

PROJECT TITLE: COMPLETE A ROUTER INSTALLATION IN A SMALL OFFICE.

NAME : Hosain Ahmed.

MOBILE NO : 01571100046.

EMAIL: mdhosain0188gmail.com.

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Describe: A **network** is a system of connected devices that communicate and share resources with each other. In technology, networks allow computers, servers, printers, and other devices to exchange data and resources (like files, applications, and internet access) across connections that can be wired (e.g., Ethernet cables) or wireless (e.g., Wi-Fi, Bluetooth).

Types of Networks:

1. **Local Area Network (LAN):** A network that covers a small, specific area, like an office, home, or school.
2. **Wide Area Network (WAN):** A network that spans a large geographical area, often connecting multiple LANs. The internet is the largest example of a WAN.
3. **Wireless Networks (WLAN):** These use wireless signals to connect devices, common in homes and offices with Wi-Fi.
4. **Metropolitan Area Network (MAN):** A larger network that covers a city or campus, connecting multiple LANs within this area.

Plan the Network Layout:

- **Identify Coverage Areas:** Check where strong signals are most needed (e.g., workstations, meeting rooms).
- **Consider Interference:** Avoid placing the router near large metal objects, microwaves, or cordless phones to reduce interference.

Gather Necessary Equipment:

- **Router:** Ensure it has sufficient speed and range for the office size.
- **Ethernet Cables:** Cat5e or Cat6 cables are generally ideal.
- **NETWORK SWITCH/ONU:** (if needed): Useful if you have multiple wired devices to connect.
- **Connector:** If your ISP provided one, connect the router to the modem.

ROUTER: The router is a physical or virtual internetworking device that is designed to receive, analyze, and forward data packets between computer networks. A router examines a destination IP address of a given data packet, and it uses the headers and forwarding tables to decide the best way to transfer the packets. There are some popular companies that develop routers; such are Cisco, 3Com, HP, Juniper, D-Link, Nortel, etc. Some important points of routers are given below:

- A router is used in LAN (Local Area Network) and WAN (Wide Area Network) environments. For example, it is used in offices for connectivity, and you can also establish the connection between distant networks such as from Bhopal to
- It shares information with other routers in networking.
- It uses the routing protocol to transfer the data across a network.
- Furthermore, it is more expensive than other networking devices like switches and hubs.



Ethernet Cables:

Ethernet cables are a type of network cable. They are designed to work with Ethernet ports. Ethernet ports can be found on routers, computers, TVs and most internet and network-enabled devices. Hardwiring devices has its benefits, including faster internet and more reliable connectivity. Within an Ethernet cable

there are four different colours for each of the cores, green, blue, orange, and brown. Each of these are either a solid colour or stripped. It is important that the colours of Ethernet cables match correctly on both ends in accordance with the standard EIA/TIA 568B. The standard also dictates in which order cables are connected.



Name	IEEE Standard	Data Rate
Ethernet	802.3	10 Mbps
Fast Ethernet/ 100Base-T	802.3u	100 Mbps
Gigabit Ethernet/ GigE	802.3z	1000 Mbps
10 Gigabit Ethernet	IEEE 802.3ae	10 Gbps

OPTICAL NETWORK UNIT (ONU): An Optical Network Unit (ONU) is a device used in fiber-optic networks, particularly in FTTx (Fiber to the x) architectures, such as FTTH (Fiber to the Home) or FTTB (Fiber to the Building). The ONU is part of the Passive Optical Network (PON) infrastructure, which enables high-speed internet access over fiber-optic cables.

Functions of an ONU:

Converting Optical to Electrical Signals: The ONU converts optical signals from the fiber-optic network into electrical signals that can be used by devices in a home or office.

- **Managing User Data:** It segments and manages data to and from the customer's devices, providing a link between the end user and the broader fiber-optic network.
- **Enabling High-Speed Access:** ONUs allows users to access high-speed internet, supporting bandwidth-heavy activities like video streaming, online gaming, and large file transfers.

How the ONU Works in a PON:

- In a PON setup, Optical Line Terminals (OLTs) at the service provider's end send data to the ONU over fiber.
- The ONU, located near the user's premises, then distributes this connection to individual devices via Ethernet or Wi-Fi.

Key Differences between a Network Switch and an ONU:

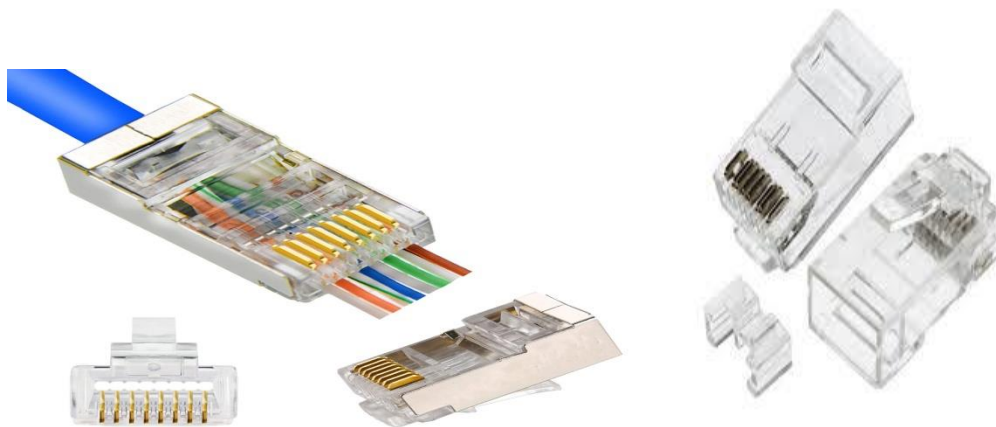
Feature	Network Switch	ONU
Primary Use	Connects devices within a LAN	Connects end-users to a fiber network
Network Layer	Data Link Layer (Layer 2) or Network Layer (Layer 3)	Physical and Data Link Layers
Technology	Ethernet	Fiber-optic
Function	Directs data packets within a network	Converts optical signals to electrical, distributes internet
Usage Environment	LANs, small to large networks	Fiber-optic internet installations



Connector: A **connector** is a device or component used to join electrical circuits, signals, or data cables, enabling communication or power transfer between different devices. Connectors are crucial in network setups, allowing cables and equipment to interface and interact efficiently. Here are some commonly used types of connectors in networking and telecommunications:

RJ45 Connector

- **Use:** Primarily for Ethernet (wired) networking.
- **Description:** An eight-pin connector commonly used to connect network cables to devices like computers, routers, and switches. It fits into Ethernet ports on networking equipment.
- **Application:** Common in Local Area Networks (LANs) for Cat5, Cat5e, Cat6, and higher-grade Ethernet cables.



SOFTWARE PART:

DECO SOFTWARE AND ITS FUNCTION: Deco is a mobile application and software developed by TP-Link for managing their Deco Mesh Wi-Fi System, which provides whole-home Wi-Fi coverage by using multiple devices (Deco units) to create a mesh network. The Deco app allows users to set up, monitor, and control their Deco network easily from their smartphones. It simplifies network management, giving users control over their internet connection and devices from anywhere.

Key Functions of the Deco Software:

1. Network Setup and Configuration:

- **Easy Setup:** The app guides users through setting up the Deco mesh network step-by-step, from connecting to the modem to positioning and syncing additional Deco units.
- **Automatic Firmware Updates:** Deco software checks for and installs firmware updates to ensure security and feature improvements without needing manual intervention.

2. Device and Network Management:

- **Device List:** Users can see a list of all devices connected to the network, view device activity, and monitor bandwidth usage.
- **Parental Controls:** Users can set limits on internet access for specific devices or users, block inappropriate content, and even set time limits for online activity.
- **Quality of Service (QoS):** Allows prioritization of devices or applications (e.g., streaming, gaming, or work apps), ensuring they receive sufficient bandwidth.

3. Guest Network Setup:

- **Guest Wi-Fi:** Users can create a separate guest network to keep visitors' devices isolated from the main network for enhanced security.
- **Customizable Access:** Control over the guest network's duration, password, and usage restrictions.

4. Security Features:

- **TP-Link HomeCare:** Some Deco models offer additional HomeCare security features, including antivirus protection, malicious content filtering, and intrusion prevention.
- **Remote Management:** Users can monitor and control their network remotely via the app, turning Wi-Fi on or off and checking connected devices from anywhere.

5. Mesh Optimization and Coverage Management:

- **Smart Device Placement:** The app provides guidance on placing Deco units for optimal coverage and signal strength, minimizing dead zones.
- **Self-Healing:** If one Deco unit disconnects or fails, the system reroutes data through other units to maintain seamless connectivity.

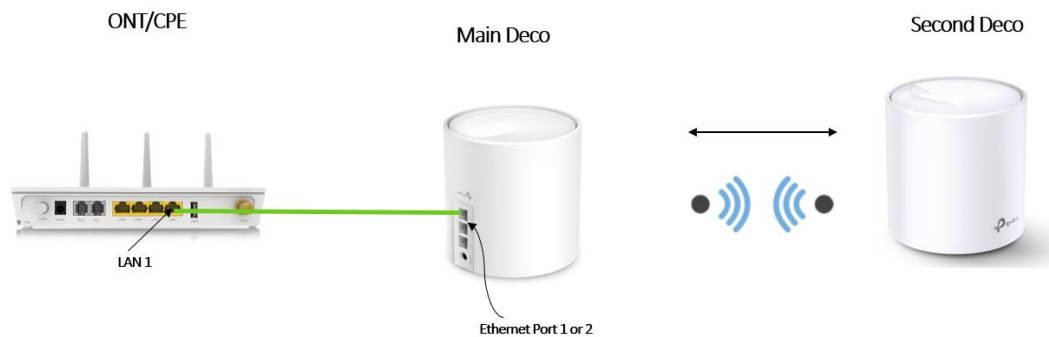
- **Bandwidth Management:** Automatically adjusts bandwidth to different devices for optimal performance across all network-connected devices.

Configuration with DECO software:

Configuring a TP-Link Deco mesh Wi-Fi system with the Deco app is straightforward. Here's a step-by-step guide to help you set up and configure your Deco network:

1. Download the Deco App

- **Install:** Download the **TP-Link Deco app** from the App Store (iOS) or Google Play (Android).
- **Create or Log In to TP-Link Account:** Open the app and sign in to your TP-Link account or create a new one if you don't already have one.



2. Connect the Primary Deco Unit

- **Power On the Deco:** Plug the primary Deco unit into a power outlet.
- **Connect to Modem:** Use an Ethernet cable to connect the Deco unit to your modem.
- **LED Indicator:** Wait for the LED on the Deco unit to pulse blue, indicating it's ready for setup.

3. Start Setup in the App

- **Open the Deco App:** Select **Set Up a New Deco** and choose the specific model you're setting up.

- **Follow On-Screen Instructions:** The app will guide you through connecting to your Deco unit and configuring your network.

4. Configure Wi-Fi Network

- **Create Wi-Fi Network Name (SSID):** Choose a name for your Wi-Fi network.
- **Set a Password:** Enter a secure password for the network.
- **Connect Device:** Once setup is complete, your device will connect to the new Wi-Fi network automatically.

5. Add Additional Deco Units (if using a multi-unit setup)

- **Place Deco Units Strategically:** Place additional Deco units around your home or office where you want to extend Wi-Fi coverage.
- **Power On Additional Units:** Plug each unit into a power source and wait for the LED to pulse blue.
- **Add Units in the App:** Tap “Add Another Deco” in the app, then follow the prompts to connect each new Deco unit.
- **Optimal Placement:** The app will help you find the best spots for each unit based on the signal strength to the main Deco.

6. Network Settings and Configuration

- **HomeCare Security (optional):** Enable TP-Link HomeCare features like antivirus, malicious content filtering, and intrusion prevention if supported by your model.
- **Parental Controls:** Set up profiles for family members, and apply filters, time limits, and scheduled pauses.
- **Quality of Service (QoS):** Prioritize bandwidth for specific devices or activities (e.g., streaming, gaming, work) to optimize performance.
- **Guest Network:** Set up a separate guest network to allow visitor access without exposing your main network.

7. Test the Network and Optimize Placement

- **Walk Through Coverage Area:** Move through the spaces you want to cover with Wi-Fi to ensure strong signal strength and no dead zones.

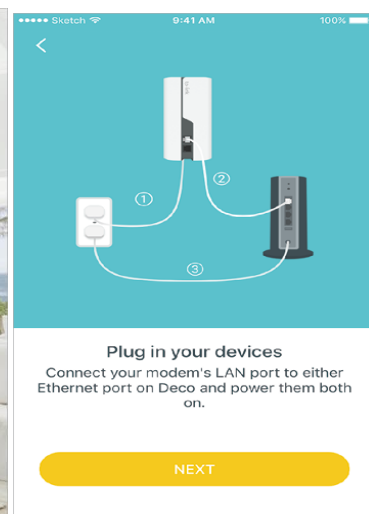
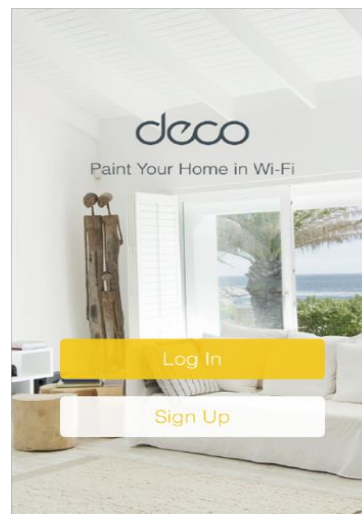
- **Self-Healing Feature:** Deco's self-healing will automatically reroute connections if one Deco unit loses power or connection, ensuring continuous service.

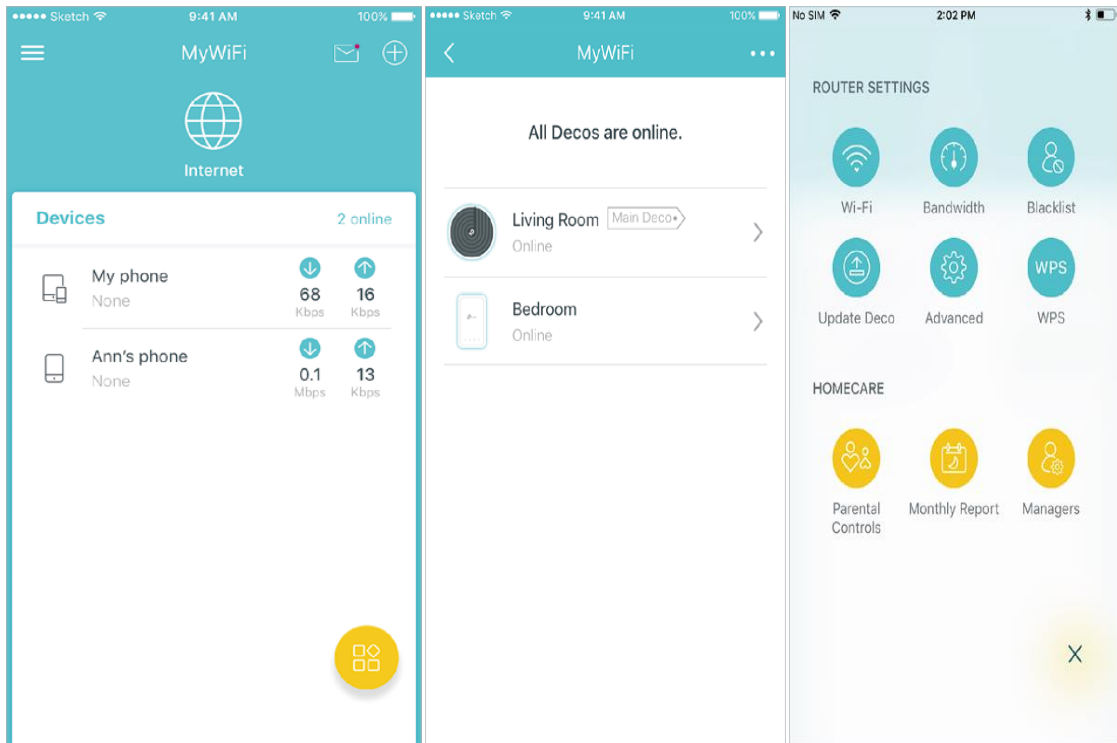
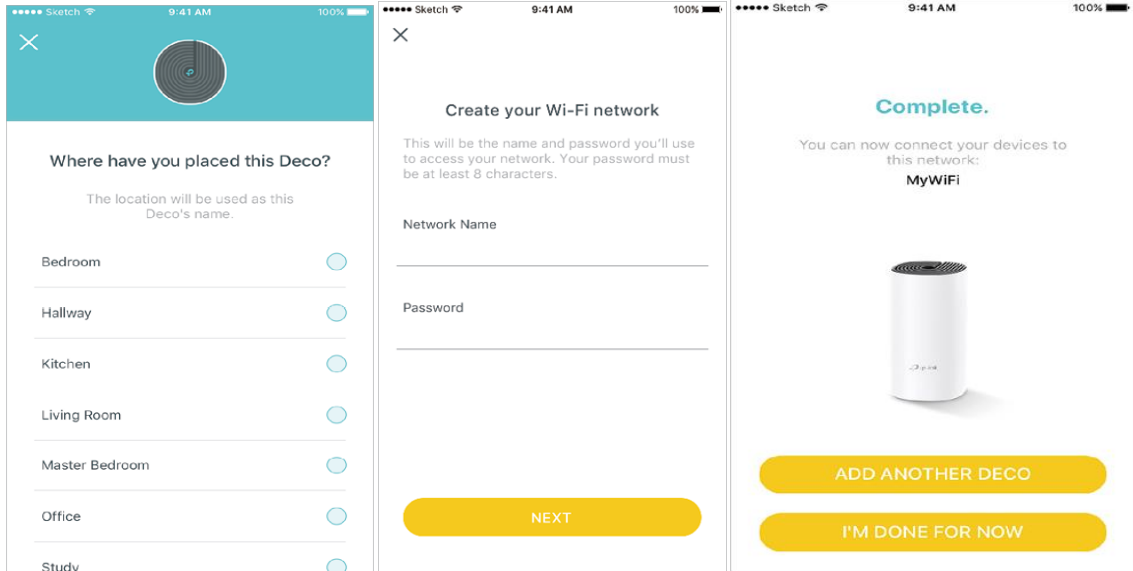
8. Firmware Update

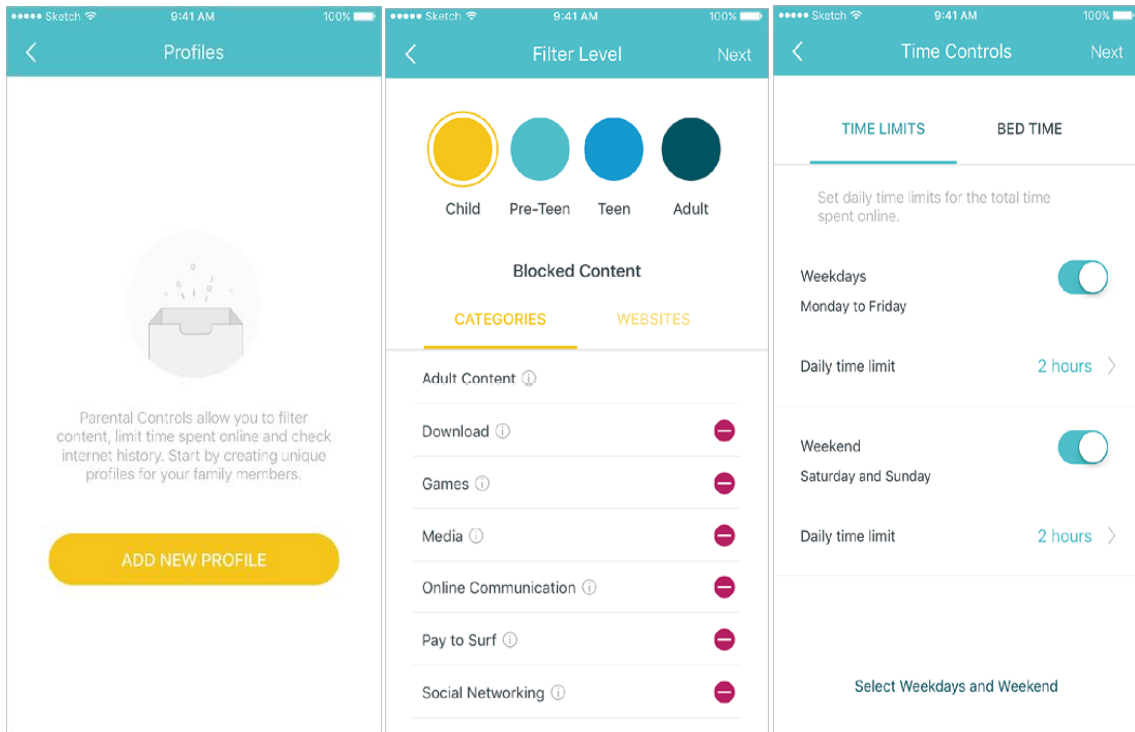
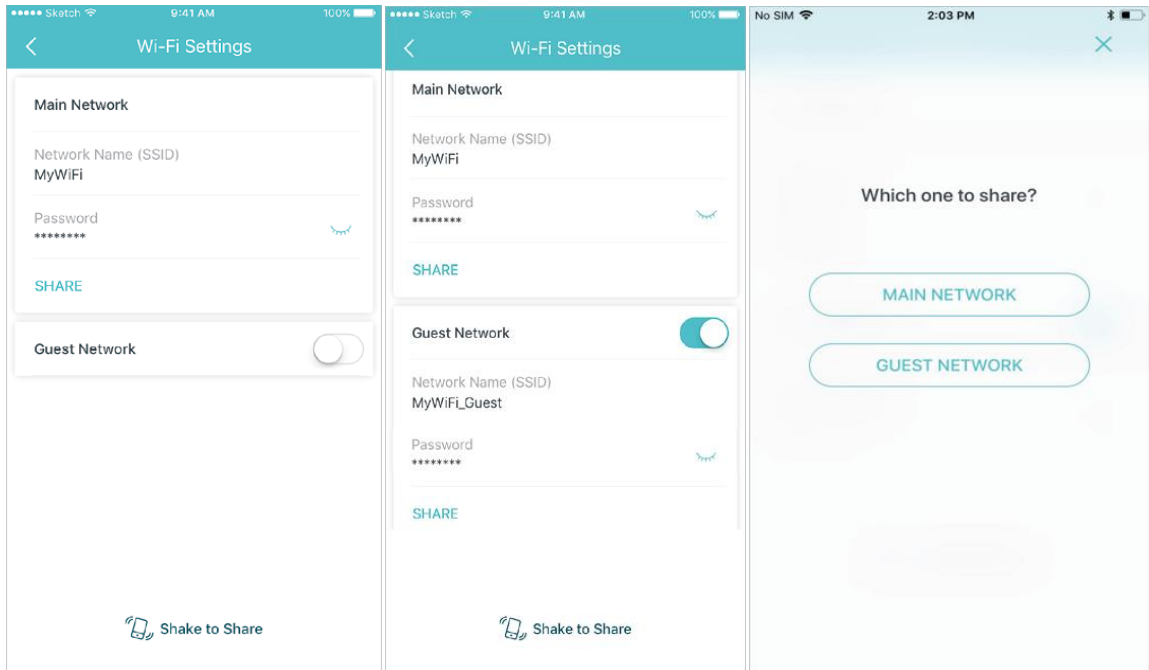
- **Check for Updates:** Go to the settings in the Deco app and look for firmware updates to ensure you have the latest features and security improvements.
- **Automatic Updates:** Enable automatic updates if available, or periodically check for updates.

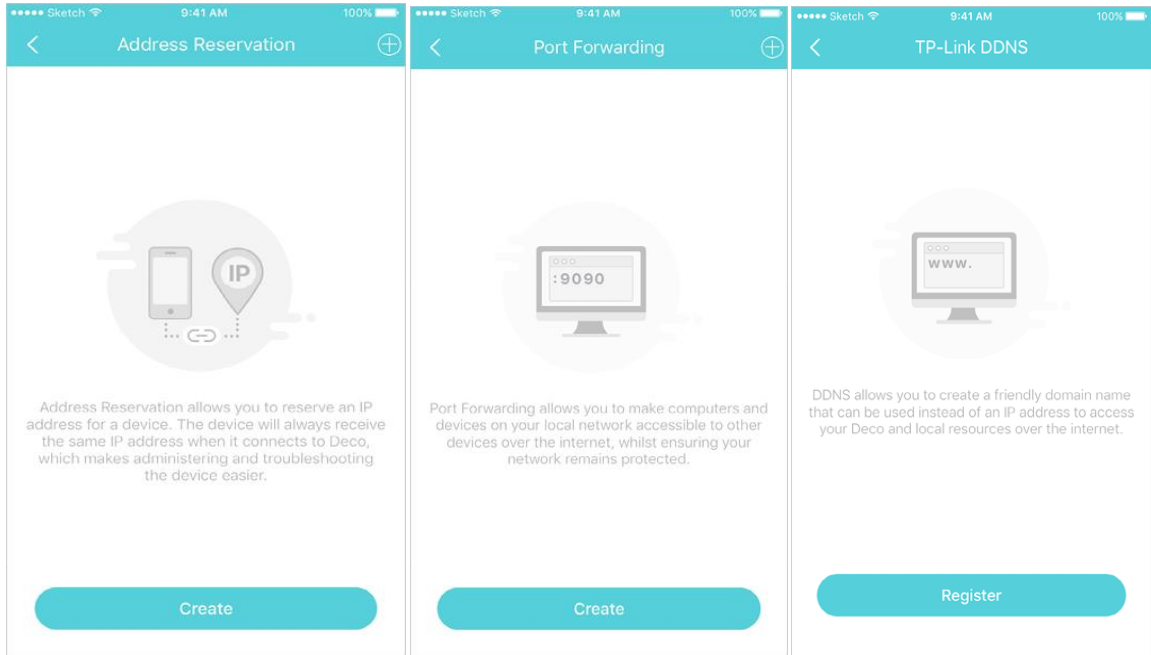
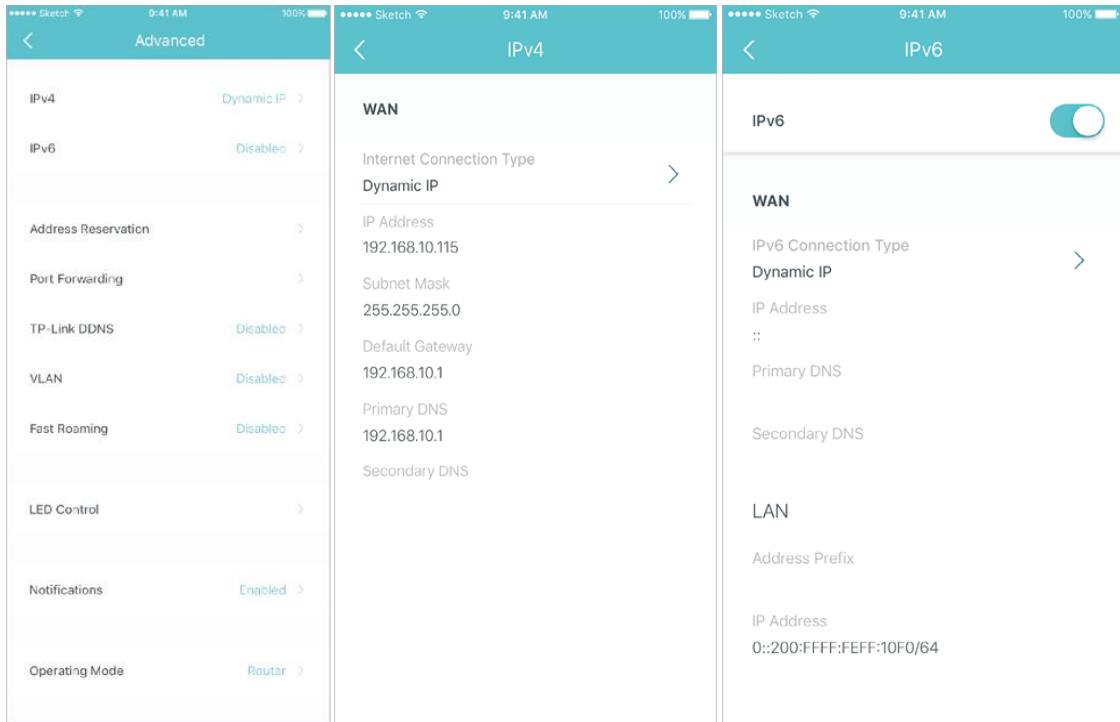
9. Remote Management and Monitoring

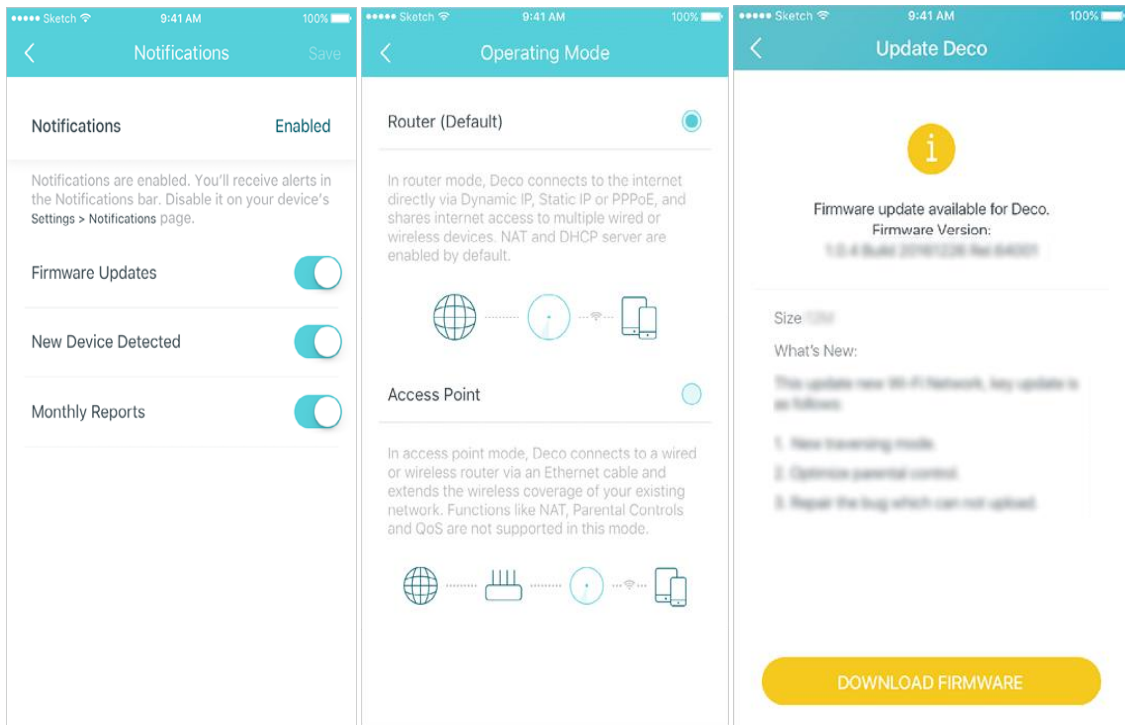
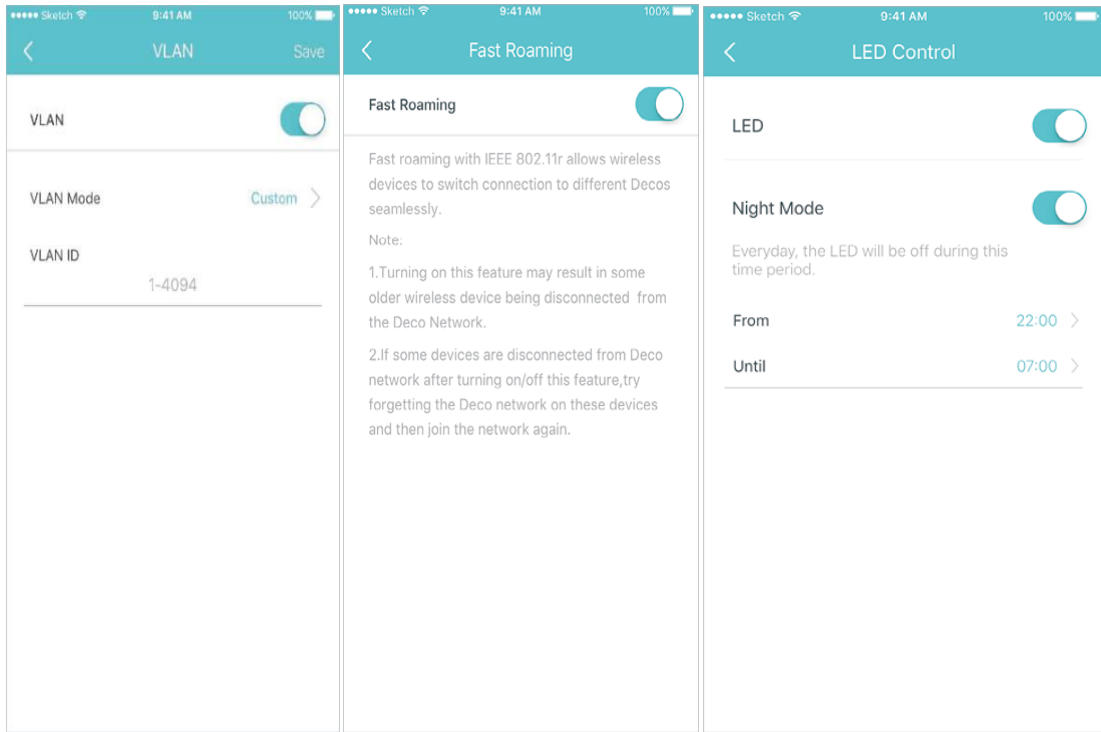
- **Control from Anywhere:** Use the app to monitor and manage your network remotely, such as adjusting parental controls or checking device connections.
- **Device Management:** You can view all connected devices, check their data usage, and block or prioritize devices as needed.

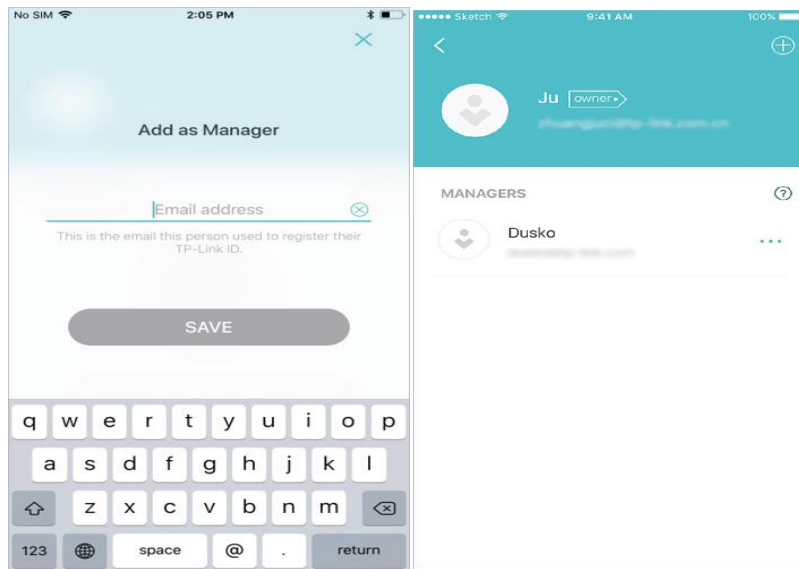
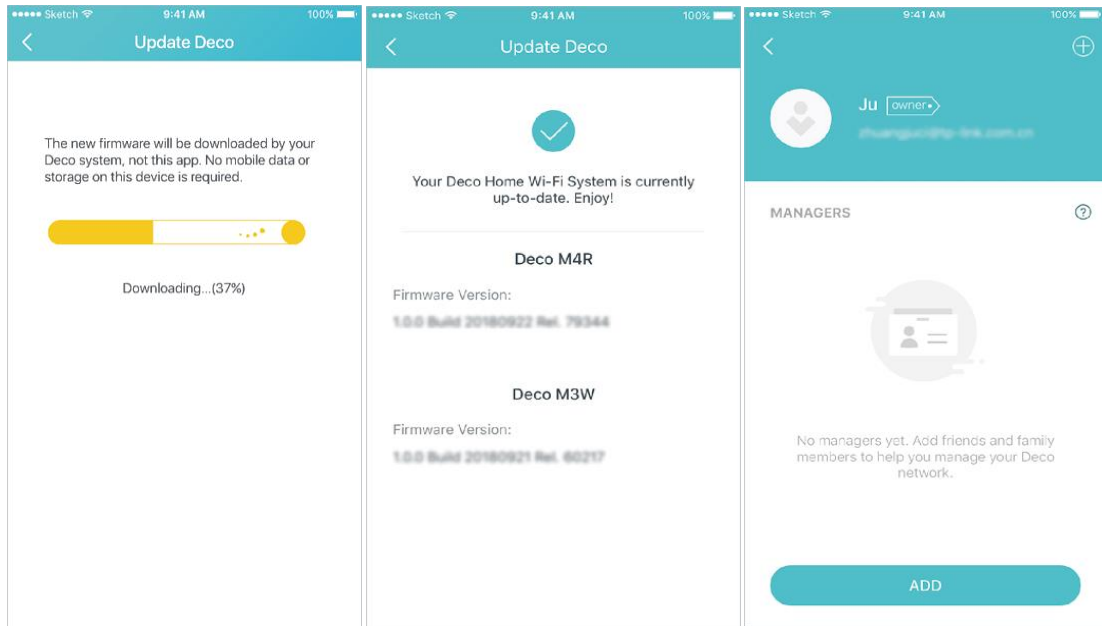












USER AND PASSWORD:

When setting up the TP-Link Deco software, you'll need a TP-Link account username and password to access and manage the app. Here's how you can create or manage your account credentials:

1. Creating a TP-Link Account

- **Open the Deco App:** Download and open the Deco app on your mobile device.
- **Create Account:** If it's your first time using the app, select Sign Up to create a new TP-Link account.
- **Enter Email and Password:** Provide an email address and create a strong password.
- **Confirm Registration:** You'll likely receive a confirmation email to verify your account. Follow the instructions to complete registration.

2. Using TP-Link Account to Log In

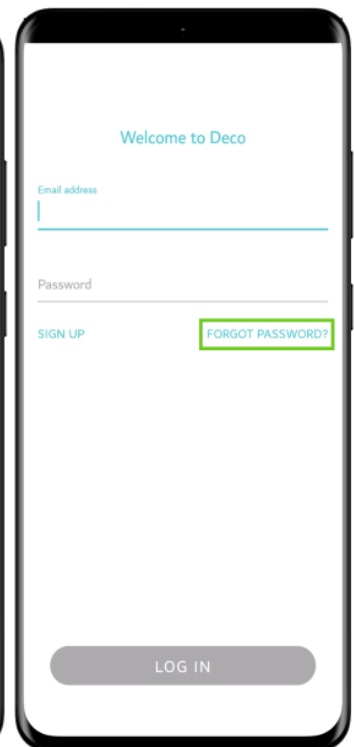
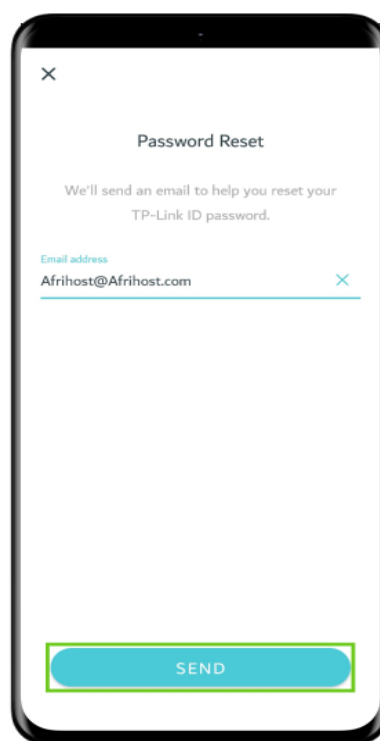
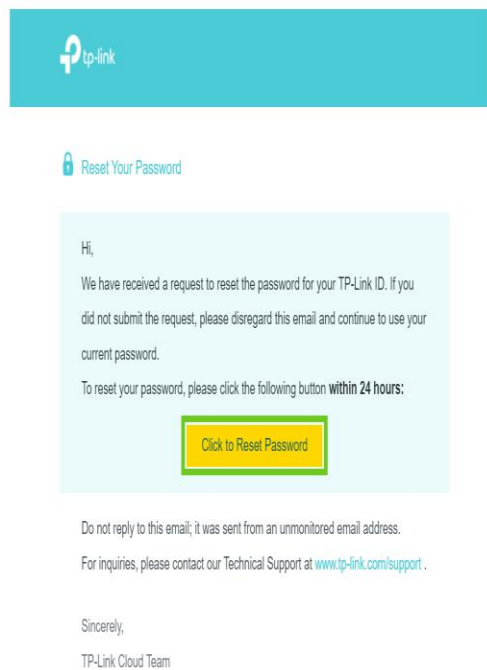
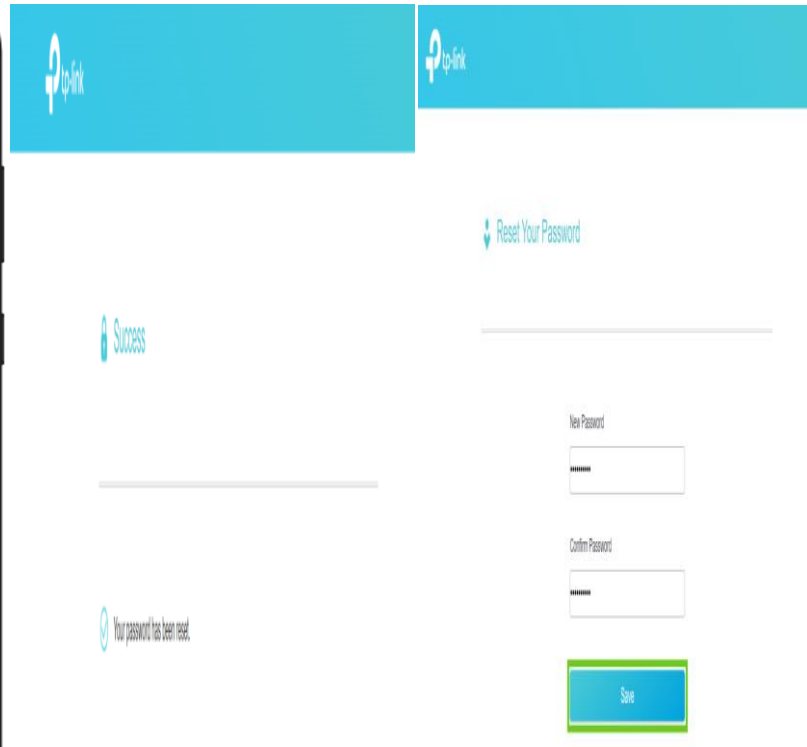
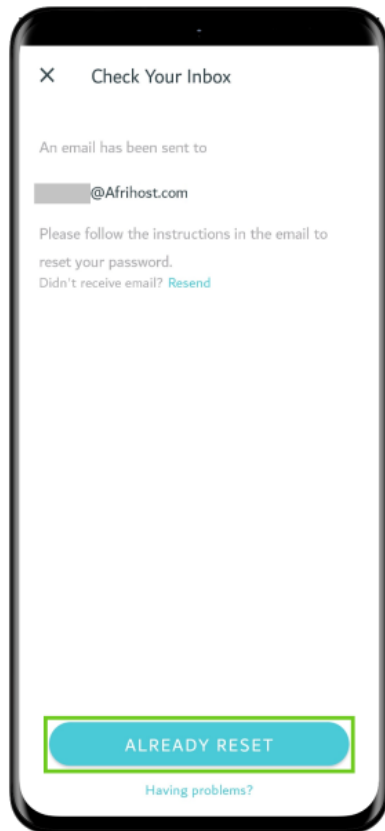
- **Log In with Account:** Once your account is created, use your email and password to log into the Deco app.
- **Stay Logged In:** You can choose to stay logged in for easier access, or you'll need to re-enter your credentials each time.

3. Forgotten Password

- **Reset Password:** If you've forgotten your password, tap Forgot Password on the login screen.
- **Email Verification:** Follow the steps sent to your registered email to reset the password.

4. Changing Username or Password

- **Access Account Settings:** After logging in, go to the account or settings section in the Deco app.
- **Change Password:** Select the option to update your password for security purposes if needed.



Conclusion:

Setting up a small office network might seem daunting, but with careful planning and the right equipment, it can be a straightforward process. By following this guide, you'll ensure that your network is reliable, secure, and ready to support your business's growth.

Whether you're setting up your first office or upgrading an existing one, we can work with you to improve your network infrastructure that will pay off in productivity and efficiency.

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