Course ID
CAMEL-ADV
Course Duration
3 days

Course Title
CAMEL: An Advanced Tutorial

Aimed At

The standard presentation of this course assumes a bachelor of science in Electrical Engineering, Mathematics, Physics, or a related subject along with an appropriate background in communications.

Group Size

5-25

Prerequisites

- CAMEL for Intelligent Networks: Value-Added Services for GSM, GPRS and UMTS (CAMEL, 3 days)
- GSM: Network Architecture, Operation, and Design (GSM-I, 5 days)
- GPRS: Network Architecture, Operation, and Design (GPRS, 3 days)
- EDGE: Network Architecture, Operation, and Design (EDGE, 2 days)
- UMTS-FDD: Network Architecture, Operation, and Design (UMTS-FDD, 3 days)

Since CAMEL builds on GSM, GPRS, and UMTS, a good knowledge of those technologies, which may be gained by taking the above courses or through equivalent experience, is required. Also, since this is an advanced course on CAMEL, our introductory CAMEL course – or equivalent knowledge – is an additional prerequisite.

Course in a Nutshell

Customized Application for the Mobile network Enhanced Logic, or CAMEL for short, is an important standard for intelligent mobile communications networks. Now under deployment worldwide, CAMEL enables mobile network operators to offer value-added services quickly and efficiently.

This, the second of our two courses on CAMEL, builds on the strong foundation of CAMEL knowledge we laid down in the first. In this course, you will learn the advanced functionality of CAMEL phases 3 and 4, CAMEL vis-à-vis IMS and SIP, CAMEL overlay for non-CAMEL networks, third-party CAMEL platforms, and CAMEL Phase 4 (3GPP releases 5, 6 and 7). We will conclude with a comprehensive review of the state-of-the-art of CAMEL including the many CAMEL systems on the market, varying approaches to CAMEL deployment, status of CAMEL implementation worldwide, what is being implemented and why, and how to plan for CAMEL implementation for a new network, existing network, and MVNO or other specialized environments. Throughout the course, you will receive practical guidance on how to design and deploy CAMEL networks. Whether you are a wireless or network design engineer, “service network” planner, or software/device designer, this course will help you master the powerful features of today’s advanced intelligent networks that are made possible by CAMEL.

Customize It!

- *Are you involved with network service logic design?* If so, we can gear the course toward the knowledge and skills needed in your job.
- *Are you a wireless or network engineer* who would like to catch up with the state-of-the-art of intelligent networks? Let us know so we can focus on the areas that interest you the most.
- *Are you a GSM or UMTS installer* who would like to learn the key concepts and theory that underlie your craft? If so, we can tailor the course to your background and needs.
- *Are you a manager, executive, or sales person* whose work involves Intelligent Network systems? If so, we can emphasize those parts of the course that deal with the markets and applications pertinent to your project or product.
- *Are you equipment and application developer* engaged in developing wireless devices, products, or services for the wireless industry? If so, we can turn this into a crash course on all that you need to know about CAMEL to get your job done.

Course Outline

- Review
  - GSM, CDMA, WCDMA, and UMTS networks
  - IN, WIN, and AIN
  - TCAP, MAP, SCCP and CAP protocols
  - IN conceptual model and planes
  - IN service creation environment
- CAMEL Phase 3 Advanced Features
  - 3G networks in general
  - UMTS network architecture
  - Cell planning: 2G versus 3G
  - Call control
  - CAMEL control of GPRS
  - CAMEL control of MO-SMS
  - Mobility management
  - Active location retrieval
  - Subscription data control
  - Enhancement to USSD
  - Pre-paging
- Trigger Detection Points and CAP Operations in Phase 3
- CAMEL Phase 3 Service Creation Examples
- CAMEL Phase 4 Advanced Features
  - General introduction
  - Call control
  - GPRS control
  - SMS control
  - Mobility management
  - Any-time interrogation
  - Subscription data control

  - Mobile number portability
- Trigger Detection Points and CAP Operations in Phase 4
- CAMEL Phase 4 Service Creation Examples
- CAMEL vis-à-vis IMS
  - Rationale for CAMEL control of IMS
  - IMS conceptual model
  - IMS development
  - IMS functional components
  - Basic principles of SIP
  - SIP session control in IMS
  - Service elements and service control
  - The IM-SSF and CSE
  - Registration
  - IMS call control
  - CAMEL application part for IMS control
  - Supported call cases for IMS control
  - Service example in IMS session control
- Various CAMEL Systems on the Market
- CAMEL Overlay for Non-CAMEL Networks
  - Network components
  - Advantages
  - Service scenarios
  - Industry approach and models
- Third-Party CAMEL Platforms
  - Implementation methods
  - Charging and rating
  - Call and session control
  - Open standards and mechanisms
  - Examples of real implementations worldwide
  - Case study
- CAMEL Phase 4: 3GPP Release 5
  - New and advanced features
  - Network components
  - Interfaces and functionality
  - Capability negotiation
- CAMEL Phase 4: 3GPP Release 6
  - New and advanced features
  - Network components
  - Interfaces and functionality
  - Enhanced dialed service
  - Handover notification criteria
  - Enhancement to SCUDIF control
  - Reporting user-to-user information
  - Enhancement to user interaction

- CAMEL Phase 4: 3GPP Release 7
  - New and advanced features
  - Network components
  - Interfaces and functionality
  - Trunk originated triggering
  - Enhancements to 3GPP Release 7
- Industry Trends in CAMEL Implementation Approach
- Worldwide Networks Overview and Status for CAMEL
- What Is Being Implemented Currently and Why?
- How to Plan CAMEL Implementation in Various Scenarios
  - New network
  - Existing network (service node, IN, etc.)
  - MVNO and specialized environments
- Open Standards and Available Options for Interfacing
- Discussion: *Your* CAMEL Implementation
  - What to implement?
  - How to implement?
  - Available options
- Wrap-up
  - Course Recap, Q/A, and Evaluations

How You Will Learn

- A seasoned instructor will present this course in interactive lecture format
- Along with lecture, we use exercises, case studies, and interesting group activities to enrich the instruction and drive home the essential points.
- If you already know something about the technology, we will build on that. We'll compare and contrast what's familiar with what's a new, making new idea easier to learn as well as more relevant.
- If your background is less technical, we will use meaningful and ingenious examples and analogies to simplify the complex subject matter.
- You will receive a printed Participant Handbook which will help you remember and retain what you learned in class and apply it on your job.

Revised *February 11, 2007*