

Extending the IQrouter WiFi using an EAP Access Point

One WiFi access point is rarely enough to give both coverage and handle the increasing loads of a high number of WiFi clients. So this recipe explains how to enhance the WiFi coverage by adding one or more additional dedicated Access Points (APs).

We document how to achieve this using the TP-Link EAP225v3 enterprise access point. However, we will ignore their included directions and skip using a central administration console and use the much simpler method of directly configuring each access point.

These instructions would apply to any EAP-series AP, so just choose the one that fits your budget and needs.

A couple of notes before we continue. These are enterprise-class Access Points, but have friendly configuration Interfaces, and also use the more advanced and flexible approach of allowing both power and data over a single Ethernet cable thanks to POE support. This makes mounting on a wall or ceiling easy, as there is only one cable to run. However, they do include a power supply if you want to skip the whole POE thing if you are just going to place it on a table or other similar location.

POE injectors are included in the 225v3 (but possibly not in others, so check if you need to obtain one), if you have a wired network, a POE-capable switch could also be used to reduce clutter, such as a [TP-Link TL-1008P](#) (the P at the end is important, as that's the one with POE).

If deploying more than one EAP, especially three or more, we highly recommend deploying the [managed configuration](#) described at the end of this document.

On to the process of actually deploying and configuring.

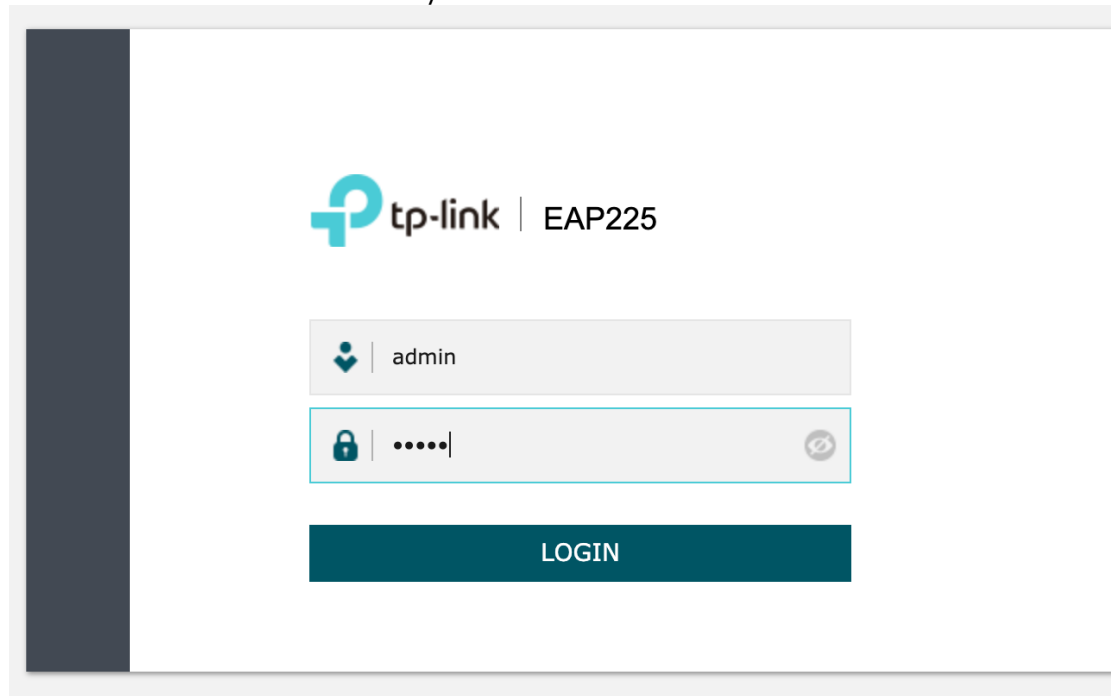
Deployment order:

1. Plug in the EAP to the LAN of the IQrouter, make sure to plug the Ethernet in the 'Ethernet' port of the EAP.
2. Turn on the EAP
3. Log in to the IQrouter and wait for the Overview page to refresh.
 - a. Go to Status->Advanced Overview
 - b. Scroll down to the DHCP Leases section
 - c. Look for a new addition (leastime will be 11hrs and 5x minutes)
 - d. The hostname will be something like EAP225-xx-xx-xx-xx (the xx-xx-xx-xx corresponds to the MAC address shown on the bottom of the unit) Make a note of this name

DHCP Leases

Hostname	IPv4-Address	MAC-Address	Leasetime remaining
EAP225-98-DA-C4-99-30-7E	192.168.0.185	98:DA:C4:99:30:7E	11h 59m 39s

- e. Write down the assigned IP address
4. Login to EAP
 - a. In a new Browser window, type in **http://[the IP address you just wrote down]**
 - b. You will be prompted to login to the EAP
 - i. Use the initial default of admin/admin




- c. System will immediately prompt for new credentials
- d. Set user to admin, set the password to something you choose, could be the same as the login password for the IQrouter to make it easier to remember.

Set up a new username and password

New Username:

New Password:

Low Middle High

Confirm Password: 

Confirm

5. **IMPORTANT: Update the Firmware now !**
We have purchased and installed many of these units, and even in mid-2021, the units come with stock firmware that is years old.
Current firmware has many enhancements and security fixes and should be installed.

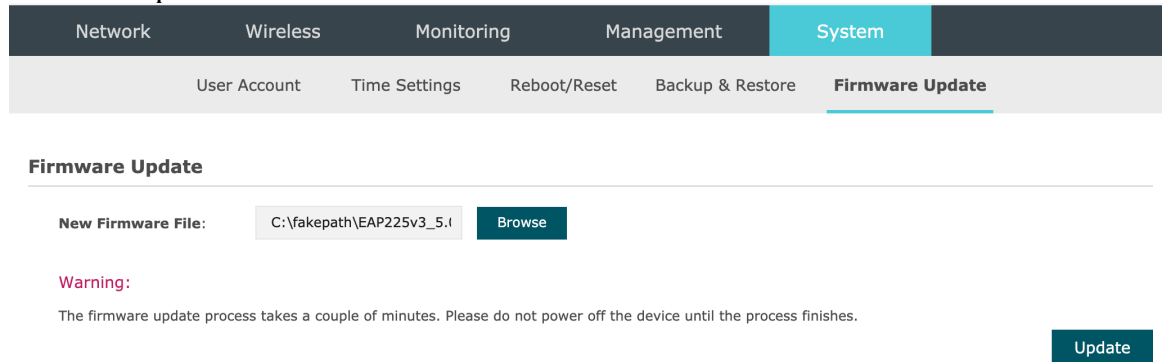
You can download the latest from this page:

<https://www.tp-link.com/us/support/download/eap225/#Firmware>

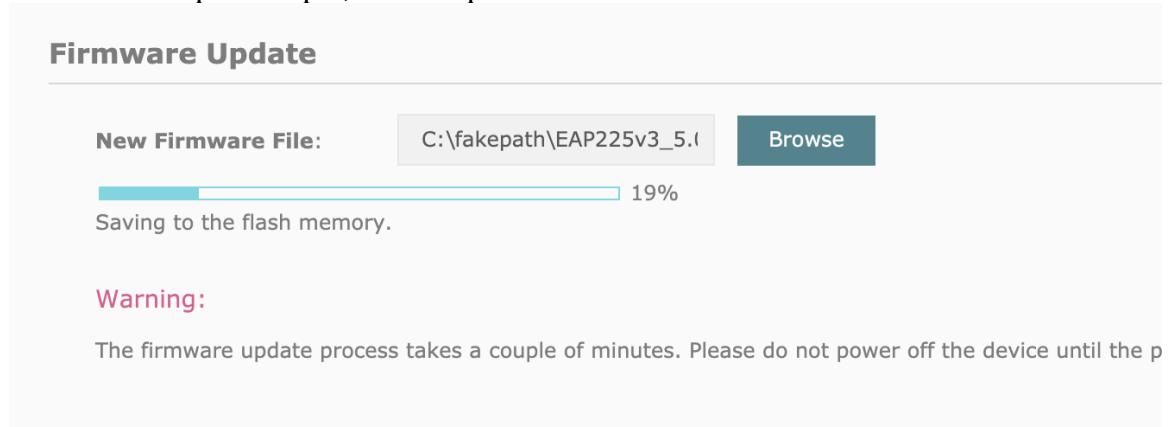
Unzip the download so you now have a folder with the firmware file inside (e.g EAP225v3_5.0.3_[20210316-rel67358]_up_signed.bin)

Since the latest versions have such big changes relative to the existing firmware, the upgrade erases any prior settings, so that's why we need to take care of this first.

- a. Click on the System menu, then Firmware Update
- b. Use the Browse button to find the .bin file from the download/unzip
- c. Click the Update button



- d. If all goes well, you'll see this as it start to update. Wait for it to fully reboot and repeat step 4, then skip 5 and continue with 6.



6. Set system time using System->Time Settings

Time Settings

Time zone: (GMT+08:00) Beijing, Hong Kong, Perth, Singapore ▼

Date: 01/01/2014 MM/DD/YYYY

Time: 00 : 02 : 32 (HH/MM/SS)

Primary NTP Server: (optional)

Secondary NTP Server: (optional)

Get GMT Synchronize PC's Clock

- a. Click the Synchronize PC's clock button
- b. Click Save

7. Go to Wireless->Wireless Settings

Wireless Basic Settings

2.4GHz 5GHz

2.4GHz Wireless Radio: Enable

Wireless Mode: 802.11b/g/n mixed ▼



Channel Width: 20/40MHz ▼

Channel: Auto ▼

Tx Power: 24 dBm(6-24)



- a. Set the SSID to the same as the IQrouter by first clicking the edit icon in the Modify column of the existing SSID definition

SSIDs

ID	SSID Name	Wireless VLAN ID	SSID Broadcast	Security Mode	Portal	SSID Isolation	Modify
1	TP-LINK_2.4GHz_CC7484	0	Enable	None	Disable	Disable	 

- b. Set the Security Mode to 'WPA-PSK', It should default to auto for the sub settings
- c. Set the wireless password to be the same as the corresponding SSID's password

SSIDs

ID	SSID	Wireless VLAN ID	SSID Broadcast	Security Mode	Portal	SSID Isolation	Modify
1	TP-Link_2.4GHz_99307E	0	Enable	None	Disable	Disable	 

SSID:

Wireless VLAN ID: (0-4094. 0 is used to disable VLAN tagging.)

SSID Broadcast: Enable

Security Mode:

Version: Auto WPA-PSK WPA2-PSK

Encryption: Auto TKIP AES

Wireless Password:

Group Key Update Period: seconds (30-8640000. 0 means no update.)

Portal: Enable

SSID Isolation: Enable

- d. Click save
- e. In the advanced option section, adjust two things, set the DTIM to 3 for better compatibility with mobiles and enable the airtime fairness

option

Wireless Advanced Settings

Beacon Interval:	<input type="text" value="100"/>	ms (40-100)
DTIM Period:	<input type="text" value="3"/>	(1-255)
RTS Threshold:	<input type="text" value="2347"/>	(1-2347)
Fragmentation Threshold:	<input type="text" value="2346"/>	(256-2346. This works only in 11b/g mode.)
Airtime Fairness:	<input checked="" type="checkbox"/> Enable	

- f. Click save
- g. Click on the 5GHz icon
- h. Repeat prior steps on the 5GHz radio

2.4GHz 5GHz

Wireless Basic Settings

5GHz Wireless Radio:	<input checked="" type="checkbox"/> Enable	
Wireless Mode:	<input type="text" value="802.11a/n mixed"/>	▼
Channel Width:	<input type="text" value="20/40MHz"/>	▼
Channel:	<input type="text" value="Auto"/>	▼
Tx power:	<input type="text" value="26"/>	(1-26)

ID	SSID Name	Wireless VLAN ID	SSID Broadcast	Security Mode	Portal	SSID Isolation	Modify
1	TP-LINK_5GHz_CC7485	0	Enable	None	Disable	Disable	

SSID Name:

Wireless VLAN ID: (0-4094, 0 is used to disable VLAN tagging)

SSID Broadcast: Enable

Security Mode: ▼

Version: Auto WPA-PSK WPA2-PSK

Encryption: Auto TKIP AES

Wireless Password:

Group Key Update Period: seconds(30-8640000,0 means no upgrade)

Portal: Enable

SSID Isolation: Enable

- i. Click save
 - j. In the advanced options, also set the Airtime fairness on, and the DTIM to 3 (under 'More settings').
8. VERY IMPORTANT:
- There is 'feature' whereby the unit will revert to a fallback mode and set up a local network if it loses 'sight' of the primary router (say, when it is rebooting). This breaks the network in many, many ways. So, we want to turn said 'feature' OFF.
- a. Click the Network menu
 - b. In IP Settings, **un**check the 'Fallback IP' option
 - c. Click save



IP Settings

Dynamic Static

Fallback IP: Enable

DHCP Fallback IP:

DHCP Fallback IP MASK:

DHCP Fallback Gateway:

9. Optionally, configure a static IP to make management easier. The default static range for an IQrouter is 192.168.7.2 – 192.168.7.99. Otherwise, lookup the IP on the Advanced Overview page, make a note of the Hostname shown for this AP, write that down along with the updated admin login creds. Remember that DHCP IPs are not durable, even though they tend to be stable. Alternatively, the hostname + .lan can be used and the IQrouter DNS will resolve it, so http:// EAP225-xx-xx-xx-xx.lan works long-term, and you can bookmark that in your browser.

Managed Access Points

For two or more EAPs, we recommend that they be set up as a managed group so their controller software can steer clients to the closest/strongest Access Point.

It also simplifies the setup and configuration, as you do it once on the controller, and then as soon as you enroll an EAP, it pushes the configuration from the controller to the unit(s).

Same for any changes, such as adding a new SSID, as soon as you configure it centrally, it gets pushed to the selected units.

The other thing this can support is a Mesh, so even though you should move heaven and earth to wire up ALL access points, if there is one, remote location with low networking demands, that just can't be wired, then a Mesh can be setup between it and the closest other AP.

Due to the concepts involved, this is a more Advanced deployment, but the TP-Link Omada system is well documented, and the UI is relatively easy to use.

Once you have one unit fully configured and tested to ensure all your settings are working, adding each other EAP takes only a minute to enroll it. Everything else is completely automatic.

We recommend you start with the OC200 controller configuration and to use the local management option via Web UI. This means admin is strictly local, with no cloud component.

If you wish to be able to remotely manage and diagnose this deployment (maybe it's for a non-techie family member), then do start with setting up an Omada cloud account and following the steps to enroll the OC200 via that.

We have a customer whose Omada cloud account manages three different family members individual home setups, plus his own, so a total of four different locations, each with 2 to 4 EAPs deployed. They love it, as they can do everything remote (a big deal in 2020).

What all will I need to set up a managed group of EAPs?

First, you should consider buying the [OC200 and a pair of EAPs as a bundle](#) and possibly save money. If you need more the two, then buy individual [EAP225v3](#), as many as needed.

Power over Ethernet – POE

Both the EAP's and the OC200 are typically powered via POE, the nice thing about the 225v3 model specifically, is that they include a POE injector for free, so even without a local POE source, you can still power them using the injector.

So you have switch <-> ethernet <-> POE Injector <-> EAP225

The OC200 may be locally powered using a 1A 5v DC USB power supply and a cable with a Micro USB end.

Alternatively, if you are going to add a switch to your network as part of this, then a good option is to get a switch that has POE ports.

So if deploying three EAPs and one OC200, a [TP-Link TL-SG108PE](#) 8-port switch, which has 4 POE ports is the perfect answer. If you need more, they have a [16-port version](#) with 8 POE ports.

Or get the Omada SDN controlled switches from their JetStream line, such as the 8-port [TL SG-2008P](#) and you can control them remotely. Recommended if you will be managing this deployment remotely, use as much SDN gear as possible.

Setup steps

The OC200 needs to be on the latest firmware to be able to upgrade the clients to the latest, so first, connect to it and enroll it, then follow the TP-Link guides [for upgrading the controller](#).

OK, now we are ready.

These steps are not as blow-by-blow as the ones above, as it's assumed if you attempt this, you are technically proficient enough to use the TP-Link documentation and training materials. So we'll be focusing on some tips and things that that we and other customers have found to be useful or IQrouter specific. This example will assume a SG108PE is used as the POE source for the OC200.

1. Connect port #8 (a 'regular' port) of the SG108PE to the LAN of the IQrouter
2. Connect a switch POE port to the POE/LAN port of the OC200
3. Using the Omada App follow the TP-Link instructions for accessing or enrolling the OC200
4. Once the basic OC200 config is done, set up the primary WiFi network via the Omada UI
5. Connect an EAP225 to the next POE port on the SG108PE
6. Upgrade the firmware on the EAP225
7. Push the network config via the Omada UI
8. Rinse and repeat 5 - 7 for each unit.

From now on, anytime you want to change something in the network config, such as updating the wifi password, you use the Omada App (or web UI) to make those changes and they'll be pushed to all the APs.

TIP: if using an IQrouter Pro, you can set additional SSID's for the EAPs to use VLAN 3 and they will be placed in the 'Guest' zone of the IQrouter and be isolated from the LAN, only Internet access. Plug the switch into LAN2/VLAN 3 port, so untagged traffic goes to LAN and VLAN 3 tagged traffic from the EAPs goes to Guest.