TELECOM BILLING
About the Tutorial

Telecom Billing is a process of collecting usage, aggregating it, applying required charges, and finally generating invoices for the customers. Telecom Billing process also includes receiving and recording payments from the customers.

This tutorial gives you a complete understanding on Telecom Billing.

Audience

This tutorial has been designed for Telecom Billing Professionals. It will help them understand end-to-end billing process along with all the associated concepts.

Prerequisites

Before proceeding with this tutorial, we assume that you have a basic understanding of GSM, GPRS services like voice, SMS and data.

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23. TELECOM BILLING – SYSTEM INTERFACES

CRM/OMOF System

Provisioning System

Network Inventory System (NIS)

Network Switches

Mediation System

Data Ware House (DWH) System

Enterprise Resource Planning (ERP)

Payment Gateway
Sending voice, data, picture, fax, etc., from one point to another using electronic media is termed as telecommunication and in short ‘telecom.’ Examples include Phone, Radio, Television, and Internet. The medium of transmission includes Wire (Copper), Fiber Optics, Ether (wireless), Radio Towers, Microwave, Satellite, etc.

Now, let us list down a few international telecom operators, who are providing satisfactory telecom services to their customers:

- Verizon
- Vodafone
- Airtel
- TATA
- Etisalat
- Qtel

Let us also list down a few basic telecom services being provided by various well known telecom operators:

- Voice Call
- Fax Service
- SMS & MMS
- Internet Connection
- Data Download and Upload
- Video Conferencing
- IP based services, i.e., voice over IP or VPN

Telecom operators are charging their customers in various ways, but there are two mainly used parameters to charge a customer:

- **Rental Charges:** These are the charges taken from the customers on monthly basis against the service provided. For example, your telephone monthly charges would be $5.00 regardless you use it or not.

- **Usage Charges:** These are the charges taken from the customers based on the service utilization. For example, you would be charged for all the calls you made or data downloaded using your phone.

Apart from monthly rental and usage charges, operators may charge you for service initiation, installation, service suspension or termination as well.
Telecom Billing is a process of collecting usage, aggregating it, applying required usage and rental charges, and finally generating invoices for the customers. Telecom Billing process also includes receiving and recording payments from the customers.

Billing Systems

There could be very complex charging scenarios, which would be difficult to handle manually. There are state-of-the-art Billing Systems available in the software market that can handle billing tasks very efficiently and provide lots of flexibilities to service providers to offer their services with different price structures.

Billing systems are often viewed as accounts receivable, as the billing system assists in the collection (receipt) of money from customers. Billing systems are also part of accounts payable (for inter-carrier settlements), as customers often use services from other companies such as wireless roaming, long distance, and call completion through other networks.

Billing systems are high end, reliable, and expensive softwares, which provide various functionalities. Here is a list of most important features but not limited to the following:

- **Rating & billing:** It involves rating the products or services usage and producing monthly bills.

- **Payment processing:** It involves posting of the customer’s payments into his/her account.

- **Credit control and collections:** It involves chasing the outstanding payments and taking appropriate actions to collect the payments.

- **Disputes and adjustments:** It involves recording customers’ disputes against their bills and creating adjustment to refund the disputed amount in order to settle the disputes.

- **Pre-pay and post-pay services:** It involves supporting both the pre-paid and the post-paid customer bases.

- **Multilingual & multiple currencies:** Multilingual and multiple currencies support is required if the business is spread across the globe and have multinational customers or else if the government regulations demand for it.

- **Inter-carrier settlements:** It involve sharing of revenue between carriers that provide services to each other’s customers.

- **Products & services:** This involves providing flexible way to maintain various products and services and sell them individually or in packages.
• **Discount applications:** This involves defining various discount schemes in order to reduce customer churn and attract and increase customer base.

**Billing Types**

When you drill down billing subject, it becomes more complicated. I would try to cover most of the concepts later in this tutorial, but first, let us have a broad view of the widely used billing types:

• **Pre-pay Billing:** A billing mechanism where customer pays in advance and after that starts using a service. Usually, prepaid customers do not receive any invoice and they are charged in real time by the highly available billing systems called ‘IN’ (Intelligent Network).

• **Post-pay Billing:** This is the conventional billing, which is coming for many years. Here, customers buy products and services and use them throughout the month, and by end of the month, invoices are generated by the service provider and sent those invoices to the customers to make their due payment.

• **Interconnect Billing:** The network operator is usually financially responsible for services provided to its customers by other networks regardless of whether or not the customer pays for the service. Interconnect billing is related to inter-carrier or sometime called **partner settlements**.

• **Roaming Charges:** When a customer goes from one network operator's coverage area to another operator's coverage area, the first operator would pay marginal charges to the second operator to provide services to their customers. Such type of charges are settled through roaming billing. This settlement is done as per TAP3 protocol, which we will discuss in the upcoming chapters.

• **Convergent Billing:** Convergent billing is the integration of all service charges onto a single customer invoice. Convergent billing means creating a unified view of the customer and all services (Mobile, Fixed, IP, etc.,) provided to that customer.

**Billing System Vendors**

Billing Systems are the backbone of any telecom operator. If operators do not have a strong billing system, then it would not be possible for them to offer their products and services with attractive promotions and deals and ultimately they cannot stand in today's competitive and dynamic market.

You can find thousands of vendors, who are selling their billing products with a claim of lot of features, but there are a few in the market which are really good and most commonly used. Some of the good billing systems are listed below:
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<td>Amdocs Ensemble</td>
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<tr>
<td>AMS Tapestry</td>
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The following diagram shows the typical architecture of a Billing System:

Here, we have two possibilities:

- CRM (Customer Relationship Management)/OMOF (Order Management and Order Fulfilment) system contacts with the billing system and billing system contacts with provisioning system to provision the services and network inventory system as well to assign phone numbers or IP addresses, etc.
Second possibility could be that the CRM/OMOF system itself contacts with provisioning system to provision the services and network inventory system as well to assign phone numbers or IP addresses, etc.

**Typical Billing Process**

Considering the above system architecture: After a call is made or you can say a usage is generated by the end customer, the mediation system gathers usage data from the network switch and builds a call-detail record (CDR). This CDR must contain ‘A’ party number and ‘B’ party number, the start and the end date & times.

The CDR is then stored until it can be rated. To rate the call, the CDR is examined to see if the call is, for example, an 800 number, a local call that is covered by a local-area calling plan, international call, or a toll call. Information such as the time of the call was placed and city code or country codes are used to calculate the rate for the call.

Once each call is rated, this information is stored until the invoice is run, usually once a month. When the invoice is run, other non-usage charges, such as discounts or monthly fees, can be applied to the bill or sometime called invoice.

There could be a rating time discount or billing time discount, different payments done by the customers, different adjustments given all these information contribute in the final invoice generation.

This information is then converted in a format, which can be printed in a readable form. Finally, the envelope is printed, stuffed with enclosures, and mailed to the end customer.

**Billing System Requirements**

A billing system should be composed of a series of independent applications that, when run together, are referred to as the billing system. A good billing system should provide the following major functionalities with a depth of flexibility:

- **Customer-interface Management:** The billing system must be able to handle customer-initiated contact, oversee outbound customer contact, and manage the contact life cycle.

- **Order Management:** It is a basic functionality, which should be available in a typical billing system. Billing system should be capable enough to capture product & service order and manage the order-entry life cycle, and oversee the order-completion life cycle.

- **Sales and Marketing:** A satisfactory billing system should answer customer’s query, handle commissions, provide sales support, track prospects, manage campaigns, analyze product performance, and acquire multiple dwelling units.
• **Rate Plans and Rating:** A billing systems must manage a variety of products and services, different rate plans associated with those products and services and should provide flexible ways to rate usage generated by those products and services.

• **Discounting:** A billing system should be capable of giving various types of discounts on different usages and rentals.

• **Invoicing:** It is important that the system performs billing inquiry, generates bills, processes deposits, performs account administration, maintains tax and fee information, and processes financial information.

• **Credit Control & Collection:** A billing system should control usage and revenue by assigning different credit classes to different customers. System should support payment collection and applying them on different invoices.

• **Multilingual Support:** Multilingual support involves providing invoices and customer care services in multiple languages.

• **Multiple Currencies:** Multiple currencies used in different countries can complicate the billing system as the billing and customer care system must be capable of recording and processing in units of multiple currencies.

• **Partner revenue management:** Partner revenue management are the sharing of revenue between carriers that provide services to each other’s customers.

• **Problem Handling:** A billing system should also be able to manage trouble ticket entry, coordinate trouble ticket closure, and track the resolution progress of a trouble ticket.

• **Performance Reporting:** A satisfactory system will provide performance reporting, ensure quality-of-service (QoS) reporting, create management reports, and generate regulatory reports.

• **Installation and Maintenance:** The system should also provide workforce scheduling and manage activities performed at the customer premises.

• **Auditing & Security:** A billing system should perform data audits and integrity checks. A secure system is always desirable for an operator.

Apart from the above functionalities, a good billing system should be:

• Accelerating time-to-market for new service launches.

• Enabling convergent view of customers and products.

• Supporting cost-efficient architectural scalability.
• Enabling partner relationship management and settlement.
• Reducing total cost of ownership.

What is Next?
Starting from the next chapter, we would try to cover complete process starting from defining products and services, associating plan and tariffs with those products, acquiring customers (selling products to the end customers), capturing usage generated by those customers, and finally, rating and billing that usage to send a final bill to those customers.
Let us suppose a telecom operator like Airtel wants to set up a billing system of its own. Then, Airtel would have to first define its products and services by its sales and marketing department before moving on to set up a billing system.

What is a Product?

A product is a logical or physical entity, which can be sold out to an end customer by the operators. This could be a mobile phone, internet connection, Voice call connection, VPN, Video on demand, Digital TV connection, etc.

A product can have its monthly rental, which we call periodic charges also. A product can be usage generating product or non-usage generating product. A usage generating product is sometime called event generating product and non-usage generating product is called non-event generating product.

For example, voice call connection, which comes along with a phone number, is a usage generating product because it generates usage whenever end customer uses this product to make a voice call. A simple phone set without a connection is a non-usage generating product and it could be given to a customer based on monthly rent only. So even if, a customer is not using it, he has to pay monthly rental.

What is a Service?

When we talk about them from marketing point of view, as such there is no difference between products and services because most of the times, both are used interchangeably by different billing and marketing experts.

Simply put, an operator uses its products to provide voice services to its customers. An international call can be called a service provided using a voice call connection. Another example could be 800 number call may or may not be available through a particular operator, call waiting, call forward could be said a service provided by a model of a phone set or by an operator.

This tutorial will use Product and Service terms interchangeably. Keeping it simple, products are the items that customers can either buy outright or lease. Products may be:

- Real objects (a mobile phone, for example).
- Services (a call waiting service on a telephone system, for example).
- More abstract concepts (a service level agreement, for example).
Product Families

Related products can be grouped together into a product family. Multiple levels of products are possible, so a product can be both a parent and a child at the same time.

In addition, each product family can have more than one parent product if required. Examples of product families are:

- Telephony services
- Cable TV
- Internet
- Leased Line

Group of Products (Packages)

Many a time, operators bundle more than one product into a single group and sell them as complete package. There are billing systems, which support bundling of various types of products together as a package. It can be offered at discounted price.

Packages allow a product to be offered to a customer at a reduced price if it is taken as part of a package. Each package can consist of any number of products and these products can be taken from more than one product family.

This package price plan for a product is usually different to its comparison (that is, non-package) price plan, as this is how the company offers a discount to the customer for buying the complete package. However, this is not mandatory, as a product can have one of its normal price plans assigned to it within a package.

Products Attributes

A product can have a number of attributes associated with them. Product attributes allow information about individual product instances to be held where the relevant information differs between types of product. For example, a pay TV product may have an attribute recording its set-top box number.

Further, a mobile phone product may need attributes to record the International Mobile Subscriber Identity (IMSI) and Mobile Station International ISDN Number (MSISDN).

Product Event Types

A product can have a number of event types associated with it. These event types govern the events that can be generated by the product.

For example, a mobile phone product could have event types such as voice calls and messaging services. There could be many more event types associated with a single phone device and operator can charge end customer for each of the event generated by the customer.
Billing System Perspective

Once your marketing department finalized all the products, services, packages, and associated prices, they are configured in the billing system.

Different billing systems provide different levels of flexibilities of defining products and their hierarchies in terms of parent, child, and grandchild products.

Some systems are flexible enough to support packages and bundles and a few provide limited functionalities related to packages and discounted prices.

Some systems keep product catalogues separately from the price catalogues to provide better modular approach and some billing systems combine products descriptions, their features, and associated prices altogether.

Once all the products, services, packages, and their events are configured in the billing system, next step is to define their rental and usage prices, which we will cover in next chapter.

What is Next?

If you understood what is a product or service and package, then you can proceed to the next chapter to understand how their prices are defined by the marketing department available with any operator.
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