



Paladin Systems Inc.

Paladin Product Overview



*a modular, end-to-end billing system that
enables telecom to easily integrate all
their service offerings into one system*





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Paladin Product Overview

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Executive Summary

As the telecom industry expands to include emerging technologies with multiple service offerings that go far and above the traditional fixed line service, convergent billing enables the telecom provider to reflect all service offerings, advertise new services, and provide a central location for all charges.

Traditional billing systems no longer provide the flexibility telecom needs to stay on top of new trends and billing needs. New services need more usage information for customer support and the increasing volume of call records compounds system problems. This increased complexity in telecom services will require new record types, larger record layouts, and more involved analysis of the record information. Modifications must be made to the traditional billing systems in order for billing to be effective in today's market.

Convergent billing creates a unique opportunity for sales and communication with the customer. No longer should the telecom bill be thought of as a revenue collection vehicle, but as an interface to provide information about new services, usage information, promotional discounts, and more. Imagine being able to do that in one place, on a monthly basis – and with a low overhead cost!

Paladin Systems Inc.'s solution is Paladin, an easy to use modular product that quickly interfaces with current and emerging billing, and customer care systems.

Company Information

Paladin Systems Inc. has over ten years experience providing telecommunications solutions, focused on delivering integrated, modular, plug-and-play applications for telecommunication companies that are moving into new service areas or companies new to the telecom field.

By offering complete, convergent solutions that start at the switch and run through customer care and marketing, Paladin Systems Inc. enables customers to proactively react to changing market conditions and to stay on top with a competitive edge that is so important in today's rapid growth environment.



Paladin Systems Inc. is based out of both the United States and Europe, with consultants specializing in software development, customer care, product and marketing development, mediation, rating, billing development and management, and general project management.

Paladin: Overview

Paladin Systems Inc.'s flagship product, Paladin, is a modular, end-to-end billing system that enables the customer to easily integrate all their service offerings into one system.

Paladin supports a large variety of telecom service offerings, including local and regional phone service, long distance, IP (VOIP, FOIP, ISP), mobile, InterConnect, calling card, callback, carrier services, VPN, Co-location and switch partitioning. Add on services such as operator service, caller-ID, call waiting, etc. are also supported.

The Paladin system offers billing, customer care, rating, LCR, market analysis, market browser, reporting, predictive analysis, predictive campaigns, and more. Because Paladin has an object-oriented, open application design, rapid integration and enhancements are easy. Custom API's can be developed to customize Paladin for each customer's unique needs, such as credit checking, payment processing, taxation interfaces, and more.

Paladin is scaleable, with multi-server growth potential that lets the customer start small and upgrade as they grow. It supports multiple server platforms (NT, UNIX, and Windows 9x/XP) and utilizes industry standard network servers. The Paladin system is compatible with any switch that provides CDR (Call Detail Record).

Paladin uses Thin Client architecture, with most of the processing done on the servers instead of on the user's local PC. Large-scale installation on user computers is unnecessary, allowing for a fast implementation schedule.

Key Benefits

- Fully convergent billing for telecom's current and emerging services.
- Integrated mediation and service provisioning.
- Incorporates both wholesale and retail services into one system.
- Compatible with all switches that provide CDRs.
- Rapid deployment/migration.
- High performance 1,700,000 switch records mediated and rated in less than 1 hour (running on Pentium 2.00Ghz, Windows XP, 100 GB server on proprietary Paladin database).
- Entry-level system can grow as customer needs expand.
- Easy customization via API.
- Can handle many multiple transactions at once and doesn't limit the number of connections.
- Response time is less than one second.
- Maintained archives (on-line history is only limited by available disk space) for Call Center use.
- Modular design allows role-based access to the system.

Paladin Components

Mediation Manager

The Mediation Manager interfaces between the network elements that provide billing data, such as the switches, log files, access systems, etc. and the Rating Manager, which rates the collected call data. The Mediation Manager can be set to automatically poll the data in intervals determined by the user (continuously, on-demand, nightly).

Rating Manager

The Rating Manager rates the collected CDRs and looks for duplicates or errors in the CDRs. If any are found, they are placed in an error queue. Re-rating or exclusions can be set at any time for any records, according to user specifications. CDRs can be exported from the Rating Manager to available tools (Microsoft Excel, Crystal Reports, etc.) for in-depth analysis.

Billing Manager

The Billing Manager processes the rated CDRs from the Rating Manager. Users can specify when the billing will occur, to facilitate billing cycles. The final billing can take the form of a printed bill, a file output, or an e-bill.

Provisioning Manager

The Provisioning Manager is a simple, standard interface for the Customer Service Representatives (CSR) to use for billing data acquisition and service provisioning. The Provisioning Manager lets a CSR operate independently from the switch-specific communication protocols and data formats, making it easier for them to accomplish their tasks in faster time.

Paladin: Features & Functionality

Paladin is a modular, end-to-end billing system that enables telecom to easily integrate all their service offerings into one system. Paladin has many features that enable a customer to quickly and easily manage all their billing needs, such as customer management, mediation, rating, billing, analysis, and service provisioning.

Customer Account Management

Managing and maintaining customer accounts is an important component to a billing system. Paladin provides an easy-to-use interface that lets the user enter, edit, and manage all customer information. Not only does it support basic information, such as account number, name, address, but it also lets the user specify service charges on any number or recurring, non-recurring, and special features charges by customer or account. Charges can be easily turned on and off with correct pro ration.

Each account can be set up in hierarchies, with multiple accounts under one customer, etc. This keeps customer accounts organized and easy to manage.

Customer information is stored in an integrated database that enables sharing across the system and lets the user analyze data and run “what-if” scenarios.



Mediation

Mediation interfaces between the network elements that provide billing data, such as the switches, log files, access systems, etc. and the Ratings Manager, which rates the collected call data. It can be split into three distinct sections: CDR Capture, CDR Pre-processing, and Forwarding.

CDR Capture

CDR Capture collects the data from the network element(s). It usually occurs via a direct communication link to the network element, such as a switch, using a protocol such as FTAM over an X.25 network, FTP, MTP, Bellcore XFER, and more. Data can also be captured from tape backups or other mass media, sometimes the only method of data retrieval on older systems. Paladin uses a generic utility that can read and write to many different formats.

CDR Capture is automated, with the speed and frequency limited only by the network element accessibility at any one time and the capacity of the communications link. Hot Call records are prioritized by the system, so important capture is done before routine captures. Failure of any capture can be sent to the user via an alarm message. All data is kept in audit logs and reconciled to make sure that data is consistent.

Data from the CDR Capture can be viewed, evaluated, and exported by the user in the Mediation Manager.

CDR Pre-processing

CDR Pre-processing lets the user specify the format of the captured data. Because CDRs received from most network elements comes in whatever form the manufacturer defined, pre-processing is an important step in the mediation process. CDR Pre-processing allows the same information to work with different systems. Pre-processing almost always involves changing the data format, but it also filters the data to remove any records that are not relevant for the Record Manager. Input files, blocks, or records that can't be read or fail validation are placed in error files, available for the user to process.

Records can be formatted according to any specification and format types are not limited.

Main features of CDR Pre-processing:

- Format and content of data files is table driven, which allows for fast adaptation to any new network elements that may be added.
- BCD, binary, ASCII, EBCDIC, and csv formats are supported by Paladin. Other formats can be easily incorporated.
- Output file size is configurable; meaning that a single input file could generate one output file or multiple output files and a multiple input file could generate one output file.
- Maintenance and development of data transformations is simplified by using only one source file for each site.
- Processor load is reduced by using a single process to deal with many different types of network elements.
- Improved throughput for hot and cold ratings is achieved by configuring multiple processes to deal with different network elements.
- Output can be file-based or IPC-based.

Forwarding

The pre-processed data can be forwarded to the rating engine in one of two possible ways. The Mediation Manager can forward the data to the post-processing system using standard file transfer protocols, such as FTP or FTAM. Audit logs are kept for all transfers of data. Or the data can be collected by the post-processing system directly.

Rating

A high-speed rating engine makes rating and re-rating easy and fast. Paladin offers unlimited rating capacity and ratings can be done in near real time.

The Rating Manager rates the collected CDRs and looks for duplicates or errors in the CDRs. If errors or duplicates are found, they are placed in an error queue. Re-rating or exclusions can be set at any time for any records, according to user specifications. CDRs can be exported from the Rating Manager to available tools (Microsoft Excel, Crystal Reports, etc.) for in-depth analysis.

The Rating Manager lets the user customize rates, with options ranging from mass updates, individualized rate tables, import/export, and custom product plans for maximum flexibility.

In addition, rate changes can be evaluated before new products are offered, maximizing profit and customer satisfaction.

Multiple types of rate plans can be created and managed by the user, with typical plans being time of day, day of week, peak off-peak, destination, zones, multi-second or single second increments, trunk or switch dependent, and many more. All rates are date sensitive so future rate plans may be entered at any time.

CDRs may also be re-rated as a separate phase should price changes have to be back-dated.

Billing

The Billing Manager processes the rated CDRs from the Rating Manager. Users can specify when the billing will occur to facilitate billing cycles (monthly, weekly, daily, or user defined). Recurring charges, non-recurring (one-time) charges, and service charges are date sensitive and prorated as required. Equipment and installation charges can display trunk and CLLI specific information.

Invoice formats are defined by the user and can be exported to a wide variety of formats, including printed bills, e-mail bills sent to a customer's email account, or even CD-ROM. Customer management reports can also be included as part of the bill.

The invoice can show all services and discounts across all products, details can be added or suppressed easily, and messages can even be included, notifying customer of new products or services, etc. Even data from outside the Paladin system can be included on an invoice, offering a truly integrated billing system. A bill can now be a valuable communication and marketing device!

Analysis

Reporting is an integral part of the rating and billing features in Paladin. Reports give the user daily visibility into your profitable and non-profitable calling areas, allowing analysis of trends, promotions, and more. Custom reports can be acquired through Crystal Reports or any other ODBC-based reporting tool, so the user is not limited to the canned reports.



Paladin offers what-if ratings that let the user evaluate impacts on revenue before new pricing structures or new products are released. In addition, customer care reports are created so positive and negative trends in the customer database can be analyzed.

Service Provisioning

Paladin's Provisioning Manager separates interfaces from core transaction management, making it easier for a CSR to operate independently from the switch-specific communication protocols and data formats, making it easier for them to accomplish their tasks.

There are two parts to Paladin's service provisioning feature: the Transaction Handler and the Network Element Server.

The Transaction Handler analyzes the usage through the switches and supplies suggested service provisioning. The approved suggestions are sent to the Network Element Server. The Network Element Server is table-driven and its processes manage the communications links and dialogues with the network elements. It supports many different types of communication links over both LANs and WANs.

In Paladin, switches are provisioned easily, access numbers, calling cards, CLLI's, and more can be added quickly, credit limits can be set on specific numbers, and company specific criteria can be used for each customer.

In addition to this process, switches may also be provisioned directly through the account maintenance process when services are added or changed.

System Architecture

Paladin uses a Thin Client/Server configuration. This allows a strategic distribution of the application processing, with the user interface available on the user machine, core billing and rating taking place on the server, and the communication between all taking place over TCP/IP networks.

The server handles switch polling, mediation, rating, and billing. Multiple threads on the server enable quick response time to client requests.

The client side of Paladin is presented in a full-featured GUI environment, in easy to understand and use pages.

Technical benefits:

- Load distribution flexibility – processes can be run in parallel on multiple processors.
- IPC improves flow-through – inter-process communication is supported to speed up the processing of data. Expensive disk I/O is reduced and each record is processed by the next job step immediately.
- Various CDR formats are already implemented, tested, and supported in Paladin, from wireline to wireless switches, intelligent network systems, and various switch interrogation and service activation formats.
- Data volumes can be reduced for the post-processing system by dropping records from one or more data streams, if they are not required anymore.

- Simple interface to post-processing systems – Paladin easily produces alternative formats for the post-processing systems, removing a need to install parsers.

Conclusion

In today's fast changing telecom environment, with more and more services outside the traditional being offered rapidly, telecom companies have to utilize convergent billing in order to stay competitive. Paladin is the obvious choice, with its integrated mediation and service provisioning, offering one billing system for both wholesale and retail, and combining all telecom services into one customizable bill.

Paladin is fully customizable for each customer's specific needs and utilizes a system architecture that is fast and scaleable.

Paladin also comes with a wide variety of support options, with training offered for all aspects of the delivered system, in-depth user training for user specific areas, and developer training on the standards and processes used by Paladin (enabling in-house enhancements and upgrades). Paladin also comes with extensive system documentation, user documentation, and data model design and structure.