Understanding

DWDM and Routing Today

Course Description

This extensive course delivers an in-dept overview of DWDM and how it can be used in small carrier networks.

How and why DWDM might be used, compare its operation with single wavelength and Course Wavelength systems and identify the advantages and challenges.

The course will then examine how SONET systems function so that attendees can appreciate the different levels in the hierarchy and how different OC levels perform. Many modern optical systems now carry IP, so the course will then go on to examine routing and switching technologies used by Cisco.

The course will also compare different classes of Cisco routers and identify the advantages and applications for each of the different types.

This course will then bring together the concepts learned to identify how modern carrier networks can take advantage of these technologies today and how the technology is likely to evolve over the next few years.

Students Will Learn

- **Appreciate the Function of Dense Wavelength Division Multiplexing**
- **Identify How SONET Works using OC-12, OC-48 and OC-192**
- **Compare Different Classes of Cisco Routers**
- **Describe Operational Hand-off of Fiber Services in Data Centers**
- **And Much More...**

Target Audience

This course is intended for technicians, engineers and managers requiring a fast overview of DWDM and routing in modern small carrier networks.

Prerequisites

None.

Course Outline

Module I: DWDM Circuits

- Appreciating What Fiber Optics Can Do
- Fiber Optics Principles
- Optical Sources: LED and Lasers
- Modulation
- Fiber Types: Multimode, Restricted Mode Launch Bandwidth, Laser Optimized Multimode, Single-mode
- Deploying Wavelength Division multiplexing and Switching options
- Advantages and challenges of DWDM
- Hardware Selection Factors
- DWDM network considerations
- Core Network Solutions

Module II: SONET

- How SONET Works
- SONET Hiearchy: OC-1, OC-3,OC-12, OC-48 and OC-192
- Relationship with STS-1, and STM-1
- Signalling and Management in SONET
- Modern evolutions and replacements for SONET
- Carrying IP over SONET and Carrier Ethernet

Module III: Cisco Switches and Routers

- Protocol layering: Layers 1, 2 and 3
- Structure of Modern routers
- Classes of Switch and Router
- Branch Routers
- Connected Grid Routers
- Data Center Interconnect Platforms
- Mobile Internet Routers
- Service Provider Core Routers
- Service Provider Edge Routers
- Small Business Routers
- Example design for Carrier Next Generation Network

Module IV: Operational Network Considerations

- Interconnection and Rack Design
- Fiber patching and Handoff
- Splice trays and hand off panels
- Fiber cable connection and testing
- Service verification
- How the technology is evolving

Delivery Method

Instructor-Led with numerous case-studies 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

2 Days