RAISE Your Game
With specialised small cell training courses from ip.access.

3G System Starter Package

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Course Outline

The ip.access 3G System Starter Package is designed to deliver sufficient theoretical and practical knowledge to enable the operator to manage and maintain a pre-installed nano3G System.

The training is mainly focused on using slide ware in order to explain and discuss the 3G System’s functionality and components. The ip.access professional trainer can however supplement the Modules with workshop and lab activities as applicable and agreed with the Customer.

The training will focus on the most frequently used functions and functionalities required to work with and operate on the 3G System. Policies and procedures are addressed only to the extent necessary to support this focus. If you need further clarification in these areas, you should refer to the Changes to Manual Procedures.

The number of Attendees each Module is restricted to, will allow for efficient knowledge transfer.

Modules

All of the following modules are included within the 3G System Starter Package training course. Alternatively, we offer a bespoke package of selected modules to cater for different training requirements.

- MO1: nano3G System Overview 3
- MO2: nano3G System Planning and Provisioning 5
- MO3: Network Orchestration Systems, Client Operations 7
- MO4: nano3G Access Point Installation 9
- MO5: nano3G Access Point Operations 11
- MO6: nano3G Access Point Troubleshooting 13
- MO7: Radio Planning and Optimisation Guidelines 15

How to Book

To enrol on the 3G System Starter Package or to arrange your own bespoke training then please contact us on either training@ipaccess.com or 01954 713700
Module 01

nano3G System Overview

Introduction

The nano3G System Overview course provides a comprehensive introduction to the ip.access nano3G system architecture, physical characteristics of the system elements such as Access Point (AP), Access Controller (AC) and Network Orchestration System (NOS), and covers the small cell system features.

This introductory course provides essential information to technical professionals responsible for operating and managing the nano3G system.

Course Objectives

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

- Understand the nano3G system architecture; describe the physical characteristics of the nodes such as nano3G AP, AC and NOS systems;
- Explain the nano3G system end user services, AP radio features and user mobility features;

Who will benefit from this course?

- Network Planning (Radio & Core)
- Performance Management / KPI Reporting
- 3G Network Operations
- Customer Care
- Alarm Management
Module 01 Continued
nano3G System Overview

Course Content

- System Overview
- Nano3G Architecture
- Main nano3G System Interfaces
- Principal Radio Aspects
- Nano3G System Features

Course Pre-requisites

The course assumes prior knowledge of telecommunications, 3G cellular radio parameters, UMTS architecture, interfaces and protocols.

Trainees who do not have knowledge of the 3G system should first get familiar with 3G.

Course material will be provided electronically and trainees will be expected to use their laptops during the session.
Module 02

nano3G System Planning and Provisioning

Introduction

This course will facilitate the integration and management of the nano3G system within the operators 3G network. It gives the network planners a greater insight into nano3G system guidelines for deploying the network elements and provisioning their data. An understanding of the system guidelines will lessen the time needed for the staff to plan and provision the network elements.

Course Objectives

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

- Describe the RF planning aspects that should be taken into account when planning AP installations;
- Understand the AP installation tasks: AP pre-provisioning, commissioning and site installation;
- Obtain a working knowledge of the site and configuration requirements for nodes such as AP, AC, NOS, SecGw and NTP.

Who will benefit from this course?

Technical professionals/Engineers in the 3G operator organisation, in roles such as:

- Network Planning (Radio & Core)
- Performance Management/KPI Reporting
- 3G Network Operations Customer Care
- Alarm Management
Module 02 Continued

nano3G System Planning and Provisioning

Course Content

- Nano3G RF Planning
- 3G System Network Dimensioning
- nano3G AP Pre-Provisioning
- nanoVirt Platform Requirements
- NTP Server Requirements
- nano3G AP Data Provisioning
- nano3G Port Usage
- Residential Femtocell Deployment Process Overview

Course Pre-requisites

The course assumes prior knowledge of telecommunications, 3G cellular radio parameters, UMTS architecture, interfaces and protocols.

Trainees who do not have knowledge of the 3G system should first get familiar with 3G Protocols and procedures.

This course assumes that the attendee is familiar with the following course material:

- MO1: nano3G System Overview

Course material will be provided electronically and trainees will be expected to use their laptops during the session.
Module 03
Network Orchestration System, Client Operations

Introduction

This course, consisting of a theory component and lab exercises, will provide operational staff with the information necessary to perform regular management tasks using the NOS client. The theory component will cover step-by-step instructions for creating and deleting management objects, changing the attributes of management objects, and creating KPI’s for performance management, user management and fault management.

Since it is essential for operational staff to have hands-on experience using the NOS client in their day-to-day operational activities, the lab exercises will focus on the NOS client screen management, configuring managed objects using NOS client wizard, updating multiple AP’s using a template and setting up alarm filters.

Course Objectives

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

- Start up the NOS client from the laptop and access the NOS;
- Create and delete managed objects, modify attributes of a managed object using the NOS client;
- Act on alarms including setting up filters;
- Change the attributes of multiple AP’s using the template functionality; Create new user accounts and user privileges;
- Schedule batch operations for the managed objects

Who will benefit from this course?

Technical professionals/Engineers in the 3G operator organisation, in roles such as:

- Network Planning (Radio & Core)
- Performance Management/KPI Reporting
- 3G Network Operations Customer Care
- Alarm Management
Module 03 Continued

Network Orchestration System, Client Operations

Course Content

- The NOS in the ip.access System Architectures
- NOS Quick Start
- Screen Layout
- Configuration Management
- NOS client wizards
- Scheduled Operations
- Templates
- Fault Management
- Performance Management
- User Management

Course Pre-requisites

The course assumes prior knowledge of telecommunications, 3G cellular radio parameters, UMTS architecture, interfaces and protocols.

This course assumes that the attendee is familiar with the following course material:

- MO1: Small Cell Overview
- MO2: nano3G System Planning and Provisioning

Course material will be provided electronically, and trainees will be expected to use their laptops during the session.

Trainees should have Read/Write access to the nano3G System to perform AP pre-provisioning activities using the NOS and NOS client.
Module 04

nano3G Access Point Installation

Introduction

This training course, which consists of a theory component and lab exercises, covers the installation of a nano3G AP. The theory component will cover step-by-step instructions for AP hardware installation, and the configuration steps required to bring a nano3G AP into service.

Since it is vital for operational staff to have hands-on experience of rolling out small cell AP’s within the 3G network, the lab exercises will focus mainly on AP commissioning and pre-configuring in the NOS, and site installation of an AP within the nano3G System. Lab exercises will help operational staff in building their competence and skills for AP deployments.

Course Objectives

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

- Install a nano3G AP on site;
- Commission a nano3G AP using a laptop;
- Pre-provision an AP using the NOS and NOS client;
- Prepare an AP configuration file for future installations;
- Check and upgrade the AP with Software Image;
- Familiarise themselves with basic AP installation troubleshooting.

Who will benefit from this course?

Technical professionals/Engineers in the 3G operator organisation, in roles such as:

- Network Planning (Radio & Core)
- Performance Management/KPI Reporting
- Field Engineers Radio Planning
Module 04 Continued

nano3G Access Point Installation

Course Content

- Installation Environment Categories
- Commissioning a nano3G AP using a laptop
- Pre-Provision an AP using the NOS
- Check and upgrade the AP software with Software Image
- Basic installation troubleshooting

Course Pre-requisites

The course assumes prior knowledge of telecommunications, 3G cellular radio parameters, UMTS architecture, interfaces and protocols.

This course assumes that the attendee is familiar with the following course material:

- MO1: nano3G System Overview
- MO2: nano3G System Planning and Provisioning
- MO3: Network Orchestration System, Client Operations

Course material will be provided electronically, and trainees will be expected to use their laptops during the session.

Trainees should have Read/Write access to the nano3G System to perform AP pre-provisioning activities using the NOS and NOS client.
Module 05

nano3G Access Point Operations

Introduction

This course, consisting of a theory component and lab exercises, will cover the management and operation of nano3G AP units. The theory component will cover step-by-step instructions for basic AP operations: Alarm Filtering, Measurement Reporting and Re-parenting AP’s.

Since it is vital for operational staff to have hands-on experience of small cell AP’s within the 3G network in their day-to-day operational activities, the lab exercises will focus mainly on basic AP operations within the nano3G system, for example, retrieving an AP, setting up Network Listen, and defining a static neighbour list.

Course Objectives

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

- Restart a nano3G AP, retrieve AP, block, unblock and decommission AP, and perform frequency calibration on an AP;

- Configure static neighbour lists using network listen; Set up PS handover configuration;

- Set up access control (IMSI based) for closed AP’s;

- Backup and restore the AP configuration attributes;

- Set up alarm filtering and alarm event log;

- Configure measurement reporting.

- Restart a nano3G AP, retrieve AP, block, unblock and decommission AP, and perform frequency calibration on an AP;

Who will benefit from this course?

Technical professionals/Engineers in the 3G operator organisation, in roles such as:

- Network Planning (Radio & Core)
- Performance Management/KPI Reporting
- 3G Network Operations
- Radio Planning
- Customer Care
Module 05 Continued

nano3G Access Point Operations

Course Content

- nano3G AP Operating Basics
- AP Configuration Management
- Static Neighbor Cells
- AP Fault Management
- AP Performance Management
- Moving and Replacing APs

Course Pre-requisites

The course assumes prior knowledge of telecommunications, 3G cellular radio parameters, UMTS architecture, interfaces and protocols.

This course assumes that the attendee is familiar with the following course material:

- MO1: nano3G System Overview
- MO2: nano3G System Planning and Provisioning
- MO3: Network Orchestration System, Client Operations
- MO4: nano3G Access Point Installation

Course material will be provided electronically, and trainees will be expected to use their laptops during the session.

Trainees should have Read/Write access to the nano3G System to perform AP pre-provisioning activities using the NOS and NOS client. AP’s should be made available for commissioning activities.
Module 06

nano3G Access Point Troubleshooting

Introduction

This course, consisting of a theory component and lab exercises, will provide operational staff with the necessary information to perform troubleshooting and diagnostic procedures for the nano3G AP. The theory component will cover step-by-step instructions for initial verification checks on the AP, and how to identify possible causes of the failure of the AP to provide service.

Since it is essential for operational staff to have hands-on experience using the NOS client in their day-to-day AP troubleshooting activities, the lab exercises will focus on the function of the AP LED status indicators, how to interpret warning lights and how to troubleshoot the following problems: when a closed access AP is not providing service as specified, when the AP connection to the SecGW fails due to authentication failure, or at start up AP is unable to access the DNS, DHCP or NTP.

Course Objectives

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

- Identify problems with AP’s using LED status indicators;
- Capture AP diagnostic logs;
- Perform nano3G AP troubleshooting for a closed access AP not providing service;
- Identify possible causes when an AP fails to start up, due to failed SecGW connectivity or inability to access DNS, DHCP or NTP.

Who will benefit from this course?

Technical professionals/Engineers in the 3G operator organisation, in roles such as:

- Network Planning (Radio & Core)
- Performance Management/KPI Reporting
- 3G Network Operations Customer Care
- Field Engineers
Module 06 Continued

nano3G Access Point Troubleshooting

Course Content

- Operational Verification
- nano3G AP Troubleshooting Workflows
- Handover and Reselection Troubleshooting
- Logs and Diagnostic Information
- Network Connection flows
- Network Services Troubleshooting
- Factory Reset
- nano3G AP Temperature
- Residential Deployment Troubleshooting
- OysterCatcher Reporting

Course Pre-requisites

The course assumes prior knowledge of telecommunications, 3G cellular radio parameters, UMTS architecture, interfaces and protocols.

This course assumes that the attendee is familiar with the following course material:

- MO1: nano3G System Overview
- MO2: nano3G System Planning and Provisioning
- MO3: Network Orchestration System, Client Operations
- MO4: nano3G Access Point Installation
- MO5: nano3G Access Point Operations

Course material will be provided electronically, and trainees will be expected to use their laptops during the session.

Trainees should have Read/Write access to the nano3G System to perform AP pre-provisioning activities using the NOS and NOS client.
Module 07

Radio Planning and Optimisation Guidelines

Introduction

The purpose of this course is to provide guidance and suggestions on AP installation locations and the RF parameters related to these environments. The locations for AP’s can range from office buildings to storefronts or warehouses.

There are many RF challenges in deploying small cell AP in 3G macro environments, and some thought is required by the staff on the AP installation and radio optimisation. While the AP’s are part of Self Organising Networks, there is helpful RF guidance and optimisation tips for radio planners and operational staff throughout this course.

Course Objectives

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

- Set RF parameters for an AP in storefront on street, storefront with parking lot, office and AP island;
- Optimise the AP’s RF coverage by performing the recommended tests;
- Describe the RF parameters required in the AP to perform hand-out and reselection.

Who will benefit from this course?

Technical professionals/Engineers in the 3G operator organisation, in roles such as:

- Network Planning (Radio & Core)
- Performance Management/KPI Reporting
- 3G Network Operations Field Engineers
- Radio Planning
Module 07 Continued

Radio Planning and Optimisation Guidelines

Course Content

Initial selection of RF parameters and on-going radio optimisation for the following AP deployment scenarios:

- AP Deployment Strategy
- AP Deployment Benefits
- Residential AP Deployment Guidelines
- Enterprise AP Deployment Guidelines
- Automatic Optimization
- Optimization Guidelines

Course Pre-requisites

The course assumes prior knowledge of telecommunications, 3G cellular radio parameters, UMTS architecture, interfaces and protocols.

This course assumes that the attendee is familiar with the following course material:

- MO1: nano3G System Overview
- MO2: nano3G System Planning and Provisioning
- MO3: Network Orchestration System, Client Operations
- MO4: nano3G Access Point Installation
- MO5: nano3G Access Point Operations
- MO6: nano3G Access Point Troubleshooting

Course material will be provided electronically, and trainees will be expected to use their laptops during the session.

Trainees should have Read/Write access to the nano3G System to perform AP pre-provisioning activities using the NOS and NOS client. AP’s should be made available for commissioning activities.