Training Proposal for Access Network Project

HUAWEI

HUAWEI Learning Service

2015

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1.1 Background Introduction

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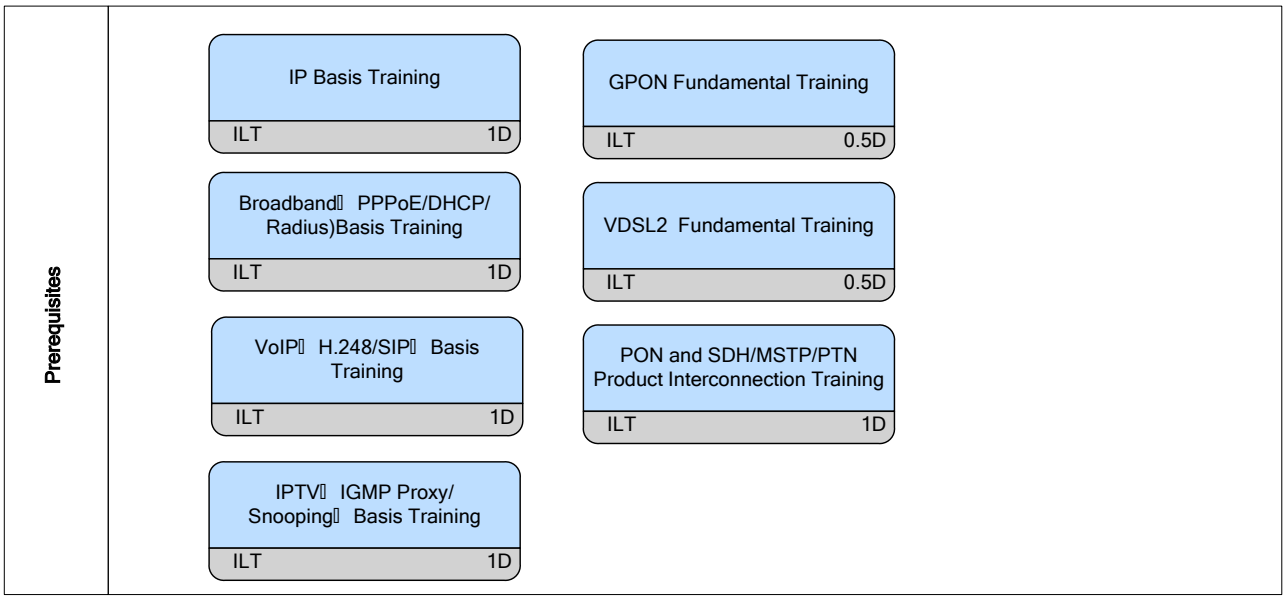
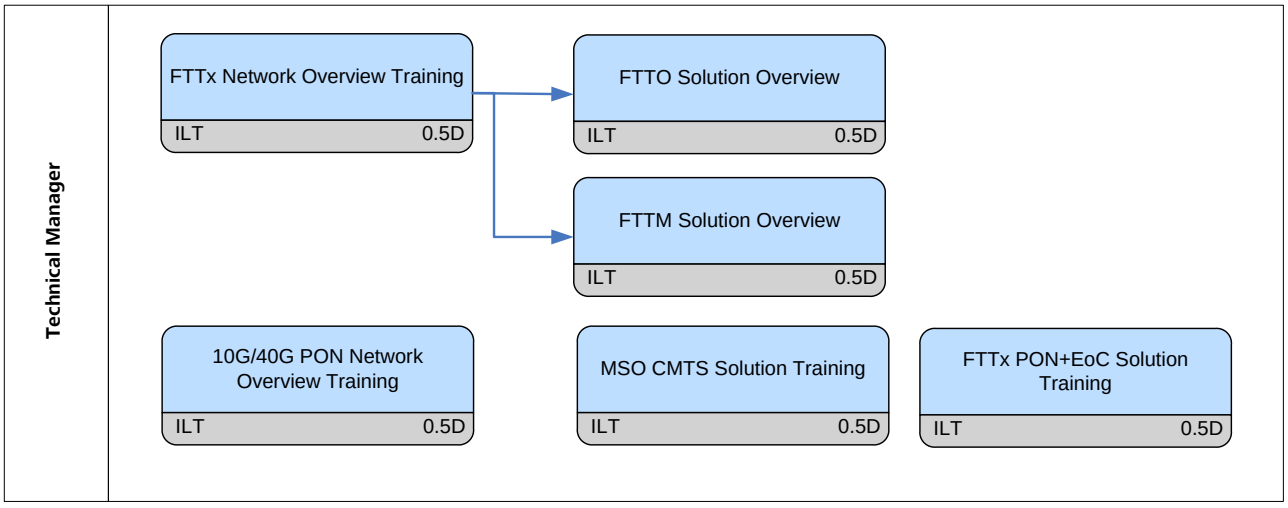
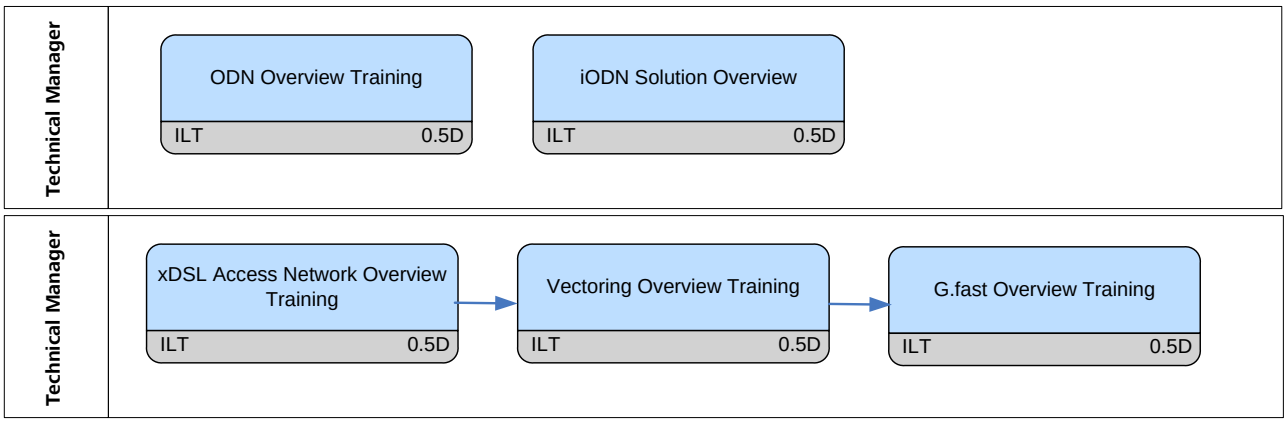
1.3 Access Network Training Path

1.3.1 Principle



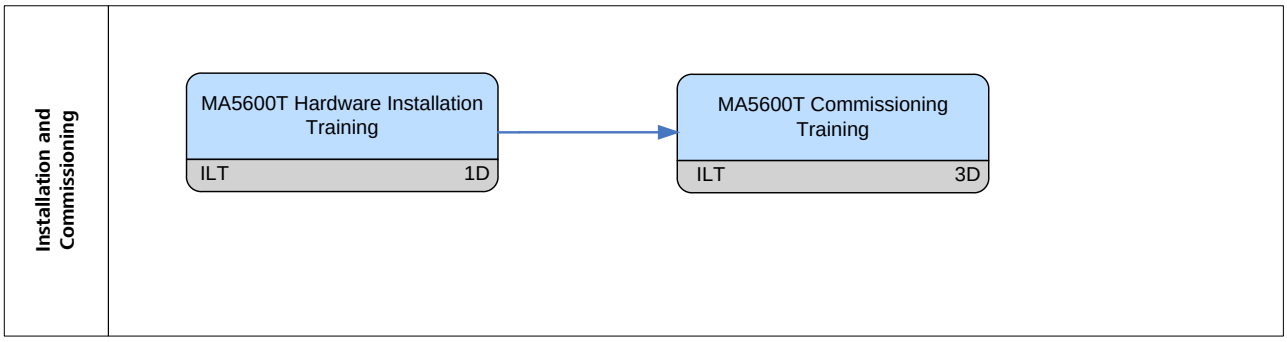
1.3.2 Evolution and Trends



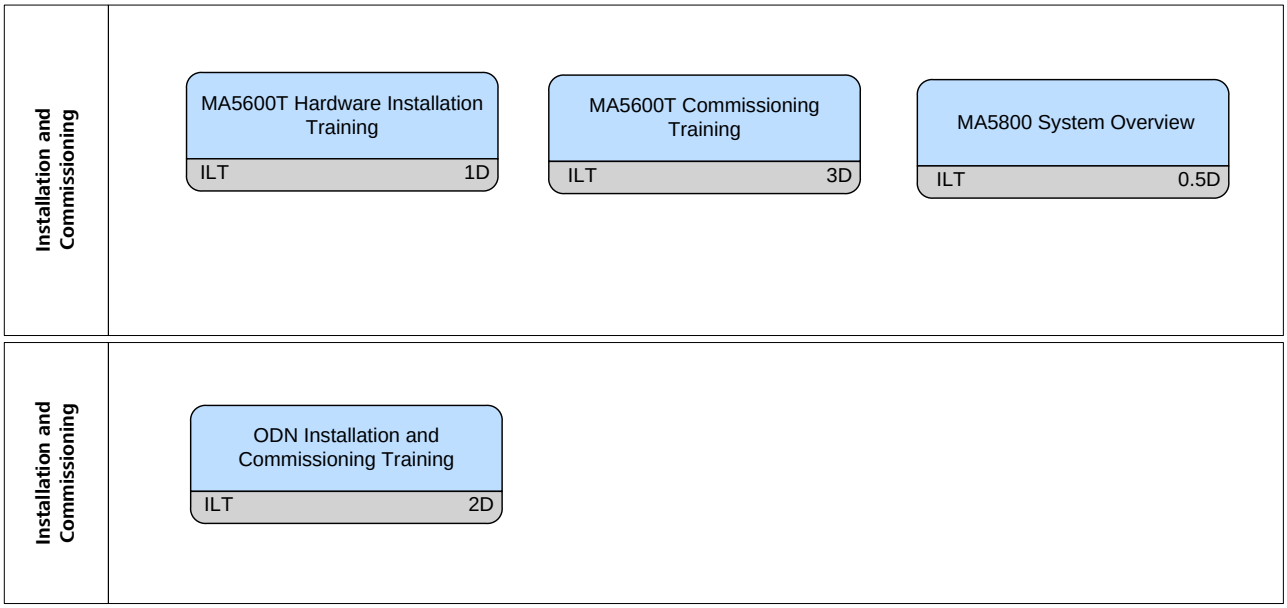


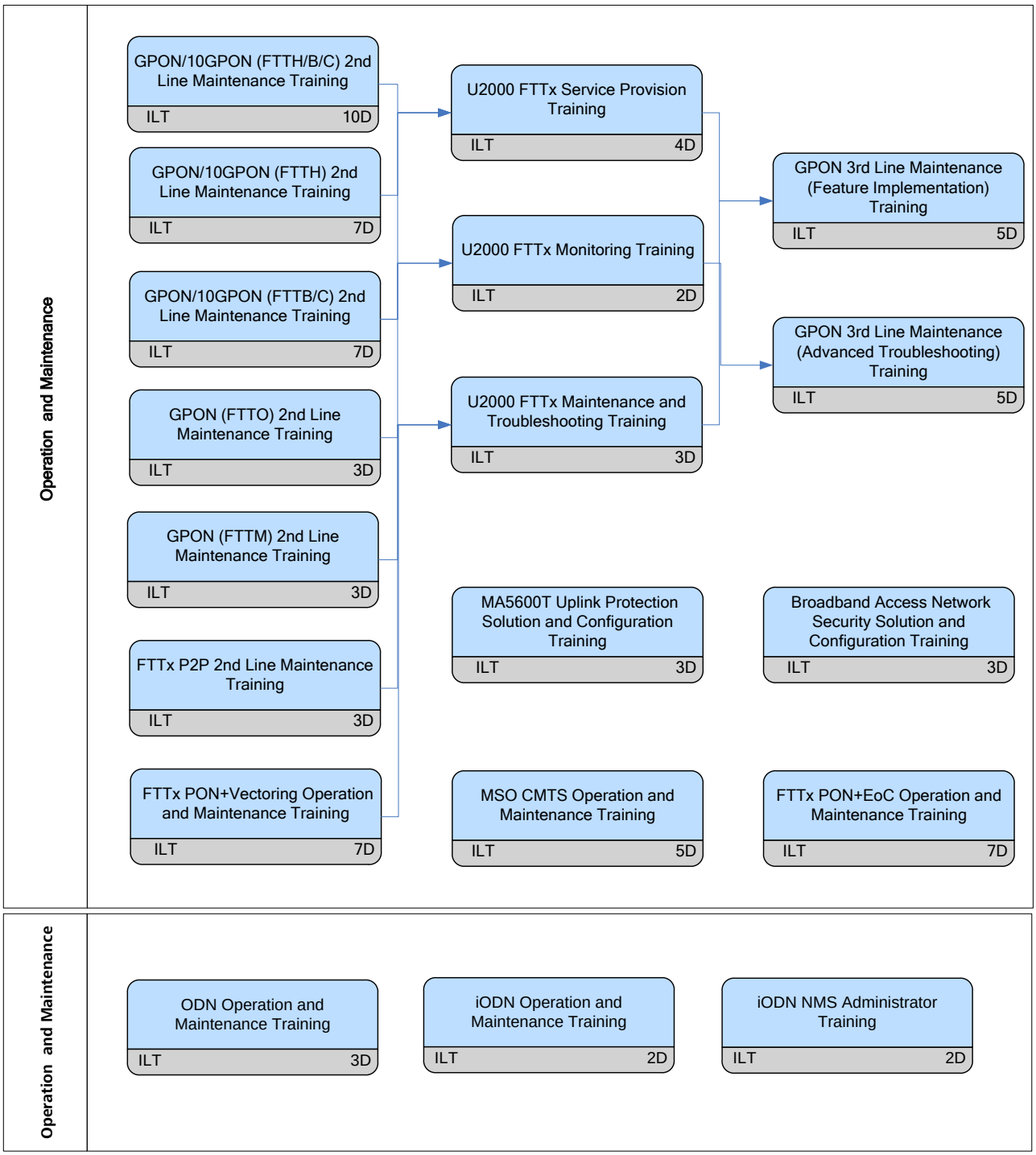
1.3.3 Planning

1.3.4 MA5600T Products

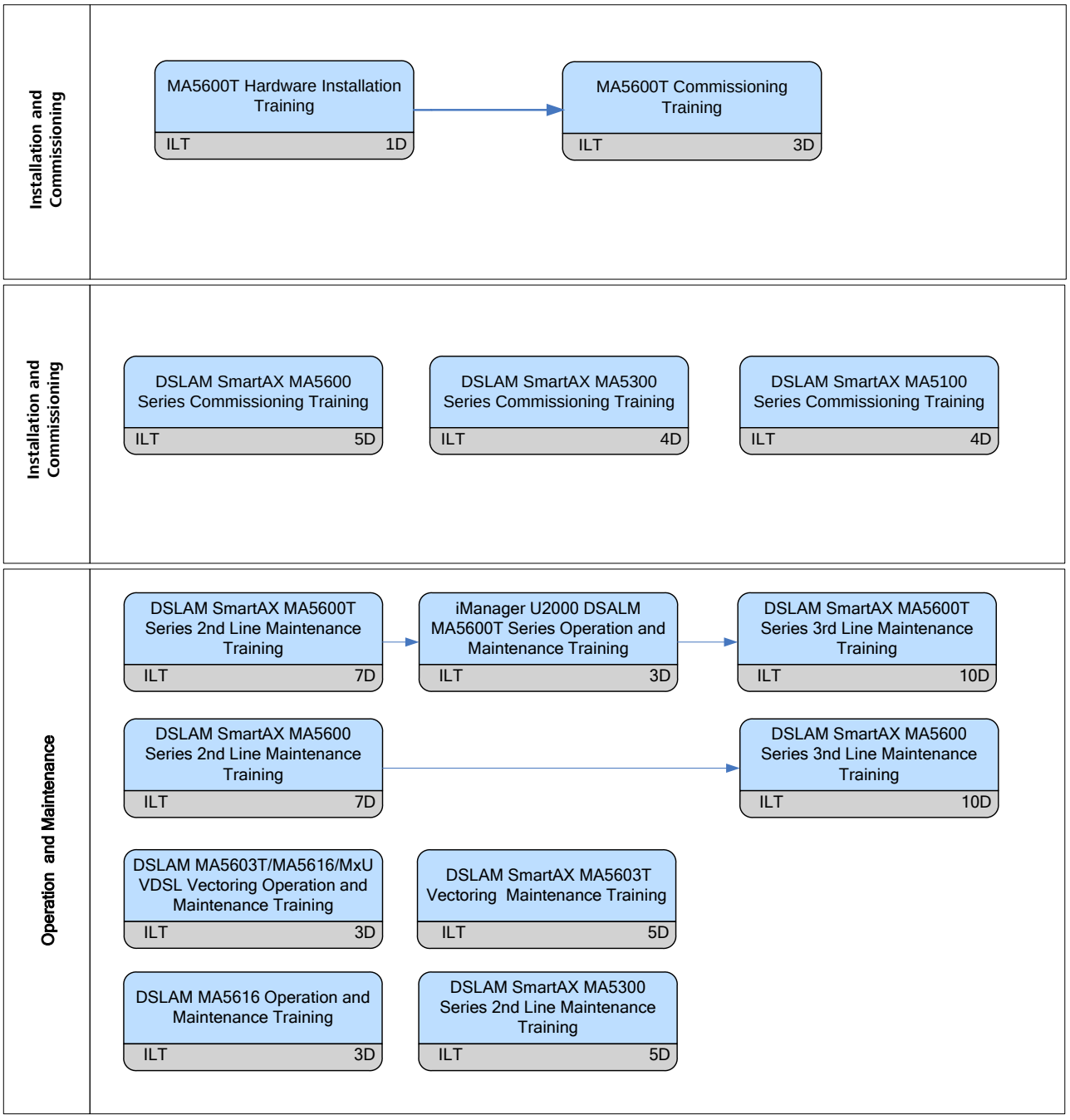


1.3.5 FTTx PON Products

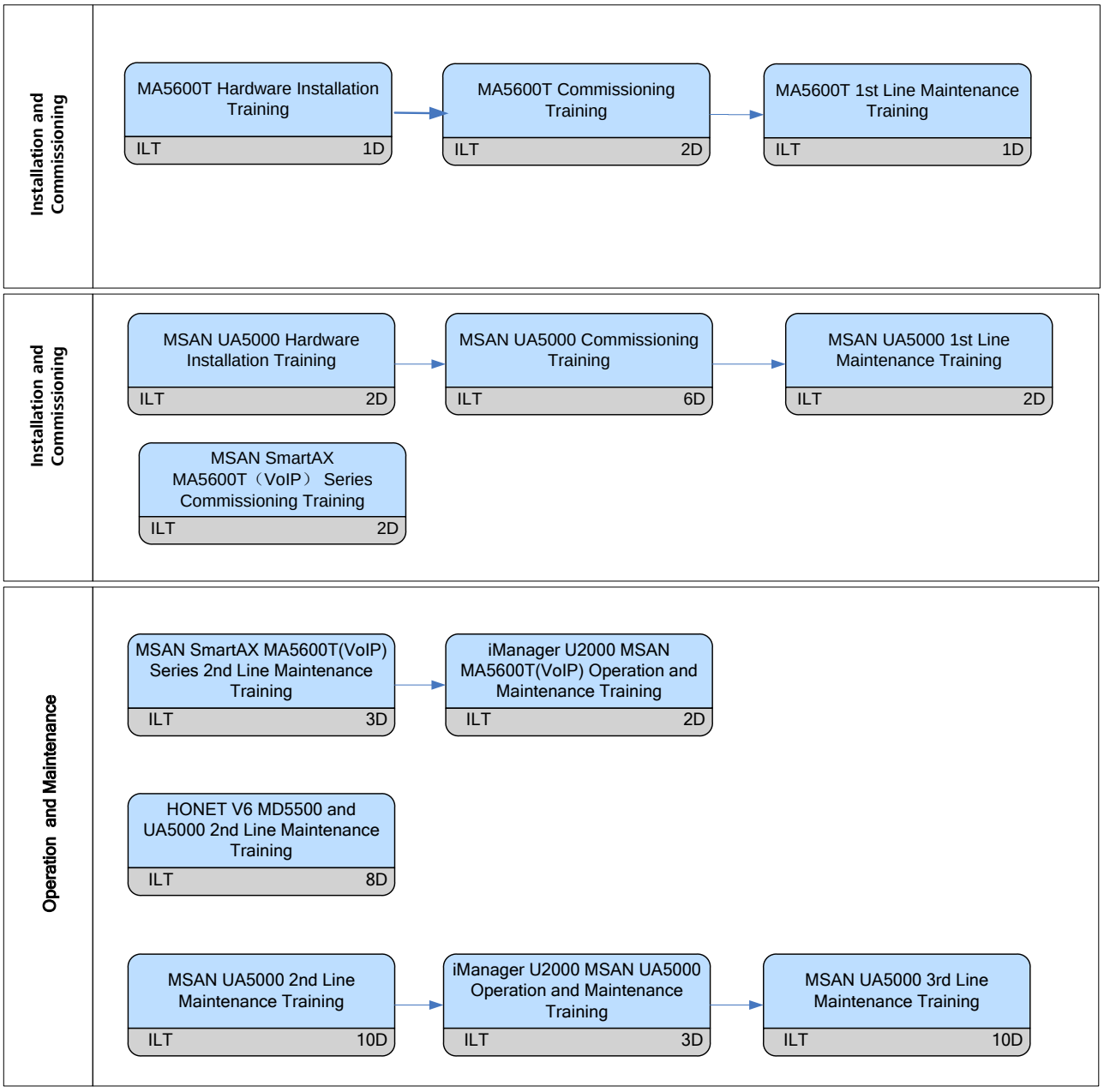



Operation and Maintenance
GPON/10GPON (FTTH/B/C) 2nd Line Maintenance Training
ILT 10D
GPON/10GPON (FTTH) 2nd Line Maintenance Training
ILT 7D
GPON/10GPON (FTTB/C) 2nd Line Maintenance Training
ILT 7D
GPON (FTTO) 2nd Line Maintenance Training
ILT 3D
GPON (FTTM) 2nd Line Maintenance Training
ILT 3D
FTTx P2P 2nd Line Maintenance Training
ILT 3D
FTTx PON+Vectoring Operation and Maintenance Training
ILT 7D
U2000 FTTx Service Provision Training
ILT 4D
U2000 FTTx Monitoring Training
ILT 2D
U2000 FTTx Maintenance and Troubleshooting Training
ILT 3D
MA5600T Uplink Protection Solution and Configuration Training
ILT 3D
MSO CMTS Operation and Maintenance Training
ILT 5D
GPON 3rd Line Maintenance (Feature Implementation) Training
ILT 5D
GPON 3rd Line Maintenance (Advanced Troubleshooting) Training
ILT 5D
Broadband Access Network Security Solution and Configuration Training
ILT 3D
FTTx PON+EoC Operation and Maintenance Training
ILT 7D
Operation and Maintenance
ODN Operation and Maintenance Training
ILT 3D
iODN Operation and Maintenance Training
ILT 2D
iODN NMS Administrator Training
ILT 2D

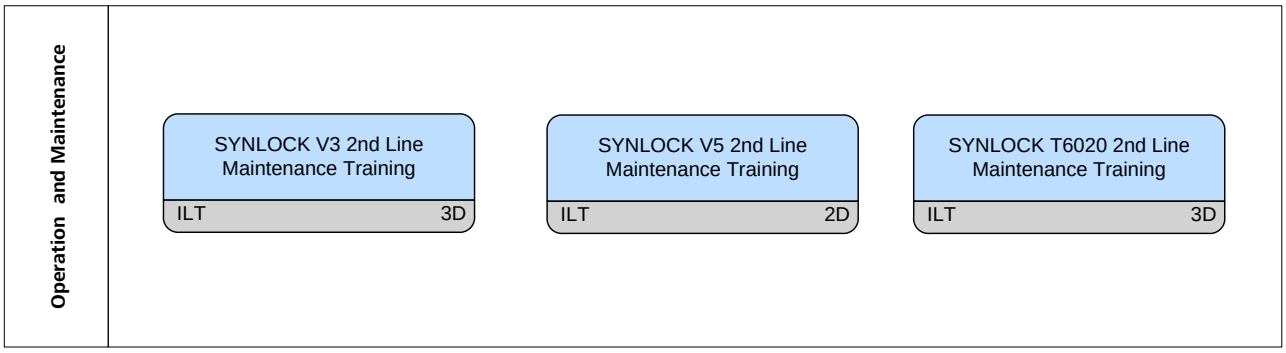
1.3.6 DSLAM Products



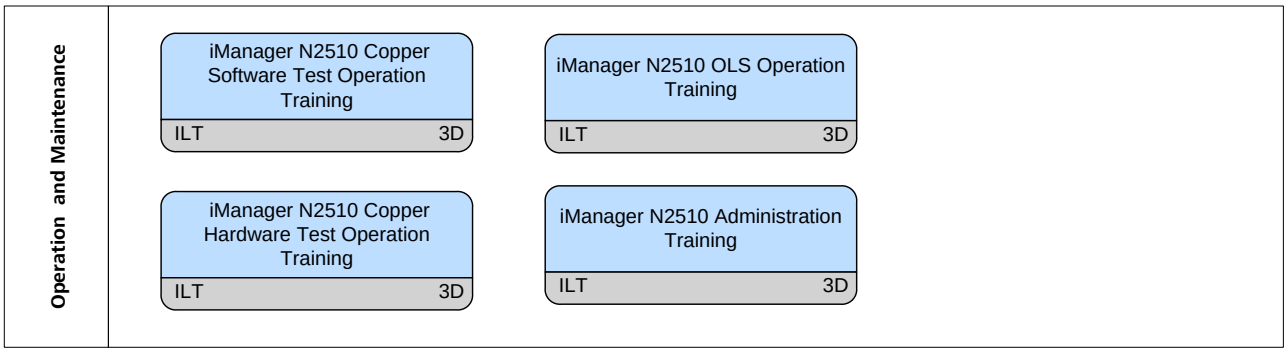
1.3.7 MSAN Products



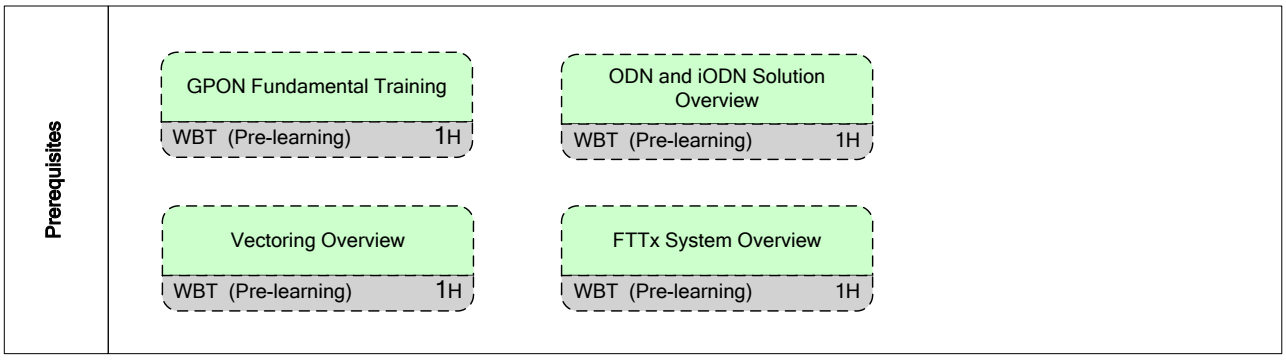
1.3.8 BITS



1.3.9 OSS



1.3.10 Access Technology Online Training (WBT)



1.4 Required Training Programs

Access Network For this project, the whole training solution is designed into the following programs.
List of Training Program(s) for Access Network Project：

Training Program	Program Level	Duration (workdays)	Training Location	Class Size

Principle				
IP Basis Training	Ⅱ	1		6 ~ 12
Broadband(PPPoE/DHCP/Radius) Basis Training	Ⅱ	1		6 ~ 12
IPTV(IGMP Proxy/Snooping) Basis Training	Ⅱ	1		6 ~ 12
VoIP(H.248/SIP) Basis Training	Ⅱ	1		6 ~ 12
PON and SDH/MSTP/PTN Product Interconnection Training	Ⅱ	1		6 ~ 12
VDSL2 Fundamental Training	Ⅱ	0.5		6 ~ 12
GPON Fundamental Training	Ⅱ	0.5		6 ~ 12
Evolution and Trends				
FTTx Network Overview Training	Ⅱ	1		6 ~ 12
FTTO Solution Overview Training	Ⅱ	0.5		6 ~ 12
FTTM Solution Overview Training	Ⅱ	0.5		6 ~ 12
xDSL Access Network Overview Training	Ⅱ	0.5		6 ~ 12
ODN Overview Training	Ⅱ	0.5		6 ~ 12
10G/40G PON Network Overview Training	Ⅱ	0.5		6 ~ 12
Vectoring Overview Training	Ⅱ	0.5		6 ~ 12
G.fast Overview Training	Ⅱ	0.5		6 ~ 12
iODN Solution Overview Training	Ⅱ	0.5		6 ~ 12
FTTx PON+EoC Solution Training	Ⅲ	0.5		6 ~ 12
MSO CMTS Solution Training	Ⅱ	0.5		6 ~ 12
Planning				
FTTx Planning Training	Ⅳ	3		6 ~ 12
ODN Planning Training	Ⅳ	3		6 ~ 12
iODN Planning Training	Ⅳ	3		6 ~ 12
DSLAM SmartAX MA5600T Series Planning Training	Ⅳ	3		6 ~ 12
MSAN SmartAX MA5600T(VoIP) Series Planning Training	Ⅳ	2		6 ~ 12
MSAN UA5000 Planning Training	Ⅳ	3		6 ~ 12

MA5600T Products				
MA5600T Hardware Installation Training	I	2		6 ~ 12
MA5600T Commissioning Training	II	5		6 ~ 12
FTTx PON Products				
MA5800 System Overview	I	0.5		6 ~ 12
GPON/10GPON (FTTH/B/C) 2nd Line Maintenance Training	II	10		6 ~ 12
GPON/10GPON (FTTH) 2nd Line Maintenance Training	II	7		6 ~ 12
GPON/10GPON (FTTB/C) 2nd Line Maintenance Training	II	7		6 ~ 12
GPON (FTTO) 2nd Line Maintenance Training	II	3		6 ~ 12
GPON (FTTM) 2nd Line Maintenance Training	II	3		6 ~ 12
FTTx P2P 2nd Line Maintenance Training	II	4		6 ~ 12
FTTx PON+Vectoring Operation and Maintenance Training	II	7		6 ~ 12
GPON 3rd Line Maintenance (Feature Implementation) Training	III	5		6 ~ 12
GPON 3rd Line Maintenance (Advanced Troubleshooting) Training	III	5		6 ~ 12
MA5600T Uplink Protection Solution and Configuration Training	III	3		6 ~ 12
Broadband Access Network Security Solution and Configuration Training	III	3		6 ~ 12
U2000 FTTx Service Provision Training	II	4		6 ~ 12
U2000 FTTx Monitoring Training	II	2		6 ~ 12
U2000 FTTx Maintenance and Troubleshooting Training	III	3		6 ~ 12
ODN Installation and Commissioning Training	II	2		6 ~ 12
ODN Operation and Maintenance Training	II	3		6 ~ 12
iODN Operation and Maintenance Training	II	2		6 ~ 12
iODN NMS Administrator Training	II	2		6 ~ 12
MSO CMTS Operation and Maintenance Training	II	5		6 ~ 12

FTTx PON+EoC Operation and Maintenance Training	III	5		6 ~ 12
DSLAM Products				
DSLAM SmartAX MA5603T Vectoring Maintenance Training	II	5		6 ~ 12
DSLAM SmartAX MA5600T Series 2nd Line Maintenance Training	II	7		6 ~ 12
DSLAM SmartAX MA5600T Series 3rd Line Maintenance Training	III	10		6 ~ 12
DSLAM MA5603T/MA5616/MxU VDSL Vectoring Operation and Maintenance Training	II	3		6 ~ 12
DSLAM MA5616 Operation and Maintenance Training	II	3		6 ~ 12
iManager U2000 DSALM MA5600T Series Operation and Maintenance Training	II	3		6 ~ 12
DSLAM SmartAX MA5100 Series Commissioning Training	II	4		6 ~ 12
DSLAM SmartAX MA5300 Series Commissioning Training	II	4		6 ~ 12
DSLAM SmartAX MA5600 Series Commissioning Training	II	5		6 ~ 12
DSLAM SmartAX MA5100 Series 2nd Line Maintenance Training	II	5		6 ~ 12
DSLAM SmartAX MA5300 Series 2nd Line Maintenance Training	II	5		6 ~ 12
DSLAM SmartAX MA5600 Series 2nd Line Maintenance Training	II	7		6 ~ 12
DSLAM SmartAX MA5600 Series 3nd Line Maintenance Training	III	10		6 ~ 12
MSAN Products				
MSAN SmartAX MA5600T(VoIP) Series 2nd Line Maintenance Training	II	3		6 ~ 12
MSAN SmartAX MA5600T(VoIP) Series Commissioning Training	II	2		6 ~ 12
iManager U2000 MSAN MA5600T(VoIP) Operation and Maintenance Training	II	2		6 ~ 12

MSAN UA5000 Hardware Installation Training	Ⅰ	2		6 ~ 12
MSAN UA5000 Commissioning Training	Ⅱ	6		6 ~ 12
MSAN UA5000 1st Line Maintenance Training	Ⅰ	2		6 ~ 12
MSAN UA5000 2nd Line Maintenance Training	Ⅱ	10		6 ~ 12
MSAN UA5000 3rd Line Maintenance Training	Ⅲ	10		6 ~ 12
HONET V6 MD5500 and UA5000 2nd Line Maintenance Training	Ⅱ	8		6 ~ 12
iManager U2000 MSAN UA5000 Operation and Maintenance Training	Ⅱ	3		6 ~ 12
BITS				
SYNLOCK V3 2nd Line Maintenance Training	Ⅱ	3		6 ~ 12
SYNLOCK V5 2nd Line Maintenance Training	Ⅱ	2		6 ~ 12
SYNLOCK T6020 2nd Line Maintenance Training	Ⅱ	3		6 ~ 12
OSS				
iManager N2000 BMS Administration Training	Ⅱ	3		6 ~ 12
iManager N2000 BMS Advanced Operation and Maintenance Training	Ⅲ	5		6 ~ 12
iManager N2000 BMS Operation Training (GPON)	Ⅱ	3		6 ~ 12
iManager N2000 BMS Operation Training (DSLAM)	Ⅱ	3		6 ~ 12
iManager N2000 BMS Operation Training (MSAN)	Ⅱ	3		6 ~ 12
iManager N2510 Copper Software Test Operation Training	Ⅱ	3		6 ~ 12
iManager N2510 Copper Hardware Test Operation Training	Ⅱ	3		6 ~ 12
iManager N2510 OLS Operation Training	Ⅱ	3		6 ~ 12
iManager N2510 Administration Training	Ⅱ	3		6 ~ 12
Access Technology Online Training (WBT)				
GPON Fundamentals(WBT)	Ⅱ	1 h		No limit
FTTx System Overview(WBT)	Ⅱ	1 h		No limit
Vectoring Overview (WBT)	Ⅱ	1		No limit

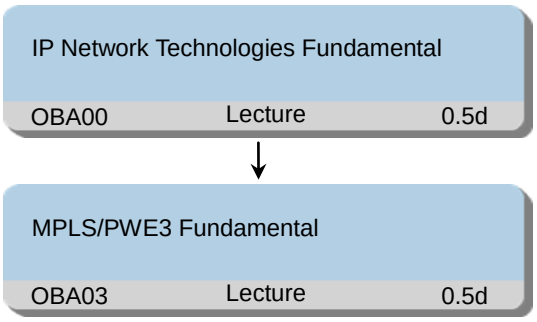
ODN and iODN Solution Overview (WBT)	Ⅱ	1		No limit

Level Description: Ⅰ: Basic Course Ⅱ: Intermediate Course Ⅲ: Advanced Course Ⅳ: Expert Course

1.5 Principle

1.5.1 IP Basis Training

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication network

Objectives

On completion of this program, the participants will be able to:

- Describe the functions of TCP/IP
- Describe routing process
- Describe the function and process of ARP
- Describe VLAN forwarding process
- Describe MPLS service implementation process
- Describe PWE3 service implementation process

Training Content

OBA00 IP Network Technologies Fundamental

- TCPIP Basis
  - Architecture of TCP/IP
  - Function of TCP/IP each layer
  - Process of TCP/IP data encapsulation
- Ethernet Overview
  - Different types of Ethernet media
  - Ethernet capabilities and limitations
  - Layer 2 and 3 switching principles

OBA03 MPLS/PWE3 Fundamental

- MPLS Basic Concepts and Application
  - MPLS definition and application

- MPLS service implementation process
- PWE3 Technologies Overview
  - PWE3 definition and application
  - PWE3 service implementation process

Duration

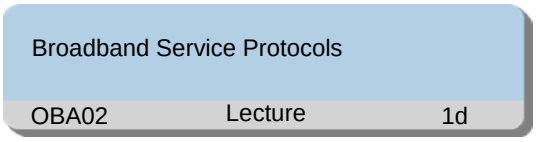
1 working day

Class Size

Min 6, Max 12

1.5.2 Broadband(PPPoE/DHCP/Radius) Basis Training

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication network

Objectives

On completion of this program, the participants will be able to:

- Describe function and message of PPP and PPPoE protocol
- Describe function and message of RADIUS protocol
- Describe function and message of DHCP protocol

Training Content

OBA02 Broadband Service Protocols

- PPP and PPPoE Protocols
  - Basic concept and function of PPP and PPPoE protocol
  - Messages and interaction of PPP and PPPoE protocol
- RADIUS Protocol
  - Basic concept and function of RADIUS protocol
  - Messages and interaction of RADIUS protocol
- DHCP Protocol
  - Basic concept and function of DHCP protocol
  - Messages and interaction of DHCP protocol

Duration

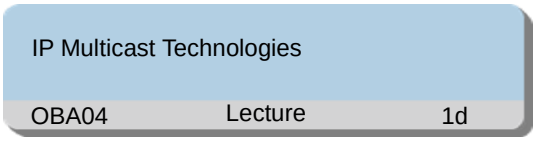
1 working day

Class Size

Min 6, Max 12

1.5.3 IPTV(IGMP Proxy/Snooping) Basis Training

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication network

Objectives

On completion of this program, the participants will be able to:

- Describe multicast definition and application
- Describe multicast network structure
- Describe multicast service implementation process
- Describe function and message of IGMP protocol

Training Content

OBA04 IP Multicast Technologies

- IPTV Overview
  - IPTV network structure and application
  - IPTV service implementation process
- IGMP Principle
  - Multicast fundamental basic
  - IGMP message and interaction process
  - IGMP snooping principle
  - IGMP proxy principle

Duration

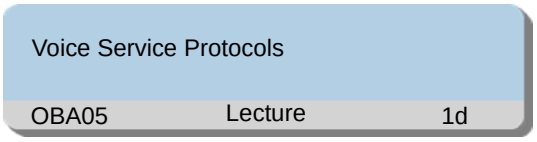
1 working day

Class Size

Min 6, Max 12

1.5.4 VoIP(H.248/SIP) Basis Training

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication network

Objectives

On completion of this program, the participants will be able to:

- Describe SIP function and position in network
- Describe SIP typical call flow
- Describe H.248 function and position in network
- Describe H.248 message structure and typical call flow

Training Content

OBA05 Voice Service Protocols

- SIP protocol
  - SIP function and position in network
  - SIP message and typical call flow
- H.248 Protocol
  - H.248 function and position in network
  - H.248 message structure and typical call flow

Duration

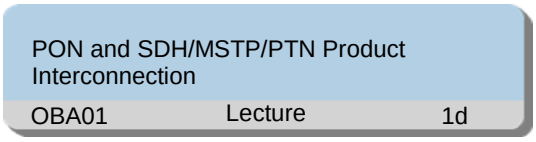
1 working day

Class Size

Min 6, Max 12

1.5.5 PON and SDH/MSTP/PTN Product Interconnection Training

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication network

Objectives

On completion of this program, the participants will be able to:

- Describe the structure of optical fiber
- Calculation of the optical fiber optical power attenuation
- Calculation of the sub-optical power attenuation
- Describe a variety of fiber optic connectors and passive optical devices
- Description of the fiber optic cable related knowledge
- Description of SDH features and functions
- List SDH network protection
- Describe WDM principle and OTN frame structure

Training Content

OBA01 PON and SDH/MSTP/PTN Product Interconnection

- Access Network Line Overview
  - Fiber fundamental
  - Relevant knowledge of the optical power
  - Common optical devices introduction
  - Fiber-related operation and maintenance
  - Fiber optic cable introduction
- PON and SDH/MSTP/PTN Product Interconnection
  - SDH principle introduction
  - SDH equipment and network applications
  - PTN principle introduction
  - PTN equipment and network applications
  - Access network connect to transmission network introduction
  - Interconnection between PON and SDH/MSTP
  - Interconnection between PON and PTN

Duration

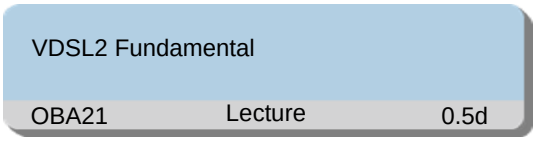
1 working day

Class Size

Min 6, Max 12

1.5.6 VDSL2 Fundamental Training

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication network

Objectives

On completion of this program, the participants will be able to:

- Describe VDSL2 orientation and networking
- Describe VDSL2 modulation mode
- Describe VDSL2 band plans and profiles
- Describe VDSL2 noise dealing principle
- Describe VDSL2 packet transfer mode

Training Content

OBA21 VDSL2 Fundamental

- VDSL2 Technology
  - VDSL2 definition and performance
  - VDSL2 modulation
  - VDSL2 band plans and profiles
  - VDSL2 noise dealing principle
  - VDSL2 packet transfer mode
  - VDSL2 QoS

Duration

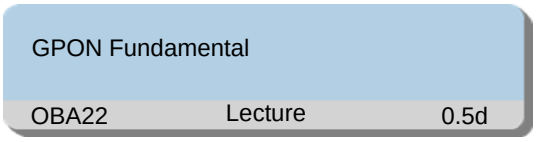
0.5 working day

Class Size

Min 6, Max 12

1.5.7 GPON Fundamental Training

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication network

Objectives

On completion of this program, the participants will be able to:

- Describe GPON typical application scenarios
- Describe the functions and specifications of GPON components
- Describe the upstream and downstream technology
- Describe the key performance parameters on distance, bandwidth, optical launched power, received sensitive power, attenuation, etc.
- Describe important concepts about GEM port and T-CONT
- Describe service encapsulation and multiplexing measures
- Describe the QoS and security solution in GPON
- Describe ONT management measures

Training Content

OBA22 GPON Fundamental

- GPON Fundamentals
  - GPON networking
  - GPON component
  - GPON upstream and downstream implementation
  - GPON key performance
  - GPON service implementation process
  - GPON QoS and security
  - GPON protection
  - GPON OAM

Duration

0.5 working day

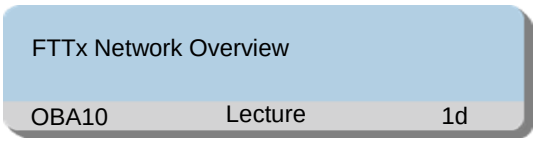
Class Size

Min 6, Max 12

1.6 Evolution and Trends

1.6.1 FTTx Network Overview Training

Training Path



Target Audience

Technical Manager

Prerequisites

- A basic understanding of telecommunication network

Objectives

On completion of this program, the participants will be able to:

- Describe FTTx features and orientation
- Describe FTTx network solution for FTTH/B/C/O/M scenarios
- Describe FTTx service solution, such as high speed Internet service, NGN/IMS services, enterprise private line services, mobile back haul services, etc.
- Describe FTTx OAM solution

Training Content

OBA10 FTTx Network Overview

- FTTx Network Overview
  - Access network evolution
  - FTTx typical networking
  - FTTx FTTH/H+/B/C/D/P scenarios
  - FTTx FTTO/M scenarios
  - FTTx service implementation process overview
  - FTTx operation and maintenance solution

Duration

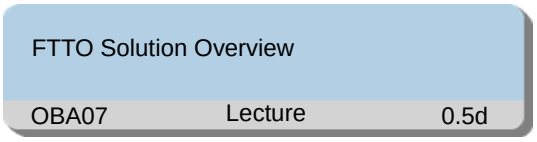
1 working day

Class Size

Min 6, Max 12

1.6.2 FTTO Solution Overview Training

Training Path



Target Audience

Technical Manager

Prerequisites

- A basic understanding of telecommunication network

Objectives

On completion of this program, the participants will be able to:

- Describe FTTx features and orientation
- Describe FTTx network solution for FTTO scenario
- Describe FTTO service solution, such as high speed Internet service, NGN/IMS services, enterprise private line services, etc.
- Describe FTTO OAM solution

Training Content

OBA07 FTTO Solution Overview

- FTTO Solution Overview
  - Access network evolution
  - FTTx typical networking
  - FTTO scenarios (GPON enterprise products and FTTO networking)
  - FTTO service implementation process overview
  - FTTO operation and maintenance solution

Duration

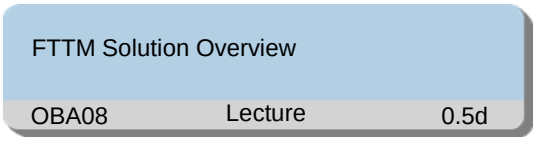
0.5 working day

Class Size

Min 6, Max 12

1.6.3 FTTM Solution Overview Training

Training Path



Target Audience

Technical Manager

Prerequisites

- A basic understanding of telecommunication network

Objectives

On completion of this program, the participants will be able to:

- Describe FTTx features and orientation
- Describe FTTx network solution for FTTM scenario
- Describe FTTM service solution, such as enterprise private line services, mobile back haul services, etc.
- Describe FTTM OAM solution

Training Content

OBA08 FTTM Solution Overview

- FTTM Solution Overview
  - Access network evolution
  - FTTx typical networking
  - FTTM scenarios (GPON mobile back haul products and networking)
  - FTTM service implementation process overview
  - FTTM operation and maintenance solution

Duration

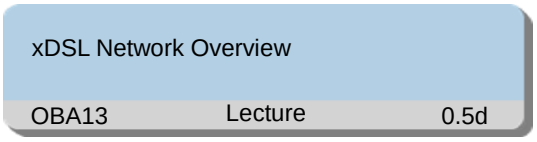
0.5 working day

Class Size

Min 6, Max 12

1.6.4 xDSL Access Network Overview Training

Training Path



Target Audience

Technical Manager

Prerequisites

- A basic understanding of telecommunication network

Objectives

On completion of this program, the participants will be able to:

- Describe xDSL network solution
- Describe xDSL service solution
- Describe function of components in xDSL network
- Describe xDSL modulation mode
- Describe xDSL band plans and profiles
- Describe xDSL service encapsulation process

Training Content

OBA13 xDSL Network Overview

- xDSL Technology Theory and Application
  - xDSL network solution
  - xDSL service solution
  - xDSL network components functions
  - xDSL modulation mode
  - xDSL band plans and profiles
  - xDSL service solution

Duration

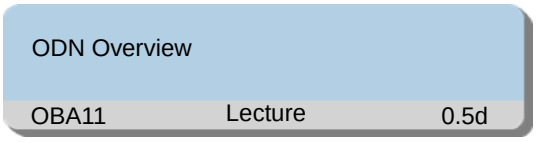
0.5 working day

Class Size

Min 6, Max 12

1.6.5 ODN Overview Training

Training Path



Target Audience

Technical Manager

Prerequisites

- A basic understanding of telecommunication network

Objectives

On completion of this program, the participants will be able to:

- Describe ODN network solution
- Describe ODN typical equipment
- Describe ODN maintenance instrument

Training Content

OBA11 ODN Overview

- ODN Overview
  - ODN network structure
  - ODN network typical application
  - ODN typical equipment
  - ODN test instrument introduction

Duration

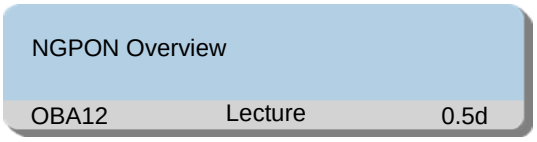
0.5 working day

Class Size

Min 6, Max 12

1.6.6 10G/40G PON Network Overview Training

Training Path



Target Audience

Technical Manager

Prerequisites

- A basic understanding of telecommunication network and GPON

Objectives

On completion of this program, the participants will be able to:

- Describe NGPON features
- Describe NGPON implementation principle
- Describe NGPON network solution

Training Content

OBA12 NGPON Overview

- NGPON Overview
  - 10G GPON introduction
  - 10G GPON key technology
  - 10G GPON network solution
  - 10G GPON and 10G EPON
  - 40G GPON introduction

Duration

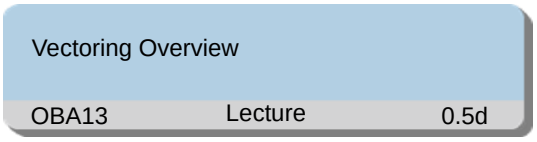
0.5 working day

Class Size

Min 6, Max 12

1.6.7 Vectoring Overview Training

Training Path



Target Audience

Technical Manager

Prerequisites

- A basic understanding of telecommunication network and GPON

Objectives

On completion of this program, the participants will be able to:

- Describe vectoring technology features
- Describe vectoring key technology
- Describe vectoring network solution

Training Content

OBA13 Vectoring Overview

- Vectoring Overview
  - Vectoring technology basic
  - Vectoring key technology
  - FTTx vectoring network solution
  - Vectoring service maintenance

Duration

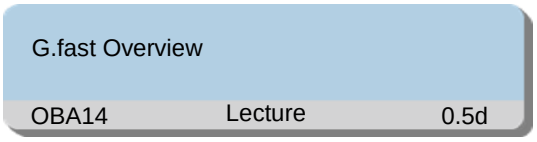
0.5 working day

Class Size

Min 6, Max 12

1.6.8 G.fast Overview Training

Training Path



Target Audience

Technical Manager

Prerequisites

- A basic understanding of telecommunication network and GPON

Objectives

On completion of this program, the participants will be able to:

- Describe G.fast technology features
- Describe G.fast key technology
- Describe G.fast network solution

Training Content

OBA14 G.fast Overview

- G.fast Overview
  - G.fast technology introduction
  - G.fast key technology
  - DSLAM G.fast network solution

Duration

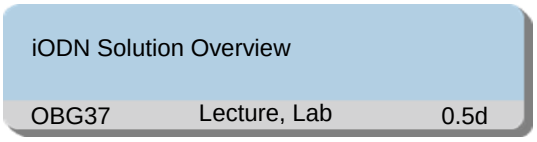
0.5 working day

Class Size

Min 6, Max 12

1.6.9 iODN Solution Overview Training

Training Path



Target Audience

Technical Manager

Prerequisites

- A basic understanding of telecommunication network and GPON

Objectives

On completion of this program, the participants will be able to:

- Describe ODN Network Composing
- Describe ODN Network Maintenance Challenge
- Describe iODN Network Structure
- Describe iODN Solution Module
- Outline iODN advantage

Training Content

OBG37 iODN Solution Overview

- iODN Solution Overview
  - ODN operation and maintenance challenge
  - iODN solution
  - iODN product

Duration

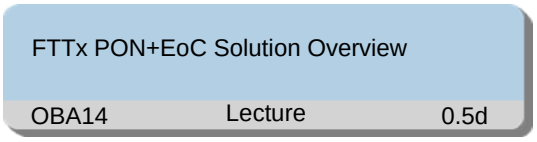
0.5 working day

Class Size

Min 6, Max 12

1.6.10 FTTx PON+EoC Solution Training

Training Path



Target Audience

Technical Manager

Prerequisites

- A basic understanding of telecommunication network

Objectives

On completion of this program, the participants will be able to:

- Describe traditional cable network Introduction
- Describe CMTS introduction and CMTS network
- Describe PON+EOC solution overview
- Outline the difference between CMTS and xPON

Training Content

OBA14 FTTx PON+EoC Solution Overview

- FTTx EoC Solution Overview
  - Traditional Cable network Introduction
  - CMTS Introduction and CMTS network
  - PON+EOC solution overview
  - CMTS and xPON comparison

Duration

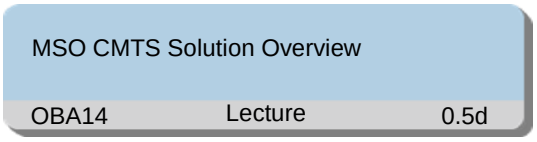
0.5 working day

Class Size

Min 6, Max 12

1.6.11 MSO CMTS Solution Training

Training Path



Target Audience

Technical Manager

Prerequisites

- A basic understanding of telecommunication network

Objectives

On completion of this program, the participants will be able to:

- Describe traditional cable network Introduction
- Describe CMTS introduction
- Describe MSO CMTS solution

Training Content

OBA14 MSO CMTS Solution Overview

- MSO CMTS Solution Overview
  - Traditional cable network Introduction
  - D-CMTS introduction
  - MSO D-CMTS solution overview

Duration

0.5 working day

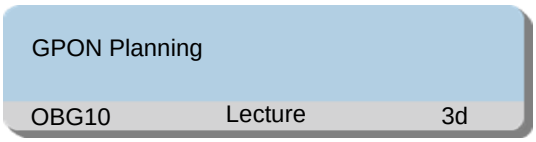
Class Size

Min 6, Max 12

1.7 Planning

1.7.1 FTTx Planning Training

Training Path



Target Audience

Planning Engineers

Prerequisites

- Be familiar with basic knowledge about telecommunications and data communications
- Be familiar with GPON technology
- At least 1 years experience in telecommunication network planning

Objectives

On completion of this program, the participants will be able to:

- Describe GPON network architecture
- Describe GPON network design background
- Outline OLT/ONU product functions and specification
- Outline OLT/ONU hardware architecture and specification
- Design GPON network for multiple services
- Design hardware system
- Plan bandwidth for internet service
- Plan bandwidth for leased line service
- Plan bandwidth for VoIP service
- Plan bandwidth for IPTV service
- Plan VLAN, IP and site name
- Plan QoS
- Design security and protection solution
- Design OAM solution

Training Content

OBG10 GPON Planning

- FTTx GPON Features and Fundamentals
  - GPON network architecture
  - GPON service implementation process
- FTTx GPON Network Design Introduction
  - GPON network design background
  - GPON network design procedure

- FTTx GPON Hardware System Configuration
  - OLT/ONU hardware and software architecture and specification
  - GPON capacity
- FTTx GPON Bandwidth Requirement Analysis
  - Internet bandwidth calculation
  - Leased line bandwidth calculation
  - VoIP and video bandwidth calculation
- FTTx GPON Service Processing Solution
  - GPON VLAN solution
  - GPON VLAN planning
  - GPON QoS solution
  - GPON QoS planning
- FTTx GPON Security and Protection Solution
  - GPON security solution
  - GPON security planning
  - GPON protection solution
  - GPON protection planning
- FTTx GPON Operation and Maintenance Solution
  - GPON OAM solution
  - GPON OAM planning

Duration

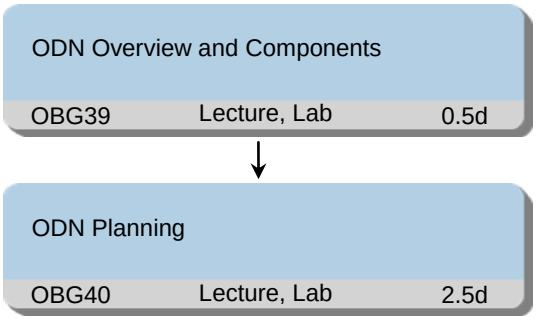
3 working days

Class Size

Min 6, Max 12

1.7.2 ODN Planning Training

Training Path



Target Audience

Planning Engineers

Prerequisites

- Be familiar with basic knowledge about telecommunications and data communications
- Be familiar with GPON Network
- At least 1 years experience in telecommunication network planning

Objectives

On completion of this program, the participants will be able to:

- Describe ODN architecture
- Describe ODF function and application
- Describe FDT function and application
- Describe FAT function and application
- Describe Closure function and application
- Describe Splitter function and application
- Describe TB/ATB/CTB function and application
- Describe ODN project lifecycle
- Outline ODN planning process
- Outline ODN planning considerations
- Outline ODN topology design
- Describe ODN splitting strategy
- Describe ODN protection design
- Describe ODN design scenario models
- Describe ODN Cable Plan Considerations
- Perform ODN Cable Route Design
- Perform ODN Cable Core Design
- Perform ODN Cable Type Selection
- Describe ODN civil work methodology
- Outline ODN duct type

- Outline ODN manhole and handhole
- Describe ISP typical scenarios and solutions
- Outline ISP modules and workflow
- Describe ODN Case

Training Content

OBG39 ODN Overview and Components

- ODN Overview and Components
  - ODN architecture
  - ODF function, specification and application
  - FDT function, specification and application
  - FAT function, specification and application
  - Closure function, specification and application
  - Splitter function, specification and application
  - TB function, specification and application
  - ATB function, specification and application
  - CTB function, specification and application

OBG40 ODN Planning

- ODN Planning Considerations
  - ODN project lifecycle
  - ODN planning considerations
  - ODN planning methodology and process
- ODN Topology Design
  - ODN topology solutions
  - ODN protection solutions
  - ODN splitting strategies
  - ODN equipment location selection
  - ODN link loss budget
- ODN Cable Design
  - ODN cable plan considerations
  - ODN cable route design
  - ODN cable core design
  - ODN cable type selection
- ODN Civil Design
  - ODN civil work methodology
  - ODN duct type
  - ODN manhole and handhole
- ODN ISP Solution
  - ISP typical scenarios and solutions
  - ISP modules and workflow
- ODN Planning Case Study
  - ODN case for existing ducting

- ODN case for low population density

Duration

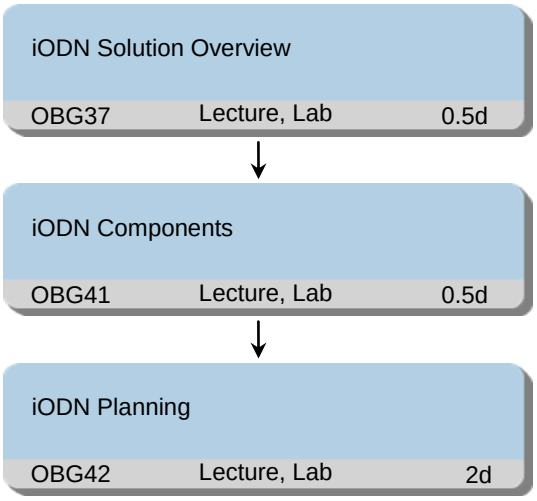
3 working days

Class Size

Min 6, Max 12

1.7.3 iODN Planning Training

Training Path



Target Audience

Planning Engineers

Prerequisites

- Be familiar with basic knowledge about telecommunications and data communications
- Be familiar with GPON Network
- At least 1 years experience in telecommunication network planning

Objectives

On completion of this program, the participants will be able to:

- Describe ODN Network Composing
- Describe ODN Network Maintenance Challenge
- Describe iODN Network Structure
- Describe iODN Solution Module
- Outline iODN advantage
- Describe ODN architecture
- Describe iODF function and application
- Describe iFDT function and application
- Describe iField component
- Describe iODN planning process
- Outline iODN topology design
- Describe iODN splitting strategy
- Describe iODN protection design
- Describe iODN design scenario models

Training Content

OBG37 iODN Solution Overview

- iODN Solution Overview
  - ODN operation and maintenance challenge
  - iODN solution
  - iODN product

OBG41 iODN Components

- iODN Components
  - iODN architecture
  - iODF function, specification and application
  - iFDT function, specification and application
  - iField function, specification and application

OBG42 iODN Planning

- iODN Planning Considerations
  - iODN project lifecycle
  - iODN planning considerations
  - iODN planning methodology and process
- iODN Topology Design
  - Topology solutions
  - Protection solutions
  - Splitting strategies
  - Equipment location selection
  - Link loss budget
- iODN Cable Design
  - Cable plan considerations
  - Cable route design
  - Cable core design
  - Cable type selection
- iODN Civil Design
  - Civil work methodology
  - Duct type
  - Manhole and handhole
- iODN ISP Solution
  - ISP typical scenarios and solutions
  - ISP modules and workflow
- iODN Planning Case Study
  - iODN case 1
  - iODN case 2

Duration

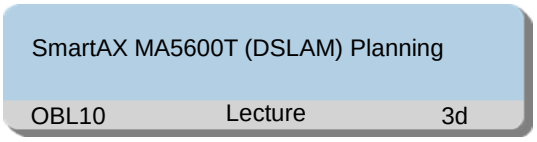
3 working days

Class Size

Min 6, Max 12

1.7.4 DSLAM SmartAX MA5600T Series Planning Training

Training Path



Target Audience

Planning Engineers

Prerequisites

- Be familiar with basic knowledge about telecommunications and data communications
- Be familiar with DSLAM technology
- At least 1 years experience in telecommunication network planning

Objectives

On completion of this program, the participants will be able to:

- Design DSLAM MA5600T network to carry multiple service
- Plan DSLAM MA5600T hardware system
- Plan DSLAM MA5600T service bandwidth
- Plan VLAN, IP and site name
- Plan DSLAM MA5600T QoS and security
- Plan OAM solution for DSLAM MA5600T

Training Content

OBL10 SmartAX MA5600T (DSLAM) Planning

- DSLAM MA5600T Global Application
  - Huawei DSLAM solution and application
- DSLAM MA5600T Access Solution
  - List DSL technology features, performance and specification, such as ADSL2+ , G.SHDSL.bis and VDSL2
- DSLAM MA5600T Hardware Configuration
  - DSLAM MA5600T system architecture and specification
  - DSLAM MA5600T hardware specification and configuration
- DSLAM MA5600T Features
  - DSLAM MA5600T layer2/layer3 specification and solution
  - DSLAM MA5600T DHCP Relay features
  - DSLAM MA5600T security characteristics
  - DSLAM MA5600T resilience features
  - DSLAM MA5600T DHCP Relay planning
  - DSLAM MA5600T security planning
  - DSLAM MA5600T resilience planning

- DSLAM MA5600T Typical Solution Analysis
  - DSLAM MA5600T triple-play service solution
  - DSLAM MA5600T wholesale service planning
  - DSLAM MA5600T leased line service solution
  - DSLAM MA5600T leased line service planning
- DSLAM MA5600T Bandwidth Requirement Analysis
  - DSLAM MA5600T internet service bandwidth calculation
  - DSLAM MA5600T IPTV bandwidth calculation
  - DSLAM MA5600T triple-play bandwidth calculation
- DSLAM MA5600T ACL and QoS Principle
  - DSLAM MA5600T QoS and ACL solution
  - DSLAM MA5600T QoS and ACL planning
- DSLAM MA5600T NMS Planning
  - DSLAM MA5600T NMS hardware and software solution
  - DSLAM MA5600T NMS hardware, software and license planning

Duration

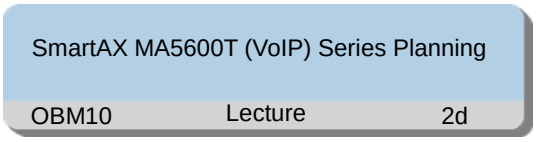
3 working days

Class Size

Min 6, Max 12

1.7.5 MSAN SmartAX MA5600T(VoIP) Series Planning Training

Training Path



Target Audience

Planning Engineers

Prerequisites

- Be familiar with basic knowledge about telecommunications and data communications
- Be familiar with VoIP technology
- At least 1 years experience in telecommunication network planning

Objectives

On completion of this program, the participants will be able to:

- Design MA5600T(VoIP) network to carry VoIP service
- Plan MA5600T(VoIP) hardware system
- Plan MA5600T(VoIP) service bandwidth
- Plan VLAN, IP and site name
- Plan VoIP interface parameters
- Plan MA5600T(VoIP) QoS and security
- Plan OAM solution for MA5600T(VoIP)

Training Content

OBM10 SmartAX MA5600T (VoIP) Series Planning

- MSAN MA5600T Voice Network Introduction
  - NGN architecture and every layer’s functions
  - NGN signaling and voice path
  - MA5600T product function in NGN
  - NGN solution and network applications
- MSAN MA5600T (VoIP) System Introduction
  - Describe MA5600T product positioning
  - MA5600T product functions
  - MA5600T system features
  - MA5600T product networking
  - MA5600T device management
- MSAN MA5600T (VoIP) Hardware Planning
  - MA5600T hardware introduction
  - MA5600T hardware planning
- MSAN MA5600T (VoIP) ETAM Planning

- Function of ETAM test system
- Solution of ETAM
- Hardware structure of ETAM
- ETAM planning

- MSAN MA5600T (VoIP) H.248 Data Planning
  - Functions and concept of H.248 protocol
  - H.248 data planning
- MSAN MA5600T (VoIP) SIP Data Planning
  - Functions and concept of SIP protocol
  - SIP data planning
- MSAN MA5600T (VoIP) Bandwidth Planning
  - VoIP service traffic calculation
  - VoIP signaling traffic calculation
  - NMS traffic calculation
- MSAN MA5600T (VoIP) QoS Planning
  - VoIP QoS features
  - VoIP QoS planning
- MSAN MA5600T (VoIP) Reliability Planning
  - Conception of dual homing, hairpin connection and self-switching
  - Network uplink protection solutions
  - Network reliability planning
- MSAN MA5600T (VoIP) Network Management Planning
  - NMS networking
  - NMS nodes calculation
  - NMS application cases
  - NMS hardware and software planning

Duration

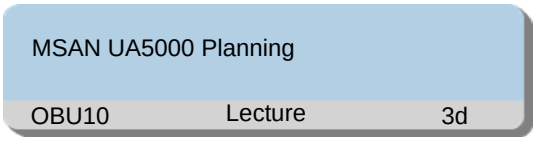
2 working days

Class Size

Min 6, Max 12

1.7.6 MSAN UA5000 Planning Training

Training Path



Target Audience

Planning Engineers

Prerequisites

- Be familiar with basic knowledge about telecommunications and data communications
- Be familiar with MSAN technology
- At least 1 years experience in telecommunication network planning

Objectives

On completion of this program, the participants will be able to:

- Describe system structure
- Describe service implementation and solution
- Plan hardware system
- Plan bandwidth for internet service, VoIP service, and multicast service
- Plan VLAN, PVC,IP and site name
- Plan V5 or MG Interface

Training Content

OBU10 MSAN UA5000 Planning

- MSAN UA5000 Description
  - System structure
  - Service implementation
- MSAN UA5000 Traffic Calculation(Narrowband)
  - Traffic calculation
  - Voice quality
- MSAN UA5000 Traffic Calculation(Broadband)
  - Internet bandwidth analysis
  - Leased line bandwidth analysis
  - Video service bandwidth analysis
  - User traffic limitation
- MSAN UA5000 Hardware Configuration
  - UA5000 hardware introduction
  - UA5000 hardware planning
- MSAN UA5000 Typical Solution Analysis
  - Internet service solution

- Wholesale and leased line service solution
- Voice service solution
- Video service solution
- Triple Play end-to-end solution

- MSAN UA5000 Data Allocation
  - VLAN and PVC Planning
  - IP address planning
  - V5 and MG interface Planning
  - Name planning
- MSAN UA5000 NMS Planning
  - NMS hardware and software planning
  - NMS application cases

Duration

3 working days

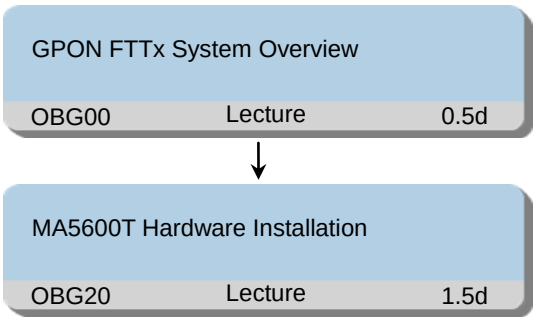
Class Size

Min 6, Max 12

1.8 MA5600T Products

1.8.1 MA5600T Hardware Installation Training

Training Path



Target Audience

Installation technician

Prerequisites

- A basic understanding of telecommunication equipment installation

Objectives

On completion of this program, the participants will be able to:

- Introduce FTTx network
- Describe the function and structure of cabinet, frames, boards and cables
- Describe FTTH/B/C/O/M solutions
- Install MA5600T devices cabinet, frame and board properly
- Perform MA5600T devices cable routing and termination properly
- Identify the cautions and facts which may affect MA5600T system running due to improperly installation

Training Content

OBG00 GPON FTTx System Overview

- FTTx System Overview
  - FTTx network introduction
  - FTTx cabinet appearance, typical configuration, parameter and connections
  - FTTx frame appearance, typical configuration, parameters and principles
  - FTTx board appearance, function, front panel and interfaces
  - FTTx cable introduction
  - FTTH/B/C/O/M solutions

OBG20 MA5600T Hardware Installation

- GPON MA5600T Hardware Installation
  - MA5600T installation tools
  - MA5600T installation precautions

- MA5600T cables routing and terminating
- MA5600T cabinet, frame and board installation

- GPON ONT Hardware Installation
  - GPON ONT Hardware Installation
- GPON MA562x/MA5612 Hardware Installation
  - MA562x/MA5612 installation tools
  - MA562x/MA5612 installation precautions
  - MA562x/MA5612 cables routing and terminating
  - MA562x/MA5612 cabinet, frame and board installation

Duration

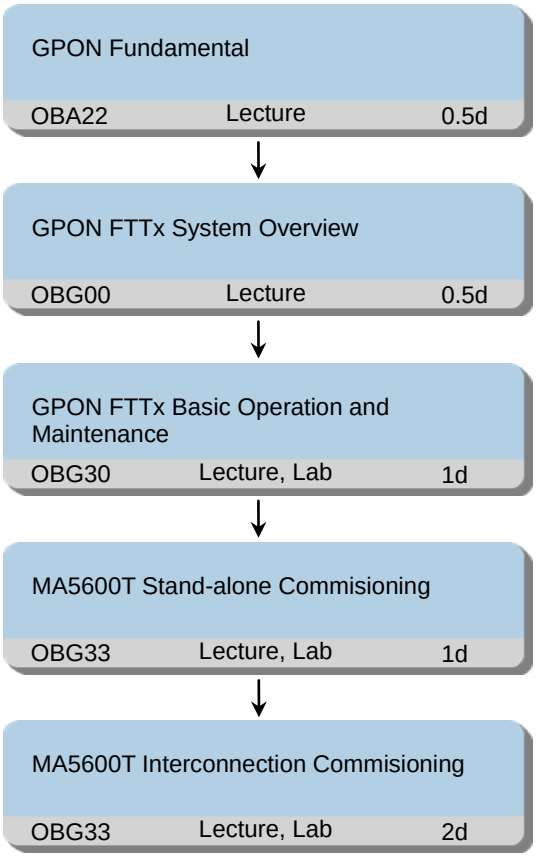
2 working days

Class Size

Min 6, Max 12

1.8.2 MA5600T Commissioning Training

Training Path



Target Audience

System and service Commissioning Technicians

Prerequisites

- A basic understanding of telecommunication and data communication
- At least 1 year operation and maintenance experience of the telecommunication equipment

Objectives

On completion of this program, the participants will be able to:

- Describe GPON typical application scenarios
- Describe the functions and specifications of GPON components
- Describe the upstream and downstream technology
- Describe the key performance parameters on distance, bandwidth, optical launched power, received sensitive power, attenuation, etc.
- Describe important concepts about GEM port and T-CONT
- Describe service encapsulation and multiplexing measures
- Describe the QoS and security solution in GPON
- Describe ONT management measures

- Introduce FTTx network
- Describe the function and structure of cabinet, frames, boards and cables
- Describe FTTH/B/C/O/M solutions
- Establish the connection and login to the system
- Perform the common basic operation, such as query status of hardware and software, backup and restore data, system name change and alarm query etc.
- Perform the hardware commissioning, stand-alone commissioning,
- Perform the commissioning verification
- Perform the hardware commissioning, stand-alone commissioning, interconnection commissioning
- Perform the commissioning verification

Training Content

OBA22 GPON Fundamental

- GPON Fundamentals
  - GPON networking
  - GPON component
  - GPON upstream and downstream implementation
  - GPON key performance
  - GPON service implementation process
  - GPON QoS and security
  - GPON protection
  - GPON OAM

OBG00 GPON FTTx System Overview

- FTTx System Overview
  - FTTx network introduction
  - FTTx cabinet appearance, typical configuration, parameter and connections
  - FTTx frame appearance, typical configuration, parameters and principles
  - FTTx board appearance, function, front panel and interfaces
  - FTTx cable introduction
  - FTTH/B/C/O/M solutions

OBG30 GPON FTTx Basic Operation and Maintenance

- GPON Basic Operation and Maintenance
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data
  - SNMP parameter configuration
  - Other basic operation, such as system name change and alarm query etc.
- GPON Basic Operation and Maintenance Practice Guide
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data

- SNMP parameter configuration
- Other basic operation, such as system name change and alarm query, etc.

OBG33 MA5600T Stand-alone Commisioning

- MA5600T Stand-alone Commisioning
  - General commissioning procedures of GPON
  - Preparations for commissioning
  - Stand-alone commissioning

OBG33 MA5600T Interconnection Commisioning

- MA5600T UNI Interconnection Commisioning
  - General commissioning procedures of GPON
  - Preparations for commissioning
  - UNI Interconnection commissioning
- MA5600T NNI Interconnection Commisioning
  - General commissioning procedures of GPON
  - Preparations for commissioning
  - NNI Interconnection commissioning

Duration

5working days

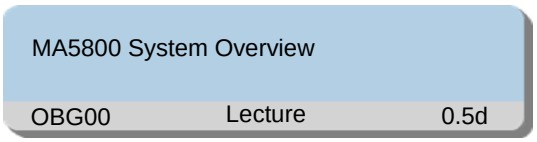
Class Size

Min 6, Max 12

1.9 FTTx PON Products

1.9.1 MA5800 System Overview

Training Path



Target Audience

System and service Commissioning Technicians

Prerequisites

- A basic understanding of telecommunication and data communication
- At least 1 year operation and maintenance experience of the telecommunication equipment

Objectives

On completion of this program, the participants will be able to:

- Introduce FTTx network
- Describe the function and structure of cabinet, frames, boards and cables of MA5800
- Describe MA5800 application solutions

Training Content

OBG00 MA5800 System Overview

- MA5800 System Overview
  - FTTx network introduction
  - FTTx cabinet appearance, typical configuration, parameter and connections
  - MA5800 frame appearance, typical configuration, parameters and principles
  - MA5800 board appearance, function, front panel and interfaces
  - MA5800 application solutions

Duration

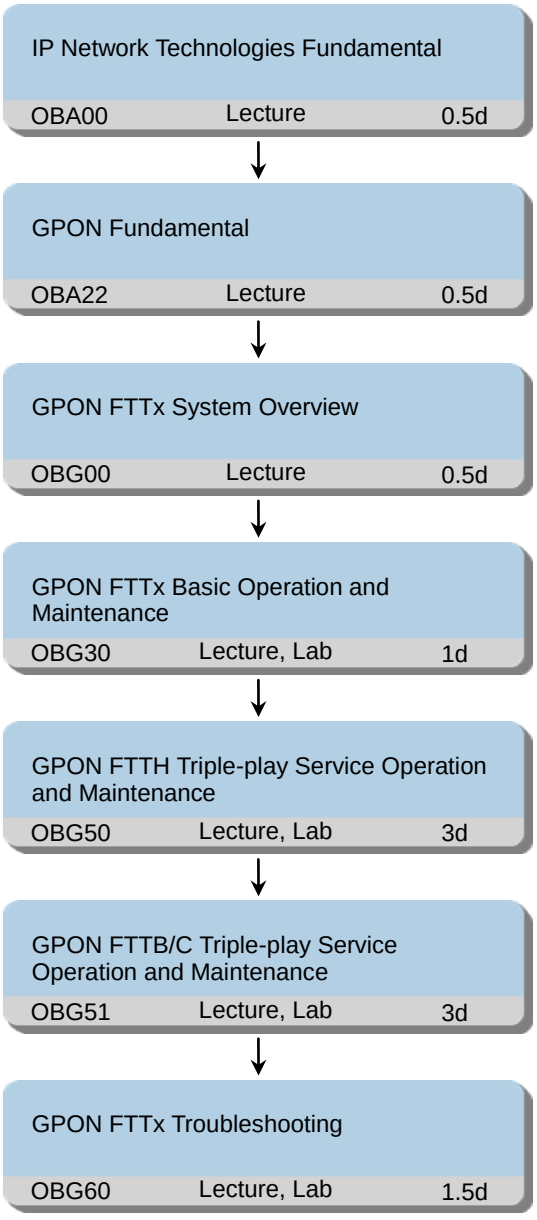
0.5 working day

Class Size

Min 6, Max 12

1.9.2 GPON/10GPON (FTTH/B/C) 2nd Line Maintenance Training

Training Path



Target Audience

Technical Support Engineers

Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication and IP Technology

Objectives

On completion of this program, the participants will be able to:

- Describe the functions of TCP/IP
- Describe routing process
- Describe the function and process of ARP
- Describe VLAN forwarding process
- Describe GPON typical application scenarios
- Describe the functions and specifications of GPON components
- Describe the upstream and downstream technology
- Describe the key performance parameters on distance, bandwidth, optical launched power, received sensitive power, attenuation, etc.
- Describe important concepts about GEM port and T-CONT
- Describe service encapsulation and multiplexing measures
- Describe the QoS and security solution in GPON
- Describe ONT management measures
- Introduce FTTx network
- Describe the function and structure of cabinet, frames, boards and cables
- Describe FTTH/B/C/O/M solutions
- Establish the connection and login to the system
- Perform the common basic operation, such as query status of hardware and software, backup and restore data, system name change and alarm query etc.
- Describe GPON FTTH service implementation process
- Perform GPON FTTH HSI service configuration, maintenance and verification.
- Perform GPON FTTH VoIP service configuration, maintenance and verification
- Perform GPON FTTH IPTV service configuration, maintenance and verification
- Describe GPON FTTB/C networking
- Perform GPON FTTB/C HSI service configuration, maintenance and verification
- Perform GPON FTTB/C VoIP service configuration, maintenance and verification
- Perform GPON FTTB/C IPTV service configuration, maintenance and verification
- Troubleshooting hardware and software system
- Troubleshooting ONU
- Troubleshooting internet access service
- Troubleshooting multicast service
- Troubleshooting voice service

Training Content

OBA00 IP Network Technologies Fundamental

- TCPIP Basis
  - Architecture of TCP/IP
  - Function of TCP/IP each layer
  - Process of TCP/IP data encapsulation
- Ethernet Overview
  - Different types of Ethernet media
  - Ethernet capabilities and limitations

- Layer 2 and 3 switching principles

OBA22 GPON Fundamental

- GPON Fundamentals
  - GPON networking
  - GPON component
  - GPON upstream and downstream implementation
  - GPON key performance
  - GPON service implementation process
  - GPON QoS and security
  - GPON protection
  - GPON OAM

OBG00 GPON FTTx System Overview

- FTTx System Overview
  - FTTx network introduction
  - FTTx cabinet appearance, typical configuration, parameter and connections
  - FTTx frame appearance, typical configuration, parameters and principles
  - FTTx board appearance, function, front panel and interfaces
  - FTTx cable introduction
  - FTTH/B/C/O/M solutions

OBG30 GPON FTTx Basic Operation and Maintenance

- GPON Basic Operation and Maintenance
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data
  - SNMP parameter configuration
  - Other basic operation, such as system name change and alarm query etc.
- GPON Basic Operation and Maintenance Practice Guide
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data
  - SNMP parameter configuration
  - Other basic operation, such as system name change and alarm query, etc.

OBG50 GPON FTTH Triple-play Service Operation and Maintenance

- GPON FTTH HSI Service Provisioning
  - GPON FTTH HSI service implementation process
  - ONT service and line profiles configuration and management
  - GPON FTTH HSI service configuration and maintenance
- GPON FTTH VoIP Service Provisioning
  - GPON FTTH VoIP service implementation process
  - GPON FTTH VoIP service configuration, maintenance and verification
- GPON FTTH IPTV Service Provisioning
  - GPON FTTH IPTV service implementation process

- GPON FTTH IPTV service configuration, maintenance and verification

OBG51 GPON FTTB/C Triple-play Service Operation and Maintenance

- GPON MxU HSI Service Provisioning
  - GPON FTTB/C HSI service implementation process
  - GPON FTTB/C HSI service configuration, maintenance and verification
- GPON MxU VoIP Service Provisioning
  - GPON FTTB/C VoIP service implementation process
  - GPON FTTB/C VoIP service configuration, maintenance and verification
- GPON MxU IPTV Service Provisioning
  - GPON FTTB/C IPTV service implementation process
  - GPON FTTB/C IPTV service configuration, maintenance and verification

OBG60 GPON FTTx Troubleshooting

- FTTx GPON OLT System Troubleshooting
  - Troubleshoot common faults in GPON system, such as NMS fails to manage a device, service board is in the failed state, control board resets caused by abnormalities, and fan is in the fault state
- FTTx GPON ONU Troubleshooting
  - Troubleshoot common faults in ONU abnormal state, such as fail to register an ONU, fail to automatically find an ONU and ONU frequently get offline
- FTTx GPON HSI Service Troubleshooting
  - Troubleshoot common faults in the Internet access service, such as PPPoE dialup failure, DHCP dialup failure, failure to access the Internet after successful dialup, Internet access service interruption, and low Internet access rate
- FTTx GPON VoIP Service Troubleshooting
  - Troubleshoot common faults in the voice service, such as no tone after offhook, busy tone after offhook, one-way audio in communication, noise in communication, poor voice service in communication, and failure to dial certain phone numbers
- FTTx GPON IPTV Service Troubleshooting
  - Troubleshoot common faults in the multicast service. such as multicast user failing to go online, dark screen after going online and demanding a program, erratic display (mosaic) in a multicast program, abnormal interruption of a multicast program, and long time in switching programs

Duration

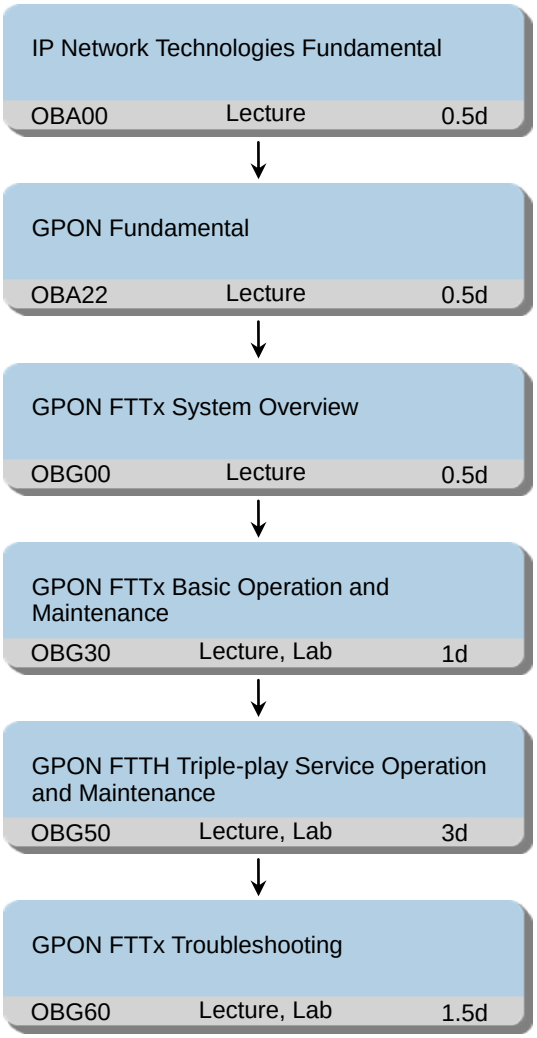
10 working days

Class Size

Min 6, Max 12

1.9.3 GPON/10GPON (FTTH) 2nd Line Maintenance Training

Training Path



Target Audience

Technical Support Engineers

Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication and IP Technology

Objectives

On completion of this program, the participants will be able to:

- Describe the functions of TCP/IP
- Describe routing process
- Describe the function and process of ARP
- Describe VLAN forwarding process
- Describe GPON typical application scenarios

- Describe the functions and specifications of GPON components
- Describe the upstream and downstream technology
- Describe the key performance parameters on distance, bandwidth, optical launched power, received sensitive power, attenuation, etc.
- Describe important concepts about GEM port and T-CONT
- Describe service encapsulation and multiplexing measures
- Describe the QoS and security solution in GPON
- Describe ONT management measures
- Introduce FTTx network
- Describe the function and structure of cabinet, frames, boards and cables
- Describe FTTH/B/C/O/M solutions
- Establish the connection and login to the system
- Perform the common basic operation, such as query status of hardware and software, backup and restore data, system name change and alarm query etc.
- Describe GPON FTTH service implementation process
- Perform GPON FTTH HSI service configuration, maintenance and verification.
- Perform GPON FTTH VoIP service configuration, maintenance and verification
- Perform GPON FTTH IPTV service configuration, maintenance and verification
- Troubleshooting hardware and software system
- Troubleshooting ONU
- Troubleshooting internet access service
- Troubleshooting multicast service
- Troubleshooting voice service

Training Content

OBA00 IP Network Technologies Fundamental

- TCPIP Basis
  - Architecture of TCP/IP
  - Function of TCP/IP each layer
  - Process of TCP/IP data encapsulation
- Ethernet Overview
  - Different types of Ethernet media
  - Ethernet capabilities and limitations
  - Layer 2 and 3 switching principles

OBA22 GPON Fundamental

- GPON Fundamentals
  - GPON networking
  - GPON component
  - GPON upstream and downstream implementation
  - GPON key performance
  - GPON service implementation process
  - GPON QoS and security

- GPON protection
- GPON OAM

OBG00 GPON FTTx System Overview

- FTTx System Overview
  - FTTx network introduction
  - FTTx cabinet appearance, typical configuration, parameter and connections
  - FTTx frame appearance, typical configuration, parameters and principles
  - FTTx board appearance, function, front panel and interfaces
  - FTTx cable introduction
  - FTTH/B/C/O/M solutions

OBG30 GPON FTTx Basic Operation and Maintenance

- GPON Basic Operation and Maintenance
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data
  - SNMP parameter configuration
  - Other basic operation, such as system name change and alarm query etc.
- GPON Basic Operation and Maintenance Practice Guide
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data
  - SNMP parameter configuration
  - Other basic operation, such as system name change and alarm query, etc.

OBG50 GPON FTTH Triple-play Service Operation and Maintenance

- GPON FTTH HSI Service Provisioning
  - GPON FTTH HSI service implementation process
  - ONT service and line profiles configuration and management
  - GPON FTTH HSI service configuration and maintenance
- GPON FTTH VoIP Service Provisioning
  - GPON FTTH VoIP service implementation process
  - GPON FTTH VoIP service configuration, maintenance and verification
- GPON FTTH IPTV Service Provisioning
  - GPON FTTH IPTV service implementation process
  - GPON FTTH IPTV service configuration, maintenance and verification

OBG60 GPON FTTx Troubleshooting

- FTTx GPON OLT System Troubleshooting
  - Troubleshoot common faults in GPON system, such as NMS fails to manage a device, service board is in the failed state, control board resets caused by abnormalities, and fan is in the fault state
- FTTx GPON ONU Troubleshooting
  - Troubleshoot common faults in ONU abnormal state, such as fail to register an ONU, fail to automatically find an ONU and ONU frequently get offline

- FTTx GPON HSI Service Troubleshooting
  - Troubleshoot common faults in the Internet access service, such as PPPoE dialup failure, DHCP dialup failure, failure to access the Internet after successful dialup, Internet access service interruption, and low Internet access rate
- FTTx GPON VoIP Service Troubleshooting
  - Troubleshoot common faults in the voice service, such as no tone after offhook, busy tone after offhook, one-way audio in communication, noise in communication, poor voice service in communication, and failure to dial certain phone numbers
- FTTx GPON IPTV Service Troubleshooting
  - Troubleshoot common faults in the multicast service. such as multicast user failing to go online, dark screen after going online and demanding a program, erratic display (mosaic) in a multicast program, abnormal interruption of a multicast program, and long time in switching programs

Duration

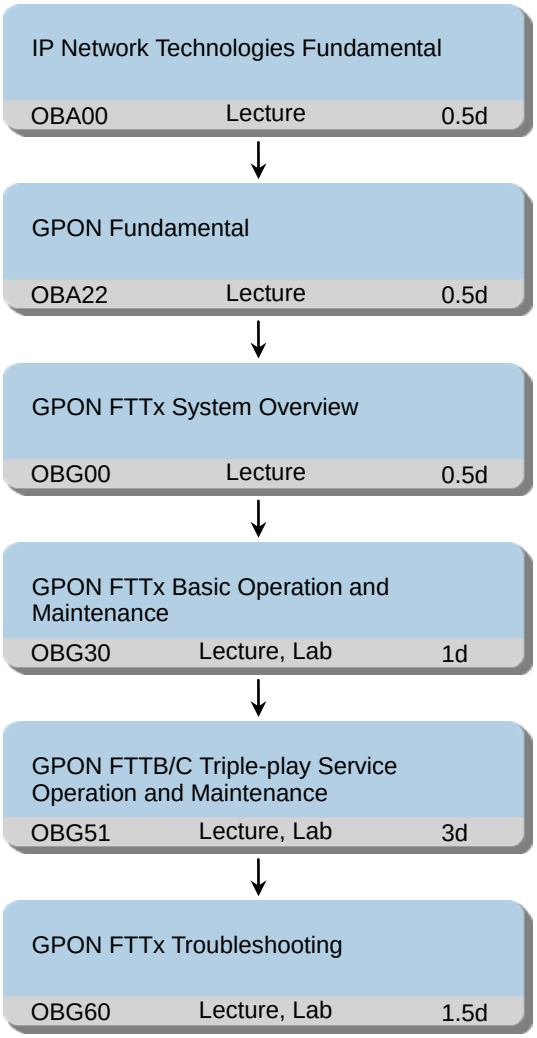
7 working days

Class Size

Min 6, Max 12

1.9.4 GPON/10GPON (FTTB/C) 2nd Line Maintenance Training

Training Path



Target Audience

Technical Support Engineers

Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication and IP Technology

Objectives

On completion of this program, the participants will be able to:

- Describe the functions of TCP/IP
- Describe routing process
- Describe the function and process of ARP
- Describe VLAN forwarding process
- Describe GPON typical application scenarios

- Describe the functions and specifications of GPON components
- Describe the upstream and downstream technology
- Describe the key performance parameters on distance, bandwidth, optical launched power, received sensitive power, attenuation, etc.
- Describe important concepts about GEM port and T-CONT
- Describe service encapsulation and multiplexing measures
- Describe the QoS and security solution in GPON
- Describe ONT management measures
- Introduce FTTx network
- Describe the function and structure of cabinet, frames, boards and cables
- Describe FTTH/B/C/O/M solutions
- Establish the connection and login to the system
- Perform the common basic operation, such as query status of hardware and software, backup and restore data, system name change and alarm query etc.
- Describe GPON FTTB/C networking
- Perform GPON FTTB/C HSI service configuration, maintenance and verification
- Perform GPON FTTB/C VoIP service configuration, maintenance and verification
- Perform GPON FTTB/C IPTV service configuration, maintenance and verification
- Troubleshooting hardware and software system
- Troubleshooting ONU
- Troubleshooting internet access service
- Troubleshooting multicast service
- Troubleshooting voice service

Training Content

OBA00 IP Network Technologies Fundamental

- TCPIP Basis
  - Architecture of TCP/IP
  - Function of TCP/IP each layer
  - Process of TCP/IP data encapsulation
- Ethernet Overview
  - Different types of Ethernet media
  - Ethernet capabilities and limitations
  - Layer 2 and 3 switching principles

OBA22 GPON Fundamental

- GPON Fundamentals
  - GPON networking
  - GPON component
  - GPON upstream and downstream implementation
  - GPON key performance
  - GPON service implementation process
  - GPON QoS and security

- GPON protection
- GPON OAM

OBG00 GPON FTTx System Overview

- FTTx System Overview
  - FTTx network introduction
  - FTTx cabinet appearance, typical configuration, parameter and connections
  - FTTx frame appearance, typical configuration, parameters and principles
  - FTTx board appearance, function, front panel and interfaces
  - FTTx cable introduction
  - FTTH/B/C/O/M solutions

OBG30 GPON FTTx Basic Operation and Maintenance

- GPON Basic Operation and Maintenance
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data
  - SNMP parameter configuration
  - Other basic operation, such as system name change and alarm query etc.
- GPON Basic Operation and Maintenance Practice Guide
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data
  - SNMP parameter configuration
  - Other basic operation, such as system name change and alarm query, etc.

OBG51 GPON FTTB/C Triple-play Service Operation and Maintenance

- GPON MxU HSI Service Provisioning
  - GPON FTTB/C HSI service implementation process
  - GPON FTTB/C HSI service configuration, maintenance and verification
- GPON MxU VoIP Service Provisioning
  - GPON FTTB/C VoIP service implementation process
  - GPON FTTB/C VoIP service configuration, maintenance and verification
- GPON MxU IPTV Service Provisioning
  - GPON FTTB/C IPTV service implementation process
  - GPON FTTB/C IPTV service configuration, maintenance and verification

OBG60 GPON FTTx Troubleshooting

- FTTx GPON OLT System Troubleshooting
  - Troubleshoot common faults in GPON system, such as NMS fails to manage a device, service board is in the failed state, control board resets caused by abnormalities, and fan is in the fault state
- FTTx GPON ONU Troubleshooting
  - Troubleshoot common faults in ONU abnormal state, such as fail to register an ONU, fail to automatically find an ONU and ONU frequently get offline
- FTTx GPON HSI Service Troubleshooting

- Troubleshoot common faults in the Internet access service, such as PPPoE dialup failure, DHCP dialup failure, failure to access the Internet after successful dialup, Internet access service interruption, and low Internet access rate

- FTTx GPON VoIP Service Troubleshooting
  - Troubleshoot common faults in the voice service, such as no tone after offhook, busy tone after offhook, one-way audio in communication, noise in communication, poor voice service in communication, and failure to dial certain phone numbers
- FTTx GPON IPTV Service Troubleshooting
  - Troubleshoot common faults in the multicast service. such as multicast user failing to go online, dark screen after going online and demanding a program, erratic display (mosaic) in a multicast program, abnormal interruption of a multicast program, and long time in switching programs

Duration

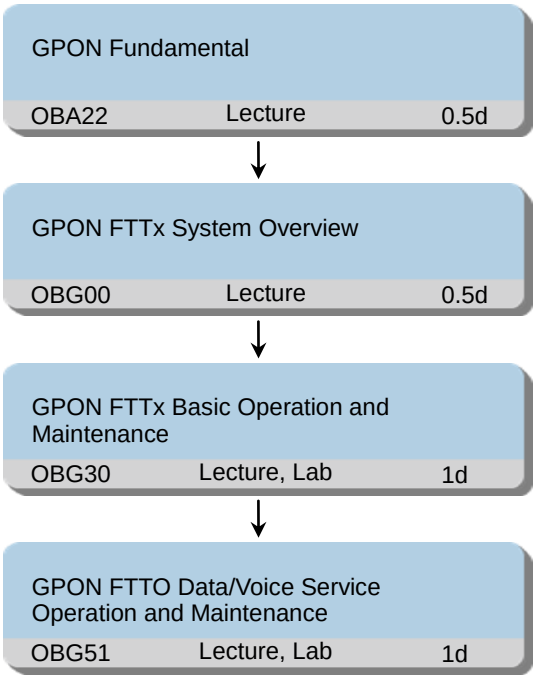
7 working days

Class Size

Min 6, Max 12

1.9.5 GPON (FTTO) 2nd Line Maintenance Training

Training Path



Target Audience

Technical Support Engineers

Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication and IP Technology

Objectives

On completion of this program, the participants will be able to:

- Describe GPON typical application scenarios
- Describe the functions and specifications of GPON components
- Describe the upstream and downstream technology
- Describe the key performance parameters on distance, bandwidth, optical launched power, received sensitive power, attenuation, etc.
- Describe important concepts about GEM port and T-CONT
- Describe service encapsulation and multiplexing measures
- Describe the QoS and security solution in GPON
- Describe ONT management measures
- Introduce FTTx network
- Describe the function and structure of cabinet, frames, boards and cables
- Describe FTTH/B/C/O/M solutions
- Establish the connection and login to the system

- Perform the common basic operation, such as query status of hardware and software, backup and restore data, system name change and alarm query etc.
- Describe GPON FTTO networking
- Perform GPON FTTO data service configuration, maintenance and verification
- Perform GPON FTTO VoIP service configuration, maintenance and verification
- Troubleshooting GPON FTTO data/voice service

Training Content

OBA22 GPON Fundamental

- GPON Fundamentals
  - GPON networking
  - GPON component
  - GPON upstream and downstream implementation
  - GPON key performance
  - GPON service implementation process
  - GPON QoS and security
  - GPON protection
  - GPON OAM

OBG00 GPON FTTx System Overview

- FTTx System Overview
  - FTTx network introduction
  - FTTx cabinet appearance, typical configuration, parameter and connections
  - FTTx frame appearance, typical configuration, parameters and principles
  - FTTx board appearance, function, front panel and interfaces
  - FTTx cable introduction
  - FTTH/B/C/O/M solutions

OBG30 GPON FTTx Basic Operation and Maintenance

- GPON Basic Operation and Maintenance
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data
  - SNMP parameter configuration
  - Other basic operation, such as system name change and alarm query etc.
- GPON Basic Operation and Maintenance Practice Guide
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data
  - SNMP parameter configuration
  - Other basic operation, such as system name change and alarm query, etc.

OBG51 GPON FTTO Data/Voice Service Operation and Maintenance

- GPON FTTO Data Service Provisioning
  - GPON FTTO data service implementation process

- GPON FTTO data service configuration, maintenance and verification
- GPON FTTO HSI service troubleshooting
- GPON FTTO VPN service troubleshooting

- GPON FTTO Voice Service Provisioning
  - GPON FTTO voice service implementation process
  - GPON FTTO voice service configuration, maintenance and verification
  - GPON FTTO voice service troubleshooting

Duration

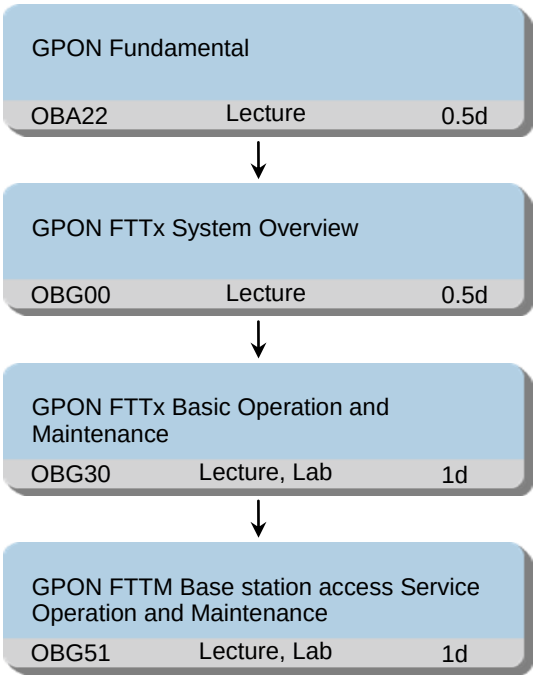
3 working days

Class Size

Min 6, Max 12

1.9.6 GPON (FTTM) 2nd Line Maintenance Training

Training Path



Target Audience

Technical Support Engineers

Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication and IP Technology

Objectives

On completion of this program, the participants will be able to:

- Describe GPON typical application scenarios
- Describe the functions and specifications of GPON components
- Describe the upstream and downstream technology
- Describe the key performance parameters on distance, bandwidth, optical launched power, received sensitive power, attenuation, etc.
- Describe important concepts about GEM port and T-CONT
- Describe service encapsulation and multiplexing measures
- Describe the QoS and security solution in GPON
- Describe ONT management measures
- Introduce FTTx network
- Describe the function and structure of cabinet, frames, boards and cables
- Describe FTTH/B/C/O/M solutions
- Establish the connection and login to the system

- Perform the common basic operation, such as query status of hardware and software, backup and restore data, system name change and alarm query etc.
- Describe GPON FTTM networking
- Perform GPON FTTM base station access service configuration, maintenance and verification
- Troubleshooting GPON FTTM base station service

Training Content

OBA22 GPON Fundamental

- GPON Fundamentals
  - GPON networking
  - GPON component
  - GPON upstream and downstream implementation
  - GPON key performance
  - GPON service implementation process
  - GPON QoS and security
  - GPON protection
  - GPON OAM

OBG00 GPON FTTx System Overview

- FTTx System Overview
  - FTTx network introduction
  - FTTx cabinet appearance, typical configuration, parameter and connections
  - FTTx frame appearance, typical configuration, parameters and principles
  - FTTx board appearance, function, front panel and interfaces
  - FTTx cable introduction
  - FTTH/B/C/O/M solutions

OBG30 GPON FTTx Basic Operation and Maintenance

- GPON Basic Operation and Maintenance
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data
  - SNMP parameter configuration
  - Other basic operation, such as system name change and alarm query etc.
- GPON Basic Operation and Maintenance Practice Guide
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data
  - SNMP parameter configuration
  - Other basic operation, such as system name change and alarm query, etc.

OBG51 GPON FTTM Base station access Service Operation and Maintenance

- GPON FTTM Base station access Service Provisioning
  - GPON FTTM base station access service implementation process
  - GPON FTTM base station access service configuration, maintenance and verification

- GPON FTTM base station access service troubleshooting

Duration

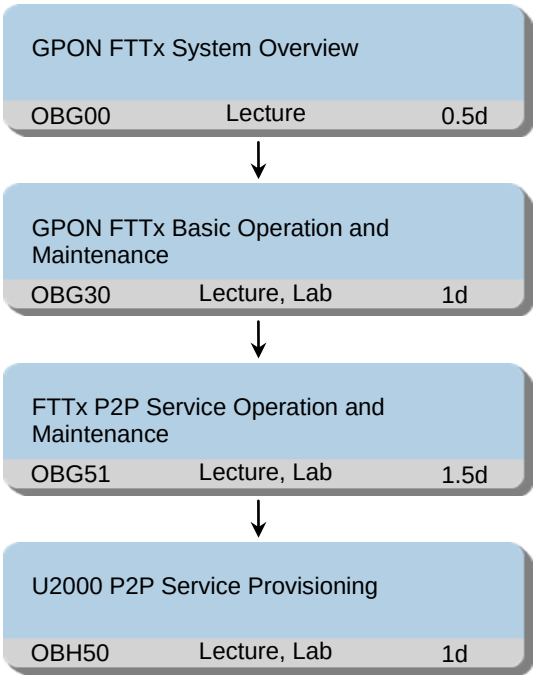
3 working days

Class Size

Min 6, Max 12

1.9.7 FTTx P2P 2nd Line Maintenance Training

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication and IP Technology

Objectives

On completion of this program, the participants will be able to:

- Introduce FTTx network
- Describe the function and structure of cabinet, frames, boards and cables
- Describe FTTH/B/C/O/M solutions
- Establish the connection and login to the system
- Perform the common basic operation, such as query status of hardware and software, backup and restore data, system name change and alarm query etc.
- Describe FTTx P2P networking
- Perform FTTx P2P Triple-play service configuration, maintenance and verification
- Perform GPON service pre-deployment via U2000
- Perform GPON FTTB service configuration via U2000
- Perform GPON FTTH service configuration via U2000

Training Content

OBG00 GPON FTTx System Overview

- FTTx System Overview
  - FTTx network introduction
  - FTTx cabinet appearance, typical configuration, parameter and connections
  - FTTx frame appearance, typical configuration, parameters and principles
  - FTTx board appearance, function, front panel and interfaces
  - FTTx cable introduction
  - FTTH/B/C/O/M solutions

OBG30 GPON FTTx Basic Operation and Maintenance

- GPON Basic Operation and Maintenance
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data
  - SNMP parameter configuration
  - Other basic operation, such as system name change and alarm query etc.
- GPON Basic Operation and Maintenance Practice Guide
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data
  - SNMP parameter configuration
  - Other basic operation, such as system name change and alarm query, etc.

OBG51 FTTx P2P Service Operation and Maintenance

- FTTH P2P Triple-play Service Provisioning
  - FTTH P2P triple-play service implementation process
  - FTTH P2P HSI service configuration and verification
  - FTTH P2P VoIP service configuration and verification
  - FTTH P2P IPTV service configuration and verification
- FTTH P2P Triple-play Service Configuration Guide
  - Configuring FTTH P2P HSI service in the lab
  - Configuring FTTH P2P VoIP service in the lab
  - Configuring FTTH P2P IPTV service in the lab
- FTTH P2P Triple-play Service Maintenance
  - FTTH P2P Triple-play service daily maintenance
  - FTTH P2P Triple-play service troubleshooting

OBH50 U2000 P2P Service Provisioning

- FTTH P2P Triple Play Service Operation on U2000
  - Introduce FTTH P2P service configuration process
  - Perform FTTH P2P HSI service configuration via U2000
  - Perform FTTH P2P VoIP service configuration via U2000
  - Perform FTTH P2P IPTV service configuration via U2000

Duration

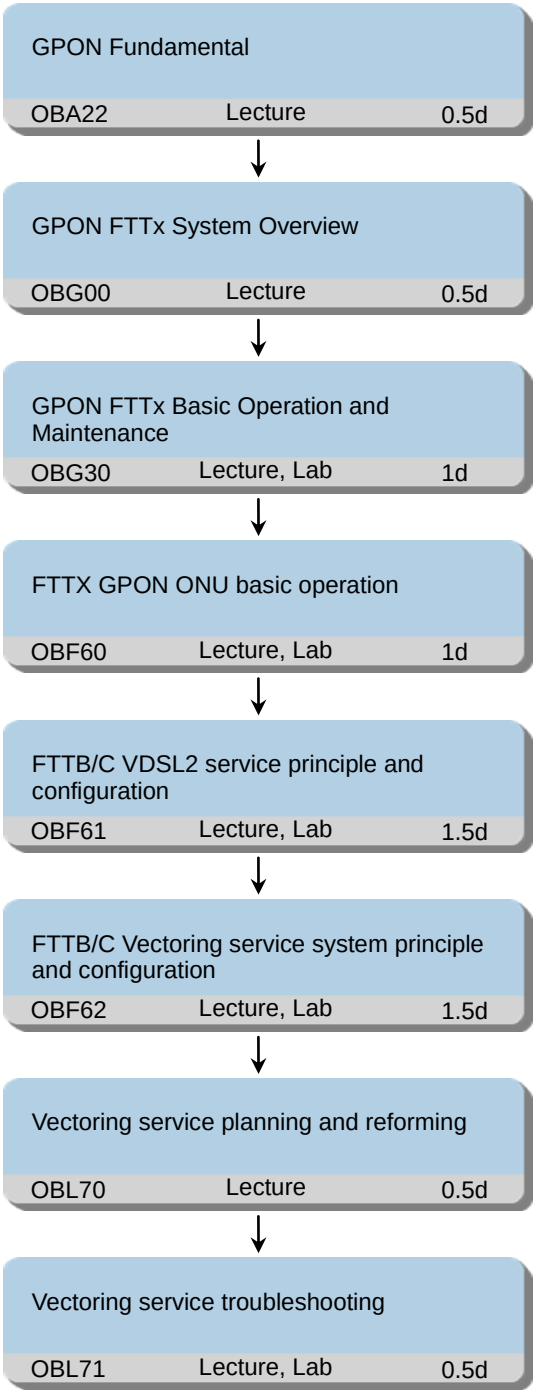
4 working days

Class Size

Min 6, Max 12

1.9.8 FTTx PON+Vectoring Operation and Maintenance Training

Training Path



Target Audience

Technical Support Engineers

Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication and data communication

Objectives

On completion of this program, the participants will be able to:

- Describe GPON typical application scenarios
- Describe the functions and specifications of GPON components
- Describe the upstream and downstream technology
- Describe the key performance parameters on distance, bandwidth, optical launched power, received sensitive power, attenuation, etc.
- Describe important concepts about GEM port and T-CONT
- Describe service encapsulation and multiplexing measures
- Describe the QoS and security solution in GPON
- Describe ONT management measures

Introduce FTTx network

- Describe the function and structure of cabinet, frames, boards and cables
- Describe FTTH/B/C/O/M solutions
- Establish the connection and login to the system
- Perform the common basic operation, such as query status of hardware and software, backup and restore data, system name change and alarm query etc.
- Describe MXU features
- Describe MXU basic configuration
- Describe VDSL2 technology features
- Describe VDSL2 key technology
- Describe VDSL2 network solution
- Describe VDSL2 configuration of FTTB/C
- Describe vectoring technology features
- Describe vectoring key technology
- Describe vectoring network solution
- Describe vectoring configuration of FTTB/C
- Describe vectoring planning method
- Describe vectoring planning cases
- Describe vectoring troubleshooting method

Training Content

OBA22 GPON Fundamental

- GPON Fundamentals
  - GPON networking
  - GPON component
  - GPON upstream and downstream implementation
  - GPON key performance
  - GPON service implementation process

- GPON QoS and security
- GPON protection
- GPON OAM

OBG00 GPON FTTx System Overview

- FTTx System Overview
  - FTTx network introduction
  - FTTx cabinet appearance, typical configuration, parameter and connections
  - FTTx frame appearance, typical configuration, parameters and principles
  - FTTx board appearance, function, front panel and interfaces
  - FTTx cable introduction
  - FTTH/B/C/O/M solutions

OBG30 GPON FTTx Basic Operation and Maintenance

- GPON Basic Operation and Maintenance
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data
  - SNMP parameter configuration
  - Other basic operation, such as system name change and alarm query etc.
- GPON Basic Operation and Maintenance Practice Guide
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data
  - SNMP parameter configuration
  - Other basic operation, such as system name change and alarm query, etc.

OBF60 FTTX GPON ONU basic operation

- GPON MxU Basic Operation and Maintenance
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data
  - SNMP parameter configuration
  - Other basic operation, such as system name change and alarm query etc..
- GPON MxU Basic Operation and Maintenance Practice Guide
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data
  - SNMP parameter configuration
  - Other basic operation, such as system name change and alarm query etc..

OBF61 FTTB/C VDSL2 service principle and configuration

- VDSL2 Technology
  - VDSL2 definition and performance
  - VDSL2 modulation
  - VDSL2 band plans and profiles

- VDSL2 noise dealing principle
- VDSL2 packet transfer mode
- VDSL2 QoS

- FTTB/C VDSL service configuration
  - FTTB/C VDSL service configuration
- FTTB/C VDSL service configuration practice guide
  - FTTB/C VDSL service configuration practice

OBF62 FTTB/C Vectoring service system principle and configuration

- Vectoring Overview
  - Vectoring technology basic
  - Vectoring key technology
  - FTTx vectoring network solution
  - Vectoring service maintenance
- FTTX Vectoring product overview
  - FTTX Vectoring product positioning and networking
  - FTTX Vectoring product functions
- FTTB/C Vectoring service configuration
  - FTTB/C Vectoring service configuration parameter
  - FTTB/C Vectoring service configuration profile
  - FTTB/C Vectoring service configuration
- FTTB/C Vectoring service configuration practice guide
  - FTTB/C Vectoring service configuration practice

OBL70 Vectoring service planning and reforming

- Vectoring service planning and reforming
  - Vectoring service planning and reforming

OBL71 Vectoring service troubleshooting

- Vectoring service troubleshooting
  - Vectoring service troubleshooting mothed
  - Vectoring service troubleshooting cases
- Vectoring service troubleshooting practice guide
  - Vectoring service troubleshooting practice

Duration

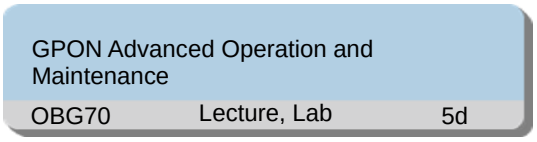
7 working day

Class Size

Min 6, Max 12

1.9.9 GPON 3rd Line Maintenance (Feature Implementation) Training

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- Completion of GPON 2nd Line Maintenance Training or having equivalent knowledge

Objectives

On completion of this program, the participants will be able to:

- Describe Layer2 features
- Outline QoS features
- Explain multicast features
- Describe network protection features
- Describe security features

Training Content

OBG70 GPON Advanced Operation and Maintenance

- MA5600T Layer 2 Features
  - MA5600T MAC address management
  - MA5600T VLAN type and VLAN switch
  - MA5600T layer2 forwarding
  - MA5600T flow classification
  - MA5600T layer2 mutual communication
- MA5600T QoS Features
  - MA5600T priority process
  - MA5600T traffic monitoring feature
  - MA5600T ACL feature
  - MA5600T congestion management
  - MA5600T traffic overload management
  - MA5600T HQoS principle and networking
- MA5600T Multicast Features
  - MA5600T multicast traffic forwarding principle
  - MA5600T multicast control principle
  - MA5600T multicast forwarding flow
  - MA5600T multicast service provisioning principle

- MA5600T multicast network interface, user interface
- MA5600T multicast bandwidth control

- MA5600T GPON Protection
  - Type B port 1+1 backup
  - Type B dual-homing protection
  - Type C protection
- MA5600T Network Protection
  - MA5600T MSTP feature and Configuration
  - MA5600T Smart Link and Monitor Link feature and Configuration
  - MA5600T Ethernet link aggregation feature and Configuration
  - MA5600T BFD feature and Configuration
  - MA5600T STM-1 protection feature and Configuration

Duration

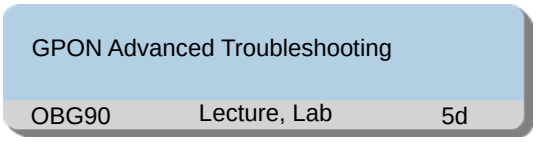
5 working days

Class Size

Min 6, Max 12

1.9.10 GPON 3rd Line Maintenance (Advanced Troubleshooting) Training

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- Completion of GPON 3nd Line Maintenance Training or having equivalent knowledge

Objectives

On completion of this program, the participants will be able to:

- Troubleshooting OLT hardware and software System
- Troubleshooting ONU
- Troubleshooting internet access service
- Troubleshooting multicast service
- Troubleshooting voice service

Training Content

OBG90 GPON Advanced Troubleshooting

- FTTx GPON OLT System Troubleshooting
  - Troubleshoot common faults in GPON system, such as NMS fails to manage a device, service board is in the failed state, control board resets caused by abnormalities, and fan is in the fault state
- FTTx GPON ONU Troubleshooting
  - Troubleshoot common faults in ONU abnormal state, such as fail to register an ONU, fail to automatically find an ONU and ONU frequently get offline
- FTTx GPON HSI Service Troubleshooting
  - Troubleshoot common faults in the Internet access service, such as PPPoE dialup failure, DHCP dialup failure, failure to access the Internet after successful dialup, Internet access service interruption, and low Internet access rate
- FTTx GPON VoIP Service Troubleshooting
  - Troubleshoot common faults in the voice service, such as no tone after offhook, busy tone after offhook, one-way audio in communication, noise in communication, poor voice service in communication, and failure to dial certain phone numbers
- FTTx GPON IPTV Service Troubleshooting
  - Troubleshoot common faults in the multicast service. such as multicast user failing to go online, dark screen after going online and demanding a program, erratic display

(mosaic) in a multicast program, abnormal interruption of a multicast program, and long time in switching programs

- MA5600T Configuration In-Depth
  - GPON FTTx HSI service implementation process
  - GPON FTTx HSI service configuration, maintenance and verification
  - GPON FTTx VoIP service implementation process
  - GPON FTTx VoIP service configuration, maintenance and verification
  - GPON FTTx IPTV service implementation process
  - GPON FTTx IPTV service configuration, maintenance and verification
- MA5600T Equipment In-Depth
  - MA5600T Product Overview
  - MA5600T System Architecture
  - MA5600T Network Applications In-Depth
  - MA5600T Equipment Management In-Depth
  - MA5600T Technical Specifications In-Depth
- MA5600T(GPON) System Troubleshooting In-depth
  - Troubleshoot hardware and software system
  - Troubleshoot faults in ONU abnormal state
  - Troubleshoot faults in the Internet access service
  - Troubleshoot faults in the voice service
  - Troubleshoot faults in the multicast service

Duration

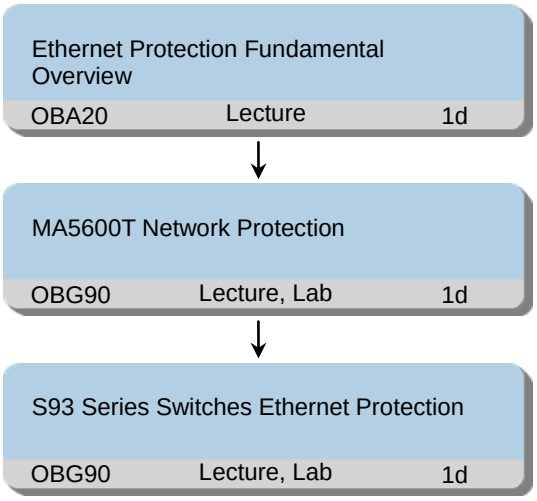
5 working days

Class Size

Min 6, Max 12

1.9.11 MA5600T Uplink Protection Solution and Configuration Training

Training Path



Target Audience

Technical Support Engineers

Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication and IP Technology

Objectives

On completion of this program, the participants will be able to:

- Describe MSTP feature
- Describe Smart Link and Monitor Link feature
- Describe Ethernet link aggregation feature
- Describe BFD feature
- Perform MSTP Configuration on MA5600T
- Perform Smart Link and Monitor Link Configuration on MA5600T
- Perform Ethernet link aggregation Configuration on MA5600T
- Perform BFD Configuration on MA5600T
- Perform MSTP Configuration on S93 to interconnect with MA5600T
- Perform Smart Link and Monitor Link Configuration on S93 to interconnect with MA5600T
- Perform Ethernet link aggregation Configuration on S93 to interconnect with MA5600T
- Perform BFD Configuration on S93 to interconnect with MA5600T

Training Content

OBA20 Ethernet Protection Fundamental Overview

- Ethernet Protection Fundamental Overview
  - MSTP feature Introduction

- Smart Link and Monitor Link feature Introduction
- Ethernet link aggregation feature Introduction
- BFD feature Introduction
- Network protection provisioning Introduction

OBG90 MA5600T Network Protection

- MA5600T Network Protection
  - MA5600T MSTP feature and Configuration
  - MA5600T Smart Link and Monitor Link feature and Configuration
  - MA5600T Ethernet link aggregation feature and Configuration
  - MA5600T BFD feature and Configuration
  - MA5600T STM-1 protection feature and Configuration

OBG90 S93 Series Switches Ethernet Protection

- S93 Series Switches Ethernet Protection
  - S9300 MSTP feature and Configuration
  - S9300 Smart Link and Monitor Link feature and Configuration
  - S9300 Ethernet link aggregation feature and Configuration
  - S9300 BFD feature and Configuration
  - S9300 STM-1 protection feature and Configuration

Duration

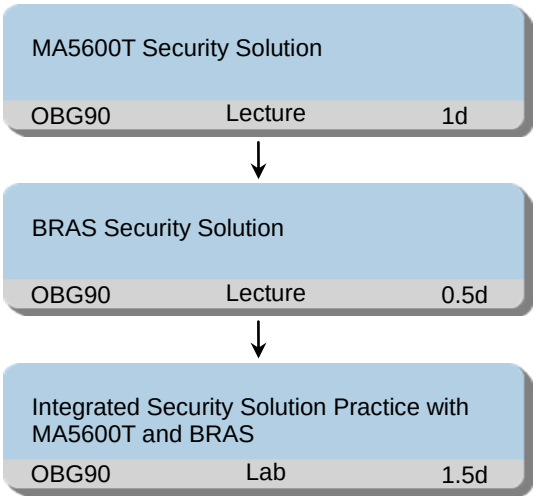
3 working days

Class Size

Min 6, Max 12

1.9.12 Broadband Access Network Security Solution and Configuration Training

Training Path



Target Audience

Technical Support Engineers

Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication and IP Technology

Objectives

On completion of this program, the participants will be able to:

- Describe PITP Configuration on MA5600T
- Describe 802.1x Configuration on MA5600T
- Describe Anti-MAC Spoofing and anti-IP Spoofing Configuration on MA5600T
- Describe User isolation and line security Configuration on MA5600T
- Describe PITP Configuration on BRAS
- Describe 802.1x Configuration with BRAS
- Describe Anti-MAC Spoofing and anti-IP Spoofing Configuration on BRAS
- Describe User isolation and line security Configuration on BRAS
- Perform PITP Configuration with BRAS and MA5600T
- Perform 802.1x Configuration with BRAS and MA5600T
- Perform Anti-MAC Spoofing and anti-IP Spoofing Configuration with BRAS and MA5600T
- Perform User isolation and line security Configuration with BRAS and MA5600T

Training Content

OBG90 MA5600T Security Solution

- MA5600T User Security
  - PITP feature

- DHCP option82 feature
- 802.1x feature
- Anti-MAC Spoofing and anti-IP Spoofing feature
- User isolation and line security feature

OBG90 BRAS Security Solution

- BRAS Security Solution
  - PITP feature with BRAS
  - 802.1x feature with BRAS
  - Anti-MAC Spoofing and anti-IP Spoofing feature
  - User isolation and line security feature with BRAS

OBG90 Integrated Security Solution Practice with MA5600T and BRAS

- Integrated Security Solution Practice with MA5600T and BRAS
  - PITP Configuration with BRAS and MA5600T
  - 802.1x Configuration with BRAS and MA5600T
  - Anti-MAC Spoofing and anti-IP Spoofing Configuration and MA5600T
  - User isolation and line security Configuration with BRAS and MA5600T

Duration

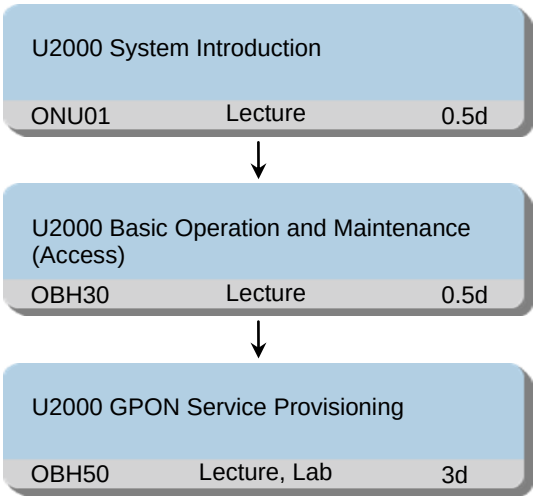
3 working days

Class Size

Min 6, Max 12

1.9.13 U2000 FTTx Service Provision Training

Training Path



Target Audience

Technical Support Engineers

Operation and Maintenance Engineers

Prerequisites

- General understanding of telecommunication network and GPON

Objectives

On completion of this program, the participants will be able to:

- Describe the architecture and main features of U2000
- List the main functions of U2000
- Login to U2000 server via client
- Add a map and device
- Deal with the alarm
- Backup and auto save the configuration
- Add a management user
- Perform GPON service pre-deployment via U2000
- Perform GPON FTTB service configuration via U2000
- Perform GPON FTTH service configuration via U2000

Training Content

ONU01 U2000 System Introduction

- iManager U2000 System Introduction
  - The architecture and main features of U2000
  - The directory structure of U2000
  - The main functions of U2000

OBH30 U2000 Basic Operation and Maintenance (Access)

- U2000 Client Introduction
  - Login to U2000 Server via Client
  - The main functions of U2000 Client
- U2000 User Management
  - Add a management user
  - Manage the user
- U2000 Topology and NE Management
  - Add a map and device
  - Discover the topology, set the communication parameters and synchronize the device data on U2000
- U2000 Alarm, Environment Monitoring and Management
  - Deal with the alarm
  - The main functions of U2000 fault management, monitor the fault alarm, notify the relevant personnel, and process the fault alarm on U2000
- U2000 Performance Statistics
  - The main function of U2000 performance
  - management and monitoring
  - The performance statistics of network resources on U2000

OBH50 U2000 GPON Service Provisioning

- iManager U2000 FTTx Guide to the Network Deployment
  - Introduce GPON pre-deployment solution
  - Perform GPON service pre-deployment via U2000
- GPON FTTB/C Triple Play Service Operation on U2000
  - Introduce GPON FTTB/C service configuration process
  - Perform GPON FTTB/C service configuration via U2000
- GPON FTTH Triple Play Service Operation on U2000
  - Introduce GPON FTTH service configuration process
  - Perform GPON FTTH service configuration via U2000

Duration

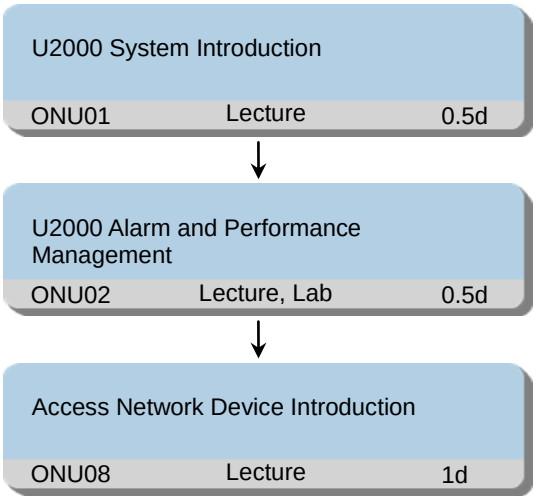
4 working days

Class Size

Min 6, Max 12

1.9.14 U2000 FTTx Monitoring Training

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- Having the basic knowledge of network management
- Having the basic principle and equipment knowledge of Access network

Objectives

On completion of this program, the participants will be able to:

- Describe the architecture and main features of U2000
- List the main functions of U2000
- Describe the basic concepts in alarm and performance management of U2000
- Perform the browse and setting operation for alarm
- Perform the basic response operation for common alarm events
- Perform the browse and setting operation for performance events
- Locate the alarm in the network
- Explain the networking and application of Huawei Access network equipment
- Describe the functions of Huawei network products
- Describe the capacity and features of Huawei network products

Training Content

ONU01 U2000 System Introduction

- iManager U2000 System Introduction
  - The architecture and main features of U2000
  - The directory structure of U2000

- The main functions of U2000

ONU02 U2000 Alarm and Performance Management

- iManager U2000-B Alarm and Performance Management
  - The basic concepts in alarm and performance management of U2000
  - Alarm settings and operations
  - The basic response operation for common alarm events
  - Performance events settings and operations

ONU08 Access Network Device Introduction

- Access Network Overview
  - The main functions, features and hardware introduction of GPON equipment
  - The main alarms and response operations of GPON equipment
  - The main functions, features and hardware introduction of DSLAM equipment
  - The main alarms and response operations of DSLAM equipment
  - The main functions, features and hardware introduction of MSAN equipment
  - The main alarms and response operations of MSAN equipment

Duration

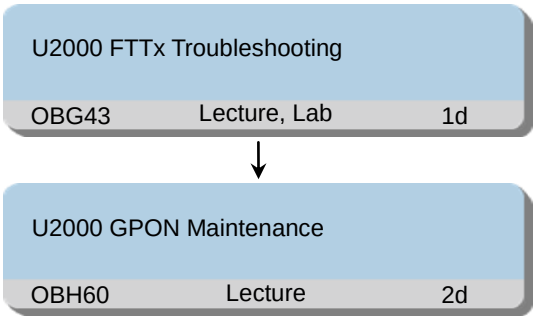
2 working days

Class Size

Min 6, Max 12

1.9.15 U2000 FTTx Maintenance and Troubleshooting Training

Training Path



Target Audience

Technical Support Engineers

Operation and Maintenance Engineers

Prerequisites

- Having the basic knowledge of network management
- Having the basic principle and equipment knowledge of Access network

Objectives

On completion of this program, the participants will be able to:

- Describe FTTx fast operation and maintenance
- Describe upgrading ONTs Automatically
- Describe replacing ONTs
- Outline configuring a Service Level for an ONT
- Describe Remote MDU Acceptance
- Describe Replacing an Ethernet-Upstream Device Quickly
- Describe Replacing a PON MDU Quickly
- Describe FTTx Alarm types
- Perform U2000 FTTx Alarm Analysis
- Perform U2000 FTTx Alarm Management
- perform U2000 FTTx Network Performance Monitoring
- Perform U2000 FTTx Network Performance Management
- Analysis FTTx common faults troubleshooting on U2000
- Describe FTTx faults diagnose through U2000
- Describe FTTx faults information collection through U2000
- Describe FTTx case study on U2000

Training Content

OBG43 U2000 FTTx Troubleshooting

- U2000 FTTx Troubleshooting
  - FTTx common faults troubleshooting on U2000

- FTTx faults diagnose through U2000
- FTTx faults information collection through U2000
- FTTx troubleshooting case study on U2000

OBH60 U2000 GPON Maintenance

- iManager U2000 FTTx Maintenance
  - FTTx Fast Operation and Maintenance
  - Bulk configuring command Line script files
  - the Script Files to NEs
  - Importing files to NEs in batches
  - FTTH Maintenance
  - Upgrading ONTs Automatically
  - Replacing ONTs
  - Configuring a Service Level for an ONT
  - FTTB Maintenance
  - Remote MDU Acceptance
  - Replacing an Ethernet-Upstream Device Quickly
  - Replacing a PON MDU Quickly
- iManager U2000 FTTx Network Alarm Management
  - FTTx alarm introduction
  - U2000 FTTx alarm analysis
  - U2000 FTTx alarm management
- iManager U2000 FTTx Network Performance Management
  - U2000 FTTx network performance monitoring
  - U2000 FTTx network performance management

Duration

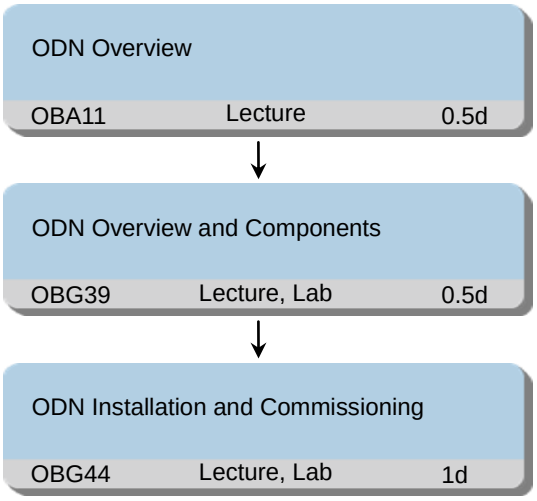
3 working days

Class Size

Min 6, Max 12

1.9.16 ODN Installation and Commissioning Training

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- Having the basic knowledge of network management
- Having the basic knowledge of Access network

Objectives

On completion of this program, the participants will be able to:

- Describe ODN architecture
- Describe ODF function and application
- Describe FDT function and application
- Describe FAT function and application
- Describe Closure function and application
- Describe Splitter function and application
- Describe TB/ATB/CTB function and application
- Describe ODN deployment method
- Describe ODN test method

Training Content

OBA11 ODN Overview

- ODN Overview
  - ODN network structure
  - ODN network typical application
  - ODN typical equipment

- ODN test instrument introduction

OBG39 ODN Overview and Components

- ODN Overview and Components
  - ODN architecture
  - ODF function, specification and application
  - FDT function, specification and application
  - FAT function, specification and application
  - Closure function, specification and application
  - Splitter function, specification and application
  - TB function, specification and application
  - ATB function, specification and application
  - CTB function, specification and application

OBG44 ODN Installation and Commissioning

- ODN Installation
  - ODN civil work
  - ODN cable work
  - ODN cabinet installation
- ODN Testing
  - ODN testing parameters
  - ODN testing preparation
  - ODN acceptance testing
  - ODN test tool

Duration

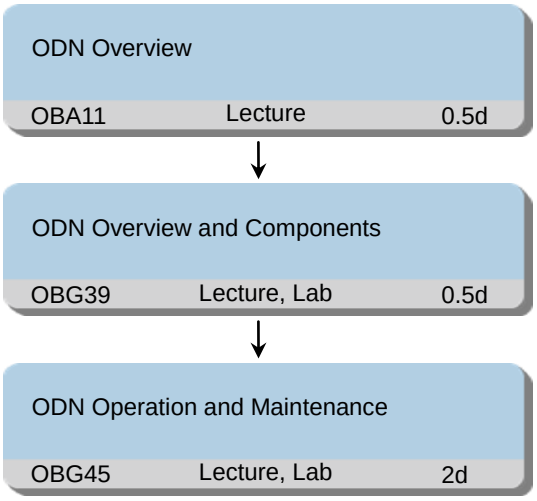
2 working days

Class Size

Min 6, Max 12

1.9.17 ODN Operation and Maintenance Training

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- Having the basic knowledge of network management
- Having the basic knowledge of Access network

Objectives

On completion of this program, the participants will be able to:

- Describe ODN architecture
- Describe ODF function and application
- Describe FDT function and application
- Describe FAT function and application
- Describe Closure function and application
- Describe Splitter function and application
- Describe TB/ATB/CTB function and application
- Describe ODN common operation
- Describe preventive maintenance purpose
- List the maintenance tools
- List of preventive Maintenance items
- List of planed maintenance items
- Complete maintenance tasks
- Outline troubleshooting flow
- Analysis the ODN common fault
- Locate the ODN common fault

- Complete corrective maintenance tasks
- Describe common fault category
- Outline typical fault troubleshooting method
- Complete fault troubleshooting

Training Content

OBA11 ODN Overview

- ODN Overview
  - ODN network structure
  - ODN network typical application
  - ODN typical equipment
  - ODN test instrument introduction

OBG39 ODN Overview and Components

- ODN Overview and Components
  - ODN architecture
  - ODF function, specification and application
  - FDT function, specification and application
  - FAT function, specification and application
  - Closure function, specification and application
  - Splitter function, specification and application
  - TB function, specification and application
  - ATB function, specification and application
  - CTB function, specification and application

OBG45 ODN Operation and Maintenance

- ODN Common Operation
  - Making an OT terminal
  - Connecting optical Fibers
  - Replacing components
  - Making and writing the Route Label
- ODN Preventive Maintenance
  - Maintenance preparations
  - Preventive maintenance
  - Planned maintenance
- ODN Corrective Maintenance
  - ODN corrective maintenance overview
  - Fault analysis
  - Locating fault points
  - Fault rectification
- ODN Troubleshooting Case Study
  - Troubleshooting optical splitter faults
  - Troubleshooting optical fiber
  - Troubleshooting fiber connection faults

- Troubleshooting optical cable faults
- Troubleshooting other component faults

Duration

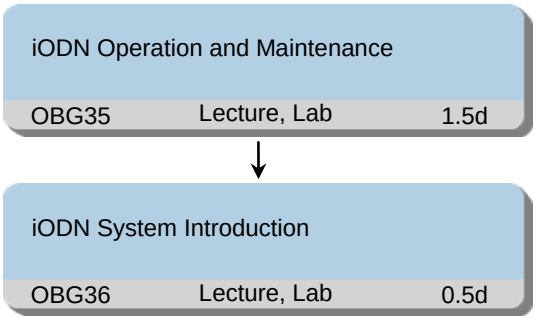
3 working days

Class Size

Min 6, Max 12

1.9.18 iODN Operation and Maintenance Training

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- Having the basic knowledge of ODN
- Having the basic principle and equipment knowledge of ODN

Objectives

On completion of this program, the participants will be able to:

- Describe iODN networking and hardware
- Describe iODN solution
- Outline the benefits of iODN solution
- Describe U2000 ODN NMS position and function
- Describe U2000 ODN NMS basic operation in web client
- Add resource through U2000 ODN NMS web client
- Configure iODN and services through U2000 ODN NMS web client
- Implement troubleshooting in U2000 ODN NMS web client
- Describe iFiled basic operation in onsite construction
- Describe the fiber jump process in and among the cabinet
- Outline remove fiber operation steps
- Outline cancel order operation steps

Training Content

OBG35 iODN Operation and Maintenance

- iODN Operation and Maintenance
  - U2000 ODN NMS position and function introduction
  - U2000 ODN NMS basic operation in web client introduction
  - Resource adding through U2000 ODN NMS web client
  - iODN and services configuration through U2000 ODN NMS web client
  - Troubleshooting in U2000 ODN NMS web client

- iField Operation and Maintenance
  - iField basic operation in onsite construction
  - Perform the fiber jump process in and among the cabinet
  - Perform remove fiber operation steps
  - Perform cancel order operation steps

OBG36 iODN System Introduction

- iODN System Introduction
  - ODN network composing
  - ODN network maintenance Challenge
  - iODN network structure
  - iODN solution module
  - iODN advantage
  - iODF function and application introduction
  - iFDT function and application introduction
  - iField component introduction

Duration

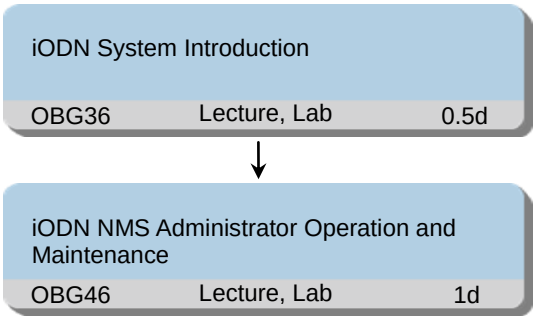
2 working days

Class Size

Min 6, Max 12

1.9.19 iODN NMS Administrator Training

Training Path



Target Audience

Technical Support Engineers

Operation and Maintenance Engineers

Prerequisites

- Having the basic knowledge of network management
- Having the basic knowledge of Access network

Objectives

On completion of this program, the participants will be able to:

- Describe ODN Network Composing
- Describe ODN Network Maintenance Challenge
- Describe iODN Network Structure
- Describe iODN Solution Module
- Outline iODN advantage
- Describe iODF function and application
- Describe iFDT function and application
- Describe iField component
- Describe U2000 ODN NMS characteristics and software structure
- Describe U2000 ODN NMS ex-interface
- Perform U2000 ODN NMS server and client configuration
- Describe iField function and applications
- Describe alarms and events in U2000 ODN NMS
- Describe monitoring network alarms
- Describe setting and handling alarms
- Outline analyzing alarm correlation
- Describe U2000 ODN NMS security management
- Describe U2000 ODN NMS log management operation
- Outline U2000 ODN NMS time localization management operation
- Adjusting the U2000 ODN NMS

- Managing License
- Managing U2000 ODN NMS database, files and disks
- Describe method of checking resource usage of the server
- Describe how to check running status of processes and services
- Describe method of backing up U2000 ODN NMS data
- Outline normal troubleshooting process and typical cases

Training Content

OBG36 iODN System Introduction

- iODN System Introduction
  - ODN network composing
  - ODN network maintenance Challenge
  - iODN network structure
  - iODN solution module
  - iODN advantage
  - iODF function and application introduction
  - iFDT function and application introduction
  - iField component introduction

OBG46 iODN NMS Administrator Operation and Maintenance

- U2000 ODN NMS and iField Introduction
  - U2000 ODN NMS introduction
  - iField introduction
  - iField and U2000 ODN NMS Communication case
- U2000 ODN NMS Alarm Management
  - Basic concepts of alarm
  - Customizing alarm template
  - Monitoring network alarms
  - Collecting alarm/event statistics
  - Handling alarms
  - Setting alarms
  - Analyzing alarm correlation
- U2000 ODN NMS Administration Introduction
  - Security management
  - Log management
  - Time localization management
- U2000 ODN NMS Management
  - Starting the U2000 ODN NMS system
  - Shutting down the U2000 ODN NMS
  - Adjusting the U2000 ODN NMS
  - Managing license
  - Managing U2000 ODN NMS database
  - Managing U2000 ODN NMS files and disks

- U2000 ODN NMS Maintenance
  - Routine maintenance
  - Troubleshooting

Duration

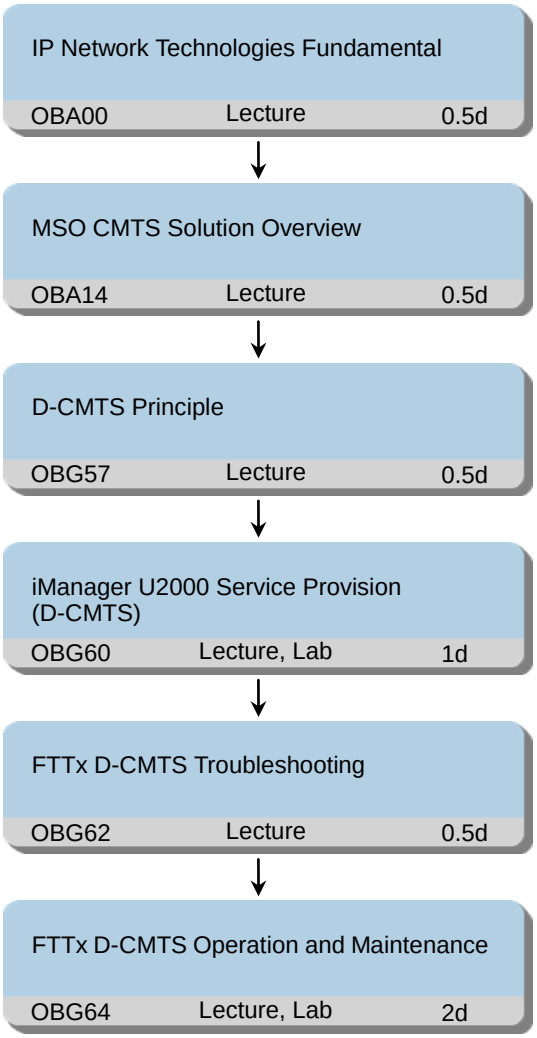
2 working days

Class Size

Min 6, Max 12

1.9.20 MSO CMTS Operation and Maintenance Training

Training Path



Target Audience

Technical Support Engineers

Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication and data communication

Objectives

On completion of this program, the participants will be able to:

- Describe the functions of TCP/IP
- Describe routing process
- Describe the function and process of ARP
- Describe VLAN forwarding process
- Describe EOC concepts

- Describe EOC technologies
- Describe traditional cable network Introduction
- Describe CMTS introduction
- Describe MSO CMTS solution
- Describe FTTx D-CMTS Triple-play service configuration procedure
- Perform FTTx D-CMTS Triple-play service configuration correctly based on data planning
- Perform the FTTx D-CMTS service provisioning on U2000
- Describes how to troubleshoot FTTx D-CMTS common faults and deal with emergencies in services and functions

Training Content

OBA00 IP Network Technologies Fundamental

- TCPIP Basis
  - Architecture of TCP/IP
  - Function of TCP/IP each layer
  - Process of TCP/IP data encapsulation
- Ethernet Overview
  - Different types of Ethernet media
  - Ethernet capabilities and limitations
  - Layer 2 and 3 switching principles

OBA14 MSO CMTS Solution Overview

- MSO CMTS Solution Overview
  - Traditional cable network Introduction
  - D-CMTS introduction
  - MSO D-CMTS solution overview

OBG57 D-CMTS Principle

- FTTx D-CMTS Fundamentals
  - HFC technology basic
  - HFC network introduction
  - CMTS concepts
  - D-CMTS technologies overview

OBG60 iManager U2000 Service Provision (D-CMTS)

- iManager U2000 Service Provision (D-CMTS)
  - iManager U2000 service Provisioning (D-CMTS)

OBG62 FTTx D-CMTS Troubleshooting

- FTTx D-CMTS Troubleshooting
  - Commonly used methods and tools for FTTx service
  - Troubleshooting the MA5600T system
  - Troubleshooting the FTTx D-CMTS devices
  - Troubleshooting the FTTx D-CMTS triple-play service

OBG64 FTTx D-CMTS Operation and Maintenance

- FTTx D-CMTS Triple-play Service Configuration

- FTTx D-CMTS Triple-play service network
- FTTx D-CMTS Triple-play service configuration procedure
- FTTx D-CMTS Triple-play service data plan and configuration and certification
- FTTx D-CMTS Triple-play service query and modify commands

- FTTx D-CMTS Triple-play Service Configuration Practice Guide
  - FTTx D-CMTS Triple-play service configuration practice
  - FTTx D-CMTS Triple-play service certification

Duration

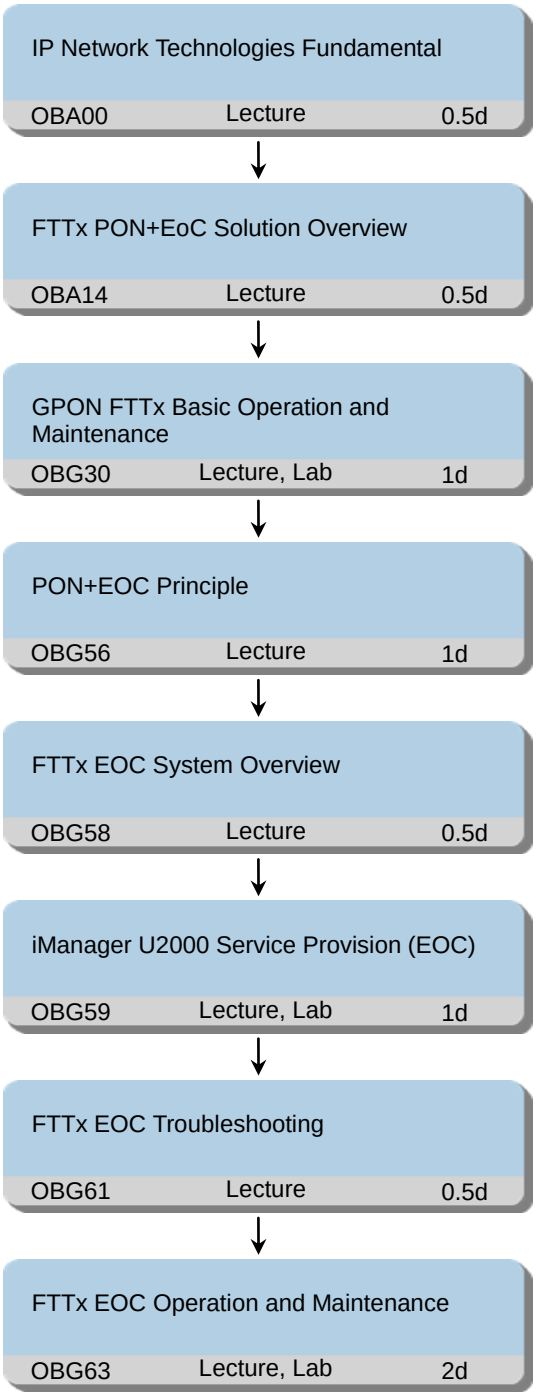
5 working days

Class Size

Min 6, Max 12

1.9.21 FTTx PON+EoC Operation and Maintenance Training

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication and data communication

Objectives

On completion of this program, the participants will be able to:

- Describe the functions of TCP/IP
- Describe routing process
- Describe the function and process of ARP
- Describe VLAN forwarding process
- Describe EOC concepts
- Describe EOC technologies
- Describe FTTx basic concepts and applications
- Describe FTTx EOC product architecture
- Describe FTTx EOC MA563x features
- Describe how to integrate EOC product in CATV network
- Describe traditional cable network Introduction
- Describe CMTS introduction and CMTS network
- Describe PON+EOC solution overview
- Outline the difference between CMTS and xPON
- Establish the connection and login to the system
- Perform the common basic operation, such as query status of hardware and software, backup and restore data, system name change and alarm query etc.
- Perform the ONU adding and check the ONU status
- Describe FTTx EOC HSI service configuration procedure
- Perform FTTx EOC HSI service configuration correctly based on data planning
- Perform the FTTx EOC service provisioning on U2000
- Describes how to troubleshoot FTTx EOC common faults and deal with emergencies in services and functions

Training Content

OBA00 IP Network Technologies Fundamental

- TCPIP Basis
  - Architecture of TCP/IP
  - Function of TCP/IP each layer
  - Process of TCP/IP data encapsulation
- Ethernet Overview
  - Different types of Ethernet media
  - Ethernet capabilities and limitations
  - Layer 2 and 3 switching principles

OBA14 FTTx PON+EoC Solution Overview

- FTTx EoC Solution Overview
  - Traditional Cable network Introduction

- CMTS Introduction and CMTS network
- PON+EOC solution overview
- CMTS and xPON comparison

OBG30 GPON FTTx Basic Operation and Maintenance

- GPON Basic Operation and Maintenance
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data
  - SNMP parameter configuration
  - Other basic operation, such as system name change and alarm query etc.
- GPON Basic Operation and Maintenance Practice Guide
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data
  - SNMP parameter configuration
  - Other basic operation, such as system name change and alarm query, etc.

OBG56 PON+EOC Principle

- GPON Fundamentals
  - GPON networking
  - GPON component
  - GPON upstream and downstream implementation
  - GPON key performance
  - GPON service implementation process
  - GPON QoS and security
  - GPON protection
  - GPON OAM
- FTTx EOC Fundamentals
  - HFC technology basic
  - HFC network introduction
  - EOC concepts
  - EOC technologies overview

OBG58 FTTx EOC System Overview

- FTTx EOC System Overview
  - FTTx MA5600T product architecture
  - FTTx MA5600T product functions
  - FTTx MA5631/MA5632 product architecture
  - FTTx MA5631/MA5632 product functions
  - FTTx HG7022/HG7042 product architecture
  - FTTx HG7022/HG7042 product functions and features
  - FTTx EOC network overview

OBG59 iManager U2000 Service Provision (EOC)

- iManager U2000 Service Provision (EOC)

- iManager U2000 service Provisioning（EOC）

OBG61 FTTx EOC Troubleshooting

- FTTx EOC Troubleshooting
  - Commonly used methods and tools for FTTx service
  - Troubleshooting the MA5600T system
  - Troubleshooting the FTTx EOC ONU devices
  - Troubleshooting the FTTx EOC service

OBG63 FTTx EOC Operation and Maintenance

- FTTx EOC ONU Operation and Maintenance
  - FTTx EOC ONU line profile and service profile configuration
  - FTTx EOC ONU adding
  - FTTx EOC ONU status and configuration maintenance
- FTTx EOC ONU Operation and Maintenance Practice Guide
  - FTTx EOC ONU operation and maintenance provisioning
- FTTx EOC HSI Service Configuration
  - FTTx EOC HSI service network
  - FTTx EOC HSI service configuration procedure
  - FTTx EOC HSI service data plan and configuration and certification
  - FTTx ECO HSI service query and modify commands
- FTTx EOC Broadband Configuration Practice Guide
  - FTTx EOC broadband configuration Provisioning

Duration

7 working day

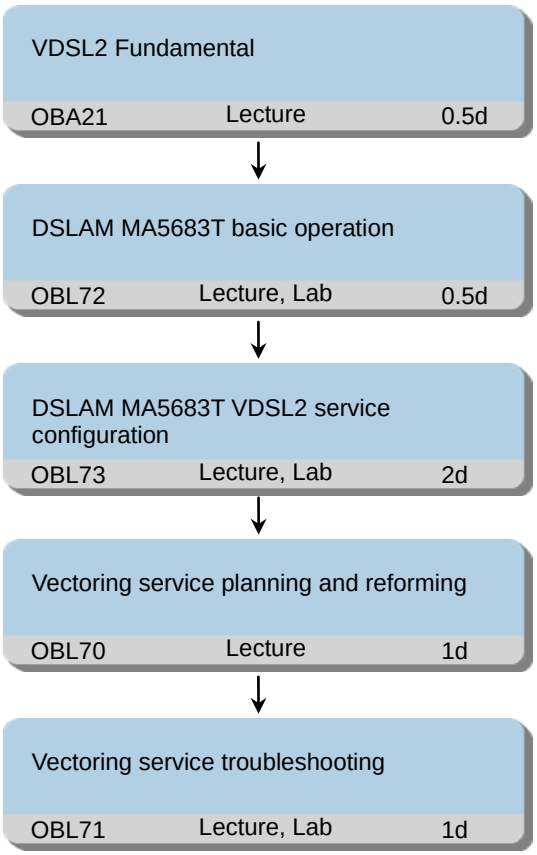
Class Size

Min 6, Max 12

1.10 DSLAM Products

1.10.1 DSLAM SmartAX MA5603T Vectoring Maintenance Training

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication and data communication

Objectives

On completion of this program, the participants will be able to:

- Describe VDSL2 orientation and networking
- Describe VDSL2 modulation mode
- Describe VDSL2 band plans and profiles
- Describe VDSL2 noise dealing principle
- Describe VDSL2 packet transfer mode
- Describe DSLAM MA5603T features
- Describe DSLAM MA5603T basic configuration

- Describe VDSL2 technology features
- Describe VDSL2 key technology
- Describe VDSL2 network solution
- Describe VDSL2 configuration on MA5603T
- Describe vectoring planning method
- Describe vectoring planning cases
- Describe vectoring troubleshooting method

Training Content

OBA21 VDSL2 Fundamental

- VDSL2 Technology
  - VDSL2 definition and performance
  - VDSL2 modulation
  - VDSL2 band plans and profiles
  - VDSL2 noise dealing principle
  - VDSL2 packet transfer mode
  - VDSL2 QoS

OBL72 DSLAM MA5683T basic operation

- DSLAM MA5603T system operation and maintenance
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data
  - SNMP parameter configuration
  - Other basic operation, such as system name change, alarm query, etc.
- DSLAM MA5603T hardware system introduction
  - DSLAM MA5683T hardware system
  - DSLAM MA5683T service board, control board

OBL73 DSLAM MA5683T VDSL2 service configuration

- DSLAM MA5603T VDSL2 service configuration
  - configure DSLAM MA5683T VDSL2 profile
  - configure DSLAM MA5683T VDSL2 parameter
  - configure DSLAM MA5683T VDSL2 service
- DSLAM MA5603T VDSL2 service configuration practice guide
  - DSLAM MA5683T VDSL2 service configuration practice

OBL70 Vectoring service planning and reforming

- Vectoring service planning and reforming
  - Vectoring service planning and reforming

OBL71 Vectoring service troubleshooting

- Vectoring service troubleshooting
  - Vectoring service troubleshooting method
  - Vectoring service troubleshooting cases
- Vectoring service troubleshooting practice guide

- Vectoring service troubleshooting practice

Duration

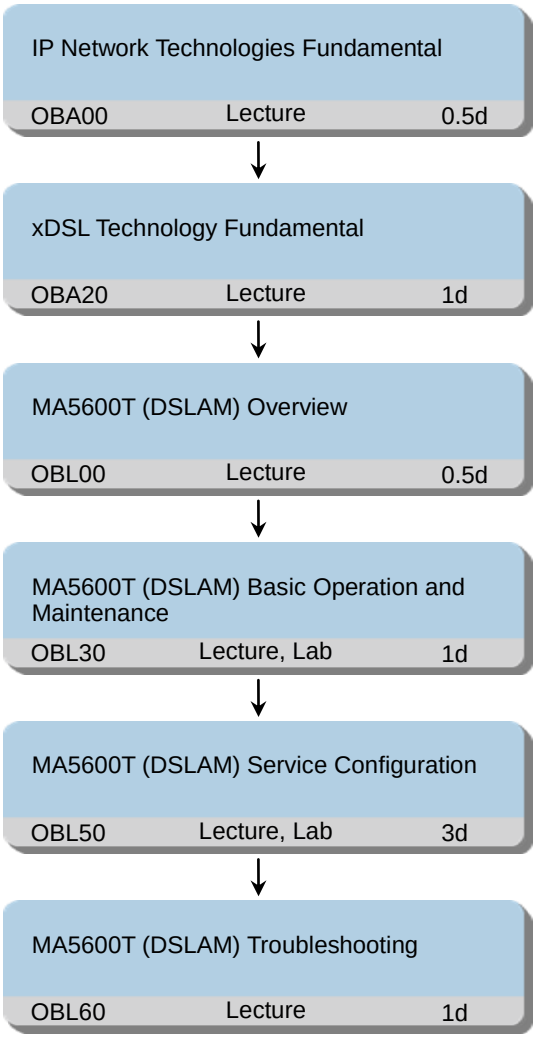
5 working day

Class Size

Min 6, Max 12

1.10.2 DSLAM SmartAX MA5600T Series 2nd Line Maintenance Training

Training Path



Target Audience

Technical Support Engineers

Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication and data communication

Objectives

On completion of this program, the participants will be able to:

- Describe the functions of TCP/IP
- Describe routing process
- Describe the function and process of ARP
- Describe VLAN forwarding process
- Describe xDSL network solution

- Describe xDSL service solution
- Describe xDSL service process
- Describe MA5600T product positioning and networking
- Outline MA5600T product functions
- Describe MA5600T system features
- List device management method
- Describe MA5600T cabinet
- Outline MA5600T shelf
- Describe MA5600T functions of boards
- Outline MA5600T cables and interconnection
- Establish the connection and login to the system
- Perform the common basic operation, such as query status of hardware and software, backup and restore data, system name change, alarm query, etc.
- Describe ADSL2+/VDSL2 service implementation in MA5600T
- Describe multicast service implementation MA5600T
- Manage ADSL2+/VDSL2 line profile
- Complete ADSL2+/VDSL2 service configuration
- Perform ADSL2+/VDSL2 service operation and maintenance
- Complete multicast service configuration
- Perform multicast service operation and maintenance
- Troubleshooting hardware and software system
- Troubleshooting internet access service
- Troubleshooting multicast service

Training Content

OBA00 IP Network Technologies Fundamental

- TCPIP Basis
  - Architecture of TCP/IP
  - Function of TCP/IP each layer
  - Process of TCP/IP data encapsulation
- Ethernet Overview
  - Different types of Ethernet media
  - Ethernet capabilities and limitations
  - Layer 2 and 3 switching principles

OBA20 xDSL Technology Fundamental

- ADSL2+ Technology
  - ADSL2+ system structure and component
  - ADSL2+ theory and key technology
  - ADSL2+ service implementation process
- G.SHDSL.Bis Technology
  - G.SHDSL.bis system structure and component
  - G.SHDSL.bis theory and key technology

- G.SHDSL.bis service implementation process
- VDSL2 Technology
  - VDSL2 definition and performance
  - VDSL2 modulation
  - VDSL2 band plans and profiles
  - VDSL2 noise dealing principle
  - VDSL2 packet transfer mode
  - VDSL2 QoS

OBL00 MA5600T (DSLAM) Overview

- DSLAM MA5600T System Introduction
  - DSLAM MA5600T product positioning and networking
  - DSLAM MA5600T product functions
  - DSLAM MA5600T system features
  - DSLAM MA5600T device management
- DSLAM MA5600T Hardware Introduction
  - DSLAM MA5600T cabinet
  - DSLAM MA5600T shelf
  - DSLAM MA5600T board function
  - DSLAM MA5600T cable and interconnection

OBL30 MA5600T (DSLAM) Basic Operation and Maintenance

- DSLAM MA5600T Basic Operation and maintenance
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data
  - Other basic operation, such as system name change, alarm query, etc.

OBL50 MA5600T (DSLAM) Service Configuration

- DSLAM MA5600T ADSL2+ HSI Service Configuration(rfc4706 Mode)
  - Uplink port configuration
  - ADSL2+ line profile configuration
  - ADSL2+ port configuration
  - ADSL2+ service configuration, query and change
  - MAC-address query
- DSLAM MA5600T VDSL2 HSI Service Configuration(TR129 Mode)
  - VDSL2 line profile configuration
  - VDSL2 port configuration
  - VDSL2 service configuration, query and change
- DSLAM MA5600T ADSL and VDSL Multicast Service Configuration
  - BTV service implementation process
  - BTV service configuration, maintenance and verification

OBL60 MA5600T (DSLAM) Troubleshooting

- DSLAM MA5600T Troubleshooting
  - Troubleshoot common faults in the MA5600T/MA5603T system, such as NMS fails to

manage a device, service board is in the failed state, service board resets repeatedly, control board resets caused by abnormalities, and fan is in the fault state

- Troubleshoot the faults in the internet access service, such as failure to access the Internet after successfully obtaining an IP address, low Internet access rate, frequent offline in accessing the Internet, failure to obtain an IP address in PPPoE dialup, failure to obtain an IP address in the DHCP mode, failure to obtain an IP address in PPPoA dialup, and failure to obtain an IP address in IPoA dialup
- Troubleshoot the faults in the multicast service, such as failure to go online for a multicast user, dark screen after going online and demanding a program, erratic display (mosaic) in a multicast program, abnormal program interruption in watching a program, and long time in switching programs

Duration

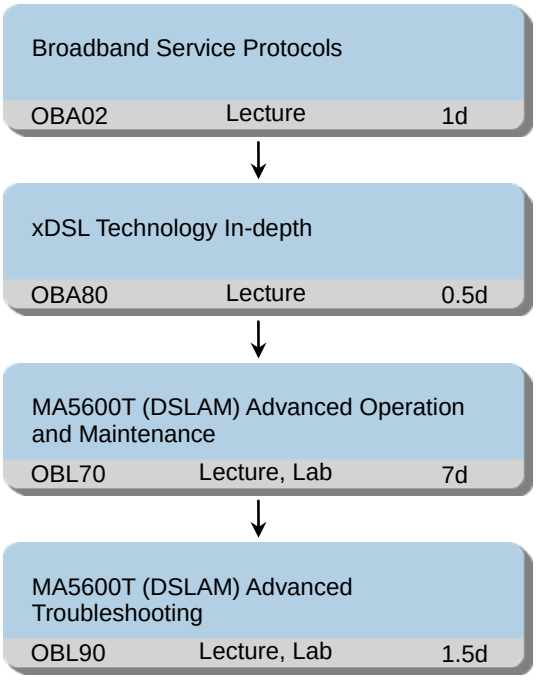
7 working days

Class Size

Min 6, Max 12

1.10.3 DSLAM SmartAX MA5600T Series 3rd Line Maintenance Training

Training Path



Target Audience

Technical Support Engineers

Operation and Maintenance Engineers

Prerequisites

- Completion of DSLAM SmartAX MA5600T Series 2nd Line Maintenance Training or having equivalent knowledge

Objectives

On completion of this program, the participants will be able to:

- Describe function and message of PPP and PPPoE protocol
- Describe function and message of RADIUS protocol
- Describe function and message of DHCP protocol
- Describe xDSL modulation mode
- Describe xDSL band plans and profiles
- Deal with noise of xDSL line
- Describe xDSL packet transfer mode
- Describe triple-play solution introduction
- Complete triple-play service configuration
- Describe and provision xDSL features
- Describe and provision layer2 features
- Describe and provision QoS features

- Describe and provision network protection features
- Describe and provision user security features
- Describe and provision multicast features
- Troubleshoot complex faults in hardware and software system
- Troubleshoot complex faults in the Internet access service
- Troubleshoot complex faults in the multicast service

Training Content

OBA02 Broadband Service Protocols

- PPP and PPPoE Protocols
  - Basic concept and function of PPP and PPPoE protocol
  - Messages and interaction of PPP and PPPoE protocol
- RADIUS Protocol
  - Basic concept and function of RADIUS protocol
  - Messages and interaction of RADIUS protocol
- DHCP Protocol
  - Basic concept and function of DHCP protocol
  - Messages and interaction of DHCP protocol

OBA80 xDSL Technology In-depth

- VDSL2 Technology In-depth
  - VDSL2 modulation
  - VDSL2 band plans and profiles
  - Upstream power back-off (UPBO)
  - Downstream power back-off (DPBO)
  - PSD Notching
  - MIB control PSD
  - Virtual Noise and SOS (Emergency Rate Reduction)
  - VDSL2 QoS
  - VDSL2 packet transfer mode
  - Enhanced DSL

OBL70 MA5600T (DSLAM) Advanced Operation and Maintenance

- Triple-play Solution of DSLAM Equipments
  - Triple-play solution introduction
  - Triple-play service implementation process
  - Triple-play service configuration, maintenance and verification
- DSLAM MA5600T xDSL Features
  - DSLAM MA5600T xDSL features
  - DSLAM MA5600T xDSL boards introduction
- DSLAM SmartAX MA5600T Layer2 Features
  - MA5600T MAC address management
  - MA5600T VLAN type and VLAN switch
  - MA5600T layer2 forwarding

- MA5600T flow classification
- MA5600T layer2 mutual communication

- DSLAM MA5600T QoS Features
  - MA5600T priority process
  - MA5600T traffic monitoring feature
  - MA5600T ACL feature
  - MA5600T congestion management
  - MA5600 QoS provisioning
- DSLAM MA5600T Network Protection
  - MSTP feature
  - Smart Link and Monitor Link feature
  - Ethernet link aggregation feature
  - BFD feature
  - Network protection provisioning
- DSLAM SmartAX MA5600T User Security
  - PITP feature
  - DHCP option82 feature
  - Anti-MAC Spoofing and anti-IP Spoofing feature
  - User isolation and line security feature
  - User security provisioning
- DSLAM SmartAX MA5600T Multicast Features
  - MA5600T multicast traffic forwarding principle
  - MA5600T multicast control principle
  - MA5600T multicast forwarding flow
  - MA5600T multicast service provisioning principle
  - MA5600T multicast network interface, user interface
  - MA5600T multicast bandwidth control
  - MA5600T multicast features provisioning

OBL90 MA5600T (DSLAM) Advanced Troubleshooting

- DSLAM SmartAX MA5600T Advanced Troubleshooting
  - Hardware and software system troubleshooting
  - Internet service troubleshooting
  - Multicast service troubleshooting

Duration

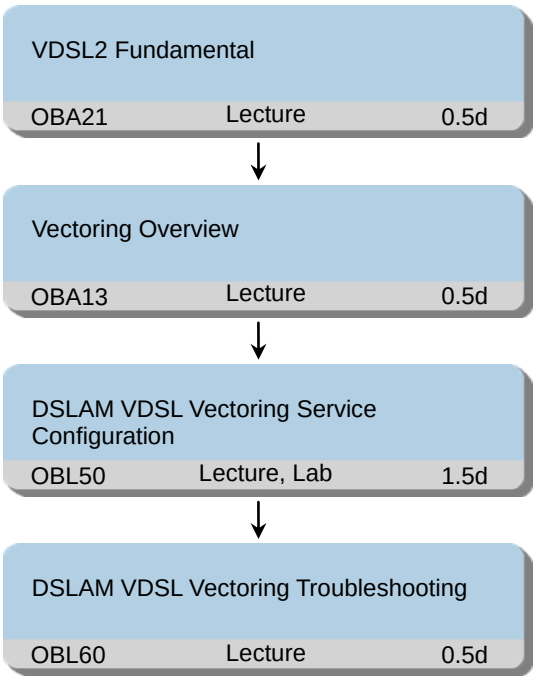
10 working days

Class Size

Min 6, Max 12

1.10.4 DSLAM MA5603T/MA5616/MxU VDSL Vectoring Operation and Maintenance Training

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication and data communication

Objectives

On completion of this program, the participants will be able to:

- Describe VDSL2 orientation and networking
- Describe VDSL2 modulation mode
- Describe VDSL2 band plans and profiles
- Describe VDSL2 noise dealing principle
- Describe VDSL2 packet transfer mode
- Describe vectoring technology features
- Describe vectoring key technology
- Describe vectoring network solution
- Describe VDSL2 service implementation
- Describe multicast service implementation
- Complete VDSL2 service configuration
- Perform VDSL2 service operation and maintenance

- Complete multicast service configuration
- Perform multicast service operation and maintenance
- Troubleshooting vectoring hardware and software system
- Troubleshooting internet/multicast service based on vectoring technology

Training Content

OBA21 VDSL2 Fundamental

- VDSL2 Technology
  - VDSL2 definition and performance
  - VDSL2 modulation
  - VDSL2 band plans and profiles
  - VDSL2 noise dealing principle
  - VDSL2 packet transfer mode
  - VDSL2 QoS

OBA13 Vectoring Overview

- Vectoring Overview
  - Vectoring technology basic
  - Vectoring key technology
  - FTTx vectoring network solution
  - Vectoring service maintenance

OBL50 DSLAM VDSL Vectoring Service Configuration

- DSLAM VDSL Vectoring Service Provisioning(CLI)
  - DSLAM MA5603T/MA5616/MxU VDSL Vectoring HSI Service Provisioning
  - DSLAM MA5603T/MA5616/MxU VDSL Vectoring Multi-service Service Provisioning

OBL60 DSLAM VDSL Vectoring Troubleshooting

- DSLAM VDSL Vectoring Troubleshooting and Maintenance
  - Troubleshooting Basics
  - Gathering Information
  - Troubleshooting DSLAM MA5603T/MA5616/MxU VDSL Vectoring devices
  - Troubleshooting DSLAM MA5603T/MA5616/MxU VDSL Vectoring services

Duration

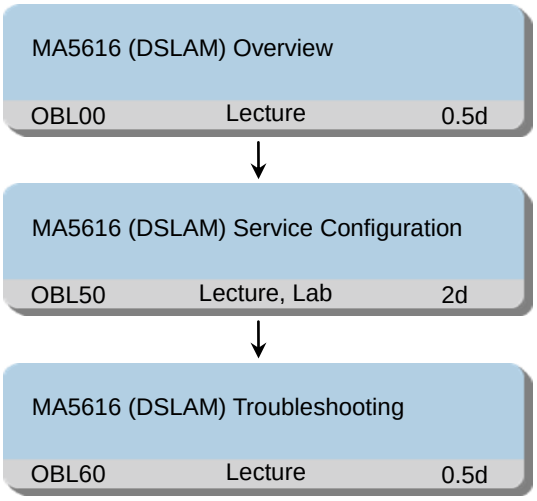
3 working days

Class Size

Min 6, Max 12

1.10.5 DSLAM MA5616 Operation and Maintenance Training

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication and data communication

Objectives

On completion of this program, the participants will be able to:

- Describe MA5616 product positioning and networking
- Outline MA5616 product functions
- Describe MA5616 system features
- Describe MA5616 functions of boards
- Outline MA5616 cables and interconnection
- Describe ADSL2+/VDSL2 service implementation in MA5616
- Describe multicast service implementation in MA5616
- Manage ADSL2+/VDSL2 line profile
- Complete ADSL2+/VDSL2 service configuration
- Perform ADSL2+/VDSL2 service operation and maintenance
- Complete multicast service configuration
- Perform multicast service operation and maintenance
- Troubleshooting hardware and software system
- Troubleshooting internet access service
- Troubleshooting multicast service

Training Content

OBL00 MA5616 (DSLAM) Overview

- DSLAM MA5616 System Introduction
  - MA5616 System Overview
  - MA5616 Boards Description
  - MA5616 Networking Applications
- DSLAM MA5616 System Narrowband Introduction
  - MA5616 System Overview
  - MA5616 System Networking
  - MA5616 Narrowband Features
  - MA5616 Narrowband Service Reliability
  - MA5616 Line Test and Maintenance

OBL50 MA5616 (DSLAM) Service Configuration

- DSLAM MA5616 Basic Operation and Administration(CLI)
  - MA5616 CLI Management Overview
  - MA5616 Initial Setup
  - MA5616 Operation Security Management
  - MA5616 Alarm Management
  - MA5616 Log Management
  - MA5616 Database Management
  - MA5616 Hardware Management
- DSLAM MA5616 Service Provisioning(CLI)
  - MA5616 Multi-service Principle
  - MA5616 Physical Layer Provisioning
  - MA5616 Data Link Layer Provisioning
  - MA5616 HSI Service Provisioning
  - MA5616 Debugging and Mirroring
- DSLAM MA5616 VoIP Service Provisioning(SIP)
  - MA5616 VoIP Service Implementation Principle
  - MA5616 VoIP Service Configuration Basics
  - MA5616 VoIP Service Configuration Example
  - MA5616 VoIP Service Maintenance

OBL60 MA5616 (DSLAM) Troubleshooting

- DSLAM MA5616 Troubleshooting and Maintenance
  - Troubleshooting Basics
  - Gathering Information
  - Troubleshooting MA5616 ADSL service
- DSLAM MA5616 VoIP Service Troubleshooting
  - MA5616 VoIP Fault Analysis and Locating
  - Categorized VoIP Fault Troubleshooting
  - Case Study

Duration

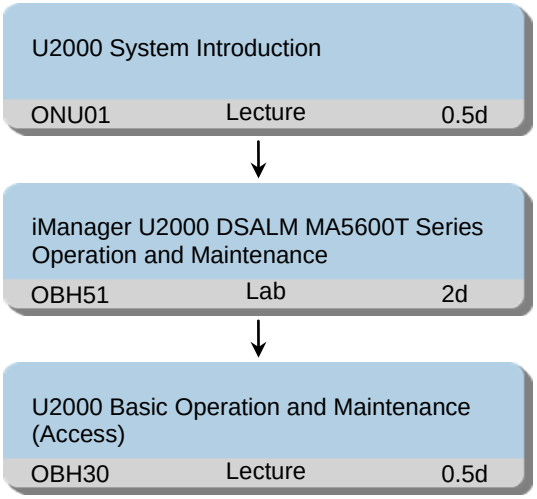
3 working days

Class Size

Min 6, Max 12

1.10.6 iManager U2000 DSALM MA5600T Series Operation and Maintenance Training

Training Path



Target Audience

Technical Support Engineers

Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication and DSLAM

Objectives

On completion of this program, the participants will be able to:

- Describe the architecture and main features of U2000
- List the main functions of U2000
- Login to U2000 server via client
- Add a map and device
- Deal with the alarm
- Backup and auto save the configuration
- Add a management user
- Perform ADSL2+ service configuration via U2000
- Perform VDSL2 service configuration via U2000

Training Content

ONU01 U2000 System Introduction

- iManager U2000 System Introduction
  - The architecture and main features of U2000
  - The directory structure of U2000
  - The main functions of U2000

OBH51 iManager U2000 DSALM MA5600T Series Operation and Maintenance

- MA56T and MDU Series ADSL2+ Triple Play Service Operation on U2000
  - Perform ADSL2+ service configuration via U2000
- MA56T and MDU Series VDSL2 Triple Play Service Operation on U2000
  - Perform VDSL2 service configuration via U2000

OBH30 U2000 Basic Operation and Maintenance (Access)

- U2000 Client Introduction
  - Login to U2000 Server via Client
  - The main functions of U2000 Client
- U2000 User Management
  - Add a management user
  - Manage the user
- U2000 Topology and NE Management
  - Add a map and device
  - Discover the topology, set the communication parameters and synchronize the device data on U2000
- U2000 Alarm, Environment Monitoring and Management
  - Deal with the alarm
  - The main functions of U2000 fault management, monitor the fault alarm, notify the relevant personnel, and process the fault alarm on U2000
- U2000 Performance Statistics
  - The main function of U2000 performance
  - management and monitoring
  - The performance statistics of network resources on U2000

Duration

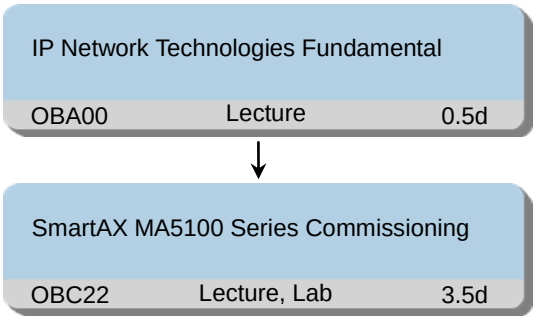
3 working days

Class Size

Min 6, Max 12

1.10.7 DSLAM SmartAX MA5100 Series Commissioning Training

Training Path



Target Audience

System Commissioning Technicians
Service Commissioning Technicians

Prerequisites

- A basic understanding of telecommunication and data communication

Objectives

On completion of this program, the participants will be able to:

- Describe the functions of TCP/IP
- Describe routing process
- Describe the function and process of ARP
- Describe VLAN forwarding process
- Perform the hardware commissioning, stand-alone commissioning, network commissioning, service commissioning and the commissioning verification

Training Content

OBA00 IP Network Technologies Fundamental

- TCPIP Basis
  - Architecture of TCP/IP
  - Function of TCP/IP each layer
  - Process of TCP/IP data encapsulation
- Ethernet Overview
  - Different types of Ethernet media
  - Ethernet capabilities and limitations
  - Layer 2 and 3 switching principles

OBC22 SmartAX MA5100 Series Commissioning

- SmartAX MA5100 Multi-service Access Module System and Hardware
  - System Overview
  - Hardware Architecture
  - Functional Features

- Networking Applications
- SmartAX MA5100 Multi-service Access Module Configuration Basic
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data
  - SNMP parameter configuration
  - Other basic operation, such as system name change, alarm query, etc.
- SmartAX MA5100 Laboratory Exercise Guide
  - Exercise guide for MA5100 service configuration
- SmartAX MA5100 Multi-service Access Module Service Configuration
  - Uplink port and ADSL2+ configuration
  - ATM-DSLAM service configuration
  - IP-DSLAM service configuration
- Multicast Service configuration practice guide
  - Multicast service provisioning

Duration

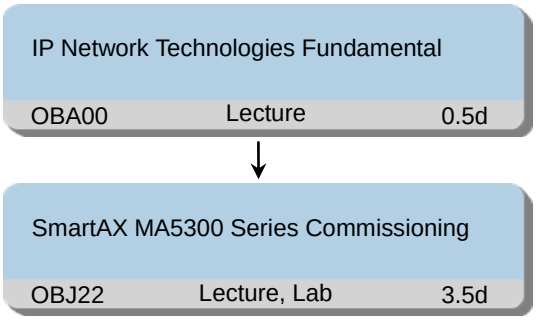
4 working days

Class Size

Min 6, Max 12

1.10.8 DSLAM SmartAX MA5300 Series Commissioning Training

Training Path



Target Audience

System Commissioning Technicians
Service Commissioning Technicians

Prerequisites

- A basic understanding of telecommunication and data communication

Objectives

On completion of this program, the participants will be able to:

- Describe the functions of TCP/IP
- Describe routing process
- Describe the function and process of ARP
- Describe VLAN forwarding process
- Perform the hardware commissioning, stand-alone commissioning, network commissioning, service commissioning and the commissioning verification

Training Content

OBA00 IP Network Technologies Fundamental

- TCPIP Basis
  - Architecture of TCP/IP
  - Function of TCP/IP each layer
  - Process of TCP/IP data encapsulation
- Ethernet Overview
  - Different types of Ethernet media
  - Ethernet capabilities and limitations
  - Layer 2 and 3 switching principles

OBJ22 SmartAX MA5300 Series Commissioning

- MA5300 Broadband Access Equipment System Overview and Hardware
  - System overview
  - Hardware architecture
  - Functional features

- Networking applications
- MA5300 Broadband Access Equipment Basic Configuration
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data
  - SNMP parameter configuration
  - Other basic operation, such as system name change, alarm query, etc.
- MA5300 Basic Configuration and Maintenance Laboratory Exercise Guide (answer)
  - Exercise guide for MA5300 basic configuration
- MA5300 Broadband Access Equipment Service Configuration
  - VLAN description
  - Line profile and parameter
  - Service configuration example
- MA5300 BTV Service Configuration
  - BTV Service Introduction
  - Basic knowledge of multicast
  - Multicast service configuration
- MA5300 Service Configuration Laboratory Exercise Guide
  - Exercise guide for MA5300 service configuration

Duration

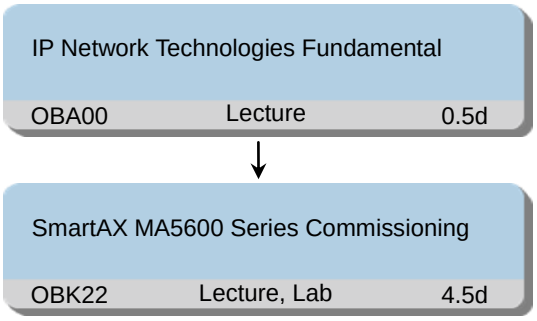
4 working days

Class Size

Min 6, Max 12

1.10.9 DSLAM SmartAX MA5600 Series Commissioning Training

Training Path



Target Audience

System Commissioning Technicians
Service Commissioning Technicians

Prerequisites

- A basic understanding of telecommunication and data communication

Objectives

On completion of this program, the participants will be able to:

- Describe the functions of TCP/IP
- Describe routing process
- Describe the function and process of ARP
- Describe VLAN forwarding process
- Perform the hardware commissioning, stand-alone commissioning, network commissioning, service commissioning and the commissioning verification

Training Content

OBA00 IP Network Technologies Fundamental

- TCPIP Basis
  - Architecture of TCP/IP
  - Function of TCP/IP each layer
  - Process of TCP/IP data encapsulation
- Ethernet Overview
  - Different types of Ethernet media
  - Ethernet capabilities and limitations
  - Layer 2 and 3 switching principles

OBK22 SmartAX MA5600 Series Commissioning

- SmartAX MA5600 Commissioning
  - General commissioning procedures of DSLAM MA5600
  - Preparations for commissioning
  - Hardware commissioning, stand-alone commissioning ,network commissioning,

service commissioning and the commissioning verification of DSLAM MA5600

Duration

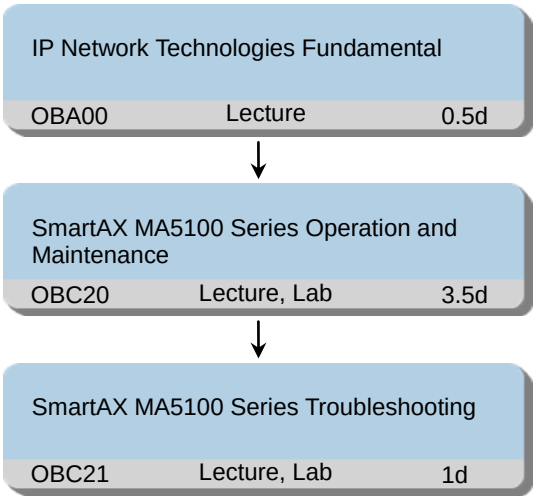
5 working days

Class Size

Min 6, Max 12

1.10.10 DSLAM SmartAX MA5100 Series 2nd Line Maintenance Training

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication and data communication

Objectives

On completion of this program, the participants will be able to:

- Describe the functions of TCP/IP
- Describe routing process
- Describe the function and process of ARP
- Describe VLAN forwarding process
- Describe System Overview
- Describe Hardware Architecture
- Describe Functional Features
- Describe Networking Applications
- Introduce CLI
- Perform System Maintenance
- Perform ATM-DSLAM Service Configuration
- Perform IP-DSLAM Service Configuration
- Troubleshooting ADSL service
- Troubleshooting LAN service

Training Content

OBA00 IP Network Technologies Fundamental

- TCPIP Basis
  - Architecture of TCP/IP
  - Function of TCP/IP each layer
  - Process of TCP/IP data encapsulation
- Ethernet Overview
  - Different types of Ethernet media
  - Ethernet capabilities and limitations
  - Layer 2 and 3 switching principles

OBC20 SmartAX MA5100 Series Operation and Maintenance

- SmartAX MA5100 Multi-service Access Module System and Hardware
  - System Overview
  - Hardware Architecture
  - Functional Features
  - Networking Applications
- SmartAX MA5100 Multi-service Access Module Configuration Basic
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data
  - SNMP parameter configuration
  - Other basic operation, such as system name change, alarm query, etc.
- SmartAX MA5100 Laboratory Exercise Guide
  - Exercise guide for MA5100 service configuration
- SmartAX MA5100 Multi-service Access Module Service Configuration
  - Uplink port and ADSL2+ configuration
  - ATM-DSLAM service configuration
  - IP-DSLAM service configuration
- Multicast Service configuration practice guide
  - Multicast service provisioning

OBC21 SmartAX MA5100 Series Troubleshooting

- SmartAX MA5100 Multi-service Access Module Troubleshooting
  - Basics troubleshooting method and procedure
  - Faulty information gathering
  - ADSL service Troubleshooting
  - LAN service Troubleshooting

Duration

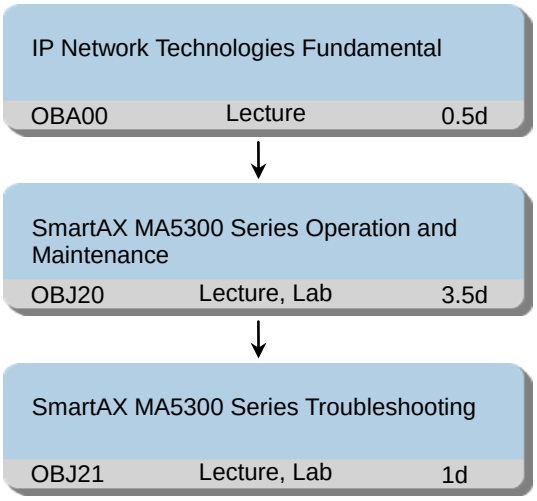
5 working days

Class Size

Min 6, Max 12

1.10.11 DSLAM SmartAX MA5300 Series 2nd Line Maintenance Training

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication and data communication

Objectives

On completion of this program, the participants will be able to:

- Describe the functions of TCP/IP
- Describe routing process
- Describe the function and process of ARP
- Describe VLAN forwarding process
- Describe product positioning and networking
- Describe hardware architecture
- Describe functional features
- Describe networking applications
- Perform service configuration and maintenance
- Perform system maintenance
- Troubleshooting hardware and software system
- Troubleshooting ADSL service
- Troubleshooting LAN service

Training Content

OBA00 IP Network Technologies Fundamental

- TCPIP Basis

- Architecture of TCP/IP
- Function of TCP/IP each layer
- Process of TCP/IP data encapsulation

- Ethernet Overview
  - Different types of Ethernet media
  - Ethernet capabilities and limitations
  - Layer 2 and 3 switching principles

OBJ20 SmartAX MA5300 Series Operation and Maintenance

- MA5300 Broadband Access Equipment System Overview and Hardware
  - System overview
  - Hardware architecture
  - Functional features
  - Networking applications
- MA5300 Broadband Access Equipment Basic Configuration
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data
  - SNMP parameter configuration
  - Other basic operation, such as system name change, alarm query, etc.
- MA5300 Basic Configuration and Maintenance Laboratory Exercise Guide (answer)
  - Exercise guide for MA5300 basic configuration
- MA5300 Broadband Access Equipment Service Configuration
  - VLAN description
  - Line profile and parameter
  - Service configuration example
- MA5300 BTV Service Configuration
  - BTV Service Introduction
  - Basic knowledge of multicast
  - Multicast service configuration
- MA5300 Service Configuration Laboratory Exercise Guide
  - Exercise guide for MA5300 service configuration

OBJ21 SmartAX MA5300 Series Troubleshooting

- MA5300 Broadband Access Equipment Troubleshooting
  - Basics troubleshooting method and procedure
  - Faulty information gathering
  - ADSL service Troubleshooting
  - LAN service Troubleshooting

Duration

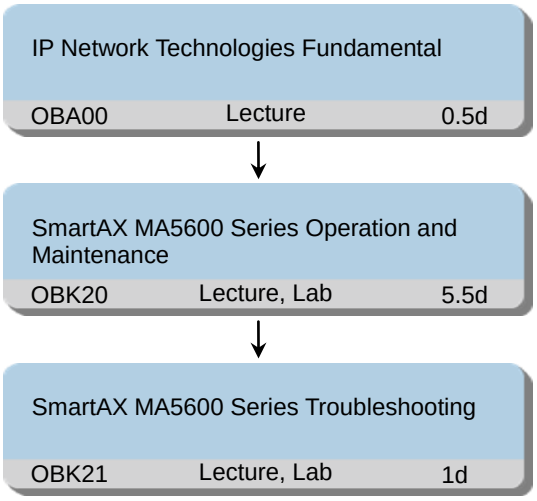
5 working days

Class Size

Min 6, Max 12

1.10.12 DSLAM SmartAX MA5600 Series 2nd Line Maintenance Training

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication and data communication

Objectives

On completion of this program, the participants will be able to:

- Describe the functions of TCP/IP
- Describe routing process
- Describe the function and process of ARP
- Describe VLAN forwarding process
- Describe system networking and positioning
- Describe hardware architecture
- Describe functional features
- Describe networking applications
- Perform system daily maintenance
- Perform service configuration and maintenance
- Troubleshooting hardware and software
- Troubleshooting ADSL service
- Troubleshooting LAN service
- Troubleshooting Multicast service

Training Content

OBA00 IP Network Technologies Fundamental

- TCPIP Basis
  - Architecture of TCP/IP
  - Function of TCP/IP each layer
  - Process of TCP/IP data encapsulation
- Ethernet Overview
  - Different types of Ethernet media
  - Ethernet capabilities and limitations
  - Layer 2 and 3 switching principles

OBK20 SmartAX MA5600 Series Operation and Maintenance

- SmartAX MA5600 System Overview
  - System overview
  - Hardware architecture
  - Functional features
  - Networking applications
- SmartAX MA5600 Basic Configuration
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data
  - SNMP parameter configuration
  - Other basic operation, such as system name change, alarm query, etc.
- SmartAX MA5600 Basic Practice Exercises Guide(with answer)
  - Exercise guide for MA5600 basic configuration
- SmartAX MA5600 ADSL2+ Service Configuration
  - VLAN configuration
  - ADSL2+ line profile and traffic table
  - ADSL2+ port and uplink port configuration
  - ADSL2+ configuration example
- SmartAX MA5600 ADSL2+ Service Practice Exercises Guide
  - Exercise guide for MA5600 ADSL2+ service configuration
- SmartAX MA5600 VDSL2 Service Configuration
  - VDSL2 line profile and traffic Table
  - VDSL2 port and uplink port configuration
  - VDSL2 configuration example
- SmartAX MA5600 VDSL2 Service Exercises Guide
  - Exercise guide for MA5600 VDSL2 service configuration
- SmartAX MA5600 BTV Service Configuration
  - BTV service introduction
  - Basic knowledge of IP Multicast
  - BTV service general configuration and maintenance
  - BTV service configuration example
- SmartAX MA5600 BTV Service Configuration Practice Guide
  - Exercise guide for MA5600 BTV service configuration

OBK21 SmartAX MA5600 Series Troubleshooting

- SmartAX MA5600 Troubleshooting
  - Basics troubleshooting method and procedure
  - Faulty information gathering
  - ADSL service Troubleshooting
  - LAN service Troubleshooting
  - Multicast service Troubleshooting

Duration

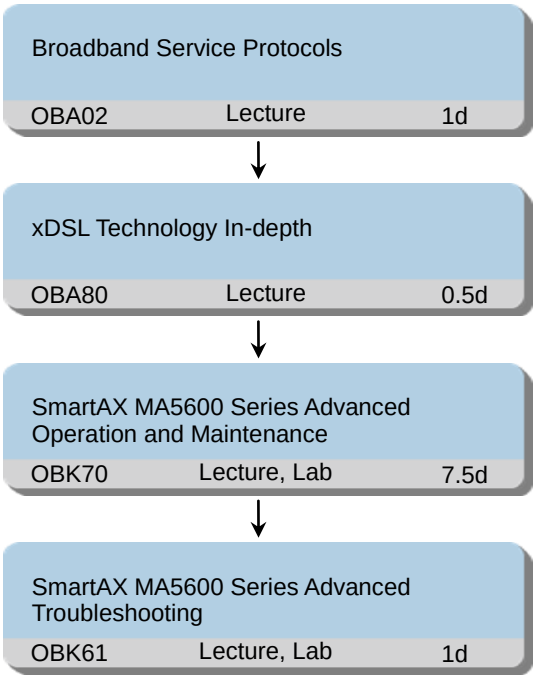
7 working days

Class Size

Min 6, Max 12

1.10.13 DSLAM SmartAX MA5600 Series 3nd Line Maintenance Training

Training Path



Target Audience

Technical Support Engineers

Operation and Maintenance Engineers

Prerequisites

- Completion of DSLAM SmartAX MA5600 Series 2nd Line Maintenance Training or having equivalent knowledge

Objectives

On completion of this program, the participants will be able to:

- Describe function and message of PPP and PPPoE protocol
- Describe function and message of RADIUS protocol
- Describe function and message of DHCP protocol
- Describe xDSL modulation mode
- Describe xDSL band plans and profiles
- Deal with noise of xDSL line
- Describe xDSL packet transfer mode
- Describe and provision QinQ VLAN features
- Describe and provision VLAN Stacking features
- Describe and provision PITP features
- Describe and provision DHCP Relay features
- Describe and provision IPoA to IPoE features

- Describe and provision PPPoA to PPPoE features
- Describe and provision Triple-play service
- Troubleshooting complex faults in MA5600 system
- Troubleshooting complex faults in ADSL service
- Troubleshooting complex faults in internet access service
- Troubleshooting complex faults in multicast service

Training Content

OBA02 Broadband Service Protocols

- PPP and PPPoE Protocols
  - Basic concept and function of PPP and PPPoE protocol
  - Messages and interaction of PPP and PPPoE protocol
- RADIUS Protocol
  - Basic concept and function of RADIUS protocol
  - Messages and interaction of RADIUS protocol
- DHCP Protocol
  - Basic concept and function of DHCP protocol
  - Messages and interaction of DHCP protocol

OBA80 xDSL Technology In-depth

- VDSL2 Technology In-depth
  - VDSL2 modulation
  - VDSL2 band plans and profiles
  - Upstream power back-off (UPBO)
  - Downstream power back-off (DPBO)
  - PSD Notching
  - MIB control PSD
  - Virtual Noise and SOS (Emergency Rate Reduction)
  - VDSL2 QoS
  - VDSL2 packet transfer mode
  - Enhanced DSL

OBK70 SmartAX MA5600 Series Advanced Operation and Maintenance

- Triple-play Solution of DSLAM Equipments
  - Triple-play solution introduction
  - Triple-play service implementation process
  - Triple-play service configuration, maintenance and verification
- SmartAX MA5600 VLAN New Service
  - QinQ VLAN features description and provisioning
  - VLAN Stacking description and provisioning
- SmartAX MA5600 PITP New Feature
  - PITP VMODE features description and provisioning
  - PITP PMODE features description and provisioning
- SmartAX MA5600 DHCP RELAY

- DHCP Relay Option 82 features description and provisioning
- DHCP Relay Option 60 features description and provisioning

- XoA to XoE Access Services and Configurations
  - IPoA to IPoE features description and provisioning
  - PPPoA to PPPoE features description and provisioning
- DSLAM Line test
  - DSLAM Line Test Networking and Device Requirement
  - DSLAM Line Test Principle
  - DSLAM Line Test Items
  - DSLAM Line Test Configuration and Example

OBK61 SmartAX MA5600 Series Advanced Troubleshooting

- MA5600 Advanced Troubleshooting
  - Hardware system troubleshooting
  - Software system troubleshooting
  - Internet service troubleshooting
  - Multicast service troubleshooting

Duration

10 working days

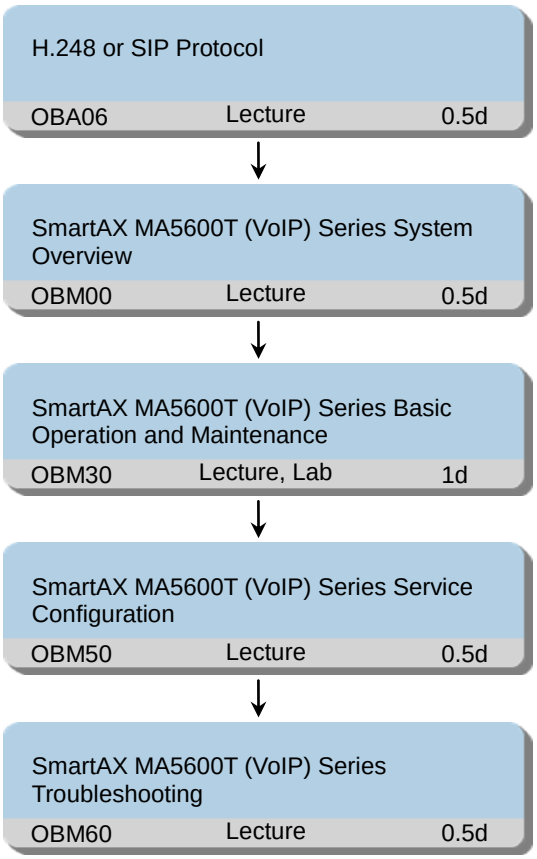
Class Size

Min 6, Max 12

1.11 MSAN Products

1.11.1 MSAN SmartAX MA5600T(VoIP) Series 2nd Line Maintenance Training

Training Path



Target Audience

Technical Support Engineers

Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication and data communication

Objectives

On completion of this program, the participants will be able to:

- Describe SIP function and position in network
- Describe SIP message and message flow
- Describe H.248 function and position in network
- Describe H.248 message structure and call flow
- Describe MA5600T(VoIP) Product orientation, function and networking application
- Describe MA5600T(VoIP) features
- Describe MA5600T(VoIP) hardware, including cabinet, shelves, boards and cables

- Establish the connection and login to the system
- Perform the common basic operation, such as query status of hardware and software, backup and restore data, system name change, alarm query, etc.
- Describe VoIP service implementation process
- Complete VoIP service configuration
- Perform VoIP service operation and maintenance
- Troubleshooting hardware
- Troubleshooting software
- Troubleshooting VoIP service

Training Content

OBA06 H.248 or SIP Protocol

- SIP protocol
  - SIP function and position in network
  - SIP message and typical call flow
- H.248 Protocol
  - H.248 function and position in network
  - H.248 message structure and typical call flow

OBM00 SmartAX MA5600T (VoIP) Series System Overview

- MSAN MA5600T Product Introduction
  - MA5600T(VoIP) Product orientation, function and networking application
  - MA5600T(VoIP) features
- MSAN MA5600T Hardware Description
  - MA5600T(VoIP) cabinet
  - MA5600T(VoIP) shelves
  - MA5600T(VoIP) boards
  - MA5600T(VoIP) boards cables

OBM30 SmartAX MA5600T (VoIP) Series Basic Operation and Maintenance

- MSAN MA5600T Basic Operation
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data
  - SNMP parameter configuration
  - Other basic operation, such as system name change, alarm query, etc.

OBM50 SmartAX MA5600T (VoIP) Series Service Configuration

- MSAN MA5600T VoIP Service Configuration(H.248 and SIP)
  - MA5600T H.248/SIP service implementation process and configuration steps
  - MA5600T H.248/SIP service configuration and verification

OBM60 SmartAX MA5600T (VoIP) Series Troubleshooting

- MSAN MA5600T Troubleshooting VoIP Service
  - Troubleshoot the hardware and software of MA5600T
  - Troubleshoot common faults in the voice service, such as no tone after offhook, busy

tone after offhook, one-way audio in communication, noise in communication, poor voice service in communication, and failure to dial certain phone numbers

Duration

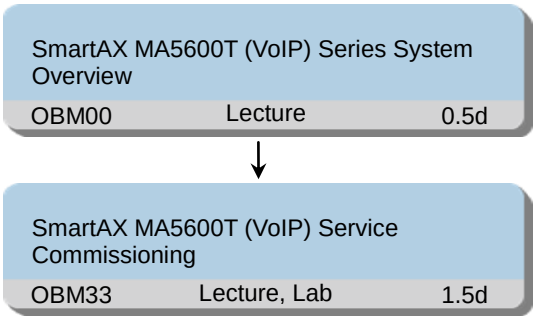
3 working days

Class Size

Min 6, Max 12

1.11.2 MSAN SmartAX MA5600T(VoIP) Series Commissioning Training

Training Path



Target Audience

Technical Support Engineers

Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication and data communication

Objectives

On completion of this program, the participants will be able to:

- Describe MA5600T(VoIP) Product orientation, function and networking application
- Describe MA5600T(VoIP) features
- Describe MA5600T(VoIP) hardware, including cabinet, shelves, boards and cables
- Perform the hardware commissioning, stand-alone commissioning, network commissioning, service commissioning and the commissioning verification

Training Content

OBM00 SmartAX MA5600T (VoIP) Series System Overview

- MSAN MA5600T Product Introduction
  - MA5600T(VoIP) Product orientation, function and networking application
  - MA5600T(VoIP) features
- MSAN MA5600T Hardware Description
  - MA5600T(VoIP) cabinet
  - MA5600T(VoIP) shelves
  - MA5600T(VoIP) boards
  - MA5600T(VoIP) boards cables

OBM33 SmartAX MA5600T (VoIP) Service Commissioning

- MSAN MA5600T Commissioning
  - General commissioning procedures of MSAN MA5600T
  - Hardware commissioning, stand-alone commissioning ,network commissioning, service commissioning and the commissioning verification of MSAN MA5600T

Duration

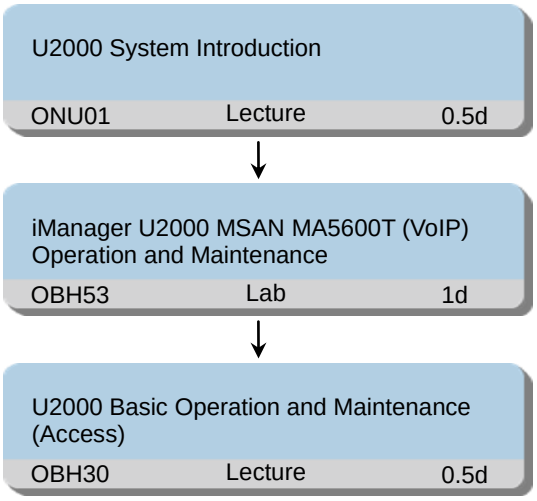
2 working days

Class Size

Min 6, Max 12

1.11.3 iManager U2000 MSAN MA5600T(VoIP) Operation and Maintenance Training

Training Path



Target Audience

Technical Support Engineers

Operation and Maintenance Engineers

Prerequisites

- A basic understanding of U2000 and MSAN

Objectives

On completion of this program, the participants will be able to:

- Describe the architecture and main features of U2000
- List the main functions of U2000
- Login to U2000 server via client
- Add a map and device
- Deal with the alarm
- Backup and auto save the configuration
- Add a management user
- Perform MSAN ADSL2+ service configuration via U2000
- Perform MSAN VoIP service configuration via U2000
- Perform MSAN multicast service configuration via U2000

Training Content

ONU01 U2000 System Introduction

- iManager U2000 System Introduction
  - The architecture and main features of U2000
  - The directory structure of U2000
  - The main functions of U2000

OBH53 iManager U2000 MSAN MA5600T (VoIP) Operation and Maintenance

- MA56T and MDU VoIP Service Operation on U2000
  - Perform MSAN MA5600T VoIP service configuration via U2000

OBH30 U2000 Basic Operation and Maintenance (Access)

- U2000 Client Introduction
  - Login to U2000 Server via Client
  - The main functions of U2000 Client
- U2000 User Management
  - Add a management user
  - Manage the user
- U2000 Topology and NE Management
  - Add a map and device
  - Discover the topology, set the communication parameters and synchronize the device data on U2000
- U2000 Alarm, Environment Monitoring and Management
  - Deal with the alarm
  - The main functions of U2000 fault management, monitor the fault alarm, notify the relevant personnel, and process the fault alarm on U2000
- U2000 Performance Statistics
  - The main function of U2000 performance
  - management and monitoring
  - The performance statistics of network resources on U2000

Duration

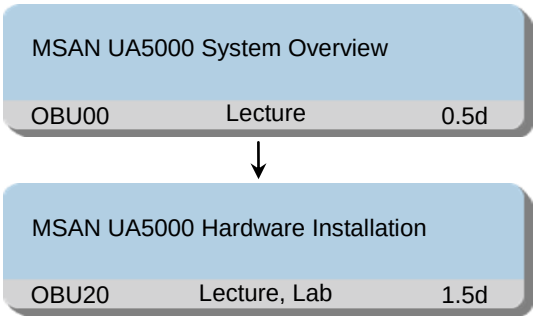
2 working days

Class Size

Min 6, Max 12

1.11.4 MSAN UA5000 Hardware Installation Training

Training Path



Target Audience

Installation technician

Prerequisites

- A basic understanding of telecommunication and data communication

Objectives

On completion of this program, the participants will be able to:

- Describe MSAN UA5000 product positioning
- Outline MSAN UA5000 product functions
- Describe MSAN UA5000 system features
- Describe MSAN UA5000 product networking
- Describe MSAN UA5000 frame, boards and ports
- Install UA5000 cabinet, frame and board properly
- Perform UA5000 cable routing and termination properly
- Identify the cautions and facts which may affect UA5000 system running due to improperly installation

Training Content

OBU00 MSAN UA5000 System Overview

- MSAN UA5000 Product Description
  - MSAN UA5000 product positioning and networking
  - MSAN UA5000 product functions
  - MSAN UA5000 system features
- MSAN UA5000 Hardware Description
  - MSAN UA5000 frame, boards and ports introduction

OBU20 MSAN UA5000 Hardware Installation

- UA5000 Installation
  - MSAN UA5000 installation procedure
  - MSAN UA5000 cabinet, frame and board installation
  - MSAN UA5000 cable routing and termination

Duration

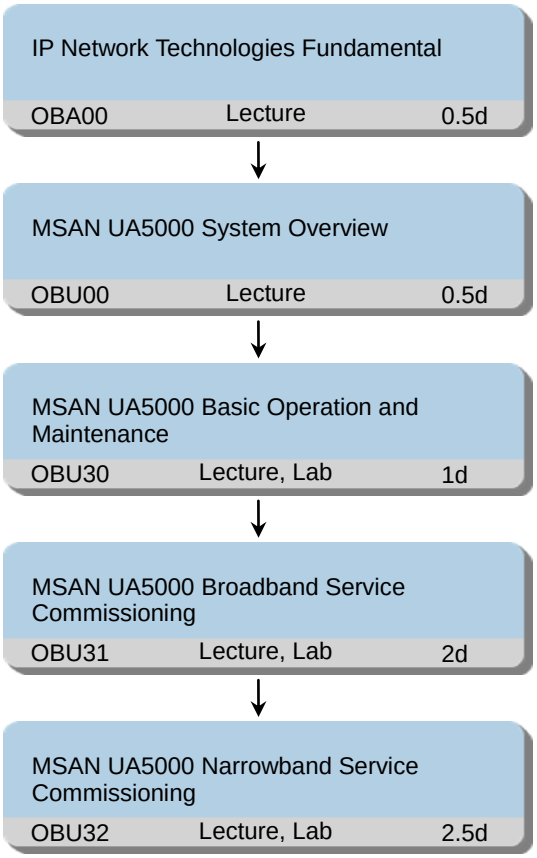
2 working days

Class Size

Min 6, Max 12

1.11.5 MSAN UA5000 Commissioning Training

Training Path



Target Audience

System Commissioning Technicians
Service Commissioning Technicians

Prerequisites

- A basic understanding of telecommunication and data communication

Objectives

On completion of this program, the participants will be able to:

- Describe MSAN UA5000 product positioning
- Outline MSAN UA5000 product functions
- Describe MSAN UA5000 system features
- Describe MSAN UA5000 product networking
- Describe MSAN UA5000 frame, boards and ports
- Establish the connection and login to the system
- Perform the common basic operation, such as query status of hardware and software, backup and restore data, system name change, alarm query, etc.
- Check the equipment running conditions, such as power connections, fiber connections,

mounted boards, etc.

- Perform the broadband system commissioning, network commissioning, xDSL service commissioning
- Eliminate the fault during the commissioning process
- Perform the narrowband system commissioning, stand-alone commissioning, network commissioning, voice service commissioning
- Eliminate the fault during the commissioning process

Training Content

OBA00 IP Network Technologies Fundamental

- TCPIP Basis
  - Architecture of TCP/IP
  - Function of TCP/IP each layer
  - Process of TCP/IP data encapsulation
- Ethernet Overview
  - Different types of Ethernet media
  - Ethernet capabilities and limitations
  - Layer 2 and 3 switching principles

OBU00 MSAN UA5000 System Overview

- MSAN UA5000 Product Description
  - MSAN UA5000 product positioning and networking
  - MSAN UA5000 product functions
  - MSAN UA5000 system features
- MSAN UA5000 Hardware Description
  - MSAN UA5000 frame, boards and ports introduction

OBU30 MSAN UA5000 Basic Operation and Maintenance

- MSAN UA5000 Quick Start
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data
  - SNMP parameter configuration
  - Other basic operation, such as system name change, alarm query, etc.
- MSAN UA5000 (PVM and IPM) Quick Start Laboratory Exercise Guide
  - PVM Basic configuration
  - IPM Basic configuration

OBU31 MSAN UA5000 Broadband Service Commissioning

- MSAN UA5000 IPM Commissioning
  - General commissioning procedures of UA5000 IPM
  - Preparations for commissioning
  - Hardware commissioning, stand-alone commissioning ,network commissioning, service commissioning and the commissioning verification of UA5000 IPM

OBU32 MSAN UA5000 Narrowband Service Commissioning

- MSAN UA5000 PVM Commissioning
  - General commissioning procedures of UA5000 PVM
  - Preparations for commissioning
  - Hardware commissioning, stand-alone commissioning ,network commissioning, service commissioning and the commissioning verification of UA5000 PVM

Duration

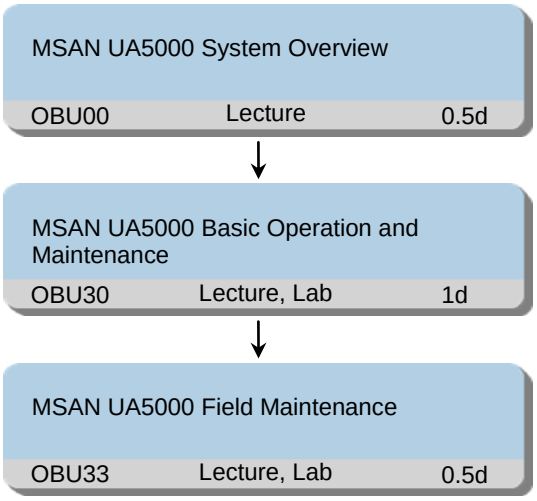
6 working days

Class Size

Min 6, Max 12

1.11.6 MSAN UA5000 1st Line Maintenance Training

Training Path



Target Audience

Field Technicians

Prerequisites

- A basic understanding of telecommunication and data communication

Objectives

On completion of this program, the participants will be able to:

- Describe MSAN UA5000 product positioning
- Outline MSAN UA5000 product functions
- Describe MSAN UA5000 system features
- Describe MSAN UA5000 product networking
- Describe MSAN UA5000 frame, boards and ports
- Establish the connection and login to the system
- Perform the common basic operation, such as query status of hardware and software, backup and restore data, system name change, alarm query, etc.
- Describe the general methods of field maintenance
- Perform the alarm query and running status query by indications of the LED
- Perform simple diagnose according to field situation and daily maintenance
- Perform component replacement

Training Content

OBU00 MSAN UA5000 System Overview

- MSAN UA5000 Product Description
  - MSAN UA5000 product positioning and networking
  - MSAN UA5000 product functions
  - MSAN UA5000 system features

- MSAN UA5000 Hardware Description
  - MSAN UA5000 frame, boards and ports introduction

OBU30 MSAN UA5000 Basic Operation and Maintenance

- MSAN UA5000 Quick Start
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data
  - SNMP parameter configuration
  - Other basic operation, such as system name change, alarm query, etc.
- MSAN UA5000 (PVM and IPM) Quick Start Laboratory Exercise Guide
  - PVM Basic configuration
  - IPM Basic configuration

OBU33 MSAN UA5000 Field Maintenance

- MSAN UA5000 Maintenance-PVMB
  - PVMB system alarm query and running status query by indications of the LED
  - PVMB system simple faults diagnose
  - PVMB system daily maintenance
  - Component replacement
- MSAN UA5000 Maintenance-IPMB
  - IPMB system alarm query and running status query by indications of the LED
  - IPMB system simple faults diagnose
  - IPMB system daily maintenance

Duration

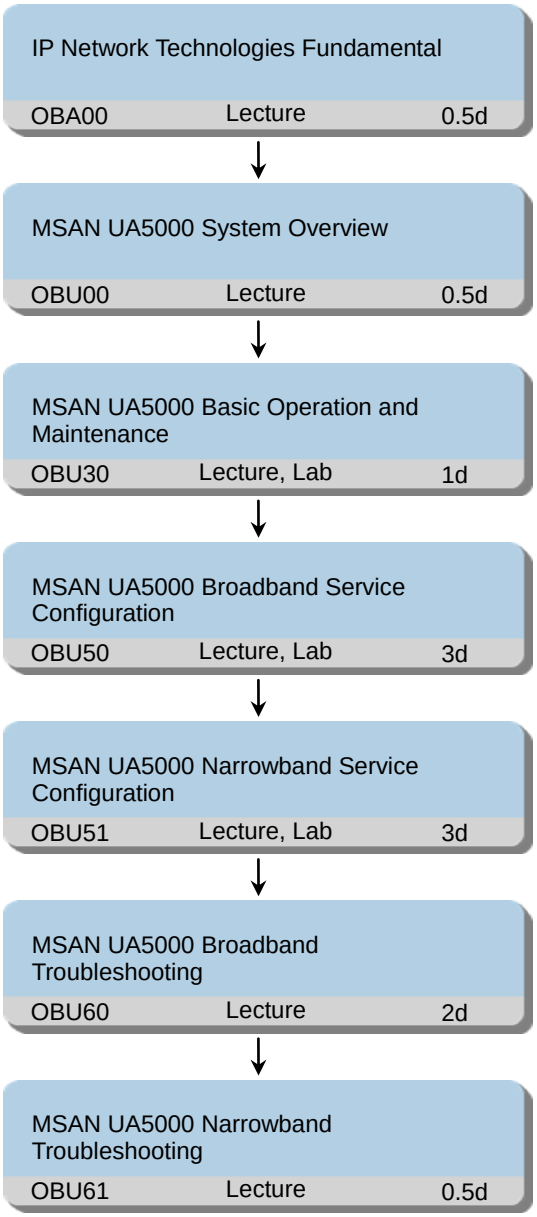
2 working days

Class Size

Min 6, Max 12

1.11.7 MSAN UA5000 2nd Line Maintenance Training

Training Path



Target Audience

Technical Support Engineers

Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication and data communication

Objectives

On completion of this program, the participants will be able to:

- Describe MSAN UA5000 product positioning
- Outline MSAN UA5000 product functions
- Describe MSAN UA5000 system features
- Describe MSAN UA5000 product networking
- Describe MSAN UA5000 frame, boards and ports
- Establish the connection and login to the system
- Perform the common basic operation, such as query status of hardware and software, backup and restore data, system name change, alarm query, etc.
- Describe ADSL2+/VDSL2 service implementation process
- Describe multicast service implementation process
- Manage ADSL2+/VDSL2 line profile
- Complete ADSL2+/VDSL2 service configuration
- Perform ADSL2+/VDSL2 service operation and maintenance
- Complete multicast service configuration
- Perform multicast service operation and maintenance
- Describe Voice service implementation process
- Complete Voice service configuration
- Perform Voice service operation and maintenance
- Troubleshooting IPM System
- Troubleshooting internet access service
- Troubleshooting multicast service
- Troubleshooting Ethernet port
- Troubleshooting PVM System
- Troubleshooting Voice service
- Troubleshooting E1 port

Training Content

OBA00 IP Network Technologies Fundamental

- TCPIP Basis
  - Architecture of TCP/IP
  - Function of TCP/IP each layer
  - Process of TCP/IP data encapsulation
- Ethernet Overview
  - Different types of Ethernet media
  - Ethernet capabilities and limitations
  - Layer 2 and 3 switching principles

OBU00 MSAN UA5000 System Overview

- MSAN UA5000 Product Description
  - MSAN UA5000 product positioning and networking
  - MSAN UA5000 product functions
  - MSAN UA5000 system features
- MSAN UA5000 Hardware Description

- MSAN UA5000 frame, boards and ports introduction

OBU30 MSAN UA5000 Basic Operation and Maintenance

- MSAN UA5000 Quick Start
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data
  - SNMP parameter configuration
  - Other basic operation, such as system name change, alarm query, etc.
- MSAN UA5000 (PVM and IPM) Quick Start Laboratory Exercise Guide
  - PVM Basic configuration
  - IPM Basic configuration

OBU50 MSAN UA5000 Broadband Service Configuration

- MSAN UA5000 Configuring ADSL Access Service
  - ADSL service implementation process
  - ADSL service configuration
  - ADSL line profile and ADSL port configuration
- MSAN UA5000 (IPMB) Configuring ADSL Service Lab Guide
  - ADSL service configuration
- MSAN UA5000 Configuring the Multicast Service
  - Multicast service implementation process
  - Multicast configuration procedure
  - Multicast service configuration example
- MSAN UA5000 (IPMB) Configuring the Multicast Service Lab Guide
  - Configure the ADSL service
  - Configure the BTV service

OBU51 MSAN UA5000 Narrowband Service Configuration

- MSAN UA5000 Configuring V5 voice service
  - V5 voice service implementation
  - V5 voice service configuration procedures
  - V5 voice service configuration Example
- MSAN UA5000 (PVM) V5 Service Configuration Laboratory Exercise Guide
  - Configure E1 ports attributes
  - Configure V5.2 Interface
  - Configure Subscriber Data
  - Save the data
  - Verification
- MSAN UA5000 Configuring VoIP service
  - VoIP voice service implementation
  - VoIP voice service configuration procedures
  - VoIP voice service configuration Example
- MSAN UA5000 (PVM) VoIP Service Configuration Laboratory Exercise Guide
  - Configure an IP address for the service network port (ETH1)

- Add A32 line cards and confirm the cards. (Optional)
- H248 interface configuration
- Configure the subscriber data
- Verification

OBU60 MSAN UA5000 Broadband Troubleshooting

- MSAN UA5000 Common Troubleshooting Operations
  - Alarm management
  - Common troubleshooting operations
- MSAN UA5000 Troubleshooting Ethernet Service
  - Ethernet port troubleshooting
- MSAN UA5000 Troubleshooting ADSL Service
  - Troubleshooting ADSL line
  - Troubleshoot common faults in the Internet access service, such as PPPoE dialup failure, DHCP dialup failure, failure to access the Internet after successful dialup, Internet access service interruption, and low Internet access rate
- MSAN UA5000 Troubleshooting Multicast Service
  - Troubleshoot common faults in the multicast service. such as multicast user failing to go online, dark screen after going online and demanding a program, erratic display (mosaic) in a multicast program, abnormal interruption of a multicast program, and long time in switching programs

OBU61 MSAN UA5000 Narrowband Troubleshooting

- MSAN UA5000 Troubleshooting E1 Link
  - E1 port troubleshooting
- MSAN UA5000 Troubleshooting VoIP Service
  - Troubleshoot common faults in the voice service, such as no tone after offhook, busy tone after offhook, one-way audio in communication, noise in communication, poor voice service in communication, and failure to dial certain phone numbers

Duration

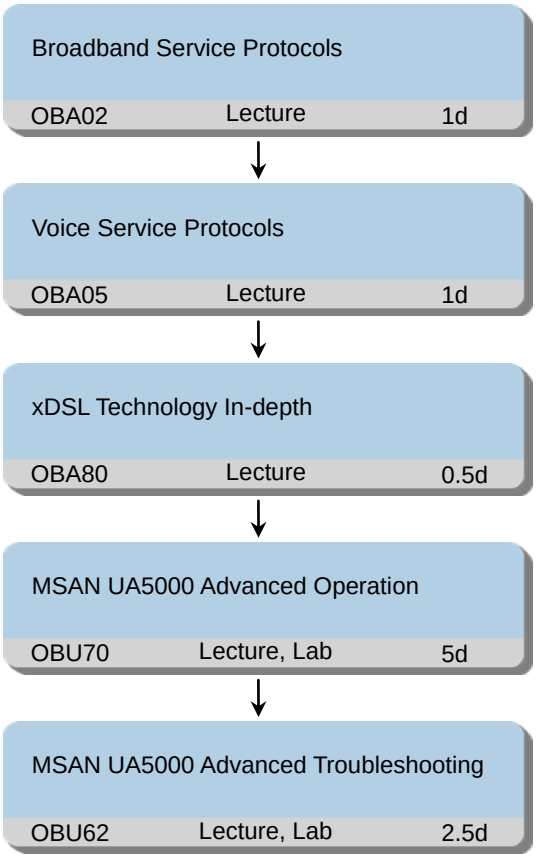
10 working days

Class Size

Min 6, Max 12

1.11.8 MSAN UA5000 3rd Line Maintenance Training

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- Completion of MSAN UA5000 2nd Line Maintenance Training or having equivalent knowledge

Objectives

On completion of this program, the participants will be able to:

- Describe function and message of PPP and PPPoE protocol
- Describe function and message of RADIUS protocol
- Describe function and message of DHCP protocol
- Describe xDSL modulation mode
- Describe xDSL band plans and profiles
- Deal with noise of xDSL line
- Describe xDSL packet transfer mode
- Describe SIP function and position in network
- Describe SIP typical call flow

- Describe H.248 function and position in network
- Describe H.248 message structure and typical call flow
- Describe and provision IPoA to IPoE features
- Describe and provision PPPoA to PPPoE features
- Describe and provision VLAN features
- Describe and provision DHCP Relay features
- Describe and provision DHCP multicast features
- Describe triple play service solution
- Complete Triple-play service configuration
- Describe and provision hairpin connection and self-switching
- Describe line test networking and device requirement
- Troubleshooting system
- Troubleshooting Internet Access Service
- Troubleshooting Multicast Service
- Troubleshooting VoIP service

Training Content

OBA02 Broadband Service Protocols

- PPP and PPPoE Protocols
  - Basic concept and function of PPP and PPPoE protocol
  - Messages and interaction of PPP and PPPoE protocol
- RADIUS Protocol
  - Basic concept and function of RADIUS protocol
  - Messages and interaction of RADIUS protocol
- DHCP Protocol
  - Basic concept and function of DHCP protocol
  - Messages and interaction of DHCP protocol

OBA05 Voice Service Protocols

- SIP protocol
  - SIP function and position in network
  - SIP message and typical call flow
- H.248 Protocol
  - H.248 function and position in network
  - H.248 message structure and typical call flow

OBA80 xDSL Technology In-depth

- VDSL2 Technology In-depth
  - VDSL2 modulation
  - VDSL2 band plans and profiles
  - Upstream power back-off (UPBO)
  - Downstream power back-off (DPBO)
  - PSD Notching
  - MIB control PSD

- Virtual Noise and SOS (Emergency Rate Reduction)
- VDSL2 QoS
- VDSL2 packet transfer mode
- Enhanced DSL

OBU70 MSAN UA5000 Advanced Operation

- MSAN UA5000 New Feature - XoA to XoE ISSUE
  - IPoA to IPoE Principles and Configuration
  - PPPoA to PPPoE Principles and Configuration
- MSAN UA5000 Configuring IPoA to IPoE Lab Guide
  - DSL service configuration
  - Configure a MAC address pool
  - Enable the switch for IPoA protocol conversion
  - Configure a default gateway for IPoA subscribers
  - Configure the encapsulation type for IPoA access services
- MSAN UA5000 Configuring PPPoA to PPPoE Lab Guide
  - DSL Service configuration
  - Configure a MAC address pool
  - Enable the switch for PPPoA protocol conversion
  - Configure the encapsulation type for PPPoA access services
- MSAN UA5000 VLAN New Service
  - VLAN types and attributes
  - QinQ VLAN and Stacking VLAN application and configuration
- MSAN UA5000 Configuring Private Circuit Service(QinQ VLAN) Lab Guide
  - Configure Private Circuit Service(QinQ VLAN)
- MSAN UA5000 Configuring Multi-ISP Wholesale Service (VLAN Stacking) Lab Guide
  - Configure Multi-ISP Wholesale Service (VLAN Stacking)
- MSAN UA5000 DHCP Relay
  - DHCP Relay Conception
  - DHCP Relay Configuration
- MSAN UA5000 Configuring DHCP Relay Lab Guide
  - Configure DHCP Relay for UA5000
- MSAN UA5000 Configuring Multicast Service
  - Multicast service implementation
  - Multicast Service Configuration, operation and maintenance
- MSAN UA5000 Triple Play Solution
  - Triple Play service solution
  - Triple play service implementation
- MSAN UA5000 Configuring the Triple Play Service
  - Triple Play service configuration, operation and maintenance
- MSAN UA5000 Configuring Triple Play Service Lab Guide
  - Configure Triple Play Service for UA5000
- MSAN UA5000 PVM System Features

- Dual homing
- Hairpin connection and self-switching

- MSAN UA5000 PVM System Features Configuration Laboratory Exercise Guide
  - Configure IPM System Feature for UA5000
- MSAN UA5000 Line test
  - Line test networking and device Requirement
  - Line test principle
  - Line test items
  - Line test configuration

OBU62 MSAN UA5000 Advanced Troubleshooting

- MSAN UA5000 Troubleshooting
  - Hardware and software system troubleshooting
  - Internet access service troubleshooting
  - Multicast service troubleshooting
  - VoIP service troubleshooting

Duration

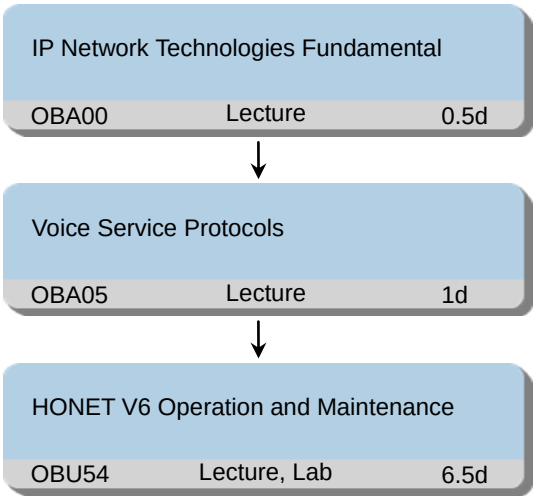
10 working days

Class Size

Min 6, Max 12

1.11.9 HONET V6 MD5500 and UA5000 2nd Line Maintenance Training

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication network

Objectives

On completion of this program, the participants will be able to:

- Describe the functions of TCP/IP
- Describe routing process
- Describe the function and process of ARP
- Describe VLAN forwarding process
- Describe SIP function and position in network
- Describe SIP typical call flow
- Describe H.248 function and position in network
- Describe H.248 message structure and typical call flow
- Describe provision xDSL service
- Describe provision IMA service
- Describe provision Ethernet service
- Describe provision CES service
- Perform V5 interface configuration
- Perform PV8/RSP frame configuration
- Perform user configuration
- Perform POTS service configuration
- Perform ISDN service configuration

- Perform daily operation and maintenance

Training Content

OBA00 IP Network Technologies Fundamental

- TCPIP Basis
  - Architecture of TCP/IP
  - Function of TCP/IP each layer
  - Process of TCP/IP data encapsulation
- Ethernet Overview
  - Different types of Ethernet media
  - Ethernet capabilities and limitations
  - Layer 2 and 3 switching principles

OBA05 Voice Service Protocols

- SIP protocol
  - SIP function and position in network
  - SIP message and typical call flow
- H.248 Protocol
  - H.248 function and position in network
  - H.248 message structure and typical call flow

OBU54 HONET V6 Operation and Maintenance

- HONET V6 overview and hardware
  - ADSL Service Application
  - IMA Service Application
  - Ethernet Service Application
  - CES application
- HONETV6 Configuration Basics
  - Establish the connection and login to the system
  - Query status of hardware and software
  - Backup, save and restore data
  - SNMP parameter configuration
  - Other basic operation, such as system name change and alarm query etc.
- HONETV6 broadband Service Configuration
  - ADSL service configuration
  - IMA service configuration
  - Ethernet service configuration
  - CES service configuration
- MD5500 POTS Configuration
  - V5 interface configuration
  - PV8/RSP frame configuration
  - User configuration
- MD5500 test and Alarm
  - MD5500 test and alarm function

- MD5500 Environment Monitor System
  - EMU introduction
  - EMU configuration
- MD5500 ISDN Service
  - MD5500 ISDN service configuration
- Practice guide for HONET Integrated Access Network Engineer training
  - ADSL service configuration
  - IMA service configuration
  - Ethernet service configuration
  - CES service configuration

Duration

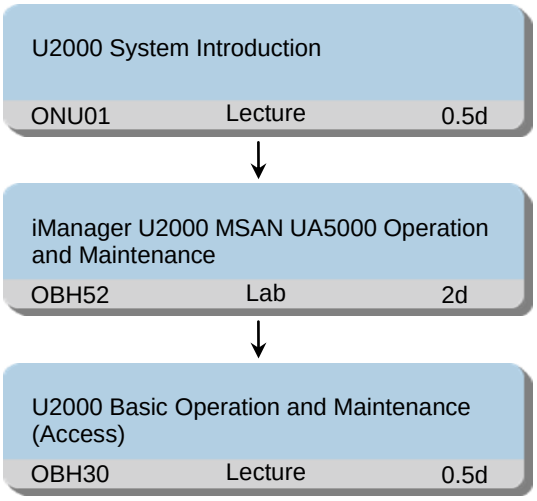
8 working days

Class Size

Min 6, Max 12

1.11.10 iManager U2000 MSAN UA5000 Operation and Maintenance Training

Training Path



Target Audience

Technical Support Engineers

Operation and Maintenance Engineers

Prerequisites

- A basic understanding of U2000 and MSAN

Objectives

On completion of this program, the participants will be able to:

- Describe the architecture and main features of U2000
- List the main functions of U2000
- Login to U2000 server via client
- Add a map and device
- Deal with the alarm
- Backup and auto save the configuration
- Add a management user
- Perform MSAN ADSL2+ service configuration via U2000
- Perform MSAN VoIP service configuration via U2000
- Perform MSAN multicast service configuration via U2000

Training Content

ONU01 U2000 System Introduction

- iManager U2000 System Introduction
  - The architecture and main features of U2000
  - The directory structure of U2000
  - The main functions of U2000

OBH52 iManager U2000 MSAN UA5000 Operation and Maintenance

- xDSL Triple Play Service Operation on U2000
  - Perform MSAN UA5000 ADSL2+ service configuration via U2000
- MSAN UA5000 Configuring V5(POTS and ISDN) Service Operation on U2000
  - V5 Voice Service Overview
  - V5 Interface Configuration Procedure
  - V5 Voice Service Configuration Example
- MSAN VoIP Service Operation on U2000
  - Perform MSAN UA5000 VoIP service configuration via U2000

OBH30 U2000 Basic Operation and Maintenance (Access)

- U2000 Client Introduction
  - Login to U2000 Server via Client
  - The main functions of U2000 Client
- U2000 User Management
  - Add a management user
  - Manage the user
- U2000 Topology and NE Management
  - Add a map and device
  - Discover the topology, set the communication parameters and synchronize the device data on U2000
- U2000 Alarm, Environment Monitoring and Management
  - Deal with the alarm
  - The main functions of U2000 fault management, monitor the fault alarm, notify the relevant personnel, and process the fault alarm on U2000
- U2000 Performance Statistics
  - The main function of U2000 performance
  - management and monitoring
  - The performance statistics of network resources on U2000

Duration

3 working days

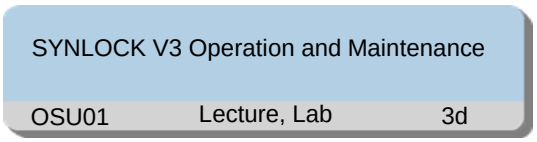
Class Size

Min 6, Max 12

1.12 BITS

1.12.1 SYNLOCK V3 2nd Line Maintenance Training

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication network

Objectives

On completion of this program, the participants will be able to:

- Understand basic concepts of synchronization network
- Describe the composition of synchronization network
- Describe the applications of synchronization network
- Describe the applications of synchronization network
- Describe system structure and features of SYNLOCK V3
- Outline main functions of boards
- Configure different levels of clock source
- Configure SYNLOCK V3 hardware
- Hand on practice via SYNLOCK V3 network management system
- Perform SYNLOCK V3 network management system maintenance
- Perform the basic maintenance operations of SYNLOCK V3
- Complete the maintenance records of SYNLOCK V3
- Describe the common analysis methods of fault locating
- Analyze the typical faults

Training Content

OSU01 SYNLOCK V3 Operation and Maintenance

- Synchronization Basics
  - Basic concepts of synchronization network
  - Composition of synchronization network
  - Applications of synchronization network
- SYNLOCK V3R2 Hardware Description
  - SYNLOCK V3R2 System Overview
  - Cabinet and Sub-rack

- Boards and Interfaces
- System Configuration

- SYNLOCK V3 Network Management System Operation
  - SYNLOCK V3 System Overview
  - Data Configuration
  - Monitoring and Maintenance
  - Alarm, Log and Performance Management
  - Database Maintenance
- SYNLOCK V3 Maintenance and Troubleshooting
  - SYNLOCK V3 hardware structure review
  - Running environment of equipment
  - Precautions of maintenance operations
  - Equipment maintenance records
  - Troubleshooting ideas and methods
  - Troubleshooting cases

Duration

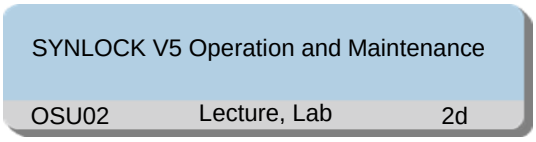
3 working days

Class Size

Min 6, Max 12

1.12.2 SYNLOCK V5 2nd Line Maintenance Training

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication network

Objectives

On completion of this program, the participants will be able to:

- Understand basic concepts of synchronization network
- Describe the composition of synchronization network
- Describe the applications of synchronization network
- Describe the applications of synchronization network
- Describe system structure and features of SYNLOCK V5
- Outline main functions of boards
- Configure different levels of clock source
- Configure SYNLOCK V5hardware
- Hand on practice via SYNLOCK V5 network management system
- Perform SYNLOCK V5 network management system maintenance
- Perform the basic maintenance operations of SYNLOCK V5
- Complete the maintenance records of SYNLOCK V5
- Describe the common analysis methods of fault locating
- Analyze the typical faults

Training Content

OSU02 SYNLOCK V5 Operation and Maintenance

- Synchronization Basics
  - Basic concepts of synchronization network
  - Composition of synchronization network
  - Applications of synchronization network
- SYNLOCK V5 Hardware Description
  - SYNLOCK V5 system overview
  - Installation and sub-rack
  - Boards and interfaces
  - System configuration

- SYNLOCK V5 Network Management System Operation
  - SYNLOCK V5 system overview
  - Data configuration
  - Monitoring and maintenance
  - Alarm, log and performance management
  - Database maintenance
- SYNLOCK V5 Maintenance and Troubleshooting
  - Hardware structure review
  - Running environment of equipment
  - Precautions of maintenance operations
  - Equipment maintenance records
  - Troubleshooting ideas and methods
  - Troubleshooting cases

Duration

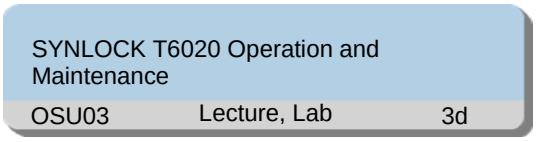
2 working days

Class Size

Min 6, Max 12

1.12.3 SYNLOCK T6020 2nd Line Maintenance Training

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication network

Objectives

On completion of this program, the participants will be able to:

- Outline product positioning of SYNLOCK T6020
- Describe hardware structure of SYNLOCK T6020
- State the functions of boards and interfaces
- List the typical system configuration of SYNLOCK T6020
- Describe the network structure and function of SYNLOCK V3
- Complete SYNLOCK T6020 system configuration data via SYNLOCK V3
- Query the device status and alarm via SYNLOCK V3
- Describe the network structure and function of SYNLOCK V3
- Complete SYNLOCK T6020 system configuration data via SYNLOCK V3
- Query the device status and alarm via SYNLOCK V3
- Explain the meaning of network synchronization
- Differentiate between clock synchronization and time synchronization
- List common technologies for network synchronization
- Describe common synchronization modes for SDH networks
- Describe clock levels and quality requirements of clock at different levels
- Explain the functions of IEEE 1588v2 clock and its advantages/disadvantages

Training Content

OSU03 SYNLOCK T6020 Operation and Maintenance

- SYNLOCK T6020 Hardware Description
  - SYNLOCK T6020 system overview
  - Installation and sub-rack
  - Boards and interfaces
  - System configuration
- SYNLOCK T6020 Network Management System Operation
  - Network management system overview

- Adding or deleting board
- Configuring board data
- Configuring the reference source
- Setting system parameters
- Setting the leap second
- Checking NE state
- Configuring PTP(1588V2)
- Checking alarms

- SYNLOCK T6020 Maintenance and Troubleshooting
  - Routine maintenance
  - Basic rules and methods for troubleshooting faults
  - Common troubleshooting cases
- Network Synchronization Theory
  - Overview of network synchronization
  - Architecture and mode of SDH network frequency synchronization
  - Introduction to IEEE 1588v2

Duration

3 working days

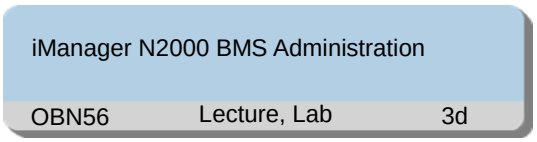
Class Size

Min 6, Max 12

1.13 OSS

1.13.1 iManager N2000 BMS Administration Training

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- Having the basic knowledge of NMS

Objectives

On completion of this program, the participants will be able to:

- Describe system structure, orientation features, network application and functions of the iManager N2000 BMS
- Perform server configuration, server startup and shutdown
- Perform system user management, N2000 user management, NE user Management and so on
- Perform service and process management, Database management and NTP configuration
- Perform database backup and restoration, routine management, emergency management, as well as know how to use management tool

Training Content

OBN56 iManager N2000 BMS Administration

- iManager N2000 BMS Server Configuration
  - Startup and shutdown
  - Setting parameters for N2000 BMS server
  - Configuring the TFTP service
- iManager N2000 BMS User and Log Management
  - User types
  - Managing OS users
  - Managing database users
  - Managing N2000 BMS users
  - Managing NE users
  - Log management
  - Introduction to log
  - Managing user logs
  - Managing device logs

- iManager N2000 BMS Process Management
  - Service and process
  - System monitor client
  - Process operation
  - Typical process cases
- iManager N2000 BMS Database Management
  - N2000 BMS database
  - Querying database status
  - Backing up and restoring a database
  - Expanding a database
  - Clearing a database
- iManager N2000 BMS Server Maintenance and Troubleshooting
  - N2000 BMS server maintenance
  - Routine maintenance
  - Emergency maintenance

Duration

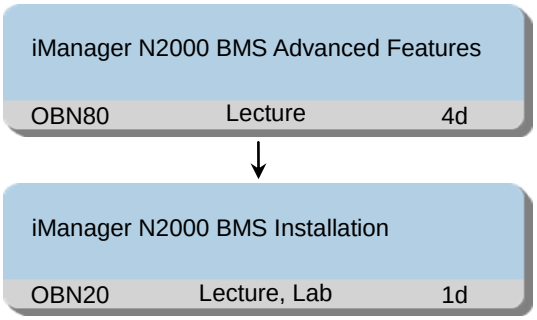
3 working days

Class Size

Min 6, Max 12

1.13.2 iManager N2000 BMS Advanced Operation and Maintenance Training

Training Path



Target Audience

Technical Support Engineers

Operation and Maintenance Engineers

Prerequisites

- Having the basic knowledge of NMS

Objectives

On completion of this program, the participants will be able to:

- Describe HA solution
- Describe Watchman principles
- Perform Watchman maintenance
- Describe NMS northbound interface
- Northbound SNMP/CORBA interface
- Northbound TL1 interface
- Background of TL1 interface
- Describe hardware and software architecture of iManager N2000 BMS
- Describe the functions of each application components
- Describe typical management solution which may cooperate with OSS and third-party application and cases
- Describe fault, provisioning, performance, management and security solution
- Describe the solution and implementation of NBI (North Bound Interface)
- Perform NBI operation and maintenance
- Describe the solution and implementation of dual system
- Describe the installation procedure
- Install iManager N2000 system properly

Training Content

OBN80 iManager N2000 BMS Advanced Features

- iManager N2000 BMS High-Availability System Maintenance
  - HA solution introduction

- Watchman principles
- Watchman maintenance

- iManager N2000 BMS Northbound Interfaces
  - NMS northbound interface overview
  - Northbound SNMP/CORBA interface
  - Northbound TL1 interface
- iManager N2000 BMS TL1 Service Provisioning Interface
  - Background of TL1 interface
  - TL1 system architecture
  - TL1 command format connection principle
  - Application and maintenance
  - Troubleshooting
- iManager N2000 BMS Environment and Power Monitoring
  - Introduction to environment and power monitoring
  - Networking of environment and power monitoring
  - General model of environment and power monitoring
  - Basic operations of environment and power monitoring
  - Environment variable monitoring
  - Power variable monitoring
  - Common fault handling
- iManager N2000 BMS Broadband Line Test
  - Test system overview
  - APP protocol
  - N2000 BMS test solution
  - Test fault location

OBN20 iManager N2000 BMS Installation

- iManager N2000 BMS Installation and Upgrade
  - iManager N2000 BMS installation
  - System overview
  - Preparations
  - Installing software
  - iManager N2000 BMS upgrade
  - iManager N2000 BMS upgrade
  - Preparations for the N2000 BMS upgrade
  - Upgrading the N2000 BMS

Duration

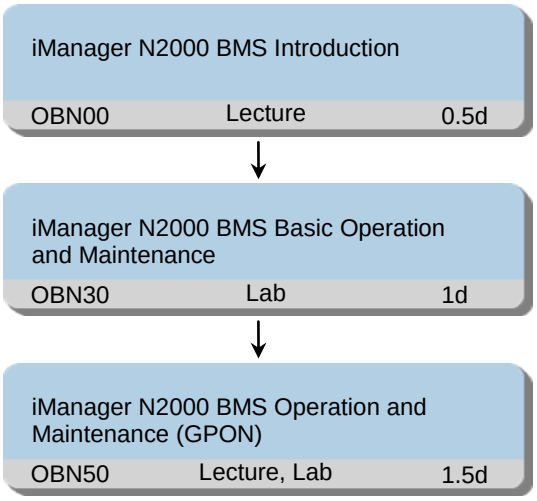
5 working days

Class Size

Min 6, Max 12

1.13.3 iManager N2000 BMS Operation Training (GPON)

Training Path



Target Audience

Technical Support Engineers

Operation and Maintenance Engineers

Prerequisites

- General understanding of telecommunication network and GPON

Objectives

On completion of this program, the participants will be able to:

- Describe network management architecture
- Describe the hardware and software architecture of iManager N2000 BMS
- Describe the features of iManager N2000 BMS
- Describe the interfaces Provided by N2000
- Login to N2000 Server via Client
- Add a map and device
- Deal with the alarm
- Backup and auto save the configuration
- Add a management user
- Perform GPON FTTH service configuration via iManager N2000 BMS
- Perform GPON FTTB/FTTC service configuration via iManager N2000 BMS

Training Content

OBN00 iManager N2000 BMS Introduction

- iManager N2000 BMS Introduction(R012)
  - Network management architecture
  - The hardware and software architecture of iManager N2000 BMS

- The features of iManager N2000 BMS
- The interfaces Provided by N2000

OBN30 iManager N2000 BMS Basic Operation and Maintenance

- iManager N2000 BMS Basic Operation and Maintenance(Scene mode)
  - Login to the BMS server via client
  - Add a map and device
  - Deal with the alarm
  - Backup and auto save the configuration
  - Add a management user
- iManager N2000 BMS Operation and Maintenance
  - The basic concepts, working theories, structures and operations about Solaris operation system and Sybase
  - The features of topology management, security management, configuration management, alarm management and performance management of iManager N2000 BMS
  - The operation for service provisioning and maintenance, element management, alarm management and performance statistics

OBN50 iManager N2000 BMS Operation and Maintenance (GPON)

- iManager N2000 BMS FTTx Guide to the Network Deployment of BMS
  - GPON service pre-deployment via EMS
- iManager N2000 BMS GPON FTTB Practice Guide
  - GPON FTTB service configuration via iManager N2000 BMS
- iManager N2000 BMS GPON FTTH Practice Guide(V2R12C03)
  - GPON FTTH service configuration via iManager N2000 BMS

Duration

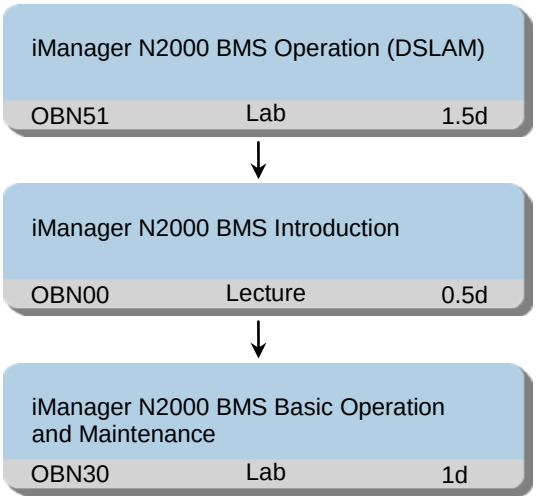
3 working days

Class Size

Min 6, Max 12

1.13.4 iManager N2000 BMS Operation Training (DSLAM)

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- General understanding of telecommunication network and DSLAM

Objectives

On completion of this program, the participants will be able to:

- Describe network management architecture
- Describe the hardware and software architecture of iManager N2000 BMS
- Describe the features of iManager N2000 BMS
- Describe the interfaces Provided by N2000
- Login to N2000 Server via Client
- Add a map and device
- Deal with the alarm
- Backup and auto save the configuration
- Add a management user
- Perform ADSL2+ service configuration via iManager N2000 BMS
- Perform VDSL2 service configuration via iManager N2000 BMS

Training Content

OBN51 iManager N2000 BMS Operation (DSLAM)

- MA5600T ADSL2+ Service Configuration Guide-N2000(R12)
  - ADSL2+ service configuration via iManager N2000 BMS
- MA5600T VDSL2 Service Configuration Guide-N2000(R12)

- VDSL2 service configuration via iManager N2000 BMS

OBN00 iManager N2000 BMS Introduction

- iManager N2000 BMS Introduction(R012)
  - Network management architecture
  - The hardware and software architecture of iManager N2000 BMS
  - The features of iManager N2000 BMS
  - The interfaces Provided by N2000

OBN30 iManager N2000 BMS Basic Operation and Maintenance

- iManager N2000 BMS Basic Operation and Maintenance(Scene mode)
  - Login to the BMS server via client
  - Add a map and device
  - Deal with the alarm
  - Backup and auto save the configuration
  - Add a management user
- iManager N2000 BMS Operation and Maintenance
  - The basic concepts, working theories, structures and operations about Solaris operation system and Sybase
  - The features of topology management, security management, configuration management, alarm management and performance management of iManager N2000 BMS
  - The operation for service provisioning and maintenance, element management, alarm management and performance statistics

Duration

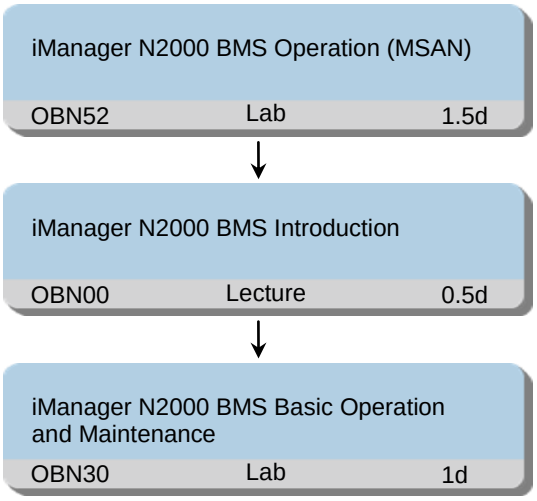
3 working days

Class Size

Min 6, Max 12

1.13.5 iManager N2000 BMS Operation Training (MSAN)

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- General understanding of telecommunication network and MSAN

Objectives

On completion of this program, the participants will be able to:

- Describe network management architecture
- Describe the hardware and software architecture of iManager N2000 BMS
- Describe the features of iManager N2000 BMS
- Describe the interfaces Provided by N2000
- Login to N2000 Server via Client
- Add a map and device
- Deal with the alarm
- Backup and auto save the configuration
- Add a management user
- Perform MSAN ADSL2+ service configuration via N2000 BMS
- Perform MSAN VoIP service configuration via N2000 BMS
- Perform MSAN V5 service configuration via N2000 BMS
- Perform MSAN multicast service configuration via N2000 BMS

Training Content

OBN52 iManager N2000 BMS Operation (MSAN)

- MSAN UA5000 Configuring ADSL Access Service on BMS

- Configuration flow
- VLAN description
- Line profile and traffic table
- Configuration example

- MSAN UA5000 Configuring Multicast Service on BMS
  - Multicast Service Overview
  - Multicast Configuration Procedure
  - IGMP Program and Profile
  - Multicast Service Configuration Example
- MSAN UA5000 Configuring V5 voice service on BMS
  - V5 Voice Service Overview
  - V5 Interface Configuration Procedure
  - V5 Voice Service Configuration Example
- MSAN UA5000 Configuring VoIP Service on BMS
  - VoIP Service Overview
  - VoIP Configuration Procedure
  - VoIP Service Configuration Example

OBN00 iManager N2000 BMS Introduction

- iManager N2000 BMS Introduction(R012)
  - Network management architecture
  - The hardware and software architecture of iManager N2000 BMS
  - The features of iManager N2000 BMS
  - The interfaces Provided by N2000

OBN30 iManager N2000 BMS Basic Operation and Maintenance

- iManager N2000 BMS Basic Operation and Maintenance(Scene mode)
  - Login to the BMS server via client
  - Add a map and device
  - Deal with the alarm
  - Backup and auto save the configuration
  - Add a management user
- iManager N2000 BMS Operation and Maintenance
  - The basic concepts, working theories, structures and operations about Solaris operation system and Sybase
  - The features of topology management, security management, configuration management, alarm management and performance management of iManager N2000 BMS
  - The operation for service provisioning and maintenance, element management, alarm management and performance statistics

Duration

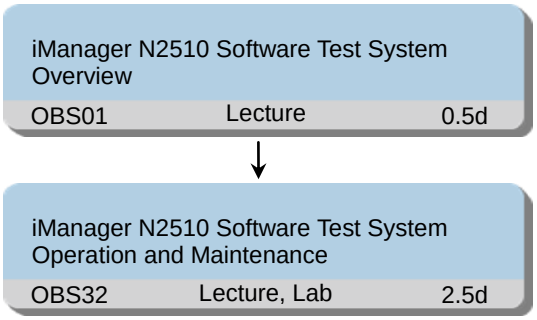
3 working days

Class Size

Min 6, Max 12

1.13.6 iManager N2510 Copper Software Test Operation Training

Training Path



Target Audience

Technical Support Engineers

Operation and Maintenance Engineers

Prerequisites

- General understanding of access network and xDSL technology

Objectives

On completion of this program, the participants will be able to:

- Describe the function of each functional unit of iManager N2510 AOS test system
- Analyze test item such as SELT, DELT
- Understand the limits of measurements
- Perform the N2510 system login
- Perform the System Configuration
- Carry out the line Testing operation
- Carry out the line analysis operation
- Carry out the line Optimization operation
- Carry out the line Evaluation operation

Training Content

OBS01 iManager N2510 Software Test System Overview

- iManager N2510 System Introduction
  - N2510 solution overview
  - LTS function module
  - AOS function module
  - OLS function module
  - N2510 system hardware platform
  - N2510 system software platform
  - Interconnection of N2510 system

OBS32 iManager N2510 Software Test System Operation and Maintenance

- iManager N2510 AOS Functional Features

- The system architecture, the network position, the networking solution and the functional structure of iManager N2510
- The workstation platform solution of iManager N2510 software test system, such as PC solution and ATAE solution
- The interfaces and its function of iManager N2510 software test system

- iManager N2510 AOS system Operation and Maintenance
  - System management
  - Resource configuration
  - Testing function
  - Network analysis
  - Line optimization
  - Line evaluation

Duration

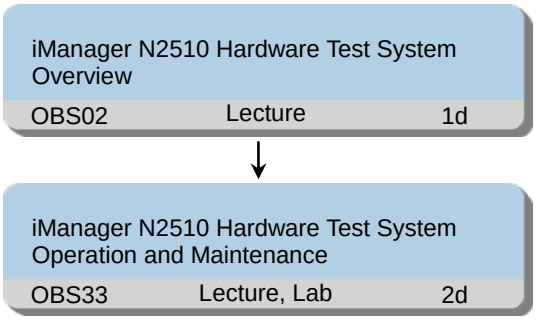
3 working days

Class Size

Min 6, Max 12

1.13.7 iManager N2510 Copper Hardware Test Operation Training

Training Path



Target Audience

Technical Support Engineers

Operation and Maintenance Engineers

Prerequisites

- General understanding of access network and xDSL technology

Objectives

On completion of this program, the participants will be able to:

- Describe LTS system typical networking
- Outline LTS system function features
- List part of testing measurement
- Describe LTS system typical networking
- Complete line resource configuration
- Perform DMM, LB, FR and DMT via iManager N2510
- Complete some of the testing demonstration

Training Content

OBS02 iManager N2510 Hardware Test System Overview

- iManager N2510 System Introduction
  - N2510 solution overview
  - LTS function module
  - AOS function module
  - OLS function module
  - N2510 system hardware platform
  - N2510 system software platform
  - Interconnection of N2510 system
- iManager N2510 LTS System Introduction
  - iManager N2510 LTS system introduction
  - iManager N2510 LTS hardware introduction
  - iManager N2510 LTS typical networking

- iManager N2510 LTS function features
- iManager N2510 LTS testing measurement

OBS33 iManager N2510 Hardware Test System Operation and Maintenance

- iManager N2510 LTS System Operation Guide
  - Line resource configuration
  - Test Case 1: short-circuiting
  - Test Case 2: Locate the fault point
  - Test Case 3: Power off the modem
  - Test Case 4: pre-evaluation test
  - Test Case 5: service quality evaluation

Duration

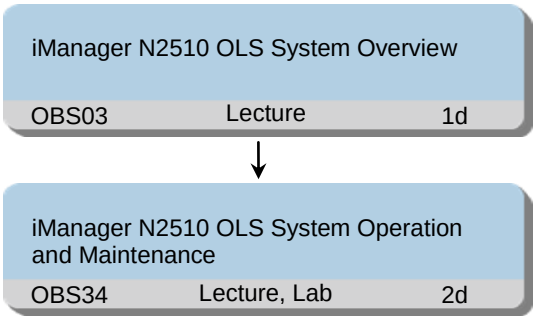
3 working days

Class Size

Min 6, Max 12

1.13.8 iManager N2510 OLS Operation Training

Training Path



Target Audience

Technical Support Engineers

Operation and Maintenance Engineers

Prerequisites

- General understanding of PON technology and related parameters

Objectives

On completion of this program, the participants will be able to:

- Describe iManager N2510 OLS networking
- Outline iManager N2510 OLS solution functions
- List part of ODN common fault
- Describe iManager N2510 OLS function
- Perform iManager N2510 OLS operation and maintenance

Training Content

OBS03 iManager N2510 OLS System Overview

- iManager N2510 OLS Solution Overview
  - iManager N2510 OLS System Introduction
  - iManager N2510 OLS Solution Overview
  - iManager N2510 OLS Function Features
  - iManager N2510 OLS Testing Measurement
- iManager N2510 OLS Hardware Introduction
  - iManager N2510 OLS System Hardware Introduction
  - iManager N2510 OLS System Typical Networking

OBS34 iManager N2510 OLS System Operation and Maintenance

- iManager N2510 OLS Operation and Maintenance
  - Perform iManager N2510 OLS operation and maintenance

Duration

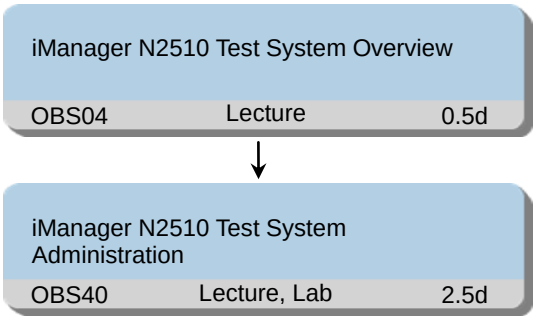
3 working days

Class Size

Min 6, Max 12

1.13.9 iManager N2510 Administration Training

Training Path



Target Audience

Technical Support Engineers

Operation and Maintenance Engineers

Prerequisites

- General understanding of access network and OS

Objectives

On completion of this program, the participants will be able to:

- Outline the system architecture, the network position, the networking solution and the functional structure of iManager N2510
- Describe the workstation platform solution of iManager N2510 software test system, such as PC solution and ATAE solution
- Describe the interfaces and its function of iManager N2510 software test system
- Describe iManager N2510 installation procedure
- Describe iManager N2510 administration item
- Perform iManager N2510 administration

Training Content

OBS04 iManager N2510 Test System Overview

- iManager N2510 System Introduction
  - N2510 solution overview
  - LTS function module
  - AOS function module
  - OLS function module
  - N2510 system hardware platform
  - N2510 system software platform
  - Interconnection of N2510 system

OBS40 iManager N2510 Test System Administration

- N2510 Installation
  - iManager N2510 installation procedure

- N2510 Administration
  - iManager N2510 administration item
  - Perform iManager N2510 administration
- N2510 Routine Maintenance
  - iManager N2510 routine maintenance
  - Perform iManager N2510 routine maintenance
- Guide to Locating the Faults of N2510
  - iManager N2510 faults management
  - Perform iManager N2510 faults management

Duration

3 working days

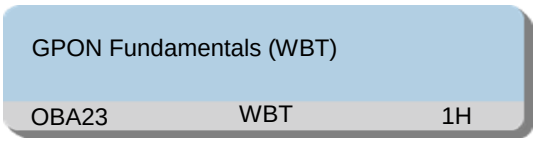
Class Size

Min 6, Max 12

1.14 Access Technology Online Training (WBT)

1.14.1 GPON Fundamentals(WBT)

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication network

Objectives

On completion of this program, the participants will be able to:

- Describe GPON typical application scenarios
- Describe the functions and specifications of GPON components
- Describe the upstream and downstream technology
- Describe the key performance parameters on distance, bandwidth, optical launched power, received sensitive power, attenuation, etc.
- Describe important concepts about GEM port and T-CONT
- Describe service encapsulation and multiplexing measures
- Describe the QoS and security solution in GPON
- Describe ONT management measures

Training Content

OBA23 GPON Fundamentals (WBT)

- GPON Fundamentals (WBT)
  - GPON networking
  - GPON component
  - GPON upstream and downstream implementation
  - GPON key performance
  - GPON service implementation process
  - GPON QoS and security
  - GPON protection
  - GPON OAM

Duration

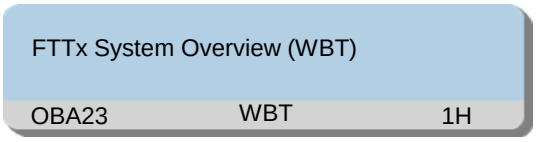
1 hour

Class Size

No limit

1.14.2 FTTx System Overview(WBT)

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication network

Objectives

On completion of this program, the participants will be able to:

- Describe FTTx network architecture
- Describe OLT appearance, typical configuration, parameter and connections
- Describe MxU appearance, typical configuration, parameters
- Describe ONT appearance, typical configuration, parameters
- Describe FTTx cable
- Describe FTTH/B/C/O/M solutions

Training Content

OBA23 FTTx System Overview (WBT)

- FTTx System Overview(WBT)
  - FTTx network introduction
  - FTTx cabinet appearance, typical configuration, parameter and connections
  - FTTx frame appearance, typical configuration, parameters and principles
  - FTTx board appearance, function, front panel and interfaces
  - FTTx cable introduction
  - FTTH/B/C/O/M solutions

Duration

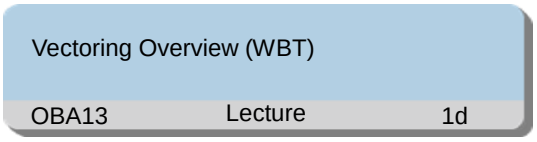
1 hour

Class Size

No limit

1.14.3 Vectoring Overview (WBT)

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication and data communication

Objectives

On completion of this program, the participants will be able to:

- Describe vectoring technology features
- Describe vectoring key technology
- Describe vectoring network solution

Training Content

OBA13 Vectoring Overview (WBT)

- Vectoring Theory Overview (WBT)
  - Describe the xDSL technologies principle
  - Describe the working principle of Vectoring
  - Describe Vectoring system architecture
  - Describe Vectoring hardware
  - Describe Vectoring solution

Duration

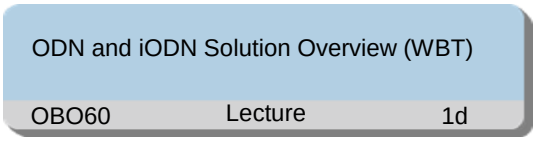
1 working day

Class Size

No limit

1.14.4 ODN and iODN Solution Overview (WBT)

Training Path



Target Audience

Technical Support Engineers
Operation and Maintenance Engineers

Prerequisites

- A basic understanding of telecommunication and data communication

Objectives

On completion of this program, the participants will be able to:

- Describe ODN Network Composing
- Describe ODN Network Maintenance Challenge
- Describe iODN Network Structure
- Describe iODN Solution Module
- Outline iODN advantage

Training Content

OBO60 ODN and iODN Solution Overview (WBT)

- ODN and iODN Solution Overview (WBT)
  - ODN architecture overview
  - ODN/ iODN solutions
  - ODN/ iODN products overview

Duration

1 working day

Class Size

No limit