

Nokia Learning Solutions

Training Catalogue 2005



NOKIA
CONNECTING PEOPLE

Meeting the challenge of continuous development

Telecommunications companies face a challenging period, during which they must continually develop in a difficult business environment to ensure they remain competitive, both today and into the future.

Many companies recognize the importance of continuously developing the competence of their organization. It is vital that their ability to keep operating is not compromised even though the number of personnel available may be limited. Personnel working in this environment are a company's most important asset, making it ever more vital that companies are able to retain their best people.

Yet, the telecommunications industry is continually changing, driven by digital convergence and increasing mobility. This sets new challenges for competence development, making it more important than ever to ensure that people are ready to take on these new challenges.

In such a situation, the investment in people must be as cost-effective as possible. Planning the development of people's competence therefore plays a critical role. Furthermore, following up to ensure that the required capabilities have been achieved is important. It is no longer enough simply to apply the training and assume that people are then capable of doing what is needed – it must be possible to verify that this is really the case.

Today's businesses often comprise complex value networks, alliances and partnerships that also require new abilities to be able to work together effectively. In this environment, trust is an important aspect and new ways to build trust between companies are needed. We believe that certification of competence development is an essential tool for building trust in people's abilities to work in these new and demanding environments.

Nokia is committed to supporting its customers' business through a full and high-quality range of competence development services. We hope our commitment is illustrated in this document. In addition to our existing portfolio, we are working hard to develop solutions that will open up new, efficient and effective opportunities to enable you to meet the challenges of the future. Nokia Learning Solutions is working for you.



Table of contents



| | | | |
|---|-----|--|-----|
| Nokia Learning Solutions | 4 | | |
| Manage your training and learn online | 7 | | |
| Consultancy services and competence development programs | 10 | | |
| The need for expertise – Nokia Network Expert Club | 13 | | |
| Self-learning solutions | 14 | | |
| Courses and workshops by target groups | 21 | | |
| Network technology and solution training | 23 | | |
| Overview and system training | 23 | | |
| Technology and specification training | 31 | | |
| Mobile network security | 34 | | |
| Nokia platforms | 39 | | |
| Field engineering | 43 | | |
| 2G field engineering | 43 | | |
| 3G field engineering | 51 | | |
| Network engineering | 55 | | |
| Radio access network engineering | 55 | | |
| Switching core network engineering | 68 | | |
| Packet core network engineering | 84 | | |
| IP multimedia subsystem engineering | 95 | | |
| OSS administration | 98 | | |
| Network operations and control | 102 | | |
| Network surveillance | 102 | | |
| Radio network configuration | 105 | | |
| Network performance reporting | 109 | | |
| Network planning | 113 | | |
| GSM, GPRS, EDGE | 113 | | |
| 3G network planning | 121 | | |
| Mobile services | 126 | | |
| Service system training and specifications | 127 | | |
| Service core | 130 | | |
| Intelligent network | 131 | | |
| Intelligent Content Delivery | 135 | | |
| Subscriber and terminal management | 142 | | |
| Service enabler solutions | 144 | | |
| Content services | 144 | | |
| Push to talk solution | 147 | | |
| Short messaging | 150 | | |
| Multimedia messaging and application gateways | 152 | | |
| Location based services | 157 | | |
| Application development resources | 162 | | |
| Value added operations support systems | 163 | | |
| Nokia NetAct OSS4 Release training | 170 | | |
| | | Nokia Verification Services | 172 |
| | | Base transceiver station | 175 |
| | | Base station controller | 181 |
| | | Radio network controller and multimedia gateway | 186 |
| | | Nokia FlexiServer platform | 191 |
| | | Circuit switched core network | 194 |
| | | Packet switched core network | 197 |
| | | Network operations and control | 198 |
| | | Network planning | 199 |
| | | Nokia learning measurement service | 200 |
| | | Nokia Trainer Licensing | 201 |
| | | Nokia Connect BTS Trainer Licensing programs | 202 |
| | | Nokia Connect network element Trainer Licensing programs | 203 |
| | | On-the-job Training and Facilitated Learning Programs | 205 |
| | | Nokia Connect GSM OJT solutions | 205 |
| | | Facilitated Learning Programs | 208 |
| | | 2005 events and new services in development | 210 |
| | | Practical training arrangements | 211 |
| | | Nokia Training Centers | 212 |
| | | Index | 214 |

Nokia Learning Solutions

The right learning solution for your needs

In Nokia Learning Solutions, we follow a simple philosophy: the right training, for the right people, at the right time at the right price. To meet your needs, we provide the full range of competence development services for all Nokia Networks' customers and partners. With over 20 years of experience in providing education in one of the fastest growing industries in the past decade, we have a vast amount of know-how, but also understand the importance of change.

Our services form a unique integrated approach that includes the analysis and identification of your competence needs, planning of competence development solutions and delivery of the solutions. We also analyze the delivery and competence to allow us to meet future needs.

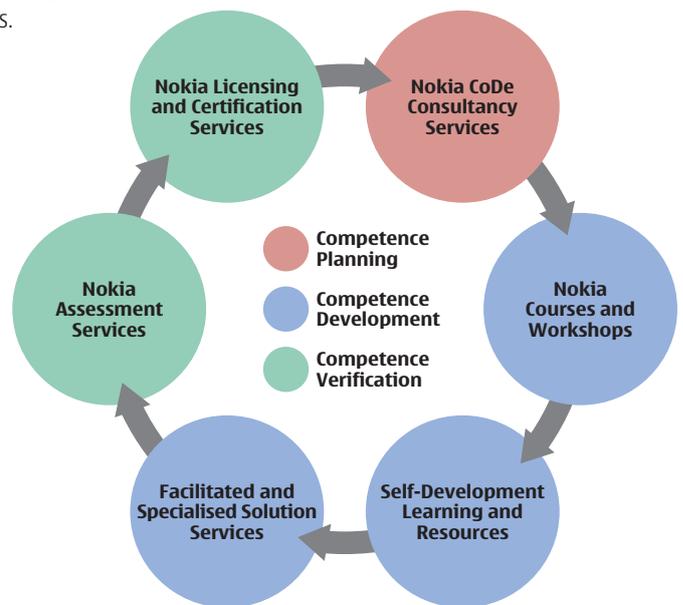
Programs are created in a modular fashion, allowing us to provide training to meet Individual needs. They are continuously being developed to include the latest changes in technology and products and to incorporate the best learning techniques. In addition, our solutions are adapted to a variety of learning styles, using a combination of alternative learning channels.

Our team of specialized trainers are also continually developing themselves to ensure that they possess the industry leading technical and training skills needed to deliver a professional, high quality service. We maintain an established network of training suppliers to ensure we can provide a complete portfolio by using experts from specialized areas.

Full range of solutions to develop industry leading class professionals

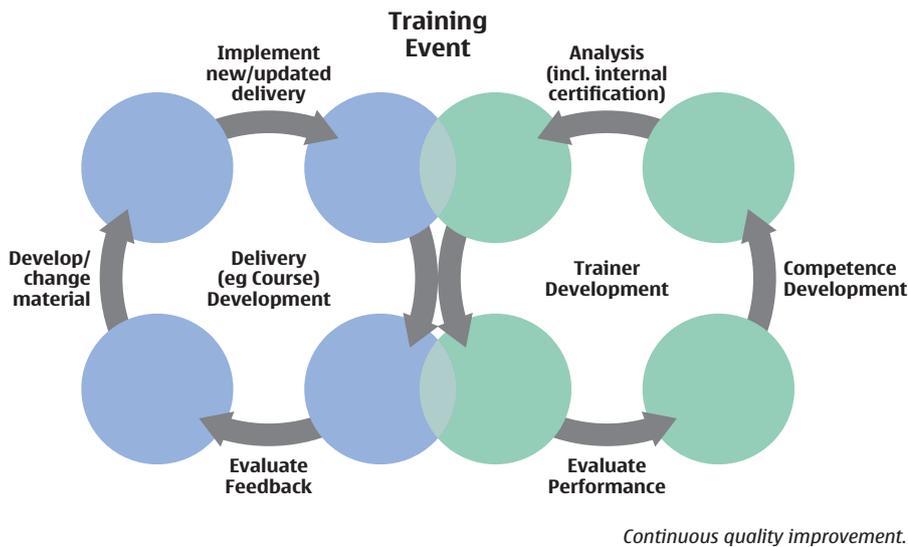
We provided training for over 30,000 participants last year, from our catalogue of over 230 products and even more customized programs. Our training deliveries include a range of different types of courses, workshops, self-learning services and a series of seminars.

As our industry faces challenges, with more emphasis on cost and efficiency, training courses are only one part of our comprehensive service. We also provide training consultancy and assessment services, enabling you to better manage your personnel development.



Manage and maximize your competence.





Flexibility in delivery

Nokia provides four options for purchasing training:

Dedicated Standard – Courses and workshops that you can purchase for participants only from your company.

Dedicated Customized – Tailored courses designed for your needs and only delivered to you. This is ideal if you have a high training demand and understand the skills and knowledge you require.

Open Seats – The majority of our standard courses and workshops are available globally as open deliveries where you can buy seats. This is ideal for situations where you only have a small group of individuals who need training quickly, or a few experts who require specialized training.

Competence Development Project – When a high degree of competence development is required, we can work together to produce a Competence Development Project that includes consultancy, planning, delivery and assessment for all your needs.

Nokia's approach to continuous quality improvement

To meet your continuing needs, we in Nokia Learning Solutions operate a process of continuous development in all our services. During 2005, we will launch an improved portal that will include new features, such as competence planning, evaluation, and budgeting. Enhancements will be made in reporting, administration and managing your learning.

Nokia training is BSI compliant and we implement a continuous feedback process where all the course and module evaluations are fed into the development cycle. We update the majority of our training yearly with the release of new hardware and software, following which we ensure that our trainers go through a professional capability development program before introducing the new or updated course.



| | | | | | |
|---|--|--|--|---|--|
| Consultancy services and competence development programs (Page 10) <ul style="list-style-type: none"> • Training support • Competence evaluation • Solution planning • Development projects | Self-learning solutions (Page 14) <ul style="list-style-type: none"> • Self-paced e-learning • E-seminars • E-JobAid • Self-reading material | Courses and workshops by target groups (Page 21) incl. support for virtual classroom, remote access, course assessment and measurement | Verification services (Page 172) <ul style="list-style-type: none"> • Training measurement • Task-based licenses • Product-based licenses • Certification • Trainer licensing | On-the-job Training and Facilitated Learning Programs (Page 205) <ul style="list-style-type: none"> • On-the-job training • Facilitated workshops | Nokia seminars <ul style="list-style-type: none"> • 2005 seminars |
| Introductory for all groups | | | | | Page 23 |
| Field engineering | | | | | Page 43 |
| Network engineering | | | | | Page 55 |
| Network operations and control | | | | | Page 102 |
| Network planning | | | | | Page 113 |
| Mobile service creation, deployment and management | | | | | Page 126 |

Nokia Learning Solutions.

Finding your solution

Our comprehensive service portfolio is grouped into six categories to support all the target groups working with our products and solutions. Recommended learning solutions for each target group can be found in the courses and workshops section (page 21).

Our services are designed to complement one another, with, for example, the assessment services intended for use with our courses and workshops.

What's new for 2005

We have continued to strengthen our diverse range of services designed to meet the demands of maturing and multi-vendor networks and have updated our recommended solutions to include more advanced and expert training. To meet the needs of your specialists, Nokia is introducing the Nokia Network Expert Club – a collaboration environment where we offer a unique forum for experts to exchange views, access updated and

new learning material, gain access to the latest books and their authors via seminars, and virtual sessions.

New innovative services for 2005

- Extended Administration service to support your planning needs better
- More globally recognized license and certification programs
- Increased use of collaboration to address the needs of specialized target groups through informal learning methods
- Continued development of e-JobAid to allow learning to continue after training
- Increased use of course assessment, virtual classroom and remote access to new parts of the portfolio

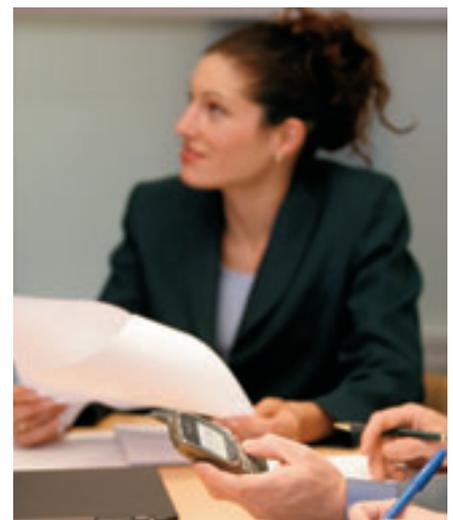
New solutions for you to maximize your investment

- Improved methods to plan and administer your training needs more effectively
- Integration of the Kirkpatrick/Philips model into our learning solutions
- Improve visibility of learning effectiveness through competence planning and reporting
- Improved ability for all learners to access learning content easily

Training solutions for new technologies

In 2004, we saw the real commercial launch of 3G and EDGE in many parts of the world and as the technology becomes more established, so does our training solution. Also, in 2005 we will add training solutions for:

- IP Multimedia Subsystem (IMS), also known as Release 5 and 6
- New service opportunities, such as Presence
- Advanced training for multi-system integration and operability
- Focused training for new features in GSM, EDGE and 3G



Manage your training and learn online



Unique training portal

Our training portal in NOLS gives you access to all the functions of online course information and e-administration. Furthermore, our training portal gives you access to

- Nokia Training Centers – get online information on how to find the way to your classroom courses
- Training news – read about the latest developments in our training offering
- Mailing lists – receive personalized training news by e-mail
- E-learning demos – test our e-learning offering
- Customized training plan and recommended flows by target group
- Access to e-assessment service
- Access to Nokia e-learning service

Improve the visibility of your training

There are several ways to get the latest information on which training is available for you. Our new mailing lists offer you personalized training news direct to your mailbox, a function that can be configured through our NOLS training portal. There are mailing lists covering the following training areas:

- Advanced 3G Radio Access Network (RAN) training
- Advanced Mobile Packet Core (MPC) training
- Advanced Circuit Switched Core Network (SCN) training
- What's new in Nokia e-learning?

Finally, 'What's new in Nokia training' sends you a summary of our training portal news, and a list of our available open course seats.

You can enroll on our mailing lists on NOLS (www.online.nokia.com). To get to the NOLS training portal, select 'Training' from the main navigation. Select 'My Settings' > 'Mailing List' from the navigation bar on the left and select the mailing list(s) of your choice. To make sure that your e-mail address is correct please go to 'My Profile' in the NOLS top navigation.

We draw on our vast experience in all training areas, and bring this know how closer to you with a service that is open 24 hours a day, 7 days a week. Our e-training services are made available through Nokia Online Services (NOLS), our e-business channel that complements our conventional services offering. You can access NOLS from anywhere you have Internet access. We provide the following e-training services:

Online course information

The information available contains course descriptions, maps, dates and number of available seats, both for our open standard courses and for your company's dedicated courses. Online access ensures you always have the latest course information, making course scheduling easier and faster for both you and your line managers.

E-administration

E-administration is an optional service that allows you to manage your Nokia training through NOLS. You can make course requests for yourself or your personnel, for our open and your

company's specific courses. You will receive our training proposals and order confirmation on the same channel. E-administration supports course approval processes inside your company with a sophisticated authority system, cutting the time spent sending e-mails or talking on the phone to get the course you desire. You also now have one common place to access your personnel's training information and can see all their courses at once.

Benefits of e-administration

- Easy and quick to use
- Helps you to track and manage your training more effectively
- Always available

E-administration must be separately activated for your company – please contact our local training representative for training and configuration.

Nokia e-learning services

E-learning complements traditional training channels with an efficient and effective delivery method that is largely free from the constraints of time and place. It enables personnel to learn at their own pace in the workplace or at home. In combination with classroom training it becomes 'blended learning'.

E-learning methods

- **Self-paced e-learning programs** are ideal for providing underpinning knowledge. They can be used to prepare students for practical courses, either classroom or virtual classroom. We use self-paced e-learning for introductory and system level training, for theory product training, as well as for training on new product releases. Self-paced e-learning offers interactive learning modules with audio narration and multimedia applications, while reference material allows a deeper investigation of the training subject. Assessments verify the learning outcomes, and successful learners receive a diploma from us. Nokia may report the individual e-learning results.
- **Recorded presentations** (such as e-course) – as if you were there. For highly specialized training, the training is sometimes restricted to particular place, or the training is of short duration and therefore not cost-effective. To meet these challenges, we are now recording these sessions and will make them available through our learning portal.
- **Question and Answer Forums** allow discussion of actual questions that appear during the learning process. They can be applied in combination with self-paced e-learning or with instructor-led training. With the Q&A Forum, the learning does not end when students leave the classroom.
- **Virtual classroom (VC)** allows online instructor-led training, allowing real-time interaction of participants and trainer without the need to travel. VC is ideal for sharing knowledge in a small interactive group. The use of Voice over IP makes it cost-effective, and extra features such as 'breakout rooms' make VC a highly interactive learning experience. VC may be applied for both theory and practice training – in the latter, the learner works with a connection to training equipment in one of our Nokia Training Centers.
- **E-learning resources** – Provides e-learning solutions for functionality changes and product improvements distributed in change deliveries and technical notes. The e-learning resources will include E-JobAid for procedures that are covered in the classroom training, yet the individual can easily follow them step-by-step in the real working environment. The E-JobAid is also supported by a Question and Answer Forum. eJobAids can also be made available in local languages.

What is e-JobAid?

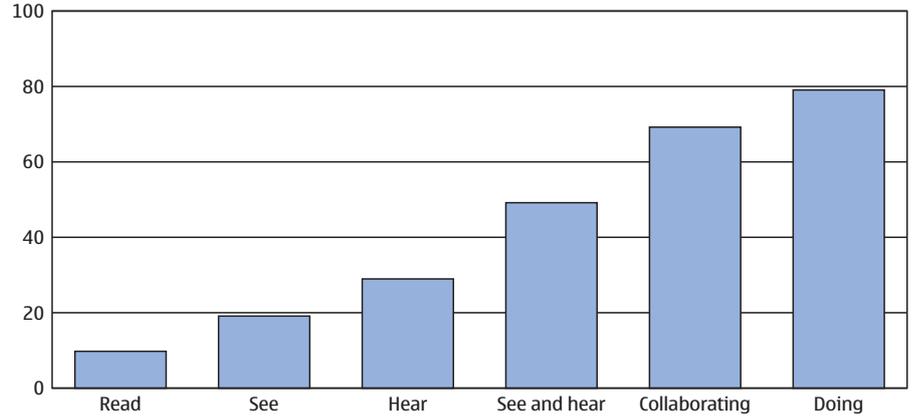
E-JobAid is a small learning unit, usually not more than five minutes long. It introduces a single working procedure in a very task-orientated presentation. We have recorded these learning units. A video, audio and either slides or a demonstration are presented on an equipment's user interface, in the same window. The presentation goes through the task step-by-step, so you can view, pause, view and review. Delivered over the Internet, the e-JobAid is not tied to a particular computer platform.



Benefits of e-learning

- **Easy access:** E-learning sessions can be held anywhere at any time.
- **Flexible scheduling:** Sessions can be arranged during the normal working day.
- **Cost-effective:** E-learning is more cost-effective than traditional classroom training, and provides additional savings through reductions in travel and opportunity costs.
- **Effective learning:** Modular learning content can easily be tailored to match the users' personal competence profile.

Knowledge retention (%)



Knowledge retention.

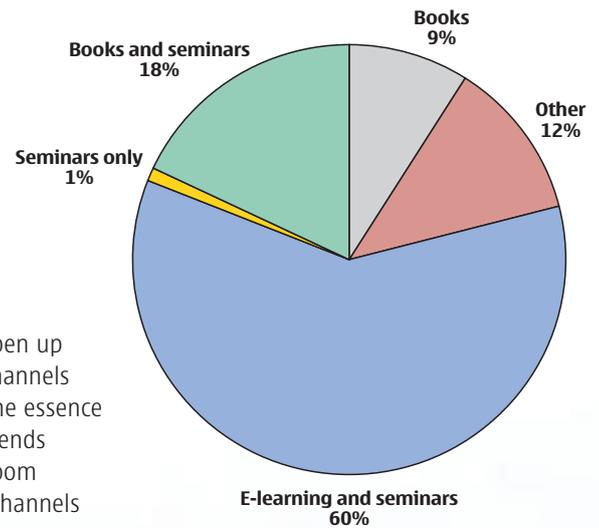
Unique e-learning portal

We use a unique extranet portal to access all forms of e-learning: self-paced learning programs, e-seminars, forums, and virtual classroom.

From e-learning to blended learning

Public research shows that a majority of learners in business education today expect e-learning to be one of their desired learning methods. Together with the economic benefits of e-learning, we have founded our training strategy on this expectation and will successively increase the e-learning offering throughout our training portfolio.

Forums and virtual classroom open up e-learning for new innovative channels for 'collaboration' and 'doing'. The essence is a learning experience that extends beyond the limitations of classroom training. The different learning channels merge to provide an integrated experience: e-learning prepares students for classroom training, e-assessment verifies the learning outcomes of classroom training and e-learning, and an online-tutor helps the learner to gain the most knowledge. These scenarios describe our understanding of 'blended learning'.



How employees want to develop their knowledge.

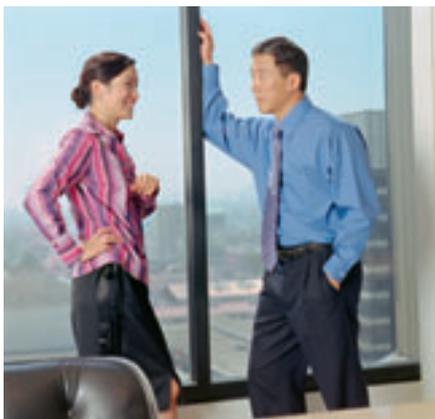


Consultancy services and competence development programs

Making the most of your investment

To allow you to get the maximum from your training investment we have built our portfolio with a modular approach to allow increased flexibility and efficiency in delivery. With this approach the identification of your needs plays a crucial part. Therefore, under the umbrella of our consultancy and competence development projects, we provide an integrated way to combine the best planning, with assessment and reporting. To support you we provide a four-level solution, where you decide how much support you need:

Support of our Training Services Manager (TSM) in selecting development paths – Our competent and experienced Training Services Managers can help guide you through our recommended actions. In some cases, they are able to bring the portfolio experts into the discussion.



Nokia Competence Evaluation and Profiler Service – We offer the opportunity for your people to create recommended development actions based on an evaluation. The results can be tracked.

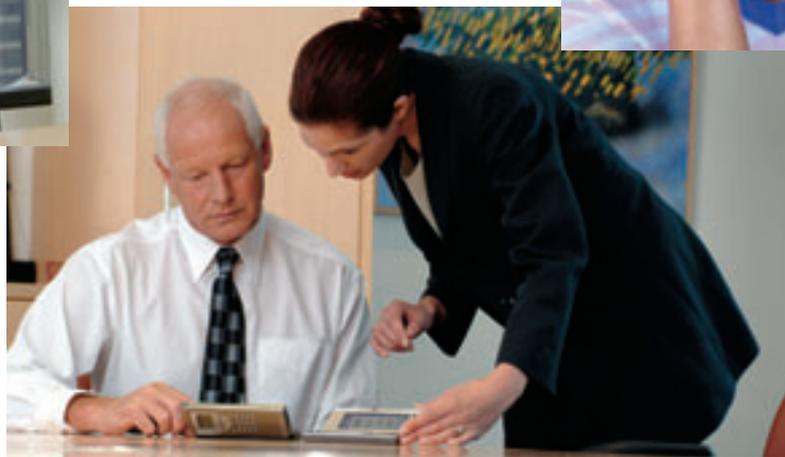
Nokia Solution Planning Consultancy Service – In addition to the evaluation service, we can also provide comprehensive planning that provides the best-tailored solutions to meet your needs, in a structured format that includes reporting.

Nokia Competence Development Project – In addition to the planning, we also can provide a full project service where we manage the full capability development, planning, assessment, reporting and licensing.

Nokia Learning Management Services – To reduce your fixed training costs and increase the effectiveness of your personnel development processes, we provide a range of options to support improved integration, administration, content and learning management between yourselves and Nokia.

Each level of our consultancy service is built on the previous one.

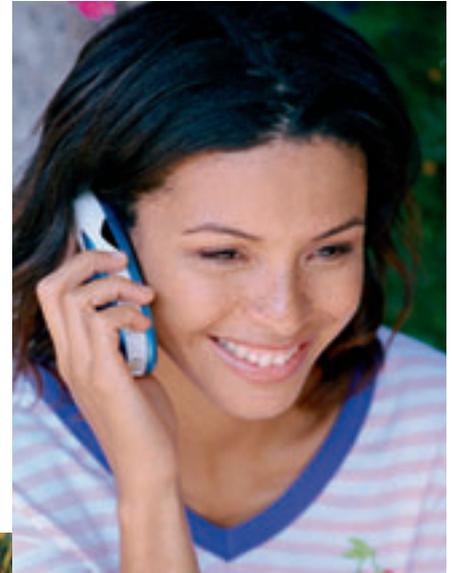
To help you further, we always nominate a dedicated person to support your needs and we take care that our deliveries are at the agreed level of quality.



Always finding the best solution for you

Our Training Services Managers will provide you with a recommended training solution that meets five objectives:

- Delivered when you need it
- Optimized to meet your needs and avoid unnecessary investment
- Meeting the challenge of complex technology implemented in your network
- Modular to ensure flexibility through a number of delivery methods
- Holistic, to explore development actions not solely based on courses and workshops



Nokia Competence Evaluation and Profiling Service

To help you plan the training needs of your organization accurately, we provide a tool that allows personnel to evaluate their own competences and skills.

We define standard profiles (job titles), which include a description of the knowledge and skills required to perform the job. This standard is the basis of the evaluation – the person is then asked to make a self-assessment, a series of questions to help determine if the person meets the requirements of the standard profile. On completing the evaluation a list of recommended development actions is provided.

The profiles can be customized to meet your needs and track the change in your peoples' competence. The benefit is that you can clearly see the progression and effect of learning.

Functionality and deliverable:

- Individual environment for each person to complete the evaluation
- Individual recommended competence development actions based upon the person's job profile (including self-development actions and proposed courses/workshops)
- Historical evaluations can be kept and the changes can be tracked by the individual and their manager
- As a manager, you can configure the job-roles to best suit your organization.

Local privacy and data-protection laws are observed with this service. Nokia does not use this information for any other purpose, unless otherwise agreed with you. Please ask your local training contact person for more information on activation and use.

Nokia Solution Planning Consultancy Service

If you face the prospect of mass training, for example, after an organizational change or when deploying new technology in your network, we can provide a solution planning service in which we carefully analyze your requirements, your organization and even the current competences you have.

Our experienced Competence Development consultants will visit you and listen to your needs and expectations. They will analyze your organization, processes and roles to develop a complete picture of your requirements. From this they will build tailored solutions that meet the needs of each target group, giving the right training at the right time.

The solution is then validated by you – and once agreed we would create a plan and start to schedule all the training. Also, we provide volume discounts if the training is ordered as part of a plan. The next stage would be for your people to use our Competence Evaluation and Profiler service (as described previously) to generate individual plans. This would also identify who should attend which training.

Deliverables of the planning process:

- Documented training plan and recommended flows per target group
- Individual competence development plan
- Customized target groups and descriptions via NOLS
- Pre-delivery evaluation of competence
- Monthly measurement report on progress
- Needs analysis
- Fully scheduled plan

Although the project requires a higher initial investment, savings are made throughout the duration of the cycle as fewer days are needed and training is specific for each target group. Furthermore, you will receive monthly reports on the progress as well as the individual improvement can be tracked.

From our experience, by planning and working together we can provide you with a more competitive price and solution than on an ad-hoc basis.





Feedback from Vodafone Omnitel on its Competence Transfer Program

“The Competence Transfer Program (CTP) has been the result of more than two years of co-operation with Nokia. This is a good example of a partnership between Vodafone Omnitel and Nokia, rather than the delivery of a simple training service. Through the established Competence Transfer Program, it is now possible to collect and store detailed information about our technical staff’s skill set and competences, establish an efficient and tailored training solution to transfer the necessary competences, and support the training plan and budget activities.”

L. Paonessa (Network Testing, OM staff Support Manager) and R. Clerico (Network Training Manager)

Nokia Competence Development Project

If you require more than just planning, and need a full combination where we take the risk to assure the competence of your engineers, then we can provide a project oriented solution combining the planning consultancy, delivery and assessment. As described in the previous section, the plan is drawn up for each target group and each individual has their own development path.

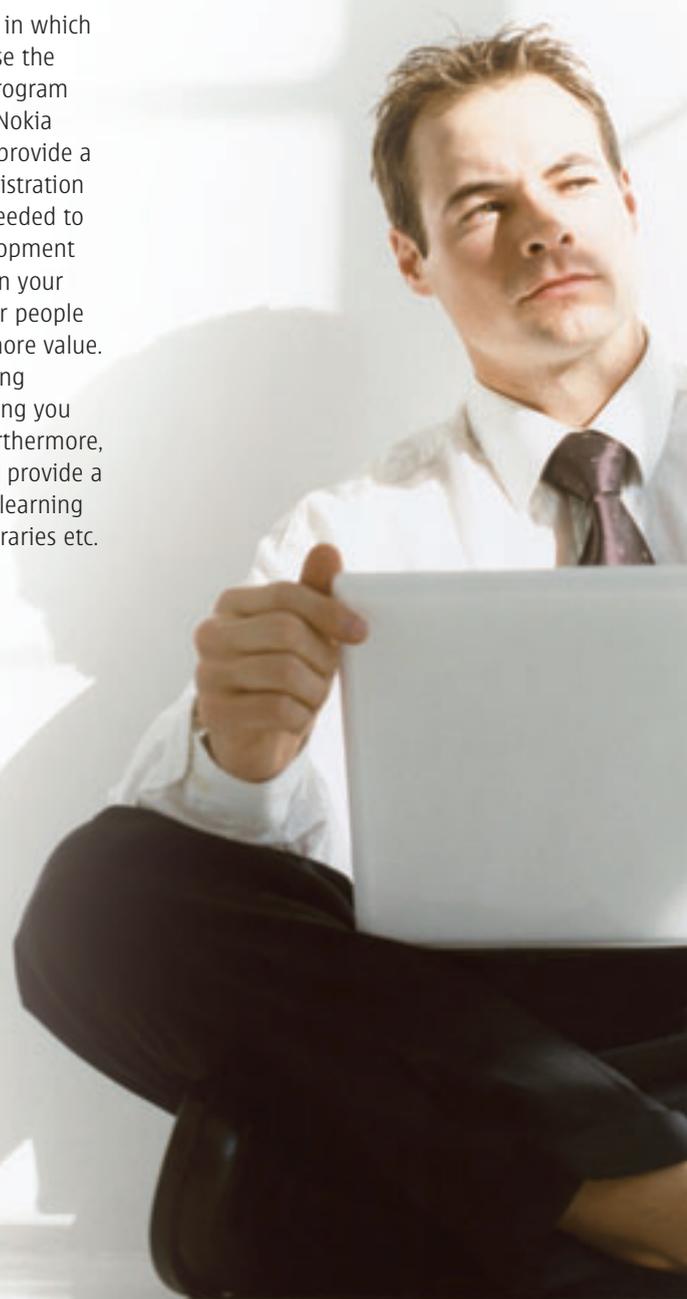
Together we create and agree on the goals, objectives and timeframe of the project. We nominate a project manager who will steer the whole project. In addition to the monthly reports, at the end of the project you will receive records of the competence assessments and a report on the effect the training investment has had on your business.

Deliverables of the planning process:

- All the deliverables of the Nokia Competence Development Planning Service
- Individual competence assessment histories
- License and Certification programs embedded into the tailored solution
- End-of-Cycle Assessment and Impact Report

Nokia Learning Management Services

There are several different ways in which we can work together to increase the effectiveness of your learning program and reduce its overall cost. The Nokia Learning Management Services provide a modular approach to the administration of learning and the platforms needed to support your competence development project. Nokia can support you in your administration needs, allow your people to focus on activities that add more value. We can also integrate the learning program with your intranet, giving you online access to our courses. Furthermore, we are able to build on this and provide a more collaborative approach to learning through the use of forums, e-libraries etc.



The need for expertise – Nokia Network Expert Club

Mobile communication has been part of our daily lives for more than a decade and the major players have climbed a steep learning curve during that time. In the past 10 years, Nokia alone has trained several tens of thousands of people in customer organizations. That pattern has been repeated throughout the industry, so that basic competence in mobile networks is no longer enough to provide a competitive advantage.

Intellectual capital is difficult for organizations to measure but it is one of the most important factors in achieving success, especially in fast-moving industries such as ours. In this environment, effectiveness and efficiency are critical parameters and experts have a very important role to play in achieving both.

By supporting your experts, we aim to contribute directly to an increase in your effectiveness and efficiency.

Nokia club to nurture vital expertise

The Nokia Network Expert Club provides a new and highly innovative way to keep your experts up to speed with the latest technologies and techniques. The focus of our unique service is on creating an environment in which experts can develop their chosen competencies at their own speed, rather than the more traditional approach of structured training packages. A dedicated, personal advisor will help each member get the most from the club.

Aimed at experts both from inside Nokia and from its customers' organizations, this professional development solution will address the development needs of experts who, unlike many other learners, need to refresh their knowledge continually.

Keeping up to speed

In order to stay on the cutting edge an expert needs:

- **to follow technological developments and new solutions.** An event calendar includes seminars and workshops about new technologies and solutions for each membership period.
- **to continue to develop a deeper understanding of his or her own area of expertise.** The membership fee includes two seminars or workshops from the exclusive Expert Club events. Expert Club members may also sign up to extra advanced and expert level open courses for a discounted fee.
- **to develop a broader view.** The club offers the chance to learn about other subsystems and solutions.

Highlights of membership

People selected for the club can enjoy the following benefits:

- Personal adviser to help define continued learning activities
- Access to an extended library of e-learning for all our products
- Extended e-content library includes e-learning, recorded seminars and presentations by experts
- Regular virtual presentations in specialized topic areas by leading experts
- Holistic assessment available to support the development of skills
- Access to a special series of exclusive expert level workshops and seminars
- ...and more collaboration elements to come

Available from the middle of 2005, the club environment will be based on a unique collaboration portal that will make it easy for Expert Club members to access information. If you are interested in hearing more about this service, or if you want to see what kind of events Nokia has arranged so far, please contact your local training services manager or send an e-mail to expert.club@nokia.com for more information.



Self-learning solutions

Technical requirements for e-learning

- Computer with web access
- Audio capabilities (sound card, speakers, microphone) are recommended for self-paced e-learning programs, mandatory for the other e-learning services
- Web browser (Microsoft IE or Netscape)
- Macromedia Flash for self-paced e-learning
- Windows Media Player for recorded presentations and learning resources



With the cost constraints we all face, and the continuous challenges to renew our knowledge and skills, a more efficient and holistic approach to learning is needed. This means that more responsibility is placed on the individual to seek out the specific knowledge they need. In addition to maximizing the blended learning approach, Nokia provides four services which support the continuous development of the individual:

- E-learning self-study packages
- Recorded presentations (e-courses)
- E-learning resources (e-JobAids)
- Published material

We provide a wide range of self-paced e-learning, developed with the learner's needs in mind. Our solutions can be bought for the individual, or alternatively they can be purchased for your whole organization, depending on your needs.

On the next page you can find an overview of the e-learning solutions we currently offer. You can find a general description of the e-learning methods on page 8. Detailed descriptions of the actual courses are in the chapter 'Courses and workshops by target groups.' Please refer to the page numbers given in the table.



| Package | Abbreviation | Available | Page |
|--|------------------------------|-----------|------|
| Self-paced e-learning packages | | | |
| Nokia UltraSite for GSM/EDGE System | 2G ULTSYSe | Now | 47 |
| 3G Introduction | 3G INTe | Now | 27 |
| 3GPP Release 4 Switching Core Network Architecture and Functionality | 3G REL 4 CORe | Now | 75 |
| 3GPP Release 4 System | 3G REL 4 SYSe | Now | 29 |
| New Features in Base Station Subsystem Release | BSS REL THE | Now | 59 |
| EDGE System Overview | EDGESYSe | Now | 28 |
| GPRS Overview | GPRSOVe | Now | 26 |
| Nokia IP Multimedia Subsystem Architecture and Functionality | IMSARCe | Now | 96 |
| Nokia IP Multimedia System | IMSSYSe | Now | 30 |
| Nokia Multimedia Messaging System | MMSSYSe | Now | 152 |
| Nokia Microwave Radio Overview | MWOVERe | Now | 45 |
| New Features in Packet Core Network Release 3 | MPC REL 3e | Now | 92 |
| New Features in Packet Core Network Release 4 | MPC REL 4e | Q2/05 | 92 |
| Introduction to Nokia mPosition | mPOSINTe | Now | 157 |
| Introduction to Nokia WAP Gateway | NWGINTe | Now | 145 |
| Nokia WAP Gateway Operation and Maintenance | NWGOM | Now | 146 |
| Nokia NetAct Operations Support System Platform (Theory) | OSSPLAT/(BL) | Now | 42 |
| Nokia NetAct Operations Support System User Release 4 (OSS3.1 ED3 -> OSS4) | OSSUSER REL 4 | Now | 171 |
| New Features in Radio Access Network Release 4 | RAN REL 4e | Now | 65 |
| Radio Network Controller Architecture and Functionality | RNCARCe | Now | 61 |
| intelligent Gateway Mobile Location Center System | iGMLCSYSe | Now | 159 |
| 2G/3G Serving Mobile Location Center System | 2G/3G SMLCSYS 1.5 & SMLCSYSe | Now | 158 |
| Nokia Switching Platform | SWPLATe | Now | 39 |
| Nokia UltraSite Triple-mode BTS Installation and Commissioning | TriULTCOMe | Now | 49 |
| Understanding GSM | UndGSMe | Now | 24 |
| Recorded Presentations | | | |
| Intelligent Content Delivery System | ICDSYS | Now | 136 |
| Base Station Controller 3i Delta | BSC3i DELTA | Now | 59 |
| Push to talk over Cellular System | PoC SYS | Now | 147 |
| Successfully Implementing EDGE in Your Business e-Seminar | EDGEDEPLOYSEMe | Now | 30 |
| Learning Resources | | | |
| 3G Radio Access Network Online Learning Resources | RANRESOURCEe | Q2/05 | 63 |
| Operations Support System Enhancements in Nokia NetAct 3.1 | OSSRESOURCEe | Now | 42 |
| Virtual Classroom | | | |
| Switching Platform Essentials | SWPLAT ESS | Now | 40 |
| Nokia NetAct Operations Support System Platform (Practice) | OSSPLAT/(BL) | Now | 42 |

Nokia reserves the right to change the above list. During 2005 Nokia will provide more system and technology training content. For more information and regular updates on our e-learning offering, please go to our NOLS training portal at www.online.nokia.com, join our mailing lists or refer to your Nokia contact person.

Self-reading published material

To complement our training material, Nokia can also provide reference and self-reading material in the form of books from Wiley, the international technical publisher.

Nokia authored titles

The following titles are supported by Nokia and are authored by our experts. These are available from Nokia Training, as well as other distributors.

| | |
|---------------------------|--|
| Name | WCDMA for UMTS: Radio Access for Third Generation Mobile Communications, 3rd Edition |
| Author | Harri Holma (Editor), Antti Toskala (Editor) |
| Publisher and year | Wiley, December 2004 |
| Short description | Written by leading experts in the field, the first edition of WCDMA for UMTS quickly became established as the best-selling and most highly respected book on the air interface of 3G cellular systems. Fully revised and updated, the second edition now covers the key features of 3GPP Release 5, ensuring its position as the leading resource in this constantly developing area. |
| Pages | 412 |
| ISBN | 0470844671 |

| | |
|---------------------------|--|
| Name | Implementing Service Quality in IP Networks |
| Author | Vilho Räsänen |
| Publisher and year | Wiley, February 2004 |
| Short description | In Implementing Service Quality in IP Networks, Vilho Räsänen addresses the issues and how to solve them. He discusses the business drivers for multi-service IP networks from various different angles. He defines service quality, explains how to estimate and measure the end-user experience and discusses different ways of conveying service quality requirements to the network. |
| Pages | 312 |
| ISBN | 047084793X |

| | |
|---------------------------|---|
| Name | UMTS Networks: Architecture, Mobility and Services |
| Author | Heikki Kaaranen, Ari Ahtiainen, Lauri Laitinen, Siamäk Naghian, Valtteri Niemi |
| Publisher and year | Wiley, February 2005 |
| Short description | UMTS Networks provides an outstanding description of 3G UMTS mobile networking technology. It discusses both the core network evolving from the globally successful GSM/GPRS system and the radio access network based on newly emerged Wideband CDMA (Code Division Multiple Access) technology. |
| Pages | 326 |
| ISBN | 047148654X |

| | |
|---------------------------|--|
| Name | UMTS Security |
| Author | Valtteri Niemi, Kaisa Nyberg |
| Publisher and year | Wiley, November 2003 |
| Short description | UMTS (Universal Mobile Telecommunication System) is a 3G systems designed for multimedia communication. UMTS Security covers the security aspects of 3G mobile networks based on WCDMA (Wideband Code Division Multiple Access) technology, the main air interface used for 3G mobile communication systems. |
| Pages | 256 |
| ISBN | 0470847948 |

| | |
|---------------------------|--|
| Name | Radio Network Planning and Optimisation for UMTS |
| Author | Jaana Laiho (Editor), Achim Wacker (Editor), Tomá Novosad (Editor) |
| Publisher and year | Wiley, October 2001 |
| Short description | Radio Network Planning and Optimization for UMTS explains comprehensively how to dimension, plan and optimize UMTS (Universal Mobile Telecommunication Systems) networks. It introduces the properties of the spread spectrum system and provides a general overview of the physical layer of FDD-WCDMA. The radio network planning process for WCDMA is clearly presented and detailed information on how to dimension, plan and rollout a 3G network, both theoretically and practically is provided. This valuable text examines current and future radio network management issues and their impact on network performance, as well as the relevant capacity and coverage enhancement methods. |
| Pages | 510 |
| ISBN | 0471486531 |

| | |
|---------------------------|---|
| Name | GSM, GPRS and EDGE Performance: Evolution Towards 3G/UMTS, Second edition |
| Author | Timo Halonen (Editor), Javier Romero (Editor), Juan Melero (Editor) |
| Publisher and year | Wiley, October 2003 |
| Short description | GSM, GPRS and EDGE Performance 2nd edition provides a complete overview of the entire GSM system. It features comprehensive descriptions of GSM's main evolutionary milestones – GPRS, AMR and EDGE and how such developments have now positioned GERAN (GSM/EDGE Radio Access Network) as a full 3G radio standard. For the first time in one volume, the radio network performance and capabilities of GSM, GPRS, AMR and EDGE solutions are studied in-depth using revealing simulations and field trials. New material includes field trials for AMR and narrowband, and EGPRS deployment guidelines. |
| Pages | 654 |
| ISBN | 0470866942 |

| | |
|---------------------------|--|
| Name | Multi-antenna Transceiver Techniques for 3G and Beyond |
| Author | Ari Hottinen, Olav Tirkkonen, Risto Wichman |
| Publisher and year | Wiley, January 2003 |
| Short description | Multi-antenna techniques are currently an extremely active area of research in wireless communications. They are widely considered to be the most promising avenue for significantly increasing the bandwidth efficiency of wireless data transmission systems and this exceptional volume presents their key aspects. MIMO and MISO (transmit diversity) techniques are explained in a common setting, in a clear and concise manner, and special emphasis is placed on combining theoretical understanding with engineering applicability. |
| Pages | 342 |
| ISBN | 0470845422 |

| | |
|---------------------------|---|
| Name | The IMS – IP Multimedia Concepts and Services in the Mobile Domain |
| Author | Miika Poikselka, Georg Mayer, Hisham Khartabil, Aki Niemi |
| Publisher and year | Wiley, June 2004 |
| Short description | This book is intended to answer the question: "What is the IMS?" It gives an expert's digested view of the IMS, its concepts, architecture, protocols, and functionalities. Specifically, it will cover: <ul style="list-style-type: none"> • General description of system concepts, architecture and functionality • Introduction to and description of base protocols • Detailed description of key functionalities • Services on top of IMS |
| Pages | 448 |
| ISBN | 047087113X |

| | |
|---------------------------|--|
| Name | Managing Mobile Services – Technologies and Business Practices |
| Author | Ulla Koivukoski, Vilho Räsänen |
| Publisher and year | Wiley, January 2005 |
| Short description | New, attractive services for communications systems are versatile and promise to make the next generation of communications a success. Yet, as the systems grow more complex and diverse, so do the challenges of managing them. Service management derives from technologies used in fixed telephony systems and has evolved towards supporting packet-based services in an increasingly open environment. It is a common belief that 3G (and later 4G) services will change the way we communicate and interrelate. The user will be put at center stage and systems will be able to handle intelligent user profiles, proactive service selection, context-aware service provisioning and ubiquitous computing. Managing, charging for and controlling these services render traditional business models inadequate and demand new solutions. |
| Pages | 232 |
| ISBN | 0470021446 |

| | |
|---------------------------|--|
| Name | Content Networking in the Mobile Internet |
| Author | Sudhir Dixit |
| Publisher and year | Wiley, October 2004 |
| Short description | To keep up with the demand for internet bandwidth, network providers are increasingly deploying fiber-optic systems that can carry hundreds of wavelengths in a single fiber. With high-data-rate wireless networks on the verge of being interfaced with the fiber backbone, the implementation of dense wavelength division multiplexing, or WDM, is poised to revolutionize communications technology. It is already opening the way to new business opportunities and can be expected to determine the future of SONET/SDH, ATM, and other key technologies. |

Though its potential is obvious, Internet Protocol (IP) over WDM has not received the comprehensive technical treatment it warrants. This book, edited by a leader in the field and contributed to by a stellar collection of experts from around the world, offers comprehensive and practical information on the transport of the IP over the optical/WDM layer.

| | |
|--------------|------------|
| Pages | 548 |
| ISBN | 0471212482 |

| | |
|---------------------------|--|
| Name | Fundamentals of Cellular Network Planning and Optimisation – 2G, 2.5G, 3G Evolution to 4G |
| Author | Ajay Mishra |
| Publisher and year | Wiley, April 2004 |
| Short description | With the complexity of the cellular networks increasing day by day, a deeper understanding of the design and performance of end-to-end cellular networks is required. Moreover, all the types of networks from 2G–2.5G–3G seem to co-exist. Fundamentals of Cellular Network Planning and Optimisation covers end-to-end network planning and optimisation aspects from second generation GSM to third generation WCDMA networks including GPRS and EDGE networks. All the sub-systems of the network i.e. radio network, transmission network and core network have been covered with focus on both practical and theoretical issues. By bringing all these concepts under one cover, this book makes essential reading for network design engineers working either with cellular service vendors or operators, experts/scientists working on end-to-end issues and undergraduate/post-graduate students. |
| Pages | 304 |
| ISBN | 047086267X |

Other titles

In addition to the Nokia authored titles, we also provide reading material not authored by Nokia. They form part of the recommended reading for our development flows.

| | |
|--------------------------|--|
| Name | The 3G IP Multimedia Subsystem (IMS) – Merging the Internet and the Cellular Worlds |
| Author | Gonzalo Camarillo, Miguel A. Garcia-Martin |
| Short description | The book presents an introduction to the IMS – its goals, history, vision, the organizations involved in its standardization and architecture and discusses the signaling plane of the IMS including protocols, such as SIP and Diameter, used between the IMS architectural entities. It also describes how the IETF developed these protocols and how they are used in the IMS architecture, describes the media plane of the IMS and Internet protocols that are not currently used in the IMS but may be in the future and provides SIP-based service examples such as presence, instant messaging and Push-to-Talk. |
| Pages | 406 |
| ISBN | 0470871563 |

| | |
|--------------------------|---|
| Name | Next Generation Wireless Applications |
| Author | Paul Golding |
| Short description | In Next Generation Wireless Applications, Paul Golding bridges the gap between the technologies available today and the services available tomorrow. What is possible with existing technology and techniques? What will 'mobility' mean to tomorrow's customers and how may we begin to create exciting new services today? Rather than covering each technology in detail the author explores their symbiotic potential, explains how, when used in association, the sum may be greater than the parts. He encourages the reader to become a 'smart integrator', to become aware of the vast array of possibilities, to think of the opportunities, and to start creating the future. |
| Pages | 588 |
| ISBN | 0470869860 |

| | |
|--------------------------|--|
| Name | Convergence Technologies for 3G Networks – IP, UMTS, EGPRS, and ATM |
| Author | Jeffrey Bannister, Paul Mather, Sebastian Coope |
| Short description | Convergence Technologies for 3G Networks describes the evolution from cellular to a converged network that integrates traditional telecommunications and the technology of the Internet. In particular, the authors address the application of both IP and ATM technologies to a cellular environment, including IP telephony protocols, the use of ATM/AAL2 and the new AAL2 signaling protocol for voice/multimedia and data transport, as well as the future of the UMTS network in UMTS Release 5/6 All-IP architecture. |
| Pages | 670 |
| ISBN | 047086091X |

| | |
|--------------------------|--|
| Name | GSM Switching, Services and Protocols |
| Author | Jörg Eberspächer, Hans-Jörg Vögel, Christian Bettstetter |
| Short description | By focusing on the fundamentals of the mobile radio systems, the book provides an excellent introductory insight to the whole area of GSM cellular radio. With an easy-to-follow instructive text, this second edition will appeal to telecommunication engineers, researchers, and developers. The graphical approach and numerous illustrations will also make it an indispensable reference for senior undergraduates and postgraduates in electrical and computer engineering. |
| Pages | 346 |
| ISBN | 047149903X |

| | |
|--------------------------|--|
| Name | GPRS Networks |
| Author | Geoffrey Sanders, Lionel Thorens, Manfred Reisky, Oliver Rulik, Stefan Deylitz |
| Short description | GPRS Networks provides a thorough grounding in GPRS by constantly explaining how and why. This practical handbook will be an essential purchase for all those involved in telecommunications, from network planners and engineers through to project managers, consultants and students. |
| Pages | 304 |
| ISBN | 0470853174 |

| | |
|--------------------------|---|
| Name | The GSM Network: GPRS Evolution: One Step Towards UMTS |
| Author | Joachim Tisal |
| Short description | By presenting the GSM standard, this book describes the varied aspects of this technology, including international scale compatibility, spectral frequency usage, availability, adaptability, quality and costs, access potentials and proposed services. The GSM Network provides an instructive insight into recent progress in this area and will have great appeal to telecommunication engineers and consultants as well as network and telecommunications managers. |
| Pages | 240 |
| ISBN | 0471498165 |

| | |
|--------------------------|---|
| Name | IP for 3G: Networking Technologies for Mobile Communications |
| Author | Dave Wisely, Philip Eardley, Louise Burness |
| Short description | IP for 3G gives a comprehensive overview of 3G networking functionality and examines how IP protocols can be developed to provide some of the basic building blocks of a mobile system, such as mobility, QoS and call control. |
| Pages | 304 |
| ISBN | 0471486973 |



Nokia task-based solution

Nokia is a leader in implementing task-based and blended learning, with our first solutions implemented in 1998 for the Nokia BSS/OSS. By working closely with several customers, we were able to build a task definition, which we used throughout the courses.

Our GPRS and 3G portfolios were built on the success of this project and have been able to provide modular training in these areas easily, allowing your people to start operations as soon as they complete their training.

Courses and workshops by target groups

Symbols used in competence flows and course descriptions

Our recommended solutions are based on generic target groups, and are designed to last the optimum number of days and provide the greatest flexibility. All the courses and workshops listed here are available globally as open courses. If you require customization, please contact your Nokia Learning Solutions contact person.

The following descriptions are based on the most accurate information we have regarding the portfolio for 2005. However, Nokia reserves the right to add, remove or change the content and/or courses should there be a need. At all times, we try to inform customers of changes being made to programs that you are actively using. When ordering new training courses and workshops, Nokia strongly recommends that you check the detailed learning program descriptions to ensure that you and the participants are aware of the objectives and requirements.

For more detailed and up to date description of all our courses and workshops, please visit our pages on NOLS (www.online.nokia.com).



Introductory course



Intermediate course



Advanced course



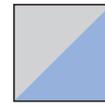
Expert course



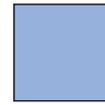
Course provided by Nokia supplier



Courses relevant for GSM



Courses relevant for GSM and 3G



Courses relevant for 3G



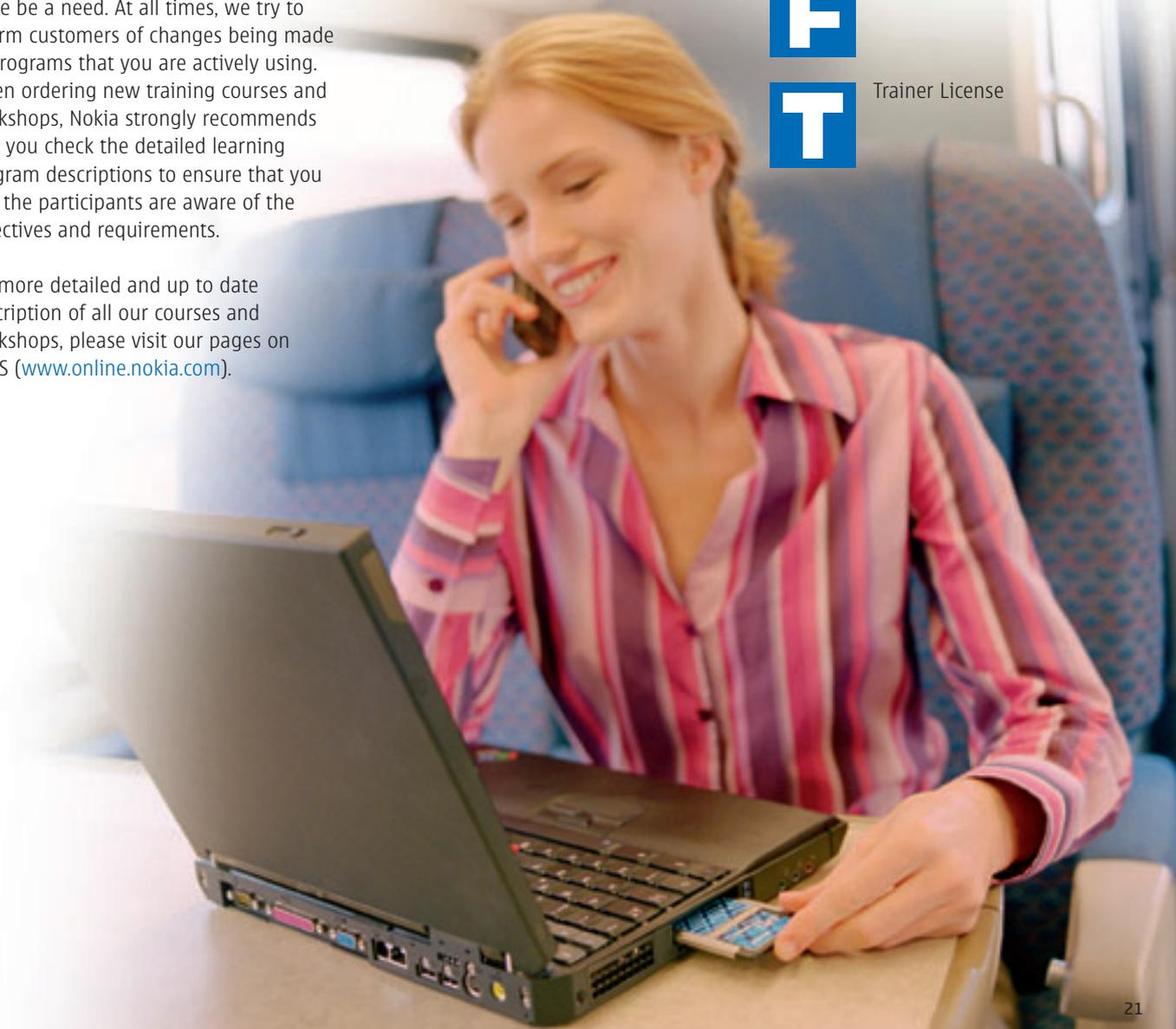
On-the-job Training



Facilitated Learning Program



Trainer License



**Classroom course –**

A structured training session that has clear learning objectives, uses standardized material and can be delivered either in a classroom or through a virtual learning environment. Nokia provides two types of courses:

- **Product-based training** – provides the participants with the knowledge and skills necessary to handle Nokia equipment and fully understand how it is implemented.
- **Task-based training** – are programs built around specific tasks that are performed in network operations. These may include using more than one element and are designed so the task is performed in the best way.

**Virtual classroom –**

More and more of our training can be provided to remote locations, again, reducing the cost of travel. It is the same as the classroom course, except the training is restructured to match the environment – for example, more days, but less training per day.

**Self-paced e-learning –**

An activity where the responsibility for learning is on the individual student.

A number of options can be applied, the most common being e-learning where the participant is guided through learning in a structured way. Books and discussion forums are also alternative methods for developing skills.

**Blended training –**

In some competence areas a simplified course or course-flow may not be the best solution. In these cases, Nokia has developed a range of “Learning Solutions” that use a mixture of materials and delivery methods.

**Workshop –**

Typically an unstructured training event based on completing set objectives or tasks. It adopts a more relaxed approach involving group work and discussion with reference material used in place of formal training material.

**Seminar –**

In these sessions, experts in the field discuss their research in highly technical or new areas of expertise. Attendees are encouraged to participate actively.

**E-seminar/E-course –**

Increasingly we are looking at cost-effective delivery solutions and sometimes record short courses, modules or even seminars, so you can join a session when it best suits you.

**Material on CD-ROM –**

Based on customer requests, we will start providing student material in a slimmer package that includes all the training and reference material on a CD-ROM. Also included in the package are the slides, so you can make notes. For an extra charge, you can receive both electronic and paper material.

**Pre- and post-assessment**

– As part of our initiative to enhance our evaluation, many of our courses offer students free pre- and post-assessments, the results of which are used to measure the efficiency of learning. For an extra charge, you can receive individual assessment results and an evaluation of participation.

**Remote access –**

Given the need to reduce traveling costs, we are now offering the facility to access a dedicated remote test bed through the Internet. This means that the venue of the training can be much more local. The price of the training is not affected, but you benefit through reduced travel costs.

**E-learning resources –**

Learning should continue outside the classroom and to support better personnel development, Nokia provides you with the option of access to an online resource. This includes e-JobAid, additional training information and Q&A discussions on training, helping the student apply the newly learnt skills in the workplace.

**License –**

Our verification portfolio includes assessment programs for individuals to prove their ability to implement, operate and maintain functions on Nokia network elements. There are several paths to follow to achieve a Nokia License.

**Certificate –**

A program to measure the competence verification standard for second line maintenance engineers. There are several paths to follow to achieve Nokia Certification.

**eValuation –**

To provide better guidance on actual training needs, eValuation enables on-line self-assessment of current competence levels in selected areas of expertise.

**Measurement report –**

Some of our practical training now includes an optional charged service, where our trainers follow-up on how competent participants are in performing the skills they have learned. The results of these are linked to the licensing programs.

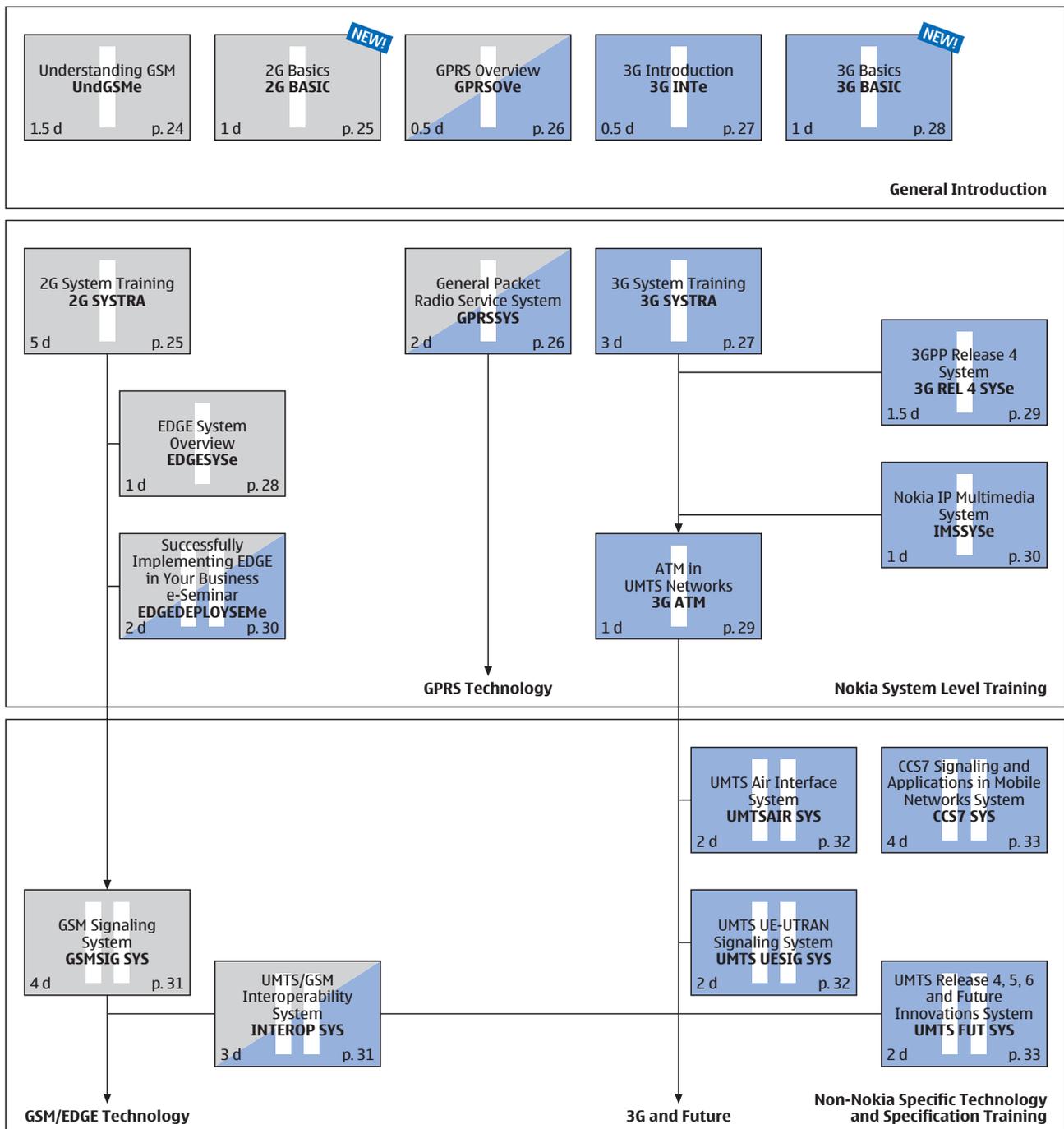
What is pre- and post-assessment?

The majority of our intermediate courses now come with the option for you to take an assessment before and after the course. The assessment is made through NOLS and the questions are based upon a random pool. By comparing the results from before and after the course, we have a tangible measure of how effective the training has been. This service is free on applicable courses.

When ordering the course, simply ask for this option and ensure that each participant has a NOLS account. They will receive an e-mail before the course to complete the assessment and they have some days after the course to do the re-assessment. An overall evaluation is made based upon all participants. Nokia can supply individual performance assessment but this is based on local agreements or laws on data-protection and carries an additional charge.

Network technology and solution training

Overview and system training



Nokia technology and system level training is divided into three categories. First, training that will give you a basic understanding of the technology, delivered through e-learning. Second, system level training that provides a thorough grounding in GSM/EDGE, GPRS and WCDMA technology and the Nokia implementation. Third, topics that are not specific to Nokia solutions, but focused on mobile specifications. These are ideal complements to our advanced solutions.

We provide comprehensive e-learning programs to support a wide range of personnel who need to understand the basics. A program of classroom training follows these, which is the foundation for our technical courses. System level aspects of GPRS networks are now included in the 2G SYSTRA course. However, participants on the old SYSTRA course who need to gain GPRS knowledge should take the interim GPRSSYS course.

Together with selected companies, we also provide a range of more technical system training courses that look into the theory behind signaling, inter-operability and specifications (such as the air interface and the future). These do not cover the Nokia solutions or approach.

Understanding GSM



Target Group

Technical and non-technical personnel working in the cellular radio industries that require fundamental knowledge of GSM.

Objectives

After the training, the participant will be able to:

- Explain at the overview level the history and evolution of the GSM system.
- List the benefits of a digital mobile system.
- List the two multiple access methods that make possible the simultaneous use of a base station by several mobile stations.
- Draw the GSM network architecture diagram including the network elements and interfaces.
- Explain the function of each network element in the GSM network architecture diagram.
- List the identifiers and addresses for locating, routing, authenticating and security purposes in a GSM network.
- Explain step by step how the mobile station and network communicate with each other to allow a certain traffic management function to occur i.e. call set up.

- Explain the basics of the GSM cellular network and what should be considered during the planning phase.
- List the service types and categories in the GSM system.
- List the different types of charging in the GSM system.
- Explain using a GSM network diagram how billing information is handled by the network.
- Explain how the Nokia implementation of GSM differs from the generic implementation.
- Draw the functional diagram of the Nokia network elements MSC/VLR, HLR and BSC.

Prerequisites

General understanding of telecommunications

Duration

1.5 days

No. of Participants

N/A

UndGSMe

Modules

- Introduction to GSM
- Technological concepts in GSM
- GSM architecture and interfaces
- Identifiers and addresses in GSM
- GSM traffic management
- GSM cellular network
- Security and privacy in GSM
- GSM services
- Charging in GSM
- Nokia implementation of GSM
- Towards the next generation from GSM

2G System Training



Target Group

Personnel needing an overview of GSM and GPRS.

Objectives

After the training, the participant will be able to:

- Explain the architecture functionality of GSM and GPRS network elements.
- Explain the main concepts of GSM and GPRS traffic management.
- Explain the main concepts of TDMA air interface transmission.
- Explain the connections/interfaces within the GSM and GPRS network.
- Explain the addressing in GPRS.
- Give an overview of the Nokia implementation of GSM and GPRS.

Prerequisites

General understanding of telecommunications

Duration

5 days

No. of Participants

Max. 24

Modules

- Introduction to GSM
- GSM architecture
- GSM traffic management
- Introduction to SS7 signaling
- GSM air interface and network planning
- Introduction to GPRS
- Introduction to TCP/IP
- GPRS architecture
- GPRS traffic management
- GPRS air interface

2G Basics



Target group

For people who need a minimum understanding of 2G. This course is recommended for field and installation personnel.

Objectives

After the training, the participant will be able to:

- Explain the architecture functionality of GSM and GPRS network elements.
- Explain, in basic terms, the speech digitization process.
- Explain the differences between the following interfaces: A, Ater, Abis and Air Interface.
- Describe the solutions adopted to overcome propagation problems.

Prerequisites

General knowledge of the basics of telecommunications

Duration

1 day

No. of Participants

Max. 24



2G BASIC

Modules

- GSM technology overview

Notes

This is a subset of the 2G SYSTRA course.

GPRS Overview



Target Group

New and inexperienced personnel, who require the basic knowledge of GPRS networks.

Objectives

After the training, the participant will be able to:

- Identify the drivers of the GPRS network and the subsequent effects on mobile data communication.
- List the business benefits for operators implementing a GPRS network with respect to emerging data communication needs and eventual migration to 3G mobile networks.
- Using a GPRS network architecture diagram, illustrate typical traffic management procedures.
- List the key network elements required to implement a GPRS network on top of an existing GSM network.
- List the functions of each of the key GPRS network elements.

Prerequisites

General understanding of telecommunications

Duration

0.5 day

No. of Participants

N/A

Modules

- Introduction to GPRS
- GPRS from a business point of view
- GPRS architecture and interfaces
- GPRS traffic management

GPRSOVe

General Packet Radio Service System



Target Group

Personnel, who are experienced in the GSM system, but need a good theoretical knowledge of the GPRS system and the Nokia GPRS solution.

Objectives

After the training, the participant will be able to:

- Describe the role of GPRS in telecommunications and data networks.
- Name the different network elements of the GPRS network and explain their functionality.
- Explain the connections/interfaces to the existing networks and between different GPRS network elements.
- Explain the structure of Nokia GPRS network.

- Explain the mobility management functions in GPRS.
- Describe addressing in GPRS.
- Describe the charging function in GPRS.
- List the most important planning/dimensioning factors in the GPRS network without reference to notes.

Prerequisites

2G SYSTRA or similar. This course contains the same GPRS related modules as the 2G SYSTRA course.

Duration

2 days

No. of Participants

Max. 24

Modules

- Introduction to GPRS
- Introduction to TCP/IP
- GPRS architecture
- GPRS traffic management
- GPRS air interface

GPRSSYS

3G Introduction



Target Group

New and inexperienced personnel, who require a basic knowledge of 3GPP Release 99 Mobile Networks.

Objectives

After the training, the participant will be able to:

- Identify the drivers behind the evolution towards 3G networks.
- Identify and list the characteristics of the radio path technology used in 3G networks compared to GSM networks.
- Complete a 3G network architecture diagram.
- List the functions of each of the 3G network elements.
- Using a 3G network architecture diagram, illustrate how 3G services, voice and Internet traffic are supported.
- Identify the available service types within 3G networks and the uses of available service applications.

Prerequisites

General understanding of telecommunications

Duration

0.5 day

No. of Participants

N/A

Modules

- Introduction to 3G
- 3G network architecture
- Introduction to 3G radio interface
- Introduction to 3G services
- Using 3G networks

3G INTE

3G System Training



Target Group

Personnel who require underpinning knowledge on 3G networks.

Objectives

After the training, the participant will be able to:

- Briefly explain and list the motivation for and development of mobile networks towards 3G.
- Without reference to the material, draw and label the key components and interfaces of the Nokia 3G solution.
- Using a simplified model, explain the key elements of the 3G/UMTS radio path and transmission.
- At an overview level, explain what UMTS radio resource management is, and describe its effect on network planning.
- Outline the functions of the different management layers within traffic management.
- List and give examples of 3G services and how they are implemented into a UMTS network.

Prerequisites

Preferably 2G SYSTRA or similar

Duration

3 days

No. of Participants

Max. 24

Modules

- Introduction to UMTS networks
- UMTS network architecture
- UMTS radio path and transmission
- UMTS traffic management
- Introduction to UMTS signaling and interfaces
- UMTS services and applications
- Vocabulary for system training

3G SYSTRA

3G Basics



Target group

People who need the minimum understanding of 3G. This course is recommended for 3G field and installation personnel.

Objectives

After the training, the participant will be able to:

- Explain the architecture functionality of WCDMA network elements.
- Without reference to the material, draw and label the key components and interfaces of the Nokia 3G solution.
- Using a simplified model, explain the key elements of the 3G/WCDMA radio path and transmission.
- At an overview level, explain what WCDMA radio resource management is, and describe its effect on network planning.
- Outline the functions of the different management layers within traffic management.
- List and give examples of 3G services and how they are implemented into a WCDMA network.

Prerequisites

General knowledge on the basics of 3G networks

Duration

1 day

No. of Participants

Max. 24

NEW!

3G BASIC

Modules

- Introduction to 3G networks
- 3G network architecture
- Introduction to 3G radio resource management and network planning

Notes

This is a subset of the 3G SYSTRA course

EDGE System Overview



Target Group

Personnel who require an overview of the EDGE system.

Objectives

After the training, the participant will be able to:

- Identify what is meant by a Nokia EDGE technology.
- Understand the principle of GMSK and 8PSK modulation.
- Explain and understand new EDGE features.
- Explain the implementation of EDGE in each network subsystem.

Prerequisites

2G SYSTRA

Duration

1 day

No. of Participants

N/A

EDGESYS

Modules

- GSM evolution to EDGE
- EDGE modulation
- Nokia EDGE features
- Nokia EDGE implementation
- Nokia NetAct and EDGE
- Nokia EDGE Network Planning Services

ATM in UMTS Networks

3G ATM



Target Group

Technical personnel requiring an understanding of ATM.

Prerequisites

3G SYSTRA

Modules

- ATM basics
- ATM protocols and signaling

Objectives

After the training, the participant will be able to:

- Explain the basics of ATM and how it is implemented in UMTS.

Duration

1 day

No. of Participants

Max. 24

3GPP Release 4 System

3G REL 4 SYSe



Target Group

Personnel in customer care, marketing, network operations and control, network engineering and network planning.

Prerequisites

None

Modules

- Generic 3GPP Release 4 – Architecture
- Generic 3GPP Release 4 – Basic technologies
- Nokia solution for 3GPP Release 4 Core – MSC server system and system features
- Nokia solution for 3GPP Release 4 Core – New user services

Objectives

After the training, the participant will be able to:

- Understand the main principles of 3GPP Release 4 architecture, the system features and basic technologies used in 3GPP Release 4.

Duration

1.5 days

No of Participants

N/A

Nokia IP Multimedia System

IMSSYS



Target Group

Core network engineering, network operations and control, core network planning, system administration, service creation and integration engineers, marketing and technical management and customer care.

Objectives

After the training, the participant will be able to:

- List the subsystems of the Nokia IP multimedia system.
- List the Nokia IP multimedia system network elements.
- Describe the protocols and interfaces between subsystems.
- List the main functionalities of the subsystems.
- Describe connectivity between sites.
- Explain the operation and maintenance principles of the Nokia IP multimedia system.
- Describe the evolution of the Nokia IP multimedia system.

Prerequisites

3G Release 5 system level understanding (vendor independent), basic understanding of IP and SIP protocols

Duration

1 day

No. of Participants

N/A

Modules

- Introduction to Nokia IP multimedia system
- Architecture of Nokia IP multimedia system
- Technologies in Nokia IP multimedia system
- Functionality of Nokia IP multimedia system
- Operation and Maintenance of Nokia IP multimedia system
- Evolution Summary of Nokia IP multimedia system

Notes

This course was formerly named IPMMSYS.

Successfully Implementing EDGE in Your Business e-Seminar

EDGEDEPLOYSE



Description

This seminar presents the general EDGE technology and how Nokia implements the solution.

Topics

1) EDGE Technology Seminar

The goal of this seminar is to give the participants a detailed understanding of how EDGE technology will enhance and improve throughput for data services.

- Contents
- GPRS Refresh
- EDGE Basics
- Channel Coding
- RLC/MAC Protocol
- Link Adaptation

2) Nokia EDGE Solution presentation

The goal of the presentation is to give the participants a detailed understanding of the Nokia EDGE solution, from equipment needed to EDGE terminals.

- Contents
- Nokia GSM/EDGE solution
- Measured EGPRS performance
- EGPRS dimensioning
- EDGE Market update

3) Nokia EDGE Solution Discussion Forum

The aim of this interactive section is to share experiences and ideas and ask questions about the Nokia EDGE solution.

Recommended for

This event is for aimed at anyone needing in-depth knowledge of the GPRS radio interface enhanced with EDGE.

Duration

2 days

Technology and specification training

GSM Signaling System

GSMSIG SYS



Target Group

Personnel requiring in-depth knowledge of GSM, with particular reference to the access part of the network (MS-BSS-MSC/VLR).

Objectives

After the training, the participant will:

- Have a thorough understanding of the architecture and functions of the protocols used on the different interfaces in a GSM network.
- Be able to search, find and understand relevant information in the GSM specifications, and similar documents, regarding GSM protocol functions and signaling procedures.
- Through the combination of detailed descriptions and system wide overviews given in the course, be able, for example, to 'locate' a signaling problem to a specific network node, interface or protocol.
- Possess a general understanding on how to interpret log files and traces taken from live networks.

Prerequisites

2G SYSTRA

Duration

4 days

No. of Participants

Max. 24

Modules

- GSM overview
- GSM signaling model
- Um air interface
- Abis interface
- A interface
- Other interfaces
- Location updating
- Call setup
- SMS transfer p.t.p
- SMS transfer cell broadcast
- Handover
- Supplementary services

Notes

- This course is arranged in co-operation with APIS (www.apis.se) and is not Nokia specific.
- In the description of the traffic cases, a TEMS test mobile is used to illustrate the signaling flow and message contents. Live or recorded files from a number of operators are studied.

UMTS/GSM Interoperability System

INTEROP SYS



Target Group

Professionals who require an understanding of how interoperability issues are handled in a mixed 2G/3G network environment.

Objectives

After the training, the participant will:

- Be aware of the interoperability problems that may arise in a 'mixed' GSM/UMTS (2G/3G) network environment.
- Understand the requirements and restrictions imposed on a dual mode (2G/3G) terminal in terms of signaling, measurements, mobility management and call handling.

- Understand how Quality of Service (QoS) issues are handled when handovers take place between 2G and 3G network environments, for both circuit switched and packet switched services.
- Have a general understanding of the signaling flows needed to execute handovers between 2G and 3G networks.

Prerequisites

2G SYSTRA, 3G SYSTRA

Duration

3 days

No. of Participants

Max. 24

Modules

- Introduction to interoperability
- ME/SIM capabilities
- Inter-RAT measurements
- QoS handling
- Security mechanisms
- Network sharing
- Handover scenarios
- Core network interworking (during handover)
- Future releases

Notes

- This course is arranged in co-operation with APIS (www.apis.se) and is not Nokia specific.
- Nokia provides a new workshop dealing with interoperability in our solution, see page 55.

UMTS Air Interface System



Target Group

Personnel requiring knowledge of the WCDMA radio interface, selected for UMTS.

Objectives

After the training, the participant will be able to:

- Understand functions and procedures taking place in the physical layer of the UMTS radio interface.
- Through the combination of detailed descriptions and system wide overview understand how the different physical channels are used, implemented and coded, and how information is transported on the physical channels.
- Search, find and understand relevant information in the 3GPP specifications and similar documents, regarding UMTS radio interface physical layer procedures and functions.

Prerequisites

3G SYSTRA

Duration

2 days

No. of Participants

Max. 24

Modules

- Introduction
- Air interface
- Physical layer procedures
- Multiplexing and channel coding
- Power control

Notes

- This course is arranged in co-operation with APIS (www.apis.se) and is not Nokia specific.
- Nokia provides practical courses on the Nokia Solution on page 55.

UMTS UE-UTRAN Signaling System



Target Group

Personnel needing in-depth knowledge of UMTS signaling, with particular reference to the Uu interface.

Objectives

After the training, the participant will be able to:

- Seek, find and understand relevant information in the UMTS specifications, and similar documents, regarding UMTS protocol functions and signaling procedures.
- The combination of detailed descriptions and system-wide overview given in the course should allow the participant to understand the requirements imposed on the UE from a signaling perspective.

Prerequisites

3G SYSTRA

Duration

2 days

No. of Participants

Max. 24

Modules

- UTRAN channels and protocols
- UMTS protocol architecture
- UMTS attach
- MT packet transfer
- Soft handover
- Uu interface – Part 1: RRC
- Uu interface – Part 2: RLC
- Uu interface – Part 3: MAC
- Uu interface – Part 4: PDCP

Notes

- This course is arranged in co-operation with APIS (www.apis.se) and is not Nokia specific.

UMTSAIR SYS

UMTS UESIG SYS

CCS7 Signaling and Applications in Mobile Networks System

CCS7 SYS



Target Group

Personnel who need knowledge on functionality, structure and use of various SS7 protocols within fixed, mobile and intelligent networks (IN).

Objectives

After the training, the participant will be able to:

- Understand the structure of signaling system No 7, as well as an overview of various SS7 protocols along with their use in PSTN, IN and mobile networks.
- Understand the fundamental SS7 protocols, MTP and ISUP, their functions, messages and signaling flow used in different situations.
- Understand various protocols, their functions and messages flows used in the different networks that use signaling system No 7.
- Associate a signaling problem with a specific network node, protocol or application software through an understanding of how to interpret log files and traces taken from live networks.

Prerequisites

2G SYSTRA or equivalent knowledge is useful but not compulsory. General telecommunication knowledge is required.

Duration

4 days

No. of Participants

Max. 24

Modules

- Signaling introduction
- SS7 introduction
- MTP – message transfer part
- MTP over ATM
- ISUP – ISDN user part
- ISUP call set-up
- SCCP – signaling connection control part
- TCAP – transaction capabilities application part
- MAP – mobile application part
- MAP traffic case
- SS7 over IP
- INAP protocol family

Notes

- This course is arranged in co-operation with APIS (www.apis.se) and is not Nokia specific.
- For more material on protocols, interfaces and procedures, see our recommended reading on page 14.

UMTS Release 4, 5, 6 and Future Innovations System

UMTS FUT SYS



Target Group

Personnel from the technology and management sector, who are interested in the most important modifications and add-ons of the UMTS Releases 4, 5, and 6.

Objectives

After the training, the participant will be able to:

- Identify and list the key elements driving the development of the UMTS specifications.
- Identify and list the main goals and modifications of each release.

Prerequisites

3G SYSTRA

Duration

2 days

No. of Participants

Max. 15

Modules

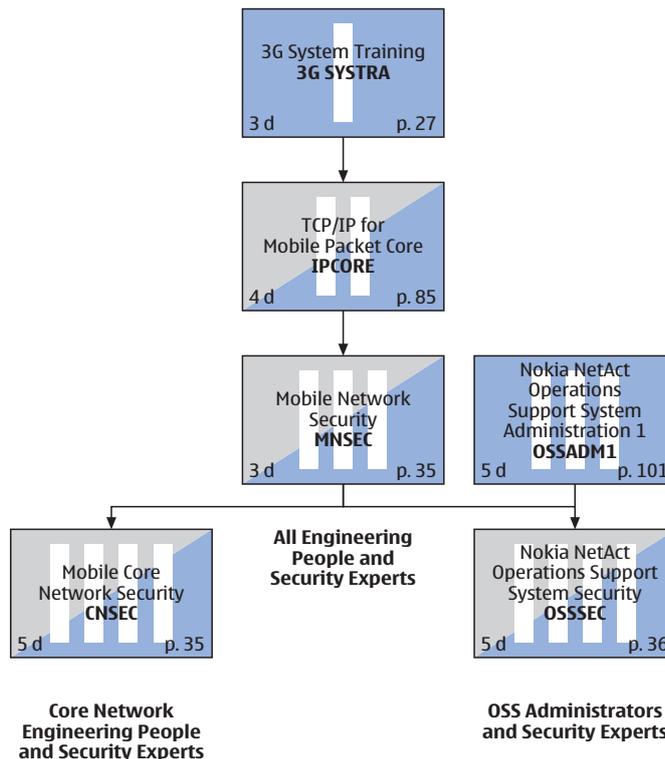
- Introduction
- Bearer independent circuit switched core network (UMTS Release 4)
- Home subscriber server (UMTS Release 5)
- IP multimedia subsystem (IMS) (UMTS Release 5)
- Open service access (OSA) (UMTS Release 99 and 4)
- Radio interface and radio access network modifications
- UMTS Release 6 prospects

Notes

This course is arranged in co-operation with Techcom (www.techcom.de) and is not Nokia specific.

Mobile network security

Mobile network security can be achieved if security awareness and vigilance are present throughout the entire operating process, from planning to operation. For that reason, we recommend that at least the network element engineering personnel are trained to a good level of knowledge in network security and are able to recognize and counter vulnerabilities in the organization's network. A well-founded understanding of security issues and principles is needed to deal with today's latest threats, which quickly become tomorrow's outdated threats. We emphasize an understanding of the security aspects of the protocols, platforms and environments involved, in order to prepare your staff for the most likely threats faced by your company.



Security tailored workshop

Tailored workshops can be adapted from standard courses and our case-study-pool. These workshops then emphasize specialized areas of the network, for example the charging gateway, DNS security and OSS host security.

Top management errors in network security

Many security problems and network outages are related to popular but erroneous management decisions. The famous SANS Institute has identified the seven top management errors related to network security:

- Pretend the problem will go away
- Authorize reactive, short-term fixes so problems re-emerge quickly
- Fail to realize how much money their information and organizational reputation are worth
- Rely primarily on a firewall for security perimeter protection
- Fail to deal with the operational aspects of security
- Fail to understand the relationship of information security to the business problem – they understand physical security, but do not see the consequence of poor information security
- Assign untrained people to maintain security and provide neither the training nor the time to make it possible to do the job

(Source: SANS Institute Network Security Roadmap 2003)

Available Security Workshops

Domain Name Service Security Workshop
DNSSEC WS
2 d p. 36

Firewall Security Workshop
FWSEC WS
2 d p. 37

Unix Host Security Workshop
HPUXSEC WS
2 d p. 37

LAN and VPN Security Workshop
VPNSEC WS
3 d p. 38

IP Routing Security Workshop
IPRSEC WS
2 d p. 38

Fundamental topics like DNS-, VPN- or firewall configurations constantly raise a number of fundamental questions: What is a suitable firewall policy at the Gi interface, how do we configure DNS towards the roaming partners and how

can we protect routing and network functionality efficiently? Standard OM courses often cannot provide the answer, because technical planning and strategic considerations are based on a profound knowledge of network procedures,

the protocols used and particular features. To provide a training solution for these fundamental topics, a set of tightly focused workshops has been organised. Other tailored workshops can be delivered with a short lead time.

Mobile Network Security



Target Group

System level experts and second line maintenance personnel in a mobile network.

Objectives

After the training, the participant will be able to:

- Understand and use the correct terms when addressing security issues.
- List potential risks for a given network.
- Explain the role of cryptography in a mobile network and describe the main principles.
- Contribute to planning, implementing and reviewing the security architecture of a mobile network.
- List the most relevant network services and describe the security implications.

- Describe selected procedures in the mobile network and their implication for network security.
- Name the 3GPP security standards and describe their implication for the mobile network.
- Be aware of security issues in daily work and spread this attitude.

Prerequisites

3G SYSTRA, IPCORE

Duration

3 days

No. of Participants

Max. 12

Modules

- Security principles and elements
- Cryptography
- Security in 3G mobile networks
- Network services
- Security networks and hosts

Mobile Core Network Security



Target Group

System level experts in 3G core network, security teams, second line maintenance personnel.

Objectives

To enable the participants to contribute in a team of security experts or to be the customer's partner for Nokia security experts.

After the training, the participant will be able to:

- Understand security in IP based networks as a whole and in the context of mobile networks.
- List the potential risks for a given network.
- Contribute to planning and implementing a secure core network.

- Use standard auditing tools to check hosts in a mobile network.
- Contribute to securing a mobile network efficiently.
- Be aware of security issues in daily work and spread this attitude.
- Understand threads for the mobile core network for SCN and PCN as well as the interdependencies.

Prerequisites

3G SYSTRA, IPCORE, MNSEC, GGSNOM

Duration

5 days

No. of Participants

Max. 8

Modules

- CNSEC introduction
- Key topics LAN security
- Key topics WAN security
- Key topics routing security
- Key topics VPN security
- Methods and principles for securing a mobile network
- Key topics network services
- Intrusion detection
- Core network security toolbox
- Core network case studies

Nokia NetAct Operations Support System Security

OSSSEC



Target Group

OSS administrators and specialists, security experts and second line maintenance personnel in a mobile network.

Objectives

To enable the participants to contribute in or towards a team of security experts when planning and implementing secure management of a mobile network using the Nokia OSS solution.

After the training, the participant will be able to:

- Understand, use and explain the correct terms when addressing OSS security issues.
- List potential risks for a given network management solution.
- Contribute to planning, implementing and reviewing the security policy of a network management solution.
- Improve security of an existing OSS by taking corrective actions and applying customization without affecting OS functionality.
- Contribute to planning, implementing and reviewing the security architecture of telecommunication management network (DCN), particularly with regard to VPN and WAN security aspects.
- Harden and configure the DCN routers, LAN-switches and firewalls according to either Nokia manuals or customer specific configuration policies.
- List the most relevant network management procedures and related network services and describe the security implications.
- Use and explain OSS user management applications to implement secure and policy based user environments on the OSS servers and DCN network elements.
- Plan, execute and evaluate penetration tests and security audits in an existing network management environment.
- Verify and benchmark security settings of an existing OSS environment and rate security interests against usability and performance criteria.
- Show awareness of security issues in daily work and spread this attitude.

Prerequisites

3G SYSTRA, IPCORE, OSSADM1, MNSEC

Duration

5 days

No. of Participants

Max. 8

Modules

- OSSSEC introduction
- OSS security architecture
- Key topics LAN security
- Key topics routing security
- Key topics VPN security
- Key topics network services
- OSS security toolbox
- OSS case studies

Domain Name Service Security Workshop

DNSSEC WS



Target Group

System level experts, network engineering and second line maintenance personnel in a mobile network.

Objectives

After the training, the participant will be able to:

- Explain the basic functionality of the DNS without references to notes.
- Plan new or improve existing DNS structures and hierarchies.
- Set-up a DNS server inside an existing hierarchy.
- Create DNS protocol traces; Understand, monitor and debug DNS configurations based on traces.
- Explain and use the most common configuration options and the DNS security features.

Prerequisites

IPCORE, MNSEC

Duration

2 days

No. of Participants

Max. 8

Modules

- DNS protocol concepts
- Elementary and advanced DNS features
- Practical DNS configuration (Linux + HP Unix)

Firewall Security Workshop

FWSEC WS



Target Group

Network engineering personnel, security experts and second line maintenance personnel in a mobile network.

Objectives

After the training, the participant will be able to:

- Outline how to set up filters on different types of firewalls (Checkpoint, CISCO, IP Tables) and discuss and plan different filtering rules based on all IP interfaces of the 3GPP mobile network.
- Discuss and explain advantages and weaknesses of firewalls.
- Configure tunnels through a firewall given suitable configurations.

Prerequisites

IPCORE, MNSEC

Duration

2 days

No. of Participants

Max. 8

Modules

- Filters and gateways
- Applying filters and rule bases

Unix Host Security Workshop

HPUXSEC WS



Target Group

OSS/CG/DNS administrators and specialists, security experts and second line maintenance personnel in a mobile network.

Objectives

After the training, the participant will be able to:

- Recognize and qualify security relevant Unix configuration settings.
- Recognize security relevant Achilles' heels in Unix host configurations.
- Monitor user behaviour and system integrity on Unix servers.
- Configure HP-Unix in order to provide controlled and restricted access to applications and resources.
- Isolate or protect Unix hosts against non-trusted environments.

- List and name sources of recent information about security incidents, statistics and other relevant topics in the context of Unix security.
- Find, download and install vendor security patches and additional software in order to enhance Unix host-security.
- Find and use recent, appropriate tools to support secure system administration, base lining and penetration testing.

Prerequisites

IPCORE, MNSEC

Duration

2 days

No. of Participants

Max. 8

Modules

- HPUXSEC introduction
- Securing Unix host access
- HP-UX security toolbox

IP Routing Security Workshop



Target Group

Network engineering personnel, security experts and second line maintenance personnel in a mobile network.

Objectives

After the training, the participant will be able to:

- List various routing protocols and their functions and implement different routing types (static/dynamic).
- Protect routers and switches against break-ins and misuse.
- Explain and know how to counter attacks on standard routing protocol weaknesses like forged LSAs, authentication or replay attacks, and outline and implement corrective actions.

Prerequisites

IPCORE, MNSEC

Duration

2 days

No. of Participants

Max. 8

Modules

- Static and dynamic routing
- Routing protocol weaknesses and security features

IPRSEC WS

LAN and VPN Security Workshop



Target Group

Network engineering personnel, security experts and second line maintenance personnel in a mobile network.

Objectives

After the training, the participant will be able to:

- Explain LAN and WAN architectures, configure VLAN infrastructure and outline possible points of attacks and corresponding countermeasures.
- Explain the authentication methods PP, L2F and L2TP, configure IP tunneling, list its advantages regarding security and configure an IPSec VPN.
- Configure VPNs in various interfaces in a mobile network.

Prerequisites

MNSEC, IPCORE

Duration

3 days

No. of Participants

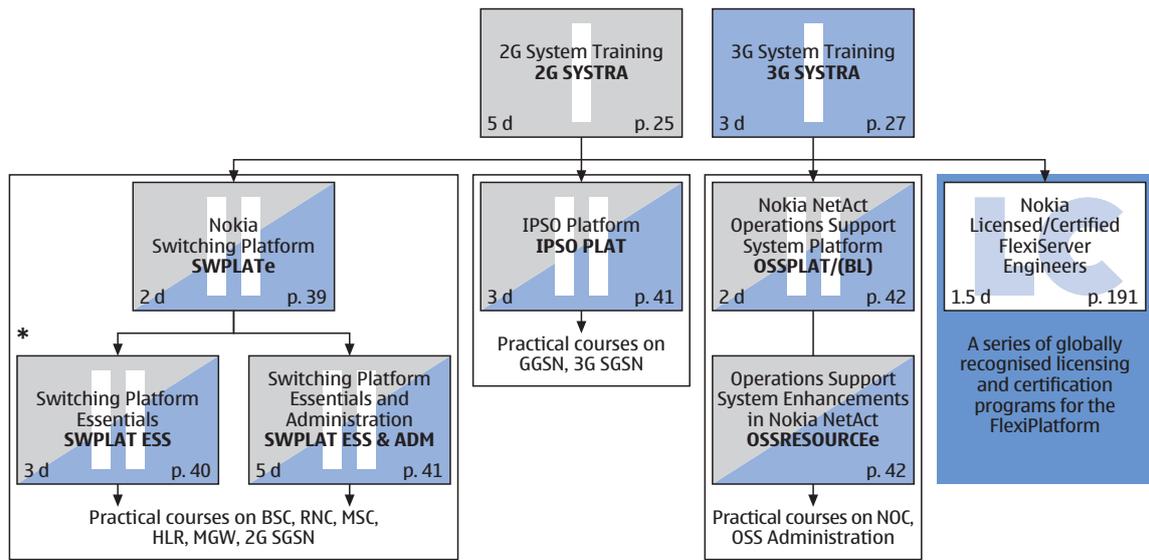
Max. 8

Modules

- LAN and WAN architectures
- Tunneling protocols
- Selected LAN/WAN/VPN configuration case studies

VPNSEC WS

Nokia platforms



*Blended learning solution

Our platform training is not specific to Nokia 2G or 3G solutions, but caters for the equipment that the student is already using. Platform training lays the foundation for any practical work on the platforms, such as handling the user

interface, a basic understanding of the equipment's hardware and software architecture, or important common maintenance tasks. The training should be attended prior to taking OM courses on the respective equipment.

The Nokia FlexiServer platform is used in a multitude of new service solutions and training is based on licenses and certification programs – for more information turn to page 173.

Nokia Switching Platform

SWPLATe



Target Group

Personnel operating and maintaining the Nokia Platform in GSM, GPRS and 3G environments.

Objectives

- After the training, the participant will be able to:
- Identify which Nokia platforms are used in different network technologies.
 - List what kind of documentation and supporting resources can be used for operation and maintenance tasks.
 - Identify what kind of user interfaces can be used to perform the operation and maintenance tasks.
 - Describe the different technologies used in GSM, GPRS and 3G platforms.
 - List the characteristics of Nokia platforms.

Prerequisites

2G SYSTRA, GPRSSYS and/or 3G SYSTRA, depending on which modules are included

Duration

2 days

No. of Participants

N/A

Modules

- System review GSM/3G
- Documentation and online resources
- Introduction to 3G platform
- Introduction to DX 200
- Changes between 2G and 3G
- Introduction to IPA 2800 platform
- Nokia MML overview
- Nokia NEMU overview
- I/O devices and logical files
- Files and software
- Data communications and signaling
- Switching
- Synchronization
- ATM basics

Notes

The applicable modules will be selected according to the learner's prerequisite knowledge and target group.

Switching Platform Essentials

SWPLAT ESS



Target Group

Technical personnel using IPA 2800 and/or DX 200 platforms in daily operations.

Objectives

After the training, the participant will be able to:

- List and identify the elements of the Nokia platform in terms of the hardware, user interfaces and how it can be supported. In addition the participant is expected to identify which network element utilizes which platform.
- List five main platforms of IPA 2800 and DX 200 and briefly explain their meaning. Also explain the functional unit grouping and PIU, power distribution, redundancy principle, switching and synchronization.
- List and explain clearly the two different approaches to how the Nokia customer documentation is structured. Furthermore, the participant is expected to give examples of the documents included in each approach and identify the different media by which the documentation is delivered.
- Explain the functioning of the MMI system and man-machine language (MML). Also, demonstrate the use of MML.
- Identify and describe the philosophy of the Nokia NEMU in terms of its role in telecommunication management networks (TMN). List the key functions

of NEMU in the network elements whilst making a difference to the role of the OMU unit. Also, demonstrate the ability to start a NEMU EM session from the client and navigate applications with the application manager.

- List and explain the four fields of DX 200 / IPA 2800 system maintenance. Also, demonstrate the ability to interrogate maintenance information.
- Give six examples of I/O devices in DX 200 and IPA 2800 and their two main working states. Also, demonstrate the ability to interrogate the state of I/O devices.
- Explain the concept of DX 200 and IPA 2800 microcomputer, file types, directory structure and file administration procedures. Also, interrogate file information.
- Explain the items belonging to a software package, software package status and the procedures used for software package administration.
- List three examples where OM data communications is used in 3G networks. Also, interrogate DCN configuration.

Prerequisites

2G SYSTRA, 3G SYSTRA, SWPLATe

Duration

3 days

No. of Participants

Max. 8

Modules

- Basics of DX 200 IPA 2800 platform
- Documentation and NOLS
- Nokia NEMU
- MMI system
- I/O system
- Maintenance
- File administration
- Software package administration

Switching Platform Essentials and Administration



Target Group

Technical personnel performing platform administrative tasks, for example system back-ups and platform troubleshooting.

Objectives

After the training, the participant will be able to:

- Demonstrate three basic operations: create, copy and delete files on a WDU disk.
- Demonstrate four main operations on the software package: fallback, rollback, safe copying and changing a software package in the DX/IPA exchanges. Also, explain the four main steps to install a change note/change delivery to a DX/IPA exchange.
- Demonstrate centralized backup configuration using NMS/Nokia NetAct.
- Demonstrate centralized change note management using NMS/Nokia NetAct.
- Modify, create and test logical file connections, file types and redundant logical files.
- Explain the authority system and user access control.
- Configure TCP/IP stack for DX/IPA.

Prerequisites

2G SYSTRA, 3G SYSTRA, SWPLATE

Duration

5 days

No. of Participants

Max. 8

SWPLAT ESS & ADM

Modules

- Basics of DX 200 /IPA 2800 platform
- Documentation and NOLS
- Nokia NEMU
- MMI system
- I/O system
- Maintenance
- File administration
- Software package administration

IPSO Platform



Target Group

Packet core network (PCN) personnel dealing with IPSO network elements, such as GGSN, LIG and 3G SGSN.

Objectives

After the training, the participant will be able to:

- Install and configure Nokia IP routers. This includes installation of the operating system (IPSO) and configuration of full IP routing functions, including static routing, OSPF and multiple routing instances. The training concentrates on topics that are most relevant to those working with Nokia GPRS/3G products.

Prerequisites

3G SYSTRA, IPCORE

Duration

3 days

No. of Participants

Max. 8

IPSO PLAT

Modules

- IPSO platform product overview
- IPSO installation
- Basic IPSO configuration with voyager
- Basic IPSO configuration with CLI
- Basic IPSO debugging
- IPSO maintenance procedures
- IPSO routing configuration

Nokia NetAct Operations Support System Platform

OSSPLAT/(BL)



Target Group

Personnel working with the Nokia NetAct Release OSS3.

Prerequisites

2G SYSTRA or 3G SYSTRA

Duration

Classroom option: 2 days
Blended option: 1 day self-study + 9 hours of virtual classroom over 3 days

No. of Participants

Max. 8

Objectives

After the training, the participant will be able to:

- Explain the Nokia NetAct functionality and product structure.
- Explain and demonstrate how to use the Nokia NetAct desktop applications.
- Explain the basic architecture of Nokia NetAct and how it is connected to the network elements.
- Explain and demonstrate how to use the Nokia NetAct customer documentation.
- Explain and use the Nokia NetAct monitor tools for fault monitoring in the network.
- List the Nokia NetAct Configurator applications and know their purpose and use in network management.
- List the Nokia NetAct Reporter applications and know their purpose and use in network management.

Modules

- Introduction to Nokia NetAct
- Nokia NetAct architecture
- Desktop applications
- Element management
- Nokia NetAct documentation
- Nokia NetAct monitor: Use of fault management tools
- Nokia NetAct Configurator: Overview of applications and functionality
- Nokia NetAct Reporter: Overview of applications and functionality

Notes

This blended learning solution comprises one day of self-paced e-learning and one day of virtual classroom training (length of VC course content). The virtual classroom sessions are arranged on several days.

Operations Support System Enhancements in Nokia NetAct

OSSRESOURCEe



Target Group

Personnel working with the Nokia NetAct OSS.

E-Content

The participant will be able to:

- Use eJobAids to support on-the-job tasks (i.e. how to perform network operations)
- Use eJobAids to support using the Nokia NetAct applications
- Use on-line reference material (i.e. on-screen-guides & presentations) to learn the effects of new or changed features

Notes

Learning solutions will be available for change delivery packages or bundles with changes relevant to the user.

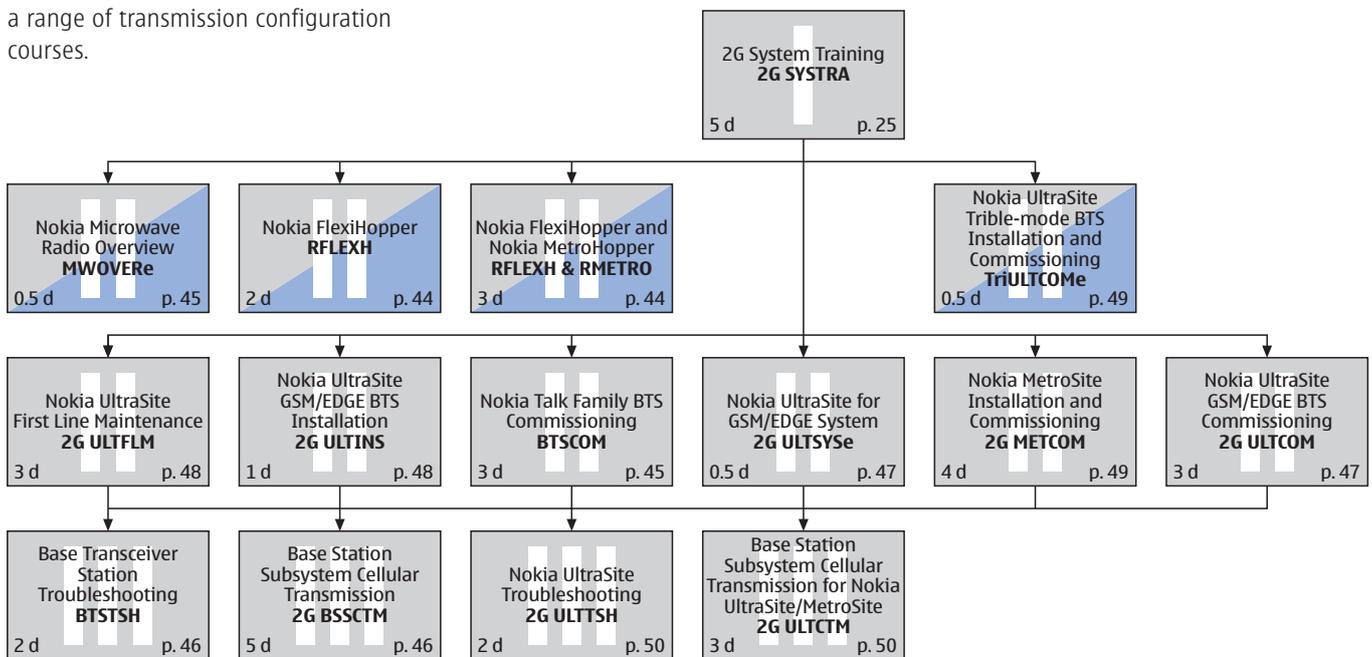
Field engineering

The field engineering group is responsible for technical tasks carried out on equipment widely distributed in the field, such as base stations and microwave equipment. The work can be grouped into installation, commissioning and first line maintenance. First line maintenance manages preventive maintenance, as well as problems under the direction of the network surveillance team. This group might also be involved in system upgrades together with engineering support.

2G field engineering

Our standard training solution covers all the aspects that your field personnel will need, including installation, commissioning, maintenance and troubleshooting courses. As transmission is becoming more challenging with the co-location of 3G base stations and changes in capacity requirements, we now provide a range of transmission configuration courses.

More information on training solutions on the Nokia Connect 10/100 Base Stations can be found on pages 203 and 205.



Nokia FlexiHopper

RFLEXH



Target Group

Operating and maintenance personnel of transmission and GSM network using Nokia Microwave Radio equipment (for example, network management personnel, technical field personnel and/or system specialists).

Objectives

After the training, the participant will be able to:

- Install, commission and maintain the Nokia FlexiHopper/FlexiHopper Plus Radio.
- List principles in the use of common RF terminology.

Prerequisites

Experience in telecommunications transmission equipment

Duration

2 days

No. of Participants

Max. 8

Modules

- Nokia FlexiHopper product overview
- Nokia FlexiHopper installation
- Nokia FlexiHopper commissioning and maintenance

Nokia FlexiHopper and Nokia MetroHopper RFLEXH & RMETRO



Target Group

Operating and maintenance personnel of transmission and GSM networks using Nokia Microwave Radio relay equipment (for example, network management personnel, technical field personnel and/or system specialists).

Objectives

After the training, the participant will be able to:

- Install, commission and maintain the Nokia FlexiHopper/FlexiHopper Plus and Nokia MetroHopper Radios.

Prerequisites

Experience in telecommunications transmission equipment

Duration

3 days

No. of Participants

Max. 8

Modules

- Nokia FlexiHopper product overview
- Nokia FlexiHopper installation
- Nokia FlexiHopper commissioning and maintenance
- Nokia MetroHopper product overview
- Nokia MetroHopper installation
- Nokia FlexiHopper and Nokia MetroHopper commissioning and maintenance with FIU 19(E) and RRIC

Nokia Microwave Radio Overview

MWOVERe



Target Group

Personnel who need a theory overview on Nokia FlexiHopper and/or Nokia MetroHopper Microwave Radios.

Objectives

After the training, the participant will

- Have an overall technical knowledge of Nokia Microwave Radios (MWR) and their use
- Know where to find more information.

Prerequisites

None

Duration

0.5 day

No. of Participants

N/A

Modules

- Introduction
- Microwave Radio essentials
- Nokia Microwave Radio products
- Typical Nokia Hopper applications

Nokia Talk Family BTS Commissioning

BTSCOM



Target Group

Technical personnel working with 3G Nokia Talk Family BTS equipment.

Objectives

After the training, the participant will be able to:

- Understand the general function of a GSM network.
- Check BTS installation.
- Understand the function of Nokia BTS and BTS units.
- Commission the 3G Nokia Talk Family BTS, following the Nokia commissioning procedure.

Prerequisites

2G SYSTRA

Duration

3 days

No. of Participants

Max. 8

Modules

- GSM DE34 BTS/Network architecture and interfaces
- GSM BTS/DE/DF34 product family
- GSM DE34 BTS configurations
- GSM DE34 BTS function and block diagram of the units
- GSM DE34 BTS plug-in unit description
- GSM DE34 BTS and plug-in unit installation /checking the installation
- GSM DE34 BTS TRU settings and branching tables
- GSM DE34 BTS MMI software
- GSM DE34 BTS commissioning

Base Transceiver Station Troubleshooting

BTSTSH



Field engineering

Target Group

BSS and Base Transceiver Station field maintenance and support personnel.

Objectives

After the training, the participant will be able to:

- Identify the potential problem areas affecting BTS performance.
- Use MMI PC to commission and test Nokia Talk Family BTS for correct configuration and operation.
- Analyze BTS status and alarms to localize faults.
- Use service terminal to reconfigure and test TRU devices.
- Create, edit, activate and copy TRU branching tables with service terminal.
- Localize and clear BTS faults using: alarm analysis, loop testing, quality and quality monitoring (BER, BER2, FER).
- Localize and clear A-bis faults with MML commands.
- Manage the cabling and settings for fault finding.

Prerequisites

2G SYSTRA, BSSESS, BSSPROD, BTSCOM

Duration

2 days

No. of Participants

Max. 8

Modules

- Overview/introduction
- GSM DE34 BTS plug-in unit description
- Abis interface integration with MML
- BSS TSH overview
- BTS TSH overview
- Cabling, installation and settings for fault finding / DE34
- Software fault cases for DE34
- Hardware fault cases for DE34
- BSS Abis fault cases and test calls

Base Station Subsystem Cellular Transmission

2G BSSCTM



Target Group

BSS field engineers, engineering support personnel, technical support personnel, as well as network planners.

Objectives

After the training, the participant will be able to:

- Commission and configure loops for the DN2 for use in mobile networks, including Microwave Radios (optional).

Prerequisites

2G SYSTRA, BSSESS, BTSCOM

Duration

5 days

No. of Participants

Max. 8

Modules

- DN2 principles and functions
- DN2 configuration and cross-connections
- TRUA principles and functions
- TRUA configuration and branching
- Q1 management configuration
- BTS loop configuration and protection

Nokia UltraSite GSM/EDGE BTS Commissioning

2G ULTCOM



Target Group

BTS commissioning engineers.

Objectives

After the training, the participant will be able to:

- Describe the Nokia UltraSite solution.
- Commission the Nokia UltraSite elements.
- Correctly commission Nokia FlexiHopper.

Prerequisites

2G SYSTRA

Duration

3 days

No. of Participants

Max. 8

Modules

- Nokia UltraSite GSM/EDGE BTS product overview
- Nokia UltraSite GSM/EDGE BTS installation check
- Nokia UltraSite GSM/EDGE BTS unit cables and combiner options
- Nokia UltraSite GSM/EDGE BTS antenna system
- Nokia UltraSite GSM/Nokia Talk Family BTS co-locating and configuration
- Nokia UltraSite GSM/EDGE BTS unit description
- Nokia UltraSite GSM/EDGE BTS commissioning
- Nokia UltraSite FlexiHopper commissioning

Notes

Pre- and post-assessment will be available in Q2/05.

Nokia UltraSite for GSM/EDGE System

2G ULTSYSe



Target Group

Personnel who require general knowledge of the Nokia UltraSite solution.

Objectives

After the training, the participant will be able to:

- Complete an illustration of the Nokia UltraSite solution architecture.
- List the basic features and functions of each Nokia UltraSite network element.
- List and describe the process and tools used to implement the Nokia UltraSite solution.
- List the tools used to operate and maintain the Nokia UltraSite solution.

Prerequisites

2G SYSTRA

Duration

0.5 day

No. of Participants

N/A

Modules

- Nokia UltraSite product family
- Nokia UltraSite implementation
- Nokia UltraSite network solutions
- Nokia UltraSite transmission solution
- Nokia UltraSite operations and maintenance
- Network planning with Nokia UltraSite

Nokia UltraSite First Line Maintenance

2G ULTFLM



Target Group

Field personnel who will perform first line maintenance at Nokia UltraSite 2G Base Stations.

Objectives

After the training, the participant will be able to:

- Detect faults in Nokia UltraSite base station plug-in units.
- Replace faulty units.
- Verify a base station's function by testing.

Prerequisites

2G SYSTRA

Duration

3 days

No. of Participants

Max. 8

Modules

- Nokia UltraSite GSM/EDGE BTS product overview
- Nokia UltraSite GSM/EDGE BTS Antenna System
- Nokia UltraSite FlexiHopper product description
- Nokia UltraSite GSM/EDGE Manager software and software handling
- Nokia UltraSite GSM/EDGE Base Station alarm handling
- Nokia UltraSite GSM/EDGE first line maintenance

Notes

Pre- and post-assessment will be available in Q2/05.

Nokia UltraSite GSM/EDGE BTS Installation

2G ULTINS



Target Group

BTS installation personnel.

Objectives

After the training, the participant will be able to:

- Describe the Nokia UltraSite solution.
- Install the Nokia UltraSite BTS completely.

Prerequisites

2G SYSTRA

Duration

1 day

No. of Participants

Max. 8

Modules

- Nokia UltraSite GSM/EDGE BTS product overview
- Nokia UltraSite GSM/EDGE BTS unit description
- Nokia UltraSite GSM/EDGE BTS installation
- Nokia UltraSite GSM/EDGE BTS unit cables and combiner options

Nokia MetroSite Installation and Commissioning

2G METCOM



Target Group

Field personnel who will install and commission Nokia MetroSite sites.

Objectives

After the training, the participant will be able to:

- Install the Nokia MetroSite elements.
- Commission the Nokia MetroSite elements.

Prerequisites

2G SYSTRA

Duration

4 days

No. of Participants

Max. 8

Modules

- Nokia MetroSite solution overview
- Nokia MetroSite BTS product overview
- Nokia MetroSite BTS installation
- Nokia MetroSite BTS commissioning
- Nokia MetroSite BBU product overview
- Nokia MetroSite BBU installation
- Nokia ITN and PDH-SDH transmission units overview
- Nokia FlexiHopper product overview
- Nokia MetroHopper product overview
- Nokia FlexiHopper and Nokia MetroHopper commissioning and maintenance with FIU 19(E) and RRIC
- Nokia MetroHub product overview
- Nokia MetroHub installation
- Nokia MetroHub commissioning

Nokia UltraSite Triple-mode BTS Installation and Commissioning

TriULTCOMe



Target Group

Personnel who need to learn about installation, commissioning and maintenance of the Nokia triple-mode BTS.

Objectives

After the training, the participant will be able to:

- Describe the Nokia UltraSite triple-mode BTS configuration.
- Install and commission the WCDMA upgrade.
- Understand the basic operation and maintenance of the triple-mode BTS.

Prerequisites

UNDGSM e, 3G INTe

Duration

0.5 day

No. of Participants

N/A

Modules

- Triple-mode BTS overview
- Triple-mode BTS WCDMA upgrade installation
- Triple-mode BTS unit installation
- Triple-mode BTS commissioning and integration
- Triple-mode BTS operation and maintenance

Base Station Subsystem Cellular Transmission for Nokia 2G UltraSite/MetroSite

2G ULTCTM



Target Group

BSS field engineers, engineering support personnel, technical support personnel, network planners.

Objectives

After the training, the participant will be able to:

- Configure the different transmission units in a Nokia UltraSite/MetroSite GSM network.
- Implement transmission loop protection in the Abis-interface.
- Configure Q1 transmission management in the BSS.

Prerequisites

2G SYSTRA, BSESS

Duration

3 days

No. of Participants

Max. 8

Modules

- Cellular transmission principles
- Hardware and software overview
- Transmission loop protection
- Q1 transmission management

Nokia UltraSite Troubleshooting

2G ULTTSH



Target Group

Personnel involved in of installation, commissioning, integration, maintenance and administration of Nokia UltraSite BTS.

Objectives

After the training, the participant will be able to:

- Perform preventive maintenance.
- Read led indicators for all devices in a Nokia UltraSite EDGE Base Station (BTS).
- Analyze BTS status and alarms to localize faults.
- Replace faulty units.
- Expand the configuration of a Nokia UltraSite EDGE Base Station (BTS).
- Troubleshoot and solve problems in Nokia UltraSite EDGE Base Station (BTS).

Prerequisites

2G SYSTRA, 2G ULTFMLM

Duration

2 days

No. of Participants

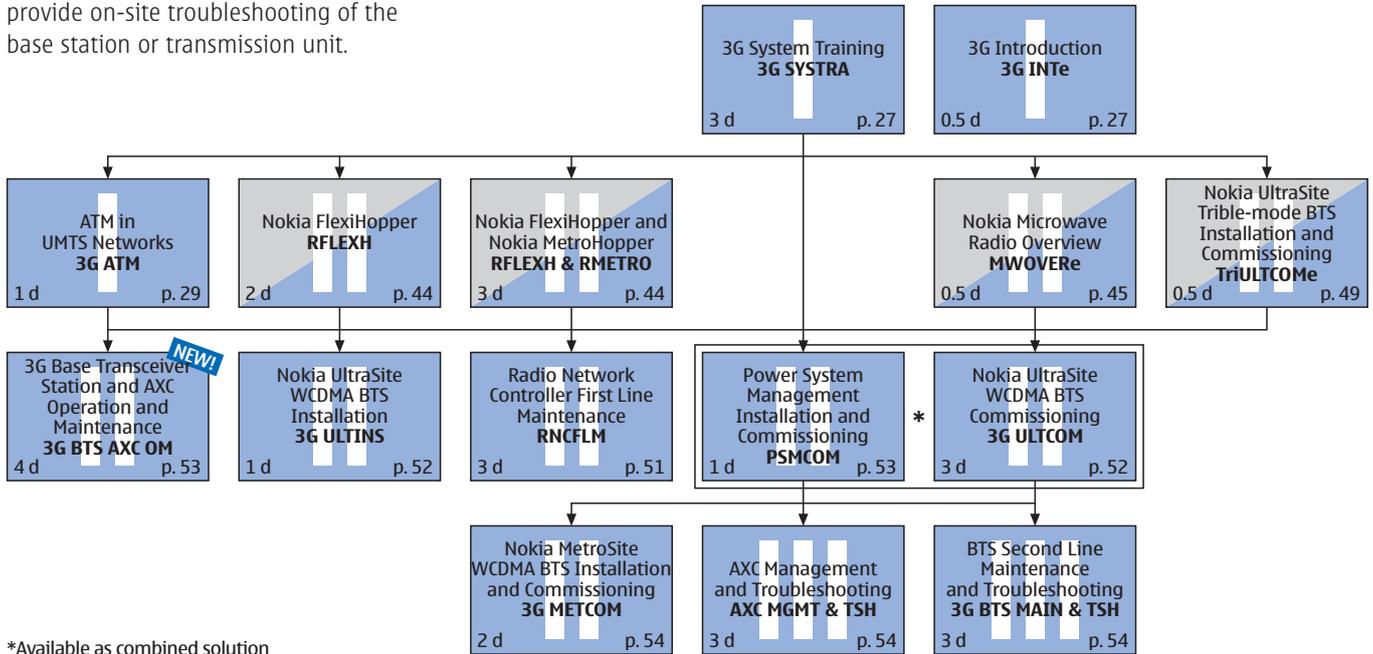
Max. 8

Modules

- 2G Nokia UltraSite overview
- Cabling, installation and settings for fault finding
- Troubleshooting for four typical faults
- Troubleshooting principles, methods and tools
- Transmission unit fault cases
- Commissioning fault cases
- Hardware fault cases

3G field engineering

The tasks of 3G field engineering personnel include installation, commissioning and maintenance of the Nokia UltraSite, Nokia MetroSite and transmission connections. In many cases the personnel are also expected to provide on-site troubleshooting of the base station or transmission unit.



*Available as combined solution

Radio Network Controller First Line Maintenance

RNCFLM



Target Group

RNC first line maintenance personnel.

Objectives

After the training, the participant will be able to:

- Perform first line maintenance tasks at Nokia RNCs.

Prerequisites

3G SYSTRA, RNCARCe

Duration

3 days

No. of Participants

Max. 8

Modules

- RNC functionality
- Using Nokia Online Services NOLS
- IPA 2800 hardware configuration
- Using RNC NEMU
- Repetition of IPA 2800 alarm structure
- Unit working state administration
- Replacing RNC plug-in units
- Basic NEMU maintenance

Notes

Participants are requested to use their own laptops during the course in order to test their own tools. The user must have local admin rights on his/her laptop. However, Nokia classrooms are equipped with PCs.

Nokia UltraSite WCDMA BTS Installation

3G ULTINS



Target Group

Personnel installing Nokia UltraSite WCDMA BTS.

Objectives

After the training, the participant will be able to:

- Describe the Nokia UltraSite WCDMA BTS solution.
- Install the Nokia UltraSite WCDMA BTS cabinet, cables, and units.

Prerequisites

3G SYSTRA

Duration

1 day

No. of Participants

Max. 8

Modules

- WCDMA BTS Overview
- WCDMA BTS Unit Overview
- WCDMA BTS Nokia UltraSite cabinet and unit installation
- WCDMA BTS Nokia UltraSite cabinet and interface cabling

Notes

One WCDMA base station for each group of four participants is needed during the practical installation exercise. The base station can be either Supreme or Optima.

Nokia UltraSite WCDMA BTS Commissioning

3G ULTCOM



Target Group

BTS commissioning engineers.

Objectives

After the training, the participant will be able to:

- Describe the Nokia UltraSite WCDMA solution.
- Commission and integrate the Nokia UltraSite WCDMA BTS.

Prerequisites

3G SYSTRA, 3G ATM

Duration

3 days

No. of Participants

Max. 8

Modules

- WCDMA BTS overview
- AXC product overview
- AXC units
- AXC installation
- WCDMA BTS unit overview
- WCDMA BTS Nokia UltraSite Supreme Indoor cabinet and unit installation
- WCDMA BTS Nokia UltraSite Supreme Indoor cabinet cabling
- WCDMA BTS commissioning
- AXC commissioning
- WCDMA BTS local operation and maintenance

Notes

Pre- and post-assessment available in Q2/05.

Power System Management Installation and Commissioning

PSMCOM



Target Group

Field personnel and supervisors who will install, commission and integrate BBU and SSS and need a deeper knowledge of the PSM.

Objectives

After the training, the participant will be able to:

- Perform the local commissioning.
- Run the local battery test.
- Perform local troubleshooting with PSM manager.
- Configure different BTS cabinets and cabling.
- Configure the BSC for Q1 management.
- List the features for remote functionality of the PSM in 2G and 3G networks.
- Connect via Windows Terminal Server to the battery backup unit and site support system.

Prerequisites

3G SYSTRA, 3G ATM

Duration

1 day

No. of Participants

Max. 8

Modules

- Power system management (PSM) overview
- PSM commissioning
- PSM maintenance and troubleshooting
- PSM integration and remote management

3G Base Transceiver Station and AXC Operation and Maintenance

NEW!

3G BTS AXC OM



Target Group

3G BTS field based operation and maintenance personnel.

Objectives

After the training, the participant will be able to:

- Describe the functionality of the plug-in units in the Nokia WCDMA BTS integrated AXC.
- Re-configure the capacity of the Nokia AXC.
- Operate and maintain the Nokia AXC.
- Describe the functionality of the Nokia WCDMA BTS plug-in units.
- Operate and maintain the Nokia WCDMA BTS.
- Re-configure the capacity/configuration of the Nokia WCDMA BTS.

Prerequisites

3G SYSTRA, 3G ATM and general knowledge about IP

Duration

4 days

No. of Participants

Max. 8

Modules

- Nokia AXC transmission solution
- Nokia integrated AXC functional description
- Nokia integrated AXC unit operation and maintenance
- Description of the Nokia AXC manager GUI
- Nokia UltraSite WCDMA Base Station product description
- Nokia UltraSite WCDMA Base Station commissioning
- Nokia UltraSite WCDMA Base Station local operation and maintenance
- Description of the Nokia 3G BTS manager GUI

Nokia MetroSite WCDMA BTS Installation and Commissioning

3G METCOM



Target Group

Field personnel who will install and commission Nokia MetroSite WCDMA BTS.

Objectives

After the training, the participant will be able to:

- Install the Nokia MetroSite for WCDMA elements.
- Commission the Nokia MetroSite for WCDMA elements.

Prerequisites

3G SYSTRA, 3G ATM, 3G ULTCOM

Duration

2 days

No. of Participants

Max. 8

Modules

- WCDMA BTS Nokia MetroSite overview
- WCDMA BTS Nokia MetroSite unit overview
- WCDMA BTS Nokia MetroSite installation
- WCDMA BTS commissioning
- AXC commissioning
- WCDMA BTS Nokia MetroSite local operation and maintenance

AXC Management and Troubleshooting



Target Group

Transmission personnel, engineering support, second line maintenance personnel, field engineering personnel, OM personnel.

Objectives

After the training, the participant will be able to:

- Implement and integrate AXC C2.0 in the transmission network.
- Manage AXC node locally and remotely.
- Perform AXC network planning.
- Create and Modify AXC transmission and

IP parameters.

- Maintain the AXC.
- Perform AXC software, hardware and transmission related troubleshooting.

Prerequisites

3G SYSTRA, 3G ULTCOM

Duration

3 days

No. of Participants

Max. 8

Modules

- AXC features
- AXC node software upgrade
- AXC commissioning in practice
- AXC automated commissioning
- AXC reconfiguration
- WCDMA BTS chaining and DCN configuration in AXC
- AXC operation and maintenance
- AXC management protocol
- AXC Q1 management
- AXC troubleshooting

AXC MGMT & TSH

BTS Second Line Maintenance and Troubleshooting



Target Group

Personnel maintaining WCDMA BTS.

Objectives

After the training, the participant will be able to:

- Describe the WCDMA BTS solution and main features of different WCDMA BTSs.
- Describe the new software and hardware features.
- Maintain the Nokia UltraSite/MetroSite WCDMA BTSs and AXC.
- Monitor the alarms.

- Troubleshoot the alarms.
- Replace faulty units.
- Make software updates.

Prerequisites

3G SYSTRA, 3G ULTCOM

Duration

3 days

No. of Participants

Max. 8

Modules

- WCDMA BTS review
- AXC features
- AXC node software upgrade
- AXC commissioning in practice
- AXC automated commissioning
- AXC reconfiguration
- AXC operation and maintenance
- AXC troubleshooting
- WCDMA BTS reconfiguration
- WCDMA BTS operation and maintenance
- WCDMA BTS troubleshooting

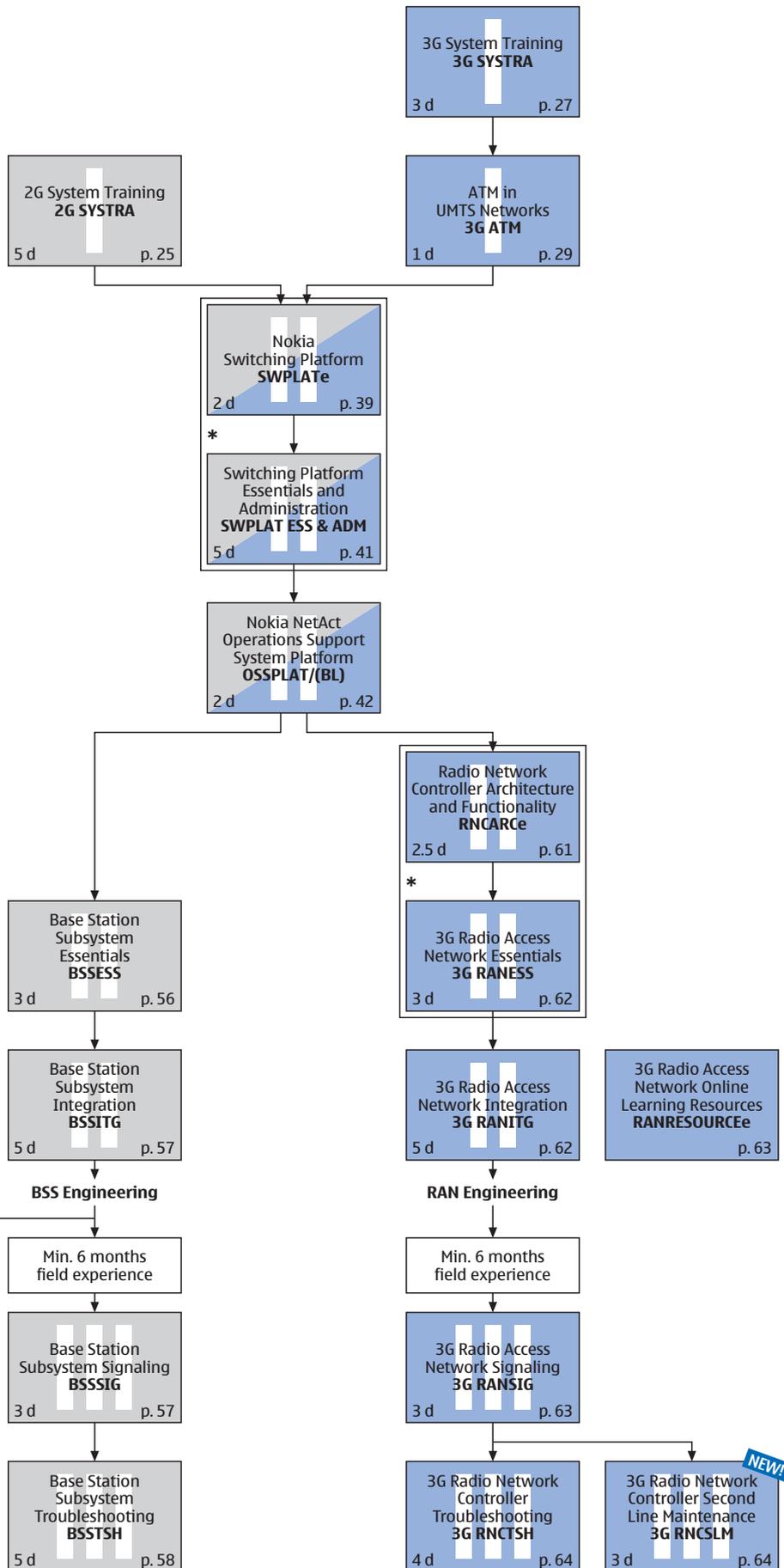
3G BTS MAIN & TSH

Network engineering

Network engineering personnel in our terminology are usually the people responsible for the second line maintenance of the network elements, subsystem and service platforms. This comprises remote and/or on-site routine analysis of network faults, in-depth fault analysis based on the experienced use of test programs, performing corrective action and reporting back to network surveillance. Network integration, software maintenance, capacity upgrades and other day-to-day operations are also included. Other typical responsibilities include process re-engineering when new hardware or software is introduced, interfacing with the Nokia Help Desk, supporting network optimization, network planning and marketing.

Radio access network engineering

The radio access network (RAN) engineering group is responsible for providing second line maintenance for the RAN and BSS network elements. Nokia offers two parallel training solutions for GSM/EDGE and 3G, comprising of essentials, integration, signaling and troubleshooting training.



*Blended learning solution

As 3G networks are now being rolled out, we provide workshops for the system experts and specialist RAN engineers, which focus on the more complex areas of inter-working, handovers, call control and features.

BSS Refresher and RAN Refresher workshops are aimed at people who need to top-up their knowledge of the Nokia solution, and who, for example, have not attended training in the BSC or RAN for three years or more.

| | | | | |
|---|---|---|---|--|
| Additionally available: e-learning | EDGE System Overview EDGESYS 1 d p. 28 | | New Features in Base Station Subsystem Release BSS REL THE 1 d p. 59 | New Features in Radio Access Network Release 4 RAN REL 4e 1 d p. 65 |
| | * | | * | * |
| Additionally available: Feature and delta courses | Base Station Subsystem EDGE Integration Delta BSS EDGE ITG DELTA 2 d p. 58 | Base Station Controller 3i Delta BSC3i DELTA 1 d p. 59 | Base Station Subsystem Features Release BSS REL PR 2 d p. 60 | Radio Access Network Release 4 RAN REL 4 2 d p. 65 |
| Additionally available: Workshops | Base Station Subsystem Refresher Workshop BSSREF WS 2 d p. 60 | Radio Access Network Inter System Handover Workshop RANIW WS 2 d p. 61 | 3G Radio Access Network Refresher Workshop 3G RANREF WS 2 d p. 66 | 3G Location Services Integration in Radio Access Network 3G LCS ITG 3 d p. 67 |
| Additionally available: Expert courses and tool training | | | Radio Network Controller Compact NEMU 3G RNC NEMU 2 d p. 67 | Radio Network Controller Connection Control 3G RNCCON 3 d p. 66 |

*Blended learning solution

Base Station Subsystem Essentials

BSS/ESS



Target Group

BSS engineering support, network surveillance personnel and NOC configuration personnel.

Objectives

After the training, the participant will be able to:

- Identify and describe the BSS network elements.
- Describe the passage of a circuit and package switched call through the BSS.
- Perform a basic TCSM2 operation.
- Explain Nokia Base Station solutions.
- Describe the functions of the BSC, its capacity and configuration.
- Describe the BSS radio network object model.
- Identify and describe the radio network parameters.

- Modify and interrogate the radio network by MML, including adjacent cells.
- Describe the concepts of radio network configuration management and the representation of radio network parameters in the Nokia network management system, Nokia NetAct.

Prerequisites

2G SYSTRA, SWPLATe, SWPLAT ESS & ADM, OSSPLAT/(BL)

Duration

3 days

No. of Participants

Max. 8

Modules

- BSS overview
- Traffic channels
- TCSM2E basic operation
- Introduction to Nokia Base Stations
- BSC architecture and functions
- Introduction to radio network administration
- Adjacent cell handling
- Radio network parameters
- Radio network configuration management 2G – principles and concepts
- Location Based service in BSS

Base Station Subsystem Integration



Target Group

Engineering personnel responsible for the integration, configuration and operation of the base station subsystem.

Objectives

After the training, the participant will be able to:

- Configure and integrate the TCSM2E.
- Integrate the A interface using MML commands.
- Integrate Abis interface using MML commands.
- Monitor the restart phases of base stations.
- Integrate Gb interface and GPRS/EGPRS radio network capacity.
- Create GPRS capacity in the BSC.
- Verify X.25 integration.

Prerequisites

2G SYSTRA, SWPLATe, SWPLAT ESS & ADM, OSSPLAT/(BL), BSSESS

Duration

5 days

No. of Participants

Max. 8

Modules

- TCSM2E configuration
- TCSM2E integration in the BSC
- A interface integration with MML
- Abis interface integration with MML
- Restart phase monitoring
- GPRS and EGPRS integration in BSC
- Verify X.25 integration

Base Station Subsystem Signaling



Target Group

BSS personnel and system specialists, who have at least six months of practical experience in the field.

Objectives

After the training, the participant will be able to:

- Provide BSS personnel with knowledge about signaling in the BSS, focusing on troubleshooting principles.

Prerequisites

2G SYSTRA, SWPLATe, SWPLAT ESS & ADM, BSSESS, BSSITG

Duration

3 days

No. of Participants

Max. 6

Modules

- BSS signaling
- Signaling examples (BSS)
- BSS signaling: Nethawk Protocol Analyzer User Guide
- Useful BSC/MSC commands
- Successful call cases
- Failing call cases

Base Station Subsystem Troubleshooting

BSSTSH



Target Group

BSS personnel and system specialists, who will be responsible for fault finding and troubleshooting and who have at least six months of practical experience in the field.

Objectives

After the training, the participant will be able to:

- Provide BSS personnel with knowledge enabling them to perform troubleshooting on various aspects of the BSS subsystem.

Prerequisites

2G SYSTRA, SWPLATe, SWPLAT ESS & ADM, BSSESS, BSSITG, BSSSIG

Duration

5 days

No. of Participants

Max. 4

Modules

- DX 200 debugger (service terminal essentials)
- BSC specific debugger extensions
- DX 200 file system
- Changing of mass memory units
- BSC database administration
- Radio network supervision in BSC
- Print-out of BSC radio network supervision parameters
- Preventive maintenance
- BSS safe copy handling
- Fault cases in BSC; BTS and BSS transmission

Base Station Subsystem EDGE Integration Delta



Target Group

GSM radio network integration personnel, operation and maintenance personnel, network management personnel, system specialists operating BSC.

Objectives

After the training, the participant will be able to:

- Describe what EDGE is.
- Explain effects on Nokia BSS solution.
- Describe the effect on the core network, network management system and network planning.
- Perform all necessary tasks to implement EDGE in BSS.
- Verify EDGE related parameters to ensure EDGE functionality.

Prerequisites

2G SYSTRA, SWPLATe, BSSESS, BSSITG, 2G NOCCM

Duration

2 days

No. of Participants

Max. 8

Modules

- Introduction to EDGE
- EDGE implementation for BSS
- EDGE integration
- Implementing parameter plans for building extended EDGE coverage
- Basic EDGE troubleshooting

BSS EDGE ITG DELTA

Base Station Controller 3i Delta

BSC3i DELTA



Target Group

GSM radio network integration personnel, operation and maintenance personnel, network management personnel, BSS field personnel, and system specialists operating BSC.

Objectives

After the training, the participant will be able to:

- Describe the functions and architecture of the BSC3i.
- Inspect the BSC3i.
- Operate the BSC3i using MML.

Prerequisites

2G SYSTRA, BSESS, BSSITG, knowledge and skills of an earlier Nokia BSC.

Duration

1 day

No. of Participants

Max. 8

Modules

- Introduction to BSC3i
- Differences between BSC3i and BSC2
- Ethernet switch ESB20
- BSC3i inspection
- BSC3i operation using MML

Notes

Only e-seminar available.

New Features in Base Station Subsystem Release

BSS REL THE



Target Group

Personnel in BSS network engineering, network operation and control, first line maintenance and site engineering, network planning, marketing.

Objectives

After the training, the participant will be able to:

- Investigate enhancements to the BSS arising from the new software release.

Prerequisites

UndGSMc, 2G SYSTRA, SWPLATe, SWPLAT ESS, BSESS

Duration

1 day

No. of Participants

N/A

Modules

- BTS features
- Radio network performance
- Data solutions
- Macro cellular
- Micro cellular
- Value added services
- Hardware requirements
 - Packet switched data
 - Operability

Notes

The modules may change depending on the software release.

Base Station Subsystem Features Release

BSS REL PR



Target Group

Configuration management personnel, engineering support, and system specialists operating BSS.

Objectives

After the training, the participant will be able to:

- Provide an overview and basic explanations of the new features in the BSS software release in Nokia Base Station Subsystem, as well as the activation procedures.

Prerequisites

2G SYSTRA, BSESS, BSSITG, BSS REL The

Duration

1–2 days

No. of Participants

Max. 8

Modules

- Hardware requirements
- Compatibility matrix
- Features
- MML changes between Releases (reference material)

Notes

Addition to BSSREL e-learning. Duration and content will vary from release to release.

Base Station Subsystem Refresher Workshop

BSSREF WS



Target Group

Advanced BSS personnel, system specialists.

Objectives

After the training, the participant will be able to:

- Use the latest information in their jobs.
- Fulfill the possible gaps related to signaling and troubleshooting.
- Troubleshoot the BSS network with the latest updates.

Prerequisites

BSSSIG, BSSTSH

Duration

2 days

No. of Participants

Max. 8

Modules

- Useful BSC/MSC commands
- Failing call cases
- Successful call cases
- DX 200 debugger (Service Terminal Essentials)
- Preventive maintenance
- Fault cases in BSC; BTS and BSS Transmission

Radio Access Network Inter System Handover Workshop

RANIW WS



Target Group

GSM/UMTS radio network integration, operations and maintenance personnel, system specialists operating Nokia BSC and RNC.

Objectives

After the training, the participant will be able to:

- Describe inter system handover functionality in Nokia BSS and RAN.
- Explain the meaning of important radio parameters.
- Describe the handover procedure and verify it with help of protocol analyzer.
- Verify intersystem handover related parameters to ensure functionality and perform troubleshooting.

Prerequisites

2G SYSTRA, BSSESS, BSSITG, 3G RANESS, 3G RANITG

Duration

2 days

No. of Participants

Max. 8

Modules

- UMTS-GSM intersystem handover introduction
- UMTS-GSM intersystem handover parameters
- UMTS-GSM intersystem handover specifications
- UMTS-GSM intersystem handover troubleshooting

Radio Network Controller Architecture and Functionality

RNCARCe



Target Group

Personnel in RAN network engineering, network operation and control, network planning, technical management.

Objectives

After the training, the participant will be able to:

- Describe the benefits and use of the Nokia RNC in 3G mobile networks.
- List the functional units in RNC and explain their function.
- Describe the major RAN procedures applicable in the Nokia RNC.

Prerequisites

3G INTe, 3G SYSTRA, SWPLATe, SWPLAT ESS

Duration

2.5 days

No. of Participants

N/A

Modules

- RAN overview – RAN Release 4
- RAN interfaces and protocols – RAN Release 4
- Nokia RNC architecture and functionality – RAN Release 4

3G Radio Access Network Essentials

3G RANESS



Target Group

RAN engineering support, 3G network operation with practical experience on the Nokia Network Management System.

Objectives

After the training, the participant will be able to:

- Explain the radio network operating principles.
- Interrogate and modify the radio network by NEMU.
- Describe the concepts of radio network configuration management and the representation of radio network parameters in the Nokia network management system, Nokia NetAct.
- List routine radio network operational tasks in a mobile network dependant on the individual responsibilities and describe the process of execution.
- Perform routine radio network operational tasks using NEMU as a tool that are part of the regular operation of a radio network. In addition, the student should identify service effecting tasks and follow the correct procedures.

Prerequisites

3G SYSTRA, 3G ATM, SWPLATe, SWPLAT ESS

Duration

3 days

No. of Participants

Max. 8

Modules

- RAN overview
- UTRAN interfaces and protocols
- Radio network controller solution
- WCDMA BTS solutions
- Migration and co-location of Nokia 2G and 3G sites
- RAN operation and configuration
- Radio network configuration management 3G – principles and concepts
- UMTS radio path and transmission

3G Radio Access Network Integration

3G RANITG



Target Group

Engineering support personnel responsible for the integration, configuration and operation of the RAN.

Objectives

After the training, the participant will be able to:

- Configure ATM resources at RNC.
- Integrate IuPS interface using MML commands.
- Integrate IuCS interface using MML commands.
- Integrate Iur interface using MML commands.
- Integrate Iub interface using NEMU tools.
- Integrate the RAN to DCN (IP configuration).

Prerequisites

3G SYSTRA, 3G ATM, SWPLATe, SWPLAT ESS & ADM, 3G RANESS

Duration

5 days

No. of Participants

Max. 8

Modules

- ATM resource management and digit analysis
- Iu-Cs integration in IPA 2800
- Iu-PS integration in 3G SGSN
- Radio network integration and expansion – method NEMU/MML
- Integration to DCN in IPA 2800

3G Radio Access Network Online Learning Resources

RANRESOURCEe



Target Group

Personnel working with the Nokia NetAct OSS.

E-Content

After the training, the participant will be able to:

- Describe content of change deliveries and technical notes.
- Demonstrate changes in commands and procedures related to Change Deliveries, software upgrades and functionality changes.

Notes

Learning solutions will be available for change delivery packages or bundles with user relevant changes.

3G Radio Access Network Signaling

3G RANSIG



Target Group

RAN personnel and system specialists with the need to analyze network element communication and procedures.

Objectives

After the training, the participant will be able to:

- Explain and monitor the interfaces in RAN by using the 3G NetHawk protocol analyzer.
- Describe the different call phases.
- Check the signaling setting in RNC.
- Analyze the signaling traffic in all RAN interfaces.

Prerequisites

3G SYSTRA, SWPLATe, 3G ATM, SWPLAT ESS & ADM, 3G RANITG

Duration

3 days

No. of Participants

Max. 6

Modules

- Introduction to 3G/UMTS signaling and interfaces
- UTRAN interfaces and protocols
- Protocol models in UTRAN
- UTRAN application protocols
- UTRAN signaling flows
- Use of Nethawk protocol analyzer

3G Radio Network Controller Second Line Maintenance

NEW! 3G RNC SLM



Target Group

RAN engineering personnel performing second line maintenance tasks and personnel who are involved in network rollout, start up and maintenance activities.

Objectives

After the training, the participant will be able to:

- Verify RAN network configuration and operation.
- Handle specific service terminal extensions in second line maintenance.
- Access NOLS and use as main support and information source.
- Supervise RNC start up.
- Check IPA platform cabling and plug-in unit strappings.
- Install change deliveries at the RNC.
- Verify NEMU settings and functionality.
- Handle various UTRAN faults.

Prerequisites

3G SYSTRA, 3G RANESS, 3G RANITG

Duration

3 days

No. of Participants

Max. 4

Modules

- RAN network verification
- Introduction to service terminal
- Using NOLS
- RNC start-up supervision
- CD installation
- Hardware configuration management
- Verify NEMU settings and functionality
- Fault finding

Notes

Available in Q1/05

3G Radio Access Network Controller Troubleshooting

3G RNCTSH



Target Group

Advanced RAN engineering personnel.

Objectives

This course has been designed for experienced RAN engineering personnel who are strongly involved in network rollout and start up.

After the training, the participant will be able to:

- Find faults with help of user documentation.
- Handle various RNC service terminal extensions in IPA 2800.
- Recover RNC after system crash.
- Configure WCDMA BTS/AXC remotely with configuration files.
- Use Nethawk protocol analyzer to monitor basic signaling procedures on UTRAN interfaces.
- Handle various UTRAN faults.

Prerequisites

3G SYSTRA, SWPLATe, 3G ATM, SWPLAT ESS & ADM, 3G RANESS, 3G RANITG, 3G RANSIG

Duration

4 days

No. of Participants

Max. 4

Modules

- Introduction to RAN troubleshooting
- Interrogation exercise RAN
- File system (operating system and software)
- Service terminal essentials + exercises RAN
- RNC restoration (recovery)
- Signaling review and Nethawk (call setup and release)
- NEMU configuration management and Nokia NetAct (integrating RNC to Nokia NetAct)
- AXC and BTS Manager
- IP and DCN in RAN (DCN management/ IP connection configuration)
- Various RAN troubleshooting fault cases

New Features in Radio Access Network Release 4

RAN REL 4e



Target Group

Personnel in RAN network engineering, network operation and control, first line maintenance and site engineering, network planning.

Objectives

After the training, the participant will be able to:

- Describe the features available with Nokia RAN Release 4.

Prerequisites

3G INTE, 3G SYSTRA, SWPLATe, SWPLAT ESS, RNCARCe, 3G RANESS

Duration

1 day

No. of Participants

N/A

Modules

- Site solutions – RAN Release 4
- Telecom features and radio resource utilization – RAN Release 4
- Transmission and transport – RAN Release 4
- Operability – RAN Release 4
- Performance management – RAN Release 4

Radio Access Network Release 4

RAN REL 4



Target Group

Configuration management personnel, engineering support, and system specialists operating RAN.

Objectives

After the training, the participant will be able to:

- Provide an overview and basic explanations of the new features in the RAN Release 4 software release in Nokia UTRAN Radio Access Subsystem, as well as activation procedures.

Prerequisites

3G SYSTRA, 3G RANESS, 3G RANITG, RAN REL 4e

Duration

2 days

No. of Participants

Max. 8

Modules

- RAN Release 4 hardware requirements
- RAN Release 4 compatibility matrix
- RAN Release 4 features
- MML changes between Release RAN Release 3 and RAN Release 4 (reference material)

3G Radio Access Network Refresher Workshop

3G RANREF WS



Target Group

RAN engineers, system specialists, advanced RNC OM personnel.

Objectives

After the training, the participant will be able to:

- Utilize the latest information in their jobs.
- Fulfill the possible gaps related to signaling and troubleshooting.
- Troubleshoot the RAN network with the latest updates.

Prerequisites

3G RANSIG, 3G RNCTSH

Duration

2 days

No. of Participants

Max. 8

Modules

- UTRAN signaling flows
- Signaling review and Nethawk (call setup and release)
- Use of Nethawk protocol analyzer
- Service terminal essentials + exercises RAN
- AXC and BTS Manager (Pr)
- Various RAN troubleshooting fault cases

Radio Network Controller Connection Control

3G RNCCON



Target Group

RAN experts who want to understand internal IPA 2800 messages in connection establishments.

Objectives

After the training, the participant will be able to:

- List the programs involved in various stages of a call, as well as the computer units in which they reside.
- Monitor and interpret messages between connection control processes in the IPA 2800 platform.
- Explain where and when different connection control analyzes are executed.
- Study control and user plane messages.
- Gain important information from messages.
- Use message monitoring as a possible troubleshooting tool.

Prerequisites

SERVTE, 3G RANESS, 3G RANITG, 3G RANSIG, 3G RNCTSH

Duration

3 days

No. of Participants

Max. 4

Modules

- Connection control test
- Introduction to connect control
- Connection control software
- Message handling
- Messages in call setup
- Connection control analysis
- Connection control zoom

Notes

Available in Q1/05

3G Location Services Integration in Radio Access Network

NEW!

3G LCS ITG



Target Group

RAN engineers working with location services.

Objectives

After the training, the participant will be able to

- Activate location service feature in RNC and describe parameters related to location service.
- Verify that location service feature works in RAN by test cases, monitoring and alarm handling.

Prerequisites

3G SYSTRA, 3G RANESS, 3G RANITG, 3G RANSIG

Duration

3 days

No. of Participants

Max. 8

Modules

- 3G location service overview
- Overview – LCS in 3G network
- LCS feature activation in RAN
- Verification of LCS feature functionality
- Different LCS cases

Notes

Available in Q3/05.

Radio Network Controller Compact NEMU

NEW!

3G RNC NEMU



Target Group

Engineering personnel involved in Compact NEMU in RNC related tasks including integration, operation and maintenance and application handling.

Objectives

After the training, the participant will be able to:

- Describe the functionality and new features in RAN 04 NEM.
- Install and use the NEMU in RNC.
- Perform the upgrade for NEMU in RNC.
- Operate and maintain NEMU in RNC.
- Appraise event and trace logs.
- Demonstrate the applications in RNC NEMU.

Prerequisites

2G SYSTRA or 3G SYSTRA, SWPLATE, SWPLAT ESS & ADM, RNCARCe, 3G RANESS

Duration

2 days

No. of Participants

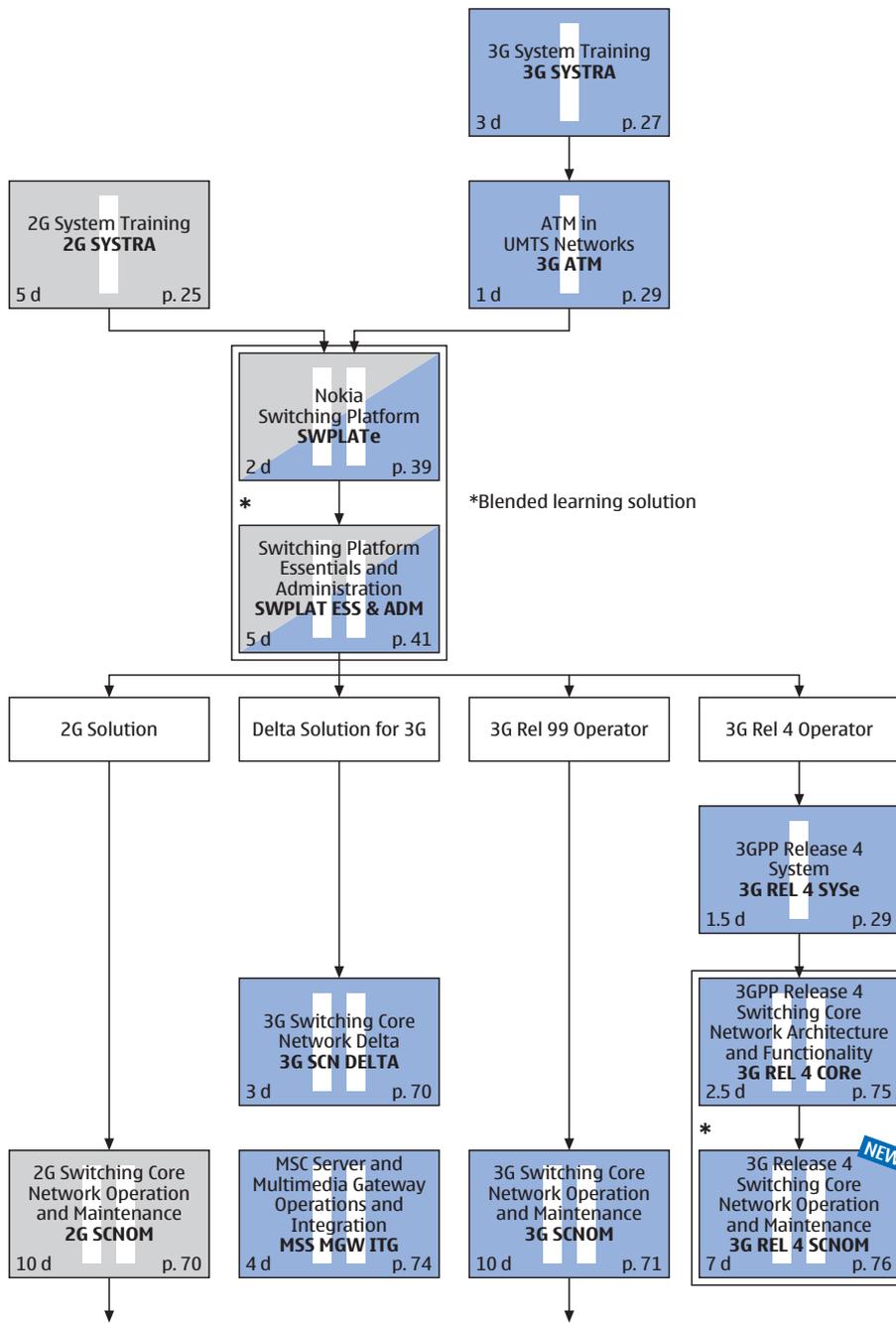
Max. 8

Modules

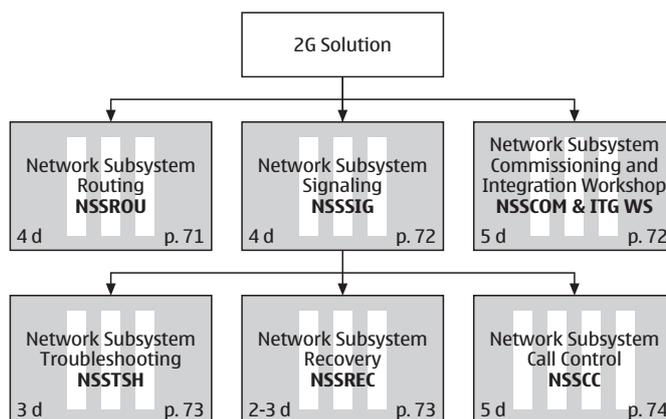
- RNC NEMU functionality and features
- Compact NEMU installation
- NEMU upgrade to RN 2.0 package
- NEMU configuration for RNC and Nokia NetAct
- Basic NEMU maintenance
- Troubleshooting in RNC NEMU
- Application handling in RNC NEMU
- Configuration management, performance management and Nokia NetAct in RNC NEMU

Switching core network engineering

The switching core network (SCN) engineering group is responsible for providing second line maintenance for the following network elements: Nokia Mobile Switching Center (MSC/MSCi), Home Location Register (HLR/HLRi), Multimedia Gateway (MGW), MSC Server (MSS) and Network Element Management (NEMU).



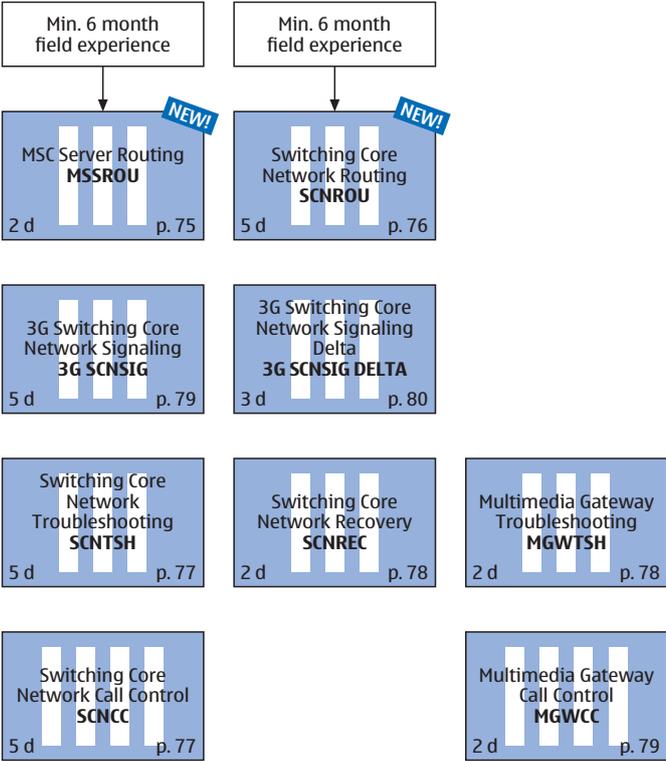
2G & 3G Operation and Maintenance SCN Solutions



Advanced 2G SCN Solutions

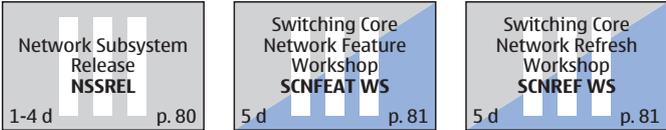
For personnel working purely on the switching core for 2G networks, we provide the recommended solution presented on the left. Each course/workshop provides specialized skills in routing, troubleshooting and recovery. In addition, the commissioning, signaling and call control provide the individual with the deepest knowledge of the product to support their work.

For 3G operators we provide comprehensive advanced courses and workshops designed to allow your experts to develop skills in troubleshooting and deployment of new releases. To complement and support the further development of the SCN engineering expert, we provide a number of courses and workshops on SCN features, releases and specialized areas.

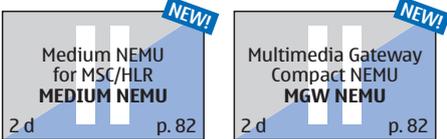


Advanced 3G SCN Solutions

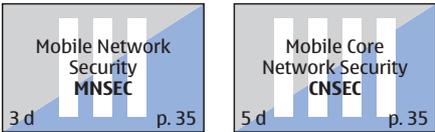
Additionally available: feature and delta courses and workshops



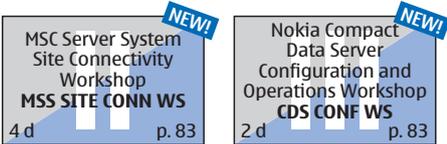
Additionally available: application and network element management courses



Additionally available: security courses



Additionally available: configuration and advanced charging workshop



2G Switching Core Network Operation and Maintenance

2G SCNOM



Target Group

Personnel working with Nokia 2G SCN (MSC/HLR).

Objectives

After the training, the participant will be able to:

- Describe the basic architecture of MSC/VLR and HLR/AC/EIR.
- Manage the subscriber services in MSC/VLR and HLR/AC/EIR.
- Maintain the cellular radio network elements from the NSS point of view.
- Create the definitions for signaling between network elements and for a new roaming contract.
- Identify the definitions for the short message service.

- Identify the principles of routing and create routing definitions.
- Identify the charging principles and perform the procedures.
- Describe various traffic measurement and observation methods.
- Perform daily first line operational tasks.

Prerequisites

2G SYSTRA, SWPLATe, SWPLAT ESS & ADM

Duration

10 days

No. of Participants

Max. 8

Modules

- Subrack and cartridge MSC/HLR architecture
- Subscriber administration
- Cellular radio network administration
- Common channel signaling system (SCN)
- Short message service
- Basics of routing
- Basics of charging
- Traffic administration

3G Switching Core Network Delta

3G SCN DELTA



Target Group

Personnel working with Nokia 3G SCN network and experienced with Nokia NSS.

Objectives

After the training, the participant will be able to:

- List the necessary definitions needed in the MSC for the UMTS network compared to the GSM network.
- Describe the ATM protocol reference model and, at an overview level, explain the main functions of AAL type 2 signaling protocol.
- Describe the main purposes of ATM resource management.
- Identify the procedures and demonstrate the ability to successfully perform integration between the MGW for 3G MSC (ATM Module) and the MSC.

- Identify the procedures and demonstrate the ability to successfully perform integration between the MGW for 3G MSC (ATM Module) and the RNC.
- Explain the transcoding principle.
- Demonstrate the ability to configure TCUs.

Prerequisites

3G SYSTRA, SWPLATe, 3G ATM, 2G SCNOM

Duration

3 days

No. of Participants

Max. 8

Modules

- MGW for 3G MSC (ATM module) overview and architecture
- 2G to 3G MSC operations
- ATM resource management and digit analysis
- Interfaces and signaling in MGW for 3G MSC (ATM module)
- Iu-Cs integration in IPA 2800
- Configuration of TCU in MGW for 3G MSC
- MSC integration in MGW for 3G MSC

3G Switching Core Network Operation and Maintenance

3G SCNOM



Target Group

Personnel working with Nokia 3G SCN (3G MSC/HLR).

Objectives

After the training, the participant will be able to:

- Describe the basic architecture of the DX 200 MSC/VLR and HLR/AC/EIR.
- Create and manage the subscriber's basic and supplementary services in the MSC/VLR and HLR/AC/EIR.
- Create and manage cellular radio network elements from the network subsystem point of view.
- Create the definitions for signaling between network elements within their own network as well as between different networks, including the definitions needed for a new roaming contract.

- Identify the necessary definitions for the short message service.
- Identify the principles of routing and create routing definitions in the MSC.
- Perform daily first line operational tasks.
- Provide knowledge and skills to operate and maintain Nokia Multimedia Gateway in a 3G environment.

Prerequisites

3G SYSTRA, SWPLATe, SWPLAT ESS & ADM

Duration

10 days

No. of Participants

Max. 8

Modules

- NSS architecture
- Subscriber administration
- Cellular radio network administration
- Common channel signaling system
- Basics of routing
- Short message service
- Core network overview and architecture
- MGW for 3G MSC overview and architecture
- Interfaces and signaling in MGW for 3G MSC (ATM module)
- Configuration of TCU in MGW for 3G MSC
- ATM resource management and digit analysis
- MSC integration in MGW for 3G MSC
- Iu-Cs integration in IPA 2800

Network Subsystem Routing

NSSROU



Target Group

NSS experts, routing specialists.

Objectives

After the training, the participant will be able to:

- Plan and define the application of most major routing features of the DX 200 MSC (e.g. alternative routing, selective circuit reservation, attribute analysis).
- Explain the interdependencies of the features.
- Use the analysis test state and test calls to verify the new analysis before taking it into use.
- Explain effect and use of the most important routing parameters.
- Give one typical application example for each feature.

Prerequisites

2G SYSTRA, SWPLATe, SWPLAT ESS & ADM, 2G SCNOM

Duration

4 days

No. of Participants

Max. 8

Modules

- Routing review (CS CN)
- Focus on hunting
- Time controlled routing
- Percentage routing (random traffic dispersion to trunks)
- Alternative routing
- Dynamic routing for non-hierarchical networks
- Selective circuit reservation
- Rate based traffic filtering
- Automatic congestion control
- Test call handling
- Attribute analysis
- Extended preanalysis

Network Subsystem Signaling



Target Group

NSS personnel who require a detailed understanding of network subsystem (NSS) signaling (CCS7) of a GSM network.

Objectives

After the training, the participant will be able to:

- Explain in more detail messages and procedures concerning CCS#7 protocols and SIGTRAN.
- Explain the interaction of different CCS#7 protocols in the protocol stack.
- Create necessary signaling definitions for inter-PLMN roaming contract.
- Configure, activate, collect and output statistical information about signaling.
- With the help of the documentation, draw the signaling flow charts in the DX 200 NSS.
- Trace (protocol analyzer) the signaling messages on different transmission interfaces (from NSS) and interpret the significance of parameters for TDM and IP signaling.

Prerequisites

2G SYSTRA, SWPLATe, SWPLAT ESS & ADM, 2G SCNOM

Duration

4 days

No. of Participants

Max. 6

Modules

- Introduction to SCN signaling
- MTP and SCCP in narrow signaling
- Signaling application parts and user parts
- Tracing of interfaces between Nokia network elements
- SS7 over IP
- Statistics

Network Subsystem Commissioning and Integration Workshop



Target Group

Experienced NSS personnel.

Objectives

After the training, the participant will be able to:

- Explain the basic configurations done in DX 200 MSCi.
- Create the basic hardware definitions in DX 200 MSCi.
- Explain the functions of the pre-processors in DX 200 MSCi.
- List and explain the phases in commissioning and integrating DX 200 MSCi.
- Explain the relation between signaling, cellular network, routing and charging definitions in DX 200 MSCi.

Prerequisites

2G SYSTRA, SWPLATe, SWPLAT ESS & ADM, 2G SCNOM

Duration

5 days

No. of Participants

Max. 8

Modules

- Introduction to commissioning
- Installation, commissioning and integration manuals
- Commissioning
- Integration
- Other necessary definitions

Notes

This course replaces the NSSCOM.



NSSCOM & ITG WS

Network Subsystem Troubleshooting

NSSTSH



Target Group

Second line NSS operation and maintenance personnel and system specialists.

Objectives

After the training, the participant will be able to:

- List the NSS troubleshooting tools.
- Define different troubleshooting techniques.
- Locate and solve problems related to the Nokia DX 200 MSC/VLR and HLR/AC/EIR.

Prerequisites

2G SYSTRA, SWPLATe, SWPLAT ESS & ADM, 2G SCNOM, NSSROU, NSSSIG, (NSS COM & ITG WS)

Duration

3 days

No. of Participants

Max. 6

Modules

- Introduction to troubleshooting in core networks
- Troubleshooting tools in Nokia circuit switched core networks (CS CN)
- CS CN troubleshooting cases

Network Subsystem Recovery

NSSREC



Target Group

DX 200 OM personnel responsible for recovering the switch after a major system crash.

Objectives

After the training, the participant will be able to:

- Deploy the current fallback software build, both from disk and DAT.
- Minimize the loss of traffic in the switch.

Prerequisites

2G SYSTRA, SWPLATe, SWPLAT ESS & ADM, 2G SCNOM, NSSROU, NSSSIG, NSS COM & ITG WS

Duration

2–3 days (3 day course including, and 2 day course excluding, Service Terminal)

No. of Participants

Max. 4

Modules

- Introduction to recovery related service terminal extensions
- Recovery principles and scenarios in CS CN
- Database recovery in CS CN
- Changing hard disks in MSC/HLR
- Recovery cases in CS CN

Network Subsystem Call Control



Target Group

NSS expert who wants to understand internal DX 200 messages in call establishment.

Objectives

After the training, the participant will be able to:

- List the programs involved in various stages of a call, as well as the computer units in which they reside.
- Monitor and interpret messages between call control processes.
- Explain where and when different call control analyzes are executed.
- Pick up important information from messages.
- Use message monitoring as a possible troubleshooting tool.

Prerequisites

2G SYSTRA, SWPLATe, SWPLAT ESS & ADM, 2G SCNOM, NSSROU, NSSSIG, (NSSCOM & ITG WS)

Duration

5 days

No. of Participants

Max. 4

Modules

- Call control test
- Introduction to call control
- Call control software
- Message monitoring exercises
- Messages in call setup
- Cause codes
- Call control analysis
- Call control zoom
- Charging and statistics in call control
- Troubleshooting guide for call control

MSC Server and Multimedia Gateway Operations and Integration

MSS MGW ITG



Target Group

Mobile circuit core network engineers who require practical experience with Nokia 3G PP Release 4 MSS and MGW.

Objectives

After the training, the participant will be able to:

- List all the network elements that form the Nokia MSC Server system solution and describe their functionality.
- Configure the most relevant protocols and interfaces used in MSC Server system both for control plane and user plane.
- Define the routing hierarchy in the MSS concept.
- Integrate the MGW Release 4 and its resources in MSS.
- Describe MGW as a cross connection network element.

Prerequisites

2G SYSTRA or 3G SYSTRA, SWPLATe, SWPLAT ESS & ADM, 2G SCNOM or 3G SCNOM

Duration

4 days

No. of participants

Max. 8

Modules

- ATM Basics
- Review of Nokia MSC Server system
- Routing configuration in MSS
- IP and QoS in MSS/MGW in 3G Release 4 networks
- ATM resource management and digit analysis
- ATM protocols and signaling
- Control plane integration for MSS/MGW
- Configuring radio network for MSS
- User plane resource creation in MGW (IP/ATM/TDM/Transcoder)

NEW!**MSSROU**

MSC Server Routing

**Target Group**

Engineering experts working with the MSC server system and responsible for routing configuration and troubleshooting.

Objectives

After the training, the participant will be able to:

- Plan and define the application of most major routing features of the DX 200 MSS.
- Explain the interdependencies of the features.
- Use the analysis test state and test calls to verify the new analysis before taking it into use.
- Explain effect and use of the most important routing parameters.
- Give one typical application example for each feature.

Prerequisites

2G SYSTRA, 3G SYSTRA, SWPLATe, SWPLAT ESS & ADM, 2G SCNOM or 3G SCNOM

Duration

2 days

No. of Participants

Max. 8

Modules

- Control plan and user plan routing review
- TFO and TrFO
- Other MSS routing feature

Notes

Available in Q2/05

3GPP Release 4 Switching Core Network Architecture and Functionality

3G REL 4 CORE**Target Group**

Personnel in network engineering, network operations and control, network planning.

Objectives

After the training, the participant will be able to point out the differences between Nokia MSC implementation in 3GPP Release 99 and 3GPP Release 4, in particular:

- Name the most important functions of MSS.
- List the primary functions of the Nokia MGW for 3GPP Release 4 networks.
- Describe the necessary steps when configuring the Multimedia Gateway from release R99 to Release 4.
- Outline the main idea behind the MSC server upgrade and site connectivity.

- List basic steps for UE to UE basic call setup in Nokia Release 4 networks.
- Outline the IP topology of the Nokia MSC server system.
- List the main MSS system features.
- Outline the GSM to UMTS inter-system handovers.
- Describe the new services introduced in Nokia 3G Release 4 MSS.

Prerequisites

3G INTE, 3G SYSTRA, 3G ATM, SWPLATe, SWPLAT ESS, 3G SCN DELTA

Duration

2.5 days

No. of Participants

N/A

Modules

- Nokia Solution for 3GPP Release 4 Core – MSS, GCS and CDS architecture and functionality
- Nokia Solution for 3GPP Release 4 Core – MGW architecture and functionality
- Nokia Solution for 3GPP Release 4 Core – MSC server resilience and site solution
- Nokia Solution for 3GPP Release 4 Core – Call handling in MSC server system
- Nokia Solution for 3GPP Release 4 Core – Handovers and Relocations
- Nokia Solution for 3GPP Release 4 Core – Migrating to MSC server system

NEW!

3G Release 4 Switching Core Network Operation and Maintenance

3G REL 4 SCNOM



Target Group

Engineering support, NOC personnel and network planning personnel who need to operate and maintain CS CN.

Objectives

After the training, the participant will be able to:

- Understand the architecture of MSS and HLR and MGW.
- Manage the subscriber services granted through CS CN and understand the security principles.
- Create, delete and modify the cellular radio networks database in CS CN.
- Configure the required interface definitions in CS CN: Iu-CS, Mc, Nc, Nb, D and A interface.
- Create the necessary roaming definitions in 3G Rel 4 CS CN network.
- List the charging and charging data transfer principles in CS CN.
- Describe various traffic measurements and observation methods.

Prerequisites

3G SYSTRA, 3G ATM, SWPLAT ESS & ADM, 3G REL 4 SYSe, 3G REL 4 CORE

Duration

7 days

No. of Participants

Max. 8

Modules

- 3GPP REL 4 MSC server, HLRi and MGW architecture
- Subscriber administration
- Cellular RNW administration
- ATM resource management and digit analysis
- Iu-CS interface integration, MGW – RNC
- D interface integration, MSS – HLR
- Nc interface integration, MSS – MSS
- Nb interface integration, MGW – MGW
- Mc interface integration, MSS – MGW
- A interface integration, MGW – BSC
- Roaming definitions in 3GPP Rel 4 CS CN
- Basics of charging
- Traffic administration

Notes

Available on CD-ROM in Q2/05. This course replaces the 3G REL 4 SCNOP.

Network engineering

Switching Core Network Routing

NEW!

SCNROU



Target Group

Experienced engineers responsible for the configuration and troubleshooting of routing in the switching core network.

Objectives

After the training, the participant will be able to:

- Plan and define the application of most major routing features.
- Explain the interdependencies of the features.
- Use the analysis test state and test calls to verify the new analysis before taking it into use.
- Explain effect and use of the most important routing parameters.
- Give one typical application example for each feature.

Prerequisites

2G SYSTRA, 3G SYSTRA, SWPLATe, SWPLAT ESS & ADM, 2G SCNOM or 3G SCNOM

Duration

5 days

No. of Participants

Max. 8

Modules

- Routing review
- Focus on hunting
- Time controlled routing
- Percentage routing
- Alternative routing
- Dynamic routing
- Selective circuit reservation
- Rate based traffic filtering
- Automatic congestion control
- Test call handling
- Attribute analysis
- Extended pre-analysis
- Control plan and user plan routing review
- TFO and TrFO
- Other MSS routing feature

Notes

Available in Q2/05

Switching Core Network Troubleshooting

SCNTSH



Target Group

SCN experts and OM personnel.

Objectives

After the training, the participant will be able to:

- List troubleshooting tools.
- Collect fault related background information.
- Analyze the nature of the fault.
- Whenever possible, provide a local solution.
- Use the necessary tools.
- Perform call failure troubleshooting.

Prerequisites

3G SYSTRA, 3G ATM, SWPLATe, SWPLAT ESS & ADM, 3G SCNOM / 3G SCN DELTA, 3G SCNSIG

Duration

5 days

No. of Participants

Max. 4

Modules

- Introduction to troubleshooting in core networks
- Troubleshooting tools in Nokia CS CN
- Service terminal for troubleshooting for SCN
- Start-up troubleshooting
- Call troubleshooting
- CS CN troubleshooting cases

Switching Core Network Call Control

SCNCC



Target Group

NSS expert who wants to understand internal DX 200 and IPA 2800 messages in call establishment.

Objectives

After the training, the participant will be able to:

- List the programs involved in various stages of a call, as well as the computer units in which they reside.
- Monitor and interpret messages between call control processes in DX 200 and IPA 2800 platform.
- Explain where and when different call control analyzes are executed.
- Study control and user plane messages.
- Pick up important information from messages.
- Use message monitoring as a possible troubleshooting tool.

Prerequisites

3G SYSTRA, 3G ATM, SWPLATe, SWPLAT ESS & ADM, 3G SCNOM / 3G SCN DELTA, 3G SCNSIG, SCNTSH

Duration

5 days

No. of Participants

Max. 4

Modules

- Call control test
- Introduction to call control
- Call control software
- Message handling
- Messages in call setup
- Cause codes
- Call control analysis
- Call control zoom
- Charging and statistics in call control

3G Switching Core Network Recovery

SCNREC



Target Group

DX 200 and IPA 2800 OM personnel responsible for recovering the switch after a major system crash.

Objectives

After the training, the participant will be able to:

- Deploy the current fallback software build, both from disk, DAT or optical magnetic tape.
- Minimize the loss of traffic in the switch.

Prerequisites

3G SYSTRA, 3G ATM, SWPLATE, SWPLAT ESS & ADM, 3G SCNOM / 3G SCN DELTA, 3G SCNSIG, SCNTSH

Duration

2 days

No. of Participants

Max. 4

Modules

- Recovery principles and scenarios in CS CN
- Database recovery in CS CN
- Changing hard disks in MSC/HLR
- Exercises with various crash scenarios
- NEMU recovery

Multimedia Gateway Troubleshooting

MGWTSH



Target Group

SCN experts and OM personnel.

Objectives

After the training, the participant will be able to:

- List troubleshooting tools.
- Collect fault related background information.
- Analyze the nature of the fault.
- Whenever possible, provide a local solution.
- Use necessary tools.

Prerequisites

3G SYSTRA, 3G ATM, SWPLATE, SWPLAT ESS & ADM, 3G SCNOM / 3G SCN DELTA, 3G SCNSIG

Duration

2 days

No. of Participants

Max. 4

Modules

- MGW introduction to troubleshooting
- MGW service terminal for troubleshooting
- MGW start-up troubleshooting
- MGW troubleshooting case

Multimedia Gateway Call Control



Target Group

Experienced engineers who require a deeper understanding of the Nokia MGW internal software communication structure. The skills acquired are used to develop troubleshooting capability further.

Objectives

After the training, the participant will be able to:

- List the programs involved in various stages of a call, as well as the computer units in which they reside.
- Monitor and interpret messages between processes involved in call establishment.
- Pick up important information from messages.

Prerequisites

3G SYSTRA, 3G ATM, SWPLATe, SWPLAT ESS & ADM, 3G SCNOM, 3G SCNSIG / 3G SCNSIG DELTA, NSSCC

Duration

2 days

No. of Participants

Max. 4

Modules

- MGW call control software
- MGW call control message handling
- MGW message in call setup
- MGW call control zoom

3G Switching Core Network Signaling



Target Group

Personnel with experience in SS7 signaling and requiring knowledge on new signaling protocols and features specific for 3G Core Networks.

Objectives

The aim of this course is to provide knowledge about GSM/UMTS core network signaling protocols.

After the training, the participant will be able to:

- Explain in more detail messages and procedures concerning CCS7 protocols and SIGTRAN.
- Explain interaction of different CCS7 protocols in the protocol stack.
- Explain the basics of ATM and their use in Nokia networks.
- Create necessary signaling definitions for inter-PLMN roaming contract.

- Configure, activate, collect and output statistical information about signaling.
- With the help of the documentation, draw the signaling flow charts in DX 200 NSS.
- Trace (protocol analyzer) the signaling messages on different transmission interfaces (from NSS) and interpret the significance of parameters for TDM and IP based signaling.

Prerequisites

2G SYSTRA, SWPLATe, SWPLAT ESS & ADM, 2G SCNOM

Duration

5 days

No. of Participants

Max. 4

Modules

- Introduction to SCN signaling
- MTP and SCCP in narrowband and broadband signaling
- Signaling application parts and user parts
- Tracing of interfaces between Nokia network elements
- SS7 over IP
- A interface (MGW-BSC)
- IU-CS interface (MGW-RNC)
- Mc interface (MSS-MGW)
- Nc interface (MSS-MSS)
- Nb interface (MGW-MGW)
- Statistics

3G Switching Core Network Signaling Delta 3G SCNSIG DELTA



Target Group

Personnel experienced in SS7 signaling and willing to learn new signaling protocols and features specific for the UMTS Release 4 core network.

Objectives

The aim of this course is to provide further knowledge about GSM/UMTS core network signaling protocols and procedures.

After the training, the participant will be able to:

- Output and interpret statistical information about signaling.
- List at least three GSM/UMTS map signaling procedures.
- With the help of the documentation, draw the signaling flow charts in Nokia core network.

- With the help of the documentation, analyze the process involved in signaling internally and thus get to the cause of faults.
- Trace and interpret the signaling on a different transmission interface (fROM CN) and interpret the significance of parameters.

Prerequisites

3G SYSTRA, 3G ATM, SWPLATE, SWPLAT ESS & ADM, 3G SCNOM / 3G SCN DELTA, NSSSIG

Duration

3 days

No. of Participants

Max. 4

Modules

- Introduction to SCN signaling
- MTP and SCCP in narrow and broadband signaling
- Tracing of interfaces between Nokia network elements
- A interface (MGW-BSC)
- IU-CS interface (MGW-RNC)
- Mc interface (MSS-MGW)
- Nc interface (MSS-MSS)
- Nb interface (MGW-MGW)

Network Subsystem Release

NSSREL



Target Group

NSS network engineering and network planning personnel.

Objectives

After the training, the participant will be able to:

- Describe the enhancements and new functions brought to the mobility services and user services.
- Illustrate new GSM functionality implemented in the Nokia MSC and HLR.
- Describe the functionality of the new features of and enhancements to the NSS interfaces.
- Illustrate the changes in the current functionality.

- Describe the main improvements and new functionality introduced for the operation and maintenance of network elements
- Describe the changes in the functionality which affect 3G Release PP specifications.

Prerequisites

2G SYSTRA, SWPLAT ESS, 2G SCNOM

Duration

1–4 days

No. of Participants

Max. 8

Modules

- GSM end user services
- GSM functions
- Changes in Interfaces
- Operations and maintenance functions
- Changes in existing functionality
- Improvements in handling 3GPP Release specifications
- Interfaces and signaling protocols

Notes

The duration and content of this course varies depending on software release and features used in the customer's network.

Switching Core Network Feature Workshop

SCNFPEAT WS



Target Group

First and second line NSS operation and maintenance personnel, system specialists.

Objectives

After the training, the participant will be able to:

- Describe and use the selected features of the NSS.

Prerequisites

2G SYSTRA, SWPLATe, SWPLAT ESS & ADM, 2G SCNOM

Duration

5 days

No. of Participants

Max. 4–6

Modules

- Depending on features used.

Notes

Duration varies from 3 to 5 days, depending on the chosen modules.

Switching Core Network Refresh Workshop

SCNREF WS



Target Group

Experienced NSS personnel who need refreshing on selected features (including routing, signaling) after a particular release.

Objectives

After the training, the participant will be able to:

- Use available routing features effectively.
- Use available signaling related features.
- Use available end user features.

Prerequisites

2G SYSTRA, SWPLATe, SWPLAT ESS & ADM, 2G SCNOM, NSSROU, NSSSIG, NSSCOM & ITG WS, NSSTSH (NSSCC, NSSREC)

Duration

5 days

No. of Participants

Max. 6

Modules

- SCN refresher
- SCN feature refresher
- SCN configuration and optimization refresher

Medium NEMU for MSC/HLR



Target Group

Engineering personnel involved in NEMU related tasks including integration, operation and maintenance and application handling on Medium NEMU.

Objectives

After the training, the participant will be able to:

- Perform NEMU commissioning tasks.
- Install and use Nokia mobile circuit core networks applications.
- Demonstrate the use of Nokia mobile circuit core networks applications.
- Optional: Install and operate the MPH – Mated Pair HLR 2N application.
- Optional: Install and operate the MVR – multi-vendor redundancy application.

Prerequisites

2G SYSTRA or 3G SYSTRA, SWPLATE, SWPLATESS & ADM, 2G SCNOM or 3G SCNOM

Duration

2 days

No. of Participants

Max. 8



MEDIUM NEMU

Modules

- General view of NEMU applications
- NE-Back-up server and redundant HLR functionality
- Remote software upgrade and CD remote management functionality
- HLR workstation functionality
- Fast subscriber management functionality
- NEMU configuration and dimensioning
- NEMU upgrade
- Optional: Install and configure MVR
- Optional: Install and configure MPH

Notes

Available on CD-ROM in Q1/05.

Multimedia Gateway Compact NEMU



Target Group

Engineering personnel involved in Compact NEMU in MGW related tasks including integration, operation and maintenance and application handling.

Objectives

After the training, the participant will be able to:

- Perform compact NEMU commissioning tasks.
- Describe the functionality and new features for NEMU in MGW.
- Install and use the NEMU in MGW.
- Perform the upgrade for NEMU in MGW.
- Operate and maintain NEMU in MGW.
- Appraise event and trace logs.
- Demonstrate the applications in MGW NEMU.

Prerequisites

2G SYSTRA or 3G SYSTRA, SWPLATE, SWPLAT ESS & ADM, 2G SCNOM or 3G SCNOM

Duration

2 days

No. of Participants

Max. 8



MGW NEMU

Modules

- MGW NEMU functionality and new features
- MGW NEMU upgrade – Basic NEMU maintenance
- GUI in NEMU – fault management, diagnostics and state handling
- Remote software management and other NEMU applications

Notes

Available in Q3/05.

Nokia Compact Data Server Configuration and Operations Workshop

NEW!

CDS CONF WS



Target Group

Engineering support and system acceptance personnel working with second and third line maintenance of Nokia MSC Server system.

Objectives

After the training, the participant will be able to:

- Explain CDS architecture and functionality.
- List possible configuration options of IWF functionality residing in Nokia MSC Server system.
- Perform commissioning on CDS and integrate CDS into MSC server system.
- Test and verify the functionality of the CDS and IWF related features in MSS System.

Prerequisites

3G REL4 SYSe, 3G REL4 CORE, MSS MGWITG

Duration

2 days

No. of Participants

Max. 4

Modules

- CDS architecture and functionality
- Commissioning and integration of CDS
- Verification of IWF functionality in MSS system

Notes

Available in Q3/05.

MSC Server System Site Connectivity Workshop

NEW!

MSS SITE CONN WS



Target Group

Engineering personnel working with Nokia MSC Server (either GSM or WCDMA) site connectivity solution.

Objectives

After the training, the participant will be able to:

- Describe the Nokia site connectivity solution for MSC Server systems.
- List the requirements from the backbone for successful operations of Nokia MSC Server systems.
- Configure and operate the backbone network elements according to Nokia MSC Server system requirements.

Prerequisites

3G REL 4 SYSe, 3G REL 4 CORE, IPSO PLAT, working experience 7600 OSR/6509 and FW/IP740 products

Duration

4 days

No. of Participants

Max. 8

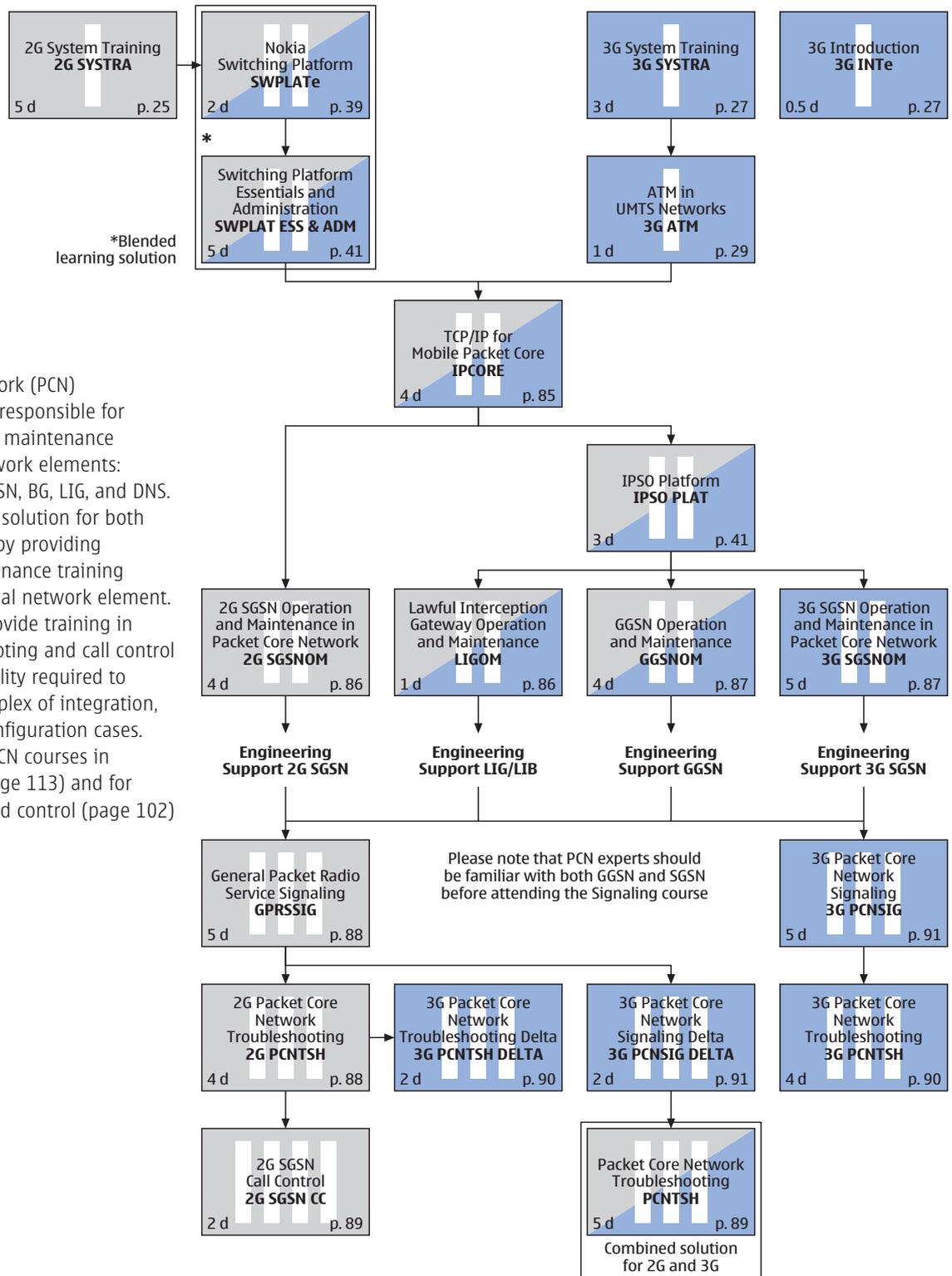
Modules

- Nokia MSS system site connectivity architecture and products
- Nokia platforms and interfaces in site connectivity solution
- LAN/IP connectivity in Nokia site connectivity solution
- Intra site resilience, security and e2e QoS protection in Nokia site connectivity solution
- MSS system control plane and user plane management in Nokia site connectivity solution
- Configuration of interfaces between Cisco OSR – Nokia MSS/MGW
- Configuration of resilience in Nokia site connectivity solution
- OSR upgrade procedures
- General configuration of Nokia site connectivity solution (routing security, OSS configuration QoS)
- Site-to-site VPN using policy based routing

Notes

Available in 2Q/05.

Packet core network engineering



The packet core network (PCN) engineering group is responsible for providing second line maintenance for the following network elements: 2G SGSN, 3G SGSN, GGSN, BG, LIG, and DNS. We provide a parallel solution for both 2G and 3G operators by providing operation and maintenance training based on the individual network element. For the expert, we provide training in signaling, troubleshooting and call control to develop the capability required to handle the most complex of integration, fault recovery and configuration cases. Nokia also provides PCN courses in network planning (page 113) and for network operation and control (page 102) personnel.

We also provide courses and workshops for the engineers who specialize in implementing, security, quality and charging features.

Additionally available:
Feature e-learning

New Features
in Packet Core
Network Release 3
MPC REL 3e
2 d p. 92

NEW!
New Features
in Packet Core
Network Release 4
MPC REL 4e
2 d p. 92

NEW!
GGSNOM
Release 4 Delta
GGSNOM REL 4 DELTA
2 d p. 137

NEW!
Mobile Packet
Core Network
Release 3 Delta
MPC REL 3 DELTA
2-3 d p. 93

Additionally available:
Quality of Service
and charging courses

End-to-End
Quality of Service
E2E QoS
3 d p. 93

Charging Gateway
Operation and
Maintenance
CGOM
3 d p. 94

Additionally available:
Security courses

Mobile Network
Security
MNSEC
3 d p. 35

Mobile Core
Network Security
CNSEC
5 d p. 35

TCP/IP for Mobile Packet Core



Target Group

Personnel requiring a good knowledge of TCP/IP for GPRS and 3G networks.

Objectives

After the training, the participant will be able to:

- Describe the main packet switching transmission technologies used in MPC.
- Recognize the role of the TCP/IP protocol family with MPC as well as the relationship between them (also including practical implementations).
- Explain the IP addressing and address management functionality.
- Review the functionality of different protocols with TCP/IP.
- Review the basics of IP routing and the functionality of different routing protocols.
- Explain the functionality of DNS.
- Recognize IP security from the MPC point of view.
- Recognize the implementation of network management with MPC and TCP/IP (SNMP).
- Explain important aspects when connecting the MPC backbone to external networks.
- Describe the impact of IPv6 on the mobile packet core network.
- Explain how roaming is achieved.

Prerequisites

3G SYSTRA, GPRSSYS

Duration

4 days

No. of Participants

Max. 24

Modules

- Introduction to IPCORE
- Transmission technologies
- TCP/IP suite protocols
- IP addressing
- IP address management
- IP routing protocols
- Tunneling in MPC
- External connectivity
- IP security in MPC
- Domain name server
- SNMP
- Roaming
- IPv6
- IP applications

IPCORE

2G SGSN Operation and Maintenance in Packet Core Network

2G SGSNOM



Target Group

Personnel taking care of configuration and operations of the 2G SGSN.

Objectives

After the training, the participant will be able to:

- Identify and list the functions of the Nokia 2G SGSN.
- Identify and list the key architecture components and interfaces of the Nokia 2G SGSN.
- Integrate the interfaces with other network elements in the network.
- Describe in detail all the mobility management and session management procedures.
- Explain the charging functionality in Nokia 2G SGSN.
- Explain procedures and use of the essential parameters to successfully perform integration of 2G SGSN in the GPRS network.
- Explain the interaction with MSC/VLR.

Prerequisites

2G SYSTRA, SWPLATe, IPCORE, SWPLAT ESS & ADM

Duration

4 days

No. of Participants

Max. 8

Modules

- 2G SGSN in GPRS
- 2G SGSN architecture
- 2G SGSN interfaces
- Integrating CCS7 interfaces in 2G SGSN
- 2G SGSN and mobility management
- Integrating Gb interface in 2G SGSN
- Integrating Gn interface in 2G SGSN
- Integrating Ga interface in 2G SGSN
- 2G SGSN and session management
- 2G SGSN packet data transfer
- 2G SGSN charging
- 2G SGSN and MSC/VLR interaction
- 2G SGSN and SMS delivery
- 2G SGSN capacity and configuration
- Visiting GPRS subscriber database

Lawful Interception Gateway Operation and Maintenance

LIGOM



Target Group

Packet core network personnel responsible for maintaining LIG.

Objectives

After the training, the participant will be able to:

- Explain LIG functionality.
- Configure LIG operation.

Prerequisites

2G SYSTRA, SWPLATe, SWPLAT ESS & ADM, IPCORE, 2G SGSNOM, GGSNOM

Duration

1 day

No. of Participants

Max. 8

Modules

- Lawful interception in 2G and 3G PS networks
- LIG configuration and operation
- LIG troubleshooting guide

GGSN Operation and Maintenance

GGSNOM



Target Group

Personnel taking care of operation and configuration of the GGSN and GPRS/3G backbone.

Objectives

After the training, the participant will be able to:

- Integrate the GGSN interfaces with Internet/Intranet, backbone elements, OSS and charging gateway.
- Configure the GGSN (QoS, routing, charging, FM).
- Configure APNs (DNS, roaming, corporate / Internet access).

Prerequisites

3G SYSTRA, IPCORE, IPSO PLAT

Duration

4 days

No. of Participants

Max. 8

Modules

- GPRS / Core network IP overview
- GGSN features
- Installing GGSN software
- Basic configuration in GGSN
- QoS configuration in GGSN
- GGSN access point configuration
- Nokia NetAct packet core configurator
- GPRS and 3G roaming
- Introduction to security in GGSN and GPRS packet core network
- Nokia GGSN software package reference Guide, Release 4.0

3G SGSN Operation and Maintenance in Packet Core Network

3G SGSNOM



Target Group

Second line maintenance personnel handling OM tasks for 3G SGSN.

Objectives

After the training, the participant will be able to:

- Identify and list the functions and key architectural components of the Nokia router based 3G SGSN.
- Describe the handling of mobility and session management in 3G SGSN.
- At an overview level, identify and list the signaling interfaces and protocols used in the 3G SGSN.
- Identify the procedure and demonstrate the ability to successfully perform integration between 3G SGSN and RNC.
- Identify the procedure and demonstrate the ability to successfully perform integration between 3G SGSN and IP backbone.
- Identify principles of CCS7 configuration in 3G SGSN.
- Integrate the Nokia 3G SGSN into SS7 (IP/NB/BB) networks.

Prerequisites

3G SYSTRA, IPCORE, IPSO PLAT, 3G ATM

Duration

5 days

No. of Participants

Max. 8

Modules

- Nokia 3G SGSN overview and architecture
- Mobility and session management in 3G SGSN
- Interfaces and signaling in 3G SGSN
- IPSO on the IP3400 platform
- Router integration in 3G SGSN
- CCS7 for mobile packet core
- Narrowband SS7 configuration in 3G SGSN
- Broadband SS7 configuration in 3G SGSN
- SS7 over IP configuration in 3G SGSN
- 3G SGSN configuration
- Configuration of additional features in 3G SGSN
- Basic debugging in 3G SGSN

General Packet Radio Service Signaling

GPRSSIG



Target Group

Second line maintenance personnel who need to analyze the GPRS network elements' communications and procedures.

Objectives

After the training, the participant will be able to:

- Take a focused look at GPRS interfaces using protocol analyzers.
- Explain and analyze GPRS related messages on various signaling planes.
- Configure, monitor and explain selected relevant GPRS procedures (DHCP, RADIUS, name lookup).
- Use message monitoring as a possible troubleshooting tool.

Prerequisites

2G SYSTRA, SWPLATe, SWPLAT ESS & ADM, IPCORE, 2G SGSNOM, GGSNOM

Duration

5 days

No. of Participants

Max. 4

Modules

- Training network structure for signaling
- Protocol analyzer introduction: Nethawk N2
- Gb interface (signaling)
- Gr interface
- Gs interface
- Protocol analyzer introduction: Ethereal
- DNS message debugging
- Gn interface
- Tracing GPRS procedures
- Roaming messages
- DHCP and RADIUS
- Tunneled message analysis

2G Packet Core Network Troubleshooting

2G PCNTSH



Target Group

Personnel taking care of the 2G packet core network elements and who need practical experience on the known troubleshooting cases.

Objectives

After the training, the participant will be able to:

- Identify the essentials of effective troubleshooting.
- Deal with troubles in the packet core network with a structured process.

Prerequisites

2G SYSTRA, SWPLATe, SWPLAT ESS & ADM, IPCORE, 2G SGSNOM, GGSNOM, GPRSSIG

Duration

4 days

No. of Participants

Max. 4

Modules

- Introduction to troubleshooting in 2G/3G MPC network
- Network interface troubleshooting tools (content and task based) for PCNTSH
- Network element troubleshooting (content and task based) for PCNTSH
- PCN troubleshooting cases

2G SGSN Call Control

2G SGSN CC



Target Group

Packet core network experts.

Objectives

After the training, the participant will be able to:

- List the programs involved in various stages of GPRS connection, as well as the computer units in which they reside.
- Monitor and interpret messages between processes involved in connection establishment.
- Pick up important information from messages.

Prerequisites

2G SYSTRA, SWPLATe, SWPLAT ESS & ADM, IPCORE, 2G SGSNOM, GGSNOM

Duration

2 days

No. of Participants

Max. 4

Modules

- SGSN call control software
- SGSN call control message handling
- SGSN message monitoring exercises
- SGSN message in GPRS mobility and session management
- SGSN call control zoom

Packet Core Network Troubleshooting (2G and 3G combined)

PCNTSH



Target Group

Personnel taking care of the 2G and 3G packet core network elements and who need a structured approach to troubleshooting cases.

Objectives

After the training, the participant will be able to:

- Identify the essentials of effective troubleshooting.
- Deal with troubles in the packet core network with a structured process.

Prerequisites

2G SYSTRA, SWPLATe, SWPLAT ESS & ADM, IPCORE, 2G SGSNOM, GGSNOM, 3G SYSTRA, 3G ATM, 3G SGSNOM, 3G PCNSIG, GPRSSIG

Duration

5 days

No. of Participants

Max. 4

Modules

- Introduction to troubleshooting in 2G/3G MPC network
- Network interface troubleshooting tools (content and task based) for PCNTSH
- Network element troubleshooting (content and task based) for PCNTSH
- PCN troubleshooting cases

3G Packet Core Network Troubleshooting

3G PCNTSH



Target Group

Personnel taking care of the 3G packet core network elements and who need a structured approach to troubleshooting cases.

Objectives

After the training, the participant will be able to:

- Identify the essentials of effective troubleshooting.
- Deal with troubles in the packet core network with a structured process.

Prerequisites

3G SYSTRA, 3G ATM, IPCORE, IPSO PLAT, GGSNOM, 3G SGSNOM, 3G PCNSIG

Duration

4 days

No. of Participants

Max. 4

Modules

- Introduction to troubleshooting in 2G/3G MPC network
- Network interface troubleshooting tools (content and task based) for PCNTSH
- Network element troubleshooting (content and task based) for PCNTSH
- PCN troubleshooting cases

3G Packet Core Network Troubleshooting Delta



Target Group

Personnel taking care of the 3G packet core network elements and who need a structured approach to troubleshooting cases.

Objectives

After the training, the participant will be able to:

- Identify the essentials of effective troubleshooting.
- Deal with troubles in the packet core network with a structured process.

Prerequisites

3G SYSTRA, 3G ATM, IPCORE, GGSNOM, 3G SGSNOM, 3G PCNSIG, 2G PCNTSH

Duration

2 days

No. of Participants

Max. 4

Modules

- Introduction to troubleshooting in 2G/3G MPC network
- Network interface troubleshooting tools (content and task based) for PCNTSH
- Network element troubleshooting (content and task based) for PCNTSH
- PCN troubleshooting cases

Notes

- This course focuses on the differences between 2G/GPRS and 3G.
- The participants will have the complete 3G PCNTSH course material but only the modules mentioned in the course description will form the basis of training.

3G PCNTSH DELTA

3G Packet Core Network Signaling

3G PCNSIG



Target Group

System level experts in 3G packet core.

Objectives

After the training, the participant will be able to:

- Analyze and explain MM and SM procedures, such as PDP context activation in local and in roaming cases, involving DHCP or RADIUS and tunneled messages.
- List and explain the most relevant interfaces in the packet core network, the protocols on these interfaces and their significant messages and contents.
- Take a focused look at UMTS Release 99 interfaces using PCM, ATM and IP protocol analyzers.
- Contribute to troubleshooting and optimizing parameters of the PCN network elements.

Prerequisites

3G SYSTRA, 3G ATM, IPCORE, IPSO PLAT, 3G SGSNOM, GGSNOM

Duration

5 days

No. of Participants

Max. 4

Modules

- Training network structure for signaling
- Protocol analyzer introduction: ATM Nethawk
- Iu-PS interface
- Protocol analyzer introduction: PCM Nethawk
- Gr interface
- Protocol analyzer introduction: Ethereal
- DNS message debugging
- Gn interface
- Tracing MM/SM procedures of 3G PCN calls
- Messages in roaming cases
- DHCP and RADIUS
- Tunneled message analysis

3G Packet Core Network Signaling Delta

3G PCNSIG DELTA



Target Group

System level experts in 3G packet core networks.

Objectives

After the training, the participant will be able to:

- Analyze complex MM and SM procedures covering all relevant interfaces of the 3G packet core network.
- Analyze and explain MM and SM procedures, such as PDP context activation in local and in roaming cases, involving DHCP or RADIUS and tunneled messages.
- List and explain the most relevant interfaces in the packet core network, the protocols on these interfaces and their significant messages and contents.
- Take a focused look at UMTS Release 99 interfaces using PCM, ATM and IP protocol analyzers.
- Contribute to troubleshooting and optimizing the parameters of the PCN network elements.

Prerequisites

3G SYSTRA, 3G ATM, IPCORE, IPSO PLAT, GGSNOM, 3G SGSNOM, GPRS SIG

Duration

2 days

No. of Participants

Max. 4

Modules

- Training network structure for signaling
- Protocol analyzer introduction: ATM Nethawk
- Iu-PS interface
- Protocol analyzer introduction: PCM Nethawk
- Gr interface
- Protocol analyzer introduction: Ethereal
- DNS message debugging
- Gn interface
- Tracing MM/SM procedures of 3G PCN calls
- Messages in roaming cases
- DHCP and RADIUS
- Tunneled message analysis

New Features in Packet Core Network Release 3

MPC REL 3e



Target Group

Core network engineering personnel, core network planning personnel.

Objectives

After the training, the participant will be able to:

- Understand the new features of GGSN release GGN3, 2G SGSN release SG3 and/or 3G SGSN release SGN2.

Prerequisites

IPCORE, GPRSOVe, IPSO PLAT, GGSNOM, 2G SGSNOM, 3G SGSNOM

Duration

2 days

No. of Participants

N/A

Modules

- New features in GGSN Release 3 (GGN3)
- New features in 2G SGSN Release 3 (SG3)
- New features in 3G SGSN Release 3 (SGN2)

New Features in Packet Core Network Release 4



MPC REL 4e



Target Group

Core network engineering personnel, core network planning personnel.

Objectives

After the training, the participant will be able to:

- Understand the new features of GGSN release GGN4.1 and 4.2, 2G SGSN release SG4 and/or 3G SGSN release SGN3.

Prerequisites

IPCORE, GPRSOVe, IPSO PLAT, GGSNOM, 2G SGSNOM, 3G SGSNOM

Duration

2 days

No. of Participants

N/A

Modules

- New features in GGSN Release 4.1 (GGN4.1) (Including also short introduction to GGSN releases 4.0 and 4.2, GGN4 and GGN4.2.)
- New features in 2G SGSN Release 4 (SG4) (Including also short introduction to 2G SGSN SG3.1.)
- New features in 3G SGSN Release 3 (SGN3)

Notes

3G SGSN Release 3 (SGN3) module will be available in Q3/05.

Mobile Packet Core Network Release 3 Delta

NEW!

MPC REL 3 DELTA



Target Group

Personnel requiring competence in the new functionality in mobile packet core network release 3 software.

Objectives

After the training, the participant will be able to:

- Correctly identify the new functionality in 2G SGSN SGN3.
- Identify the new functionality GGSN rel 3/3.5/4.0.
- Correctly identify the new functionality in 3G SGSN SGN3.
- Compare and analyze the impact of the new functionality on the PCN.

Prerequisites

2G SYSTRA or 3G SYSTRA, IPCORE, IPSO PLAT, GGSNOM, 2G SGSNOM or 3G SGSNOM

Duration

2–3 days

No. of Participants

Max. 8

Modules

- 2G SGSN SGN3
- GGSN GGN release 3/3.5/4.0
- 3G SGSN SGN3
- DNS BIND 9.2

End-to-End Quality of Service

EtE QoS



Target Group

Second line engineering personnel responsible for configuration of end-to-end quality of service.

Objectives

After the training, the participant will be able to:

- Explain the meaning of end-to-end QoS.
- Explain the network elements that involve QoS in GPRS and UMTS.
- List four R97/98 and four R99 attributes and explain a meaning of each attribute.
- List two main functions in terminal equipment (TE).
- List one function in mobile termination (MT).
- Explain the radio priority based algorithm in BSS.
- Explain the purpose of the priority based QoS.
- Explain the meaning of primary and secondary PDP context.

- Explain the use of TFT, TI, linked TI, and teardown indicator in PDP context activation/modification/deactivation.
- Explain the principles of packet data transfer.
- State the new statistics introduced by QoS.
- Implement QoS in Nokia GGSN.
- Explain the QoS in radio access bearer.
- Explain the QoS in 3G packet core network bearer.
- Explain the QoS in external bearer.
- Implement charging in GPRS and UMTS.

Prerequisites

3G SYSTRA, 3G ATM, IPCORE, IPSO PLAT, GGSNOM, 3G SGSNOM

Duration

3 days

No. of Participants

Max. 8

Modules

- Introduction to Quality of Service
- End-to-end QoS in the GPRS
- End-to-end QoS in the UMTS
- Quality of Service profile
- QoS in TE/MT bearer
- QoS in 2G radio access bearer
- QoS in 2G packet core network bearer
- QoS in 3G radio access bearer
- QoS in 3G packet core network bearer
- QoS in external bearer
- Charging in GPRS related QoS
- Charging in UMTS related QoS



Target Group

Personnel responsible for OM and/or engineering of the PCN charging gateway.

Objectives

After the training, the participant will be able to:

- Explain the general charging issues in PCN.
- Configure the charging gateway and charging parameters in other network elements.
- Use the Nokia charging gateway features efficiently.

Prerequisites

2G SYSTRA or 3G SYSTRA, IPCORE, 2G SGSNOM / 3G SGSNOM, IPSO PLAT, GGSNOM

Duration

3 days

No. of Participants

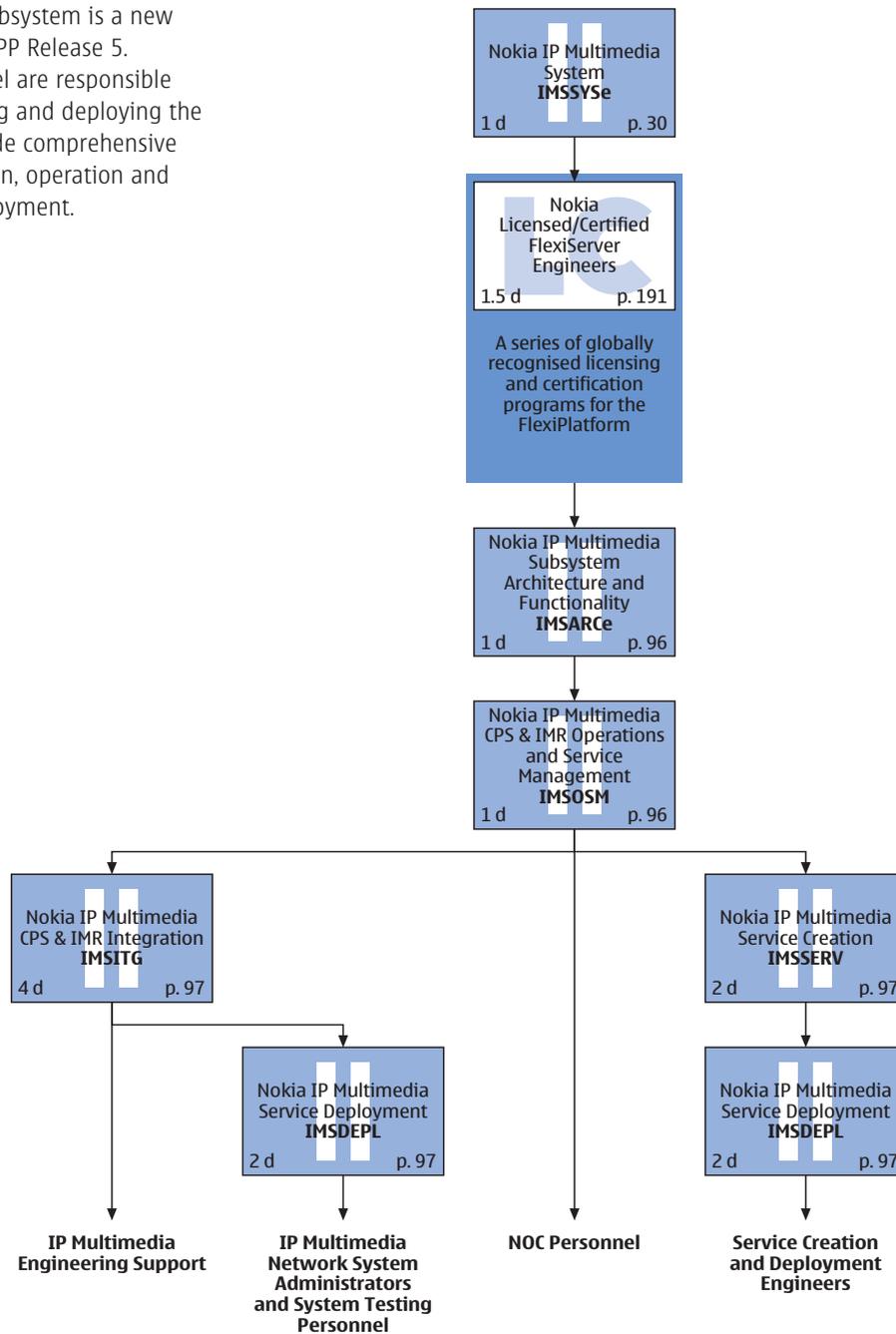
Max. 8

Modules

- Packet core network overview for charging gateway
- Charging in packet core network
- Charging gateway architecture
- Operating the charging gateway
- Charging exercises for charging gateway

IP multimedia subsystem engineering

The IP multimedia subsystem is a new solution based on 3GPP Release 5. Engineering personnel are responsible for integrating, testing and deploying the system and we provide comprehensive training for integration, operation and service creation/deployment.



Nokia IP Multimedia Subsystem Architecture and Functionality

IMSARCe



Target Group

Engineering support, system administrators, NOC personnel.

Objectives

After the training, the participant will be able to:

- Describe the IP multimedia subsystem network elements.
- Describe the architecture of IP multimedia subsystem.
- List the main system components of CPS and IMR and describe their functionalities.
- List the most important features of IMM.
- Describe the hardware and software architecture of CPS and IMR.
- Describe the interfaces between network elements and other related subsystems in Nokia IMS architecture.
- Describe the interfaces supplied by each network element in the Nokia IP multimedia subsystem.

- Describe the hardware architecture of CPS and IMR and blade structure.
- Describe the implementation of QoS and security in Nokia IMM.
- Explain the IP multimedia subsystem signaling flow.
- Explain the network element specific operation and maintenance.
- Explain the evolution of Nokia IP multimedia subsystems.

Prerequisites

IMSSYSs, Nokia FlexiServer License

Duration

1 day

No. of Participants

N/A

Modules

- IMS overview
- Nokia connection processing server
- Nokia IP multimedia register

Nokia IP Multimedia CPS & IMR Operations and Service Management

IMSOSM



Target Group

NOC personnel, engineering support personnel who are responsible for the second line maintenance of the network, service creation and integration engineers, and system administrators.

Objectives

After the training, the participant will be able to:

- Create, modify and delete an IP multimedia service for subscribers.
- Execute basic configuration tasks required in Nokia CPS and HSS for the operations of the network.

Prerequisites

IMSSYSs, Nokia FlexiServer License, IMSARCe

Duration

1 day

No. of Participants

Max. 8

Modules

- Introduction to the Nokia IP multimedia subsystem
- Operation and maintenance of Nokia IP multimedia system
- Deployment of the basic services in Nokia IP multimedia subsystem

Nokia IP Multimedia CPS & IMR Integration

IMSITG



Target Group

Engineering support personnel who are responsible for the second line maintenance of the network, and system administrators.

Objectives

After the training, the participant will be able to:

- Build the necessary configuration in Nokia IP multimedia subsystem for establishing a basic SIP session.
- Integrate all the interfaces in Nokia CPS to neighboring network elements.

- Integrate all the interfaces in Nokia IMR to neighboring network elements as well as to DX 200 HLR to form a HSS.
- Handle basic level troubleshooting cases raised in Nokia CPS and IMR.

Prerequisites

IMSSYS, Nokia FlexiServer License, IMSARCe, IMSOSM

Duration

4 days

No. of Participants

Max. 8

Modules

- CPS and IMR specific hardware installation
- Software installation and configuration in Nokia CPS and IMR
- System integration in Nokia IP multimedia subsystem
- Troubleshooting in the Nokia IP multimedia system operations

Nokia IP Multimedia Service Creation

IMSSERV



Target Group

Service creation and deployment engineers.

Objectives

After the training, the participant will be able to:

- Describe service creation based on CPL scripts.
- Create CPL scripts.
- Describe the service creation on SIP servlet API.
- Create servlets that can be deployed to Nokia IP multimedia subsystem.

Prerequisites

IMSSYS, Nokia FlexiServer License, IMSARCe, IMSOSM

Duration

2 days

No. of Participants

Max. 8

Modules

- Creation of CPL scripts
- SIP servlet API
- Creation of services on Nokia IMS solution

Nokia IP Multimedia Service Deployment

IMSDEPL



Target Group

Service creation and deployment engineers.

Objectives

After the training, the participant will be able to:

- Deploy services with deployment tool.
- Provide deployed service to users.
- Unprovide service from users.
- Undeploy services from IMS system.

Prerequisites

IMSSYS, Nokia FlexiServer License, IMSARCe, IMSOSM, IMSSERV

Duration

2 days

No. of Participants

Max. 8

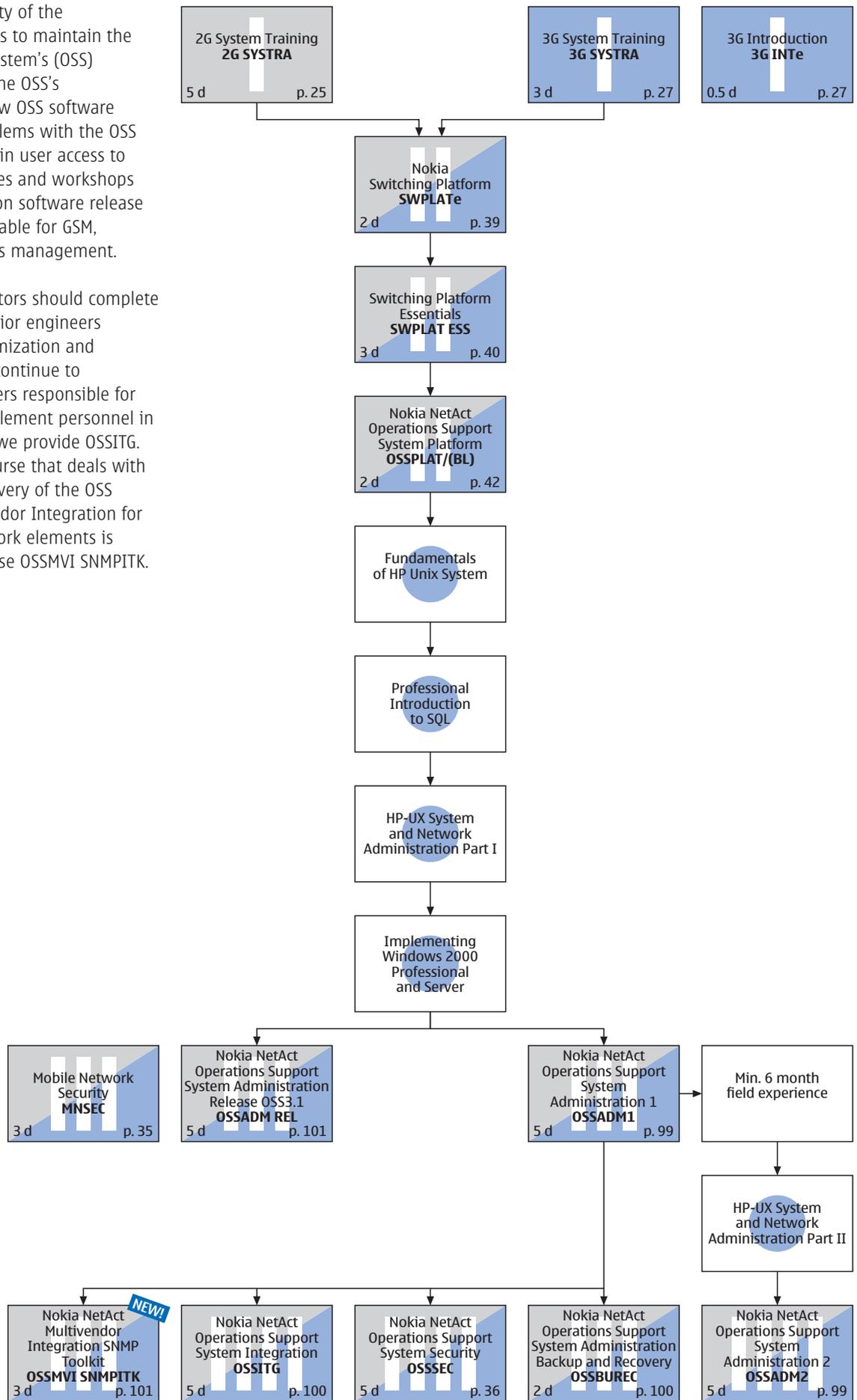
Modules

- Introduction to Nokia IMS service deployment
- IMS deployment tools and parameters
- IMS service installation and verification
- Service provisioning in IMS
- Troubleshooting in IMS service deployment

OSS administration

The main responsibility of the administration team is to maintain the operations support system's (OSS) availability, monitor the OSS's performance, plan new OSS software releases, resolve problems with the OSS and issue and maintain user access to the OSS. All our courses and workshops address the systems on software release OSS3.1 and are applicable for GSM, GPRS and 3G networks management.

All system administrators should complete the OSSADM1 and senior engineers responsible for customization and optimization should continue to OSSADM2. For engineers responsible for supporting network element personnel in network integration, we provide OSSITG. We also provide a course that deals with the back-up and recovery of the OSS (OSSBUREC). Multi-vendor Integration for SNMP managed network elements is presented in the course OSSMVI SNMPITK.



Nokia NetAct Operations Support System Administration 1

OSSADM1



Target Group

Nokia NetAct administration personnel.

Objectives

After the training, the participant will be able to:

- Describe the components of the OSS3.1 framework.
- List components and configurations for OSS3.1 hardware and storage solutions.
- Navigate the OSS3.1 file system and inquire about the RTE of their OSS3.1 installation.
- Use the OSS3.1 availability assurance features to keep the Nokia NetAct system in a stable running condition.
- Check the OSS3.1 processes and use the OSS3.1 process supervision.
- Use dynamic configuration to configure OSS3.1 processes.

- Describe the OSS3.1 database concept and environment, and employ disk supervision.
- Administer users for Nokia NetAct and for network elements.
- Describe Windows administration procedures relevant for the Windows application server in Nokia NetAct.

Prerequisites

2G SYSTRA, 3G SYSTRA, SWPLAT ESS, OSSPLAT/(BL)

Duration

5 days

No. of Participants

Max. 8

Modules

- OSS3.1 framework
- OSS3.1 hardware
- OSS3.1 run-time environment tools
- OSS3.1 availability assurance
- OSS3.1 processes
- OSS3.1 configuration
- OSS3.1 database maintenance
- OSS3.1 user management
- OSS3.1 Windows application server

Nokia NetAct Operations Support System Administration 2

OSSADM2



Target Group

Nokia NetAct (OSS) administration personnel.

Objectives

After the training, the participant will be able to:

- Perform platform administration beyond the scope of day to day maintenance.
- Perform database administration beyond the scope of day to day maintenance.
- Describe the connectivity of 2G, 3G and packet core network elements with Nokia NetAct.
- Explain, and when necessary, configure the flow of event and alarm data into Nokia NetAct.

- Explain, and when necessary, configure the flow of measurement data into Nokia NetAct.
- Find and correct specific Nokia NetAct problems using the knowledge gained in the preceding course topics.

Prerequisites

2G SYSTRA, 3G SYSTRA, SWPLAT ESS, OSSPLAT/(BL), OSSADM1

Duration

5 days

No. of Participants

Max. 4

Modules

- OSS3.1 platform administration
- OSS3.1 database administration
- OSS3.1 connectivity
- OSS3.1 event and alarm flow
- OSS3.1 measurement data flow
- OSS3.1 troubleshooting

Nokia NetAct Operations Support System Integration

OSSITG



Target Group

Nokia NetAct administration personnel.

Objectives

After the training, the participant will be able to:

- Integrate a new network element into the Nokia NetAct system.
- Troubleshoot existing network element connections.

Prerequisites

IP CORE, OSSADM1

Duration

5 days

No. of Participants

Max. 4

Modules

- Modules for DCN integration to CLNS, SNMP, NWI3, DX 200, IPA 2800, IPSO

Notes

Please order a tailored solution depending on the network elements to be integrated to Nokia NetAct.

Nokia NetAct Operations Support System Administration Backup and Recovery

OSSBUREC



Target Group

Nokia NetAct administration personnel.

Objectives

After the training, the participant will be able to:

- Take backups from the Nokia NetAct system.
- Recover the Nokia NetAct database and file system.

Prerequisites

OSSPLAT/(BL), OSSADM1

Duration

2 days

No. of Participants

Max. 4

Modules

- OSS3.1 introduction
- OSS3.1 disaster backup and recovery
- OSS3.1 Omniback
- OSS3.1 database management
- OSS3.1 database backup and recovery
- OSS3.1 RMAN – recovery manager

Nokia NetAct Operations Support System Administration Release OSS3.1

OSSADM REL



Target Group

Nokia NetAct administration personnel experienced in NMS/2000 T12.

Objectives

After the training, the participant will be able to:

- Describe the components of the OSS3.1 framework.
- List components and configurations for OSS3.1 hardware and storage solutions.
- Navigate the OSS3.1 file system and inquire about the RTE of their OSS3.1 installation.
- Incorporate changes in the use of availability assurance tools into their daily work and describe the changes in process startup and supervision from T12 to OSS3.1.
- Use dynamic configuration to configure OSS3.1 processes.
- Incorporate changes in database management into their daily work and describe new advanced database features employed in OSS3.1.

- Incorporate changes in user management from T12 to OSS3.1 into their daily work.
- Describe the new data flow for 3G network elements (RNC/MGW) and the changes in SNMP data flow from T12 to OSS3.1.
- Describe Windows administration procedures relevant for the Windows application server in Nokia NetAct.

Prerequisites

OSSPLAT/(BL)

Duration

5 days

No. of Participants

Max. 8

Modules

- OSS3.1 framework
- OSS 3.1 hardware
- T12-OSS3.1: Changes in file systems and run-time environment
- T12-OSS3.1: Changes in availability assurance and processes
- OSS3.1 configuration
- T12-OSS3.1: Changes in database management
- T12-OSS3.1: Changes in user management
- T12-OSS3.1: Changes in alarm and performance management data flow
- OSS3.1 Windows application server

Nokia NetAct Multivendor Integration SNMP Toolkit

NEW!

OSSMVI SNMPITK



Target Group

Engineers responsible for integrating 3rd party products to the Nokia NetAct and OSS system administrators.

Objectives

After the training, the participant will be able to:

- Configure Nokia NetAct for fault management adaptations.

Duration

3 days

No. of Participants

Max. 8

Prerequisites

HP-UX system administration, OSSPLAT/(BL), OSSADM1 (recommended)

Modules

- General Nokia NetAct principles for MVI
- Introduction to Nokia NetAct open southbound interfaces
- Configuring Nokia NetAct for fault management adaptations
- SNMP basics for MVI
- Configuring the SNMP integration toolkit
- Troubleshooting the SNMP integration toolkit

Network operations and control

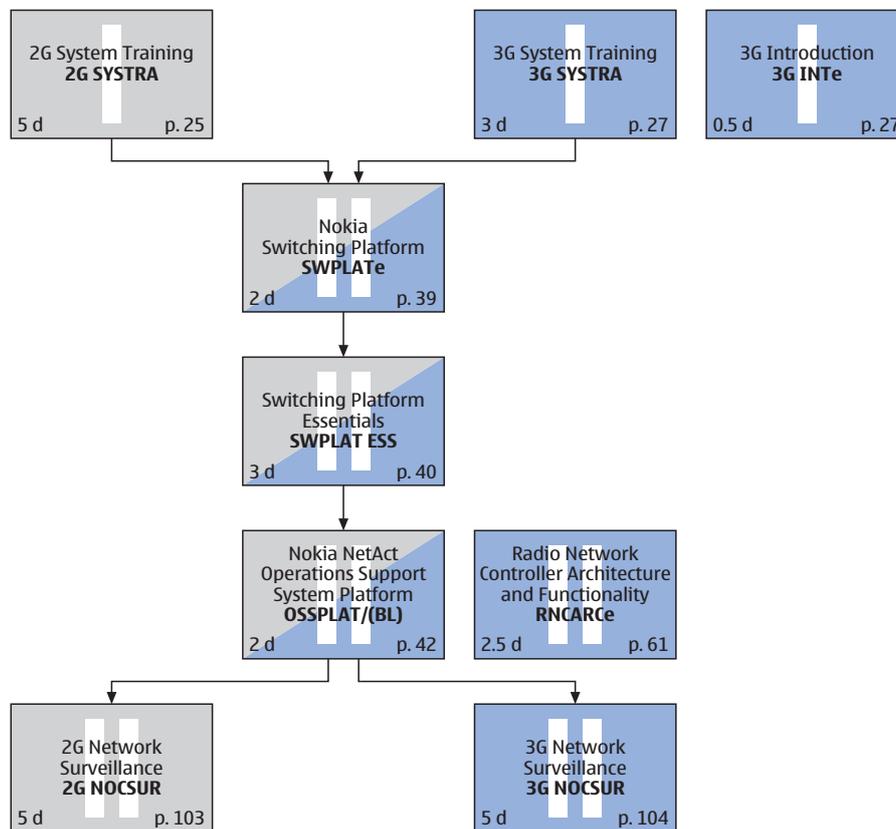
Generally, persons working in Network Operations and Control (NOC) perform network wide tasks of surveillance, maintenance co-ordination, configuration, reporting and administration. In our terminology, these persons are the first line for handling fault situations in the network and escalating problems on specific network elements to network engineering. Characteristically, NOC personnel work in a central location supporting regional or national operations and have specific task-based knowledge on a wide range of equipment.

Network surveillance

The network surveillance group typically monitors the telecom network 24 hours a day, seven days a week. The main responsibilities are to detect and analyze network faults, take corrective actions and track them in a trouble ticket system. The network surveillance team also guides the field maintenance teams

through trouble management. We provide parallel training for 2G and 3G (although these can be combined in a customized solution).

Note: For training on the Nokia Service Quality Manager please refer to pages 167 and 168.





Target Group

Network operation and control personnel responsible for network monitoring tasks in BSS, SCN and PCN using the Nokia NetAct OSS.

Objectives

After the training, the participant will be able to:

- List and give an overview of the architecture and function of Nokia BSS, SCN and PCN.
- Explain the basic concept of signaling in the Nokia GSM solution in order to analyze the fault situation and verify the availability of service.
- Monitor a network to a sufficient level, in order to identify the location of fault, its effects on service and identify a course of action to take.
- Handle BSS, SCN and PCN network faults to a stage where the target group rectifies the problem, with the proviso that the type of fault is solvable. Should the fault not be solvable then the student should identify the correct reporting procedures to take.
- Perform defined preventive maintenance tasks on BSS and core network elements, and report any problems. In addition, identify tasks affecting service and follow the correct working and reporting procedures.
- Handle preventive maintenance tasks of network elements.

Prerequisites

2G SYSTRA, SWPLATe, SWPLAT ESS, OSSPLAT/(BL)

Duration

5 days

No. of Participants

Max. 8

Modules

- BSS overview and architecture
- SCN overview and architecture
- PCN overview and architecture
- Signaling in DX 200 – NOC
- Alarm monitoring – process
- Handling BSS alarm monitoring
- Handling SCN alarm monitoring
- Handling PCN alarm monitoring
- Handling network faults – process
- Handling BSS faults
- Handling SCN faults
- Handling PCN faults
- Handling preventive maintenance tasks – process
- Handling BSS preventive maintenance tasks
- Handling SCN preventive maintenance tasks
- Handling PCN preventive maintenance tasks
- Alarm parameter management

Notes

Alarm parameter management can be included as an optional module for personnel involved in alarm parameter management and alarm flow reductions.



Target Group

Network operation and control personnel responsible for network monitoring tasks in RAN, SCN and PCN using the Nokia NetAct OSS.

Objectives

After the training, the participant will be able to:

- List and give an overview of the architecture and function of Nokia RAN, SCN and PCN.
- Explain the basic concept of signaling in Nokia GSM and WCDMA solution in order to analyze the fault situation and verify the availability of service.
- Monitor a network to a sufficient level, in order to identify the location of the fault, its effect on service and identify a course of action to take.
- Handle RAN, SCN and PCN network faults to a stage where the target group rectifies the problem, on the provision that the type of fault is solvable. Should the fault not be solvable then the student should identify the correct reporting procedures to take.
- Perform defined preventive maintenance tasks on RAN and core network elements, and report any problems. In addition, identify tasks affecting service and follow the correct working and reporting procedures.
- Handle preventive maintenance tasks of network elements.

Prerequisites

3G SYSTRA, SWPLATe, SWPLAT ESS, OSSPLAT/(BL)

Duration

5 days

No. of Participants

Max. 8

Modules

- RAN overview and architecture
- SCN overview and architecture
- PCN overview and architecture
- Signaling in IPA2800 – NOC
- Signaling in IPSO
- Alarm monitoring – process
- Handling BSS alarm monitoring
- Handling SCN alarm monitoring
- Handling PCN alarm monitoring
- Handling network faults – process
- Handling RAN faults
- Handling SCN faults
- Handling PCN faults
- Handling preventive maintenance tasks – process
- Handling RAN preventive maintenance tasks
- Handling SCN preventive maintenance tasks
- Handling PCN preventive maintenance tasks
- Alarm parameter management

Notes

Alarm parameter management can be included as an optional module for personnel involved in alarm parameter management and alarm flow reductions.

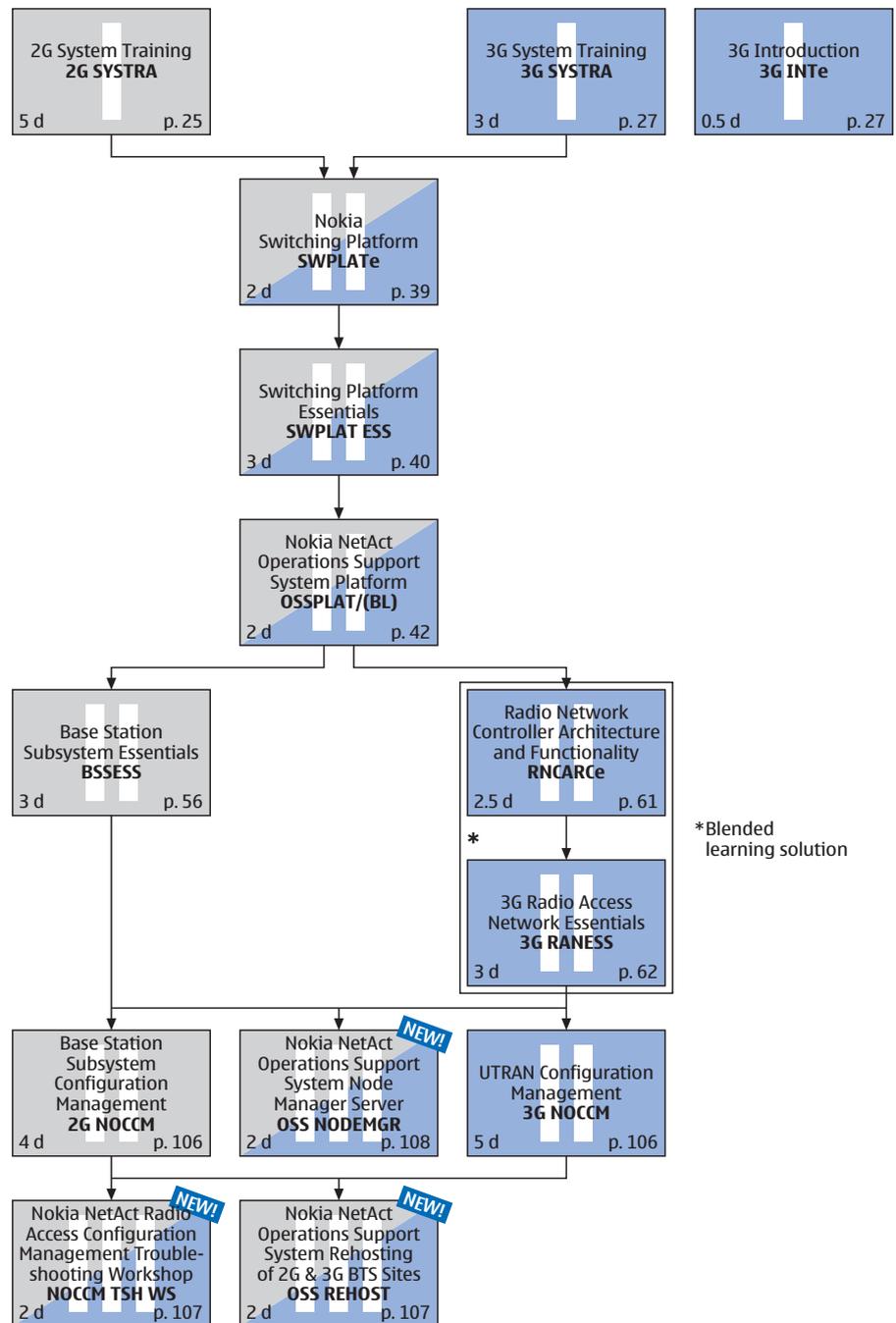
Radio network configuration

The radio network configuration personnel group typically implements enhancements and changes to the network elements' configuration on a network or area level. Other tasks are to maintain network documentation and manage software and hardware. The radio network configuration group co-operates closely with the network rollout and network planning departments.

Even though the operating principles are the same, the tools required by radio network configuration personnel are different for 2G and 3G networks so the training presents two alternatives for the different networks.

In the advanced area there is demand for very customer-specific training, so no standard training solutions are offered. However, courses and workshops can be tailored to cover advanced topics like:

- Radio access optimization
- Retuning 2G and 3G networks
- Rehosting base stations
- Managing inter-OSS adjacencies



*Blended learning solution

Base Station Subsystem Configuration Management

2G NOCCM



Target Group

Network configuration personnel;
engineering support BSS.

Objectives

After the training, the participant will be able to:

- Understand Radio Access Configurator concepts and functionality for network architecture, managed objects, configuration data, templates, non-network data and rules.
- Execute operational tasks in a radio network and use the various OSS tools.
- Perform plan based and single configuration management operations.
- Perform the integration and expansion of base stations using Nokia NetAct tools.

- Assign software to base stations using Nokia NetAct tools.
- Create and maintain views in Nokia NetAct.
- Use the offline tool Plan Editor in order to manage plans and actual data.

Prerequisites

2G SYSTRA, SWPLATe, SWPLAT ESS, OSSPLAT/(BL), BSSESS

Duration

4 days

No. of Participants

Max. 8

Modules

- RNW configuration management – principles and concepts
- 2G BSS CM related operational tasks
- RNW element software management
- View management
- CM applications
- Introduction to plan editor offline tool
- Implementing plans and retuning radio network configuration
- Exercise: Implement 2G parameter plans
- Plan based creation of BTS sites
- Exercise: Create 2G BTS site
- Managing adjacencies
- Exercise: Manage 2G adjacencies

UTRAN Configuration Management

3G NOCCM



Target Group

Network configuration personnel;
engineering support UTRAN.

Objectives

After the training, the participant will be able to:

- Understand Radio Access Configurator concepts and functionality for network architecture, managed objects, configuration data, templates, non-network data and rules.
- Execute operational tasks in a radio network and use the various OSS tools.
- Perform plan based and single configuration management operations.
- Perform the integration and expansion of base stations using Nokia NetAct tools.

- Perform the integration and expansion of base stations using NEMU/MML.
- Assign software to base stations using Nokia NetAct tools.
- Create and maintain views in Nokia NetAct.
- Use the offline tool plan editor in order to manage plans and actual data.

Prerequisites

3G SYSTRA, SWPLATe, SWPLAT ESS, OSSPLAT/(BL), RANESS

Duration

5 days

No. of Participants

Max. 8

Modules

- RNW configuration management – principles and concepts
- 3G RAN CM related operational tasks
- RNW element software management
- View management
- RNW integration and expansion – method NEMU/MML
- CM applications
- Introduction to plan editor offline tool
- Implementing plans and retuning RNW configuration
- Exercise: Implement 3G parameter plans
- Plan based creation of BTS sites
- Exercise: Create WCDMA BTS site
- Managing adjacencies
- Exercise: Manage 3G adjacencies

Notes

The module “RNW Integration and expansion – method NEMU/MML” is optional. If it is not included, the length of the course is 4 days.

NEW!

Nokia NetAct Radio Access Configuration Management Troubleshooting Workshop

NOCCM TSH WS**Target Group**

Engineering support personnel responsible for UTRAN and/or BSS configuration management.

Objectives

After the training, the participant will be able to:

- Verify and analyze faults in the RAN configuration management process and localize them in the network.
- Identify information resources for troubleshooting and describe how to use them for configuration management.
- Troubleshoot fault cases that can occur in RAN configuration management.

Prerequisites

2G SYSTRA, 3G SYSTRA, SWPLAT ESS, OSSPLAT/(BL), RANESS, BSSESS, 2G NOCCM, 3G NOCCM

Duration

2 days

No. of Participants

Max. 8

Modules

- Assessment of plan based configuration management process
- Verify performance and set up of CM applications
- Troubleshooting of configuration management faults

NEW!

Nokia NetAct Operations Support System Rehosting of 2G and 3G BTS Sites

OSS REHOST**Target Group**

Engineering support personnel responsible for BSS and or UTRAN configuration management.

Objectives

After the training, the participant will be able to:

- Rehost a 2G BTS site to another BSC with the splitting BSS application.
- Modify new parameters for the defined new objects under the target BSC.
- Move WCDMA BTS sites from one RNC to another using plan editor.
- Modify RNW configuration, ATM layer configuration and IP network configuration data required for the re-hosting operation.

Prerequisites

2G SYSTRA, 3G SYSTRA, SWPLAT ESS, OSS PLAT/(BL), RANESS, BSSESS, 2G NOCCM, 3G NOCCM

Duration

2 days

No. of Participants

Max. 8

Modules

- Rehosting of 2G BTS sites
- Rehosting of WCDMA BTS sites

Notes

This course outlines advanced modules for rehosting sites. Those modules can also be included in a tailored solution with the 2G and 3G NOCCM. For further information, please contact your Nokia Learning Solutions contact person.

NEW!

Nokia NetAct Operations Support System Node Manager Server Integration, Usage, Administration and Troubleshooting

OSS NODEMGR**Target Group**

Engineering support personnel responsible for BSS and /or UTRAN configuration management, and Nokia NetAct administrators.

Objectives

After the training, the participant will be able to:

- Describe the Node manager server-concept.
- Administer Node manager server in the Nokia NetAct environment.
- Verify element management protocols used by integrated element manager connections towards network elements.
- Troubleshoot Node manager problems.

Prerequisites

2G SYSTRA, 3G SYSTRA, SWPLAT ESS, OSS PLAT/(BL), RANESS, BSSESS, OSSADM1

Duration

2 days

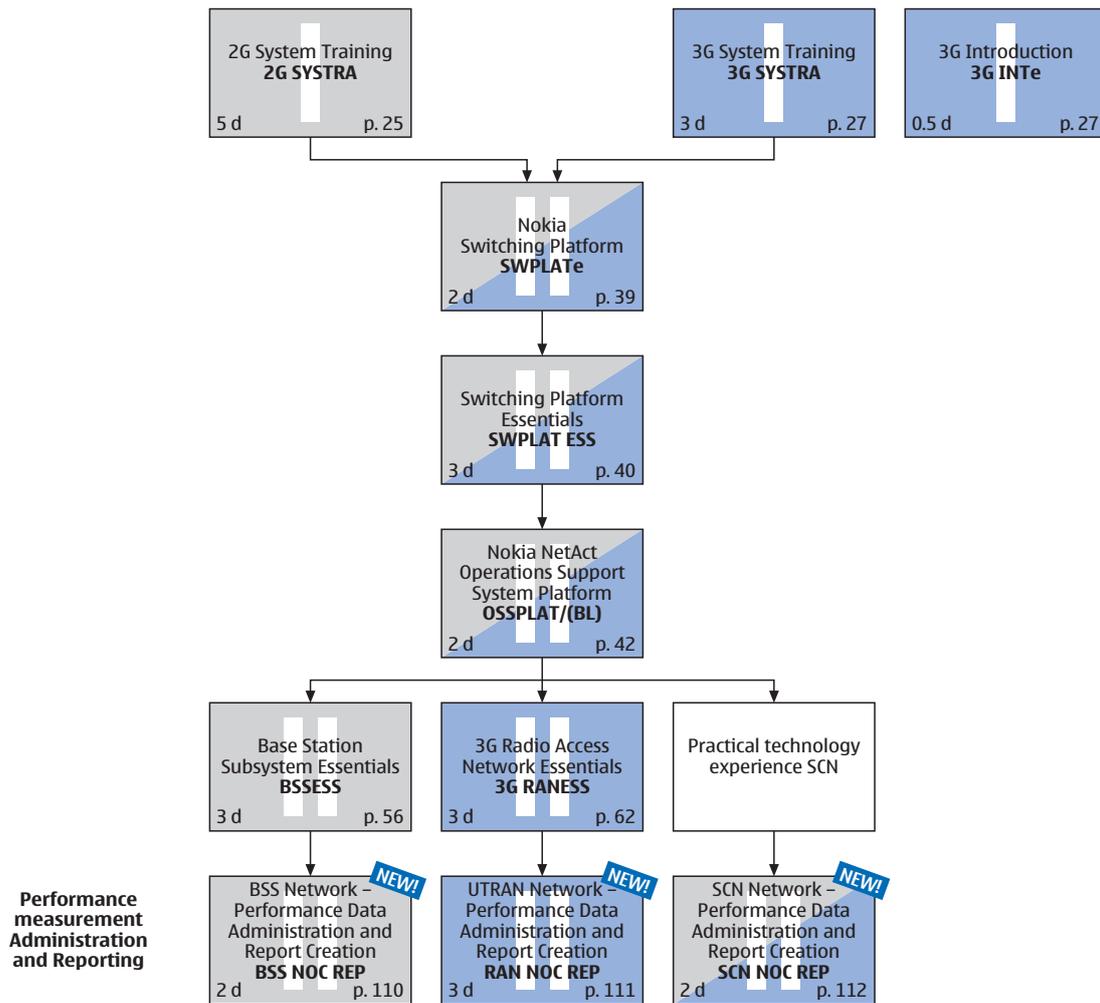
No. of Participants

Max. 8

Modules

- Introduction to Node managers and Node manager server
- Node manager installation and integration(s) to Node manager server
- Node manager information in managed network element configuration
- Node manager troubleshooting

Network performance reporting



The network performance reporting group is responsible for monitoring the quality of service in the network and looking for potential faults and service-related problems through the use of network statistics.

The BSS NOC REP, RAN NOC REP and SCN NOC REP courses explain the administration of performance data from the sub network and how the data in the Nokia NetAct OSS can be visualized using Reporter applications. These courses can be tailored to cover more technologies in one course.

If you need more consultative workshops on defining or analyzing specific elements in your own network, please contact your local Nokia Learning Solutions contact person.

Base Station Subsystem Network – Performance Data Administration and Report Creation

NEW!

BSS NOC REP



Target Group

2G network measurement administration and reporting personnel.

Objectives

After the training, the participant will be able to:

- Describe the NOC performance management process and discuss the interdependence with the other NOC processes such as monitoring the network or proactive maintenance.
- Describe the administration of network performance data process and embed it into the whole NOC performance management process.
- Describe and perform the administration of network performance data with Nokia NetAct.
- Describe and perform the administration of network performance data locally in the BSS network.
- Describe PM process, report definition process, measurement administration process and reporting process.
- Explain purpose and scope of Nokia NetAct Reporter tools used by different user groups.
- Demonstrate how to view predefined reports with Report Browser and KPI Browser.
- Apply the Report Builder tools to define, organize and store KPI formulas.
- Define a new example report with Report Builder and organize this report for regular reporting in the report tree using the report creation process previously defined.

Prerequisites

2G SYSTRA, SWPLATe, SWPLAT ESS, OSSPLAT/(BL), BSSESS

Duration

2 days

No. of Participants

Max. 8

Modules

- Performance management principles in network operation and control – process
- Administration of performance data – process
- Nokia NetAct – centralized administration of performance data
- BSS – administration of performance data
- Reporting processes and Nokia NetAct Reporter introduction
- Report viewing and KPI viewing process
- Report creating and KPI creating process

Notes

This course can be delivered as a tailored solution including RAN and SCN modules.

UTRAN Network – Performance Data Administration and Report Creation

NEW!

RAN NOC REP



Target Group

3G network measurement administration and reporting personnel.

Objectives

After the training, the participant will be able to:

- Describe the NOC performance management process and discuss the interdependence with the other NOC processes such as monitoring the network or proactive maintenance.
- Describe the administration of network performance data process and embed it into the whole NOC performance management process.
- Describe and perform the administration of network performance data with Nokia NetAct.
- Describe and perform the administration of network performance data locally in the UTRAN network. If possible use local applications to generate example reports in network elements.
- Describe the PM process, report definition process, measurement administration process and reporting process.
- Explain purpose and scope of Nokia NetAct Reporter tools used by different user groups.
- Demonstrate how to view predefined reports with Report Browser and KPI Browser.
- Apply the Report Builder tools to define, organize and store KPI formulas.
- Define a new example report with Report Builder and organize this report for regular reporting in the report tree using the report creation process previously defined.

Prerequisites

3G SYSTRA, SWPLATe, SWPLAT ESS, OSSPLAT/(BL), 3G RANESS

Duration

3 days

No. of Participants

Max. 8

Modules

- Performance management principles in network operation and control – process
- Administration of performance data – process
- Nokia NetAct – centralized administration of performance data
- UTRAN – administration of performance data using NEMU applications
- Reporting processes and Nokia NetAct Reporter introduction
- Report viewing and KPI viewing process
- Report creating and KPI creating process

Notes

This course can be delivered as a tailored solution including BSS and SCN modules.

Switching Core Network – Performance Data Administration and Report Creation

NEW!

SCN NOC REP



Target Group

SCN measurement administration and reporting personnel.

Objectives

After the training, the participant will be able to:

- Describe the NOC performance management process and discuss the interdependence with the other NOC processes such as monitoring network or proactive maintenance.
- Describe the administration of the network performance data process and embed it into the whole NOC performance management process.
- Describe and perform the administration of network performance data with Nokia NetAct.
- Describe and perform the administration of network performance data locally in the SCN.
- Describe the PM process, report definition process, measurement administration process and reporting process.
- Explain purpose and scope of Nokia NetAct Reporter tools used by different user groups.
- Demonstrate how to view predefined reports with Report Browser and KPI Browser.
- Apply the Report Builder tools to define, organize and store KPI formulas.
- Define a new example report with Report Builder and organize this report for regular reporting in the report tree using the report creation process previously defined.

Prerequisites

3G SYSTRA, SWPLATe, SWPLAT ESS, OSSPLAT/(BL)

Duration

2 days

No. of Participants

Max. 8

Modules

- Performance management principles in network operation and control – process
- Administration of performance data – process
- BSS – administration of performance data
- Reporting processes and Nokia NetAct Reporter introduction
- Report viewing and KPI viewing process
- Report creating and KPI creating process

Notes

This course can be delivered as a tailored solution including BSS and RAN modules.

Network planning

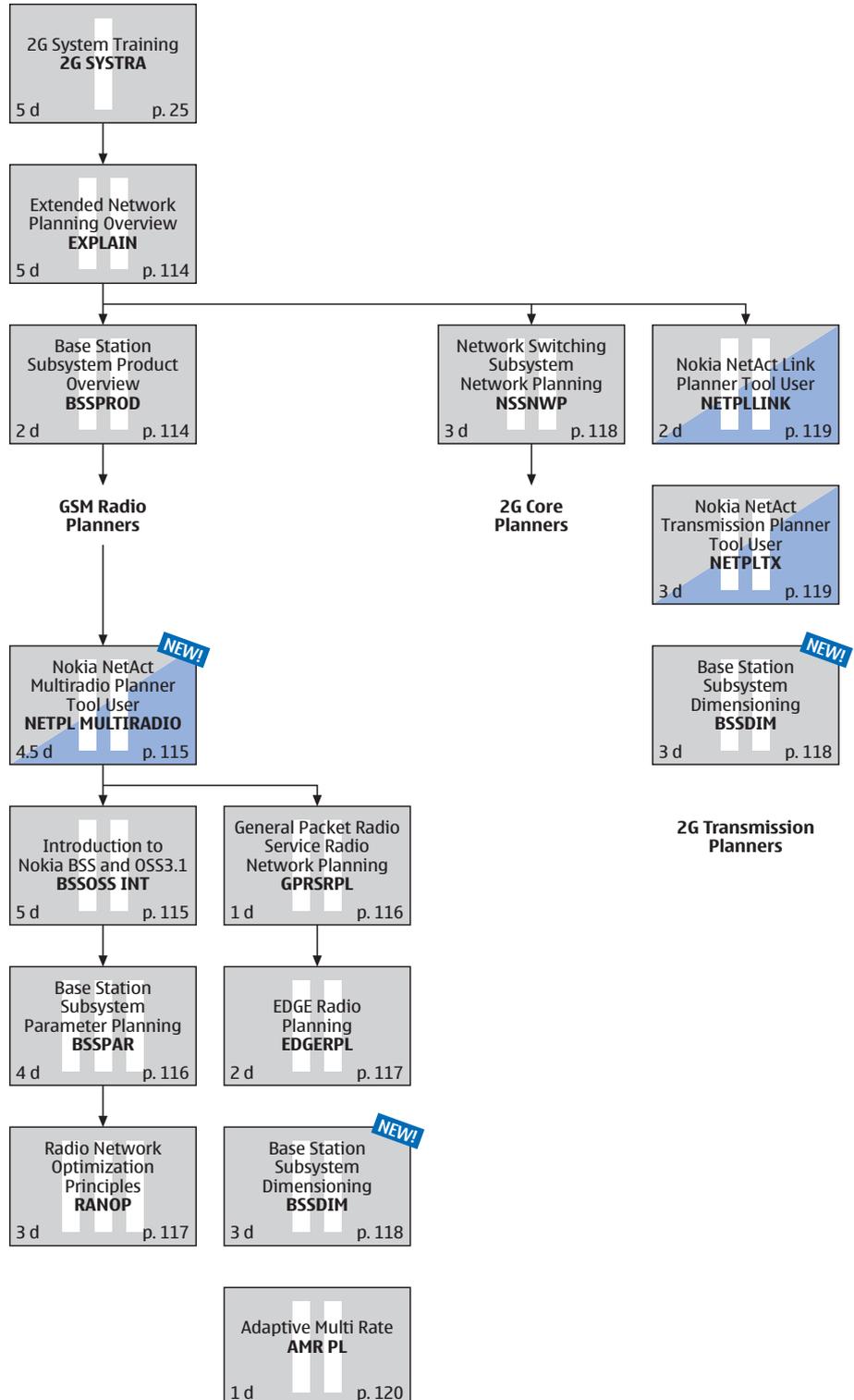
GSM, GPRS, EDGE

Network planning covers a wide area of personnel responsible for planning, parameter configuration, performance and optimization. This target group typically supports the operation and maintenance people, as well as the customer care and project management functions. Network planners are required to have a deep understanding of the technology and a proficiency in using the appropriate planning tools. Furthermore, network optimization personnel typically provide network status reports and trigger proactive maintenance.

The Nokia recommended learning solution is focused on developing the knowledge and skills needed to plan and optimize the radio and core network.

If you have a more specific and practical requirement, the development solution could be a consultancy workshop by our Network Performance Services.

Our recommended flow for GSM, GPRS and EDGE network planners comprises of introductory training on network technology (courses 2G SYSTRA, EDGESYS, GPRSOVe), with release updates (BSS REL), principles of network planning and optimization (courses EXPLAIN, RANOP), planning knowledge on the Nokia equipment (courses BSSPROD, BSSPAR, GPRSRL, NSSNWP, EDGERPL, BSSDIM), and hands-on training for Nokia network planning tools and network management system (courses NETPL MULTIRADIO, BSSOSS INT, NETPLTX, NETPLLINK).



Extended Network Planning Overview

EXPLAIN



Target Group

Network planning and network optimization personnel.

Objectives

After the training, the participant will be able to:

- Name and describe the main network elements in GSM.
- Understand radio wave propagation physics.
- Explain basic network planning methods, tasks to be done during the entire planning process.
- Describe different planning tools used.

Prerequisites

2G SYSTRA

Duration

5 days

No. of Participants

Max. 24

Modules

- GSM standardization and technology
- Radio propagation channel
- Radio network planning process
- Configuration planning
- Coverage planning
- Capacity planning
- Frequency planning
- Optimization and radio network functionality
- Transmission planning
- Radio network planning tools
- Special cases: indoor and tunnel environments
- Other technologies: TETRA, GPRS, EDGE and UMTS
- EXPLAIN exercise

Base Station Subsystem Product Overview

BSSPROD



Target Group

Network planning and network optimizing personnel.

Objectives

After the training, the participant will be able to:

- Name the different BTS types.
- List installation requirements.
- Describe capacity and configuration possibilities.
- List different BSC configurations.
- Know the maximum number of TRXs per BSC.

Prerequisites

2G SYSTRA, EXPLAIN

Duration

2 days

No. of Participants

Max. 24

Modules

- Nokia Talk Family BTS products: dimensions, capacity and functionality
- Nokia MetroSite elements: dimensions, capacity and functionality
- Nokia UltraSite elements: dimensions, capacity and functionality
- Nokia InSite Site BTS dimensions, capacity and functionality
- Microwave products for Nokia Talk Family, Nokia MetroSite and Nokia UltraSite solutions
- Transmission units and configuration examples
- TCSM2 and BSC2E / BSC2I dimensions and capacity

Nokia NetAct Multiradio Planner Tool User

NEW!

NETPL MULTIRADIO



Target Group

Engineers who will tune the Nokia NetAct Multiradio Planner tool

Objectives

After the training, the participant will be able to:

- Set up Nokia NetAct, create projects and work with GIS.
- Create site templates, cell layers and antenna slots.
- Define frequency bands, frequency layer and interference tables.
- Compare empirical models, diffraction models and the wave sight model.
- Perform traffic analysis and cell dimensioning.
- Work with ILSA, create a new frequency plan and work with existing frequency plans.
- Generate neighbors and allocate exceptions.

Prerequisites

2G SYSTRA, 3G SYSTRA and planning knowledge on these technologies.

Duration

4.5 days

No. of Participants

Max. 12

Modules

- Introduction to Nokia NetAct Planner
- Setting up a new project
- Radio network dimensioning
- Neighbors and code planning
- Parameter tuning
- Generating reports
- Simulating radio network

Notes

- This course replaces NETPLRNW and NETPLWCDMA and will be available in Q1/05
- The course covers both 2G and 3G aspects
- Module names may change

Introduction to Nokia BSS and OSS3.1

BSSOSS INT



Target Group

Network planning and network optimization personnel.

Objectives

After the training, the participant will be able to:

- Describe the functions of the BSC and TCSM2E, their capacity and configuration.
- Understand radio access configurator concepts and functionality for network architecture, managed objects, configuration data, templates, non-network data and rules.
- Perform plan based configuration management operations.
- Use the offline tool plan editor in order to manage plans and actual data.

Prerequisites

2G SYSTRA, EXPLAIN, BSSPROD

Duration

5 days

No. of Participants

Max. 8

Modules

- BSS overview
- TCSM2E basic operation
- BSC general description
- Nokia NetAct basic architecture
- Using Nokia NetAct
- RNW configuration management – principles and concepts
- CM applications
- Introduction to plan editor offline tool
- Implementing plans and retuning RNW configuration
- Exercise implement 2G parameter plans
- Managing adjacencies

Base Station Subsystem Parameter Planning

BSSPAR



Target Group

GSM radio network planning and optimization engineers.

Objectives

After the training, the participant will be able to:

- Define parameter values for idle mode operation.
- Identify parameters for radio resource management.
- Discuss the power control and handover processes.
- Describe the parameters for selected Nokia BSS features.
- Plan the parameters for several types of cells.
- List the parameters that are used for (E)GPRS radio timeslot classification.
- List the parameters that are used for providing HSCSD services.

Prerequisites

2G SYSTRA, EXPLAIN, BSSPROD, BSSOSS INT

Duration

4 days

No. of Participants

Max. 12

Modules

- BSSPAR course introduction
- Introduction to parameter planning
- Radio channel configurations
- Idle mode operation
- BSS protocols and signaling capacity
- Radio resource management
- Measurement processing
- Power control (GSM)
- Handover control and adjacencies
- Coverage enhancement features
- Capacity and spectral efficiency features
- Radio network performance features
- Voice and channel coding (FR, HR, EFR, AMR)
- Dual band features
- Intelligent underlay overlay
- High speed circuit switched data
- GPRS and EGPRS (EDGE)
- MS location services

General Packet Radio Service Radio Network Planning

GPRSRPL



Target Group

Radio network planners with little or no GPRS planning experience.

Objectives

After the training, the participant will be able to:

- Explain how the territory allocation algorithm works and how it affects delays and throughputs in GPRS networks.
- Explain how to dimension the radio network capacity in a GPRS network.
- Describe how to use the measurements and counters to monitor effectively GPRS network performance.

Prerequisites

2G SYSTRA, EXPLAIN, BSSPROD, GPRSRPL, EDGESYS

Duration

1 day

No. of Participants

Max. 12

Modules

- MS location services
- GPRS review
- Protocols and signaling
- Radio network planning and dimensioning
- GPRS performance, counters and KPIs

Radio network Optimization Principles



Target Group

Network planning personnel, employees that are involved in comprehensive radio network optimization, such as NMS operating personnel.

Objectives

To provide participants with the knowledge and skills to optimize Nokia GSM networks. The participant will be introduced to the general network optimization process, get to know how to calculate quality indicating figures and learn about important BSC counters. Moreover, measurement types and counter numbers will be explained. Many case studies and practice oriented group works are part of the training as well as optimization related Nokia features.

Prerequisites

2G SYSTRA, EXPLAIN, BSSPROD, GPRSRPL, EDGESYS

Duration

3 days

No. of Participants

Max. 12

Modules

- Course introduction
- Network quality cycle
- Quality targets
- Monitor quality
- Quality reporting
- Network configuration analysis
- Quality in detail
- General quality improvement
- Reference material

EDGERPL

EDGE Radio Planning



Target Group

Network planning personnel needing a good theoretical knowledge of the EDGE system.

Objectives

After the training, the participant will be able to:

- Know what the Nokia EGPRS solution is.
- Discuss the effect of EDGE on radio network planning.
- Explain the different modulation and coding schemes.
- Describe the structure of an EGPRS radio block.
- Perform link budget calculations for all modulation and coding schemes.
- Discuss TRS planning issues introduced by EDGE.

Prerequisites

2G SYSTRA, EXPLAIN, BSSPROD, GPRSRPL, EDGESYS

Duration

2 days

No. of Participants

Max. 12

Modules

- EDGE introduction
- EGPRS implementation
- EGPRS radio planning
- EGPRS transmission overview

Base Station Subsystem Dimensioning

NEW!

BSSDIM



Target Group

GSM network design, engineering, planning, purchasing, operations and optimization personnel, BSS field personnel.

Objectives

After the training, the participant will be able to:

- Describe the functionalities, interconnections, configurations, and capacities of each network element in the Nokia Base Station Subsystem.
- Explain the network planning inputs and outputs, which are required to dimension and implement a BSS.
- Perform the dimensioning of base station sites for type, range, coverage, capacity and grade of service.
- Dimension cellular transmission links, with capacity for traffic and signaling, for efficiency and reliability.

- Perform the dimensioning and configuration planning of the Nokia Base Station Subsystem and Transcoder.
- Dimension the capacity of all types of BSS signaling links, to avoid them causing performance bottlenecks.
- Outline features (in software and hardware), which may be used to enhance Nokia BSS performance statistics for coverage, capacity, quality, and spectral efficiency and how they affect dimensioning exercises.

Prerequisites

2G SYSTRA, BSSSESS, GSM/GPRS/EDGE knowledge

Duration

3 days

No. of Participants

Max. 12

Modules

- BSS network configuration and interfaces
- BSS control plane and user plane flow
- BSS dimensioning strategies and rules
- Radio network planning and traffic engineering principles
- Abis BTS, BSC interface dimensioning
- PCU capacity and dimensioning
- TCSM capacity and dimensioning
- Gb capacity and dimensioning
- Special features and dimensioning

Network Switching Subsystem Network Planning

NSSNWP



Target Group

Network planning engineers needing a good theoretical and practical knowledge of the network switching subsystem (NSS) planning.

Objectives

After the training, the participant will be able to:

- List the most important planning/ dimensioning factors.
- Use an excel sheet for NSS dimensioning and modify it for their own needs.
- Provide MSC and HLR detailed planning information.
- Describe the functionalities of Nokia SRRi and the SIGTRAN and IP-trunk solution
- Describe the NSS measurements and statistics.
- Describe the most important improvements in M12 and their impact.

Prerequisites

NSSROU, NSSSIG

Duration

3 days

No. of Participants

Max. 12

Modules

- Detailed planning
- Measurements and statistics
- NSS dimensioning
- SIGTRAN, IP-trunk planning and M12 Delta
- SRRi planning

Nokia NetAct Link Planner Tool User

NETPLLINK



Target Group

Engineers involved in maintenance and planning of digital microwave radio links and who work with Nokia NetAct Planner.

Objectives

After the training, the participant will be able to:

- Set up Nokia NetAct, create projects, and work with the GIS.
- Explain the Nokia NetAct Link Planner concept, set up the equipment parameters, and synchronize with transmission planner.
- Configure the physical network using the link database and view window.
- Use propagation prediction models correctly and create the link budget tab.

- Create and analyze the link performance tabs.
- Plan frequency channels and use the interference tool to assess levels of interference between microwave sites.
- Calculate the route, capacity and map timeslots.
- Produce and analyze various types of reports.

Prerequisites

2G SYSTRA, EXPLAIN

Duration

2 days

No. of Participants

Max. 12

Modules

- Nokia NetAct software fundamentals
- Nokia NetAct Link Planner software fundamentals, radio equipment characteristic, antenna consideration
- Designing the physical network (initial planning)
- Link budget and microwave propagation
- Quality and performance calculation
- Frequency planning and interference analysis
- Planning routes and timeslots
- Reports in Nokia NetAct Link Planner

Nokia NetAct Transmission Planner Tool User

NETPLTX



Target Group

TX planning personnel dealing with fixed and cellular networks both for voice and data transmission, and working with Nokia NetAct Transmission Planner.

Objectives

After the training, the participant will be able to:

- Set up Nokia NetAct, create projects, and work with the GIS.
- Explain the module concept, create plans, and synchronize with link planner.
- Plan the conduit and transmission topology and route logical connections.
- Design circuit switch networks and dimension links.
- Design interswitch networks, generate traffic and dimension links.
- Design 3G and IP networks and dimension links.

- Design signaling networks, generate traffic and dimension links.
- Plan ATM networks according to overlying data traffic.
- Plan SDH networks according to overlying data and voice traffic.
- Plan optical networks according to overlying SDH and transmission networks.
- Plan low-level properties of physical network devices.

Prerequisites

2G SYSTRA, EXPLAIN

Duration

3 days

No. of Participants

Max. 12

Modules

- Nokia NetAct software fundamentals
- Nokia NetAct Transmission Planner software fundamentals
- Basic transmission network planning
- Interswitch network planning
- 3G ATM and IP cellular network planning
- Signaling network planning
- ATM transmission planning
- PDH/SDH transmission planning
- Optical transmission planning
- Detail network planning

Adaptive Multi Rate

AMR PL



Target Group

Personnel who need knowledge of AMR to plan, implement and maintain AMR.

Objectives

After the training, the participant will be able to:

- Explain basics of AMR, AMR link adaptation and codec adaptation principles, AMR benefits, AMR interaction with other BSS solutions and AMR parameters and implementation.

Prerequisites

2G SYSTRA

Duration

1 day

No. of Participants

Max. 12

Modules

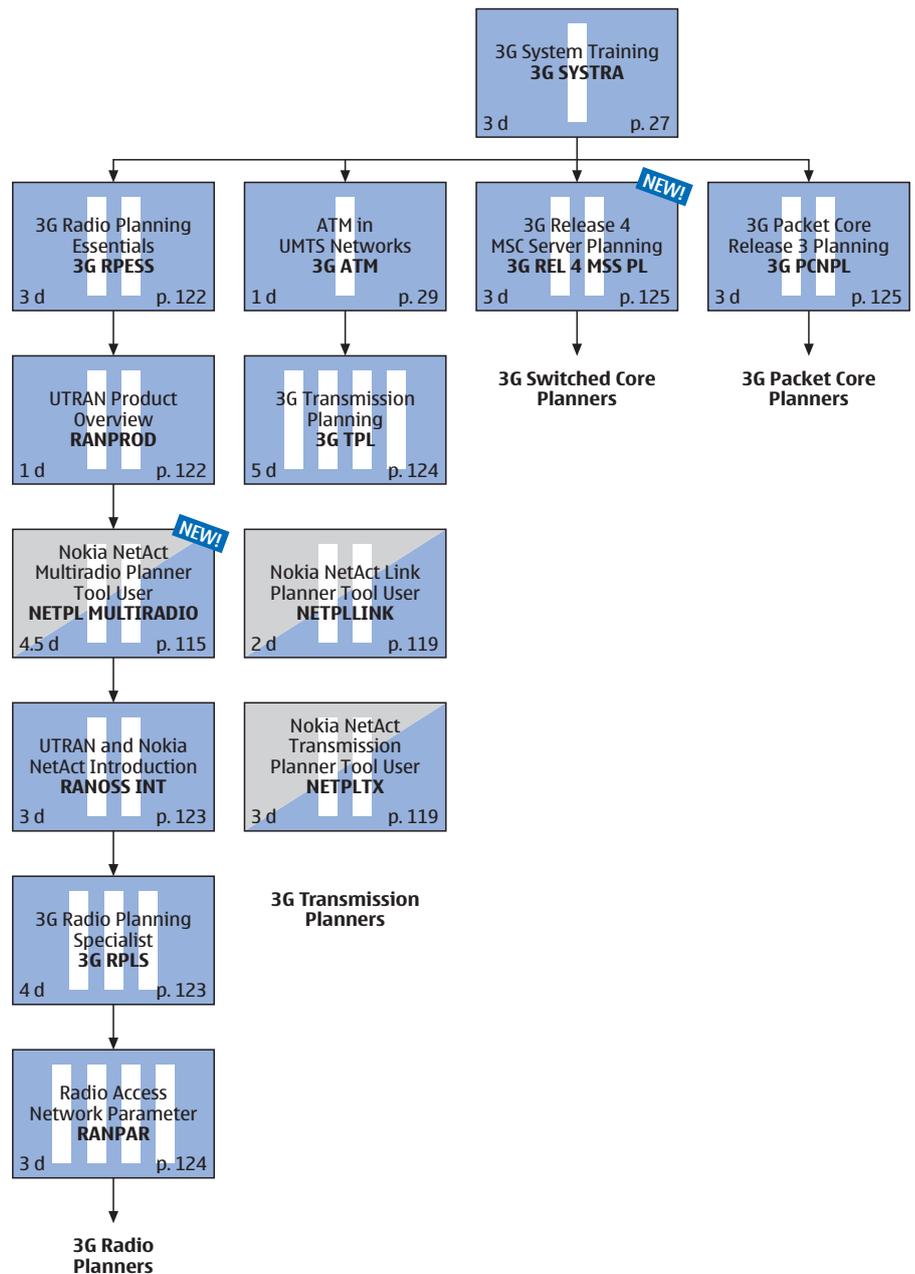
- Overview of AMR technology
- Implementation of AMR in Nokia solution
- Nokia AMR planning aspects
- AMR performance

Notes

Nokia does not provide release training specifically for planners. Instead, we recommend that network planners use our release e-learning to study new features (BSS REL The).

3G network planning

Our recommended course flow for 3G network planning comprises of introductions to network technology training (courses 3G SYSTRA, 3G ATM), principles of network planning and optimization (courses 3G RPESH, 3G PCNPL, 3G REL 4 MSS PL) followed by comprehensive planning knowledge on the Nokia equipment (courses RANPROD, RANPAR, 3G RPLS, 3G TPL), and hands-on training for Nokia network planning tools and network management system (courses NETPL MULTIRADIO, RANOSS INT, NETPLTX, NETPLLINK).



3G Radio Planning Essentials

3G RPESS



Target Group

Radio planners having a GSM background with a basic understanding of a 3G network.

Objectives

The aim of this course is to provide participants with the knowledge about 3G radio network planning. The key factors affecting a WCDMA power budget calculation and capacity and coverage planning issues will be discussed. Co-siting with GSM as well as coverage and capacity improvement alternatives will be presented. Many case studies and practice oriented group works are also part of the training.

Prerequisites

3G SYSTRA

Duration

3 days

No. of Participants

Max. 12

Modules

- WCDMA fundamentals concerning network planning
- Radio network dimensioning
- Power budget calculation
- Coverage and capacity planning
- Capacity and coverage improvement
- Pre-launch optimization
- Nokia WCDMA Base Station Family
- WCDMA/GSM co-Siting
- RAN sharing
- Multilayer planning
- Planning support for 3G rollout
- Case study

UTRAN Product Overview

RANPROD



Target Group

Radio network planning personnel, civil works personnel.

Objectives

After the training, the participant will be able to:

- List the basic RAN products.
- Understand their configurations.

Prerequisites

3G SYSTRA

Duration

1 day

No. of Participants

Max. 24

Modules

- Nokia UltraSite WCDMA BTS Product Family
- General WCDMA BTS system architecture
- Mechanical size, weight, cable entry, footprints, power consumption
- Cooling system
- Installation requirements for building static, required space
- Battery back-up system
- Site support cabinet, cabinet chaining
- WCDMA BTS sensitivities
- WCDMA BTS power
- Capacity and configuration possibilities
- Transmission capabilities
- Co-siting/interworking 3G-2G equipment
- Antenna configurations
- Nokia duplexer and combiner
- Mast head amplifier

UTRAN and Nokia NetAct Introduction

RANOSS INT



Target Group

Network planning and network optimization personnel.

Objectives

After the training, the participant will be able to:

- Understand radio access configurator concepts and functionality for network architecture, managed objects, configuration data, templates, non-network data and rules.
- Perform plan based configuration management operations.
- Use the offline tool plan editor to manage plans and actual data.

Prerequisites

3G SYSTRA, 3G RPESS, RNCARCe, RANPROD

Duration

3 days

No. of Participants

Max. 8

Modules

- Nokia NetAct basic architecture
- Using Nokia NetAct
- Radio network configuration management – principles and concepts
- CM applications
- Introduction to plan editor offline tool
- Implementing plans and retuning radio network configuration
- Exercise implement 3G parameter plans
- Managing adjacencies

3G Radio Planning Specialist

3G RPLS



Target Group

Personnel needing a good theoretical knowledge of the main WCDMA system procedures of the access and non-access stratum. 3G radio network planners.

Objectives

After the training, the participant will be able to:

- Explain how UTRAN controls the UE's behavior. As part of the network planning process, wide ranges of parameters have to be set. Their meaning, the context of their use, potential impact on coverage and capacity, and the equivalent Nokia parameters are covered. Procedures for parameter exchange between the UE and UTRAN are presented.
- Many procedures are timer driven, and its impact on the network performance is outlined. UTRAN also commands the UE to perform measurements, which are required by RNC to perform tasks such as handover control and admission control. Finally, the impact of higher layer procedures on mobility and connection management on UTRAN and WCDMA is covered.

Prerequisites

3G SYSTRA, 3G RPESS, RANOSS INT

Duration

4 days

No. of Participants

Max. 12

Modules

- Warm-up
- Physical layer
- RRC modes, system information, paging, and update procedures
- Cell selection and reselection
- RRC connection establishment
- WCDMA measurements in the UE
- GSM measurements for inter-RAT cell reselection and handover
- Mobility management and connection management
- UTRAN control protocol overview (without RRC)

Radio Access Network Parameter

RANPAR



Target Group

Personnel needing a good theoretical knowledge of the main WCDMA RRM system parameters.

Objectives

After the training, the participant will be able to:

- Describe the purpose of RRM.
- List the RRM functional entities.
- Describe the purpose of each of the RRM functional entities.
- Identify the location of RRM entities.
- Identify relationships between RRM entities.
- Describe the Nokia RAN parameter database structure.

Prerequisites

3G SYSTRA, 3G RPESH, RANOSS INT, 3G RPLS

Duration

3 days

No. of Participants

Max. 12

Modules

- Radio resource management functions overview
- Physical channels
- Load control
- Admission control algorithms and parameters
- Packet scheduler algorithm and parameters
- Handover control
- Power control
- Resource manager

3G Transmission Planning

3G TPL



Target Group

Personnel needing a good theoretical knowledge of 3G transmission network planning and available network elements.

Objectives

After the training, the participant will be able to:

- Understand CES and IMA and some 2G and 3G co-siting solutions.
- Review Nokia cellular transmission PDH and SDH equipment and explain the basics of Nokia MetroHub, FIU19, Marconi SDH nodes, Nokia PowerHopper and DMC Altium.
- Describe the Iub ATM connections to BS.
- Understand AXN different units and interfaces.
- Understand LACE process and the use of transmission planner.
- Understand the different ATM transmission and cross-connections parameters of the AXN.

- Understand the RNC different interfaces.
- Understand the RNC ATM transmission and cross-connections parameters.
- Understand the basics of ATM AAL2 traffic, addressing and routing and their RNC parameters.
- Understand the basis of IP over ATM for user data and their RNC parameters.
- Understand synchronization principles of a 3G transmission network.
- Understand how synchronization takes place at each network element (SDH/PDH equipment, AXN, RNC, SGSN).

Prerequisites

3G SYSTRA, 3G ATM

Duration

5 days

No. of Participants

Max. 12

Modules

- Course introduction
- ATM overview

Notes

The course is meant for transmission planners working in networks with Nokia RNC and AXN. If the network is equipped with either RNC or AXN, the course can be shorter.

3G Release 4 MSC Server Planning

NEW! 3G REL 4 MSS PL



Target Group

CS core network planners working with 3G Release 4 network.

Objectives

After the training, the participant will be able to:

- Design a 3G Release 4 CS core network and fill in the source data with the right parameters.

Prerequisites

3G SYSTRA, GSM experience, CS core planning, good understanding of 3G Release 4 features

Duration

3 days

No. of Participants

Max. 12

Modules

- Overview of 3G Release 4 MSS System
- Network dimensioning
 - MSS, MGWs, traffic and backbone
 - Network structure and architecture
 - Topology options
 - Signaling
- Practical tasks – detailed design for:
 - Plan LAN connectivity and IP addressing
 - Plan SIGTRAN, MEGACO, BICC connections
 - Plan virtual MGWs
 - Plan user plane routing
 - Plan the external connections

Notes

Module names may change.

3G Packet Core Release 3 Planning

3G PCNPL



Target Group

Network planners who need a good foundation knowledge and understanding of the Nokia 3G packet core network solution and need to learn 3G PS core network planning.

Objectives

After the training, the participant will be able to:

- Understand planning processes for a 3G network with a focus on MPC networks.
- Explain network planning considerations for various scenarios, including GSM/GPRS to 3G network evolution.
- Describe important functionalities in 3G MPC network elements required for network planning.
- Explain 3G interfaces and planning considerations for all MPC related interfaces.

- Describe PS core network connectivity and infrastructure planning.
- Explain how to dimension 3G MPC network elements including future evolution possibilities.
- Understand quality of service in a 3G network with particular focus on MPC from the planning point of view.
- List security considerations while planning a 3G MPC network.

Prerequisites

3G SYSTRA

Duration

3 days

No. of Participants

Max. 12

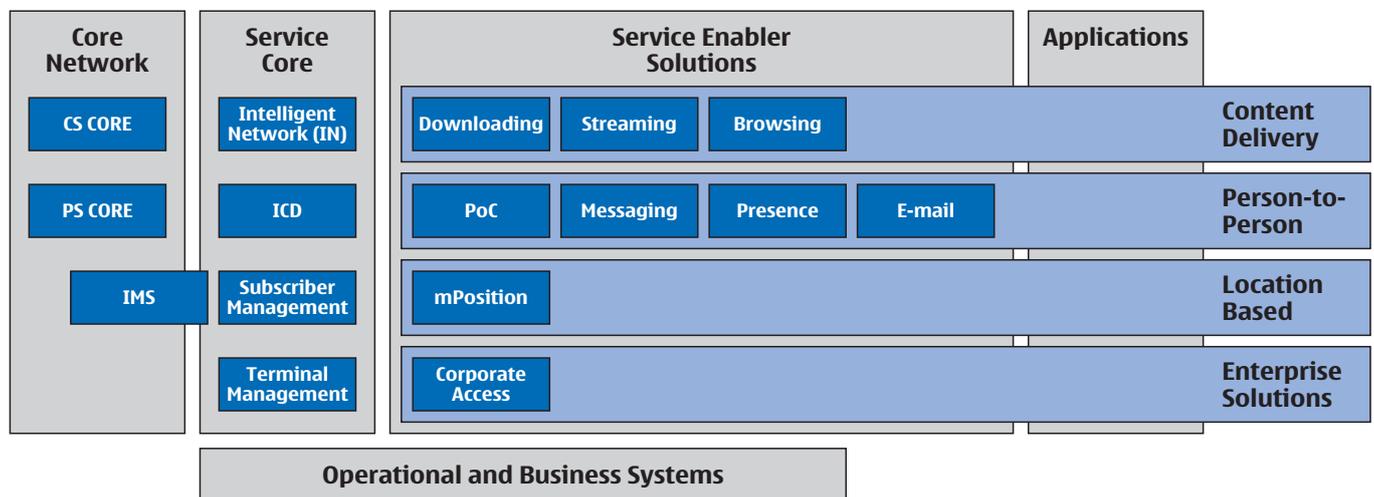
Modules

- Introduction to packet core network planning and packet core overview
- IP addressing and VLANs in core network
- Iu-PS planning
- Gn planning
- Gi planning
- Gp planning
- Dimensioning of packet core elements
- Security planning
- QoS planning

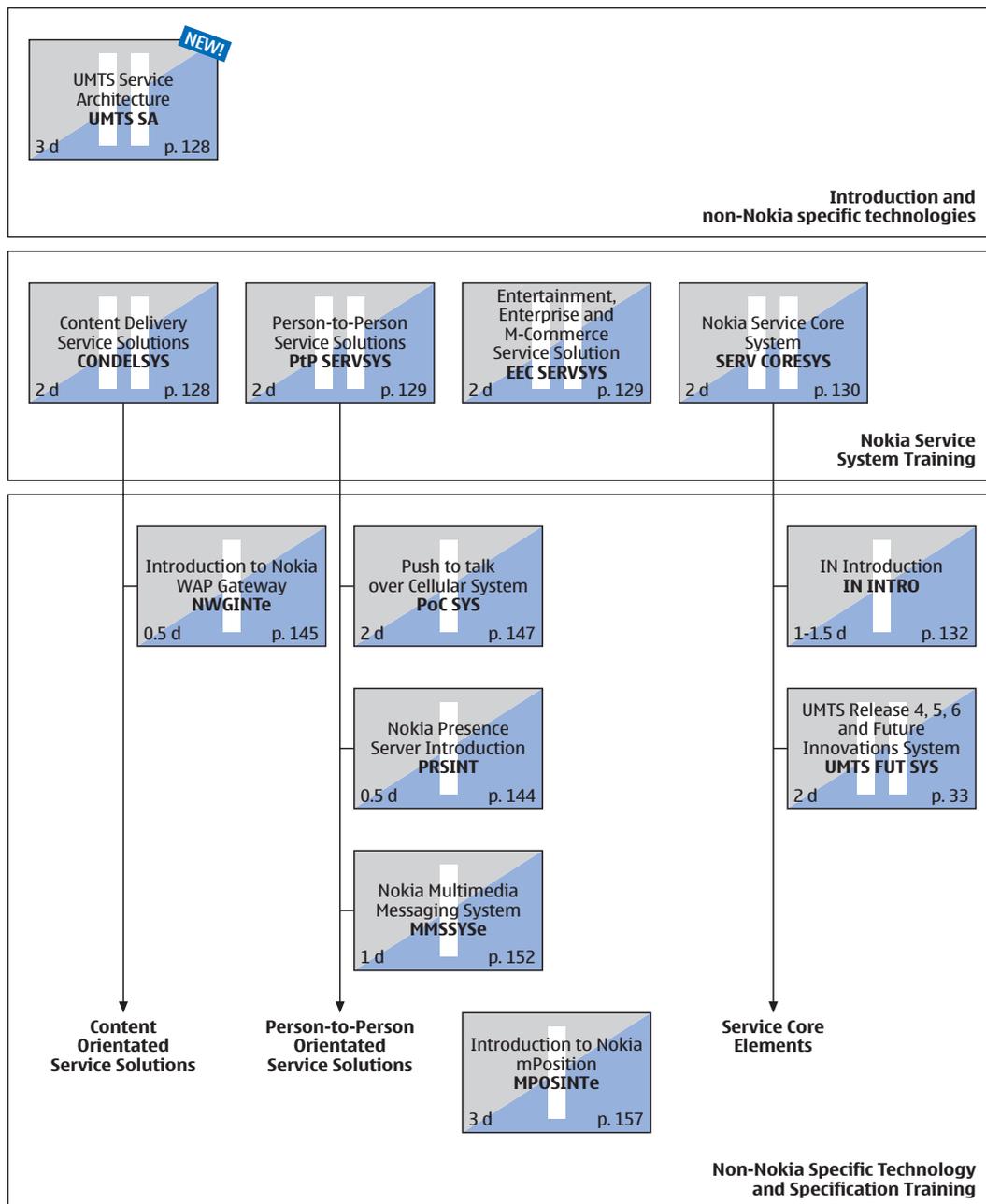
Mobile services

The technical architecture of mobile services is divided into the service core, service enablers and applications. The service core provides functionality such as service control, subscriber management and charging. The service enablers provide the platform to deliver the actual service, such as WAP or MMS to the customer. Finally, applications are the actual content being delivered to the customer, such as a WAP page, game, Java™ application etc.

Nokia provides an extensive portfolio that supports participants every step of the way to developing an understanding of the services and the technical architecture.



Service system training and specifications



The fastest growing development area in networks is the service subsystem, with new products constantly coming through. Therefore, to support the under-pinning knowledge required to be effective in this area, we have divided our training solution into three parts. First, a general introduction to mobile services (non-Nokia specific). Second, the Nokia solution

approach – these courses are a unique blend of theory training with interactive simulation to really explore the service opportunities and implementation issues, without going deeply into the technical products. The third part is an introduction to the Nokia specific products, such as the service enablers that will be covered in detail later in this section.

Nokia can also provide consultative workshops on the different and future solutions. These workshops are tailored on request and are aimed at high-level marketing and strategy planning personnel.

UMTS Service Architecture

NEW!

UMTS SA



Target Group

Personnel who require a comprehensive overview of service architectures that are required to provide new end user applications in UMTS networks.

Objectives

After the training, the participant will be able to:

- Get a technical overview of the various service architectures deployed in cellular networks and their interactions with each other and with the mobile network.
- Have a good understanding of the underlying standards and protocols used when implementing the services.
- Get a good overview of the major functions in a mobile handset, and the protocols and languages used to enable the services.

Prerequisites

2G SYSTRA or 3G SYSTRA

Duration

3 days

No. of Participants

Max. 24

Modules

- Introduction to mobile applications
- IP protocols
- Fixed vs. mobile computers
- User equipment
- Messaging
- Streaming service
- IP multimedia subsystem (IMS)
- Presence service
- Push to talk over Cellular (PoC)
- Location services
- Security

Notes

This course is arranged in co-operation with APIS (www.apis.se) and is not Nokia specific.

Content Delivery Service Solutions

CONDELSYS



Target Group

Personnel from the technology, service planning and management sector, who are interested in the Nokia content delivery solutions.

Objectives

After the training, the participant will be able to:

- Identify and list current and potential services that are designed for content delivery.
- Based upon a simulation, identify the opportunities and challenges of content delivery services.
- Identify the network requirements to host such services, including the effect on capacity.
- Identify the Nokia Service Enabler solutions for browsing, streaming and downloading.
- Based upon a simulation, demonstrate the ability to correctly plan, develop and deploy new content delivery services AND provide a model for the provision of content. This should include the reasoning behind charging.

Prerequisites

None

Duration

2 days

No. of Participants

Max. 12

Modules

- Overview of content delivery services
- Showcase: Content delivery solutions
- Simulation: Identify opportunities and challenges with content delivery services
- Effect on and requirements from the network of content delivery solutions
- Nokia Service Enabler solutions for browsing
- Nokia Service Enabler solutions for streaming
- Nokia Service Enabler solutions for downloading
- Simulation: Plan, develop and deploy new content delivery services
- Simulation: Develop model for the provision of content for the delivery services

Person-to-Person Service Solutions

PtP SERVSYS



Target Group

Personnel from the technology, service planning and management sector, who are interested in the Nokia person-to-person service solutions.

Objectives

After the training, the participant will be able to:

- Identify and list current and potential person-to-person services.
- Based upon a simulation, identify the opportunities and challenges with person-to-person services.
- Identify the network requirements to host such services, including the effect on capacity.
- Identify the Nokia Service Enabler solutions for Push to talk, Messaging, Presence and e-mail.

- Based upon a simulation, demonstrate the ability to correctly plan, develop and deploy new person-to-person services and provide a model for the provision of content. This should include reasoning behind charging.

Prerequisites

None

Duration

2 days

No. of Participants

Max. 12

Modules

- Overview of person-to-person services
- Showcase: Person-to-person solutions
- Simulation: Identify opportunities and challenges with person-to-person services
- Effect on and requirements from the network of person-to-person solutions
- Nokia Service Enabler solutions for Push to talk
- Nokia Service Enabler solutions for Messaging
- Nokia Service Enabler solutions for Presence
- Nokia Service Enabler solutions for e-mail
- Simulation: Plan, develop and deploy new person-to-person services
- Simulation: Develop model for the provision of content for the person-to-person services

Entertainment, Enterprise and M-Commerce Service Solution

EEC SERVSYS



Target Group

Personnel from the technology, service planning and management sector, who are interested in the Nokia entertainment, enterprise and m-commerce solutions.

Objectives

After the training, the participant will be able to:

- Identify and list current and potential services associated with infotainment and m-commerce.
- Based upon a simulation, identify the opportunities and challenges with enterprise and entertainment services.
- Identify the network requirements to host such services, including the impact on capacity.
- Identify the requirements for successfully implementing m-commerce solutions into the network.

- Identify the Nokia service enabler solutions for entertainment, enterprise and m-commerce.
- Based upon a simulation, demonstrate the ability to correctly plan, develop and deploy new enterprise, entertainment and m-commerce services AND provide a model for the provision of content. This should include the reasoning behind income models.

Prerequisites

None

Duration

2 days

No. of Participants

Max. 12

Modules

- Overview of content delivery services
- Showcase: Content delivery solutions
- Simulation: Identify opportunities and challenges with content delivery services
- Effect on and requirements from the network on network of service solution evolution
- Nokia service enabler solutions for entertainment
- Nokia service enabler solutions for enterprise
- Nokia service enabler solutions for m-commerce
- Simulation: Plan, develop and deploy new entertainment services
- Simulation: Plan, develop and deploy new enterprise services
- Simulation: Develop model for use of m-commerce in everyday use



Target Group

Personnel from the technology, service planning and management sector, who are interested in the Nokia service core solution.

Objectives

After the training, the participant will be able to:

- Identify and list the elements (and functions) of the service core.
- At an overview level, describe the role of IN, gateways and ICD in the provision of services.
- Identify and explain the role of the charging, subscriber and terminal management.
- Identify the elements of the future roadmap of the service core in Release 5. Also, list and explain the role of rich call, SIP, CAMEL, OSA and how service provisioning will evolve.

- Identify the core network requirements to host services, including the effect on capacity.
- Identify the Nokia solutions for ICD, IN and IMS service core components.
- Based upon a simulation, identify the opportunities that machine-to-machine solutions bring.

Prerequisites

None

Duration

2 days

No. of Participants

Max. 12

Modules

- Overview of the service core
- Showcase: IN solutions and requirements
- Showcase: ICD
- Subscriber, charging and terminal management in the Nokia service core
- Nokia service solution for IN in Release 3 and 4
- Nokia service solution for ICD
- Nokia service solution and evolution in IMC
- Standard interfaces and protocols and implementation in the Nokia solution
- Simulation: Adding new service enablers into the core
- Nokia service solution for machine-to-machine services

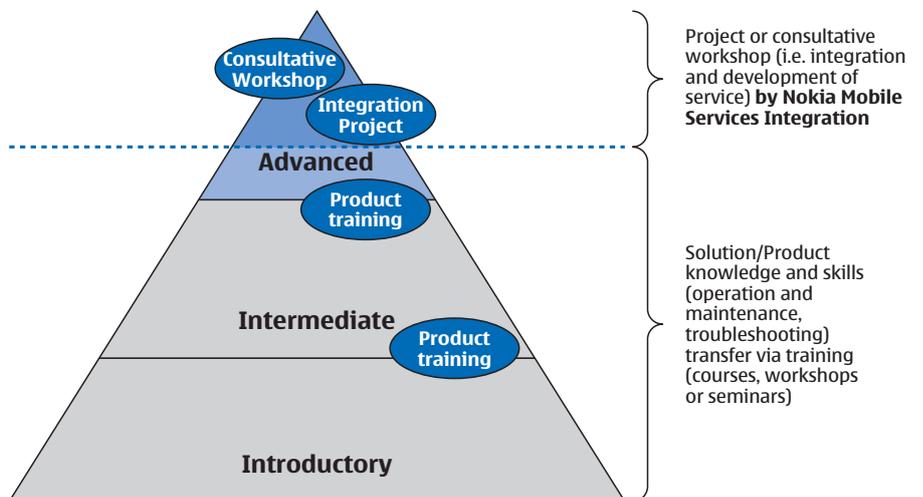
Service core

Nokia provides a full range of services to support integration, development and establishment of new service solutions. By nature, these are very specific to your unique implementation and requirements. Nokia Learning Solutions provides a comprehensive portfolio to support the products. We also provide services for the integration and development of services. Consultancy workshops can also be delivered. Rather than training events, these are projects and hence the format and price will differ.

For more information contact your local Nokia Learning Solutions contact person.

Personnel who work with the service core are responsible for the integration, operation and maintenance of the network elements that provide the platform for service enablers. They are usually responsible for supporting service

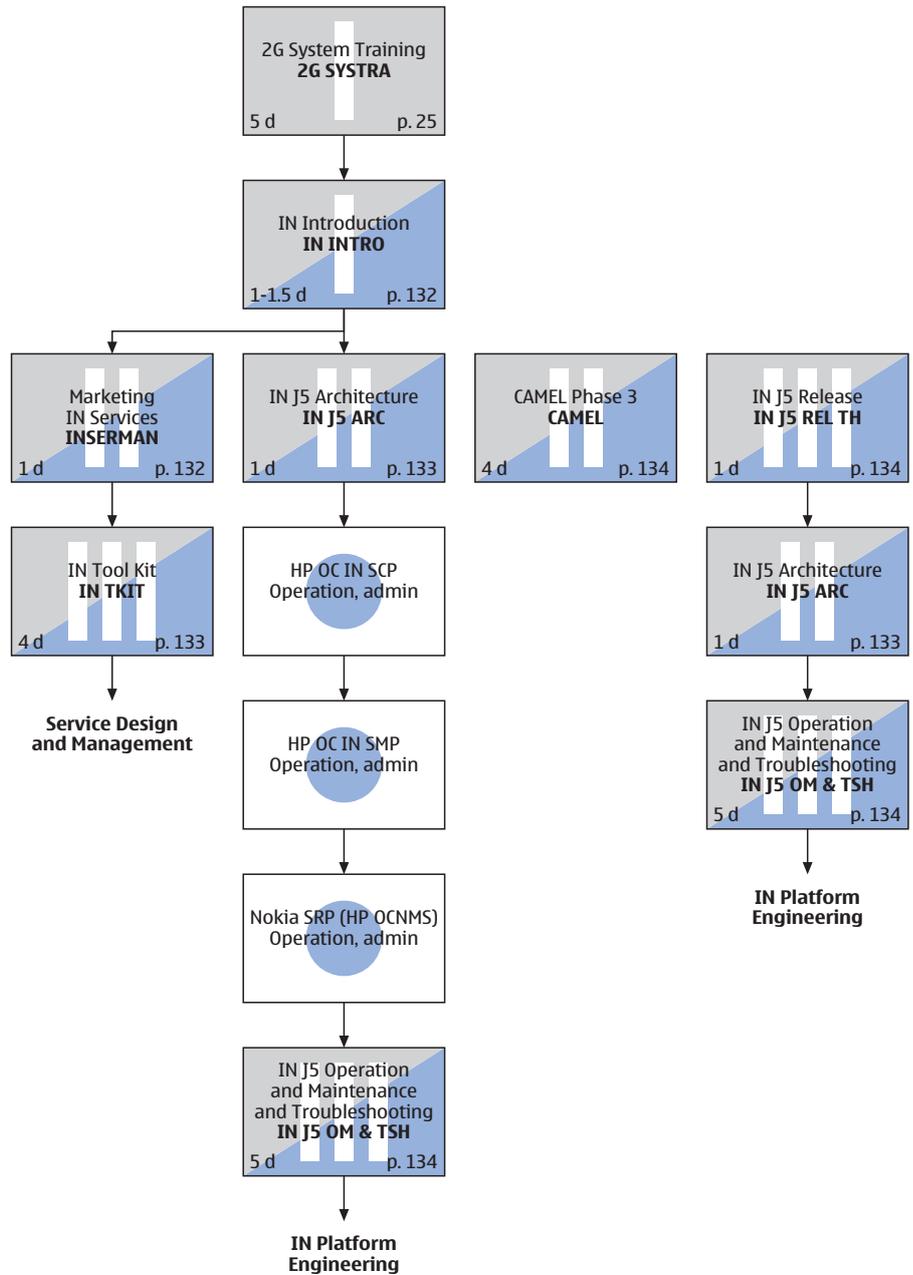
creation and deployment and correcting faults raised by NOC or customer care. The specific network elements may vary from operator to operator, depending on the implementation.



Intelligent network

Intelligent network specialists are responsible for the operation and maintenance of the IN solution, integrating it into the SCN and MPC and for the creation and deployment of services into the network. We provide a comprehensive solution to develop IN capability, which includes training for marketing people on the potential of IN services. We also provide a solution for the J5 release, which includes troubleshooting training.

For more information please refer to Hewlett-Packard (www.hp.com/communications/opencall/training/index.html) and contact carina.nordling@hp.com.



IN Introduction

IN INTRO



Target Group

Technical and non-technical personnel dealing with IN.

Objectives

After the training, the participant will be able to:

- Explain three differences between a non-IN network and an IN network.
- List and describe four Nokia IN services types.
- List and explain the function of SSP, SCP, SRP, SMP, SCE, SMI, SMAP.
- Name the equipment on which SSP, SCP and SMP are implemented in the Nokia implementation.
- List two kinds of propagation.
- Describe the service creation principle of the IN tool kit.
- Describe the prepaid concept.
- Describe the VPN concept.
- Describe the localized services concept.

Prerequisites

2G SYSTRA

Duration

1–1.5 days

No. of Participants

Max. 24

Modules

- Introduction to intelligent network
- IN architecture
- Service examples
- IN J5 briefing

Notes

The duration of the course for IN J4 is 1 day and 1.5 days for IN J5. IN J5 includes the module IN J5 briefing.

Marketing IN Services

INSERMAN



Target Group

Management and marketing personnel who market IN to end users.

Objectives

After the training, the participant will be able to:

- List the marketing steps towards successful launch.
- Describe the price scheme possibilities.
- Explain the concept of PP card and voucher management.
- Understand the bottlenecks between marketing requirements and system capabilities.

Prerequisites

IN INTRO

Duration

1 day

No. of Participants

Max. 24

Modules

- Marketing steps
- Price scheme possibilities
- PP card and voucher management
- Marketing requirements and system possibilities
- Branding

IN Tool Kit



Target Group

Service design and management personnel using the mobile IN application as a tool.

Objectives

After the training, the participant will be able to:

- Create commercial services with the IN tool kit.
- Use service creation, provision, announcements, charging, default, service administration, groups, global lists, SSA, subscriber administration, tariff management and CDR format definition tools.
- Modify, withdraw and manage the created services.
- Forecast the interaction problems, solve poor FDE combinations.

Prerequisites

IN INTRO

Duration

4 days

No. of Participants

Max. 6

Modules

- IN J5 service introduction
- Service creation with IN tool kit
- Tools IN tool kit
- Functional definition elements
- Overlapping operations
- Service examples INAP
- Service examples CAMEL

Notes

The duration of IN TKIT course for IN J4 is 3 days. It is recommended, however, to attend the 5 day IN practice package IN J4Th and IN J4Pr. The duration of IN TKIT for J5 is 4 days.

IN J5 Architecture



Target Group

Technical and non-technical personnel who need to know and understand IN network elements and their connections to each other.

Objectives

After the training, the participant will be able to:

- List and explain the functionality of all IN network elements of the J5 solution.
- Describe the interfaces.
- List the protocols used.
- Describe which hardware and software are used.

Prerequisites

IN INTRO

Duration

1 day

No. of Participants

Max. 24

Modules

- Platform architecture
- Interface overview
- Protocols used
- Triggering
- SRP/SMAP voice

IN TKIT

IN J5 ARC

IN J5 Operation and Maintenance and Troubleshooting

IN J5 OM & TSH



Target Group

Personnel operating IN platform.

Objectives

After the training, the participant will be able to:

- Operate the IN platform.
- Use all available tools and understand their outputs.
- Collect all information required (alarms, measurements, logs etc.) in order to report efficiently to the help desk.
- Make a change note.
- Troubleshoot the IN network elements.

Prerequisites

IN INTRO, IN J5 ARC

Duration

5 days

No. of Participants

Max. 6

Modules

- SMP and SEP functionality
- Maintenance
- Change notes
- Troubleshooting

IN J5 Release

IN J5 REL TH



Target Group

Personnel working with the IN J5 solution who already know the IN J4 solution.

Objectives

After the training, the participant will be able to:

- Know the changes between IN J4 and IN J5.

Prerequisites

IN INTRO

Duration

1 day

No. of Participants

Max. 8

Modules

- Platform changes
- Capacity issues
- Hardware and software changes
- Upgrade procedures
- New features

CAMEL Phase 3

CAMEL



Target Group

Personnel working in the field of maintenance, support, solution development and project management for mobile services.

Objectives

The course explains the features and principles of CAMEL phase 3. This includes the circuit switched call control with IN and the packet session handling by IN. Additionally the CAMEL relevant protocols (CAP/MAP) will be analyzed. As a final part of the course the implementation of an intelligent network using Open Service Access (OSA) is introduced.

Prerequisites

The participants are required to have excellent knowledge of standard GSM/GPRS/UMTS procedures for call handling and packet services.

Duration

4 days

No. of Participants

Max. 15

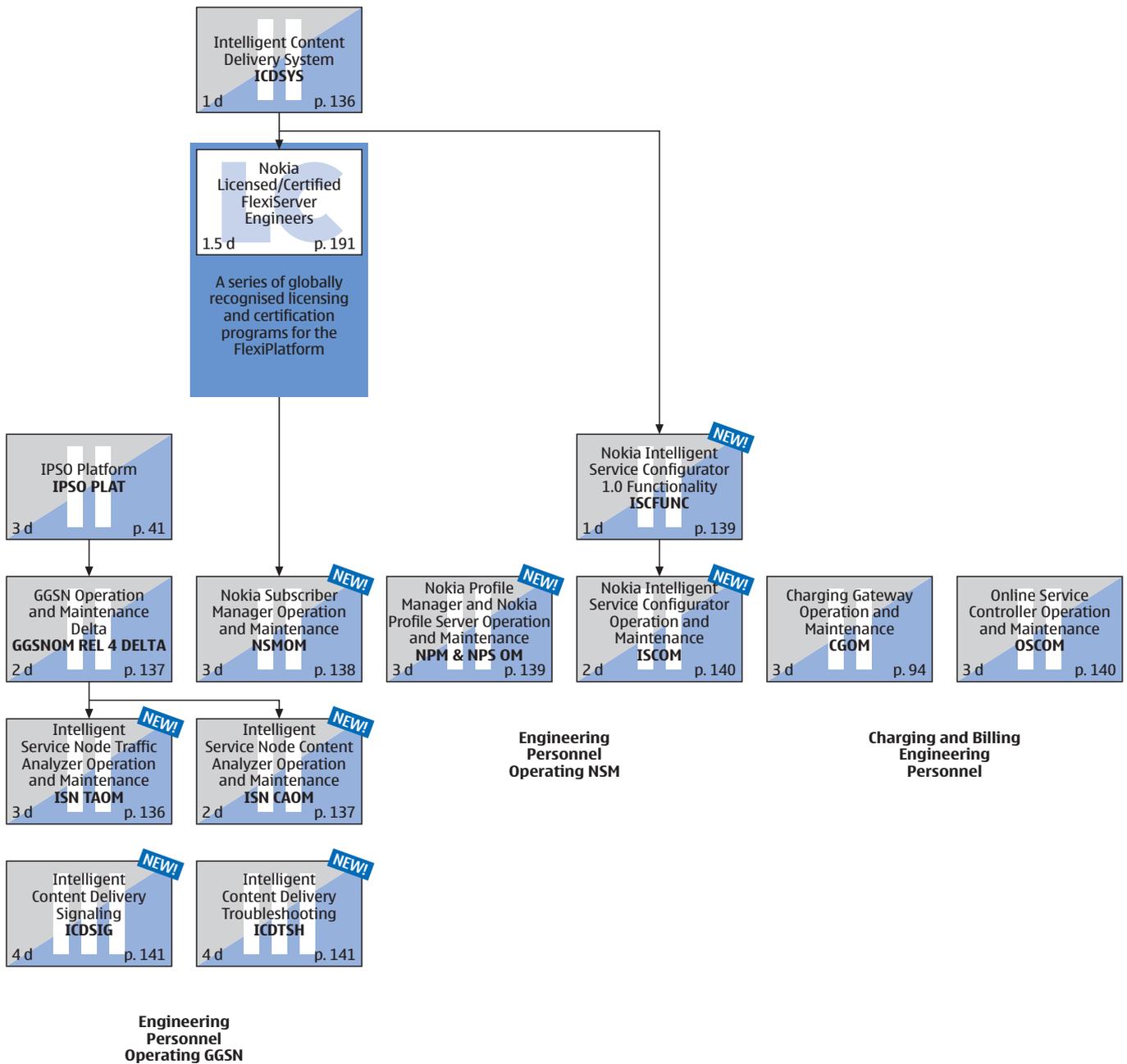
Modules

- CAMEL introduction
- CAMEL service creation
- CAMEL IN network architecture
- CAMEL IN subscriber data
- CAMEL IN calls
- CAMEL special IN topics
- CAMEL IN functions and models
- CAMEL IN protocols
- CAMEL OSA

Notes

This course is arranged in co-operation with Techcom (www.techcom.de) and is not Nokia specific.

Intelligent Content Delivery



As the use of packet data starts to increase, a more flexible way to address charging is needed – the Intelligent Content Delivery (ICD) solution provides such a platform. For personnel responsible for charging, we provide a comprehensive training solution for all the elements and planning within the concept.

The ICD solution is built upon the Nokia FlexiServer solution, and therefore taking a license program (which includes the training) is necessary. For more information turn to page 191. We provide recommended training for three groups: Personnel responsible for 1) the configuration of the GGSN, 2) subscriber management and 3) charging.

Intelligent Content Delivery System



Target Group

Engineering personnel operating Nokia ICD system.

Objectives

After the training, the participant will be able to:

- List Nokia ICD system network elements.
- State the benefits of the ICD solution.
- Explain the main functionalities of the Nokia ICD system.
- Describe interfaces between network elements.
- List the protocols used in each network element.
- Briefly explain how to operate and maintain the system.
- Describe the evolution of the Nokia ICD system.

Prerequisites

2G SYSTRA or 3G SYSTRA

Duration

1 day

No. of Participants

Max. 24

Modules

- Introduction to Nokia ICD system
- Architecture of Nokia ICD system
- Functionality of Nokia ICD system
- Operating and maintenance of Nokia ICD system
- Nokia ICD system evolution

Intelligent Service Node Traffic Analyzer Operation and Maintenance



ISN TAOM



Target Group

Engineering personnel needing to operate the Nokia ISN Traffic Analyzer as part of the Intelligent Content Delivery (ICD) system solution.

Objectives

After the training, the participant will be able to:

- Describe the ISN components, their architecture and functionalities.
- List the features of the ISN Traffic Analyzer.
- Describe the software architecture of the ISN Traffic Analyzer.
- Describe and configure the interfaces of the ISN Traffic Analyzer.
- Explain the signaling flow of the ISN Traffic Analyzer.
- Perform software installation and commissioning of the ISN Traffic Analyzer.
- Perform ISN Traffic Analyzer specific operation and maintenance procedures.
- Perform simple troubleshooting tasks.

Prerequisites

IPSOPLAT, ICDSYS, GGSNOM

Duration

3 days

No. of Participants

Max. 8

Modules

- Intelligent service node traffic analyzer introduction
- Intelligent service node traffic analysis
- Intelligent service node traffic analyzer software installation and configuration
- Intelligent service node traffic analyzer operation and maintenance procedures
- Intelligent service node traffic analyzer troubleshooting

Intelligent Service Node Content Analyzer Operation and Maintenance

NEW!

ISN CAOM



Target Group

Engineering personnel needing to operate the Nokia ISN Content Analyzer as part of the Intelligent Content Delivery (ICD) system solution.

Objectives

After the training, the participant will be able to:

- Describe the ISN components, its architecture and functionalities.
- List the features of the ISN Content Analyzer.
- Describe the software architecture of the ISN Content Analyzer.
- Describe and configure the interfaces of the ISN Content Analyzer.
- Explain the signaling flow of the ISN Content Analyzer.
- Perform software installation and commissioning on the ISN Content Analyzer.
- Perform ISN Content Analyzer specific operation and maintenance procedures.
- Perform simple troubleshooting tasks.

Prerequisites

IPSOPLAT, ICDSYS, GGSNOM

Duration

2 days

No. of Participants

Max. 8

Modules

- Intelligent service node content analyzer introduction
- Intelligent service node content analysis
- Intelligent service node content analyzer software installation and configuration
- Intelligent service node content analyzer operation and maintenance procedures
- Intelligent service node content analyzer troubleshooting

GGSN Operation and Maintenance Delta

GGSNOM REL 4 DELTA



Target Group

GGSN support engineers who have a good knowledge of GGSN previous releases.

Objectives

After the training, the participant will be able to:

- Understand the influence of the new features on the operating and maintenance tasks.
- Install and configure the GGSN Release 4 software.
- Configure context access points, service access points and related services.

Prerequisites

GPRSSYS, IPCORE, IPSOPLAT, GGSNOM, ICDSYS, FlexiServer e-learning

Duration

2 days

No. of Participants

Max. 8

Modules

- Service awareness overview (GGSN Release 4)
- GGSN Release 4 specific features
- Software installation (GGSN Release 4 Delta)
- GGSN Release 4 access points (GGSN Release 4 Delta)

Nokia Subscriber Manager Operation and Maintenance

NEW!

NSMOM



Target Group

Personnel requiring information on the functionality of the Nokia NSM Release 1.1. NSM system administrators and commissioning personnel.

Objectives

After the training, the participant will be able to:

- Identify the challenges assessed by the Nokia NSM.
- Describe the NSM functionality in the Nokia ICD system.
- Identify the architecture of NSM 1.1.
- Manage subscriptions using the NSM mass manager GUI tool.
- Describe the NSM file based provisioning interface.
- Manage OSC subscription information.
- Manage ISN-GGSN subscription information.
- Manage ISN-CA subscription information.
- Manage mass subscriptions.
- Manage user-defined service packages in Nokia NSM release 1.1.
- Describe the architecture of NSM nodes.
- Install NSM software components.
- Configure NSM software components.
- Perform NSM preventive maintenance procedures.
- Troubleshoot NSM configuration problems in NSM release 1.1.

Prerequisites

ICDSYS, (Nokia FlexiServer License)

Duration

3 days

No. of Participants

Max. 8

Modules

- Introduction to NSM
- Overview of NSM architecture
- Using basic NSM functionality
- Performing mass management operations
- Managing services
- NSM architecture
- NSM directory node software installation and configuration
- NSM directory node operation and maintenance procedures
- NSM application server node software installation and configuration
- NSM application server node operation and maintenance procedures
- NSM troubleshooting

Notes

- Versions 1.0 and 1.1 are called NSM (NSM 1.0 and NSM 1.1).
- Training can be customized
- Versions 1.2 and onwards are called NPM and NPS (see separate course description for NPM & NPS OM)

Nokia Profile Manager and Nokia Profile Server Operation and Maintenance

NEW!

NPM & NPS OM



Target Group

System administrators, operations personnel and network engineers taking care of Nokia Profile Manager and Nokia Profile Server.

Objectives

After the training, the participant will be able to:

- Identify the challenges assessed by the Nokia NPM/NPS.
- Describe the NPM/NPS functionality in the Nokia ICD system.
- Describe the architecture of NPM/NPS nodes.
- Install NPM/NPS software components.
- Configure NPM/NPS software components
- Perform NPM/NPS preventive maintenance procedures.
- Manage subscriptions using the NPM Mass Manager GUI tool.

- Describe the NPM file based provisioning interface.
- Manage OSC subscription information.
- Manage ISN-GGSN subscription information.
- Manage ISN-CA subscription information.
- Manage user-defined service packages.
- Troubleshoot NPM/NPS configuration problems in NPM/NPS release 1.2.

Prerequisites

ICDSYS, (Nokia FlexiServer License)

Duration

3 days

No. of Participants

Max. 8

Modules

- Introduction to NPM/NPS
- Overview of NPM/NPS architecture
- Using basic NPM/NPS functionality
- NPS directory node software installation and configuration
- NPS directory node operation and maintenance procedures
- NPM application server node software installation and configuration
- NPM application server node operation and maintenance procedures
- Managing Nokia ICD subscriptions
- Performing mass management operations
- Managing services
- NPM/NPS troubleshooting

Notes

- Nokia Profile Manager is the former NSM Server.
- Nokia Profile Server is a migration of the former NSM Directory and the Nokia Profile Server (NAP).
- Earlier versions called NSM 1.0 and NSM 1.1 are still available on request.

Nokia Intelligent Service Configurator 1.0 Functionality

NEW!

ISCFUNC



Target Group

Personnel requiring information on the functionality of the Nokia ISC.

Objectives

After the training, the participant will be able to:

- Describe the role of the Nokia ISC in the Nokia ICD System.
- List the functionality of the Nokia ISC.
- Describe the architecture of the Nokia ISC.
- Describe the service modeling principles in the Nokia ISC.

- Model basic Nokia ICD services.
- Deploy services to the Nokia ISD.
- Deploy services to the Nokia NSM in Nokia ISC Release 1.0.

Prerequisites

ICDSYS

Duration

1 day

No. of Participants

Max. 8

Modules

- Introduction to the Nokia ISC
- Nokia ISC architecture
- Using basic Nokia ISC functionality
- Creating Nokia ICD services

Nokia Intelligent Service Configurator 1.0 Operation and Maintenance

NEW!

ISCOM



Target Group

Nokia ISC system administrators and commissioning personnel.

Objectives

After the training, the participant will be able to:

- Describe the architecture of the Nokia ISC.
- Commission Nokia ISC software components.
- Configure Nokia ISC software components.
- Perform Nokia ISC preventive maintenance procedures.
- Troubleshoot Nokia ISC configuration problems.

Prerequisites

ICDSYS, ISCFUNC

Duration

2 days

No. of Participants

Max. 8

Modules

- Nokia ISC deployment architecture
- Nokia ISC hardware configuration
- Nokia LinAS OS installation and configuration
- Nokia ISC software installation and configuration
- Nokia ISC integration
- Nokia ISC operation and maintenance procedures
- Nokia ISC troubleshooting

Online Service Controller Operation and Maintenance

OSCOM



Target Group

Operator support personnel who need to operate Online Service Controller (OSC) as part of the intelligent content delivery (ICD) system solution.

Objectives

After the training, the participant will be able to:

- Have a thorough understanding of the architecture, concepts and features of the OSC, as well as appreciate its important position within the intelligent content delivery (ICD) system.
- Describe and configure the interfaces of OSC.
- Perform OSC specific hardware configuration, software installation and commissioning.
- Perform OSC specific operation and maintenance procedures.

Prerequisites

ICDSYS

Duration

3 days

No. of Participants

Max. 8

Modules

- Online Service Controller overview
- Online Service Controller architecture
- Online Service Controller interfaces
- Online Service Controller functionality and features
- Online Service Controller specific hardware installation
- Online Service Controller software installation and basic configuration
- Online Service Controller integration towards other ICD elements
- Online Service Controller balance interface integration
- Operations and maintenance procedure for Nokia Online Service Controller

Intelligent Content Delivery Signaling

NEW!

ICDSIG



Target Group

System administrators, operations personnel and network engineers with the need to analyze the packet core network with ICD extension.

Objectives

After the training, the participant will be able to:

- Take a focused look at the packet core network with ICD network elements and their interfaces.
- Explain and analyze ICD related messages with a protocol analyzer.
- Handle all relevant local ICD network element tools.
- Explain and configure differentiated charging rules.
- Describe the subscription information in the LDAP directory of the Nokia Subscription Manager.
- Monitor traffic and charging within the Nokia ICD system.

Prerequisites

ICDSYS, NPM/NPS OM, GGSNOM REL 4, ISN TAOM, ISN CAOM, OSCOM, CGOM, GPRSSIG or 3G PCNSIG

Duration

4 days

No. of Participants

Max. 4

Modules

- Introduction and review of the key functionalities of all ICD network elements
- Introduction to Protocol Analyzer
- Monitoring with network specific tools and message debugging
- Monitoring messages between ICD network elements
- Verification of charging rules, local and via LDAP

Notes

Available in Q3/05.

Intelligent Content Delivery Troubleshooting

NEW!

ICDTSH



Target Group

System administrators, operations personnel and network engineers who need practical experience to analyze and troubleshoot the packet core network with ICD extension.

Objectives

After the training, the participant will be able to:

- To have a concept of how to troubleshoot in an effective way.
- Deal with troubles in the packet core + ICD network with a structured process.
- Perform a verification of the functionality of the ICD solution.

Prerequisites

ICDSYS, NPM/NPS OM, GGSNOM REL 4, ISN TAOM, ISN CAOM, OSC OM, CG OM, GPRSSIG or 3G PCNSIG, PCNTSH (2G or 3G)

Duration

4 days

No. of Participants

Max. 4

Modules

- Introduction to troubleshooting in packet core and ICD network solutions
- Network interface troubleshooting tools
- Network element specific troubleshooting tools
- ICD troubleshooting cases

Notes

Available in Q3/05.

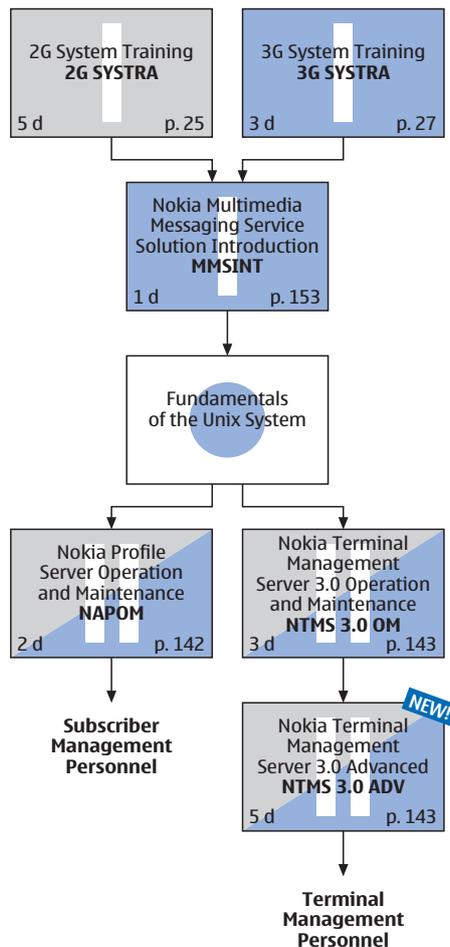
Subscriber and terminal management

Nokia Profile Server enables operators and subscribers to manage as well as personalize mobile services such as multimedia messaging and download. Operators can easily manage service packaging and access control of their ever-growing non-voice mobile services, offering them all from a single place.

As multimedia messaging enters the market, Nokia Profile Server gives mobile terminal users greater control and flexibility in deciding how they want to send and receive MMS (Multimedia Messaging Services) messages through modification of their MMS profile.

Our training solution comprises the following:

- System training gives a general overview of the structure of the messaging service and specifications. These training sessions are theory courses.
- Operation and maintenance training is aimed at personnel actually operating and maintaining the Nokia products. The training includes practical exercises.



Nokia Profile Server Operation and Maintenance

NAPOM



Target Group

Operations and maintenance personnel.

Objectives

After the training, the participant will be able to:

- Operate and maintain Nokia Profile Server 3.0

Prerequisites

UNIX Fundamentals, 2G SYSTRA or 3G SYSTRA, MMSSYSe, MSSINT

Duration

2 days

No. of Participants

Max. 8

Modules

- Overview
- Architecture
- Operating Profile Server
- Creating profiles
- Data provisioning
- NMS interface
- External interfaces
- Daily maintenance
- Cluster configuration
- Troubleshooting

Nokia Terminal Management Server 3.0 Operation and Maintenance

NTMS 3.0 OM



Target Group

Operation and maintenance personnel, installation personnel, integration personnel.

Objectives

After the training, the participant will be able to:

- Install, integrate, maintain and administer the Nokia Terminal Management Server (NTMS).

Prerequisites

2G SYSTRA or 3G SYSTRA, Unix fundamentals

Duration

3 days

No. of Participants

Max. 8

Modules

- Introduction to NTMS
- Architecture and interfaces of NTMS
- Installation upgrade and configuration of NTMS
- Operation and Maintenance of NTMS

Nokia Terminal Management Server 3.0 Advanced

NEW!

NTMS 3.0 ADV



Target Group

Personnel responsible for operation and configuration of the NTMS.

Objectives

After the training, the participant will be able to:

- Describe the internal structure of NTMS.
- Analyze the log files and take corrective actions based upon log files' content.
- Analyze the CDR files.
- Use the general setting concept within NTMS.
- Overview and configuration of NTMS supplementary features.
- Identify and test change delivery notes.
- Execution and analysis of system acceptance tests.
- Create customized service logic (optional).
- Understand the licensing strategy of NTMS.
- Test unsupported mobile phone types.
- Define legacy phone definitions to NTMS.

Prerequisites

NTMS 3.0 OM

Duration

5 days

Participants

4–6

Modules

- Log files analysis
- Feature overview
- NTMS fine-tuning
- NTMS testing with mobile devices

Notes

Running the advanced course on a live NTMS server is not recommended.

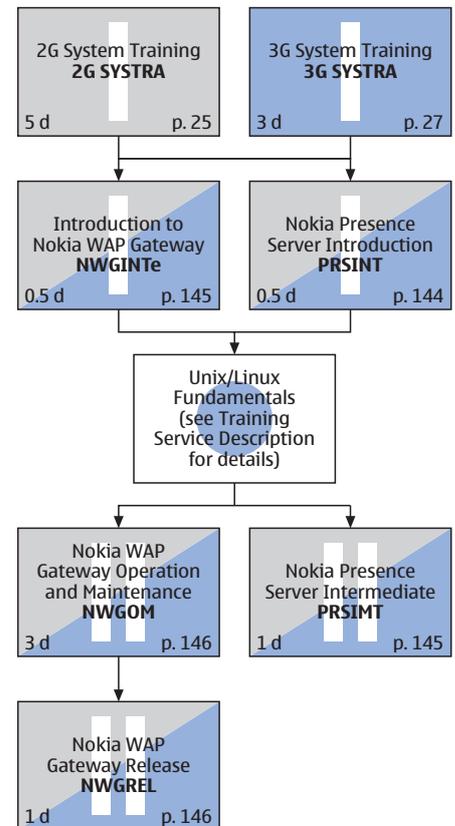
Service enabler solutions

The service enabler solutions are the elements that allow for innovative services to work in a network, such as MMS, SMS and location services. These solutions are connected into the service core and the platforms vary in implementation. Generally, the operation and maintenance of these computing boxes is done by specialized engineers who are responsible for the integration, management, upgrade and fault handling.

Content services

Nokia WAP Gateway provides the mechanism for content to be delivered on a mobile device.

We provide system training to all target groups on content services and operation and maintenance training for those engineers responsible for the implementation and maintenance of the services.



Nokia Presence Server Introduction



Target Group

Operation and maintenance personnel.

Objectives

After the training, the participant will be able to:

- Explain the basic concepts of presence services.
- Draw a model of a Wireless Village server and explain the functionality of different service elements.
- Describe use cases of presence applications and ideally, invent new ones.
- Determine the suitability of a specific hardware configuration for use with Nokia Presence Server.
- Explain the key features of Nokia Presence Server.

Prerequisites

2G SYSTRA or 3G SYSTRA

Duration

0.5 day

No. of Participants

Max. 15

PRSINT

Modules

- Presence, basics and standards
- Wireless Village basics
- Wireless Village message flow examples
- Presence usage scenarios and application examples
- Nokia Presence Server platform
- Nokia Presence Server, overview and features

Notes

- This learning program is the basis for an intermediate course and can also be given separately to anyone working with the product.
- This module is not a prerequisite for the application development module.

Nokia Presence Server Intermediate

PRSINT



Target Group

Operation and maintenance personnel.

Objectives

After the training, the participant will be able to:

- Describe Presence Server administrator tasks.
- Use Presence Server web user interface and command line tool.
- Control and monitor Presence Server components.
- Change Presence Server configuration.
- Install applications on Presence Server.
- Modify legacy terminal gateway properties.
- Integrate Presence Server into network management system.
- Configure and monitor logs and alarms.
- Describe high availability (HA) environment.
- Configure Presence Server for high availability installation.
- Control and monitor Presence Server in high availability installation.
- Describe basic troubleshooting methods.
- Perform database switch in high availability installation.

Prerequisites

PRSINT

Duration

1 day

No. of Participants

Max. 8

Modules

- Administration overview
- Web UI
- Configuration files
- SNMP interface
- Logs and alarms
- Troubleshooting
- Web service applications and legacy terminal gateway
- HA basics and environment
- Setting up Nokia Presence Server and database for HA configuration
- Managing error situations

Introduction to Nokia WAP Gateway

NWGINTe



Target Group

Personnel requiring knowledge on the Nokia WAP Gateway.

Objectives

After the training, the participant will be able to:

- Explain the basic functionality of the Nokia WAP Gateway.
- List the basic and optional features of the Nokia WAP Gateway.
- Explain the difference between push and pull services.

Prerequisites

2G SYSTRA or 3G SYSTRA and basic knowledge of WAP Gateway

Duration

0.5 day

No. of Participants

N/A

Modules

- Introduction to NWG
- Basic features
- Optional features

Nokia WAP Gateway Operation and Maintenance

NWGOM



Target Group

Operation and maintenance personnel.

Objectives

After the training, the participant will be able to:

- Perform daily routines related to Nokia WAP Gateway maintenance.
- Use the different tools available for Nokia WAP Gateway maintenance.
- Configure parameter values for the features available.
- Check the overall status of the system.

Prerequisites

NWGINT, MMSSYS, Unix Fundamentals

Duration

3 days

No. of Participants

Max. 8

Modules

- Overview
- Request handling
- Operating Nokia WAP Gateway
- Logging and statistics
- Handling alarms
- WAP push
- Subscriber identification
- Barring and delivery rules
- Security
- Billing

Notes

E-course available in version 4.1 for theory part (2–3 hours).

Nokia WAP Gateway Release

NWGREL



Target Group

Operation and maintenance personnel.

Objectives

After the training, the participant will be able to:

- List the relevant changes for release 4.1.
- Configure parameter values for the features available.

Prerequisites

NWGINTe, NWGOM

Duration

1 day

No. of Participants

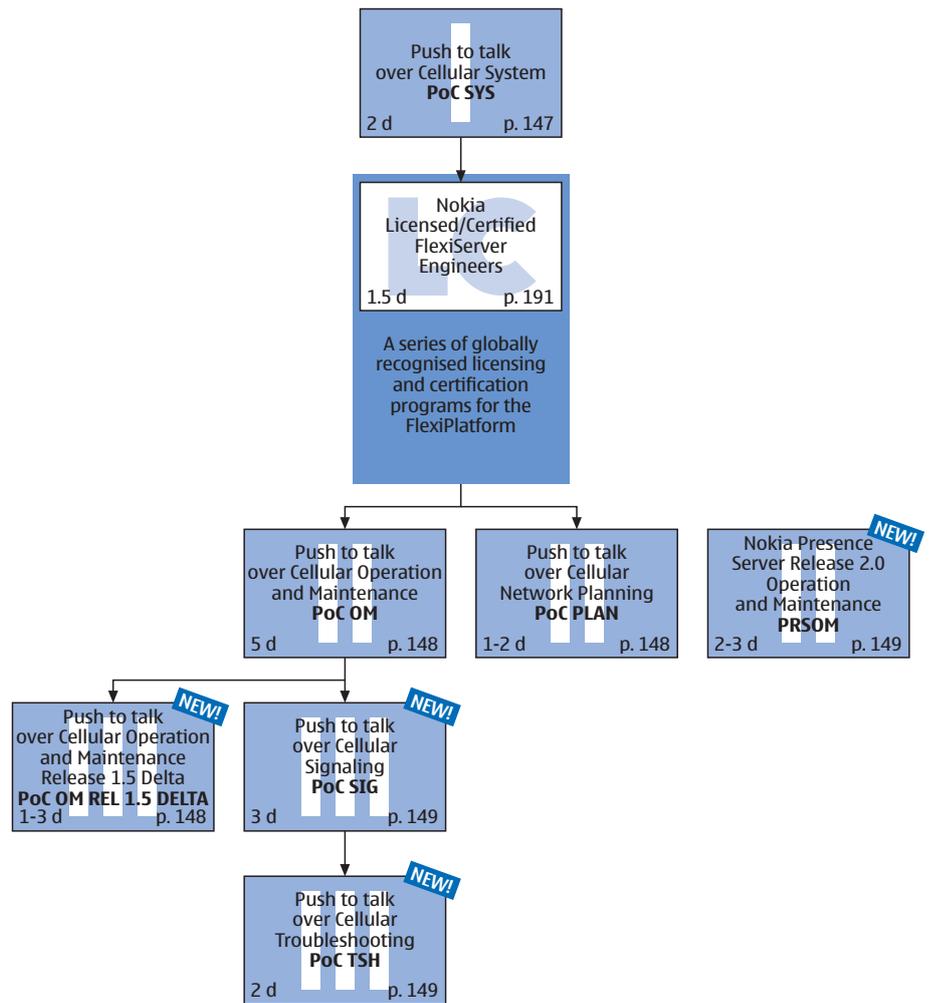
Max. 8

Modules

- WAP overview
- New features and functionality in:
 - Cookie filter
 - Push
 - HAP BIG-IP and HCA
 - Command line tool
 - Liberty single sign-on and authentication
 - Non-blocking IO
 - User agent profile
 - HTML and XHTML converters

Push to talk solution

Push to talk (PoC) is an innovative new service capability where a community can send messages to a group of subscribers, such as in an office or to a group of friends. We provide system training on the solution (PoC SYS), which is built upon the Nokia FlexiServer. This means that a license is required before proceeding to the OM (PoC OM) solution.



Push to talk over Cellular System

PoC SYS



Target Group

Personnel requiring technical understanding of the PoC System.

Objectives

After the training, the participant will be able to:

- List the main network elements of the PoC system.
- Describe the interfaces of PoC to GPRS networks.
- Describe the functionality of the call processor server.

Prerequisites

None

Duration

2 days

No. of Participants

Max. 24

Modules

- Push to talk over Cellular service introduction
- Push to talk over Cellular architecture
- Push to talk over Cellular network elements
- Push to talk over Cellular over GPRS networks
- Push to talk over Cellular enabled terminals
- Basic principles of network dimensioning for Push to talk over Cellular

Push to talk over Cellular Operation and Maintenance PoC OM



Target Group

Operation and maintenance personnel who need to integrate, operate and maintain the PoC network elements.

Objectives

After the training, the participant will be able to:

- Execute a back-up of the Nokia FlexiServer configuration.
- Interpret the Nokia FlexiServer alarms.
- List the main parameters for PoC traffic over IP.
- Understand the PoC CDRs format.
- List three external interfaces to the PoC system.

Prerequisites

PoC SYS

Duration

5 days

No. of Participants

Max. 8

Modules

- Push to talk over Cellular system architecture
- Push to talk over Cellular system IP networking
- Push to talk over Cellular Register services
- Push to talk over Cellular call processor
- Push to talk over Cellular user and group provisioning
- Push to talk over Cellular parameter management in the PoC call processor
- Push to talk over Cellular maintenance

Push to talk over Cellular Network Planning

PoC PLAN



Target Group

Personnel responsible for network planning when using PoC.

Objectives

After the training, the participant will be able to:

- Describe the general theory of PoC IP network applications, PoC core network integration, and PoC related GPRS quality of services to AW.

Prerequisites

PoC SYS, FlexiServer e-learning

Duration

1–2 days

No. of participants

Max. 8

Modules

- Introductions
- PoC IP network application
- Network requirements
- PoC site connectivity solutions
- PoC IP architecture
- PoC system DNS architecture
- Network time protocol services
- Operability of PoC from the IP perspective

Push to talk over Cellular Operation and Maintenance Release 1.5 Delta



Target Group

Personnel responsible for operating the PoC Call Processor and Register.

Objectives

After the training, the participant will be able to:

- List the new features of PoC Release 1.5.
- Understand how PoC Release 1.5 works.

Prerequisites

PoC OM

Duration

1–3 days

No. of Participants

Max. 8

Modules

- Introduction to PoC Release 1.5
- Operation and maintenance

Notes

Available in Q3/05.

NEW!

PoC OM REL 1.5 DELTA

Nokia Presence Server Release 2.0 Operation and Maintenance

NEW!

PRSOM



Target Group

Personnel responsible for operating the Nokia Presence server.

Objectives

After the training, the participant will be able to:

- Understand how the Presence Server works.
- Maintain the Presence Server.
- Perform basic troubleshooting on Presence Server.

Prerequisites

IPCORE and Unix knowledge

Duration

2–3 days

No. of Participants

Max. 8

Modules

- Introduction to Presence Server Release 2.0
- Operation and maintenance
- Presence Server troubleshooting

Notes

Available in Q3/05.

Push to talk over Cellular Signaling

NEW!

PoC SIG



Target Group

People who need a deep understanding of call set-up in a PoC system.

Objectives

After the training, the participant will be able to:

- Understand the basic structure of the protocols involved in a PoC call.
- Understand how the different call scenarios are set up in the system.
- Trace the calls using Ethereal.

Prerequisites

IPCORE, PoC SYS, PoC OM

Duration

3 days

No. of Participants

Max. 4

Modules

- Introduction to PoC signaling
- Session initiation protocol
- Megaco protocol
- SOAP protocol
- RTP protocol
- Call set up and tracing

Notes

Available in Q2/05.

Push to talk over Cellular Troubleshooting

NEW!

PoC TSH



Target Group

People who need to troubleshoot a PoC system.

Objectives

After the training, the participant will be able to:

- Understand how the provisioning application works.
- Use a logical approach to PoC troubleshooting.

Prerequisites

IPCORE, PoC SYS, PoC OM, PoC SIG

Duration

2 days

No. of Participants

Max. 4

Modules

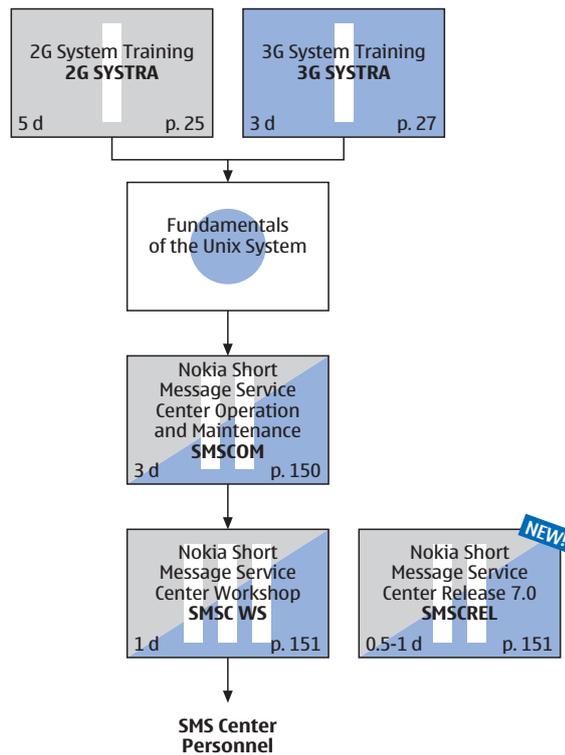
- Introduction to troubleshooting
- Provisioning application
- PoC troubleshooting cases

Notes

Available in Q2/05.

Short messaging

The short messaging group comprises network service engineers who are responsible for the administration and operation of the Nokia SMSC product solutions.



Nokia Short Message Service Center Operation and Maintenance

SMSCOM



Target Group

Operations and maintenance personnel responsible for the SMSC.

Objectives

After the training, the participant will be able to:

- Name the elements of Nokia SMS Center from memory.
- Explain the message processing within Nokia SMS Center from memory.
- Perform given operating tasks in a given way with reference to training material.
- Perform given configuration tasks in a given way with reference to training material.
- Perform given maintenance tasks in a given way with reference to training material.

Prerequisites

2G SYSTRA or 3G SYSTRA, Unix Fundamentals, SIGTRAN Fundamentals (when MAP/SIGTRAN in use)

Duration

3 days

No. of Participants

Max. 8

Modules

- SMS Center architecture
- SMS Center message handling
- SMS Center documentation
- Operating SMS Center
- SMS Center management
- Configuring SMS Center
- SMS Center maintenance
- SMS Center CIMD2 protocol
- SMS Center optional features

Notes

Current release is SMSCOM 6.0. SMSCOM 7.0 will be available in Q3/05.

Nokia Short Message Service Center Release 7.0

NEW!

SMSCREL



Target Group

Operation and maintenance personnel responsible for the deployment of new SMSC software in the network.

Objectives

After the training, the participant will be able to:

- Provide knowledge on new features of the latest SMS Center version, as well as some operating and configuring practice.

Prerequisites

2G SYSTRA or 3G SYSTRA, Unix Fundamentals, SIGTRAN Fundamentals (when MAP/SIGTRAN in use) and SMSCOM 6.0.

Duration

0.5–1 day

No. of Participants

Max. 8

Modules

- SMS Center 7.0 Release

Notes

0.5 day with basic modules, 1 day depending on optional features.

Nokia Short Message Service Center Workshop

SMSC WS



Target Group

Technical specialists supporting the SMSC.

Objectives

After the training, the participant will be able to:

- Use the information discussed in daily tasks.

Prerequisites

2G SYSTRA or 3G SYSTRA, Unix Fundamentals, SMSCOM

Duration

1 day

No. of Participants

Max. 8

Modules

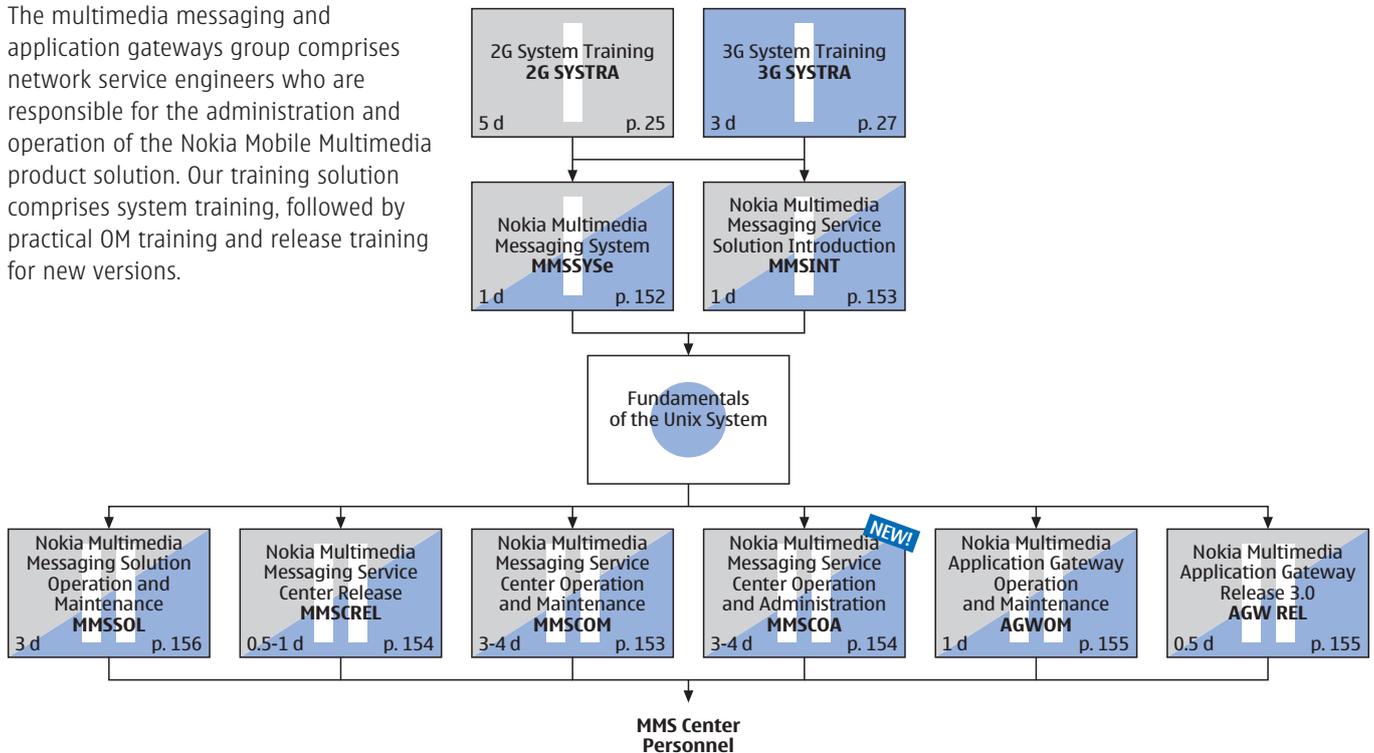
- Defined per delivery

Notes

The content of the workshop is defined separately session by session, according to the subjects discussed with the customer. The same applies for location, environment and other arrangements. These workshops are always operator specific.

Multimedia messaging and application gateways

The multimedia messaging and application gateways group comprises network service engineers who are responsible for the administration and operation of the Nokia Mobile Multimedia product solution. Our training solution comprises system training, followed by practical OM training and release training for new versions.



Nokia Multimedia Messaging System

MMSSYS



Target Group

Personnel requiring an overview of the Nokia Multimedia Messaging Service Center including the network element architecture and implementation in Nokia GSM and GPRS networks.

Objectives

After the training, the participant will be able to:

- List and briefly describe the four main multimedia messaging services.
- List the network elements and their functions from the multimedia messaging services point of view.
- List and briefly describe the MMS Center elements and their functions.
- List the specific features of the Nokia MMS Center.
- Name the three elements that form the MMS Center platform from memory.

- List the three responsibilities of the MMS Center Kernel.
- State the difference between an application interface acting as a client or as a server.
- Explain the main functions of the WAP network interface.
- List the three elements of the MMS Center platform.
- List four key features of the MMS Center.
- List four internal and external protocols used with the MMS Center.
- Name the different network elements and their roles in a GSM and GPRS networks from the MMS Center point of view.
- Name the basic functions of the different network elements in the GSM and GPRS networks from the MMS Center point of view.

Prerequisites

2G SYSTRA or 3G SYSTRA

Duration

1 day

No. of Participants

N/A

Modules

- Introduction to multimedia services
- MMS Center architecture
- MMS Center implementation
- MMS GPRS network architecture and functionality
- MMS GSM network architecture and functionality

Nokia Multimedia Messaging Service Solution Introduction

MMSINT



Target Group

Non-technical personnel.

Objectives

After the training, the participant will be able to:

- Name the basic multimedia messaging services and characteristics.
- Name the message routing points of the cellular network.
- Name items that are part of Nokia MMS solution.
- Name Nokia MMS Solution services.

Prerequisites

2G SYSTRA or 3G SYSTRA, HP UNIX fundamentals

Duration

1 day

No. of Participants

Max. 24

Modules

- Introduction to MMS
- Nokia MMS solution 3.1 message handling
- Nokia MMS solution 3.1 MMS Center
- Nokia MMS solution 3.1 Multimedia Application Gateway
- Nokia MMS solution 3.1 Profile Server
- Nokia MMS solution 3.1 Terminal Management Server

Notes

Training for optional features is available on request. Course exists also for 3.0 software release.

Nokia Multimedia Messaging Service Center Operation and Maintenance

MMSCOM



Target Group

Operation and maintenance personnel.

Objectives

After the training, the participant will be able to:

- Perform given operating tasks in a given way with reference to training material.
- Perform given maintenance tasks in a given way with reference to training material.
- Perform given configuration tasks in a given way with reference to training material.
- Be aware of 3GPP and OMA specifications about multimedia messaging service (MMS).

Prerequisites

2G SYSTRA or 3G SYSTRA, MMSSYS(e), Unix fundamentals

Duration

3–4 days

No. of Participants

Max. 8

Modules

- MMS Center architecture
- MMS Center message handling
- MMS Center documentation
- Operating and administrating MMS Center
- Reporting and statistics
- Configuring MMS Center
- Interworking MMS functionality
- External application interface
- Billing
- Exercises

Optional features training modules

- Content adaptation
- E-mail gateway
- Clustered solution
- Subscriber database interface
- Legal interception interface
- In advance credit check interface
- Mobile number portability with MAP interface
- Secured IP interfaces

Notes

Duration from three to four days, depending on the release or if training for any of the optional features is ordered. This course is based on release 3.0.

Nokia Multimedia Messaging Service Center Operation and Administration

NEW! MMSCOA



Target group

Operation and maintenance personnel with less than six months experience of Nokia MMS Center.

Objectives

After the training, the participant will be able to:

- Name the characteristics of multimedia messaging from memory.
- Name all the elements of Nokia MMS Center from memory.
- Perform given operating tasks in accordance with the training material.
- Perform given maintenance tasks in accordance with the training material.
- Perform given configuration tasks in accordance with the training material.
- Be aware of 3GPP and OMA specifications about multimedia messaging service (MMS).

Prerequisites

2G SYSTRA or 3G SYSTRA, HP UNIX fundamentals

Duration

3–4 days

No. of Participants

Max. 8

Modules

- Architecture
- User management
- Message handling
- Subscriber and terminal management
- Fault management
- External applications interface
- Interworking MMS Center functionality
- Charging
- Performance management
- System management

Optional training modules:

- Internet mail gateway
- In advance credit check
- Content adaptation
- Subscriber database interface
- Secured IP interfaces
- Virtual MMS Center
- Mobile number portability and address resolution
- Legal interception
- MM7 interface
- Digital rights management

Notes

The duration depends on the optional features selected by the customer. This course is based on release 3.1.

Nokia Multimedia Messaging Service Center Release

MMSCREL



Target Group

Operation and maintenance personnel with at least six months experience with Nokia MMS Center.

Objectives

After the training, the participant will be able to:

- List the Nokia MMS Center Release 3.1 new features.
- Maintain and administer the features of Nokia MMS Center 3.1.

Prerequisites

2G SYSTRA or 3G SYSTRA, MMSCOM, UNIX fundamentals

Duration

0.5–1 day

No. of Participants

Max. 8

Modules

- Nokia MMS Center 3.1 Release
- Exercises

Notes

- Release training available also for MMS 3.0.
- 0.5 day includes only basic modules, 1 day depending on optional features.

Nokia Multimedia Application Gateway Operation and Maintenance

AGWOM



Target Group

Operation and maintenance personnel with less than six months experience with AGW.

Objectives

After the training, the participant will be able to:

- Name the four MMS services that make up AGW.
- Name the third party programs that make up AGW and state their function.
- Perform given operating tasks in a given way.
- Perform given maintenance tasks in a given way.
- Perform given configuration tasks in a given way.

Prerequisites

2G SYSTRA or 3G SYSTRA, MMSSYS, Unix fundamentals

Duration

1 day

No. of Participants

Max. 8

Modules

- AGW basics
- Legacy support (MMS service)
- Multimedia Message Storage (MMS service)
- Email smart push (MMS service)
- Multimedia voice messaging (MMS service)

Notes

This course is based on release 3.0.

Nokia Multimedia Application Gateway Release 3.0

AGW REL



Target Group

Operation and maintenance personnel.

Objectives

After the training, the participant will be able to:

- Maintain and administer the latest release of Nokia AGW.
- Maintain and administer the features of Nokia AGW 3.0.

Prerequisites

2G SYSTRA, AGWOM 2.0, HP UNIX fundamentals (or equivalent)

Duration

0.5day

No. of Participants

Max. 8

Modules

- AGW Release 3.0
- Exercises

Nokia Multimedia Messaging Solution Operation and Maintenance

MMSSOL



Target Group

Operation and maintenance personnel.

Prerequisites

3G SYSTRA, MMSINT, UNIX fundamentals

Modules

- Under development

Objectives

After the training, the participant will be able to:

- Provide knowledge and develop skills to operate and maintain the Nokia MMS solution.

Duration

3 days

No. of Participants

Max. 8

Notes

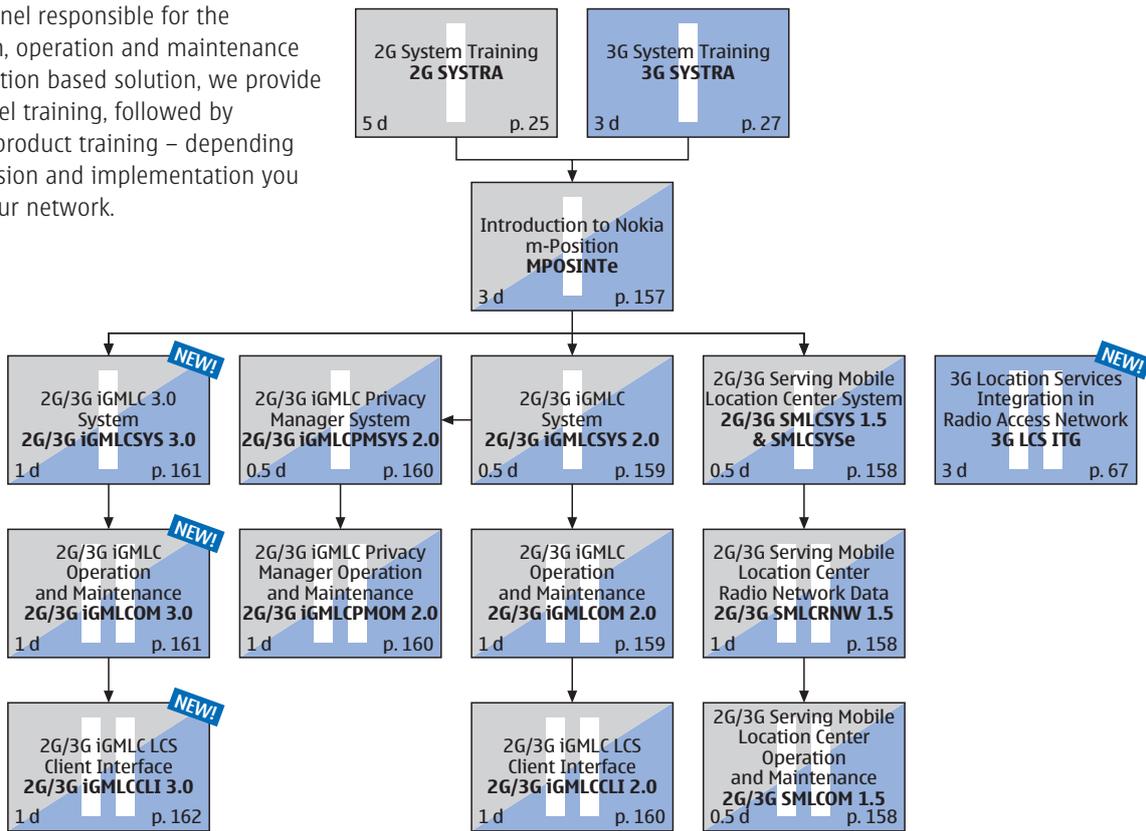
MMS solution level courses are designed to cover various operator processes across multiple platforms and interfaces within Nokia MMS solution.

Nokia Multimedia Messaging solution

Nokia MMS solution provides a service platform to put operators on the fast track to revenue by enabling “Ready to go” services, through instant service provisioning and activation. Nokia MMS solution core elements are Nokia Multimedia Messaging Service Center and Nokia Multimedia Application Gateway. Nokia MMS solution can also include the following elements: Nokia WAP Gateway, Nokia Messaging Gateway, Nokia Profile Server, Nokia Terminal Management Server and Nokia Charging Center.

Location based services

For personnel responsible for the integration, operation and maintenance of the location based solution, we provide system level training, followed by extensive product training – depending on the version and implementation you have in your network.



Introduction to Nokia mPosition



Target Group

Personnel involved with Nokia mPosition location based services: service creation and management, service platform administration, marketing, customer care.

Objectives

After the training, the participant will be able to:

- Describe the Nokia mPosition network solutions for Global System for Mobile Communications (GSM) and wideband code division multiple access (WCDMA) networks.

Prerequisites

UndGSMe, 3G INTE

Duration

3 days

No. of Participants

N/A

Modules

- Introduction to Nokia mPosition
- Nokia mPosition for GSM/EDGE
- Nokia mPosition for WCDMA

MPOSINTE

NEW!

2G/3G Serving Mobile Location Center System

2G/3G SMLCSYS 1.5 & SMLCSYS e



Target Group
Generic.

Objectives
Basic understanding of Serving Mobile Location Center (SMLC)

Prerequisites
2G SYSTRA, 3G SYSTRA, MPOSINTe, iGMLCSYS

Duration
0.5 day

No. of Participants
Max. 24

Modules

- SMLC introduction
- SMLC architecture
- SMLC graphical user interface

Notes
E-learning solution is available for software version 1.5.

NEW!

2G/3G Serving Mobile Location Center Radio Network Data

2G/3G SMLCRNW 1.5



Target Group
Field engineers working with location based services.

Objectives
After the training, the participant will be able to:

- Create radio network data file and timing advance statistical data files and update the SMLC database.

Prerequisites
2G SYSTRA or 3G SYSTRA, SMLCSYS

Duration
1 day

No. of Participants
Max. 8

Modules

- SMLC radio network data
- SMLC statistical data
- SMLC algorithms
- SMLC data update
- SMLC manual data update
- SMLC NetImport data update
- SMLC automatic data update
- SMLC database

NEW!

2G/3G Serving Mobile Location Center Operation and Maintenance

2G/3G SMLCOM 1.5



Target Group
Field engineers working with location based services.

Objectives
After the training, the participant will be able to:

- Operate, maintain and troubleshoot SMLC.

Prerequisites
2G SYSTRA or 3G SYSTRA, SMLCSYS, SMLCRNW

Duration
0.5 day

No. of Participants
Max. 8

Modules

- SMLC getting started
- SMLC configuration files
- SMLC logging management
- SMLC fault management
- SMLC general operations
- SMLC troubleshooting

Service enabler solutions

intelligent Gateway Mobile Location Center System

iGMLCSYSe



Target Group

Personnel working with location based services.

Objectives

After the training, the participant will be able to:

- Describe the role of the Nokia intelligent Gateway Mobile Location Center (iGMLC) in both the mPosition for legacy phones and mPosition for E_OTD solutions.

Prerequisites

2G SYSTRA or 3G SYSTRA

Duration

0.5 day

No. of Participants

N/A

Modules

- Nokia iGMLCSYSe solution

2G/3G intelligent Gateway Mobile Location Center System

2G/3G iGMLCSYS 2.0



Target Group

Personnel working with location based services.

Objectives

Basic understanding of iGMLC.

Prerequisites

2G SYSTRA or 3G SYSTRA, MPOSINTE

Duration

0.5 day

No. of Participants

Max. 24

Modules

- iGMLC introduction
- iGMLC architecture
- iGMLC processing
- iGMLC graphical user interface

Notes

E-learning solution is also available for this course.

2G/3G intelligent Gateway Mobile Location Center Operation and Maintenance

2G/3G iGMLCOM 2.0



Target Group

Field engineers working with location based services.

Objectives

After the training, the participant will be able to:

- Operate, maintain and troubleshoot iGMLC.

Prerequisites

2G SYSTRA or 3G SYSTRA, 2G/3G iGMLCSYS 2.0

Duration

1 day

No. of Participants

Max. 8

Modules

- iGMLC getting started
- iGMLC configuration management
- iGMLC LCS client management
- iGMLC system maintenance
- iGMLC troubleshooting

2G/3G intelligent Gateway Mobile Location Center LCS Client Interface

2G/3G iGMLCCLI 2.0



Target Group

Field engineers or application developers working with location based services.

Objectives

After the training, the participant will be able to:

- Discuss and understand the interface between iGMLC and LCS clients.

Prerequisites

2G SYSTRA or 3G SYSTRA, 2G/3G iGMLCSYS 2.0, 2G/3G iGMLCOM 2.0

Duration

1 day

No. of Participants

Max. 8

Modules

- iGMLC LCS client interface introduction
- Understanding document type definitions in iGMLC
- Understanding iGMLC LCS client interface – LIF MLP 1.1
- Understanding iGMLC LCS client interface – Privacy manager
- Understanding iGMLC LCS client interface – LIF MLP 3.0
- Working with a sample client for iGMLC
- iGMLC secure sockets layer connection

2G/3G intelligent Gateway Mobile Location Center Privacy Manager System

2G/3G iGMLCPMSYS 2.0



Target Group

Personnel working with location based services.

Objectives

Provide a basic understanding of iGMLC Privacy Manager.

Prerequisites

2G SYSTRA or 3G SYSTRA

Duration

0.5 day

No. of Participants

Max. 8

Modules

- iGMLC Privacy Manager architecture
- iGMLC Privacy Manager processing
- iGMLC Privacy Manager graphical user interface

2G/3G intelligent Gateway Mobile Location Center Privacy Manager Operation and Maintenance

2G/3G iGMLCPMOM 2.0



Target Group

Field engineers working with location based services.

Objectives

After the training, the participant will be able to:

- Operate, maintain and troubleshoot iGMLC Privacy Manager.

Prerequisites

2G SYSTRA or 3G SYSTRA, 2G/3G iGMLCPMSYS 2.0

Duration

1 day

No. of Participants

Max. 8

Modules

- iGMLC Privacy Manager configuration management
- iGMLC Privacy Manager operator provisioning
- iGMLC Privacy Manager subscriber provisioning
- iGMLC Privacy Manager fault management
- iGMLC Privacy Manager logging and billing management
- iGMLC Privacy Manager database management
- iGMLC Privacy Manager troubleshooting

NEW!

2G/3G intelligent Gateway Mobile Location Center 3.0 System

2G/3G iGMLCSYS 3.0



Target Group

Personnel needing a basic understanding of iGMLC 3.0.

Objectives

After the training, the participant will be able to:

- Explain the role of iGMLC 3.0.
- List the interfaces supported by iGMLC 3.0.
- Explain the various roaming scenarios.
- Explain the basic architecture of the iGMLC 3.0.
- Explain and draw the internal processing in iGMLC 3.0.
- Describe the scaling principles of the iGMLC 3.0.
- List the main GUIs of iGMLC 3.0.

Prerequisites

MPOSINte, EDGESYS

Duration

1 day

No. of Participants

Max. 15

Modules

- Introduction to iGMLC 3.0
- Roaming support
- iGMLC 3.0 architecture
- iGMLC 3.0 processing
- iGMLC 3.0 GUIs

NEW!

2G/3G intelligent Gateway Mobile Location Center Operation and Maintenance

2G/3G iGMLCOM 3.0



Target Group

Operation and maintenance personnel needing a deeper understanding of iGMLC 3.0.

Objectives

After the training, the participant will be able to:

- Start iGMLC 3.0.
- Describe and use the iGMLC 3.0 configuration tools/files.
- Describe and use the operator provisioning functions.
- Describe and perform system maintenance tasks on the iGMLC 3.0.
- Describe the troubleshooting principles for iGMLC 3.0.

Prerequisites

MPOSINte, 2G/3G iGMLCSYS 3.0

Duration

1 day

No. of Participants

Max. 4–6

Modules

- iGMLC 3.0 getting started
- iGMLC 3.0 configuration management
- iGMLC 3.0 operator provisioning
- iGMLC 3.0 subscriber provisioning
- iGMLC 3.0 system maintenance
- iGMLC 3.0 troubleshooting

NEW!

2G/3G iGMLCCLI 3.0

2G/3G intelligent Gateway Mobile Location Center LCS Client Interface



Target Group

Operation and maintenance personnel and application developers needing a deeper understanding of iGMLC Client Interface 3.0.

Objectives

After the training, the participant will be able to:

- List the LCS client interfaces supported by iGMLC 3.0.
- Describe the role of document type definitions (DTDs) in iGMLC 3.0.
- Describe the iGMLC 3.0 LCS Client Interfaces – MLP 3.0 & MLP3.1 supported by iGMLC 3.0.
- Send and receive location requests from the iGMLC 3.0.
- Describe the procedures to establish one-way SSL connection from a standalone Java client to the iGMLC 3.0.
- Describe the available Java SDKs for LBS application creation.

Prerequisites

2G/3G iGMLCSYS 3.0, 2G/3G iGMLCOM 3.0

Duration

1 day

No. of Participants

Max. 6

Modules

- iGMLC 3.0 Client interface introduction
- DTDs in iGMLC 3.0
- iGMLC 3.0 LCS Client interface
- Working with sample Client for iGMLC 3.0
- iGMLC 3.0 secure sockets layer connection
- Java SDKs for LBS

Application development resources

The service core and enablers provide the platform to implement new service capabilities into the network. Some services are already included, in other cases the services can be developed by you or a diverse range of companies. To support the explosive and innovative development of services, Nokia provides a comprehensive online resource

(www.forum.nokia.com) that provides tools, documents, articles and support for developers. It is free to join and already has over 1.5 million registered developers. Nokia has also launched an extended service called Forum Pro, where exclusive events, training and early access to the latest material are available.

Value added operations support systems

The Nokia OSS supports a multitude of functionality that supports specific aspects of network operation. This includes a number of optional features that support tasks such as service quality monitoring, data-mining and performance measurements. These tools are designed for use by several target groups as shown in the picture.

Find your Nokia NetAct Feature Training.

| | Relevant for all network technologies | BSS | UTRAN | PCN | SCN |
|--------------------------------|---------------------------------------|--|-------------|--|-------------|
| Platform | OSSPLAT | | | | |
| Monitor | OSSPLAT | 2G NOCSUR | 3G NOCSUR | TRAFFICA Z4 / TRAFFICA Z4 REL TRAFFICA Z4 ADM / TRAFFICA Z4 ADM REL | |
| Reporter | | BSS NOC REP | RAN NOC REP | OSS INSP | SCN NOC REP |
| Network Configuration | | 2G NOCCM OSS REHOST OSS OPTIMIZER OSS NODEMGR | 3G NOCCM | PCCOM | |
| Service Quality Manager | SQMINT SQMADM | | | | |
| NDW NMS/10 | NDWREP NDWADM NMS10 | | | | |
| Planner | | NETPL MULTIRADIO NETPLLINK NETPLTX | | | |

Service enabler solutions

Nokia Traffica Z4



Target Group

Second line OM personnel; personnel working with Nokia Traffica.

Objectives

After the training, the participant will be able to:

- Explain the idea of Traffica.
- Describe the Traffica architecture and elements connected to it.
- Explain the functionalities of Traffica local and remote.
- Perform client tasks with regards to Traffic News and Traffic Views.
- Handle the Traffica user's tasks.
- Explain the various client solutions available to Traffica users.
- Describe the various Nokia NetAct applications that can be integrated with Traffica.

Prerequisites

2G SYSTRA or 3G SYSTRA

Duration

3 days

No. of Participants

Max. 8

Modules

- Z4 Introduction to Traffica
- Z4 Traffica architecture
- Z4 Traffica functionality
- Z4 Traffic News
- Z4 Traffic Views
- Z4 Traffica interworking



TRAFFICA Z4

Nokia Traffica Z4 System Administration



Target Group

Second line OM personnel; personnel administrating Nokia Traffica.

Objectives

After the training, the participant will be able to:

- Explain the idea of Traffica.
- Describe the Traffica architecture and elements connected to it.
- Manage users with user manager, explain the tools for administering Traffica and in the practical part, to build up Traffica topology, create own definitions and transfer these remotely to other Trafficas.

Prerequisites

2G SYSTRA or 3G SYSTRA, TRAFFICA Z4.

Duration

1 day

No. of Participants

Max. 8

Modules

- Z4 Introduction to Traffica
- Z4 Traffica architecture
- Z4 Traffica system administration



TRAFFICA Z4 ADM

Nokia Traffica Z4 Release

NEW!

TRAFFICA Z4 REL



Target Group

Second line OM personnel; personnel working with Nokia Traffica.

Objectives

After the training, the participant will be able to:

- Explain the idea of Traffica.
- Describe the Traffica architecture.
- Perform client tasks with regards to Traffic News and Traffic Views.
- Handle the Traffica user's tasks.

Prerequisites

2G SYSTRA or 3G SYSTRA, TRAFFICA Z3.1

Duration

0,5 day

No. of Participants

Max. 8

Modules

- Z4 Introduction to Traffica
- Z4 Traffica architecture
- Z4 Traffic news
- Z4 Traffic views
- Z4 Database export

Nokia Traffica Z4 System Administration Release

NEW!

TRAFFICA Z4 ADM REL



Target Group

Second line OM personnel; personnel administrating Nokia Traffica.

Objectives

After the training, the participant will be able to:

- Explain the idea of Traffica.
- Describe the Traffica architecture.
- Manage users according to the change brought with the Z4 release, explain the new tools for administering Traffica, create their own definitions and transfer these remotely to other Trafficas..

Prerequisites

2G SYSTRA or 3G SYSTRA, TRAFFICA Z3.1, TRAFFICA Z3.1 ADM

Duration

0,5 days

No. of Participants

Max. 8

Modules

- Z4 Introduction to Traffica
- Z4 Traffica architecture
- Z4 Traffica system administration

Nokia NetAct Operations Support System Optimizer

NEW!

OSS OPTIMIZER



Target Group

Network optimization personnel, network planners.

Objectives

After the training, the participant will be able to:

- Explain the interfaces and the interaction of optimizer with other OSS tools from reporter and RAC functionality area and outline the optimization process.
 - Prepare the optimization process by managing the GIS settings, handling measurements and managing network configuration data.
 - Visualize the network configuration data.
 - Create a new optimization plan in optimizer.
 - Manage adjacencies manually and edit network parameters as a single or mass operation.
 - Describe the process of provisioning the plan to the network.
- Retrieve measurements and create interference matrix. Evaluate the interference measurement quality.
 - Perform an adjacency optimization using the auto tuning function of optimizer.
 - Theorise about interference matrix calculation and corresponding measurements.
 - Create a frequency and BSIC plan and verify the frequency allocation results in optimizer.
 - Visualize capacity and perform capacity optimization.
 - Optimize service quality.

Prerequisites

2G SYSTRA or 3G SYSTRA

Duration

1–3 days

No. of Participants

Max. 8

Modules

- Introduction to optimizer and optimization process
- Preparing for the network optimization
- Visualizing the network configuration and performance data
- Managing optimization plans
- Managing adjacencies and network object parameters manually
- Verification and provisioning process
- Creating and verifying interference matrix
- Auto tuning adjacencies
- Creating a new frequency plan with optimizer
- Compare iterations and verify optimization result
- Capacity optimization
- Service optimization

Notes

Duration depends on covered optimizer features; full course content is outlined here; applicable for Optimizer 1.3

Nokia NetAct Inspector – Active QoS Measurement

OSS INSP



Target Group

Service management and network performance personnel.

Objectives

After the training, the participant will be able to:

- Explain the purpose and scope of Nokia NetAct Inspector. Discuss the application and the accordant user groups within the operator's organization.
 - Develop a strategy in the operator's network to set up measurement stations and stethoscopes in online and offline modes.
 - Describe the overall Inspector using process and define measurement stations and stethoscopes in practical examples.
- Demonstrate use of Inspector in teamwork with other suitable Nokia NetAct functionalities like Monitor and Reporter. Generate example reports showing QoS indicators of existing services.

Prerequisites

OSSPLAT/(BL)

Duration

2 days

No. of Participants

Max. 8

Modules

- Nokia NetAct Inspector introduction
- Inspector using strategy process
- Inspector environment setup process
- QoS monitoring and reporting process

Packet Core Configurator Operation and Maintenance

PCCOM



Target Group

Personnel taking care of operation and configuration of the Nokia NetAct Packet Core Configurator.

Objectives

After the training, the participant will be able to:

- Explain the functionality of the Nokia NetAct Packet Core Configurator as a tool for service access provisioning as well as for network development and optimization.
- Configure access point creation, modification, termination and re-hosting with the Nokia NetAct Packet Core Configurator.
- Create and analyze PCC reports.
- Perform consistency checks and uploads.

Prerequisites

None

Duration

2 days

No. of Participants

Max. 4

Modules

- GPRS / Core network IP overview
- GGSN features
- Basic configuration in GGSN
- GGSN access point configuration
- Basic GGSN debugging
- GPRS and 3G roaming
- Nokia NetAct Packet Core Configurator

Notes

This course can be conducted in Training Center Düsseldorf (Germany) or at the operator's premises.

Introduction to Nokia Service Quality Manager

SQMINT



Target Group

Personnel who want an overview of service management as a concept and an overview of Nokia Service Quality Manager (SQM).

Objectives

After the training, the participant will be able to:

- Understand TMF and TMN (TOM).
- Define problem classes, service classes, rules, and services.
- Navigate through SQM monitoring tools.
- Navigate through SQM map tools.

Prerequisites

2G SYSTRA, knowledge of a Nokia NMS and its applications

Duration

1 day

No. of Participants

Max. 12

Modules

- Overview of service management
- Rule package structure
- Applications and functionalities
- Map and map applications



Target Group

Personnel who want to administer the Nokia Service Quality Manager.

Objectives

After the training, the participant will be able to:

- Draw the system architecture of Nokia Service Quality Manager.
- Name and identify the Nokia SQM processes and configuration files.
- Administer the collectors.
- Define permissions for users.
- Start up and shut down processes.

Prerequisites

2G SYSTRA or 3G SYSTRA, SQMINT

Duration

1.5 days

No. of Participants

Max. 4

Modules

- SQM hardware and software
- SQM software and environment
- System maintenance/handling (SQMADM)
- Installing PC clients

Nokia NetAct Reporter – Network Data Warehouse Reporting



Target Group

Personnel in the customer interface and all those who want to understand the basic functionality of the Nokia Network Data Warehouse (NDW) and who need PM reporting as a tool in their daily work.

Objectives

After the training, the participant will be able to:

- Explain the concept and architecture of Nokia NetAct Reporter.
- View Nokia NDW default reports.
- Create reports with Report Builder.
- View KPIs and reports using Report Browser and KPI Browser.
- Create Reports using ODR/ODB.

Prerequisites

2G SYSTRA or 3G SYSTRA

Duration

3 days

No. of Participants

Max. 8

Modules

- Introduction to Nokia NetAct Reporter
- NDW default reports
- Report creation and viewing using Report Builder, KPI Browser and Report Browser
- Report creation using ODR/ODB

Nokia NetAct Reporter – Network Data Warehouse Administration

NDWADM



Target Group

NDW administrators and other people with ND4 system administration among their responsibilities.

Objectives

After the training, the participant will be able to:

- Administer the NDW UNIX part.
- Administer the NDW Windows part.

Prerequisites

2G SYSTRA or 3G SYSTRA, HP-UX Admin1, OSSADM1 (recommended)

Duration

3 days

No. of Participants

Max. 8

Modules

- Introduction to Nokia NetAct Reporter
- System administration for NDW UNIX part
- System administration for NDW Windows part 2

Network Management System 10

NMS10



Target Group

NMS/10 installation, operation, maintenance and network monitoring personnel.

Objectives

After the training, the participant will be able to:

- Explain the use of NMS/10 in the network control system.
- Explain the principles of HP open view.
- Configure NMS/10 SF.
- Configure the NMS/10 MF.
- Configure the Q1 agent.
- Supervise the network with the NMS/10 MF.
- Use the MF manager.
- Configure Q3 agent.
- Supervise the network with Q3 agent.

Prerequisites

None

Duration

3 days

No. of Participants

Max. 6

Modules

- NMS/10 SR C6.1
- Configuration of equipment
- MF Overview/Introduction
- Q1 agent
- Q3 agent

Nokia NetAct OSS4 Release training

The learning solutions for new Nokia NetAct Operations Support System OSS4 will be available in Q3/05.

Release Training

Release learning solutions outline the changes for different OSS users from operators experienced with Nokia NetAct OSS3.1.

OSS System administrators may update their competence in a classroom training OSSADM REL including practical exercises. This training will cover all platform related administrative tasks, changes and underpinning knowledge needed to manage all OSS platforms (e.g. new LINUX application server).

For **various OSS user groups** Nokia provides two delivery options both called OSSUSER REL 4. The first option contains separated e-JobAid recordings with slides, audio support and screen grabbing of the OSS applications outlining the changes for each functionality area. The second option is a combined classroom training tailored for each target group with practical demonstrations. The delivery method depends very much on the operator's size, number of students, tasks per students and regional distribution of OSS systems. This way every operator size can be addressed with these solutions to find the most suitable, preferred and cost optimized solution.

Standard course flows per target group

For **OSS system administrators** Nokia provides a 3-course model. The first course to attend is OSSADM1 in order to manage the regular maintenance tasks of the system. OSSADM2 is for advanced system administrators focusing the insights of the new user management concepts and the database administration. OSSADM3 is for real expert administrators outlining deep insights of Nokia NetAct including typical trouble shooting cases.

All standard OSS and NOC courses for **various OSS user groups** will be updated to cover all new functionality of Nokia NetAct OSS4. The courses are: OSSPLAT/(BL), 2G NOCSUR, 3G NOCSUR, 2G NOCCM, 3G NOCCM, OSS REHOST, OSS NODEMGR, BSS NOC REP, RAN NOC REP, SCN NOC REP, OSS OPTIMIZER, OSS INSP.

Nokia NetAct Operations Support System Administration Release OSS4

NEW!

OSSADM REL



Target Group

Nokia NetAct OSS administration personnel.

Objectives

After the training, the participant will be able to:

- Explain the differences in Nokia NetAct architecture, new hardware and configuration types in OSS4.
- Explain the differences in day to day maintenance and administration of applied technologies.
- Explain the changes in role and architecture of the HP-UX servers and perform the system administration tasks.
- Explain the role and architecture of the Linux Application Server and GUIs and perform the system administration tasks.
- Describe new configuration tools and procedures and perform configuration changes.
- Describe changes in mechanisms for availability assurance.
- Explain the differences in user management.
- Explain the main changes in the security architecture of the OSS, the efficient use of the security features and describe the impact on the administrative tasks.

- Describe the changes in database concept and environment and perform database administration beyond the scope of day to day maintenance.
- Give an overview of new backup solution.
- Describe changes in Nokia NetAct system administrator tasks.
- Describe the changes in connectivity of 2G, 3G and packet core network elements with Nokia NetAct.
- Explain the differences in CORBA administration beyond the scope of day to day maintenance.
- Describe the differences in FM, CM and PM administration in Nokia NetAct.

Prerequisites

2G SYSTRA or 3G SYSTRA, SWPLAT ESS, OSSPLAT/(BL), OSSADM1 (OSS3.1), OSSADM2 (OSS3.1)

Duration

5 days

No. of Participants

Max. 8

Modules

- OSS3.1 to 4: Nokia NetAct architecture
- OSS3.1 to 4: Hardware
- OSS3.1 to 4: Applied technologies
- OSS3.1 to 4: HP-UX Servers
- OSS3.1 to 4: LinAS
- OSS3.1 to 4: GUIs
- OSS3.1 to 4: Configuration
- OSS3.1 to 4: Availability assurance
- OSS3.1 to 4: Managing users
- OSS3.1 to 4: Security
- OSS3.1 to 4: Database
- OSS3.1 to 4: Backup
- OSS3.1 to 4: System administration routines
- OSS3.1 to 4: DCN overview
- OSS3.1 to 4: CORBA
- OSS3.1 to 4: FM, PM, CM administration

Nokia NetAct Operations Support System User Release 4 (OSS3.1 ED3 -> OSS4)

NEW!

OSSUSER REL 4



Target Group

Personnel working with Nokia NetAct system using OSS applications.

Objectives

After the training, the participant will be able to:

- List the main differences in Nokia NetAct architecture between releases OSS3.1 ED3 and OSS4 in terms of hardware, software and server structure.
- Describe the functionality differences and new features between releases OSS3.1 ED3 and OSS4 for:

- Configuration management applications
- Performance management applications
- Monitoring management applications
- Desktop applications.

Prerequisites

OSSPLAT/(BL), NOC courses

Duration

2-3 days

No. of Participants

Max. 8

Modules

- OSS4 changes in Nokia NetAct architecture
- OSS4 changes in configuration management
- OSS4 changes in performance management
- OSS4 changes in monitoring management
- OSS4 changes in desktop applications

Notes

OSSUSER REL 4 training can be delivered as E-JobAid training or classroom training tailored per target group / functionality area.

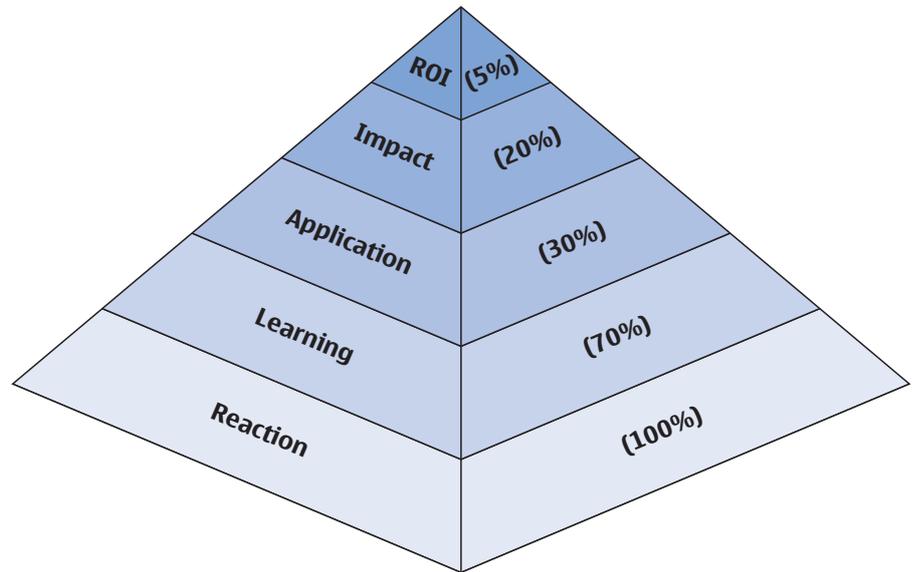
Nokia Verification Services

Ensuring that you get the most from your investments and maximizing the potential of your people are both issues we all face. Networks continue to increase in complexity and the business environment remains challenging. To meet this demand, Nokia is introducing a range of assessment, licensing and certification services to help ensure you have the right level of competence, in the right place, for optimal investment. Our services are based on the established Jack Phillips and Donald Kirkpatrick models, which are used to determine the effect and benefit of learning on your organization and people.

The main purpose of Verification Services is to support the definition and measurement of KPIs for competence development programs. We offer support in breaking down your business objectives into measurable learning objectives in order to define the most effective competence development program.

We have a team of competent and experienced assessors as well as a strong collaboration with market leading companies in the field of competence and impact measurement. References can be given on request.

Our unique Question Bank solution gives us the freedom to tailor tests to fit your exact needs and business objectives. The solution also supports the data collection for any ROI measurement.



The Kirkpatrick/Phillips verification model

Reaction – For every course and workshop we collect an evaluation from the participants to assess their feelings about the training. Each participant receives the “Recognition of Participation”.

Learning – The efficiency of learning is measured on a course level through an assessment that tests the knowledge the participants have gained. Most of our intermediate courses offer this for free. Results on an individual level are available for an additional price. On successfully completing the assessment, the individual will receive a Nokia Diploma. In addition to this we also offer exams with the aim of measuring the knowledge an individual has on a given equipment and technology area. On successfully completing the exam, the individual will receive a Nokia Certificate.

Application – The third level of the model is the measured transfer – in other words, what the person can and cannot do – assessed through our globally recognized license program for customers. The license will verify an individual’s ability to undertake a set of skilled actions required to perform a job.

Impact – The fourth level is the effect of learning on the financial and functional bottom line of your organization. To support and measure the effect a competence development program has on your business objectives, we also provide a training measurement service that provides clear reports on the progress and benefit of training, according to KPIs defined in co-operation with you.

ROI – The highest level is in effect also the simplest level. ROI is calculated as net benefits divided by net cost times one hundred. The definition of net benefits is done in co-operation with your organization as well as net costs. The costs should include all costs that are relevant to the learning solution, from the price of the delivery over travel costs and production time loss. All data with regards to benefit and cost are collected through the previous four levels.

What services are available?

- Accreditation
- Nokia Licensing
- Nokia Certification
- Nokia Trainer Licensing
- Evaluation and Measurement Services

Competence verification

Competence verification is aimed at different aspects of an individual's competence. For example, with Nokia's subcontractors, training is a tool towards achieving competence verification.

Nokia Licensing requires an individual to be assessed on a test bed or live network to prove they can implement, operate and maintain the functions of one or more Nokia network elements.

Nokia Certification requires an expert to pass a closed book examination, which is created by Nokia experts for one or more Nokia network elements.

During competence development planning, a single or series of Nokia Licenses or a Nokia Certificate is often the agreed target to verify that the competences have been achieved.

For example, in a telecom implementation project, the "key personnel", team leaders, supervisors and so on, may be Nokia Certified Engineers. These key personnel can assist with the on-site training and support of the majority of the workforce, who will be licensed to perform specific tasks, such as BSC commissioning. Some 10% of the workforce may be Nokia Certified and the remaining 90% will be Nokia Licensed. The individuals may be licensed to perform BSC installation, BSC commissioning, BSC integration or a combination of the three, depending on how the subcontractor organizes the work.

How a Nokia License or Nokia Certificate will benefit your organization

There are a number of benefits for organizations in having their competences verified using the Nokia License and Nokia Certificate services:

- It enables you to identify, benchmark and manage the overall competence level of your organization
- It enables you to link your competence/ career ladder to Nokia Licensing and Nokia Certification
- It provides you with a method to identify competence across international affiliates
- It provides you with a requirement standard when recruiting engineers

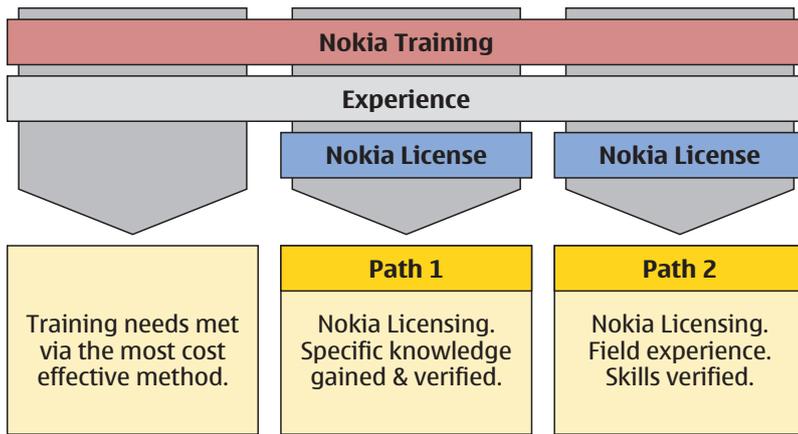
The key benefits for the individual in the organization are:

- Licensing offers the opportunity to prove your skills to your employer
- Certification offers the opportunity to prove your skills and expert knowledge to your employer
- A successful individual will receive a Nokia Licensed Engineer ID badge or Nokia Certified Engineer ID badge

In brief, a Nokia License verifies the basic tasks of performing BTS installation or BTS commissioning.

Nokia Certification requires an individual to pass a Nokia Certificate exam. The exam asks different types of questions about a wide variety of tasks. If an individual achieves a Nokia Certified Engineer standard they must have a wide variety of competence in a particular Nokia network element or group of network elements.

Nokia License



A Nokia License is designed for an individual who has proved their ability to implement, operate and maintain functions on Nokia network elements, through testing in a test bed or live network. There are a number of ways of achieving a Nokia License.

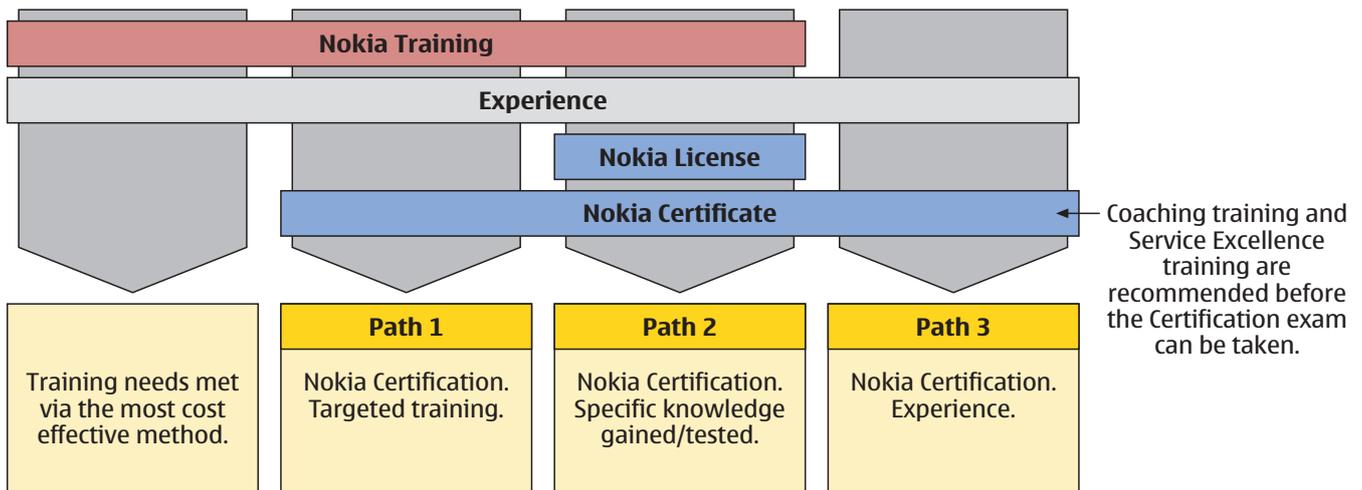
A Nokia License is aimed at selected tasks for specific equipment. It may include:

- Specific training
- Scenario-based testing of practical skills in test beds
- Knowledge of escalation processes
- Selected tasks that follow a pre-defined process and are carried out during network implementation

Skills are verified using one or more methods:

- Performing the task on-site, e.g. NOC monitoring
- As an individual is assessed on-site, e.g. BTS commissioning
- Observation of an individual performing the tasks in a live network, e.g. NOC monitoring
- Performing the task in a test bed
- Online testing

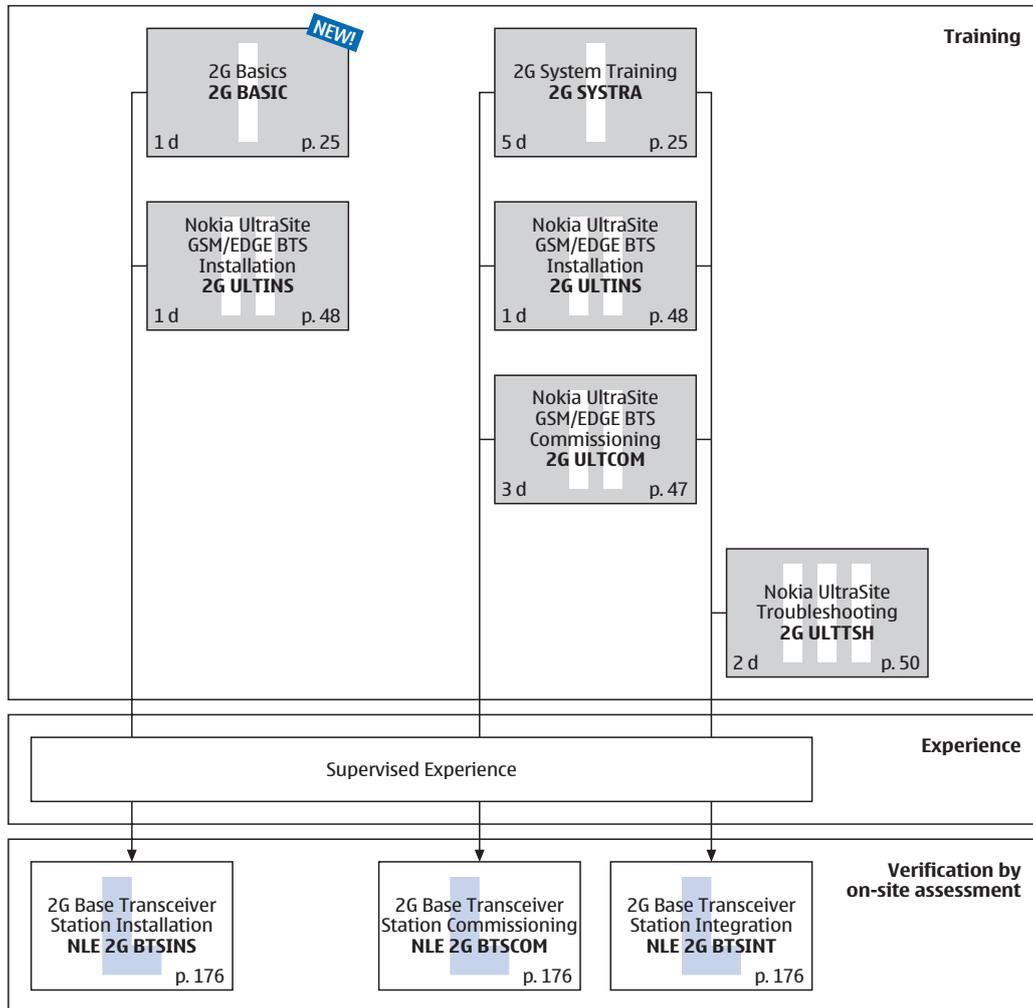
Nokia Certificate



Nokia Certification is a tool for assessing an engineer's knowledge and skills regarding one or a group of Nokia network elements. There are a number of different paths to achieving a Nokia Certificate.

Looking for assessment that is an alternative to Licensing or Certification? If you need assessment for your personnel's development or competence measurement and if licensing and/or certification is not suitable for your company's needs or culture, we can provide the same assessment process, but without a resulting license or certificate. This is called accreditation and we can provide customized solutions to meet your needs.

Base transceiver station



As radio access networks become increasingly complex, so does the need for a highly competent workforce whom you can trust to work effectively and to a high level of quality. To meet this need, Nokia is extending the field engineering licensing and certification programs, from being available only to Nokia subcontractors to all our customers. We have already experienced the improvement in quality through the use of verification methods.

Nokia License – 2G Base Transceiver Station Installation

NEW!

NLE 2G BTSINS



Target Group

Engineers who are responsible for the installation of Nokia 2G BTS.

Nokia Equipment

Nokia UltraSite GSM/EDGE BTS and Nokia MetroSite BTS equipment, Nokia TalkFamily BTS.

Scope of License

Cabinet installation

- PIU installation
- Internal cabling and connectors

Interface cabling

- Power
- Grounding
- External alarms
- Transmission/Q1
- Fiber optics
- Barcode reading
- Documentation

Testing Methods

Dedicated on-site assessment

Validity and Renewal

Valid for 12 months. Renewal is based on dedicated on-site assessment

Notes

The license can only be issued based on an on-site assessment arranged through Nokia Learning Solutions.

Nokia License – 2G Base Transceiver Station Commissioning

NEW!

NLE 2G BTSCOM



Target Group

Engineers who are responsible for the commissioning of Nokia 2G BTS.

Nokia Equipment

Nokia UltraSite GSM/EDGE BTS and Nokia MetroSite BTS equipment, Nokia TalkFamily BTS.

Scope of License

- BTS commissioning
- Power measurements
- Barcode reading

Testing Methods

Dedicated on-site assessment

Validity and Renewal

Valid for 12 months. Renewal is based on dedicated on-site assessment

Notes

The license can only be issued based on an on-site assessment arranged through Nokia Learning Solutions.

Nokia License – 2G Base Transceiver Station Integration

NEW!

NLE 2G BTSINT



Target Group

Engineers who are responsible for the integration of Nokia 2G BTS.

Nokia Equipment

Nokia UltraSite GSM/EDGE BTS and Nokia MetroSite BTS equipment, Nokia TalkFamily BTS.

Scope of License

- Test calls
 - Circuit switch
 - Packet switch
- External alarm tests to NOC

Testing Methods

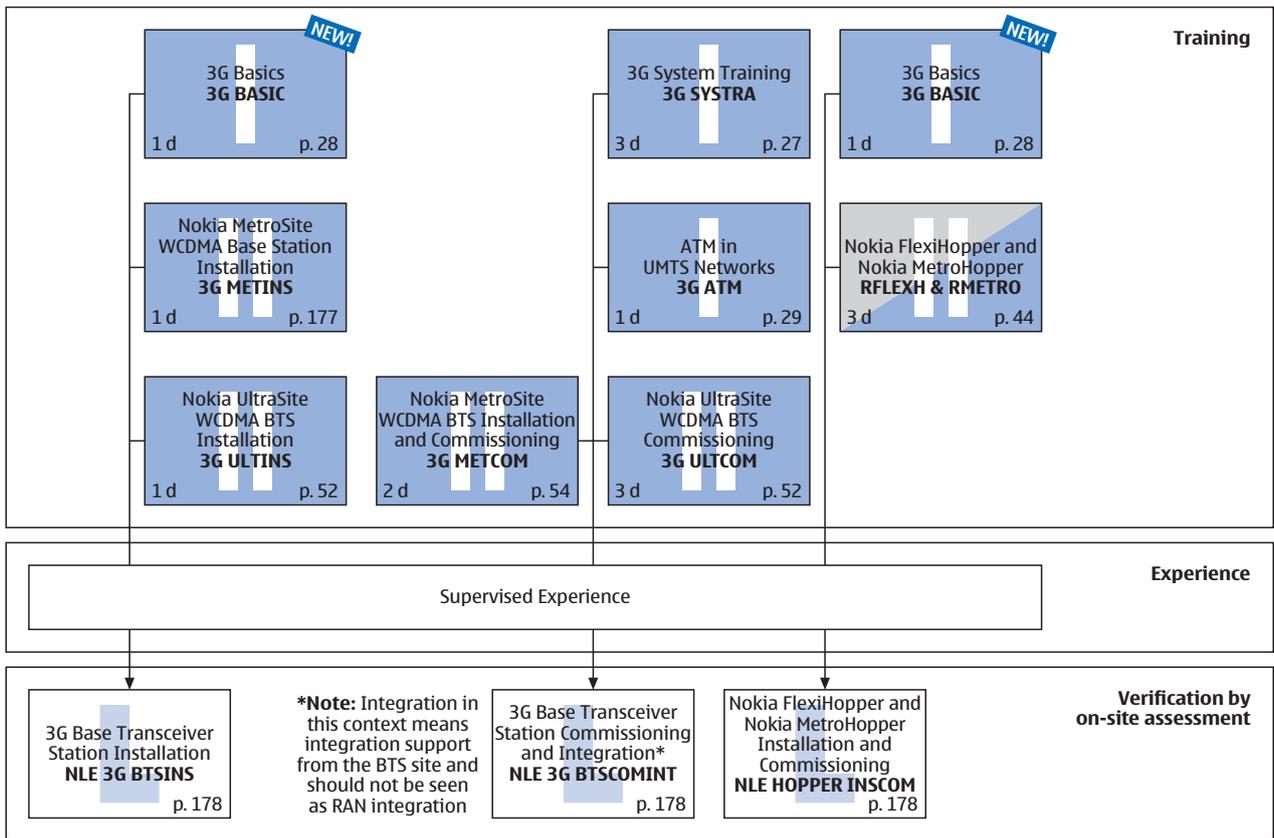
Dedicated on-site assessment

Validity and Renewal

Valid for 12 months. Renewal is based on dedicated on-site assessment

Notes

The license can only be issued based on an on-site assessment arranged through Nokia Learning Solutions.



Nokia MetroSite WCDMA Base Station Installation



3G METINS



Target Group

Nokia MetroSite WCDMA BTS installation personnel.

Objectives

After the training, the participant will be able to:

- Install the Nokia MetroSite for WCDMA elements

Prerequisites

General electrical installation knowledge, knowledge of telecommunications equipment, good knowledge of safety instructions

Duration

1 day

No. of Participants

4–8 depending on the delivery method

Modules

- Nokia MetroSite WCDMA BTS overview
- Nokia MetroSite WCDMA BTS unit overview
- Nokia MetroSite WCDMA BTS installation

Notes

This course is primarily aimed at Nokia subcontractors responsible for the installation of the Nokia 3G MetroSite.

NEW!

Nokia License – 3G Base Transceiver Station Installation

NLE 3G BTSINS



Target Group

Engineers who are responsible for the installation of Nokia WCDMA BTS.

Nokia Equipment

Nokia UltraSite WCDMA BTS,
Nokia MetroSite WCDMA BTS

Scope of License

- Cabinet Installation
- PIU installation
- Internal cabling and connectors
- Interface cabling
- Power
- Grounding
- External alarms
- Transmission/Q1
- Fiber optics
- Barcode reading
- Documentation

Testing Methods

Dedicated on-site assessment

Validity and Renewal

Valid for 12 months. Renewal is based upon dedicated on-site assessment

Notes

The license can only be issued based on an on-site assessment arranged through Nokia Learning Solutions.

Nokia License – 3G Base Transceiver Station Commissioning and Integration

NEW!

NLE 3G BTSCOMINT



Target Group

Engineers who are responsible for the commissioning and integration of Nokia WCDMA BTS.

Nokia Equipment

Nokia UltraSite WCDMA BTS,
Nokia MetroSite WCDMA BTS

Scope of License

- BTS Commissioning
- Power measurements
- Barcode reading
- Test calls
- Circuit switch
- Packet Switch
- External alarm tests to NOC

Validity and Renewal

Valid for 12 months. Renewal is based on dedicated on-site assessment

Notes

The license can only be issued based on an on-site assessment arranged through Nokia Learning Solutions.

Testing Methods

Dedicated on-site assessment

Nokia License – Nokia FlexiHopper and Nokia MetroHopper Installation and Commissioning

NEW!

NLE HOPPER INSCOM



Target Group

Engineers who are responsible for the installation and commissioning of Nokia FlexiHopper and Nokia UltraHopper.

Nokia Equipment

Nokia MetroHopper, Nokia FlexiHopper
and Nokia PowerHopper

Scope of License

- Indoor unit installation
- Outdoor unit and dish installation
- Flexbus cabling
- Barcode reading
- Documentation
- Commissioning of the transmission link

Validity and Renewal

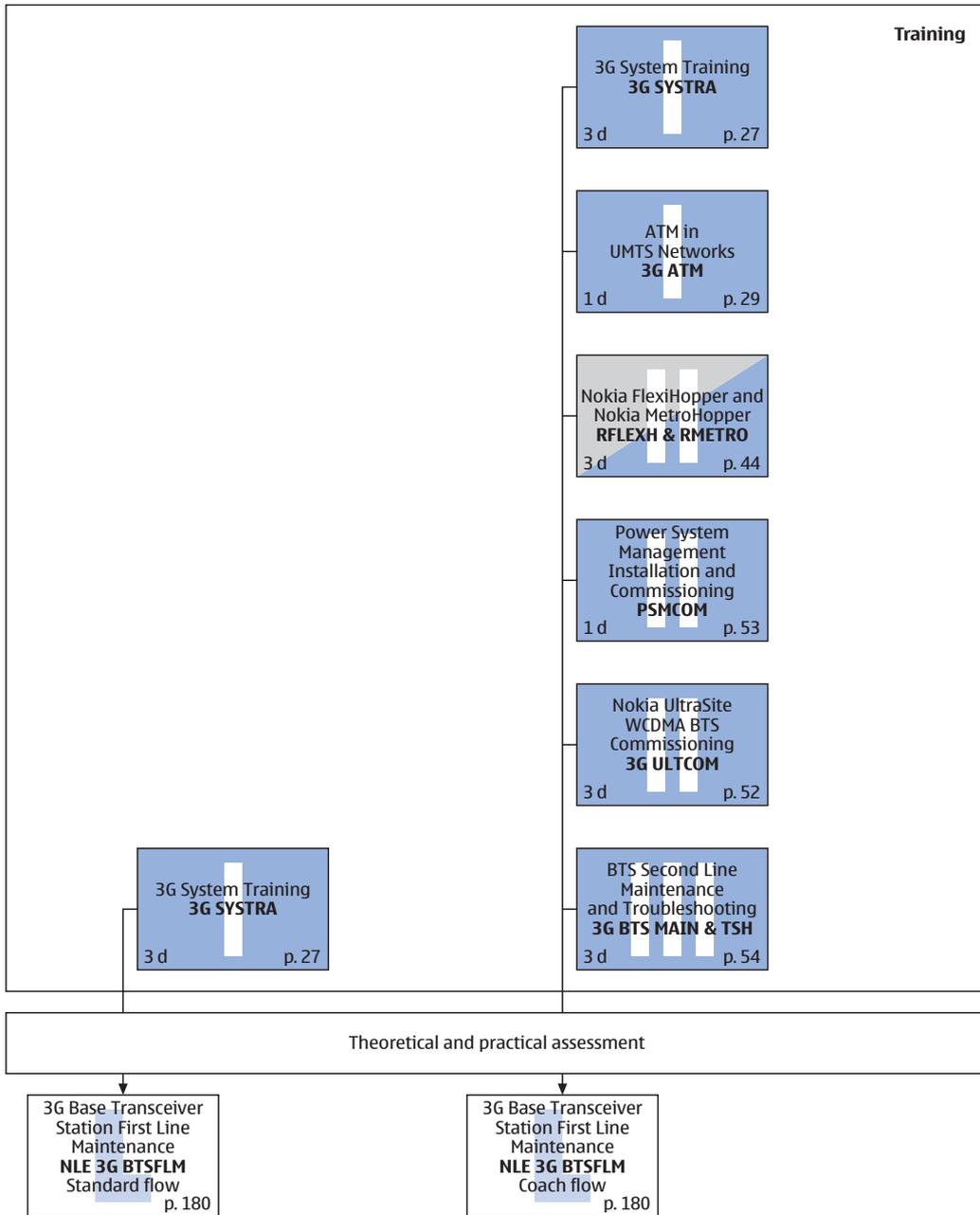
Valid for 12 months. Renewal is based upon dedicated on-site assessment

Notes

The license can only be issued based on an on-site assessment arranged through Nokia Learning Solutions.

Testing Methods

Dedicated on-site assessment



Nokia License – 3G Base Transceiver Station First Line Maintenance



Target Group

Engineers who are responsible for the first line maintenance of Nokia 3G BTS and cellular transmission solution.

Nokia Equipment

Nokia UltraSite WCDMA BTS

Scope of License

- Inspection of equipment
- Cleaning of the site and equipment
- Performance measurement verification
- Site status report
- Check of cabling and cable-labeling
- Removal and replacement of faulty units

(e.g. plug-in units, mechanical spare parts)

- Function verification in accordance with the maintenance work instructions and the maintenance procedure documents
- FLM work related registration of faulty hardware on site and in regional stocks (update of installed base / inventory file / SSD)
- Handling the hardware units in regional stocks and for HWS spare part management
- Participating in upgrade projects with on-site activities
- Updating log-records

NEW!

NLE 3G BTSFLM

Testing Methods

Prerequisite theory test
On-site / Test bed assessment

Validity and Renewal

Valid for 12 months. Renewal is based upon dedicated on-site assessment

Notes

The license can only be issued based on an on-site assessment arranged through Nokia Learning Solutions.

Nokia Certified Engineer – 2G Base Transceiver Station



Target Group

2G BTS specialists who have proven capability and skills in operating, maintaining, integrating and troubleshooting the Nokia 2G BTS.

Exam Domains

- Nokia GSM Radio Access Networks' architecture

- Nokia 2G BTS software /hardware
- Nokia 2G BTS implementation
- Nokia 2G BTS site support power supply systems
- Care Services
- Cellular transmission equipment
- Network management
- RF antenna

NEW!

NCE 2G BTS

Assessment (Format/duration)

Closed book knowledge assessment examination (2hrs)

Validity and Renewal

The certificate is valid for 18 months, after which the exam must be taken again.

Nokia Certified Engineer – 3G Base Transceiver Station



Target Group

3G BTS specialists who have proven capability and skills in operating, maintaining, integrating and troubleshooting the Nokia 3G BTS.

Exam Domains

- Nokia 3G Radio Access Networks' and 3G BTS architecture

- Nokia 3G BTS implementation
- Nokia AXG implementation
- Nokia 3G BTS site support power supply systems
- Care Services
- Cellular transmission
- Network management
- RF antenna
- ATM

NEW!

NCE 3G BTS

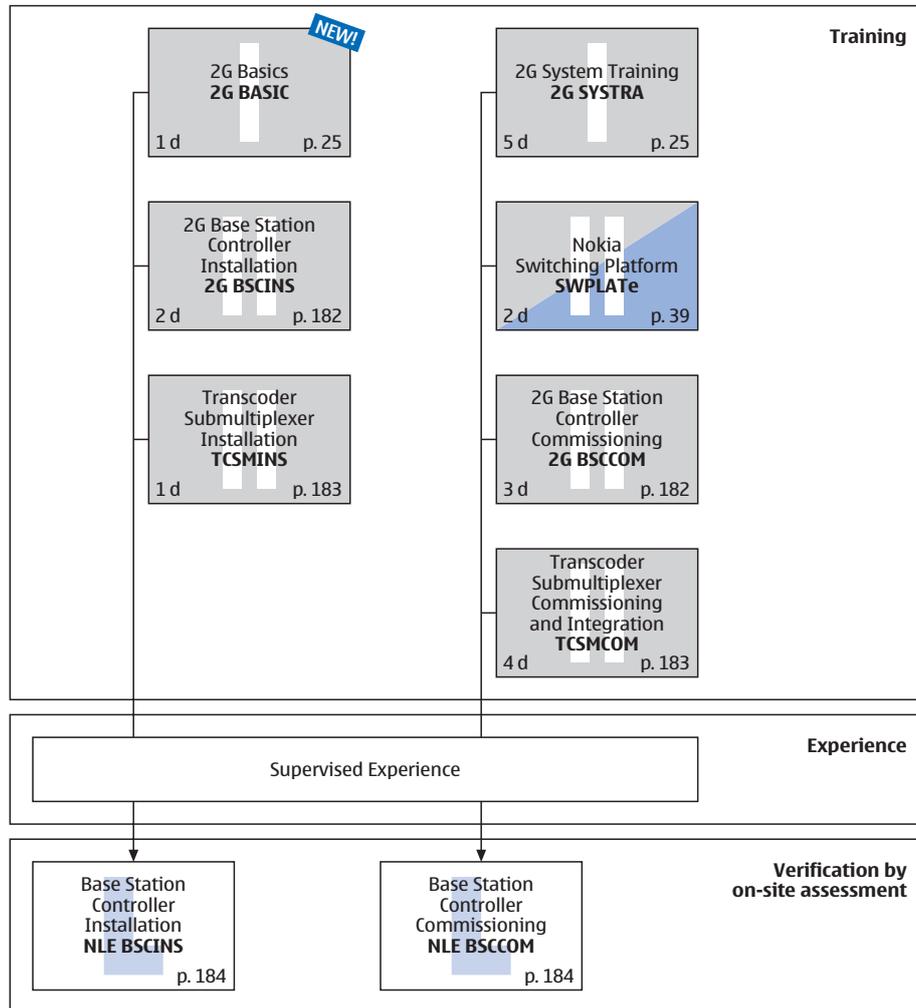
Assessment (Format/duration)

Closed book knowledge assessment examination (2hrs)

Validity and Renewal

The certificate is valid for 18 months, after which the exam must be taken again.

Base station controller



We provide licenses for persons responsible for the installation and commissioning of the Nokia BSS. For your Nokia BSS engineers we provide a certification program to verify their competence. The BSC and TCSM installation and commissioning courses/assessments are only available to Nokia authorized sub-contractors and to customers where a prior agreement has been made.

2G Base Station Controller Installation

NEW!

2G BSCINS



Target Group

Installation personnel for BSC equipment.

Objectives

After the training, the participant will be able to:

- Describe the documentation and working order required to complete the installation.
- Unpack the crates so as not to cause damage to the equipment.
- Carry out an onsite inspection of the cabinet, sub racks, plug-in units and cables for any damage caused in transit.
- Undertake the installation of the BSC to Nokia standards.

Prerequisites

General electrical installation knowledge, knowledge of telecommunications equipment, good knowledge of safety instructions

Duration

2 days

No. of Participants

4

Modules

- Health and safety
- Quality control
- BSC – Documentation for installation
- BSC – About the installation procedure
- BSC – Unpacking and checking the equipment
- BSC – Installing the cabinets
- BSC – Installing the inter-cabinet cables
- BSC – Installing the power supply cables and powering up the network element
- BSC – Installing the plug-in units
- BSC – Installing the station cables
- BSC – Finishing off the installation activity

Notes

This course is primarily aimed at Nokia subcontractors responsible for the installation of the Nokia BSC

2G Base Station Controller Commissioning

NEW!

2G BSCCOM



Target Group

Personnel who need to perform BSC commissioning work.

Objectives

After the training, the participant will be able to:

- Describe the Nokia implementation of GSM architecture
- Describe Nokia DX 200 platform and BSC architecture
- Perform commissioning of BSC using defined procedures and instructions
- Perform handling of basic faults encountered during BSC commissioning procedure

Prerequisites

Good knowledge of Nokia BSC software installation and software installation tools

Duration

3 days

No. of Participants

4–8 depending on the delivery method

Modules

- Health and safety
- Quality control
- Nokia GSM implementation
- Nokia BSC files and software packages
- Nokia DX 200 platform and BSC architecture
- Fault handling
- Software upgrade guided procedures
- Commissioning procedures

Notes

This course is primarily aimed at Nokia subcontractors responsible for the commissioning of the Nokia BSC.

Transcoder Submultiplexer Installation

NEW!

TCSMINS



Target Group

Personnel who will install TCSM2E equipment.

Objectives

After the training, the participant will be able to:

- Describe the documentation and working order required to complete the installation.
- Unpack the crates so as not to cause damage to the equipment.
- Carry out an onsite inspection of the cabinet, sub racks, plug-in units and cables for any damage caused in transit.
- Undertake the installation of the TCSM2E to Nokia standards.
- Fill in the "Installation Certificate of Completion" after completion of quality checks.

Prerequisites

General electrical installation knowledge, knowledge of telecommunications equipment, good knowledge of safety instructions

Duration

1 day

No. of Participants

4–8 depending on the delivery method

Modules

- Health and safety
- Quality control
- TCSM2E installation
- TCSM2E – Documentation for installation
- TCSM2E – About the installation procedure
- TCSM2E – Unpacking and checking the equipment
- TCSM2E – Installing the cabinets
- TCSM2E – Installing the inter-cabinet cables
- TCSM2E – Installing the power supply cables
- TCSM2E – Installing the plug-in units
- TCSM2E – Installing the station cables
- TCSM2E – Finishing off the installation activity

Notes

This course is primarily aimed at Nokia subcontractors responsible for the installation of the Nokia TCSM.

Transcoder Submultiplexer Commissioning and Integration

NEW!

TCSMCOM



Target Group

Personnel who need to perform TCSM2E commissioning work.

Objectives

After the training, the participant will be able to:

- Describe the Nokia implementation of GSM architecture at overview level
- Describe Nokia DX 200 platform, BSC and TCSM2E architecture
- Perform commissioning of TCSM2E using defined procedures and instructions
- Perform integration of TCSM2E into a BSC using defined procedures and instructions
- Perform handling of basic faults encountered during TCSM2E commissioning procedure

Prerequisites

2G SYSTRA

Duration

4 days

No. of Participants

4–8 depending on the delivery method

Modules

- Health and safety
- Quality control
- TCSM2E – Nokia GSM implementation
- TCSM2E – Nokia DX 200 Platform, BSC and TCSM2 architecture
- TCSM2E commissioning and integration
- TCSM2E – Nokia BSC files and SW packages
- TCSM2E commissioning procedures
- TCSM2E – integration of TCSM2E into a BSC
- TCSM2E – A-Interface integration
- TCSM2E – Fault handling

Notes

This course is primarily aimed at Nokia subcontractors responsible for the commissioning of the Nokia TCSM.

Nokia License – Base Station Controller Installation

NEW!

NLE BSCINS



Target Group

Engineers who are responsible for the installation of Nokia MSC/HLRi.

Nokia Equipment

Nokia BSC2i

Nokia BSC3i

Scope of License

- Preparing for installation
- Preparing the equipment room
- Unpacking and inspecting the equipment
- Installing the free standing racks
- Installing the floor rails
- Installing cabinets on the floor rails
- Grounding (earthing)
- Connecting power supply
- Installing the cables
- Equipping of cabinets with plug-in units
- Installing the station cables
- Installing the doors and side plates
- Finishing

Testing Methods

Dedicated on-site assessment

Validity and Renewal

Valid for 12 months. Renewal is based upon dedicated on-site assessment

Notes

The license can only be issued based on an on-site assessment arranged through Nokia Learning Solutions.

Nokia License – Base Station Controller Commissioning

NEW!

NLE BSCCOM



Target Group

Engineers who are responsible for the commissioning of Nokia BSC.

Nokia Equipment

Nokia BSC2i

Nokia BSC3i

Scope of License

- Check the necessary measurement devices and tools are available
- Inspect hardware
- Monitoring startup
- Open the first MML session
- Inspect software versions
- Inspect the I/O devices
- Inspect the maintenance system
- Inspect unit diagnostics and working states
- Inspect the clock and synchronization unit
- Check hardware configuration
- Copy additional software and setting the time zone
- Fill commissioning checklist

Testing Methods

Dedicated on-site assessment

Validity and Renewal

Valid for 12 months. Renewal is based upon dedicated on-site assessment

Notes

The license can only be issued based on an on-site assessment arranged through Nokia Learning Solutions.

Nokia Certified Engineer – Base Station Controller

NEW!

NCE BSC



Target Group

BSC specialists who have proven capability and skills on operating, maintaining, integrating and troubleshooting the Nokia BSC.

Mandatory Training

- Service Excellence for partners (applicable to Nokia Subcontractors only)
- On-site coaching training

Exam Sections

- Nokia BSC software/hardware architecture
- Integration
- Software/hardware maintenance
- Network management
- Troubleshooting
- GSM and GPRS BSS

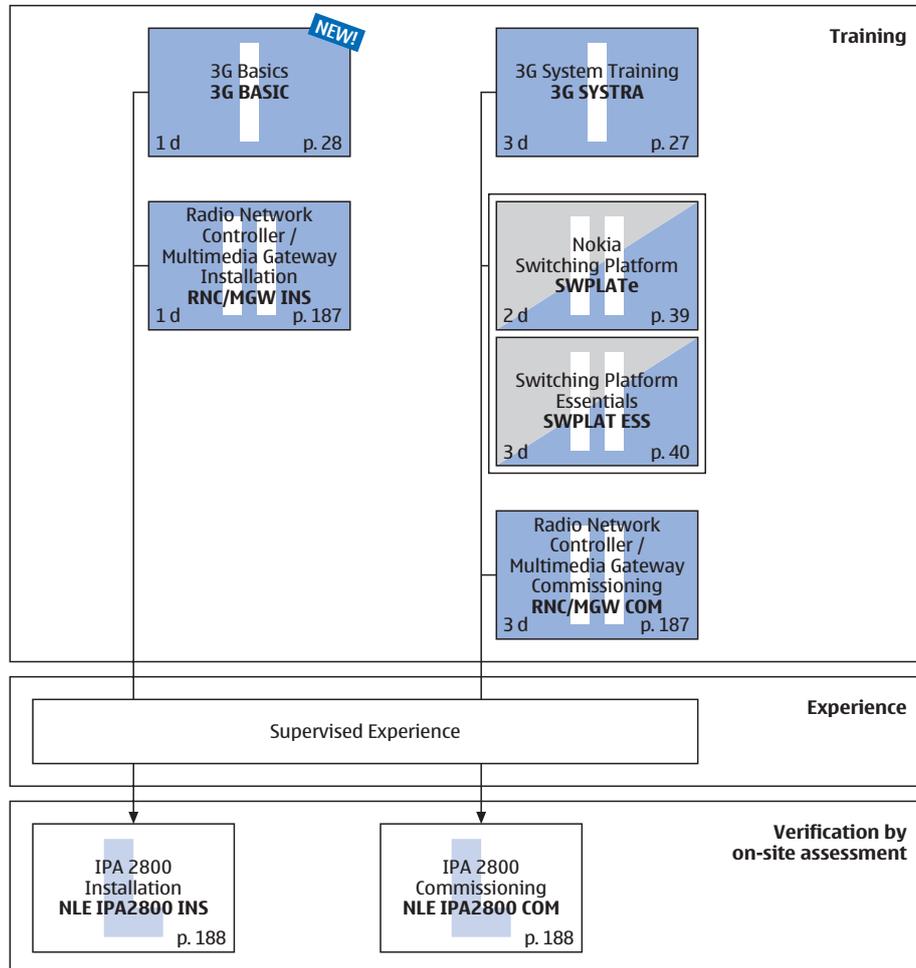
Assessment (Format/duration)

Closed book knowledge assessment examination (2hrs)

Validity and Renewal

The certificate is valid for 18 months, after which the exam must be taken again.

Radio network controller and multimedia gateway



We provide courses and licenses for persons responsible for the installation and commissioning of the Nokia RNC and Nokia MGW. These solutions are only available to Nokia authorized sub-contractors and to customers where a prior agreement has been made. For your Nokia RAN engineers we provide licensing and certification programs to verify their competence.

Radio Network Controller / Multimedia Gateway Installation

NEW!

RNC/MGW INS



Target Group

Personnel undertaking Nokia RNC and/or MGW installation.

Objectives

After the training, the participant will be able to:

- Install Nokia RNC and/or MGW

Prerequisites

General electrical installation knowledge, knowledge of telecommunications equipment, good knowledge of safety instructions

Duration

1 day

No. of Participants

4

Modules

- Health and safety
- Quality control
- About the RNC and ATM installation procedure
- Unpacking and checking the RNC and ATM equipment
- Preparing the RNC and ATM cabinets for installation
- Installing the RNC and ATM cabinets
- Installing the RNC and ATM inter-cabinet cables
- Installing the RNC and ATM plug-in units
- Installing the RNC and ATM station cables
- Installing the power supply cables and powering up the RNC and ATM
- Finishing off the RNC and ATM installation activity
- Documentation for RNC and ATM installation
- Course Summary RNC and ATM installation

Notes

This course is primarily aimed at Nokia subcontractors responsible for the installation of the Nokia RNC/MGW.

Radio Network Controller / Multimedia Gateway Commissioning

NEW!

RNC/MGW COM



Target Group

RNC and/or MGW personnel who are responsible for the commissioning of new RNCs and/or MGWs.

Objectives

After the training, the participant will be able to:

- Correctly commission the Nokia RNC/MGW.
- Perform software upgrades on RNC/MGW

Prerequisites

IPA 2800 Platform skills, basic TCP/IP knowledge and skills

Duration

3 days

No. of Participants

4–8 depending on the delivery method

Modules

- Health and safety
- Quality control
- RAN overview
- RNC/MGW overview and architecture
- Using the NEMU
- IPA 2800 commissioning
- Using HIT macro tool
- Software implementation on IPA 2800
- Introduction to NETOP
- Software upgrade on NEMU

Notes

This course is primarily aimed at Nokia subcontractors responsible for the Commissioning of the Nokia RNC/MGW.

Nokia License – IPA 2800 Installation

NEW!

NLE IPA2800 INS



Target Group

Engineers who are responsible for the commissioning of Nokia RNC.

Nokia Equipment

Nokia RNC

Scope of License

- Preparing for installation
- Preparing the equipment room
- Unpacking and inspecting the equipment
- Installing the free standing racks
- Installing the floor rails
- Installing cabinets on the floor rails
- Grounding (earthing)
- Connecting power supply
- Installing the cables
- Equipping of cabinets with plug-in units
- Installing the station cables
- Installing the doors and side plates
- Finishing

Testing Methods

Dedicated on-site assessment

Validity and Renewal

Valid for 12 months. Renewal is based upon dedicated on-site assessment

Notes

The license can only be issued based on an on-site assessment arranged through Nokia Learning Solutions.

Nokia License – IPA 2800 Commissioning

NEW!

NLE IPA2800 COM



Target Group

Engineers who are responsible for the commissioning of Nokia RNC.

Nokia Equipment

Nokia RNC/MGW

Scope of License

- Inspecting hardware
- Logging into the MMI system for the first time
- Creating Telnet or HTTP connection to print out alarms
- Monitoring the unit start-up
- Inspecting the hardware management system
- Setting the calendar time and date for the network element
- Interrogating hardware configuration information
- Interrogating software build information
- Inspecting unit diagnostics and working states
- Inspecting recovery
- Inspecting synchronisation system
- Configuring VDS device
- Testing NEMU
- Testing element manager applications
- Checking the UGLYFIGX.XML file is copied to the LFILES directory
- Installing the change notes

Testing Methods

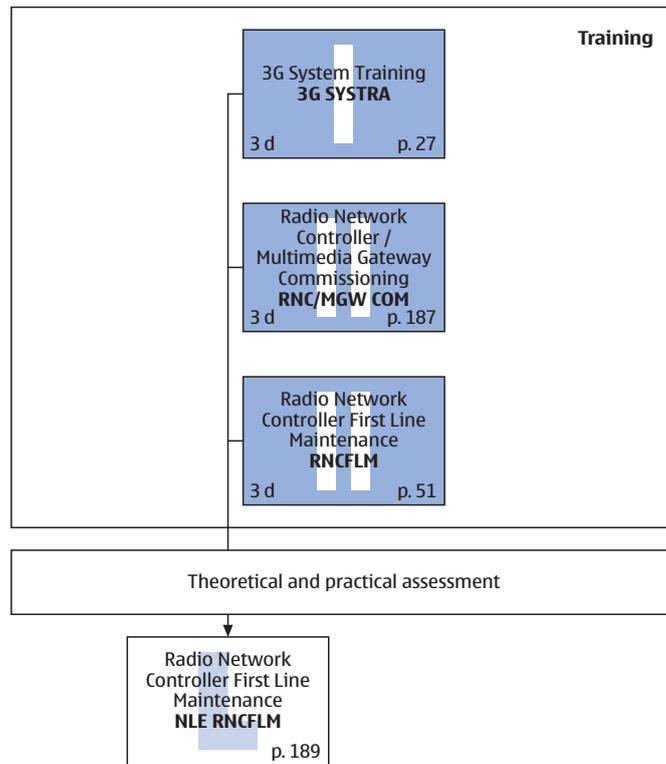
Dedicated on-site assessment

Validity and Renewal

Valid for 12 months. Renewal is based upon dedicated on-site assessment

Notes

The license can only be issued based on an on-site assessment arranged through Nokia Learning Solutions.



Nokia License – Radio Network Controller First Line Maintenance

NEW!

NLE RNCFLM



Target Group

Engineers who are responsible for the commissioning of Nokia RNC.

Nokia Equipment

RNC, ATM and SDH equipment on RNC site

Scope of License

- Inspecting the hardware management system
- Cleaning of the site and equipment
- Safe copying RNC and RNC NEMU
- Testing NEMU
- Performance measurement verification
- Site status report

- Check of cable-labeling
- Removal and replacement of faulty units (e.g. plug-in units, mechanical spare parts)
- Function verification in accordance with the maintenance work instructions and the maintenance procedure documents
- FLM work related registration of faulty hardware on site and in regional stocks
- Handling the hardware units in regional stocks and for HWS Spare Part Management
- Participating in upgrade projects with on-site activities
- Updating log-records

Testing Methods

Prerequisite theory test
On-site / Test bed assessment

Validity and Renewal

Valid for 12 months. Renewal is based upon dedicated on-site assessment

Notes

The license can only be issued based on an on-site assessment arranged through Nokia Learning Solutions.

Nokia Certified Engineer – Radio Network Controller

NEW!

NCE RNC



Target Group

RNC specialists who have proven capability and skills in operating, maintaining, integrating and troubleshooting the Nokia RNC.

Mandatory Training

- Service Excellence for partners (applicable to Nokia Subcontractors only)
- On-site coaching training

Exam Domains

- Nokia RNC software/hardware architecture
- Integration
- Software/hardware maintenance
- Network management
- Troubleshooting
- WCDMA in radio access networks
- ATM in radio access networks
- IP in radio access networks

Assessment (Format/duration)

Closed book knowledge assessment examination (2hrs)

Validity and Renewal

The certificate is valid for 18 months, after which the exam must be taken again.

Nokia FlexiServer platform

The Nokia FlexiServer provides the basis for many of the Nokia Service and 3GPP Release 5/6 network elements. As the platform will be used over a wide range of areas and by different types of engineers, we provide a range of licenses and certificates that verify the competence of different engineers – depending on the tasks they are expected to perform.

Have you had FlexiServer training – but no License or Certificate?

As the Nokia FlexiServer Licenses and Certification programs were only available during 2004, we provided courses which did not include assessment. For those persons who have already attended FlexiServer courses or gained practical experience of the platform, we can now provide a standalone verification solution to ensure that you do not need to go through the training again to acquire a license.

Nokia License – FlexiServer Hardware Installation

NLEFLEXHW



Target Personnel

Engineers who are responsible for the installation of Nokia FlexiServer blade hardware.

Requirements

- Knowledge of antistatic policy requirements
- Knowledge of antishock safety instructions

Training and Assessment Plan

- Technology specific competence (1d)
 - Self-paced e-learning modules (1d)
 - Introduction to Flexi platforms (NOLS)
 - FlexiServer hardware and scaling (NOLS)
 - FlexiServer blade hardware installation (CD-ROM)
- Knowledge assessment (2h)
- Practical assessment (4h)

Validity and Renewal

Valid until the next release. Renewal is made through release training + assessment.

Notes

The license can only be issued based on an on-site assessment arranged through Nokia Learning Solutions.

Nokia License – FlexiServer Software Installation

NLEFLEXSW



Target Personnel

Engineers who are responsible for the software installation and basic configuration of the Nokia FlexiServer.

Requirements

- Ability to work with telecommunication servers
- Basic Linux/Unix knowledge
 - Linux Command Line Interface
 - Linux Test Editor
- Understanding of IP networks and related protocols
- Addressing in IPv4 and IPv6
- Cisco LAN switch configuration

Training and Assessment Plan

- Self-paced e-learning (1d)
 - Introduction to Flexi platforms
 - FlexiServer hardware and scaling
 - FlexiServer functionality
 - Operating FlexiServer
- Knowledge assessment (2h)
- Classroom session (3.5d)
 - Introduction to the Nokia FlexiServer hardware
 - FlexiServer software installation
 - Software management in the FlexiServer
 - Basic IP configuration of the FlexiServer
 - System management in the FlexiServer
 - Backup management in the FlexiServer
 - Alarms and logs in the FlexiServer
- Practical assessment (3h)

Validity and Renewal

Valid until next release. Renewal is made through release training + assessment.

Notes

The license can only be issued based on an on-site assessment arranged through Nokia Learning Solutions.

Nokia License – FlexiServer Software Maintenance

NLEFLEXSWUP



Target Personnel

Engineers who are responsible for the software updates and upgrades on the Nokia FlexiServer software.

Requirements

- Ability to work with telecommunication servers
- Basic Linux/Unix knowledge
 - Linux Command Line Interface
 - Linux Test Editor
- Understanding of IP networks and related protocols
- Addressing in IPv4 and IPv6

Training and Assessment Plan

- Self-paced e-learning modules (3h)
 - Software updates in FlexiServer
 - Software upgrades in FlexiServer
- Knowledge assessment (2h)
- Classroom/simulation (tbc)
- Practical assessment (4h)

Validity and Renewal

Valid until the next release. Renewal is made through taking release training + assessment.

Notes

The license can only be issued based on an on-site assessment arranged through Nokia Learning Solutions.

Nokia License – FlexiServer Routine Maintenance

NLEFLEXRM



Target Personnel

Engineers who are responsible for the routine maintenance of the Nokia FlexiServer.

Requirements

- Ability to work with telecommunication servers
- Basic Linux/Unix knowledge
 - Linux Command Line Interface
 - Linux Test Editor
- Understanding of IP networks and related protocols
- Addressing in IPv4 and IPv6

Training and Assessment Plan

- Technology specific competence (1d)
- Self-paced e-learning modules (1d)
 - Backup and recovery process
 - Alarms handling and basic troubleshooting
 - Routine procedures in FlexiServer
- Knowledge assessment (2h)
- Practical assessment (4h)

Validity and Renewal

Valid until the next release. Renewal is made through release training + assessment.

Notes

The license can only be issued based on an on-site assessment arranged through Nokia Learning Solutions.

Nokia Certified FlexiServer Engineer

NCEFLEX



Target Personnel

System administrators with proven capability and skills in installing, upgrading and configuring the Nokia FlexiServer.

Training/license Requirements

- FlexiServer hardware installation license (NLEFLEXHW)
- FlexiServer software installation and configuration license (NLEFLEXSW)
- FlexiServer software maintenance license (NLEFLEXSWUP)
- FlexiServer routine maintenance license (NLEFLEXRM)

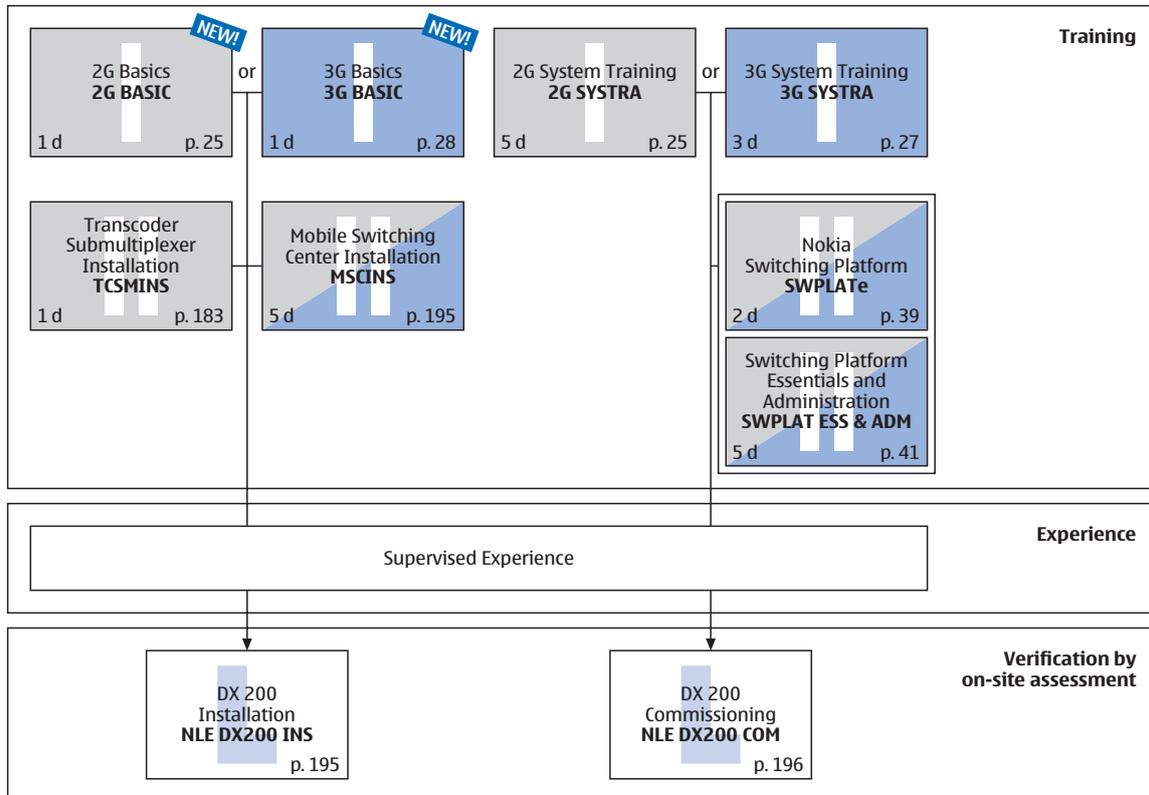
Assessment (Format/duration)

Knowledge (0.5d)

Validity and Renewal

The certificate is valid for 18 months.

Circuit switched core network



For circuit core engineers, we provide licenses in platform installation/ commissioning and certification for those engineers responsible for operation, configuration and maintenance. These installation and commissioning solutions are only available to Nokia authorized sub-contractors and to customers where a prior agreement has been made.

Mobile Switching Center Installation

NEW!

MSCINS



Target Group

Personnel who will install MSCi/HLRi equipment.

Objectives

After the training, the participant will be able to:

- Perform installation of MSCi and HLRi

Prerequisites

General electrical installation knowledge, knowledge of telecommunications equipment, good knowledge of safety instructions

Duration

3–5 days

No. of Participants

4

Modules

- Health and safety
- Quality control
- About the MSCi and HLRi installation procedure
- Unpacking and checking the MSCi and HLRi equipment
- Preparing the MSCi and HLRi racks for installation
- Installing the MSCi and HLRi racks
- Installing the MSCi and HLRi inter-rack/subrack cables
- Installing the MSCi and HLRi plug-in units
- Installing the MSCi and HLRi station cables
- Installing the power supply cables and powering up the MSCi and HLRi
- Finishing off the MSCi and HLRi installation activity
- Documentation for MSCi and HLRi installation
- Course summary MSCi and HLRi installation

Notes

This course is primarily aimed at Nokia subcontractors responsible for the installation of the Nokia MSCi/HLRi.

Nokia License – DX 200 Installation

NEW!

NLE DX200 INS



Target Group

Engineers who are responsible for the installation of Nokia MSC/HLRi.

Nokia Equipment

Nokia MSC/HLR, TSCM2E, SRRi, BSC

Scope of License

- Preparing for installation
- Preparing the equipment room
- Unpacking and inspecting the equipment
- Installing the free standing racks
- Installing the floor rails
- Installing cabinets on the floor rails
- Grounding (earthing)
- Connecting power supply
- Installing the cables
- Equipping of cabinets with plug-in units
- Installing the station cables
- Installing the doors and side plates
- Finishing

Testing Methods

Dedicated on-site assessment

Validity and Renewal

Valid for 12 months. Renewal is based upon dedicated on-site assessment

Notes

It is assumed that an individual who can successfully install a MSCi, also has the required competence to install a HLRi, TSCM2E, SRRi or BSC.

The license can only be issued based on an on-site assessment arranged through Nokia Learning Solutions.

Nokia License – DX 200 Commissioning

NEW! NLE DX200 COM



Target Group

Engineers who are responsible for the commissioning of Nokia MSC/HLRi.

Nokia Equipment

Nokia MSC/HLRi

Scope of License

- Preparation of commissioning
- Initial inspections
- Inspection of user interfaces and software versions
- Inspection of maintenance system
- Unit diagnostics and working states
- Finishing

Testing Methods

Dedicated on-site assessment

Validity and Renewal

Valid for 12 months. Renewal is based upon dedicated on-site assessment

Notes

The license can only be issued based on an on-site assessment arranged through Nokia Learning Solutions.

Nokia Certified Engineer – 2G Circuit Switched Core Network

NEW! NCE 2G CSCN



Target Group

2G CS CN specialists who have proven capability and skills in operating, maintaining, integrating and troubleshooting the Nokia 2G CS CN.

Mandatory Training

- Service Excellence for partners (applicable to Nokia Subcontractors only)
- On-site coaching training

Exam Domains

- Nokia MSC & HLR software/hardware architecture
- Installation
- Commissioning
- Integration
- MB/CLS/CLAB/SBUS
- Maintenance/upgrade
- Other issues / 2G CS CN

Assessment (Format/duration)

Closed book knowledge assessment examination (2hrs)

Validity and Renewal

The certificate is valid for 18 months, after which the exam must be taken again.

Nokia Certified Engineer – 3G Circuit Switched Core Network

NEW! NCE 3G CSCN



Target Group

3G CS CN specialists who have proven capability and skills on operating, maintaining, integrating and troubleshooting the Nokia 3G CS CN.

Mandatory Training

- Service Excellence for partners (applicable to Nokia Subcontractors only)
- On-site coaching training

Exam Domains

- Nokia MGW software/hardware architecture
- Commissioning
- Integration
- ATM
- Maintenance/upgrade
- Other issues / 3G CS CN

Assessment (Format/duration)

Closed book knowledge assessment examination (2hrs)

Validity and Renewal

The certificate is valid for 18 months, after which the exam must be taken again.

Packet switched core network

For packet core network engineers, Nokia provides two certification programs. These are to certify the competence of the individual on the 2G and 3G network.

Nokia Certified Engineer – 2G Packet Switched Core Network

NEW!

NCE 2G PSCN



Target Group

2G PS CN specialists who have proven capability and skills in operating, maintaining, integrating and troubleshooting the Nokia 2G PS CN.

Mandatory Training

- Service Excellence for partners (applicable to Nokia Subcontractors only)
- On-site coaching training

Exam Domains

- Nokia 2G PS CN architecture
- Network elements (GGSN, SGSN, DNS, CG, FW, DHCP, LIG)
- Interfaces (Gx, NMS, charging etc.)
- Connections to outside packet core (WAP, corporate etc.)
- Roaming
- Resiliency
- Network security
- Troubleshooting

Assessment (Format/duration)

Closed book knowledge assessment examination (2hrs)

Validity and Renewal

The certificate is valid for 18 months, after which the exam must be taken again.

Nokia Certified Engineer – 3G Packet Switched Core Network

NEW!

NCE 3G PSCN



Target Group

3G PS CN specialists who have proven capability and skills in operating, maintaining, integrating and troubleshooting the Nokia 3G PS CN.

Mandatory Training

- Service Excellence for partners (applicable to Nokia Subcontractors only)
- On-site coaching training

Exam Domains

- Nokia 3G PS CN architecture
- Network elements (GGSN, 3G SGSN, DNS, CG, FW, DHCP, LIG)
- Interfaces (Gx, NMS, charging etc.)
- Connections to outside packet core (WAP, corporate etc.)
- Roaming
- Resiliency
- Network security
- Quality of Services
- Troubleshooting

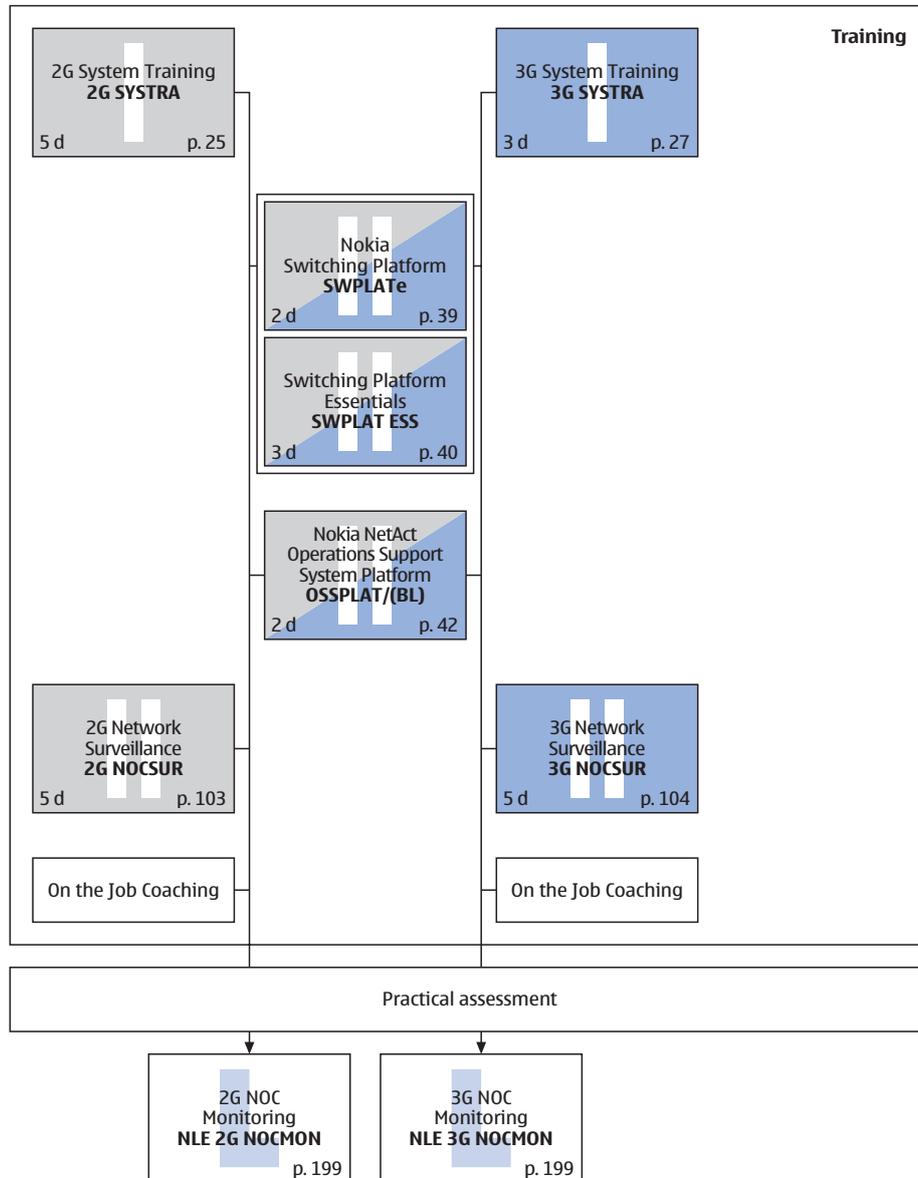
Assessment (Format/duration)

Closed book knowledge assessment examination (2hrs)

Validity and Renewal

The certificate is valid for 18 months, after which the exam must be taken again.

Network operations and control



Nokia License – 2G NOC Monitoring Nokia License – 3G NOC Monitoring

NEW!

**NLE 2G NOCMON
NLE 3G NOCMON**



Target Group

Engineers who are responsible for the monitoring of Nokia 2G or 3G networks via Network Operations Center (NOC).

Nokia Equipment

Nokia NetAct/OSS Fault Management applications for all Nokia delivered 3G network e.g. WCDMA BTS, RNC, MSC/HLR, MGW, BG, CG, Cellular Transmission FH/MH, Nokia PowerHopper.

Scope of License

- Follow the network indicators
- Monitor and acknowledge alarms
- Receive customer complaints from Customer Care
- Receive other reported problems from other operators
- Follow performance indicators and warnings for abnormal network behavior
- Check for remote correction (e.g. lock/unlock, reload, restart) depending on the instructions received from second line maintenance
- Create trouble ticket
- Analyze if ERP should be activated and if so forward to monitoring shift leader
- Assign and ensure acknowledgement
- Follow problem resolution
- Close trouble ticket
- Report the network and ongoing work status

Testing Methods

Assessment in NOC

Validity and Renewal

Valid for 12 months. Renewal is based upon new assessment in NOC.

Notes

The license can only be issued based on an on-site assessment arranged through Nokia Learning Solutions.

Network planning

Nokia Certified Engineer – 3G Transmission Network Planning

NEW!

NCE 3G TRS



Target Group

3G Transmission network planners who have proven capability and skills on operating, maintaining, integrating and troubleshooting the 3G Transmission Network.

Mandatory Training

- Service Excellence for partners (applicable to Nokia Subcontractors only)
- On-site coaching training

Exam Domains

- Transmission dimensioning
- Initial transmission topology and capacity planning
- Physical layer planning
- Microwave link route planning
- ATM detailed planning
- Nokia RAN Architecture
- DCN Management Planning
- Integration process

Assessment (Format/duration)

Closed book knowledge assessment examination (2hrs)

Validity and Renewal

The certificate is valid for 18 months, after which the exam must be taken again.

Nokia Certified Engineer – 3G Radio Network Planning

NEW!

NCE 3G RNP



Target Group

3G Radio network planners who have proven capability and skills on operating, maintaining, integrating and troubleshooting the Nokia 3G Radio network.

Exam Domains

- Network Dimensioning
- Nominal Planning
- Detailed planning
- Pre-optimisation and drive test measurements integration

Assessment (Format/duration)

Closed book knowledge assessment examination (2hrs)

Validity and Renewal

The certificate is valid for 18 months, after which the exam must be taken again.

Mandatory Training

- Service Excellence for partners (applicable to Nokia Subcontractors only)
- On-site coaching training

Nokia learning measurement service

Nokia learning measurement service provides raw data and analysis of the effectiveness of training and a capability assessment (with individual results) of each participant. The results can be used to assess the effect on business performance and identify capability development actions.

This service is available for network operations, BSS, RAN, NSS, MPC and field engineering personnel.

On completing the service you will receive:

- Report on the effectiveness of training per course.
- Report on the effectiveness of transfer and capability assessment per individual.
- Diploma for each individual with complete skills assessment.
- Recommended actions for capability development.
- Workshop to review the results.

Please ask for a presentation from your local training contact person.

This service is subject to our assessment ethics, which include that full-disclosure is made to the participants and they are aware of the project. Local data-protection laws may also affect the amount of information collected.

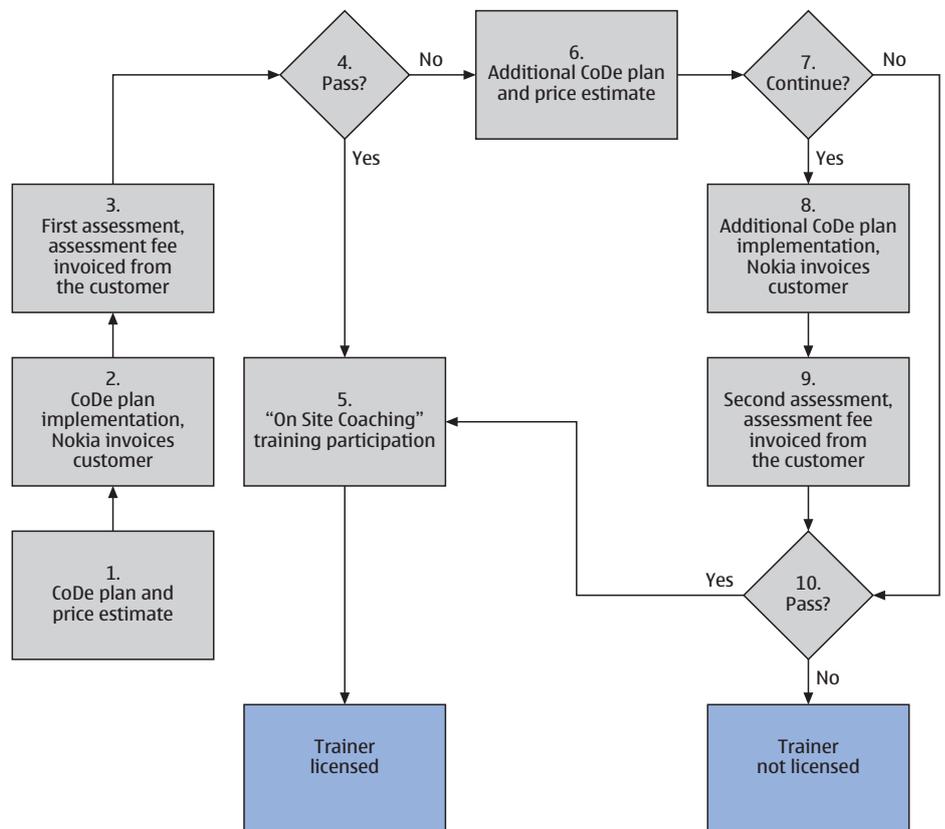
Nokia Trainer Licensing

Nokia provides five trainer licensing programs that allow customers to develop the capability to provide in-house training. These programs are designed to allow the fast and effective transfer of competence to customers who quickly need to ramp-up basic GSM networks with minimal features.

Depending on the skills of the individual, both technical and training, a competence development plan is developed, agreed and executed. The individual needs to pass an assessment. If the assessment is successful, on-site coaching training will be provided and the individual will be licensed.

Should the assessment fail, an additional plan is made followed by training and a re-assessment.

Once the person is a licensed trainer, they will receive regular information relevant to providing the training.
NOTE: Unless otherwise agreed, Nokia does not license the company to sell training, nor does it supply training material (with direct updates) or support to the trainer.

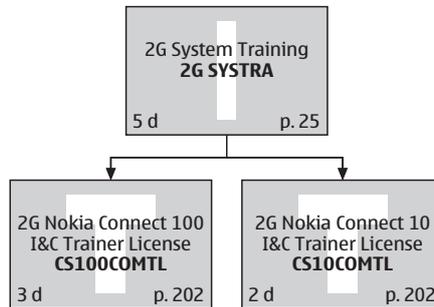


Can these programs be extended to other areas?

The success of trainer licensing programs is related to the complexity of the technology. Generally, the more complex the product, the more time and energy are needed to maintain both the technical competence and trainer capability. Currently, we don't provide standard programs beyond the Nokia Connect Family.

However, if you have special circumstances where you need to provide training in-house, we can discuss the possibilities, opportunities and risks of developing training capability in your organization. Please contact your training contact person for more information.

Nokia Connect BTS Trainer Licensing programs



2G Nokia Connect 100 I&C Trainer License

CS100COMTL



Target Group

Personnel who will conduct the Nokia ConnectSite 100 Base Station installation and commissioning training.

Description

Introduces the Nokia ConnectSite 100 BTS, and its units, and teaches how to install and commission it.

Duration

3 days

Prerequisites

2G SYSTRA or equivalent

Training Modules

- Nokia ConnectSite 100 BTS site solution overview
- Nokia ConnectSite 100 BTS product overview
- Nokia ConnectSite 100 BTS antenna system
- Nokia ConnectSite 100 BTS units description
- Nokia ConnectSite 100 BTS installation
- Nokia ConnectSite 100 BTS commissioning

Assessment

- Knowledge assessment
- Trainer evaluation

Validity and Renewal

The license is valid for the current release. When training is made on a new release, the trainer's competence is re-evaluated.

Notes

Nokia Service Excellence training is included in the package.

2G Nokia Connect 10 I&C Trainer License

CS10COMTL



Target Group

Personnel who will conduct the Nokia ConnectSite 10 Base Station installation and commissioning training.

Description

Introduces the Nokia ConnectSite 10 BTS, and its units, and teaches how to install and commission it.

Duration

2 days

Prerequisites

2G SYSTRA or equivalent

Training Modules

- Nokia ConnectSite 10 BTS site solution overview
- Nokia ConnectSite 10 BTS product overview
- ITN and PDH-SDH transmission unit overview
- Nokia ConnectSite 10 BTS installation
- Nokia ConnectSite 10 BTS commissioning
- Nokia ConnectSite 10 BTS maintenance

Assessment

- Knowledge assessment
- Trainer evaluation

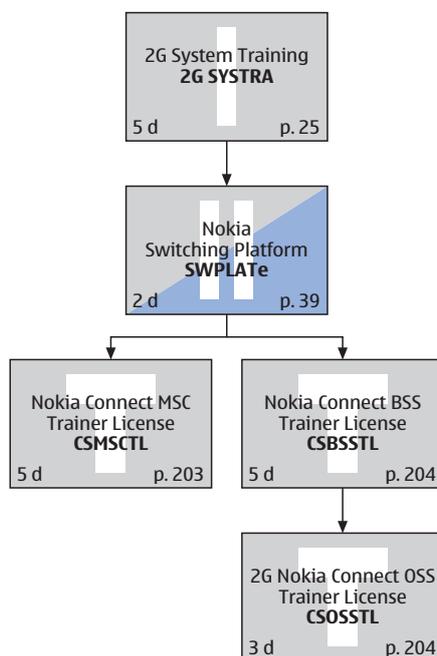
Validity and Renewal

The license is valid for the current release. When training is made on a new release, the trainer's competence is re-evaluated.

Notes

Nokia Service Excellence training is included in the package.

Nokia Connect network element Trainer Licensing programs



Nokia Connect MSC Trainer License

CSMSTL



Target Group

Personnel who will conduct the Nokia Connect MSC operation and maintenance training.

Description

Introduces the Nokia Connect MSC switch, and its units and architecture including HLR and VLR, and teaches how to define the signaling, routing and charging operation.

Duration

5 days

Prerequisites

2G SYSTRA or equivalent and DX platform knowledge

Training Modules

- Nokia Connect NSS architecture and functions
- Subscriber administration
- Cellular radio network administration
- Common channel signaling
- Routing administration
- Charging administration

Assessment

- Knowledge assessment
- Trainer evaluation

Validity and Renewal

The license is valid for the current release. When training is made on a new release, the trainer's competence is re-evaluated.

Notes

Nokia Service Excellence training is included in the package.

Nokia Connect BSS Trainer License

CSBSSTL



Target Group

Personnel who will conduct the Nokia ConnectSite BSC essentials and integration training.

Description

Introduces the Nokia Connect BSC solution, including its architecture, radio network parameters and explains the A and Abis interface integration.

Duration

5 days

Prerequisites

2G SYSTRA or equivalent and DX platform knowledge

Training Modules

- Nokia Connect BSS solution overview
- Nokia Connect BSC architecture and function
- TCSM2E basic operation
- TCSM2E configuration
- TCSM2E integration in the BSC
- Traffic channels
- A interface integration with MML
- Abis interface integration with MML
- Introduction to radio network administration
- Adjacent cell handling
- Radio network parameters
- Radio network configuration management 2G – principles and concepts

Assessment

- Knowledge assessment
- Trainer evaluation

Validity and Renewal

The license is valid for the current release. When training is made on a new release, the trainer's competence is re-evaluated.

Notes

Nokia Service Excellence training is included in the package.

2G Nokia Connect OSS Trainer License

CSOSSTL



Target Group

Personnel who will deliver the Nokia Connect OSS – use of OSS applications training course.

Description

Explains the functionality of the Nokia Connect OSS, the applications and how those applications are used to monitor, manage and configure the Nokia Connect GSM network.

Duration

3 days

Prerequisites

2G SYSTRA or equivalent, Nokia Connect NSS and BSS essentials

Training Modules

- Introduction to Nokia NetAct
- Nokia NetAct basic architecture
- Using Nokia NetAct
- Nokia NetAct documentation
- Nokia NetAct Monitor: introduction concepts and data flow
- Nokia NetAct Monitor: use of fault management tools
- Alarm monitoring – process
- 2G RNW configuration tasks – method OSS – view management and software configuration management
- Performance management principles in network operation and control – process
- Administration of performance data – process
- Nokia NetAct – centralized administration of performance data
- Nokia NetAct Reporter functionality areas
- Using Nokia NetAct Reporter

Assessment

- Knowledge assessment
- Trainer evaluation

Validity and Renewal

The license is valid for the current release. When training is made on a new release, the trainer's competence is re-evaluated.

Notes

Nokia Service Excellence training is included in the package.

On-the-job Training and Facilitated Learning Programs

On-the-job/facilitated training is a continuation or alternative to the learning process provided by classroom courses in Nokia Training Center. The training is always designed to meet your demands – to ensure a structured program where the trainer and your people work together on practical tasks, transferring knowledge and skills in a natural way.

On-the-job training is structured around a set of tasks that should be completed as part of the program. In many cases, these are usually for certain specific target groups and are usually customized. We provide a standard delivery of the Nokia Connect solution through this method – however, because of the nature of on-the-job training being customized

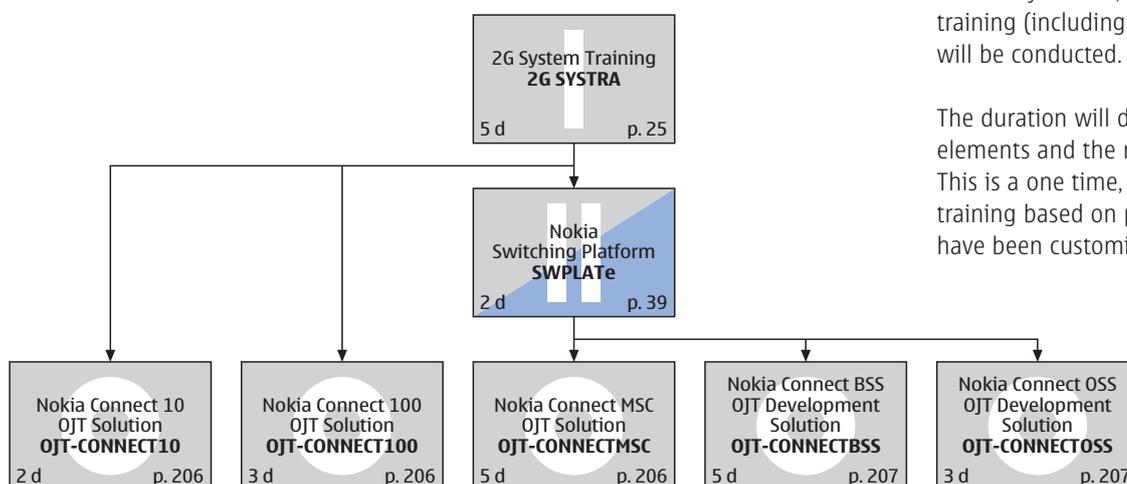
to suit the needs of the participants, it is best to define one according to the need, as opposed to having a standard set. Thus, if you have a need for on-the-job training as part of your learning solution, then please contact us about our tailored solutions.

Facilitated Learning Programs are 100% tailored to meet your needs. These are highly customized workshops, where we provide a fully dedicated test bed and our most competent trainers on specific topics, to go through an unstructured event of investigating, testing and examining certain topics. These could cover a wide range of topics including signaling cases, troubleshooting/recovery situations and features.

The on-the-job training service consists of the following features:

- On-the-job training is ideal to learn tasks needed for everyday operation and telecom implementation in the environment where the participants will be working regularly.
- In on-the-job training, a site or local test bed is used for executing the tasks. This provides an excellent opportunity for the subcontractor's telecom implementation and care personnel to get to know their own area of the network with the guidance of a network specialist from Nokia.
- On-the-job training is given only for one or a maximum of three of your people at a time, providing the most efficient way of learning.
- It is always customized to the needs of the participants.

Nokia Connect GSM OJT solutions



To support the fast deployment of the Nokia Connect Solution, a team of on-site trainers (limited to a maximum of three) will visit your site, where all the necessary training (including theory and hands on) will be conducted.

The duration will depend on network elements and the number of participants. This is a one time, intensive on-site training based on performing tasks that have been customized for your needs.

Nokia Connect 10 OJT Solution



Target Group

Personnel who will install and commission the Nokia ConnectSite 10 BTS.

Description

Introduces the Nokia ConnectSite 10 BTS, and teaches how to install and commission it.

Duration

2 days

Prerequisites

2G SYSTRA or equivalent

Environment

The trainer will be available for 8 hours / 5 participants.

OJT Tasks

- Nokia ConnectSite 10 BTS site solution overview
- Nokia ConnectSite 10 BTS product overview
- ITN and PDH-SDH transmission unit overview
- Nokia ConnectSite 10 BTS installation
- Nokia ConnectSite 10 BTS commissioning
- Nokia ConnectSite 10 BTS maintenance

Assessment

Skills Assessment

OJT-CONNECT10

Nokia Connect 100 OJT Solution



Target Group

Personnel who will install and commission Nokia ConnectSite 100 BTS.

Description

Introduces the Nokia ConnectSite 100 BTS, and teaches how to install and commission it.

Duration

3 days

Prerequisites

2G SYSTRA or equivalent

Environment

The trainer will be available for 8 hours / 5 participants.

OJT Tasks

- Nokia ConnectSite 100 BTS site solution overview
- Nokia ConnectSite 100 BTS product overview
- Nokia ConnectSite 100 BTS antenna system
- Nokia ConnectSite 100 BTS units description
- Nokia ConnectSite 100 BTS installation
- Nokia ConnectSite 100 BTS commissioning

Assessment

Skills Assessment

OJT-CONNECT100

Nokia Connect MSC OJT Solution



Target Group

Personnel who will operate and maintain the Nokia Connect MSC.

Description

Introduces the Nokia Connect MSC switch, and its units and architecture including HLR and VLR, and teaches how to define the signaling, routing and charging operation.

Duration

5 days

Prerequisites

2G SYSTRA or equivalent and DX platform knowledge

Environment

The trainer will be available for 8 hours / 5 participants.

OJT Tasks

- Nokia Connect NSS architecture and functions
- Subscriber administration
- Cellular radio network administration
- Common channel signaling
- Routing administration
- Charging administration

Assessment

Skills Assessment

OJT-CONNECTMSC

Nokia Connect BSS OJT Development Solution

OJT-CONNECTBSS



Target Group

Personnel who will need to operate and integrate Nokia ConnectSite BSC.

Description

Introduces the Nokia Connect BSC solution, including its architecture, radio network parameters and explains the A and Abis interface integration.

Duration

5 days

Prerequisites

2G SYSTRA or equivalent and DX platform knowledge

Environment

The trainer will be available for 8 hours / 5 participants.

OJT Tasks

- Nokia Connect BSS solution overview
- Nokia Connect BSC architecture and function
- TCSM2E basic operation
- TCSM2E configuration
- TCSM2E integration in the BSC
- Traffic channels
- A interface integration with MML
- Abis interface integration with MML
- Introduction to radio network administration
- Adjacent cell handling
- Radio network parameters
- RNW configuration management 2G – principles and concepts

Assessment

Skills Assessment

Nokia Connect OSS OJT Development Solution

OJT-CONNECTOSS



Target Group

Personnel who will deliver the Nokia Connect OSS – Use of OSS applications training course.

Description

Explains the functionality of the Nokia Connect OSS, the applications and how those applications are used to monitor, manage and configure the Nokia Connect GSM network.

Duration

3 days

Prerequisites

2G SYSTRA or equivalent, Nokia Connect NSS and BSS essentials

Environment

The trainer will be available for 8 hours / 5 participants.

OJT Tasks

- Introduction to Nokia NetAct
- Nokia NetAct basic architecture
- Using Nokia NetAct
- Nokia NetAct documentation
- Nokia NetAct Monitor: Introduction concepts and data flow
- Nokia NetAct Monitor: Use of fault management tools
- Alarm monitoring – process
- 2G RNW configuration tasks – method OSS – view management and software configuration management
- Performance management principles in network operation and control (process)
- Administration of performance data – process
- Nokia NetAct – centralized administration of performance data
- Nokia NetAct Reporter functionality areas
- Using Nokia NetAct Reporter

Assessment

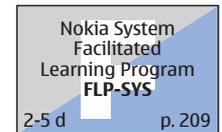
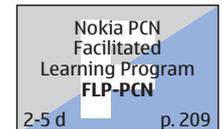
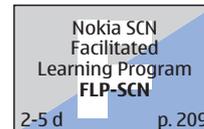
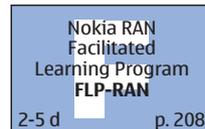
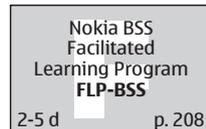
Skills Assessment

Facilitated Learning Programs

The three characteristics of a Facilitated Learning Programs are:

- The persons attending the program agree on the topics/scenarios/simulations that they require the instructor(s) to focus on.
- The instructor is there to provide a structured way to lead the program, using training methods to reflect on learning, answer questions and provide the facilities (test bed, tools, support material and room).
- The program objectives are loosely defined between the instructor and the participant as the program develops.

To help support the understanding of this new service, we provide five basic “frameworks” – one for each subsystem – and an additional one to look at end-to-end scenarios.



End-to-end

Subsystem

Nokia BSS Facilitated Learning Program

FLP-BSS



Target Group

The most senior system specialist in the BSS, responsible for system verification, feature and functionality testing, troubleshooting and end-to-end functionality.

Prerequisites/Requirements

Dependent on learning programs topics – but must have proven knowledge of the Nokia BSS and practical experience of

feature testing, signaling and troubleshooting. Ideally the person has over 4 years of experience and can learn in a practical manner.

Max Group Size

4

Duration

2–5 days

FLP Options

- BSS system verification
- Feature/functionality testing
- Signaling case studies (e.g. effect of features)
- Extreme recovery situations in the Nokia BSS
- Message analysis

Nokia RAN Facilitated Learning Program

FLP-RAN



Target Group

The most senior system specialist in the RAN, responsible for system verification, feature and functionality testing, troubleshooting and end-to-end functionality.

Prerequisites/Requirements

Dependent on learning programs topics – but must have proven knowledge of the Nokia RAN and practical experience of feature testing, signaling and troubleshooting. Ideally the person has over 2 years of experience and can learn in a practical manner.

Max Group Size

4

Duration

2–5 days

FLP Options

- Feature/functionality testing
- Signaling case studies (e.g. effect of features)
- Extreme recovery situations in the Nokia RAN
- Message analysis

Notes

We provide workshops on Signaling, Troubleshooting Interworking 2G/3G, Handovers, System Verification and features – please refer to page 56.

Nokia SCN Facilitated Learning Program

FLP-SCN



Target Group

The most senior system specialist in the NSS, responsible for system verification, feature and functionality testing, troubleshooting and end-to-end functionality.

Prerequisites/Requirements

Dependent on learning programs topics – but must have proven knowledge of the Nokia NSS and practical experience of feature testing, signaling and troubleshooting. Ideally the person has over 4 years of experience and can learn in a practical manner.

Max Group Size

4

Duration

2–5 days

FLP Options

- NSS system verification
- Feature/functionality testing
- Signaling case studies (e.g. effect of features)
- Message analysis
- Extended call control cases
- Extended routing cases

Notes

We provide workshops on signaling, troubleshooting call control, routing, charging and features – please refer to page 69.

Nokia PCN Facilitated Learning Program

FLP-PCN



Target Group

The most senior system specialist in the PCN, responsible for system verification, feature and functionality testing, troubleshooting and end-to-end functionality.

Prerequisites/Requirements

Dependent on learning programs topics – but must have proven knowledge of the Nokia PCN and practical experience of feature testing, signaling and troubleshooting. Ideally the person has over 3 years of experience and can learn in a practical manner.

Max Group Size

4

Duration

2–5 days

FLP Options

- PCN system verification
- Feature/functionality testing
- Signaling case studies (e.g. effect of features)
- Extended QoS measurements and performance analysis

Nokia System Facilitated Learning Program

FLP-SYS



Target Group

The most senior system specialist in the network subsystems, responsible for system verification, feature and functionality testing, troubleshooting and end-to-end functionality.

of feature testing, signaling and troubleshooting. Ideally the person has over 3 years of experience in a specific technology area and learns in a practical manner.

Max Group Size

4

Duration

2–5 days

FLP Options

- End-to-end signaling
- End-to-end feature/functionality testing
- End-to-end troubleshooting
- End-to-end integration and verification

Prerequisites/Requirements

Dependent on learning programs topics – but must have proven knowledge of the Nokia solutions and practical experience

2005 events and new services in development

Nokia Learning Solutions is always investing in ways to improve and develop new services for you. As the current operating conditions have made traditional competence development solutions expensive, and with the increasing complexity of networks, we believe there is a greater pressure to focus on a holistic approach to learning and to develop learning communities for experts that extend beyond a single organization.

We are always keen to explore the potential of new services and a peek into the future is provided here. If you have any suggestions on how we could improve our learning solution or would like to be involved in the development process, then please pass your comments to your local Nokia Learning Solutions contact person.

Solutions to develop new people quickly in-house

The following are some of our further plans to implement e-training services:

Improved Competence Planning

With the changes in technology that will occur over the next three years in an environment driven by IP technology, more emphasis is needed on understanding the upcoming changes, how the competence gaps can be identified and learning solutions optimized. We are building a set of tools and competences to better support your long-term planning.

Integration of learning portals

Learning does not end when the classroom door closes but rather continues with self-study, practice experience, and communication among colleagues. This part of the learning process is typically very individual, and strongly dependent on self-motivation and organizational circumstances. As our learning portal contains a huge number of 'learning nuggets', our aim is to make this more accessible, and more useful, through better integration of learning environments. Improved access will help you create a more collaborative culture.

Continued development of the holistic model

The holistic approach breaks learning into more manageable chunks, where the more formal training programs act like "scaffolds" and the cognitive knowledge is achieved through the retrieval of specific information. Although knowledge management principles are well established, implementation into an organization takes place through gradual evolution. Already our 2005 portfolio and services have incorporated much of the research we have been doing. In the coming year, we will focus more on the role of verification as a means to not only track competence and the effect of learning, but also a means to prevent competence gaps from occurring through applied integration monitoring and assessment tools.

Collaborative learning driven through mobility

As the mobile device has become an integral part of our lives and we see improvements in screen size, usability and speed, new opportunities for self-development start to open up. In 2004 we have already been very active in focused trials that use mobile devices to support collaborative learning. In 2005 we will continue to drive the integration of mobility into more of our learning solutions.

New collaborative forums and techniques

As the environment around us changes so quickly, more development emphasis is being placed on supporting the individual in the work place – this may be through embedded learning (i.e. as part of the job), coaching and supporting the person. In 2005, we will continue to develop both the content, but more importantly, the process of supporting the deployment of these techniques.



Nokia Seminars

As the technology continually develops, so does the need to ensure that your key people know what will happen tomorrow. When a solution or topic area is still very much in its early phase, we can't provide structured courses or workshops. Instead, we identify areas of potential interest to you and bring together the leading experts in Nokia (and sometimes outside) to a seminar environment. These people are the established leaders and experts in their field, and many have published papers or have unique competence and insight. The seminar is by nature a theoretical learning environment and we try to arrange such events globally in comfortable settings. Where possible, we combine the events with practical elements, such as demonstrations or discussions.

2005 Seminars

We arrange a twice yearly series of seminars to tackle the current technology and network issues. For 2005 these include:

- Mobile Web Services and Standardization
- Network Security
- Network Performance and Quality
- 3G Radio Network Optimization

The seminars are mainly provided as part of our Expert Club Services (page 13). If you wish to receive a more detailed description and schedule please contact your local training contact person.

Practical training arrangements

Global expertise combined with local resources

Nokia provides competence development solutions through a global network of Training Centers. Training is held in modern classrooms that are fully equipped to offer high-quality instruction and practical hands-on exercises.

The training equipment covers the entire Nokia product range, from individual terminals to complete networks. Training can also be arranged in the customer premises as long as appropriate equipment is available.

By combining local expertise with global Nokia resources, our local Training Centers are committed to meeting your competence development needs. In addition, we also work with relevant third parties such as Hewlett-Packard and Oracle to offer a complete training solution in a single package.

Help with practical arrangements and registration

Nokia has dedicated personnel to handle your needs and requests from the moment you order the service. Travel information will be provided, as well as help with practical arrangements, and special requests are always taken into account. If you need help with travel arrangements, please contact your local Nokia representative.

To schedule a Nokia Training Center program or register for a specific course, please contact your local Nokia representative who will assist you with your request. Many of our programs are extremely popular, so we advise you to make your reservation well in advance. To ensure that you have a place, plan to register at least 30 days before the start of the course.

Cancellation policy

If you cannot participate in a course you are already registered for, please inform us as soon as possible. If a course seat is cancelled within the contractual days prior to its start, a full training fee will be charged.

Nokia reserves the right to cancel an Open Course if the minimum number of participants is not registered. A written announcement of the cancellation will be sent to you at least 21 days before the course begins. Nokia will make every effort to place you in another course at your convenience.



Nokia Training Centers

Nokia Training Centers – to provide local competence development services

Along with its solutions for competence development, Nokia Customer Training offers a comprehensive range of support services to help network providers differentiate in their business environment. This support covers the entire process of planning, building and deploying a network. From site assessment and network planning to rollout services and operations support, our complete portfolio covers everything needed to get networks up and running. Once the network is deployed, Nokia Customer Training offers advanced care services and management solutions to keep it operating.

Nokia Training Centers are located throughout the world. For more information on how to get to your Training Center, please visit NOLS (www.online.nokia.com – Training, Info Point).



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- Training Centers
- Training Facilities

Index

| Course | Page |
|--------------------|------|
| 2G BASIC | 25 |
| 2G BSCCOM | 182 |
| 2G BSCINS | 182 |
| 2G BSSCTM | 46 |
| 2G METCOM | 49 |
| 2G NOCCM | 106 |
| 2G NOCSUR | 103 |
| 2G PCNTSH | 88 |
| 2G SCNOM | 70 |
| 2G SGSN CC | 89 |
| 2G SGSNOM | 86 |
| 2G SYSTRA | 25 |
| 2G ULTCOM | 47 |
| 2G ULTCTM | 50 |
| 2G ULTFLM | 48 |
| 2G ULTINS | 48 |
| 2G ULTSYSe | 47 |
| 2G ULTTSH | 50 |
| 2G/3G iGMLCCLI 2.0 | 160 |

| | |
|------------------------------|-----|
| 2G/3G iGMLCCLI 3.0 | 162 |
| 2G/3G iGMLCOM 2.0 | 159 |
| 2G/3G iGMLCOM 3.0 | 161 |
| 2G/3G iGMLCPMOM 2.0 | 160 |
| 2G/3G iGMLCPMSYS 2.0 | 160 |
| 2G/3G iGMLCSYS 2.0 | 159 |
| 2G/3G iGMLCSYS 3.0 | 161 |
| 2G/3G SMLCOM 1.5 | 158 |
| 2G/3G SMLCRNW 1.5 | 158 |
| 2G/3G SMLCSYS 1.5 & SMLCSYSe | 158 |
| 3G ATM | 29 |
| 3G BASIC | 28 |
| 3G BTS AXC OM | 53 |
| 3G BTS MAIN & TSH | 54 |
| 3G INTe | 27 |
| 3G LCS ITG | 67 |
| 3G METCOM | 54 |
| 3G METINS | 177 |
| 3G NOCCM | 106 |
| 3G NOCSUR | 104 |
| 3G PCNPL | 125 |
| 3G PCNSIG DELTA | 91 |
| 3G PCNSIG | 91 |
| 3G PCNTSH DELTA | 90 |
| 3G PCNTSH | 90 |

| | |
|--------------------|-----|
| 3G RANESS | 62 |
| 3G RANITG | 62 |
| 3G RANREF WS | 66 |
| 3G RANSIG | 63 |
| 3G REL 4 CORE | 75 |
| 3G REL 4 MSS PL | 125 |
| 3G REL 4 SCNOM | 76 |
| 3G REL 4 SYSe | 29 |
| 3G RNC NEMU | 67 |
| 3G RNCNCON | 66 |
| 3G RNCSLM | 64 |
| 3G RNCTSH | 64 |
| 3G RPES | 122 |
| 3G RPLS | 123 |
| 3G SCN DELTA | 70 |
| 3G SCNOM | 71 |
| 3G SCNSIG | 79 |
| 3G SCNSIG DELTA | 80 |
| 3G SGSNOM | 87 |
| 3G SYSTRA | 27 |
| 3G TPL | 124 |
| 3G ULTCOM | 52 |
| 3G ULTINS | 52 |
| AGW REL | 155 |
| AGWOM | 155 |
| AMR PL | 120 |
| AXC MGMT & TSH | 54 |
| BSC3i DELTA | 59 |
| BSS EDGE ITG DELTA | 58 |
| BSS NOC REP | 110 |
| BSS REL PR | 60 |
| BSS REL The | 59 |
| BSSDIM | 118 |
| BSSSESS | 56 |
| BSSITG | 57 |
| BSSOSS INT | 115 |
| BSSPAR | 116 |
| BSSPROD | 114 |
| BSSREF WS | 60 |
| BSSSIG | 57 |
| BSSTSH | 58 |
| BTSCOM | 45 |
| BTSTSH | 46 |
| CAMEL | 134 |
| CCS7 SYS | 33 |
| CDS CONF WS | 83 |
| CGOM | 94 |
| CNSEC | 35 |
| CONDELSYS | 128 |
| CS100COMTL | 202 |
| CS10COMTL | 202 |
| CSBSSTL | 204 |
| CSMSCTL | 203 |
| CSOSSTL | 204 |
| DNSSEC WS | 36 |
| EDGEDEPLOYSEMe | 30 |
| EDGERPL | 117 |
| EDGESYSe | 28 |
| EEC SERVSYS | 129 |
| EtE QoS | 93 |
| EXPLAIN | 114 |
| FLP-BSS | 208 |
| FLP-PCN | 209 |



| | | | | | |
|--------------------|-----|-------------------|-----|----------------------|-----|
| FLP-RAN | 208 | NCE 3G PSCN | 197 | OSSITG | 100 |
| FLP-SCN | 209 | NCE 3G RNP | 200 | OSSMVI SNMPITK | 101 |
| FLP-SYS | 209 | NCE 3G TRS | 199 | OSSPLAT/(BL) | 42 |
| FWSEC WS | 37 | NCE BSC | 185 | OSSRESOURCEe | 42 |
| GGSNOM REL 4 DELTA | 137 | NCE RNC | 190 | OSSSEC | 36 |
| GGSNOM | 87 | NCEFLEX | 193 | OSSUSER REL 4 | 171 |
| GPRSOVe | 26 | NDWADM | 169 | PCCOM | 167 |
| GPRSRPL | 116 | NDWREP | 168 | PCNTSH | 89 |
| GPRSSIG | 88 | NETPL MULTIRADIO | 115 | PoC OM REL 1.5 DELTA | 148 |
| GPRSSYS | 26 | NETPLLINK | 119 | PoC OM | 148 |
| GMS SIG SYS | 31 | NETPLTX | 119 | PoC PLAN | 148 |
| HPUXSEC WS | 37 | NLE 2G BTSCOM | 176 | PoC SIG | 149 |
| ICDSIG | 141 | NLE 2G BTSINS | 176 | PoC SYS | 147 |
| ICDSYS | 136 | NLE 2G BTSINT | 176 | PoC TSH | 149 |
| ICDTSH | 141 | NLE 2G NOCMON | 199 | PRSINT | 145 |
| iGMLCSYSe | 159 | NLE 3G BTSCOMINT | 178 | PRSINT | 144 |
| IMSARCe | 96 | NLE 3G BTSFLM | 180 | PRSOM | 149 |
| IMSDEPL | 97 | NLE 3G BTSINS | 178 | PSMCOM | 53 |
| IMSITG | 97 | NLE 3G NOCMON | 199 | PtP SERVSYS | 129 |
| IMSOSM | 96 | NLE BSCCOM | 184 | RAN NOC REP | 111 |
| IMSSERV | 97 | NLE BSCINS | 184 | RAN REL 4 | 65 |
| IMSSYSe | 30 | NLE DX200 COM | 196 | RAN REL 4e | 65 |
| IN INTRO | 132 | NLE DX200 INS | 195 | RANIW WS | 61 |
| IN J5 ARC | 133 | NLE HOPPER INSCOM | 178 | RANOP | 117 |
| IN J5 OM & TSH | 134 | NLE IPA2800 COM | 188 | RANOSS INT | 123 |
| IN J5 REL TH | 134 | NLE IPA2800 INS | 188 | RANPAR | 124 |
| IN TKIT | 133 | NLE RNCFLM | 189 | RANPROD | 122 |
| INSERMAN | 132 | NLEFLEXHW | 191 | RANRESOURCEe | 63 |
| INTEROP SYS | 31 | NLEFLEXRM | 193 | RFLEXH & RMETRO | 44 |
| IPCORE | 85 | NLEFLEXSW | 192 | RFLEXH | 44 |
| IPRSEC WS | 38 | NLEFLEXSWUP | 192 | RNC/MGW COM | 187 |
| IPSO PLAT | 41 | NMS10 | 169 | RNC/MGW INS | 187 |
| ISCFUNC | 139 | NOCCM TSH WS | 107 | RNCARCe | 61 |
| ISCOM | 140 | NPM & NPS OM | 139 | RNCFLM | 51 |
| ISN CAOM | 137 | NSMOM | 138 | SCN NOC REP | 112 |
| ISN TAOM | 136 | NSSCC | 74 | SCNCC | 77 |
| LIGOM | 86 | NSSCOM & ITG WS | 72 | SCNFEAT WS | 81 |
| MEDIUM NEMU | 82 | NSSNWP | 118 | SCNREC | 78 |
| MGW NEMU | 82 | NSSREC | 73 | SCNREF WS | 81 |
| MGWCC | 79 | NSSREL | 80 | SCNROU | 76 |
| MGWTSH | 78 | NSSROU | 71 | SCNTSH | 77 |
| MMSCOA | 154 | NSSSIG | 72 | SERV CORESYS | 130 |
| MMSCOM | 153 | NSSTSH | 73 | SMSC WS | 151 |
| MMSCREL | 154 | NTMS 3.0 ADV | 143 | SMSCOM | 150 |
| MMSINT | 153 | NTMS 3.0 OM | 143 | MMSCREL | 151 |
| MMSOL | 156 | NWGINTe | 145 | SQMADM | 168 |
| MMSYSe | 152 | NWGOM | 146 | SQMINT | 167 |
| MNSEC | 35 | NWGREL | 146 | SWPLAT ESS & ADM | 41 |
| MPC REL 3 DELTA | 93 | OJT-CONNECT10 | 206 | SWPLAT ESS | 40 |
| MPC REL 3e | 92 | OJT-CONNECT100 | 206 | SWPLATe | 39 |
| MPC REL 4e | 92 | OJT-CONNECTBSS | 207 | TCSMCOM | 183 |
| MPOSINTe | 157 | OJT-CONNECTMSC | 206 | TCSMINS | 183 |
| MSCINS | 195 | OJT-CONNECTOSS | 207 | TRAFFICA Z4 ADM REL | 165 |
| MSS MGW ITG | 74 | OSCOM | 140 | TRAFFICA Z4 ADM | 164 |
| MSS SITE CONN WS | 83 | OSS INSP | 166 | TRAFFICA Z4 REL | 165 |
| MSSROU | 75 | OSS NODEMGR | 108 | TRAFFICA Z4 | 164 |
| MWOVERe | 45 | OSS OPTIMIZER | 166 | TriULTCOMe | 49 |
| NAPOM | 142 | OSS REHOST | 107 | UMTS FUT SYS | 33 |
| NCE 2G BTS | 180 | OSSADM REL | 101 | UMTS SA | 128 |
| NCE 2G CSCN | 196 | OSSADM REL | 171 | UMTS UESIG SYS | 32 |
| NCE 2G PSCN | 197 | OSSADM1 | 99 | UMTSAIR SYS | 32 |
| NCE 3G BTS | 180 | OSSADM2 | 99 | UndGSMe | 24 |
| NCE 3G CSCN | 196 | OSSBUREC | 100 | VPNSEC WS | 38 |

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