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EAPOL (4-way handshake)



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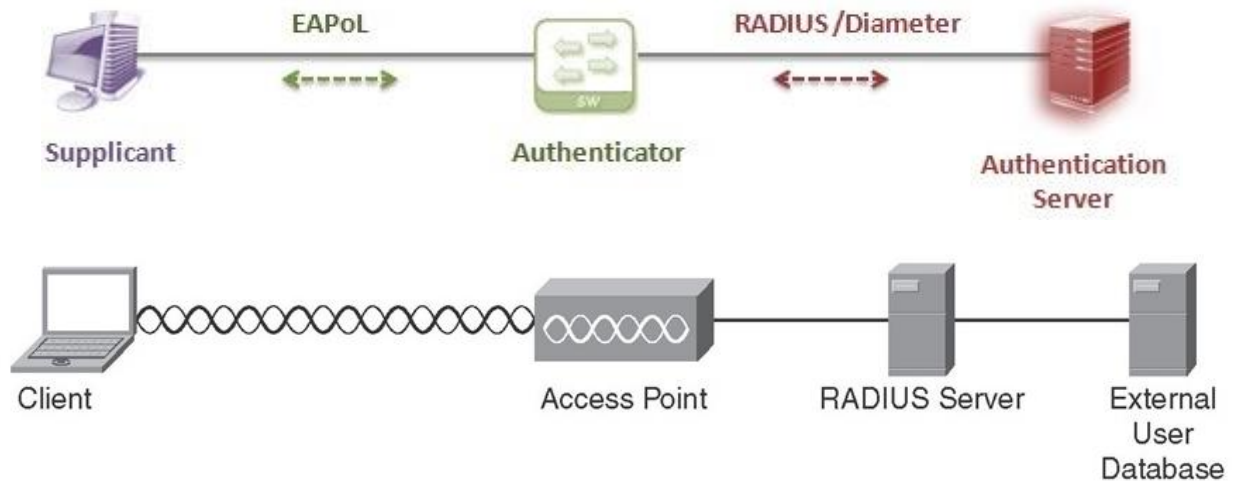
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EAPOL (Extensible Authentication Protocol over LAN):

- EAPOL (Extensible Authentication Protocol over LAN) is a network authentication protocol used in 802.1x (Port Based Network Access Control).
- It is the encapsulation protocol used between the Supplicant (the client device) and the Authenticator (the access point or switch).



- EAPoL packets are used to exchange authentication credentials, establish a secure channel, and negotiate encryption keys.
- The EAPOL 4-way handshake is a security protocol used in WPA2 to establish a secure connection between a wireless client and an access point.
- It is a four-message exchange that allows the client and access point to generate a pairwise transient key (PTK) that is used to encrypt all subsequent traffic between them.

The four messages in the EAPOL 4-way handshake are:

Message 1: The access point sends a message to the client containing an ANonce (Authenticator nonce) and a Key Replay Counter.

Message 2: The client responds with a message containing its own SNonce (Station nonce) and a Message Integrity Code (MIC).

Message 3: The access point responds with a message containing its own MIC.

Message 4: The client responds with a message acknowledging the successful completion of the handshake.

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The ANonce and SNonce are random numbers that are used to ensure that the messages in the handshake cannot be replayed. The MIC is a cryptographic hash that is used to verify the integrity of the messages.

The PTK is generated by combining the ANonce, SNonce, and the Pairwise Master Key (PMK). The PMK is a 256-bit key that is shared between the client and access point. The PTK (pairwise transient key) is used to encrypt all subsequent traffic between the client and access point.

The EAPOL 4-way handshake is a secure protocol that helps to protect wireless networks from unauthorized access. It is a critical part of the WPA2 security suite and helps to ensure that only authorized users can access a wireless network.

Here are some of the benefits of using the EAPOL 4-way handshake:

- It is a secure protocol that helps to protect wireless networks from unauthorized access.
- It is efficient and does not add a significant amount of overhead to wireless networks.
- It is widely supported by wireless clients and access points.

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