COURSE DESCRIPTION

INTELLIGENT NETWORKS & CAMEL

Format: Classroom
Duration: 5 Days
COURSE SUMMARY

HIGHLIGHTS
- Highly focused and in-depth training from the experts - including relevant updates from Informa’s extensive research team
- PACE enabled training to maximise competency development and application of learning
- Trainers and programme directors that are experts, industry experienced, and highly accomplished training professionals
- Training outcomes and competency development designed to meet industry and organisational requirements

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OUTCOMES & COMPETENCY DEVELOPMENT
Participants will develop or be able to:
- State the main advantages of Intelligent Networks for the provision of advanced services in modern networks, and identify typical services which could be provided using IN techniques
- Identify and evaluate the features of IN Capability Sets (ETSI and ITU)
- Draw the standard IN Architecture, describing the use of each functional entity
- Use signalling flow diagrams to show how IN can be used to enable advanced services in modern telecommunication networks
- Describe the main problems in providing Intelligent Network techniques alongside Mobility within a common SS7 network
- Draw and explain the operation of the standard CAMEL architecture
- Use signalling flow diagrams to show how the CAMEL feature can be used to enable advanced operator-specific services whilst roaming (using Intelligent Network techniques)
- List and evaluate the main features provided by CAMEL phases 1 to 4
- Identify the main charging mechanisms provided for both circuit-switched operation and GPRS within the CAMEL feature
- Using basic diagrams, illustrate typical CAMEL signalling flows for Mobile Originated, Mobile Terminated, and Mobile Forwarded services, and also for prepaid scenarios
- State three advantages of CAMEL over other prepaid solutions

This course explains the role that the IN (Intelligent Network) concept and CAMEL (Customised Applications for Mobile Networks Enhanced Logic) play in providing effective control of services and features in modern telecommunication networks.

Potential services and applications are discussed and used to illustrate the value that both IN and CAMEL can bring to both operators and users. Specifically, the role and operation of CAMEL in mobile Prepaid solutions is explained and discussed in detail.

A clear explanation is given of the Intelligent Network Application Part (INAP), Mobile Application Part (MAP), and CAMEL Application Part (CAP) of SS7 and how they interact with Call Control Protocols (ISDN User Part - ISUP) to provide control of the overall service. Examples are used throughout to illustrate different call and service scenarios.

We look at the concept of the Intelligent Network, together with its basic features and services, and the role of SS7. Later, an overview of the relevant 3GPP procedures is given (required in order to understand CAMEL operation).

SS7 is a key enabler for both IN and CAMEL, and we look at it in enough detail to make sense of the signalling flows employed in IN / CAMEL service control, and discuss the different implementation and deployment options.

We build on the IN concept to illustrate how CAMEL is used to provide operator specific (IN based) services for users, even whilst roaming in other networks. A detailed explanation of the different CAMEL features is presented (organized by phases), including CAMEL’s role in the Virtual Home Environment (VHE) and Open Services Architecture (OSA) concepts.

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“The course was very insightful and the lessons learnt from the course will be very relevant to the telecoms industry.

— BL ETISALAT

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COURSE CONTENTS

SECTION 1 - SERVICES IN MODERN NETWORKS
- Modern Network Architecture – A Brief Overview
- Services and Features of Modern Networks
- Advanced Services and Applications
- IN Service Support in Fixed Networks - Entities
- SS7 In Modern Networks - Basics

SECTION 2 - INTELLIGENT NETWORKS
- Switching and Signalling In Modern Networks
- Call Control – ISUP (ISDN User Part)
- Example Basic Call Scenarios
- The Intelligent Network Concept Explained
- Benefits of Using the IN Concept
- IN Services
- Service Creation
- The IN Conceptual Model Explained
- The Standard IN Architecture and Functional Entities
- Basic Call State Models (BCSMs)
- The Intelligent Network Application Part (INAP)
- IN Operation - Basic Calls and Services
- Overview of the Underlying SS7 Network: INAP, TCAP, and SCCP
- Protection and Resilience
- Example Service Scenario

SECTION 3 - SS7 PROCEDURES IN SUPPORT OF IN
- Message Transfer Part of SS7
- SCCP in the Modern Network
- SCCP Architecture and IN
- TCAP Explained
- TCAP in Support of IN Procedures
- INAP - the IN Application Part of SS7
- IN Procedures and Signal Flows

SECTION 4 - IN IMPLEMENTATION
- Deployment Options
- Mapping Functional to Physical Entities
- Resilience and Redundancy
- Compatibility of Protocols
- SIGTRAN and IN
- Testing

SECTION 5 - 3GPP OPERATION
- The GSM / UMTS Architectures
- Defining Mobility and Roaming
- Procedures – Location Update, Routing a Call, Sending a Short Message
- GPRS – Its Role and Basic Operation

SECTION 6 - CAMEL – INTRODUCING IN INTO MOBILE NETWORKS
- IN Techniques In Mobile Networks – The problems
- Roaming Issues
- The Role of CAMEL
- The Features of each CAMEL Phase
- Example Services Provided by CAMEL
- Example Prepaid Architecture

SECTION 7 - CAMEL – ARCHITECTURE AND PROTOCOLS
- The Modified Mobile Architecture - Incorporating CAMEL into GSM and UMTS
- The CAMEL Application Part (CAP) and Messages Explained
- CAMEL Operation, including:
  - Basic – Mobile Originated, Mobile Terminated, Forwarding
  - With User Interaction
  - With GPRS
  - With SMS
  - With Location Information / Handovers
  - In Fraud Prevention

SECTION 8 - CAMEL AND PREPAID
- Using CAMEL For Prepaid Solutions
  - In The Home Network
  - Whilst Roaming
  - Circuit-Switched, GPRS, Short Message Service

SECTION 9 - THE EVOLVING MOBILE NETWORK
- The Role of CAMEL in the Evolving Mobile Network
- CAMEL in an Evolved Packet Core (EPC) / IP Core Network Environment
- CAMEL Phase 4 and the IMS / SIP Architecture
- PCC and CAMEL - Operation
- The Role of Diameter Signalling
- Advanced Network Signalling Scenarios
OUR TRAINING SERVICES

TELECOMS ACADEMY STRUCTURE

Our training programmes are delivered worldwide as part of the training and development plans of many operators, vendors, and service providers. The programmes cover a wide range of competency development requirements.

To ensure we meet the training needs of the industry as effectively as possible, we operate three schools:

School of Telecoms Management
Business training tailored to the telecoms industry, ranging from the intensive 5-day Telecoms Mini MBA to specialist leadership and marketing training.

School of Advanced Communication Technologies
Covering a multitude of technologies, these courses range from overviews aimed at nontechnical staff to in-depth engineering training.

Distance Learning
Our comprehensive suite of Distance Learning programmes provide an excellent opportunity to expand knowledge and build confidence.

PACE ENABLED TRAINING

Our programmes are PACE Enabled – a training method that optimises both training value and student engagement. It delivers highly efficient competency development that is focused squarely on practical application in the work place. It is simple in concept and comprises four key elements;

- **Preparation** – Pre-course preparation in order to "hit the ground running"
- **Application** – Applied Learning that focuses on practical application in order to maximise both training value
- **Consolidation** – Post-course continuing competency development, access to resources and on-going support
- **Experience** – An outstanding end-to-end training experience designed to develop competences as effectively as possible

OUR TRAINERS

We only use trainers and programme directors that satisfy the following three criteria:

- Experts in their field
- High level of Industry Experience
- Expert facilitators and training professionals.

All our trainers have undergone a rigorous election process and are subject to continuous monitoring and evaluation. Each trainer is accredited for specific courses or topic areas. Whether engineers or business experts, all our trainers are required to continue their own development within their specialist areas, and to broaden their Industry view of trends, best practice and technology.

This is achieved by our on-going work with many tier 1 operators and vendors, and by full exposure to Ovum research and KNect 365 TMT worldwide events.

UNIVERSITY ACCREDITATION

Some of our programmes have been accredited by the University of Derby Corporate; a UK-based university highly acclaimed in the area of employer engagement. They are at the forefront of the drive to integrate highly focused industry-led training with the academic rigor and quality control of university-based education. Our comprehensive Advanced Telecoms Management Series have been accredited Post-Graduate Level, with our extensive suite of Distance Learning at Undergraduate Level)

We would be happy to discuss extending accreditation to tailored ATMS or programmes based on our Distance Learning modules. Although accreditation is specific to these programmes, the work we do with the University of Derby enable us to develop and apply best practice across our portfolio.

CUSTOMISED IN-HOUSE TRAINING

Telecoms Academy has worked with countless companies to deliver customised training programmes. We take time to understand your requirements, you’ll work with our specialist training team to ensure that we deliver your perfect training programme for your business.

A customised training programme from Telecoms Academy ensures you get a course that precisely matches your organisation’s needs, presented by a first-rate training organisation, with access to all the latest industry research and analysis.

Why choose in-house training from Telecoms Academy?

- Content can be customised to focus on the issues you want – work with us to develop the training course to match the exact needs.
- Unique industry research – from Ovum’s team of industry leading analysts
- Expert trainers – our team of versatile trainers have the knowledge and experience to deliver a highly effective learning experience
- The most efficient way to train your staff – at the time and location to minimise disruption
- Flexible delivery options – with a range of instructor led, distance learning and virtual classroom formats available you can build a blended solution to maximise training effectiveness over the long term
- Pre and post course assessment – can be included in programmes to measure competencies and check on the required progress.

Contact us to discuss how we can build your perfect programme.