Managing the Switch

Displaying Information About the Installed Hardware Modules

You can display information about the switch hardware and the hardware modules installed in the switch chassis by using the **show hardware** command.

```
switch# show hardware
Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
Documents: http://www.cisco.com/en/US/products/ps9372/tsd_products_support_seri
```

```
es_home.html
Copyright (c) 2002-2013, Cisco Systems, Inc. All rights reserved.
The copyrights to certain works contained herein are owned by
other third parties and are used and distributed under license.
Some parts of this software are covered under the GNU Public
License. A copy of the license is available at
http://www.gnu.org/licenses/gpl.html.

Software
  ...

Hardware
  cisco Nexus9000 C9504 (4 Slot) Chassis ("Supervisor Module")
  Intel(R) Xeon(R) CPU E5-2403 with 16402560 kB of memory.
  Processor Board ID SAL17184072

  Device name: cloud-n9k
  bootflash:   20971520 kB
Kernel uptime is 10 day(s), 19 hour(s), 55 minute(s), 55 second(s)

Last reset
  Reason: Unknown
  System version:
  Service:

plugin
  Core Plugin, Ethernet Plugin
--------------------------------
Switch hardware ID information
--------------------------------

Switch is booted up
  Switch type is : Nexus9000 C9504 (4 Slot) Chassis
  Model number is N9K-C9504
  H/W version is 0.2010
  Part Number is 73-15298-01
  Part Revision is 1
  Manufacture Date is Year 17 Week 25
  Serial number is SAL17257PBN
  CLEI code is 12345678

--------------------------------
Chassis has 8 Module slots and 6 Fabric modules slots
--------------------------------

Module1  empty

Module2  empty

Module3  empty

Module4  ok
  Module type is : 36p 40G Ethernet Module
  0 submodules are present
  Model number is N9k-X9636PQ
  H/W version is 0.1010
  Part Number is
  Part Revision is 1
  Manufacture Date is Year 17 Week 25
  Serial number is SAL17257AHD
  CLEI code is

FM21  empty

FM22  ok
  Module type is : Fabric Module
  0 submodules are present
  Model number is N9K-C9504-FM
  H/W version is 0.1010
  Part Number is 73-15287-01
  Part Revision is 1
  Manufacture Date is Year 17 Week 19
  Serial number is SAL17194HVX
```

```
  CLEI code is 12345678

FM23  empty

FM24  powered-dn
  Module type is : Fabric Module
  0 submodules are present
  Model number is N9K-C9504-FM
  H/W version is 0.1010
  Part Number is 73-15287-01
  Part Revision is 1
  Manufacture Date is Year 17 Week 19
  Serial number is SAL17194HRK
  CLEI code is 12345678

FM25  empty

FM26  powered-dn
  Module type is : Fabric Module
  0 submodules are present
  Model number is N9K-C9504-FM
  H/W version is 0.1010
  Part Number is 73-15287-01
  Part Revision is 1
  Manufacture Date is Year 17 Week 19
  Serial number is SAL17194HSR
  CLEI code is 12345678

Module27  ok
  Module type is : Supervisor Module
  0 submodules are present
  Model number is N9K-SUP-A
  H/W version is 0.3011
  Part Number is 73-15279-03
  Part Revision is 1
  Manufacture Date is Year 17 Week 18
  Serial number is SAL17184072
  CLEI code is 12345678

Module28  ok
  Module type is : Supervisor Module
  0 submodules are present
  Model number is N9K-SUP-A
  H/W version is 1.0
  Part Number is 73-15279-05
  Part Revision is A0
  Manufacture Date is Year 17 Week 39
  Serial number is SAL1739DAUL
  CLEI code is CMUCAE2BAA

Module29  ok
  Module type is : System Controller
  0 submodules are present
  Model number is N9K-SC-A
  H/W version is 0.2010
  Part Number is 73-15294-02
  Part Revision is 1
  Manufacture Date is Year 17 Week 22
  Serial number is SAL17225YFS
  CLEI code is

Module30  ok
  Module type is : System Controller
  0 submodules are present
  Model number is N9K-SC-A
  H/W version is 0.2010
  Part Number is 73-15294-02
  Part Revision is 1
  Manufacture Date is Year 17 Week 22
  Serial number is SAL17225YG8
  CLEI code is

--------------------------------------
```

```
Chassis has 8 PowerSupply Slots
--------------------------------------

PS1 ok
  Power supply type is: 3000.00W 220v AC
  Model number is N9K-PAC-3000W-B
  H/W version is 0.2
  Part Number is 341-0580-01
  Part Revision is 02
  Manufacture Date is Year 17 Week 22
  Serial number is DTM1722000A
  CLEI code is 12345678

PS2 absent

PS3 absent

PS4 fail/shutdown
  Power supply type is: 3000.00W 220v AC
  Model number is N9K-PAC-3000W
  H/W version is 0.0
  Part Number is
  Part Revision is 1
  Manufacture Date is Year 16 Week 46
  Serial number is DTM164601XC
  CLEI code is 12345678

---------------------------------
Chassis has 3 Fan slots
---------------------------------

Fan1 ok
  Model number is N9K-C9504-FAN
  H/W version is 0.5020
  Part Number is 73-15288-05
  Part Revision is 02
  Manufacture Date is Year 17 Week 18
  Serial number is SAL171843HG
  CLEI code is 12345678

Fan2 ok
  Model number is N9K-C9504-FAN
  H/W version is 0.5020
  Part Number is 73-15288-05
  Part Revision is 02
  Manufacture Date is Year 17 Week 18
  Serial number is SAL171843K2
  CLEI code is 12345678

Fan3 ok
  Model number is N9K-C9504-FAN
  H/W version is 0.5010
  Part Number is 73-15288-05
  Part Revision is 2
  Manufacture Date is Year 17 Week 14
  Serial number is SAL171421SY
  CLEI code is
switch#
```

Displaying the Hardware Inventory for a Switch

You can display information about the field replaceable units (FRUs), including product IDs, serial numbers, and version IDs by using the **show inventory** command.

```
switch# show inventory
NAME: "Chassis",  DESCR: "Nexus9000 C9504 (4 Slot) Chassis "
PID: N9K-C9504           ,  VID: V01 ,  SN: SAL17257PBN

NAME: "Slot 4",  DESCR: "36p 40G Ethernet Module"
```

```
PID: N9k-X9636PQ         ,  VID:     ,  SN: SAL17257AHD

NAME: "Slot 22",  DESCR: "Fabric Module"
PID: N9K-C9504-FM        ,  VID: V01 ,  SN: SAL17194HVX

NAME: "Slot 24",  DESCR: "Fabric Module"
PID: N9K-C9504-FM        ,  VID: V01 ,  SN: SAL17194HRK

NAME: "Slot 26",  DESCR: "Fabric Module"
PID: N9K-C9504-FM        ,  VID: V01 ,  SN: SAL17194HSR

NAME: "Slot 27",  DESCR: "Supervisor Module"
PID: N9K-SUP-A           ,  VID: V01 ,  SN: SAL17184072

NAME: "Slot 28",  DESCR: "Supervisor Module"
PID: N9K-SUP-A           ,  VID: V01 ,  SN: SAL1739DAUL

NAME: "Slot 29",  DESCR: "System Controller"
PID: N9K-SC-A            ,  VID:     ,  SN: SAL17225YFS

NAME: "Slot 30",  DESCR: "System Controller"
PID: N9K-SC-A            ,  VID:     ,  SN: SAL17225YG8

NAME: "Slot 33",  DESCR: "Nexus9000 C9504 (4 Slot) Chassis Power Supply"
PID: N9K-PAC-3000W-B     ,  VID: V01 ,  SN: DTM1722000A

NAME: "Slot 36",  DESCR: "Nexus9000 C9504 (4 Slot) Chassis Power Supply"
PID: N9K-PAC-3000W       ,  VID: V01 ,  SN: DTM164601XC

NAME: "Slot 41",  DESCR: "Nexus9000 C9504 (4 Slot) Chassis Fan Module"
PID: N9K-C9504-FAN       ,  VID: V01 ,  SN: SAL171843HG

NAME: "Slot 42",  DESCR: "Nexus9000 C9504 (4 Slot) Chassis Fan Module"
PID: N9K-C9504-FAN       ,  VID: V01 ,  SN: SAL171843K2

NAME: "Slot 43",  DESCR: "Nexus9000 C9504 (4 Slot) Chassis Fan Module"
PID: N9K-C9504-FAN       ,  VID:     ,  SN: SAL171421SY
switch#
```

Displaying the Backplane and Serial Number Information

You can display the backplane information, including the serial number for the switch by using the **show sprom backplane** command.

Note The following example shows the contents of the first instance of the backplane SPROM.

```
switch# show sprom backplane 1
DISPLAY backplane sprom contents:
Common block:
 Block Signature : 0xabab
 Block Version   : 3
 Block Length    : 160
 Block Checksum  : 0x15a3
 EEPROM Size     : 65535
 Block Count     : 5
 FRU Major Type  : 0x6001
 FRU Minor Type  : 0x0
 OEM String      : Cisco Systems, Inc.
 Product Number  : N9K-C9504
 Serial Number   : SAL17257PBN
 Part Number     : 73-15298-01
 Part Revision   : 1
 Mfg Deviation   : 0
 H/W Version     : 0.2010
 Mfg Bits        : 0
 Engineer Use    : 0
```

```
 snmpOID         : 0.0.0.0.0.0.0.0
 Power Consump   : 0
 RMA Code        : 0-0-0-0
 CLEI Code       : 12345678
 VID             : V01
Chassis specific block:
 Block Signature : 0x6001
 Block Version   : 3
 Block Length    : 39
 Block Checksum  : 0x42c
 Feature Bits    : 0x0
 HW Changes Bits : 0x0
 Stackmib OID    : 0
 MAC Addresses   : 00-22-bd-f6-ce-70
 Number of MACs  : 128
 OEM Enterprise  : 9
 OEM MIB Offset  : 5
 MAX Connector Power: 0
WWN software-module specific block:
 Block Signature : 0x6005
 Block Version   : 1
 Block Length    : 0
 Block Checksum  : 0x66
wwn usage bits:
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
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 00 00 00 00 00 00 00 00
 00 00
License software-module specific block:
 Block Signature : 0x6006
 Block Version   : 1
 Block Length    : 16
 Block Checksum  : 0x77
lic usage bits:
 00 00 00 00 00 00 00 00
Second Serial number specific block:
 Block Signature : 0x6007
 Block Version   : 1
 Block Length    : 28
 Block Checksum  : 0x34a
 Serial Number   : SAL17257PBN
switch#
```

Displaying Environmental Information for the Switch

You can display all of the environment-related switch information by using the **show environment** command.

```
switch# show environment
Power Supply:
Voltage: 12 Volts
Power                                  Actual      Actual        Total
Supply    Model                        Output      Input      Capacity    Status
                                      (Watts )    (Watts )    (Watts )
-------  -------------------  -----------  ----------  ----------  -------------
-
1        N9K-PAC-3000W-B           517 W       563 W      3000 W     Ok
2        ------------                0 W         0 W         0 W     Absent
3        ------------                0 W         0 W         0 W     Absent
4        N9K-PAC-3000W               0 W         0 W         0 W     Shutdown


                                     Actual        Power
Module    Model                        Draw    Allocated    Status
                                      (Watts )    (Watts )
-------  -------------------  -----------  -----------  --------------
4        N9k-X9636PQ              178.00 W      399.60 W    Powered-Up
22       N9K-C9504-FM             118.00 W      300.00 W    Powered-Up
24       N9K-C9504-FM               N/A           0.00 W    Powered-Dn
26       N9K-C9504-FM               N/A           0.00 W    Powered-Dn
27       N9K-SUP-A                 47.00 W       79.92 W    Powered-Up
28       N9K-SUP-A                 45.00 W       79.92 W    Powered-Up
29       N9K-SC-A                  12.00 W       60.00 W    Powered-Up
30       N9K-SC-A                  22.00 W       60.00 W    Powered-Up
fan1     N9K-C9504-FAN                47 W      225.00 W    Powered-Up
fan2     N9K-C9504-FAN                48 W      225.00 W    Powered-Up
fan3     N9K-C9504-FAN                46 W      249.00 W    Powered-Up

N/A - Per module power not available


Power Usage Summary:
--------------------
Power Supply redundancy mode (configured)               Non-Redundant(combined
)
Power Supply redundancy mode (operational)              Non-Redundant(combined
)

Total Power Capacity (based on configured mode)           3000.00 W
Total Power of all Inputs (cumulative)                    3000.00 W
Total Power Output (actual draw)                           517.00 W
Total Power Input (actual draw)                            563.00 W
Total Power Allocated (budget)                            1728.24 W
Total Power Available for additional modules              1271.76 W

Clock:
----------------------------------------------------------
Clock           Model                Hw         Status
----------------------------------------------------------


Fan:
-----------------------------------------------------
Fan             Model                Hw         Status
-----------------------------------------------------
Fan1(sys_fan1)  N9K-C9504-FAN        0.5020     Ok
Fan2(sys_fan2)  N9K-C9504-FAN        0.5020     Ok
Fan3(sys_fan3)  N9K-C9504-FAN        0.5010     Ok
Fan_in_PS1      --                   --         Ok
Fan_in_PS2      --                   --         None
Fan_in_PS3      --                   --         None
Fan_in_PS4      --                   --         None
Fan Zone Speed: Zone 1: 0x0
Fan Air Filter : NotSupported
```

```
Temperature:
----------------------------------------------------------------------
Module   Sensor        MajorThresh   MinorThres   CurTemp     Status
                        (Celsius)     (Celsius)    (Celsius)
----------------------------------------------------------------------
4        CPU              105           95           32          Ok
4        TD2-1            105           95           41          Ok
4        TD2-2            105           95           41          Ok
4        TD2-3            105           95           41          Ok
4        VRM-1            110           100          41          Ok
4        VRM-2            110           100          45          Ok
4        VRM-3            110           100          40          Ok
22       CPU              105           95           34          Ok
22       TD2-1            105           95           45          Ok
22       TD2-2            105           95           41          Ok
22       VRM-1            110           100          49          Ok
22       VRM-2            110           100          47          Ok
27       OUTLET           75            55           29          Ok
27       INLET            60            42           21          Ok
27       CPU              90            80           27          Ok
28       OUTLET           75            55           27          Ok
28       INLET            60            42           21          Ok
28       CPU              90            80           32          Ok
29       CPU              105           95           40          Ok
30       CPU              105           95           34          Ok
switch#
```

Displaying the Current State of a Module

You can display information about the modules installed in the switch chassis by using the **show module** command. This information includes module type, bootup status, MAC addresses, serial numbers, software versions, and hardware versions. You can use this command in the following ways to display information about all of the installed module or specific modules:

- For information on all modules, use the **show module** command.
- For information on a specific supervisor, system controller, I/O, or fabric module, use the **show module** *slot_number* command to specify a slot number.

Note To determine the slots to specify, use the **show inventory** command.

This table provides descriptions of the module status displayed by the **show module** commands.

I/O Module State	Description
powered up	The hardware has electrical power. When the hardware is powered up, the software begins booting.
testing	The module has established connection with the supervisor and the module is performing bootup diagnostics.
initializing	The diagnostics have completed successfully and the configuration is being downloaded.

I/O Module State	Description
failure	The switch detects a module failure upon initialization and automatically attempts to power-cycle the module three times. After the third attempt, the module powers down.
ok	The switch is ready to be configured.
power-denied	The switch detects insufficient power for an I/O module to power up.
active	This module is the active supervisor or system controller module and the switch is ready to be configured.
HA-standby	The HA switchover mechanism is enabled on the standby supervisor module.
standby	The switchover mechanism is enabled on the standby system controller module.

Use the **show module** [*slot_number*] command to display information about all of the installed modules or for the module that you specify by its slot number.

This example shows how to display information about all the modules installed in a chassis.

```
switch# show module
Mod  Ports  Module-Type                        Model              Status
---  -----  ---------------------------------- ------------------ ----------
4    36     36p 40G Ethernet Module            N9k-X9636PQ        ok
22   0      Fabric Module                      N9K-C9504-FM       ok
24   0      Fabric Module                      N9K-C9504-FM       powered-dn
26   0      Fabric Module                      N9K-C9504-FM       powered-dn
27   0      Supervisor Module                  N9K-SUP-A          active *
28   0      Supervisor Module                  N9K-SUP-A          ha-standby
29   0      System Controller                  N9K-SC-A           active
30   0      System Controller                  N9K-SC-A           standby

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

Mod  Sw              Hw
---  --------------  ------
4    6.1(4.11)       0.1010
22   6.1(4.11)       0.1010
27   6.1(4.11)       0.3011
28   6.1(4.11)       1.0
29   6.1(4.11)       0.2010
30   6.1(4.11)       0.2010


Mod  MAC-Address(es)                         Serial-Num
---  --------------------------------------  ----------
4    00-22-bd-f8-2a-83 to 00-22-bd-f8-2a-b6  SAL17257AHD
22   00-00-00-00-00-00 to 00-00-00-00-00-00  SAL17194HVX
24   00-00-00-00-00-00 to 00-00-00-00-00-00  SAL17194HRK
26   00-00-00-00-00-00 to 00-00-00-00-00-00  SAL17194HSR
27   00-22-bd-f6-9d-58 to 00-22-bd-f6-9d-69  SAL17184072
28   00-22-bd-fc-04-b0 to 00-22-bd-fc-04-c1  SAL1739DAUL
29   00-00-00-00-00-00 to 00-00-00-00-00-00  SAL17225YFS
30   00-00-00-00-00-00 to 00-00-00-00-00-00  SAL17225YG8

* this terminal session
switch#
```

Note This example shows how to display information about a module in a specific slot (slot 4) of the chassis.

```
switch# show module 4
Mod  Ports  Module-Type                          Model              Status
---  -----  ----------------------------------- ------------------ ----------
4    36     36p 40G Ethernet Module             N9k-X9636PQ        ok

Mod  Sw              Hw
---  --------------  ------
4    6.1(4.11)       0.1010


Mod  MAC-Address(es)                         Serial-Num
---  --------------------------------------  ----------
4    00-22-bd-f8-2a-83 to 00-22-bd-f8-2a-b6  SAL17257AHD
switch#
```

Displaying Temperatures for a Module

You can display temperature readings for module temperature sensors by using the **show environment temperature** command. Each system controller, supervisor, I/O, and fabric module has temperature sensors with two thresholds:

- Minor temperature threshold—When a minor threshold is exceeded, a minor alarm occurs and the following actions occur for all four sensors:
  - Displays system messages
  - Sends Call Home alerts (if configured)
  - Sends SNMP notifications (if configured)
- Major temperature threshold—When a major threshold is exceeded, a major alarm occurs and the following actions occur:
  - For sensors 1, 3, and 4 (outlet and onboard sensors), the following actions occur:
    - Displays system messages.
    - Sends Call Home alerts (if configured).
    - Sends SNMP notifications (if configured).
  - For sensor 2 (intake sensor), the following actions occur:
    - If the threshold is exceeded in a switching module, only that module is shut down.
    - If the threshold is exceeded in an active supervisor module with HA-standby or standby present, only that supervisor module is shut down and the standby supervisor module takes over.
    - If you do not have a standby supervisor module in your switch, you have up to 2 minutes to decrease the temperature. During this interval, the software monitors the temperature every 5 seconds and continuously sends system messages as configured.

Tip We recommend that you install dual supervisor modules. If you are using a switch without dual supervisor modules, we recommend that you immediately replace the fan module if just one fan is not working.

Note A threshold value of –127 indicates that no thresholds are configured or applicable.

Use the **show environment temperature** command to display the temperature readings for each of the powered-up modules.

```
switch# show environment temperature
Temperature:
-----------------------------------------------------------------------
Module   Sensor        MajorThresh   MinorThres   CurTemp     Status
                       (Celsius)     (Celsius)    (Celsius)
-----------------------------------------------------------------------
4        CPU             105           95           32          Ok
4        TD2-1           105           95           41          Ok
4        TD2-2           105           95           41          Ok
4        TD2-3           105           95           41          Ok
4        VRM-1           110           100          41          Ok
4        VRM-2           110           100          45          Ok
4        VRM-3           110           100          40          Ok
22       CPU             105           95           34          Ok
22       TD2-1           105           95           45          Ok
22       TD2-2           105           95           41          Ok
22       VRM-1           110           100          49          Ok
22       VRM-2           110           100          47          Ok
27       OUTLET          75            55           29          Ok
27       INLET           60            42           20          Ok
27       CPU             90            80           27          Ok
28       OUTLET          75            55           27          Ok
28       INLET           60            42           22          Ok
28       CPU             90            80           33          Ok
29       CPU             105           95           40          Ok
30       CPU             105           95           34          Ok
switch#
```

Connecting to a Module

You can connect to any module by using the **attach module** *slot_number* command. When the the module prompt appears, you can obtain further details about the module by using module-specific commands in EXEC mode.

You can also use the **attach module** command to display the standby supervisor module information, although you cannot configure the standby supervisor module using this command.

Note To see which slots are filled with modules, use the **show inventory** command.

Use the **attach module** *slot_number* command to get direct access to a specific module.

This example shows how to attach to the supervisor in slot 28.

```
switch# attach module 28
Attaching to module 28 ...
```

```
To exit type 'exit', to abort type '$.'
Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
Copyright (c) 2002-2013, Cisco Systems, Inc. All rights reserved.
The copyrights to certain works contained in this software are
owned by other third parties and used and distributed under
license. Certain components of this software are licensed under
the GNU General Public License (GPL) version 2.0 or the GNU
Lesser General Public License (LGPL) Version 2.1. A copy of each
such license is available at
http://www.opensource.org/licenses/gpl-2.0.php and
http://www.opensource.org/licenses/lgpl-2.1.php
switch(standby)#
```

Note To exit the module-specific prompt, use the **exit** command.

Tip If you are not accessing the switch from a console terminal, this command is the only way to access the standby supervisor module.

Saving the Module Configuration

To save the new configuration to nonvolatile storage, use the **copy running-config startup-config** command from EXEC mode. Once you enter this command, the running and the startup copies of the configuration are identical.

The following table lists various scenarios when module configurations are preserved or lost.

Scenario	Result
A particular switching module is removed and you used the **copy running-config startup-config** command again.	The configured module information is lost.
A particular switching module is removed and the same switching module is replaced before you enter the **copy running-config startup-config** command again.	The configured module information is preserved.
A particular switching module is removed and replaced with the same type switching module, and you entered the **reload module** *slot_number* command.	The configured module information is preserved.
A particular switching module is reloaded when you enter the **reload module** *slot_number* command.	The configured module information is preserved.

Shutting Down or Starting Up a Module

You can shut down or power up a module by using the **poweroff module** or **no poweroff module** command to specify the module by its slot number in the chassis.

Note To determine the slot number for a module, use the **show inventory** command.

Step 1 Use the **configure terminal** to enter the global configuration mode.

Example:
```
switch# configure terminal
switch(config)#
```

Step 2 Shut down (or alternatively power up) a specific module by entering the [**no**] **poweroff module** *slot_number* command.

Example:
```
switch(config)# poweroff module 3
switch(config)#
```

Example:
```
switch(config)# no poweroff module 3
switch(config)#
```

Purging a Nonfunctioning Module from the Running Configuration

You can clear the running configuration for a system controller, I/O, or fabric slot (slots 1 to 30) that is not functioning by using the **purge module** command in EXEC mode.

Note This command does not work on supervisor slots or on any I/O slot that currently has a powered-up module.

Use the **purge module** *slot_number* **runnning-config** command to clear the running configuration for the specified I/O slot.

```
switch# purge module 4 running-config
```

Before You Begin

Verify that either the system controller, I/O, or fabric slot is empty or that the module installed in the slot is powered down.

For example, suppose that you create an IP storage configuration with an I/O module in slot 3 of Switch A. This module uses an IP address. You decide to remove this I/O module and move it to Switch B, and you no

longer need the IP address. If you try to configure this unused IP address, you receive an error message that prevents you from proceeding with the configuration. In this case, you need to enter the **purge module 3 running-config** command to clear the old configuration in Switch A before using the IP address.

Displaying Power Usage Information

To display the power usage information for the entire switch, use the **show environment power** command. This command shows the power usage for the modules installed in the switch.

Note Power usage is reserved for both supervisor modules regardless of whether one or both supervisor modules are present.

Use the **show environment power** command to display power usage information for the switch.

```
switch# show environment power
Power Supply:
Voltage: 12 Volts
Power                              Actual      Actual        Total
Supply    Model                    Output      Input      Capacity    Status
                                  (Watts )    (Watts )    (Watts )
-------  -------------------  ----------  ----------  ----------  -------------
-
1        N9K-PAC-3000W-B           517 W       566 W      3000 W     Ok
2        ------------                0 W         0 W         0 W     Absent
3        ------------                0 W         0 W         0 W     Absent
4        N9K-PAC-3000W               0 W         0 W         0 W     Shutdown


                                   Actual        Power
Module    Model                      Draw    Allocated    Status
                                  (Watts )    (Watts )
-------  -------------------  -----------  -----------  --------------
4        N9k-X9636PQ             177.00 W      399.60 W    Powered-Up
22       N9K-C9504-FM            118.00 W      300.00 W    Powered-Up
24       N9K-C9504-FM              N/A         0.00 W    Powered-Dn
26       N9K-C9504-FM              N/A         0.00 W    Powered-Dn
27       N9K-SUP-A               47.00 W      79.92 W    Powered-Up
28       N9K-SUP-A               45.00 W      79.92 W    Powered-Up
29       N9K-SC-A                12.00 W      60.00 W    Powered-Up
30       N9K-SC-A                23.00 W      60.00 W    Powered-Up
fan1     N9K-C9504-FAN              47 W      225.00 W    Powered-Up
fan2     N9K-C9504-FAN              48 W      225.00 W    Powered-Up
fan3     N9K-C9504-FAN              47 W      249.00 W    Powered-Up

N/A - Per module power not available


Power Usage Summary:
--------------------
Power Supply redundancy mode (configured)                 Non-Redundant(combined
)
Power Supply redundancy mode (operational)                Non-Redundant(combined
)

Total Power Capacity (based on configured mode)             3000.00 W
Total Power of all Inputs (cumulative)                      3000.00 W
Total Power Output (actual draw)                             517.00 W
Total Power Input (actual draw)                              566.00 W
Total Power Allocated (budget)                              1728.24 W
Total Power Available for additional modules                1271.76 W

switch#
```

Power Cycling a Module

You can reset a module by using the **reload module** *slot_number* command and specifying the module by its slot number in the chassis.

Caution Reloading a module disrupts traffic through the module.

Note To see which slots are filled with modules, use the **show inventory** command.

Step 1 Use the **configure terminal** command to enter the global configuration mode.

Example:
```
switch# configure terminal
switch(config)#
```

Step 2 Use the **reload module** *slot_number* command to specify the slot number of the module to reset.

Example:
```
switch(config)# reload module 4
This command will reload module 4. Proceed[y/n]?  [n] y
reloading module 4 ...
switch(config)#
```

Rebooting a Switch

You can reboot or reload the switch by using the **reload** command without any options.

Note If you need to use the **reload** command, be sure to save the running configuration first by using the **copy running-config startup-config** command.

Step 1 Use the **configure terminal** command to enter the global configuration mode.

Example:
```
switch# configure terminal
switch(config)#
```

Step 2 Use the **copy running-config startup-config** command to save the running configuration.

Example:
```
switch(config)# copy running-config startup-config
```

Step 3 Use the **reload** command to reload the switch.

Example:
```
switch(config)# reload
```

Overview of Supervisor Modules

The switch has one or two supervisor modules.

When a switch has two supervisors, one supervisor is automatically active while the other is in standby mode. If the active supervisor goes down or is disconnected for replacement, the standby supervisor automatically becomes active. If you need to replace one of two installed supervisor modules with another module, you can do so without interrupting operations. The supervisor that you are not replacing becomes the active supervisor and retains the kickstart configuration while you replace the other supervisor. If the switch has just one supervisor, you can install the new supervisor in the open supervisor slot during operations and make that supervisor active after the installation.

Note If there are two supervisors installed in the chassis, both must be the same type. That is, either both supervisors must be supervisor A modules (four cores, 16 GB memory, and 64 GB of SSD) or both must be supervisor B modules (six cores, 24 GB memory, and 256 GB of SSD).

Supervisor modules are automatically powered up and started with the switch.

To understand the terms used for the supervisors, see the following table.

Module Terms	Usage	Description
module-27 and module-28	Fixed	• Module-27 refers to the supervisor module in chassis slot 27 (labeled as SUP 1 on the chassis). • Module-28 refers to the supervisor module in chassis slot 28 (labeled as SUP 2 on the chassis).
sup-1 and sup-2	Fixed	• sup-1 refers to the supervisor module in the SUP 1 slot (slot 27 in the CLI output). • sup-2 refers to the supervisor module in the SUP 2 slot (slot 28 in the CLI output.

Module Terms	Usage	Description
sup-active and sup-standby	Relative	• sup-active refers to the active supervisor module—relative to the slot that contains the active supervisor module. • sup-standby refers to the standby supervisor module—relative to the slot that contains the standby supervisor module.
sup-local and sup-remote	Relative	If you are logged into the active supervisor, the following applies: • sup-local refers to the active supervisor module. • sup-remote refers to the standby supervisor module. If you are logged into the standby supervisor, the following applies: • sup-local refers to the standby supervisor module (the one that you are logged into). • There is no sup-remote available from the standby supervisor module (you cannot access a file system on the active supervisor).

Overview of I/O Module Support

The switch supports the following I/O modules in slots 1 through 4:

- 48-port 1-/10-Gigabit SFP+ plus 4-port 40-Gigabit QSFP+ I/O module (N9K-X9464PX)
- 48-port 1-/10-GBASE-T plus 4-port 40-Gigabit QSFP+ I/O module (N9K-X9464TX)
- 48-port 1-/10-GBASE-T plus 4-port 40-Gigabit QSFP+ I/O module (N9K-X9564TX)
- 48-port 1-/10-Gigabit SFP+ plus 4-port 40-Gigabit QSFP+ I/O module (N9K-X9564PX)
- 36-port 40-Gigabit QSFP+ aggregation (non-blocking) I/O module (N9K-X9636PQ)
- 36-port 40-Gigabit QSFP+ I/O module (N9K-X9536PQ)
- 32-port 40-Gigabit QSFP+ I/O module (N9K-X9432PQ)

Note The slots are labeled as LC 1 to LC 4.

Accessing an I/O Module Through a Console

You can troubleshoot bootup problems for an I/O module by accessing the module through its console port. This action establishes a console mode that you must exit in order to use other Cisco NX-OS commands.

To attach to the console port for an I/O module, use the **attach console module** command to specify the module that you need to work with.

Use the **attach console module** *slot_number* command to attach the console to a specific I/O module.

```
switch# attach console module 3
connected
Escape character is `~,' (tilde comma]
```

Note To exit the console mode, enter the **~,** command.

Overview of Fabric Modules

The switch supports up to six fabric modules in the chassis. Two of these modules are located behind each fan tray. The following table lists which fabric modules are behind each fan tray. The fan tray has an LED that displays the status for the two fabric modules behind it. To replace a fabric module, you must first remove the fan tray that covers it.

Fan Tray Slot	Fabric Module Slots
41 (labeled as FAN 1)	21 (labeled as FM 1)
	22 (labeled as FM 2)
42 (labeled as FAN 2)	23 (labeled as FM 3)
	24 (labeled as FM 4)
43 (labeled as FAN 3)	25 (labeled as FM 5)
	26 (labeled as FM 6)

We recommend that you install three to six fabric modules in the switch. To ensure that each of the fan trays is powered up, be sure that the fabric modules are installed in the slots specifed in the following table and install blank filler modules in the remaining slots to maintain the designed airflow.

Quantity of Fabric Modules Installed	Slots filled with fabric modules
1	—
2	—
3	22, 24, and 26 (labeled as FM 2, FM 4, and FM 6)

Quantity of Fabric Modules Installed	Slots filled with fabric modules
4	22, 23, 24, and 26 (labeled as FM 2, FM 3, FM 4, and FM6)
5	21, 22, 23, 24, and 26 (labeled as FM 1, FM 2, FM 3, FM 4, and FM 6) or 22, 23, 24, 25, and 26 (labeled as FM 2, FM 3, FM 4. FM 5, and FM 6)
6	21, 22, 23, 24, 25, and 26 (labeled as FM 1, FM 2, FM 3, FM 4, FM 5, and FM 6)

Overview of Power Modes

You can configure one of the following power modes to either use the combined power provided by the installed power supply units (no power redundancy) or to provide power redundancy for when there is a power loss:

Combined mode

This mode allocates the combined power of all power supplies to active power for switch operations. This mode does not allocate reserve power for power redundancy in case of power outages or power supply failures.

Power-supply (*n*+1) redundancy mode

This mode allocates one power supply as a reserve power supply in case an available power supply fails. The remaining power supplies are allocated for available power. The reserve power supply must be at least as powerful as each power supply used for the available power.

For example, if a switch requires 2.0 kW of available power and the switch has two power supplies that each output 3 kW, then one of the power supplies provides 3.0 kW of available power and one power supply provides 3.0 kW of reserve power in case the other power supply fails.

Input-source (grid *n*+*n*) redundancy mode

This mode allocates half of the power to available power and the other half to reserve power. You must use a different power source for the active and reserve power sources so that if the power source used for active power fails, the other power source used for the reserve power can provide power for the switch.

For example, if the switch requires 4.0 kW of power, the switch has four power supplies that each output 3 kW. If you have two power grids, you use grid A to power two 3-kW power supplies that provide the available power for the switch and you use grid B to power the other two 3-kW power supplies that provide the reserve power in case grid A fails.

Power Mode Configuration Guidelines

The amounts of available and reserve power depend on the power redundancy mode that you specify and the number of power supplies installed in the switch. For each redundancy mode, consider the following:

Combined mode

The available power equals the combined output of all installed power supplies. There is no reserve power. You activate this mode by using the **power redundancy-mode combined** command.

For example, if the power requirement for a switch is 5.2 kW and the switch has one 3-kW power supply with 220 V input and 3.0-kW output, consider the following power planning scenarios:

- Scenario 1—No added power supplies

  If you do not add a power supply unit, the available power (3.0 kW) is insufficient for the switch power requirement of 5.2 kW, so the switch powers the supervisor modules, system controllers, fan trays, and at least one fabric module before powering as many of the fabric and I/O modules as the remaining available power can support (one or more fabric or I/O modules might not be powered).

- Scenario 2—Install an extra 3-kW power supply

  If you install an additional 3-kW power supply unit that can output 3.0 kW, the available power becomes 6.0 kW. The increased amount of available power exceeds the switch power requirement of 5.2 kW, so all of the modules and fan trays in the switch can power up.

The following table shows the results for each scenario.

Scenario	Power Requirement	Power Supply 1 Output	Power Supply 2 Output	Available Power	Reserve Power	Result
1	5.2 kW	3.0 kW	—	3.0 kW	—	Available power is less than the power requirement for the switch, so you cannot power the entire switch (some of the I/O modules will not be able to power up).
2	5.2 kW	3.0 kW	3.0 kW	6.0 kW	—	Available power exceeds the power requirement for the switch, so the entire switch can power up.

Power supply (*n*+1) redundancy mode

The power supply that outputs the most power provides the reserve power so that it can take over for any other power supply that fails, and all of the other installed power supplies provide the available power. You activate this power mode by using the **power redundancy-mode ps-redundant** command.

- Scenario 1—No added power supplies

  One 3-kW power supply provides the reserve power and the other 3-kW power supply, also outputting 3.0 kW, provides the available power. The available power (3.0 kW) does not meet the switch requirements of 5.2 kW, so the switch powers up except for some of its I/O modules.

- Scenario 2—Adding one 3-kW power supply

  One 3-kW power supply, which outputs 3.0 kW, provides the reserve power and the other two 3-kW power supplies, also outputting 3.0 kW each, provide a sufficient amount of power (6.0 kW) to meet the switch requirements (5.2 kW), so the entire switch powers up.

The following table shows the results for each scenario.

Scenario	Power Requirement	Output (kW) for Power Supplies			Available Power	Reserve Power	Result
		1	2	3			
1	5.2 kW	3.0 kW	3.0 kW	—	3.0 kW	3.0 kW	Available power is less than the power requirement for the switch, so you cannot power the entire switch (one or two of the I/O modules will not be able to power up).
2	5.2 kW	3.0 kW	3.0 kW	3.0 kW	6.0 kW	3.0 kW	Available power exceeds the power requirement for the switch, so the entire switch can power up.

Input-source (grid or *n*+*n*) redundancy mode

Half of the 3-kW power supplies are connected to one power source (grid) and the other half are connected to another power source. The available power is provided by one power source and the reserve power is provided by the other power source. If the power source that provides the available power fails, the switch uses the reserve power source to provide its required power. You activate this power mode by using the **power redundancy-mode insrc_redundant** command.

For example, if the power requirement for a switch is 5.2 kW and the switch has two power supplies that output 3 kW, consider the following power planning scenarios:

- Scenario 1—No added power supplies

  The available power is 3.0 kW (output from one 3-kW power supply) and the reserve power is 3.0 kW (output from the other power supply). The available power (3.0 kW) does not meet the switch requirements (5.2 kW), so most of the modules will power up but some of the I/O modules will not be able to power up.

- Scenario 2—Adding two 3-kW power supplies

  The available power is 6.0 kW (output from two 3-kW power supplies on grid A) and the reserve power is 6.0 kW (output from the other two power supplies on grid B). The available power (6.0 kW) exceeds the power requirement of the switch (5.2 kW), so the entire switch can power up.

The following table shows the results for each scenario.

Scenario	Power Requirement	Output for Power Supplies				Available Power	Reserve Power	Result
		1	2	3	4			
1	5.2 kW	3.0 kW	3.0 kW	—	—	3.0 kW	3.0 kW	Available power (3.0 kW) is less than the power requirement for the switch (5.2 kW), so most of the switch can power up but one or more I/O modules cannot power up.
2	5.2 kW	3.0 kW	3.0 kW	3.0 kW	3.0 kW	6.0 kW	6.0 kW	Available power (6.0 kW) exceeds the power requirement for the switch (5.2 kW), so the entire switch can power up.

Setting the Power Mode

You can configure the power supply mode by using the **power redundancy-mode** command.

Note To display the current power supply configuration, use the **show environment power** command.

Step 1 Use the **configure terminal** command to enter the global configuration mode.

Example:
```
switch# configure terminal
switch(config)#
```

Step 2 Use the **power redundancy-mode** *mode* command to specify one of the following power modes:

- For combined mode, include the **combined** keyword.
- For power supply redundancy mode, include the **ps-redundant** keyword.
- For input source redundancy mode, include the **insrc_redundant** keyword.

Example:
```
switch(config)# power redundancy-mode insrc_redundant
switch(config)#
```

Overview of Fan Trays

Fan trays provide airflow through the switch for cooling. Each fan tray contains multiple fans to provide redundancy. The switch can continue functioning in the following situations:

- One or more fans fail within a fan tray—Even with multiple fan failures, the switch can continue functioning. When a fan fails within a tray, the functioning fans in the module increase their speed to compensate for the failed fans.
- The fan tray is removed for replacement—The fan tray is designed to be removed and replaced while the switch is operating without presenting an electrical hazard or damage to the switch.

Note When a fan fails or when you remove a fan tray, the remaining operating fans speed up to compensate for the loss of fans. This process can increase the noise made by the fan trays until you replace the missing fan tray or replace the defective fan tray.

Note When replacing a failed fan tray in a running system, be sure to promptly replace the fan tray.

Tip If one or more fans fail within a fan tray, the Fan Status LED turns red. A fan failure could lead to temperature alarms if not corrected immediately.

The fan status is continuously monitored by the software. In case of a fan failure, the following actions occur:

- System messages are displayed.
- Call Home alerts are sent (if configured).
- SNMP notifications are sent (if configured).

To display the fan module statuses, see Displaying the Status for the Fan Trays, on page 24.

Note The fan trays fill slots 41 (labeled as FAN 1), 42 (labeled as FAN 2), and 43 (labeled as 43) in the chassis.

Displaying the Status for the Fan Trays

You can display the status of the fan trays by using the **show environment fan** command.

```
switch# show environment fan
Fan:
----------------------------------------------------
Fan              Model                Hw         Status
----------------------------------------------------
Fan1(sys_fan1)   N9K-C9504-FAN        0.5020     Ok
Fan2(sys_fan2)   N9K-C9504-FAN        0.5020     Ok
Fan3(sys_fan3)   N9K-C9504-FAN        0.5010     Ok
Fan_in_PS1       --                   --         Ok
Fan_in_PS2       --                   --         None
Fan_in_PS3       --                   --         None
Fan_in_PS4       --                   --         None
Fan Zone Speed: Zone 1: 0x0
Fan Air Filter : NotSupported
switch#
```