Setting Up Your First SkyPilot Network

Using this guide

This document provides a quick start guide to setting up a baseline SkyPilot wireless mesh network.

You can set up a fully-functional, demonstration network using any of the three topologies shown in the figures.

What you need

- Product kits for the network you will be setting up, including mounting hardware and extra cabling.
- Two notebook computers to use as consoles for configuration and verification. (One notebook must have Wi-Fi capability if you're setting up a SkyPilot Extender DualBand.)

Tags in the figures identify the panels that provide instructions for installing and manually configuring SkyPilot devices. (Each topology requires a SkyGateway.)

Note: To ensure mesh network connectivity, make sure you specify the same frequency and domain for all SkyPilot devices on the network.

SkyGateway with SkyExtender DualBand node



Follow the instructions in Panel A to set up and configure a SkyGateway. Next, follow the instructions in Panel B to set up and configure a SkyExtender DualBand to operate as a node on the SkyPilot network. Verify that the mesh network connection is active by "pinging" the notebook attached to the SkyGateway.

SkyGateway with SkyConnector node



Follow the instructions in Panel A to set up and configure a SkyGateway. Next, follow the instructions in Panel C to set up and configure a SkyConnector to operate as a node on the SkyPilot network. Verify that the mesh network connection is active by "pinging" the notebook attached to the SkyGateway.

SkyGateway with SkyExtender node



Follow the instructions in panel A to set up and configure a SkyGateway. Next, follow the instructions in panel C and A to set up and configure a SkyExtender to operate as a node on the SkyPilot network. Verify that the mesh network connection is active by "pinging" the notebook attached to the SkyGateway.

SkyGateway

The SkyGateway operates as a hub for your wireless mesh network. As the interface to wired infrastructure, a SkyGateway provides subscribers with access to the internet or WAN.

1 Attach cables



Connect Ethernet and serial cables, threading the cables through the provided cable cover and gaskets. Reattach the cover, making sure the Ethernet cable passes through the cutout.



From the notebook, start a terminal emulation program (for example, Tera Term) and select the COM port on which the serial cable is attached. Connect to the device using these serial communication settings: 38400 bps, 8 data bits, no parity, one stop bit, and no flow control.

Cha

Connect the Ethernet cable extending from the SkyGateway to the port labeled "CPE" on the power injector. Connect an Ethernet cable between the port labeled "Computer" on the power injector and an Ethernet port on the notebook computer. Plug the AC adapter into the power injector and connect the power cord to the AC adapter. Plug the power cord into an outlet to power on the SkyGateway.

Configure and reboot	7 Create net
t prov manual ged provisioning state to manual. nter primary Frequency [5745]: 5760 t prov domain nter domain TD (1-10000) [1234]: 1240	An IP address can be auton If your network does not aut your network administrator for the space below.
in ID changed: 1240	C <u>O</u> btain an IP address a
boot oting	Specify an IP address: IP Address:
	Subnet Mask: 25
<i>py manual</i> to enable manual provisioning. At the prompt	On the notebook computer on

enter a primary frequency. Use set prov domain to supply a domain. Enter *reboot* to apply the configuration to Flash memory and restart.

mputer, open the Network control panel and configure a new network connection. Give the notebook an IP address of 192.168.0.20 and a Netmask of 255.255.255.0.



work connection

y WINS Configuration IP Address

natically assigned to this computer. tomatically assign IP addresses, ask or an address, and then type it in

utomatically

2.168.0.20	0
5.255.255.0	0

2 Connect notebook



Connect the serial straight-through cable extending from the SkyGateway to the provided DB-9 adapter, then plug the adapter into a serial port on the notebook computer.



Observe the boot messages in the terminal window. If the "waiting for GPS" fails to resolve, confirm that a GPS signal is present. **Note**: GPS acquisition can take up to 15 minutes, even with optimal GPS reception. When the welcome message appears, log in to the device by entering the default password, public.

What's next?

To set up a SkyPilot SkyExtender DualBand to provide access to the mesh network via Wi-Fi enabled devices, go to panel **B**

To set up a SkyConnector or Sky-Extender to provide access to the mesh network via a PC or LAN, go to panel C

SkyExtender DualBand

SkyConnector or SkyExtender

In addition to extending network range, a SkyExtender DualBand can operate as a node providing a wireless access point for Wi-Fi enabled devices.

SkyGateways and SkyExtenders use a GPS signal to synchronize with other devices on the network. To ensure optimal reception, mount the unit outdoors with an unobstructed view of the sky and use a handheld GPS receiver to check signal

3 Make t	erminal v connect	connection
O <u>T</u> CP/IP	H <u>o</u> st:	banzai.pcc.com
		⊠ T <u>e</u> lnet T
• Serial	Po <u>r</u> t:	COM2 ·
	ОК	Cancel

From the notebook, start a terminal emulation program (for example, Tera Term) and select the COM port on which the serial cable is attached. Connect to the device using these serial communication settings: 38400 bps, 8 data bits, no parity, one stop bit, and no flow control.

6 Reboot and verify link

Sshow link



After reboot, log in to the device and enter *show link* to view the

current network status of the device. If an active path is present, the

SkyExtender DualBand is communicating with the network. Note:

link formation may take several minutes.



1 Attach cables



Connect Ethernet and serial cables, threading the cables through the provided cable cover and gaskets. Reattach the cover, making sure the standard N connectors on the base of the SkyExtender DualBand. Ethernet cable passes through the cutout.



Connect the serial straight-through cable extending from the SkyExtender DualBand to the provided DB-9 adapter, then plug the adapter into a serial port on the notebook computer. Connect the Ethernet cable to the port labeled "CPE" on the power injector. Plug the AC adapter into the power injector and connect the power cord to the AC adapter. Plug the power cord into an outlet.

	a wireless n	network	
lick an it	em in the list below t	to connect to a wireless network in	range or to get more
nformatio	n		, , , , , , , , , , , , , , , , , , ,
((o))	0800074928EC		
	000007702010	· · · · ·	
	Security-snabled will	ireless network	
6610		CH CL D'LLO L	

Open the Network control panel and set up a wireless conr with the IP address 192.168.0.10 and Netmask 255.255.255.0. From the Network Connection control panel choose the SSID associated with the device access point. (The network key is *publicpublic*.)



Attach the two 2.4 GHz antennas included with the device to the



In the terminal window, watch the boot messages to confirm acquisition of a GPS signal. When a welcome message appears, log in to the device by entering the default password, *public*. Enter set prov manual to enable manual provisioning mode. Enter set prov freq and supply a primary frequency. Enter set prov domain and provide a domain. Enter reboot to save the configuration to flash memory and restart.

c	Command Prompt
	Q:\> ping 192.168.0.20
	Pinging 192.168.0.20 with 56 data bytes:
	64 bytes from sbc405gpr (192.168.0.20): icmp_seq=0. time=0. m
	64 bytes from sbc405gpr (192.168.0.20): icmp_seq=1. time=0. m
	64 bytes from sbc405gpr (192.168.0.20): 1cmp_seq=2. time=0. m 192.168.0.20 PING Statistics
	3 packets transmitted, 3 packets received, 0% packet loss round-trip (ms) min/avg/max = 0/0/0
	0./>

address of the notebook computer connected to the SkyGateway, 192.168.0.20. If *ping* fails to return packets, repeat steps 3-7.

A SkyConnector or SkyExtender can operate as a node on the wireless mesh network, providing Internet access via a PC or router connected to the device.

Note: If using a SkyExtender instead of a SkyConnector, perform steps 1 through 5 in panel (A) then return to this panel and pick up the installation at step 4.

3 Conne	ect notebook	
	Ethernet cable	
		5

Connect a second Ethernet cable from the power injector port labeled "Computer" to a notebook computer.

6 Verify link	7 Ver
Teinet Connect Editerminalelp	ov Command P
>show link Node Id LType NType State RSSI LTxMod RTxMod LAnt RAnt 00:0a:db:00:00:30 data ext act mgmt 55 54 54 0 3	Q:\> ping Pinging 1 64 bytes 64 bytes 192. 3 packets round-tri
	Q: \> '
After rebooting the device, enter the show link command to view the	From the notel

current network status of the device. Enter *a* to guit the commandline interface.

1 Mount the device



Insert an Ethernet cable through the weather gasket and connect to the Ethernet port on the back of the SkyConnector. Attach the device to a pole.

Bindings	Advanced		Advanced NetBIOS	
DNS Configuration	Gateway	Gateway WINS Configuration IP Ac		
An IP address can If your network do your network admi the space below.	be automat es not auton nistrator for a	ically assi natically a an addres	igned to this o ssign IP addr s, and then t	computer. esses, ask ype it in
C Dbtain an IP address automatically				
_ ● <u>S</u> pecify an IF	^o address:—			
	102	169	0 10	

On the notebook computer, open the Network control panel and configure a new network connection. Give the notebook an IP address of 192.168.0.10 and a Netmask of 255.255.255.0.

4 Create network connection

fy network connection



book, open a DOS command window and ping the IP address of the notebook computer connected to the SkyGateway, 192.168.0.20. If *ping* fails to return packets, repeat steps 4-7.



Connect the Ethernet cable to the port labeled "CPE" on the power injector. Plug the AC adapter into the power injector then plug the adapter into an outlet.

5 Log in and configure
🚛 Telnet
<u>C</u> onnect <u>E</u> dit <u>I</u> erminal <u>H</u> elp
>set prov manual Changed provisioning state to manual >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 <qlp[a]d] r t>: p ->Enter primary frequency [5745]: 5795 -> Select a Frequency action: quit, primary, allow, deny, list, reqion, dwell time <qlp[a]d] r t>: q >reboot</qlp[a]d] r t></qlp[a]d] r t>

Telnet to the device at IP address 192.168.0.2. Log in by entering the password *public*. Enter *set prov manual* and choose the same frequency you gave the SkyGateway. Enter *q* to exit the command, then enter *reboot* to apply the configuration to Flash memory.

What's next?

For more detailed documentation on setting up SkyPllot devices and managing a wireless mesh network, visit www.skypilot.com/support.



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