

## To Stop a PPP Connection

```
# send SIGTERM to pppd, which causes it to hang up and exit cleanly
$ killall pppd
```

## Starting Cellular Connection on Boot

To automatically start pppd on boot requires setting the peer file to use and telling the system to run the ppp init script on boot.

1. Issue **ls /etc/ppp/peers** to see the available peers files (l4e1, lsp3, etc.) to set the peer file.
2. Edit **/etc/ppp/ppp\_on\_boot** (with **vi** or **sudo**) and change **\$PPPD call provider** to your desired provider (l4e1). **\$PPPD call l4e1**.
3. Assuming you've set your APN, manually start the init script and check your Internet connection to test your change to: **ppp\_on\_boot\$ /etc/init.d/ppp start**
4. Issue this command: **\$ update-rc.d ppp defaults**.
5. Restart and test your connection.

Refer to the *Conduit LoRa Access Point User Guide* for instructions on stopping automatic start up.

## Configuring the LoRa Network Server for mLinux

1. Log in to the console, if you are not logged in.
2. Establish an Internet connection via Ethernet or cellular.
3. Edit the packet forwarder configuration as necessary by modifying **/opt/lora/local\_conf.json** with **vi** or **nano**.

Field	Setting
gateway_conf["server_address"]	LoRa network server address
gateway_conf["serv_port_up"]	LoRa network server's up port
gateway_conf["serv_port_down"]	LoRa network server's down port

4. Start the packet forwarder: **\$ /etc/init.d/lora-packet-forwarder start** .

## Mounting the MTCAP

The device ships with a mounting bracket. You will also need:

- Four #6 screws with anchors
- Screwdriver
- Drill

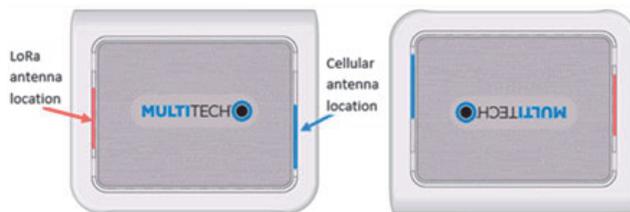
## Determining Location for the MTCAP

Follow these guidelines for best performance:

- The LoRa antenna is omnidirectional, but for best results, mount the device so the LoRa antenna is in a vertical position as shown in the following image.
- Place the MTCAP as high as possible, such as near the top of a wall.
- Select a location central to all devices to be connected to this MTCAP.
- Avoid obstructions.

**Important:** Thick walls and reflective surfaces, such as metal, weaken the signal between the MTCAP and other devices.

- Note the LoRa antenna location in the following image. The LoRa signal will be strongest radiating from that side of the device. The LoRa antenna is 31.2 mm long.
- We recommend conducting a site survey to test the signal strength in different locations before you mount the device.



## Mounting the MTCAP

1. Determine where you want to mount the device.
2. Mark where you want the screws to go.
3. Drill holes for the screws and insert anchors.
4. Place the mounting bracket and secure it with screws.
5. Attach the device to the bracket and rotate to lock into place



## Additional LoRa and mLinux Information

For additional information, including how to configure LoRa devices to communicate with your gateway, visit <http://www.multitech.net>.

- For an introduction to Lora, go to : <http://www.multitech.net/developer/software/lora/introduction-to-lora/>
- For help using mLinux, go to: <http://www.multitech.net/developer/software/mlinux/>.

## Safety and Regulatory Content

For safety and regulatory content, refer to the *Conduit AP User Guide* for your model, available at [www.multitech.com](http://www.multitech.com).

MultiTech declares that this device is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU. The declaration of conformity may be requested at <https://support.multitech.com>.

## Conduit® AP mLinux Quick Start

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## Conduit® AP MTCAP-L4E1 and MTCAP-LSP3 for mLinux Quick Start



## Welcome

Conduit AP (MTCAP) connects thousands of IoT assets to the cloud using the LoRaWAN® protocol.

**Note:** Check for an updated version of this document at <https://www.multitech.com/brands/multiconnect-conduit-ap/>.

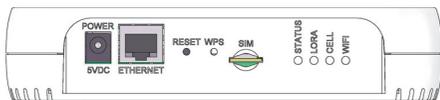
## Package Contents

Your MTCAP ships with the following:

- 1 – RJ45 Ethernet cable
- 1 – Power supply
- 1 – Quick Start

**Important:** Contact MultiTech if a replacement power supply is needed. Using a different power supply may damage the device and voids the warranty.

## Connectors and LEDs



**Note:** Some features are available only on select models. The above image shows the model with all features.

Item	Description
<b>Connectors</b>	
Power	5 Volt power jack.
Ethernet	RJ45 Ethernet jack.
Reset	Reset button. Reboots device or restores factory defaults.
WPS	Reserved for future use.
SIM	<i>Cellular models only.</i> SIM slot.
<b>LEDs</b>	
STATUS	Blinks when operating system is fully loaded.
LORA	Lights when LoRa software is active.

Item	Description
CELL	<i>Cellular models only.</i> Lights when there is power to the radio. Blinks when the SIM is registered with the carrier.
WIFI	Reserved for future use.
Ethernet Link	Left LED on the Ethernet connector. Blinks when data is sent or received on the Ethernet link. Steady light when there is a valid Ethernet connection.
Ethernet Speed	Right LED on the Ethernet connector. Lit when the Ethernet is linked at 100 Mbps. If not lit, the Ethernet is linked at 10 Mbps.

## Installing a SIM Card

If your device has a SIM slot, you'll need a micro SIM card from your network provider.

To install the SIM card:

- With the contact side facing down, align the notched edge as shown on the following image and slide the SIM card completely into the SIM holder.



## Cabling Your Device

To cable the MTCAP:

- Connect the Ethernet cable to the device's Ethernet port and to a PC.
- Connect the power supply to the power jack and wait 30 seconds for the device to power up.

## Sprint Activation

*For MTCAP-LSP3 only.* When you install the SIM card, the device uses Sprint's over the air activation to automatically register your SIM to their network. For information on checking your APN and PDP context, refer to the *Conduit AP MTCAP User Guide for Sprint* (S000704).

## Accessing the Terminal Interface

- On the PC, configure a static IP address for the network interface that is connected to the device within the following range: 192.168.2.2 - 192.168.2.254
- Open an SSH connection and log in.

**Default IP address:** (DHCP is disabled)  
192.168.2.1

**Default credentials for mLinux version 4:**  
username: mtadm and password: root

**Note:** The above credentials do **NOT** have root privileges. Some commands will not work unless you use **sudo** (for super user permissions). Refer to your model's *Conduit AP MTCAP User Guide* for details.

To use sudo, either execute `:sudo [command]` or start the root shell: `sudo -s`

Then enter the mtadm password. The prompt changes to `mtcap:/home/mtadm#`

For tips on using sudo, go to <http://www.multitech.net/developer/software/mlinux/using-mlinux/log-in-as-an-admin-post-production/>

## Setting Time Zone, Time, and Date

To set the time zone, date, and time:

- Create a symbolic link from the zone info file for your location to **/etc/localtime**:  
`In -fs /usr/share/zoneinfo/Europe/Zurich /etc/localtime`

- Update the date and time to the current time:  
`date "2016-12-11 14:58:01"`
- Update the hardware clock:  
`hwclock -u -w`

## Set Custom IP Address, Network Information, and Ethernet Internet Access

To set the IP address and network information:

- Network configuration is defined in **/etc/network/interfaces**:  
To change the static IP, change the **address** and **netmask** fields in that file (use **vi** or **nano**).  
To apply changes, either reboot the device or issue: **ifdown eth0 && ifup eth0**. You'll lose your SSH session.
- To enable DHCP with default settings, issue **mlinux-dhcpd start**:  
Configure the dhcp server by editing **/etc/udhcpd.conf**, (use **vi** or **nano**).  
You can issue the above command with **stop** or **restart**.
- To configure internet access via the Ethernet port, modify **/etc/network/interfaces** as follows:
  - Add **gateway 192.168.2.254** beneath the **netmask** line, where **192.168.2.254** is your network router's IP address.
  - To apply changes, reboot the device or issue: **ifdown eth0 && ifup eth0** Again, you'll lose the SSH session..
  - Test for internet access with **ping 8.8.8.8**.

## Configuring the Cellular Connection

To establish a cellular data link, you must configure and initiate a PPP connection. Sample options, files, and chat scripts are provided in the ppp peers directory **/etc/ppp/peers**. Anything specific to the network or connection should be placed in one of these files. Global options should be placed in **/etc/ppp/options**.

- For L4E1 models only,* For LSP3, skip to Step 2 (Sprint users should not change the APN).  
`# Set "APN" to the APN for your cellular provider`  
`$ mlinux-set-apn APN`
- For LSP3 models only,* For L4E1, skip to Step 3.  
`# Before establishing PPP connection, modify the file, /etc/ppp/options`  
`sudo -s`  
`echo -e '+ipv6\nip6cp-use-ipaddr' >>/etc/ppp/options`
- Set up cellular data connection.  
`# Dial the connection (using /etc/ppp/peers/xxxx config)`  
`$ pppd call xxxx (where xxx is l4e1 or lsp3)`
- Use the **route** Linux utility to verify ppp0 is up.

`$ route`

**Kernel IP routing table**

Destination	Gateway	Genmask	Flags	Metric	Ref	Use	Iface
default	33.140.12.18	0.0.0.0	UG	0	0	0	ppp0
33.140.12.18	*	255.255.255.255	UH	0	0	0	ppp0
192.168.2.0	*	255.255.255.0	U	0	0	0	ethp0

The **ifconfig** Linux utility can be used to inspect the ppp0 interface details.

`$ ifconfig ppp0`

```
ppp0 Link encap:Point-to-Point Protocol
inet addr:33.140.12.18 P-t-P:33.140.12.18
Mask:255.255.255.255
UP POINTOPOINT RUNNING NOARP MULTICAST
MTU:1500 Metric:1
RX packets:7 errors:0 dropped:0 overruns:0 frame:0
TX packets:8 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:3
RX bytes:106 (106.0 B) TX bytes:145 (145.0 B)
```

Also, view the **pppd** logs in **/var/log/messages** to see the modem dialing and assigned IP address or errors if the connection was unsuccessful.