

Hands-On

# FTTH - NGN

Fiber to the Home in Next Generation Networks



## Course Description

Next generation networks are likely to need to deliver High Speed Internet (HSI), Voice and IPTV. High Definition IPTV may require very high access bandwidth so new loop installations will probably require fiber loops. There are many new options for loop and access aggregation network design.

This Hands-On course will examine the new fiber technologies now available, consider the advantages of each and provide an understanding of how a Next Generation Access network can take advantage of Ethernet over fiber options.

## Students Will Learn

- Describe The Different Fiber Optic Technologies Available For Next Generation Loops
- Consider In Detail The Advantages Of Each Technology
- Consider The Sizing And Design Of A NGN Access And Aggregation Network
- Select The Appropriate Ethernet Technology Standards For Deployment
- And Much More...

## Course Outline

### Module I: Next Generation Network Design Requirements

Next Generation Network Networks

Functions and Requirements

Loop Requirements

Application Requirements

Backhaul

Example Next generation Applications

## **Module II: Fiber Optic Technology Options**

Fiber optics subsystems

FTTH, FTTA, FTTP, FTTC, FAITH,

Multi-mode and Single mode fiber engineering

Transmitters and Receivers

Wavelength Considerations:

Wavelength Division Multiplexing (WDM)

Dense Wavelength Division Multiplexing (DWDM)

Course Wavelength Division Multiplexing (CWDM)

Difference between Passive and Active Optics

## **Module III: Access Subsystems**

Passive Optical Networks (PON)

ITU-T G.984

ATM Passive Optical Networks (APON)

Broadband Passive Optical Networks (BPON)

Gigabit capable Passive Optical Networks (GPON)

Ethernet Passive Optical Networks (EPON)

Transition from SONET/SDH to Ethernet based systems

Carrier Ethernet-Based Converged Services Infrastructure

## **Module IV: Ethernet in the First Mile and the Backhaul**

IEEE 802.3 options

Optical Ethernet Options

Ethernet in the first mile

1000BASE-LX, 1000BASE-SX

10GBASE-SR, 10GBASE-LX4, 10GBASE-ER

10GBASE-LR, 10GBASE-SW, 10GBASE-LW, 10GBASE-EW

IEEE 802.1Q VLANs

Q-in-Q and MAC-in-MAC

### **Module V: Aggregation and Protection Options**

Aggregation Options

Building Aggregated Backhauls

Rapid Packet Ring (RPR)

### **Module VI: Near Future Evolution**

New ways of delivering fiber loops

Mechanisms for fiber sharing

Cost comparisons and financing

## **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**

2 Days