

Ericsson convergent charging and billing

Ericsson's convergent charging and billing solution supports prepaid as well as postpaid payment options for all user services.

✦ ROBERT TÖRNKVIST
✦ RALPH SCHUBERT

The growing range of multimedia services represents an opportunity to tap into new revenue streams. In order to realize them, however, operators need a single, convergent charging and billing solution — one that supports both prepaid and postpaid payment options for all user services. The solution must integrate the management of subscribers, orders, and products and be able to rate and manage balances in real time. It must also allow operators to adjust their prices, offer promotions and discounts, create bundles with new products, and enhance their service offerings.

Combining two leaders in real-time charging and billing

Ericsson's acquisition of LHS further strengthened its market position in revenue management and put the company in a unique position to offer convergent charging and billing solutions that enable operators to handle all users and services in the same way independent of payment options or access (for instance, prepaid or postpaid, fixed, mobile, broadband, or TV). Today, more than 810 million subscribers are charged and billed via solutions from Ericsson and LHS.

Ericsson's real-time charging solutions are the most widely deployed in telecom networks worldwide — catering to more than 700 million subscribers at over 155 operators. LHS is a leading provider of customer care and billing with 132 installations serving more than 110 million subscribers.

Past experience shaping the future

In the past, the corporate segment shaped billing systems to correspond to the need for advanced rating and multiple unique agreements. Today, the evolution of billing systems is increasingly driven by new multimedia services for consumers, of whom 71 percent globally are prepaid subscribers. Consumers demand spending control and personalization, and operators want to provide the full range of services to all subscribers independent of their payment option.

To create an attractive multimedia services offering, operators must be quick to market and have simple price plans and understandable bills. Real-time capability is the key to meeting

- ✦ consumers' needs to control spending; and
- ✦ operators' needs to manage credit risks and share revenues with multiple partners, including advertisers.

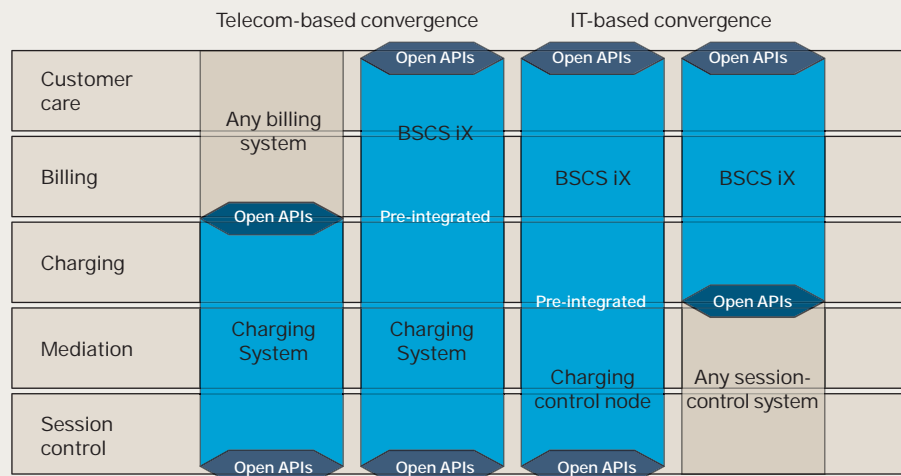
Transformation is not just about hardware and software; it is also about business processes. One cannot have silo offerings for fixed, mobile, internet, and TV. Instead, operators need to look at their processes and bring together the marketing departments for the different propositions in order to maximize the benefit of an access-converged offering.

Current convergent charging and billing solutions

Today's convergent charging and billing solutions are based on two approaches: the IT-based and the telecom-based. Each is a viable option with its own set of advantages and challenges. Ericsson provides complete solutions for both approaches and one set of enablers that fits every operator regardless of its starting point (Figure 1).

The solutions give operators a single

FIGURE 1 The five functional layers required to realize a convergent charging and billing solution, and overview of Ericsson's implementation alternatives available today.



place for defining and maintaining a complete product portfolio, including in-house services, partner services, and advertising-sponsored services. Operators can easily configure pricing and product offers, which reduces lead times and dependencies on external suppliers. The result is improved marketing flexibility, lower operating and management costs, and secure revenue streams.

Five functional layers

A convergent charging and billing solution consists of five functional layers based on common technology:

- ❖ The customer care layer provides a 360-degree view of all subscribers and services, including self-care.
- ❖ The billing layer provides a single bill and statement for all communication services — fixed, mobile, broadband, and TV — to increase convenience for subscribers.
- ❖ The charging layer provides real-time rating, bonuses, and promotions as well as notifications to subscribers in real time. This stimulates usage and increases customer intimacy and loyalty.
- ❖ The mediation layer reduces revenue leakage by providing online bidirectional transport of charging information between network and service elements for real-time charging.
- ❖ The session control layer enforces credit and spending control by providing network and service elements that can notify users and stop services when real-time charging indicates that credit has been depleted.

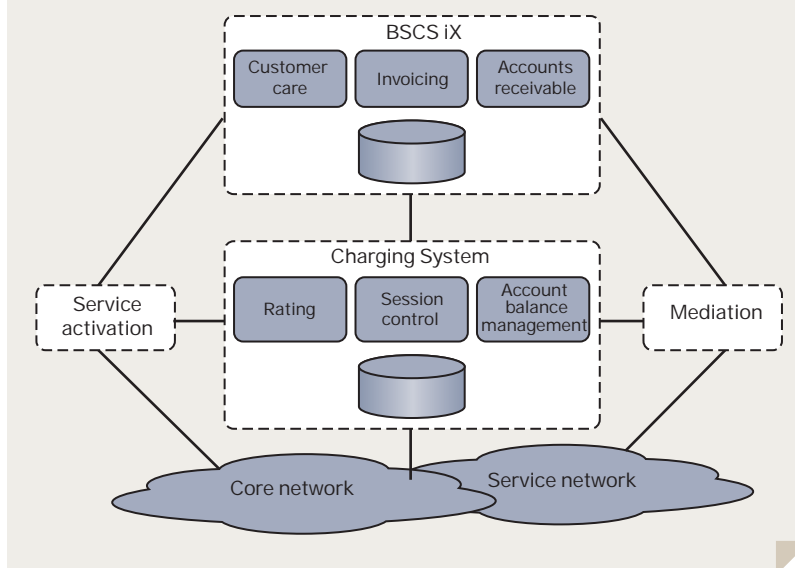
Each layer requires unique convergent capabilities and should work interdependently. In addition, the convergent charging and billing solution must have

- ❖ the ability to configure new price plans, services, and products quickly;
- ❖ highly configurable business rules to ensure that requirements are met with minimum need for customization; and
- ❖ high availability and scalability, preverified and lab tested (this is not something an operator can afford to integrate in the field).

Convergence based on Charging System and BSCS

The convergent charging and billing solution, which is based on BSCS and Charging System, provides a pre-

FIGURE 2 Solution architecture for a convergent charging and billing solution based on BSCS and Charging System.



integrated end-to-end solution that gives operators quick time to market and low implementation risk.

The solution integrates the five functional layers described above using proven products. The main building blocks are BSCS iX and Charging System. This approach makes it possible to separate customer care and billing from charging, mediation, and session control, providing good scalability and performance of the complete solution while incorporating the unique characteristics of the different layers (Figure 2).

BSCS is used to implement the customer care and billing layers. BSCS functionality includes product and customer definition, order management, order fulfillment, billing, and debt management. It also integrates with the general ledger for legal accounting. BSCS is thus the interface for customer care and any financial follow-up.

Charging System is used to implement the charging, mediation, and session control layers. The system activates services in the network and the real-time account. One of its main functions is real-time rating and management of account balances. Charging System must thus supervise sessions. It also handles real-time user communication.

Ericsson's solution provides a single

place for product and customer definition, irrespective of payment method.

Operator scenarios

Ericsson's convergent charging and billing solution can be used for all products, customer administration and rating, and charging, regardless of payment method. The following cases give a better understanding of how it works.

Use case: Product and offer development

Product and offer development starts with the product management and marketing departments, which outline the sellable product offerings. They decide on pricing-relevant information such as time of day, peak/off-peak, time interval, origins, and destinations, and outline a price plan for every offering. Each price plan corresponds to a service package and can be complemented with additional offerings such as promotion packages.

Product definitions are configured in the billing and charging layers. The charging layer "owns" all usage-related configuration and charges; the billing layer "owns" all other charges.

Operators use a graphical user interface (GUI) to configure usage tariffs, and they may use built-in tools to test the tariffs before they put them into live operation.

The ability to define all products ❖❖

❖ in a uniform manner, independent of payment method, adds flexibility and freedom to the process when the payment method is just one aspect of many. This reduces time to market and cost when operators launch new products.

Use case: Order fulfillment

A subscriber calls customer service or accesses the self-care portal to order a new product or to modify an existing one.

When configuring service for a given product, operators determine qualifications and reservations of available resources in network inventories, workforce management systems, stocks, and so forth — for example, they reserve the MSISDN in the number database and verify that the entered SIM card number exists in the SIM card inventory.

When the order has been configured, the customer care layer sends an activation order to the network entities. The order fulfillment function makes sure that all components are activated in the correct sequence and, if errors occur, drives rollback to ensure that the status in the network is not affected by the problem.

The customer care layer keeps information about the legal customer; that is, the person or registered company that holds the contract. The charging layer holds the database with the real-time account balance.

This separation of critical real-time and non-real-time information guarantees high availability and performance in the real-time-critical parts of the system. At the same time it gives customer care a comprehensive view of customers, facilitating good service and up-sell opportunities.

Use case: Rating and billing

The session control layer supervises ongoing sessions (for instance, voice call and data connection) and events (such as SMS, MMS, and content) in real time and stops services when the charging layer indicates that credit has been depleted. The charging layer continuously rates and reserves funds on the real-time account balance. If the account balance reaches a low level, the charging layer issues a low-balance warning to the subscriber.

The charging layer forwards all rat-

ed events to the billing layer for inclusion in the subscriber's invoice or usage statement.

Recurring charges, such as monthly subscription fees, are applied in the billing layer as part of the bill run. The charging layer rewards and notifies subscribers in real time when they qualify for a bonus or discount.

Real-time notifications of charges and rewards increase customer control over spending, increase customer satisfaction, and stimulate usage. The availability of usage statements for all subscribers increases spending control and gives operators a printed marketing channel.

Secure choice for all operators

Ericsson's roadmap for evolving convergent charging and billing is defined by the prime objective of securing and being able to offer all operators a secure path into convergence, while also retaining their prepaid and postpaid offerings.

Ericsson has ongoing R&D alignment projects in place that aim to further streamline the components within the convergent charging and billing solution. This will further increase the capabilities of the solution and reduce an operator's total cost of ownership.

In summary, convergent prepaid and postpaid charging and billing is far from mission impossible. By taking initial steps today with a partner that can provide a complete convergence solution and evolution path, even incumbent operators can begin to secure a competitive position for the future. ❖

Robert Törnkvist,



❖ who joined Ericsson in 1990, is an expert in charging. During his 18 years with Ericsson, he has worked with various mobile network development projects. Apart from a two-year break to work with positioning, he has worked with prepaid and charging since 1996. Robert currently serves as system manager within Revenue Management.

Ralph Schubert



❖ is the head of solution architecture at LHS. He has more than a decade's worth of experience working with major network operators worldwide in the telecommunications and media industries. He has also worked as an IT consultant for German Television. Ralph holds a Ph.D. in physics, and has even worked in scientific research at an international research laboratory.