

Hands-On

Indoor Wi-Fi & Wired Networking - Fundamentals



Course Description

Networking and Wi-Fi equipment is ubiquitous in telecom, and continues to evolve with new standards and features. It has become more important than ever for telco personnel to be competent with the setup, use, and troubleshooting of networking devices, particularly for customer-facing employees, yet many telco employees still have little or no formal training in networking.

The Indoor Wi-Fi & Wired Networking - Fundamentals course provides students with a solid understanding of networking fundamentals. Topics include the Open Systems Interconnection (OSI) model, switches, routers, Wi-Fi, basic device security, set-up and troubleshooting. Many common networking terms are defined, allowing students to understand them when they hear them. Examples are shown for a typical Fiber-to-the-Prem circuit, such as via an ONT, WAP/AP, to a Wi-Fi router, followed by Hands-On set-up of actual Wi-Fi or network router equipment, as used by the telco (please co-ordinate with BTS).

Students will finish the course with a greater understanding and confidence in networking, and be able to apply that knowledge when working with customers.

Students Will Learn

- **Open Systems Interconnection (OSI) model**
- **Switches**
- **Routers**
- **Wi-Fi**
- **Basic device security**
- **Set-up and troubleshooting**
- **Many common networking terms are defined, allowing students to understand them when they hear them.**
- **A typical Fiber-to-the-Prem circuit**
- **Circuits via an ONT, WAP/AP, to a Wi-Fi router**
- **Hands-On set-up of actual Wi-Fi or network router equipment, as used by the telcos**
- **And more...**

Target Audience

The course is intended for Installation & Repair, plus certain Central Office techs and circuit engineers, who together help design, equip, and support the customer end of the FTTP network.

Prerequisites

No specific prerequisites are required. However, a general understanding of telecommunications will be helpful. Our Telephony for "Telecom Technicians" course is available for employees with little or no previous telecom experience.

Course Outline

Module 1: Networking Basics

- Introduction & Modern PSTN Summary
- The OSI Model
- Layer 2: MAC
- Layer 3: IP
- Layer 4: Packet
- Layer 9: Application
- Common Networking Terms
- MAC, Switch
- IP, Router
- Port
- DHCP
- DNS
- FTP
- TFTP
- NTP
- Security / ASA / Firewalls (Windows, UNIX)
- Intranet/Internet

Module 2: Switches

- Bridge / Hub / Switch Definition
- Collisions & CSMA/CD
- 10BaseX & Cables
- Media Access Control (MAC) Address
- 802.3 Frame
- Local Area Network (LAN)
- 802.1Q Virtual LAN (VLAN)
- Trunking
- Quality of Service (QoS)
- 802.1D Spanning Tree Protocol (STP)
- Switch Setup

Module 3: Routers

- Gateway / Router Definition
- Routing
- Routing Protocol Overview
- Internet Protocol (IP)
- IP Address & Classes - IPv4
- Subnets
- Mask & Prefix Notation
- Dynamic Host Configuration Protocol (DHCP)
- Domain Name System (DNS)
- ARP
- IPv6
- TCP & UDP
- Port Numbers
- MAC vs. IP: Why both?
- Layer 3 Switch
- Network Address Translation (NAT)
- Router Setup

Module 4: Wi-Fi

- 802.11a-n Family Standards / Wi-Fi
- Wireless LAN (WLAN)
- Wireless Access Point (WAP)
- Wireless Router
- Mesh Networks

Basic Wi-Fi Setup (web GUI)

SSID

Security:

WEP/WPA

WPA2 AES Personal

WPA2 AES Enterprise

802.1X Authentication

- Ad-Hoc Mode
- Decibels & dBm
- Antennas & Coverage
- Sample Network (Fiber - ONT - Wireless Router)

Module 5 : Setup & Troubleshooting

- Device Setup (customer specific) - maintenance port/GUI
- Cabling
- Device Placement
- Security:
 - Authentication & Passwords
 - Keys
 - 802.1X
- Speed Testing
- Windows: ipconfig
- LINUX: ifconfig
- ping Command
- tracert Command
- Troubleshooting
- Wire Shark

Delivery Method

Instructor-Led with numerous Hands-On labs and exercises.

Equipment Requirements

(This apply's to our hands-on courses only)

BTS always provides equipment to have a very successful Hands-On course. BTS also encourages all attendees to bring their own equipment to the course. This will provide attendees the opportunity to incorporate their own gear into the labs and gain valuable training using their specific equipment.

Course Length

3 Days