An Oracle White Paper

Revolutionizing the Business of Convergent Charging

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Executive Overview

Until now, service providers have been burdened with multiple software systems within their revenue management environment. It is not uncommon for a service provider to have a dozen or more separate systems supporting revenue management functions. A key reason for this is that no single platform could deliver a complete revenue management solution for all types of customers, services, and payment methods. For this reason, service providers have deployed different “stovepipe” systems to manage prepaid and postpaid services, as well as different systems to manage different services such as voice, data, content, media and messaging. Subsequently, this patchwork environment has served to escalate capital expenditure and driven operational costs higher, hampering the service provider’s ability to meet increasingly aggressive market requirements whilst maintaining a satisfactory margin contribution from each subscriber.

Today, service providers are evaluating alternatives to address this costly and inflexible situation. To reduce operational costs and improve responsiveness, they must do something quickly, because the environment for wireless services has never been more competitive. Increasingly, service providers are looking for a single platform suite that can support their entire service offering—understanding that removing the barriers imposed by multiple disparate systems is critical to delivering competitive flexibility and reducing lifetime costs.

Providing a Future-Proof Full Convergence Offering

Oracle provides a truly unified solution that allows the service provider to support any service to any user with any payment method by simultaneously supporting the strict latency and availability demands of the prepaid world and the need for rapid and flexible service delivery. A streamlined and consistent environment for rapid service delivery, pricing, business processes, subscriber interfaces, and views of customer and financial data are the foundation for complete business convergence. The Oracle Communications convergent charging solution, consisting of Network Charging and Control, and Billing and Revenue Management provides a comprehensive and configurable platform, which seamlessly integrates all online and offline, real-time and batch charging processes while maintaining a unified data model for all subscribers and services.

Revolutionizing the Business of Convergent Charging

This white paper focuses on a critically strategic element of many wireless service providers' revenue streams—online and offline converged charging. It describes the challenges, and success criteria, and the Oracle Communications convergent charging solution (Oracle Communications Network Charging and Control and Oracle Communications Billing and Revenue Management) for enabling both prepaid & postpaid payment for any wireless service. This solution provides for the complete spectrum of business capabilities from a purely prepaid opportunity with minimal or zero invoicing requirements right through to a fully fledged converged prepaid, postpaid offering, delivering full multi-play services and service bundles with all the necessary supporting consumer and partner financial accounting.

Convergent Wireless Success Criteria

Throughout the world, over the past decade, mobile prepaid services for voice, short message service (SMS) and data have grown dramatically. Prepaid is now the predominant global payment method for most mobile services and its growth is expected to continue exponentially. With the onset of new network technologies, and economic and competitive pressures, it is a critical time for operators and service providers to decide on their convergent strategy. For most of these providers, voice prepaid has become a valuable revenue stream with a great upside for growth as consumers look to extend their service use beyond traditional voice, SMS and simple data services.

Service providers developing convergent strategies are measuring their success according to several key business and technical criteria.

Business Criteria

Business & Competitive Agility

Pricing flexibility and rapid time to market are two critical factors in delivering business and competitive agility. Operators need the ability to offer differentiated services across multiple networks and applications with the options to deliver true multi-play customer focused bundles. It is also important that the offerings should be intuitively priced (such as value-based pricing), supported by innovative and flexible top-up methods, encouraging further service usage and simultaneously building customer loyalty. Further, news services and offers to the subscriber must be delivered when they are most likely to accept. If a consumer has just upgraded their handset to a smartphone then that is the time to offer a new media package; i.e., the instant the handset is operational. And where possible this should all be accomplished without the use of specialist technological and network knowledge, as indicated, with time-to-market measured in hours, days or weeks, and not the traditional months.

Financial Viability and Minimized risk

Today's separated and disconnect systems have created a financial nightmare for many operators. The silos of systems all have their own support and upgrade paths, with specialist teams and service contracts. In fact many systems simply have reached the end of their serviceable life in terms of capacity and/ or functional enhancements. Further, the ability for the systems to interwork in a cost effective and meaningful manner is becoming almost impossible. The spaghetti of interworking and interrelationships brings with it escalating service and maintenance cost with no end to the financial drain.

Any solution that supports the overall convergent strategy must provide the lowest possible total cost of ownership (TCO) accompanied by an accelerated return on investment (ROI). This of course means protecting existing investments where possible and making sure new investments will deliver on value.

In addition, the service provider should not be required to wait for a "big bang" approach, where the benefits of the solution cannot be leveraged until the final delivery. For example, a service provider might want to deliver prepaid promotional and targeted e-vouchers to encourage subscriber top-up to meet short term financial and competitive pressures. Incremental delivery of the wireless solutions, where each increment delivers tangible business benefits and its own ROI, is required.

Financial Integrity

The revenue assurance department faces the challenges of eliminating any chance of revenue leakage, fraud and bad debt. This becomes extremely important when launching multiple services to subscribers electing to use prepaid balances. Although most traditional prepaid systems today can support drain-free voice services, supporting value added services including mixes of data and content or media (often from third parties) introduces a complex challenge. Mobile service providers must be assured that the subscriber balances can simultaneously handle allocating resources between multiple services (voice, data and value added applications) and sharing balances between multiple parties without any risk of balance overruns and hence potentially bad debt or even fraud. Real-time online and offline charging can address this challenge head on.

Business Analytics and Knowing Your Customer

Providing the best possible customer satisfaction, growing customer loyalty and reducing churn associated with mobile services requires having a single view of the customer capturing such elements as their historic usage, propensity to 'try' new services and their likelihood to churn. In the past this has been difficult or impossible to do with critical customer information being "trapped" in multiple legacy systems. Service providers are now looking for a single view of their customers pulling all this data together into a common central point. Integrated business analytics will then be able to perform such tasks as subscriber segmentation, churn prediction and even provide analysis of how best to package and bundle relevant services together to maximize customer uptake.

Technical Criteria

High Service Availability

Having 99.999 percent service availability will continue to be a critical factor in the delivery of prepaid wireless services. The added complexity of delivering drain-free next-generation services, new business models, and innovative pricing schemes present a new set of challenges to maintain this level of availability. When the system experiences problems, it must recover resiliently, without loss of service revenue, and return to full capacity and redundancy rapidly. For example, during system maintenance or upgrade the subscriber and end user should be unaware of these factors taking place.

Open Architecture

The openness of a any convergent solution can be viewed from three perspectives: ease of integration, extensibility, and modularity. A truly open architecture addresses all three to the fullest:

- Ease of integration— It is often difficult for existing prepaid systems to integrate with other critical business systems in the operator eco-system. To succeed with prepaid services, providers must have complete access to all data and processes in terms of open application programming interfaces (APIs). Documented, time-tested APIs provide an open means for anyone to integrate a solution either directly to other systems or through an enterprise middleware product.
- Extensibility— Although true best-of-breed solutions can provide most functionality as part of the product, no solution provides 100 percent of what a service provider requires as part of an out-of-the-box product. Every service provider wants to differentiate itself from the competition. Therefore, at times, the service provider might require the solution to be easily extended beyond the core product's capability. Wherever possible this should be through configuration rather than specialist actual coding. The use of SOA and presence of Web 2.0 architectures supports this extensibility.
- Modularity— A solution must be able to be deployed fully or partially, depending on the immediate and future needs of the wireless service provider. Existing infrastructure should not need to be replaced simply for the sake of replacement.

Security

With the evolution of the wireless value chain, having security built from the ground up in the converged solution is critical to preventing system data and processes from being compromised. CSRs, resellers, mobile virtual network enablers & operators (MVNE/Os), third-party service and application providers, and even mobile subscribers will require access to various types of data with various access permissions.

Scalability

As service providers expand service offerings and consolidate disparate systems, scalability of the revenue management application is a key factor. The popularity of new value added mobile services is driving unprecedented subscriber uptake. This leads to the need for application and database scalability to handle evermore subscriber transactions with the service provider.

Convergent Solution Approaches

Service providers can investigate several directions for delivering convergent wireless services.

A potential system provider is a network equipment vendor that has traditionally provided prepaid solutions as a service control point (SCP) or a service node. These systems were built with the network in mind, especially prepaid voice, and they were designed to achieve the high availability and latency requirements of Tier 1 service providers. This design focus, together with relatively simple functional requirements for prepaid rating, however, has resulted in these systems being much more restrictive than postpaid billing systems.

Network equipment provider systems typically have difficulty supporting account hierarchies, innovative pricing, promotions, discounting, and bundling—all fundamental to postpaid accounts and convergence. Some systems even have difficulty supporting the pre-delivery charging of non-voice services. The development of more-complex pricing models can be further restricted by the need to preserve the optimizations made for high performance.

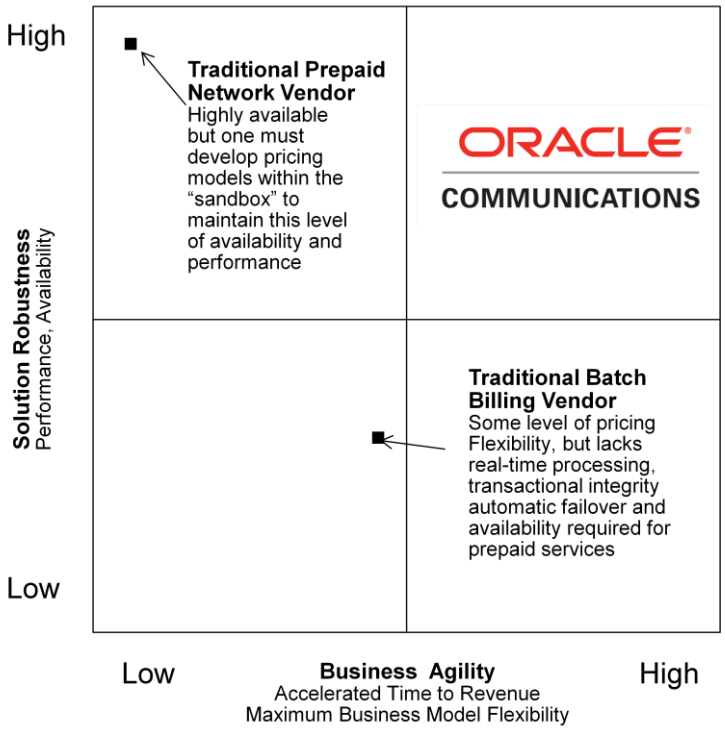

Figure 1: Batch-billing systems versus traditional prepaid systems

On the other hand are the traditional batch-billing systems for the postpaid market segment. These systems provide more capabilities in terms of pricing options and services supported versus the traditional prepaid systems—albeit often with custom coding, less-than-ideal time to market, and higher costs. More important, batch-billing systems were not developed with the stringent network requirements in mind, including the real-time transactional processing required to support true drain-free prepaid services, high availability, and resiliency.

In short, to meet the strict criteria for hybrid or converged services, service providers must look to solutions that can provide robustness and business agility without sacrificing one for the other. Oracle provides an unmatched approach in delivering prepaid and postpaid payment options for wireless services from a single product based, configurable platform suite to meet this need.

Oracle Revenue Management Solution

As with any true business solution, serious ramifications (lost opportunities & revenues, cost overruns) can occur if the architecture and technical decisions do not consider the business objectives early in the solution design process.

Oracle has demonstrated an absolute commitment to a single technical platform that is used today by more than 450 customers for a plethora of core and value-added services across the wireless, internet, cable, and wireline networks. Oracle recognizes that the business environment continues to change rapidly. Thus, it continues to innovate and evolve the technical platform to meet the continuing needs of the market. This is done not for the sake of science, but rather as a practical application of technology.

The Oracle Communications convergent charging solution is a cost-effective, product-based solution suite designed to meet the challenges facing service providers in delivering profitable convergent online & offline wireless services. Oracle's real-time, convergent platform allows service providers to fully support the customer revenue lifecycle, whatever their payment preferences—from deploying voice, data, content, and messaging services to signing up customers to account top-ups. Adherence to open standards and protocols to enable openness and integration with other critical elements and functionality within the telecommunications eco system is also key. One such standard that impacts charging is defined by the *3rd Generation Partnership Project* (3GPP). In particular there are two key products that work seamlessly together to deliver a convergent offering; Oracle Communications Network Charging and Control (OCNCC) and Oracle Communications Billing and Revenue Management (OCBRM). Figure 2 provides a high level view of how the critical functionality may be divided between these two products.

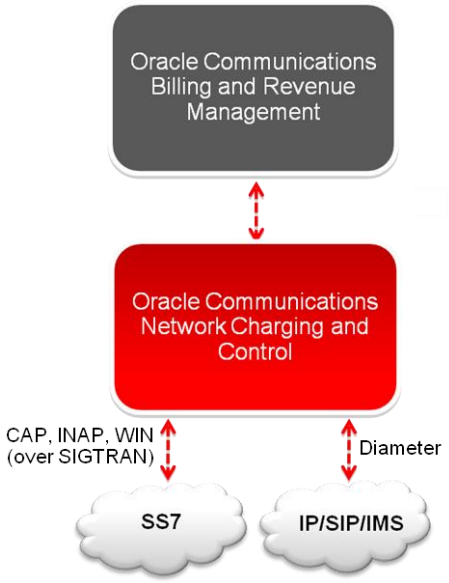

Figure 2: High level depiction of OCNCC and OCBRM functionality

With respect to the 3GPP context, Figure 3 below architecturally positions the main functional components of the Oracle Communications convergent charging solution.

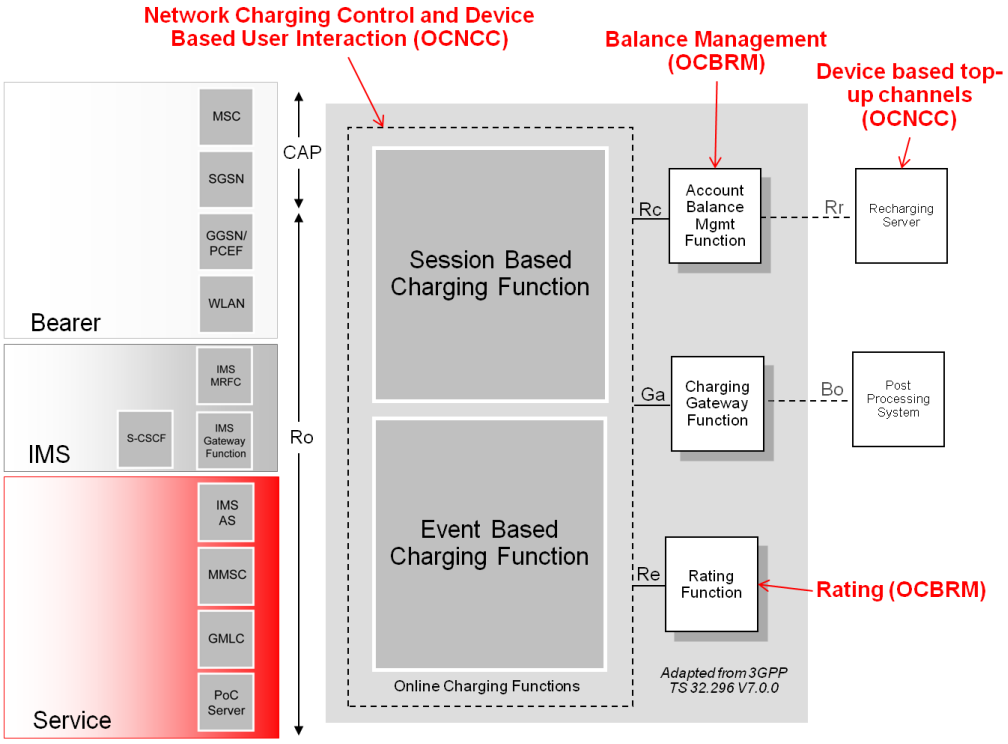

Figure 3: OCNCC and OCBRM functionality with respect to 3GPP context

Key Business Solution Design Principles

The following are the key business solution design principles for the Oracle Communication convergent charging solution:

- Eliminate stovepipe solutions and reduce financial risk
- Enable rapid delivery of new services and business models
- Enable personalized and smart service delivery

Eliminate Stovepipe Solutions & Reduce Financial Risk

- Unified technical solution—To deliver a truly unified technical solution, based on a single solution suite, which seamlessly integrates all real-time and batch processes, spanning the two worlds of prepaid and postpaid. Further the solution is engineered to deliver a tight alignment of critical business processes throughout the entire network to customer stack, providing a consistent environment for all service creation, delivery, business logic, configuration, and personalization.
- Managing growth and evolution—Transaction numbers and subscriber volumes are only set to grow; it is happening already. Any platform deployed today must manage growth and evolution in terms of capacity and scale whilst maintaining full carrier grade availability. The Oracle high quality, product-based solution approach delivers horizontal scalability with low risk access to both capacity and solution upgrades.
- Revenue Integrity—Fraud, bad debt, and revenue leakage are risks that absolutely have to be removed. The use of real-time transactional processing for all services guarantees the elimination of the revenue drain typically found in more traditional prepaid architectures. The objective is to provide full revenue assurance through an open audit trail with fraud detection and prevention capabilities, thus maximizing the profitability of all service offerings and minimizing the revenue risk.

Enable Rapid Delivery of New Services & Business Models

- Multi - services and bundling—The solution must provide the ability to innovatively bundle multi-play services together across all network elements from fixed & mobile through GSM and CDMA to the latest next generation IP standards. Further, it must be possible to allowing any service to be offered to any customer with any payment option; the final choice being given either to the operator or in some cases to the subscriber themselves. The common service control environment for all services and payment types dramatically reduces OPEX whilst delivering consistent and reliable services
- Rapid service delivery —To provide the service provider with an interactive graphical drag and drop tools to enable services to be created, modified and configured in real time. This rapid and flexible service creation environment working close to the network enables the service provider to respond instantly to external market pressures, influences and of course the competition. New services, new

price plans and new service logic should be instantly enabled. Figure 4 shows a screen shot from the service configuration tool, the Control Plan Editor. There are than 200 building blocks enabling the innovative operator to build virtually any service. Furthermore, using over 20 years of service innovation experience, Oracle consulting have used this tool to create a predefined library of service templates which are configurable and 'ready to launch', enabling rapid time to market for new services.

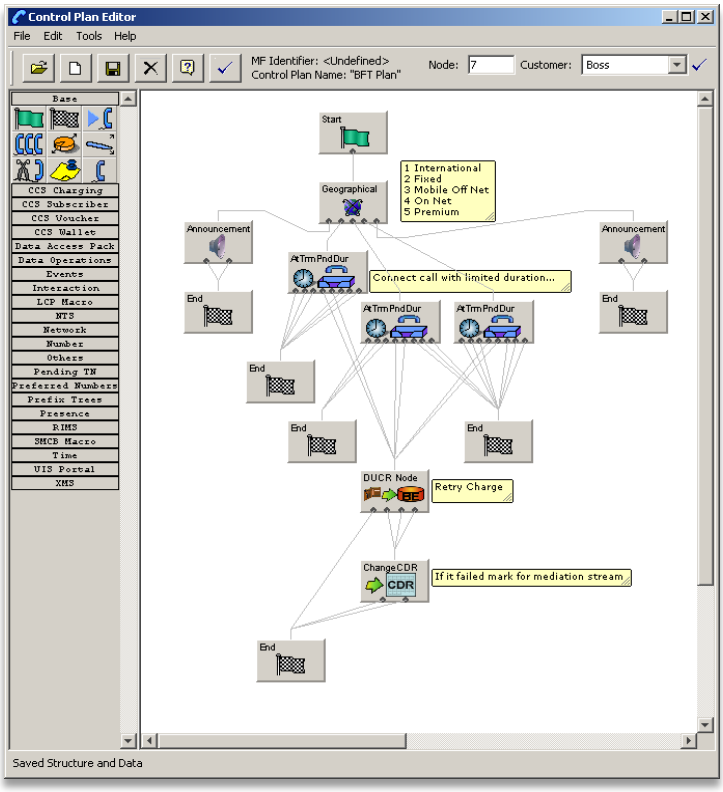

Figure 4: The Control Plan Editor providing a configurable suite to build service logic

- New Business Models—increasingly service providers need to be able to work with external providers to deliver a richer and more relevant consumer experience. The ability to manage partners in the value chain has never been more critical. One such element is sponsorship; be that simply from a parent to child or from one business to another in the form or advertising and promotion is also key. Within the telecommunications market itself, government regulation opens up new opportunities such as MVNOs. Being able to share infrastructure costs across multiple branded businesses whilst supporting complete account and administrative separation is another benefit. Figure 5 depicts a typical relationship required between a network provider, a mobile virtual network enabler and a mobile virtual network operator.

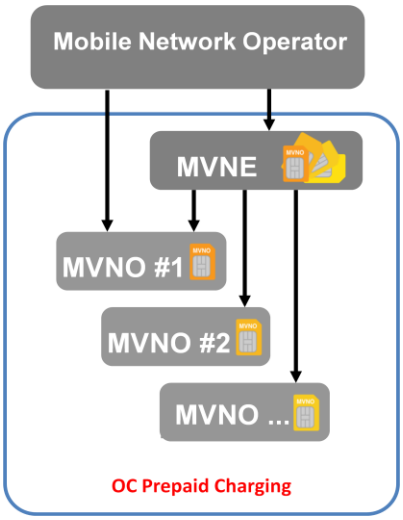

Figure 5: MVNE / MVNO operational relationships

Enable Personalized & Smart Service Delivery

- Subscriber Knowledge— Delivering competitive services to end consumers in a competitive retail market requires special relevant knowledge about that subscriber. 'Marking' a customer or recording extra personalized details is becoming increasingly important. That data also needs to be available at the network and service control level to influence and shape a service in real-time. Delivering the same service to all subscribers is no longer enough. Service logic and service delivery needs to be achieved with the granularity of the individual in mind; it must be possible to personalize the delivery taking account of individual preferences. In addition to the Control Plan Editor the Oracle solution has a tool called the Subscriber Profile Manager. This enables the individual subscriber data to be 'tagged' with individual information, such as birth date, sport team preference and so on, to enable truly personalized service delivery.
- Customer revenue intelligence—To access and analyze personal customer, usage, and revenue data usually trapped in the traditional silo of systems. Further, to use this data to predict such subscriber characteristics as churn, payment preferences, service update. Determine which bundle is best suited to which subset of subscribers through advanced segmentation and prediction approaches. The product based integration with Oracle Communications Data Manager will cost effectively deliver this capability.
- Intelligent Promotions — To create smart and truly real-time promotional campaigns that are targeted at segmented subscriber groups or even down the individual subscriber. In this way the subscriber usage can be influenced and 'tuned', growing their operator loyalty whilst significantly increasing the subscriber revenue and margin contribution.
- Personalized Communications – The solution operates in real-time monitoring service logic and balance positions and can communicates with the subscriber in a personal manner. For example,

through the use of the Subscriber Profile Manager and the control logic it would be possible to deliver the following personal message when the service criteria are met: "Josh, you are a loyal and valued customer. Having spent over $25 this month as a special reward for the remainder of this month a further 10% discount will be applied to all subsequent on-net voice calls "

Revenue Management Lifecycle

Oracle supports every phase of the revenue management lifecycle by delivering the best possible combination of products, services, and partners. The lifecycle represents a closed-loop process for generating, capturing, collecting, and assuring revenue that provides complete insight into the revenue relationships that customers have with their wireless service provider.

Revenue Generation

The Oracle Communications convergent charging solution's Revenue Generation capabilities allow wireless service providers to create & deliver services priced optimally for subscribers, the service providers, and their partners. This component helps maximize customer and partner value through complete account management with agile and configurable service delivery. With real-time access to customer data and the ability to rapidly create and configure innovative offerings and promotions, wireless service providers can respond quickly to changing market conditions to ensure they build subscriber loyalty and retain their most profitable customers.

Pricing, customer and partner management are addressed in this phase along with actual services enablement including at the network level where necessary.

Revenue Capture

The Oracle Communications convergent charging solution's Revenue Capture capabilities maximize market share for the wireless service provider using competitive pricing models and flexible balance and credit control, to enable any service for any subscriber. When services are used, subscribers are authorized; usage is captured, rated, and charged; and balances are updated. Real-time interaction and service authorization with the network elements eliminate the risk of revenue drain and at the same time improve customer satisfaction & loyalty. Within Revenue Capture, services are pre-authorized based on balance status and services. IEDRs and CDRs enrichment with additional information is also performed. Following the service logic, rating, discounting and guiding to the appropriate monetary or non-monetary balance or balances will be conducted. Finally in this phase balance management is carried out, which includes managing of reservations, maintaining of thresholds and charging transactions on all customer balances.

Revenue Collection

Revenue Collection ensures that all necessary bills and invoices are generated and that the appropriate monies are collected from the correct debtors. Postings are made to accounts receivable and G/L accounts, while handling all payments terms, settlements, and disputes. A real-time, accurate view of revenue provides insight to respond to market dynamics. The actual act of 'billing' is performed in this

phase. Billing for postpaid accounts needs to take account of such elements as service aggregation, billing time discounts based on aggregated volumes, calculating rollovers, granting and resetting of resources, performing resource conversion (folds), applying deferred taxes, and applying cycle charges.

Finally in the Revenue Collection phase all aspects of financial management of accounts receivable and general ledger postings, and the recording of payments and collections and settlements are covered. This settlement and remittance function allows providers to share revenue with and pay royalties to third-party partners, which may include other service/network providers or content providers.

Revenue Analysis

Revenue Analysis occurs across the entire revenue management lifecycle. Understanding the revenue relationships with customers and partners improves their satisfaction and the ability of the wireless service provider to serve their overall needs. Revenue Analysis ensures all transactions are conducted with the fullest possible control, integrity, and completeness. It provides real-time verification, reporting, intelligence, and control of all events and actions, which helps maximize revenue and minimize loss associated with fraud, bad debt and revenue drain. Revenue Intelligence is where data from the key service and subscriber resources can be brought together in one place to help predict churn, revenue and margin, and customer lifetime values is performed. This is achieved through the product based integration with Oracle Communications Data Manager. By analyzing customer behavior based on this rich aggregation of data and simulation tools, the solution is able to deliver a value-oriented view of customers to the provider. Finally service and system reporting for audit, reconciliation, sales and marketing analysis will be conducted.

Conclusion

The Oracle Communications convergent charging solution supports the full service creation, network charging and control, and service payment lifecycle with full reporting and transactional transparency at all stages. Through advanced configuration tools the operator is able to deliver any multi-play value added service. This is agnostic of the network and free from any payment restrictions. All this is achieved within a known, predictable and defined investment and operational cost structure. The richness and ease of the service creation environment enables real-time promotions and service modification in direct response to market demands. The user may be exposed to a full service multi-play portfolio without limitations. Further, telecommunications partners from media, entertainment and retail can join with the operator in delivering a full service menu to the subscriber with guaranteed integrity throughout the entire revenue management lifecycle. Business analytics and insight coupled with real time promotions and a real time service logic environment means the operator is able to keep the customer enticed with the latest service offerings. Through meaningful and relevant and personalized deals and promotions the operator is able to keep his customer loyal, whilst maintaining and growing their revenue contribution.

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