



Aironet Wireless LAN Fundamentals & Site Survey

Length
4 days

Format
Lecture/lab

Track
Design

Version
6.0

Course Description

The Aironet Wireless LAN Fundamentals and Site Survey (AWFSS) v6.0 is a technical training course targeted to technical sales staff and technical engineers who will be designing, selling, and installing enterprise-class wireless LANs, such as in-building wireless LANs and building-to-building wireless bridges. It covers topologies, configuration, and troubleshooting, as well as security and management issues.

Who Should Attend

Channel Partners/Resellers, Customers, Employees

Recommended Prerequisites

You will gain the most from this course if you have a basic understanding of the following topics:

- Basic Computer Literacy
- Knowledge of fundamental networking components and terminology
- Knowledge of the Open Systems Interconnection (OSI) reference model
- Knowledge of basic LAN components and functions

Related Training

- Aironet Wireless LAN Advanced Topics (AWLAT)

AWFSS

Learning Objectives

After completing this course, you will be able to:

- Describe radio frequencies used in WLAN applications
- Identify antenna concepts and interpret regulatory compliance
- Identify components, topologies, and the use of channels for WLANs
- Describe detailed technical features, functions, and benefits of the WLAN product offerings available from Cisco
- Select the appropriate wireless bridge model and describe how it offers a better solution than the other alternatives
- Configure a Cisco client card with Cisco utilities
- Configure the core access point and bridge
- Secure a WLAN using security methods and products available from Cisco
- Implement a WLAN management solution available from Cisco
- Describe the requirement necessary for deployment and performing a site survey
- Describe the steps, concepts, and tools available while performing a site survey



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Course Outline

Module 1: Wireless LAN (WLAN) Radio Technologies

Lesson 1: Defining Unlicensed Radio Frequency Bands and Standards

IP Wireless Frequency Bands
WLAN Standards
802.11 Standards and Usage

Lesson 2: Describing Spread Spectrum RF Technology and Modulation Techniques for 802.11

Defining WLAN RF Technology
Transmitting a Signal
IEEE 802.11b Characteristics
IEEE 802.11a Characteristics
IEEE 802.11g Characteristics

Lesson 3: Defining Multipath Distortion and Diversity

Multipath Distortion
Mitigating Multipath Distortion

Module 2: Antenna Concepts

Lesson 1: Defining Antenna Theory

Definition of Terms
Antenna Concepts
Various Antenna Types
Typical Antenna Diagram

Lesson 2: Defining Antenna Regulatory Compliance

Antenna Characteristics

Lesson 3: Answering Common Antenna Deployment Questions

Common Questions
Bigger Antennas
Use of Amplifiers
Attenuation
Protecting Against Lightning
Weatherproofing Radio Connectors
Installing Antennas Outdoors

Module 3: WLAN Topologies

Lesson 1: Describing WLAN Technology Features

Defining a WLAN
Typical WLAN Topologies

Lesson 2: Describing Channels and Multi-Rate Shifting

Channel Reuse
Mixed Environments
Multi-Rate Shifting

Lesson 3: Introducing Wireless Mesh Networking

Wireless Mesh Networking
Outdoor Wireless Mesh Solution
Components
Adaptive Wireless Path Protocol
Mesh Applications

Module 4: Cisco Aironet WLAN Products

Lesson 1: Describing Wireless LAN Access Points, Bridges Antennas and Accessories

Cisco Aironet Indoor Rugged Access Points
1500 Series Wireless Outdoor Mesh Access
Points
1300 Series Access Point and Bridge
Cisco Aironet Access Point Comparisons
1400 Series Wireless Bridge
Powering Options for Access Points and
Bridges
Power Injectors for Access Points
2.4-GHz Antennas
5-GHz Antennas

Lesson 2: Describing WLAN Client Adapters

Cisco Aironet 802.11a/b/g Client Adapter
Cisco Wireless IP Phone7920
Cisco Compatible Extensions Program



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Lesson 3: Describing WLAN Network Management, Control, and Services

Cisco's Core WLAN Network Management
CiscoWorks Wireless LAN Solution Engine
CiscoWorks Wireless LAN Solution Engine Express
Cisco Secure ACS Solution Engine
Cisco's Advanced WLAN Network Management
Cisco WLAN Controllers
Cisco Wireless Control System
Cisco Wireless Location Appliance
Integrated Services Routers
Cisco 3200 Series Wireless and Mobile Routers

Lesson 4: Introducing Access Point Enterprise-Class Features

Software Support
Security
Virtual LAN Support
Quality of Service

Module 5: Wireless Bridges

The Global Application Delivery Problem
Application Optimization
Application Monitoring
Application Security
Management Functionality

Lesson 1: Using Wireless Bridges and Alternatives

Wireless Bridges and Bridge Alternatives
1300 Series Wireless Bridge
1300 Series Outdoor Channels and Power Levels
1400 Series Access Point Bridge
1400 Series Outdoor Channels and Power Levels
BR1410 and BR1310 Deployment Scenarios

Lesson 2: Choosing Roles in the Radio Network

Role in Radio Network
Comparing Access Points and Bridges

Lesson 3: Determining Bridge Path Information

Installation Considerations
Distance and Path Loss Considerations
Bridge Distance Calculations
Outdoor Path Considerations
Antenna Considerations
Common Deployment Questions

Module 6: Aironet Desktop Utility

Lesson 1: Describing Configuration Utilities

Software Download
Supported Operating Systems
PC Card LEDs
Aironet Client Administrator Utility

Lesson 2: Installing and Configuring Aironet Desktop Utility

Install the Aironet Desktop Utility
Current Status Page
ADU Profile Manager
ADU Tools

Module 7: Core Access Point and Bridge Basic Configuration

Lesson 1: Describing Cisco Unified Wireless Network Core Products

Introducing WLAN Management
WLAN Core Products Overview
Components and Protocols
Management Benefits
Security
Roaming Concepts

Lesson 2: Setting up Autonomous Access Point Hardware

Access Point Hardware
Initial Connect and Reset



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Course Outline

Lesson 3: Configuring the Access Point

- Access Point: Root Mode
- Home Page
- Express Setup
- Express Security Setup
- Network Interfaces
- Cisco Services
- VLAN Configuration
- QoS Configuration
- Simple Network Management Protocol Setup
- Filtering
- Access Point Cisco IOS CLI

Module 8: Security

Lesson 1: Introducing 802.11 Security

- WLAN Security
- Wired Equivalent Privacy
- Enhanced 802.11 Security
- Wi-Fi Protected Access
- Advanced Encryption Standard Encryption

Lesson 2: Defining Vulnerabilities of WLAN Security

- Basic 802.11 Security Concerns
- Documented WEP Attacks
- Passive and Active Attacks

Lesson 3: Introducing Cisco Wireless

- Security Suite
- Strong Authentication
- Cisco LEAP
- EAP-FAST
- EAP-PEAP
- EAP-TLS

Lesson 4: Configuring Cisco Secure ACS

- Network Configuration
- System Configuration
- External User Database
- Group Setup
- User Setup

Lesson 5: Configuring Encryption and Authentication on Autonomous Access Points

- Securing the Access Point
- Configuring the Access Point for Encryption and Authentication
- Non-Root Device Configuration
- Configuring MAC Authentication
- Configuring the Client for Authentication and Encryption

Module 9: WLAN Management Solutions

Lesson 1: Introducing CiscoWorks Wireless LAN Solution Engine

- Wireless LAN Solution Engine Features
- Device Discovery, Management and Configuration
- Fault Monitoring
- Using Reports
- Location Manager
- Monitoring your Network with Radio Management
- Intrusion Detection System

Lesson 2: Introducing the Cisco Wireless Control System

- Wireless Control System Overview
- Monitoring your Network with Cisco WCS
- Cisco WCS Maps
- Rogue Access Point Detection

Lesson 3: Introducing the Cisco Wireless Location Appliance

- Cisco Wireless Location Appliance Overview
- Location Tracking
- Calibration
- System Design
- Designing WLAN for Location
- Creating a Network Design in Cisco WCS
- Importing the Cisco Wireless Location Appliance into Cisco WCS
- Enabling and Configuring Device Tracking



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Course Outline

Lesson 4: Identifying Other WLAN Management Tools

- Management Information Bases
- Wired Network Management System Tools
- Client Management
- RF Spectrum Management
- Tool Comparison
- Module 8: Security

Module 10: Site Survey Preparation and Techniques

Lesson 1: Determining the Deployment Requirements for a Site Survey

- Methodology
- Customer Requirements
- Protocol Evaluation
- Coverage
- Possible Problem Areas
- Common Questions
- Access Point Placement Guidelines
- Enterprise Wireless Planning
- Documentation
- Preassessment Form

Lesson 2: Performing a Site Survey Preparation

- Access Point Placement
- Coverage Parameters
- Environmental Effects
- Survey Mistakes

Module 11: Manual Site Survey Tools and Utilities

Lesson 1: Identifying Site Survey Tools

- Types of Access Points
- Correct Surveying Equipment
- Client Cards
- Antennas
- Antenna Cable Loss
- Recommended Site Survey Equipment
- Cisco Wireless Site Survey Kit

Lesson 2: Using Site Survey Utilities

- Cisco Site Survey Tool
- Cisco Aironet Site Survey Utility
- AirMagnet Survey Pro Tool
- Cisco IP Phone 7920 Site Survey Tool
- Access Point Configuration
- Access Point Statistics
- Cisco 1000 Series Lightweight Access Point

Lesson 3: Using AirMagnet Site Survey

- Tool for a Manual Survey
- Determining DSA Coverage
- DSA Coverage Audit
- Using the AirMagnet Site Survey
- Add an Access Point Icon
- Site Viewer Display Modes



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Aironet Wireless LAN Fundamentals & Site Survey

Course Labs

- Lab 6-1: Client Configuration
- Lab 7-1: Set Radio SSIDs, Channel, and Data Rates for an Access Point
- Lab 7-2: Restore the Access Point to Default Data Rates
- Lab 7-3: Test Throughput to a Lab Server Using FTP
- Lab 7-4: Set Data Rates on the Access Point for 802.11b Only
- Lab 7-5: Compare Throughput with 802.11g Protection Turned on and Turned off
- Lab 7-6: Walk to Different Areas of the Lab to Measure Throughput
- Lab 8-1: Configure the Wireless Client Card and Access Point for WEP
- Lab 8-2: Configure the Access Point and Cisco Secure ACS for LEAP
- Lab 8-3: Configure the Access Point for LEAP with WPA Encryption
- Lab 8-4: Configure the Access Point and Cisco Secure ACS to add MAC Address Authentication to LEAP Authentication
- Lab 9-1: Setting Up the Cisco Core Product Components
- Lab 9-2: CiscoWorks WLSE Auto-Discovery



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