Billing Systems

From Service to Bill
Billing Systems

- Billing system basics
- Billing systems structure
- Real-time billing needs
- Need for flexibility
- Conclusions
Billing System Goals

“Telephone billing systems are the largest commercial transaction processing systems running currently on earth?”

Kari Pasonen,
VP at Comptel

Tens of millions events processed daily!
Basic functionality

Bill delivery

Usage Data Rating

Usage Data Collection
Service Usage Data

- Previously CDR – Call Data Records
  - One Record Per Call
  - Vendor-specific format
  - Typical CDR data:
    - Calling Party; Called Party; Call Start; Call Duration; Service Type; ...

- Currently Usage Data Records (not only calls, but all other services)
  - One record per service provided
  - Similar format for interoperability
Service Usage Data Sources - examples

- **Landline telephony**
  - Local switches

- **GSM telephony**
  - Voice calls – MSC
  - SMS traffic – SMSC
  - Data traffic – GGSN
  - MMS traffic – MMSC
  - Roaming CDRs from business partners
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Billing Mediation

- Rating Engine
  - Unified communication protocol
  - Output Formatting
    - CDR Correlation
    - CDR Validation
    - CDR Translation
  - Unified UDR format
- Device-specific communication protocol
  - Device-specific UDR format
Rating Engine

- Invoicing Engine
  - UDR data with value information

- Tariff Definition Database

- Customer Database

- Compute value for every Usage Data Record
  - UDR data in unified format

- Billing Mediation
Invoicing Engine

- Tariff Definition Database
- Customer Database

Payment Management

- Per-subscriber Invoice Data
  - Generate Invoice
  - Calculate taxes
  - Apply constant payments and discounts
  - Summarize customers’ usage value

UDR data with value information

Rating Engine
Business Support Systems

- Billing system is just a part of BSS
  - Payment Management
  - CRM
  - Fraud detection
  - Usage data analysis
  - Order management
  - Inter-partner revenue management
  - Many other applications…
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Pre-paid service scenario
Pre-paid billing needs

- Real-time balance check and reservation
- Real-time billing (just after the service was provided)
- Online charging during the service usage (how long can client use the service)
  - Optional element, not always implemented
Pre-paid billing specific issues

- Traditional billing systems usually operated in batch mode.
- Pre-paid billing is usually a part of a pre-paid service platform (separate from post-paid billing system).
- New generation convergent billing systems offered (unified pre- and post-paid).
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Need For Flexibility

- "Changing billing system is like replacing wings on Jumbo-Jet in mid-Atlantic"
  - LightReading, industry portal

- New services constantly added - have to be integrated with existing billing system
  - Billing Mediation expansion
  - New tariff definition

- Customers specific functionality
Billing Mediation Expansion

- Development of adapters for new network elements
  - New services provided (content-based, advanced services)
  - Equipment from another vendor (UDR formats not compatible)
  - Each service platform has to provide UDRs (one record per service offered)
New Tariff Definition

- Capability to rate UDRs for all types of services
- Tariff Definition flexibility:
  - Charging for new services
  - Advanced charging scenarios (Cross-product discounts, bulk discounts, occasional discounts)
- Rule-based rating (currently state-of-the-art)
Customer specific functionality

- Each implementation is a big deal for the Billing System vendor.
- Each customer has a set of specific requirements.
- It is not uncommon for the vendor to implement customer-specific functionality extension (especially for big customers).
- Smaller vendors are more willing to expand system functionality.
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Conclusions

- High data throughput
  - Tens of millions events rated daily

- High operational flexibility
  - Postpaid and prepaid customers
  - New services offered every month
  - Lack of billing system flexibility can severely impact operator’s business

- Crucial for operators’ business
  - Extreme stability is a must
  - Very hard to replace
Main Software Vendors

- Amdocs
- Convergys
- CSG Systems
- Intec
- LHS
- Portal Software

Source: Yankee Group
Most Software Vendors (Oct 2004)

- Amdocs Ltd.
- American Management Systems Inc.
- Anite Calculus
- AsialInfo Holdings Inc.
- Billing Concepts Inc.
- Boston Communications Group Inc.
- Cerillion Technologies Ltd.
- ComArch SA
- Convergys Corp.
- CPqD Telecom & IT Solutions
- CSG Systems International Inc.
- Daleen Technologies Inc. (now Viziqor Solutions)
- DST Innovis Inc.
- Formula Telecom Solutions Ltd.
- Highdeal
- Intasys Billing Technologies
- Intec Telecom Systems Inc.
- IntraISP
- LHS Telekom GmbH
- Liberate Technologies
- MaxBill Ltd.
- MetraTech Corp.
- Mind CTI Ltd.
- Nexus Telecom AG
- Orga Systems GmbH
- Portal Software Inc.
- Protek (now Viziqor Solutions)
- Rodopi Billing Software
- Sentori Inc.
- Teleknowledge Group Ltd.
- TeleSphere
- Telution Inc.
- UshaComm Communications Technology Inc.
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Source: LightReading
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