CAMEL Gateway

System Overview

PROTEI CAMEL Gateway is a powerful CAMEL enabler intended for fast and easy Intelligent Networks (IN) services deployment in mobile networks using CAMEL Application Part (CAP) protocols.

CAMEL Gateway is a key element for the successful deployment of real Virtual Home Environment (VHE) services. The server allows real-time control of calls, SMS and GPRS sessions in GSM networks using external applications that communicate with the CAMEL Gateway through Application Programming Interface (API).

Horizontally scalable architecture provides high reliability and extensive scope to increase system throughput in pace with network growth. SIGTRAN support allows easy integration of PROTEI CAMEL Gateway into next generation mobile networks.

One of the unique features of PROTEI CAMEL Gateway is the ability to forward initial DP (service request) to the external SCP (CAMEL-proxy mode), allowing the system to be used simultaneously with existing SCP installations.

The system supports CAMEL phase 2 and 3 specifications and is compatible with main MSC vendors.

The ability to control calls, SMS messages and GPRS sessions (SMS and GPRS services are supported by CAMEL Phase 3 and higher) plus real-time interaction with subscribers opens new horizons for developing and implementing a broad range of additional services.

Matters of development and deployment of services and their tariffs may be addressed by operators as well as by external service providers that have access to the CAMEL Gateway via an API.

A key application of this system is to provide Hot Billing for all subscribers of the mobile network.

Technology Overview

CAMEL is part of the VHE concept and provides a full range of additional intelligent services to subscribers in home networks and while roaming in CAMEL-enabled visitor networks.

It does not require modernization of operators' networking equipment or connection of voice channels for transmitting traffic through the network's transport nodes. This makes CAMEL the most efficient method for providing additional services or roaming services to mobile subscribers.

An important feature of this technology is the fact that services implemented over the CAMEL protocol do not require international standardization or special cooperation between mobile service providers. Thus, even the most exclusive and nonstandard service implemented in the home network of one service provider becomes available through CAMEL technologies to all its subscribers regardless of their location.

The use of open APIs (including Parlay) for designing call control applications gives new opportunities to create non-standard operator-specific services. Such services can be developed by the operator's specialists or by third party service-providers. An embedded service creation environment simplifies service development.

This approach is much more flexible in comparison with traditional SCP architecture because the operator receives not only services developed by the SCP vendor, but also a powerful and flexible tool for creating new services. The operator can dramatically decrease time to market while deploying innovative services that will attract new subscribers and strengthen competitive standing.

Service Logic Definition

The logic of services provided to subscribers is determined by external API applications that interact with mobile networks through the CAMEL Gateway.

When providing services, the home location register (HLR) and visitor location registers (VLR) exchange information about the client's subscription to CAMEL services (CSI). The gateway controls calls, SMS exchange or GPRS sessions, as well as other procedures provided by a particular service on the basis of information from external applications.
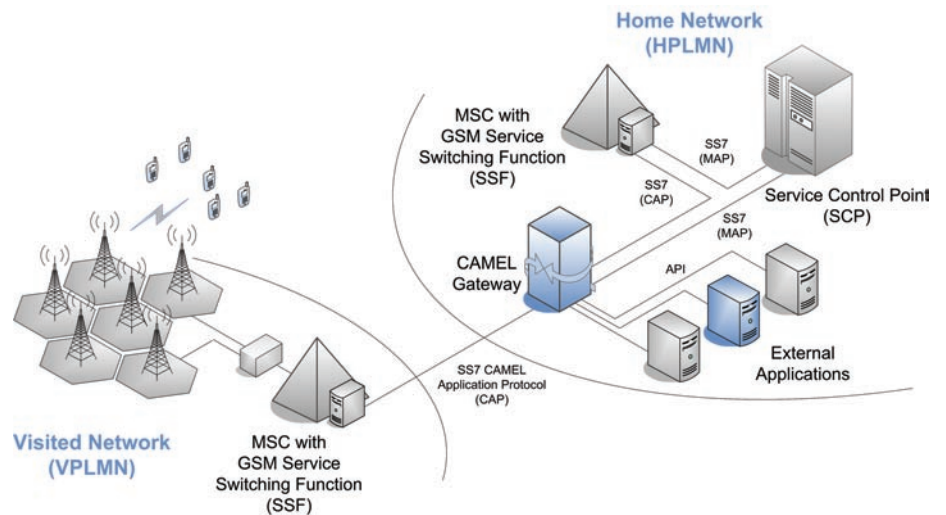
A typical request from MSC/gsmSSF to CAMEL Gateway contains a service key which should correspond to a particular external application.

System Features

- Provides a wide range of prepaid services to subscribers with real-time billing in home and visited networks;

- Real-time control, logging, and accounting of incoming, outgoing, and forwarded calls in home and visited networks;

- Control, logging and accounting of outgoing SMS messages in home and visited networks (available in CAMEL Phase 3 and higher);

- Real-time control and accounting (by time or by volume) of GPRS sessions in home and visited networks (available in CAMEL Phase 3 and higher);

- Using voice prompts and announcements available at the MSC where the subscriber is registered;

- Determining current subscriber status (e.g. busy, out of network range, etc.);
- Management of call processing logic and service accounting logic by external applications connected via API;
- Flexible adaptation of data formats included in Call Detail Records to conform to requirements of operators and service providers;
- Number Translation (Virtual Number) service support;
- Flexible implementation of intelligent services based on the CAMEL phase 2 and phase 3 features and API application features;
- CAMEL-proxy functionality;
- Virtual Private Networks (VPN) implementation;
- Advice of Charge (AoC) support;
- Service statistics log;
- Flexible SS7 configuration;
- Logging transaction results with various levels of detailing;
- Configuration and monitoring using any kind of remote access technology. All system parameters may be configured through editing configuration files and/or using the web-based administration software;
- Alarm logging with SNMP support.

System Architecture, Capacity and Principles of Scalability

CAMEL Gateway consists of the following subsystems:

- Subsystem for interaction with mobile networks over SS7/CAP;
- Subsystem for interaction with external applications via API over TCP/IP;

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- Subsystem for logging and statistics collection;
- Subsystem for administration and maintenance

PROTEI CAMEL Gateway is a horizontally scalable system with network architecture; if the load on one of the subsystems reaches its set threshold, excess traffic is transferred to a free module. High redundancy ensures optimal system availability.

If a module fails, traffic is redistributed among other modules until the failed module becomes available again, with no interruption to service. Similarly, new modules can be put into operation without interrupting service flow.

Capacity of one module is 4 E1, up to 32 signaling links, up to 500 TPS (transactions per second).

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