



## Performing Secure Erase

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## Information about Secure Erase

Beginning with Cisco NX-OS Release 9.3(10), the Secure Erase feature is supported on N9K-C93180YC-FX TOR with FEX C2348UPQ.

Cisco Nexus 9000 switches consume storage to conserve system software images, switch configuration, software logs, and operational history. These areas can have customer-specific information such as details regarding network architecture, and design as well as a potential target for data thefts.

The Secure Erase process is used in the following two scenarios:

- Return Material Authorization (RMA) for a device - If you must return a device to Cisco for RMA, remove all the customer-specific data before obtaining an RMA certificate for the device.
- Recovering the compromised device - If the key material or credentials that are stored on a device is compromised, reset the device to factory configuration, and then reconfigure the device.



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**Note** Secure Erase feature will not erase content in External storage.

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The device reloads to perform a factory reset which results in the EoR chassis modules to enter the power down mode. After a factory reset, the device clears all configuration, logs, and storage information.

## Prerequisites for Performing Secure Erase

- Ensure that all the software images, configurations, and personal data are backed up before performing the secure erase operation.
- Ensure that there is an uninterrupted power supply when the process is in progress.

- Ensure that neither In-Service Software Upgrade (ISSU) nor In-Service Software Downgrade (ISSD) is in progress before starting the secure erase process.

## Guidelines and Limitations for Secure Erase

- FX3 or FX3S or FX3P switches are supported in TOR and FEX mode. If secure erase is done in FEX mode, a switch will boot in TOR mode after the secure erase operation.
- Software patches, if installed on the device, will not be restored after the Secure Erase operation.
- If the **factory-reset** command is issued through a session, the session is not restored after the completion of the factory reset process.

The top of rack switches and supervisor modules returns to the loader prompt.

End of row switch modules will be in a powered down state.

If you configure secure erase of fex, the factory reset is initiated and fex configuration will be removed.

Fex secure erase to be monitored using fex console. In case of failure, reboot and bring up fex and initiate secure erase again.

## Configuring Secure Erase

To delete all necessary data before shipping to RMA, configure secure erase using the below command:

Command	Purpose
<p><b>factory-reset module</b><i>mod</i></p> <p>Example:</p> <pre>switch(config)# factory-reset [module &lt;3&gt;]</pre>	<p>Use the command with <b>all</b> options enabled. No system configuration is required to use the <b>factory reset</b> command.</p> <p>To secure erase for fex, use <b>factory-resetfex</b> [<i>allfex_no</i>]</p> <ul style="list-style-type: none"> <li>To secure erase all fex at once, use option <b>all</b>.</li> </ul> <p><b>Note</b> Ensure that the fex is not in Active-Active scenario, before initiating secure erase operation.</p> <p>Use the option <b>mod</b> to reset the start-up configurations:</p> <ul style="list-style-type: none"> <li>For top of rack switches, the command is <b>factory-reset</b> or <b>factory-reset module 1</b>.</li> <li>In LXC mode for top of rack switches, the command is <b>factory-reset module 1</b> or <b>27</b></li> <li>For end of row module switches, the command is <b>factory-reset module #module_number</b></li> </ul> <p>After the factory reset process is successfully completed, the switch reboots and is powered down.</p>



**Note** Parallel secure erase operations are not supported. To erase more than one module in single EoR chassis, the recommended order is line card, fabric, standby supervisor, system controller, and then active supervisor.

You can boot that secure erase image to trigger the data wipe.

The following is an example output for configuring secure erase factory reset command:

```
FX2-2- switch#
FX2-2- switch# show fex
FEX          FEX          FEX          FEX
Number      Description  State        Model
Serial
-----
109         FEX0109    Online       N2K-C2348TQ-10GE
FOC1816R0F2
110         FEX0110    Online       N2K-C2348TQ-10G-E
FOC2003R1SQ

FX2-2-switch# factory-reset fex all
!!!! WARNING:
This command will perform factory-reset of all FEX modules !!!!
The factory reset operation will erase ALL persistent storage on the specified FEX module.
This includes configuration, all log data, and the full contents of flash and SSDs.
Special steps are taken in an effort to render data non-recoverable. Please, proceed with
caution and understanding that this operation cannot be undone and will leave the system
in a fresh-from-factory state.
```

!!!! WARNING !!!!

```
Do you want to continue? (y/n) [n] y
Initiating factory-reset for the FEX: 109 --- SUCCESS!!
FEX: 109 is reloading for the reset operation to proceed.
Factory reset may take time...
Please, wait and do not power off the FEX...
Trying to remove the FEX:109 config !!!
Initiating factory-reset for the FEX: 110 --- SUCCESS!!
FEX: 110 is reloading for the reset operation to proceed.
Factory reset may take time...
Please, wait and do not power off the FEX...
Trying to remove the FEX:110 config !!!
Successfully removed FEX:110 config. !!!
```

The following shows the example of fex logs:

```
FX2-2-switch# 2021
FEX console logs:
=====
bgl-ads-4157:138> telnet 10.127.118.15 2007
Trying 10.127.118.15...
Connected to 10.127.118.15.
Escape character is '^]'.

fex-109#
fex-109# [129266.313614] writing reset reason 9, Factory-reset requested by abc
[129266.391801] Restarting system - Factory-reset requested by abc [9]
U-Boot 2011.12 (Jun 25 2014 - 16:28:41) Cisco Systems
CPU0: P1020E, Version: 1.1, (0x80ec0011)
Core: E500, Version: 5.1, (0x80212051)
Clock Configuration:
CPU0:666.667 MHz, CPU1:666.667 MHz,
CCB:333.333 MHz,
DDR:333.333 MHz (666.667 MT/s data rate) (Asynchronous), LBC:83.333 MHz
L1: D-cache 32 kB enabled
I-cache 32 kB enabled
Board: P1020FEX
[MCPSUMR 0x00000000, RSTRSCR 0x00000000, AUTORSTSR 0x0000c000]
I2C buses: ready
Golden image
U-boot retry count 0
Jump to upgradeable image at 0xefd20040
U-Boot 2011.12 (Jun 25 2014 - 16:19:54) Cisco Systems
CPU0: P1020E, Version: 1.1, (0x80ec0011)
Core: E500, Version: 5.1, (0x80212051)
Clock Configuration:
CPU0:666.667 MHz, CPU1:666.667 MHz,
CCB:333.333 MHz,
DDR:333.333 MHz (666.667 MT/s data rate) (Asynchronous), LBC:83.333 MHz
L1: D-cache 32 kB enabled
I-cache 32 kB enabled
Board: P1020FEX
[MCPSUMR 0x00000000, RSTRSCR 0x00000000, AUTORSTSR 0x0000c000]
I2C buses: ready
Upgradeable image
DRAM: Configuring DDR for 666.667 MT/s data rate
Time-out count = 480
DDR configuration get done
1 GiB (DDR3, 32-bit, CL=6, ECC on)
Memory test from 0x40000 to 0x1fdfffff
Data line test..... OK
Address line test..... OK
OK
Flash: 288 MiB
```

```

L2: 256 KB enabled
Set dbglevel to its default value (0x1)
PCIE1: Root Complex of mini PCIe SLOT, x1, regs @ 0xffe0a000
PCIE1: Bus 00 - 01
PCIE2: Root Complex of PCIe SLOT, no link, regs @ 0xffe09000
PCIE2: Bus 02 - 02
Net: eTSEC1, eTSEC3
Hit Ctrl-L to stop autoboot: 0
WARN: user forced bootcmd="run sysboot"
.. WARNING: adjusting available memory to 30000000
## Booting kernel from Legacy Image at 01000000 ...
Image Name: Linux-2.6.27.47
Created: 2015-11-20 10:22:39 UTC
Image Type: PowerPC Linux Kernel Image (gzip compressed)
Data Size: 8936305 Bytes = 8.5 MiB
Load Address: 00000000
Entry Point: 00000000
Verifying Checksum ... OK
## Flattened Device Tree blob at 00c00000
Booting using the fdt blob at 0x00c00000
Uncompressing Kernel Image ... OK
Loading Device Tree to 03ffb000, end 03ffff82 ... OK
setup_arch: bootmem
mpc85xx_fex_setup_arch()
arch: exit
[0.436112] Host controller irq 17
[0.477490] pci 0000:00:00.0: ignoring class b20 (doesn't match header type 01)
[0.566841] Assign root port irq 17 for 0000:00:00.0
[2.210329] Enabling all PCI devices
[2.802226] FSL:i2c-mpc - probing i2c controller
modprobe: FATAL: Could not load /lib/modules/2.6.27.47/modules.dep: No such file or directory
[2.975494] FSL:i2c-mpc - probing i2c controller
modprobe: FATAL: Could not load /lib/modules/2.6.27.47/modules.dep: No such file or directory
modprobe: FATAL: Could not load /lib/modules/2.6.27.47/modules.dep: No such file or directory
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modprobe: FATAL: Could not load /lib/modules/2.6.27.47/modules.dep: No such file or directory
modprobe: FATAL: Could not load /lib/modules/2.6.27.47/modules.dep: No such file or directory
[3.889037]
[3.889041] Watchdog init<0>
Mount failed for selinuxfs on /selinux: No such file or directory
INIT: version 2.86 booting
Setting system clock: [ OK ]
Mounting all filesystems: [ OK ]
/sbin/dhclient-script: configuration for eth1 not found. Continuing with defaults.
/etc/sysconfig/network-scripts/network-functions: line 78: eth1: No such file or directory
Mounting system image: [ OK ]
Unpacking system image: [ OK ]
Uncompressing system image: [ OK ]
Loading system image: [ OK ]
net.ipv4.ip_forward = 0
net.ipv4.ip_default_ttl = 64
net.ipv4.ip_no_pmtu_disc = 1
Starting internet superserver: inetd [ OK ]
net.core.rmem_max = 524288
net.core.wmem_max = 524288
net.core.rmem_default = 524288
net.core.wmem_default = 524288
net.core.somaxconn = 1024
net.core.netdev_max_backlog = 1024
modprobe: FATAL: Could not load /lib/modules/2.6.27.47/modules.dep: No such file or directory
[23.255118] Device eth0 configured with sgmi interface
Non issu restart

```

```

[24.151321]
[24.151327] base_addr is 26524<0>
Secure erase requested! Please, do not power off module!
Starting the secure erase. !!
This may take time. Please wait !!
>>>> Wiping all storage devices ...
[28.706882] NX-OS starts punching watchdog
grep: Backu: No such file or directory
+++ Starting mtd secure erase for the partition /dev/mtd2 +++
Erasing /dev/mtd2 ...
Erasing 128 Kibyte @ 17e0000 -- 99 % complete.
---> SUCCESS
Writing random data onto /dev/mtd2
Filling /dev/mtd2 using random data ...
Erasing blocks: 192/192 (100%)
Writing data: 24576k/24576k (100%)
Verifying data: 24576k/24576k (100%)
---> SUCCESS
Erasing /dev/mtd2 ...
Erasing 128 Kibyte @ 17e0000 -- 99 % complete.
---> SUCCESS
+++ Skipping cmos secure erase +++
>>>> Done
+++ Skipping nvram secure erase +++
>>>> Done
>>>> Iniatilzing system to factory defaults ...
+++ Starting init-system +++
Initializing /dev/mtd5
/isan/bin/mount_jffs2.sh: line 68: ${LOG_FILE}: ambiguous [ 651.954326] Restarting system.
U-Boot 2011.12 (Jun 25 2014 - 16:28:41) Cisco Systems
CPU0: P1020E, Version: 1.1, (0x80ec0011)
Core: E500, Version: 5.1, (0x80212051)
Clock Configuration:
CPU0:666.667 MHz, CPU1:666.667 MHz,
CCB:333.333 MHz,
DDR:333.333 MHz (666.667 MT/s data rate) (Asynchronous), LBC:83.333 MHz
L1: D-cache 32 kB enabled
I-cache 32 kB enabled
Board: P1020FEX
[MCPSUMR 0x00000000, RSTRSCR 0x00000000, AUTORSTSR 0x0000c000]
I2C buses: ready
Golden image
U-boot retry count 1
Jump to upgradeable image at 0xefd20040
U-Boot 2011.12 (Jun 25 2014 - 16:19:54) Cisco Systems
CPU0: P1020E, Version: 1.1, (0x80ec0011)
Core: E500, Version: 5.1, (0x80212051)
Clock Configuration:
CPU0:666.667 MHz, CPU1:666.667 MHz,
CCB:333.333 MHz,
DDR:333.333 MHz (666.667 MT/s data rate) (Asynchronous), LBC:83.333 MHz
L1: D-cache 32 kB enabled
I-cache 32 kB enabled
Board: P1020FEX
[MCPSUMR 0x00000000, RSTRSCR 0x00000000, AUTORSTSR 0x0000c000]
I2C buses: ready
Upgradeable image
DRAM: Configuring DDR for 666.667 MT/s data rate
Time-out count = 480
DDR configuration get done
1 GiB (DDR3, 32-bit, CL=6, ECC on)
Memory test from 0x40000 to 0x1fdffff
Data line test..... OK
Address line test..... OK

```

```

OK
Flash: 288 MiB
L2: 256 KB enabled
Set dbglevel to its default value (0x1)
PCIE1: Root Complex of mini PCIe SLOT, x1, regs @ 0xffe0a000
PCIE1: Bus 00 - 01
PCIE2: Root Complex of PCIe SLOT, no link, regs @ 0xffe09000
PCIE2: Bus 02 - 02
Net: eTSEC1, eTSEC3
Hit Ctrl-L to stop autoboot: 0
WARN: user forced bootcmd="run sysboot"
.. WARNING: adjusting available memory to 30000000
## Booting kernel from Legacy Image at 01000000 ...
Image Name: Linux-2.6.27.47
Created: 2015-11-20 10:22:39 UTC
Image Type: PowerPC Linux Kernel Image (gzip compressed)
Data Size: 8936305 Bytes = 8.5 MiB
Load Address: 00000000
Entry Point: 00000000
Verifying Checksum ... OK
## Flattened Device Tree blob at 00c00000
Booting using the fdt blob at 0x00c00000
Uncompressing Kernel Image ... OK
Loading Device Tree to 03ffb000, end 03fffe82 ... OK
setup_arch: bootmem
mpc85xx_fex_setup_arch()
arch: exit
[ 0.436112] Host controller irq 17
[ 0.477490] pci 0000:00:00.0: ignoring class b20 (doesn't match header type 01)
[ 0.566841] Assign root port irq 17 for 0000:00:00.0
[ 2.210556] Enabling all PCI devices
[ 2.804559] FSL:i2c-mpc - probing i2c controller
modprobe: FATAL: Could not load /lib/modules/2.6.27.47/modules.dep: No such file or directory
[ 2.975502] FSL:i2c-mpc - probing i2c controller
modprobe: FATAL: Could not load /lib/modules/2.6.27.47/modules.dep: No such file or directory
modprobe: FATAL: Could not load /lib/modules/2.6.27.47/modules.dep: No such file or directory
modprobe: FATAL: Could not load /lib/modules/2.6.27.47/modules.dep: No such file or directory
modprobe: FATAL: Could not load /lib/modules/2.6.27.47/modules.dep: No such file or directory
modprobe: FATAL: Could not load /lib/modules/2.6.27.47/modules.dep: No such file or directory
modprobe: FATAL: Could not load /lib/modules/2.6.27.47/modules.dep: No such file or directory
modprobe: FATAL: Could not load /lib/modules/2.6.27.47/modules.dep: No such file or directory
[ 3.889014]
[ 3.889018] Watchdog init<0>
Mount failed for selinuxfs on /selinux: No such file or directory
INIT: version 2.86 booting
Setting system clock: [ OK ]
Mounting all filesystems: [ OK ]
/sbin/dhclient-script: configuration for eth1 not found. Continuing with defaults.
/etc/sysconfig/network-scripts/network-functions: line 78: eth1: No such file or directory
Mounting system image: [ OK ]
Unpacking system image: [ OK ]
Uncompressing system image: [ OK ]
Loading system image: [ OK ]
net.ipv4.ip_forward = 0
net.ipv4.ip_default_ttl = 64
net.ipv4.ip_no_pmtu_disc = 1
Starting internet superserver: inetd [ OK ]
net.core.rmem_max = 524288
net.core.wmem_max = 524288
net.core.rmem_default = 524288
net.core.wmem_default = 524288
net.core.somaxconn = 1024
net.core.netdev_max_backlog = 1024
modprobe: FATAL: Could not load /lib/modules/2.6.27.47/modules.dep: No such file or directory

```

```
[ 22.630994] Device eth0 configured with sgmi interface
Non issu restart
[ 23.535827]
[ 23.535832] base_addr is 26524<0>
INIT: Entering runlevel: 3
fex login: Sorry, user root is not allowed to execute '/sbin/sysctl -q -w vm.drop_caches=3'
as root on fex.
[ 28.090052] NX-OS starts punching watchdog
fex login:
```

The following is an example output for configuring secure erase factory reset command on module:

```
switch# factory-reset [all | module <mod>]
switch# factory-reset [module <3>]
!!!! WARNING !!!!
The factory reset operation will erase ALL persistent storage on the specified module.
This includes configuration, all log data, and the full contents of flash and SSDs.
Special steps are taken to render data non-recoverable. Please, proceed with caution and
understanding that this operation cannot be undone and will leave the system in a
fresh-from-factory state.
!!!! WARNING !!!!
Continue? (y/n) [n] y
A module reload is required for the reset operation to proceed. Please, wait...
...truncated...
Secure erase requested! Please, do not power off module!
>>>> Wiping all storage devices ...
+++ Starting mmc secure erase for /dev/mmcblk0 +++
*** Please, wait - this may take several minutes ***
\
---> SUCCESS
+++ Starting SSD secure erase for /dev/sda +++
*** Please, wait - this may take several minutes ***
\
---> SUCCESS
+++ Starting cmos secure erase +++
\
---> SUCCESS
>>>> Done
+++ Starting nvram secure erase +++
\
---> SUCCESS
>>>> Done
```

The following is an example output logs for configuring secure erase factory reset command on LC:

```
switch# show mod
Mod    Ports    Module-Type                Model                Status
-----
1      32       32x40/100G Ethernet Module N9K-X9732C-FX       ok
22     0        4-slot Fabric Module      N9K-C9504-FM-E      ok
24     0        4-slot Fabric Module      N9K-C9504-FM-E      ok
26     0        4-slot Fabric Module      N9K-C9504-FM-E      ok
27     0        Supervisor Module         N9K-SUP-B+          active *
28     0        Supervisor Module         N9K-SUP-B+          ha-standby
29     0        System Controller         N9K-SC-              active
30     0        System Controller         N9K-SC-              standby

Mod    Sw        Hw        Slot
-----
1      10.2(1.196) 0.1070    LC1
22     10.2(1.196) 1.2       FM2
24     10.2(1.196) 1.2       FM4
26     10.2(1.196) 1.1       FM6
27     10.2(1.196) 1.0       SUP1
28     10.2(1.196) 1.2       SUP2
```



```

29          10.2(1.196)    1.4      SC1
30          10.2(1.196)    1.4      SC2

switch#
switch# factory-reset mod 1
!!!! WARNING !!!!
The factory reset operation will erase ALL persistent storage on the specified module.
This includes configuration, all log data, and the full contents of flash and SSDs.
Special steps are taken in an effort to render data non-recoverable.
Please, proceed with
caution and understanding that this operation cannot be undone and will leave the system
in
a fresh-from-factory state.
!!!! WARNING !!!!
Continue? (y/n) [n] y
A module reload is required for the reset operation to proceed. Please, wait...
reloading module 1 ...
.....
SUCCESS! All persistent storage devices detected on the specified module have been purged.

switch#
switch# show mod
Mod          Ports      Module-Type          Model              Status
-----
1             32         32x40/100G Ethernet Module  N9K-X9732C-FX     powered-dn
22            0          4-slot Fabric Module  N9K-C9504-FM-E    ok
24            0          4-slot Fabric Module  N9K-C9504-FM-E    ok
26            0          4-slot Fabric Module  N9K-C9504-FM-E    ok
27            0          Supervisor Module     N9K-SUP-B+        active *
28            0          Supervisor Module     N9K-SUP-B+        ha-standby
29            0          System Controller     N9K-SC-A          active
30            0          System Controller     N9K-SC-A          standby

Mod          Power-Status      Reason
-----
1             powered-dn       Configured Power down

Mod  Sw          Hw      Slot
22   10.2(1.196)  1.2     FM2
24   10.2(1.196)  1.2     FM4
26   10.2(1.196)  1.1     FM6
27   10.2(1.196)  1.0     SUP1
28   10.2(1.196)  1.2     SUP2
29   10.2(1.196)  1.4     SC1
switch#

```

The following is an example output logs for configuring secure erase factory reset command on mod:

```

switch# factory-reset mod 26
!!!! WARNING !!!!
The factory reset operation will erase ALL persistent storage on the specified module.
This includes configuration, all log data, and the full contents of flash and SSDs.
Special steps are taken in an effort to render data non-recoverable.
Please, proceed with
caution and understanding that this operation cannot be undone and will leave the system
in
a fresh-from-factory state.
!!!! WARNING !!!!
Continue? (y/n) [n] y
A module reload is required for the reset operation to proceed. Please, wait...
reloading module 26 ...
.....
.....
.....
.....

```

```
.....
.....
.....
.....
.....
.....
.....
.....
```

SUCCESS! All persistent storage devices detected on the specified module have been cleared.  
>>>> Please, note - multiple write passes were required to remove data from one or more devices. <<<<

switch# show mod

Mod	Ports	Module-Type	Model	Status
1	32	32x40/100G Ethernet Module	N9K-X9732C-FX	powered-dn
22	0	4-slot Fabric Module	N9K-C9504-FM-E	ok
24	0	4-slot Fabric Module	N9K-C9504-FM-E	ok
26	0	4-slot Fabric Module	N9K-C9504-FM-E	powered-dn

Mod	Power-Status	Reason
1	powered-dn	Configured Power down
26	powered-dn	Configured Power down

Mod	Sw	Hw	Slot
22	10.2(1.196)	1.2	FM2
24	10.2(1.196)	1.2	FM4
27	10.2(1.196)	1.0	SUP1
28	10.2(1.196)	1.2	SUP2
29	10.2(1.196)	1.4	SC1

switch#