Wireless networks have become ubiquitous. Most IT professionals have installed a wireless network at their home. But implementing a wireless network in an enterprise is much more complex. This course is designed to take an IT professional through the lifecycles of planning, implementing, and maintaining a wireless network. The course has broad appeal to all IT professionals, including IT decision makers, architects, product management, and technical support staff. The course does not require any prior wireless knowledge, although learners must have rudimentary knowledge of IP networking. The course is 40% hands on labs and 60% lecture. Labs are a combination of individual labs and team-oriented goal-based labs where learners collaborate to solve problems and implement solutions.

AUDIENCE
The course has broad appeal to all IT professionals, including IT decision makers, architects, project management and technical support staff.

PREREQUISITES
The course does not require any prior wireless knowledge. However, learners must have rudimentary knowledge of IP networking as obtained in the following Interface courses:
» NET175: CompTIA Network+
  OR
» CCNA215: ICND1 - Interconnecting Cisco Networking Devices Part1 v2

WHAT YOU WILL LEARN
» Identify sources of interference and make recommendations to overcome interference problems
» Describe how Wi-Fi works and the different deployment options
» Identify and analyze Wi-Fi packets in Wireshark that are used for connecting and sending data
» Configure and deploy a Wireless network
» Understand the different security parameters for different user groups, such as employees or guest access
» Identify and resolve common wireless connectivity problems
» Use packet and spectrum analyzers to identify and troubleshoot wireless connectivity, performance, and security problems
» Explain the major enhancements being introduced by Wi-Fi equipment vendor

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WIRE400: Wireless Networking for the IT Professional

Day 1 – Plan a wireless network
Learners will focus on understanding key aspects of the physical layer. Learners are introduced to spectrum analyzers and wireless network cards, and shown how to analyze and access the quality of the wireless medium and detect sources of interference. Learners will attain a solid understanding of why wireless and wired networks require different protocols and procedures in order to reliably transmit data over a wireless medium. At the end of day 1, learners will have an understanding of how to conduct a physical layer site survey in their business environment.

- Identify the unique challenges of transmitting data over a wireless medium
- List the major components of a radio
- Understand different antenna options, including MIMO and beamforming
- Distinguish between different propagation models
- Use a spectrum analyzer to understand channels and channel bandwidth
- Use a spectrum analyzer to detect and analyze sources of interference

Day 2 – Configure and deploy a Wi-Fi network
Learners will be taught how to configure a basic wireless network. Learners are introduced to the major configuration options on an Access Point and the clients. They will understand how to find, connect, and send data over a Wi-Fi network. At the end of day 2, learners will understand how Wi-Fi works within their enterprise environment.

- Set up an open Wi-Fi network
- Use Wireshark to detect and analyze Wi-Fi packet flows
- Use Wireshark to analyze the impact of changing basic Wi-Fi settings
- Compare and contrast autonomous and centrally managed Access Points
- Distinguish between layer 2 and layer 3 roaming
- Use Wireshark to analyze wireless and wired QoS settings

Day 3 – Configure and implement wireless security
Learners will be exposed to the most common wireless attacks and how to minimize the risk of these attacks. Learners will walk through the different Wi-Fi security configuration options including 802.1X, Pre-Shared Keys, Counter mode encryption with CBC-MAC, and AES. At the end of day 3, learners will be able to describe the pros and cons of the Wi-Fi security setting deployed in their home and business.

- Configure and implement Wi-Fi authentication, encryption and message integrity
- Distinguish between wired and wireless security vulnerabilities
- Use Backtrack to execute wireless penetration test attacks
- Use packet and spectrum analyzers to identify wireless security attacks
- Understand wireless intrusion prevention mechanisms

Day 4 – Troubleshoot Wireless Networks
Learners will apply the knowledge and experience gained through the week in troubleshooting several difficult wireless problems. This last day is 100% hands-on based labs. These labs are designed to reinforce key learnings that relate to implementing and to troubleshooting the most common wireless network problems. Learners are encouraged to bring their own real-world deployment problems for analysis in the classroom. This section is entirely lab and discussion based. At the end of day 4, learners will have a solid methodology on how to troubleshoot wireless network problems in their organization.

- Use spectrum analyzers to troubleshoot interference problems
- Use Wireshark to troubleshoot connectivity problems
- Use Wireshark to troubleshoot capacity and performance problems
- Use Wireshark to troubleshoot security issues
- Combine the results of spectrum and packet analyzers to identify different wireless network problems
- Analyze real-world problems

Day 5 – Implement the latest Wi-Fi product enhancements
Learners will be taught about the major enhancements to Wi-Fi products being rolled out by equipment vendors. Discussion will include the benefits to the enterprise and end-users, how these enhancements work, and implementation challenges. This knowledge will enable the learners to prepare and plan for upgrades to their wireless network. Learners successfully completing all the labs in this course are given a certification of completion. At the end of day 5, learners will be equipped with the knowledge to make decisions on how to utilize next generation Wi-Fi products.

- Compare and contrast 802.11n high throughput and 802.11ac very high throughput
- Understand the benefits of Multi-User MIMO (MU-MIMO)
- Identify the changes to support Wireless Access Vehicular Environments (WAVE)
- Discuss interworking with cellular networks
- Be familiar with Hotspot 2.0 and the deployment of carrier grade Access Points

Register by phone at 602-266-8585, or online at www.InterfaceTT.com.
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