Oracle Communications Billing and Revenue Management (BRM) for Communications & Media Markets

A Technical White Paper
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Introduction

The communications and media markets are undergoing significant transformations which present service providers with new challenges that require new strategies. Service providers are facing significant business challenges on various fronts—increased competition locally and globally, erosion of customer loyalty due to commoditization of services, and decreasing margins for traditional service offerings. To compete in this new business environment, service providers must transform their businesses to meet the new market demands.

As the leading provider of Billing and Revenue Management solutions for the global communications and media markets, Oracle is committed to helping service providers transform to meet the key business objectives of maximizing customer value, enhancing business agility, and maximizing profitability.

Figure 1: Benefits of revenue management
- Optimize value of customers: Acquiring and retaining the right customers by offering high-margin, high-value services and increasing customer loyalty with customer-focused billing options.

- Maximize profitability: Increasing revenue potentials and reducing operational costs by consolidating business processes and systems.

- Enable business agility: Adapting quickly to changing market demands and competitive pressures with a future-proof solution that enables rapid launch of new service offerings and business models.

Oracle Communications BRM provides the complete end-to-end solution for managing revenue, supporting the key business processes of generation, capture, collection, and analysis of revenue. Combining the industry’s most comprehensive functional footprint with a superior real-time architecture, Oracle is the leading worldwide provider of Revenue Management solutions for the global communications and media markets.
The Oracle Communications BRM Application: A Functional Overview

Managing revenue is a fluid process where revenue is generated, captured, collected, and assured. This lifecycle is evolving to become a critical component of the enterprise and goes beyond the closed-end processes traditionally associated with billing. Service providers are increasingly looking to Revenue Management as a competitive differentiator that leads to profitability. With its broad business processes, Revenue Management impacts the way that providers introduce new products and services, manage customer accounts, balances, and payments, and manage revenue integrity.

Oracle solutions for Revenue Management are designed to take the complexity out of profitability. Today’s service provider often has to navigate dozens of billing applications, customer information systems, and financial applications in order to get an accurate view of the customer. This complexity results from the array of applications used for different services, payment methods, and customer groups. In this environment, it is difficult for the service provider to get a good picture of the value—and profitability—that customers bring to the enterprise. The Oracle Communications Billing and Revenue Management solution provides a single convergent platform for service providers to manage revenue in real-time across any customer type, network, service, geography, and payment method.

An example of how Oracle can help services providers adapt quickly to a changing market is its ability to offer a Revenue Management solution for triple- or quad-play, pre- and/or post-paid services over a single platform. Traditional billing systems, designed as batch systems with rigid architectures, are unable to meet the necessary flexibility required by the changing market conditions and stringent network requirements of real-time transactional processing. Oracle Communications Billing and Revenue Management solution addresses not only performance and high availability but also an open and flexible architecture that allows service providers to offer multiple services over heterogeneous network and protocols further maximizing customer value and lowering of the total cost of ownership.

**Revenue Generation** enables services to be delivered to customers, priced in a manner that is optimized for the user, the service provider, and partners. This solution helps maximize customer and partner value through sophisticated account management and agile service delivery. With real-time access to customer data and the ability to quickly create innovative offerings, service providers can respond quickly to changing market conditions to ensure they retain their most profitable customers.

**Revenue Capture** maximizes market share using competitive pricing models and flexible credit control to enable any service for any subscriber. As services are consumed, transactions are pre-authorized, captured, and rated, and balances are updated. Real-time interactions help to reduce the risk of revenue leakage and improve customer satisfaction.
Revenue Collections ensures that all bills and invoices are generated and that the appropriate monies are collected from the correct debtors. Postings are made to accounts receivables and general ledger accounts, while handling all payment terms, settlements, and disputes. A real-time and accurate view of revenue provides insight to respond to market dynamics.

Revenue Analysis ensures all transactions are conducted with the fullest possible control, integrity, and completeness. It provides real-time verification, reporting, analysis, and control of all events and actions, which helps maximize revenue and minimize loss associated with fraud and revenue leakage.

When these four business processes are integrated with your existing business-critical systems such as CRM and ERP, they provide a powerful business weapon for creating competitive advantage. In the following sections we provide a description of the comprehensive Revenue Management capabilities of the Oracle solution.

Revenue Generation

Revenue Generation enables service providers to increase customer value and generate revenue potential through competitive pricing strategies, effective management of customer and partner data, and rapid delivery of new service offerings to customers. With real-time access to customer data and the ability to easily create innovative offerings, service providers can respond quickly to changing market conditions to ensure they retain their most profitable customers.

The Oracle Communications BRM solution enables service providers to respond to market pressures and increase customer lifetime value. The following revenue generation processes and capabilities are included in the Oracle Communications BRM solution:

- **Pricing Management.** Build, test, and roll out new product offerings while creating and optimizing price plans.

- **Customer and Partner Management.** Acquire, maintain, and grow customers. Establish partner value chains to deliver maximum value to your customers. Integrate with CRM applications to help up-sell and cross sell and provide a more personalized customer experience.

- **Service Enablement.** Create and manage service, provide service activation and deactivation, and maintain information related to device

Pricing Management

Product and pricing management is a key strength of Oracle Communications Billing and Revenue Management system. The ability to create and roll out high-margin offerings in a timely manner is a critical requirement for revenue generation. In this section we describe the key features of pricing management that allow service providers to rapidly meet the demands of a increasingly competitive and changing market.
Product and Pricing Catalog

With Oracle Communications BRM’s flexible product catalog support, service providers can define their offering strategy based on market vision and innovation instead of being limited by systems constraints. By leveraging the various levels of “building blocks”, service providers can easily and quickly roll out new products and services to the market.

In the Oracle Communications BRM product catalog, offerings are organized into Plan Lists, Plans, Deals, Products, and Discounts. A Product specifies chargeable events, such as cycle fees or usage events, and associates each event with rate plans that can be based on any number of attributes, including time, zone, event quantity and account profile. The rate structure includes specification of simple or tiered rates based on event or other resource quantities. Similarly, discounts can also be created using flexible rules based on a variety of conditions and attributes. Products and discounts are grouped into a Deal for a given service. The Plan, a combination of one or more deals, allows the service provider to offer any number of convergent services to subscribers utilizing sophisticated cross-service discounting. Plans are categorized in Plan Lists to enable segmentation based on specific business requirements.

Figure 2: Oracle Communications BRM pricing model
This bundling structure allows service providers to better organize products and services for their customers. Providers can achieve optimal pricing flexibility with reduced operational overhead because of the modularity and reusability of the pricing model.

While the structured product catalog offers manageability of the product offerings, the comprehensive and robust pricing model offers optimal flexibility in designing the rating and discounting rules to support the most innovative of pricing scenarios. The model supports various pricing scenarios based on an extensive set of parameters including:

- Flexible pricing options tailored to the types of services being offered by the provider. For example, rate GPRS usage based on both duration and data quantity, offer promotions such as Friends and Family to voice subscribers, use customer profile data to determine content charges and discounts.

- Flexible rating and discounting structures for supporting tiered pricing or volume discounting based on consumption level.

- Pricing based on day and time ranges, including day-of-week, day-of-month, and month-of-year parameters, as well as time-of-day configurations. Special holiday rates may also be configured by defining a calendar.

- Pricing based on service, event, and/or customer profile attributes. For example, zone analysis can be done for telephony usage events to evaluate the originating/terminating “zones” (e.g., U.S. to Canada) and use the result in the rate calculation.

- Flexible validity rules at rate plan, product, discount, and deal levels. For example, specify that a discount has validity from the first time it is used for the duration of three months.

- Comprehensive product and discount dependency and exclusion rules.

- Innovative pricing such as:
  - “Best Plan” which chooses an optimal bundle for individual subscriber based on usage during the past billing cycle
  - Compensation for dropped calls
  - Tailoring the pricing of an offer to a specific corporate customer

In addition, the Oracle Communications BRM solution provides industry-leading flexibility in discounting support via the Advanced Discounting Manager:
• Allows service providers to create different real-time, billing-time, or volume-based discounts
• Supports discounting based on quantity consumed and/or revenue generated
• Offers cross-account discounting incentives
• Provides cross-service discounts for cross-sell and up-sell opportunities
• Allows multiple discounts to be prioritized, and applied in parallel or sequentially
• Supports dynamic discounting such as reduction in charge for the 10 most frequent numbers called during the current billing cycle

The pricing capabilities in the Oracle Communications BRM solution allow operators to create innovative marketing strategies in order to expand their customer base, quickly react to customer demand and competitive pressure, and generate up-sell opportunities to customers with creative pricing configurations.

Product Administration and Management

The Oracle Communications BRM solution provides several administrative tools and management capabilities which help in reducing operational overhead and lower the total cost of ownership. Some of these tools include:

Pricing Center

Pricing Center is the main user interface for managing the product catalog and pricing data in the Oracle Communications BRM solution. It is a user-friendly graphical user interface (GUI) designed to enhance configurability and operability of the pricing definition process. Service providers can create offering bundles and associated discounts and promotions with detailed rating and discounting rules.

Figure 3: The Oracle Communications BRM Pricing Center application
Permissioning Center

Permissioning Center is an optional manager that delivers security/access control capabilities for the management of permissions. Users are assigned to roles, which enables the definition of a collection of permission strings. Features include the capability to leverage roles across tens of hundreds of users, thus eliminating the replication of work when defining user permissions. Roles can also be hierarchical in nature, which means that permissions can be inherited from a “parent” role.

Permissioning Center can define user access rules for Oracle Communications BRM applications such as Customer Center, Pricing Center, Payment Center, Revenue Assurance Center and Suspense Management Center.

Customer and Partner Management
The Oracle Communications BRM solution offers an extensive set of capabilities for account management, enabling service providers to acquire, maintain, and grow their customers and partners. Account management is a mission-critical function as providers aim to maximize customer value by increasing customer loyalty and retention and up-selling/cross-selling high-margin product offerings, while reducing costs of operations by managing customer data accurately and efficiently.

Customer and partner accounts may be created and managed through Oracle Communications BRM, through CRM integration, or through integrations with legacy applications. Oracle Communications BRM offers a web services interface that supports integration with leading CRM application such as Oracle's Siebel, enabling service providers to accelerate time to market and reduce deployment costs.

The Oracle Communications BRM solution supports the following key business functions:

- Customer and partner registration; account creation and maintenance
- Management of complex account groups, hierarchies, and subscription relationships
- Service subscription and product/price plan purchase
- Management of billing options and payment methods
- Presentation of account balances and credit limits
- Reviewing invoices and bill and event details; responding to customer inquiries
- Accounts receivables activities such as adjustments or disputes

**Customer Center**

Customer Center, an optional manager, is a tool to manage customer and partner accounts. Customer Center can be used by customer service representatives (CSRs) to manage all aspects of an account, including but not limited to account creation, modifying existing accounts, viewing invoices, viewing and managing balance information, and searching on account activities. The intuitive Customer Center user interface provides CSRs with all the information they need to respond quickly to account inquiries.

Companies can tailor the Customer Center to reflect their unique business practices, including changing terminology, modifying screens, hiding unused features, and inserting additional screens.

Customer Center leverages Sun’s Web Start client application, which is integrated with Oracle Communications BRM. Because Customer Center is deployed centrally, Customer Center modifications are automatically downloaded to the CSR desktop as companies upgrade or update Oracle Communications BRM, eliminating the need for administrators to manage each CSR desktop.
Oracle Communications BRM offers a web-based customer self-care application to supplement the tools used by CSRs. The Self-Care Manager is a developer toolkit for building a web-based self-care interface. With the Self-Care Manager, customers can perform a large set of account management tasks 24x7 without interacting with CSRs, thereby providing convenience for the customer as well as cost savings for the service provider. Some of these tasks may include:

- Viewing account and service balances
- Real-time viewing of service usage
- Viewing and paying outstanding dues
- Viewing resource reservations
- Topping up account
- Viewing invoices

Subscription Management

The Subscription Management solution ensures that account and subscription data is managed accurately and the appropriate financial results are generated, including:

- Tracking of status and validity of subscriptions
• Tracking of associated pricing options including products and discounts
• Management of charge sharing and discount sharing relationship
• Management of cycle activities, proration rules, and rollovers as well as product purchase and
cancellation and subscription and pricing changes that may be requested by the customer or
provider.
• Management of subscription changes including validation against product transition and
dependency rules

Along with Oracle Communications BRM's superior pricing capabilities, the Subscription
Management solution enables service providers to create innovative and compelling market
offerings. Key features of this solution include flexible cycle periods, rollover rules as well as
configurable validity for products, discounts and cycles.

Flexible Cycle Periods

Service providers can easily create innovative and compelling market offerings with Oracle
Communications BRM’s flexible cycle management capabilities. Service providers may establish
cycles in varying lengths (e.g., daily, weekly, monthly, or annual) within which customer charges
or discounts are managed. For example, service providers can offer weekly cycle bundles in
which the customer is granted 100 free minutes each week for a weekly or monthly recurring
charge. These offering cycles may or may not align with the billing cycle, so appropriate
proration rules may be defined to achieve the desired behavior. For instance, a customer may be
billed on the first of the month but may have a cycle fee that applies on the 15th of the month.
The same solution may be used to grant free resources in operator defined periods.

Flexible Rollover Rules

The Oracle Communications BRM application supports flexible rollover rules, leveraging the
flexible pricing and rating capabilities in the BRM solution. Rollover rules may be defined to
determine when and if subscriber resources can be extended for consumption to the next cycle
period, as well as duration (e.g., weekly or monthly). Flexible rollover rules enable service
providers to reduce churn by increasing customer satisfaction and retention.

Flexible Validity Rules

In addition to defining product and discount validity in units of time relative to purchase, the
current release has expanded validity specification to include relative validity based on first usage.
For example:
• A trial product can be configured to have usage validity for 10 days from first usage
• If a product’s purchase validity is set to be valid on first usage, the purchase fee is charged on the
day that the product is first used
• A 10% discount on voice charges can be configured to have validity for 40 days from the first time it is applied to a usage event

**Backdated Subscription Actions**

As there can be a delay in synchronizing the subscription actions from a CRM system into the billing system, the Oracle Communications BRM application supports account creation, and purchases and cancellations for a past date. Charges can be automatically applied or corrected from this backdated date ensuring that the service provider's customer is accurately charged without requiring any manual updates in the billing system.

**Brand Manager**

The Brand Manager is an optional manager that further extends the breadth of the Oracle Communications BRM solution to support branded service provider business models. The BRM application enables any business that offers services under its own brand identity to do so without having to build the necessary infrastructure to support the services.

To ensure brand data protection, Oracle Communications BRM uses a hierarchical security-based framework for segmenting each brand by its relevant system data, including accounts, pricing plans, services, and reports. In addition, the invoice designer client application is brand-aware for creating brand-specific invoice templates.

Service providers can also offer billing services for partner brands. The data for the service provider and the partner are maintained separately within their own brand(s) with configurable access permissions, thus ensuring data security.

**Service Enablement**

The Oracle Communications BRM solution provides service enablement capabilities that enable service providers to create and manage services, provide service activation and deactivation, and maintain information related to devices.

**Service Management**

An integral part of the account creation process is collecting the necessary information to provision services to the customer. Some services can be provisioned in real time, such as setting up mobile phone service. Other services may require staged provisioning with steps performed by external systems—for example, sending a technician to a customer’s home for installation of equipment after service is purchased over the Internet. In these situations, the provisioning information collected within Oracle Communications BRM is held with the account in an inactive state. Once the installation is complete the provisioning information is forwarded to the external systems and the service status is activated.
The Oracle Communications BRM application is based on a modular and extensible architecture approach to providing service management capabilities. All Oracle Communications BRM Service Managers leverage a common service management framework, called Services Framework, as the foundation. The extensible Service Management Framework allows Oracle and its customers to flexibly and rapidly create new services in the system as well as the associated event types to be processed. Given that specific service management requirements differ based on market, market-specific business logic can be added on top of the re-usable service management framework to meet the specific market requirements.

Oracle offers a number of pre-configured Service Managers. These Service Managers provide specific service provisioning and activation, authentication, authorization, and other service management capabilities, as well as third-party integrations needed based on the industry requirements.

**GPRS Manager**

The GPRS Manager is used to integrate Oracle Communications BRM with a service provider’s GPRS network services. The GPRS Manager can authenticate users, authorize them to use a provider’s GPRS services, and track their usage to generate the appropriate charges using the GPRS Manager’s accounting capabilities.
GSM Manager

The GSM Manager enables service providers to manage wireless services, such as voice or SMS, over their GSM network. The GSM Manager is fully integrated with the Oracle Communications BRM Number Inventory and the SIM Card Inventory Managers, enabling full service management capabilities for any GSM based service. In addition, the GSM Manager provides the following key benefits:

- GSM Service Extensibility and Customer Center Integration
- Provisioning Interface
- Event Processing Integration

GSM AAA Manager

The GSM AAA Manager enables service providers to integrate Oracle Communications BRM directly with their prepaid network elements. The BRM application, as a part of the actual call flow, performs the user authentication, service authorization, and session accounting (AAA). AAA requests are sent directly to the GSM AAA Manager, which then uses the Oracle Communications BRM real-time rating capabilities.

The GSM AAA Manager also supports reservations and session pre-authorization, which enables service providers to quickly deploy traditional and advanced prepaid services with reduced revenue leakage. With access to Oracle Communications BRM’s pricing flexibility, service providers are able to bundle prepaid voice, data, content, and messaging services together. They can also track loyalty and offer incentives to their subscribers. Additionally, the GSM AAA Manager enables service providers to support advanced GSM services such as closed user groups, friends and family, and others.
E-Mail Manager

The E-Mail Manager allows providers to integrate their e-mail system with Oracle Communications BRM application. The E-Mail Manager provides authentication and authorization for delivery and retrieval of e-mail messages. The policies associated with e-mail authentication and authorization can be configured by the provider.

LDAP Manager

The Lightweight Directory Access Protocol (LDAP) Manager provides integration between Oracle Communications BRM and an LDAP directory. The BRM application supports customer registration, customer management, and service authorization in the LDAP environment. Oracle Communications BRM is the single front-end to all customer care and billing data administration, regardless of whether the data resides in Oracle Communications BRM or an LDAP directory. For example, password changes are performed in the BRM, which then automatically updates subscriber information in the LDAP directory. The service provider can choose whether data resides in the BRM, the LDAP directory, or both.

RADIUS Manager

The RADIUS protocol is an industry standard protocol for AAA. Terminal servers or network access servers (NAS) use the RADIUS protocol to communicate AAA requests to, and return results from, a database of customer information. The RADIUS Manager uses the RADIUS protocol to provide AAA services in the BRM environment. Service Providers use RADIUS Manager to perform the authentication, authorization, and accounting services required when customers use their terminal server or NAS to connect to BRM.

Content Manager

The Content Manager enables content providers to use the Oracle Communications BRM application hosted by service providers or content aggregators to authenticate and authorize customers’ content purchases, rate the content through a variety of options, and track customer usage patterns in order to gain valuable insight into the types of content customers are buying.

Inventory Management

The Inventory Management Framework provides the structure for development of applications to order devices by integrating to third party order management systems, and managing device lifecycles. In BRM, an order is a request for a physical or virtual object such as set-top converters or voucher cards. The Inventory Management Framework is used to create orders for device inventories, such as an inventory of new set-top devices or pre-paid scratch cards or vouchers. The Inventory Management Framework is used by optional BRM components such as the Voucher Manager to facilitate order management features. Some of the specific functions of the Oracle Communications BRM Inventory Management Framework are described as follows.
Device Management

Devices are tangible or intangible assets that can be associated with an accountholder’s service. Device management is a key capability required as part of the service enablement process.

The device management solution in Oracle Communications BRM is based on an extensible inventory management framework which enables customers to track any physical as well as nonphysical items associated with services. Physical devices include equipment such as phones, set-top converters, or PDAs. Nonphysical items include entities such as IP addresses, phone numbers, and web pages.

The device management framework provides a structure for development of applications to manage the whole lifecycle of devices in Oracle Communications BRM. Devices can be managed with different attributes, transition states, and traceable history. The framework allows configuration to create dependencies between services and devices. The devices can be assigned/unassigned to a customer.

The Device Management Framework can also be leveraged to connect an existing device management system to Oracle Communications BRM.

Oracle Communications BRM offers a number of device managers in its Market Extensions suite of offerings that enable management of industry-specific devices such as phone numbers, SIM cards, vouchers, and IP addresses.

Number Manager

The Number Manager generates phone numbers and creates blocks of numbers for telecommunications providers. Using the Number Manager, administrators can reserve phone numbers and track the entire lifecycle of the numbers in the system. They can search for blocks of numbers or individual numbers and view the status as well as other details about the numbers. Administrators can also update associated number attributes such as the brand, network, or category to which a number belongs. The Number Manager also provides support for mobile number portability processes.

SIM Manager

The SIM Card Manager enables SIM card administrators to not only generate SIM card orders and the content (i.e. IMSIs) relating to SIM Cards, but also to effectively manage the life cycle of SIM cards. The SIM Card Manager creates orders for SIM card vendors, generates request files, and processes response files. The SIM Card Manager can also interact with provisioning systems for pre-provisioning of SIM cards—mobile service providers can use this feature to sell pre-provisioned phones from retail outlets.
Revenue Capture

Revenue Capture maximizes market share using competitive pricing models and flexible balance and credit control to enable any service for any subscriber. As services are consumed, transactions are pre-authorized, captured, rated, and charged, and balances are managed. Real-time interactions help to reduce the risk of revenue leakage and improve customer satisfaction.

The Oracle Communications BRM solution enables service providers to maximize profit from business transactions and reduce revenue leakage. The following revenue capture processes and capabilities are included in the Oracle Communications BRM solution:

- **Service Authorization.** Authenticate customers, authorize service, and guide transactions through network integration.
- **Event Collection and Enrichment.** Analyze, classify, enhance, split, and assemble transactions.
- **Rating and Discounting.** Rate and discount transactions and revenue share using monetary and non-monetary resources.
- **Balance Management.** Monitor resource availability, manage reservations, maintain thresholds, and charge transactions.

Benefits of the Oracle Communications BRM solution include:

- Maximize profit from business transactions and reduce revenue leakage
- Reduce fraud and revenue leakage through ability to authorize service usage. Lower TCO through more seamless integration with the network
- Increase flexibility of business models and increase customer loyalty through usage enrichment
- Improve responsiveness to market and competitive pressures with real-time access to revenue data

Service Authorization

The ability to authenticate users and determine their authorized services and available consumption levels is crucial for service providers. Oracle Communications BRM addresses this vital requirement with a transactional real-time architecture designed to minimize fraud and bad debt.

When a registered user attempts to access a service, Oracle Communications BRM performs authentication and authorization in real time, using real-time data. External applications and databases can also be accessed as part of the process via an application programming interface (API).

The authentication and authorization policies are fully customizable by the service provider. This means that as different types of services are added, Oracle Communications BRM's
authentication and authorization capabilities can be extended to perform any required verification. This capability is essential for offering new services quickly and for staying ahead of rapid changes inherent in the industry.

**Resource Reservation Manager**

In a prepaid environment, the credit limit/available resource of the customer account determines the consumption limit of the customer, thus reducing the credit risks of offering services to customers. However, the ability to support revenue assurance while offering value-added services to customers in a multi-service prepaid environment is essential in the prepaid business model.

The Oracle Communications BRM Resource Reservation Manager provides revenue assurance in a multi-service environment. This framework provides operators with a flexible operating platform—on top of which multiple voice and data services can be offered to customers in a convergent environment.

The Resource Reservation Manager supports various business scenarios with a single subscriber view and is a key component in managing the financial liability of customers. It supports the following capabilities:

- Ability for service managers to reserve specific amounts of resources or consumption quantities.
- Ability to create and track multiple reservations at any given time, providing support for multi-service prepaid business models. This allows customers to use multiple concurrent network services and charge them against the same account balance.
- Ability for customers to configure reservation rules for each type of service offered
- Support for shared available resources of accounts across all services in a multi-service environment, while ensuring the consumption of resources is limited to the credit limit threshold of the account.

**Event Collection and Enrichment**

The event collection, tracking, and enrichment process occurs prior to the event rating process. This process ensures all customer activities, collected from any external source, are tracked accurately in the system and enriched to include additional data required for the rating process. Oracle Communications BRM collects, tracks, and enriches data in both transactional real-time and near real-time batch.

Event collection is achieved through tight integration with external systems, which allows Oracle Communications BRM to collect event records from external sources, such as a mediation device for voice phone calls, validate, guide, and map the records to a standard internal format.

The enrichment process enables new values to be added to the original event, for example, special account attributes such as customer segments. These additional values can either be used
within the subsequent near real-time batch rating functions of the Oracle Communications BRM solution or be transmitted directly to integrating systems, such as billing or remittance.

Rating and Discounting

Rating and discounting is the process of calculating the appropriate charges and credits for an event based on a wide-range of parameters associated with subscriber, event, and service attributes as defined in the Product Catalog. The Oracle Communications BRM solution enables service providers to freely define the set of chargeable “events types” to be rated—creating the most flexible and robust rating and discounting solution in the industry. Providers can define any number of chargeable events in the system: usage events for the various service offerings; one-time, non-recurring events such as registration or cancellation charges; as well as recurring events of varying duration (e.g., weekly, monthly, multi-monthly, and annual events). Each event type may be rated and discounted using different parameters and metrics, with rating and discounting rules as simple or complex as needed for the business requirement.

The Oracle Communications BRM application supports re-rating which re-calculates balance impacts for ratable transactions that require any retroactive rate changes or corrections. Oracle Communications BRM supports complete re-rating capabilities for both real-time and batch events, encompassing all services for prepaid and postpaid accounts. Rerating enhancements introduced in the current release include special rerating triggers when out-of-order events are detected, custom analysis to determine whether rerating is required, rerating with price overrides, and tracking the rerating reason for better control of rerating jobs.

The Oracle Communications BRM solution provides integrated support for both transactional real-time and near real-time batch event processing. Service providers can optimize the systems architecture based on the specific data and performance requirements of each service offering.

Real-Time Rating

The Oracle Communications BRM real-time rating capabilities are based on a data-driven object model. Events are rated and account balances updated instantly, preventing revenue leakage and ensuring accurate and up-to-date account balance information. It also allows operators to perform real-time credit limit monitoring, which significantly reduces financial risks.

Batch Rating

The Oracle Communications BRM application offers a high-performance batch rating platform that delivers scalability and flexibility through a modular architecture. High performance is achieved through a design that separates the rating and billing functions from the EDR format-specific mapping and interpretation rules. The result is a system that relieves the accounting system from performance-intense tasks.
The Oracle Communications BRM batch rating architecture can be tailored to the operator’s business needs and to the specific properties of the service offerings. The batch rating system, also called the Pipeline Rating Platform, includes the import of data records, reformatting into a standard internal format, the enrichment including determining zone, time, and other event attributes, rating, applying discounts and the transmission of the processed event data to a other system. A standard interface language permits the insertion of new modules into the processing pipeline without having to change the pricing configuration modules.

Balance Management

Balance and Resource Management

The Oracle Communications BRM solution provides a fully extensible model for managing subscriber resources. Resources are defined to be any consumable asset a subscriber may use to pay for or track service consumption. Currency is the most common resource, but the Oracle Communications BRM solution enables service providers to define creative ways to collect for the services rendered. For example, a service provider may grant the subscriber a number of “free unit” credit resources as part of service registration or on a recurring basis to encourage subscriber usage. The service provider may also define “loyalty points” as a resource to increase customer loyalty. Credit limit thresholds may be established for each resource to ensure required financial control.

Multiple Balances Support

The Oracle Communications BRM supports multiple sets of balances within one account; each is referred to as a “balance group”. A balance group is a set of balances scoped to either the account or the service. This capability allows users to track balances separately for each service without the overhead and operation impact of having to create separate accounts, resulting in improved revenue assurance and accurate financial management with enhanced credit limit control.

The multiple balances support also provides the architecture for prepaid/postpaid convergence within one account, where a subscriber may own both prepaid and postpaid services within one account and track the balances separately. This allows the service providers to up-sell to customers with innovative marketing campaigns—including cross-service promotions—as well as target high-margin convergent customers and corporate accounts.

Balance Validity and Sub-Balances

The Oracle Communications BRM solution is designed to support balance tracking at any level, determined by the specific products and services offered by the service provider. The balance for a particular resource may contain multiple sub-balances, each with a validity period. The flexible tracking of validity-based resource buckets provides added control for how the balances may be
aggregated and/or consumed, and when a resource should expire. For example, a subscriber may have a total of 500 free minutes in the account, 20% of which will expire at the end of the month, while the remaining 80% will be valid until the end of the following month.

The flexible balances capability extends the control of granting and tracking balances at a more precise level to the operators. It also provides the architecture for managing prepaid balances for a subscriber where the prepaid balance may expire within a certain period of time.

Flexible balance validity tracking enables service providers to better manage free units and resource bundles. In addition, the ability to track validity of granted resources allows for improved accuracy in financial reporting and controls.

**Credit Limit Monitoring**

Credit Limit Monitoring allows service providers to prevent fraudulent activities and revenue leakage. The Oracle Communications BRM real-time architecture ensures that all user activities are tracked, and impacts of all real-time transactions are monitored against the established credit limits for the subscriber. This includes any prepaid reservations made against any resource balances. Credit limit thresholds can be defined for all consumable resources for the user to achieve maximum revenue control.

Credit Limit and threshold tracking for non-currency balances is also available in batch processing, allowing postpaid subscribers to be notified in near-realtime after they have reached preconfigured thresholds or limits.

**Balance Monitoring**

The Balance Monitoring feature monitors currency balances for a specified group of accounts and services, and provides notification when a balance exceeds a predefined threshold. The feature enables a service provider to monitor their customers’ spending, resulting in reduced credit exposure and improved risk detection. This feature also provides value to subscribers by allowing them to monitor spending habits and adjust their usage when charges exceed their preset limits.

**Revenue Collection**

Revenue Collection ensures that all bills and invoices are generated and that the appropriate monies are collected from the correct debtors. Postings are made to accounts receivables and general ledgers accounts, while handling all payments terms, settlements, and disputes. A real-time and accurate view of revenue provides insight to respond to market dynamics.

The Oracle Communications BRM solution enables service providers to increase business agility with real-time business, financial, and revenue information. The following revenue collection processes and capabilities are included in the Oracle Communications BRM solution:
• **Billing.** Calculate bills and partner statements, create invoices, and apply additional discounting and taxation.

• **Financial Management.** Manage receivables, general ledger, integrate with ERP systems, and close accounting cycles.

• **Payment and Collections.** Process payments and payment terms, manage aged receivables, provide dunning, and handle disputes.

• **Revenue Sharing and Settlements.** Calculate accounts payable and net settlements, integrate with clearing houses, and provide settlements for roaming, content, and resellers.

The Oracle Communications BRM provides a complete and flexible Revenue Collection system that allows service providers to effectively manage and maximize their revenue stream. The solution performs real-time billing, maintains complete audit trails of all billing activities, supports a wide range of payment methods, and provides flexible ways to manage customer A/R operations.

The key benefits of this industry leading solution include:

• Delivery of business agility with real-time business, financial, and revenue information

• Provision of an accurate account of all revenue

• Business agility through real time access to business, financial, and revenue information

• Improvement of customer satisfaction through flexible payment and collection methods

• Growth of revenue opportunity and reduction of revenue leakage through real-time settlements

**Billing**

Billing in the Oracle Communications BRM Revenue Collection solution is the process of calculating bills and partner statements, applying additional discounting and taxes, and finally invoicing the customers. Billing comprises batch applications that collect and aggregate all rated events and perform a number of end-of-cycle activities.

During the course of the billing period, similar charges are aggregated in “bill items” for every customer. Examples of bill items are cycle fees or usage charges. Items may also be custom defined by the operator based on business needs. The cycle-end billing process aggregates all the bill items, and performs activities such as applying 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.

In the Oracle Communications BRM, billing cycles can be any number of months (i.e. n-month) long. Billing cycles can also be quarterly, or annual. If the solution is configured to have a multi-month billing cycle, the bill will be finalized only after the multi-month period; cycle and other
charges may still be applied monthly or may be applied for the multi-month period, depending on the configuration of the product catalog.

Non-Cyclic Billing

The Oracle Communications BRM solution also supports various non-cyclic billing scenarios:

- **Bill Now.** Allows service providers to perform billing independent of the billing cycle. This enables CSRs to invoice customers for all outstanding charges at any point, without having to wait until the end of the normal billing cycle. CSRs can also selectively bill for specific bill items.

- **On-Demand Billing.** Allows service providers to create bills and invoice customers automatically at the time of purchase, enabling the collection of large purchase sums without waiting for the end of the billing cycle.

- **In-Advance Billing.** Allows service providers to charge and bill subscribers in advance for a number of cycles. The offset timeframe is defined on a per-product basis in the Pricing Center and is valid for cycle forward fees.

Multiple Bills and Billing Hierarchy

Operators can create multiple bills for each account for the same billing cycle, with each billing level identified as a bill unit. For example, the customer is able to pay for voice service charges separately from their data service charges through two different bills, or a family account may have an invoice account for the parents and a prepaid account for a child. Each bill may include balances from one or more balance groups. The billing date and accounting type can be set independently for each bill unit. This allows the operator to create either a single bill for the entire account or separate bills for one or more services. Each bill unit can be prepaid or postpaid and may be paid using different payment methods. At the same time, flexibility exists for a payment to be allocated to multiple bill units.

**Figure 6: Example of an account with multiple bill units**

![Diagram of account with multiple bill units](image)
Figure 7: Example of a billing hierarchy

The Oracle Communications BRM application provides the architecture on top of which complex subscriber billing and payment arrangements can be established. The split billing and flexible payment capabilities allow operators to provide superior service to their customers by offering differentiated customer-focused billing options. Subscribers may designate to split charges by different service offerings, and select different prepaid and postpaid payment methods for each bill. Service providers can increase customer retention and attract new customers with customer-focused billing options as well as target high margin customers such as corporate accounts and/or subscribers with family or group plans.

Bill and account suppression

Operators may choose to extend a bill cycle without finalizing the bill. At the beginning of each cycle, The BRM system creates a new bill for the new period and finalizes the bill for the old period. If there is no need to send out a bill for a period, this feature enables the extension of the existing bill into the next period and continues in this manner until the bill is finalized. The most common reason for suppression is when the bill does not reach a defined threshold minimum.

In addition, customers may manually suspend their account temporarily. In this case, the account may be suppressed for a defined period and during this period their products and services may be inactivated. It is also possible to charge customers a separate monthly fee during the suppression period.

Billing Segments

Billing segments may be defined for a billing date to allow control over which accounts to bill—this could be based on customer segments, market data, or on a performance optimization and load balancing approach.

Bill cycle management is the function of controlling, balancing, or restricting the selection of an accounting day of month (DOM). The Oracle Communications BRM maintains configuration to control the selection and validation of the accounting DOM. Every bill unit will contain the
segment information which will identify a set of valid accounting cycle DOM that is available for that particular bill unit. The billing segment for a bill unit is created during the account creation process.

**Bill Run Management**

Bill run management comprises a set of capabilities that enables users to fine-tune the bill creation process. These capabilities include:

- A control file used to restrict and partition the set of accounts to include in the billing run. When billing is run, only the accounts associated with the billing segments and DOM that are referenced in the control file are actually billed.

- Payment term values that can be used in the calculation of payment due dates. There is also a policy to calculate the payment due date based on the calendar and the payment term. For example, a customer may have 30 business days to pay a bill.

- A configurable system calendar to define country specific calendars for payment term calculation processes. For example, a holiday calendar could be used in due date calculations based on business days to ensure that days such as public holidays are not counted as business days.

- If an account’s billing did not run on the intended day, the possibility to specify an adjustment to the payment term in order to give the customer sufficient time for payment.

**Taxation Managers**

The Oracle Communications BRM solution integrates with third-party tax packages through the API interface and also has policies for flat tax calculation. Complex tax calculation of Sales and Use, International VAT, and Telecommunications tax solutions are also possible. Integrations are available with SALES/USE and WorldTax from Taxware International and Quantum and CommTax from Vertex.

The solution provides the ability to configure tax calculations in real time for each transaction or to defer the tax calculation until the end of billing cycles.

**Invoicing**

The Oracle Communications BRM solution generates invoices—soft or hard copy—and provides them to customers who use the invoice payment type. Invoices can be generated automatically or manually after a bill run. The format of the invoice can be changed using a custom invoice template.

Invoices can be stored in HTML or XML formats. Invoices can also be stored in a separate database. This speeds up invoicing performance; allows providers to store a larger number of invoices; and provides the ability to view, e-mail, and print invoices without affecting the BRM database.
The Oracle Communications BRM is also integrated with Oracle Business Intelligence (BI) Publisher to generate content-rich invoice documents in various formats: PDF, RTF, HTML. Two pre-built sample invoice templates targeted at individual consumers and corporate customers respectively are included. As the pre-built templates are configured with comprehensive data for an invoice in the communications and media industries, it enables service providers to deploy the Oracle Communications BRM invoicing solution rapidly by tailoring these templates to their business needs. Oracle BI Publisher also enables merging of data from multiple sources into one document thus allowing for data from a CRM system, like promotional marketing messages, to be inserted into the BRM invoices.

The Oracle Communications BRM leverages Oracle BI Publisher to provide multiple ways to publish the generated invoices. Invoices can be made available for Electronic Bill Presentment and Payment (EBPP) application in a self-care environment. In addition, invoices can be mailed or sent to external application for printing, or published via email, fax, ftp.

Financial Management

The Oracle Communications BRM solution allows the management of Accounts Receivables (A/R) and the General Ledger (G/L) System. The solution also offers published APIs for integration to other Financial ERP systems such as SAP or Oracle.

Receivables Management

The Oracle Communications BRM solution offers an extremely flexible Accounts Receivables (A/R) system by supporting A/R operations at various levels, including account, bills, bill items, and events. Charges from events are aggregated into bill items and collections of such items form bills. Items can be configured by various rules such as event and service types, which provide an extremely versatile way to aggregate charges. Adjustments for each bill may be made independently, and a customer account may have several bills. Prepaid and postpaid bills may both be subject to similar A/R operations.

Accounting Types

The Oracle Communications BRM application supports two accounting types: open item accounting and balance forward accounting.

- **Open item accounting** is targeted at businesses and reflects charges from a single period only. Business customers can indicate which specific line items they want to pay. With this type of accounting, A/R is maintained at each bill level. Any payments and adjustments have to be made against that specific bill. A subscriber is billed only for charges from the bill items in the current bill. If the customer does not pay that bill, the next bill does not include unpaid charges from the previous bill.
**Balance forward accounting** is similar to a credit card account and is the preferred way for automatic payments types and most consumer subscriptions. An ongoing statement reflects the current balance based on past credits and debits. With this accounting type, all previous A/R transactions are moved to the latest bill. All payments and adjustments are performed against the latest bill only. A subscriber bill includes all the charges that a customer owes, including those from previous billing cycles. If a customer does not pay a bill, the next bill includes the charges from the previous bill.

**General Ledger Accounting**

The Oracle Communications BRM solution supports traditional general ledger accounting through the use of a general ledger (G/L) interface. G/L account codes are assigned to balance impacts through a configuration file or through Pricing Center. As balance impacts occur, the corresponding G/L accounts are affected. The solution supports flexible charge and credit allocation that allows a single charge or credit to be split among G/L account codes. G/L account codes can be assigned to both rated and pre-rated events. Summaries of G/L account impacts can be viewed via standard reports or be exported into external G/L systems.

**Revenue Recognition**

The Oracle Communications BRM solution tracks revenue in accordance with generally accepted accounting principles. Comprehensive general ledger reports provide the operator with accurate and timely financial data. The Oracle Communications BRM application tracks six revenue types to support both cash basis and accrual basis accounting methods. Listed below are the six revenue types that BRM supports:

- Billed
- Unbilled
- Billed Earned
- Unbilled Earned
- Billed Unearned
- Unbilled Unearned

**Payments and Collections**

The Oracle Communications BRM solution processes payments and payment terms, manages aged receivables, and provides dunning as well as reversals and write offs. The Oracle Communications BRM application flexibly supports multiple payment methods including invoice, credit card, direct debit, voucher top-up, etc. Each account may have multiple payment methods if multiple balances and bills are generated for the account.
The BRM application allows allocation of single payment over multiple open bill items. Payments may be entered into the system via an integration with a payment gateway or may be manually entered using the Oracle Communications BRM payment tool.

**Paymentech Data Manager**

The Paymentech Data Manager is an optional manager. The Paymentech Data Manager is used to interface with the Paymentech clearinghouse. The BRM application supports direct debit of funds by using Paymentech as well as all credit cards supported by Paymentech. The connections to the clearinghouse may be online or batch.

**Top-Up Manager**

The Top-Up Manager provides a mechanism for applying advanced payments to an account’s balance, which can be subsequently applied to services used by the subscriber. It is primarily used in prepaid environment. The Top-Up allows a subscriber to top up their account whenever the balance falls below a configurable threshold or at any time. The system also allows for automatic top-ups for credit card/debit card accounts.

The Top-Up Manager is pre-integrated with the Oracle Communications BRM. Voucher Management solution to allow for top ups using vouchers. It can also easily be integrated to other external voucher systems.

**Voucher Manager**

The Voucher Manager enables customers to securely manage lifecycle of electronic vouchers and voucher cards. By allowing resources to be bundled together, vouchers enable subscribers to access traditional prepaid cash top-up services as well as access next-generation service bundles in a single voucher. Vouchers can be used as a bundled offering by transferring currency and non-currency credits to a balance group. In addition to providing greater subscriber payment flexibility, vouchers also offer service providers an avenue to access retail or online sales channels.

**Collections Manager**

The Collections Manager is an optional but integral part of the Oracle Communications BRM solution. It is a comprehensive and flexible collections system that supports the critical features that make up a collections processing solution. It enables customers to preprocess delinquent accounts in-house and, as a last resort, to sell the debt to outside collections agencies.

**Revenue Sharing and Settlements**

The Oracle Communications BRM revenue sharing and settlements capabilities provide a convergent platform for settlements between business entities. The settlement and remittance
functionality allows providers to share revenue with and pay royalties to third-party partners, which may include other service/network providers or content providers. For example, a wireless operator that offers online games to its subscribers would typically pay a portion of its revenues to the game content provider. The Oracle Communications BRM application supports multiple business models such as revenue sharing, wholesale, and resale.

Revenue Sharing and Settlements capabilities provide the following core functionalities:

- Ability to integrate the third-party systems with the Oracle Communications BRM Content Manager for the authentication and authorization of services.
- Ability to flexibly define and charge the customers for third party products such as content and commerce services.
- Ability to settle the revenue with partners for various business models such as wholesale, resale, and revenue sharing. In addition, it is also possible to use this manager to generate commission statements to dealers or sales agents to compensate for services sold.
- Ability to delay revenue sharing with a partner until after the partner service is billed to the customer or after the payment has been made by the customer.
- It is also possible to do bi-directional settlements such as a partner paying a service provider a rental fee to connect to their network while, simultaneously, the service provider shares revenues for the partner’s services that have been provided to the service provider’s subscribers.

Roaming

The Oracle Communications BRM solution offers a comprehensive solution to process roaming calls and data interchange with other network operators. Roaming allows customers of one network operator to use their mobile phones in foreign networks. They can travel to other regions or countries and use the services of any network operator that has a roaming agreement with their home network operator.

The BRM application allows network operators to perform the following:

- Out-collect processing. Rate the usage for customers from another network operator (visiting customers) when they use the home operator’s network; assuming there is an established roaming agreement between the network operators.
- In-collect processing. Rate the usage for events created by your subscribers while using another operator’s network. With in-collect processing, operators receive event records and a bill for the aggregated charges of the events.
- Similar to out-collect processing, all data received from another network operator for roaming usage of subscribers is rated according to the roaming agreement between the two operators. The input data is in either TAP3 or CIBER files, depending on what is specified in the applicable roaming agreement. TAP files are validated as per the specifications in GSMA TD.57.
Oracle Communications BRM application fully supports the creation of RAP files according to the Returned Accounts Procedures (RAP) version 1.4 as specified in GSM Association TD.32.

Interconnect

For carriers that must keep track of and bill for interconnection charges using interconnect billing systems, BRM’s Interconnect capabilities enable them to manage their carrier relations and wholesale operations. The Oracle Communications BRM Interconnect capabilities provide support for the following:

- Circuit-switched services, voice over IP (VoIP), GSM, Wireless GPRS, UMTS, WAP, IP, GSM, and fixed-net circuit-switched, as well as packet-switched, IP-based services
- Freely configurable CDR/EDR/IDR formats; new fields and structures are easily added via configuration
- Flexible rules-based evaluation, guiding, and processing that provide product configuration and service-level agreement dependencies without add-on development
- Multiple network model configurations for optimal planning and simulation of future interconnection agreements
- Parallel evaluation of alternative network setups, including dynamic routing
- SLA support for QoS-based charging principles definition and monitoring of dynamic service-level agreement and validation
- Multiple parallel-rating and promotions for various IC billing scenarios such as ICP carriers, reseller, content-provider, competitor-analysis, and best-rate
- Multiple parallel and online aggregation scenarios
- High-performance compression of vital business information
- Unlimited calculation of usage statistics such as margin analysis, commission evaluation, sharing calculation, and revenue stats
- Unmatched real cross-product-volume-discounting; any discount can be directly granted to any other service or product combination
- Built-in script programming language that supports implementation, enhancement, and manipulation for new guiding, splitting, mapping, rating, and pricing rules
- Parallel tariff simulation for Interconnect carrier agreement verification and analysis
Revenue Analysis

Revenue Analysis occurs across the entire Revenue Management lifecycle. 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 and revenue leakage.

The Oracle Communications BRM application provides services providers with business intelligence and operational controls. The following revenue analysis processes and capabilities are included in the Oracle Communications BRM:

- **Revenue Assurance** Data consistency, redundant processes, system high-availability, and transactional completeness. Automated monitoring and notification. Business operational process, tools, and error analysis.

- **Reporting.** Reconciliation, interactive and dynamic reporting, and notification.

Benefits of the revenue analysis features in Oracle Communications BRM solution include:

- Reduce revenue leakage and exploit market upside through effective business intelligence
- Reduce cost of operations through revenue simulation capability
- Reduce revenue leakage with usage verification
- Enhance business visibility and intelligence and operational responsiveness through real-time reports and notifications
- Reduce revenue leakage and provide data consistency with transactional completeness

Revenue Assurance

Revenue Assurance refers to the process used to verify the end-to-end completeness, accuracy, and integrity of capturing, recording, rating, and billing all revenue generating events as they flow through the system. Revenue Assurance enables operators to answer the following types of questions:

- Is all usage being rated, recorded, and billed?
- Are all subscribers being billed appropriately?
- What is the status of a specific usage event or batch of events?

Revenue Assurance Manager

One of the tools available in the Oracle Communications BRM solution is an optional manager called Revenue Assurance Manager. The Revenue Assurance Manager is an important tool for
any operator that wants to ensure the end-to-end completeness, accuracy, and integrity of capturing, rating, recording, and billing all revenue-producing events flowing through The Oracle Communications BRM system. The Revenue Assurance Manager provides a framework for collecting audit information about the rating and billing processes. The framework consists of a set of control points that can be configured to capture audit data at different points within the Oracle Communications BRM rating and billing applications.

The Oracle Communications BRM application provides a set of aggregation scenarios that can be configured throughout the batch rating system and act as the control points where revenue assurance data is captured. The control points within the batch rating system are fully configurable, meaning that users can specify where they should be located and what data is captured at each point.

Users can build and run reports against the revenue assurance data to ensure the accuracy and integrity of the rating and billing processes as well as that of any custom applications the users may have instrumented on their own.

Automated Monitoring and Notification

With its superior transactional real-time architecture, the Oracle Communications BRM solution enables real-time event monitoring and notification based on extensible business rules defined by the service provider. All transactions entered and processed by the system are tracked as “events” and logged for audit and control purposes. The Oracle Communications BRM application also supports a flexible event notification framework that can be configured to notify various impacted systems and users when the qualifying criteria have been met. The notification framework is extensible in order to implement specific business rules defined by the service provider.

Suspense Management

Suspense Management is an operational system that provides users with the facilities for managing events that have been suspended while processing through the Oracle Communications BRM batch rating system. The batch rating system suspends events for various reasons. Often suspended calls result from a rate plan that is not appropriately defined for a given event, or because an event field contains an invalid value.

For customers leveraging the Oracle Communications BRM batch event processing solution who want greater control over suspended usage events, Suspense Manager enables operators to view, edit, recycle, write-off, and audit the events that were suspended while processing through the rating system. These capabilities provide users with much greater operational control over their usage processing, allowing them to analyze problems that are causing events to suspend. This enables them to correct the errors, recycle the events, eliminate the errors from occurring in the future, and ultimately minimize the potential for revenue leakage.
Reporting

The Oracle Communications BRM reporting solution enables service providers to perform revenue analysis, reconciliation, and deliver operational insight by leveraging the data captured by the various applications and processes supported by the system.

Oracle’s industry leading reporting platform, Oracle BI Publisher, is used to enable reporting for the BRM application. A number of pre-defined BI Publisher report templates are included with the BRM application. In addition, Oracle BI Publisher allows for customers to easily extend and build report templates specific to their business needs.

Some of the key features of Oracle BI Publisher are:

- Users can develop report templates in familiar desktop tools like MS Word, MS Excel or Adobe Acrobat. This significantly reduces the time and cost to develop and maintain reports.
- Supports generation of reports in various output formats: RTF, PDF, Excel, HTML, XML.
- Reports can be delivered to printers, email, fax, ftp or published for online viewing or to a web portal.

The pre-defined report templates in BRM enable customers to get a head start on report development. Report templates provide specific functionality for targeted groups such as sales, marketing, finance, and accounting. Template examples include general ledger, A/R aging reports, G/L chart of accounts, product cancellations and subscriptions, and remittance, as well as market-specific examples. Combined with BRM’s documented data schema, users can rapidly build and deploy custom reports.

Technology Platform Extensions

In addition to the extensive set of functional and operational capabilities discussed, the Oracle Communications BRM application also offers a set of platform extensions. These technology platform extensions help to scale the system and improve performance, facilitate integration with external applications, and expedite the system deployment and development process.

- AAA Gateway Manager
- LDAP Manager
- Multi-database (Multi-DB) Manager
- Enterprise Application Integration (EAI) Manager
- Web Services Manager
- Deployment Tools
- Development Tools
AAA Gateway Manager

The AAA Gateway Manager is an optional feature that provides an interface to the network. It provides high-speed translation from the protocol used by the network Service Control Point (SCP) to the BRM communication protocol and makes calls to the Revenue Capture Platform where authorization, authentication, event rating, and account balance updates are performed.

The AAA Gateway Manager provides support for HP OpenCall’s Message Based Interface (MBI) and Diameter protocols via two separate packages that may be licensed as add-on options to the AAA Gateway: the HP OpenCall Manager and the Diameter Charging Manager.

The AAA Gateway supports both the latency and high availability requirements for prepaid. CDR processing is monitored for latency by a timeout monitoring facility in the AAA Gateway. If the timeout facility detects an unacceptable latency, the CDR can then be processed based on a configurable set of business rules. For example, if an authorization request is for a local call, business rules might indicate approval following the timeout of such a request, while a timed-out request for authorization for an international call might receive a denial.

The Oracle Communications BRM application can operate in a degraded mode, if necessary—in the event of a failure in a lower-layer component within the revenue capture platform. For example, the system can maintain service authorization availability if the primary AAA Gateway loses connectivity to its Connection Manager. Even when operating in a degraded mode, the system prevents revenue leakage, by ensuring that all events are captured in a replay log and persisted to disk for durability. Use of the replay log then ensures that each event undergoes charging as soon as the system recovers.

To support the high availability requirement for prepaid, multiple connections to the network are maintained. Each AAA Gateway manager connects to at least two distinct Connection Managers, which in turn route requests to appropriate business logic modules within the Revenue Capture Platform. The design of the Oracle Communications Billing and Revenue Management Solution allows time-sensitive requests such as authentication and authorization to be performed by accessing data from the high-speed Transactional In-Memory Object Store (TIMOS) cache.

For more information on TIMOS, please see the Technical Overview—Object Tier section of this document.

For a more detailed discussion of Oracle Communications BRM prepaid solution and architecture, please see “Exceeding Performance and High Availability Requirements for Prepaid”, a white paper by Oracle Communications Global Business Unit.

Multi-DB Manager

Multi-database Manager is an optional feature that enables multiple databases to be used within a single Oracle Communications BRM installation. Multi-database capabilities allow accounts and
their associated objects to be distributed across multiple databases. This enables providers to support very large installations, both in terms of the number of subscribers and the workload.

A multi-database system consists of one primary database and one or more secondary databases. When designing a multi-database system, the Oracle Communications BRM administrator has control over how the account data should be distributed. Typically, all account information is stored in the secondary databases. Configuration data, such as price lists, is stored and updated in the primary database, and then replicated to the secondary databases at specified intervals. The Oracle Communications BRM application uses configurable database priorities to determine the appropriate database for account creation and data distribution. After the initial configuration, all data storage and retrieval is handled by the Oracle Communications BRM, completely transparent to users.

**EAI Manager**

The Oracle Communications BRM Enterprise Application Integration (EAI) framework is an optional manager that facilitates integrations between Oracle Communications BRM and other enterprise applications. It ensures data synchronization and minimizes data duplication among applications. The EAI Manager assembles and publishes BRM business events through a consistent interface. A connector—built by the service provider or a systems integrator—transfers that data to and from the actual enterprise application.

EAI Manager publishes a default set of business events in XML format. Developers can specify additional events by defining the business events in a configuration file, or publish a subset of the default events by modifying the configuration file.

**Web Services Manager**

Web standards enable companies to more quickly integrate disparate applications within an enterprise. The Web Services Manager provides a standards-based way to obtain data from BRM—for instance, accountholder bill summaries or account balances—as well as to send data to BRM in the case of account creation or product purchases.

The Web Services Manager accepts SOAP messages sent over HTTP. The payload in the message contains an input flist (or API parameters) in XML format and specifies the opcode (BRM API that performs a specific BRM function) to call. The Web Services Manager converts the input flist from XML into native PCM implementation and calls the specified opcode. The output flist is converted back to XML format and sent back to the caller as a return SOAP message.

**JCA Resource Adapter**

The Oracle Communications BRM JCA Resource Adapter is based on J2EE Connector Architecture (JCA) 1.5 standards.
With the growing need for business process optimization, efficient integration with existing back-end applications has become the key to success. BRM JCA Resource adapter primarily addresses the need to provide a connectivity platform for integrating complex business processes in a tightly coupled way. The adapter is deployed on a J2EE-compliant application server, such as Oracle Application Server or WebLogic Server. External applications send requests for information to the adapter, which then calls BRM opcodes and returns data to the external application. This enables any J2EE-compliant application to integrate with the BRM server for optimizing business processes.

The BRM JCA Resource adapter leverages the Connector Architecture for supporting global transactions, Java Unified Logging (JUL), security and connection management.

Deployment tools

Pipeline Configuration Manager

The Pipeline Configuration Manager is one of the optional managers built to expedite the Oracle Communications BRM deployment process. The Pipeline Configuration Manager provides a set of scripts and utilities that can be used to configure pipelines and load data into the Pipeline database.

The aim of this component is to provide a toolset to ease and speed the configuration of the batch rating platform, or the Pipeline. The Pipeline Configuration Manager can be used to do the following:

- A utility is provided to configure the Pipeline after it has been installed. This utility reads a set of sample data files and runs a set of scripts that load data and configure a sample set of pipelines.
- A utility is used to load pricing data into the Pipeline database. A user can migrate legacy data by adding the data to an XML file and run the utility to load the data.
- The toolset will speed up the initial configuration of the Pipeline as well as future updates.

Conversion Manager

The Conversion Manager is an optional manager used to convert account and billing information from a legacy system to the Oracle Communications BRM database using a set of APIs/opcodes that are included in the Conversion Manager package. Data files and mapping specifications are fed to the Conversion Manager utility. The mapping specifications tell the Conversion Manager how the legacy data should map to the Oracle Communications BRM format. Mapping specification files exist for each type of supported data:

- Account data
- Service data
• Bill data
• Product deal data

The Conversion Manager will make the data migration process easier for the service provider, thereby reducing the cost of deployment and speeding the implementation process.

Development Tools

The Oracle Communications BRM application offers a wide range of tools for developing and enhancing Oracle Communications BRM functionality. These tools include the Developer Center, the BRM Software Development Kit, a Data Dictionary, and the Localization Software Development Kit.

Developer Center

The Developer Center provides a Java-based integrated development environment for customizing and extending the Oracle Communications BRM functionality in an integrated environment. The developer tools ease the tasks most frequently performed by developers. Developer Center tools include the following:

• Storage Class Editor (SCE). SCE enables developers to take full advantage of the open architecture and extensibility of the Oracle Communications BRM system by providing a point-and-click interactive user interface to extend the object schema easily and intuitively.

• Object Browser. This GUI-based application allows developers to view object instances in the Oracle Communications BRM system for specified storable classes. The tool provides a set of functionality supported in the Testnap command line utility in an intuitive GUI.

• Opcode Workbench. Opcodes are BRM APIs that perform specific functions. The Opcode Workbench facilitates the testing and troubleshooting of opcodes in an interactive graphical environment. It supports a set of functionality available not only in the Testnap command line utility, but also in the integrated development environment of Developer Center.

• Universal Event Mapper (UEM). Used in conjunction with the Universal Event Loader (UEL) and the Universal Event Importer (UEI), the UEM is a GUI tool that enables developers to specify how to parse and filter usage event files. The template specifications, once created with the GUI tool, are stored in the BRM database for use during the usage loading process. UEM also allows developers to create event templates based on the format of usage files that contain usage data.

The BRM Software Development Kit (SDK)

The BRM Software Development Kit (SDK) provides developers with the components needed to extend and customize BRM functionality within an organized and consistent directory structure. It includes the following components:
- All public libraries and include files, including C, C++, Java, COM, and Perl libraries
- Sample source code that compiles and works for all supported languages
- All policy FM code with relevant working makefiles
- Templates to create custom FMs and DMs
- Debug version of the CM for enabling policy or custom FM debugging
- Debug version of the DM for enabling DM debugging

**Customer Center Software Development Kit**

The Customer Center (SDK) allows for configuration and customization of User Interfaces for Customer Center and Self-Care Manager so it can be tailored to support the specific business operations of the service provider.

The customer center SDK includes:
- A graphical interface for configuring the UI appearance and behavior
- Scripts and source code examples for extending or customizing the functionality
- Provision for testing customizations locally and deploying to production

**Data Dictionary**

The Data Dictionary simplifies the BRM system administration by serving as a central repository for all field, storable class, and opcode definitions within the BRM system. The Data Dictionary is dynamic, enabling providers to make modifications on the fly. So code changes can be implemented without having to stop and restart the database.

**Localization Software Development Kit**

The Localization SDK is used to develop localized versions of BRM non-developer client tools for languages not supported by Oracle Communications BRM. The Localization SDK supports the following:
- Translation of software menus, dialog boxes, and online help for The Oracle Communications BRM client applications, including those written using Microsoft Foundation Class (MFC) or Java.
- Localizations of Western European locales—or more precisely, locales whose languages are written with the Roman alphabet.
- Double byte, or East Asian locales such as Korean, Japanese, Traditional Chinese, and Simplified Chinese.
Enterprise Application Integrations

As business processes have evolved, service providers have to maintain a massive BSS infrastructure that consists of a number of software systems. Billing systems are at the heart of this BSS architecture requiring integrations with the network systems on one end and with enterprise applications like CRM systems and financial systems on the other end. This problem is compounded as mergers and acquisitions bring in a new set of systems to be folded into the same infrastructure. Traditional integrations in the field are costly to maintain and rigid in nature. This result in inability to respond to shifting market needs and curb the innovation necessary to have the competitive edge.

Oracle takes the complexity out of the service provider’s hands by providing pre-built integrations for Oracle Communications BRM with leading industry applications to support an end-to-end business process. This greatly reduces the total cost of implementation and maintenance for the service provider. The integrations are designed using open, standards-based methodologies allowing for easy extensibility.

Applications Integration Architecture (AIA) for Communications

Oracle Application Integration Architecture provides an open, standards-based framework for creating cross-application business processes that support the way organizations run their business today, while paving the way for long term, strategic, business transformation plans. Oracle Application Integration Architecture is powered by Oracle Fusion Middleware, the industry's most comprehensive family of integrated, standards-based, and customer-proven middleware products.

Oracle Application Integration Architecture for Communications is Oracle's approach to delivering end-to-end, integrated business processes, applications and technology for the communications industry. Within the AIA for Communications framework, Oracle Communications BRM is integrated with Siebel CRM and Oracle EBS Financials via three Process Integration Packs (PIPs): Order to Bill, Agent Assisted Billing Care and Revenue Accounting.

Order to Bill

The Oracle Communications Integration Pack for Order to Bill automates the order management process between Siebel CRM and Oracle Communications BRM, including automatic product and price synchronization, customer synchronization and integrated order processing.

To ensure the accuracy and real-time availability of customer, billing, product, and pricing data for improved customer service and value it offers the following key features:

- Product and price synchronization between BRM and CRM
• Customer synchronization between CRM and BRM
• Create new customers
• Update existing customers
• Integrated order management
• Process sales order
• Interface fulfilled services to Billing
• Update sales order
• Agent Assisted Billing Care

By connecting Siebel CRM with Oracle Communications BRM, the Oracle Communications Agent Assisted Bill Care PIP provides real-time access to critical billing information through a single point of entry, Siebel CRM. Agents can now gain real-time access to customer billing information, including four tiers of customer account balance data, three tiers of invoice data, payment and adjustment history, and collections information.

Revenue Accounting

The Communications Revenue Accounting PIP moves General Ledger data from Oracle Communications BRM to the Oracle E-Business Suite application, thus enabling customers to use Oracle General Ledger as an accounting engine on top of the Oracle Communications BRM application - it provides an automated interface of general ledger reports from the Billing system to Oracle General Ledger.

Integration with Oracle Communications Services Gatekeeper

With increasing competition, service providers need to distinguish their offerings by launching new innovative services in the shortest time possible. Oracle Communications Services Gatekeeper (OCSG) delivers a converged service exposure layer, providing operators the choice and flexibility of using web, SOA or telecom interfaces to expose their network capabilities to third party partners. This enables service providers to maximize revenue from legacy fixed and mobile network investments and also future proofing its investments for service exposure through IP networks.

Oracle Communications Services Gatekeeper is integrated with Oracle Communications BRM using a set of three integration points:-

• The Parlay X 2.1 Payment/DIAMETER communication service allows applications to reserve funds from subscriber accounts and charge them directly on-line using the DIAMETER Ro interface.
• Any request flowing through Oracle Communications Services Gatekeeper can be subject to credit control checks. Using criteria based both on the request data and other configurable data, these interceptors pass requests to the BRM server using the DIAMETER Ro interface. BRM server verifies that the subscriber or application has enough credit to allow the request. Credit control checks can be performed both for application-initiated and network-triggered requests. All, or a configurable subset of the requests, can be subject to these credit control checks.

• Offline billing is supported using the CDR to Diameter Service. Charging Data Records (CDRs) generated by Oracle Communications Services Gatekeeper are passed on to the BRM server using the DIAMETER Rf interface.

The Oracle Communications BRM Architecture

Flexible and open architecture is one of the key strengths of the Oracle Communications BRM solution. Service providers can easily customize and extend the solution to fit their specific business needs. The development tools allow service providers to more easily leverage the open architecture and create the desired systems behavior with less cost and higher efficiency.

The Oracle Communications BRM application offers a scalable, flexible, highly available architecture that delivers open APIs and integration with industry-leading applications. For any provider in any market, the Oracle Communications BRM application is a powerful, convergent platform that offers unparalleled support for multiple services, and enables business agility.

This section provides a technical overview of the Oracle Communications BRM architecture and explains how the architecture delivers the full range of capabilities required for success in the competitive and demanding communications and media industry: scalability, reliability and availability, security, extensibility, purging/archiving, legacy integration, and internationalization.

Technical Overview

The Oracle Communications BRM architecture provides the foundation for the end-to-end Oracle Communications Billing and Revenue Management solution. Most functionality is segregated into layers using well-defined interfaces, enabling each to be modified and enhanced without disrupting functionality at the platform level.

At the same time, this design allows the platform to evolve without adversely affecting functional capabilities. As a result, Oracle is able to develop and advance Billing and Revenue Management capabilities rapidly, while allowing service providers to easily extend the system to meet unique business requirements.

Figure 8: The Oracle Communications BRM Architecture
The Applications Tier

The applications tier consists of programs and processes that use the object-oriented API as an interface to the BRM system. This tier includes the BRM client applications such as Customer Center, Pricing Center, and BRM server applications such as billing, invoicing and collections. Third-party applications developed by customers and partners also use the same documented APIs. All enterprise as well as network applications would integrate and interact with the Oracle Communications BRM system through the applications tier.

The BRM Server

The BRM server consists of the following components: the Real-Time Revenue Management Server, the Batch Processing Server, the Object Server and an optional Transactional In-Memory Object Store (TIMOS).

- **The Real-Time Revenue Management Server** enforces business policies. It consists of Connection Managers (CMs), discounts, re-rating, zoning and facilities modules. The CMs manage connections between the application tier and modules process data collected by BRM client applications and enforce the business rules. This architecture allows the Oracle Communications BRM system to be easily customized to meet unique business requirements.

- **The Object Server** provides an abstraction of the stored data. This layer consists of Data Managers (DMs) that translate requests from CMs into a language recognized by the BRM database or other data access systems. The Oracle Communications BRM system provides
separate DMs for each supported database. In addition, there are DMs for other external systems, such as the credit card processing service provided by the Payment Managers.

• **The Transactional In-Memory Object Store (TIMOS)** component of the object server was introduced to support the requirements prepaid business model in the communications industry. TIMOS leverages the fast access speeds of system memory (RAM) to improve throughput and latency for time-critical operations. For example, authentication and authorization requests can be performed by accessing only data from the TIMOS cache. Requests that can tolerate higher latencies, such as an account query by a customer service representative or billing requests, bypass the TIMOS Data Manager, accessing the database directly via a Database Manager. This minimizes any impact that the non-real-time or non-time-critical requests have on the latency-sensitive requests.

• **The Batch Processing Server** is optimized to handle large volumes of transactions (e.g. hundreds of millions of transactions per day) in terms of preprocessing, enrichment, duplicate checking, aggregation, and rating among other functions.

For a more detailed discussion of the Oracle Communications BRM prepaid solution and architecture, please see “Exceeding Performance and High Availability Requirements for Prepaid”, a white paper by Oracle Communications Global Business Unit.

**The Data Tier**

The data tier consists of the BRM database and other data access systems. The BRM application currently supports Oracle Enterprise Server databases, including advanced compression mode, which customers must purchase separately. The Oracle Communications BRM is pre-integrated with other data servers at this tier; for example, credit card processing, LDAP and taxation systems.

**Figure 9: The Oracle Communications BRM scalability architecture**
The Oracle Communications BRM application achieves high scalability in several ways. First, its multi-tier architecture is designed to run all BRM processes on the same computer or distributed among several computers. Distributed processing allows for maximum flexibility and optimal load distribution when configuring a BRM system and as the number of users expands. As a result, service providers can add as many servers as required at the process, object, and data tiers.

A second factor that contributes to the high scalability of Oracle Communications BRM is the combination of transactional real-time and near real-time batch processing that utilizes a multi-threaded, pipelined architecture and in-memory processing. Integrated support for both types of rating allows extremely high performance.

To further improve scalability, Oracle Communications BRM allows providers to easily balance load processing by reconfiguring client and database connections. This enables providers to smooth out usage spikes at the front-end and avoid bottlenecks at the database level.

Finally, transaction management functions have been built into the object layer, enabling Oracle Communications BRM to fully scale and take advantage of the underlying hardware. Without this capability, load balancing would be limited beyond a certain level of transactions.

**Figure 10: The Oracle Communications BRM high-availability architecture**
Reliability and Availability

As the Oracle Communications BRM application is designed to take advantage of redundant processing capability, adding systems can immediately increase reliability and availability as well as scale performance. Further, systems can be added without interruption, thus ensuring continuous operation.

The Oracle Communications BRM also supports automatic rerouting and reconnection throughout the system. As a result, if a server supporting a client application at the process tier fails, the client attempts to reconnect and reroute through an alternative path.

The Oracle Communications BRM supports high availability in the object server layer as well. Multiple AAA Gateway managers can be configured to operate in an active/active or in an active/standby mode. If a TIMOS Data Manager fails to respond to a request, the system automatically fails over to the backup TIMOS Data Manager. During the switch to the backup server, the system ensures that the response is sent within the required latency limits.

In addition, The Oracle Communications BRM supports full transaction semantics. Client applications can open transactions that group multiple object transactions into a single atomic operation that can be committed or aborted. The underlying DBMS can be used to guarantee this transactional integrity.

High availability at the database level is supported by Oracle’s RAC (Real Application Cluster) software.

Operations Management
The Oracle Communications BRM solution includes an Operations Management Framework (OMF) as the basic framework to instrument, and collect information from all BRM processes that are based on the Pipeline Framework (IFW) or Multi-Threaded Framework (MTF). This includes processes such as the AAA Gateway, Batch Rating, Real-time Pipeline and DM_TIMOS. This Operations Management Framework consists of several sub-components that are used to collect, access, and display data on the instrumented processes.

The Oracle Communications BRM application offers the following out-of-the-box operations management capabilities:

- Centralized management console
- Process monitoring and management
- Performance monitoring

Oracle Application Management Pack for BRM provides application life-cycle services for the BRM application suite. By combining Oracle Enterprise Manager’s enterprise management solution with BRM application suite, IT organizations can significantly reduce the cost and complexity to manage a production BRM environment.

The Oracle Communications BRM application also leverages the use of third-party systems management products and provides an out of the box integration with HP OpenView. Additionally, the monitoring agents and open APIs allows for field integrations with other large scale enterprise management tools like BMC Performance Manager, IBM Tivoli etc.

**Centralized Management Console**

The Oracle Communications BRM application is a distributed system, and a typical configuration will have different processes running on several different servers. The Centralized Management Console provides the ability to view a graphical representation of the BRM process topology. The Oracle Application Management Pack for BRM provides a consolidated view across all managed BRM processes in a browser based console, facilitating the end user to easily visualize, monitor and control BRM processes from this central location.

The process topology information is stored in a standard file format that can be used for field integrations to other third-party systems management products.

**Performance Alerts**

The Oracle Communications BRM operations management allows defining performance thresholds. The system is instrumented to collect appropriate performance information, and compare this data with the predefined configuration settings. Alerts are displayed in the central management console if performance drops below the predefined thresholds.

**Performance History**
The Oracle Communications BRM system is configured to capture and save the performance related information during a specified time period. This will enable users to compare and analyze system performance between different time periods. Historical information is retained for a configurable period of time. Users are able to modify the default setting in order to meet specific needs and requirements.

Security
Security is an integral part of the Oracle Communications BRM architecture. All layers within the system are single TCP/IP port listeners, which facilitate the use of firewalls, proxies, and filters. In addition, all client connections are fully authenticated, so only authorized users and programs have access to the remainder of the system.

The Oracle Communications BRM implements applications, such as the CSR interface, as thin clients. The client application handles the display of data while all the processing is done at the business process tier, which is typically on a server that is in a more secure and carefully managed environment. Additionally, the Permissioning Center provides security/access control functionality for defining and controlling user permissions and access level for all Oracle Communications BRM Client Application Center-enabled GUIs such as Customer Center, Pricing Center, and Suspense Management Center.

Because Oracle Communications BRM can monitor, analyze, and control usage sessions in real time, it further reduces exposure to fraud. For example, Oracle Communications BRM can automatically deny access to duplicate login attempts.

The Oracle Communications BRM application supports two encryption schemes: Messages-Digest algorithm 5 and Advanced Encryption Standard 256 bit (AES-256). All data in the BRM database can be encrypted using one of the above encryption schemes.

Extensibility
Extensibility, a core element of the Oracle Communications BRM architecture, is achieved through well-defined APIs at each level of the system and as a result of an object model that supports full inheritance. These features make it easy to extend interfaces in a number of ways. Oracle Communications BRM simplifies extending of objects at the database level via the Developer Center component thus enabling for new services to be rapidly introduced to the market.

The Oracle Communications BRM provides a standard set of applications. For customers needing custom applications, the Oracle Communications BRM offers a set of client libraries for C, C++, Java, and Perl—the same libraries used by The Oracle Communications BRM applications. The BRM application also provides a wide range of features and default business policies. These policies are implemented in Policy Modules, for which source code is provided.
with the product. Customers can tailor these business policies or create additional policies to implement business specific features. The Oracle Communications BRM application supports the creation of custom Process Modules that can leverage the hundreds of existing high- and low-level system operations and/or implement new operations.

Oracle Communications BRM is a highly flexible platform that enables implementation of new applications to support evolving business models and fuel innovation in bringing new services to market.

Purging and Archiving

Database growth rates can be extremely high for companies with large numbers of subscriber accounts and offered services. To help service providers manage this growth, Oracle Communications BRM enables service providers to maximize system resources by purging nonessential data from production databases. Using this feature, event tables and their indexes are divided into smaller, more manageable pieces known as partitions. Service providers can then simply drop a partition that contains events that have become obsolete.

This capability is designed for the purposes of purging obsolete events from the BRM database only, not for archiving data. For data archival, Oracle recommends that customers archive or back up any partitions before purging, using compatible third-party backup utilities.

Platform and Database Support

Please contact your local Oracle CGBU representative for details regarding supported platforms.

Integration with Legacy Systems

The Oracle Communications BRM application allows transparent integration with other systems including legacy systems. Operations that are routed to a legacy system for execution appear as object operations within the BRM system. Applications that need to interface with the legacy system are written to the same API as other applications. The translation from BRM object operations to legacy system operations is implemented as a Data Manager (DM) communication between the BRM object tier and the external system is completely transparent to the remainder of the system. Custom DMs can also be created to interface with highly specialized storage mechanisms.

Internationalization and Localization

With the Oracle Communications BRM solution, enterprises can deliver localized products to a diverse audience. The Oracle Communications BRM server database is globalized to support single-byte and double-byte characters; and client tools may be localized to support noncomplex text, single-direction languages.
The Oracle Communications BRM client tools, including their online help files, are available out of the box in several languages in addition to English. Please see official product documentation for details.

Configuration information and server messages are kept in English only. Error and warning messages for client tools have been translated into the target language. Each account in the Oracle Communications BRM also contains a locale attribute, which can be accessed by customer-written applications. Dates, times, currency, and other attributes are displayed in the format determined by the operating system settings. For example, if the client system locale is French, this data is displayed in the format commonly used in France. Canonicalization support is also available for the Western European languages.

**Multi-Currency**

Each Oracle Communications BRM installation must declare a default (system) currency, to which all accounts will default. Each account can default to the system base currency or be defined for another currency. The currency declared for an account dictates the currency of the accounts receivables. For example, an account in U.S. dollars maintains its balances in U.S. dollars only. An account in Japanese yen maintains its balances in Japanese yen only. The exception to this is the Euro, which is discussed below. There are no restrictions as to the currency of an individual account, except that subordinate or sponsor-billed accounts must be in the same currency as their parent or sponsor account.

Product purchases against an account can be processed in the account currency or in the system currency. If the account currency is different from the system currency, any products valued in the system currency that are purchased by that account are immediately revalued (using a fold) into the account currency. The currency conversion fold is maintained in the Pricing Center. This fold is real time; that is, all currency conversions are made with the current fold rate.

General ledger amounts are kept in the currency in which the data was posted. The General Ledger report separates the amounts by resource ID. Since each currency is a separate resource, the G/L amounts are separated by currency type.

**Internationalization Architecture**

The Oracle Communications BRM application supports its internationalization capabilities through two components: Globalized Server and Internationalized Clients.

The Globalized Server provides database support for single-byte and double-byte character sets, as well as database support for noncomplex and complex text.

The localization SDK is used to customize out-of-the-box client localizations and to create new localizations for noncomplex-text, single-direction languages.
The Internationalized Clients component enables client tools to be localized. Please consult with your Oracle representative for the list of available localized versions.

**Conclusion**

Oracle—with the industry leading Oracle Communications Billing and Revenue Management Solution and the help of strategic partners in its extensive value chain—delivers a convergent platform that enables service providers to manage the end-to-end revenue lifecycle for maximum profitability.

As the communications and media markets continue to evolve, service providers are facing significant business challenges on various fronts. Increased competition locally and globally, erosion of customer loyalty due to commoditization of services, and decreasing margins for traditional service offerings are making it necessary for service providers to transform their businesses to meet new market demands.

The Oracle Communications BRM solutions provide a breakthrough approach to doing business. Oracle Communications BRM enables service providers to adapt to the changing market with agility—equipping them to transform their businesses by:

- Transitioning to a customer-focused business and intensifying efforts on customer retention and satisfaction.
- Converging business systems to a single platform with the business agility to support multiple services, multiple business models, and multiple customer and partner relationships across networks, devices, and geographies.
- Sustaining competitive advantage with the ability to spot new market opportunities and quickly launch innovative service offerings.
- Consolidating revenue management solutions to an integrated platform, thereby reducing operational costs and gaining complete visibility of revenue data.
- Reducing total cost of ownership and enabling efficient business processes by providing pre-built, open, standards-based integrations to leading enterprise applications.

Oracle Communications BRM provides the complete end-to-end solution for managing revenue, supporting the key business processes incorporating generation, capture, collection, and assurance of revenue. As a result, communications and media service providers can achieve faster time to market, reduce the risks of innovation, and define the convergent services of tomorrow.