**LM 5. Wireless Network Security**

1. **LM5. Student Learning Outcomes**

After completing this module, a student will be able to:

* Describe the architecture for securing wireless network
* List the measures to physically secure WLAN
* Describe the measures for access control and authentication in WLAN
* Discuss the issues of using VPN to secure WLAN
* Differentiate intrusion detection systems and intrusion prevention systems
* Describe the method of data protection using in enterprise wireless network
* Describe how to develop a comprehensive security policy for wireless network
* Describe the auditing process for a wireless network security

1. **LM5. Learning Material & Study Guide**

Note: this module covers the security measures for wireless network.

* Describe the architecture for securing wireless network

<https://www.cisco.com/c/en/us/about/press/internet-protocol-journal/back-issues/table-contents-14/wireless-networks.html>

-comprehensive security: physical security, authentication, encryption, VPN, and security policy and management.

* List the measures to physically secure WLAN

<http://searchsecurity.techtarget.com/feature/Wireless-AP-placement-basics>

<http://searchnetworking.techtarget.com/feature/Using-VLANs-to-compartmentalize-WLAN-traffic>

-Design for security. Control Radio Frequency signal leak by strategically placing APs and using appropriate antenna type and power level.

-Physical or logical segmentation. Use VLAN to compartmentalize WLAN traffic.

* Describe the measures for access control and authentication in WLAN

<https://books.google.com/books?id=noWHCgAAQBAJ&pg=PA161&lpg=PA161&dq=ssid+bofuscation&source=bl&ots=CfCLH4fhhY&sig=93JeGN8aTOHZEGKUS7jNnGDpluE&hl=en&sa=X&ved=0ahUKEwin_7mA98TYAhVE0VMKHa9WB7IQ6AEIKzAA#v=onepage&q=ssid%20bofuscation&f=false>

[https://www.howtogeek.com/204458/why-you-shouldn’t-use-mac-address-filtering-on-your-wi-fi-router/](https://www.howtogeek.com/204458/why-you-shouldn't-use-mac-address-filtering-on-your-wi-fi-router/)

-SSID obfuscation, MAC Filtering

<https://www.cisco.com/c/en/us/td/docs/routers/access/wireless/software/guide/SecurityAuthenticationTypes.html#wp1034858>

-open authentication, pre-shared key authentication, EAP authentication

<https://en.wikipedia.org/wiki/IEEE_802.1X#Typical_authentication_progression>

-802.1x authentication

* Describe WLAN authorization by combining 802.1X and VLANs

<http://searchnetworking.techtarget.com/feature/Combining-8021X-and-VLANs-for-WLAN-authorization>

* Discuss the issues of using VPN to secure WLAN

<https://en.wikipedia.org/wiki/Virtual_private_network>

<http://searchnetworking.techtarget.com/tip/WLAN-security-Beyond-the-VPN>

- What’s VPN? What are the security challenges WLAN bring to VPN

* Differentiate intrusion detection systems and intrusion prevention systems

<https://www.networksasia.net/article/what-are-differences-between-intrusion-detection-and-intrusion-prevention-1227715200>

* Describe the method of data protection using in enterprise wireless network

<https://www.howtogeek.com/204697/wi-fi-security-should-you-use-wpa2-aes-wpa2-tkip-or-both/>

-encryption algorithm used in WEP, WPA, and WPA2. WPA2 AES mode is preferred.

<https://www.networkworld.com/article/3247658/wi-fi/wi-fi-alliance-announces-wpa3-to-secure-modern-networks.html>

-describe WPA3 and new feature of WPA3

<https://en.wikipedia.org/wiki/IPsec>

-Internet Protocol Security (IPSec) operates at network layer. Protect network traffic either wired or wireless. Two modes: transport mode and tunnel mode.

<https://www.cisco.com/c/en/us/about/security-center/framework-segmentation.html>

<https://www.calyptix.com/research-2/ssl-vpn-and-ipsec-vpn-how-they-work/>

<http://searchsecurity.techtarget.com/tip/IPSec-VPN-vs-SSL-VPN-Comparing-respective-VPN-security-risks>

IPsec VPN is one of the main VPN technology. SSL VPN is the other one.

* Describe how to develop a comprehensive security policy for wireless network

<http://www.ciscopress.com/articles/article.asp?p=1998559&seqNum=3>

-network security concepts

<http://searchmobilecomputing.techtarget.com/tip/Creating-a-wireless-security-policy>

-security policy specific to wireless network

* Describe the auditing process for a wireless network security

<http://www.wseas.us/e-library/conferences/2008/bucharest/mcbe/13mcbe.pdf>

-you can just focus on section 4.