Training Proposal for Mobile Softswitch (GSM/UMTS) Project

HUAWEI Learning Service
2014
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COMMERCIAL IN CONFIDENCE
1.8 WBT

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1 Training Solution

1.1 Mobile Softswitch (GSM/UMTS) Training Path

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<th>Maintenance Skill Enhancement</th>
<th>Typical Networking Scenario</th>
<th>Network Evaluation and Optimization Training</th>
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<td>GU CS Core Network Design Overview</td>
<td>MSS Signaling Analysis</td>
<td>MSOFTX3000 (CPCI) Product Training</td>
<td>MSOFTX3000 (CPCI) Data Configuration Training</td>
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<td>SmartCare Voice Service Quality Improvement Training</td>
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<td>SmartCare Voice Service Quality Improvement Training</td>
<td>VoLTE Solution (CS) Advanced Operation and Maintenance Training</td>
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</table>

Prerequisites: CS O&M Training

Maintenance Skill Enhancement:
- MSOFTX3000 (CPCI) Service Provision Training
- GSM/UMTS Typical Signaling Flow Training
- MSOFTX3000 (CPCI) Data Configuration Training
- MSOFTX3000 (CPCI) Operation and Maintenance Training
- MSOFTX3000 (CPCI) Operation and Maintenance Training

Typical Networking Scenario:
- MSC POOL Training
- CSFB Training
- AoIP Training
- VoLTE Solution (CS) Advanced Operation and Maintenance Training

Network Evaluation and Optimization Training:
- GSM/UMTS Softswitch Core Network Evaluation and Optimization Training
1.2 SmartCare Training Path

1.3 Required Training Programs

Mobile Softswitch (GSM/UMTS) For this project, the whole training solution is designed into the following programs. List of Training Program(s) for Mobile Softswitch (GSM/UMTS) Project:

<table>
<thead>
<tr>
<th>Training Program</th>
<th>Program Level</th>
<th>Duration (workdays)</th>
<th>Training Location</th>
<th>Class Size</th>
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**GSM-R**

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**UGC**

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**SmartCare**

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<td>SmartCare Voice Service Quality Improvement Training</td>
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<tr>
<td>SmartCare IMS Service Quality Improvement Training</td>
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**WBT**

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<td><strong>M-Learning</strong></td>
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<tr>
<td>CSFB</td>
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Level Description: I: Basic Course  II: Intermediate Course  III: Advanced Course  IV: Expert Course
1.4 WCDMA-CS

1.4.1 Mobile SoftSwitch Fundamental Training

Training Path

Mobile SoftSwitch Fundamental
OWA02 Lecture, LVC 1d

GSM/UMTS Softswitch Products Overview
OWG01 Lecture, LVC 1d

Target Audience

All Technical and non-Technical Personnel

Prerequisites

- A basic knowledge of mobile communication

Objectives

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

- Describe architecture of UMTS R4 system
- Describe interfaces in UMTS R4
- Describe protocols in Circuit Switch domain of R4
- Describe call procedure in Circuit Switch domain of R4
- Describe Features of Core Network
- Describe system structure of MSOFTX3000 and UMG8900
- Describe functions and services provided by MSOFTX3000 and UMG8900
- Describe typical networking and application of MSOFTX3000 and UMG8900

Training Content

OWA02 Mobile SoftSwitch Fundamental
- GSM and UMTS Softswitch Core Network Principle
  - Architecture of UMTS R4 system
  - Interfaces in UMTS R4
  - Protocols in Circuit Switch domain of R4
  - Call procedure in Circuit Switch domain of R4
  - Features of Core Network

OWG01 GSM/UMTS Softswitch Products Overview
- MSOFTX3000 System Overview
  - MSOFTX3000 introduction
  - System structure of MSOFTX3000
- Functions and services provided by MSOFTX3000
- Typical networking and application of MSOFTX3000

- UMG8900 System Overview
  - UMG8900 introduction
  - System structure of UMG8900
  - Functions and services provided by UMG8900
  - Typical networking and application of UMG8900

Duration

  2 working days

Class Size

  Min 6, Max 12
1.4.2  MSOFTX3000 (CPCI) Hardware System Training

Training Path

Target Audience

Core network monitor engineers
Installation engineers
Commissioning engineers
Operation and maintenance engineers

Prerequisites

- A basic knowledge of mobile communication

Objectives

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

- Describe logical structures of MSOFTX3000
- Describe the board functions of MSOFTX3000
- Describe the internal connection and cables of MSOFTX3000

Training Content

OWG10 MSOFTX3000 (CPCI) Hardware System

- MSOFTX3000(CPCI) Hardware System
  - MSOFTX3000 system structure
  - MSOFTX3000 board function
  - Internal connection and cables

Duration

1 working day

Class Size

Min 6, Max 12
1.4.3 MSOFTX3000 (CPCI) Data Configuration Training

Training Path

Target Audience

Core network commissioning engineers
Operation and maintenance engineers

Prerequisites

- A basic knowledge of mobile communication
- Successful completion of “MSOFTX3000(CPCI) Hardware System Training”

Objectives

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

- Describe configuration flow of local office integration
- Perform hardware configuration of MSOFTX3000
- Perform physical port configuration of MSOFTX3000
- Perform the interconnection between MSOFTX3000 and UMG8900
- Perform the local office information (SPC, MCC, MNC, MSRN) configuration
- Perform interworking configuration between MSOFTX3000 and HLR (MTP-based networking mode, M3UA-based non-peer-to-peer networking mode, M3UA-based peer-to-peer networking mode, STP-transferred networking mode)
- Perform interworking configuration between MSOFTX3000 and BSC (MTP-based networking mode, M2UA-based networking mode, M3UA-based non-peer-to-peer networking mode, Mini-A-Flex networking mode, IP-based A interface)
- Perform interworking configuration MSOFTX3000 and PSTN (networking mode based on M2UA, M3UA)
- Perform interworking configuration MSOFTX3000 and RNC (M3UA Non-Peer-to-Peer, Iu-Flex, IP-Based Iu Interface)
- Perform interworking configuration MSOFTX3000 and MSC Server (BICC over M3UA, SIP over SCTP)
- Verify the configuration result

Training Content

OWG21 MSOFTX3000(CPCI) data configuration

- MSOFTX3000(CPCI) Hardware Data Configuration
  - Configuration flow of hardware data
  - Equipment components configuration
  - Physical port parameters configuration
Clock synchronization mode configuration
Query hardware data

**MSOFTX3000(CPCI) Mc interface Data Configuration**
- Mc interface introduction
- H.248 protocol introduction
- Data configuration based on different scenario (Single MGW, Multi-MGW IP networking, Multi-MGW TDM networking, Multi-MGW IP and TDM networking)
- Verification of configuration

**MSOFTX3000(CPCI) Local Office Data Configuration**
- Configure the local signaling point
- Configure the mobile local office information
- Configure the MAP function
- Add the VLR configuration
- Configure the SCCP GT data
- Configure the call source data
- Configure the MSRN/HON prefixes
- Configure the MSRN/HON suffixes
- Add the mapping between MSC numbers and the MSRN/HONs
- Verification of configuration

**MSOFTX3000(CPCI) Interworking with HLR Data Configuration**
- Networking scenario between MSOFTX3000 and HLR (MTP-based networking mode, M3UA-based non-peer-to-peer networking mode, M3UA-based peer-to-peer networking mode, STP-transferred networking mode)
- Interconnection configuration based on different scenario
- Verification of configuration

**MSOFTX3000(CPCI) Interworking with BSC Data Configuration**
- Networking scenario between MSOFTX3000 and BSC (MTP-based networking mode, M2UA-based networking mode, M3UA-based non-peer-to-peer networking mode, Mini-A-Flex networking mode, IP-based A interface)
- Signaling and Speech configuration to BSC based on different scenario
- Location Area configuration
- Verification of configuration

**MSOFTX3000(CPCI) Interworking with PSTN-MSC Data Configuration**
- Networking scenario between MSOFTX3000 and PSTN (networking mode based on M2UA, networking mode based on M3UA)
- Signaling and Speech configuration to PSTN based on different scenario
- Verification of configuration

**MSOFTX3000(CPCI) Interworking With RNC Data Configuration**
- Networking scenario between MSOFTX3000 and RNC (M3UA Non-Peer-to-Peer, Iu-Flex, IP-Based Iu Interface)
- Signaling and Speech configuration to RNC based on different scenario
- Location Area configuration
- Verification of configuration
- MSOFTX3000(CPCI) Interworking with MSC Server Data Configuration
  - Networking scenario between MSOFTX3000 and MSC Server (BICC over M3UA, SIP-I)
  - Signaling and Speech configuration to MSC Server based on different scenario
  - Verification of configuration
- MSOFTX3000(CPCI) Number Analysis Configuration
  - Concepts introduction (call source, route selection source name, route selection name, call prefix)
  - Basic Called Number configuration
  - Basic Routing configuration

Duration

6 working days

Class Size

Min 6, Max 12
1.4.4 MSOFTX3000 (CPCI) Operation and Maintenance Training

Training Path

MSOFTX3000 (CPCI) Operation and Maintenance
OWG23 Lecture, Lab, E-lab 3d

Target Audience

Core network monitor engineers
Operation and maintenance engineers

Prerequisites

- A basic knowledge of mobile communication
- Successful completion of “MSOFTX3000(CPCI) Hardware System Training”

Objectives

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

- Operate BAM process and manager
- Check BAM status
- Backup and restore system
- Perform alarm management (browsing alarms, querying alarms, printing alarms, dumping alarm logs)
- Perform performance management (creating performance measurement tasks, customizing performance entity, dumping the result of measurement)
- Perform iGWB operation (checking status of processes, browsing CDR, checking hard disk space, iGWB switchover)
- Query equipment status
- Query resource information
- Query the service status
- Replace board or cable

Training Content

OWG23 MSOFTX3000 (CPCI) Operation and Maintenance
- BAM Introduction and Operation
  - BAM software structure
  - BAM processes operation
  - BAM manager operation
  - Check BAM status
  - BAM hard disk operation
- MSOFTX3000(CPCI) System Backup and Recovery
  - Manually backing up databases
  - Checking the Automatic backup of the database
- Restoring the SQL Server database
- Restoring the password of the SQL Server database

**MSOFTX3000(CPCI) Alarm Management and Operation**
- Browsing alarms
- Querying alarms
- Printing alarms
- Dump alarm logs
- Alarm box operation
- Process alarm information follow the alarm help

**MSOFTX3000(CPCI) Performance Management Operation**
- Create performance measurement task
- Query performance measurement task
- Dump the result of measurement
- Customize performance entity

**iGWB(CPCI) Introduction and Operation**
- iGWB system structure
- iGWB operation (Checking status of processes, browsing CDR, Checking hard disk space, iGWB switchover)
- Major alarm information related to iGWB

**MSOFTX3000(CPCI) Routine Operation and Maintenance**
- Query equipment status
- Query resource information
- Perform backup
- Query the service status
- Browse alarm information
- Browse the performance task

**MSOFTX3000(CPCI) Common Operation**
- User authority operation
- Replace board
- Loopback operation
- Trace operation
- CDR operation
- Dialing test
- License operation
- Log operation

**MSOFTX3000(CPCI) Patch Management**
- List Patch
- Display patch
- Loading patch
- Activate patch
- Confirm patch
- Rollback patch
Duration

3 working days

Class Size

Min 6, Max 12
1.4.5 MSOFTX3000 (ATCA) Hardware System Training

Training Path

<table>
<thead>
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<th>MSOFTX3000 (ATCA) Hardware System</th>
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<tbody>
<tr>
<td>OWG11 Lecture, LVC 1d</td>
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Target Audience

- Core network monitor engineers
- Installation engineers
- Commissioning engineers
- Operation and maintenance engineers

Prerequisites

- A basic knowledge of mobile communication

Objectives

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

- Describe MSOFTX3000 boards and its functions
- Describe MSOFTX3000 peripherals and other components
- Describe MSOFTX3000 internal connection and external connection
- Describe logical system architecture of MSOFTX3000
- Describe the signaling processing flow, service processing flow, maintenance processing flow, alarm management flow of MSOFTX3000

Training Content

OWG11 MSOFTX3000 (ATCA) Hardware System

- MSOFTX3000(ATCA) System Principle
  - MSOFTX3000 system architecture
  - MSOFTX3000 service processing subsystem
  - MSOFTX3000 maintenance management subsystem
  - MSOFTX3000 environment monitoring subsystem
  - MSOFTX3000 alarm management system

- MSOFTX3000(ATCA) Hardware System
  - MSOFTX3000 cabinet
  - MSOFTX3000 boards
  - MSOFTX3000 peripherals and other Components
  - MSOFTX3000 connection and Cables

Duration

1 working day
Class Size

Min 6, Max 12
1.4.6 MSOFTEX3000 (ATCA) Data Configuration Training

Training Path

Target Audience

Core network commissioning engineers
Operation and maintenance engineers

Prerequisites

- A basic knowledge of mobile communication
- Successful completion of “MSOFTEX3000(ATCA) Hardware System Training”

Objectives

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

- Install the host software and local maintenance software after MGC and MGW hardware installation
- Describe configuration flow of local office integration
- Perform hardware configuration of MSOFTEX3000
- Perform physical port configuration of MSOFTEX3000
- Perform the interconnection between MSOFTEX3000 and UMG8900
- Perform the local office information (SPC, MCC, MNC, MSRN) configuration
- Perform interworking configuration between MSOFTEX3000 and HLR (MTP-based networking mode, M3UA-based non-peer-to-peer networking mode, M3UA-based peer-to-peer networking mode, STP-transferred networking mode)
- Perform interworking configuration between MSOFTEX3000 and BSC (MTP-based networking mode, M2UA-based networking mode, M3UA-based non-peer-to-peer networking mode, Mini-A-Flex networking mode, IP-based A interface)
- Perform interworking configuration MSOFTEX3000 and PSTN (networking mode based on M2UA, M3UA)
- Perform interworking configuration MSOFTEX3000 and RNC (M3UA Non-Peer-to-Peer, Iu-Flex, IP-Based Iu Interface)
- Perform interworking configuration MSOFTEX3000 and MSC Server (BICC over M3UA, SIP over SCTP)
- Verify the configuration result

Training Content

OWG22 MSOFTEX3000(ATCA) data configuration

- MSOFTEX3000(ATCA) Hardware and Module Configuration
  - Describe the procedure of configuration
- Perform the configuration of hardware
- Perform the configuration of module

**MSOFTX3000(ATCA) Local Office Data Configuration**
- Configure the local signaling point
- Configure the mobile local office information
- Configure the MAP function
- Add the VLR configuration
- Configure the SCCP GT data
- Configure the call source data
- Configure the MSRN/HON prefixes
- Configure the MSRN/HON suffixes
- Add the mapping between MSC numbers and the MSRsNs/HONs
- Verification of configuration

**MSOFTX3000(ATCA) Mc interface Data Configuration**
- Mc interface introduction
- H.248 protocol introduction
- Data configuration based on different scenario (Single MGW, Multi-MGW IP networking, Multi-MGW TDM networking, Multi-MGW IP and TDM networking)
- Verification of configuration

**MSOFTX3000(ATCA) Interworking with HLR Data Configuration**
- Networking scenario between MSOFTX3000 and HLR (MTP-based networking mode, M3UA-based non-peer-to-peer networking mode, M3UA-based peer-to-peer networking mode, STP-transferred networking mode)
- Interconnection configuration based on different scenario
- Verification of configuration

**MSOFTX3000(ATCA) Interworking with BSC Data Configuration**
- Networking scenario between MSOFTX3000 and BSC (MTP-based networking mode, M2UA-based networking mode, M3UA-based non-peer-to-peer networking mode, Mini-A-Flex networking mode, IP-based A interface)
- Signaling and Speech configuration to BSC based on different scenario
- Location Area configuration
- Verification of configuration

**MSOFTX3000(ATCA) Interworking with PSTN-MSC Data Configuration**
- Networking scenario between MSOFTX3000 and PSTN (networking mode based on M2UA, networking mode based on M3UA)
- Signaling and Speech configuration to PSTN based on different scenario
- Verification of configuration

**MSOFTX3000(ATCA) Interworking With RNC Data Configuration**
- Networking scenario between MSOFTX3000 and RNC (M3UA Non-Peer-to-Peer, Iu-Flex, IP-Based Iu Interface)
- Signaling and Speech configuration to RNC based on different scenario
- Location Area configuration
- Verification of configuration
- MSOFTEX3000(ATCA) Interworking with MSC Server Data Configuration
  - Networking scenario between MSOFTEX3000 and MSC Server (BICC over M3UA, SIP-I)
  - Signaling and Speech configuration to MSC Server based on different scenario
  - Verification of configuration
- MSOFTEX3000(ATCA) Number Analysis Configuration
  - Concepts introduction (call source, route selection source name, route selection name, call prefix)
  - Basic Called Number configuration
  - Basic Routing configuration

Duration

6 working days

Class Size

Min 6, Max 12
1.4.7 MSOFTX3000 (ATCA) Operation and Maintenance Training

Training Path

Target Audience

Core network monitor engineers
Operation and maintenance engineers

Prerequisites

- A basic knowledge of mobile communication
- Successful completion of "MSOFTX3000(ATCA) Hardware System Training"

Objectives

On completion of this program, the participants will be able to:
- Perform the device management
- Perform the tracing task
- Perform the alarm operation
- Querying Logs
- Perform security management
- Perform the OMU status checking
- Perform the License management
- Perform the Oracle processes starting and stopping
- Perform the system backup and recovery
- Perform the service checking
- Perform the replacing boards
- Perform the iGWB configuration and maintenance

Training Content

OWG24 MSOFTX3000 (ATCA) Operation and Maintenance
- MSofT3000(ATCA) Product Operation and Maintenance
  - OMU Server Operation and Maintenance
  - Service Operation Status Check
  - Parts Replacement
  - Rollback
- iGWB(ATCA) Operation and Maintenance
  - Describe the iGWB functions
  - Describe the hardware structure of iGWB
  - Describe the software structure of iGWB
  - Perform the iGWB configuration
Perform the iGWB maintenance

- MSofTX3000(ATCA) Performance Management
  - Introduction to Performance Management
  - Performance Management Routine Operation
  - Basic KPI

- MSofTX3000(ATCA) Routine Operation and Maintenance
  - Equipment Status Check
  - System Resource Check
  - Data Consistency Check
  - Log Management

- MSofTX3000(ATCA) Database Management and Operation
  - MSofTX3000 Database Overview
  - Database Backup and Restoration Policy
  - Database Backup and Restoration Procedure

- MSofTX3000(ATCA) Alarm Management and Monitoring
  - Introduction to Alarm Management
  - Alarm Collection and Management
  - Alarm Handling

Duration

3 working days

Class Size

Min 6, Max 12
1.4.8 MSS Service Provision Training

Training Path

Target Audience

Core network commissioning engineers
Operation and maintenance engineers

Prerequisites

- A basic knowledge of mobile communication
- Successful completion of "MSOFTX3000 Data Configuration" and "UMG8900 Data Configuration"

Objectives

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

- Configure roaming restriction
- Configure call service, USSD service
- Change the resource of VLR
- Set authentication configuration and cipher configuration
- Configure roaming data in MSC Server
- Configure IN service in MSC Server
- Adjust the load among SS7 trunk routes
- Adjust the load among M3UA or MTP3 signaling links
- Makeup tone file
- Set announcement configuration
- Add an MSISDN number segment
- Modify a route in an office direction

Training Content

OWG31 MSS Service Provision

- Intelligent Service Provision
  - IN service trigger configuration based on different scenarios(triggered by CSI, triggered by specified called number, triggered by number segment)
  - Emergency service trigger configuration
  - Number change configuration when IN service trigger

- MSS Routing Configuration
  - General routing(on priority, load-sharing, time) principle and configuration
  - Routing configuration based on TDM and IP bearer

- Call Services and Supplementary Service
- Normal call configuration (MOC and MTC)
- Call barring provision
- Call failure provision
- Emergency call provision
- CLIP
- Supplementary service provision
- USSD service provision

- Mobility Management Provision
  - Location Area Provision
  - Location update setting
  - User data management in VLR

- Security Management Provision
  - 2G Authentication Setting
  - 3G Authentication Setting
  - Cipher Setting

- Roaming Service Provision
  - Roaming user configuration
  - Roaming restriction configuration

- Network Adjustment Provision
  - VLR resource management
  - Module adjustment and management
  - Links adjustment and management
  - Circuit adjustment and management
  - Routing adjustment and management
  - New National Access Code adding
  - Change GT data

- Announcement provision
  - Make up tone file
  - Upload tone file
  - Configure tone file
  - Set the tone file playing mode

**Duration**

5 working days

**Class Size**

Min 6, Max 12
1.4.9 GU UMG8900 Hardware System Training

Training Path

GU UMG8900 Hardware System
OWH10 Lecture, LVC 1d

Target Audience

Core network monitor engineers
Installation engineers
Commissioning engineers
Operation and maintenance engineers

Prerequisites

• A basic knowledge of mobile communication

Objectives

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

• Describe UMG8900 hardware structure
• Describe UMG8900 logical architecture
• Describe UMG8900 software architecture
• Describe UMG8900 Cascading System
• Describe main boards’ functions of UMG8900
• Describe Internal message processing flow

Training Content

OWH10 GU UMG8900 Hardware System

• UMG8900 Hardware System(SSM32)
• UMG8900 Hardware System(SSM160)
• UMG8900 Hardware System(SSM256)
  ■ UMG8900 hardware structure
  ■ UMG8900 logical architecture
  ■ UMG8900 software architecture
  ■ UMG8900 cascading system
  ■ Main boards’ functions of UMG8900
  ■ Internal message flow

Duration

1 working day

Class Size

Min 6, Max 12
1.4.10 GU UMG8900 Operation and Maintenance Training

Training Path

GU UMG8900 Operation and Maintenance Training
OWH23 Lecture, Lab, E-lab 2d

Target Audience

Core network monitor engineers
Operation and maintenance engineers

Prerequisites

- A basic knowledge of mobile communication
- Successful completion of "GU UMG8900 Hardware System Training"

Objectives

On completion of this program, the participants will be able to:
- Query equipment status
- Query resource information
- Operate performance task
- Perform system backup and recovery
- Query the service status
- Replace the hardware boards
- Replace the cable

Training Content

OWH23 GU UMG8900 Operation and Maintenance Training

- UMG8900 Routine Operation and Maintenance
  - Query equipment status
  - Query resource information
  - Perform backup
  - Query the service status
  - Browse alarm information
  - Browse the performance task

- UMG8900 System Backup and Recovery
  - UMG8900 System backup preparation
  - UMG8900 System backup operation
  - UMG8900 System recovery operation

- UMG8900 Common Operation
  - User authority operation
  - Replace board
  - Loopback operation
- Trace operation
- CDR operation
- Dialing test
- License operation
- Log operation
- Recording
- Tone file makeup and upload

- UMG8900 Common Operation Task List
  - UMG8900 Routine Operation and Maintenance
  - UMG8900 Common Operation

- UMG8900 Alarm Management and Operation
  - Browse alarm
  - Manage alarm
  - Handle alarm follow the alarm help
  - Create performance tasks
  - Dump performance report
  - Customize performance entity
  - Set alarm prompt for poor performance

Duration

2 working days

Class Size

Min 6, Max 12
1.4.11 UMG8900 Data Configuration Training

Training Path

GU UMG8900 Data Configuration Training
OWH22 Lecture, Lab, E-lab 2d

Target Audience

Core network commissioning engineers
Operation and maintenance engineers

Prerequisites

- A basic knowledge of mobile communication
- Successful completion of “GU UMG8900 Hardware System Training”

Objectives

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

- Perform hardware and hardware interface configuration
- Perform bearer (IP, TDM, ATM) configuration on UMG8900
- Perform UMG8900 interworking with BSC
- Perform UMG8900 interworking with MSC/PSTN
- Perform UMG8900 interworking with RNC

Training Content

OWH22 GU UMG8900 Data Configuration Training

- UMG8900 Basic Data Configuration (SSM32)
- UMG8900 Basic Data Configuration (SSM160)
- UMG8900 Basic Data Configuration (SSM256)
  - Configuring system time
  - Configuring frames and boards
  - Configuring the clock
- UMG8900 Mc Interface Configuration
  - Configuring MGW data
  - Configuring the Link
  - Activating the VMGW
- UMG8900 Bearer Data Configuration
  - UMG8900 IP bearer configuration
  - UMG8900 ATM bearer configuration
  - UMG8900 TDM bearer configuration
- UMG8900 interworking with BSC-MSC-PSTN Data Configuration
  - Interworking with BSC based on different scenarios
  - Interworking with MSC/PSTN based on different networking
- Interworking with MGW based on different networking
- Detailed configuration commands and key parameters
- UMG8900 interworking with MGW Data Configuration
  - Interworking with MGW based on different networking
  - Detailed configuration commands and key parameters
- UMG8900 interworking with RNC Data Configuration
  - Interworking with RNC based on different scenarios
  - Protocol stack interworking with RNC
  - Detailed configuration commands and key parameters

Duration

2 working days

Class Size

Min 6, Max 12
1.4.12 GSM/UMTS Typical Signaling Flow Training

Training Path

GSM/UMTS Typical Signaling Flow Training
OWA03 Lecture, Lab 3d

Target Audience

Core network commissioning engineers
Operation and maintenance engineers
Optimization engineers

Prerequisites

- At least one year experience of operation and maintenance of GSM NSS/UMTS CS or other telecommunication equipments
- A basic knowledge of mobile communication

Objectives

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

- Describe the different types of location update
- Describe the flow procedure of location update
- Describe the data configuration of location update
- Describe the 2G/3G security architecture
- Describe the Generating quintuple
- Describe the principle for key transmission within a system and between systems
- Describe the basic call signaling flow
- Describe the signaling flow messages and associated IEs
- Describe the call related routing flow
- Describe the BICC call related data configuration
- Describe SMS function and classification
- Describe SMMO flow and messages
- Describe SMMT flow and messages
- Describe short message notification flow

Training Content

OWA03 GSM/UMTS Typical Signaling Flow Training
- Location Update Flow Introduction
  - Basic Concepts
  - Location Update Procedures
  - Table Lookup during Location Update
  - Data Configuration
  - MAP Related Signaling Flows
MSOFTX3000 Security Management Flow Introduction
- GSM Authentication
- UMTS Authentication
- TMSI Reallocation
- Related Data Configuration

GSM_UMTS CS Basic Call Signaling Flow Analysis
- Voice Services Classification
- Intra-MSC Call Flow
- Inter-MSC Call Flow
- Bearer Establishment and Release Flow

SMS Signaling Procedure Analysis
- SMS Overview
- SMMO Flow
- SMMS Flow
- Short Message Notification

Duration

3 working days

Class Size

Min 6, Max 12
1.4.13 MSS Signaling Analysis Training

Training Path

MSS Signaling Analysis Training

OWA04 Lecture, Lab 5d

Target Audience

Core network commissioning engineers
Operation and maintenance engineers
Optimization engineers

Prerequisites

- At least two years experience of operation and maintenance of GSM NSS/UMTS CS or other telecommunication equipments
- A basic knowledge of mobile communication and soft switch principle

Objectives

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

- Describe BSSAP protocol stack and function
- Analysis main procedures of BSSAP (Paging, Initial MS Message, Cipher Mode Control, Assignment, Handover, Release, DTAP Message)
- Describe Iu interface protocol stack and function
- Describe classification of RANAP messages
- Analysis Iu connection Management, RAB assignment, SRNS Relocation, CS Domain MM, CC procedures in Iu Interfaces
- Perform protocol stack and main functions of SIGTRAN
- Analysis SCTP association establishment and close flows
- Explain UA concepts (AS, SG, IPSP, Entity, Routing key)
- Perform messages analysis of SCTP, M2UA, M3UA
- Describe H248 Protocol stack and functions
- Perform message analysis of H248 based on scenario
- Describe BICC protocol stack and functions
- Analysis key parameters of BICC
- Analysis BICC message

Training Content

OWA04 MSS Signaling Analysis Training

- SCTP Multi-Homing Principles and Networking of the MSOFTX3000
  - SCTP concepts introduction
  - SCTP functions and messages
  - SCTP basic signaling flows
- SCTP Multi-Homing principles
- M3UA Principles of the MSOFTX3000
  - M3UA Overview and Basic Concepts
  - M3UA Principles
  - Applications of M3UA on the MSOFTX3000
- M3UA Principles of the MSOFTX3000 Manual
  - M3UA concepts, messages structure and flows
  - Applications of M3UA on the MSOFTX3000
- RANAP Protocol Analysis(Iu CS)
  - Iu interface protocol stack and function
  - Classification of RANAP messages
  - Iu connection Management, RAB assignment, SRNS Relocation
  - CS Domain MM, CC procedures in Iu Interfaces
  - Key parameters description in RANAP messages
- BSSAP Protocol Analysis
  - BSSAP protocol stack and function
  - Main procedure description of BSSAP(Paging, Initial MS Message, Cipher Mode Control, Assignment, Handover, Release, DTAP Message)
  - Key parameters description in BSSAP messages
- H.248 Descriptions of the MSOFTX3000
  - H.248 Protocol stack and functions
  - Concepts introduction (Context, Termination and Stream) in H.248
  - Descriptors and commands defined by H.248 applied in Mobile Core Network
  - Message analysis of H.248 based on scenario
- BICC Interface and Function Descriptions of the MSOFTX3000
  - BICC Protocol stack and functions
  - BICC call model (SN, CMN)
  - Bearer establishment procedure
  - Key parameter description of BICC
  - BICC message analysis
- SIP Interface and Function Descriptions of the MSOFTX3000
  - SIP application and functions
  - Concepts of SIP
  - SIP message analysis and description

Duration

5 working days

Class Size

Min 6, Max 12
1.4.14 Number Translation Training

Training Path

[Number Translation Training]

OWG41 Lecture, Lab 2d

Target Audience
Core network commissioning engineers
Operation and maintenance engineers
Optimization engineers

Prerequisites
- At least two years experience of operation and maintenance of GSM NSS/UMTS CS or other telecommunication equipments
- A basic knowledge of mobile communication

Objectives
On completion of this program, the participants will be able to:
- Describe number translation flow
- Perform number change
- Perform failure process
- Perform call barring
- Perform typical number translation based on scenarios
- Perform general routing configuration on request of priority, load-sharing and time schedule
- Perform routing configuration based on TDM and IP bearer

Training Content

OWG41 Number Translation Training
- Advanced Number Analysis and Data Configuration
  - Simplified Number Analysis
  - Number Normalization Analysis
  - Call Analysis
  - Handover Analysis
  - Call Restriction Analysis

Duration
2 working days

Class Size
Min 6, Max 12
1.4.15 GSM/UMTS SoftSwitch Core Network Design Training

Training Path

GSM/UMTS SoftSwitch Core Network Design Training
OWG53 Lecture, Lab 3d

Target Audience

Core network operation and maintenance engineers
Core network design engineers

Prerequisites

- At least one year experience of core network design
- A basic knowledge of core network design

Objectives

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

- Describe GSM/UMTS softswitch network planning procedure and rules
- Calculate broadband signaling interfaces in core network
- Perform signaling network design
- Perform traffic network design
- Perform access network interconnection design
- Perform service network interconnection design
- Perform billing system interconnection design
- Perform EMS interconnection design

Training Content

OWG53 GSM/UMTS SoftSwitch Core Network Design Training

- GU CS Network Design Overview
  - Importance of Network Design
  - Overview of Network Design
- GU CS Network Design Training
  - Information Collection Introduction
  - Naming and Numbering
  - Network Solution Design
  - Signaling Network Design
  - Traffic Network Design
  - Access Network Interconnection Design
  - EMS Interconnection design
  - Billing Interconnection design
  - Time Synchronization Interconnection Design
  - Clock Synchronization Interconnection Design
- IP Interconnection Design
- GU CS Bandwidth Calculation Training
  - Bandwidth Calculation Overview
  - Signaling Bandwidth Calculation Principle
  - Traffic Bandwidth Calculation Principle
  - O&M, Billing Bandwidth Calculation Principle
  - MSRN and HON Number Quantity Calculation
- Networking Design Practice
  - Signaling Networking Design Practice
  - Traffic Networking Design Practice
  - Signaling IP Interconnection Design Practice
  - Traffic IP Interconnection Design Practice
- Bandwidth Calculation Practice
  - 2G/3G Network Bandwidth Calculation Practice

Duration

3 working days

Class Size

Min 6, Max 12
1.4.16  GSM/UMTS SoftSwitch Core Network Evaluation and Optimization Training

Training Path

GSM/UMTS SoftSwitch Core Network Evaluation and Optimization Training

OWG54  Lecture, Lab  3d

Target Audience

Core network operation and maintenance engineers
Optimization engineers

Prerequisites

- At least two years experience of operation and maintenance of GSM NSS/UMTS CS or other telecommunication equipments
- A basic knowledge of core network optimization

Objectives

On completion of this program, the participants will be able to:
- Describe procedure for evaluating resources of V/G office
- Perform evaluation and optimization of the hardware resource, logical resource, signaling resource, TC/EC resource, trunk resource, traffic resource
- Perform paging success rate analysis and optimization
- Perform SMS success rate analysis and optimization
- Perform assignment success rate analysis and optimization
- Perform handover success rate analysis and optimization
- Perform MO/MT call completion rate analysis and optimization

Training Content

OWG54 GSM/UMTS SoftSwitch Core Network Evaluation and Optimization Training

- Resource Capacity Assessment and Optimization
  - Assessment and Optimization of MSOFTX3000 Capacity
  - Assessment and Optimization of UMG8900 Capacity
  - Assessment and Optimization of Traffic Resource
  - Assessment and Optimization of Signaling Link Resource
- MSOFTX3000(ATCA) Capacity Assessment
  - MSOFTX3000 ATCA Platform
  - MSOFTX3000 Performance Assessment System
  - MSOFTX3000 Resource Capacity Counters Classification and Definition
  - MSOFTX3000 Existing Network Assessment Procedure
- Location Update Success Rate Analysis
  - Definition of Location Update Success Rate
  - Analysis of Location Update Success Rate
Operation Guide to Signaling Analysis

- Mobile Originated Call Completion Rate Analysis
  - Definition of Mobile Originated Call Completion Rate
  - Analysis of Mobile Originated Call Completion Rate
- Mobile Terminated Call Completion Rate Analysis
  - Definition of Mobile Terminated Call Completion Rate
  - Analysis of Mobile Terminated Call Completion Rate
- Paging Success Rate Analysis
  - Definition of Paging Success Rate
  - Analysis of Paging Success Rate
- Assignment Success Rate Analysis
  - Evaluation on Assignment Success Rate
  - Analysis of Assignment Failure Causes
  - Summary of Analysis Conclusions
  - Operation Guide to Signaling Analysis
- Handover Success Rate Analysis
  - Evaluation on Handover Success Rate
  - Analysis of Failure Causes
- Short Message Origination Success Rate Analysis
  - Definition of Short Message Origination Success Rate
  - Analysis of Short Message Origination Success Rate
- Short Message Termination Success Rate Analysis
  - Definition of Short Message Termination Success Rate
  - Analysis of Short Message Termination Success Rate
- Call Connection Delay Analysis
  - Analysis of Call Flow
  - Signaling Flow on the A/Iu Interface
  - Baseline of Call Delay in Each Phase
  - Overall Idea
  - Delay Analysis Before Optimization
  - Conclusion
  - Optimization Suggestions

Duration

3 working days

Class Size

Min 6, Max 12
1.4.17 MSC POOL Training

Training Path

Target Audience

Core network commissioning engineers
Operation and maintenance engineers

Prerequisites

- At least two years experience of operation and maintenance of GSM NSS/UMTS CS or other telecommunication equipments
- A basic knowledge of mobile communication

Objectives

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

- Describe MSC Pool networking
- Describe principles related to the MSC Pool features (The load balancing of MSC Pool, Handover in MSC Pool, Disaster tolerance in MSC Pool, Subscriber migration in MSC Pool, A-Flex by the MGW, Managing A-Interface Circuits on the MGW, Charging based on Virtual MSC IDs or Location Areas)
- Describe MSC Pool configuration flow overview
- Perform MSC Pool feature configuration in MSC Server and MGW
- Perform MSC Pool configuration based on different scenarios (NNSF implemented by RNC, NNSF implemented by MGW, Restructure MSC Pool based on current network)
- Monitor MSC Pool Load in real time
- Operate performance report of the MSC Pool
- Perform migration of subscribers
- Perform MSC Pool configuration synchronization between NE and M2000
- Perform end-to-end tracing of calls on the MSC Pool
- Understand the measurement units, measurement entities, and related calculation formulas for the MSC Pool
- Understand how to analyze the operating status of networks before and after an MSC Pool reconstruction

Training Content

OWG62 MSC POOL Training

- MSC POOL principle
  - MSC Pool networking
  - Principles related to the MSC Pool feature
The load balancing of MSC Pool
Handover in MSC Pool
Disaster tolerance in MSC Pool
Subscriber migration in MSC Pool
A-Flex by the MGW
Managing A-Interface Circuits on the MGW
Charging based on Virtual MSC IDs or Location Areas

- MSC Pool Data Configuration
  - MSC Pool Networking and Data collection
  - MSC Pool configuration flow overview
  - MSC Pool feature configuration in MSC Server and MGW
  - MSC Pool configuration based on different scenarios (NNSF implemented by RNC, NNSF implemented by MGW, Restructure MSC Pool based on current network)

- MSC POOL Operation and Maintenance
  - Querying MSC Pool configuration
  - Monitoring MSC Pool Load in Real Time
  - Operate Performance Report of the MSC Pool
  - Manual Migration of Subscribers
  - MSC Pool configuration synchronization between NE and M2000
  - End-to-end tracing of calls on the MSC Pool

- MSC POOL Performance Measurement Manual
  - Measurement entities for MSC Pool
  - Examples of MSC Pool performance measurement

Duration

5 working days

Class Size

Min 6, Max 12
1.4.18 MSS XPTU Configuration Training (ETSI)

Training Path

Target Audience

Core network commissioning engineers
Operation and maintenance engineers

Prerequisites

- At least two years experience of operation and maintenance of GSM NSS/UMTS CS or other telecommunication equipments
- A basic knowledge of mobile communication

Objectives

On completion of this program, the participants will be able to:
- Describe Structure of the ETSI lawful interception system
- Outline MSC Server Function in LI system
- Outline function of X1, X2 interface in LI system
- Outline function of X3 interface in LI system
- Describe the XPTU Configuration in the MSC Server
- Perform the XPTU interworking with LIG

Training Content

OWG33 MSS XPTU Configuration Training (ETSI)

- XPTU(ATCA) Configuration and Operation
  - Describe structure of the ETSI lawful interception system
  - Outline MSC Server function in LI system
  - Outline function of X1, X2 interface in LI system
  - Outline function of X3 interface in LI system
  - Describe the XPTU configuration in the MSC Server
  - Perform the XPTU interworking with LIG

Duration

1 working day

Class Size

Min 6, Max 12
1.4.19 2G/3G Core Network Sharing Training

Training Path

Target Audience

Core network commissioning engineers
Operation and maintenance engineers

Prerequisites

- At least two years experience of operation and maintenance of GSM NSS/UMTS CS or other telecommunication equipments
- A basic knowledge of mobile communication

Objectives

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

- Describe GSM security mechanism (authentication and encryption)
- Describe UMTS Security mechanism (authentication and encryption)
- Perform GSM security mode setting
- Perform UMTS security mode setting
- Describe GSM to UMTS inter-system handover operation
- Describe UMTS to GSM inter-system handover operation
- Describe Iu interface protocol stack and function
- Describe key parameters of RANAP messages
- Iu connection Management, RAB assignment, SRNS Relocation, CS Domain MM, CC procedures in Iu Interfaces

Training Content

OWG61 2G/3G Core Network Sharing Training

- GSM/UMTS Security Functions
  - GSM Security mechanism (authentication and encryption)
  - UMTS Security mechanism (authentication and encryption)
  - GSM security mode setting
  - UMTS security mode setting
- Security Management Flow Introduction
  - GSM Authentication
  - UMTS Authentication
  - TMSI Reallocation
  - Related Data Configuration
- 2G/3G Inter-system Handover
- Handover procedure
- Handover data configuration
- Common faults and troubleshooting

- 2G/3G Inter-System Handover Manual
  - GSM to UMTS inter-system handover
  - UMTS to GSM inter-system handover

Duration

1 working day

Class Size

Min 6, Max 12
1.4.20 MSS IP Technology Training

Training Path

- **IP fundamental**
  - OWI71 Lecture, Lab 1d

- CN internal IP Networking
  - OWI72 Lecture, Lab 0.5d

- Datacom Equipments in CN
  - OWI73 Lecture, Lab 1d

- CN IP Reliability and QOS
  - OWI74 Lecture, Lab 1d

- CN IP Troubleshooting
  - OWI75 Lecture, Lab 1.5d

Target Audience

Core network commissioning engineers
Operation and maintenance engineers

Prerequisites

- At least one year experience of operation and maintenance of MsoftX3000 and UMG8900 equipments

Objectives

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

- Outline the structure of IP Bear network and the main protocols used
- Outline the IP fundamental knowledge and the application in CN
- Describe the IP networking inside CN
- Describe the hardware of datacom equipments used in CN
- Perform the O&M of the datacom equipments used in CN
- Describe the IP reliability solutions in CN
- Perform the data configuration of the IP reliability solutions
- Outline the QOS requirements for IP bear network
Apply the QOS methods in CN
When there happens the IP related trouble, perform basic analysis of the trouble location and recover the service

Training Content

OWI71 IP fundamental
- Datacom fundamental
  - The fundamental IP knowledge and the application in CN
- CN IP Bear Network Overview
  - The structure of IP bear Network and the main protocols used

OWI72 CN internal IP Networking
- VLAN Principle and Configuration
  - VLAN principle and the application in CN
  - the related data configuration in CN
- CN internal IP Networking
  - The internal IP networking in CN, such as MSoftX3000 and UMG8900

OWI73 Datacom Equipments in CN
- Datacom Equipment Hardware Introduction
  - The hardware of datacom equipments used for CN
- Datacom Equipment O&M
  - The O&M of datacom equipments used in CN

OWI74 CN IP Reliability and QOS
- CN IP Reliability
  - The principle and data configuration of reliability solutions, such as SCTP multihoming, BFD, PG, Route Backup and VRRP
- CN IP QOS
  - The QOS requirement to IP bear Network;
  - The QOS technical methods in CN

OWI75 CN IP Troubleshooting
- CN IP Troubleshooting
  - The IP troubleshooting methods, steps and typical cases in CN

Duration
5 working days

Class Size
Min 6, Max 12
1.4.21 MSS Troubleshooting Training

Training Path

[Diagram]

Target Audience

Core network commissioning engineers
Operation and maintenance engineers

Prerequisites

- At least one year experience of operation and maintenance of Huawei MSOFTX3000
- At least one year experience of operation and maintenance of Huawei UMG8900

Objectives

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

- Perform tracer, CSIS of MSOFTX3000 to fault finding and locating
- Perform MSOFTX3000 signaling troubleshooting
- Perform MSOFTX3000 service troubleshooting and case analysis (Call fault, Data service fault, SMS fault, Location Update fault, announcement playing)
- Perform tracer, loopback, voice recorder for fault finding and troubleshooting
- Perform signaling troubleshooting
- Perform the bearer troubleshooting

Training Content

OWG38 MSOFTX3000 Troubleshooting Training

- MSOFTX3000 General Troubleshooting Methods
  - General troubleshooting methods
  - MSOFTX3000: CSIS
  - UMG8900: IP Trace, Call Trace and Loopback

- MSOFTX3000 Call Failure Troubleshooting
  - Call flow
  - Troubleshooting methods and notes of call fault
  - Cases analysis of call fault

- MSOFTX3000 IN Service Failure Troubleshooting
  - System structure of wireless IN
  - Mobile IN networking
- Trigger principle of IN service
- Principle of Playing Tone of IN service
- Troubleshooting methods of IN fault
- MSOFTX3000 Trunk Failure Troubleshooting
  - Introduction of the trunk circuit knowledge
  - Introduction and reason of the state of ISUP circuit
  - Troubleshooting methods for the fault of ISUP circuit and BICC circuit
- MSOFTX3000 Signaling Failure Troubleshooting
  - Troubleshooting methods for signaling fault
  - Cases analysis for MTP, SCCP and TCAP layers fault
  - Cases analysis for SCTP, M2UA and M3UA layers fault
- MSOFTX3000 Location Update Failure Troubleshooting
  - Location Update Flow Introduction
  - Location Update Failure Processing Method
  - Location Update Cases Analysis

OWH36 GU UMG8900 Troubleshooting Training
- UMG8900 Voice Failure Troubleshooting
  - Troubleshooting methods for tone fault (One-way Audio, Call Accompanied by Echoes and Noise) of the UMG8900
- UMG8900 Bearer Failure Troubleshooting
  - Troubleshooting methods for bearer fault (IP, TDM and ATM) of the UMG8900

Duration

5 working days

Class Size

Min 6, Max 12
1.4.22 AoIP Training

Training Path

| AoIP Training | OWG77 | Lecture, Lab, E-lab | 2d |

Target Audience

Core network commissioning engineers
Operation and maintenance engineers

Prerequisites

- At least two years experience of operation and maintenance of GSM NSS/UMTS CS or other telecommunication equipments
- A basic knowledge of mobile communication

Objectives

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

- Outline the Modifications from AoTDM to AoIP
- Describe the function of each network element on AoIP
- Describe AoIP codec selecting policy
- Describe the difference of signaling flow between AoIP and AoTDM
- Describe the principle of QoS and IP domain on AoIP
- Configure AoIP data on MSC Server and MGW
- Analyze and handle faults related to core network AoIP
- Complete analysis and handling of common faults

Training Content

OWG77 AoIP Training

- AoIP Networking and Principle
  - Background
  - Networking
  - Modification from AoTDM to AoIP
  - Codec selection policy
  - AoIP Call Flow
  - QoS Control
  - IP Domain Control

- AoIP Data Configuration
  - Data configuration for direct connection mode between MSC Server and BSC
  - Data configuration for MGW connection mode between MSC server and BSC(M3UA forward)
  - Introduction to AoIP software parameter of MSC Server
AoIP Troubleshooting

- Core network AoIP troubleshooting methods
- Common fault handling

Duration

2 working days

Class Size

Min 6, Max 12
1.4.23  MSS Common Emergency Operation Training

Training Path

Target Audience

Core network commissioning engineers
Operation and maintenance engineers

Prerequisites

- At least two years experience of operation and maintenance of GSM NSS/UMTS CS or other telecommunication equipments
- A basic knowledge of mobile communication

Objectives

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

- Describe MSS emergency scenarios
- Recover MSOFTX3000 O&M communication
- Handle MSOFTX3000 hardware fault
- Handle the fault caused by misoperation of MSOFTX3000
- Perform fault prevention for heavy traffic during holidays
- Clear high risky alarms of MSOFTX3000
- Recover MSOFTX3000 emergency in different scenario, including C/D interface congestion, interworking failure with SCP and OCS, CPU overload, calls fail because of abnormal circuit state and so on
- Recover UMG8900 O&M communication
- Handle UMG8900 hardware fault
- Handle UMG8900 link fault
- Handle resource usage exceeds the threshold of UMG8900
- Handle bearer network fault
- Reset the device of UMG8900
- Solve the A interface, C/D interface congestion problem
- Implement the database recovery operation
- Replace WCCU board
- Replace the BAM by the EWS
- Export Content of CDR Pool
- Switch the iGWB Nodes
- Backup and recover the system configuration manually
- Replacing OMU board
Training Content

OWG78 MSS Common Emergency Operation Training

- MSS Common Emergency Operation and Failure Prevention (MSFTX3000)
  - MSS emergency scenarios
  - MSFTX3000 O&M communication fault
  - MSFTX3000 hardware fault
  - Fault caused by misoperation of MSFTX3000
  - Fault prevention for heavy traffic during holidays
  - High risky alarms of MSFTX3000
  - MSFTX3000 emergency in different scenario, including C/D interface congestion, interworking failure with SCP and OCS, CPU overload, calls fail because of abnormal circuit state and so on

- MSS Common Emergency Operation and Failure Prevention (UMG8900)
  - UMG8900 O&M communication fault
  - UMG8900 hardware fault
  - UMG8900 link fault
  - Handle resource usage exceeds the threshold of UMG8900
  - Bearer network fault
  - Reset the device of UMG8900

Duration

2 working days

Class Size

Min 6, Max 12
1.4.24 CSFB Training

Training Path

Target Audience

Core network commissioning engineers
Operation and maintenance engineers

Prerequisites

- At least two years experience of operation and maintenance of GSM NSS/UMTS CS or other telecommunication equipments
- A basic knowledge of mobile communication

Objectives

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

- Describe the fundamental of the CSFB
- Describe the SGs interface and protocol
- Describe the network deployment of the CSFB
- Describe the main service procedure of CSFB
- Analyze CSFB signaling message and main information element
- Describe data configuration procedure of CSFB
- Perform CSFB interworking configuration and service commissioning
- Describe performance measurement units and alarms of CSFB

Training Content

OWG86 CSFB Training

- CSFB Solution Introduction
  - CSFB Fundamentals
  - CSFB Key Procedures
  - SGs Interface and Protocol
  - CSFB Redundancy Solution
  - Call Delay Analysis
  - CSFB Network Deployment

- CSFB Signaling Introduction
  - SGsAP Interface Protocol Overview
  - CSFB Main Signaling Procedure Analysis

- CSFB Data Configuration, Operation and Maintenance
  - Networking Overview
  - Data Configuration
- System Commissioning
- Operation and Maintenance
- Configuration Example

Duration

2 working days

Class Size

Min 6, Max 12
1.4.25 MSOFTX3000 mAGCF Feature Training

Training Path

| mAGCF feature | OWG64 | Lecture, Lab | 0.5d |

Target Audience

- Core network commissioning engineers
- Operation and maintenance engineers

Prerequisites

- At least one year experience of operation and maintenance of MsoftX3000 and UMG8901 equipments

Objectives

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

- Describe the feature of the service
- Perform the related data configuration

Training Content

- OWG64 mAGCF feature
  - mAGCF feature introduction
    - Feature overview
    - Service Processing Flow
  - mAGCF data configuration
    - Data configuration overview
    - mAGCF service configuration

Duration

0.5 working day

Class Size

Min 0, Max 0
1.4.26 VoLTE Solution (CS) Advanced Operation and Maintenance Training

Training Path

Target Audience

Core network commissioning engineers
Operation and maintenance engineers

Prerequisites

- At least one year experience of operation and maintenance of MSOFTX3000 and UMG8900 equipments
- Finish Operation and Maintenance Training of MSOFTX3000 and UMG8900

Objectives

On completion of this program, the participants will be able to:
- Describe VoLTE Solution Basic Concepts
- Describe eSRVCC Logical Architecture
- Describe eSRVCC Service Procedure
- Describe MSOFTX3000 eSRVCC Charging
- Describe MSOFTX3000 eSRVCC Codec Negotiation
- Describe MSOFTX3000 eSRVCC reconstruction methods
- Describe MSOFTX3000 eSRVCC data configuration procedures
- Perform MSOFTX3000 eSRVCC data configuration
- Describe GTPv2-C Protocol stack
- Describe function of key messages and IEs on Sv interface
- Describe MGCF Logical Architecture
- Describe MGCF voice service procedure
- Perform MSOFTX3000 MGCF data configuration

Training Content

OWG66 VoLTE Solution (CS) Advanced Operation and Maintenance Training
- MSOFTX3000 eSRVCC Introduction
  - Commercial LTE Voice Solutions
  - Key Technologies Involved in VoLTE
  - eSRVCC Logical Architecture
  - eSRVCC Service Procedure
  - eSRVCC Charging
  - eSRVCC Codec Negotiation
- MSOFTX3000 eSRVCC Data Configuration, Operation and Maintenance
- Reconstruction Method
- MSS Data configuration
- System Commissioning
- Operation and Maintenance

- MSOFTX3000 eSRVCC GTPv2-C Protocol Analysis
  - GTPv2-C Protocol Introduce
  - Key Messages and IEs Introduce
  - Case Analysis

- MSOFTX3000 MGCF Introduction
  - MGCF Logical Architecture
  - Interface and Protocol
  - Voice Service Procedure
  - MGCF Codec Negotiation

- MSOFTX3000 MGCF Data Configuration and Operation and Maintenance
  - MSS Data configuration
  - System Commissioning
  - Operation and Maintenance

Duration

2 working day

Class Size

Min 6, Max 12
1.5 GSM-R

1.5.1 GTSOFTX3000 Product Training

Training Path

GTSOFTX3000 Hardware System
OMH20 Lecture 0.5d

GTSOFTX3000 Data Configuration
OMH22 Lecture, Lab 6d

GTSOFTX3000 Operation and Maintenance
OMH21 Lecture, Lab 3.5d

Target Audience

GSM-R core network monitor engineers
Installation engineers
Commissioning engineers
Operation and maintenance engineers

Prerequisites

- A basic knowledge of telecommunication
- Successful completion of "GTSOFTX3000 Hardware System"

Objectives

On completion of this program, the participants will be able to:
- Describe the MSOFTX3000 hardware structures
- Describe the MSOFTX3000 cascade structures
- Describe the function, indicators, ports and working mode of each board
- Explain the types and applications of different fibers and cables
- Describe the concept of Hardware Configuration
- Perform hardware configuration
- Know how to verify hardware configuration
- Perform the connection between GTSOFTX3000 and MGW
- Perform GTSOFTX3000 Office information configuration
- Perform data configuration between GTSOFTX3000 to HLR
- Perform data configuration between GTSOFTX3000 and BSC (M2UA based, M3UA based)
- Perform the data configuration from GTSOFTX3000 to RNC based on IP and ATM
• Perform data configuration between GTSOFTX3000 and PSTN/MSC in different mode
• Manage equipments, for example: checking board status and version
• Manage data, for example: backup system data, executing MML commands
• Manage logs, for example: querying logs, saving logs
• Manage tracing tasks, for example: creating a tracing task, checking tracing result, saving result
• Perform the routine operation and maintenance
• Operation of replace the hardware board
• Operation of change the cable
• Operation of system backup
• Operation of system recovery
• Manage alarms (browsing alarms, querying alarms, printing alarms, dump alarm logs)
• Create performance tasks
• Checking status of performance tasks
• Customized performance tasks
• Dump the measurement result
• Start and stop the process of BAM
• Point out key information and its directory of BAM

Training Content

OMH20 GTSOFTX3000 Hardware System
• GTSOFTX3000 Hardware System
  ■ Describe the MSOFTX3000 hardware structures
  ■ Describe the MSOFTX3000 cascade structures
  ■ Describe the function, indicators, ports and working mode of each board
  ■ Explain the types and applications of different fibers and cables

OMH22 GTSOFTX3000 Data Configuration
• GTSOFTX3000 Hardware Data Configuration
  ■ Understand the concept of Hardware Configuration
  ■ Grasp the process and method of Hardware Configuration
  ■ Grasp the relations of the parameters in commands
  ■ Grasp how to check the results of hardware configuration
• GTSOFTX3000 interworking with MGW Configuration
  ■ Protocol stack between GTSOFTX3000 and MGW
  ■ Configuration flow
  ■ Configuration commands and key parameters
  ■ Verification of configuration
• GTSOFTX3000 Local Office Data Configuration
  ■ GTSOFTX3000 Office information configuration and query
• GTSOFTX3000 Interworking with HLR Data Configuration
  ■ Acknowledge relative basic concepts of MAP and functions of C/D interface.
  ■ Perform data configuration from MSOFTX3000 to HLR
• GTSOFTX3000 Interworking with BSC Data Configuration
- Understand the relative concepts
- Master the relationship between commands
- Perform data configuration for interworking with BSC (M2UA based)
- **GTSOFTX3000 Interworking With RNC Data Configuration**
  - Describe M3UA correlative concept
  - Perform the M3UA data configuration between MSOFTX3000 and MGW
  - Perform the data configuration from MSOFTX3000 to RNC based on IP and ATM
- **GTSOFTX3000 Interworking with PSTN-MSC Data Configuration**
  - Understand networking solutions between MSOFTX3000 and PSTN/MSC
  - Perform data configuration interconnect MSOFTX3000 with PSTN/MSC in different mode
- **GTSOFTX3000 Number Analysis Configuration**
  - Basic concepts of number analysis
  - The flow of number analysis
  - Key commands and functions for number analysis tables
  - Typical case for number analysis

**OMH21 GTSOFTX3000 Operation and Maintenance**
- **GTSOFTX3000 Routine Operation and Maintenance**
  - Manage equipments, for example: checking board status and version
  - Manage data, for example: backup system data, executing MML commands
  - Manage logs, for example: querying logs, saving logs
  - Manage tracing tasks, for example: creating a tracing task, checking tracing result, saving result
  - Perform the routine operation and maintenance tasks (daily, weekly and monthly)
- **GTSOFTX3000 Parts Replacement**
  - Operation of replace the hardware board
  - Operation of change the cable
  - Cautions of replacement
- **GTSOFTX3000 System Backup and Recovery**
  - Operation of system backup
  - Operation of system recovery
  - Cautions of backup and recovery
- **GTSOFTX3000 BAM Introduction**
  - BAM function
  - BAM components
  - Start and stop the process of BAM
  - Key information and its directory of BAM
- **GTSOFTX3000 Alarm Management and Operation**
  - Browsing Alarms
  - Querying Alarms
  - Printing Alarms
- Dump Alarm logs
- Alarm Box Operation
- GTSOFTX3000 Performance Measurement and Operation
  - Creating performance tasks
  - Checking status of performance tasks
  - Customized performance tasks
  - Suspending performance tasks
  - Delete performance tasks
  - Dumping the measurement result

Duration

10 working days

Class Size

Min 6, Max 12
1.5.2 GSM-R UMG8900 Product Training

Training Path

GSM-R UMG8900 Hardware System
OMH30 Lecture 1d

GSM-R UMG8900 Operation and Maintenance
OMH31 Lecture, Lab 2d

GSM-R UMG8900 Data Configuration
OMH32 Lecture, Lab 2d

Target Audience

GSM-R core network monitor engineers
Installation engineers
Commissioning engineers
Operation and maintenance engineers

Prerequisites

- A basic knowledge of telecommunication
- Successful completion of "GSM-R UMG8900 Hardware System"
- A basic knowledge of telecommunication
- Successful completion of "GSM-R UMG8900 Hardware System"

Objectives

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

- Describe UMG8900 hardware structure
- Describe UMG8900 logical architecture
- Describe UMG8900 software architecture
- Describe UMG8900 Cascading System
- Describe main boards' functions of UMG8900
- Describe Internal message flow of UMG8900
- Describe function of SIWF
- Configure SIWF
- Perform operation and maintenance of SIWF
- Query equipment status
- Query resource information
- Perform backup and recovery of UMG8900
- Query the service status
- Browse alarm information
- Browse the performance task
- Configure System Parameters
- Configure System Time
- Configure Frames and Boards
- Configure the Clock
- Configure the NMS Interface
- Configure the MGW Control Interface and SIGTRAN Interface
- Configure ATM bearer, IP bearer, TDM bearer
- Configure signaling transfer
- Configure MGW data
- Configure the link
- Perform interworking with MGW based on different networking
- Perform interworking with BSC based on different scenarios
- Perform interworking with MSC/PSTN based on different networking

Training Content

OMH30 GSM-R UMG8900 Hardware System
- GSM-R UMG8900 Hardware System (SSM256)
  - UMG8900 hardware structure
  - UMG8900 logical architecture
  - UMG8900 software architecture
  - UMG8900 Cascading System
  - Main boards' functions of UMG8900
  - Internal message flow
- GSM-R UMG8900 Hardware System (SSM32)

OMH31 GSM-R UMG8900 Operation and Maintenance
- GSM-R SIWF Operation and Maintenance
  - Function of SIWF
  - Configuration of SIWF
  - Operation and maintenance of SIWF
  - SIWF application in GSM-R
- GSM-R UMG8900 Routine Operation and Maintenance
  - Query equipment status
  - Query resource information
  - Perform backup
  - Query the service status
  - Browse alarm information
  - Browse the performance task
- GSM-R UMG8900 System Backup and Recovery
System backup preparation
System backup operation
System recovery operation

OMH32 GSM-R UMG8900 Data Configuration

- GSM-R UMG8900 Hardware Data Configuration
  - Configuring System Parameters
  - Configuring System Time
  - Configuring Frames and Boards
  - Configuring the Clock
  - Configuring the NMS Interface
  - Configuring the MGW Control Interface and SIGTRAN Interface
  - ATM bearer configuration
  - IP bearer configuration
  - TDM bearer configuration
  - Signaling Transfer configuration

- GSM-R UMG8900 Mc Interface Configuration
  - Configuring MGW data
  - Configuring the Link
  - Activating the VMGW

- GSM-R UMG8900 Interworking with BSC-MSC-PSTN-MGW Data Configuration
  - Interworking with BSC based on different scenarios
  - Interworking with MSC/PSTN based on different networking
  - Interworking with MGW based on different networking

Duration

5 working days

Class Size

Min 6, Max 12
1.5.3 GSM-R Feature Training

Training Path

GSM-R Overview
OMH01 Lecture 0.5d

GSM-R Feature Training
OMH40 Lecture, Lab 4.5d

Target Audience

GSM-R core network telecommunication engineers
GSM-R core network commissioning engineers
Operation and maintenance engineers

Prerequisites

- A basic knowledge of railway telecommunication system

Objectives

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

- Describe the fundamental of GSM-R
- Describe the architecture of GSM-R system
- Describe the service and function of GSM-R system
- Configure and verify eMLPP service
- Configure and verify USS1 service
- Configure and verify VBS service
- Configure and verify VGCS service
- Configure and verify Multiple-Engine service
- Configure and verify functional addressing
- Configure and verify call area restriction Configure and verify location dependent addressing service
- Configure and verify SMC integration service
- Configure and verify access matrix service
- Configure and verify break-in and force release service
- Configure and verify missed call SMS prompt service
- Configure and verify priority cell service
- Perform AC (Acknowledgement Center) server software installation and uninstallation
- Configure AC in BAM
- Operate GMS (Group Management Server) installation
Training Content

OMH01 GSM-R Overview
- Overview of the GSM-R System
  - Describe the fundamental of GSM-R.
  - Describe the architecture of GSM-R system.
  - Describe the service and function of GSM-R system.

OMH40 GSM-R Feature Training
- GSM-R Features Training - eMLPP
  - eMLPP Service Configuration, principle, service flow, service verification, troubleshooting and case analysis
- GSM-R Features Training - USS1
  - USS1 Service Configuration, principle, service flow, service verification, troubleshooting and case analysis
- GSM-R Features Training - VBS
  - VBS Service Configuration, principle, service flow, service verification, troubleshooting and case analysis
- GSM-R Features Training - VGCS
  - VGCS Service Configuration, principle, service flow, service verification, troubleshooting and case analysis
- GSM-R Features Training - Multiple-Engine Control
  - Multiple-Engine Service Configuration, principle, service flow, service verification, troubleshooting and case analysis
- GSM-R Features Training - Functional Addressing
  - Functional Addressing Service Configuration, principle, service flow, service verification, troubleshooting and case analysis
- GSM-R Features Training - Call Area Restriction
  - Call Area Restriction Service Configuration, principle, service flow, service verification, troubleshooting and case analysis
- GSM-R Features Training - Location Dependent Addressing
  - Location Dependent Addressing Service Configuration, principle, service flow, service verification, troubleshooting and case analysis
- GSM-R Features Training - SMC Integration
  - SMC Integration Service Configuration, principle, service flow, service verification, troubleshooting and case analysis
- GSM-R Features Training - Access Matrix
  - Access Matrix Service Configuration, principle, service flow, service verification, troubleshooting and case analysis
- GSM-R Features Training - Break-in and Forced Release
  - Break-in and Force release Service Configuration, principle, service flow, service verification, troubleshooting and case analysis
- GSM-R Features Training - Missed Call SMS Prompt
  - Missed call SMS prompt Service Configuration, principle, service flow, service verification, troubleshooting and case analysis
verification, troubleshooting and case analysis

- GSM-R Features Training - Priority Cell
  - Priority Cell Configuration, principle, service flow, service verification, troubleshooting and case analysis

- GSM-R Features Training - Operation and Maintenance of the AC
  - Functions of AC (Acknowledge Center)
  - AC software installation and uninstallation
  - Configuring AC in BAM
  - AC operation

- GSM-R Features Training - Operation and Maintenance of the GMS
  - GMS (Group Management Server) networking and functions
  - GMS installation

Duration

  5 working days

Class Size

  Min 6, Max 12
1.6 UGC

1.6.1 UGC3200 (Convergent Gateway Office) Operation and Maintenance Training

Training Path

- **OMS2600 (UGC) Operation and Maintenance**
  - OZC10 Lecture, Lab 1d

- **UGC3200 (CGO) Operation and Maintenance**
  - OZE08 Lecture, Lab 4d

- **UMG8900 (CGO) Operation and Maintenance**
  - OZE04 Lecture, Lab 2d

- **iManager NMS (CGO) Operation and Maintenance**
  - OZO05 Lecture, Lab 1d

Target Audience

- Convergency Gateway Office monitor engineers
- Commissioning engineers
- Operation and maintenance engineers

Prerequisites

- A basic knowledge of telecommunication

Objectives

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

- Introduce the hardware structure, the power system and the board functions of ATCA platform, as well as the monitor system
- Describe function and features of OMS2600
- Perform OMS2600 hardware operation (replacing boards, checking running status)
- Perform software O&M (checking process status and so on)
- Introduce the UGC3200 hardware structure
- Introduce the function, location and working flow of UGC3200
- Perform number analysis configuration
- Perform the local office data and the data configuration related to H248 and SIP
- Perform the interworking data with MGW, PSTN, GSM, CDMA, etc
- Perform device and service status check
- Perform iGWB operation and maintenance
- Introduce the system functions of UMG8900
- Introduce the UMG8900 hardware structure
- Introduce the function, indicators, ports and working mode of each board
- Perform UMG8900 Mn(H248) interface configuration
- Perform UMG8900 interworking with MSC-PSTN-MGW data configuration
- Operate GUI
- Perform routine maintenance
- Describe the NMS structure
- Perform system login
- Operate user right management
- Operate topology management
- Operate fault management
- Operate performance management
- Perform system monitor
- Backup database

Training Content

OZC10 OMS2600 (UGC) Operation and Maintenance
- ATCA Hardware Platform Introduction
  - Introduce the hardware structure, the power system and the board functions of ATCA platform, as well as the monitor system
- OMS2600(UGC) Product Introduction
  - Product Orientation of OMS2600
  - Interfaces
  - Function and Features
  - System Structure
- OMS2600(UGC) Operation and Maintenance
  - OMS2600 Operation
  - OSTA Hardware O&M
  - Software O&M
  - NE O&M

OZE08 UGC3200(CGO) Operation and Maintenance
- UGC3200(Convergent GW) System Overview
  - Introduce the UGC3200 hardware structure
  - Introduce the function, location and working flow of UGC3200
- UGC3200(Convergent GW) Call Number Analysis
  - Basic Concept and Basic call flow
  - Procedure and Configuration
  - Number Analysis Configuration Example
- UGC3200(Convergent GW) Data Configuration
Introduce the local office data and the data configuration related to H.248 and SIP
Introduce the interworking data with MGW, PSTN, GSM, CDMA, etc.

- **UGC3200 (Convergent GW) Operation and Maintenance**
  - Operator Guide
  - Administrator Guide
  - Device and Service status Check

- **iGWB Operation and Maintenance**
  - iGWB function introduction
  - iGWB data configuration
  - iGWB operation and maintenance

**OZE04 UMG8900 (CGO) Operation and Maintenance**

- **CGO UMG8900 Hardware Introduction**
  - Introduce the system functions of UMG8900
  - Introduce the UMG8900 hardware structure
  - Introduce the function, indicators, ports and working mode of each board

- **CGO UMG8900 interworking Data Configuration**
  - UMG8900 Mc (H248) Interface Configuration
  - UMG8900 Interworking with MSC-PSTN-MGW Data Configuration

- **CGO UMG8900 Operation and Maintenance**
  - OMU Principle
  - GUI Operation Introduction
  - Routine Maintenance

**OZO05 iManager NMS (CGO) Operation and Maintenance**

- **iManager NMS (CGO) Product Introduction**
  - Product network structure, main features and Typical Configuration in IMS
  - SNMP Protocol introduction
  - Northband interface

- **iManager NMS (CGO) Operation and Maintenance**
  - System Login
  - User Right Management
  - Topology Management
  - Fault Management
  - Performance Management
  - System Monitor
  - Database Backup

**Duration**

8 working days

**Class Size**

Min 6, Max 12
1.7 SmartCare

1.7.1 SEQ Analyst and Probe Administrator Training

Training Path

Target Audience

Core network monitoring engineers

Prerequisites

- At least one year experience of operation and maintenance of Core Network equipments

Objectives

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

- Describe position, feature, function, interface protocol and structure of SEQ Analyst and Probe
- Describe hardware structure and function of different parts of SEQ Analyst and Probe
- Describe software structure and function of different software sub-system of SEQ Analyst and Probe
- Configure server, module group, local service IP and service data of SEQ Analyst and Probe
- Describe network design principles
- Describe IP address and VLAN configuration principles
- Design time synchronization
- Describe transmission and security requirements
- Describe configuration principles
- Perform SEQ Analyst data configuration, including security configuration, data Collection system interworking configuration, CS/PS Network configuration, O&M configuration, service data Configuration
- Perform routine maintenance

Training Content

OSE01 SEQ Analyst and Probe Administrator Training

- SEQ Analyst and Probe Product Overview
  - Product Description
  - Application Scenarios
  - Product Architecture
  - Interfaces and Protocols
  - Technical Specifications
- SEQ Analyst and Probe Hardware Overview
  - Hardware structure
- Function of different hardware parts

- SEQ Analyst Network Design
  - Cable Connection
  - IP Address and VLAN Configuration
  - Time Synchronization Design
  - Transmission Requirements

- NetProbe3010 Network Design
  - Probe Networking Principle
  - Probe Access Modes
  - Probe Network Design Guide

- SPM Network Design
  - Probe Networking Principle
  - Probe Access Modes
  - Probe Network Design Guide

- SEQ Analyst Data Configuration and Commissioning
  - General Configuration Procedure
  - Security Configuration
  - Data Collection System Interworking Configuration
  - Database Synchronization Configuration
  - CS Network Configuration
  - PS Network Configuration
  - O&M Configuration
  - Service Data Configuration
  - Commissioning

- SPM Data Configuration and Commissioning
  - General Configuration Process
  - Basic Function Configuration
  - Interconnection Configuration
  - Configuring CS NEs
  - Carrier Network Configuration
  - Commissioning

- NetProbe3010 Data Configuration and Commissioning
  - Configuring Data for Interworking with the SEQ Analyst
  - Configuring Devices
  - Configuring Interface Record Reporting

- SEQ Analyst and Probe Operation and Maintenance
  - Maintenance system structure
  - Hardware management
  - Installation management
  - Software management
  - Alarm management
  - Log management
- Service troubleshooting

Duration

3 working days

Class Size

Min 6, Max 12
1.7.2 SmartCare Voice Service Quality Improvement Training

Training Path

| SmartCare Voice Service Quality Improvement Training |
| OSE02 Lecture, Lab 2d |

Target Audience

- Core network commissioning engineers
- Operation and maintenance engineers

Prerequisites

- At least two years experience of operation and maintenance of GSM NSS/UMTS CS or other telecommunication equipments
- A basic knowledge of mobile communication

Objectives

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

- Describe voice/SMS signaling flow
- Describe voice/SMS service modeling method
- Describe voice/SMS KQI system
- Describe relationship between the voice/SMS KQI and each PI
- Perform CS network real-time monitor
- Perform Location Update, Call Service, SMS, Handover, Paging analysis
- Describe SmartCare SQM function
- Perform voice quality monitoring
- Perform voice service quality analysis
- Describe SmartCare CEM function
- Perform VVIP/VIP group monitoring
- Perform Customer/Customer group analysis
- Perform VAP/VAC/Device analysis
- Describe voice KQI analysis flow
- Detect voice KQI problems
- Assess and demarcate voice KQI problems

Training Content

OSE02 SmartCare Voice Service Quality Improvement Training

- SmartCare CS SQx KQI Modeling Method (Voice)
  - Voice E2E signaling flow
  - Voice service modeling method
  - Voice KQI system
  - Relationship between the voice KQI and each PI
• SmartCare CS SQx KQI Modeling Method (SMS)
  ■ SMS E2E signaling flow
  ■ SMS service modeling method
  ■ SMS KQI system
  ■ Relationship between the SMS KQI and each PI
• Smartcare CS NPM Tools Operation for Voice Service
  ■ Real-Time Monitoring
  ■ CS Network Quality Analysis
  ■ Record Query
• Smartcare CS SQM Tools Operation for Voice Service
  ■ SQM Function Overview
  ■ Voice Service Quality Monitoring
  ■ Voice Service Quality Analysis
• Smartcare CS CEM Tools Operation for Voice Service
  ■ CEM Overview
  ■ VVIP/VIP Group Monitoring
  ■ Customer/Customer Group Analysis
  ■ VAP Analysis
  ■ VAC Analysis
  ■ Device Analysis
  ■ Roaming Analysis
  ■ Compliant Handling
• SmartCare Voice Service Quality Assessment and Optimization Guide
  ■ Voice KQI System Introduction
  ■ Voice KQI Assessment Method
  ■ Voice KQI Optimization Method
  ■ Case Analysis

Duration

2 working days

Class Size

Min 6, Max 12
1.7.3 SmartCare IMS Service Quality Improvement Training

Training Path

[Image]

Target Audience

- Core network commissioning engineers
- Operation and maintenance engineers

Prerequisites

- At least two years experience of operation and maintenance of IMS or other telecommunication equipments
- A basic knowledge of mobile communication

Objectives

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

- Perform IMS network performance analysis
- Perform IMS KPIs real-time Monitoring
- Perform IMS service quality analysis

Training Content

OSE03 SmartCare IMS Service Quality Improvement Training

- SmartCare IMS Service Quality Analysis
  - IMS network performance analysis
  - IMS KPIs real-time Monitoring
  - IMS xDR query
  - IMS service quality analysis

Duration

- 2 working days

Class Size

- Min 6, Max 12
1.8 WBT

1.8.1 MSS Signaling Analysis(WBT)

Training Path

Target Audience

Core network commissioning engineers
Operation and maintenance engineers

Prerequisites

- At least two years experience of operation and maintenance of GSM NSS/UMTS CS or other telecommunication equipments
- A basic knowledge of mobile communication and soft switch principle

Objectives

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

- Describe BICC protocol stack and functions
- Describe the Bearer Independent Call Control model
- Describe BICC message structure
- Describe the similarities and differences between BICC and ISUP, and the main difference between BICC CS1 and CS2
- Describe basic BICC call procedures
- Describe the functions of SIGTRAN
- Describe SIGTRAN protocol structure, message and signaling flow
- Describe SCTP functions
- Describe the signaling message and procedures of SCTP
- Describe the functions of SIGTRAN UA layers
- Describe the procedures and implementation of M2UA
- Describe the procedures and implementation of M3UA
- Describe H248 protocol function
- Describe H248 message structure
- Describe the function of H248 commands
- Describe H248 signaling procedure

Training Content

OWG79 MSS Signaling Analysis(WBT)
- BICC Protocol Introduction(WBT)
  - Introduction of BICC
- BICC Node Model
- BICC Protocol Model
- Features of BICC Protocol
- BICC Message Structure
- Main BICC Messages
- BICC Specific Information Elements
- Call Setup Procedure
- Codec Negotiation Procedure
- Call Release Procedure

- **SIGTRAN-SCTP Introduction (WBT)**
  - SIGTRAN Overview
  - SCTP Introduction
  - SCTP Terms
  - SCTP Functions
  - SCTP Message Format
  - SCTP Signaling Procedures

- **SIGTRAN UA Layers Introduction (WBT)**
  - Introduction of UA Layers
  - UA Common Terminologies
  - M2UA Function and Protocol Stack
  - Terminologies of M2UA
  - M2UASignaling Flow
  - M3UA Function and Protocol Stack
  - Terminologies of M3UA
  - M3UA and MTP3 Mapping of Messages
  - M3UA Signaling Flow

- **H.248 Protocol Introduction (WBT)**
  - H.248 Protocol Structure and Function
  - Connection model
  - Descriptors and Packages
  - H.248 Message Structure
  - H.248 Commands
  - Signaling Procedure

**Duration**

2.5 hours

**Class Size**

No limit
1.8.2  GSM and UMTS Softswitch Core Network Principle(WBT)

Training Path

Target Audience

Core network commissioning engineers
Operation and maintenance engineers

Prerequisites

 All Technical and non-Technical Personnel

Objectives

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

 Write down the Softswitch core network structure
 Describe the Softswitch core network technical features
 Describe interfaces and protocol in softswitch
 Write down the call flow in Softswitch core network

Training Content

OWG80 GSM and UMTS Softswitch Core Network Principle(WBT)

 GSM and UMTS Softswitch Core Network Principle(WBT)
    Softswitch Core Network Structure
    Softswitch Interface and Protocol
    Call Flow in Softswitch Core Network
    Features in Softswitch

Duration

0.5 hour

Class Size

No limit
1.8.3 MSC POOL Principle (WBT)

Training Path

MSC POOL Principle (WBT)
OWG81 WBT 1h

Target Audience

Core network commissioning engineers
Operation and maintenance engineers

Prerequisites

- At least two years experience of operation and maintenance of GSM NSS/UMTS CS or other telecommunication equipments
- A basic knowledge of mobile

Objectives

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

- Describe MSC Pool networking
- Describe principles related to the MSC Pool features (The load balancing of MSC Pool, Handover in MSC Pool, Disaster tolerance in MSC Pool, Subscriber migration in MSC Pool, A-Flex by the MGW, Managing A-Interface Circuits on the MGW, Charging based on Virtual MSC IDs or Location Areas)

Training Content

OWG81 MSC POOL Principle (WBT)
- MSC POOL Principle (WBT)
  - MSC Pool networking
  - Principles related to the MSC Pool feature
  - The load balancing of MSC Pool
  - Handover in MSC Pool
  - Disaster tolerance in MSC Pool
  - Subscriber migration in MSC Pool
  - A-Flex by the MGW
  - Managing A-Interface Circuits on the MGW
  - Charging based on Virtual MSC IDs or Location Areas

Duration

1 hour

Class Size

No limit
1.8.4 UMG8900 System Overview(WBT)

Training Path

UMG8900 System Overview(WBT)

OWG82 WBT 1h

Target Audience

Core network commissioning engineers
Operation and maintenance engineers

Prerequisites

- A basic knowledge of mobile communication

Objectives

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

- Describe UMG8900 product orientation
- Describe product feature
- Describe system architecture
- Describe service and networking applications

Training Content

OWG82 UMG8900 System Overview(WBT)

- UMG8900 System Overview(WBT)
  - UMG8900 Product Orientation
  - Product Feature
  - System Architecture
  - Service and Networking Applications
  - Technical Specification

Duration

1 hour

Class Size

No limit
1.8.5 MSOFTX3000(ATCA) System and Principle(WBT)

Training Path

OWG83 MSOFTX3000(ATCA) System and Principle(WBT)

Target Audience

Core network commissioning engineers
Operation and maintenance engineers

Prerequisites

- A basic knowledge of mobile communication

Objectives

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

- Describe the orientation of MSOFTX3000 in the network
- Describe MSOFTX3000 system structure
- Describe the networking and application of MSOFTX3000
- Describe the interfaces and protocols
- Describe MSOFTX3000 physical structure
- Describe MSOFTX3000 logical system architecture
- Describe Signaling internal processing flows

Training Content

- MSOFTX3000(ATCA) System Overview(WBT)
  - MSOFTX3000 Orientation and Networking
  - MSOFTX3000 Protocol Interfaces
  - Supporting Services and Features
  - MSOFTX3000 System Architecture
- MSOFTX3000(ATCA) System Principle(WBT)
  - MSOFTX3000 Service Processing Subsystem
  - MSOFTX3000 Maintenance Management Subsystem
  - MSOFTX3000 Environment Monitoring Subsystem
  - MSOFTX3000 Alarm Management System

Duration

2 hours

Class Size

No limit
1.8.6 GU CS Core Network Design Overview (WBT)

Training Path

GU CS Core Network Design Overview (WBT)
OWG84 WBT 0.5h

Target Audience

Core network operation and maintenance engineers
Core network design engineers

Prerequisites

- At least one year experience of core network design

Objectives

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

- Describe the importance of network design
- Describe the main contents of network design

Training Content

OWG84 GU CS Core Network Design Overview (WBT)

- GU CS Core Network Design Overview (WBT)
  - Importance of network design
  - Overview of network design

Duration

0.5 hours

Class Size

No limit
1.8.7 AoIP Networking and Principle(WBT)

Training Path

**AOIP Networking and Principle(WBT)**

OWG85 WBT 0.5h

Target Audience

- Core network operation and maintenance engineers
- Core network design engineers

Prerequisites

- At least one year experience of core network design

Objectives

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

- Outline the Modifications from AoTDM to AoIP
- Describe the function of each network element on AoIP
- Describe AoIP codec selecting policy
- Describe the signaling flow difference between AoIP and AoTDM
- Describe the principle of QoS and IP domain on AoIP

Training Content

**OWG85 AoIP Networking and Principle(WBT)**

- AoIP Networking and Principle(WBT)
  - The Modifications of networking from AoTDM to AoIP
  - The function of each network element on AoIP
  - AoIP codec selecting policy
  - The signaling flows difference between AoIP and AoTDM
  - The principle of QoS and IP domain on AoIP

Duration

- 0.5 hour

Class Size

- No limit
1.8.8  CSFB Solution Introduction(WBT)

Training Path

CSFB Solution Introduction(WBT)

OWG88  Lecture, Lab  1d

Target Audience

Core network commissioning engineers
Operation and maintenance engineers

Prerequisites

- At least one year experience of operation and maintenance of MsoftX3000 and UMG8903 equipments

Objectives

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

- Describe the fundamental of the CSFB
- Describe the key procedures of the CSFB
- Describe the SGs interface and protocol
- Describe the network deployment of the CSFB
- Describe the main service procedure of CSFB
- Describe CSFB signaling message and main information element
- Analyze CSFB signaling message and service status
- Describe data configuration procedure of CSFB
- Perform CSFB interworking and service commissioning
- Describe measurement units and alarms about CSFB

Training Content

OWG88 CSFB Solution Introduction(WBT)

- CSFB Solution Introduction(WBT)
  - CSFB Fundamentals
  - CSFB Key Procedures
  - SGs Interface and Protocol
  - CSFB Redundancy Solution
  - Call Delay Analysis
  - CSFB Network Deployment

Duration

1 working day

Class Size

Min 0, Max 0
1.9 M-Learning

1.9.1 CSFB

Training Path

Target Audience
Core network monitoring engineers

Prerequisites
- At least one year experience of operation and maintenance of Core Network equipments

Objectives
On completion of this program, the participants will be able to:
- Describe principle of CSFB

Training Content

CSFB
- CSFB
  - CSFB Networking
  - CSFB Location Update Flow
  - CSFB SMS MO Signaling Flow
  - CSFB SMS MT Signaling Flow
  - CSFB Mobile Originated Call Signaling Flow
  - CSFB Mobile Terminated Call Signaling Flow
  - CSFB Call Delay Analysis
  - CSFB MTRR and MTRF Signaling Flow

Duration
1 hour

Class Size
No limit