



CCNP Wireless CUWSS

Quick Reference

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Chapter 1

Prepare for the Site Survey

Conducting a wireless site survey is a critical step of a carefully planned journey. Before rushing to the facility to be surveyed with your laptop and some access points (APs), you must collect information about the purpose of the required wireless coverage. The final wireless network design will depend heavily on several factors, such as the building type, the wireless clients specifications and needs, the physical area where the APs have to be positioned, or even the type of industry run at the facility. This chapter helps you plan for this site survey by listing the main elements that you need to have in mind before planning for the actual survey.

Identify Customer Requirements

One of the most obvious requirements of the site survey preparation is to take into account the customer requirements. Your aim is not to provide a flat coverage throughout the facility, but to adapt the AP density and type, design roaming paths, throughput, and security levels to match your customer needs, even if this customer is not able to express them in “wireless words.”

RF Application Needs

One common need of wireless coverage is “data” for guest Internet access or staff mobility. In this configuration, a first expectation is that the user will be relatively stationary. Users might move from one room to another, but their behavior is called “nomadic” more than “roaming.” Nomadic means that the wireless connection will be used from a static position (for example, a laptop on a table). The user might move to another room and expect the laptop to still be connected to the wireless network in the new location. In most cases, the user will not check the connection while moving. The connection might have dropped several times while moving from one room to the other without really

impacting the user experience, as long as the disconnections are short enough for the user not to see any timeout error message when resuming his activity in the new location. Most standard data applications will need to be disconnected for several seconds before displaying such a timeout message. The second expectation in this type of deployment is that clients will use the wireless network for applications such as web browsing, e-mail, or occasional file transfer. A requirement to fulfill this expectation is IP persistence, where the user roams within the network and desires to maintain persistent application connectivity.

In the case of web or e-mail applications, the requirements usually are “wireless coverage from wherever users will connect.” These locations can easily be precisely determined. When the need extends to file transfer, a longer dialog with the customer is often needed. Some people believe that all users will get 54 Mbps, or even 300 Mbps throughput. On the other end of the spectrum, some people think that wireless links are highly unreliable and insecure, and intend to limit their usage to the strict minimum. Your customer is probably somewhere between these two extremes.

Although web browsing type of usage is common, “data coverage” can have many different meanings that need to be examined carefully with your customer. Mobile users transferring heavy Computer Aided Design (CAD) documents might have different coverage needs from wireless users using thin clients to access central resources.

In contrast with this stationary or nomadic type of usage, some users need roaming. Roaming is the action of actively using the wireless connection while moving. A typical example is VoWLAN, where users commonly walk while talking. Coverage and throughput must be consistent all along the path, from the corridor to the staircase or the elevator and down (or up) to the next floor. VoIP uses RTP and UDP and does not tolerate drops in the connection. Its real time nature tries to carefully evaluate the roaming paths and design a consistent coverage accordingly. This will impact the number and type of APs to deploy, along with their position and the distance between them. You would probably not cover a staircase for a web browsing type of application (few people check their e-mail, using an open laptop, while walking up or down the stairs), whereas you would definitely cover the staircase for a VoWLAN deployment.

Another type of roaming application is data collection. Users typically carry a handheld device (such as handheld scanner or tablet) to gather information in a facility. Throughput is not expected to be high, because the amount of information to be transmitted is usually rather low. Nevertheless, coverage has to be consistent throughout the facility. If the application on the handheld cannot access the network, the user cannot work.

Type of Facility

Determining the type/construction of the facility to be covered might also help you plan for the type of coverage. Although there might be infinite variations in what type of usage your client intends for the wireless network, each type of building has “typical” signature as far as type of needs is concerned. Use this section as a guide to help your client decide the required coverage.

Enterprise Office

The enterprise office is usually rich in potential applications and features, such as standard data (e-mail, calendar, basic file transfer, and database access) or more demanding data applications requiring permanent coverage and consistent throughput (supply chain management, sales force automation, customer relationship management). This type of environment might also have specific needs related to location services, VoWLAN, or security. In any case, your wireless design should support the most critical applications and clearly states its boundaries; if your coverage does not allow for location services, state it and do not let your customer assume that such coverage might be a possible extension by simply adding a location server.

A variation from the enterprise office is the small office/home office (SOHO). A common approach to this type of environment is that the small office does not need a detailed site survey. Deploying a few APs is enough to ensure proper coverage. Nevertheless, small offices are often located near other small offices. A typical issue is heavy RF interferences from the many neighboring wireless networks. A thorough Layer 1 sweep might be needed to select the best channels and power levels for your APs. Lowering the transmit (Tx) power to just what is needed to provide coverage inside the office area makes the network more secure against interferences from outside the office. When the small office is a branch of a larger office, you can integrate the small office wireless network into the larger office management tool by using HREAP APs connected to the larger office wireless LAN controllers; install a small

WLAN controller or use an ISR with an embedded WLAN controller. In all cases, you can monitor the small office from the larger office WCS.

Industrial/Manufacturing Environment

Industrial and manufacturing environments refer to factories or warehouses. They require a careful site survey, particularly focusing on a Layer 1 sweep to detect sources of interferences. A typical characteristic of this type of environment is the presence of numerous metallic objects and sources of electromagnetic fields (electric engines, forklifts, and so on). Although typical applications are related to data collection, you need to carefully examine with your customers what the other needs might be. Location services and VoWLAN are more commonly expected in this type of environment.

Outdoor Coverage

The wireless network might need to extend beyond the corporate building edge to cover an outdoor storage area, a parking lot, or even the entire campus. Outdoor coverage is often different from its indoor counterpart. The channels and power levels that can be used outdoor are specific. You also need to determine if the coverage needs to be a point-to-point bridge between two buildings or if an entire blanket is expected over a large area. In this last case, you need to thoroughly study the interference pattern of the area to cover and the expected applications to be provided (wireless cameras feeds, roaming calls while walking, web access type of coverage from stationary stations, and so on). As a CCNP Wireless professional, you are expected to have some awareness of indoor versus outdoor wireless coverage differences and perform a basic outdoor survey. Also know that your expected knowledge about outdoor wireless for the CCNP Wireless certification is limited. Outdoor mesh networks are a specific specialization beyond the scope of the CCNP Wireless exams.

Industry Verticals

Beyond the type of facility, the type of industry in which your customer operates might give you interesting hints about what type of application and coverage is expected.

Early adopters of wireless technology were in vertical markets where users needed more mobility than throughput or interoperability. Today, interoperability is a concern, and your customer might choose a technology (802.11b/g or 802.11a with or without 802.11n support) based on this criterion. Because 802.11n is backward-compatible with pure 802.11b/g or 802.11a network, it is a popular choice across all of today's markets. Figure 1-1 shows popular technology choices for various markets. Notice that even though all three technologies work well, this figure only reflects common choices.

FIGURE 1-1
Popular technology
choices

	802.11a	802.11b/	802.11n
Enterprise Office	X	X	X
Health Care	X	X	X
Higher Education	X	X	X
Financial Institutions		X	X
Hospitality		X	X
Industry/Manufacturing		X	X
Retail		X	X
Transportation	X	X	X
Warehousing		X	X

Health Care

Health care customers often use specific applications that need to be studied carefully to determine the type of coverage of throughput they require. For example, portable X-Ray devices might be bandwidth consuming, operate only in the already crowded 2.4 GHz band, and be used in areas (such as clean rooms) where multipath is a serious issue.

Hospitals commonly require dense coverage to provide high throughput. You have to keep in mind that this type of environment might already use RF devices in the ISM band (2.4 GHz or 5 GHz). These devices might not be 802.11 and would be a source of interference for the 802.11 network. On the other hand, the 802.11 network will also disturb these devices! You must verify, before any site survey or deployment planning, if such devices are in use,

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