PROTEI SMSC
SMS & USSD Message Center

System overview

PROTEI SMSC is an SMS and EMS gateway with USSD server capabilities. It provides SMS messaging services in GSM and CDMA networks, and USSD messaging in GSM networks. In GSM networks, PROTEI-SMSC also functions as a transient/inter-network SMS gateway (SMS-GMSC/SMS-IWMSC).

The system is a scalable, high performance solution that meets all current operator requirements. Flexible architecture makes it truly future-proof and SIGTRAN support allows easy integration with next-generation mobile networks.

PROTEI SMSC allows mobile network operators to provide SMS, EMS, USSD and Billing services. The system also serves the needs of content providers and application service providers.

Additional applications

PROTEI SMSC supports a wide range of SMS/USSD-based messaging services:

Customer Care Services

A Customer Care utilities package is available for PROTEI SMSC. It allows operators to provide standard customer care services such as balance information or prepay card activation via USSD or SMS. Integration with the operator's billing system is carried out on installation.

SMPP Proxy/Router

Designed for use by service or content providers, the SMPP Proxy/Router transfers SMPP messages between one or more SMS/USSD centers and external applications. It is capable of flexible processing by message type, sender/recipient numbers, application IP address etc, making it a key element in access control systems for content providers.

Fixed Line SMSC

The Fixed Line SMS Center allows SMS messages to be exchanged within a fixed-line network and with networks of different standards. Superior functionality and flexible configuration ensure easy deployment and integration into existing systems.

Dedicated USSD Server

Built for USSD message exchange between mobile subscribers and external applications in GSM networks, PROTEI's USSD server is the easiest and most effective way for mobile network operators to provide balance information, prepaid card activation and other customer services. The USSD server provides flexible message routing based on service key, message body and MSC address.

Access policies and bandwidth allowances can be managed separately for each application. USSD phase1 and phase 2 are supported, allowing interaction with USSD services via a multi-level USSD menu. Embedded tools aid the creation of flexible, user-friendly menus. The system supports open XML and/or ODBC interface for integration with external applications and databases.

Global SMS Server

Provides access to SMS VAS services via a universal international number, accessible from any GSM network which has negotiated SMS messaging with the Global SMS service provider.

Email-SMS Server

The SMS-to-Email service allows mobile subscribers and email users to exchange messages via SMS. A selection of basic email functions is supported (send/receive messages, basic account management, etc.) Communicates with the SMSC via SMPP v3.4 and with email servers via SMTP.

SMS-to-ICQ Server

The SMS-to-ICQ service allows mobile subscribers and ICQ users to exchange messages via SMS. A selection of standard ICQ functions is supported (send/receive messages, manage online status, register as a new ICQ user, search for contacts using UIN or email etc.) Communicates with the SMSC via SMPP v3.4 and with ICQ via XML.

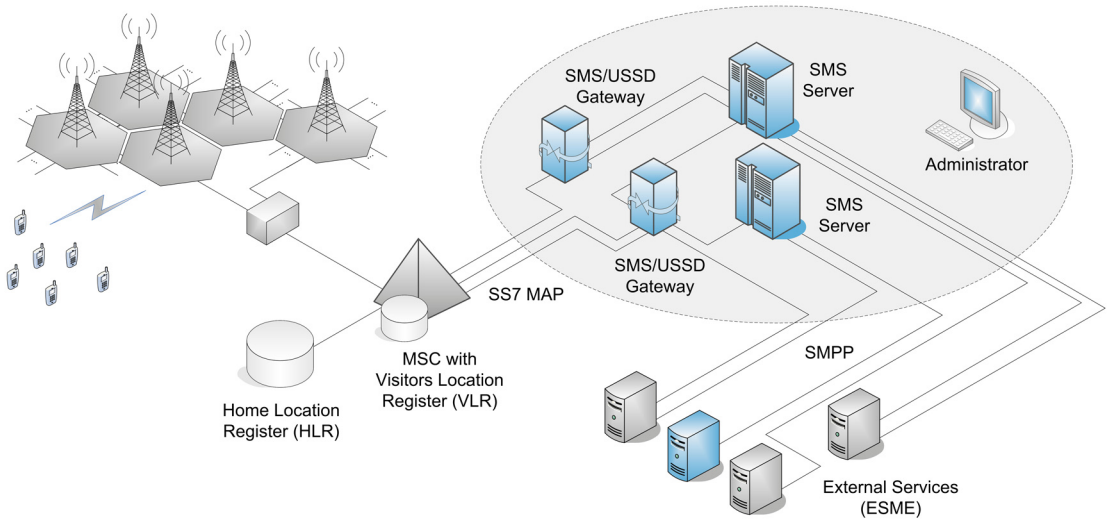
SMS Sender

SMS Sender is a powerful, user-friendly system for mass SMS distribution. SMS sending lists can be created from predefined lists and message bodies. Lists can be created automatically using information from external databases (for example, billing information) or manually by the system administrator. Individual parameters can be set for each sending list, such as delivery schedule and data source. A simple graphic interface makes the system easy for non-technical departments (e.g. marketing) to use.

Functions overview

- Universal platform for SMS, USSD and LBS services;
- Send alphanumeric or binary SMS, EMS or USSD messages from external application to mobile network subscriber;
- Receive alphanumeric or binary SMS/USSD messages from a mobile network, transfer to external application or mobile network subscriber;
- Analyse USSD service numbers for routing messages to the appropriate external application;
- USSD phase 1 and phase 2 compliance;
- Conforms to GSM standards 03.38, 03.40, 09.02;
- Flexible SS7 signalling configuration;
- System modules can work in load sharing mode (load sharing based on SCCP – Global Title);
- Alert-SC support;
- Deferred Delivery;
- Total compatibility with EMS technology, Nokia Smart Messaging and Siemens OTA;
- Communication with external applications via SMPP (Short Message Peer to Peer Protocol) v3.4;
- Message queuing control;
- Set user SMPP access rights;
- Set IP-address and port number of outgoing SMPP connection individually for each service application;
- Message queuing control;
- Remove short message from SMSC queue on command from external application
- Replace short message in SMSC queue on command from external application
- Control access rights for senders/recipients;
- Create user access control lists;
- Delivery reports;
- Determine subscriber location on command from external application;
- Short message receipt/delivery logging;
- Alarm log;
- Remote configuration & control via telnet/ssh or WEB operating and maintenance subsystem;
- Horizontal scaling: throughput capacity can be increased by creating additional SS7 signal channels and building distributed systems;
- Up to 32 links per SMS/USSD gateway;
- Additional subscriber services: SMS forwarding, auto-responder, username;
- Real-time SMS billing (integration with CAMEL/BRT interfaces).

The complete service center consists of a number of subsystems:



- Message processing and storage subsystem: Filters, categorises and assigns priorities (for short message sending, report sending and, if necessary, Alert-SC procedures) and queues outgoing messages.
- Reports and statistics storage subsystem: Collects and stores account and statistical information.
- External application interface: Implements protocols for communication with external applications. SMPP over TCP/IP is the main protocol, support for further protocols can be added.
- Operating and maintenance system: Used for system administration and configuration.

SMS/USSD gateway (PROTEI-SMSC/L)

The following subsystems are implemented on the basis of the gateway:

USSD and SMS messaging subsystem: performs all functions connected with processing and delivery of USSD messages to recipient, including transmission of SMS messages received from the external application interface or the mobile network interface.

Gateway external application interface: as SMSC external application interface. Communicates with the mobile network via SS7 (MAP,TCAP,SCCP,MTP), with CDMA and CDMA-2000 networks via IS-41 and with external applications by SMPP over TCP/IP.

Mobile network interface: implements the OKC7 protocol stack and performs all functions required for processing and delivering short messages or USSD messages received from the mobile network, external application or short message processing subsystem. Messages can be delivered to a mobile network subscriber, short message processing subsystem or an external application.

Reliability and Scalability

Limiting traffic from external applications

In order to guarantee performance, traffic to the GSM network from external applications can be limited. Limitations can be applied to the rate of message transfer; the system accepts or rejects messages according to thresholds set by the administrator. The message queue is protected from overflow, even if outgoing SMS cannot be sent.

Horizontal scalability and Reliability

PROTEI SMSC is a horizontally scalable system with network architecture; if the load on one of the subsystems (SS7 gateway, SMS server or reports and statistics server) 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.

With no single point of failure or bottlenecks, PROTEI SMSC constantly delivers dependable high performance.

Technical details

Hardware, software

- Intel platform;
- Compact 19” rack mounting equipment;
- Multiprocessors/PSU optionally available;
- High reliability with Raid 1 or Raid 5 SCSI HDD;
- Linux/XFS.

Performance

- From tens to thousands of messages per second, depending on configuration
- Message queue size from hundreds of thousands to millions of messages

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