Access Point (AP) in Wireless LAN

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Meta Title: Access Point (AP) in Wireless LAN | STL Tech Blog

Meta Description: In order to create a wireless local area network in a house or place of business, a wireless access point is used as a networking device. Click on this STL Tech Blog to know more.

Wireless Access Point

The Internet has become part of everyone's life through broadband or mobile network 4G and the currently booming 5G. India had around 92.57 million internet users in 2010 and reached approximately 932 million in early 2022. The projection is 1.5 billion internet users by the year 2040, indicating that most things in the future will be run via the Internet. All said and done, do you know why we are observing almost zero buffering while we watch a YouTube video or download software these days? The device that has made internet connectivity reach its pinnacle is a **Wireless Access Point** or WAP. Let's discuss the role of a **Wireless Access Point in a computer network** so that the next time when you see your Wi-Fi not connecting or see a 3GB file get downloaded in under a minute, you can clearly point out that it's because of **Wireless Access Point**.

What is a Wireless Access Point?

WAP Device

A **Wireless Access Point**, or simply Wireless AP, is an **access point device** that sends and receives data via a wireless LAN. This **access point** serves as the connecting bridge between the **wireless LAN** and a fixed wire network.

A WAP is similar to an Ethernet hub but varies in the aspect of LAN frame relays. An **access point device** relays 802.11 frames to all other 802.3 or 802.11 stations in the same subnet, whereas an ethernet hub relays LAN frames only to other 802.3 stations. Whenever a wireless device exceeds the range of one AP, it is shifted to the next AP.

The major **differences between** an **access point and router** include,

- An **access point** is a sub-device within the LAN that offers another location for network devices to connect from and allows more devices to access the network. On the other hand, a router acts as a hub that sets up a **wireless LAN** and manages all devices & communication in them.
- **Wi-Fi AP** routers can work as **access points**, but not all access points can operate as routers.
- While routers manage LAN, connect with external network systems, receive, and distribute data in multiple directions, ensure secured access, and create a point of connectivity, a **Wireless Access Point** usually only provides access to the established network of the router.

Types of Access Points

Depending on the functionalities, **Wireless Access Points** can be categorized into three types listed below.

Standalone access point

It is a **network access point** that offers similar functionality in a wireless network that a hub provides to a wired network. It provides connectivity between various wireless devices. It accepts and relays frames from a connected device and forwards it to the destination device based on its physical address. Typically, a standalone access point is used in commercial establishments like offices, public places, etc.

Multifunction Access Point

A multifunction **access point** is a combination of two or more **access point devices**. Here additional devices are merged with the **wireless access point** to bring additional functionalities along with the current functionality of the access point. A wireless router used in ISPs is the right example of a multifunction access point. It includes three network devices; a regular Ethernet switch, an **access point,** and a router.

Controlled Access Point

This **access point** works as the client of the WLC (Wireless LAN Controller). A controlled **access point** is also referred to as a Lightweight Access Point (LWAP). However, it is not capable of taking any forwarding decision. After receiving a frame from a connected device, the controlled access point forwards it to the WLC instead of the destination device. Next, WLC decides whether the received frame should be delivered or discarded based on the security configuration. If the frame is required to be forwarded, then WLC sends that frame to that Lightweight **Access Point** Protocol (LWAPP) that is connected to the destination device. Subsequently, LWAPP transfers this frame to the destination device.

Key Benefits of Using a Wireless Access Point

WAP network devices offer the following benefits when connected to **Wireless LAN**.

1. **Broader Transmission Range**:

- A **Wireless Access Point** has a broader transmission range of around 100 – 300 meters, whereas a wireless router signal covers only up to 10 -12 meters.
- With a **Wireless Access Point** device, users can access the full network in large places like IT tech parks, big multistorey buildings, etc.

2. Flexible Networking:

In commercial areas, numerous wireless devices are used with different networking patterns based on the environment and needs. Here, **Wireless Access Point** will act as a signal amplifier to extend the coverage of wireless networks, and hence users can roam seamlessly in the network without facing any drop.

3. **More User Access:**

- Usually, the wireless router allows around 10 to 20 devices or users at a time to access the network. But **Wireless Access Point** allows 50 -100 users or devices to access the internet.
- **Wireless Access Point** in a computer network has a better ability to relay and receive signals which allow high usage.

Drawbacks of Wireless Access Points

1. **High cost**:

Wireless Access Point devices are of high cost when you consider that large enterprises need many devices to cover the area where users need network connectivity. So, the service provider can control the cost, and users may be reluctant to opt for WAP and use home routers which are less expensive alternatives.

2. **Poor stability**:

- As WAP networks use air as a medium of transmission, the network stability may not be ideal at times when compared to the optical fiber network since the transmission medium is light and it is fixed. Especially in **Wireless LAN**, there are more devices, yet it is slower than that of a cable network, making it less reliable.
- The wireless signals can be interrupted due to obstacles like heavy rain, huge walls, heavy wind, trees, large gatherings, etc.
- The signal strength relies on the location where the **Wireless Access Point** device is deployed.

3. **Less Secure**:

   Compared to the wired network, **Wireless Access Point** devices are less secure since air s used as a transmission medium, and skilled hackers might be able to breach the security barriers. However, the security features are much more advanced these days, and hacking a **WAP network** is much more difficult.

Applications of Access Points (AP) in Wireless LAN

Some of the top useful applications of **Wireless Access Point include,**

- Suppose the current router is unable to accommodate wireless devices. In that case, you can extend the network by adding an access point in **the wireless LAN** rather than going for a second router.
- Companies can deploy a bunch of **access point devices** to ensure full internet connectivity is available across the office premises.
- **Wireless Access Points** facilitate Wi-Fi infrastructure mode networking.
- Although Wi-Fi connections don’t need access points to function when we speak technically, but they allow Wi-Fi networks to reach larger distances and offer access to more clients. Current **Wireless Access Points** support up to 255 users, while old ones were able to support only around 20.
- **WAP network** also offers a bridging capability that allows a local Wi-Fi network to connect with other cable networks.
- You can also use **Wireless Access Points** to increase the signal range & strength of your **wireless LAN**. It offers full-range wireless coverage and eliminates “dead spots,” especially in large spaces like office buildings, resorts, etc.

Conclusion

A **Wireless Access Point** is necessary for any enterprise or institution that constantly connects numerous wireless internet users. The **WAP network** offers many unique advantages compared to a conventional wireless router. **Access point devices** are easy to set up, cover a broader range than a router, offer flexible networking, and connect more users and devices than a router. Also, using Wireless Access Point to set up a **wireless LAN** can provide better connectivity and eliminate buffering even when transmission signal strength is weak.

WAP network is more convenient for accessing that router. Adding new users to the network is less complicated when compared to routers. Also, you can add guest users to the **wireless LAN** and give them secured access through a password. Additionally, you can segment users to safeguard your network assets and resources. When you opt for Wireless Access Points to connect **to wireless LAN**, you allow the IT infrastructure to assist the next-generation technologies with uninterrupted internet over a wide transmission range. Overall, we can conclude that Wireless Access Points have many benefits that can't be overlooked and hence definitely worth the investment**.**

FAQs

1. **Why use an Access Point to build a wireless network?**

A: Wireless Access Points are network devices that act as a connectivity bridge to connect other devices to **wireless LAN**. An access point is useful for broadening the wireless coverage of an existing LAN network and increasing the count of internet users. High-speed Ethernet cables extend from a router to the nearest **access point device**, which converts the router's wired signal into the wireless transmission of the access point. A WAP is a sub-device within a **wireless LAN** that provides additional locations for different connecting devices allowing them to operate with high internet connectivity. However, a router can sometimes be used as an access point, but not all access points can be converted to routers.

2. **What are the usual types of Access Point configurations?**

A: The usual types of **Access Point** configurations include,

Bridges

Here**, Wireless Access points** will be configured as both non-root or root bridges to join multiple **wireless LAN** networks. A WAP here will create a wireless link with a non-root bridge. The Traffic is later carried over from the wireless link to the fiber network.

Root access point

Here, an **access point** is directly connected to a wired Local Area Network (LAN), offering a connecting junction for wireless usage. If two or more access points are connected to the network, users can get good internet connectivity while roaming within the vicinity.

Repeater access point

Here an **access point** will be configured like a standalone repeater to widen the range of your infrastructure or overcome a hurdle that interrupts radio communication.

Workgroup bridge

Wireless Access Points that are combined together as a workgroup bridge mode can link to other access points as clients & offer network connections for Ethernet port connected devices.

3. **What is the difference between Access Point and Router?**

A: The main differences between access point and router are**,**

Access Point	**Router**
It is a networking device that enables multiple devices to connect with a **wireless LAN** network	It works as a transmitter, receiver and analyzer between computer networks and data that are linked with it.
Maintenance cost is relatively higher	Maintenance cost is comparatively lower than access points
It covers significantly more users and devices than a router	It covers only a small set of devices.
The transmission range is up to 2000 sq. ft	The transmission range is up to 150 ft indoors and 300 ft outdoors.
It can’t function as a router.	A Router can work as an access poin**t.**