



WI-FI LAB

LAB MATERIALS

- Any MAX or Balance series router
- Two Access Points and Switch to power AP
- Laptop
- Smartphone

**A limited number of lab kits will be provided for attendees to share. Recommended for attendees to bring their own materials, but not necessary.*

PREPARATION

- Reset devices to defaults before the lab. When the unit is powered on, hold down its reset button with a paperclip for 10 seconds and release it.
- Depending on the Peplink device, the instructions on how to access a device's web configuration interface may vary and can be found in the corresponding User Manual:
 - <https://www.peplink.com/support/downloads/>
- Start a web browser on a computer connected to the Peplink router through the LAN.
- To connect to the router's web admin interface, enter the following LAN IP address in the address field of the web browser:
 - MAX series <http://192.168.50.1>
 - Balance series <http://192.168.1.1>
- Enter the default login credentials to access the web admin interface:
 - Username: admin
 - Password: admin
- Access Points have different default IP addresses and login credentials. The device's default IP address and login credentials can be found on its label.
- Make sure the devices run the latest software version.

SCENARIO 1: TWO LAN/WI-FI NETWORKS - ONE SSID FOR USERS, OTHER FOR IOT DEVICES

1. Connect router and APs to the switch. Use device UI for configuration.
2. Configure IoT VLAN 10 with IP 192.168.10.1/24 and DHCP server on the router.
3. Add IoT VLAN 10 on the switch.
4. Enable external AP management on AP Controller
5. Create the first Wi-Fi SSID named "Network_AAAA", where AAAA are the last 4 symbols of router serial number. Map SSID to Untagged LAN. Choose standard security policy. Enable fast Wi-Fi station roaming. Set Band Steering to "Prefer"
6. Create a second Wi-Fi SSID named "IoT_AAAA", where AAAA are the last 4 symbols of router serial number. Map SSID to IoT VLAN. Choose standard security policy. Enable Layer 2 Isolation.
7. Set 2.4 GHz and 5 GHz radio output power to Medium. Set 2.4 GHz radio channel width to 20 MHz, 5 GHz radio channel width to 40 MHz.
8. Check if both external Access Points are seen from AP Controller and config is synced
9. Connect to each SSID from laptop or smartphone, check IP addresses.

SCENARIO 2: WI-FI MESH NETWORK

- Continue with "Scenario 1" configuration. Use router UI for the changes.
- Create Wireless Mesh using 5 GHz frequency. Use mesh ID "mesh_AAAA", where AAAA are the last 4 symbols of router serial number. Assign mesh with AP profile.
- Disconnect LAN cable between switch and router (keep AP power on).
- Check mesh status.
- Disable AP on the router and connect to any BSSID of meshed Access Points.

SCENARIO 3: GUEST ACCESS USING CAPTIVE PORTAL

- Reset router and AP device configuration to defaults. Use [InControl2](#) for configuration.
- Tag router and AP with "guest-wifi" tag.
- Add Guest VLAN ID and push it to router and switch with "guest-wifi" tag. Use available VLAN number and IP address, enable DHCP server.
- Add "Guest_AAAA" SSID on devices (where AAAA are the last 4 symbols of router serial number) with "guest-wifi" tag, leave security open, enable layer 2 isolation and assign it to Guest VLAN.
- Set AP transmit port to low and select 40 MHz channel width on 5 GHz band.
- Add Captive Portal with Guest Account access mode. Configure a guest account: valid for 1 day after login and allowing 2 concurrent sessions.
- Go to Guest VLAN settings and assign the Captive portal.
- Connect to Guest Wi-Fi SSID and test network authentication.

BEST PRACTICES & TIPS

- When there are multiple access points in the area, check if Wi-Fi Auto channel selection chooses non overlapping channels. Adjust channels manually if necessary. Also, may need to reduce AP radio transmit power when multiple APs are deployed close to each other, for example in each school class.
- In a noisy environment the recommendation is to reduce Wi-Fi channel bandwidth: set 2.4 GHz radio to 20 MHz and 5 GHz radio to 40 MHz channel size.
- For wireless mesh (connection between APs) the recommendation is to use 5 GHz frequency.
- When AP is meshed and it uses the same physical radio (2.4 or 5 GHz) for backhaul and access, the throughput will drop about twice as on physical layer Wi-Fi radio is half-duplex (at one time moment the communication goes in a single direction).

TROUBLESHOOTING

- If Wi-Fi station cannot connect to the Access Point, check these settings: Wi-Fi security profile, supported frequencies by AP and station. Try to change Wi-Fi channel.
- If Wi-Fi connection throughput is slow, check Wi-Fi signal, increase TX power if necessary, change the channel or channel size.