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THE DATABASE MANAGEMENT SYSTEM AS THE BASIS OF BILLING SYSTEMS

The basic concepts and definitions relating to the billing systems are discussed. The database management system Oracle is also considered. Structure and functions of billing systems, i.e. the pre-processing data subsystem, the subsystem of operational management of the billing, the subsystem for notifying the customer, are studied. Groups of standards and important qualities of billing systems are also considered.

Systems, which calculate the cost of communication services for each client and store information about all the tariffs and other value characteristics, which are used by telecommunication operators for billing customers and settlements with other service providers, are called billing systems (BS); the cycle of what they do is called billing. Any BS is created on the basis of a certain database management system (DBMS). Most BS in the world were created on the basis of DBMS Oracle. Among other products, it is possible to allocate Sybase and Informix as designed for large volumes of information. Examples of billing systems are BIS Flagship, the CBOSS Arbor, Bill-2000-prepaid.

There are a few names of the billing system: ASR — automated system for calculations; IBS – information billing system.

One of the important qualities of BS is its flexibility, i.e. the ability to adapt to changing circumstances. The modular design of the system provides for the subsystem of preliminary processing of the data, the operational control subsystem and subsystem of alerts.

The system openness means the openness of the source code of a software product, which allows the operator not to depend on the developer in the future and to maintain and upgrade the system.

Scalability on load. With the growth of the subscriber base and additional services it would not be necessary to change or modify the software part of BS. Increase of the capacity of BS should be achieved through the modernization of the hardware of the system. What is important to consider when designing scalable systems? It is necessary to use a DBMS designed for large data volumes. DBMS needs to be compatible with different computer platforms to support multi-processor mode.

Reliability is one of the main requirements of any system. The reliability of the BS is determined by the reliability of the DBMS and technologies used in the development of the system. The reliability of the supplier (vendor) application software is not least. It is important The time that supplier runs in the market is of great importance. The percentage of the presence of developed systems on the telecommunications market is indirect indicator.

Multi-language means possibility to set different languages for reporting.

Multicurrency support means ability to work with any currency.

Delayed billing is billing, in which payments are made after successful calls.

Hot billing means that changes in the account balance take place in the process of conversation, and information about the balance on Your account can be obtained immediately after the call.

Optimization of billing means improvement of BS by its operator.

Large BS is system, used by big operators.

Posting of billing means fixation for the results of the calculation of billing; after the calculations are done the results are available to users (sent to print).

Scheme of the billing organization means that information about the calls and their duration is recorded by the switch and after pre-processing is passed to accounting system. Accounting system identifies the call and performs the necessary calculations, thereby forming the subscriber account. Standards, tariffs, information about services, data about customers, their contracts with subscribers and third-party providers of services, as well as the cost of transmitting information through various channels are kept in the system memory.

In addition, any BS should have a database that stores the history of payments; only these data allow to monitor the payment process and automate the so-called activation/deactivation of subscribers.

Functionality of BS can be divided into three classes:

- designed for transnational Telecom operators;
- registered on a national scale;

- systems of the middle class for regional networks.

BS belonging to the first class, should provide interoperability at the international level, in different time zones, i.e. they must be of multi-currency and multilingual.

Registered systems of national significance are produced for definite operator. The operator may need a new BS that is compatible with the existing design system. Of course, the cost of such isolated systems is much higher than of the systems, belonging to the first class.

On the regional level it is possible to do the standard BS. However, such systems must possess the qualities listed above: flexibility, scalability, reliability.

Any BS is created and configured on the business process of Telecom operator, has its own set of functions corresponding to the technological cycle of service, and can interact with specific network equipment, that supplies it with information about calls and connections. But there is a standard set of functions supported by almost all BS. It includes:

- the operations performed by pre-processing and analysis of initial information (for example, a function for receiving of data about the connections and services, i.e. requests to a switch),
- operations for management of network equipment, i.e. functions for activating/deactivating (lock/unlock) of subscribers, and commands of changes in the terms of subscription of subscribers sent directly to the switchboard,
- the main functions of DBMS applications, including billing records of switch on calls and services, creating and editing database tables of the accounting system, billing and printing of the bills, the credit control of accounts, preparation of reports and archiving.

The pre-processing subsystem of the data. This application analyzes the original information of connection, determines the class of service and the traffic parameters (direction of the call, the source areas of billing, roaming conditions). This subsystem includes the decoder for original information about connections.

The subsystem of operational management for the billing. This subsystem provides the ability (automatically or through the operator of billing system) to modify the terms of subscription for subscribers at the switch, i.e. to block the communication of the individual subscriber or to remove this blocking, to activate or cancel the service.

Subsystem of alerts of customers by voice or electronic communications. This subsystem takes from database tables information to send notifications and announcements.

Division of system into functional subsystems (that is mentioned above) is not "strict" for all of the BS. This is just an example of the "classic" ASR.

There are three main groups of international standards. In 1998 the American National Standards Institute (ANSI) approved standard ANSI 124. In 1998 it published the first North American standard for billing, named CIBER, which is currently supported by the firm CIBERNET and its Committee CAC-IS. This Committee unites developers of billing systems and Telecom operators.

The main scope of CIBER is cellular network of standard AMPS. European (by origin) standard TAR appeared in 1992. It is supported by the TADIG working group. Most of the operators in Europe use TAP2, although there is a third version of TAP. Since 1995 modification TAP2 that is known as specification TD.27, or NAGTAP2, began to be used in the United States.