

New Generation IVR and Customer Care Service Platform

System Description

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

This system provides an efficient tools for interactive voice services with multi-level menu, inbound and outbound announcement services etc. The system supports standard IVR functions and can be efficiently integrated with the external information systems by using open XML or ODBC interface. On the base of PROTEI IVR the customer can easily create different services like balance inquiry, payment registration, services activation or deactivation, subscriber self-care services, low balance notification optimizing menu structure for his needs.

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

In order to get information on 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 receive other information the subscriber should dial the correspondent IVR service number from his own mobile phone or from PSTN. By using DTMF, subscriber can navigate to the particular menu item, e.g., number activation/deactivation or balance enquiry.

The further interaction algorithm depends on the accessed service. For example when the account balance enquiry from the PSTN is processed the subscriber should enter the telephone number and the secure password to receive this information. If the subscriber gets an access from his own phone the balance information will be retrieved from billing and transferred to the subscriber automatically without any additional actions from the subscriber.

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

During this dialog IVR interacts with the Mobile operator billing system to retrieve the requested information or to change the necessary settings in the subscriber profile.

Outbound notification is initiated by the request from the billing system or the System Administrator.

Service Creation Tools

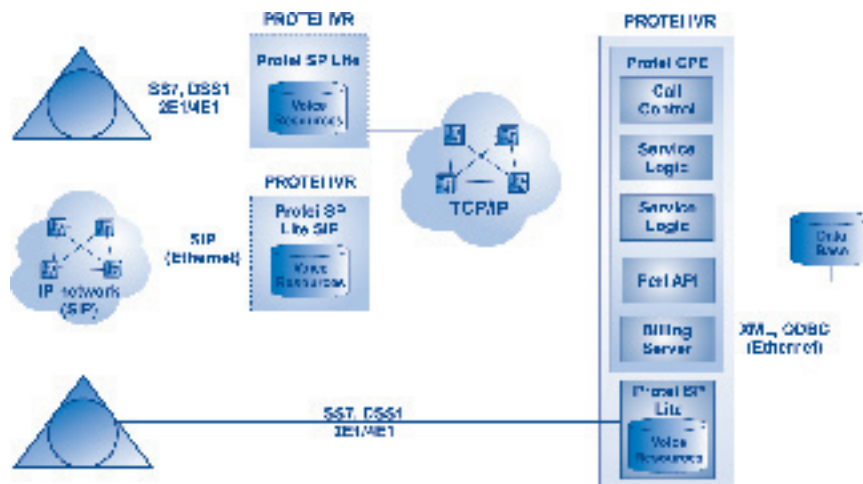
The service creation environment (voice menu constructor) organized in the form of the open scripts defining calls processing rules mentioned above. These scripts are written using internal language with the elements of the standard programming language (Perl) that allows easily making any changes in the system's work algorithm: creating voice menu items, defining DTMF templates for user interaction, configuring request to the external information systems, creating number modification rules etc. A call processing logic is defined in the form of the hierarchical menu consisting of the separate items and transition rules between them. All menu schemes can be defined by the System Administrator by using voice menu constructor.

System Architecture, Capacity and Principles of Scalability

The PROTEI IVR is a carrier-class system that can be scaled horizontally. When the productivity or capacity of the server reaches its maximum, additional modules can be used. Automatic synchronization of the system configuration between the modules in case of the distributed solutions is supported. The system has a network architecture, which additionally increases its reliability. Several system modules are used in the loadsharing mode. If one of the modules fails then the traffic is redistributed among the other modules without any service interruption.

System features

- Interactive Voice Response (IVR) with flexible menu constructor;
- Subscriber's supplementary service management;
- Balance information (balance enquiry processing);
- "Promised payment" registration;
- Voucher (Scratch card) payment registration;
- Outbound subscriber's notification about the low balance etc;
- Flexible service access management for different subscriber groups;
- Multilanguage support;
- Full compatibility with any Operator billing system;
- Open interfaces to billing systems by different vendors (XML or ODBC);
- SNMP supported for alarm monitoring;
- CDRs are available for all services;
- Simultaneous processing of several requests, high system throughput;
- Wide possibilities of tuning the system to the specific business process



with one centralized service logic server. Such system architecture is optimal for reliable functioning, maintenance and service management. It allows improving functionality and increases network resources usage efficiency. New services can be easily deployed without any existing service interruption.

Such architecture also allows:

- implementation of all voice services such as voice mail, balance enquiry, voucher activation etc) on the base of the unified platform;
- efficient usage of the centralized service platforms by the companies with several remote regional branches;
- creation of the distributed systems by optimal way;
- usage of data networks with minimal requirements to the network bandwidth between the central node and the remote sites;
- usage of the standard VoIP network elements such as gateways (which could also be used for another purposes e.g. as an elements of the carrier multiservice network);

the most efficient utilization of the 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;
- Considerable reduction of the operating costs and load shedding on the Customer Care department;
- Efficient Customer Care services implementation;
- Architecture adopted to the large company needs;
- Easy new services deployment;
- Fast and easy integration with the external OSS and billing systems.

Architecture

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

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