Understanding
LTE Charging Management and Charging Applications

Course Description

The traditional telecommunications billing paradigm of time and distance has been under attack in both fixed and mobile networks for some years and new, more sophisticated charging systems are being developed.

For UMTS, a new charging architecture was specified by the 3GPP standards group. This evolved rapidly through Releases 6 and 7 of the 3GPP specifications and has been updated for LTE in Release 8.

Following the industry maxim of not offering a service until it can be charged for, charging needs to be ahead of services in sophistication and this system is designed to cope with any future demands.

This course presents the overall architecture of 3GPP Charging Management before specifically examining major aspects in some detail. These include the interfaces between components and the associated Reference Points as well as specific charging areas such as IMS and Location Services (LCS).

The Diameter Base Protocol provides the Authentication, Authorization and Accounting (AAA) facilities needed by the architecture. Diameter thus replaces older systems such as RADIUS.

Policy-based charging is also covered.

Students Will Learn

- **The UMTS Charging Management Architecture**
- **Charging Principles**
- **Policy and Charging Control**
- **Offline Charging Reference Points**
- **Online Charging Reference Points**
- **Legacy Interfaces and Reference Points**
- **Implementation Options**
- **Diameter**
- **Diameter Charging Application**
- **Policies**
- **MMS Charging**
- **Location Services (LCS) Charging**
- **IM Subsystem Charging**
- **CDRs**

Target Audience

Anyone needing an in-depth overall understanding of LTE Charging Management and Charging Applications. Such attendees would be employed or contracted to operators, manufacturers, integrators or regulators. Anyone requiring to focus on LTE Charging Management and Charging Applications as directed in the specific topics of this course.

Course Outline

Module I: The UMTS Charging Management Architecture

       The Principle of Billing

       Overall Architecture

       Structure of Standards

       Charging mechanisms

     Flow Based Charging Principles

     Offline and Online charging

Module II: Charging Principles

Data Generation and Transfer

     ..... Offline

     ..... Online

     Levels of Charging: Bearer, Subsystem and Service

     Data Correlation between Levels

     Utilization of Charging Information

     ..... Inter-Operator Settlement

Module III: **Policy and Charging Control**

Flow Based Charging

Policy Control

Architecture

Functional Entities

PCRF - Policy Control and Charging Rules Function

PCEF - Policy and Charging Enforcement Function

Data Flows and Procedures

Module IV: Offline Charging Reference Points

Rf between a 3G network element and the CDF

Gz between a PCEF and a CGF

Ga for CDR transfer between a CDF and the CGF

Bx for CDR file transfer between any (generic) 3G domain, subsystem or service CGF and a BD.

Wf between a 3GPP WLAN CTF and the CDF.

Module V: Online Charging Reference Points

Ro between a 3G network element and the OCS

CAP for CAMEL between a network element with integrated SSF and the OCS

Gy between a PCEF and an OCS

Re between the OCF and a Rating Function (RF)

Rc between the OCF and an Account Balance Management Function (ABMF)

Wo between a 3GPP WLAN CTF and the OCS

Module VI: Legacy Interfaces and Reference Points

Go

Gq, Gx and Rx

Ro

Module VII: Implementation Options

Charging principles

Charging Data Transfer

Partial CDRs

Evolution of Principles between 3GPP Releases

Specifications

Release 6

Release 7

Release 8

PCRF - Policy Control and Charging Rules Function

PCEF Policy and Charging Enforcement Function

Module VIII: **Diameter**

The Need for Diameter

Diameter Basics

Diameter Stack

SCTP

The Diameter Header

The Diameter Document Set

Diameter Protocol Overview

AVPs (Attribute Value Pairs)

Sessions and Connections

Module IX: Diameter Charging Application

RFC 4006 Diameter Credit Control Application

Realms

Charging Scenarios

Charging Trigger Function (CTF)

Charging Data Function (CDF)

Online Charging Function (OCF)

Event Based and Session Based Charging

Basic Principles for Diameter Online and Offline charging

Message Sequences

Online Situation

Module X: **Policies**

Some Terms

Policy Decision Functions

Module XI: **MMS Charging**

MMS Charging Principles

Online Charging Scenarios

Offline Charging Scenarios

Module XII: **Location Services (LCS) Charging**

LCS Architecture

LCS offline Charging Scenarios

LCS Online Charging Scenarios

Charging Information

R0, Bl and Ga interfaces

Module XIII: **IM Subsystem Charging**

IMS Charging Architecture

IMS Charging Principles

Online and Offline Principles

Diameter Application

Charging Information and CDR Types

Module XIV: **CDRs**

CDR Transfer

CDR Format and Parameters

Delivery Method

Instructor-led with numerous case-studies and exercises.

Equipment Requirements
(This apply's to our hands-on courses only)

BTS always provides equipment to have a very successful Hands-On course. BTS also encourages all attendees to bring their own equipment to the course. This will provide attendees the opportunity to incorporate their own gear into the labs and gain valuable training using their specific equipment.

Course Length

2 Days