Customer Training Catalog Course Descriptions

FBB

HUAWEI Learning Service

2015

CONTENTS

1.1 Training Course Descriptions

FBB Training Courses are designed as follows:

Code	Training Courses	Level	Duration (working days)	Training Location	Class Size
FBB Training Courses					
OBB01	FBB Broadband Network Development and Solutions	II	0.5		6 ~ 12
OBB02	OTT Service Development and Solutions	II	0.5		6 ~ 12
OBB06	FBB Network Planning Overview	II	0.5		6 ~ 12
OBB07	FBB Broadband Access Network Planning	III	2		6 ~ 12
OBB08	FBB Broadband Access Network Planning-E2E Design	III	2.5		6 ~ 12
OBB10	FBB Network End-to-End Logical Design	IV	1.5		6 ~ 12
OBB11	FBB HSI/IPTV Service Design	IV	3		6 ~ 12
OBB18	FBB Network Planning and Design Cases Study and Practice	IV	1		6 ~ 12
OBB20	FBB Network Solution Overview	II	0.5		6 ~ 12
OBB21	FBB Network Public Technologies	II	3		6 ~ 12
OBB25	FBB HSI/IPTV Service Provisioning	II	3.5		6 ~ 12
OBB26	FBB HSI/IPTV Service Restoration	III	2.5		6 ~ 12

1.2 FBB Training Course Descriptions

1.2.1 OBB01 FBB Broadband Network Development and Solutions

Objectives

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

- Describe FBB concepts
- Describe trend and driving forces of FBB
- Describe FBB digital home service development
- Describe FBB OTT service development
- Describe FBB service development
- Describe FBB Network
- Outline FBB solution

Target Audience

FBB Technical Managers

FBB Business Managers

FBB Maintenance Engineers

FBB Planning Engineers

Prerequisites

- A basic understanding of telecommunication

Content

- FBB concept introduction
- Trend and driving forces of FBB
- FBB digital home service development introduction
- FBB OTT service development introduction
- FBB service development introduction
- FBB network introduction
- FBB solution introduction

Training Methods

Lecture

Duration

0.5 working day

Class Size

Min 6, max 12

1.2.2 OBB02 OTT Service Development and Solutions

Objectives

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

- Describe the trend and driving forces of OTT
- Describe the challenges what OTT bring
- Describe the OTT solution

Target Audience

FBB Technical Managers
FBB Business Managers
FBB Maintenance Engineers
FBB Planning Engineers

Prerequisites

- A basic understanding of telecommunication

Content

- OTT service introduction
- OTT brings new challenges
- OTT solution overview
- OTT cases sharing

Training Methods

Lecture

Duration

0.5 working day

Class Size

Min 6, max 12

1.2.3 OBB06 FBB Network Planning Overview

Objectives

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

- Describe current mainstream of FBB business
- Describe FBB development trend of future business
- Describe current network structure of Fixed network operators
- Describe considering factors in FBB network planning

Target Audience

FBB Technical Managers
FBB Business Managers
FBB Maintenance Engineers
FBB Planning Engineers

Prerequisites

- At least two years of experience in the operation and maintenance of Access network or Datacom network equipments
- Familiar with TCP/IP protocols and FTTx technologies

Content

- current mainstream FBB business presentation
- FBB future business development trend
- New business, New challenges
- current network structure of Fixed network operators
- FBB network planning considering factors

Training Methods

Lecture

Duration

0.5 working day

Class Size

Min 6, max 12

1.2.4 OBB07 FBB Broadband Access Network Planning

Objectives

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

- Describe various typical technologies of FBB broadband access network
- Design FBB xPON broadband access network
- Design FBB xDSL broadband access network
- Design FBB Home network broadband access network

Target Audience

FBB Planning Engineers and Experts
FBB Technical Support Engineers and Experts
FBB Technical Managers

Prerequisites

- At least two years of experience in the operation and maintenance of Access network or Datacom network equipments
- Attended "FTTx GPON 2nd Line Maintenance Training" or having equivalent knowledge

Content

- New business, New requirements to FBB network planning
- FBB broadband access network typical technology introduction-DSL/PON/LAN
- Choice between PON and DSL
- FBB broadband access network planning successful case study and discussion
- xPON overview
- ODN typical topology type and design
- Choice of splitter
- Attenuation estimation methods of optical link
- ODN planning
- How to choose OLT and OLT planning
- GPON compare with EPON
- xPON technology development trend
- xPON network planning successful cases study and practice
- xDSL overview
- xDSL covering survey
- xDSL site choice
- xDSL business disaster emergency recovery
- How to solve xDSL copper line interference
- xDSL network planning successful cases study and practice
- Home network technology introduction
- Mainstream product introduction of CPE
- CPE product design and development
- Operators provide CPE device or the user purchase CPE
- CPE daily maintenance FAQ
- FBB home network planning successful cases study and practice

Training Methods

Lecture

Duration

2 working days

Class Size

Min 6, max 12

1.2.5 OBB08 FBB Broadband Access Network Planning-E2E Design

Objectives

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

- Calculate HSI/IPTV/VoIP service total bandwidth
- Complete FBB network end-to-end QoS design
- Complete FBB network end-to-end reliability design
- Complete FBB network end-to-end security design

Target Audience

FBB Planning Engineers and Experts
FBB Technical Support Engineers and Experts
FBB Technical Managers

Prerequisites

- At least two years of experience in the operation and maintenance of Access network or Datacom network equipments
- Familiar with TCP/IP protocols and FTTx technologies
- Attended "NE Series Routers 2nd Line Maintenance Training" or having equivalent knowledge
- Attended "FTTx GPON 2nd Line Maintenance Training" or having equivalent knowledge

Content

- What is Bandwidth Dimensioning ?
- Why is Bandwidth Dimensioning required ?
- Should VAS bandwidth be included in or excluded from HSI bandwidth ?
- Bandwidth Dimensioning for HSI, IPTV and VoIP Services
- What is High Availability ?
- Components of High Availability
- How should the level of High Availability be defined ?
- Benefits of High Availability to End User and FBB Network Operator
- NE-level High Availability: Software Features：
- In Service Software Upgrade (ISSU)
- Non-Stop Forwarding (NSF) and Stateful Switchover (SSO)
- OS Software Modularity
- BGP Non-stop Routing
- Virtual Router Redundancy Protocol (VRRP)
- Stateful IP Services
- Warm Reload
- Warm Upgrade
- Line Card Redundancy with Y-cables
- What is QoS ?
- Why is QoS required ?
- Can QoS be omitted for a bandwidth over-dimensioned FBB network ?
- Benefits of QoS to (a) End User and (b) FBB Network Operator
- QoS Design Principles
- E2E QoS Design
- QoS Marking
- QoS Marker Transparency
- QoS Queuing
- Traffic Policing, Traffic Shaping and Call Admission Control (CAC)
- WiFi QoS
- QoS Features of Network Equipment
- Multi-vendor QoS Design
- QoS Monitoring
- Case Study
- Security vs Availability
- P Operator Security Design Principle
- P Operator Service Level Security Measures
- Line based Authentication
- NCA for IPTV
- Anti-Piracy Security Measure
- Customer Profile Protection

- Anti-DOS Attack on BRAS
- IGMP message flooding by ONU LAN Cable Loopback
- OSPF and BGP with MD5 Protection
- Use of Firewall
- Server Hardening
- Physical Security Measures
- FBB broadband access network planning successful cases sharing and study
- FBB broadband access network planning simulation exercises

Training Methods

Lecture

Duration

2.5 working days

Class Size

Min 6, max 12

1.2.6 OBB10 FBB Network End-to-End Logical Design

Objectives

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

- Calculate HSI/IPTV/VoIP service total bandwidth
- Complete FBB network end-to-end VLAN design
- Complete FBB network end-to-end IP address design
- Complete FBB network end-to-end QoS design
- Complete FBB network end-to-end reliability design
- Complete FBB network end-to-end security design
- Complete FBB network IGP routing design
- Complete FBB network BGP routing design
- Complete FBB MPLS network design
- Complete FBB network channel design(Home network/Access network/IP network)
- Describe IPTV central network architecture

Target Audience

FBB Planning Engineers and Experts
FBB Technical Support Engineers and Experts
FBB Technical Managers

Prerequisites

- At least two years of experience in the operation and maintenance of Access network or Datacom network equipments
- Familiar with TCP/IP protocols and FTTx technologies
- Attended "NE Series Routers 2nd Line Maintenance Training" or having equivalent knowledge
- Attended "FTTx GPON 2nd Line Maintenance Training" or having equivalent knowledge

Content

- Bandwidth Design overview
- Basic bandwidth calculation as (HSI/IPTV/VoIP) business needs
- FBB end-to-end bandwidth planning and design example
- VLAN design overview
- Single VLAN or double VLAN
- Home network VLAN design
- SME access network VLAN design
- VPN VLAN design
- FBB end-to-end VLAN planning and design example
- IP address design overview
- IP address design basic principles
- Business IP address design
- Equipment IP address design
- Management IP address design
- IPv6 address planning overview
- FBB end-to-end IP address planning and design example
- Multicast design overview
- L3 multicast technology introduction
- Multicast routing design
- L2 multicast technology introduction
- IGMP snooping and IGMP proxy principles
- Multicast VLAN design
- How to choose multicast control point according to the needs of the business?
- Multicast reliability design
- Multicast security design
- QoS design overview
- 802.1 p, IP DSCP, MPLS EXP QoS design
- CAR flow control design
- PQ, WFQ, WRR, LLQ QoS design
- FBB end-to-end QoS design examples
- OAM design overview

- CMCI, Ethernet OAM, MPLS OAM technology introduction
- FBB End-to-end OAM design examples
- FBB channel design overview
- Home network architecture introduction
- Home network VLAN/IP/RGW/multicast design
- Access network architecture introduction
- Access network GPON access/GEM port/VLAN/multicast/reliability design
- Aggregation network architecture introduction
- Aggregation network VLAN planning/business gathering/reliability/security design
- Service-POP network architecture introduction
- Service-POP business bearing/VLAN planning/routing design/reliability design
- Backbone network structure introduction
- Backbone routing design
- IGW design
- Server Farm design overview
- Server Farm network architecture introduction
- Server Farm deployment/VLAN planning/IP address planning/routing planning/VPN/reliability/security design
- IPTV platform architecture introduction
- IPTV central network design

Training Methods

Lecture

Duration

1.5 working days

Class Size

Min 6, max 12

1.2.7 OBB11 FBB HSI/IPTV Service Design

Objectives

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

- Complete FBB HSI service network planning
- Complete FBB IPTV service network planning

Target Audience

FBB Planning Engineers and Experts
FBB Technical Support Engineers and Experts
FBB Technical Managers

Prerequisites

- At least two years of experience in the operation and maintenance of Access network or Datacom network equipments
- Familiar with TCP/IP protocols and FTTx technologies
- Attended "NE Series Routers 2nd Line Maintenance Training" or having equivalent knowledge
- Attended "FTTx GPON 2nd Line Maintenance Training" or having equivalent knowledge

Content

- HSI Service Overview
- HSI Service Authentication
- HSI Service User Management
- HSI Service Address Assignment
- HSI Service Domain Name Resolution
- HSI Service Accounting
- HSI Service VAS
- HSI Service design example
- IPTV Service Overview
- IPTV Service Authentication
- IPTV Service Multicast Solution
- IPTV Headend Interconnection Solution (Using IPv4 as an Example)
- IPTV Service Security
- IPTV Service QoS principle
- IPTV iVSE Solution
- IPTV Service design example
- Server Farm design overview
- AAA servers design example
- DHCP servers design example
- NGN network architecture introduction and system design overview
- IMS network architecture introduction and system design overview
- NMS network architecture introduction and system design overview
- IPTV Service System Overview
- IPTV Major Services Introduction
- Access Planning for the IPTV Data Center
- IPTV Service IP Address Planning
- IPTV Service System Access Design Overview
- Access Solution 1: Firewall Gateway Mode (VRRP + Static Route)
- Access Solution 2: Firewall Gateway Mode (VRRP + Dynamic Route)
- Access Solution 3: Layer 2 and Layer 3 Hybrid Mode
- IPTV Access Solution Comparison

Training Methods

Lecture

Duration

3 working days

Class Size

Min 6, max 12

1.2.8 OBB18 FBB Network Planning and Design Cases Study and Practice

Objectives

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

- Complete FBB multi-service network planning

Target Audience

FBB Planning Engineers and Experts

FBB Technical Support Engineers and Experts

FBB Technical Managers

Prerequisites

- At least two years of experience in the operation and maintenance of Access network or Datacom network equipments
- Familiar with TCP/IP protocols and FTTx technologies
- Attended "NE Series Routers 2nd Line Maintenance Training" or having equivalent knowledge
- Attended "FTTx GPON 2nd Line Maintenance Training" or having equivalent knowledge

Content

- FBB Network Planning and Design Cases Study
- FBB Network Planning and Design Practice

Training Methods

Lecture

Duration

1 working day

Class Size

Min 6, max 12

1.2.9 OBB20 FBB Network Solution Overview

Objectives

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

- Describe FBB Network Solutions
- Describe FBB Services
- Describe FBB Network Products

Target Audience

FBB Technical Managers
FBB Business Managers
FBB Maintenance Engineers
FBB Planning Engineer

Prerequisites

- At least two years of experience in the operation and maintenance of Access network or Datacom network equipments
- Familiar with TCP/IP protocols and FTTx technologies

Content

- FBB Solutions Overview
- FBB Network Solution for IP MAN
- FBB Network Solution for Aggregation network
- FBB Services Overview
- FBB Products Description

Training Methods

Lecture

Duration

0.5 working day

Class Size

Min 6, max 12

1.2.10 OBB21 FBB Network Public Technologies

Objectives

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

- Complete FBB bearer network service deployment and maintenance
- Complete FBB aggregation network service deployment and maintenance
- Complete FBB access network service deployment and maintenance

Target Audience

FBB Technical Support Engineers and Experts

FBB Operation and Maintenance Engineers and Experts

FBB Planning Engineers and Experts

Prerequisites

- At least two years of experience in the operation and maintenance of Access network or Datacom network equipments
- Familiar with TCP/IP protocols and FTTx technologies
- Attended "NE Series Routers 2nd Line Maintenance Training" or having equivalent knowledge
- Attended "FTTx GPON 2nd Line Maintenance Training" or having equivalent knowledge

Content

- FBB IP MAN IGP/BGP Routing technologies
- FBB IP MAN BGP MPLS L3VPN technologies
- FBB MAN side of the multicast technology
- FBB MAN side of the QoS technology
- FBB MAN side of the HA technology
- FBB IP MAN Routing of Solutions
- FBB MAN multicast, QoS and HA
- BRAS features and working principle
- AAA working principle
- Configuration of BGP, QoS, MPLS and multicast
- Configuration of VRRP protocol
- Configuration of BRAS Internet service(PPPOE and Leased Line)
- Configuration of AAA

Training Methods

Lecture, Hands-on exercise

Duration

3 working days

Class Size

Min 6, max 12

1.2.11 OBB25 FBB HSI/IPTV Service Provisioning

Objectives

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

- Describe FBB HSI/IPTV service provisioning process
- Complete FBB HSI/IPTV end-to-end deployment and maintenance
- Complete FBB HSI/IPTV end-to-end operations and maintenance

Target Audience

FBB Technical Support Engineers and Experts

FBB Operation and Maintenance Engineers and Experts

FBB Planning Engineers and Experts

Prerequisites

- At least two years of experience in the operation and maintenance of Access network or Datacom network equipments
- Familiar with TCP/IP protocols and FTTx technologies
- Attended "NE Series Routers 2nd Line Maintenance Training" or having equivalent knowledge
- Attended "FTTx GPON 2nd Line Maintenance Training" or having equivalent knowledge

Content

- Practice: Configuration of PPPoE service
- Practice: Configuration of SME HSI service
- Practice: FBB HSI reliability configuration
- IPTV service end-to-end architecture
- IPTV business type(BTV/VOD/NVOD/TSTV)
- IPTV user authentication
- STB on-line process
- IPTV service monitoring
- FBB IPTV service provisioning process
- Configuration of PPPoE user
- Configuration of multicast(PIM) protocol
- Configuration of IGMP protocol
- Configuration of IPTV service reliability
- Practice: Configuration of PPPoE user
- Practice: Configuration of multicast(PIM) protocol
- Practice: Configuration of IGMP protocol
- Practice: Configuration of IPTV service reliability

Training Methods

Lecture, Hands-on exercise

Duration

3.5 working days

Class Size

Min 6, max 12

1.2.12 OBB26 FBB HSI/IPTV Service Restoration

Objectives

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

- Complete FBB HSI/IPTV end-to-end operations, fault location and troubleshooting

Target Audience

FBB Technical Support Engineers and Experts

FBB Operation and Maintenance Engineers and Experts

FBB Planning Engineers and Experts

Prerequisites

- At least two years of experience in the operation and maintenance of Access network or Datacom network equipments
- Familiar with TCP/IP protocols and FTTx technologies
- Attended "NE Series Routers 2nd Line Maintenance Training" or having equivalent knowledge
- Attended "FTTx GPON 2nd Line Maintenance Training" or having equivalent knowledge

Content

- IPTV service end-to-end architecture
- IPTV business type(BTV/VOD/NVOD/TSTV)
- IPTV user authentication
- STB on-line process
- IPTV service monitoring
- FBB IPTV service provisioning process
- Analysis and troubleshooting of HSI Service
- FBB HSI Typical Troubleshooting Case Analysis
- Case: Failure to Access the Internet
- Case: Going Offline Frequently
- Case: Low Internet Access Rate
- Case: Failure to Obtain an IP Address in the DHCP Mode
- Analysis and troubleshooting of IPTV Service
- FBB IPTV Typical Troubleshooting Case Analysis
- Case: Dark Screen After Program Ordering
- Case: Mosaic Display in Multicast Programs
- Case: Abnormal Program Interruption in Watching a Program

Training Methods

Lecture

Duration

2.5 working days

Class Size

Min 6, max 12