



Bash

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About Bash

In addition to the Cisco NX-OS CLI, Cisco Nexus 3500 platform switches support access to the Bourne-Again SHell (Bash). Bash interprets commands that you enter or commands that are read from a shell script. Using Bash enables access to the underlying Linux system on the device and to manage the system.

Accessing Bash

In Cisco NX-OS, Bash is accessible from user accounts that are associated with the Cisco NX-OS dev-ops role or the Cisco NX-OS network-admin role.

The following example shows the authority of the dev-ops role and the network-admin role:

```
switch# show role name dev-ops

Role: dev-ops
  Description: Predefined system role for devops access. This role
              cannot be modified.
  Vlan policy: permit (default)
  Interface policy: permit (default)
  Vrf policy: permit (default)
-----
Rule   Perm   Type   Scope   Entity
-----
4      permit command  conf t ; username *
3      permit command  bcm module *
2      permit command  run bash *
1      permit command  python *

switch# show role name network-admin

Role: network-admin
  Description: Predefined network admin role has access to all commands
              on the switch
-----
```

```

Rule      Perm      Type      Scope      Entity
-----
1         permit   read-write
switch#

```

Bash is enabled by running the **feature bash-shell** command.

The **run bash** command loads Bash and begins at the home directory for the user.

The following examples show how to enable the Bash shell feature and how to run Bash.

```

switch# configure terminal
switch(config)# feature bash-shell

switch# run bash
Linux# whoami
admin
Linux# pwd
/bootflash/home/admin
Linux#

```



Note You can also execute Bash commands with the **run bash <command>** command.

The following is an example of the **run bash <command>** command.

```
run bash whoami
```

Escalate Privileges to Root

The privileges of an admin user can escalate their privileges for root access.

The following are guidelines for escalating privileges:

- Only an admin user can escalate privileges to root.
- Bash must be enabled before escalating privileges.
- Escalation to root is password protected.
- SSH to the switch using `root` username through a non-management interface will default to Linux Bash shell-type access for the root user. Type `vsh` to return to NX-OS shell access.

The following example shows how to escalate privileges to root and how to verify the escalation:

```

switch# run bash
Linux# sudo su root

```

```
We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:
```

- ```

#1) Respect the privacy of others.
#2) Think before you type.
#3) With great power comes great responsibility.

```

```
Password:
```

```
Linux# whoami
```

```
root
Linux# exit
exit
```

## Examples of Bash Commands

This section contains examples of Bash commands and output.

### Displaying System Statistics

The following example shows how to display system statistics:

```
switch# run bash
Linux# cat /proc/meminfo
MemTotal: 3795100 kB
MemFree: 1472680 kB
Buffers: 136 kB
Cached: 1100116 kB
ShmFS: 1100116 kB
Allowed: 948775 Pages
Free: 368170 Pages
Available: 371677 Pages
SwapCached: 0 kB
Active: 1198872 kB
Inactive: 789764 kB
SwapTotal: 0 kB
SwapFree: 0 kB
Dirty: 0 kB
Writeback: 0 kB
AnonPages: 888272 kB
Mapped: 144044 kB
Slab: 148836 kB
SReclaimable: 13892 kB
SUnreclaim: 134944 kB
PageTables: 28724 kB
NFS_Unstable: 0 kB
Bounce: 0 kB
WritebackTmp: 0 kB
CommitLimit: 1897548 kB
Committed_AS: 19984932 kB
VmallocTotal: 34359738367 kB
VmallocUsed: 215620 kB
VmallocChunk: 34359522555 kB
HugePages_Total: 0
HugePages_Free: 0
HugePages_Rsvd: 0
HugePages_Surp: 0
Hugepagesize: 2048 kB
DirectMap4k: 40960 kB
DirectMap2M: 4190208 kB
Linux#
```

### Running Bash from CLI

The following example shows how to run a bash command from the CLI with the `run bash <command>` command:

```

switch# run bash ps -el
F S UID PID PPID C PRI NI ADDR SZ WCHAN TTY TIME CMD
4 S 0 1 0 0 80 0 - 497 select ? 00:00:08 init
5 S 0 2 0 0 75 -5 - 0 kthrea ? 00:00:00 kthreadd
1 S 0 3 2 0 -40 - - 0 migrat ? 00:00:00 migration/0
1 S 0 4 2 0 75 -5 - 0 ksofti ? 00:00:01 ksoftirqd/0
5 S 0 5 2 0 58 - - 0 watchd ? 00:00:00 watchdog/0
1 S 0 6 2 0 -40 - - 0 migrat ? 00:00:00 migration/1
1 S 0 7 2 0 75 -5 - 0 ksofti ? 00:00:00 ksoftirqd/1
5 S 0 8 2 0 58 - - 0 watchd ? 00:00:00 watchdog/1
1 S 0 9 2 0 -40 - - 0 migrat ? 00:00:00 migration/2
1 S 0 10 2 0 75 -5 - 0 ksofti ? 00:00:00 ksoftirqd/2
5 S 0 11 2 0 58 - - 0 watchd ? 00:00:00 watchdog/2
1 S 0 12 2 0 -40 - - 0 migrat ? 00:00:00 migration/3
1 S 0 13 2 0 75 -5 - 0 ksofti ? 00:00:00 ksoftirqd/3
5 S 0 14 2 0 58 - - 0 watchd ? 00:00:00 watchdog/3

...

4 S 0 8864 1 0 80 0 - 2249 wait ttyS0 00:00:00 login
4 S 2002 28073 8864 0 80 0 - 69158 select ttyS0 00:00:00 vsh
4 R 0 28264 3782 0 80 0 - 54790 select ? 00:00:00 in.dcos-telnet
4 S 0 28265 28264 0 80 0 - 2247 wait pts/0 00:00:00 login
4 S 2002 28266 28265 0 80 0 - 69175 wait pts/0 00:00:00 vsh
1 S 2002 28413 28266 0 80 0 - 69175 wait pts/0 00:00:00 vsh
0 R 2002 28414 28413 0 80 0 - 887 - pts/0 00:00:00 ps
switch#

```

## Running Python from Bash

The following example shows how to load Python and configure a switch using Python objects:

```

switch# run bash
Linux# python
Python 2.7.5 (default, May 16 2014, 10:58:01)
[GCC 4.3.2] on linux2
Type "help", "copyright", "credits" or "license" for more information.
Loaded cisco NxOS lib!
>>>
>>> from cisco import *
>>> from cisco.vrf import *
>>> from cisco.interface import *
>>> vrfobj=VRF('myvrf')
>>> vrfobj.get_name()
'myvrf'
>>> vrfobj.add_interface('Ethernet1/3')
True
>>> intf=Interface('Ethernet1/3')
>>> print intf.config()

!Command: show running-config interface Ethernet1/3
!Time: Thu Aug 21 23:32:25 2014

version 6.0(2)U4(1)

interface Ethernet1/3
 no switchport
 vrf member myvrf

>>>

```