Lab 9.3.9 WLAN Design

Estimated Time: The time needed for this lab may vary

Number of Team Members: Students will work individually or in small groups.

Objective

In this lab, students will identify various applications of wireless local area networks (WLANs). The student will then choose one application and detail a WLAN design for it. The detailed design should utilize all of the following to present their findings:

- Drawings
- Configurations
- Topologies
- Issues
- Advantages
- Disadvantages
- Challenges
- Any other useful information

Scenario

The four main design requirements for a WLAN solution are as follows:

- It must have high availability
- It must be scalable
- It must be manageable
- It must be an open architecture allowing integration with third-party equipment

Along with the design requirements there are a few WLAN design basics:

- Same principles apply to all WLAN designs
- Get to know the customer and the customer's needs
- Design the WLAN to meet those needs

Preparation

The student will read and understand the material presented in FWL Module 9 prior to the lab.

Tools and resources

The following tools and resources will be helpful with this lab:

- Online Internet Research
- Industry Site Visits or contacts
- Trade Journals

Step 1 Customer industry

Identify the customer's industry that the team will design the Wireless LAN application for. Some common industries are listed below:

- Retailing
- Warehousing
- Healthcare
- Hotel/Hospitality
- Education
- Wireless Office
- Transportation
- Government and Military
- Internet Service Provider

Provide a brief summary of the business.

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Step 2 Data collection

When dealing with data collection, consider the following questions:

What are the needs of the customer?

What applications will be used over the WLAN?

What bandwidth do these applications require?

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Step 3 Load and coverage

The following questions should be answered when dealing with load and coverage:

What is the total number of potential wireless clients on the network?

How big of an area has to be covered by the wireless LAN?

A diagram or sketch of the coverage area is required with this section.

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Step 4 Bandwidth and throughput

The following should be dealt with in regards to bandwidth and throughput:

What actual bandwidth speed is required by the wireless networking application used?

How will this bandwidth requirement be achieved with the chosen AP configuration?

Cell size

Channels

Data rate settings

High speed technologies like 802.11a or 802.11g

Note this information on the diagram.

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Step 5 Mobile users

When dealing with WLANs the demands of mobile users must be considered:

Will the users need to roam about the coverage area?

Will they require seamless roaming?

What kind of design can be used in the topology to accomplish these objectives?

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Step 6 Power consumption

What kind of power settings will be used on the wireless clients to conserve power when and if they need to be mobile and roam about the facility?

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Step 7 Interference

The following steps must be taken when dealing with potential interference to the WLAN:

Identify the typical sources of RF interference for the type of industry that the WLAN application is being designed for.

Locate each type of RF interference and note a possible option or solution for this type of interference.

Note the sources of RF interference on the diagram.

Step 8 Encryption

Encryption must also be considered depending on the client and the industry the WLAN is being designed for:

What are the data security and privacy requirements of the customer?

What methods will be used to ensure their privacy and security requirements for the wireless LAN?

No encryption

40 bit encryption

128 bit encryption

Note the advantages and disadvantages of each.

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Step 9 Fire code and safety

What are the fire and safety risks usually associated with the industry coverage area that has been chosen? List each risk and identify the available options and solutions for each of them.

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