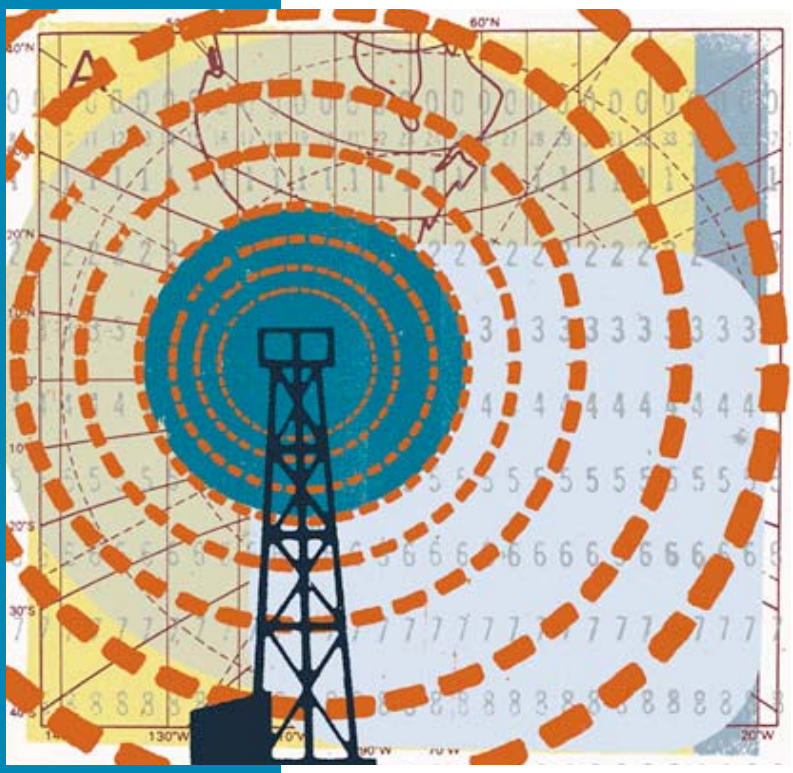
SkyPilot Command-Line Interface Reference



SkyPilot™ NETWORKS

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SkyPilot Firmware 1.4
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Contents

Introduction

The command-line interface is a text-based interactive application built into all SkyPilot™ devices. It enables you to manually provision a device, monitor and manage a device, and do real-time logging.

This document provides instructions for accessing a SkyPilot device's command-line interface, along with detailed descriptions of all the commands available through the interface.

This document covers the following topics:

- Checking VLAN status
- Accessing the command-line interface
- Using the command-line interface
- Command summary
- Provisioning parameters scope

Checking VLAN Status

If your SkyPilot network is configured to use a management VLAN, SkyPilot devices automatically uses the same VLAN for management traffic. Therefore, you'll need to access the network nodes from a PC that's a member of that management VLAN. Typically this means you'll need to access the command-line interface from the SkyPilot EMS server or other management workstation across the SkyPilot mesh network. If you've previously configured a management SSID as a member of the management VLAN, you can use this SSID to connect directly to the node.

Accessing the Command-Line Interface

You can connect to any SkyPilot device and access its command-line interface through Telnet over an Ethernet connection, or (SkyGateway and SkyExtender only) via a terminal session from a console connected to the device's RJ-45 serial port. After logging in (by supplying a password), you can enter commands at the command prompt. See the following sections for details:

- "Getting Access via Ethernet" (next section)
- "Getting Access via a Serial Connection" on page 4

Getting Access via Ethernet

To set up a Telnet session:

1 Prepare a PC.

Open the network settings panel and assign the computer an IP address from 192.168.0.5 to 192.168.0.254, and a subnet mask of 255.255.255.0.

If you've already assigned an IP address to the SkyPilot device, you can configure your PC with an IP address on the same subnet. The default IP address of SkyExtenders and SkyConnectors is 192.168.0.2, and is available even after you've assigned a new IP address. For SkyGateways, however, the default address is no longer available once you assign a new address.

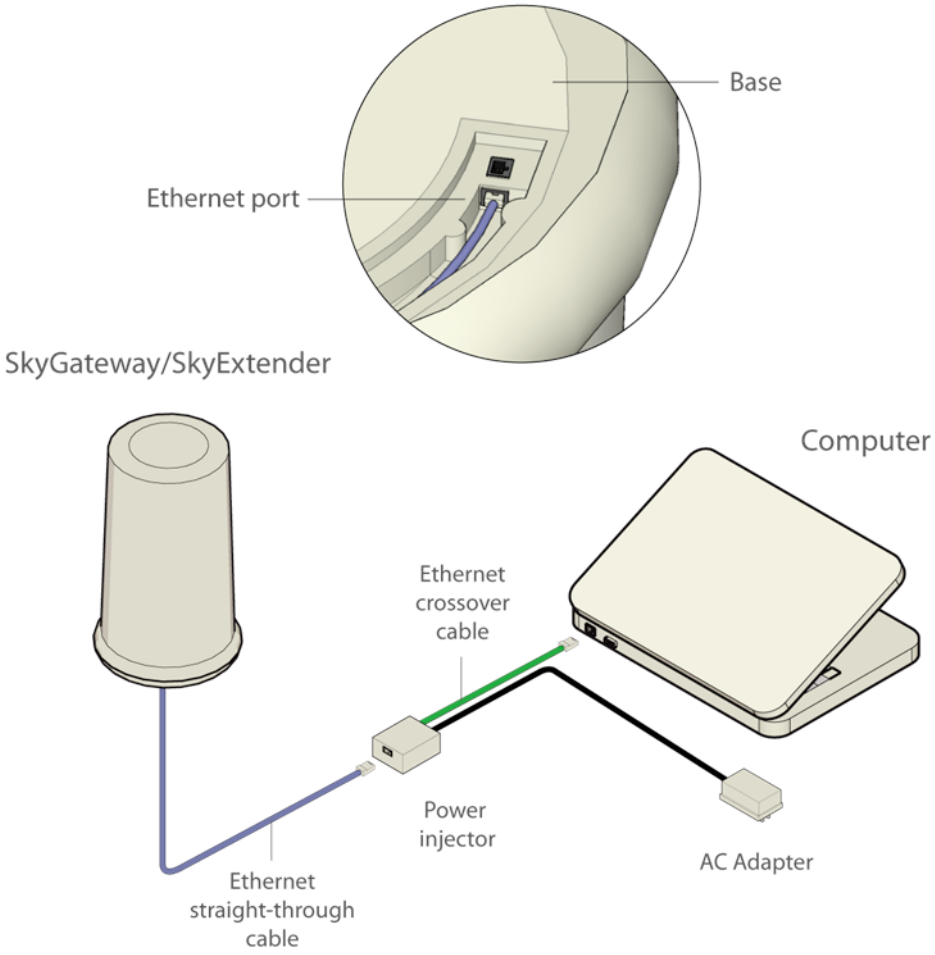
2 Connect the computer to the SkyPilot device, as shown in Figure 1.

a Use an Ethernet crossover cable to connect the computer to the power injector. (For SkyConnectors, either a crossover or a straight-through cable may be used.)

b Connect the Ethernet straight-through cable (provided) between the power injector and the Ethernet interface on the bottom of a SkyGateway or SkyExtender (except SkyExtender DualBand), or the back of a SkyConnector.

c Plug the AC adapter into the power injector.

Figure 1. Ethernet connection to a SkyGateway/SkyExtender



3 Start a Telnet session.

4 From the Telnet session, connect to the device by supplying its IP address.

5 Log in by entering the password at the command prompt. (Use the default, `public`, if you haven't changed the password.)

Getting Access via a Serial Connection

You can use a serial connection to access the command-line interface of a SkyGateway or SkyExtender. (The SkyConnector doesn't have a serial port.)

To access via a serial connection:

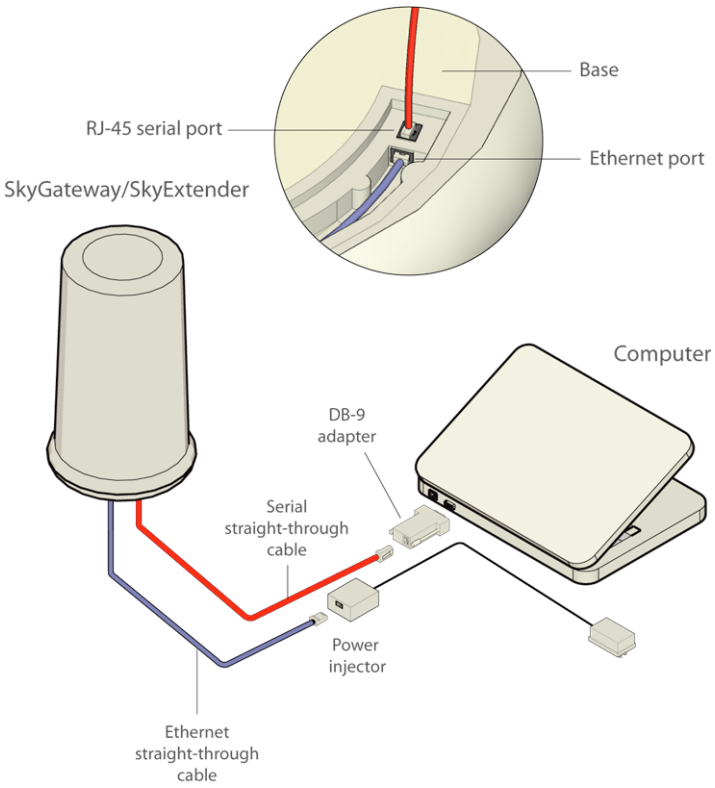
1 Connect the computer to the SkyPilot device, as shown in Figure 2.

a Plug the DB-9 adapter into a serial port on the computer.

b Plug one end of the serial straight-through cable into the DB-9 adapter and the other end into the RJ-45 serial port on the base of the SkyGateway or SkyExtender.

c Connect the Ethernet straight-through cable (provided) between the power injector and the Ethernet interface on the base of the SkyGateway or SkyExtender.

Figure 2. Serial connection to a SkyGateway/SkyExtender



2 Start a communications session.

   a From the computer, start a terminal emulation program (for example, HyperTerminal or the open-source terminal client Tera Term).

   b Select the COM port you used to physically connect the computer to the device.

   c Connect to the SkyPilot device using these serial communication settings: 38400 bps, 8 data bits, no parity, one stop bit, no flow control.

3 Log in by entering the password at the command prompt. (Use the default, `public`, if you haven't changed the password.)

Using the Command-Line Interface

Some commands include command-line arguments, which may be required (indicated by angle brackets: `< >`) or optional (indicated by square brackets: **[ ]**). If you enter a command without including its required arguments, the command may respond by displaying the proper command syntax.

Other commands don't include any arguments in the command invocation, but prompt you for the following as you proceed through the command sequence:

- A set of choices indicated by letters or numbers (enclosed in angle brackets and separated by vertical bars); for example, `<y | n | q>`, or `<d | 1-100>`, meaning you can enter `d` or a number from 1 to 100. In these cases, pressing the ENTER alone selects the first choice. Some commands display a numbered list of choices, after which you enter the number corresponding to your choice.
- A request that you enter a particular value (for example, for a provisioning parameter), with the current value displayed in square brackets. Pressing ENTER alone after such a prompt retains the current value.

Command Summary

Table 1 summarizes the most commonly used commands, and Table 2 summarizes those that are more advanced and less frequently used.

Table 1. Common Commands (Page 1 of 3)

Command	Description
`dhcp`	Renews a DHCP lease or shows DHCP status
`exit`	Terminates (disconnects) the command-line interface session, unless the client is connected through a serial interface to a SkyPilot node
`help`	Displays a brief description of the each command along with the command's syntax
`nodetest`	Performs a two-way exchange of data to determine the link integrity between two SkyPilot devices
`ping`	Performs a Layer 3 ping test
`reboot`	Reboots the device
`rebootap`	Reboots a DualBand/TriBand access point (DualBand/TriBand only)
`set`	Sets common provisioning parameters in real time (except as noted), as follows: • `eth`—Enabling or disabling of Ethernet interface, as well as physical settings such as speed and duplexity • `filter`—Packet filtering • `ip`—IP address, subnet mask, and default gateway • `password`—Password for accessing the device's command-line interface (real time and flash memory setting) • `vlan`—Virtual local area network settings (See next row for `set prov` commands)

Table 1. Common Commands (Page 2 of 3)

Command	Description
`set prov`	Sets common provisioning parameters in a device's flash memory, as follows: • `auto`—Automatic provisioning mode • `domain`—Domain to which the device belongs, or all domains • `eth`—Enabling or disabling of Ethernet interface, as well as physical settings such as speed and duplexity • `filter`—Packet filtering • `freq`—Primary frequency for the device, as well as an allowed range of frequencies • `ip`—IP address, subnet mask, and default gateway • `manual`—Manual provisioning mode
`show`	Displays the device's current value for provisioning parameters, as follows: • `ap`—Access point settings and clients • `config`—All current configuration settings • `date`—Current system date and time • `dhcp`—DHCP OFFER options (option fields sent by the DHCP server) • `domain`—Domain to which the device belongs, or all domains • `eth`—Ethernet interface state (enabled or disabled), as well as physical settings such as speed and duplexity • `filter`—All filters in effect (EtherType, IP Address, and so on) • `freq`—Primary frequency for devices, as well as an allowed range of frequencies • `int`—Ethernet and RF interface information • `ip`—IP address, subnet mask, and default gateway • `link`—Link optimization table, mesh link states, or mesh link statistics • `prov`—Provisioning mode, and parameters for manually provisioned devices • `reboot`—Reason for most recent reboot • `sched`—Scheduler's activity as a graphical representation of total timeslots and timeslots with data transmission/reception activity • `status`—Current provisioning settings

Table 1. Common Commands (Page 3 of 3)

Command	Description
`show` (continued)	• `uptime`—Elapsed time since the device was last booted • `users`—All users logged into the node • `version`—Version of hardware, software, and operating system • `vlan`—Virtual local area network settings

Table 2. Advanced Commands (Page 1 of 4)

Command	Description
`acceptimage`	Changes the image state for a partition to `accepted`
`clear`	Clears all counters that are displayed by the `show link stats` command or are available via SNMP
`debug`	Enables or disables debug logging to the current Telnet session
`ftpimage`	Downloads a software image to the device
`ftpimageap`	Downloads a software image to the access point
`reload`	Reloads the device's configuration file from the provisioning server
`reloadap`	Reloads the access point's file from the provisioning server (DualBand/TriBand only)
`set`	Sets advanced provisioning parameters in real time (except as noted), as follows: • `acl`—Access control list • `activeimage`—Which partition's software image to use as the active image (flash memory setting) • `appower`—Access point transmit power (SkyExtender DualBand only) • `apwatchdog`—Access point watchdog task (SkyExtender DualBand only) • `buzzer`—Sound pitch indicating signal strength (recent Outdoor SkyConnectors only)

Table 2. Advanced Commands (Page 2 of 4)

Command	Description
`set` (continued)	• `classifier`—QoS classifiers • `factoryap`—Access point factory settings (SkyExtender DualBand only) • `log`—Facility log levels that control log message verbosity • `logevents pagesize`—Page size for log events messages • `netkey`—Key that's exchanged as part of the link formation process (real time and flash memory setting) • `power`—Power level of transmit signal (non-SkyGateways only) • `radar`—Radar detection state (SkyGateway only) • `snmp`—SNMP community strings and trap receivers • `spectrum`—Spectrum analysis • `telnet`—Telnet inactivity timeout • `timezone`—NTP server IP address and time zone offset • `trafficrate`—Traffic rate controls (See next row for `set prov` commands)
`set prov`	Sets advanced provisioning parameters in a device's flash memory, as follows: • `buzzer`—Sound pitch indicating signal strength (recent Outdoor SkyConnectors only) • `classifier`—QoS classifiers • `parent`—Preferred parent, which will always be used even if it isn't the best path (non-SkyGateways only) • `power`—Power level of transmit signal (non-SkyGateways only) • `radar`—Radar detection state (SkyGateway only) • `snmp`—SNMP community strings and trap receivers • `timezone`—NTP server IP address and time zone offset • `trafficrate`—Traffic rate controls • `web`—Web interface server settings

Table 2. Advanced Commands (Page 3 of 4)

Command	Description
`show`	Displays the device's current value for provisioning parameters, as follows: • `acl`—Access control list • `bridge`—Bridge station cache and port information • `buzzer`—Sound pitch indicating signal strength (recent outdoor SkyConnectors only) • `classifier`—QoS classifiers • `debug`—Debug status • `flash`—Flash memory status • `gps`—GPS information (SkyGateway, SkyExtender, SkyExtender DualBand only) • `ip2mac`—Mapping of IP to MAC addresses (SkyGateway only) • `log`—Facility log levels that control log message verbosity • `logevents`—Page size for log events messages • `mac2ip`—Mapping of MAC to IP addresses (SkyGateway only) • `mem`—System memory partition blocks and statistics • `mesh`—Mesh forwarding table, mesh route cost table, or MAC learning table • `netkey`—Key that's exchanged as part of the link formation process • `power`—Power level of transmit signal • `phyerrors`—List of PHY (physical layer) errors detected by the Atheros radio chip • `process`—Operating system processes • `radar`—Radar detection state • `snmp`—SNMP community strings and trap receivers • `spectrum`—Spectrum analysis • `tech`—Snapshot of device's current configuration and status • `temp`—Temperature of the device's radio chip • `timezone`—NTP server IP address and time zone offset • `trafficrate`—Traffic rate controls

Table 2. Advanced Commands (Page 4 of 4)

Command	Description
`spectrum`	Displays help for the spectrum analyzer
`traceroute`	Traces a path to a specified MAC address or the device's default SkyGateway

Provisioning Parameters Scope

Depending on the provisioning parameter and the method you use to change its value, the change takes effect in either of the following scopes:

- **Immediate (real time)**—When you set a parameter with a command of the form `set parameter`, the setting takes effect immediately (in real time), without any need to restart the device. However, once the device is restarted, it will revert to its original provisioning setting contained in its flash memory.
- **Flash**—When you set a parameter with a command of the form `set prov parameter`, the setting is changed in the device's flash memory; the new setting does not take effect until the device is restarted.

NOTE Parameter value changes that can be made *only* in flash memory (not in real time) appear in this document in the flash format, `set prov parameter`. If the value change can be made in real time *or* flash, it appears in the real-time format, `set parameter`.

Table 3 shows, for all the provisioning parameters, which types of device they apply to (excluding DualBand/TriBand access points) and whether you can change the parameter value in real time (with a `set parameter` command), in a device's flash memory (with a `set prov parameter` command), or in either.

Table 3. Provisioning Parameters Scope (Page 1 of 2)

Parameter	Device Type	Immediate (Real Time)	Flash
acl	All	✔	
auto	All		✔
buzzer	SkyConnector only	✔	✔
classifier	All	✔	✔
domain	All		✔
eth	All	✔	✔
filter	All	✔	✔
freq	All		✔
ip	All	✔	✔
manual	All		✔
netkey	All	✔	
parent	Non-SkyGateway devices		✔
password	All	✔	
power	SkyGateway only	✔	✔
radar	SkyGateway only	✔	✔
snmp	All	✔	✔
timezone	All	✔	✔

Table 3. Provisioning Parameters Scope (Page 2 of 2)

Parameter	Device Type	Immediate (Real Time)	Flash
`trafficrate`	All	✔	✔
`vlan`	All	✔	✔
`web`	All		✔

Command Descriptions

This section describes the entire command set (in alphabetical order), including each command's syntax and arguments, and provides examples.

acceptimage

Sets the specified partition's image state to `accepted` (which is normally done automatically by the device). This command bypasses the automated process, and should only be used when you're preprovisioning equipment with known good images to ensure that the device does not prematurely mark the image unbootable due to more than 10 reboots or power cycles.

NOTE Once an image is marked `accepted`, it will be considered a trusted image. Therefore, the device will *not* automatically revert to the other partition image regardless of whether links can be successfully formed.

Syntax

```
acceptimage <A | B>
```

Arguments

A	Sets partition A's image state to `accepted`
B	Sets partition B's image state to `accepted`

Example

```
> acceptimage A
Image accepted.

>
```

clear

Clears spectrum analysis results or counters that are displayed by the `show link stats` command or that are available via SNMP.

Syntax

```
clear <counters | spectrum>
```

Arguments

`counters`	Clears counters, as specified by the following additional arguments:	
	`MAC`	Clears the link statistics counters for the device having the specified MAC address
	`all`	Clears the link statistics counters for all devices
`spectrum`	Clears the device's maximum hold RSSI statistics	

Example

```
> clear counters
Error: Missing MAC address.
Usage: clear counters <MAC | all>

> clear counters all
Counters cleared for all links.

> clear counters spectrum
Clear multi channel max hold statistics.

>
```

debug

Enables or disables debug logging to the current Telnet session. This command is not available when you've accessed the command-line interface through a serial connection because debug logging is always enabled in that case.

Syntax

```
debug <on | off | status>
```

Arguments

`on`	Enables debugging
`off`	Disables debugging
`status`	Displays the current debug status
None	Displays the command's syntax

Example

```
> debug on
Debug logging enabled.
```

dhcp

Renews a DHCP lease or shows DHCP status.

Syntax

```
dhcp <renew | show>
```

Arguments

`renew`	Renews a DHCP lease
`show`	Displays DHCP status

Example

```
> dhcp show
IP address         : 192.168.5.225
Subnet mask        : 255.255.255.0
Broadcast address  : 192.168.5.255
Default gateway    : 192.168.5.1
Lease duration     : 3600
Lease rebinding    : 1458
Lease renewal      : 108
DHCP server        : 192.168.5.2
FTP server         : 192.168.5.2
HTTP server        : 172.16.1.5
NTP server         : 172.16.1.5
Hostname           : New_Adam

>
```

exit

Terminates the current Telnet session.

Syntax

```
exit
```

Arguments

None

Example

```
> exit
exit
Connection closed by foreign host.
```

ftpimage

Downloads a software image to the device. Unlike the automated provisioning process, which only lets you download images into the inactive partition, using the `ftpimage` command during manual provisioning lets you download the image into either of the partitions—A or B (see "`set activeimage`" on page 32). SkyPilot recommends first downloading new images into the backup partition to avoid overwriting the active image. You can download software with this command from any device running an FTP server that's reachable over the network.

Syntax

```
ftpimage
```

Arguments

None — Displays a series of prompts for the necessary values:

`IP address`	IP address of the server containing the desired software image
`login`	User name for logging in
`password`	Password corresponding to the specified user name
`directory`	Directory on the FTP server containing the software image
`filename`	File name (including the file extension) of the software image
`partition`	Partition into which the software image is to be downloaded: `A` or `B`

Example

```
> ftpimage
-> Enter FTP server IP address: 192.168.4.80
-> Enter FTP server login [anonymous]:
-> Enter FTP server password:
-> Enter directory:
-> Enter filename: SkyExt.1.2p3.bin
-> Enter destination partition <A|B>: A

FTP server IP address : 192.168.4.80
FTP server login      : anonymous
Directory             :
Filename              : SkyExt.1.2p3.bin
Destination partition : A

-> Are these settings correct? no, yes <n|y>: y
>
```

ftpimageap

Downloads a software image to a DualBand/TriBand access point. You can download software with this command from any device running an FTP server that's reachable over the network. For TriBands, you'll be prompted for the destination access point.

Syntax

```
ftpimageap
```

Arguments

None — Displays a series of prompts for the necessary values:

`IP address`	IP address of the server containing the desired software image
`login`	User name for logging in
`password`	Password corresponding to the specified user name
`directory`	Directory on the FTP server containing the software image
`filename`	File name (including the file extension) of the software image
`access point`	Access point into which the software image is to be downloaded: `A` (for the 2.4 GHz access point) or `B` (for the 4.9 GHz access point)

Example

```
> ftpimageap
Enter FTP server IP address: 192.168.4.80
-> Enter FTP server login [anonymous]:
-> Enter FTP server password:
-> Enter directory:
-> Enter filename: SkyAP.2.0.20.bin
-> Enter destination access point A) 2.4GHz or B) 4.9GHz <A|B>: A

FTP server IP address : 192.168.4.80
FTP server login      : anonymous
Directory             :
Filename              : SkyAP.2.0.20.bin
Access point          : 2.4GHz

-> Are these settings correct? no, yes <n|y>: y
>
```

help

Displays a brief description of each command as well as its *synopsis*—the command's syntax.

Syntax

```
help [? | command]
```

Arguments

?	Displays information for all commands (can also be typed by itself on the command line)
command	Displays information for the specified command
None	Displays information for all commands

Example

```
> ?
acceptimage - Sets the image state to be accepted.
              Synopsis: acceptimage <A | B>

clear       - Clears counters.
              Synopsis: clear <counters | spectrum>

debug       - Enables or disables debug log messages.
              This command is available only in a telnet session.
              Synopsis: debug <on | off | status>

dhcp        - Renew or show DHCP lease.
              Synopsis: dhcp <renew | show>

ftpimage    - Download a software image and store it in flash.
              Synopsis: ftpimage

ftpimageap  - Download an access point software image and store it in flash.
              Synopsis: ftpimageap

help        - Display CLI command list.
              Synopsis: help [command]

nodetest    - Two way link layer ping test.
              Synopsis: nodetest <MAC> [packetCount [packetSize]]

ping        - Layer 3 ping utility.
              Synopsis: ping <host> [packetCount [packetSize]]

reboot      - Reboots node.
              Synopsis: reboot

rebootap    - Reboots the 802.11b access point.
              This command is available only on SkyExtender DualBand.
              Synopsis: rebootap

reload      - Reloads configuration file.
              Synopsis: reload

reloadap    - Reloads the access point's configuration file.
              Synopsis: reload
```

```
set         - Sets configuration information in flash memory.
              Synopsis: set <activeimage | appower | apwatchdog |classifier |
                             eth | factoryap | filter | ip | log | netkey |
                             logevents | password | power | prov | radar |
                             snmp | spectrum | telnet | timezone | trafficrate>

show        - Queries and displays information.
              Synopsis: show <acl | appower | bridge | classifier | config |
                              date | debug | dhcp | domain | eth | filter |
                              flash | freq | gps | int | ip | ip2mac | link |
                              log | logevents | mac2ip | mem | mesh | netkey |
                              packet | phyerrors | power | process | prov |
                              radar | reboot | snmp | spectrum | stack |
                              status | tech | temp | timezone | trafficrate |
                              uptime | users | version | vlan>

spectrum    - Shows spectrum help.
              Synopsis: spectrum

traceroute  - Traces path to destination MAC address discovering intermediary
              nodes along this path.  If the MAC address is not supplied, then
              the default gateway is used as the destination.
              Synopsis: traceroute [MAC]

exit        - Terminate current CLI session.
              Synopsis: exit
```

nodetest

Performs a two-way exchange of data to determine the link integrity between two SkyPilot devices.

Syntax

```
nodetest <MAC> [packet-count [packet-size]]
```

Arguments

MAC	MAC address of the device to ping
packet-count	Number of packets to send before terminating the ping test; if no value is entered, 100 packets are sent
packet-size	Size (in bytes) of the packets to send during the ping test; if no value is entered, the default packet size of 100 bytes is used
None	Displays the command's syntax

Example

```
> nodetest 000adb010048
> ##########################################################

 Average and standard deviation calculations
       Latency          PacketCount
| Ave    10972.29 | LostPacket    0 |
| StDev   5472.26 | SuccessPkt  101 |

Link Ping results: 100.000%      Successes: 101  Misses: 0

>
```

ping

Performs a Layer 3 ping test.

Syntax

```
ping <host> [packet-count [packet-size]]
```

Arguments

host	IP address of the device to ping
packet-count	Number of packets to send before terminating the ping test; if no value is entered, 3 packets are sent
packet-size	Size (in bytes) of the packets to send during the ping test; if no value is entered, the default packet size of 64 bytes is used

Example

```
> ping 192.168.4.188

PING 192.168.4.188: 56 data bytes
64 bytes from sbc405gpr (192.168.4.188): icmp_seq=0. time=0. ms
64 bytes from sbc405gpr (192.168.4.188): icmp_seq=1. time=0. ms
64 bytes from sbc405gpr (192.168.4.188): icmp_seq=2. time=0. ms
----192.168.4.188 PING Statistics----
3 packets transmitted, 3 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 0/0/0
>
```

reboot

Reboots the device.

Syntax

```
reboot
```

Arguments

None

Example

```
> reboot
Rebooting...
```

rebootap

Reboots a SkyPilot DualBand/TriBand access point. For TriBands, you'll be prompted for the desired access point.

NOTE Rebooting the TriBand's LAN switch is on the 4.9 GHz access point, rebooting it causes a momentary loss of connectivity to the 2.4 GHz access point.

Syntax

```
rebootap
```

Arguments

None

Example

```
> rebootap
Which access point do you want to reboot A) 2.4GHz or B) 4.9GHz <A|B>: A
2.4GHz access point will restart in 20 seconds.
2.4GHz access point restarted.

>
```

reload

Reloads the device's configuration file from the server.

Syntax

```
reload
```

Arguments

None

Example

```
> reload

>
```

reloadap

(DualBand/TriBand only) Reloads the access point's configuration file from the server. The device must be configured for automatic provisioning.

Syntax

```
reloadap
```

Arguments

None

set acl

Adds, deletes, or clears a device access control list (ACL), in real time.

ACLs enhance system security by controlling access to the local management interface on a SkyPilot node port. Unlike filters, which filter all data passing through a given SkyPilot node, ACLs examine data destined for a given node. (For more information about ACLs, refer to "Managing Access Control Lists" in *SkyPilot Network Administration*.)

Syntax

```
set acl add <subnet> <netmask> <destination> <protocol>
set acl del <row-index>
set acl clear
```

Arguments

subnet	IP address to be accessed when using the ACL's specified port and protocol
netmask	Netmask for addresses to be accessed via the ACL
destination	Destination port through which access is granted; a number from 1 to 65535
protocol	Protocol of this ACL; 0 for UDP or 1 for TCP
row-index	Entry number in the ACL table of the ACL to delete

Examples

```
> set acl add 192.168.0.0 255.255.0.0 23 1

> show acl
Index IP Address      Subnet Mask     Port  Protocol
----- --------------- --------------- ----- --------
1     0.0.0.0         0.0.0.0         23    TCP
2     192.168.0.0     255.255.0.0     23    TCP

> set acl del 2

> show acl
Index IP Address      Subnet Mask     Port  Protocol
----- --------------- --------------- ----- --------
1     0.0.0.0         0.0.0.0         23    TCP

> set acl clear

ACL table cleared!
> show acl
Index IP Address      Subnet Mask     Port  Protocol
----- --------------- --------------- ----- --------

>
```

set activeimage

Specifies which partition's software image to use as the active image.

NOTE Changes you make with the `set activeimage` command are made to the settings stored in flash memory, and do not take effect until the device is rebooted. You cannot change a device's active image in real time.

Syntax

```
set activeimage <A | B>
```

Arguments

A	Selects the image from partition A
B	Selects the image from partition B

Example

```
> set activeimage A
Active image set to A
>
```

set apwatchdog

Enables or disables a SkyExtender DualBand's access point watchdog process, which may be useful during 802.11b access point troubleshooting.

NOTE Changes you make with the `set apwatchdog` command take effect immediately. This setting is not stored in the device's flash memory.

Syntax

```
set apwatchdog <on | off>
```

Arguments

`on`	Enables the DualBand's access point watchdog process
`off`	Disables the DualBand's access point watchdog process

Example

```
> set apwatchdog on
Access point watchdog enabled.
>
```

set buzzer

Sets (in real time) sound pitch that indicates signal strength (recent Outdoor SkyConnectors only).

NOTE To change the device's buzzer setting in its flash memory, use the `set prov buzzer` command. The new setting will take effect when the device is rebooted.

Syntax

`set buzzer <off | numSec>`

Arguments

`off`	Disables the signal strength buzzer
numSec	Enables the signal strength buzzer and sets the number of seconds the buzzer sounds

Example

```
> show buzzer
Buzzer state: Off

> set buzzer 4
Buzz 4 second(s).

> show buzzer
Buzzer on: 1 seconds remain

> set buzzer off
Buzzer off!!!

> show buzzer
Buzzer state: Off
```

set classifier

Sets (in real time) the device's Quality of Service (QoS) classifiers.

QoS classifiers are used to classify traffic according to the types of packets that will be directed to a subscriber's high-priority queue, for both upstream (as packets enter the Ethernet interface) and downstream (as packets enter the SkyGateway Ethernet interface) traffic. All other traffic will be directed to the subscriber's standard (low-priority) queue. (For more information about QoS classifiers, refer to "Quality of Service (QoS)" in *SkyPilot Network Administration*.)

NOTE To change the device's QoS classifier settings in its flash memory, use the `set prov classifier` command. The new settings will take effect when the device is rebooted.

Syntax

```
set classifier
```

Arguments

None — Displays a series of prompts for the necessary command argument values (pressing ENTER at a value prompt will continue with whatever the current value is, which is shown within square brackets):

`q`	Quits the command.
`a`	Adds a QoS classifier. At the resulting prompts, enter the QoS classifier elements (refer to "QoS Classifiers" in the *SkyPilot Network Administration*).
`d`	Deletes a QoS classifier.
`m`	Modifies an existing QoS classifier. At the resulting prompts, enter the QoS classifier elements (refer to "QoS Classifiers" in the *SkyPilot Network Administration*).
`l`	Lists the device's current QoS classifiers.
`c`	Clears a classifier.

Example

```
> set classifier

Select a Classifier action:  quit, add, delete, modify, list, clear <q|a|d|m|l|c>: l
Rule TOS Low  TOS High TOS Mask IP Protocol IP Src Addr IP  IP Src Mask
---- -------- -------- -------- ----------- --------------- ---------------
1    00010000 11111111 11111111 0x00

Rule IP Dest Addr    IP Dest Mask    Port Src1 Port Src2 Port Dest1 Port Dest2
---- --------------- --------------- --------- --------- ---------- ----------
1
```

```
Rule MAC Src           MAC Src Mask      MAC Dest          MAC Dest Mask
---- ----------------- ----------------- ----------------- -----------------
1

Rule EtherType 802.1P Low 802.1P High 802.1Q Vlan Direction
---- --------- ---------- ----------- ----------- ----------
1                                                 downstream


Select a Classifier action:  quit, add, delete, modify, list, clear <q|a|d|m|l|c>: m
Enter the index of the classifier : 1
Enter the direction : upstream, downstream  <u | d> : d u
Enter IP TOS Low : 00010000
 IP TOS Low is not changed.
Enter IP TOS High : 11111111
 IP TOS High is not changed.
Enter IP TOS Mask : 11111111
 IP TOS Mask is not changed.
Enter IP Protocol Number < ICMP:01 | IGMP:02 | TCP:06 | UDP:11 | IPV6:29 | RSVP:2E |
IPX-in-IP:6F | L2TP:73 | [ProtocolNo] : 0x00
IP Protocol is not set.
Enter IP Source address :
IP Source address is not changed.
Enter IP Source Mask address :
IP Source Mask address is not changed.
Enter IP Destination address :
IP Destination address is not changed.
Enter IP Destination Mask address :
IP Destination mask is not changed.
Enter Source Port Start Address :
Source port start address is not changed.
Enter Source Port End address :
Destination port end address is not changed.
Enter Source MAC Address :
Source MAC address is not changed.
Enter Source MAC Address Mask:
Source MAC address Mask is not changed.
Enter Destination MAC Address :
Destination MAC address is not changed.
Enter Destination MAC Mask Address :
Destination MAC address mask is not changed.
Enter Ether Type Number :
 Ether Type is not changed.
Enter IEEE 802.1P User Priority Low (0 - 7):
IEEE 802.1P User Priority Low is not changed.
Enter IEEE 802.1P User Priority High (0 - 7):
IEEE 802.1P User Priority High is not changed.
Enter IEEE 802.1Q VLAN ID :
VLAN ID is not changed.
Classifier Successfully Modified.

Select a Classifier action:  quit, add, delete, modify, list, clear <q|a|d|m|l|c>: q
>
```

set eth

Enable or disables the device's 10/100bT Ethernet interface, enables or disables autonegotiation, and sets speed and duplexity, all in real time. (By default, the interface is enabled.)

NOTE To change the device's Ethernet interface settings in its flash memory, use the `set prov eth` command. The new settings will take effect when the device is rebooted.

Syntax

```
set eth
```

Arguments

None — Displays a series of prompts for the necessary command argument values (pressing ENTER at a value prompt will continue with whatever the current value is, which is shown within the square brackets):

`q`	Quits the command.
`s`	Sets the state of the device's Ethernet interface. At the resulting prompt, enter `e` to enable the interface or `d` to disable it.
`n`	Enables or disables autonegotiation (of speed and duplexity). At the resulting prompt, enter `y` to enable autonegotiation or `n` to disable it.
`m`	Modifies the port's physical settings. At the resulting speed prompt, enter `10` for 10bT or `100` for 100bT. At the duplexity prompt, enter `f` for full duplex or `h` for half duplex.

Example

```
> set eth
Select an Ethernet action: quit, state, negotiation, modify
<q|s|n|m>: m
Select speed [100bT]: 10bT, 100bT <10|100>:
Speed not changed: 100bT.
Select duplexity [f]: full, half <f|h>:
Duplexity not changed: full
Select an Ethernet action: quit, state, negotiation, modify
<q|s|n|m>: s
Select ethernet state [Enabled]:  enable, disable <e|d>:
Ethernet state not changed: Enabled
Select an Ethernet action: quit, state, negotiation, modify
<q|s|n|m>: q
>
```

set factoryap

Resets DualBand/TriBand access point(s) to their factory default settings. (For TriBands, both access points are reset.)

NOTE Changes you make with the `set factoryap` command take effect immediately. The access point will be offline for up to 5 minutes while being reset to its factory default settings.

Syntax

```
set factoryap
```

Arguments

None

set filter

Sets the device's packet filtering.

Filters are used to control the transfer of user data packets through a SkyPilot network. The filtering actions are performed on data packets received over the SkyPilot device's 10/100bT Ethernet interface. Unlike access control lists, which examine data destined for a given SkyPilot node, filters are used to filter all data passing through a given node. (For more information about filters, refer to "Filtering" in *SkyPilot Network Administration*.)

NOTE To change the device's filter settings in flash memory, use the `set prov filter` command. The new settings will take effect when the device is rebooted.

Syntax

```
set filter
```

Arguments

None — Displays a series of prompts for the necessary command argument values (pressing ENTER at a value prompt will continue with whatever the current value is, which is shown within the square brackets):

`q`	Quits the command.
`a`	Adds a filter. At the resulting prompt, enter the number corresponding to the filter type you want to add; then enter the hexadecimal number indicating the filter type; and finally, enter `1` to set the default permission to not-allow or `2` to set it to allow.
`p`	Sets an existing filter's default permission. At the resulting prompt, enter the number corresponding to the type of filter whose permission you want to set; then enter `1` to set the default permission to not allow or `2` to set it to allow.
`l`	Lists the current filter settings.
`c`	Clears the user-specified filter table.
`y`	Answers yes to the current command-line question; typically enables filters during runtime.
`n`	Answers no to the current command-line question; typically disables filters during runtime.

Example

```
> set filter
Select a Filter action:  quit, on, off , add, delete, permissions,
list, clear <q|y|n|a|d|p|l|c>: l

========= The Filter Table is OFF =========

1) EtherType Table Default Permission    = "ALLOW"
2) IPType Table Default Permission       = "ALLOW"
3) IPaddrSrc Table Default Permission    = "ALLOW"
4) IPaddrDst Table Default Permission    = "ALLOW"
5) UDPSrcPort Table Default Permission   = "ALLOW"
6) UDPDstPort Table Default Permission   = "ALLOW"
7) TCPSrcPort Table Default Permission   = "ALLOW"
8) TCPDstPort Table Default Permission   = "ALLOW"
9) ARPsrcIPaddr Table Default Permission = "ALLOW"


Select a Filter action:  quit, on, off , add, delete, permissions,
list, clear <q|y|n|a|d|p|l|c>: p
Enter the Filter Type
1) EtherType
2) IPType
3) IPaddrSrcType
4) IPaddrDstType
5) UDPSrcPortType
6) UDPDstPortType
7) TCPSrcPortType
8) TCPDstPortType
9) ARPsrcIPaddrType
>>> 1
Permission? (1 = not allow, 2 = allow)
>>> 2
Successfully set the default permission.

Select a Filter action:  quit, on, off , add, delete, permissions,
list, clear <q|y|n|a|d|p|l|c>: a
Enter the Filter Type
1) EtherType
2) IPType
3) IPaddrSrcType
4) IPaddrDstType
5) UDPSrcPortType
6) UDPDstPortType
7) TCPSrcPortType
8) TCPDstPortType
9) ARPsrcIPaddrType
>>> 1
EtherType (in hex): 10
Permission? (1 = not allow, 2 = allow)
>>> 2
Successfully Added Ether Type Filter.
Select a Filter action:  quit, on, off , add, delete, permissions,
list, clear <q|y|n|a|d|p|l|c>: q
>
```

set ip

Sets the device's IP address, subnet mask, and default gateway.

NOTE To change the device's settings in flash memory, use the `set prov ip` command. The new settings will take effect when the device is rebooted.

Syntax

```
set ip
```

Arguments

None — Displays a series of prompts for the necessary values (pressing ENTER at a value prompt will continue with whatever the current value is, which is shown within the square brackets):

`address`	Device's IP address
`subnet mask`	Device's subnet mask
`gateway`	IP address of the device's default SkyGateway

Example

```
> set ip
Enter IP address [0.0.0.0]: 192.168.1.100
Enter subnet mask [0.0.0.0]: 255.255.255.0
Enter default gateway [0.0.0.0]: 192.168.1.1
>
```

set log

Sets the verbosity of system log messages that are displayed to all Telnet or serial login sessions. System log messages are maintained independently for a variety of facilities (processes), and you can independently set each facility's log level.

Syntax

```
set log <facility | all> <level>
```

Arguments

facility	Specifies the facility to which this command applies:	
	`acl`	ACL activity messages
	`apwatchdog`	Status of communication between a SkyExtender DualBand and its access point (DualBand only)
	`auth`	Real-time device status as it proceeds through authentication
	`dynmod`	Real-time dynamic modulation information messages as a link changes from one modulation rate to another
	`filter`	Status messages concerning the different filter types: IP Address, IP Protocol, EtherType, Port
	`ftp`	Outpost message associated with FTP
	`gps`	Outpost message associated with GPS
	`hello`	Hello (device discovery) messages between SkyPilot network nodes
	`KABeacon`	Outpost message associated with KABeacon
	`link`	Real-time status messages as links are formed and optimized
	`prov`	Real-time device status as it proceeds through provisioning
	`radar`	Outpost message associated with radar
	`range`	Outpost message associated with range
	`shaper`	Quality of Service (QoS) traffic shaper status messages
	`snmp`	Messages concerning the SNMP agent activity
	`spectrum`	Outpost message associated with spectrum
	`system`	General messages about the overall status of your SkyPilot network
`all`	Specifies that this command applies to all facilities.	

level	Specifies the verbosity (how much information is generated) to assign to the facility or facilities specified by this command.	
	`0`	No logging
	`1`	Display major errors only
	`2`	Display brief event information
	`3`	Display detailed event information
None	Displays the command's syntax	

Example

To see the output of the `hello` process, you would change the log level of that process from 1 (its default) to 2, with the following command:

```
set log hello 2
```

With this log level set, a message similar to the following will be displayed every time a hello message exchange takes place:

```
> set log hello 2
> 0x80c760 (spLinkMgr): TS: 12660:10:01:48 0x80c760 (spLinkMgr):
spSystem.c:2200 (SP_HELLO_COMPONENT_ID) me <---  HELLO REQ v0
(...00:00:46, tx'd on ant 5)
```

set logevents pagesize

Sets the log events *page size*—the number of lines to display (before pausing) in response to the `show logevents` command.

Syntax

```
set logevents pagesize <value>
```

Arguments

value	A number from 10 to 10000, specifying the page size for log events messages.

set netkey

Sets (in real time) the netkey used to authenticate a node on a network. All nodes that belong to a given network must have the same netkey.

For security reasons, the netkey itself is not accessible from the command line; you must use a *passphrase* to manipulate it. The passphrase functions as a password and should similarly be kept secret. The passphrase can be from 6 to 64 printable characters and is case sensitive. The default passphrase is

`SkyPilot Network, Inc.`

NOTE Changes you make with the `set netkey` command take effect immediately and are also stored in flash memory.

Syntax

```
set netkey
```

Arguments

None	Prompts twice for the new netkey passphrase (a string from 6 to 64 letters, numbers, and symbols).

Example

```
> set netkey
Enter network key: ******
Re-enter network key: ******
Successfully set network key.
>
```

set password

Sets the password (in real time) used to log in to the device's command-line interface.

NOTE Changes you make with the `set password` command take effect immediately and are also stored in flash memory.

Syntax

```
set password
```

Arguments

None	Prompts twice for the new password (a string of alphanumeric characters from 6 to 64 characters long)

Example

```
> set password
Enter new password: ********
Re-enter password: ********
Password changed.
>
```

set power

(Manually provisioned devices only) Sets (in real time) the SkyGateway's transmit power.

NOTE To change the SkyGateway's power setting in its flash memory, use the `set prov power` command. The new setting will take effect when the SkyGateway is rebooted.

Syntax

```
set power <max | 4a | 2a | 1a | 4p>
```

Arguments

`max`	Sets the transmit power to the maximum.
`4a`	Sets the transmit power to 4 watts average.
`2a`	Sets the transmit power to 2 watts average.
`1a`	Sets the transmit power to 1 watt average.
`4p`	Sets the transmit power to 4 watts peak.

Example

```
> set power 2a
Power mode set to 2 Watt average
>
```

set prov

Sets the device's provisioning mode to manual or automatic (the default), and, for manually provisioned devices, sets any or all of the device's provisioning parameters in flash memory.

NOTE Any changes you make with this command are stored in flash memory, and do not take effect until the device is rebooted.

Invoking the set prov Command

Syntax

```
set prov [all | auto | manual | parameter]
```

Arguments

`all`	For a manually provisioned device, prompts you to set all the basic provisioning parameters for the device; see "Batch Provisioning" on page 49.
`auto`	Sets the device's provisioning mode to automatic. For more information about automatic provisioning, refer to "Automatically Provisioning a Network" in *SkyPilot Network Administration*.
`manual`	Sets the device's provisioning mode to manual. For more information about manual provisioning, refer to "Manually Provisioning a Device" in *SkyPilot Network Administration*.
`parameter`	For a manually provisioned device, sets the specified single provisioning parameter for the device. For more information, see "Provisioning a Single Parameter" on page 50.
None	Same as `all`.

Batch Provisioning

Specifying the `all` option (or no option) in the `set prov` command enables you to do batch provisioning—setting all the basic provisioning parameters for a device. The changes are stored in flash memory, and take effect after the device is rebooted.

Example

At every value prompt in this example, ENTER has been pressed, thereby retaining the device's current setting.

```
> set prov all
Use DHCP to obtain IP [Yes] <y|n>:
DHCP State not changed.
Enter FTP Server Address [0.0.0.0]:
FTP Server address not changed: 0.0.0.0
Enter Provisioning Server Address [0.0.0.0]:
Provisioning Server address not changed: 0.0.0.0
Enter IP address [192.168.8.101]:
IP address not changed: 192.168.8.101
Enter subnet mask [255.255.255.0]:
Subnet mask not changed: 255.255.255.0
Enter default gateway [192.168.8.1]:
Default gateway not changed: 192.168.8.1
Select a Timezone action: quit, enable, disable, modify <q|e|d|m>:


Select an Ethernet action: quit, state, negotiation, modify
<q|s|n|m>:

Enter domain ID (1-4096 or all) [222]:
Domain ID not changed: 222

19 available frequencies are the following:
5745 5750 5755 5760 5765 5770 5775 5780 5785 5790
5795 5800 5805 5810 5815 5820 5825 5830 5835

Select a Frequency action: quit, primary, allow, deny, list,
reqion, dwell time <q|p|a|d|l|r|t>:

Select a Traffic Rate Control Settings action: quit, enable,
disable, modify, clear <q|e|d|m|c>:


Select a Classifier action:  quit, add, delete, modify, list, clear
<q|a|d|m|l|c>:

Select a VLAN action:  quit, enable, disable, modify <q|e|d|m>:

Enter new password:

Enter network key:
Netkey not changed.
```

```
Select a Snmp action:  quit, read-write enable, read-only enable,
disable, modify <q|w|r|d|m>:

Select a Timezone action: quit, enable, disable, modify <q|e|d|m>:

>
```

Provisioning a Single Parameter

There are many provisioning parameters beyond those you can set with batch provisioning. To set these additional parameters (for example, to configure SNMP and VLANs), you use the individual provisioning commands, which are of the form `set prov` *`parameter`*. For details about each command, including its arguments, see its reference page in this document.

Example

```
> help set prov
?           - Display list set prov options.
              Synopsis: set prov ?

            - Set provisioning paramters.
              Synopsis: set prov

all         - Set provisioning paramters.
              Synopsis: set prov all

auto        - Set the provisioning mode to auto.
              Synopsis: set prov auto

buzzer      - Set buzzer provisioning setting.
              Synopsis: set prov buzzer

classifier  - Set packet classifiers.
              Synopsis: set prov classifier

domain      - Set flash domain ID.
              Synopsis: set prov domain

eth         - Set flash Ethernet settings.
              Synopsis: set prov eth

filter      - Set flash filter settings.
              Synopsis: set prov filter

freq        - Set flash frequency settings.
              Synopsis: set prov freq

ip          - Set flash IP settings.
              Synopsis: set prov ip
```

```
manual      - Set the provisioning mode to manual.
              Synopsis: set prov manual

parent      - Set flash preferred parent node.
              Synopsis: set prov parent <MAC>

snmp        - Set flash SNMP settings.
              Synopsis: set prov snmp

timezone    - Set flash timezone settings.
              Synopsis: set prov timezone

trafficrate - Set flash trafficrate settings.
              Synopsis: set prov trafficrate

vlan        - Set flash VLAN settings.
              Synopsis: set prov vlan

web         - Set web server parameters
              Synopsis: set prov web

>
```

set prov domain

Assigns the device to a specified domain or to all domains. SkyPilot devices connect only to devices within the same domain as their domain. For more information about domains, refer to "Domains" in *SkyPilot Network Administration*.

NOTE Changes you make with the `set prov domain` command are made to the settings stored in flash memory, and do not take effect until the device is rebooted. You cannot change a device's domain setting in real time.

Syntax

```
set prov domain
```

Arguments

None	Prompts for the necessary value (pressing ENTER will continue with whatever the current value is, which is shown within square brackets):	
	1-10000	Assigns the device to the domain having the specified domain ID, as a number from 1 to 10000
	all	Assigns the device to all domains (not applicable to SkyGateways)
	None	Retains the current value (which is shown within the square brackets)

Examples

```
> set prov domain
Enter domain ID (1-10000 or all) [ 10]: 1234
Domain ID changed: 1234
>
```

```
> set prov domain
Enter domain ID (1-10000 or all) [222]: all
Domain ID changed: 'all'
>
```

set prov freq

Sets the device's primary frequency for communication on the network, as well as the range of frequencies allowed during frequency hunting. When used on SkyGateways, this command configures the transmission frequency.

NOTE Changes you make with the `set prov freq` command are made to the settings stored in flash memory, and do not take effect until the device is rebooted. You cannot change a device's frequency settings in real time.

Syntax

```
set prov freq
```

Arguments

None — Displays a series of prompts for the necessary command argument values (pressing ENTER at a value prompt will continue with whatever the current value is, which is shown within the square brackets):

`q`	Quits the command without applying any settings.
`p`	Sets the primary frequency. At the resulting prompt, enter a number from 5745 to 5835 that's divisible by 5.
`a`	Sets an allowed frequency. At the resulting prompt, enter a number from 5745 to 5835 that's divisible by 5, or `all`. To specify multiple allowed frequencies but not `all`, enter this command multiple times.
`d`	Denies (disallows) a frequency from inclusion during frequency hunting. At the resulting prompt, enter a number from 5745 to 5835 that's divisible by 5, or `all`. To specify multiple denied frequencies but not `all`, enter this command multiple times.
`l`	Lists the primary and allowed frequencies.
`r`	Sets the frequency region so as to limit the available frequencies to just those appropriate for your geographic region. Available frequency regions are limited based on the device type.
`t`	Sets the *dwell time*—the time the device tries to communicate on any given frequency before alternately trying the next frequency in the allow list and retrying the primary frequency.

Example

```
> set prov freq
19 available frequencies are the following:
5745 5750 5755 5760 5765 5770 5775 5780 5785 5790
5795 5800 5805 5810 5815 5820 5825 5830 5835

Select a Frequency action: quit, primary, allow, deny, list,
reqion, dwell time <q|p|a|d|l|r|t>: a
Allow frequency <(from above the list)|'all'>: 5795


Select a Frequency action: quit, primary, allow, deny, list,
reqion, dwell time <q|p|a|d|l|r|t>: r
Enter frequency reqion: ALL-HI, US-HI, UK-HI, US-MID, EU-MID <allhi
| ushi | ukhi | usmid | eumid>:

Select a Frequency action: quit, primary, allow, deny, list,
reqion, dwell time <q|p|a|d|l|r|t>: t
Enter frequency dwell time (1-30 minutes) [1]: 2

Select a Frequency action: quit, primary, allow, deny, list,
reqion, dwell time <q|p|a|d|l|r|t>: q
>
```

set prov parent

Sets the preferred parent for non-SkyGateway devices. The parent can be a SkyGateway, SkyExtender, or SkyExtender DualBand (but not a SkyConnector). If you set a preferred parent, it will always be used even if it isn't the best path.

NOTE Changes you make with the `set prov parent` command are made to the settings stored in flash memory, and do not take effect until the device is rebooted. You cannot change a device's parent setting in real time.

Syntax

`set prov parent <MAC>`

Arguments

MAC	MAC address of parent device

set prov vlan

For SkyGateways, enables, disables, or configures the network's management VLAN. For SkyExtenders and SkyConnectors, the device's data VLAN. (For more information about VLANs, refer to "Virtual Local Area Networks (VLANs)" in *SkyPilot Network Administration*.)

NOTE Changes you make with the `set prov vlan` command are made to the settings stored in flash memory, and do not take effect until the device is rebooted. You cannot change a device's VLAN settings in real time.

Syntax

```
set prov vlan <q|e|d|m>
```

Arguments

`q`	Quits the command without applying any settings
`e`	Enables any VLANs previously configured by the `m` option
`d`	Disables any VLANs previously configured by the `m` option
`m`	Modifies the device's VLAN assignments (for which you are prompted)

Example

```
> set prov vlan
Select a Vlan action:  quit, enable, disable, modify  <q|e|d|m>: e
Select a Vlan action:  quit, enable, disable, modify  <q|e|d|m>: m
Enter data Vlan (1-4096) [10]: 1234
Select a Vlan action:  quit, enable, disable, modify  <q|e|d|m>: m
Enter management Vlan (1-4096) [1234]:
Select a Vlan action:  quit, enable, disable, modify  <q|e|d|m>: q
>
```

set prov web

Configures the device's Web interface server settings. (For more information about the Web interface, refer to the *SkyPilot Web Interface Reference*.)

NOTE Changes you make with the `set prov web` command are made to the settings stored in flash memory, and do not take effect until the device is rebooted. You cannot change a device's Web interface server settings in real time.

Syntax

```
set prov web
```

Arguments

None	Prompts you to enter a number corresponding to your desired action, and then prompts for any additional required values.

Example

```
> set prov web
The WebServer is enabled
The End-User Page is enabled

Select an action
1) Toggle WebServer Status
2) Toggle End-User Page Status
3) Enter New Web Login Password
4) Enter New End User Web Login Password
5) Quit
Choose... <1|2|3|4|5>: 1
The WebServer is disabled.

> set prov web

The WebServer is Disabled
The End-User Page is enabled

Select an action
1) Toggle WebServer Status
2) Toggle End-User Page Status
3) Enter New Web Login Password
4) Enter New End User Web Login Password
5) Quit
Choose... <1|2|3|4|5>: 1
The WebServer is enabled.

>
```

set radar

Sets (in real time) the SkyGateway's radar detection state.

NOTE To change the SkyGateway's radar setting in its flash memory, use the `set prov radar` command. The new setting will take effect when the SkyGateway is rebooted.

Syntax

```
set radar <on | off>
```

Arguments

`on`	Turns on radar detection.
`off`	Turns off radar detection.

Example

```
> set radar on
-> Enable traffic shutdown? <yes, no <y|n>: n
Radar detection enabled with no traffic shutdown
>
```

set snmp

Sets (in real time) SNMP community strings and trap receivers. By default, no community strings or trap receivers are configured on a SkyPilot network. For information about SNMP, refer to "SNMP" in *SkyPilot Network Administration*.

To use the `set snmp` command, you select a modification target (for example, `r` for a read-only community string), then set a modification action (such as `a` for add), and finally enter the configuration setting (such as text for a community string identifier).

NOTE To change the device's SNMP settings in its flash memory, use the `set prov snmp` command. The new settings will take effect when the device is rebooted.

Syntax

```
set snmp <q|w|r|d|m>
```

Arguments

`q` Quits the command or subcommand (available at all command and subcommand levels)

`b` Goes back a prompt level (available at all command levels except the top level)

`m` Enables selection of a modification target and action. You're first prompted to select the target:

- `w` Specifies that the modification target is a read-write community string.
- `r` Specifies that the modification target is a read-only community string.
- `t` Specifies that the modification target is a trap receiver.

You're then prompted to select one of the following actions to be performed on that target:

- `a` Specifies adding a community string (6 to 64 alphanumeric characters) or trap receiver (a trap port number from 1 to 65535).
- `d` Specifies disabling the community string or trap receiver.
- `l` Specifies listing the community strings or trap receivers.

Example

```
> set snmp
Select a Snmp action:  quit, read-write enable, read-only enable,
disable, modify <q|w|r|d|m>: w
Snmp setting changed: read-write
Select a Snmp action:  quit, read-write enable, read-only enable,
disable, modify <q|w|r|d|m>: r
Snmp setting changed: read-only
Select a Snmp action:  quit, read-write enable, read-only enable,
disable, modify <q|w|r|d|m>: m
Select modification:  back, read-write, read-only, trap receivers,
quit <b|w|r|t|q>: t
Select a trap action:  back, add, delete, list, quit <b|a|d|l|q>: l
Row    IP Address         Port
---    ---------------    -----
Select a trap action:  back, add, delete, list, quit <b|a|d|l|q>: a
Enter trap destination IP address:
Select a trap action:  back, add, delete, list, quit <b|a|d|l|q>: b
Select modification:  back, read-write, read-only, trap receivers,
quit <b|w|r|t|q>:
Select a Snmp action:  quit, read-write enable, read-only enable,
disable, modify <q|w|r|d|m>:
>
```

set spectrum

Sets the spectrum analyzer configuration. (For detailed information about the spectrum analyzer, see the "`spectrum`" command, described on page 126.)

Syntax

```
set spectrum <on | off | single | multi>
```

Arguments

`on`	Turns on the spectrum analyzer
`off`	Turns off the spectrum analyzer
`single`	Sets up an analysis for a single channel
`multi`	Sets up an analysis for multiple channels

Example

```
> set spectrum single

Single channel spectrum settings
--------------------------------
Set single channel mode <on | off> [off]: on
Mode changed: Single Channel Mode On

Set max visible rssi: dynamic adjust, rssi value <d | 1-100> [d]: d
Max visible rssi changed: dynamic adjust

Set graph height, number of lines <1-50> [16]:
Graph height not changed.

Set spectrum sleep timer: disable auto off, number of minute <d |
1-60> [5]:
Sleep timer not changed.

Set sampling time in second <1-60> [10]:
Sampling time not changed.

Set self activity filter: disable, enable <d | e> [e]:
Self activity filter setting has not changed.

>
```

set telnet

Specifies how many minutes a Telnet session to the device is allowed to remain inactive before being terminated.

Syntax

```
set telnet
```

Arguments

None	Prompts for the necessary value (pressing ENTER will continue with whatever the current value is, which is shown within square brackets):	
	timeout	Specifies the number of minutes as any positive number
	0	Specifies that the session never times out
	None	Retains the current value (which is shown within the square brackets)

Example

```
> set telnet
Enter Telnet inactivity timeout or 0 to disable the timeout [30
minute(s)]: 35
This change applies to all active and future Telnet sessions: 35
minute(s)

>
```

set timezone

Specifies an NTP (Network Time Protocol) server IP address and sets the time zone offset for accurate time. An NTP server can be used by the SkyPilot network to provide a synchronized time on all SkyPilot nodes. When a SkyPilot node starts up, it has an initial default date and time of January 1, 1970, 00:00:00 GMT. Using an NTP server, the node adjusts its time to be synchronized with the NTP server, which typically is set to UTC (Coordinated Universal Time) or GMT.

For more information about the NTP server, refer to "Time Zones" in *SkyPilot Network Administration*.

NOTE To change the device's time zone settings in its flash memory, use the `set prov timezone` command. The new settings will take effect when the device is rebooted.

Syntax

```
set timezone <q|e|d|m>
```

Arguments

`q`	Quits the command without applying any settings
`e`	Enables any time zone settings previously configured by the `m` option
`d`	Disables any time zone settings previously configured by the `m` option
`m`	Modifies the NTP server IP address and time zone settings (for which you're prompted)

Example

```
> set timezone
Select a Timezone action: quit, enable, disable, modify <q|e|d|m>: e
Select a Timezone action: quit, enable, disable, modify <q|e|d|m>: m
Enter timezone NTP server [0.0.0.0]: 1.2.3.4
Enter timezone offset [0.00]: 10
Select a Timezone action: quit, enable, disable, modify <q|e|d|m>: m
Enter timezone NTP server [1.2.3.4]:
Enter timezone offset [+10.00]:
Select a Timezone action: quit, enable, disable, modify <q|e|d|m>: q

>
```

set trafficrate

Sets (in real time) the device's traffic rate controls. For more information about traffic rates, refer to "Quality of Service (QoS)" in *SkyPilot Network Administration*.

NOTE To change the device's traffic rate settings in its flash memory, use the `set prov trafficrate` command. The new settings will take effect when the device is rebooted.

Syntax

```
set trafficrate
```

Arguments

None	Displays a series of prompts for the necessary command argument values (pressing ENTER at a value prompt will continue with whatever the current value is, which is shown within the square brackets). For information about traffic rate values, refer to "Traffic Rate Controls" in *SkyPilot Network Administration*.

Example

```
> set trafficrate
Select a Traffic Rate Control Settings action: quit, enable,
disable, modify, clear <q|e|d|m|c>: m
Enter maximum upstream rate (Kbps) 64-10000 [10000]:
Enter maximum downstream rate (Kbps) 64-10000 [10000]:
Enter maximum broadcast rate (Kbps) 64-10000 [10000]:
Select a Traffic Rate Control Settings action: quit, enable,
disable, modify, clear <q|e|d|m|c>: q

>
```

show acl

Displays the device's current access control list (ACL).

Syntax

```
show acl
```

Arguments

None

Example

```
> show acl
```

```
show acl
Index IP Address      Subnet Mask     Port  Protocol
----- --------------- --------------- ----- --------
1     192.168.4.0     255.255.255.0   161   UDP
>
```

show ap

Displays the access point's settings or clients.

NOTE There is no corresponding `set ap` command; to configure an access point, use the access point's Web interface.

Syntax

```
show ap <client | info | power | radius | security | wlan |
security | syslog | radius> [24 | 49]
```

Arguments

`client`	Lists the access point's clients, displaying each client's MAC address, SSID, VLAN ID, type, authorization, and status
`info`	Displays the access point's radio settings: the policy (type of clients permitted), country ID, communication channel, and diversity setting
`power`	Displays the access point's transmit signal power level
`wlan`	Displays the access point's network settings, including its SSID, E/B (Enabled and Broadcasting settings, shown as "Y" or "N"), BSSID (broadcast SSID value), VLAN ID, QoS (802.1P QoS level), DHCP (enabled/disabled status), and security (type of security policy selected)
`security`	Displays the access point's security settings, including the protocol version in effect and whether Peer-to-Peer and wireless management are enabled or disabled
`syslog`	Displays the access point's syslog server settings, including whether it's enabled or disabled and the server and port numbers
`radius`	Displays the access point's Radius server settings, including server name, host name, secret key, and authorization and accounting port numbers

Examples

```
> show ap info
2.4GHz Radio
------------
Radio policy      : 802.11b/g
Country           : 0
Channel           : 1
Antenna Diversity : ON

> show ap power
400 milli-Watts

> show ap wlan

2.4GHz WLAN SSID       E/B BSSID         VLAN QOS DHCP   Security
---------------------- --- ------------- ---- --- ------ --------
SkyPilot               Y/Y                0     2
```

show bridge

Displays the device's current bridge station cache and port information. Each SkyPilot node functions as a bridge device, bridging the Ethernet interface with the RF interface. Traffic originating from the Ethernet interface traverses the bridge and is then sent out the RF interface. Conversely, traffic originating from the RF interface traverses the bridge and is then sent out the Ethernet interface.

Syntax

```
show bridge [cache | port]
```

Arguments

`cache`	Lists the device's bridge station cache entries, which contain MAC addresses and the associated bridge port from which the MAC address originates (see Table 4)
`port`	Lists the device's bridge port entries (see Table 5)
None	Lists both the device's bridge station cache entries and its bridge port entries

Table 4. Fields Displayed by show bridge cache Command

Field	Description
`MAC Address`	MAC addresses of all devices known by the bridge; includes SkyPilot nodes and connected (user) PCs
`Tick`	Time tick when the bridge last saw an Ethernet frame from the MAC address
`pPortInfo`	Bridge port that saw the Ethernet frame

Table 5. Fields Displayed by show bridge port Command

Field	Description
DevName	Device (interface) name: • emac = Ethernet • ar = Atheros • mirror = mirror
Num	(Developer use only) Interface instance
MuxCookie	(Developer use only) Device identifier
Type	(Developer use only) Device type: END (Enhanced Network Device)
inPkts	Number of packets received by the bridge port
outPkts	Number of packets sent out the bridge port

Example

```
> show bridge

Bridge Station Cache Contents:
MAC Address           Tick     pPortInfo
-----------------------------------------------
00:0A:DB:01:30:FE  0x01E9B71E  DYNAMIC ar0
00:0A:DB:01:05:67  0x01E9E0B3  DYNAMIC mirror1
00:13:20:02:49:69  0x01E9E0B3  DYNAMIC ar0
00:12:0E:0D:37:BF  0x01E9DBFF  DYNAMIC ar0
00:11:A3:01:B7:DB  0x01E9D28D  DYNAMIC ar0
00:E0:7D:CA:E7:EC  0x01E9E061  DYNAMIC emac0

Bridge Port Info List:
EntryAddr   DevName   Num  MuxCookie   Type     inPkts   outPkts
-------------------------------------------------------------
0x00A26520  emac       0   0x00A264B8  END      1380184  1247503
0x00A26488  ar         0   0x00A1F9D0  END      1291385  830020
0x00A181B0  mirror     1   0x00A18148  END      36957    503910

>
```

show buzzer

(Recent outdoor SkyConnectors only) Displays the current buzzer setting.

Syntax

```
show buzzer
```

Arguments

None

Example

```
> show buzzer
Buzzer state: Off

>
```

show classifier

Displays the device's QoS (packet) classifiers.

Syntax

```
show classifier
```

Arguments

None

Example

```
> show classifier
```

```
Rule TOS Low  TOS High TOS Mask IP Protocol IP Src Addr IP  IP Src Mask
---- -------- -------- -------- ----------- --------------- ---------------
1                                          1.1.1.1         255.255.255.0

Rule IP Dest Addr    IP Dest Mask    Port Src1 Port Src2 Port Dest1 Port Dest2
---- --------------- --------------- --------- --------- ---------- ----------
1    2.2.2.2         255.255.255.0   100       111       200        211

Rule MAC Src           MAC Src Mask      MAC Dest          MAC Dest Mask
---- ----------------- ----------------- ----------------- -----------------
1    00:0A:DB:45:45:45 FF:FF:FF:FF:FF:FF

Rule EtherType 802.1P Low 802.1P High 802.1Q Vlan Direction
---- --------- ---------- ---------- ---------- ----------
1                                               upstream

>
```

show config

(Automatically provisioned devices only) Displays the device's configuration settings received from the provisioning server.

NOTE The resulting display does *not* show any configuration updates made by using the `set prov parameter` command, regardless of whether those changes have taken effect or are stored in flash memory. To view the current operating parameters, use the "`show status`" command, described on page 117.

Syntax

`show config parameter`

Arguments

`parameter`	Displays the current configuration setting of the specified single provisioning parameter for the device. For a complete list of the individual `show config` commands, see the `show` entries in Table 1 on page 6 and Table 2 on page 8. For details about each command, including its arguments, see the corresponding reference page in this document.
None	Displays the device's complete set of configuration settings.

Example

```
> show config
================================================================================
Node Parameters
---------------
Domain                          : 888
Power mode                      : default
Radar detection                 : default
Preferred parent                : 00:0a:db:01:07:94
Telnet timeout (minutes)        : 33
Buzzer time (seconds)           : 33
Lease time (minutes)            : 30
Web server                      : enable

================================================================================
Ethernet
--------
State                           : Enabled
Negotiation                     : Auto

================================================================================
Frequency
---------
Region                          : FCC-HI
Primary                         : 5805
Allowed                         :
Dwell time (minutes)            : 30

================================================================================
VLAN
----
```

```
================================================================================
SNMP
----
Mode                            : read-write
Trap receiver                   : 10.12.14.1:162
Trap disable                    : spTrapReboot spTrapModulationChangeDown
                                  spTrapModulationChangeUp spTrapLinkDown
                                  spTrapLinkUp spTrapColdStart
                                  spTrapWarmStart
Read-only community             :
Read-write community            :

================================================================================
Timezone
--------
Timezone offset                 : -8.00

================================================================================
Software Versions
-----------------
Primary                         : SkyConn.1.3.bin
Backup                          : SkyConn.1.3.bin
Software schedule               : SUN JAN 00 00:00:00 1900
Software schedule valid         : false

================================================================================
Traffic Rate Control
--------------------
Max rate down (Kbps)            : 8000
Max rate up (Kbps)              : 8000

================================================================================
Classifier
----------
Rule TOS Low  TOS High TOS Mask IP Protocol IP Src Addr IP  IP Src Mask
---- -------- -------- -------- ----------- --------------- ---------------
1
2                                           10.12.14.2      255.255.255.255
3
4                                           10.12.14.2      255.255.255.255

Rule IP Dest Addr    IP Dest Mask    Port Src1 Port Src2 Port Dest1 Port Dest2
---- --------------- --------------- --------- --------- ---------- ----------
1    10.12.14.2      255.255.255.255
2
3    10.12.14.2      255.255.255.255
4

Rule MAC Src           MAC Src Mask      MAC Dest          MAC Dest Mask
---- ----------------- ----------------- ----------------- -----------------
1
2
3
4

Rule EtherType 802.1P Low 802.1P High 802.1Q Vlan Direction
---- --------- ---------- ----------- ----------- ----------
1                                                 upstream
2                                                 downstream
3                                                 downstream
4                                                 upstream

================================================================================
Access Control List
-------------------

================================================================================
Filters
-------
Enable                          : yes
```

```
EtherType dflt permission      : allow

IP Protocol dflt permission    : allow

IP Address dst dflt permission : allow

IP Address src dflt permission : allow

ARP src dflt permission        : allow

Port dst dflt permission       : allow

Port src default permission    : allow
Row Port  Protocol Permission
--- ----- -------- ----------
1   67    UDP      deny

================================================================================
Syslog Server
-------------

>
```

show date

Displays the current system date and time.

Syntax

```
show date
```

Arguments

None

Example

```
> show date
```

```
FRI AUG 27 02:04:53 2004
```

show debug

Displays the device's current debug status (identical to the `debug status` command).

Syntax

```
show debug
```

Arguments

None

Example

```
> show debug
Debug logging enabled.
>
```

show dhcp

Displays the DHCP OFFER options (in the fields described in Table 6). If the command output doesn't display the lease duration, lease rebinding, and lease renewal values, the node hasn't obtained a DHCP lease.

Syntax

```
show dhcp
```

Arguments

None

Table 6. Fields Displayed by show dhcp Command (Page 1 of 2)

Field	Description
IP address	Layer 3 IP address
Subnet mask	Network mask
Broadcast address	IP address used as the packet source for packets broadcast from this node
Default gateway	IP address of the default SkyGateway that routes packets to their proper destination
Lease duration	Duration (in seconds) of the DHCP lease
Lease rebinding	Remaining time (in seconds) until the lease expires
Lease renewal	Remaining time (in seconds) until lease renewal
DHCP server	IP address of the DHCP server that provided the DHCP options
FTP server	IP address of the FTP server from which software images are retrieved

Table 6. Fields Displayed by show dhcp Command (Page 2 of 2)

Field	Description
HTTP server	IP address of the server from which this device retrieves its configuration file
NTP server	IP address of the NTP server used to synchronize to Universal Coordinated Time (UTC)
Hostname	Name assigned to the node by the DHCP server (each SkyPilot device can have a unique hostname)

Example

> show dhcp

```
IP address         : 192.168.4.189
Subnet mask        : 255.255.255.0
Broadcast address  : 192.168.4.255
Default gateway    : 192.168.4.1
Lease duration     : 172800
Lease rebinding    : 150913
Lease renewal      : 86113
DHCP server        : 192.168.4.100
FTP server         : 192.168.4.100
HTTP server        : 192.168.4.103
NTP server         : 172.16.1.20
Hostname           : marvin_mgw
>
```

show domain

Displays the device's domain information: the domain ID if the device belongs to a single domain or ALL if the device belongs to all domains.

Syntax

```
show domain
```

Arguments

None

Example

```
> show domain
Current Domain                  :222
>
```

show eth

Displays the device's Ethernet interface state (enabled or disabled), as well as physical settings such as speed and duplexity.

Syntax

```
show eth
```

Arguments

None

Example

```
> show eth
Link     : Up
Duplex   : Auto-Full
Speed    : Auto-100BASE-T

Rx Errors                        = 00000000
Rx Bytes received                = 09454882
Rx bytes/sec                     = 00000846
Tx Errors                        = 00000000
Tx Bytes transmitted             = 05853959
Tx bytes/sec                     = 00000846

>
```

show filter

Displays either all filter tables in the system or a single specified filter table. In addition, the current filtering status is shown.

Syntax

```
show filter [filter-num]
```

Arguments

filter-num	Displays the specified filter table. This argument is a sequential number that is incremented whenever a new filter is added.
None	Displays all the filters in the system.

Example

```
> show filter

========= The Filter Table is ON =========

1) EtherType Table Default Permission    = "ALLOW"

2) IPType Table Default Permission       = "ALLOW"

3) IPaddrSrc Table Default Permission    = "ALLOW"

4) IPaddrDst Table Default Permission    = "ALLOW"

5) UDPSrcPort Table Default Permission   = "ALLOW"
  Index      Port      Permission
---------  --------  --------------
   001       0067      NOT ALLOW

6) UDPDstPort Table Default Permission   = "ALLOW"

7) TCPSrcPort Table Default Permission   = "ALLOW"

8) TCPDstPort Table Default Permission   = "ALLOW"

9) ARPsrcIPaddr Table Default Permission = "ALLOW"

>
>
```

show flash

Displays the device's flash memory status.

Syntax

```
show flash
```

Arguments

None

Example

```
> show flash
NAND flash has 0 bad blocks. 100% of replacement block available.

>
```

show freq

Displays the device's primary frequency, as well as its allowed range of frequencies.

Syntax

```
show freq
```

Arguments

None

Example

```
> show freq
Frequency range setting stored in flash is: US high band

Current frequency range setting is: US high band
Current frequency is: 5825
Current valid frequencies are:
 5745  5750  5755  5760  5765  5770  5775  5780  5785  5790
 5795  5800  5805  5810  5815  5820  5825  5830  5835
Dwell time (minutes): 1

>
```

show gps

Displays the device's GPS information (non-SkyConnectors only).

Syntax

```
show gps <position | signal>
```

Arguments

`position`	Displays the device's current position
`signal`	Displays GPS satellite information and signal strength

Example

```
> show gps position

GPS Position
------------
Latitude  : 37.382145 degrees
Longitude : -121.959763 degrees
Altitude  : 1.118043 meters

Satellite Signal Strength
-------------------------
Number of satellites: 8
Satellite Number | Signal Strength
      23         |          4.60
       1         |         12.00
      22         |          3.80
      19         |          2.80
      25         |         10.20
      20         |          9.00
      11         |          3.80
      14         |          4.40

Average Signal Strength: 6.32
>
```

show int

Displays information about the device's Ethernet interface (including statistics) and RF interface (SPID, IP address, and netmask).

Syntax

```
show int [eth | rf]
```

Arguments

`eth`	Displays information about the Ethernet interface (see Table 7)
`rf`	Displays information about the RF interface (see Table 8)
None	Displays information about the Ethernet and RF interfaces

Table 7. Fields Displayed about Ethernet Interface (Page 1 of 2)

Field	Description
`Internet Address`	IP address
`Broadcast Address`	Broadcast address
`Netmask` and `Submask`	Netmask and submask in hexadecimal
`Ethernet Address`	MAC address of the device's Ethernet interface
`Maximum Transfer Unit Size`	Maximum number of bytes that can be transferred in a single unit between this node and any other node
`Octets Received`	Number of bytes received by the device since the last reboot
`Octets Sent`	Number of bytes sent from the device since the last reboot
`Packets Received`	Number of packets received on the device since the last reboot
`Packets Sent`	Number of packets sent from the device since the last reboot

Table 7. Fields Displayed about Ethernet Interface (Page 2 of 2)

Field	Description
`Non-unicast Packets Received`	Number of non-unicast (that is, broadcast) packets received since the last reboot
`Non-unicast Packets Sent`	Number of non-unicast (that is, broadcast) packets sent since the last reboot
`Unicast Packets Received`	Number of unicast packets received since the last reboot
`Unicast Packets Sent`	Number of unicast packets sent since the last reboot
	(Some SkyPilot internal-use-only fields omitted)
`Netmask`	Netmask in dotted notation

Table 8. Fields Displayed about RF Interface (Page 1 of 3)

Field	Description
`SPID`	SkyPilot ID of the node
`Default Gateway`	Default mesh gateway (`00:60:b3:09:53:21`)
`PPS received`	Number of pulses per second received
`frames received`	Number of frames received
`frames sent`	Number of frames sent
`CRC errors`	Number of CRC errors received
`decrypt CRC errors`	Number of decryption CRC errors
`Michael errors`	Number of Michael errors

Table 8. Fields Displayed about RF Interface (Page 2 of 3)

Field	Description
RX - wrong antenna	Number of frames received on the wrong antenna
RX - too small	Number of frames received that were too small
RX - wrong destination	Number of frames received that were not destined for the local node
RX - no link	Number of frames received for which there is no known link to the source
RX – drops	Number of receive frames dropped
RX - mblk events	Number of times receive frame was dropped due to no free mblks remaining in the ring buffer
TX – errors	Number of transmit frame errors
TX – timeouts	Number of transmit timeouts
memory events	Number of memory allocation failures
descriptor events	Number of descriptor allocation failures
netJob events	Number of times the device failed to queue the frame
tau sync events	Number of times tau count was out of sync
PPS misses	Number of times PPS signal was lost
PPS timeouts	Number of times PPS loss threshold was exceeded
discards	Number of frames discarded due to bad frame, unicast to another network, or unknown source

Table 8. Fields Displayed about RF Interface (Page 3 of 3)

Field	Description
late responses	Number of time overrun errors in the MAC address
no frame events	Number of frames scheduled for transmission that could not be processed by the radio
busy events	Number of times the radio could not transmit or receive due to a previously scheduled event

Example

```
> show int
```

```
mirror (unit number 0):
     Flags: (0x8063) UP BROADCAST MULTICAST ARP RUNNING
     Type: ETHERNET_CSMACD
     Internet address: 192.168.4.188
     Broadcast address: 192.168.4.255
     Netmask 0xffffff00 Subnetmask 0xffffff00
     Ethernet address is 00:0a:db:09:52:6c
     Metric is 0
     Maximum Transfer Unit size is 1500
     0 octets received
     84 octets sent
     0 packets received
     2 packets sent
     0 non-unicast packets received
     0 non-unicast packets sent
     0 unicast packets received
     2 unicast packets sent
     0 input discards
     0 input unknown protocols
     0 input errors
     0 output errors
     0 collisions; 0 dropped
     Netmask: 255.255.255.0
radio:
     SPID: 00:60:b3:09:53:21
     Default Gateway: 00:60:b3:09:53:21
     7085 PPS received
     33066 frames received
     31636 frames sent
     123 CRC errors
     0 decrypt CRC errors
     0 Michael errors
     0 RX - wrong antenna
     0 RX - too small
     0 RX - wrong destination
     0 RX - no link
     0 RX - drops
     0 RX - mblk events
```

```
     0 TX - errors
     2529 TX - timeouts
     0 memory events
     0 descriptor events
     0 netJob events
     1 tau sync events
     42 PPS misses
     0 PPS timeouts
     0 discards
     0 late responses
     0 no frame events
     0 busy events
>
```

show ip

Displays the device's IP address information.

Syntax

```
show ip
```

Arguments

None

Example

```
> show ip
IP Address       : 192.168.8.21
Subnet Mask      : 255.255.255.0
Default Gateway  : 192.168.8.1
>
```

show ip2mac

(SkyGateway only) Displays the MAC addresses (and optionally their corresponding IP addresses) of all SkyPilot nodes connected to the SkyGateway.

Syntax

```
show ip2mac [IP]
```

Arguments

`IP`	Displays mapping table of connected MAC addresses and their corresponding IP addresses
None	Displays mapping table of connected MAC addresses

Example

```
> show ip2mac
1) 192.168.8.101 -> 00:0a:db:09:52:73

>
```

show link

Displays the link table, link optimization table, mesh link states, or mesh link statistics. Link states and statistics include items such as frequency, transmit power, and modulation.

Syntax

```
show link [all [MAC] | opt | state | stats] [active | fail |
inactive | prov | standby | MAC]
```

If the second parameter is omitted, the default, `active`, is implied.

Arguments

`all`	Displays the link optimization, mesh link states, mesh link statistics, and link tables for links specified by the second parameter
`opt`	Displays link optimization table entries for the links specified by the second parameter (in the fields described in Table 9)
`state`	Displays link state table entries for the links specified by the second parameter (in the fields described in Table 10)
`stats`	Displays link statistics table entries for the links specified by the second parameter (in the fields described in Table 11)
`active`	Displays active links entries of the table specified by the first parameter
`fail`	Displays failed link entries of the table specified by the first parameter
`inactive`	Displays inactive link entries of the table specified by the first parameter
`prov`	Displays provisioned link entries of the table specified by the first parameter
`standby`	Displays standby link entries of the table specified by the first parameter
`MAC`	Displays the MAC entry of the table specified by the first parameter
None	Displays the link table

.

Table 9. Fields Displayed for `show link opt` Command

Field	Description
`MAC Address`	MAC address of remote node, and its corresponding antenna data: • Best Local Antenna • Best Remote Antenna • Best Local Modulation • Best Remote Modulation
`RSSI table`	For each device antenna, the RSSI of packets received
`Modulation table`	For each device antenna, the transmit and receive success rate for a range of rates

Table 10. Fields Displayed for `show link state` Command (Page 1 of 2)

Field	Description
`MAC Address`	MAC address of remote node
`LType`	Link type: • `data` = Data • `ctrl` = Control
`NType`	Node type: • `gw` = SkyGateway • `ext` = SkyExtender • `ext-d` = SkyExtender DualBand • `ext-t` = SkyExtender TriBand • `cpe-i` = SkyConnector Indoor • `cpe-o` = SkyConnector Outdoor
`State`	Link state (refer to "Monitoring Link States" in *SkyPilot Network Administration*)
`LAnt`	Local antenna
`RAnt`	Remote antenna

Table 10. Fields Displayed for `show link state` Command (Page 2 of 2)

Field	Description
`Mod`	Local modulation
`Freq`	Frequency
`TxPower`	Local transmit power
`RxGain`	Local receive gain range (distance in meters)
`Range`	Distance in meters between the local and remote nodes
`Connect Time`	Date and time link was first established
`Downed Time`	Date and time link became inactive
`First Opt Time`	Date and time of first link optimization
`Num of Opt`	Number of link optimization attempts

Table 11. Fields Displayed for `show link stats` Command (Page 1 of 2)

Element	Description
`MAC Address`	MAC address of remote node
`LType`	Link type: `data` = Data
`RSSI`	Last RSSI
`LTxMod`	Local node's transmit modulation
`RTxMod`	Remote node's transmit modulation
`TxPow`	Transmit power
`RxFrames`	Number of radio frames received
`TxFrames`	Number of radio frames transmitted

Table 11. Fields Displayed for `show link stats` Command (Page 2 of 2)

Element	Description
RxPackets	Number of packets received
TxPackets	Number of packets transmitted
RxBytes	Number of bytes received
TxBytes	Number of bytes transmitted
TxRetries	Number of transmit retries
TxRLimit	Number of times transmit retry limit was reached
RxMalformed	Number of malformed frames received
RxDuplicate	Number of duplicate frames received
RxMissed	Number of receive frames missed
Queue Drops	Number of packets dropped due to queue full
RED Drops	Number of packets dropped due to RED (Random Early Detection)
TxAborts	Number of transmit frames aborted
TxDataFrames	Number of data frames transmitted
TxAcks	Number of ACKs transmitted
PktTtl	Number of packets queued from both the high priority and low priority transmit queues
H:Q/Max	Number of packets in the high priority transmit queue
N:Q/Max	Number of packets in the normal priority transmit queue
Counter Start Time	Data and time when counters were last reset

Example

> show link

```
MAC Address       LType NType State     LRSSI  RRSSI  LTxMod RTxMod LAnt RAnt
----------------- ----- ----- --------- ------ ------ ------ ------ ---- ----
00:0a:db:00:01:50 data  cpe-o act mgmt  66     65     48     36     3    0
00:0a:db:00:01:7f data  cpe-i standby-o 63     0      36     54     7    0
00:0a:db:00:01:95 data  cpe-o act mgmt  53     42     48     36     3    0
00:0a:db:00:02:1d data  cpe-o act mgmt  44     47     48     36     2    0
00:0a:db:01:00:48 data  ext   act mgmt  64     76     36     54     7    5
00:0a:db:01:00:75 data  cpe-o standby-o 49     0      36     48     0    0
00:0a:db:01:05:67 data  cpe-o act mgmt  57     59     48     36     0    0
00:0a:db:01:30:ff data  ext-d standby-o 70     77     54     54     0    4

> show link state
MAC Address       LType NType State     LAnt RAnt Mod Freq TxPower RxGain Range
----------------- ----- ----- --------- ---- ---- --- ---- ------- ------ -----------
00:0a:db:00:01:50 data  cpe-o act mgmt  3    0    48  5805 45      3      0
00:0a:db:00:01:7f data  cpe-i standby-o 7    0    36  5805 45      3      0
00:0a:db:00:01:95 data  cpe-o act mgmt  3    0    48  5805 45      3      0
00:0a:db:00:02:1d data  cpe-o act mgmt  2    0    48  5805 45      3      0
00:0a:db:01:00:48 data  ext   act mgmt  7    5    36  5805 45      3      0
00:0a:db:01:00:75 data  cpe-o standby-o 0    0    36  5805 45      3      0
00:0a:db:01:05:67 data  cpe-o act mgmt  0    0    48  5805 45      3      0
00:0a:db:01:30:ff data  ext-d standby-o 0    4    54  5805 45      3      150

MAC Address     Connect Time         Downed Time          First Opt Time       Num Opt
----------------- -------------------- -------------------- -------------------- --
00:0a:db:00:01:50 APR 18 2006 14:07:25 APR 18 2006 14:06:08 APR 18 2006 14:06:09 1
00:0a:db:00:01:7f APR 18 2006 14:06:15 APR 18 2006 14:06:15 APR 18 2006 14:06:41 1
00:0a:db:00:01:95 APR 18 2006 14:10:00 APR 18 2006 14:06:12 APR 18 2006 14:06:13 1
00:0a:db:00:02:1d APR 18 2006 14:10:18 APR 18 2006 14:06:07 APR 18 2006 14:06:07 1
00:0a:db:01:00:48 APR 18 2006 14:08:31 APR 18 2006 14:06:27 APR 18 2006 14:07:17 1
00:0a:db:01:00:75 APR 18 2006 14:06:13 APR 18 2006 14:06:13 APR 18 2006 14:06:13 1
00:0a:db:01:05:67 APR 18 2006 15:52:45 APR 18 2006 15:51:10 APR 18 2006 15:51:18 1
00:0a:db:01:30:ff APR 18 2006 14:07:27 APR 18 2006 14:09:45 APR 18 2006 14:06:09 0

> show link stats
MAC Address       LType RSSI LTxMod RTxMod TxPow RxFrames    TxFrames    RxPackets
TxPackets
----------------- ----- ---- ------ ------ ----- ----------- ----------- ----------
- -----------
00:0a:db:00:01:50 data  65   48     36     45    12445       17743       3432
3018
00:0a:db:00:01:7f data  63   36     54     45    2339        2631        766
810
00:0a:db:00:01:95 data  54   48     36     45    14596       20228       3764
3130
00:0a:db:00:02:1d data  44   48     36     45    12205       16452       3481
2656
00:0a:db:01:00:48 data  63   36     54     45    64663       66120       14117
10931
00:0a:db:01:00:75 data  49   36     48     45    2422        2543        791
802
00:0a:db:01:05:67 data  58   48     36     45    114329      126351      37445
39135
00:0a:db:01:30:ff data  70   54     54     45    4260        4975        1472
1061

MAC Address       LType RxBytes     TxBytes     RxMalformed RxDuplicate RxMissed
Queue Drops
----------------- ----- ----------- ----------- ----------- ----------- -----------
-----------
00:0a:db:00:01:50 data  1270453     1587504     0           0           157         0
00:0a:db:00:01:7f data  925085      1264506     0           0           37          0
00:0a:db:00:01:95 data  1541019     1598662     0           0           245         0
00:0a:db:00:02:1d data  1582189     1499961     0           0           4           0
```

```
00:0a:db:01:00:48 data  5459301     2911240     0           0           9           0
00:0a:db:01:00:75 data  702091      1244570     0           0           8           0
00:0a:db:01:05:67 data  17056152    30389887    0           0           4223        0
00:0a:db:01:30:ff data  1076391     1299822     0           0           57          0

MAC Address       LType RED Drops   TxRetries   TxRLimit    TxAborts    TxDataFrames
TxAcks
----------------- ----- ----------- ----------- ----------- ----------- -----------
- -----------
00:0a:db:00:01:50 data  0           401         7           0           3006        0
00:0a:db:00:01:7f data  0           8           1           0           808         0
00:0a:db:00:01:95 data  0           143         2           0           3097        0
00:0a:db:00:02:1d data  0           124         0           0           2641        0
00:0a:db:01:00:48 data  0           1313        20          0           10881       0
00:0a:db:01:00:75 data  0           0           0           0           790         0
00:0a:db:01:05:67 data  0           615         37          0           35134       0
00:0a:db:01:30:ff data  0           72          14          0           1043        0

MAC Address       LType Counter Start Time
----------------- ----- --------------------
00:0a:db:00:01:50 data  APR 18 2006 14:06:08
00:0a:db:00:01:7f data  APR 18 2006 14:06:15
00:0a:db:00:01:95 data  APR 18 2006 14:06:12
00:0a:db:00:02:1d data  APR 18 2006 14:06:07
00:0a:db:01:00:48 data  APR 18 2006 14:06:27
00:0a:db:01:00:75 data  APR 18 2006 14:06:13
00:0a:db:01:05:67 data  APR 18 2006 14:06:10
00:0a:db:01:30:ff data  APR 18 2006 14:06:08
>
```

show log

Displays the device's current log settings: the facility or facilities currently included in the log, and their respective log levels.

For information about log facilities and levels, see "`set log`" on page 42.

Syntax

```
show log
```

Arguments

None

Example

```
> show log

Facility                        Level
--------                        -----
system                          : 1
prov                            : 2
auth                            : 1
hello                           : 1
link                            : 2
snmp                            : 1
shaper                          : 1
acl                             : 1
filter                          : 1
dynmod                          : 1
spectrum                        : 1
gps                             : 1
radar                           : 1
range                           : 1
apwatchdog                      : 1

>
```

show logevents

Displays the log event messages or the current page size (the number of lines to display before pausing).

Syntax

```
show logevents
```

Arguments

`all`	Displays all the log event messages in ascending order (oldest messages first, followed by newer messages)
`less`	Displays all the log event messages in descending order
`pagesize`	Displays the current pagesize (the number of lines to display before pausing)

show mac2ip

(SkyGateway only) Displays the IP addresses (and optionally their corresponding MAC addresses) of all SkyPilot nodes connected to the SkyGateway.

Syntax

```
show mac2ip [MAC]
```

Arguments

MAC	Displays mapping table of connected IP addresses and their corresponding MAC addresses
None	Displays mapping table of connected IP addresses

Example

```
> show mac2ip
1) 00:0a:db:09:52:73 -> 192.168.8.101

>
```

show mem

(Developer use only) Displays detailed statistics about the available and allocated memory on the device. Current statistics include the number of bytes, number of blocks, and average block size for both free and allocated memory, and the maximum block size for free memory. Cumulative statistics include the number of bytes, number of blocks, and average block size allocated since the node was last started.

Syntax

```
show mem
```

Arguments

None

Example

```
> show mem

status    bytes     blocks   avg block  max block
 ------ ---------- --------- ---------- ----------
current
   free    1650624        60      27510    1474312
  alloc   10540064       484      21776          -
cumulative
  alloc   10600448       666      15916          -
```

show mesh

Displays the device's mesh forwarding table, mesh route cost table, and MAC learning table.

Syntax

```
show mesh [fwd | route | mac]
```

Arguments

`fwd`	Displays the mesh forwarding table, which tells the node how to forward packets to a destination node based on the immediate next hop.
`route`	Displays the mesh route cost table, which lists the possible hops the node can take to reach the mesh SkyGateway. Each hop has an associated cost, and the node typically chooses the hop with the lowest cost.
`mac`	Displays the MAC learning table, which represents the host machines (PCs that are connected to the device by an Ethernet cable, and that are represented as MAC addresses) and their associated CPE (customer premise equipment).
None	Displays mesh forwarding, mesh route cost, and MAC learning tables.

Example

`> show mesh route`

```
> show mesh
Mesh Forwarding Table:
Destination        Next Hop           Route Type
-----------------  -----------------  ----------
00:0a:db:00:02:1d  00:0a:db:00:02:1d  D
00:0a:db:01:00:48  00:0a:db:01:00:48  D
00:0a:db:00:01:50  00:0a:db:00:01:50  D
00:0a:db:01:05:67  00:0a:db:01:05:67  D
00:0a:db:01:00:75  00:0a:db:01:00:48  L
00:0a:db:00:01:7f  00:0a:db:01:00:48  L
00:0a:db:00:01:95  00:0a:db:00:01:95  D
00:0a:db:01:30:ff  00:0a:db:01:00:48  L

Mesh Routing Table:
Mesh Gateway       Next Hop           Cost
-----------------  -----------------  --------
00:0a:db:01:07:94  00:0a:db:01:07:94  0

MAC Learning Table:
Host               Node
-----------------  -----------------
00:0a:db:00:02:1d  00:0a:db:00:02:1d
00:13:20:29:2c:3d  00:0a:db:00:01:7f
00:0a:db:01:00:48  00:0a:db:01:00:48
00:0a:db:00:01:50  00:0a:db:00:01:50
00:0a:db:01:05:67  00:0a:db:01:05:67
```

```
00:0a:db:01:00:75  00:0a:db:01:00:75
00:0a:db:00:01:7f  00:0a:db:00:01:7f
00:0a:db:00:01:95  00:0a:db:00:01:95
00:11:a3:00:48:b2  00:0a:db:01:30:ff
00:12:0e:0d:37:bf  00:0a:db:01:30:ff
00:11:a3:01:b7:db  00:0a:db:01:30:ff
00:e0:7d:ca:e7:ec  00:0a:db:01:05:67
00:0a:db:01:30:fe  00:0a:db:01:30:ff
00:0a:db:01:30:ff  00:0a:db:01:30:ff

>
```

show netkey

Displays the hash of the netkey, enabling you to verify that the same netkey is set on multiple nodes.

Syntax

```
show netkey
```

Arguments

None

Example

```
> show netkey
64:02:d6:45:58:be
>
```

show packet stats

Displays the device's packet statistics table, which for each link shows the number of packets dropped and number of packets *shaped*—intentionally dropped due to exceeding the rate limit. The first section shows how many packets the radio successfully transmitted (S) and how many packets were dropped due to non-acknowledgement (D). The second section shows how many packets the radio allowed (S) and how many packets it dropped (D) due to the shaping.

Syntax

```
show packet stats
```

Arguments

None

Example

`> show packet stats`

```
       SPID      |   Radio    |
ff:ff:ff:ff:ff:ff|D          5|
                 |S    3712209|
ff:ff:ff:ff:ff:00|D          0|
                 |S      79990|
ff:ff:ff:ff:ff:01|D          0|
                 |S      79983|
ff:ff:ff:ff:ff:02|D          0|
                 |S          0|
ff:ff:ff:ff:ff:03|D          0|
                 |S          0|
ff:ff:ff:ff:ff:04|D          0|
                 |S          0|
ff:ff:ff:ff:ff:05|D          0|
                 |S          0|
ff:ff:ff:ff:ff:06|D          0|
                 |S          0|
ff:ff:ff:ff:ff:07|D          0|
                 |S          0|
00:0a:db:01:06:b8|D          0|
                 |S     194166|
00:0a:db:01:0a:60|D          0|
                 |S     489994|
00:0a:db:00:00:27|D          0|
                 |S       1055|
00:0a:db:00:00:4e|D          0|
                 |S        653|
00:0a:db:00:00:9f|D          0|
                 |S     344048|
00:0a:db:01:0a:59|D          0|
                 |S     345466|
00:0a:db:00:00:90|D          0|
                 |S     120856|
        Subtotal |D          5|
        Subtotal |S    5368420|
------------------------------
       SPID      |   Shaper   |
```

```
00:0a:db:00:00:27|D          0|
                 |S          0|
00:0a:db:00:00:4e|D          0|
                 |S          0|
00:0a:db:01:0a:59|D          0|
                 |S          0|
00:0a:db:01:0a:60|D          0|
                 |S          0|
00:0a:db:00:00:90|D          0|
                 |S        157|
00:0a:db:00:00:9f|D          0|
                 |S          0|
00:0a:db:01:06:b8|D          0|
                 |S          0|
00:0a:db:01:07:bc|D          0|
                 |S          0|
  Inactive Links |D          0|
                 |S       5177|
        Subtotal |D          0|
        Subtotal |S       5334|
-------------------------------------------------------------------------------
    |   Radio    |   Shaper   |   Bridge   |   Filter   |    Vlan    |  Ethernet  |
Sum |D          5|D          0|D       1179|D          0|D       N/A |D          0|
    |S    5368420|S       5334|S    8573596|S     311371|S       N/A |S     311371|
-------------------------------------------------------------------------------
-------------
Total Packet Drops = 1184     D->Packet Drops;   S->Packet Successes
>
```

show phyerrors

Displays a list of PHY (physical layer) errors detected by the device's Atheros radio chip.

Syntax

```
show phyerrors
```

Arguments

None

Example

```
> show phyerrors
```

```
PHY Layer Errors:
     PHY 0  (Transmit underrun)    : 0
     PHY 1  (Timing error)         : 0
     PHY 2  (Illegal parity)       : 0
     PHY 3  (Illegal rate)         : 0
     PHY 4  (Illegal length)       : 0
     PHY 5  (Radar detect)         : 0
     PHY 6  (Illegal service)      : 0
     PHY 7  (TX override receive)  : 0
     PHY 8                         : 0
     PHY 9                         : 0
     PHY 10                        : 0
     PHY 11                        : 0
     PHY 12                        : 0
     PHY 13                        : 0
     PHY 14                        : 0
     PHY 15                        : 0
     PHY 16                        : 0
     PHY 17 (OFDM timing)          : 0
     PHY 18 (OFDM signal parity)   : 0
     PHY 19 (OFDM illegal rate)    : 0
     PHY 20 (OFDM illegal length)  : 0
     PHY 21 (OFDM power drop)      : 0
     PHY 22 (OFDM illegal service) : 0
     PHY 23 (OFDM restart)         : 0
     PHY 24                        : 0
     PHY 25 (CCK timing)           : 0
     PHY 26 (CCK header CRC)       : 0
     PHY 27 (CCK illegal rate)     : 0
     PHY 28                        : 0
     PHY 29                        : 0
     PHY 30 (CCK illegal service)  : 0
     PHY 31 (CCK restart)          : 0
>
```

show power

Displays the device's transmit signal power level.

Syntax

```
show power
```

Arguments

None

Example

```
> show power
Power mode                    : default

>
```

show process

(Developer use only) Displays a list of all running operating system processes along with the information described in Table 12.

Syntax

```
show process
```

Arguments

None

Table 12. Fields Displayed by `show process` Command (Page 1 of 2)

Field	Description
NAME	Name of the process
ENTRY	Symbol name or address location at which the process began execution
TID	Process ID
PRI	Priority of the process. Lower numbers indicate higher priorities
STATUS	Process status; any of the following: • READY—Not waiting for any resource, except possibly the CPU • PEND—Pending (blocked) due to an unavailable resource • DELAY—Sleeping for some duration; see the DELAY field (later) for the remaining time • SUSPEND—Unavailable for execution • DELAY+S—Both delayed and suspended • PEND+S—Both pending and suspended • PEND+T—Pending with a timeout • PEND+S+T—Pending with a timeout and suspended • ...+I—Inherited priority (appended to any of the status strings above) • DEAD—Does not exist
PC	Program counter

Table 12. Fields Displayed by `show process` Command (Page 2 of 2)

Field	Description
SP	Stack pointer
ERRNO	Error code of the most recent error encountered for this process
DELAY	For delayed processes (not delayed and pending), the number of clock ticks remaining in the delay

Example

```
> show process
```

```
NAME          ENTRY            TID    PRI  STATUS    PC        SP     ERRNO   DELAY
----------  ------------    --------    ---  ----------  --------  -----   -----
tExcTask      excTask         efb530   0    PEND    2928ac   efb410   3006b    0
tWdbTask      wdbTask         a08588   3    PEND    236c60   a082e8   3d0002   0
spScheduler   spSchedulerT    5dd2f8   10   PEND    236c60   5dd238   0        0
spTimeTick    spTimeTickTa    9fc4a0   55   PEND    237468   9fc380   0        0
spLinkMgr     spLinkMgrTas    5d4090   60   PEND    20bffc   5d3ec0   0        0
spSlidingSl   spSlidingSlo    5d92d0   65   PEND    20bffc   5d9150   0        0
spRoute       spRouteTaskE    5f27b0   70   PEND    20bffc   5f2620   1c0001   0
tNetTask      netTask         eba9d0   90   PEND    236c60   eba8e0   0        0
spCLI         spCli           5e1d68   95   READY   23c354   5e0b68   3d0002   0
tTelnetd      telnetd         5df448   100  PEND    236c60   5df0d8   0        0
tDhcpcState   1a9ae0          a158f0   105  PEND    237468   a157e0   0        0
tDhcpcReadT   dhcpcRead       a14300   105  PEND    236c60   a14050   3d0002   0
tSnmpd        221938          a03708   110  PEND    236c60   a02c58   3d0002   0
spLinkPing    spLinkPingTa    5efe90   120  PEND    20bffc   5efce0   1c0001   0
tSnmpTmr      221544          a04970   150  PEND    2928ac   a04830   0        0
tLogTask      logTask         ef8b48   200  PEND    2928ac   ef8a38   0        0
spSystem      spSystemTask    5d69b0   200  DELAY   23bcd0    5d68f0  30065    23
spProvision   spProvisionA    9f7d78   205  PEND    20bffc   9f7af8   1c0001   0
spAuthentic   spAuthManage    5e8330   208  PEND    20bffc   5e7d50   1c0001   0
spTraceRoute  spTraceRoute    5e4688   210  PEND    20bffc   5e44e8   1c0001   0
spTTCPT       spTTCPTCPSer    5ed570   220  PEND    236c60   5ed290   0        0
spTTCPU       spTTCPUDPSer    5eac50   220  PEND    236c60   5eaa20   0        0
spTemperatu   spTemperatur    5f3d48   240  DELAY   23bcd0   5f3c78   038
tBridgeAger   17f144          a0c980   250  DELAY   23bcd0   a0c8d0   0

>
```

show prov

Displays all the device's provisioning parameters and their current values.

Command Syntax:

```
show prov
```

Arguments

None

Example

```
> show prov
```

```
================================================================================
Node Parameters
---------------
Provisioning state              : auto
Domain                          : 888
Power mode                      : 1 Watt average
Radar detection                 : Disable
Preferred parent                : 00:00:00:00:00:00

================================================================================
Ethernet
--------
State                           : Enabled
Negotiate                       : Auto

================================================================================
IP Settings
-----------
IP address                      : 10.12.14.2
Subnet mask                     : 255.255.255.0
Default gateway                 : 10.12.14.1
DHCP state                      : Enabled
FTP server IP address           : 0.0.0.0
HTTP server IP address          : 0.0.0.0

================================================================================
Frequency
---------
Region                          : FCC-HI
Primary                         : 5805
Allowed                         : 5800 5805
Dwell time (minutes)            : 30

================================================================================
VLAN
----
Management VLAN                 : Disabled

VLAN ID P2P Enabled
-------------------
Untagged

================================================================================
SNMP
----
Mode                            : Read-Write
Read-write community strings    : 0
Read-only community strings     : 0
Trap destinations               : 0
```

```
================================================================================
Timezone
--------
Enable                          : no
NTP server IP address           : 3.4.5.6
Offset                          : +3.00

================================================================================
Traffic Rate Control
--------------------
Max rate broadcast (Kbps)       : 0

================================================================================
Classifier
----------
Rule TOS Low  TOS High TOS Mask IP Protocol IP Src Addr IP  IP Src Mask
---- -------- -------- -------- ----------- --------------- ---------------
1                              0x01

Rule IP Dest Addr    IP Dest Mask    Port Src1 Port Src2 Port Dest1 Port Dest2
---- --------------- --------------- --------- --------- ---------- ----------
1                                    23        32

Rule MAC Src           MAC Src Mask      MAC Dest          MAC Dest Mask
---- ----------------- ----------------- ----------------- -----------------
1

Rule EtherType 802.1P Low 802.1P High 802.1Q Vlan Direction
---- --------- ---------- ----------- ----------- ----------
1    0x0800    1          1           0          downstream


================================================================================
Filters
-------

========= The Filter Table is OFF =========

1) EtherType Table Default Permission    = "ALLOW"

2) IPType Table Default Permission       = "ALLOW"

3) IPaddrSrc Table Default Permission    = "ALLOW"

4) IPaddrDst Table Default Permission    = "ALLOW"

5) UDPSrcPort Table Default Permission   = "ALLOW"

6) UDPDstPort Table Default Permission   = "ALLOW"

7) TCPSrcPort Table Default Permission   = "ALLOW"

8) TCPDstPort Table Default Permission   = "ALLOW"

9) ARPsrcIPaddr Table Default Permission = "ALLOW"

>
```

show radar

Displays the SkyGateway's radar detection mode and status.

Syntax

```
show radar
```

Arguments

None

Example

```
> show radar
Radar detection                : Disable

                     Radar                Radar
Frequency    Avoidance Countdown    Detection Count
---------    -------------------    ---------------
5805         00:00                  0

>
```

show reboot

Displays the reason for the device's most recent reboot.

Syntax

```
show reboot
```

Arguments

None

Example

```
> show reboot
Reboot reason: Soft Reboot
Details: CLI reboot

>
```

show sched

Displays the scheduler's activity for the previous second. The full output represents the total number of timeslots available in a single second for use by a device's radio. Each group of eight periods represents a single timeslot, and any timeslots for which letters and/or numbers are displayed represent timeslots when data transmission or reception occurred.

A schedule with little to no empty timeslots can indicate an overloaded device and may be a network bottleneck.

Syntax

```
show sched
```

Arguments

None

Example

`> show sched`

```
Second: 861434
   0 .H-xxxxx ........ ........ ........ ........ ........ ........ ........
  72 ........ ........ ........ ........ ........ ........ ........ T64x....
 144 ........ ........ ........ ........ ........ ........ ........ ........
 216 ........ ........ ........ ........ ........ ........ ........ ........
 288 ........ ........ ........ ........ ........ ........ ........ ........
 360 ........ ........ ........ ........ ........ ........ ........ ........
 432 ........ ........ ........ ........ ........ ........ ........ ........
 504 Exxxxxxx ........ ........ ........ ........ ........ ........ ........
 576 ........ ........ ........ ........ ........ ........ ........ ........
 648 ........ ........ ........ ........ ........ ........ ........ ........
 720 ........ ........ ........ ........ ........ ........ ........ ........
 792 ........ ........ ........ ........ ........ ........ ........ ........
 864 ........ ........ ........ ........ ........ ........ ........ ........
 936 ........ ........ ........ ........ ........ ........ ........ ........

(lines omitted here)

9576 Exxxxxxx ........ ........ ........ ........ ........ ........ ........
9648 ........ ........ ........ ........ ........ ........ ........ ........
9720 ........ ........ ........ ........ ........ ........ ........ ........
9792 ........ ........ ........ ........ ........ ........ ........ ........
9864 ........ ........ ........ ........ ........ ........ ........ ........
9936 ........ ........ ........ ........ ........ ........ ........ ........
10000 - End of cycle
........
10008 ........ ....
Current Tau = 473
Trigger Tau = -1
Scheduler trigger is not enabled

>
```

show snmp

Displays the device's current SNMP settings.

Syntax

```
show snmp
```

Arguments

None

Example

```
> show snmp

Mode                            : read-write
Read-write community strings    : 0
Read-only community strings     : 0
Trap destinations               : 1

Trap Receiver List
----------------------
Row    IP Address          Port
---    ---------------     -----
  1    10.12.14.1          162

>
```

show spectrum

Runs the spectrum analyzer according to its current settings, and displays the results. (For detailed information about the spectrum analyzer, see the "`spectrum`" command, described on page 126.)

Syntax

```
show spectrum
```

Arguments

None

Example

```
> show spectrum
Wait for 10 seconds.
( Single Channel 5805Mhz )
     ( Sampling Time: 10 seconds)
RSSI
 61              -   -
 57
 53
 49
 45 -
 26
 22
 19
 15
 11                -
  7   -   - -
  3     - :
--------------------------
Ant 0 1 2 3 4 5 6 7 All
 'X' - Indicates no data collected
 '-' - Max hold Rssi
 ':' - Average Rssi

      ( Single Channel 5805Mhz )
     ( Sampling Time: 10 seconds)
 Ant   MaxRssi   AvgRssi   MinRssi
-------------------------------------
  0  |   46    |    1    |    0    |
  1  |    8    |    0    |    0    |
  2  |    4    |    0    |    0    |
  3  |   10    |    4    |    0    |
  4  |    7    |    0    |    0    |
  5  |   34    |    0    |    0    |
  6  |   61    |    1    |    0    |
  7  |   11    |    1    |    0    |
 all |   61    |    0    |    0    |

>
```

show status

Displays the device's current operating settings. (To view an automatically provisioned device's configuration as supplied by the provisioning server, use the "`show config`" command, described on page 71.)

Command Syntax:

```
show status
```

Arguments

None

Example

`> show status`

(Lines omitted here.)

```
Frequency Settings
------------------
Frequency range setting stored in flash is: US high band

Current frequency range setting is: US high band
Current frequency is: 5805
Current valid frequencies are:
 5745  5750  5755  5760  5765  5770  5775  5780  5785  5790
Dwell time (minutes): 1
================================================================
VLAN
----
Management : Disabled
Data       : Disabled (P2P Enabled)

VLAN ID
----------

VLAN
SNMP
----
Mode                          : disabled
Read-write community strings  : 0
Read-only community strings   : 0
Trap destinations             : 0
================================================================
VLAN
Timezone Settings
-----------------
Enable                        : no
NTP server IP address         : 0.0.0.0
Offset                        : 0.00
>
```

show tech

(SkyPilot customer support use only) Displays the node's current configuration and status, including low-level details to aid in troubleshooting.

Command Syntax:

```
show tech
```

Arguments

None

Example

> show tech

(Lines omitted here.)

```
Access Control List
-------------------

================================================================
Filters
-------
Enable                          : no

EtherType dflt permission       : allow
IP Protocol dflt permission     : allow
IP Address dst dflt permission  : allow
IP Address src dflt permission  : allow
ARP src dflt permission         : allow
Port dst dflt permission        : allow
Port src default permission     : allow

================================================================
*************** 16) Show Reboot ********************
Reboot reason: Soft Reboot
Details: CLI reboot

>
```

show temp

Displays the temperature of the device's radio chip (in both degrees Celsius and degrees Fahrenheit) and the heater's operating status.

Syntax

```
show temp
```

Arguments

None

Example

```
> show temp

Celsius     :30
Fahrenheit  :87
Heater      :OFF
>
```

show timezone

Displays the device's time zone information: its NTP server's IP address and time zone offset (from GMT or UTC).

Syntax

```
show timezone
```

Arguments

None

Example

```
> show timezone

Enable                          : yes
NTP server IP address           : 172.16.1.5
Offset                          : -8.00

>
```

show trafficrate

Displays the device's traffic rate control settings.

Syntax

```
show trafficrate
```

Arguments

None

SkyExtender/SkyConnector Example

```
> show trafficrate

Max rate up (Kbps)        : 1000
Max rate down (Kbps)      : 1000

>
```

SkyGateway Example

```
> show trafficrate

Max rate broadcast (Kbps)     : 256

>
```

show uptime

Displays the elapsed time (in days, hours, minutes, and seconds) since the device was last booted.

Syntax

```
show uptime
```

Arguments

None

Example

```
> show uptime
0 days 01:39:18
>
```

show users

Displays a list of all users logged into the device.

Syntax

```
show users
```

Arguments

None

Example

```
> show users
Type    Logged In IP Address          Inactive Time Login Time
------- --------- ------------------ ------------- ---------------
---------
Console No
Telnet  Yes       172.16.1.5          0 minute(s)  WED MAY 17
13:47:51 2006

>
```

show version

Displays information about the device's hardware, software, and operating system versions.

Syntax

```
show version [ap]
```

Arguments

ap	(DualBand/TriBand only) Displays version information for the hardware and software running on DualBand/TriBand access point(s)
None	(non-DualBand/TriBand) Displays version information for the hardware, software, and operating system running on a device

Example

```
> show version
Hardware Versions
-----------------------------------------------------------------
Node type             : SkyConnector Outdoor
System part no.       : 710-00010-01
Serial no.            : F20486428
CPLD Rev no.          : 00010010
Ethernet MAC          : 00:0A:DB:01:06:B8
Radio MAC             : 00:60:B3:B7:3F:AB

Software Versions
-----------------------------------------------------------------
Active Software Image : B
Image A Name          : linkerDynModConn_b
Image A MD5           :
62:36:ce:9e:38:0b:99:da:b8:58:c6:96:15:28:ee:0e
Image A State         : Accepted
Image A Counter       : 1000
Image B Name          : SkyConn.1.2p3.bin
Image B MD5           :
e8:35:26:4e:ee:f1:84:78:26:e8:e9:53:c8:8e:57:00
Image B State         : Accepted
Image B Counter       : 571
Software              : 1.2p3
Boot ROM              : 001.06.000.S

Operating System Versions
-----------------------------------------------------------------
VxWorks (for IBM PowerPC 405EP Rev B - SkyPilot. IBMB405EP) version
5.5.1.
Kernel: WIND version 2.6.
Made on Jan 23 2006, 17:45:24.
Boot line:
emac(0,0)skypilot: e=192.168.0.2 h=192.168.0.2 g=192.168.0.2 f=0x8
tn=sbc405gpr  o=skyp

>
```

show vlan

Displays the device's VLAN settings. Items listed under **VLAN ID** are the VLANs for which peer-to-peer is enabled.

Syntax

```
show vlan
```

Arguments

None

Example

```
> show vlan

Management : Disabled
Data       : Disabled (P2P Enabled)

VLAN ID
----------
untagged

>
```

spectrum

Displays full documentation (help) for the SkyPilot spectrum analyzer.

Syntax

```
spectrum
```

Arguments

None

Example

```
> spectrum

--- Spectrum Help ---
The spectrum analyzer feature consists of two operating modes -
single channel and multi channel.  Single channel focuses on the
current operating channel without disrupting service, showing the
results of every antenna that currently formed links allow for.
Multi channel disables normal functionality and scans through a
specified range of frequencies, displaying the results per antenna.

General Commands
------------
spectrum- Shows this help page.

show spectrum mode- Shows the current running mode.

set spectrum on <single | multi> - Enables the spectrum analyzer in
                                   specified mode.

set spectrum off- Turns off the current spectrum mode.
clear spectrum - Clears the max hold rssi statistics.

show spectrum single - shortcut for spectrum single channel
  graph.

show spectrum multi - shortcut for spectrum multi channel graph.

show spectrum - re-runs the last spectrum show graph
  command issued.

Single Channel Commands
-----------------------
show spectrum single graph [seconds]
    - shows a single channel graph. Automatically enables single
      channel mode if it is not already enabled. The optional
      seconds argument is used to set the sampling time.

show spectrum single setting
    - shows single channel settings and running statistics.

Multi Channel Commands
```

```
----------------------
show spectrum multi captured [antennaNumber]
    - shows the multi channel graph of the buffered data for each
      antenna (8 graphs).  Unlike the 'show spectrum multi graph',
     this command does not enable the spectrum mode.  The optional
      antennaNumber argument is used to select a single graph of
      the specified antenna.

show spectrum multi graph [antennaNumber]
    - shows the multi channel graph for each antenna (8 graphs).
      Automatically turns on multi channel mode if it is not
      already enabled.  The optional antennaNumber argument is used
      to select a single graph of the specified antenna.

show spectrum multi setting
    - shows the multi channel settings and running statistics.

Spectrum Settings Explanation
-----------------------------
set spectrum <single | multi>
    - sets the following adjustable parameters for either single or
      multi channel modes:

      max visible rssi: dynamic adjust, rssi value <d | 1-100>
        - This allows the user to control the maximum height of the
          graph. The default setting for single channel is dynamic
          adjust, which adjusts the height of the graph based on
          the highest average rssi among the eight antennas. The
          default setting for multi channel is 30 rssi.

      max graph height in number of lines <1-50>
        - Graph scale related. This attribute adjusts the vertical
          resolution of the graph. The default setting is 16 lines.

     spectrum sleep timer: disable auto off, number of minute <d |
1-60>
        - Sets the sleep timer to determine when to automatically
          shut off the spectrum process. If disable is selected,
          the spectrum analyzer will run until a "set spectrum off"
          command is executed. By default the spectrum analyzer
          turns off if idle (i.e. no show graph or set commands
          executed) for 5 minutes.

      sampling time in seconds <1-60>
        - The average rssi is calculated as a moving average. This
          attribute adjusts the window of the moving average. The
          default setting is 10 seconds, which causes a "single
          channel graph show" command to delay for 10 seconds in
          order to collect enough data when the spectrum mode is
          first enabled.

show spectrum multi graph [antennaNumber]
    - shows the multi channel graph for each antenna (8 graphs).
      Automatically turns on multi channel mode if it is not
      already enabled.  The optional antennaNumber argument is used
      to select a single graph of the specified antenna.

show spectrum multi setting
```

```
    - shows the multi channel settings and running statistics.

Spectrum Settings Explanation
-----------------------------
set spectrum <single | multi>
    - sets the following adjustable parameters for either single or
      multi channel modes:

      max visible rssi: dynamic adjust, rssi value <d | 1-100>
        - This allows the user to control the maximum height of the
          graph. The default setting for single channel is dynamic
          adjust, which adjusts the height of the graph based on
          the highest average rssi among the eight antennas. The
          default setting for multi channel is 30 rssi.

      max graph height in number of lines <1-50>
        - Graph scale related. This attribute adjusts the vertical
          resolution of the graph. The default setting is 16 lines.

      spectrum sleep timer: disable auto off, number of minute <d |
      1-60>
        - Sets the sleep timer to determine when to automatically
          shut off the spectrum process. If disable is selected,
          the spectrum analyzer will run until a "set spectrum off"
          command is executed. By default the spectrum analyzer
          turns off if idle (i.e. no show graph or set commands
          executed) for 5 minutes.

      sampling time in seconds <1-60>
        - The average rssi is calculated as a moving average. This
          attribute adjusts the window of the moving average. The
          default setting is 10 seconds, which causes a "single
          channel graph show" command to delay for 10 seconds in
          order to collect enough data when the spectrum mode is
          first enabled.
>
```

traceroute

Traces a path to a specified MAC address or the device's default SkyGateway, discovering intermediate nodes along this path.

Syntax

```
traceroute [MAC]
```

Arguments

MAC	Traces a route to the device with the specified MAC address
None	Traces a route to the device's default SkyGateway

Example

```
> traceroute 00:0a:db:09:52:73

traceroute to 00:0a:db:01:07:94
   1  (36) --> 01:00:48 --> (54)
   2  (54) --> 01:07:94 --> (36)

>
```