in Kernel Virtual Machines (KVM), Linux Containers (LXC), or Docker containers. The storage drive can also be used to save packet captures, trace logs generated by the operating system and third-party applications. USB 3.0 SSD can be used simultaneously as a general-purpose storage device and as an application-hosting device. You must use only Cisco USB drives; non-Cisco USB drives are not supported.



Note Support for USB 3.0 SSD is not available on Cisco Catalyst 9500 Series High Performance Switches.



Note USB 3.0 SSD cannot be used to boot images, emergency install the images, or upgrade internal flash using (software maintenance update (SMU or **install** commands. Bootloader support for USB 3.0 SSD is not available.

USB 3.0 SSD is enabled with Self-Monitoring, Analysis and Reporting Technology (S.M.A.R.T) functionality for health monitoring of the drive. The purpose of S.M.A.R.T is to monitor the reliability of the drive and predict drive failures, and to carry out different types of drive self tests. SMART Disk Monitoring Daemon (smartd) is enabled immediately after the insertion of a USB 3.0 SSD and starts logging warnings and errors in the /crashinfo/tracelogs/smart_errors.log. These warnings and errors are also displayed on the console. On removing the USB 3.0 SSD, smartd stops running.

USB 3.0 SSD is supported as a field-replaceable unit (FRU) that offers flexible storage configurations. If SSD is used initially on a PC, the default partition on USB 3.0 SSD is created by the PC supporting all the file systems. If SSD is used initially on the switch, one partition of the drive is created to support EXT4 file system.

File System on USB 3.0 SSD

USB3.0 SSD is shipped as a raw device and when the device boots up, Cisco IOS software creates a partition with EXT4 as the default file system. However, the device supports all EXT based file systems (EXT2/EXT3/EXT4). Non-EXT based file systems such as VFAT, NTFS, LVM and so on are not supported.

The following file system operations are supported on the drive.

- Read
- Write
- Delete
- Copy
- Format

Formatting USB 3.0 SSD

Use the **format usbflash1: {ext2 | ext3 | ext4 | secure}** command to format the EXT file systems or the entire drive.

To format the USB 3.0 SSD drive in a device stack, use **format usbflash1-switch_num: {ext2 | ext3 | ext4 | secure}**.

Unmounting USB 3.0 SSD from the Switch

To safely remove the USB 3.0 SSD from a switch or a switch stack, use the **hw-module switch <switch_num> usbflash1 unmount** command in privileged EXEC mode. This command unmounts the filesystem created upon insertion, and notifies the system to complete any pending read or write operations for safely removing it from the switch.

```
Device#hw-module switch 1 usbflash1 unmount
```

```
*Jan 5 22:21:32.723: %IOSXE-0-PLATFORM: Switch 1 R0/0: SSD_UNMOUNT_LOG: usbflash1:
has been unmounted. All the usbflash1 entries in IOS will now be cleared until the SSD
is plugged back into the switch.
```

```
*Jan 5 22:21:32.729: %IOSD_INFRA-6-IFS_DEVICE_OIR: Device usbflash1 removed
```

After you run this command, you will not be able to access the USB anymore. To use the USB again,, reinsert it in to the switch.

If you run **hw-module switch <switch_num> usbflash1 unmount** command on a switch or switch stack without inserting the USB, the following error is displayed.

```
Device#hw-module switch 1 usbflash1 unmount
```

```
*Jun 20 22:50:40.321:
ERROR: USB Not Present in this Slot 1
```

Monitoring USB 3.0 SSD

You can view the contents of the USB 3.0 SSD before working on its contents. For example, before copying a new configuration file, you might want to verify that the file system does not already contain a configuration file with the same name. To display information about files on a file system, use one of the privileged EXEC commands listed in the following table.

Command	Description
dir usbflash1:	Displays the list of files on the USB flash file system on an active switch. To access flash partitions of a standby switch or the device members in a stack, use usbflash1-n where n is the standby switch number or the stack member number.
dir usbflash1-switch_num:	Displays the list of files on the file system in a stack setup.
dir stby-usbflash1:	Displays the list of files on the file system on the standby switch in a stack setup.
show usbflash1: filesystem	Displays more information about the file system.
show inventory	Displays the physical inventory information for the USB hardware. After multiple switchovers, the show inventory output might display the USB flash file system (usbflash1) for the active switch with the switch number.
more file-url	Displays the logs with SMART errors and overall health of the drive.

The following example displays the output of **dir usbflash1:/** command in privileged EXEC mode:

```
Switch#dir usbflash1:
Directory of usbflash1:/
11 drwx          16384   Oct 9 2015 01:49:18 +00:00  lost+found
3145729 drwx           4096   Oct 9 2015 04:10:41 +00:00  test
118014062592 bytes total (111933120512 bytes free)
```

The following example displays the output of **dir usbflash1:switch_num:** command in a device stack.

```
Switch#dir usbflash1-2:
Directory of usbflash1-2:/
11 drwx 16384 Jun 8 2018 21:35:39 +00:00 lost+found
118014083072 bytes total (111933390848 bytes free)
```

Alternately, you can use **dir stby-usbflash1:** to access the file system in a standby switch.

```
Switch#dir stby-usbflash1:
Directory of usbflash1-3:/
11 drwx          16384  May 16 2018 23:32:43 +00:00  lost+found
118014083072 bytes total (110358429696 bytes free)
```

To display the file system information for usbflash1, use the **show usbflash1: filesystem** command in EXEC mode.

```
Switch#show usbflash1: filesystem
Filesystem: usbflash1
Filesystem Path: /vol/usb1
Filesystem Type: ext4
```

To display the physical inventory information for USB 3.0 SSD hardware, use the **show inventory** command.

```
Switch#show inventory

NAME: "usbflash1", DESCR: "usbflash1"
PID: SSD-120G          , VID: STP21460FN9, SN: V01
```

Example output of **show inventory** command in a device stack.

```
Switch#show inventory

NAME: "usbflash1", DESCR: "usbflash1"
PID: SSD-120G          , VID: STP21460FN9, SN: V01

NAME: "usbflash1-3", DESCR: "usbflash1-3"
PID: SSD-120G          , VID: STP21310001, SN: V01
```

To check the overall health of the drive, use the **more flash:smart_overall_health.log** command in privileged EXEC mode.

```
Switch#more flash:smart_overall_health.log

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

To check health error logs, use the **more crashinfo:tracelogs/smart_errors.log** command in privileged EXEC mode.

```
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
```



Note The system might display warnings in the `smart_errors.log` which can be ignored, if the overall health self assessment in `flash/smart_overall_health.log` displays PASSED.

Troubleshooting USB 3.0 SSD Insertion and Removal

Table 1: Errors and Troubleshooting

Error encountered	Troubleshooting
USB3.0 SSD not detected after insertion	<ul style="list-style-type: none"> • Check if you are using a Cisco USB 3.0 SSD. If not, remove the drive from the device, and replace it with a Cisco USB 3.0 SSD. • If you are using a Cisco USB 3.0 SSD and the system is unable to detect the drive, remove and reinsert the USB 3.0 SSD. If it continues to fail, the USB might be defective.
<p>Errors displayed on the console after removing USB 3.0 SSD</p> <pre>*Mar 20 00:48:16.353: %IOSXE-4-PLATFORM: Switch 1 R0/0: kernel: xhci_hcd 0000:00:14.0: Cannot set link state. *Mar 20 00:48:16.353: %IOSXE-3-PLATFORM: Switch 1 R0/0: kernel: usb usb4-port1: cannot disable (err = -32) *May 10 01:12:49.603: %IOSXE-3-PLATFORM: Switch 3 R0/0: kernel: JBD2: Error -5 detected when updating journal superblock for sda1-8.</pre>	Remove the USB 3.0 SSD from the device after running the unmount CLI. For more information, see Unmounting USB 3.0 SSD from the Switch, on page 2 .
<p>Error displayed on the console on inserting a non-Cisco USB 3.0 SSD:</p> <pre>%IOSXEBOOT-4-SSD_MOUNT_LOG: (local/local): ***INFO: Not a CISCO SSD - Cannot be used***</pre>	Remove the USB from the device, and replace it with a Cisco USB 3.0 SSD.

Feature History for USB 3.0 SSD

This table provides release and related information for features explained in this module.

These features are available on all releases subsequent to the one they were introduced in, unless noted otherwise.

Release	Feature	Feature Information
Cisco IOS XE Fuji 16.9.1	USB 3.0 SSD	<p>USB 3.0 SSD provides extra 120 GB storage to be used as a general-purpose storage device and as an application-hosting device.</p> <p>Support for this feature was introduced only on the C9500-12Q, C9500-16X, C9500-24Q, C9500-40X models of the Cisco Catalyst 9500 Series Switches.</p>

Use Cisco Feature Navigator to find information about platform and software image support. To access Cisco Feature Navigator, go to <http://www.cisco.com/go/cfn>.