



GSM R12 Core Network Training Programs

Package Description



Table of Contents

1	Introduction	3
2	Why invest in GSM R12 Core Network Package?	3
3	What's in the GSM R12 Core Network Package?	4
4	Delta Training	5
5	GSM Fundamentals	9
6	Field Maintenance	18
7	Network Operation and Configuration	20
8	Network Development	50
9	Transport Network	53
10	Related training packages	55

1 Introduction

Ericsson has developed a comprehensive Training Programs service to satisfy the competence needs of our customers, from exploring new business opportunities to expertise required for operating a network.

The Training Programs service is delineated into packages that have been developed to offer clearly defined, yet flexible training to target system and technology areas. Each package is divided into flows, to target specific functional areas within your organization for optimal benefits.

2 Why invest in GSM R12 Core Network Package?

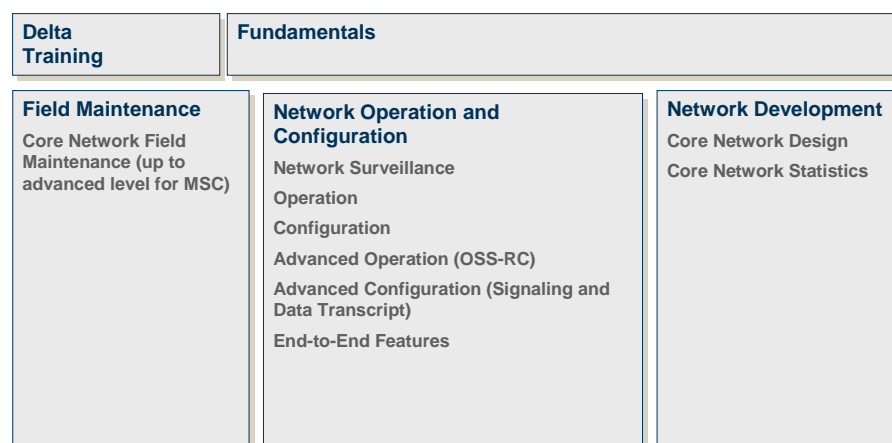
This training package supports to reach a number of important goals in managing the Mobile Core Network:

- **Better managing a complex network**
Consisting of a number of different nodes based on several platforms, the Core Network is very complex and is a crucial factor to successfully operating a Mobile Network. The training flows target competence per platform and node, and in addition they take care of establishing all interfaces for integrated operation on a network level.
- **Optimal investment**
The package provides non-overlapping flows, dedicated per technology and work area with several competence levels. It reflects a career model and enables flexible timing of investments and for taking competence steps. Investment gets better targeted to improve job performance in exactly the needed area and for the needed skill level.
- **Effectively building and maintaining competence over system releases**
This package outlines the competence build-up in dedicated work areas for different technologies, as well as maintaining competence over system releases as the Core Network technology advances. This is accomplished by "Delta Training" as well as by "Refresh" courses that make sure that optimal job performance is maintained over time.
- **Comprehensive competence**
From Maintenance to Integration and Network Planning, and from Overview level to advanced and specialist competence, the whole range of competence for all target groups is represented by the courses, which form the modules for the flows.

- Best fit in Learning Method**
 Choosing Remote Learning (Web Based Learning (WBL) and Virtual Classroom Training (VCT)) can eliminate time out of office and travel cost. WBL courses for the overview level of competence provide the learner with a flexible tool to learn as needed, most important competence first. Task-oriented learning methodology for maintenance training shortens the time period between competence build-up and satisfactory job performance.
- Helping the introduction of system-wide features**
 With the introduction of “End-to-End” features on Core Network level, such as Signaling over IP and pool concepts, it becomes more and more important to understand the impact on the network and the working tasks, as well as on performance for the end-user. Training dedicated to these features treats those aspects and helps preparing the organization for handling the new benefits. **Benefit with package**
 description of benefit (if needed)
- Closing competence gaps**
 The training offering closes competence gaps when going into new areas like MSS, SACC and end-to-end solutions. **Benefit with package**

3 What's in the GSM R12 Core Network Package?

The following section describes each of the flows in details. Each flow states the prerequisite knowledge. The course flows are focusing on the following job categories.



4 Delta Training

4.1 APZ 212 50 and APG40 Delta (FAB 102 1844 R1A)

Within the AXE810 platform the new powerful APZ 212 50 processor has been introduced to enhance capacity. This brings along the need for competence on handling the newly introduced HW and changes in the SW. Also the APG40 operating system was updated to Windows 2003 along with changed functionality. This flow provides the means to update the competence of previous APZ and APG40 versions in order to efficiently handle the new AXE system components.

4.1.1 What is achieved by attending the Flow

Participants attending this flow would be familiar with handling the APZ 212 50 and APG40 on latest release level, and will after attending the flow be able to apply the handling of the new central AXE810 components in their daily work tasks and adapt their work procedures.

4.1.2 Rationale for Flow design

The APZ 212 50 Overview is developed as a theory course to introduce this new version of an APZ to a broad target group in order to be able to judge the impact on the network and the working routines. For personnel working directly with operating the APZ 212 50, the course APZ 212 50 Operation Delta includes hands-on lab experience for handling the operational tasks in order to be prepared for the daily job tasks.

The APG 40 Delta course is developed as a separate course in order to support anybody, from operation personnel to specialized personnel for handling the advanced APG40 functionality, in understanding the new functionality that this version brings along on the Windows 2003 platform.

4.1.3 Prerequisites

Participants attending this flow as a whole or in parts should have very good working experience in operating and maintaining AXE exchanges on existing revisions of the APZ and APG40..

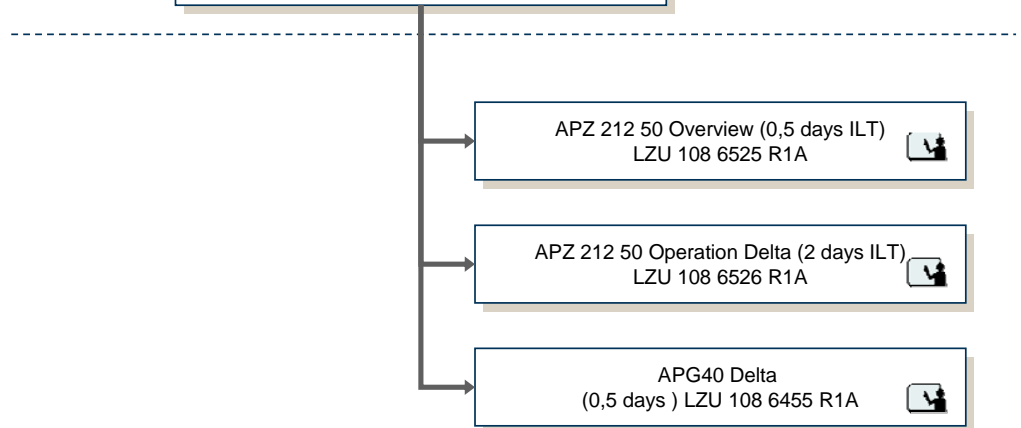


4.1.4 Training Flow

APZ212 50 and APG40 Delta (FAB 102 1844 R1A)

Prerequisite Knowledge

Knowledge and experience in working with older versions of APZ and APG40



4.2 GSM R12/WCDMA R5 Mobile Core Network Delta Training (FAB 102 1845 R1A)

The changes from the Core Network in GSM R11 to the Core Network in GSM R12 require new competencies in handling the included nodes in terms of maintenance, operation, configuration and even network development. Handling of new hardware, functionality and features is introduced by the Delta Training flow.

4.2.1 What is achieved by attending the Flow

The Core Network related Delta courses make the participants familiar with the changed hardware and functionality in the Core Network nodes and enables them to apply the changes of the new Core Network release in their daily work. The Delta courses also serve as input to determine necessary changes in the network setup and design.

4.2.2 Rationale for Flow design

This flow contains courses that are dedicated for parts of the Core Network. The work tasks differ for the nodes involved in the Mobile Softswitch Solution, the Packet Switched Core Network and the OSS area. Most target groups for this flow would work in only one of these areas in Core Network.

In order to minimise the training time and specialize the courses as much as possible, several Delta courses have been developed, being dedicated to their area.

The GSM/WCDMA MSC R12 Delta deals with the changes in the MSC R12 and MSC Server R12 compared to the R11 release of the nodes. Features for the MSC R12 (non-layered network) also to the MSC-Server, while the MSC-Server in addition introduces MSS level functionality.

The M-MGw R4 Delta training introduces the new functionality in the M-MGw up to release R4.1.1.0 compared to M-MGw R3.1. Together with the GSM/WCDMA MSC R12 Delta course it provides the full insight of new functionality introduced in the Mobile Softswitch Solution (MSS) R4.1.

The UDB R12 Delta (User Data Basis) course summarizes the new functionality introduced in AUC R12, HLR R12 and FNR R12 compared to the R11 versions of the nodes.

The SGSN R7 Delta course provides the competence needed to handle the new functionality of this node and introduces the theory on an overview level. This goes for both GSM and WCDMA related functionality as well as for the node being used as Dual Access node in a common GSM and WCDMA Core Network.

The course GGSN R4 Delta is a one day theory course and covers the new functionality introduced for the GGSN R4 release compared to the GGSN R3 release.

The courses are intended for personnel operating and maintaining the GSM Core Network, as well as for personnel working with Configuration Management, Network Quality and Network Planning and Deployment.

The OSS RC Delta course introduces the changes in applications and handling the platform.

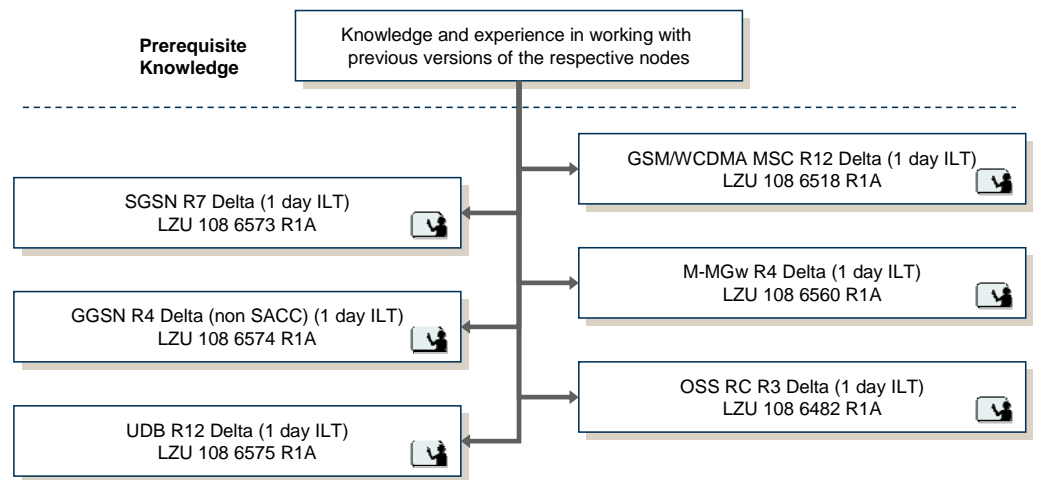


4.2.3 Prerequisites

The participants of this course should have a very good working experience with one or several nodes in the GSM R11 Mobile Core Network.

4.2.4 Training Flow

GSM R12/WCDMA R5 Mobile Core Network Delta Training (FAB 102 1845 R1A)





5 GSM Fundamentals

5.1 Introduction to IP Networks, WBL (FAB 102 1313 R1A)

In the mobile Core Network the IP technology gains importance. IP based interfaces and transport mechanisms become more and more common. It is important to understand the IP network in order to successfully operate and trouble shoot the Core Network.

5.1.1 What is achieved by attending the Flow

Attending this flow provides a good understanding of the IP technology and protocol, the underlying principles of data communication, and its use in different networks.

Furthermore the following topics are treated: How a PC communicates with other devices and networks, modern LAN and WAN technologies and concepts, the TCP/IP protocol suite, mobile network technologies, network architecture and applications and the management of data networks.

5.1.2 Rationale for Flow design

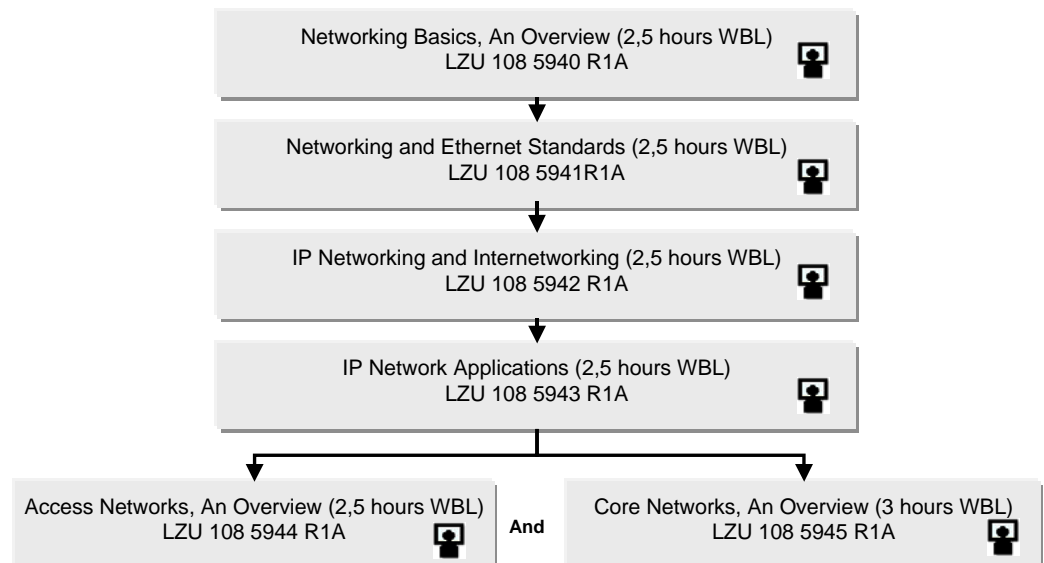
The flow completely consists of WBL courses, giving the learner the possibility to learn the IP Network principles at his own pace, not having to leave his work place. The order of the courses leads from networking principles over the IP technology towards its application in the core and access networks.

5.1.3 Prerequisites

There are no prerequisites to this course flow. General telecommunication knowledge might be of advantage, though.

5.1.4 Training Flow

Introduction to IP Networks, WBL (FAB 102 1313 R1A)



5.2 IP Fundamentals (FAB 102 1314 R2A)

The IP Fundamentals training flow targets all technical personnel requiring knowledge on the TCP/IP protocol suite describing IP addressing principles and the purpose and operation of different protocols such as IP, TCP, UDP, ICMP, ARP. Compared to the WBL based training, this flow adds on deeper competence and real hands-on experience.

5.2.1 What is achieved by attending the Flow

The focus is on the different protocol structures and transfer mechanisms. Practical networking exercises are included to prepare participants for real life challenges. Throughout the course flow, hands-on labs are used to pinpoint important aspects of theory sessions. The flow brings the participants from the level of being able to handle simple IP networks up to expert level in configuring and fault managing complex networks. This way participants will be prepared to apply the IP competence in Telecom networks.

5.2.2 Rationale for Flow design

Starting with the IP Networking course to assure competence in handling and setting up IP networks, the IP Advanced course will provide the participants with deep detail competence on all aspects of IP Networks, including fault management and security aspects.

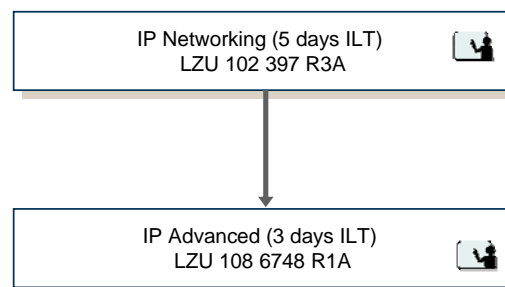
5.2.3 Prerequisites

The participants of this course flow should have some general knowledge of datacom networks.

5.2.4 Training Flow

IP Fundamentals

(FAB 102 1314 R2A)



5.3 IPv6 Fundamentals (FAB 102 1383 R1A)

IPv6 is starting to replace IPv4 protocols in the networks with the aim of providing better Quality of Service mechanisms. In the Ericsson GPRS implementation, IPv6 is now used in the user plane level. Coming releases will further make use of IPv6, and therefore it is important to build-up competence in IPv6 in time.

5.3.1 What is achieved by attending the Flow

Participants who have good knowledge and working experience in IPv4 protocols and networks get the competence to apply their skills and knowledge also in IPv6 networks. The level of competence can be chosen by either taking the 1 day theory based course or by attending the 2 days course that adds hands-on experience to the theory.

5.3.2 Rationale for Flow design

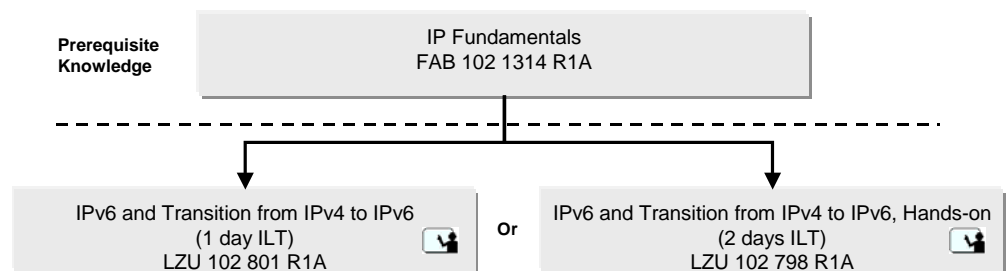
Two alternatives are given in the flow: Theory training or theory and hands-on training. Depending on the target group, which might work with configuring and setting up IPv6 networks, or is dealing with IPv6 on a theoretical level in planning, the appropriate course can be chosen.

5.3.3 Prerequisites

Participants of this flow shall have attended the course flow IP Fundamentals (FAB 102 1314 R1A) or have equivalent IP competence on IPv4.

5.3.4 Training Flow

IPv6 Fundamentals (FAB 102 1383 R1A)



5.4 IPv6 Routing Configuration (FAB 102 1384 R1A)

This course flow consists of a profound technical presentation of the routing protocols RIPng, OSPFv3, ISIS and BGP4+ and hands-on lab exercises for configuration of the protocols. The protocols and their different functions in the Internet are discussed.

The flow is meant for personnel working with operation, configuration and planning of IPv6 networks.

5.4.1 What is achieved by attending the Flow

Participants attending this flow will be able to configure the routing protocols and plan the routing setup of an IPv6 based network.

5.4.2 Rationale for Flow design

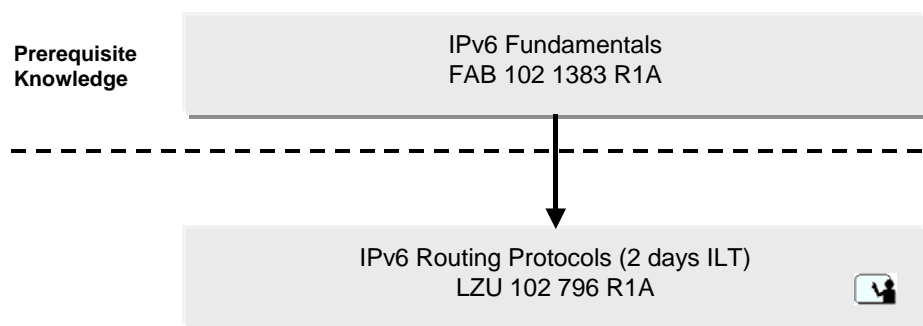
The competence on configuring routing protocols has been put into a dedicated flow, as not all personnel working with IPv6 would necessarily need this competence. The flow reflects advanced competence in the IPv6 configuration and planning work areas.

5.4.3 Prerequisites

Participants of this course flow should have attended the course flow for IPv6 Fundamentals (FAB 102 1383 R1A) or have equivalent experience.

5.4.4 Training Flow

IPv6 Routing Configuration (FAB 102 1384 R1A)



5.5 IPv6 Advanced Network Configuration (FAB 102 1385 R1A)

This course flow is a profound technical presentation of the Internet protocol IPv6, Transitions Mechanisms from IPv4 to IPv6 and of the advanced features related to IPv6: QoS (DiffServ, RSVP / IntServ) and IPSec. These features are essential in a network using IPv6. The subjects will be discussed and will be related to cases in a real network.

5.5.1 What is achieved by attending the Flow

The participants will learn how to configure the advanced features on an IPv6 router. Examples of how to configure a host in an IPv6 network will be presented.

5.5.2 Rationale for Flow design

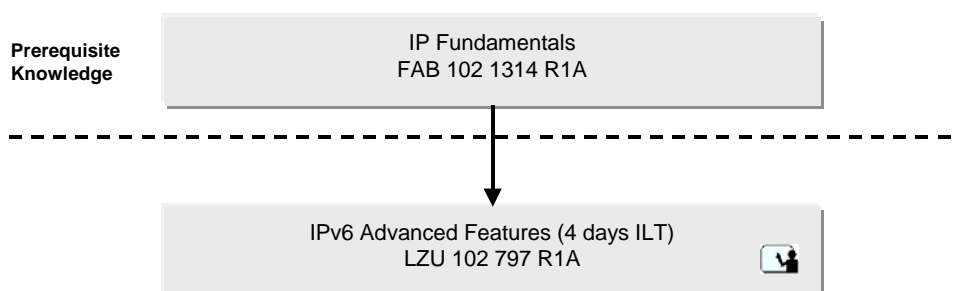
The competence provided by this flow adds on to the competence in configuring IPv4 based networks. The Transition mechanism from IPv4 to IPv6 as well as all advanced features are discussed here. This way the flow is an alternative to the IPv6 Fundamentals flow and in addition it provides more advanced competence and hands-on experience.

5.5.3 Prerequisites

Participants of this course flow should have attended the course flow for IP Fundamentals (FAB 102 1314 R1A).

5.5.4 Training Flow

IPv6 Advanced Network Configuration (FAB 102 1385 R1A)



5.6 ATM Fundamentals (FAB 102 1315 R2A)

ATM is an underlying transport technology in the Core and Radio networks.

The ATM Fundamentals training flow targets all technical personnel requiring competence on the Asynchronous Transfer Mode (ATM) principles. This flow covers all protocols supported, cell formats, creating circuits and connections to enable ATM network traffic and ATM internetworking. The evolution and trends of ATM networking and alternative technologies including IP and Frame Relay as well as multi-service traffic types and quality of service (QoS) is discussed. The latter part of the course focuses on IP over ATM.

5.6.1 What is achieved by attending the Flow

The participants will get the basic competence needed to understand the ATM and IP over ATM technologies in order to apply this competence when setting up and configuring networks.

5.6.2 Rationale for Flow design

The actual course is merged from an ATM course and a dedicated IP over ATM course, as these topics and related competences are connected more and more when discussing these technologies in the context of Mobile Core Network.



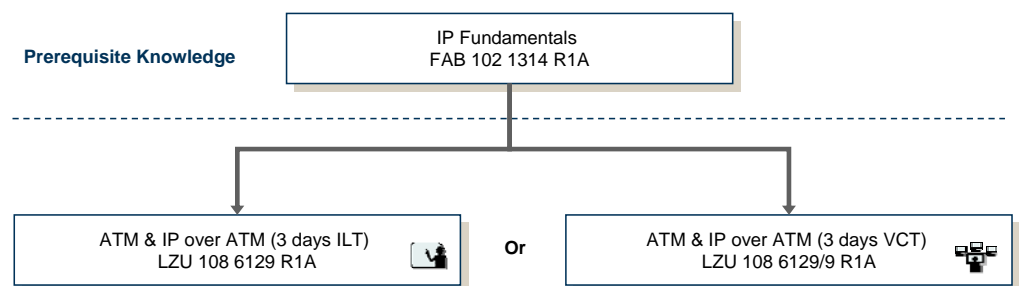
The course can be delivered as both Instructor-led Training (ILT) in a classroom environment or as Virtual Classroom Training (VCT) where students can attend the training from their own workplace over the web at a pre-designated day and time.

5.6.3 Prerequisites

Participants of this course flow should have attended the course flow IP Fundamentals (FAB 102 1314 R1A).

5.6.4 Training Flow

ATM Fundamentals (FAB 102 1315 R2A)



5.7 GSM Network Fundamentals, Blended Training (FAB 102 1465 R1A)

This flow introduces personnel starting to work with GSM networks into the fundamentals of GSM, the different nodes and subnetworks in detail and outlines the most important traffic cases and capabilities of a GSM network.

Topics like the new Mobile Softswitch Solution (layered) architecture of the Core Network as well as the complete structure of the Radio Access Network and the Network Management system are discussed among other topics.



5.7.1 What is achieved by attending the Flow

By attending this flow the participants will be familiar with the terminology used with GSM. Participants will be able to explain the structure of a GSM network and its sub-networks, as well as its functionality and included nodes. This competence is the basis for all hands-on and more advanced training in the GSM area.

5.7.2 Rationale for Flow design

The flow is divided into 2 branches. The first branch provides instructor-led training (ILT or VCT) for GSM and GPRS. The second branch is made up of web-based learning products (WBL) only and serves as alternative to the instructor-led branch.

The WBL branch is divided into several courses in order to allow the participants to take the appropriate steps in learning, fitting their competence needs. Generally all courses can be taken in any order, with priority on the competence area where the participants see the biggest need. A recommendation is to start with the Core Network Overview and the Radio Network Overview. By having all the courses web based, a very flexible setup is provided to the learner to define their own pace of learning and control their learning progress. Learning can take place conveniently at the work place.

All WBL courses in this flow are available in a SCORM compliant version and could be interworking with a Learning Management System, also enabling to track the students progress. Interactive practise modules and a course test help the learner to control the learning progress.

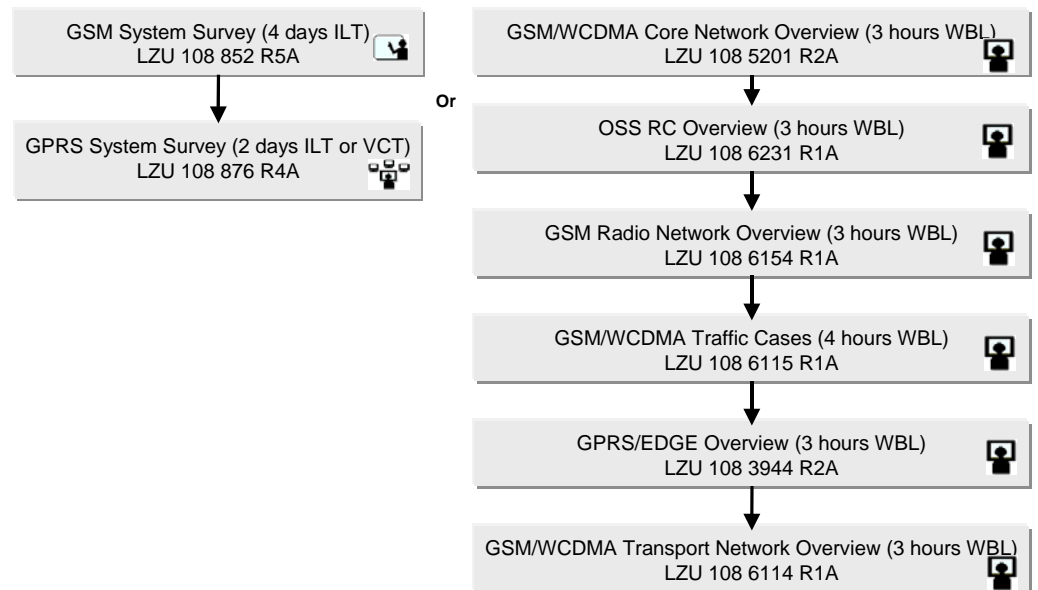
5.7.3 Prerequisites

There are no prerequisites to this flow, but general telecommunication knowledge is an advantage.



5.7.4 Training Flow

GSM Network Fundamentals, Blended Training (FAB 102 1465 R1A)





6 Field Maintenance

6.1 GSM Core Network Maintenance (FAB 102 1466 R2A)

This flow is aimed at Field Technicians maintaining the GSM Core Network nodes on-site.

In the course flow participants learn to maintain the Core Network nodes MSC, MSC-S, SGSN and M-MGw. This includes hardware maintenance as well as preventive maintenance routines.

For the MSC and MSC-S being based on the AXE platform two courses provide needed deeper competencesuch as advanced maintenance and trouble shooting tasks on the most critical parts of the AXE exchange. Please note that these tasks also apply for the BSC node.

6.1.1 What is achieved by attending the Flow

After attending this flow the participants will be able to perform standard maintenance tasks on the Core Network nodes as well as advanced maintenance and troubleshooting tasks on the nodes based on the AXE platform. Participants can refresh their competence in maintenance of the most critical parts of the AXE by repeating the Emergency Handling course after gaining more work experience.

6.1.2 Rationale for Flow design

The complete flow is instructed following the methodology of task-oriented training: The students learn by solving problems in real working situations on the nodes. In this way the students not only solve work orders given in the courses, but also learn the methodology to approach new problems coming up in the network. Following this methodology the students can take over work assignments in the maintenance area directly after returning from the course.

The flow is split up into ocurses for different nodes, following the different platforms that those nodes are based on.



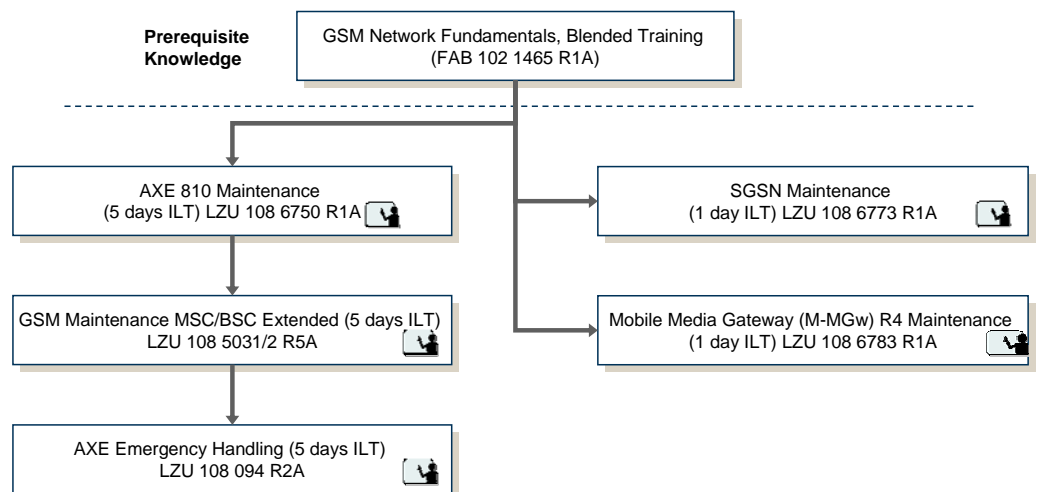
Between attending the courses of the AXE related branch of this flow it is recommended that the student gain further working experience in the network.

6.1.3 Prerequisites

Participants of this flow should have attended the courses of the flow GSM Network Fundamentals, Blended Training (FAB 102 1465 R1A).

6.1.4 Training Flow

GSM Core Network Maintenance (FAB 102 1466 R2A)





7 Network Operation and Configuration

7.1 APG40 (NT4) Node Operation & Configuration (FAB 102 1345 R1A)

This training flow introduces students to the APG 40 node (based on the NT4 operating system) and its functionality. The students will carry out operational and maintenance tasks on the Platform and the APIO application. The flow consists of 3 practical courses that target different functions.

The first course is targeted towards Operation and Maintenance personnel with the following main parts included: Introduction to APG 40, APG 40 Hardware and Software, ACS Functions, Services and Facilities, configure STS, collect statistics using STS, APIO including FMS and MCS.

The Installation and Configuration course is targeted towards system administrators and also contains some installation activities. The following main parts are included: Start up of APG 40, Installation of APIO, Description of the APG 40 Domain, Domain Handling on APG 40 and Migration from IOG 20 to APG 40.

The course APG40 Recovery Procedures deals with recovering the APG40 from serious fault and failure situations.

7.1.1 What is achieved by attending the Flow

After attending this flow the participants will be competent to install, start, operate, maintain and recover the APG40 node.

Apart from the Operation and Maintenance course, the other 2 courses target advanced and specialized competence.

7.1.2 Rationale for Flow design

The flow starts with an Operation and Maintenance course that introduces basic procedures of the node that would be part of the tasks of a bigger target group at the operator. This course is intended for personnel, which is familiar with the IOG20 node from the GSM system as well as for personnel that does not have competence on any AXE based I/O system.

The other two courses add on specialized competence so that competence development plans can make use of the courses as modules, which can be assembled in order to match all target groups respectively.

This is an instructor-led training flow with focus on practical exercises.

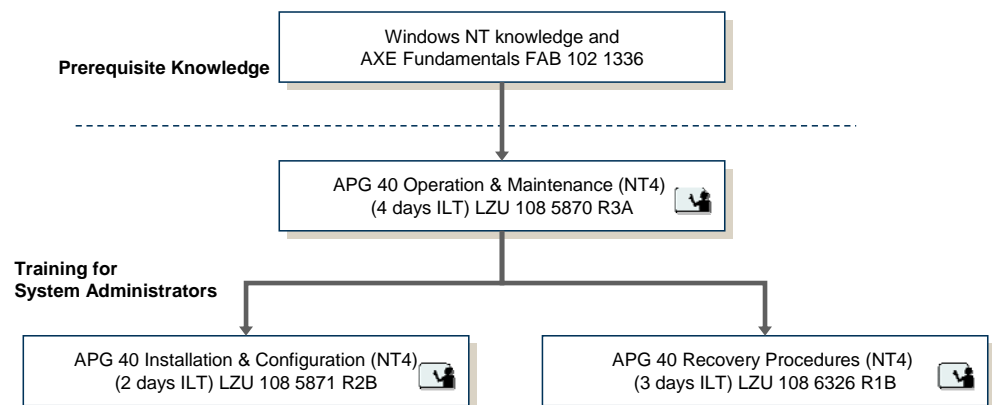


7.1.3 Prerequisites

It is recommended that participants have prior working experience with AXE and/or IOG 20.

7.1.4 Training Flow

APG 40 (NT4) Node Operation & Configuration (FAB 102 1345 R1A)



7.2 APG40 (Windows 2003 C2) Node Operation & Configuration (FAB 102 1347 R1A)

This training flow introduces students to the APG 40 node (based on the Windows 2003 C2 operating system) and its functionality. The students will carry out operational and maintenance tasks on the Platform and the APIO application. The flow consists of 3 practical courses that target different functions.

The first course is targeted towards Operation and Maintenance personnel with the following main parts included: Introduction to APG 40, APG 40 Hardware and Software, ACS Functions, Services and Facilities, configure STS, collect statistics using STS, APIO including FMS and MCS.

The Installation and Configuration course is targeted towards system administrators and also contains some installation activities. The following main parts are included: Start up of APG 40, Installation of APIO, Description of the APG 40 Domain, Domain Handling on APG 40 and Migration from IOG 20 to APG 40.



The course APG40 Recovery Procedures deals with recovering the APG40 from serious fault and failure situations.

7.2.1 What is achieved by attending the Flow

After attending this flow the participants will be competent to install, start, operate, maintain and recover the APG40 node.

Apart from the Operation and Maintenance course, the other 2 courses target advanced and specialized competence.

7.2.2 Rationale for Flow design

The flow starts with an Operation and Maintenance course that introduces basic procedures of the node that would be part of the tasks of a bigger target group at the operator. This course is intended for personnel, which is familiar with the IOG20 node from the GSM system as well as for personnel that does not have competence on any AXE based I/O system.

The other two courses add on specialized competence so that competence development plans can make use of the courses as modules, which can be assembled in order to match all target groups respectively.

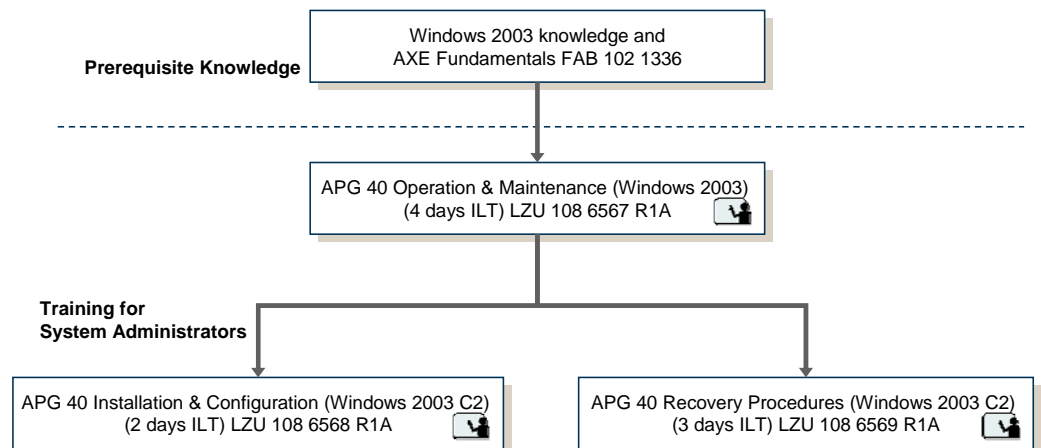
This is an instructor-led training flow with focus on practical exercises.

7.2.3 Prerequisites

It is recommended that participants have prior working experience with AXE and/or IOG 20.

7.2.4 Training Flow

APG 40 (Windows 2003 C2) Node Operation & Configuration (FAB 102 1847 R1A)



7.3 APG40 (Windows 2003 C4) Node Operation & Configuration (FAB 102 1911 R1A)

This training flow introduces students to the APG 40 node (based on the Windows 2003 C4 operating system) and its functionality. The students will carry out operational and maintenance tasks on the Platform and the APIO application. The flow consists of 3 practical courses that target different functions.

The first course is targeted towards Operation and Maintenance personnel with the following main parts included: Introduction to APG 40, APG 40 Hardware and Software, ACS Functions, Services and Facilities, configure STS, collect statistics using STS, APIO including FMS and MCS.

The Installation and Configuration course is targeted towards system administrators and also contains some installation activities. The following main parts are included: Start up of APG 40, Installation of APIO, Description of the APG 40 Domain, Domain Handling on APG 40 and Migration from IOG 20 to APG 40.

The course APG40 Recovery Procedures deals with recovering the APG40 from serious fault and failure situations.

7.3.1 What is achieved by attending the Flow

After attending this flow the participants will be competent to install, start, operate, maintain and recover the APG40 node.

Apart from the Operation and Maintenance course, the other 2 courses target advanced and specialized competence.

7.3.2 Rationale for Flow design

The flow starts with an Operation and Maintenance course that introduces basic procedures of the node that would be part of the tasks of a bigger target group at the operator. This course is intended for personnel, which is familiar with the IOG20 node from the GSM system as well as for personnel that does not have competence on any AXE based I/O system.

The other two courses add on specialized competence so that competence development plans can make use of the courses as modules, which can be assembled in order to match all target groups respectively.

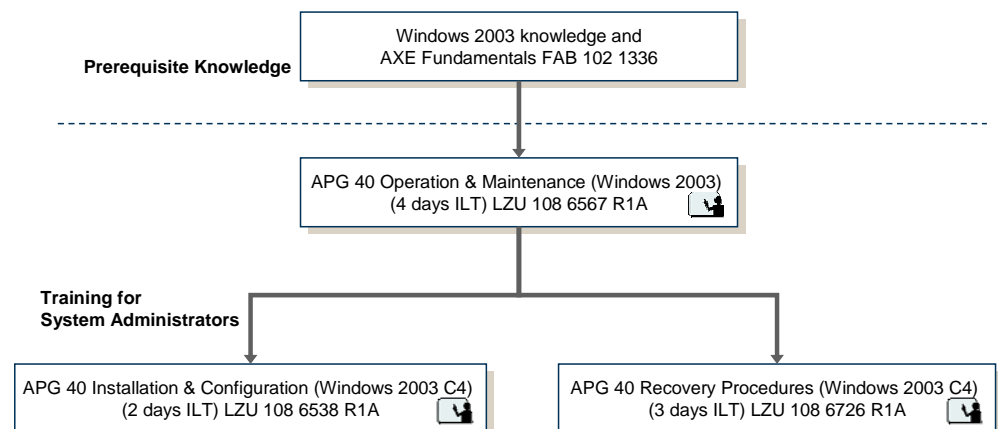
This is an instructor-led training flow with focus on practical exercises.

7.3.3 Prerequisites

It is recommended that participants have prior working experience with AXE and/or IOG 20.

7.3.4 Training Flow

APG 40 (Windows 2003 C4) Node Operation & Configuration (FAB 102 1911 R1A)





7.4 **GSM R12 MSC/MSC-S Operation & Configuration (FAB 102 1850 R1A)**

This flow covers the operation tasks to be performed on an AXE exchange commonly for the MSC and BSC as well as the configuration of the MSC and MSC Server applications in a classical or layered (MSS) network.

7.4.1 **What is achieved by attending the Flow**

The course GSM AXE Operation provides the participants with the competence to operate the AXE platform as it can be found in an MSC, MSC-S and BSC exchange, or as platform for HLR, FNR or AUC. This course concentrates on the node rather than on a network view.

The course GSM MSC/MSC-S R12 Configuration provides the competence to configure the GSM MSC and MSC-S functional application. It provides students with the ability and methodology to configure various Traffic Cases in a MSC and MSC-S exchange considering a network view. Configuration of data in the MSC-S towards the M-MGw node as part of a MSS network architecture is included in this course.

Both courses focus on practical exercises and could be instructed with access to remotely located equipment or node simulators.

It shall be noted that for MSC, MSC-S and M-MGw (MSS level) and BSC system technicians an additional service is available: Structured Knowledge Transfer (SKT). The SKT service makes sure that personnel gets efficient in performing their tasks in the live network within short time after returning from classroom training. This is achieved by measurements and mentorship while performing tasks in the live network. The scope of the service always gets defined together with the Technical Management of the operator.

7.4.2 **Rationale for Flow design**

This flow is designed in order to provide dedicated competences on the AXE platform as used for the MSC, MSC-S and BSC, as well as on the MSC and MSC-S application.

As the AXE operation competence is of use for more nodes than just the MSC, MSC-S and BSC (for example HLR and FNR) and as the definition of work areas, separating Configuration Management from Operation, might require different competencies, the flow is developed with two courses addressing exactly those competencies. As BSC is treated

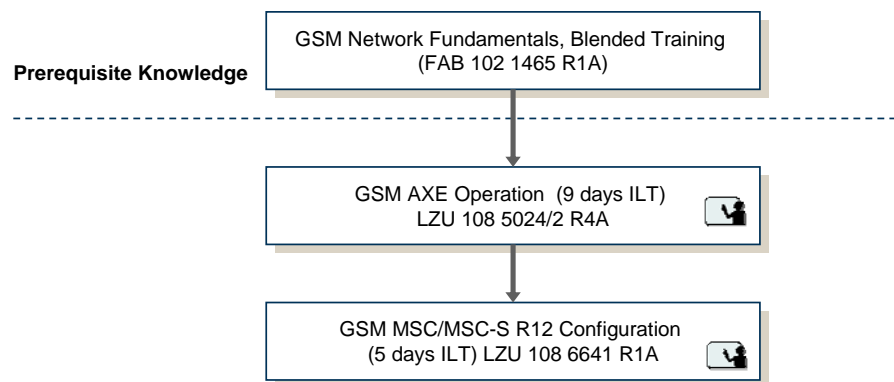
here, the course can be booked commonly for system engineers operating MSC/MSC-S and/or BSC, or MSC/MSC-S and BSC specific modules could be excluded if one or the other node is not handled by the participants of the course, which would shorten the duration of the course.

7.4.3 Prerequisites

Participants should have completed the training flow GSM Network Fundamentals, Blended Training (FAB 102 1465 R1A).

7.4.4 Training Flow

GSM R12 MSC/MSC-S Operation & Configuration (FAB 102 1850 R1A)



Note: Ericsson Education offers completing the competence development of the operator in the area of operating a WCDMA MSC by delivering a Structured Knowledge Transfer (SKT) Service on-site. For more information on SKT please refer to

<http://www.ericsson.com/products/services/training/skt.shtml>



7.5 GSM R12/WCDMA R5 User Database and Authentication Operation (FAB 102 1849 R1A)

This training flow covers the operation and configuration tasks for the nodes HLR, FNR and AUC. Operation of the nodes as well as configuration of network interfaces and subscriber related data are treated in this flow.

7.5.1 What is achieved by attending the Flow

Depending on the target group, participants would attend one or several of the courses in this flow. After attending all the courses in this flow, participants would be able to operate and configure the HLR, FNR and AUC applications, and would be able to explain their roles in the network and handle the connections to other nodes.

7.5.2 Rationale for Flow design

The courses in this flow can be taken in any order and do not depend on each other. It is an advantage, though, to have an understanding of the HLR node before attending the FNR course.

The competence on the MSC or MSC-S is put as prerequisite as with this competence it is easier to understand the role of the HLR, FNR and AUC nodes in the GSM network. The competence of configuring signaling on an AXE exchange is given in the MSC/MSC-S flow mainly.

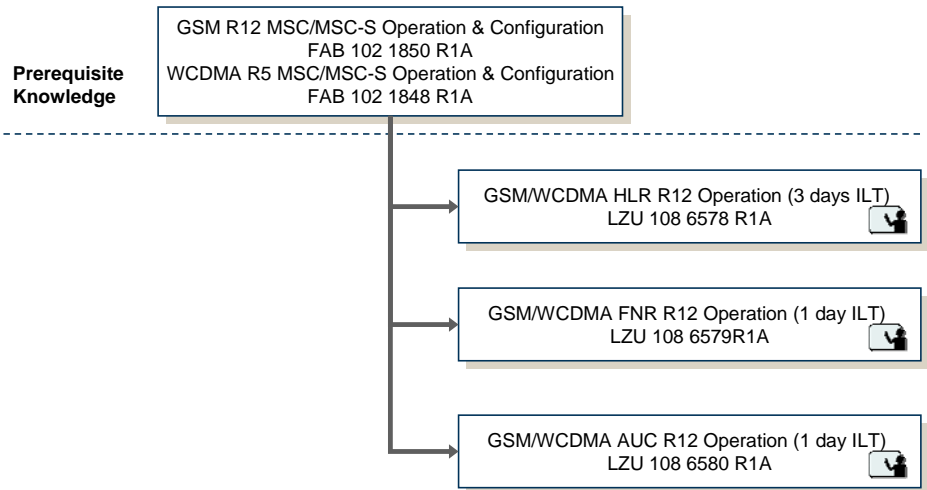
7.5.3 Prerequisites

Participants of this flow should have completed the training flow GSM R12 MSC/MSC-S Operation & Configuration (FAB 102 1850 R1A).



7.5.4 Training Flow

GSM R12/ WCDMA R5 User Database & Authentication Operation (FAB 102 1849 R1A)



7.6 **GSM/WCDMA Mobile Media Gateway (M-MGw) R4 Operation and Configuration (FAB 102 1851 R1A)**

The M-MGw is introduced into the GSM Core Network within the scope of migrating from a non-layered system architecture towards the Mobile Softswitch Solution (MSS) or layered architecture. As a new node and a new platform in the GSM network, the M-MGw brings along new competence needs in operating, configuring and maintaining the node. Also within a WCDMA network, the M-MGw node is an integral part of the deployed MSS architecture.

7.6.1 **What is achieved by attending the Flow**

This flow covers the operation and configuration tasks that are to be performed on the M-MGw commonly for the GSM and WCDMA Core Network.

The course CPP Node Features and Functions covers the required prerequisite information about the Connectivity Packet Platform (CPP) on which the M-MGw is built. This course is designed to structure the CPP functions in the nodes and relate the functionality of the CPP to the boards in that node. The course can be taken as both Instructor-led Training (ILT) in a classroom environment or as Virtual Classroom Training (VCT) where students can attend the training from their own workplace over the web at a pre-designated day and time.

The course GSM/WCDMA M-MGw R4 Operation & Configuration covers all operation and configuration tasks that are specific for the M-MGw application. Configuration and operation of the node functionality, such as Media Streaming, is treated as well as configuration of the interfaces towards other network elements like the MSC-S or the Radio Access Network.

7.6.2 **Rationale for Flow design**

The flow is split into a platform (CPP) related part and an application (M-MGw) related part. As the CPP is the platform also for other nodes, like the RNC and RBSs in a WCDMA network, the related target groups can be seated together on this course, allowing a higher fill rate and optimal usage of this course. This is also done with the perspective of merging GSM and WCDMA networks and work areas in dual access Core Networks.

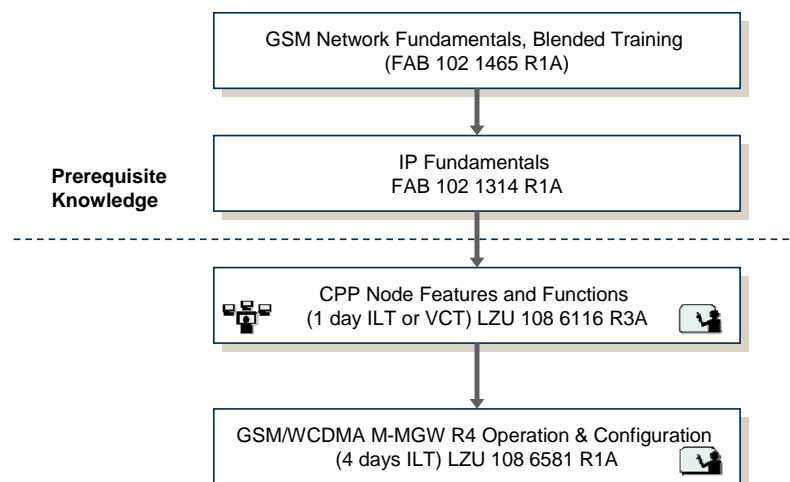
The M-MGW course is dedicated to personnel working with that application only.

7.6.3 Prerequisites

Participants should have attended the flow GSM Network Fundamentals, Blended Training (FAB 102 1465 R1A) and shall have good ATM competence up to the level of the flow ATM Fundamentals (FAB 102 1315 R1A).

7.6.4 Training Flow

GSM/WCDMA Mobile Media Gateway (M-MGW) R4 Operation and Configuration (FAB 102 1851 R1A)



7.7 GSM/WCDMA SGSN R7 Operation (FAB 102 1852 R1A)

In Ericsson GPRS networks both the SGSN and the CGSN (GSM only) nodes are based on the WPP platform. The procedures in terms of operation tasks for those nodes are commonly treated in this flow.

Please note that the J20 GGSN node is covered in a dedicated flow as the J20 is based on a different platform compared to WPP, which is the platform for the SGSN and CGSN.

7.7.1 What is achieved by attending the Flow

Participants of this flow get the competence to perform operation tasks on the SGSN and the CGSN nodes. This is the



basic competence for continuing with configuration or administration training for these nodes.

Also Fault Management Procedures are treated here.

7.7.2 Rationale for Flow design

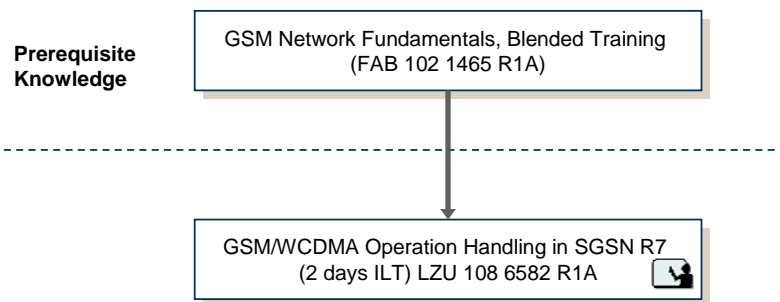
As dedicated target groups for operation, like front office system technicians, exist in bigger networks, the flow stops after providing the basic operation competence. Configuration and administration tasks are provided in dedicated flows. This way the combination of flows is modular enough to provide a career model for split or combined target groups in these work areas. The flows for the operation and configuration do not overlap.

7.7.3 Prerequisites

Participants of this flow shall have attended the flow GSM Network Fundamentals, Blended Training (FAB 102 1465 R1A).

7.7.4 Training Flow

GSM/WCDMA SGSN R7 Operation (FAB 102 1852 R1A)



7.8 GSM/WCDMA SGSN R7 Configuration (FAB 102 1853 R1A)

The SGSN R7 has numerous interfaces towards the rest of the GSM and/or WCDMA network and towards other networks like the internet. In order to setup these interfaces, competence on



configuration of the node as such, as well as on signaling and transport mechanisms is needed.

7.8.1 What is achieved by attending the Flow

This training flow covers in great detail the configuration of the SGSN node including all network interfaces, protocols and routing. The flow focuses on hands-on exercises for the participants to gain experience in configuring the nodes.

The courses GSM SGSN R7 Configuration and WCDMA SGSN R7 Configuration cover interface management for the GPRS within the GSM and WCDMA networks respectively. The course also covers in detail the integration procedure for GSM SGSN nodes. As the SGSN R7 can act as dual access node, carrying both GSM and WCDMA traffic simultaneously, the course GSM/WCDMA SGSN R7 Configuration (Dual Access) has been developed in order to provide a concept for operators using the node for both networks. Target groups for GSM and WCDMA can be seated together on this course. Due to the fact that both the GSM RAN and the WCDMA RAN interfaces, as well as Dual Access configuration, is treated, the duration of this course is 5 days.

The course GSM/WCDMA SGSN R7 Configuration Extended provides the competence in configuring the protocols towards the backbone connected to the SGSN. Routing protocols and connection towards other SGSN and potential GGSN are covered.

7.8.2 Rationale for Flow design

The flow is split into different competence levels: General configuration, and integration towards the backbone network. Therefore a configuration course and a configuration extended course are provided as dedicated modules. The courses do not have redundant parts, and can be taken directly one after the other, or even, as recommended, after gaining some more work experience after attending the first course.

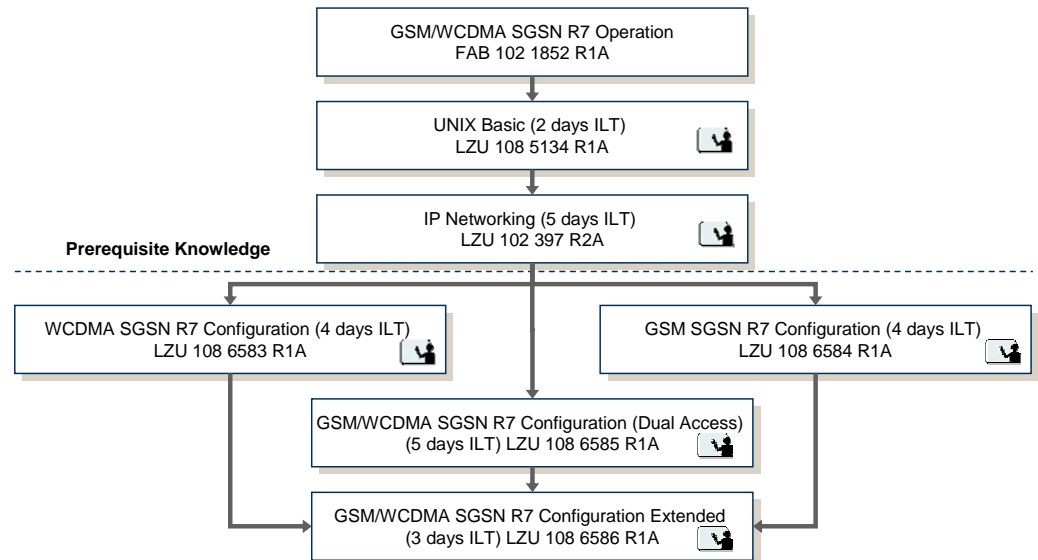
Participants shall attend only one of the configuration courses, either the one for GSM or the one for WCDMA or the one for SGSN with Dual Access.

7.8.3 Prerequisites

Participants shall have attended the flow GSM/WCDMA SGSN R7 Operation (FAB 102 1852 R1A) and shall have UNIX and IP competence up to the levels of the courses UNIX Basics (LZU 108 5134) and IP Networking (LZU 102 397).

7.8.4 Training Flow

GSM/WCDMA SGSN R7 Configuration (FAB 102 1853 R1A)



7.9 GSM/WCDMA SGSN R7 System Administration (FAB 102 1854 R1A)

In order to efficiently handle the SGSN node on the WPP platform, competence is required in the area of system administration with tasks like user and software administration.

7.9.1 What is achieved by attending the Flow

Participants attending this flow gain the competence for performing system administration and software management tasks. The flow covers the general aspect of SGSN system administration such as user administration and log managements as well as the software installation procedures for the SGSN.

7.9.2 Rationale for Flow design

This flow is separated from the operation and configuration flows as operators might have a dedicated target group for performing system administration tasks. Deeper competence in UNIX and Solaris is required for these tasks. Not every system engineer might have this competence when working in the configuration area.



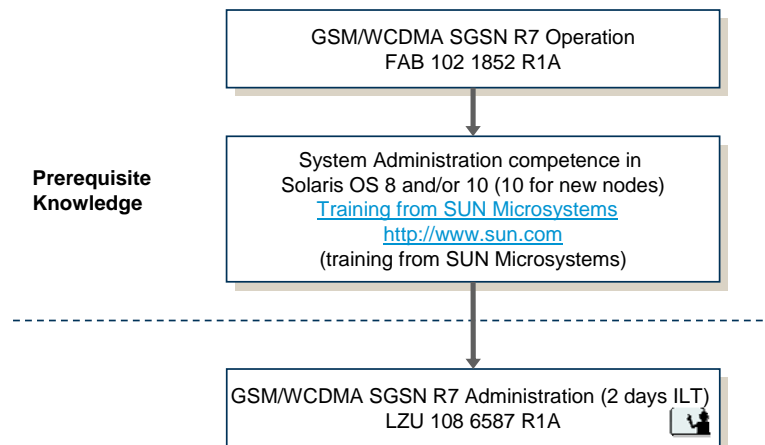
As this flow does not have redundant parts with other flows, the system administration training can of course also be taken by system engineers that handle both administration and configuration tasks.

7.9.3 Prerequisites

Participants of this flow should have attended the flow GSM/WCDMA SGSN R7 Operation (FAB 102 1852 R1A). Furthermore the courses SUN Solaris System Administration I and II are prerequisite as system administration works with Solaris on the nodes.

7.9.4 Training Flow

GSM/WCDMA SGSN R7 System Administration (FAB 102 1854 R1A)



7.10 GSM/WCDMA SGSN R7 Trouble Shooting (FAB 102 1855 R1A)

In addition to operation, configuration and system administration tasks, experts on the system require trouble shooting competence in order to determine the cause of a fault and either solve it or be able to raise a qualified trouble ticket.

7.10.1 What is achieved by attending the Flow

This flow provides competence on advanced level for participants working with trouble shooting of the SGSN.

The course GSM/WCDMA SGSN R7 Trouble Shooting enables the participants to detect, isolate and correct configuration faults, and detect, isolate and report software faults.

After attending the flow the participants will be able to collect data from relevant log files and interpret the content in order to determine if the fault is due to wrong configuration or any other cause that can be solved by the operator, or if a software fault exists that should be reported back to Ericsson.

In addition the new feature Integrated Traffic Capture, which provides traces of the signaling on the Gb interface on the node, is introduced.

7.10.2 Rationale for Flow design

The competence provided in this flow is very advanced, and a dedicated group of experts at the operator would need this competence. Therefore it is outlined as dedicated flow, not included in the configuration flow. The flow is valid for an SGSN R7 in both GSM and WCDMA networks.

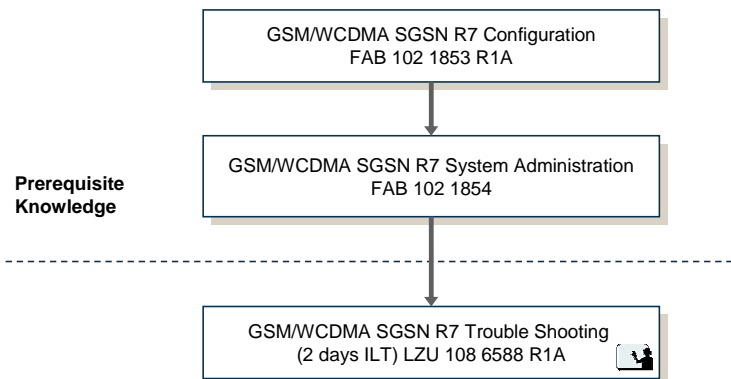
7.10.3 Prerequisites

In order to be able to follow the course, participants should have attended the flows GSM/WCDMA SGSN R7 Configuration (FAB 102 1853 R1A) and GSM/WCDMA SGSN R7 System Administration (FAB 102 1854 R1A). Additional working experience in configuration and administration of the SGSN is recommended before attending.



7.10.4 Training Flow

GSM/WCDMA SGSN R7 Trouble Shooting (FAB 102 1855 R1A)



7.11 J20 GGSN R3 Configuration (FAB 102 1842 R1A)

The GGSN R3 on J20 platform requires dedicated competencies not covered in the training flows for the SGSN, due to different platforms of those nodes. This flow covers all needed competencies for the GGSN application on GGSN R3 level. The flow does not cover the Juniper platform specific tasks. Please see the section on prerequisites for those.

7.11.1 What is achieved by attending the Flow

This training flow enables the participants to operate and configure a J20 GGSN R3 in the Core Network.

The course GGSN R3 Network Engineer provides competence on the various hardware components including switching boards, routing engines, and forwarding engine elements specific to the J20. The course includes a detailed look at the architecture of the JUNOS operating system with focus on those software components unique to the GGSN application. The participant will configure the GGSN Interfaces, the GTP specific parameters, charging in GGSN, APN, QoS, Security, including the firewall filter and IP-Sec and GRE on the J20, as well as simple VPNs.



A module on Flexible Bearer Charging (FBC) and a view on Service Aware Charging and Control are included in this course, as part of the Service Aware Charging and Control (SACC) framework.

7.11.2 Rationale for Flow design

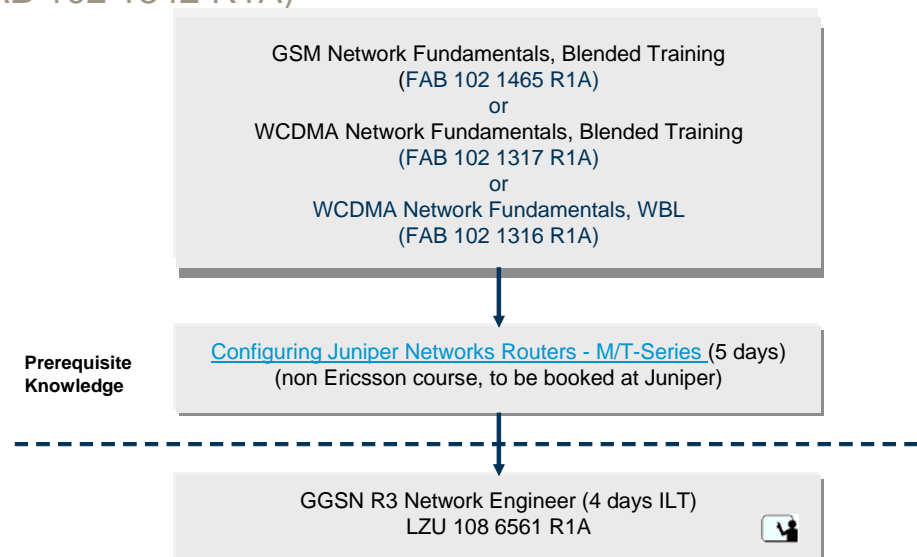
This flow is outlined separately from the SGSN related flows, as the J20 GGSN requires other competencies than the WPP based GPRS nodes. All relevant tasks for the GGSN application on the J20 platform are covered in one course, as one and the same target group would handle all hands-on tasks for this node.

7.11.3 Prerequisites

Participants of this flow should have attended the flow GSM Network Fundamentals, Blended Training (FAB 102 1465 R1A). Furthermore, as the J20 is based on a Juniper node, the course "Configuring Juniper Networks Routers - M/T-Series" shall be attended. This course is available from Juniper.

7.11.4 Training Flow

J20 GGSN R3 Configuration (FAB 102 1842 R1A)





7.12 **GGSN R4 Configuration (FAB 102 1856 R1A)**

The GGSN R4, like the GGSN R3, on J20 platform requires dedicated competencies not covered in the training flows for the SGSN, due to different platforms of those nodes. This flow covers all needed competencies for the GGSN application on GGSN R4 level. The flow does not cover the Juniper platform specific tasks. Please see the section on prerequisites for those.

7.12.1 **What is achieved by attending the Flow**

This training flow enables the participants to operate and configure a GGSN R4 in the Core Network.

The course GGSN R4 Network Engineer provides competence on the various hardware components including switching boards, routing engines, and forwarding engine elements specific to the J20. The course includes a detailed look at the architecture of the JUNOS operating system with focus on those software components unique to the GGSN application. The participant will configure the GGSN Interfaces, the GTP specific parameters, charging in GGSN, APN, QoS, Security, including the firewall filter and IP-Sec and GRE on the J20, as well as simple VPNs.

Please note that compared to the GGSN R3 training course,, the modules related to the Service Aware Charging and Control (SACC) solution are no longer covered in the GGSN R4 Network Engineer course, but instead there is a dedicated portfolio outlined for SACC, including relevant tasks on the GGSN R4 as well as on other nodes being part of the total solution. This way the right emphasize can be given on the competence for the SACC end-to-end solution. For relevant courses, please refer to the Training Package “Service Aware Charging and Control (SACC)”, see section “Related Training Packages” in this document.

7.12.2 **Rationale for Flow design**

This flow is outlined separately from the SGSN related flows, as the GGSN requires other competencies than the WPP based GPRS nodes. All relevant tasks for the GGSN application on the J20 platform are covered in one course, as one and the same target group would handle all hands-on tasks for this node.

7.12.3 **Prerequisites**

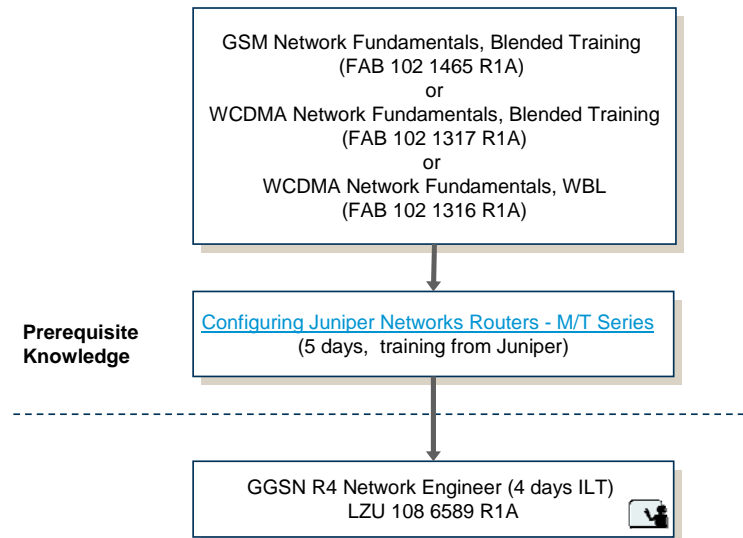
Participants of this flow should have attended the flow GSM Network Fundamentals, Blended Training (FAB 102 1465 R1A) or relevant WCDMA related training. Furthermore, as the J20 is based on a Juniper node, the course “Configuring

Juniper Networks Routers - M/T-Series" shall be attended.
This course is available from Juniper.

7.12.4 Training Flow

GGSN R4 Configuration

(FAB 102 1856 R1A)



7.13 GSM R12 Core Network Advanced Configuration (FAB 102 1898 R1A)

In addition to operation, configuration and troubleshooting training on platforms and nodes, target groups at the operator such as network deployment and integration engineers, in charge of work areas like configuration design, inter working testing and network expansion, would need additional competencies. These can be in the area of configuration design or signaling, as well as in introducing new functionality into the network.

7.13.1 What is achieved by attending the Flow

This flow provides competencies on the signaling protocols deployed in the Core Network, as well as configuration design competence for the AXE based nodes.

In the area of signaling, the course GSM Signaling in the Core Network discusses all protocols in the Core Network in detail, for the circuit switched part as well as for the packet switched



part. The new protocols introduced as part of the migration towards the Mobile Softswitch Solution, like BICC and GCP, are covered in this course.

In the area of configuration design for new nodes or expansions, the Data Transcript courses provide needed competence:

The course AXE 810 Data Transcript develops the student's current knowledge and understanding of exchange data to a point where he/she will be able to interpret exchange requirements and write the data transcript for an AXE 810, regardless of the application run on this platform. The student will have the opportunity for discussion about data transcript production, inputs, flow and ideas. Generally, theoretical lessons will be followed by practical work giving the student the opportunity to write data transcript from exchange requirements.

The course GSM Data Transcript, as continuation of the course AXE 810 Data Transcript, adds on the data transcript aspects specific to the MSC and MSC-S application with regards to the traffic cases of this node. Some aspects of BSC Data Transcript are also treated here.

7.13.2 Rationale for Flow design

Both competence areas, signaling and data transcript, have been put into one flow as often the same group of people is targeted here.

Still the flow is modular enough, by outlining different courses, to dedicate specific training to dedicated target groups.

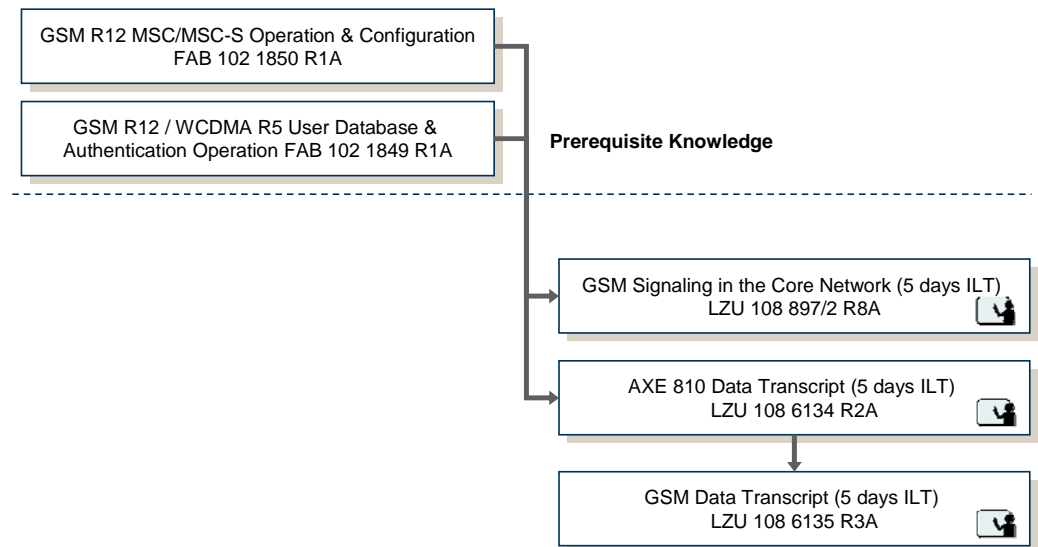
7.13.3 Prerequisites

The participants of this flow should have attended at least one of the following flows:

GSM R12 MSC/MSC-S Operation & Configuration (FAB 102 1850 R1A) and/or GSM R12 User Database & Authentication Operation (FAB 102 1849 R1A).

7.13.4 Training Flow

GSM R12 Core Network Advanced Configuration (FAB 102 1898 R1A)



7.14 MSS R3.1 Configuration (FAB 102 1858 R1A)

With the migration towards the Mobile Softswitch Solution (MSS) architecture, also referred to as Layered Architecture, the network topology changes significantly. The M-MGw is introduced as a new node, the MSC acts as MSC Server (MSC-S) node and the network design changes.

For personnel previously working in a non-layered network with classical architecture, the migration brings along the need for a number of new competencies targeted in this flow.

It shall be noted that personnel starting newly working in a GSM network would get the required competencies on the MSS parts for the different nodes by attending the above mentioned flows for MSC-S and M-MGw of this training package for GSM R12 mostly. In that sense this flow here can be considered as a kind of "Delta" training for personnel involved in the migration towards MSS.

7.14.1 What is achieved by attending the Flow

This flow provides the required competencies to be able to handle the network after the migration towards MSS in terms of operation and configuration.

It introduces the M-MGw node as well as the MSC Server concept, and provides competence on integration, configuration and network impact.

7.14.2 Rationale for Flow design

With the first plans of migrating towards the MSS architecture, an immediate need is created on getting an understanding of what MSS or layered architecture means and what the impacts are from a technical point of view. Therefore a dedicated course "GSM Mobile Softswitch Solution Introduction" has been developed that provides these competencies. This course is meant for a broader technically oriented target group.

The hands-on courses for M-MGw and MSC Server target mainly personnel in charge of operating and configuring the MSC and/or M-MGw nodes. Therefore these courses have been separated from the Introduction course.

In addition to the standardized hands-on courses, more competencies in terms of network planning, network optimization etc might be needed. As those competencies are specific to the operator needs, and vary for different network strategies, Ericsson offers the concept of Learning Solutions for these advanced competencies. A Learning Solution is defined together with Ericsson and the Operator and is based on analyzing the business and performance goals to be achieved with the migration towards MSS, and includes a content delivery and evaluation part that makes sure that the goals are reached. Please refer to http://www.ericsson.com/products/hp/Learning_Solutions_pos.shtml for a detailed description of the Learning Solution concept.

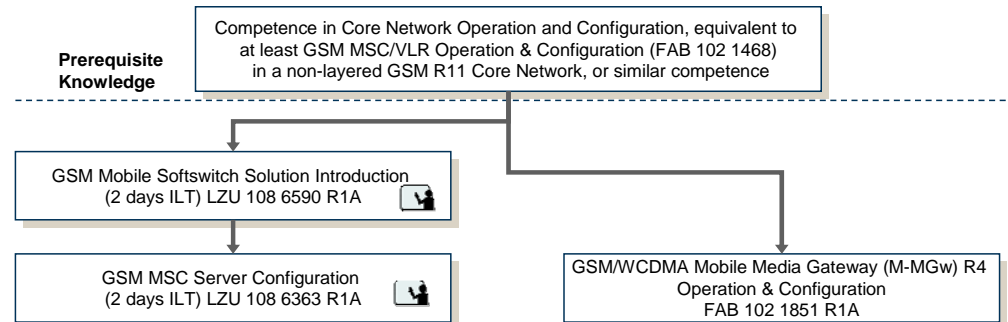
7.14.3 Prerequisites

Participants of this flow shall have very good competence in Core Network Operation and Configuration, equivalent to at least the flow GSM MSC/VLR Operation & Configuration (FAB 102 1468) in a non-layered GSM Core Network (see GSM R10 Core Network training package).

7.14.4 Training Flow

MSS R3.1 Configuration

(FAB 102 1858 R1A)



Mobile Softswitch Solution, hands-on training:

The integration or migration of a Core Network towards Mobile Softswitch Solution (Layered Architecture) comprises different target groups, depends on the setup of the organization, business goals and performance goals of the operator, and requires a variety of different competencies. Thus, no single course, covering all needs is offered for the hands-on training part. Ericsson Education offers Learning Solution for best fitting the different target groups' competence needs according to the operators' goals. For more information on the concept of Learning Solution, please refer to the following link: http://www.ericsson.com/products/hp/Learning_Solutions_pos.shtml

7.15 MSS R4.0/R4.1 Configuration (FAB 102 1859 R1A)

With the migration towards the Mobile Softswitch Solution (MSS) architecture, also referred to as Layered Architecture, the network topology changes significantly. The M-MGw is introduced as a new node, the MSC acts as MSC Server (MSC-S) node and the network design changes.

For personnel previously working in a non-layered network with classical architecture, the migration brings along the need for a number of new competencies targeted in this flow.

It shall be noted that personnel starting newly working in a GSM or WCDMA MSS network would get the required competencies on the MSS parts for the different nodes by attending the above mentioned flows for MSC-S and M-MGw in this training package for GSM R12 mostly. In that sense this flow here can be considered as a kind of "Delta" training for personnel involved in the migration towards MSS.

7.15.1 What is achieved by attending the Flow

This flow provides the required competencies to be able to handle the network after the migration towards MSS in terms of operation and configuration. This also applies for personnel previously working in a non-layered GSM network assigned to work in a WCDMA MSS network.

It introduces the M-MGw node as well as the MSC Server concept, and provides competence on integration, configuration and network impact.

7.15.2 Rationale for Flow design

With the first plans of migrating a GSM network towards the MSS architecture, an immediate need is created on getting an understanding of what MSS or layered architecture means and what the impacts are from a technical point of view. Therefore a dedicated course "GSM MSS R4 Introduction" has been developed that provides these competencies. This course is meant for a broader technically oriented target group.

The hands-on courses for M-MGw and MSC Server target mainly personnel in charge of operating and configuring the MSC and/or M-MGw nodes. Therefore these courses have been separated from the Introduction course.

Besides the migration of a GSM Core Network from non-layered towards a MSS architecture, a similar competence change might be required if personnel needs to change the work area from GSM non-layered Core Network towards WCDMA MSS Core Network. Out of an existing GSM network, a common GSM and WCDMA Core Network might be created, or a dedicated WCDMA Core Network might be built next to the existing GSM network. The same personnel might assume the task to handle both the GSM and the WCDMA MSS Networks. For personnel previously working in a non-layered GSM network, the new competencies needed for working in a MSS based WCDMA Core Network are covered in the course WCDMA MSS R4 Introduction. In addition to the course GSM MSS R4 Introduction, also the configuration tasks for connecting a WCDMA RAN are treated here on overview level. This also applies for the course WCDMA MSC-S R12 Configuration, which handles the connection of the WCDMA RAN to the MSS.

It shall be noted that personnel should attend either the GSM branch of the flow, or the WCDMA branch, as both branches have a bigger overlap. If personnel is to handle both a WCDMA and a GSM MSS network, then Ericsson could customize one of the two MSS Introduction courses to be extended by about half a day, to cover relevant parts from the other course variant respectively.

In addition to the standardized hands-on courses, more competencies in terms of network planning, network optimization etc might be needed. As those competencies are specific to the operator needs, and vary for different network strategies, Ericsson offers the concept of Learning Solutions for these advanced competencies. A Learning Solution is defined together with Ericsson and the Operator and is based on analyzing the business and performance goals to be achieved with the migration towards MSS, and includes a content delivery and evaluation part that makes sure that the

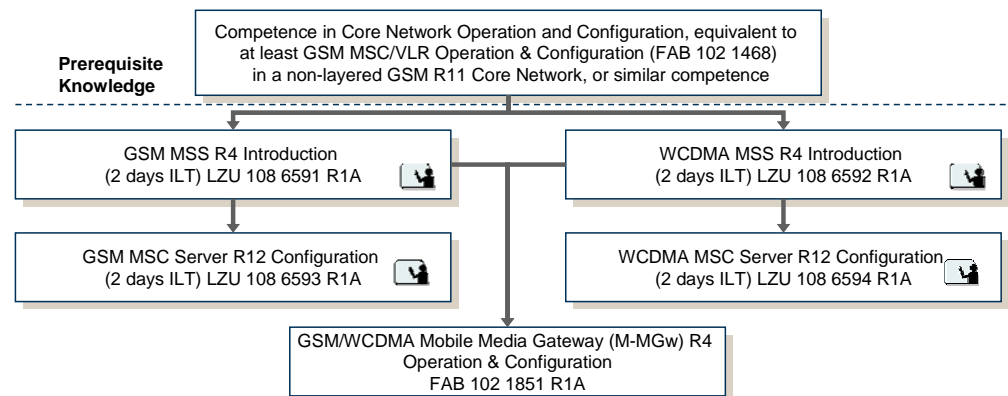
goals are reached. Please refer to http://www.ericsson.com/products/hp/Learning_Solutions_pos.shtml for a detailed description of the Learning Solution concept.

7.15.3 Prerequisites

Participants of this flow shall have very good competence in Core Network Operation and Configuration, equivalent to at least the flow GSM MSC/VLR Operation & Configuration (FAB 102 1468) in a non-layered GSM Core Network (see GSM R11 Core Network training package).

7.15.4 Training Flow

MSS R4.0/R4.1 Configuration (FAB 102 1859 R1A)



Mobile Softswitch Solution, hands-on training:

The integration or migration of a Core Network towards Mobile Softswitch Solution (Layered Architecture) comprises different target groups, depends on the setup of the organization, business goals and performance goals of the operator, and requires a variety of different competencies. Thus, no single course, covering all needs is offered for the hands-on training part. Ericsson Education offers Learning Solution for best fitting the different target groups' competence needs according to the operators' goals. For more information on the concept of Learning Solution, please refer to the following link: http://www.ericsson.com/products/hp/Learning_Solutions_pos.shtml

7.16 GSM R12 End-to-End Feature Solutions (FAB 102 1899 R2A)

With the GSM R12 Core Network a number of system wide features, which are implemented over a number of nodes, are introduced. These are features that enable capacity gain, like the pool features MSC Pool and SGSN Pool, as well as features that focus on introducing IP on the interfaces, like the feature Gb over IP for connecting the SGSN to the BSC, or the SIGTRAN support. The feature TFO/TrFO Interworking addresses bandwidth saving and speech quality in the network.

7.16.1 What is achieved by attending the Flow

The introduction of new features brings along the need for new competencies, in order to be able to get the best out of using the new functionality.

After attending this flow, the participants will be able to determine the impact of introducing the features MSC Pool, SGSN Pool, Gb over IP, SIGTRAN and TFO/TrFO Interworking into an existing GSM Core Network. The participants would be able to judge the changes of work tasks, network design and performance when using and operating the newly introduced functionality.

7.16.2 Rationale for Flow design

The flow is made up of courses per feature. This way it is possible to cover all scenarios that might apply for an operator, introducing single features or a set of those.

Although the courses are developed to be independent, the system requirements show the need of participating in courses in a flow for the feature SGSN Pool, which requires Gb over IP. Therefore it is recommended to attend the Gb over IP course before the course SGSN Pool Introduction.

7.16.3 Prerequisites

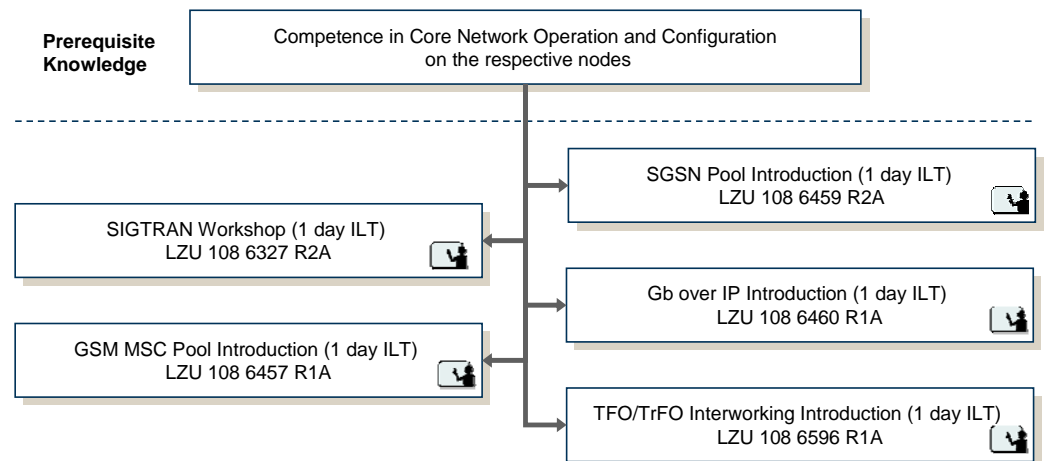
The participants should have very good competence in operating and configuring the nodes that are affected by the features:

- GSM MSC Pool: MSC, MSC-S, BSC and OSS-RC
- SGSN Pool: SGSN, BSC, RNC and OSS-RC
- Gb over IP: SGSN and BSC
- SIGTRAN: MSC, MSC-S, M-MGw, HLR
- TFO/TrFO Interworking: BSC, RNC, M-MGw, MSC and MSC-S



7.16.4 Training Flow

GSM R12 End-to-End Feature Solutions (FAB 102 1899 R2A)



7.17 GSM R12/WCDMA R5 Core Network Charging Operation (FAB 102 1866 R1A)

Charging data is produced in the MSC/MSC-S and the GSN nodes in the Core Network. The configuration of the nodes, in order to get CDRs produced according to the specifications and requirements of the connected billing or multi mediation environment, requires dedicated competencies, which are provided by this flow.

It shall be noted that this flow concentrates on the functionality of the MSC/MSC-S and SGSN nodes only and does not cover much of IN related or billing node related content. Those contents are covered in dedicated Training Packages for Charging Solutions. An overview of the charging and billing environment is included in these courses, though. It shall further be noted that all GGSN related charging functionality is treated in the Training Package "Service Aware Charging and Control (SACC)".

7.17.1 What is achieved by attending the Flow

The course GSM/WCDMA MSC R12 Charging Operation enables participants to operate, configure and maintain



charging functionalities in the MSC and MSC-S. It also gives an overall view of charging functions in Ericsson's GSM/WCDMA network. The focus is on configuring the charging analysis, CDR fields and charging output parameters on the MSC/MSC-S node.

The course GSM/WCDMA SGSN R7 Charging Operation covers an equivalent scope as outlined above for the MSC/MSC-S, on the SGSN.

7.17.2 Rationale for Flow design

The charging operation courses for MSC/MSC-S and SGSN have been separated from each other, as different technical competencies are needed for the different nodes. The courses are a logical continuation of the operation and configuration training for those nodes.

If there would also be a target group that specifies the requirements for CDRs in the whole network, potentially a design or deployment group, in need of knowing about the capabilities of MSC/MSC-S and SGSN nodes in terms of charging, then this target group could find both courses in this flow of interest as well.

7.17.3 Prerequisites

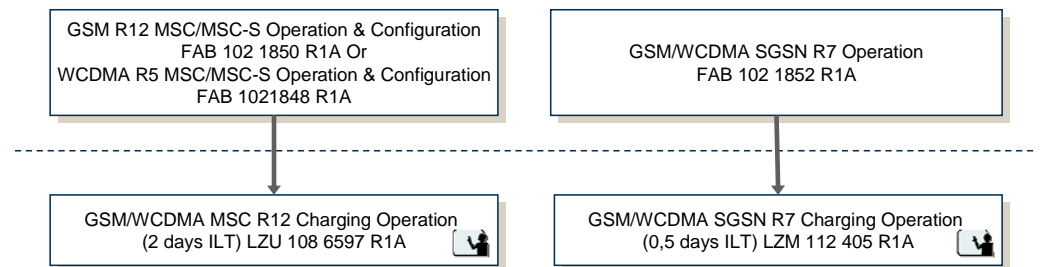
Participants of this flow shall have attended the flow GSM R12 MSC/MSC-S Operation & Configuration (FAB 102 1850 R1A) as prerequisite for the MSC Charging Operation course, and the flow GSM/WCDMA SGSN R7 Operation (FAB 102 1852 R1A) as prerequisite for the GSM/WCDMA SGSN R7 Charging Operation course.



7.17.4 Training Flow

GSM R12 / WCDMA R5 Core Network Charging Operation (FAB 102 1866 R1A)

Prerequisite Knowledge



8 Network Development

8.1 GSM R12 Core Network Statistics Handling (FAB 102 1900 R1A)

Statistics are an important measure in order to determine the network quality. This flow covers the statistics that can be taken in a GSM Core Network from the MSC/MSC-S, SGSN, GGSN and M-MGw nodes.

8.1.1 What is achieved by attending the Flow

The courses in this flow make the participants familiar with performance measurement functions of the MSC/MSC-S, SGSN, GGSN and M-MGw nodes in the network. The focus of this learning process is to outline how to periodically request, collect, format, store and output statistics and traffic measurement information from nodes in the Core Network.

For the AXE the STS application is used for statistics. Please note that the operation of STS is covered in the course APG 40 Operation & Maintenance (LZU 108 5870), while the emphasis in this flow is on the configuration of the counters and statistics with a network view and understanding.

The courses in this flow outline the performance measurement capabilities of the nodes connected to the relevant traffic theory, provide examples for measurements and look upon the OSS-RC applications used to support the process.

8.1.2 Rationale for Flow design

The flow is split into courses per node and function. For the SGSN and GGSN, both are treated in one course as the network performance related to both nodes is tightly linked.

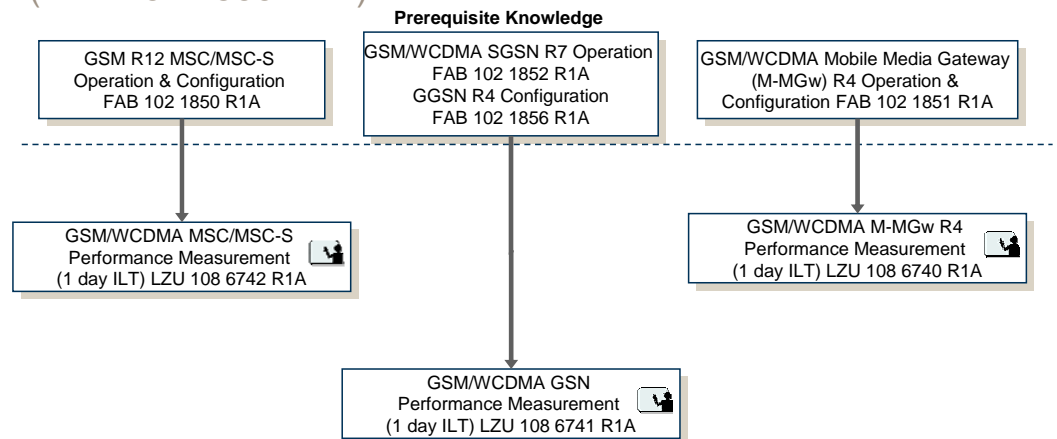
8.1.3 Prerequisites

Participants attending this flow should have competence in operating the nodes up to the level of the flow GSM R12 MSC/MSC-S Operation & Configuration (FAB 102 1850 R1A) and/or GSM/WCDMA SGSN R7 Operation (FAB 102 1852 R1A), GGSN R4 Configuration (FAB 102 1856) or GSM/WCDMA Mobile Media Gateway (M-MGw) R4 Operation and Configuration (FAB 102 1851 R1A).

8.1.4 Training Flow

GSM R12 Core Network Statistics Handling

(FAB 102 1900 R1A)



8.2 GSM R12 Core Network Planning (FAB 102 1901 R1A)

This flow is meant for network design engineers. Typical tasks would be to plan the network topology and dimension links and nodes following common traffic modeling processes in order to suite the requirements on traffic coming into the Core Network.

8.2.1 What is achieved by attending the Flow

This flow covers the planning process and actual planning of a Core Network setup. Planning the Core Network upon parameters like expected traffic, as well as the dimensioning of the single nodes in order to choose the product packages that have the right capacity is handled in this flow. Both tasks are closely related, as the dimensioning of nodes is performed after receiving the requirements from Core Network Design.

In the course GSM R12 Network Planning - Core Network the participants learn how to dimension the traffic and signaling part of the Core Network, given requirements from the Radio Access Network Planning and from expected traffic. In the course GSM R12 Network Planning - Node Hardware Dimensioning the participants learn how to dimension the nodes in the Core Network and choose the correct product packages to match the requirements given from Network Design in the Core and Transmission network. Cases are used to demonstrate and train the gained competencies.



The Mobile Softswitch Solution (MSS) or layered architecture network is also treated in these courses, including the dimensioning of the M-MGW node.

8.2.2 Rationale for Flow design

The two courses for Core Network Planning and Node HW Dimensioning have been separated as they refer to two different steps in designing a Core Network.

Splitting the subject into two courses provides maximum flexibility. If wanted, both courses can be instructed in a sequence to the same target group, without any redundant topics.

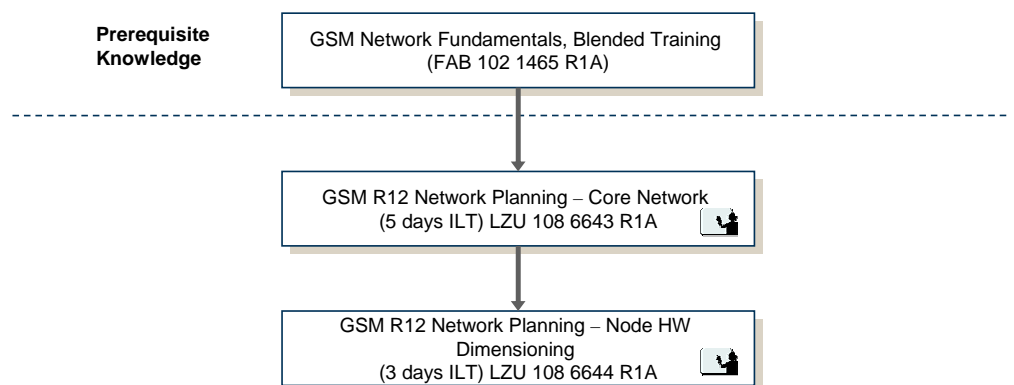
It shall be noted that dedicated training flows exist for the Mobile Packet Backbone Network, which focuses on the IP connectivity for the all-IP Core Network. Please refer to the Training Package "Mobile Packet Backbone Network (M-PBN)".

8.2.3 Prerequisites

Participants shall be competent in the concepts of GSM and signaling, and shall have attended the flow GSM Network Fundamentals, Blended Training (FAB 102 1465 R1A).

8.2.4 Training Flow

GSM R12 Core Network Planning (FAB 102 1901 R1A)





9 Transport Network

9.1 AXD 301/305 Field Maintenance (FAB 102 1341)

The AXD is a node in the ATM backbone network. This flow will make the students familiar with maintaining an AXD 301/305. Field Maintenance personnel is the target group of this flow.

9.1.1 What is achieved by attending the Flow

The course AXD 301/305 Hardware Maintenance will teach students how to trouble shoot alarms, replace faulty hardware and utilize the test management facilities on the AXD 301/305.

9.1.2 Rationale for Flow design

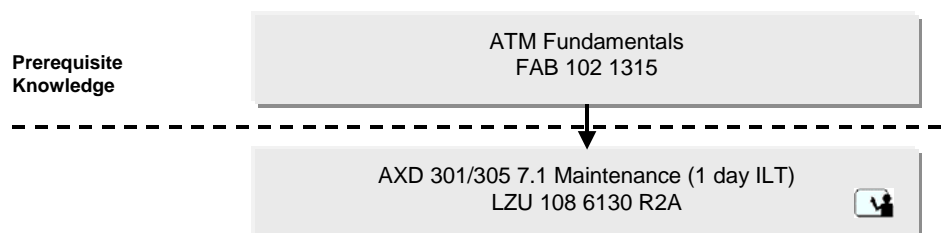
The Field Maintenance is kept separate from the Configuration and Verification work area, as that should best reflect the split between field technician and system engineer target groups.

9.1.3 Prerequisites

Participants should have completed the flow ATM Fundamentals (FAB 102 1315 R1A).

9.1.4 Training Flow

AXD 301/305 Field Maintenance (FAB 102 1341)





9.2 AXD 301/305 Network Operation & Configuration (FAB 102 1342)

This flow is intended for technical personnel that will configure connections in the ATM network and configure the different features supported by the AXD 301/305 nodes.

9.2.1 What is achieved by attending the Flow

This flow will give the participants competence on the principles of ATM core networks and the functionality of the AXD 301/305 core switch.

The course AXD 301/305 Configuration & Verification consists of theory sessions followed by practical exercises to achieve competence on how to operate the system.

9.2.2 Rationale for Flow design

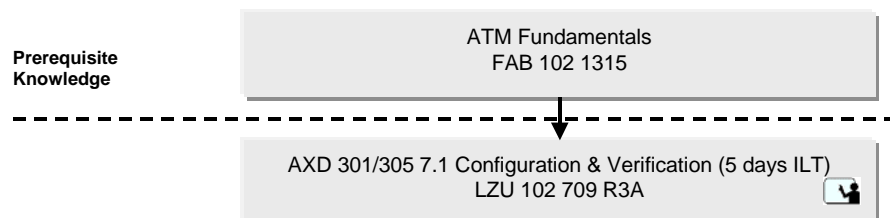
The configuration and verification course is kept separate from the maintenance work area, as that should best reflect the split between system engineer and field technician target groups.

9.2.3 Prerequisites

Participants should have completed the flow ATM Fundamentals (FAB 102 1315 R1A).

9.2.4 Training Flow

AXD 301/305 Network Operation & Configuration (FAB 102 1342)





10 Related training packages

The following related training packages can be found at <http://www.ericsson.com/education/development/>

- GSM RAN R12
- WCDMA R5 Core Network
- Ericsson IP Multi Media Subsystem (IMS) Solutions
- Charging System 3.0
- Mobile Packet Backbone Network (M-PBN)
- Service Aware Charging and Control (SACC)