ribbon
Ribbon Academy
Customer Course Catalog

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About us

In today's competitive market, businesses and individuals must acquire knowledge of leading-edge tools to stay ahead. By learning the latest technologies, all companies and their personnel gain the expertise needed to attain this goal.

Ribbon`s Packet and Optical Training Services is responsible for training company personnel as well as a broad spectrum of Ribbon`s Packet and Optical customers.

We offer excellent training for people like you, covering the complete range of the company`s hardware products and dedicated software.

We offer tailor-made training courses and workshops, which provide in-depth instruction in the operation, maintenance, and troubleshooting of our network systems and components.

The courses and workshops are held either at our training centers, or at the customer premises, depending on the session requirements.

Our resources extend to online training sessions, as well as self-learning movies on our Intranet site, regarding global subjects such as the technologies themselves.

Our instructors are all certified with many years of industry and teaching experience. Recognized as industry experts, they lecture worldwide and are able to deliver courses in many languages such as English, Spanish, Russian, German, as well as a bevy of other languages.

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Training Course Types

RIBBON Training Services offers two training course types.

Frontal Courses

A frontal course is the traditional way to train. This type of training is offered in any RIBBON training center in the world or at the customer premises.

At the RIBBON training centers worldwide, we offer the customer rich high tech learning environments including labs containing physical equipment and multiple management stations for intensive hands-on practice. At the customer site, training can be done using a local lab or, if one is not available, one can be provided using a high-speed internet connection and a remote connection to the HQ labs.

These types of courses are limited to up to eight participants and can be catalog courses or "tailored" courses. Catalog courses are courses chosen from this catalog while tailored courses are courses that are built specifically to address the customer's needs.

Remote Courses

A remote course is a course done using an internet video/audio connection, where you have the trainer on one side and on the other, up to 10 participants sitting near their own PCs.

In this type of training, presentations can be given as well as demonstrations on the management system. Communication is done using audio and video means and the participants can ask questions using microphones.

This type of course requires a fast internet connection, headphones, and a microphone.

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Prerequisites When Performing Courses at the Customer's Site:

For Theoretical Sessions or the Theoretical Parts of Management Sessions:

- Projectors supporting HD resolution
- Whiteboard or flipchart, with markers

For Hands-on Management Sessions:

Apollo

Using a local lab for network management courses:

- Management software
- At least 4 PCs connected to the management station to be used as clients
- At least 2 to 3 elements connected to the management station
- No live traffic

Using a remote lab for network management courses:

- At least 4 PCs connected to an un-firewalled high-speed internet connection, to be used as clients

For installation courses at the customer's site:

- At least 2 elements not carrying live traffic

Neptune

Using a local lab for network management courses:

- Management software
- At least 4 PCs connected to the management station to be used as clients
- At least 2 to 3 elements connected to the management station
- No live traffic

LightINSIGHT

Using a local lab for network management courses:

- Management software
- At least 4 PCs connected to the management station to be used as clients
- At least 2 to 3 elements connected to the management station

Using a remote lab for network management courses:

- At least 4 PCs connected to an un-firewalled high-speed internet connection, to be used as clients

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Remote Lab Service

For our customers, we offer a fully equipped remote lab that can be used for practicing network management.

The lab is physically located at RIBBON`s central office but can be remotely accessed from anywhere in the world.

The lab can be used to let new network operators experience the system, try out complex operations or to let more seasoned operators try a new version or a new card.

This service can be extremely useful when wanting to practice in a lab environment and not on the live network where traffic could be affected.

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Apollo - Recommended Course Path for New Customers:

	OTN Transport (no fabric) **LightSoft**	OTN Transport (no fabric) **Muse**	OTN Switching (with fabric) **LightSoft**	OTN Switching (with fabric) **Muse**
Technology	WDM OTN [3 days]	WDM OTN [3 days]	WDM OTN [3 days]	WDM OTN [3 days]
Initial Configuration	Initial Configuration [3 days]	Initial Configuration [3 days]	Initial Configuration [3 days]	Initial Configuration [3 days]
Operation & Management	OTN Transport LightSoft [5 days]	OTN Transport Muse [5 days]	OTN Switching LightSoft [3 days]	OTN Switching Muse [3 days]
Advanced Optical Protection	WSON [2 days]	WSON [2 days]	ASON [2 days]	ASON [2 days]
Advanced Workshops	HW Protection [2 days] Planning Concepts [2 days] Advanced Network Maintenance [3 days]	HW Protection [2 days] Planning Concepts [2 days] Advanced Network Maintenance [3 days]	HW Protection [2 days] Planning Concepts [2 days] Advanced Network Maintenance [3 days]	HW Protection [2 days] Planning Concepts [2 days] Advanced Network Maintenance [3 days]

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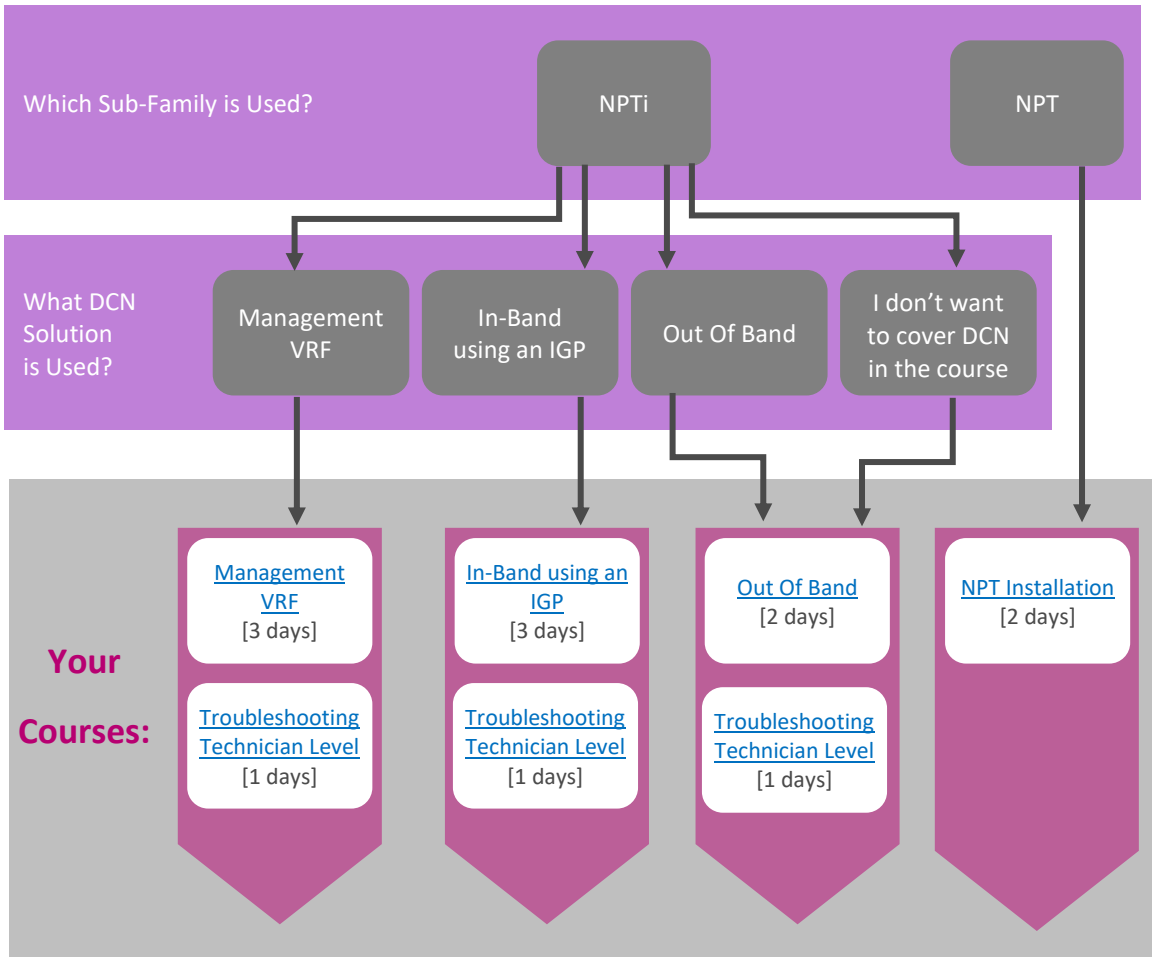
Neptune - Recommended Course Path for New Customers:

1. Installation & Technician Level Troubleshooting



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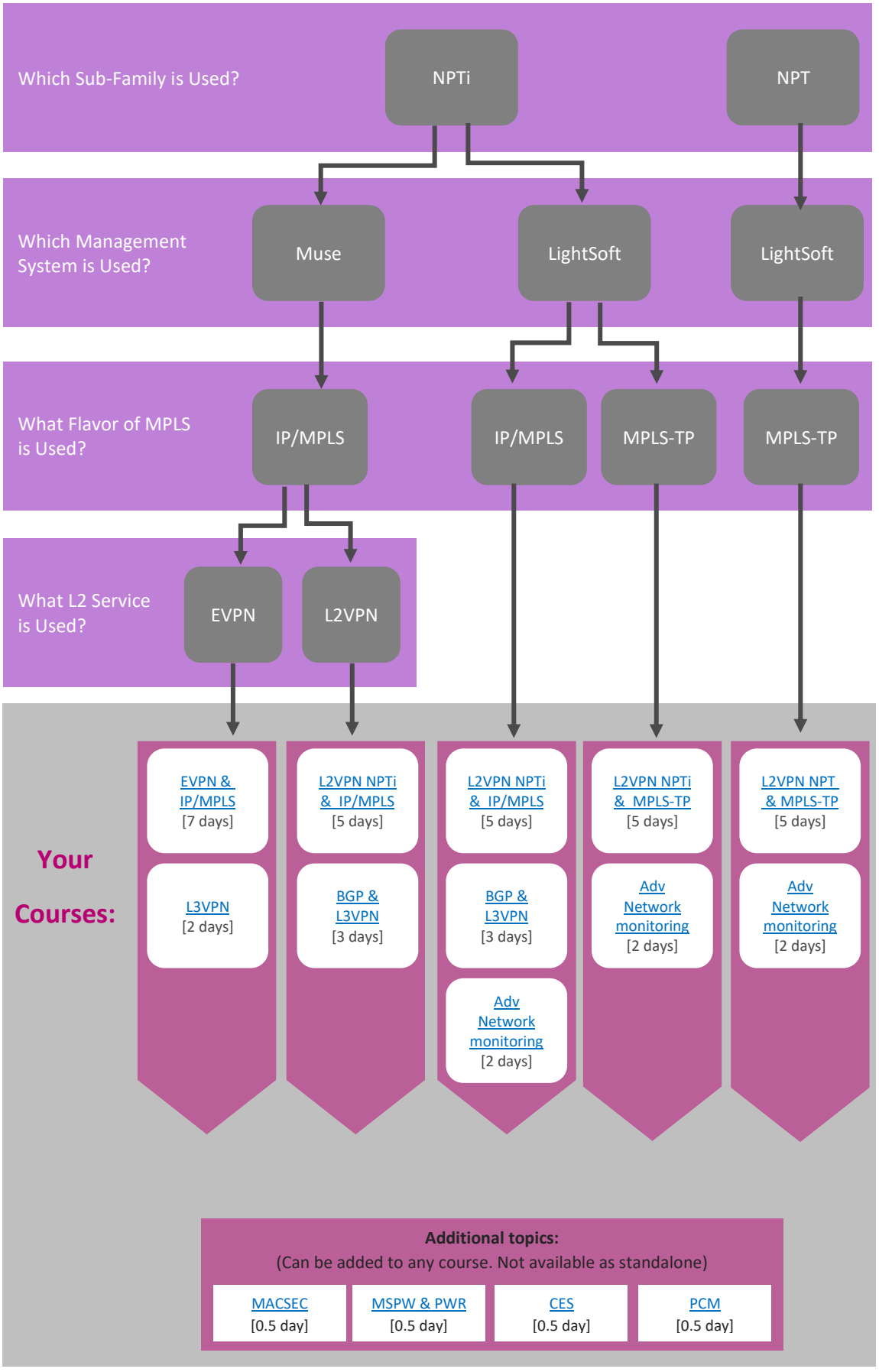
2. Management



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TECHNOLOGIES COURSE LIST

Ribbon Communications Confidential and Proprietary

Introduction to WDM and OTN technologies

Course Duration: 3 days

Course Code: WDM_OTN

Course Content:

- WDM, OTN, Coherent technology
- WDM: Frequency, wavelength, diffraction. matter properties: absorption, emission, scattering, reflection, refraction
- Electromagnetic spectrum: bands (visible, x-ray, infra-red, etc.) and uses
- Laser concepts: types, characteristics, implementation
- Optical fiber concepts.
- Optical communication via optical fibers. Measurements, photodiodes, capacities (rates, limits), signal characteristics (intensity (amplitude), phase, polarization), noise, OSNR, attenuation, dispersion, nonlinear phenomena, optical modulation
- Fix & Flex Grid, High baud rate
- OTN: Technology (standards), architecture, hierarchy, (OPU, ODU, OTU) packet structure and overhead, types of FECs, OTN capacities (ODU0, ODU1, ODU2/2e/2f, ODU3/3e, ODU-flex, ODU4, ODUC2, etc...)

Goals:

Upon completion of this course, you will be able to:

- Understand the theory of WDM technology and components
- Understand the theory of OTN technology

Target Audience:

- For a basic understanding of optical communication without any prior background in the field
- Experienced field engineers who wish to refresh or clarify the basic concepts of optical communication

Prerequisites:

- Basic knowledge in telecommunications

Notes:

- Material in this course is a prerequisite for all Apollo courses
- This course does not include how to manage OTN and DWDM through NMS or EMS

Ribbon Communications Confidential and Proprietary

Ethernet/IP/MPLS

Course Duration: 3 days

Course Code: DATA01

Course Content:

- This course covers IP protocols and technologies:
- OSI model (7 layer model)
- Binary and hexadecimal number systems
- Ethernet (standard, frame structure)
- Switching (principles of Ethernet switching)
- Virtual LAN
- ICMP (protocols, applications)
- ARP
- Subnetting (principles and calculations)
- Spanning Tree Protocol
- IP (protocols, IP header)
- Routing (principles of IP routing)
- TCP/UDP
- Network Address Translation
- Ethernet CFM
- MPLS overview
- Distance vector
- Routing Information Base (RIB) and Forwarding Information Base (FIB)

Goals:

Upon completion of this course, you will be able to:

- Understand how a data network is built
- Understand how IP, Ethernet and MPLS protocols work

Target Audience:

- For basic technological background to start the Neptune training program

Prerequisites:

- Technical background

Notes:

- Material in this course is a prerequisite for all Neptune courses (except for pure SDH implementation)

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APOLLO COURSE LIST

Ribbon Communications Confidential and Proprietary

Apollo Introduction and Initial Configuration

Course Duration: 3 days

Course Code: APOL01

Course Content:

- Apollo shelf overview
- Apollo shelf power consumption
- Common cards and modules
- NVM loader
- Initial configuration via LCT and CLI
- DCN configuration
- NE DB backup via LCT or CLI

Goals:

Upon completion of this course, you will be able to:

- Perform initial configuration of various Apollo shelves via LCT & CLI
- Perform NE DB backup
- Perform basic local troubleshooting

Target Audience:

- Field engineers
- Support teams

Prerequisites:

- Basic knowledge in telecommunications

Notes:

- This course is not a management course
- This course does not include link tune-up , NMS and STMS
- The course covers both Apollo 96xx and 99xx products
- This course must be given in the Main Ribbon offices, to have access to Apollo equipment for practice

Ribbon Communications Confidential and Proprietary

Apollo OTN Transport Operation (LightSOFT)

Course Duration: 5 days

Course Code: APOL02-LS

Course Content:

- Apollo shelves
- Apollo shelf power consumption
- Common cards and modules overview
- DWDM, and photonic cards and modules overview
- LightSOFT - Introduction
- LightPULSE Overview
- STMS - Introduction
- WDM cards configuration via STMS
- GCC and OSC Overview
- Optical links and trails using LightSOFT
- Hardware and Y-Protection Overview
- ONCP
- Physical construction of a WDM optical link
- Optical link calibration using OSA
- Network Monitoring and Alarms
- Encryption technology Overview
- Encryption Configuration
- OTDR technology and implementation in Apollo

Goals:

Upon completion of this course, you will be able to:

- Configure Apollo cards using the LightSOFT network management systems
- Configure encryption on the Apollo Interface cards
- Create optical links & trails in LightSOFT
- Physically build and monitor an Apollo WDM optical network

Target Audience:

- NOC personnel
- Network engineers

Prerequisites:

- Introduction to WDM and OTN technologies - [WDM_OTN]

Notes:

- This course does not include ODU-XC functionality and ASON/WSON. For those functionalities, please refer to the relevant courses below.
- This course does not include initial configuration. For this, please refer to the Apollo Introduction and Initial Configuration course [APOL01]

Ribbon Communications Confidential and Proprietary

Apollo OTN Transport Operation (Muse NC)

Course Duration: 5 days

Course Code: APOL02-MUSE

Course Content:

- Apollo shelves
- Apollo shelf power consumption
- Common cards and modules overview
- DWDM, and photonic cards and modules overview
- Muse NC - Introduction
- Signal Health (Muse NC)
- WDM cards configuration via Muse NC
- GCC and OSC Overview
- Optical links and trails using Muse NC
- Hardware and Y-Protection Overview
- ONCP
- Physical construction of a WDM optical link in Muse NC
- Optical link calibration using OSA
- Network Monitoring and Alarms
- Encryption technology Overview
- Encryption Configuration
- OTDR technology and implementation in Apollo

Goals:

Upon completion of this course, you will be able to:

- Configure Apollo cards using the Muse NC network management systems
- Configure encryption on the Apollo Interface cards
- Create optical links & trails in Muse NC
- Physically build and monitor an Apollo WDM optical network

Target Audience:

- NOC personnel
- Network engineers

Prerequisites:

- Introduction to WDM and OTN technologies - [WDM_OTN]

Notes:

- This course does not include ODU-XC functionality and ASON/WSON. For those functionalities, please refer to the relevant courses below.
- This course does not include initial configuration. For this, please refer to the Apollo Introduction and Initial Configuration course [APOL01]

Ribbon Communications Confidential and Proprietary

Apollo OTN Switching Operation (LightSOFT)

Course Duration: 3 days

Course Code: APOL03-LS

Course Content:

- Apollo shelves with ODU-XC capability
- Fabric overview
- MIO, TIO TIOMR and HIO cards overview
- OTN Link and Trail creation via LightSOFT
- Physical construction of OTN optical link in LightSOFT
- OTN link tune-up using OPM and OSA
- LightPULSE
- Network monitoring and alarms

Goals:

Upon completion of this course, you will be able to:

- Configure the Apollo OTN -Fabric cards using the LightSOFT Network Management System
- Create OTN links & trails via LightSOFT
- Physically build and monitor an Apollo OTN network

Target Audience:

- NOC personnel
- Network engineers

Prerequisites:

- Introduction to WDM and OTN technologies - [WDM_OTN]

Notes:

- This course does not include ASON or WSON overviews or configuration
- This course does not include initial configuration. For this, refer to the course - Apollo Introduction and Initial configuration [APOL01APOL01]
- The course covers Apollo OPT99xx products

Ribbon Communications Confidential and Proprietary

Apollo OTN Switching Operation (Muse NC)

Course Duration: 3 days

Course Code: APOL03-MUSE

Course Content:

- Apollo shelves with ODU-XC capability
- Fabric overview
- MIO, TIO TIOMR and HIO cards overview
- OTN Link and Trail creation via Muse NC
- Physical construction of OTN optical link in Muse NC
- OTN link tune-up using OPM and OSA
- Signal Health (Muse NC)
- Network monitoring and alarms

Goals:

Upon completion of this course, you will be able to:

- Configure the Apollo OTN -Fabric cards using the Muse NC Network Management System
- Create OTN links & trails via Muse NC
- Physically build and monitor an Apollo OTN network

Target Audience:

- NOC personnel
- Network engineers

Prerequisites:

- Introduction to WDM and OTN technologies - [WDM_OTN]

Notes:

- This course does not include ASON or WSON overviews or configuration
- This course does not include initial configuration. For this, refer to the course - Apollo Introduction and Initial configuration [APOL01APOL01]
- The course covers Apollo OPT99xx products

Ribbon Communications Confidential and Proprietary

Optical Network Management for Customers moving from LightSOFT to Muse NC

Course Duration: 3 days

Course Code: APOL_MUSE-NC

Course Content:

- PaaS Concept
- Muse Network Controller Overview
- Muse NC GUI, Nodes Links Services
- Muse NC Topology customization
- Muse NC Service provisioning
- Muse NC Alarms & Alarm forwarding

Goals:

Upon completion of this course, you will be able to:

- Know the Muse Network Controller SDN, GUI and features
- Configure Apollo cards and provision services through Muse NC
- Apollo management in Muse NC

Target Audience:

- Anybody that has been using LightSOFT as Network Management System and now wants to upgrade to Muse NC

Prerequisites:

- WDM and OTN course [WDM_OTN]
- Apollo OTN transport operation course [APOL02-LS] or
- Apollo OTN switching operation course [APOL03-LS]

Notes:

- This course does not include initial configuration. For this, refer to the course - Apollo Introduction and Initial configuration [APOL01APOL01]

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Apollo ASON

Course Duration: 2 days

Course Code: APOL04

Course Content:

- ASON theory
- ASON configuration
- ASON topology setup
- Maintenance ASON Network

Goals:

Upon completion of this course, you will be able to:

- Create ASON Network
- Perform maintenance for ASON network

Target Audience:

- NOC personnel
- Network engineers

Prerequisites:

- WDM and OTN course [WDM_OTN]
- Apollo OTN switching operation course [APOL03-LS/APOL03-MUSE]

Notes:

- This course does not include ASON and WSON overview and configuration

This course does not include OTN switching. For this, please refer to the course - Apollo OTN switching operation [APOL03-LS/APOL03-MUSE]

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Apollo WSON

Course Duration: 2 days

Course Code: APOL05

Course Content:

- ROADM overview
- WSON theory
- WSON topology setup
- Maintenance of WSON network

Goals:

Upon completion of this course, you will be able to:

- Create a WSON Network
- Perform maintenance for a WSON network

Target Audience:

- NOC personnel
- Network engineers

Prerequisites:

- WDM and OTN course [WDM_OTN]
- Apollo OTN transport operation course [APOL02]

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Apollo Hardware Protection Workshop

Course Duration: 2 days

Course Code: APOL_AD_01

Course Content:

- Optical protection: Y-Protection
- Hardware protection:
    - Client signal protection by OLP
    - Single Optical channel protection by OLP
    - Composite Optical channels protection by OLP

Goals:

Upon completion of this course, you will be able to:

- Create the above protection mechanisms
- Monitor and operate protection mechanisms

Target Audience:

- NOC personnel
- Network engineers

Prerequisites:

- WDM and OTN course [WDM_OTN]
- Apollo OTN switching operation course [APOL03]

Notes:

- This course does not include ASON/WSON. For this, please refer to the Apollo ASON [APOL04] and Apollo WSON [APOL05] courses

Ribbon Communications Confidential and Proprietary

Apollo Planning Concepts Workshop

Course Duration: 2 days

Course Code: APOL_AD_02

Course Content:

- Optical Link Planning Concepts
    - Amplification
    - Dispersion compensation
    - Coherent channels characteristics & features
    - Regeneration
    - FEC
    - Equalization
    - OTDR
- Optical network planning concepts
    - Network planning considerations - the traffic table
    - Using FOADMs, 2-Degree and Multi Degree ROADMs
    - Colorless, Directionless, and Contention-less sites

Goals:

Upon completion of this course, you will be able to:

- Understand the optical effects that determine how optical links are designed
- Understand how optical parameters are measured
- Understand how optical parameters are compensated
- Understand network and service planning concepts

Target Audience:

- Planning personnel
- Network engineers

Prerequisites:

- Apollo OTN transport course [APOL02]
- Apollo OTN switching course [APOL03]

Notes:

- This course is built as a workshop and consists of many exercises that let the participant face real-world planning challenges
- This course gives the participants tools to understand the underlying concepts of network planning design, however it does not certify them to design optical networks independently

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Apollo Advanced Optical Network Maintenance

Course Duration: 3 days

Course Code: APOL_AD_03

Course Content:

- The effect of OSNR, PMD, attenuation, chromatic dispersion, BR and nonlinear effects on optical links
- Analyzing optical links
- Optimal troubleshooting processes in optical networks
- Optical link case studies
- Advanced optical layer operation in LightSOFT

Goals:

Upon completion of this course, you will be able to:

- Understand the different optical phenomena and their effect on network performance
- Analyze an optical link using LightSOFT tools
- Perform troubleshooting optimally, to gain long-term network stability
- Preform optical network routine maintenance

Target Audience:

- Planning personnel
- Network engineers

Prerequisites:

- Apollo OTN transport course [APOL02-LS/APOL02-MUSE]
- Apollo OTN switching course [APOL03-LS/APOL03-MUSE]

Notes:

- This course is carried on in the Main RIBBON offices only

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NEPTUNE COURSE LIST

Ribbon Communications Confidential and Proprietary

NPTi Installation & Basic Configuration In-band Management Using an IGP (OSPF/ISIS)

Course Duration: 3 days

Course Code: NPTi_INST_IGP

Course Content:

This course covers Neptune functionality including:

- Product introduction
- Neptune shelves
- Cards and modules
- NVM loader/ ZTI (depending on the NPT shelf)
- Introduction to LCT application
- Introduction to CLI for Neptune
- Installation of NPTi using LCT-NPT (including hands-on)
- Installation of NPTi using CLI (including hands-on)
- Basic configuration (slot assignment, port configuration)
- IGP (OSPF or ISIS) protocol overview
- IGP configuration (including hands-on)
- In-band management configuration (including hands-on)
    - Setting a loopback as a management interface
    - Setting MNG port as a management interface (GW)
    - Static route configuration on the EMS server

Goals:

Upon completion of this course, you will be able to:

- Describe the different Neptune chassis and cards
- Configure a Neptune locally using LCT software and CLI so it can be managed remotely by using ISIS or OSPF for DCN

Target Audience:

- Those who wish to get acquainted with the Neptune product line and cards
- Field personnel who want to know how to connect to the device locally for initial installation and configuration

Prerequisites:

- Basic knowledge in telecommunications
- Basic knowledge in routing concepts

Notes:

- This course does not include network-management topics

Ribbon Communications Confidential and Proprietary

NPTi Installation & Basic Configuration Management VRF (NPTi only)

Course Duration: 3 days

Course Code: NPTi_INST_MVRF

Course Content:

This course covers Neptune functionality including:

- Product introduction
- Neptune shelves
- Cards and modules
- NVM loader/ ZTI (depending on the NPT shelf)
- Introduction to LCT application
- Introduction to CLI for Neptune
- Installation of NPTi using LCT-NPT (including hands-on)
- Installation of NPTi using CLI (including hands-on)
- Basic configuration (slot assignment, port configuration)
- Management VRF-concept overview
    - IGP configuration
    - LDP configuration
    - Management VRF configuration
    - MP-BGP configuration

Goals:

Upon completion of this course, you will be able to:

- Describe the different Neptune chassis and cards
- Configure the Neptune locally using LCT software and CLI so it can be managed remotely using a management VRF

Target Audience:

- Those who wish to get acquainted with the Neptune product line and cards
- Field personnel who want to know how to connect to the device locally for initial installation and configuration

Prerequisites:

- Basic knowledge in telecommunications
- Basic knowledge in routing concepts

Notes:

- This course does not include network-management topics
- This course doesn't include deep theory of IP/MPLS concepts, but only its configuration for DCN purposes.
- For in-depth content, check the management IP/MPLS course path

Ribbon Communications Confidential and Proprietary

NPTi Installation & Basic Configuration Out Of Band (OOB) Management

Course Duration: 2 days

Course Code: NPTi_INST_OOB

Course Content:

This course covers Neptune functionality including:

- Product introduction
- Neptune shelves
- Cards and modules
- Introduction to LCT application
- Introduction to CLI for Neptune
- Installation of NPTi using LCT-NPT (including hands-on)
- Installation of NPTi using CLI (including hands-on)
- Basic configuration (slot assignment, port configuration)
- OOB configuration:
    - MNG port configuration (LCT and CLI)
    - Configuring static routes on the EMS server

Goals:

Upon completion of this course, you will be able to:

- Describe the different Neptune chassis and cards
- Configure the Neptune locally using LCT software and CLI so it can be managed remotely using OOB management

Target Audience:

- Those who wish to get acquainted with the Neptune product line and cards
- Field personnel who want to know how to connect to the device locally for initial installation and configuration

Prerequisites:

- Basic knowledge in telecommunications

Notes:

- This course suites customers with OOB DCN, or customers needing installation course without DCN topics
- This course does not include network-management topics

Ribbon Communications Confidential and Proprietary

NPTi Technician Level Troubleshooting

Course Duration: 1 day

Course Code: NPTi_TS

Course Content:

This course covers Neptune cases that may affect DCN connectivity, and require troubleshooting by LCT / CLI including:

- LIF configuration status
- IGP neighbor status check & IGP configuration
- Routing table, checking learned routes
- IP ping & traceroute from NPT
- Optical parameters
- "NE connection settings" verification
- If management VRF is used:
    - LDP status
    - BGP session status
    - L3VPN status

Goals:

Upon completion of this course, you will be able to:

- Connect to Neptune using LCT and CLI to solve common DCN issues

Target Audience:

- Field personnel who have already participated in one of the Neptune installation courses and want to be able to troubleshoot NPTi communication cases

Prerequisites:

- One of the NPTi installation courses: NPTi_INST_IGP , NPTi_INST_MVRF or NPTi_INST_OOB

Notes:

- This course does not include network-management topics

Ribbon Communications Confidential and Proprietary

NPTi & MPLS-TP - LightSoft L2VPN

Course Duration: 5 days

Course Code: NPTi_TP_L2VPN_LS

Course Content:

This course covers remote management of NPT in LightSoft, provisioning of MPLS-TP networks and L2VPN services, including:

- Product introduction
- Neptune shelves
- Cards and modules
- LightSoft & EMS-NPT Introduction
- NPTi configuration (including hands-on):
    - Slot assignment
    - Switch configuration
    - Port configuration
- IP networks (including hands-on)
- MPLS-TP & Ethernet technology overview
- MPLS-TP tunnels (including hands-on):
    - Creation
    - Editing and deletion
    - Linear protection
- L2VPN service (including hands-on)
    - Creation-including profiles
    - Editing and deletion

Goals:

Upon completion of this course, you will be able to:

- Operate an MPLS-TP network composed of Neptune products, using L2VPNs, EMS-NPT, and LightSOFT

Target Audience:

- NOC personnel
- Network engineers

Prerequisites:

- Basic knowledge in telecommunications

Notes:

- This course doesn’t include initial installation of the NPTi

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NPTi & MPLS-TP - LightSoft Advanced Network Monitoring

Course Duration: 2 days

Course Code: NPTi_TP_AD_LS

Course Content:

This course covers advanced network management tools in LightSoft and EMS-NPT, including:

- Traffic editing options (including hands-on):
  - Tunnel configuration-add protection, editing and selecting paths, editing COS, and editing BW
  - L2VPN Service configuration
- Consistency tools (including hands-on):
  - Inconsistency types and cases
  - Tunnel consistency
  - L2VPN Service consistency
- Network availability tools
  - Editing CAC via links
  - Availability on links
  - Availability map

Goals:

Upon completion of this course, you will be able to:

Perform advanced actions on an NPTi network via LightSoft:

- Change traffic configurations
- Solve inconsistencies
- Monitor network availability

Target Audience:

- NOC personnel
- Network engineers

Prerequisites:

- NOC personnel
- Network engineers

Notes:

- Participate in course NPTi_TP_L2VPN

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NPTi & IP/MPLS – LightSoft L2VPN

Course Duration: 5 days

Course Code: NPTi_IP_L2VPN_LS

Course Content:

This course covers remote management of NPT in LightSOFT, provisioning of IP/MPLS networks and L2VPN services, including:

- Product introduction
- Neptune shelves
- Cards and modules
- LightSOFT & EMS-NPT Introduction
- NPTi configuration (including hands-on):
    - Slot assignment
    - Switch configuration
    - Port configuration
- IP networks (including hands-on)
- IGP-ISIS or OSPF (including hands-on):
    - Protocol overview
    - configuration
- LDP
    - Protocol overview
    - configuration
- L2VPN service (including hands-on)
    - Configuration-including profiles configuration
    - Editing and deletion

Goals:

Upon completion of this course, you will be able to:

- Operate an IP/MPLS network with L2VPNs composed of Neptune products using EMS-NPT and LightSOFT

Target Audience:

- NOC personnel
- Network engineers

Prerequisites:

- NOC personnel
- Network engineers

Notes:

- This course is a prerequisite to the NPTi_BGP&L3VPN_LS course
- This course doesn't include initial installation of the NPTi

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NPTi & IP/MPLS - LightSoft BGP & L3VPN

Course Duration: 3 days

Course Code: NPTi_BGP&L3VPN_LS

Course Content:

This course covers remote management of NPT in LightSoft and provisioning of L3VPN services in IP/MPLS networks, including:

- L3VPN technology overview
- L3VPN and VRF configuration (including hands-on)
- BGP protocol overview
    - iBGP and MP-BGP
    - eBGP
    - Routing attributes
- MP-BGP configuration between VRFs (including hands-on)
- Routing policies & redistribution-concept and configuration (including hands-on)
- CE-PE eBGP configuration

Goals:

Upon completion of this course, you will be able to:

- Operate an IP/MPLS network with L3VPNs composed of Neptune products using EMS-NPT and LightSOFT

Target Audience:

- NOC personnel
- Network engineers

Prerequisites:

- Extensive background in routing concepts
- Participating in NPTi_IP_L2VPN_LS

Notes:

- This course doesn't include initial installation of the NPTi

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NPTi & IP/MPLS – LightSoft Advanced Network Monitoring

Course Duration: 2 days

Course Code: NPTi_IP_AD_LS

Course Content:

This course covers advanced network management tools in LightSOFT and EMS-NPT, including:

- Traffic editing options (including hands-on):
  - L2VPN Service editing
  - L3VPN service editing
- Consistency tools (including hands-on):
  - Inconsistency types and cases
  - L2VPN Service consistency
  - L3VPN Service consistency
- Routing troubleshooting:
  - "Actual routes" - table overview
  - "IP ping & Traceroute" - NPT tool

Goals:

Upon completion of this course, you will be able to:

- Perform advanced actions on NPTi networks via LightSOFT:
- Change traffic configurations
- Solve inconsistencies
- Monitor network availability

Target Audience:

- NOC personnel
- Network engineers

Prerequisites:

- Participating in NPTi_IP_L2VPN_LS and NPTi_IP_BGP&L3VPN_LS

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NPTi & IP/MPLS – Muse L2VPN

Course Duration: 5 days

Course Code: NPTi_IP_L2VPN_MUSE

Course Content:

This course covers remote management of NPT in Muse, provisioning of IP/MPLS networks and L2VPN services, including:

- Product introduction
- Neptune shelves
- Cards and modules
- Muse Introduction
- NPTi configuration (including hands-on):
    - Slot assignment
    - Switch configuration
    - Port configuration
- IP networks (including hands-on)
- IGP-ISIS or OSPF (including hands-on):
    - Protocol overview
    - configuration
- LDP
    - Protocol overview
    - configuration
- L2VPN service (including hands-on)
    - Configuration-including profiles configuration
    - Editing and deletion

Goals:

Upon completion of this course, you will be able to:

- Operate an IP/MPLS network with L2VPNs composed of Neptune products using Muse

Target Audience:

- NOC personnel
- Network engineers

Notes:

- This course is a prerequisite to the NPTi_BGP&L3VPN_MUSE course
- This course doesn't include initial installation of the NPTi

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NPTi & IP/MPLS – Muse BGP & L3VPN

Course Duration: 3 days

Course Code: NPTi_BGP&L3VPN_MUSE

Course Content:

This course covers remote management of NPT in Muse and provisioning of L3VPN services in IP/MPLS networks, including:

- L3VPN technology overview
- L3VPN and VRF configuration (including hands-on)
- BGP protocol overview
    - iBGP and MP-BGP
    - eBGP
    - Routing attributes
- MP-BGP configuration between VRFs (including hands-on)
- Routing policies & redistribution-concept and configuration (including hands-on)
- CE-PE communication - eBGP/ static routes/ IGP

Goals:

Upon completion of this course, you will be able to:

- Operate an IP/MPLS network with L3VPNs composed of Neptune products using Muse

Target Audience:

- NOC personnel
- Network engineers

Prerequisites:

- Extensive background in routing concepts
- Participating in NPTi_IP_L2VPN_MUSE

Notes:

- This course doesn't include initial installation of the NPTi

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NPTi & IP/MPLS – Muse EVPN

Course Duration: 7 days

Course Code: NPTi_IP_EVPN_MUSE

Course Content:

This course covers remote management of NPT in Muse, provisioning of IP/MPLS networks and EVPN services, including:

- Product introduction
- Neptune shelves
- Cards and modules
- Muse Introduction
- NPTi configuration (including hands-on):
    - Slot assignment
    - Switch configuration
    - Port configuration
- IP networks (including hands-on)
- IGP-ISIS or OSPF (including hands-on):
    - Protocol overview
    - configuration
- LDP
    - Protocol overview
    - configuration
- BGP protocol overview
    - iBGP and MP-BGP
    - eBGP
    - Routing attributes
- MP-BGP configuration between VRFs (including hands-on)
- EVPN service configuration

Goals:

Upon completion of this course, you will be able to:

- Operate an IP/MPLS network with EVPNs composed of Neptune products using Muse

Target Audience:

- NOC personnel
- Network engineers

Notes:

- This course is a prerequisite to the NPTi_L3VPN_MUSE course
- This course doesn't include initial installation of the NPTi

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NPTi & IP/MPLS – Muse L3VPN

Course Duration: 2 days

Course Code: NPTi_L3VPN_MUSE

Course Content:

This course covers remote management of NPT in Muse, provisioning of L3VPN services, including:

- L3VPN technology overview
- L3VPN and VRF configuration (including hands-on)
- Routing policies & redistribution-concept and configuration (including hands-on)
- CE-PE communication - eBGP/ static routes/ IGP

Goals:

Upon completion of this course, you will be able to:

- Operate an IP/MPLS network with L3VPNs composed of Neptune products using Muse

Target Audience:

- NOC personnel
- Network engineers

Prerequisites:

- Extensive background in routing concepts
- Participating in NPTi_IP_EVPN_MUSE

Notes:

- This course doesn't include initial installation of the NPTi

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NPT Installation & Basic Configuration

Course Duration: 2 days

Course Code: NPT_INST

Course Content:

This course covers Neptune functionality including:

- Product introduction
- Neptune shelves
- Cards and modules
- Introduction to LCT application
- Installation of NPTi using LCT-NPT (including hands-on)
- Basic configuration (slot assignment, port configuration)
- Timing configuration
- Maintenance operations: laser force, traffic loops, etc.

Goals:

Upon completion of this course, you will be able to:

- Describe the different Neptune chassis and cards
- Install and configure the Neptune locally using LCT software

Target Audience:

- Those who wish to get acquainted with the Neptune product line and cards
- Field personnel who want to know how to connect to the device locally for initial installation and configuration

Prerequisites:

- Basic knowledge in telecommunications

Notes:

- This course is not a management course
- This course isn’t suitable for NPTi shelves

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NPT & MPLS-TP L2VPN

Course Duration: 5 days

Course Code: NPT_TP_L2VPN

Course Content:

This course covers remote management of NPT in LightSOFT and provisioning of MPLS-TP network and L2VPN services, including:

- Product introduction
- Neptune shelves
- Cards and modules
- LightSOFT & EMS-NPT Introduction
- NPT configuration (including hands-on):
    - Slot assignment
    - Switch configuration
    - Port configuration
- Topology links (including hands-on)
- MPLS-TP & Ethernet technology overview
- MPLS-TP tunnels (including hands-on):
    - Creation
    - Editing and deletion
    - Linear protection
- L2VPN service (including hands-on)
    - Creation
    - Editing and deletion

Goals:

Upon completion of this course, you will be able to:

- Operate an MPLS-TP network with L2VPNs composed of Neptune products with EMS-NPT and LightSOFT

Target Audience:

- NOC personnel
- Network engineers

Prerequisites:

- Basic knowledge in telecommunications

Notes:

- This course doesn’t include initial installation of the NPT

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NPT & MPLS-TP
Advanced Network Monitoring

Course Duration: 2 days

Course Code: NPT_TP_AD

Course Content:

This course covers advanced network management tools in LightSOFT and EMS-NPT, including:

- Traffic editing options (including hands-on):
  - Editing tunnels-adding protection, path editing and selection, editing COS, editing BW
  - L2VPN Service editing
- Consistency tools (including hands-on):
  - Inconsistency types and cases
  - Tunnel consistency
  - L2VPN Service consistency
- Network availability tools
  - Editing CAC on links
  - Link availability
  - Availability map

Goals:

Upon completion of this course, you will be able to:

Perform advanced actions on an NPT network via LightSOFT:

- Change traffic configuration
- Solve inconsistencies
- Monitor network availability

Target Audience:

- NOC personnel
- Network engineers

Prerequisites:

- Participate in course NPT_TP_L2VPN

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Circuit Emulation Service (CES)

Can be added to any of the **Network management** courses
Not a standalone course!

Course Duration: 0.5 days

Course Code: CES

Course Content:

This course covers concepts and configurations of CES, including:

- CES cards overview
- CES functionality overview
- CES configuration (hands-on) including TMU configuration

Goals:

Upon completion of this course, you will be able to:

- Describe the functionality of and configure CES

Target Audience:

- NOC personnel
- Network engineers

Notes:

- Can be added to any of the **Network management** courses
  Not a standalone course!

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PCM Services

Can be added to any of the **Network management** courses
Not a standalone course!

Course Duration: 0.5 days

Course Code: PCM

Course Content:

This course covers concepts and configurations of PCM traffic, including:

- PCM cards (SM_10 or EM_10) and its PCM modules overview
- SM_10 / EM_10 card functionality overview
- PCM traffic configuration (hands-on)

Goals:

Upon completion of this course, you will be able to:

- Describe the functionality of and configure PCM traffic

Target Audience:

- NOC personnel
- Network engineers

Notes:

- Can be added to any of the **Network management** courses
  Not a standalone course
- SM_10 - used in NPTs with SDH matrix
- EM_10 - used in NPTi, and NPTs with a switching matrix

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MACsec

Can be added to any of the **Network management** courses
Not a standalone course!

Course Duration: 0.5 days

Course Code: MACSEC

Course Content:

This course covers concepts and configurations of MACsec, including:

- MACsec cards
- MACsec functionality overview
- MACsec cards & session configuration (including hands-on)

Goals:

Upon completion of this course, you will be able to:

- Describe the functionality of and configure MACsec

Target Audience:

- NOC personnel
- Network engineers

Notes:

- Can be added to any of the **Network management** courses for NPTi (MACsec supported only for NPTi shelves)

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Multi Segment Pseudo Wire (MSPW) & Pseudo Wire Redundancy (PWR)

Can be added to any of the **Network management** courses
Not a standalone course!

Course Duration: 0.5 days

Course Code: MSPWR

Course Content:

This course covers concepts and configurations of the features MS-SW and PWR, including:

- MS-PW concept
- MS-PW configuration (hands-on)
- PWR concept
- PWR configuration (hands-on)

Goals:

Upon completion of this course, you will be able to:

- Describe the functionality and configure protected services (PWR) and MS-PW

Target Audience:

- NOC personnel
- Network engineers

Notes:

- Can be added to any of the Network management courses
- MS-PW is relevant for MPLS-TP networks

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ADVANCED MANAGEMENT TOOLS COURSE LIST

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LightINSIGHT Operation

Course Duration: 1 day

Course Code: MNG_AD_01

Course Content:

- LightINSIGHT General Overview
- LightINSIGHT Modules and Dashboards
- LightINSIGHT Report Generation

Goals:

Upon completion of this course, you will be able to:

- Describe the architecture of LightINSIGHT
- Describe the modules available in LightINSIGHT
- Use LightINSIGHT predefined reports
- Create LightINSIGHT customized reports using filters and calculated values
- Create LightINSIGHT agents

Target Audience:

- Network Engineers who wish to be able to properly use LightINSIGHT

Prerequisites:

- Basic knowledge in data communications
- Neptune-Network Management-L2 [NPT02] or
- Neptune-Network Management-MPLS [NPT03] course or
- Apollo OTN transport operation[APOL02-LS/APOL02-MUSE] or
- Apollo OTN switching operation [APOL03-LS/APOL03-MUSE]
- Participants should be proficient in the relevant technologies and products

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Muse Network INSIGHT Operation

Course Duration: 1 day

Course Code: MNG_AD_02

Course Content:

- Muse Network INSIGHT General Overview
- Muse Network INSIGHT Dashboards, charts, datasets, SQL
- Muse Network INSIGHT Report Generation

Goals:

Upon completion of this course, you will be able to:

- Describe the architecture of Muse Network INSIGHT
- Describe the modules available in Muse Network INSIGHT
- Use Muse Network INSIGHT predefined reports
- Create Dashboard using predefined charts and datasets

Target Audience:

- Network Engineers who wish to be able to properly use Muse Network INSIGHT

Prerequisites:

- Basic knowledge in data communications
- Neptune-Network Management-L2 [NPT02] or
- Neptune-Network Management-MPLS [NPT03] course or
- Apollo OTN transport operation[APOL02-LS/APOL02-MUSE] or
- Apollo OTN switching operation [APOL03-LS/APOL03-MUSE]
- Participants should be proficient in the relevant technologies and products

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Muse Network Planner

Course Duration: 1 day

Course Code: MNG_AD_03

Course Content:

- Overview
- Planning Workflow
- Setting Preferences
- Phase and multiphase
- Topology Management
- Use of Site templates
- Topology and cables
- Amplifier optimization
- OSC and OTDR filter distribution
- Simulation, Routes and paths
- Equipment assignment and DCN. Software packages
- Finalization and Report generation

Goals:

Upon completion of this course, you will be able to:

- Use Muse NP to plan a network
- Generate the necessary files and reports to implement the network

Target Audience:

- Network Engineers who wish to be able to properly use Muse Network Planner

Prerequisites:

- Basic knowledge in data communications
- Neptune-Network Management or
- Apollo Network Management

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