

Introduction

The Wireless# certification covering the current objectives will certify that successful candidates know the fundamentals of RF behavior, can describe the features and functions of wireless components, and have the skills needed to install and configure wireless network hardware components. A typical candidate should have a basic understanding of data networking concepts.

The skills and knowledge measured by this examination are derived from a survey of wireless networking experts and professionals. The results of this survey were used in weighing the subject areas and ensuring that the weighting is representative of the relative importance of the content.

The following chart provides the breakdown of the Wireless# exam as to the weight of each section of the exam.

| Subject Area | % of Exam |
|--------------------------------------|------------------|
| Wireless Technologies and Standards | 32 |
| Hardware, Software, and Installation | 28 |
| Radio Frequency (RF) Fundamentals | 9 |
| Applications, Support, and Security | 33 |
| Total | 100% |

Wireless Technologies and Standards

1.1 Define the roles of the following organizations in providing direction and accountability within the wireless networking industry

- IEEE
- Wi-Fi Alliance
- Zigbee Alliance
- Bluetooth SIG
- WiMAX Forum
- Infrared Data Association (IrDA)

1.2 Define the characteristics of Wi-Fi technology

- Range
- Frequencies/channels used
- Power saving modes
- Data rates and throughput
- Dynamic rate selection
- Roaming functionality
- Infrastructure and ad hoc modes
- SSID / network names

1.3 Summarize the basic attributes and advantages of the following wireless LAN standards, amendments, and product certifications

- 802.11a
- 802.11b
- 802.11g
- Wi-Fi® certification
- WMM® certification
- WPA / WPA2® certification

1.4 Summarize the characteristics, basic attributes, and advantages of ZigBee

- Frequencies
- Power requirements
- Topology models
- Security features
- IEEE 802.15.4 standard
- ZigBee stack

1.5 Summarize the characteristics, basic attributes, and advantages of WiMAX

- Fixed vs. mobile and frequencies used
- Data rates, throughput, range, and line-of-sight parameters
- Quality of Service (QoS) and security features
- Different wireless MAN standards - 802.16-2004, 802.16e, ETSI HiperMAN, Wi-Bro

1.6 Summarize the characteristics, basic attributes, and advantages of Bluetooth

- Frequencies used
- FHSS hop rates and adaptive frequency hopping support
- Data rates, throughput, and range
- Power classification

- Different wireless PAN standards - 802.15.1, 802.15.2, 802.15.3, Bluetooth 1.2, Bluetooth 2.0+EDR

1.7 Summarize the characteristics, basic attributes, and advantages of Infrared technology

- Frequencies used
- Data rates, range, and line-of-site parameters
- Protocol types
- Interfering sources
- Different wireless PAN specifications - (Serial Infrared (SIR), Medium Infrared (MIR), Fast Infrared (FIR), Ultra Fast Infrared (UFIR), Infrared Simple (IrSMP), Infrared Financial Messaging (IrFM), Infrared Transfer Protocol (IrTRAN-P)

1.8 Summarize the characteristics, basic attributes, and advantages of VoWLAN

- Wireless VoIP phone characteristics
- Wireless VoIP SOHO router characteristics
- Wireless VoIP SOHO router operation

1.9 Summarize the characteristics, basic attributes, and advantages of RFID

- RFID system requirements
- RFID tag types
- RFID hardware components

Hardware, Software, and Installation

2.1 Identify the purpose, features, and functions of the following wireless network components. Choose the appropriate installation or configuration steps in a given scenario.

- Access Points
- Wireless LAN Routers
- Wireless Bridges
- Wireless Repeaters
- WLAN Switch
- Wireless VoIP Gateway
- Wireless Media Gateway
- Power over Ethernet Devices

2.2 Identify the purpose, features, and functions of the following client devices. Choose the appropriate installation or configuration steps in a given scenario.

- CardBus PC cards
- USB / USB2 devices
- Compact Flash devices
- SDIO devices
- PCI devices
- MiniPCI devices
- Client utility software and drivers
- Bluetooth connectivity devices
- Wireless IP Phone
- Wireless Gaming Adapter
- Wireless Print Server
- Wireless IP Camera
- Wireless Hotspot Gateway

- Wireless Presentation Gateway
- 2.3 Identify the purpose, features, and functions of the following types of antennas. Choose the appropriate installation or configuration steps in a given scenario.
- Omni-directional / dipole
 - Semi-directional

Radio Frequency (RF) Fundamentals

3.1 Define the basic units of RF measurements.

- Milliwatt
- Decibel (dB)
- dBm
- dBi

3.2 Identify factors which affect the range and speed of RF transmissions

- Line-of-sight requirements
- Interference (Baby monitors, spread spectrum phones, microwave ovens, bright sunlight)
- Environmental factors

3.3 Define and differentiate between the following wireless technologies

- DSSS
- OFDM
- FHSS
- Infrared
- MIMO

3.4 Define the concepts which make up the functionality of RF and spread spectrum technology

- OFDM/DSSS Channels
- Co-location of DSSS and OFDM systems
- Adjacent-channel and co-channel interference
- WLAN / WPAN co-existence

Applications, Support, and Security

4.1 Identify proper procedures for installing and configuring common WLAN applications

- Small Office, Home Office
- Extension of existing networks into remote locations
- Building-to-building connectivity
- Flexibility for mobile users
- Public wireless hotspots
- Mobile office, classroom, industrial, and healthcare
- Short distance device connectivity
- Municipal connectivity
- VoWLAN
- RFID

4.2 Identify and describe common ZigBee applications

- Building Automation and Residential / Light Commercial Control
- Industrial Control
- Personal Health Care
- PC & Peripherals
- Consumer Electronics

4.3 Identify and describe common WiMAX applications

- Campus and Wireless ISP Broadband Wireless Access (Point-to-Multipoint)
- Wireless Voice and Data Backhaul (Point-to-Point)
- Security / Surveillance
- Enterprise Private Networks

4.4 Identify and describe common Bluetooth applications

- Computer peripherals (GPS receivers, printers, keyboards, mice, digital cameras)
- Mobile audio (Cell Phones, MP3 Players, Headsets)
- Mobile data devices (PDAs)
- Unique devices (automotive diagnostics, wireless sensor links, gaming devices)

4.5 Identify and describe common Infrared applications

- PDA data communication and synchronization
- Point-of-Sale systems
- Laptop computer data communication
- Financial Messaging (IrFM)

4.6 Identify and describe the following wireless LAN security techniques. Describe the installation and configuration of each.

- SSID hiding
- WEP
- WPA-Personal
- WPA2-Personal
- RADIUS
- 802.1X/EAP
- Passphrases
- MAC Filtering
- Push-button Wireless Security
- Virtual Private Networking (VPN)

4.7 Identify procedures to optimize wireless networks in specific situations.

- Hardware placement
- Hardware selection
- Identifying sources of interference
- Network utilization
- Appropriate security protocols

4.8 Recognize common problems associated with wireless networks and their symptoms, and identify steps to isolate and troubleshoot the problem. Given a problem situation, interpret the symptoms and the most likely cause. Problems may include:

- Decreased throughput
- No connectivity
- Intermittent connectivity
- Weak signal strength
- Device upgrades