

Chapter 7: Wireless LAN Topologies

In chapter 7, the book discusses a few different topologies for Wireless networking. The first technology discussed is Wireless Wide Area Network (WWAN), which is used to connect large geographical regions together, and allows for communication between LANs across the world. In the wireless space, this is usually done with cellular data carriers implementing technologies such as GPRS, CDMA, TDMA, LTE, and GSM. Initially, bandwidth limitations caused these technologies to slow to a crawl. This was because the sophistication needed to handle high transmission rates were just not available at the time. Now, the tech has evolved to be much more powerful and capable of handling such high volumes of traffic. The second Wireless technology discussed is the Wireless Metropolitan Area Network (WMAN). WMAN technology is used to provide radio frequency coverage for an entire city and its surrounding suburbs. The 802.16 standard of technology, sometimes referred to as Worldwide Interoperability for Microwave Access (WiMAX) was developed for use with WMANs and is responsible for ensuring that all WMAN devices are able to connect to each other and provide signal access for as many devices as possible. In the early years of WMANs, cities tried to implement large-scale 802.11 networks that would provide internet access to the entire area. The issue with this is that this technology was not designed to handle data of that scale, so ultimately these networks were scrapped. With the development of new technology, such as 802.16, these cities may be able to again attempt to implement these services for their citizens. The next network technology discussed is the Wireless Personal Area Network (WPAN), which is defined by a small network handling devices that are on or near the user's physical space. The most important aspect of this technology is Bluetooth. In a WPAN, the user's cell phone, computer,

tablet, headphones, game controllers, etc are all part of this user's network. Infrared is another important technology that resides within the WPAN space. This is responsible for television remotes, IR receivers, night cameras, etc. The main difference between Bluetooth and Infrared is that Bluetooth uses FHSS technology, but infrared uses light waves to transmit the required data. The IEEE group responsible for this network topology is IEEE 802.15, which handles Bluetooth and Zigbee, a low-cost alternative for WPAN communication mediums. In a Wireless Local Network (WLAN), interconnectivity is possible between devices that reside in a building or across multiple buildings on a campus. This standard is commonly thought of as Wi-Fi, which enhances the use case of wireless devices being able to connect to the internet using the company's hardware. This does provide a security risk, so if a company is implementing a WLAN they should take extra precautions to ensure their network is secure. In a usual setting, WLANs may use many access points that spread across a large area of a campus. These access points are able to communicate with the router and campus servers, which provides a convenient way for the building's inhabitants to get work done efficiently and fast, with minimal downtime. In these network types listed above, there are multiple configurations that company's can look towards to suit their needs and keep their business running smoothly. In an access point system, the default configuration is called root. Other configurations for APs include Mesh mode, sensor mode, bridge mode, workgroup bridge mode, and AP as a Client Mode. In mesh mode, the access points are able to communicate together and load balance the data being requested. Sensor mode is typically applied to networks that have wireless IDS in place. Sensor mode allows the WIDS to receive signals and devices on the network, and determine if there is any threat present in that data.