New Generation IVR and Customer Care Service Platform

System Description

PROTEI IVR is a carrier-class Interactive Voice Response (IVR) system that enables the deployment of a wide range of telephone-access information services . IVR interacts with subscribers, providing them information requested by DTMF menu navigation.

This system provides efficient tools for interactive voice services including multilevel menu, inbound and outbound announcement services . The system supports standard IVR functions and can be efficiently integrated with external information systems using open XML or ODBC interface. PROTEI IVR, makes it easy to create services like balance inquiry, payment registration, services activation or deactivation, subscriber self-care services, low balance notification and many more, and ot optimize menu structure according to the needs of each service.

The call processing logic is defined in the form of a hierarchical menu consisting of menu items and a set of rules for transition between them. The initial (root) menu item is selected for the particular incoming call according to the called party number and the calling party number. Subsequent processing of the incoming call can be defined as a sequence of steps between the nodes of the menu tree based on incoming call parameters or information (DTMF sequences), entered by the subscriber while located in a certain menu item.

In order to get information about his/her account, to change the supplementary service settings (e.g. call barring settings etc), to make a payment by voucher (scratch card) or to recieve other information the subscriber dials the appropriate IVR service number from his own mobile phone or from PSTN. By using DTMF, the subscriber can navigate to the desired menu item, e.g. number activation/deactivation, balance enquiry, etc.

Subsequent interaction depends on the service being accessed. For example when an account balance enquiry from PSTN is processed, the subscriber should enter his or her telephone number and a secure password to access balance information. If the subscriber accesses the service from his own phone, the balance information will be retrieved from billing and transferred to the subscriber automatically without any additional action from the subscriber.

All menu schemes can be defined by the system administrator by using the embedded voice menu constructor.

During this dialog, the IVR interacts with the mobile operator's billing system to retrieve the requested information or to change settings in the subscriber profile as required.

Outbound notification is initiated on request from the billing system or the system administrator.

Service Creation Tools

The service creation environment (voice menu constructor) is organized in the form of open scripts defining the call processing rules mentioned above. These scripts are written using an internal language with elements of standard programming language (Perl) that allows changes to be made quickly and easily: creating voice menu items, defining DTMF templates for user interaction, configuring requests to external information systems, creating number modification rules and so on. Call processing logic is defined in the form of a hierarchical menu consisting of separate items and rules for navigating between them. All menu schemes can be defined by the system administrator using the voice menu constructor.

System Architecture, Capacity and Scalability

PROTEI IVR is a horizontally scaleable carrier-class system. If load on the server reaches its maximum, extra modules can be added to increase capacity. For distributed solutions, automatic synchronization of system configuration between modules is supported. The system has network architecture, which additionally increases its reliability. Several system modules are used in load sharing mode. If one of the modules fails, traffic is redistributed among the other modules without any interruption to service.

System Features

- Interactive Voice Response (IVR) with flexible menu constructor;
- Supplementary service management;
- Balance information (balance enquiry processing);
- 'Promised payment' registration;
- Voucher (scratchcard) payment registration;
- Outbound notification about low balance etc;
- Flexible service access management for different subscriber groups;
- Multilanguage support;
- Full compatibility with any billing system;
- Open interfaces to billing systems from different vendors (XML or ODBC);
- SNMP support for alarm monitoring;
- CDR generation for all services;
- Simultaneous processing of several requests, high system thoughput;
- Broad scope for modifying and configuring the system to specific business needs.

PROTEI distributed IVR
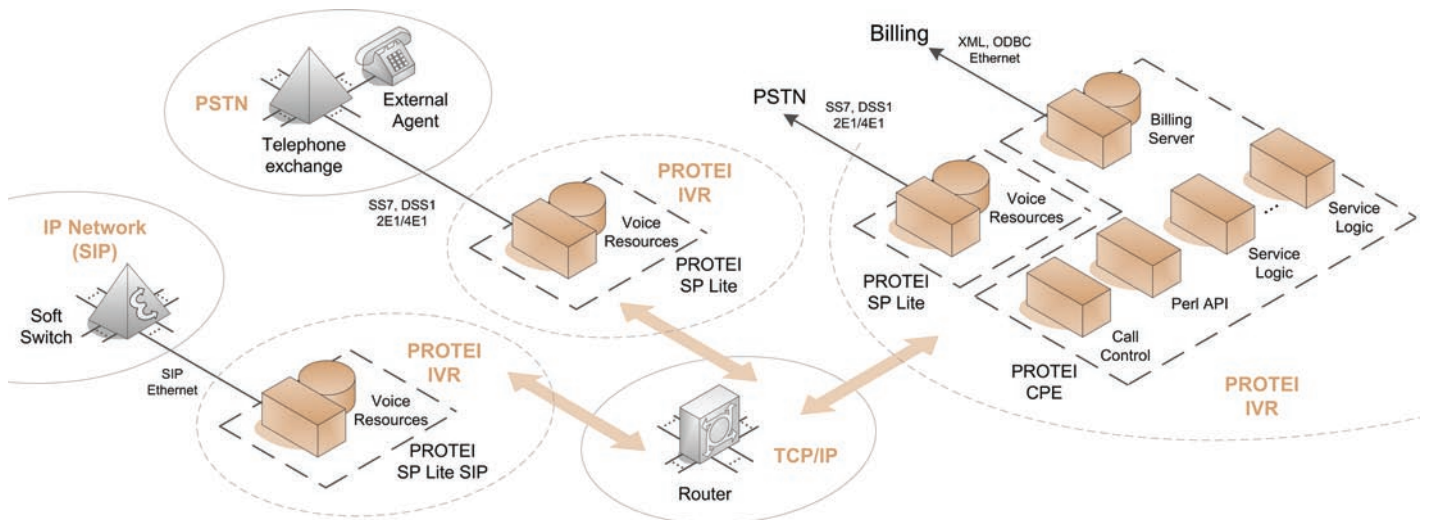
Architecture

The architecture of PROTEI IVR allows efficient deployment of this system both in traditional networks and using the main NGN advantages. The system can be connected either to MSC using E1 trunks (SS7 (MTP/ISUP) or PRI) or to VoIP gateways or NGN elements directly using SIP protocol. IVR and service logic software units can either function on the same server or several IVRs can work with one centralzed service logic server.

Such system architecture is optimal for reliable performance, maintenance and service management. It improves functionality and uses network resources more efficiently. New services can be deployed easily without any interruption to existing services.

The system architecture also allows:

• implementation of all voice services (such as voice mail, balance enquiry, voucher activation etc) on the base of a unified platform;

• efficient usage of centralized service platforms by companies with several remote regional branches;

• optimal construction of distributed systems;

• minimal network bandwidth usage between the central node and the remote sites;

• usage of standard VoIP network elements such as gateways (which could also be used for other purposes e.g. as elements of a multi-service carrier network);

• optimal usage of network storage capacity with highly efficient VoIP codecs (G.729 etc.), e.g. for voice mail systems and IVR voice prompt storage.

Benefits

• Improved customer relations, QoS and subscriber satisfaction;

• Significant reduction in operating costs and reduced load on customer care department;

• Efficient implementation of customer care services;

• Architecture adapted to the needs of large companies;

• Easy deployment of new services;

• Fast and easy integration with external OSS and billing systems.

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