



GigaWave Technologies® White Paper

CCNA Wireless Certification

Author: Humberto Barron, Wireless LAN Training Specialist, CCSI, CCAI, CCNA



CCNA Wireless Certification

Introduction

"As networks continue to stimulate economic growth, collaboration and human interaction, the need for networking talent will grow in importance. To address the growing global demand for networking talent, we estimate that we will need to **double or even triple our certified individuals** over the next five years," - Jeanne Beliveau-Dunn, general manager of the Career Certification and Training department at Cisco.

On June 24, 2008, at this year's Cisco Live! event in Orlando, Florida, Cisco announced the introduction of three new concentrations to augment its popular associate-level career certification: CCNA Security, CCNA Voice, and CCNA Wireless. By expanding on the competencies and skills acquired through CCNA training and curricula, these specialized concentrations offer individuals a first step to a career path into the converged technologies that make up today's modern networks.

Expanding the CCNA portfolio is part of a company-wide initiative at Cisco to address the global IT talent shortage, accelerate the expansion of the information economy, and improve the productivity of the technical community.

This paper will describe the growing need for this type of certification, what the CCNA Wireless certification is and its benefits, and what pre-requisites, exams, and training is required to get certified.

Growing Need for Wireless Specialists

A recent study commissioned by Cisco and conducted by Forrester Consulting found that there is a pervasive need for specialized networking skills. In fact, the study found that **36 percent** of the global companies surveyed reported that they have dedicated wireless specialists in their IT organizations, a number that will almost **double in the next five years**. The survey respondents also cited the importance of certifications in their professional development. In their own career history, the IT decision-makers surveyed indicated that professional and technical certifications were second only to a four-year college degree in the qualifications needed for their position.

"We're already experiencing a lack of skilled network engineers, and without a concerted effort to address this issue, the number will continue to dwindle," notes Zeus Kerravala, analyst with Yankee Group. "That's not only bad for Cisco but for all companies that run on a network - which is just about everyone."

The supply of professionals with the technical expertise to manage sophisticated networks has been diminishing across all global theatres, with particularly strong shortfalls in converged and advanced networking technologies such as security, voice and wireless applications.



Global studies are confirming the impending shortage of specialized skills.

In a recent global survey by The McKinsey Quarterly, respondents noted that finding talented people will most likely be the single most important managerial preoccupation for the rest of this decade. In the earlier cited worldwide study conducted by Forrester Consulting on behalf of Cisco, there was found to be a pressing need for networking skills throughout multiple functions of current and future IT organizations. For example:

- Eighty percent of surveyed companies expect to have a dedicated security role within five years, compared to 46 percent that have such a role currently.
- Sixty-nine percent expect to have a dedicated voice role, compared to 40 percent that have that role now. **Sixty-six percent expect to have a dedicated wireless role**, compared to 36 percent that have one currently.

The Cisco Learning Network and the new concentrations have been designed to help address this challenge.

"We're trying to find ways to scale the development of talent that the marketplace needs," says Jeanne Beliveau-Dunn, general manager of the Career Certification and Training department at Cisco.. "We are coming at the problem from two angles: first, bringing more people into the community; second, taking those who are already in the industry and helping to diversify their skills to meet the needs of the market by targeting the services that are now being designed onto the network, such as security, voice and wireless."

Enter CCNA Wireless Certification

The new series of concentrations builds upon of the foundation for Cisco networking, the CCNA certification:

CCNA Wireless recognizes the critical importance of professionals supporting wireless LANs including Networking Associates/Administrators, Wireless Support Specialists and WLAN project managers.

Companies are eager to adopt technologies such as enterprise mobility, but the skills needed to implement these are at a premium. Companies need lower-level network engineers who can handle some of the high-level work, and this new Cisco certification may begin bridging this gap.

Robert Whiteley, principal analyst with Forrester Research, says "Companies are eager to adopt the technology, but what they find is that people with traditional IT skills are challenged to plan it, build it and implement it. You certainly have gurus who can go out there and make it happen, but do you really want to be using your top-tier Level 3 talent to do all this? Or do you expect it to be a little more operationalized, to the point where this stuff works and takes fewer integration resources?"

Networking roles are becoming more specialized, and some of the skills associated with top-tier network engineers are migrating down the IT organization. With rapidly changing technology, those skills need to be moved to lower-level, specialized roles, so that implementation can become more operational.

Benefits of CCNA Wireless Certification

This new concentration will benefit both technician and employer. Certified individuals are more successful in their jobs, and these credentials will help prepare them for new career opportunities. The CCNA Wireless Certification validates candidates' skills in the configuration, implementation and support of Cisco wireless local-area networks (WLANs). Students completing the recommended Cisco training are provided with information and practice activities to prepare them for configuring, monitoring, and troubleshooting basic tasks of a Cisco WLAN in Small/Medium-size Businesses (SMB) and Enterprise networks. Employers will be able to ensure their staff have the skills necessary for basic wireless networking on a Cisco WLAN in SMB and Enterprise networks. The certification can validate applicant experience, allowing hiring companies to keep up with demand, changes in the networking industry, and help prepare current staff for the evolving network infrastructure.

This certification will also serve as a stepping-stone to more advanced wireless training. As the wireless industry begins to see explosive growth, there will be a need for more advanced wireless professionals specializing in such high-level areas as wireless security, mobility services, voice over wireless, wireless site surveying, and wireless location-based services. As these professionals become more specialized and move into these high-level design and implementation areas, there will be a great demand for entry-level personnel to perform some of the lower-level configurations, installation, maintenance, and monitoring of wireless LANs.

Pre-Requisites for CCNA Wireless Certification

The only prerequisite for the CCNA Wireless certification is a valid CCNA certification which can be obtained by passing the following exams: [640-802 CCNA](#) or, both [640-822 ICND1](#) & [640-816 ICND2](#). The recommended training for each exam is as follows:

640-802 CCNA: Interconnecting Cisco Networking Devices Part 1 ([ICND1](#)) v1.0 and Interconnecting Cisco Networking Devices Part 2 ([ICND2](#)) v1.0.

640-822 ICND1: Interconnecting Cisco Networking Devices Part 1 ([ICND1](#)) v1.0

640-816 ICND2: Interconnecting Cisco Networking Devices Part 2 ([ICND2](#)) v1.0.

Note: Each course may be taken through Global Knowledge. Visit www.globalknowledge.com for more information.



CCNA Wireless Exam

The certification requires the successful passing of only one exam: [640-721-IUWNE](#).

This exam tests a candidate's knowledge of installing, configuring, operating, and troubleshooting small to medium-size WLANs.

The exam is 90 minutes long and candidates must answer 65 questions.

Passing scores are set by using statistical analysis and are subject to change. At the completion of the exam, candidates receive a score report along with a score breakout by exam section and the passing score for the given exam. Cisco does not publish exam passing scores because exam questions and passing scores are subject to change without notice.

Cisco Career Certification exams include the following test formats:

- Multiple-choice, single answer
- Multiple-choice, multiple answer
- Drag-and-drop
- Fill-in-the-blank
- Testlet
- Simlet Simulations

Recommended Training

You can gain the knowledge and hands-on skills to pass this exam through the completion of the following instructor-led course: ***Implementing Cisco Unified Wireless Networking Essentials (IUWNE)*** from GigaWave Technologies.

This course will help prepare you to meet the exam objectives. These objectives are outlined in some detail in the following section. Reference final page for a complete course description.

Exam Topics

The following information provides general guidelines for the content likely to be included on the Implementing Cisco Unified Wireless Networking Essentials (IUWNE) exam. However, other related topics may also appear on any specific delivery of the exam.

Describe WLAN fundamentals

- Describe basics of spread spectrum technology (modulation, DSS, OFDM, MIMO, Channels reuse and overlap, Rate-shifting, CSMA/CA)
- Describe the impact on wireless communications of various wireless technologies (Bluetooth, WiMAX, ZigBee, cordless phone)
- Describe wireless regulatory bodies, standards and certifications (FCC, ETSI, 802.11a/b/g/n, WiFi Alliance)





GigaWave Technologies® White Paper

- Describe WLAN RF principles (antenna types, RF gain/loss, EIRP, refraction, reflection, etcetera)
- Describe networking technologies used in wireless (SSID maps to WLAN_ID maps to Interface maps to VLAN, 802.1q trunking)
- Describe wireless topologies (IBSS, BSS, ESS, Point-to-Point, Point-to-Multipoint, basic Mesh, bridging)
- Describe 802.11 authentication and encryption methods (Open, Shared, 802.1X, EAP, TKIP, AES)
- Describe frame types (associated/unassociated, management, control, data)

Install a basic Cisco wireless LAN

- Describe the basics of the Cisco Unified Wireless Network architecture (Split MAC, LWAPP, stand-alone AP versus controller-based AP, specific hardware examples)
- Describe the Cisco Mobility Express Wireless architecture: Smart Business Communication System (SBCS), Cisco Config Agent (CCA), 526WLC, 521AP (stand-alone and controller-based).
- Describe the modes of controller-based AP deployment (local, monitor, HREAP, sniffer, rogue detector, bridge)
- Describe controller-based AP discovery and association (OTAP, DHCP, DNS, Master-Controller, Primary-Secondary-Tertiary, n+1 redundancy)
- Describe roaming (Layer 2 and Layer 3, intra-controller and inter-controller, mobility groups)
- Configure a WLAN controller and access points WLC: ports, interfaces, WLANs, NTP, CLI and Web UI, CLI wizard, LAG AP: Channel, Power
- Configure the basics of a stand-alone access point (no lab) (Express setup, basic security)
- Describe RRM

Install Wireless Clients

- Describe client OS WLAN configuration (Windows, Apple, and Linux.)
- Install Cisco ADU
- Describe basic CSSC
- Describe CCX versions 1 through 5

Implement basic WLAN Security

- Describe the general framework of wireless security and security components (authentication, encryption, MFP, IPS)
- Describe and configure authentication methods (Guest, PSK, 802.1X, WPA/WPA2 with EAP-TLS, EAP-FAST, PEAP, LEAP)
- Describe and configure encryption methods (WPA/WPA2 with TKIP, AES)
- Describe and configure the different sources of authentication (PSK, EAP-local or -external, Radius)



Operate basic WCS

- Describe key features of WCS and Navigator (versions and licensing)
- Install/upgrade WCS and configure basic administration parameters (ports, O/S version, strong passwords, service vs. application)
- Configure controllers and APs (using the Configuration tab not templates)
- Configure and use maps in the WCS (add campus, building, floor, maps, position AP)
- Use the WCS monitor tab and alarm summary to verify the WLAN operations

Conduct basic WLAN Maintenance and Troubleshooting

- Identify basic WLAN troubleshooting methods for controllers, access points, and clients methodologies
- Describe basic RF deployment considerations related to site survey design of data or VoWLAN applications,
- Describe common RF interference sources such as devices, building material, AP location
- Describe basic RF site survey design related to channel reuse, signal strength, cell overlap
- Describe the use of WLC show, debug and logging
- Describe the use of the WCS client troubleshooting tool
- Transfer WLC config and O/S using maintenance tools and commands
- Describe and differentiate WLC WLAN management access methods (console port, CLI, telnet, ssh, http, https, wired versus wireless management)

In Summary

The preceding evidence suggests that specialized networking professionals will be in great demand as we try to meet a global IT skills shortage, especially in high-growth areas such as wireless LANs. Right out of the gate, entry-level IT professionals can specialize in a chosen career path, such as wireless, with the CCNA Wireless certification as a first stepping-stone.

The importance of specialized certifications is extremely powerful because it can benefit both employees and employers by validating a technician's skills in the implementation of basic wireless networking in Small to Medium-size Businesses (SMBs) and Enterprise networks, as well as serve as a first step to more advanced specialized wireless training.

Finally, the exam requirements for certification have been outlined as well as the instructor-led training available to help prepare candidates for certification.

Recommended CCNA Wireless Exam Training Track

Implementing Cisco Unified Wireless Networking Essentials – Course Description:

This course is instructor-led training and includes instructor assisted, hands-on labs. The Implementing Cisco Unified Wireless Networking Essentials training class is designed to help candidates prepare for the CCNA Wireless certification, an associate level certification in the wireless field. The goal of the IUWNE is to provide students with information to prepare to help design, install, configure, monitor and conduct basic troubleshooting tasks of a Cisco WLAN in small and medium-sized business and enterprise installations. The IUWNE training class reinforces the instruction by providing students with hands-on labs that range from creating an ad-hoc network and analyzing the communication, configuring a controller, configure and migrate standalone access points (APs), install and configure a Mobility Express Wireless Controller and AP, experiment with connections and roaming, configure Extensible Authentication Protocol-Flexible Authentication via Secure Tunneling (EAP-FAST) authentication with Wi-Fi Protected Access (WPA), configure the controller and the AP from the Cisco Wireless Control System (WCS) interface, add a map to the WCS, enhance it with the Map editor tool and locate the AP on the map, backup the controller configuration, as well as troubleshooting issues introduced by the instructor.

References

- Careless, J. (2008, June 24). Tackling the global shortage of skilled network engineers: New Cisco initiatives – the Cisco Learning Network and three new CCNA certifications – help accelerate the development of technical talent. New@Cisco.com. Retrieved June 30, 2008, from http://newsroom.cisco.com/dlls/2008/ts_062408.html
- McGillicuddy, S. (2008, June 25). Cisco certifications to include security, voice and wireless for CCNA. SearchNetworking.com. Retrieved June 30, 2008, from http://searchnetworking.techtarget.com/news/article/0,289142,sid7_gci1318769,00.html#
- CCNA Wireless Certification. (n.d.) Retrieved June 30, 2008, from http://www.cisco.com/web/learning/le3/le2/le0/le2/learning_certification_type_home.html



GigaWave Technologies® White Paper

About the Author

Humberto Barron is a Cisco Wireless LAN Training Specialist and Certified Cisco Systems Instructor (CCSI) at GigaWave Technologies. Since 2005, he has trained dozens of Cisco instructors, including Cisco Learning Partners in Asia and Canada, as well as Cisco employees, Cisco distributors, Cisco premier partners, Cisco resellers and Cisco end-users.

Prior to 2005, Humberto was a coordinator and senior Cisco Certified Academy Instructor (CCAI) at one of the earliest Cisco Networking Academies in San Diego, CA, where he also served as adjunct professor in the San Diego Community College District. Besides a CCSI and CCAI, he holds a Cisco Advanced Wireless LAN Field Specialist certification, CCNA, Network +, and A+ certifications.

About GigaWave Technologies

GigaWave Technologies offers innovative wireless networking workshops for IT professionals who want to know how to design, install, secure or sell high performance Wireless Local Area Network (WLAN) and bridging technologies. As a leading provider of WLAN training, curriculum development and wireless services, GigaWave provides its trademark, high-caliber, hands-on training techniques to progressive organizations across the globe. GigaWave specializes in wireless networking and has attained an unrivaled level of WLAN expertise.

As an authorized Cisco Learning Partner, GigaWave Technologies develops and delivers the Cisco wireless networking classes. For the most current training schedule and to view full course descriptions, go to www.giga-wave.com, or call 210-375-0085. GigaWave is a division TESSCO Technologies.

About TESSCO

TESSCO Technologies Incorporated is a provider of the product and supply chain solutions needed to build, operate and use wireless systems. TESSCO is committed to delivering, fast and complete, the product needs of wireless system operators, program managers, contractors, resellers, and self-maintained utility, transportation, enterprise and government organizations. As Your Total Source® provider of mobile and fixed-wireless network infrastructure products, mobile devices and accessories, and installation, test and maintenance equipment and supplies, TESSCO assures customers of on-time availability, while streamlining their supply chain process and lowering inventories and total costs. To learn more, please visit www.tessco.com.



10521 Gulfdale
San Antonio, Texas 78216
210-375-0085 Phone
210-375-8382 Fax
info@giga-wave.com
www.giga-wave.com

