WILEY

Certified Wireless Network Administrator (CWNA)
PW0-106

Chapter 16
Site Survey Systems and Devices

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Chapter 17 Overview

- Site Survey Defined
- Site Survey Tools
- Coverage Analysis

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Site Survey Defined

- The process of spectrum and coverage analysis with the intention of planning a WLAN
  - Coverage analysis
  - Interference source identification
  - Placement and configuration of devices

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Protocol and Spectrum Analysis

- Protocol analysis involves capturing and analyzing actual WLAN frames
- Spectrum analysis investigates only the RF activity in a space
- Two categories exist
  - Standalone
  - Integrated

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Spectrum Analysis

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Potential sources of interference in the 2.4 GHz ISM band

- Microwave ovens
- 2.4 GHz cordless phones, DSSS and FHSS
- Fluorescent bulbs
- 2.4 GHz video cameras
- Elevator motors
- Cauterizing devices
- Plasma cutters
- Bluetooth radios
- Nearby 802.11, 802.11b, 802.11g, or 802.11n (2.4 GHz) WLANs

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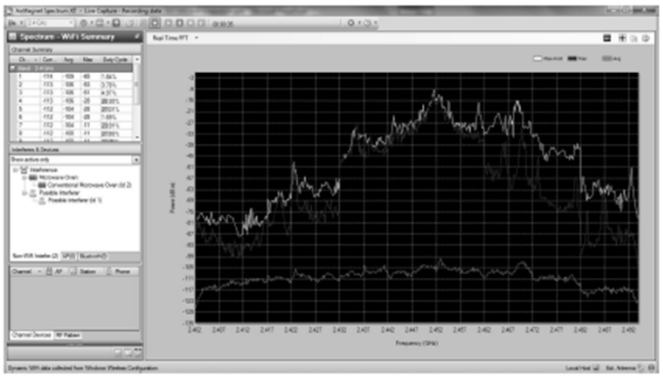
Microwave oven spectrum use



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Potential sources of interference in 5 GHz U-NII bands

- 5 GHz cordless phones
- Radar
- Perimeter sensors
- Digital satellite
- Nearby 5 GHz WLANs
- Outdoor wireless 5 GHz bridges

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Coverage Analysis

- Proper coverage analysis must be performed using some type of received signal strength measurement tool
- Common mistake is leaving the access point radio at the default full-power setting, which can cause hidden node
- Good starting point for a 2.4 GHz access point is 25 mW transmit power

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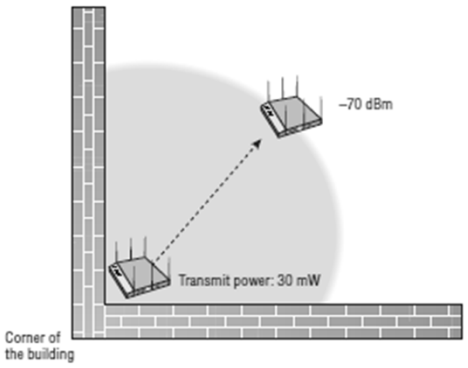
Starting coverage cell



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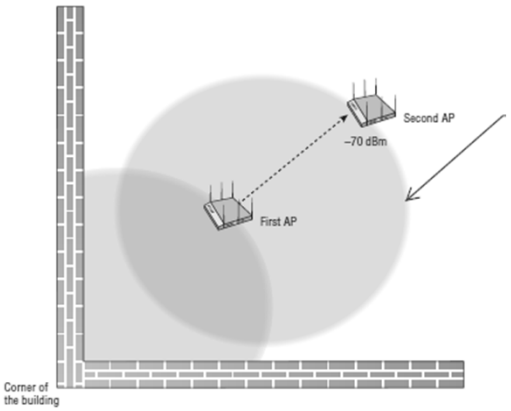
Second AP location



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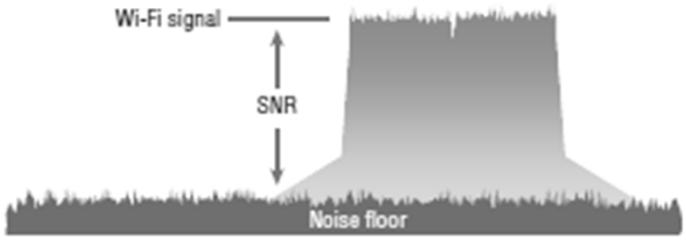
Signal-to-Noise Ratio (SNR)



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Recommended coverage for a 2.4 GHz VoWiFi network

Data rate	Minimum received signal	Minimum signal-to-noise ratio
54 Mbps	–71 dBm	25 dB
36 Mbps	–73 dBm	18 dB
24 Mbps	–77 dBm	12 dB
12/11 Mbps	–82 dBm	10 dB
6/5.5 Mbps	–89 dBm	8 dB
2 Mbps	–91 dBm	6 dB
1 Mbps	–94 dBm	4 dB

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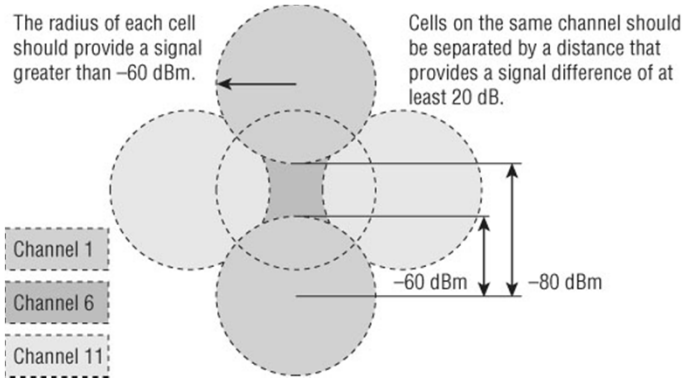
VoWiFi Cell Recommendation



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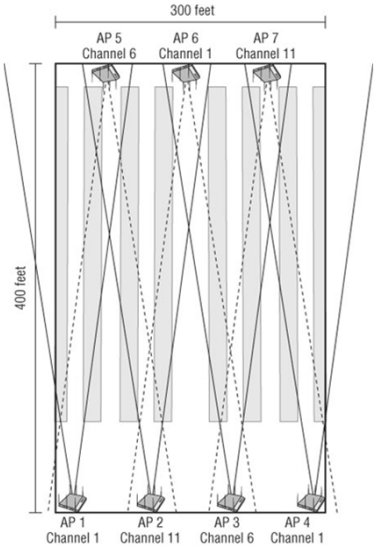
AP Placement – Semidirectional Antennas



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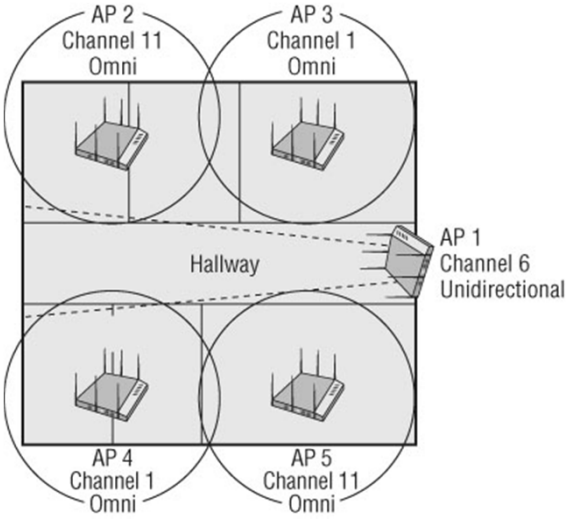
AP Placement – Omnidirectional Antennas



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Site Survey Tools (Indoor)

- Spectrum analyzer
- Blueprints
- Signal strength measurement software
- 802.11 client cards
- Access points
- WLAN controller
- Battery pack
- Binoculars
- Flashlight
- Walkie-talkies
- Antennas
- Temporary mounts
- Digital camera
- Measuring devices
- Colored tape
- Ladder or forklift

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WLAN mobile site survey mast

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Site Survey Tools (Outdoor)

- Topography map
- Link analysis software
- Calculators
- Maximum tree growth data
- Binoculars
- Walkit-talkies
- Signal generator and wattmeter
- Variable-loss attenuator
- Inclinometer
- GPS
- Digital camera
- Spectrum analyzer
- High-power spotlight or sunlight reflector

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Signal generator and wattmeter

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Coverage Analysis

- Manual
  - Passive
  - Active
- Predictive
- Self-Organizing WLANs

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Macintosh detailed Wi-Fi information

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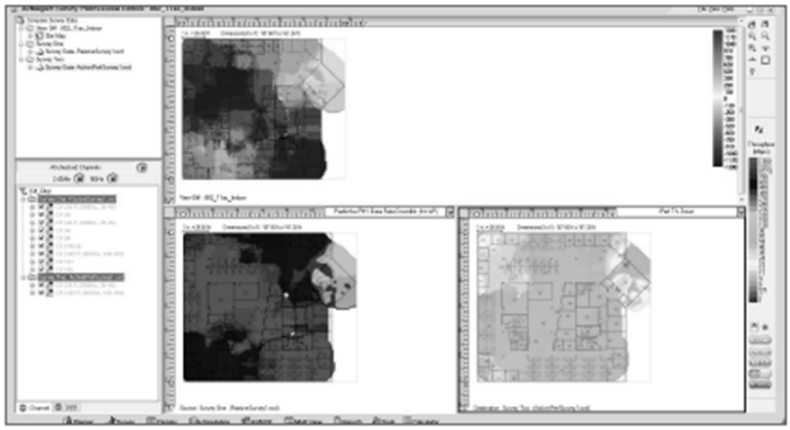
Commercial coverage analysis application



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Wireless Network Validation

Fluke AirCheck
Wi-Fi Tester

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