

Customer Training Catalog Course Descriptions Mobile Backhaul Solution Training



HUAWEI
HUAWEI Learning Service
2015



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1.1 Training Course Descriptions

Mobile Backhaul Solution Training Training Courses are designed as follows:

Code	Training Courses	Level	Duration (working days)	Training Location	Class Size
Evolution and Trends Training Courses					
ODL01	LTE Small Cell Backhaul Solution Overview	II	0.5		6 ~ 12
ODL02	LTE IP Backhaul Solution Overview	II	0.5		6 ~ 12
ODN31	IP Backhaul Solution Overview	IV	0.5		6 ~ 12
ODL13	IP RAN SDN Solution Overview	III	0.5		6 ~ 12
ODP01	PTN IP RAN Solution	III	0.5		6 ~ 12
ODP16	PTN-Based Mobile Backhaul Evolution Solution	III	0.5		4 ~ 12
ODP31	PTN 6900 Mobile Backhaul Solution	III	0.5		4 ~ 12
Operation and Maintenance Training Courses					
ODL03	ATN Series Products Introduction	I	0.5		6 ~ 12
ODL04	ATN Series Products Routine Maintenance	I	0.5		6 ~ 12
ODL05	ATN Series Products Installation	I	0.5		6 ~ 12
ODL06	ATN Series Products Remote Commissioning	I	1		6 ~ 12
ODL07	LTE Security Feature Principle and Configuration	III	1		6 ~ 12
ODL08	LTE Backhaul Security Solution Deployment	III	2		6 ~ 12
ODN25	IP Backhaul Network Basics	II	1.5		6 ~ 12
ODN26	IP Backhaul Network Routing Protocol Introduction and Configuration	III	1		6 ~ 12
ODN27	IP Backhaul Network Services Introduction and Configuration	III	5.5		6 ~ 12
ODN28	IP Backhaul Network Advanced Feature Introduction and Configuration	III	1.5		6 ~ 12
ODN29	IP Backhaul Network Solution Deployment and Analysis	III	0.5		6 ~ 12
ODN30	IP Backhaul Network Routine Maintenance and Troubleshooting	III	2		6 ~ 12

ODN33	IP Backhaul Network HVPN Solution Design and Implementation	IV	1.5		6 ~ 12
ODN34	IP Backhaul Network Mixed VPN Solution Design and Implementation	IV	1		6 ~ 12
ODN36	IP Backhaul Network Expansion and Optimization	IV	1.5		6 ~ 12
ODN37	IP Backhaul Network Protocol Troubleshooting	IV	1.5		6 ~ 12
ODL09	LTE Mobile Backhaul 1588v2 Feature	III	2		6 ~ 12
ODL10	MBB ATN+CX IDEAL (Seamless MPLS) Solution Introduction	III	1		6 ~ 12
ODL11	MBB ATN+CX IDEAL (Seamless MPLS) Solution Design and Configuration	III	4		6 ~ 12
ODL14	ATN Series Products Layer2 Feature Design and Deployment	II	1		6 ~ 12
ODL15	ATN Series Products IGP Feature Design and Deployment	II	1		6 ~ 12
ODL16	ATN Series Products Fixed Network Service Design and Deployment	II	1		6 ~ 12
ODL17	ATN Series Products OAM Feature Design and Deployment	II	1.5		6 ~ 12
ODL18	IP Backhaul Network Advanced Troubleshooting	IV	5		6 ~ 12
ODP02	PTN Products System Overview	II	0.5		6 ~ 12
ODP03	PTN Products Hardware Description	II	1		6 ~ 12
ODP04	PTN Products Features Description	II	1		6 ~ 12
ODP05	PTN Products Installation and Commissioning	I	1		6 ~ 12
ODP06	PTN Products Field Maintenance	I	0.5		6 ~ 12
ODP07	PTN Products Routine Maintenance in NOC	II	0.5		6 ~ 12
ODP08	PTN Products Public Principle	II	2		6 ~ 12
ODP09	PTN Products Public Features	II	2		6 ~ 12
ODP10	PTN Products Basic Configuration	II	1		6 ~ 12
ODP11	PTN Products Service Configuration	II	2		6 ~ 12
ODP12	PTN Products Advanced Configuration	III	2		4 ~ 12

ODP13	PTN Products Basic Troubleshooting	II	0.5		6 ~ 12
ODP14	PTN Products Advanced Troubleshooting	III	2.5		4 ~ 12
ODP17	PTN Ring Protection Feature	II	1		6 ~ 12
ODP32	PTN 6900 Products Hardware Description	II	0.5		6 ~ 12
ODP33	PTN 6900 Products Features Description	II	0.5		6 ~ 12
ODP34	PTN 6900 Products Installation and Commissioning	I	0.5		6 ~ 12
ODP35	PTN 6900 Products Routine Maintenance in NOC	I	0.5		6 ~ 12
ODP36	PTN 6900 Products Public Principle	II	1		6 ~ 12
ODP37	PTN 6900 Products Public Features	II	4		6 ~ 12
ODP38	PTN 6900 Products Service Configuration	II	3.5		6 ~ 12
ODP39	PTN 6900 Products Advanced Configuration	III	1		6 ~ 12
ODP40	PTN 6900 Products Basic Troubleshooting	II	0.5		6 ~ 12
ODP41	PTN 6900 Products Advanced Troubleshooting	III	3		6 ~ 12
ODP43	PTN 7900 Products Hardware Description	II	0.5		6 ~ 12
ODP44	PTN 7900 Products Features Description	II	0.5		6 ~ 12
ODP45	PTN 7900 Products Installation and Commissioning	I	0.5		6 ~ 12
ODP46	PTN 7900 Products Routine Maintenance in NOC	I	0.5		6 ~ 12
ODP47	PTN 7900 Products Public Principle	II	1		6 ~ 12
ODP48	PTN 7900 Products Public Features	II	4		6 ~ 12
ODP49	PTN 7900 Products Service Configuration	II	3.5		6 ~ 12
ODP50	PTN 7900 Products Advanced Configuration	III	1		6 ~ 12
ODP51	PTN 7900 Products Basic Troubleshooting	II	0.5		6 ~ 12
ODP52	PTN 7900 Products Advanced Troubleshooting	III	3		6 ~ 12
IP Network OSS Training Courses					
ODM10	iManager U2000 Operation and Maintenance Solution	II	0.5		6 ~ 12
ODM11	iManager U2000 IP Backhaul Network Deployment	II	1		6 ~ 12
ODM12	iManager U2000 IP Network Monitoring	II	1		6 ~ 12
ODM13	iManager U2000 IP Backhaul Network Service Management	III	4.5		6 ~ 12

ODM14	iManager U2000 IP Backhaul Network Service Assurance	III	3		6 ~ 12
Planning and Designing Training Courses					
ODN39	IP Backhaul Network Planning and Designing	IV	4.5		6 ~ 12
ODP15	PTN Network Planning and Design	IV	3		4 ~ 12
ODP42	PTN 6900 Network Planning and Design	IV	4.5		4 ~ 12

1.2 Evolution and Trends Training Course Descriptions

1.2.1 ODL01 LTE Small Cell Backhaul Solution Overview



Objectives

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

- Describe small cell characteristics
- Describe small cell bearing requirements
- Describe small cell backhaul solution implementation
- Describe small cell backhaul products

Target Audience

Operation and maintenance engineers

Prerequisites

- A general understanding of relative network protocols
- At least 1 year of experiences in the operation and maintenance of IP backhaul network

Content

- Small cell concepts and application scenarios
- Small cell backhaul requirement and challenges
- Small cell backhaul solution implementation
- Huawei small cell backhaul products introduction

Training Methods

Lecture

Duration

0.5 working day

Class Size

Min 6, max 12

1.2.2 ODL02 LTE IP Backhaul Solution Overview



Objectives

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

- Describe the wireless network evolution to LTE network
- Describe LTE network architecture and features
- Describe LTE mobile backhaul network requirements
- Describe LTE mobile backhaul network solutions

Target Audience

Operation and maintenance engineers

Prerequisites

- A general understanding of relative network protocols
- At least 1 year of experiences in the operation and maintenance of IP backhaul network

Content

- Wireless network standard of the evolution to LTE
- Requirements and challenges of LTE mobile backhaul network
- Implementation and deployment of the LTE bearer solutions
- Operations and management of LTE bearer network

Training Methods

Lecture

Duration

0.5 working day

Class Size

Min 6, max 12

1.2.3 ODN31 IP Backhaul Solution Overview



Objectives

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

- Describe the MBB overall development trend
- Describe the demands and challenges of the MBB backhaul network
- Describe the mobile backhaul solution
- Describe the LTE mobile backhaul solution
- Describe the operation and management of the MBB era

Target Audience

Operation and maintenance engineers
Operation and management engineers

Prerequisites

- Familiar with the working principle of IGP routing protocol;
- Familiar with the working principle of MPLS VPN including L3VPN and VPLS

Content

- The challenge of MBB

- All kinds of mobile backhaul implement
- Service data forwarding in IP backhaul solution(CX+ATN)
- Service protection in IP backhaul solution(CX+ATN)
- QOS and clock synchronization in IP backhaul solution(CX+ATN)
- Overall development trend of MBB
- Requirements and challenges of MBB
- Implementation and deployment of mobile backhaul network solutions
- Operations and management of MBB

Training Methods

Lecture

Duration

0.5 working day

Class Size

Min 6, max 12

1.2.4 ODL13 IP RAN SDN Solution Overview



Objectives

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

- Describe basic concepts of SDN technology
- Describe the requirement of IP RAN SDN solution
- Describe the implementation of IP RAN SDN solution

Target Audience

Mobile backhaul network senior operation and maintenance engineer
Manager

Prerequisites

- Familiar with the IP RAN solution

Content

- Basic concepts of SDN technology
- The requirement of IP RAN SDN solution
- The implementation of IP RAN SDN solution

Training Methods

Lecture, Demo

Duration

0.5 working day

Class Size

Min 6, max 12

1.2.5 ODP01 PTN IP RAN Solution



Objectives

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

- Describe Huawei PTN IP RAN solution

Target Audience

This course is intended for technical or non-technical management personnel who require a general understanding of PTN IP RAN solutions

Prerequisites

- Having an overview of telecommunications

Content

- Huawei IP RAN Solution
- Successful Applications of Huawei PTN

products

- PTN-Based Mobile Backhaul Evolution Solution

Training Methods

Lecture

Duration

0.5 working day

Class Size

Min 6, max 12

1.2.6 ODP16 PTN-Based Mobile Backhaul Evolution Solution



Objectives

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

- Describe Huawei PTN-Based mobile backhaul evolution solution

Target Audience

This course is intended for technical or non-technical management personnel who require a general understanding of PTN IP RAN solutions

Prerequisites

- Having an overview of telecommunications

Content

- Huawei IP RAN Solution
- Successful Applications of Huawei PTN products
- PTN-Based Mobile Backhaul Evolution Solution

Training Methods

Lecture

Duration

0.5 working day

Class Size

Min 4, max 12

1.2.7 ODP31 PTN 6900 Mobile Backhaul Solution



Objectives

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

- Describe Huawei PTN 6900 Mobile Backhaul Solution

Target Audience

This course is intended for technical personnel who require a general understanding of PTN 6900 mobile backhaul solutions

Prerequisites

- Having an overview of telecommunications

Content

- The development of mobile backhaul
- Huawei PTN 6900 backhaul network solution

Training Methods

Lecture

Duration

0.5 working day

Class Size

Min 4, max 12

1.3 Operation and Maintenance Training Course Descriptions

1.3.1 ODL03 ATN Series Products Introduction



Objectives

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

- Describe ATN products chassis and boards
- Describe ATN network application

Target Audience

ATN Series Product Operation and maintenance engineers

FO engineer

Prerequisites

- Familiar with basic knowledge of data communications

Content

- Mobile Services Trends and Challenges

- ATN Products Chassis and Boards
- ATN Network Application
- Mobile services trends and challenges
- ATN products chassis and boards
- ATN network application
- Small cell concepts and application scenarios
- ATN905 products chassis and boards

Training Methods

Lecture

Duration

0.5 working day

Class Size

Min 6, max 12

1.3.2 ODL04 ATN Series Products Routine Maintenance



Objectives

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

- Check if the board is running normally with LED
- Check the information of the system with the routine maintenance commands
- Check the info-center
- Check the U2000 system

Target Audience

ATN Series Product Operation and maintenance engineers
FO engineer

Prerequisites

- Familiar with basic knowledge of data communications

Content

- Overview of routine maintenance
- Routine maintenance item
- Operations involving risks
- Commonly used commands introduction
- ATN905 daily maintenance process
- ATN905 daily maintenance implementation

Training Methods

Lecture

Duration

0.5 working day

Class Size

Min 6, max 12

1.3.3 ODL05 ATN Series Products Installation



Objectives

- On completion of this course, the participants will be able to:
- Install ATN series products cabinet, frame and board properly
 - Perform ATN series products cable routing and termination properly
 - Identify the cautions and facts which may affect ATN series products system running due to improperly installation

Target Audience

ATN Series Product Operation and maintenance engineers
FO engineer

Prerequisites

- Familiar with basic knowledge of data communications

Content

- Safety precautions
- Installation preparation
- Installing the ATN series products
- Installing and routing cables
- Checking cable connectivity
- Safety precautions
- Installation preparation
- Installing the ATN905 series products
- Installing and routing cables
- Commissioning the ATN905 series products

Training Methods

Lecture

Duration

0.5 working day

Class Size

Min 6, max 12

1.3.4 ODL06 ATN Series Products Remote Commissioning



Objectives

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

- Describe Plug-and-Play concepts
- Know how to perform remote commissioning through the DCN
- Know how to perform remote commissioning using DHCP

Target Audience

ATN Series Product Operation and maintenance engineers
FO engineer

Prerequisites

- Familiar with basic knowledge of data communications

Content

- IP backhaul site deployment scenario
- Basic configuration planning
- Remote commissioning through the DCN
- Remote commissioning using DHCP
- Summary
- Remote commissioning introduction
- ATN products remote commissioning through U2000

Training Methods

Lecture, Hands-on exercise, E-lab

Duration

1 working day

Class Size

Min 6, max 12

1.3.5 ODL07 LTE Security Feature Principle and Configuration



Objectives

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

- Describe IPsec concept
- Describe LTE security requirements
- Complete IPsec feature configuration

Target Audience

Mobile backhaul network design and deployment of engineers

Mobile backhaul transport dimension for measurement engineers

Prerequisites

- A general understanding of relative network protocols
- At least 1 year of experiences in the operation and maintenance of IP backhaul network

Content

- VPN Introduction
- Principles of IPSec
- IKE Overview
- IPSec Configuration
- Basic concepts and operation commands introduction
- Configure the IPSec VPN in IKE negotiation mode

Training Methods

Lecture, Hands-on exercise

Duration

1 working day

Class Size

Min 6, max 12

1.3.6 ODL08 LTE Backhaul Security Solution Deployment



Objectives

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

- Describe LTE backhaul solution
- Describe security Plug-and-Play PKI-based site deployment step
- Complete LTE backhaul IPsec feature deployment

Target Audience

Mobile backhaul network design and deployment of engineers

Mobile backhaul transport dimension for measurement engineers

Prerequisites

- A general understanding of relative network protocols
- At least 1 year of experiences in the operation and maintenance of IP backhaul network

Content

- LTE security challenges

- Huawei security solution
- Transport Security Solution
- EPC Security Solution
- SGi Security Solution
- Wireless Security Solution
- eNodeB Security Solution
- OM Plane Security Solution
- LTE backhaul security challenges
- LTE security scenarios and solutions
- Security Plug-and-Play PKI-based site deployment process
- IPsec solution for LTE networks configuration guide

Training Methods

Lecture, Hands-on exercise

Duration

2 working days

Class Size

Min 6, max 12

1.3.7 ODN25 IP Backhaul Network Basics



Objectives

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

- Describe the TCP/IP model and common network protocols
- Describe the ethernet technology
- Describe the switch working principle
- Describe the VLAN technology
- Describe the IP routing protocols
- Describe the router working principle
- Describe the IP backhaul networking equipment

Target Audience

Operation and maintenance engineers
Operation and management engineers

Prerequisites

- Familiar with basic knowledge of data communications

Content

- TCP/IP and OSI Reference Model
- Function of layers of TCP/IP
- Classification of IP addresses
- Ethernet physical layer
- Ethernet data link layer
- VLAN technology and its applications

- What is router and route
- IP routing table structure
- The classification of routing protocols
- Hardware structure of the ATN & the CX600 & NE products
- ATN&CX&NE products chassis and boards
- U2000 system structure
- U2000 system functions
- U2000 system common operation
- U2000 topology management
- Familiar with the U2000 software used to complete the basic configuration of the data
- Completion the experiments of the U2000 Plug and Play
- What is HA
- BFD concept
- OAM concept
- Service availability overview

Training Methods

Lecture, Hands-on exercise,E-lab

Duration

1.5 working days

Class Size

Min 6, max 12

1.3.8 ODN26 IP Backhaul Network Routing Protocol Introduction and Configuration



Objectives

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

- Describe the IGP routing protocol basics in IP backhaul network
- Describe the deployment of the IGP routing protocols in the IP backhaul network
- Complete the configuration of the IGP routing protocol in the IP backhaul network

Target Audience

Operation and maintenance engineers
Operation and management engineers

Prerequisites

- A general understanding of relative network protocols
- At least 1 year of experiences in the operation and maintenance of data communication equipment

Content

- IS-IS working process
- IS-IS multi-process introduction

- IS-IS configuration based on U2000 system
- U2000 configuration of IS-IS routing protocol in IP backhaul network
- OSPF working process
- OSPF areas introduction
- OSPF multi-process introduction
- OSPF configuration based on U2000 system
- U2000 configuration of OSPF routing protocol in IP backhaul network
- BGP basic concepts
- BGP working principle
- BGP route reflector
- BGP path attributes

Training Methods

Lecture, Hands-on exercise, E-lab

Duration

1 working day

Class Size

Min 6, max 12

1.3.9 ODN27 IP Backhaul Network Services Introduction and Configuration



Objectives

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

- Describe the MPLS label technology
- Describe LDP Protocol
- Describe the MPLS TE tunnel establishment of technical
- Describe the reliability of the TE tunnel technology
- Complete the configuration of MPLS tunnels and reliability
- Describe the MPLS L3VPN bearing technology
- Describe the reliability of the VPN FRR service technology
- Complete the L3VPN service and reliability configuration
- Describe the MPLS L2VPN bearing technology
- Describe the reliability of PW Redundancy service technology
- Complete the TDM / ATM of PWE3 service and reliability configuration

Target Audience

Operation and maintenance engineers
Operation and management engineer

Prerequisites

- A general understanding of relative network protocols
- At least 1 year of experiences in the operation and maintenance of data communication equipment

Content

- MPLS basic concepts
- MPLS LDP basic concepts
- U2000 configure MPLS LDP
- MPLS TE working principle
- MPLS TE deployment in IP backhaul scenario

- TE FRR protection technology introduction
- TE Hot-standby protection technology introduction
- U2000 configuration of TE Tunnel
- U2000 configuration of TE Hot-standby
- U2000 configuration of MPLS TE Tunnel in IP backhaul network
- U2000 configuration of TE hot-standby
- VPN basic concept
- BGP MPLS VPN working principle
- BGP MPLS VPN in IP backhaul scenario
- VPN FRR protection technology introduction
- U2000 configuration of E2E BGP MPLS VPN
- U2000 configuration of VPN FRR
- U2000 configuration of E2E L3VPN in IP backhaul network
- U2000 configuration of VPN FRR
- The basic concepts of PWE3
- How TDM service is emulated by PWE3
- How ATM service is emulated by PWE3
- How Ethernet service is emulated by PWE3
- Deploying PWE3 services
- PW Redundancy protection technology introduction
- U2000 configuration of E2E PWE3
- U2000 configuration of PW redundancy
- U2000 configuration of E2E PWE3 in IP backhaul network
- U2000 configuration of PW redundancy

Training Methods

Lecture, Hands-on exercise, E-lab

Duration

5.5 working days

Class Size

Min 6, max 12

1.3.10 ODN28 IP Backhaul Network Advanced Feature Introduction and Configuration



Objectives

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

- Describe the QoS technology
- Describe the QoS implementation and deployment in IP backhaul network
- Describe the clock synchronization technology
- Describe the clock synchronization implementation and deployment in IP backhaul network
- Complete QoS configuration in the IP backhaul network
- Complete clock synchronization technology configuration in IP backhaul network

Target Audience

Operation and maintenance engineers
Operation and management engineer

Prerequisites

- A general understanding of relative network protocols
- At least 1 year of experiences in the operation and maintenance of data communication equipment

Content

- QoS model introduction
- QoS basic concept
- Differv mode introduction
- Deploying QoS in backhaul scenario
- U2000 configuration of QoS in IP backhaul network
- The synchronization of Ethernet clock technology
- SyncE clock technology
- 1588 v2 clock technology
- U2000 configuration of Sync Eth in IP backhaul network
- U2000 configuration of 1588v2 in IP backhaul network

Training Methods

Lecture, Hands-on exercise,E-lab

Duration

1.5 working days

Class Size

Min 6, max 12

1.3.11 ODN29 IP Backhaul Network Solution Deployment and Analysis



Objectives

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

- Describe the IP backhaul solution implementation
- Analyse the typical IP backhaul network

Target Audience

Operation and maintenance engineers
Operation and management engineer

Prerequisites

- A general understanding of relative network protocols
- At least 1 year of experiences in the operation

and maintenance of data communication equipment

Content

- How to deploy IP backhaul network
- Case Research

Training Methods

Lecture, Hands-on exercise, E-lab

Duration

0.5 working day

Class Size

Min 6, max 12

1.3.12 ODN30 IP Backhaul Network Routine Maintenance and Troubleshooting



Objectives

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

- Description U2000 routine monitoring program in IP backhaul network
- Describe U2000 routine maintenance program in IP backhaul network
- Complete the routine maintenance operations in IP backhaul network
- Describe U2000 fault location process in IP backhaul network
- Describe U2000 fault location method in IP backhaul network

Target Audience

Operation and maintenance engineers
Operation and management engineer

Prerequisites

- A general understanding of relative network protocols
- At least 1 year of experiences in the operation and maintenance of data communication equipment

Content

- Daily monitoring and maintenance of IP backhaul network
- IP backhaul network monitoring program
- How to monitor network performance
- How to monitor network status
- Routine maintenance of network elements
- Routine maintenance of the network management system
- IP backhaul network troubleshooting ideas and processes
- IP backhaul network fault location method
- IP backhaul network troubleshooting cases

Training Methods

Lecture, Hands-on exercise

Duration

2 working days

Class Size

Min 6, max 12

1.3.13 ODN33 IP Backhaul Network HVPN Solution Design and Implementation



Objectives

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

- Design and deploy the HVPN docking program
- Design and deploy HVPN routing protocol
- Design and deploy layered TE tunnel and reliability technology
- Design and deploy hierarchical L2VPN program and technical reliability
- Design and deploy hierarchical L3VPN program and reliability technology
- Design and deploy the HVPN program QoS technology
- Design and deploy the HVPN program clock synchronization technology

Target Audience

Mobile backhaul network design and deployment of engineers

Mobile backhaul transport dimension for measurement engineers

Prerequisites

- Familiar with the working principle of IGP routing protocol
- Familiar with the working principle of MPLS VPN including L3VPN and VPLS

Content

- Design and implementation of docking in HVPN solution
- Design and implementation of IGP in HVPN solution
- Design and implementation of MPLS Tunnel in HVPN solution
- Design and implementation of Ethernet service in HVPN solution
- Design and implementation of TDM/ATM service in HVPN solution
- Design and implementation of HA in HVPN solution
- Design and implementation of QoS in HVPN solution
- Design and implementation of Clock Synchronization in HVPN solution
- U2000 configuration HVPN solution

Training Methods

Lecture, Hands-on exercise, E-lab

Duration

1.5 working days

Class Size

Min 6, max 12

1.3.14 ODN34 IP Backhaul Network Mixed VPN Solution Design and Implementation



Objectives

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

- Design and deploy the Mixed VPN docking program
- Design and deploy Mixed VPN routing protocol
- Design and deploy layered TE tunnel and reliability technology
- Design and deploy hierarchical L2VPN program and technical reliability
- Design and deploy L2VPN+L3VPN program and reliability technology
- Design and deploy the Mixed VPN program QoS technology
- Design and deploy the Mixed VPN program clock synchronization technology

Target Audience

Mobile backhaul network design and deployment of engineers

Mobile backhaul transport dimension for measurement engineers

Prerequisites

- Familiar with the working principle of IGP routing protocol;
- Familiar with the working principle of MPLS VPN including L3VPN and VPLS

Content

- Design and implementation of docking in Mixed VPN solution
- Design and implementation of IGP in Mixed VPN solution
- Design and implementation of MPLS Tunnel in Mixed VPN solution
- Design and implementation of Ethernet service in Mixed VPN solution
- Design and implementation of TDM/ATM service in Mixed VPN solution
- Design and implementation of HA in Mixed VPN solution
- Design and implementation of QoS in Mixed VPN solution
- Design and implementation of Clock Synchronization in Mixed VPN solution
- U2000 configuration Mixed VPN solution

Training Methods

Lecture, Hands-on exercise, E-lab

Duration

1 working day

Class Size

Min 6, max 12

1.3.15 ODN36 IP Backhaul Network Expansion and Optimization



Objectives

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

- Describe the expansion and optimization process
- Complete expansion and optimization on IP backhaul network

Target Audience

Mobile backhaul network design and deployment of engineers

Mobile backhaul transport dimension for measurement engineers

Prerequisites

- Familiar with the working principle of IGP routing protocol;
- Familiar with the working principle of MPLS VPN including L3VPN and VPLS

Content

- How to add new service on IP backhaul network
- How to add a CSG
- How to delete a CSG
- How to change chain to ring
- Add new service on CSG on access ring
- Add a CSG to an access ring
- Delete a CSG from an access ring
- Change chain to ring

Training Methods

Lecture, Hands-on exercise

Duration

1.5 working days

Class Size

Min 6, max 12

1.3.16 ODN37 IP Backhaul Network Protocol Troubleshooting



Objectives

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

- Describe troubleshooting process on IP backhaul network
- Describe troubleshooting locating method on IP backhaul network
- Troubleshooting the ordinary fault of IP backhaul network

Target Audience

Mobile backhaul network design and deployment of engineers

Mobile backhaul transport dimension for measurement engineers

Prerequisites

- Familiar with the working principle of IGP routing protocol;
- Familiar with the working principle of MPLS VPN including L3VPN and VPLS

Content

- IP backhaul network troubleshooting ideas and processes
- IP backhaul network fault location method
- IP backhaul network troubleshooting cases
- Troubleshooting routing protocol problem on IP backhaul network
- Troubleshooting MPLS tunnel problem on IP backhaul network
- Troubleshooting VPN service problem on IP backhaul network

Training Methods

Lecture, Hands-on exercise

Duration

1.5 working days

Class Size

Min 6, max 12

1.3.17 ODL09 LTE Mobile Backhaul 1588v2 Feature



Objectives

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

- Understand basic concepts of synchronization network
- Describe the principle of 1588V2
- Describe the 1588V2 device model, message and BMC algorithm
- Describe the typical application scenarios and deployment of 1588V2
- Outline the planning principles of mainstream 1588V2 network scenarios
- Perform the 1588V2 characteristics of deployment process
- Understand the 1588V2 detection methods

Target Audience

Mobile backhaul network operation and maintenance engineer

Prerequisites

- Having basic experience of telecommunications network

Content

- IEEE 1588v2 Standard Introduction
- IEEE 1588v2 Overview
- IEEE 1588v2 Device Model
- IEEE 1588v2 Messages
- BMC Algorithm
- IEEE 1588v2 Typical Application Scenarios
- IEEE 1588v2 Deployment
- IEEE 1588v2 Standard Introduction
- IEEE 1588v2 Overview
- IEEE 1588v2 Device Model
- IEEE 1588v2 Messages
- BMC Algorithm
- IEEE 1588v2 Typical Application Scenarios
- IEEE 1588v2 Deployment

- IEEE 1588v2 Overview
- IEEE 1588v2 Deployment Planning
- IEEE 1588v2
- Synchronize Ethernet Design
- IEEE 1588v2 Network capability and performance Analysis
- IEEE 1588v2 Reliability Design
- IEEE 1588v2 Network Management Ability Analysis
- IEEE 1588v2 Overview
- IEEE 1588v2 Deployment Planning
- IEEE 1588v2
- Synchronize Ethernet Design
- IEEE 1588v2 Network capability and performance Analysis
- IEEE 1588v2 Reliability Design
- IEEE 1588v2 Network Management Ability Analysis
- Deployment Preparation
- IEEE 1588v2 Network Planning
- IEEE 1588v2 Configuration Process
- IEEE 1588v2 Asymmetry Compensation Analysis
- Deployment Preparation
- IEEE 1588v2 Network Planning
- IEEE 1588v2 Configuration Process
- IEEE 1588v2 Asymmetry Compensation Analysis
- Maintenance and Troubleshooting Methods
- IEEE 1588v2 Maintenance Process
- IEEE 1588v2 Troubleshooting Process
- Maintenance and Troubleshooting Methods
- IEEE 1588v2 Maintenance Process
- IEEE 1588v2 Troubleshooting Process

Training Methods

Lecture

Duration

2 working days

Class Size

Min 6, max 12

1.3.18 ODL10 MBB ATN+CX IDEAL (Seamless MPLS) Solution Introduction



Objectives

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

- Describe Requirement for IDEAL Solution
- Describe Network and Service Design and Implementation of IDEAL Solution

Target Audience

Mobile backhaul network senior operation and maintenance engineer

Prerequisites

- Familiar with the working principle of routing protocol
- Familiar with the working principle of MPLS L3 VPN

Content

- IDEAL Solution Overview
- Logical Network Design and Implementation
- Service Design and Implementation
- Reliability Design and Implementation
- QoS Design and Implementation
- Clock Solution Design and Implementation
- Security Design and Implementation
- OAM Design and Implementation

Training Methods

Lecture

Duration

1 working day

Class Size

Min 6, max 12

1.3.19 ODL11 MBB ATN+CX IDEAL (Seamless MPLS) Solution Design and Configuration



Objectives

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

- Describe Network Protocol Implementation of IDEAL Solution
- Configure Network Protocol of IDEAL Solution
- Describe Service Implementation of IDEAL Solution
- Configure Services of IDEAL Solution

Target Audience

Mobile backhaul network senior operation and maintenance engineer

Prerequisites

- Familiar with the working principle of routing protocol
- Familiar with the working principle of MPLS L3 VPN

Content

- Physical Network Implementation
- Interconnection Implementation
- Basic Configuration Example
- IGP(ISIS/OSPF) Implementation
- IGP Configuration Example
- BGP Implementation
- Route Priority and Routing Policy Implementation
- BGP Configuration Example

- MPLS Tunnel(RSVP-TE/LDP) Implementation
- MPLS Tunnel Configuration Example
- MPLS(BGP LSP) Implementation
- BGP LSP Configuration Example
- ETH (LTE S1/3G) Services Implementation
- ETH (LTE S1/3G) Services Configuration Example
- LTE X2 Services Implementation
- LTE X2 Services Configuration Example
- Enterprise Services Implementation
- Enterprise Services Configuration Example
- QoS Implementation
- QoS Configuration Example
- Clock Synchronization Implementation
- Clock Synchronization Configuration Example
- Network Management Implementation
- Network Management Configuration Example
- IDEAL Solution Network and Service Practice Guide

Training Methods

Lecture, Hands-on exercise

Duration

4 working days

Class Size

Min 6, max 12

1.3.20 ODL14 ATN Series Products Layer2 Feature Design and Deployment



Objectives

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

- Describe eth-trunk implementation
- Describe eth-trunk forwarding
- Describe LACP function
- Configure Eth-Trunk in ATN products
- Describe functions of QinQ
- Describe how QinQ is implemented
- Describe how selective QinQ is implemented
- Configure QinQ and selective QinQ on ATN products

Target Audience

ATN Series Product Operation and maintenance engineers

Prerequisites

- Familiar with basic knowledge of data

communications

Content

- Eth-Trunk overview
- LACP protocol overview
- Eth-Trunk practice
- QinQ overview
- Selective QinQ overview
- QinQ Practice

Training Methods

Lecture, Hands-on exercise

Duration

1 working day

Class Size

Min 6, max 12

1.3.21 ODL15 ATN Series Products IGP Feature Design and Deployment



Objectives

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

- Describes IGP routing protocol functions
- Describe IGP routing protocol basic concepts
- Configure IGP routing protocol

Target Audience

ATN Series Product Operation and maintenance engineers

Prerequisites

- Familiar with basic knowledge of data communications

Content

- OSPF overview
- Basic OSPF concepts

- OSPF route calculation
- OSPF fast convergence
- OSPF Practice
- IS-IS overview
- IS-IS basic concepts
- IS-IS route calculation
- IS-IS fast convergence
- IS-IS Practice

Training Methods

Lecture, Hands-on exercise

Duration

1 working day

Class Size

Min 6, max 12

1.3.22 ODL16 ATN Series Products Fixed Network Service Design and Deployment



Objectives

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

- Describe the concept and architecture of MPLS L2VPN
- Describe the implementation of Ethernet service emulation
- Configure E-Line services

Target Audience

ATN Series Product Operation and maintenance engineers

Prerequisites

- Familiar with basic knowledge of data

communications

Content

- MPLS L2VPN overview
- Ethernet service emulation
- E-Line service configuration practice

Training Methods

Lecture, Hands-on exercise

Duration

1 working day

Class Size

Min 6, max 12

1.3.23 ODL17 ATN Series Products OAM Feature Design and Deployment



Objectives

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

- Introduce the Huawei ATN EDD solution
- Describe the concept and principle of RFC2544
- Describe the concept and principle of basic Y.1731 functions
- Describe the concept and principle of HQoS
- Configure EDD
- Describe the concept and principle of Ethernet OAM
- Describe the concept and principle of MPLS-TP OAM
- Configure OAM
- Describe the concept and principle of Ethernet OAM.
- Describe the concept and principle of MPLS-TP OAM.
- Configure OAM.

Target Audience

ATN Series Product Operation and maintenance engineers

Prerequisites

- Familiar with basic knowledge of data communications

Content

- Huawei ATN EDD solution
- The concept and principle of RFC2544
- The concept and principle of basic Y.1731 functions
- The concept and principle of HQoS
- EDD configuration
- Ethernet OAM overview
- MPL-TP OAM overview
- OAM configuration practice

Training Methods

Lecture, Hands-on exercise

Duration

1.5 working days

Class Size

Min 6, max 12

1.3.24 ODL18 IP Backhaul Network Advanced Troubleshooting



Objectives

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

- Describe IP backhaul network problem scenario
- Describe IP backhaul network troubleshooting process
- Describe routing protocol problem handling process for IP backhaul network
- Describe MPLS tunnel problem handling process for IP backhaul network
- Describe VPN Service problem handling process for IP backhaul network
- Complete IP backhaul network problem analysis and troubleshooting

Target Audience

Mobile backhaul network design and deployment of engineers

Mobile backhaul transport dimension for measurement engineers

Prerequisites

- A general understanding of relative network protocols
- At least 1 year of experiences in the operation and maintenance of data communication equipment

Content

- IP backhaul network standard solution introduction
- IP backhaul network problem classification
- IP backhaul network problem troubleshooting process

- Routing protocol application in IP backhaul network
- Troubleshooting ISIS-Related problem
- Troubleshooting BGP-Related problem
- IP backhaul network routing protocol problem case analysis
- MPLS tunnel application in IP backhaul network
- Troubleshooting MPLS TE-related problem
- IP backhaul network MPLS TE problem case analysis
- HVPN solution application in IP backhaul network
- Troubleshooting MPLS L3VPN problem
- IP backhaul network HVPN solution problem case analysis
- Mixed VPN solution application in IP backhaul network
- Troubleshooting MPLS L2VPN problem
- Troubleshooting MPLS L2VPN problem
- IP backhaul network Mixed VPN solution problem case analysis
- IP backhaul network live network problem case analysis and discussion
-

Training Methods

Lecture, Hands-on exercise

Duration

5 working days

Class Size

Min 6, max 12

1.3.25 ODP02 PTN Products System Overview



Objectives

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

- Describe PTN Products system features

Target Audience

This course is intended for technical or non-technical management personnel who require a general understanding of PTN IP RAN solutions

Prerequisites

- Having an overview of telecommunications

Content

- PTN products & its applications
- Features and applications of PTN 3900 & 1900
- Features and applications of PTN 950 & 910 & 912

Training Methods

Lecture, Demo

Duration

0.5 working day

Class Size

Min 6, max 12

1.3.26 ODP03 PTN Products Hardware Description



Objectives

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

- Describe PTN Frame-Shaped Series hardware structure
- Describe PTN Case-Shaped Series hardware structure

Target Audience

This course is intended for Installation and commissioning engineers 1st /2nd Line maintenance engineers and network planning and design engineers

Prerequisites

- Having an overview of PTN products applications
- Having an overview of telecommunications

Content

- Networking applications of the PTN Frame-Shaped series products

- System structure of the PTN Frame-Shaped series products
- Main functions of the boards used on the PTN Frame-Shaped series products
- System protection schemes of the PTN Frame-Shaped series products
- PTN Case-Shaped series products application
- PTN Case-Shaped series products chassis
- PTN Case-Shaped series products boards

Training Methods

Lecture, Demo

Duration

1 working day

Class Size

Min 6, max 12

1.3.27 ODP04 PTN Products Features Description



Objectives

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

- Describe PTN Frame-Shaped Series software feature
- Describe PTN Case-Shaped Series software feature

Target Audience

This course is intended for 1st /2nd /3rd Line maintenance engineers and network planning and design engineers

Prerequisites

- Having an overview of PTN products applications
- Having an overview of telecommunications

Content

- PTN Frame-Shaped series products applications
- PTN Frame-Shaped series products protection features
- PTN Frame-Shaped series products QoS

features

- PTN Frame-Shaped series products OAM features
- PTN Frame-Shaped series products synchronization features
- PTN Frame-Shaped series products In-band DCN features
- Service type of PTN Case-Shaped series products
- Microwave feature of PTN Case-Shaped series products
- PTN Case-Shaped series products protection, QoS, OAM, Synchronization, xDSL features etc.

Training Methods

Lecture

Duration

1 working day

Class Size

Min 6, max 12

1.3.28 ODP05 PTN Products Installation and Commissioning



Objectives

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

- Describe PTN 3900 & 1900 Installation and the precautions
- Describe PTN 950 & 910 Installation and the precautions

Target Audience

This course is intended for installation and commissioning engineers

Prerequisites

- Completion of course “PTN Products Hardware Description” or having equivalent knowledge of PTN products hardware

Content

- Cabinet installation
- PTN 3900 sub-rack installation
- PTN 1900 sub-rack installation
- Precautions of installation
- PTN 950 installation
- PTN 910 installation
- Checking process after installation

Training Methods

Lecture, Demo

Duration

1 working day

Class Size

Min 6, max 12

1.3.29 ODP06 PTN Products Field Maintenance



Objectives

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

- Describe PTN 3900 & 1900 On-Site maintenance
- Describe PTN 950 & 910 On-Site maintenance
- Describe 3900 & 1900 troubleshooting
- Describe 950 & 910 troubleshooting

Target Audience

This course is intended for 1st Line /Field maintenance engineers

Prerequisites

- Completion of course “PTN Products Hardware Description” or having equivalent knowledge of PTN products hardware

Content

- Routine maintenance in NMS Center
- On-site routine maintenance
- Routine maintenance of spare parts
- Understand the meanings of PTN 950 & 910 & 912 indicators

Training Methods

Lecture, Hands-on exercise

Duration

0.5 working day

Class Size

Min 6, max 12

1.3.30 ODP07 PTN Products Routine Maintenance in NOC



Objectives

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

- Describe PTN Products routine maintenance
- Describe the tools and method of routine maintenance in NOC

Target Audience

This course is intended for 2nd Line maintenance engineers

Prerequisites

- Completion of course “PTN Products Hardware Description” and “PTN Products Features Description” or having equivalent knowledge of PTN products

- Having the experience of using NMS to manage telecom equipments

Content

- Tools and method of routine maintenance in NOC.

Training Methods

Lecture, Hands-on exercise

Duration

0.5 working day

Class Size

Min 6, max 12

1.3.31 ODP08 PTN Products Public Principle



Objectives

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

- Describe TCP&IP basic concepts
- Describe Ethernet basic principle
- Describe basic IP routing protocol works
- Describe MPLS basic concepts

Target Audience

This course is intended for 2nd/3rd Line maintenance engineers and network planning and design engineers

Prerequisites

- Having TCP/IP fundamental knowledge

Content

- TCP/IP and OSI Reference Model
- Function of layers of TCP/IP
- Describe classification of IP addresses
- Basic principle of IP routing

- Ethernet physical layer
- Ethernet data link layer
- VLAN technology and its applications
- MSTP technology and its applications
- What are router and route
- Classification of routing protocols
- How IS-IS routing protocol works
- MPLS concepts
- How LSP is setup and how MPLS forward packets
- Common ways of MPLS troubleshooting
- MPLS OAM concepts and applications

Training Methods

Lecture

Duration

2 working days

Class Size

Min 6, max 12

1.3.32 ODP09 PTN Products Public Features



Objectives

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

- Describe PTN products PWE3 technology
- Describe PTN products control plane
- Describe PTN products QoS technology
- Describe PTN products protection technology
- Describe PTN products packet clock technology

Target Audience

This course is intended for 2nd/3rd Line maintenance engineers and network planning and design engineers

Prerequisites

- Completion of “PTN Products Hardware Description” / “PTN Products Features Description” courses or having the equivalent PTN products knowledge
- Completion of “PTN Products Public Principle” course or having the equivalent knowledge

Content

- Basic concepts of PWE3
- How TDM service is emulated by PWE3
- How ATM service is emulated by PWE3
- How Ethernet service is emulated by PWE3

- Typical applications of different service type
- Four elements of MPLS TE
- How IS-IS TE distribute the TE information
- How the TE path is calculated
- How RSVP-TE works
- Basic principle of LDP
- QoS model
- QoS basic concept
- ATM QoS
- Concepts of the HQoS
- QoS typical application in PTN network
- MPLS APS and MPLS FRR protection
- LMSP protection
- Ethernet LAG protection
- E1-link protection
- Necessity of synchronization on IP network
- Principle of ACR/TOP
- Principle of synchronization Ethernet
- IEEE 1588v2 principle

Training Methods

Lecture, Demo

Duration

2 working days

Class Size

Min 6, max 12

1.3.33 ODP10 PTN Products Basic Configuration



Objectives

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

- Configure PTN products basic parameters
- Configure PTN products interfaces
- Configure PTN products control plane
- Configure PTN products MPLS tunnel

Target Audience

This course is intended for 2nd and 3rd Line maintenance engineers

Prerequisites

- Completion of “PTN Products Hardware Description” / “PTN Products Features Description” courses or having the equivalent PTN products knowledge
- Completion of “PTN Products Public Principle” course or having the equivalent knowledge
- Completion of “PTN Products Public Features” course or having the equivalent knowledge

Content

- Starting U2000

- Creating network using U2000
- Configuration flow of SDH interface
- SDH interface configuration using T2000
- Parameters of SDH interface
- Basic configuration of Control plane
- IS-IS configuration process
- LDP configuration process
- RSVP configuration process
- Static route configuration process
- Dynamic MPLS Tunnel Configuration
- Static MPLS Tunnel Configuration
- U2000 basic operation through practice
- Interface configuration
- Tunnel configuration

Training Methods

Hands-on exercise, Demo

Duration

1 working day

Class Size

Min 6, max 12

1.3.34 ODP11 PTN Products Service Configuration



Objectives

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

- Configure PTN products CES service
- Configure PTN products ATM service
- Configure PTN products E-Line service
- Configure PTN products E-LAN service
- Configure PTN products E-AGGR service

Target Audience

This course is intended for 2nd and 3rd Line maintenance engineers

Prerequisites

- Completion of “PTN Products Hardware Description” / “PTN Products Features Description” courses or having the equivalent PTN products knowledge
- Completion of “PTN Products Public Principle” course or having the equivalent knowledge of IP
- Completion of “PTN Products Public Features” course or having the equivalent knowledge of PTN features

- Completion of “PTN Products Basic Configuration” course or having the experience of U2000 operation

Content

- Using trail function to configure CES service
- CES service configuration process based on per-NE basis
- E-Line service configuration
- E-Line service related parameters
- Using trail function to configure ATM service
- ATM service configuration process based on per-NE basis
- E-LAN service configuration
- E-LAN service related parameters

Training Methods

Hands-on exercise, Demo

Duration

2 working days

Class Size

Min 6, max 12

1.3.35 ODP12 PTN Products Advanced Configuration



Objectives

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

- Configure PTN products QoS features
- Configure PTN products protection
- Deploy PTN products integrated services

Target Audience

This course is intended for 3rd Line maintenance engineers

Prerequisites

- Completion of "PTN Products 2nd Line Maintenance Training" or having the equivalent PTN products knowledge

Content

- MPLS APS protection configuring process
- MPLS FRR protection configuring process
- Ethernet LAG configuring process
- Creating a DiffServ Domain
- Creating the Service WRED Policy
- Creating the WFQ Scheduling Policy

- Creating the Port Policy
- Creating the V-UNI Ingress Policy
- Creating the V-UNI Egress Policy
- Creating the PW Policy
- Creating the QinQ Policy
- Configuring the ATM CoS Mapping
- Creating the ATM Policy
- End-to-end CES service configuration
- End-to-end ATM service configuration
- End-to-end E-Line service configuration
- End-to-end E-LAN service configuration
- End-to-end E-Aggr service configuration

Training Methods

Hands-on exercise, Demo

Duration

2 working days

Class Size

Min 4, max 12

1.3.36 ODP13 PTN Products Basic Troubleshooting



Objectives

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

- Describe PTN products basic troubleshooting process

Target Audience

This course is intended for 2nd/3rd Line maintenance engineers

Prerequisites

- Completion of “PTN Products Hardware Description” / “PTN Products Features Description” courses or having the equivalent PTN products knowledge
- Completion of “PTN Products Public Principle” course or having the equivalent knowledge of IP
- Completion of “PTN Products Public Features” course or having the equivalent knowledge of

PTN features

- Completion of “PTN Products Basic Configuration” course or having the experience of U2000 operation

Content

- Fault handing flow
- Familiar with methods of analyzing and locating faults
- Regular operations for troubleshooting
- Software package loading & diffusion

Training Methods

Lecture, Hands-on exercise

Duration

0.5 working day

Class Size

Min 6, max 12

1.3.37 ODP14 PTN Products Advanced Troubleshooting



Objectives

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

- Describe PTN products alarm and performance analysis
- Describe PTN products common troubleshooting case
- Locate and eliminate PTN products faults

Target Audience

This course is intended for 3rd Line maintenance engineers

Prerequisites

- Completion of "PTN Products 2nd Line Maintenance Training" or having the equivalent PTN products knowledge

Content

- PTN Products Alarm and Performance Analysis

- DCN Communication Faults
- Operation Fails
- Interconnection Faults
- Service Faults
- Network Topology and Parameter Settings
- Troubleshooting of Faults of the NMS and DCN
- Troubleshooting of Control Plane Faults
- Tunnel Fault Troubleshooting
- CES Service Troubleshooting
- Ethernet Service Troubleshooting
- ATM Service Troubleshooting

Training Methods

Lecture, Hands-on exercise, Case-study

Duration

2.5 working days

Class Size

Min 4, max 12

1.3.38 ODP17 PTN Ring Protection Feature



Objectives

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

- Describe PTN Ring Protection working principle
- Configure PTN Ring Protection

Target Audience

This course is intended for 2nd/3rd Line maintenance engineers and network planning and design engineers

Prerequisites

- PTN Ring Protection Feature Introduction

Content

- PTN Ring Protection Basic Concepts
- PTN Ring Protection Switchover
- PTN Ring Protection Application
- PTN Ring Protection Practice

Training Methods

Lecture

Duration

1 working day

Class Size

Min 6, max 12

1.3.39 ODP32 PTN 6900 Products Hardware Description



Objectives

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

- Describe PTN 6900 series hardware structure
- Describe PTN 6900 series boards

Target Audience

This course is intended for Installation and commissioning engineers 1st /2nd Line maintenance engineers and network planning and design engineers

Prerequisites

- Having an overview of PTN 6900 products applications
- Having an overview of telecommunications

Content

- PTN 6900-3/8/16 products application scenarios
- Cabinet and system overview
- PTN 6900 boards introduction

Training Methods

Lecture

Duration

0.5 working day

Class Size

Min 6, max 12

1.3.40 ODP33 PTN 6900 Products Features Description



Objectives

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

- Describe PTN 6900 series software feature

Target Audience

This course is intended for 1st /2nd /3rd Line maintenance engineers and network planning and design engineers

Prerequisites

- Having an overview of PTN 6900 products applications
- Having an overview of telecommunications

Content

- PTN 6900 service features
- PTN 6900 routing features
- PTN 6900 protection features
- PTN 6900 OAM features
- PTN 6900 QoS features
- PTN 6900 synchronization features

Training Methods

Lecture

Duration

0.5 working day

Class Size

Min 6, max 12

1.3.41 ODP34 PTN 6900 Products Installation and Commissioning



Objectives

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

- Describe PTN 6900 products installation and the precautions

Target Audience

This course is intended for installation and commissioning engineers

Prerequisites

- Completion of course “PTN 6900 Products Hardware Description” or having equivalent knowledge of PTN 6900 products hardware

Content

- Installation preparation
- PTN 6900 installation guide
- Checking process after installation
- Safety operation guide
- Preparations for commissioning
- On-Site commissioning

Training Methods

Lecture, Demo

Duration

0.5 working day

Class Size

Min 6, max 12

1.3.42 ODP35 PTN 6900 Products Routine Maintenance in NOC



Objectives

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

- Describe PTN 6900 products routine maintenance
- Describe the tools and method of routine maintenance in NOC

Target Audience

This course is intended for 2nd Line maintenance engineers

Prerequisites

- Completion of course “PTN 6900 Products Hardware Description” and “PTN 6900 Products Features Description” or having equivalent knowledge of PTN 6900 products
- Having the experience of using NMS to

manage telecom equipments

Content

- Maintenance items and operations
- Dustproof maintenance of the fevice
- Operations involving risks
- Overview of parts replacement
- Replacing boards
- Replacing other parts

Training Methods

Lecture, Demo

Duration

0.5 working day

Class Size

Min 6, max 12

1.3.43 ODP36 PTN 6900 Products Public Principle



Objectives

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

- Describe TCP&IP basic concepts
- Describe Ethernet basic principle
- Describe basic IP routing protocol works

Target Audience

This course is intended for 2nd/3rd Line maintenance engineers and network planning and design engineers

Prerequisites

- Having TCP/IP fundamental knowledge

Content

- TCP/IP and OSI Reference Model
- Function of layers of TCP/IP
- Describe classification of IP addresses

- Basic principle of IP routing
- Ethernet physical layer
- Ethernet data link layer
- VLAN technology and its applications
- MSTP technology and its applications
- What is router and route
- Classification of routing protocols
- How IS-IS routing protocol works

Training Methods

Lecture

Duration

1 working day

Class Size

Min 6, max 12

1.3.44 ODP37 PTN 6900 Products Public Features



Objectives

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

- Describe routing protocol technology
- Describe MPLS/MPLS TE technology
- Describe MPLS L3VPN technology
- Describe protection technology
- Describe QoS technology
- Describe clock synchronization technology

Target Audience

This course is intended for 2nd/3rd Line maintenance engineers and network planning and design engineers

Prerequisites

- Completion of “PTN 6900 Products Hardware Description” / “PTN 6900 Products Features Description” courses or having the equivalent PTN 6900 products knowledge
- Completion of “PTN 6900 Products Public Principle” course or having the equivalent knowledge

Content

- IS-IS overview
- IS-IS basic concepts
- IS-IS route calculation
- IS-IS fast convergence
- PTN 6900 network ISIS planning
- BGP overview
- BGP working principles
- BGP route attributes
- BGP extended applications
- Reliability technology overview
- Fast detection technology

- Reliability technologies
- MPLS basics
- Static MPLS tunnels
- Dynamic MPLS LDP tunnels
- MPLS TE overview
- Working Principles of MPLS TE
- MPLS Tunnel APS Protection
- MPLS Tunnel configuration
- MPLS L2VPN overview
- TDM Service emulation
- ATM service emulation
- Ethernet service emulation
- L2VPN service protection techniques
- Service and reliability configuration
- MPLS BGP VPN overview
- Implementation principles of MPLS BGP VPN
- MPLS BGP VPN service protection techniques
- QoS measurement counters
- QoS models
- IP & MPLS QoS technology
- ATM QoS technology
- Analysis of QoS requirements for wireless services
- Mobile network synchronization requirements
- Mobile network synchronization system
- Implementation of time synchronization on mobile networks

Training Methods

Lecture

Duration

4 working days

Class Size

Min 6, max 12

1.3.45 ODP38 PTN 6900 Products Service Configuration



Objectives

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

- Configure basic parameters
- Configure mpls tunnel
- Configure CES service
- Configure ATM service
- Configure ETH L2 service
- Configure ETH L3 service

Target Audience

This course is intended for 2nd/3rd Line maintenance engineers and network planning and design engineers

Prerequisites

- Completion of “PTN 6900 Products Hardware Description” / “PTN 6900 Products Features Description” courses or having the equivalent PTN 6900 products knowledge
- Completion of “PTN 6900 Products Public Principle” course or having the equivalent knowledge of IP
- Completion of “PTN 6900 Products Public Features” course or having the equivalent knowledge of PTN 6900 features
- Completion of “PTN 6900 Products Basic Configuration” course or having the experience of U2000 operation

Content

- Starting U2000
- Creating network and discovering devices using U2000
- Interface configuration by using U2000
-
- IS-IS configuration for legacy PTN
- IS-IS configuration for PTN 6900
-
- Control plane parameters configuration
- E2E MPLS Tunnels configuration
- MPLS tunnel APS 1:1 protection configuration
- E-APS configuration
- E2E TDM PW APS 1:1 protection
- AC-Side E-APS 1:1 protection
- E2E ATM PW APS 1:1 protection
- E2E ETH PW APS 1:1 protection
- MP-BGP configuration for PTN 6900
- MP-BGP configuration for legacy PTN
- E2E ETH L3 VPN protection

Training Methods

Hands-on exercise, Demo, E-lab

Duration

3.5 working days

Class Size

Min 6, max 12

1.3.46 ODP39 PTN 6900 Products Advanced Configuration



Objectives

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

- Configure QoS in mobile backhaul network
- Configure clock synchronization in mobile backhaul network

Target Audience

This course is intended for 3rd Line maintenance engineers and network planning and design engineers

Prerequisites

- Completion of "PTN 6900 Products 2nd Line Maintenance Training" or having the equivalent

PTN 6900 products knowledge

Content

- QoS configuration in mobile backhaul network
- Clock Syn configuration in mobile backhaul network

Training Methods

Hands-on exercise, Demo

Duration

1 working day

Class Size

Min 6, max 12

1.3.47 ODP40 PTN 6900 Products Basic Troubleshooting



Objectives

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

- Describe basic troubleshooting process

Target Audience

This course is intended for 2nd/3rd Line maintenance engineers and network planning and design engineers

Prerequisites

- Completion of “PTN 6900 Products Hardware Description” / “PTN 6900 Products Features Description” courses or having the equivalent PTN 6900 products knowledge
- Completion of “PTN 6900 Products Public Principle” course or having the equivalent knowledge of IP
- Completion of “PTN 6900 Products Public Features” course or having the equivalent

knowledge of PTN 6900 features

- Completion of “PTN 6900 Products Basic Configuration” course or having the experience of U2000 operation

Content

- Fault processing flow
- Familiar with methods of analyzing and locating faults
- Regular operations for troubleshooting

Training Methods

Lecture

Duration

0.5 working day

Class Size

Min 6, max 12

1.3.48 ODP41 PTN 6900 Products Advanced Troubleshooting



Objectives

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

- Describe alarm and performance analysis
- Describe common troubleshooting case
- Locate and eliminate PTN products faults

Target Audience

This course is intended for 3rd Line maintenance engineers and network planning and design engineers

Prerequisites

- Completion of "PTN 6900 Products 2nd Line Maintenance Training" or having the equivalent

PTN 6900 products knowledge

Content

- Performance monitoring and analysis
- Troubleshooting case study
- Troubleshooting practice

Training Methods

Lecture, Hands-on exercise

Duration

3 working days

Class Size

Min 6, max 12

1.3.49 ODP43 PTN 7900 Products Hardware Description



Objectives

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

- Describe PTN 7900 series hardware structure
- Describe PTN 7900 series boards

Target Audience

This course is intended for Installation and commissioning engineers 1st /2nd Line maintenance engineers and network planning and design engineers

Prerequisites

- Having an overview of PTN 7900 products applications

- Having an overview of telecommunications

Content

- PTN 7900 products application scenarios
- Cabinet and system overview
- PTN 7900 boards introduction

Training Methods

Lecture

Duration

0.5 working day

Class Size

Min 6, max 12

1.3.50 ODP44 PTN 7900 Products Features Description



Objectives

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

- Describe PTN 7900 series software feature

Target Audience

This course is intended for 1st /2nd /3rd Line maintenance engineers and network planning and design engineers

Prerequisites

- Having an overview of PTN 7900 products applications
- Having an overview of telecommunications

Content

- PTN 7900 service features
- PTN 7900 protection features
- PTN 7900 OAM features
- PTN 7900 QoS features
- PTN 7900 synchronization features

Training Methods

Lecture

Duration

0.5 working day

Class Size

Min 6, max 12

1.3.51 ODP45 PTN 7900 Products Installation and Commissioning



Objectives

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

- Describe PTN 7900 products installation and the precautions

Target Audience

This course is intended for installation and commissioning engineers

Prerequisites

- Completion of course “PTN 7900 Products Hardware Description” or having equivalent knowledge of PTN 7900 products hardware

Content

- Installation preparation
- PTN 7900 installation guide
- Checking process after installation
- Safety operation guide
- Preparations for commissioning
- On-Site commissioning

Training Methods

Lecture, Demo

Duration

0.5 working day

Class Size

Min 6, max 12

1.3.52 ODP46 PTN 7900 Products Routine Maintenance in NOC



Objectives

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

- Describe PTN 7900 products routine maintenance
- Describe the tools and method of routine maintenance in NOC

Target Audience

This course is intended for 2nd Line maintenance engineers

Prerequisites

- Completion of course “PTN 7900 Products Hardware Description” and “PTN 6900 Products Features Description” or having equivalent knowledge of PTN 7900 products
- Having the experience of using NMS to

manage telecom equipments

Content

- Maintenance items and operations
- Dustproof maintenance of the fevice
- Operations involving risks
- Overview of parts replacement
- Replacing boards
- Replacing other parts

Training Methods

Lecture, Demo

Duration

0.5 working day

Class Size

Min 6, max 12

1.3.53 ODP47 PTN 7900 Products Public Principle



Objectives

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

- Describe TCP&IP basic concepts
- Describe Ethernet basic principle
- Describe basic IP routing protocol works

Target Audience

This course is intended for 2nd/3rd Line maintenance engineers and network planning and design engineers

Prerequisites

- Having TCP/IP fundamental knowledge

Content

- TCP/IP and OSI Reference Model
- Function of layers of TCP/IP
- Describe classification of IP addresses

- Basic principle of IP routing
- Ethernet physical layer
- Ethernet data link layer
- VLAN technology and its applications
- MSTP technology and its applications
- What is router and route
- Classification of routing protocols
- How IS-IS routing protocol works

Training Methods

Lecture

Duration

1 working day

Class Size

Min 6, max 12

1.3.54 ODP48 PTN 7900 Products Public Features



Objectives

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

- Describe routing protocol technology
- Describe MPLS/MPLS TE technology
- Describe MPLS L3VPN technology
- Describe protection technology
- Describe QoS technology
- Describe clock synchronization technology

Target Audience

This course is intended for 2nd/3rd Line maintenance engineers and network planning and design engineers

Prerequisites

- Completion of “PTN 7900 Products Hardware Description” / “PTN 7900 Products Features Description” courses or having the equivalent PTN 6900 products knowledge
- Completion of “PTN 7900 Products Public Principle” course or having the equivalent knowledge

Content

- IS-IS overview
- IS-IS basic concepts
- IS-IS route calculation
- IS-IS fast convergence
- PTN 6900 network ISIS planning
- BGP overview
- BGP working principles
- BGP route attributes
- BGP extended applications
- Reliability technology overview

- Fast detection technology
- Reliability technologies
- MPLS basics
- Static MPLS tunnels
- Dynamic MPLS LDP tunnels
- E2E MPLS Tunnels configuration
- MPLS tunnel protection configuration
- MPLS L2VPN overview
- TDM Sservice emulation
- ATM service emulation
- Ethernet service emulation
- L2VPN service protection techniques
- Service and reliability configuration
- MPLS BGP VPN overview
- Implementation principles of MPLS BGP VPN
- MPLS BGP VPN service protection techniques
- QoS measurement counters
- QoS models
- IP & MPLS QoS technology
- ATM QoS technology
- Analysis of QoS requirements for wireless services
- Mobile network synchronization requirements
- Mobile network synchronization system
- Implementation of time synchronization on mobile networks

Training Methods

Lecture

Duration

4 working days

Class Size

Min 6, max 12

1.3.55 ODP49 PTN 7900 Products Service Configuration



Objectives

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

- Configure basic parameters
- Configure mpls tunnel
- Configure CES service
- Configure ATM service
- Configure ETH L2 service
- Configure ETH L3 service

Target Audience

This course is intended for 2nd/3rd Line maintenance engineers and network planning and design engineers

Prerequisites

- Completion of “PTN 7900 Products Hardware Description” / “PTN 7900 Products Features Description” courses or having the equivalent PTN 6900 products knowledge
- Completion of “PTN 7900 Products Public Principle” course or having the equivalent knowledge of IP
- Completion of “PTN 7900 Products Public Features” course or having the equivalent knowledge of PTN 6900 features
- Completion of “PTN 7900 Products Basic Configuration” course or having the experience of U2000 operation

Content

- Starting U2000
- Creating network and discovering devices using U2000
- Interface configuration by using U2000
- IS-IS configuration for legacy PTN
- IS-IS configuration for PTN 7900
-
- Control plane parameters configuration
- E2E MPLS Tunnels configuration
- MPLS tunnel APS 1:1 protection configuration
- E-APS configuration
- E2E TDM PW APS 1:1 protection
- AC-Side E-APS 1:1 protection
- E2E ATM PW APS 1:1 protection
- E2E ETH PW APS 1:1 protection
- MP-BGP configuration for PTN 7900
- E2E ETH L3 VPN protection

Training Methods

Hands-on exercise, Demo, E-lab

Duration

3.5 working days

Class Size

Min 6, max 12

1.3.56 ODP50 PTN 7900 Products Advanced Configuration



Objectives

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

- Configure QoS in mobile backhaul network
- Configure clock synchronization in mobile backhaul network

Target Audience

This course is intended for 3rd Line maintenance engineers and network planning and design engineers

Prerequisites

- Completion of "PTN 7900 Products 2nd Line Maintenance Training" or having the equivalent PTN 7900 products knowledge

Content

- QoS measurement counters

- QoS models
- IP & MPLS QoS technology
- ATM QoS technology
- Analysis of QoS requirements for wireless services
- Mobile network synchronization requirements
- Mobile network synchronization system
- Implementation of time synchronization on mobile networks

Training Methods

Hands-on exercise, Demo

Duration

1 working day

Class Size

Min 6, max 12

1.3.57 ODP51 PTN 7900 Products Basic Troubleshooting



Objectives

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

- Describe basic troubleshooting process

Target Audience

This course is intended for 2nd/3rd Line maintenance engineers and network planning and design engineers

Prerequisites

- Completion of “PTN 7900 Products Hardware Description” / “PTN 7900 Products Features Description” courses or having the equivalent PTN 6900 products knowledge
- Completion of “PTN 7900 Products Public Principle” course or having the equivalent knowledge of IP
- Completion of “PTN 7900 Products Public Features” course or having the equivalent

knowledge of PTN 7900 features

- Completion of “PTN 7900 Products Basic Configuration” course or having the experience of U2000 operation

Content

- Fault processing flow
- Familiar with methods of analyzing and locating faults
- Regular operations for troubleshooting

Training Methods

Lecture

Duration

0.5 working day

Class Size

Min 6, max 12

1.3.58 ODP52 PTN 7900 Products Advanced Troubleshooting



Objectives

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

- Describe alarm and performance analysis
- Describe common troubleshooting case
- Locate and eliminate PTN products faults

Target Audience

This course is intended for 3rd Line maintenance engineers and network planning and design engineers

Prerequisites

- Completion of "PTN 7900 Products 2nd Line Maintenance Training" or having the equivalent

PTN 7900 products knowledge

Content

- Performance monitoring and analysis
- Troubleshooting case study
- Troubleshooting practice

Training Methods

Lecture, Hands-on exercise

Duration

3 working days

Class Size

Min 6, max 12

1.4 IP Network OSS Training Course Descriptions

1.4.1 ODM10 iManager U2000 Operation and Maintenance Solution



Objectives

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

- Describe the operation and maintenance challenges in the IP backhaul network
- Describe Huawei iManager U2000 end-to-end network management solutions
- Describe the value of U2000 in the IP backhaul network cell deployment
- Describe the value of U2000 in the IP backhaul network service deployment
- Describe the value of U2000 in the IP backhaul network service maintenance
- Describe the value of U2000 in the IP backhaul network fault troubleshooting

Target Audience

Operation manager
Technical manager

Prerequisites

- Having basic knowledge of Datacom

Content

- U2000 system structure
- U2000 system functions

- U2000 system common operation
- IP backhaul network alarm management highlight
- Visualized service path troubleshooting
-
- The challenge of IP backhaul network maintenance
- iManager U2000 end to end service management
- Using U2000 to implement IP backhaul network plug and play
- Visualized service deployment
- Minute-level Automatic Fault Locating

Training Methods

Lecture

Duration

0.5 working day

Class Size

Min 6, max 12

1.4.2 ODM11 iManager U2000 IP Backhaul Network Deployment



Objectives

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

- Describe basic concepts of plug and play
- Describe the steps of the plug and play in the IP backhaul network
- Use U2000 to complete the plug and play

Target Audience

Mobile backhaul network planning and design engineer

Prerequisites

- Having basic knowledge of Datacom

Content

- U2000 server deploying mode
- DCN type

- How to select U2000 server
- How to implement plug and play
- How to plan plug and play
- Plug and play configuration by U2000
-
- Plug and play process
- Using U2000 to Practice plug and play

Training Methods

Lecture, Hands-on exercise

Duration

1 working day

Class Size

Min 6, max 12

1.4.3 ODM12 iManager U2000 IP Network Monitoring



Objectives

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

- Describe The purpose of the IP network performance monitoring
- Describe the method of IP network performance monitoring
- Use U2000 to complete the IP network performance monitoring

Target Audience

Mobile backhaul network operation and maintenance engineer

Prerequisites

- Having basic knowledge of Datacom

- Familiar with operation of iManager U2000

Content

- The purpose of monitor IP network
- Operations of U2000 report manager
- Using U2000 to monitor IP network
-

Training Methods

Lecture, Hands-on exercise

Duration

1 working day

Class Size

Min 6, max 12

1.4.4 ODM13 iManager U2000 IP Backhaul Network Service Management



Objectives

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

- Describe the common service of the IP backhaul network
- Describe L3VPN service implementation in the IP backhaul network
- Use U2000 to complete the L3VPN service management and configuration
- Describe PWE3 service implementation in the IP backhaul network
- Use U2000 to complete the PWE3 service management and configuration
- Describe VPLS service implementation in the IP backhaul network
- Use U2000 to complete the VPLS service management and configuration
- Describe HVPN service implementation in the IP backhaul network
- Use U2000 to complete the HVPN service management and configuration
- Describe Mixed VPN service implementation in the IP backhaul network
- Use U2000 to complete the Mixed VPN service management and configuration

Target Audience

Mobile backhaul network operation and maintenance engineer

Prerequisites

- Familiar with the working principle of IGP routing protocol

- Familiar with the working principle of MPLS VPN including L3VPN、VPLS and PWE3

Content

- Introducing L3VPN service basic concept
- Using U2000 to deploy L3VPN service
- L3VPN service configuring procedure
- Using U2000 to configure L3VPN service
- Introducing PWE3 service basic concept
- Using U2000 to deploy PWE3 service
- PWE3 service configuring procedure
- Using U2000 to configure PWE3 service
- Introducing VPLS service basic concept
- Using U2000 to deploy VPLS service
- VPLS service configuring procedure
- Using U2000 to configure VPLS service
- Introducing HVPN service basic concept
- Using U2000 to deploy HVPN service
- HVPN service configuring procedure
- using U2000 to configure HVPN service
- Introducing Mixed VPN service basic concept
- Using U2000 to deploy Mixed VPN service
- Mixed VPN service configuring procedure
- Using U2000 to configure Mixed VPN service

Training Methods

Lecture, Hands-on exercise,E-lab

Duration

4.5 working days

Class Size

Min 6, max 12

1.4.5 ODM14 iManager U2000 IP Backhaul Network Service Assurance



Objectives

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

- Describe the challenges of IP backhaul network maintenance
- Describe the U2000 alarm management
- Use U2000 to configure alarm management
- Describe the U2000 fault location and processing methods
- Use U2000 troubleshooting in the IP backhaul network

Target Audience

Mobile backhaul network senior operation and maintenance engineer

Prerequisites

- At Least one year U2000 products operation experience
- Familiar with the working principle of MPLS VPN including L3VPN, VPLS and PWE3

Content

- U2000 system structure
- U2000 system functions
- U2000 system common operation
- IP backhaul network alarm management highlight
- Visualized service path troubleshooting
-

- The challenge of IP backhaul network maintenance
- iManager U2000 end to end service management
- Using U2000 to implement IP backhaul network plug and play
- Visualized service deployment
- Minute-level Automatic Fault Locating
- Alarm locating
- Alarm experience
- Alarm masking
- Alarm correlation analysis
- The requirement of IP backhaul network troubleshooting
- Fault type and dealing process
- Fault locating ways
- The troubleshooting case on IP backhaul network
-
- Using U2000 to do troubleshooting

Training Methods

Lecture, Hands-on exercise

Duration

3 working days

Class Size

Min 6, max 12

1.5 Planning and Designing Training Course Descriptions

1.5.1 ODN39 IP Backhaul Network Planning and Designing



Objectives

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

- Describe planning and design principles of the IP backhaul network
- Describe planning and design methods of the IP backhaul network

Target Audience

Mobile backhaul network planning and design engineers

Network evaluation and optimization engineers

Prerequisites

- Familiar with the working principle of IGP routing protocol
- Familiar with the working principle of MPLS VPN including L3VPN and VPLS

Content

- The basic concepts of HLD and LLD
- How to planning IP backhaul network
- IP backhaul network planning steps
- Design Rule and Requirements Analysis
- Topology and Hardware Planning
- NE parameter planning
- IP address planning
- SNMP basic concept
- DCN solution in IP backhaul network
- NM planning
- DCN planning
- IP routing protocol basic concept
- IS-IS routing protocol planning

- OSPF routing protocol planning
- MPLS basic concept
- MPLS TE basic concept
- Static tunnel planning
- dynamic tunnel planning
- VPN concept and classification
- MPLS L3VPN basic concept
- MPLS L2VPN basic concept
- TDM PWE3 services planning
- ATM PWE3 service planning
- ETH L3VPN service planning
- High availability concept
- High availability of deployment
- Voice service High availability planning
- Data service High availability planning
- QoS basic concept
- Qos planning
- Clock concept (Synchronization Ethernet +1588 v2)
- Deployment of the clock synchronization
- Synchronization Ethernet planning
- The IEEE1588v2 planning
- Case Research

Training Methods

Lecture

Duration

4.5 working days

Class Size

Min 6, max 12

1.5.2 ODP15 PTN Network Planning and Design



Objectives

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

- Describe the PTN network planning process
- Collect the network requirements information
- Plan the PTN network layers
- Plan the PTN network services
- Plan the PTN network management and DCN
- Plan the equipment types according to the network requirement
- Plan the PTN equipment boards
- Plan the PTN network protections
- Plan the PTN network synchronization
- Plan the PTN network QoS
- Design the PTN network layers
- Design the PTN network slots allocation
- Design the PTN equipment parameters
- Design the MPLS tunnel parameters
- Design CES /ATM /Ethernet services parameters

Target Audience

This course is intended for Network planning and design engineers

Prerequisites

- Completion of "PTN Products 2nd Line

Maintenance Training"or having the equivalent PTN products knowledge

Content

- PTN network planning and design overview
- Products specifications
- Requirements collection
- Topology and hardware planning
- NM and DCN planning
- NE parameters planning
- Service bandwidth analysis
- Service and tunnel planning
- QoS planning
- Protection planning
- OAM planning
- Synchronization planning
- Case research
- PTN network design overview

Training Methods

Lecture, Case-study

Duration

3 working days

Class Size

Min 4, max 12

1.5.3 ODP42 PTN 6900 Network Planning and Design



Objectives

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

- Describe planning and design principles of the PTN&PTN 6900 mobile backhaul network
- Describe planning and design methods of the PTN&PTN 6900 mobile backhaul network

Target Audience

This course is intended for Network planning and design engineers

Prerequisites

- Completion of "PTN 6900 Products 2nd Line Maintenance Training" or having the equivalent PTN 6900 products knowledge

Content

- The basic concepts of HLD and LLD
- How to plan mobile backhaul network
- Mobile backhaul network planning steps
- Design rule and requirements analysis
- Topology and hardware planning
- NE parameter planning
- IP address planning
- Simple Network Management Protocol (SNMP) concept
- DCN overview
- Network management and DCN planning
- Routing protocol basics
- IS-IS basic concepts
- IS-IS fast convergence

- Planning the IS-IS routing protocol in mobile backhaul network
- MPLS basic concept
- MPLS TE basic concept
- Tunnel planning
- VPN concept and classification
- MPLS L3VPN basic concept
- MPLS L2VPN basic concept
- TDM PWE3 services planning
- ATM PWE3 service planning
- ETH L3VPN service planning
- HA overview
- Key technologies for network HA
- HA planning for PTN
- PTN 6900 network
- QoS Technology
- QoS Planning
- Clock concept (Synchronization Ethernet +1588 v2)
- Synchronization Ethernet planning
- The IEEE1588v2 planning
- Case research

Training Methods

Lecture, Case-study

Duration

4.5 working days

Class Size

Min 4, max 12

