Integrating with Communications Billing Systems: A CRM for Communications Solution

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EXECUTIVE OVERVIEW
Customer Relationship Management (CRM) applications deliver compelling business benefits—improved customer retention rates, more personalized business relationships, increased profitability—to help companies automate, track, and manage customer interactions more effectively.

In most organizations, however, true customer management cannot be accomplished by a CRM system working in isolation. Rather, a CRM solution must work in tandem with other systems in the enterprise, exchanging data or triggering workflow activities to support varied business processes. Providing a 360-degree view of a customer requires access to information from external systems, such as billing, provisioning, inventory management, human resources, and enterprise management.

This document outlines how Oracle’s PeopleSoft Enterprise CRM for Communications can integrate seamlessly with billing systems. We provide a high-level discussion of Oracle’s PeopleSoft Enterprise Integration Broker technology used in these integrations; however, the focus of this paper is the prebuilt functional integration points provided in PeopleSoft Enterprise CRM for Communications. Note that separate discussion documents are available on PeopleSoft Enterprise integration technology.

BILLING INTEGRATION FRAMEWORK
Introduction
PeopleSoft Enterprise CRM for Communications integrates with communications companies’ billing systems. The Billing Integration Framework enables sales and service agents to retrieve, display, and update billing and account information when handling customer calls—all from within Oracle’s PeopleSoft Enterprise CRM. The result is faster processing of customer inquiries, product quotes, and service orders and the sharing of consistent, current information across the organization.

Providing a complete 360-degree view of a customer requires access to information from external systems, such as billing, provisioning, inventory management, human resources, and enterprise management. PeopleSoft Enterprise CRM for Communications provides a comprehensive accounts and billing framework that
efficiently tracks associated users, installed products and services, and customer account and billing data.

This account and billing framework includes prebuilt asynchronous and synchronous messages. In addition to these messages, we have created specific tables within PeopleSoft Enterprise CRM to manage billing and account information that is synchronized for billing transactions occurring within PeopleSoft Enterprise CRM for Communications.

Major integration points include:

- Account creation initiated from within PeopleSoft Enterprise CRM for Communications when a new account is designated upon order entry (otherwise, validation of existing account is performed).
- Modification of products and services in billing based upon changes to existing services and product installations.
- Update of customer account information.
- Bill view and adjustments capability.

Business benefits related to this billing integration framework are outlined below.

<table>
<thead>
<tr>
<th>Benefit for CSP</th>
<th>Feature Function Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide a multidimensional view of the customer across all accounts, services,</td>
<td>Customers can obtain a complete multidimensional view of the customer because the order capture and service management functions (CRM system) are integrated with the billing system:</td>
</tr>
<tr>
<td>bills, trouble tickets, and more.</td>
<td>• Account-related information is captured when a customer orders a service that requires an account to be set up in the billing application.</td>
</tr>
<tr>
<td></td>
<td>• When customers call regarding existing services, the account number that the service is billed on is captured during the transaction—ensuring the change can be accurately reflected on the bill.</td>
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<tr>
<td></td>
<td>• The account component in PeopleSoft Enterprise CRM for Communications tracks all billing account information including:</td>
</tr>
<tr>
<td></td>
<td>• Captures and tracks the detailed data associated with a user’s billing account (payment type, billing frequency, account balance, account status, and so forth).</td>
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<tr>
<td></td>
<td>• Tracks all bills associated with each account.</td>
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<tr>
<td></td>
<td>• Complex account hierarchies support various business scenarios including sponsored accounts (where another entity pays a portion of the bill) and subordinate accounts (where another entity pays the entire bill).</td>
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<tr>
<td></td>
<td>• The bill component in PeopleSoft Enterprise CRM for Communications tracks all bill details including:</td>
</tr>
<tr>
<td></td>
<td>• Tracks bill line items that have originated from the billing application (long distance charges, taxes and tariffs, and so forth).</td>
</tr>
<tr>
<td>Benefits</td>
<td>Details</td>
</tr>
<tr>
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</tr>
</tbody>
</table>
| Significantly reduce the number of call transfers required to support a customer inquiry. | Customer inquiries are addressed with fewer call transfers because the CSR:  
- Has access to the complete, multidimensional view of all customer account and bill information as described above, all within a single application.  
- Bill dispute functionality lets the CSR dispute individual bill line items. Configurable application rules determine whether the dispute needs to be routed to the billing department or whether a credit can be automatically applied to the account—enabling the CSR to eliminate an unnecessary call transfer to the billing department. |
| Increase customer satisfaction by reducing the amount of time required to resolve a customer inquiry. | Customers receive timely answers to their inquiries because:  
- CSRs do not need to access multiple applications to address a customer inquiry rather complete account views (as described above) are available to CSRs to quickly address a customer inquiry.  
- The CSR has the ability to view an HTML version of the bill (if this is provided by the billing application), enabling them to see precisely what the customer is seeing therefore resolving the inquiry more quickly.  
- Customers can access similar account information through Web self-service answering their questions quickly without contacting the call center. |
| Reduce CRM implementation costs and speed return on investment. | Prebuilt integration messaging with communications billing applications reduces the implementation cost and speeds the benefit of installing a CRM system:  
- Billing integration services have been built using PeopleSoft Enterprise Integration Broker technology.  
- Integration functionality includes:  
  - Create new account.  
  - Add service to an account.  
  - Modify existing services (service management).  
  - Modify account and billing information.  
  - Credit account.  
  - View account information.  
  - View bills bill items and bill details. |

In summary, the account/billing framework provides both a consistent user interface for presenting account and billing information and prebuilt business processes that are frequently required in call centers. For each of these processes, PeopleSoft Enterprise CRM for Communications provides prebuilt touch points for integration to billing systems.
Billing Integration Assumptions

The major assumptions made during the design and development of this framework, include:

- The identification of new customers typically occurs in CRM. Whether new customers were identified as prospects to which an organization targeted marketing campaigns or the customers directly contacted an organization to obtain products and/or services, the process remains the same. The customer information is initially entered into CRM, as this is the customer-facing application used to manage customer interactions, including the tracking of information gathered in sales and marketing. As part of establishing a new customer, it becomes necessary to establish an account for the customer. This usually will occur during the initial order entry process.

- The information gathered to establish an account is accomplished using the PeopleSoft Enterprise CRM for Communications account screen and the information is passed to the billing system for account creation. (This can occur in real time, near real time, or batch mode as described below.)

- Once a customer has established an account, additional products and/or services can be associated with the account, and changes to existing products and services can be made. Capturing orders within CRM not only allows for the use of the opportunity management and forecasting capabilities of CRM Sales, but it also allows for the overall management of the order process through CRM workflow and business projects. Each aspect of the process—from credit verification, to account creation, to order provisioning, to activation—involves disparate systems, which can be coordinated through PeopleSoft Enterprise CRM. The information captured through this process needs to be shared with the billing system to ensure that products and services are appropriately reflected on bills. For example, if an existing Internet customer wants to add optional email accounts, the billing system needs to be updated so that the customer is billed for the use of those email accounts.

- With PeopleSoft Enterprise CRM for Communications, assumptions about the association of accounts with bills are as follows:
  
  - Accounts can have multiple bills associated with it (bill cycles).
  
  - Bills have multiple bill items associated with it (for example, rollup of CDRs—Call Detail Records—versus subscription charge).
  
  - Bill items have multiple events associated with it (for example, CDRs).

Billing Integration Business Processes

The following business processes and associated integration points are supported by the prebuilt enterprise integration points (EIPs) to communications billing systems provided by PeopleSoft Enterprise CRM for Communications.
• Create new account.
• Bill/account inquiry.
• View bill.
• Modify payment/bill address information.
• Change service (upgrade/downgrade).
• Modify bill (bill disputes/adjustments).

Figure 1: The graph depicts these business processes, each of which is further described below.

Customer Account Creation

When new customers order products and services via PeopleSoft Enterprise CRM for Communications, information about those customers and the ordered products and/or services need to be shared between CRM and the associated billing system. Typically services cannot be activated nor billed until appropriate customer and account information is established in the billing system. Customer information (such as name, address, payment method, billing cycle, product/service, and price of product/service) is passed from CRM to the billing system to create an account in the billing system. Once the account is created in the billing system, the account number and any other information associated with the account that is needed by CRM are updated in the CRM database. This process is depicted in the flow below.

During the order capture process both customer information and payment information are gathered. As part of the overall order process, this information is published to the communications billing system. Payment information allows for
both new account creation as well as being able to associate a new order with an existing account. When a new account is to be created, the user can associate the new account with an existing account (establishing an account to account relationship) or designate that a new individual account is to be created. The user is also to designate payment method for the account.

Figure 2: When a new account is to be created, the user can associate the new account with an existing account.

Once an order is successfully submitted, CRM workflow (implemented using Oracle’s PeopleSoft Enterprise Business Projects) publishes information to the external communications billing system. Order processing does not proceed until CRM receives a reply message from the communications billing system verifying account creation. Also, during this process, an account record is created in CRM with a status of pending. Once the communications billing system returns its account number, the CRM account record status is updated to Active. All of this processing is invoked by the business project associated with the order.

Bill and Account Inquiry

Account and associated billing information is stored within CRM tables empowering CSRs to quickly and easily respond to customer inquiries. Most information is read-only with special pages being presented to allow updates with the updates being published to the communications billing system. (Updates are described in detail in a later section.) The major categories of information tracked for accounts include:

- **Account details.** Account name, status, customer name, type of account, parent or sponsoring account ID (for account to account associations), start and end date of account.

- **Current billing summary.** Last bill ID, last bill date, current bill ID, bill start and end dates, current bill day, next bill date.
• **Payment method.** Detail displayed varies on the type of payment: invoice, credit card, and automatic bank debit. Changes to payment method can be initiated from the account page.

• **Billing address.** Changes and additions to billing address initiated from the account page. Multiple addresses can be associated with an account with only one address being designated as primary.

• **Account access questions.** Questions and answers that can be used as additional level of security for account access.

• **Account balance.** Current monetary balance and opening balance (for prepaid accounts) displayed.

• **Account usage.** Current usage balance and opening balance (for prearranged usage) displayed. Note that the system supports multiple types of usage, for example, minutes.

• **Bill history.** Bill number, amount, start and end date, and bill due date provided in summary grid. From this grid, the user can drill down to details (bill items) or view an image of the bill. The number of bill cycles displayed is a configurable parameter in the system.

• **Relationships.** Displays relationships to account (beyond the account to account relationship shown on the main page). Relationship types include account owner, primary contact, corporate customer, and user.

• **Dispute history.** Dispute number, status, date created, date closed, dispute type, adjustment type, and resource type is displayed in a summary grid. The number of disputes that can be made against an account is a configurable parameter. (More detail is provided in the section on bill disputes.)

• **Installed services.** The description status and install date of all the services and products associated to the account displayed in a summary grid.

By default the system displays the last information retrieved from the communications billing system. For account balance, account usage, bill history, a button is provided to synchronously retrieve the latest data from the communications billing system. In the case of bill cycles, the amount of data retrieved is a configurable parameter. Once retrieved, this data overwrites the data in the CRM account/bill database tables. Therefore, only the latest information is stored in CRM.

As previously stated, multiple bills can be associated with a single account. For each bill, PeopleSoft Enterprise CRM for Communications provides the ability to display bill items and the event detail for each bill item.

The following describes the general information that applies to a specific bill. Other than adjustment information, it is anticipated that all other information related to a specific bill will be read-only. Most fields are self-explanatory.
Fields that display the general information about a specific bill include: account with which bill is associated (name and number), bill number, invoice number, bill date (date of billing statement), start date and end date (first and last day of bill cycle), bill due date, currency, parent bill ID, previous total, and total due.

For each bill, the following information can be displayed for each specific bill item: description, item status, primary currency, total due, total received, disputed amount, amount adjusted, date opened, and date closed (for disputes).

For each bill item, the following information can be displayed for each associated event: descriptions, destination number, start and end date/time, and total.

The billing framework provides drill-down capability to obtain greater levels of detail about a specific account and/or bill. For example, from viewing information about a specific bill, and the items associated with it, you can drill down on the details of each item. For example, a local tariff may be a specific item, or long distance calls may be a specific item. You can drill down on the long-distance calls item to specifically view each call associated with the item. (These are referred to as bill events.)

Bill events are displayed in a grid, letting the user sort the data by destination number, destination, start and end times, and total (dollars). Agents and customers using the self-service application can submit disputes at the bill item or the item detail (event). When a bill dispute is initiated (through the push of a button), a support case of type = “Bill Dispute” is automatically created. On the case, the amount and reason for the dispute, adjustment amount, if applicable, and other information is gathered, and this information is automatically published to the billing system.

Within the account structure you can define multiple sub-accounts, each of which can be associated with different aspects of a company or household organization. Account relationships include individuals, companies, and other accounts. With account relationships, the standard product supports defining subordinate, sponsored, and individual.

**View Bill**

Often call center agents must access an image of a bill in order to respond to customer inquiries. From the bill history page on the account component, a user can access the image of a specific bill.
Modify Payment and Billing Address Information

Much of the account information is displayed as read-only including payment information. A button is provided to access the following page, which allows the update of payment information.

Change Service

When customers make changes to existing services (adding features, changing rate plans, removing options, and so forth) or suspend, disconnect, resume types of actions PeopleSoft Enterprise CRM for Communications publishes the changes to the communications billing system via business project. (This is similar to the new account creation process that occurs during order capture.)
For disconnect, suspend, and resume actions, CRM prompts for a date that the action is to take effect and publishes this information to the communications billing system. Note that there are separate prebuilt business projects provided for each type of service management action (change features, disconnect, suspend, and resume).

**Modify Bill—Bill Adjustments and Disputes**

A significant percentage of inbound support calls in the communications industry is related to bills and account balances. The CSR needs billing details that reflect details of all the bill items that appear on a bill. The CSR also needs to be able to make bill adjustments and handle disputes.

![Diagram depicting the overall flow](image)

Figure 5: The graph depicts the overall flow.

PeopleSoft Enterprise CRM for Communications lets customers dispute account and bill information at multiple levels: account balance, account usage, bill item, and bill event. (Bill hierarchy is described in the data point section.) Configurable
parameters let administrators set maximum thresholds for each level, as well as a maximum threshold for the account.

Whenever a dispute is initiated, PeopleSoft Enterprise CRM for Communications creates a support case that is designed specifically for bill disputes.

Data specific to the level of the dispute is automatically populated on the case. For example, if the dispute is on the account balance, the account balance information is populated on the case. If the dispute is for a bill item, information related to that item is populated. Figure 6 shows the fields that could be potentially populated when a bill dispute case is created. Note that the dispute status has been changed to Approved. The system automatically updates this field to approve and closes the case if the dispute falls within the configurable thresholds that have been defined for the system. Once the user saves a dispute case, the data is asynchronously published to the communications billing system.

![Dispute Information Table]

**Figure 6:** Bill disputes can be initiated from the navigation menu, the interaction manager, and from customer self-service.

**PRODUCT AND PRICING BILLING INTEGRATION CONSIDERATIONS**

CRM and billing systems often track different information when it comes to products and pricing plans. CRM is focused on information used to support and sell to the customer. Provisioning systems are focused on the information required to activate a service, and billing systems are concerned with the specific parameters of the product that drive one time, recurring, and event-based charges.

Depending on the flexibility of the billing system, one time and recurring charges can be passed to billing from CRM, enabling the CRM system to provide flexible selling options to customers. Generally, the event-based charges must be set up in billing and linked to specific product packages in CRM. CRM provides the ability to take a limited set of rate plans to come up with a large number of flexible customer-tailored selling product packages (as described below).

Due to the unique nature of each billing system’s data model and how it is used within each customer account, the product and pricing synchronization interface is
not prebuilt. Instead, we work with your billing team to identify how your specific implementation of products and pricing can be integrated to the PeopleSoft Enterprise CRM for Communications product and pricing data model.

The sections below provide specific information on how the PeopleSoft Enterprise CRM for Communications product and pricing setup works so you can compare the data views with your specific setup of products and pricing in your billing system(s).

**Product Information**

PeopleSoft Enterprise CRM for Communications provides a flexible product definition paradigm. To understand how this paradigm could be used to represent different products/services requires a basic understanding of this paradigm. The major components of the product hierarchy include:

<table>
<thead>
<tr>
<th>Data/Attributes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packages</td>
<td>Packages group together services, discrete products and service features, and bundles of these products to provide a unified sales offering. Only plans can be selected for ordering in the order entry process. For a product like a handset, it can be included as part of a complex bundled service or offered directly for sale. Packages can include a mix and match of a subset of all the options available for a particular service, allowing sales and marketing more flexibility in product offerings.</td>
</tr>
<tr>
<td>Services</td>
<td>A service is an actual service provided to a customer, such as wireless service or DSL service. You can bundle related services into selectable options. For example, you could have a phone package that includes different makes and models of phones available for selection. Or you could have a package that includes multiple rate plans but only a subset of service features and options and a subset of phones that you have available.</td>
</tr>
<tr>
<td>Inventory</td>
<td>A physical product that is generally required to deliver a service, such as a mobile phone, a cable modem, a phone line, or a satellite dish.</td>
</tr>
<tr>
<td>Attributes</td>
<td>The billing system requires the collection of detailed information to effectively provision services. As this information will vary from product to product or from service provider to service provider, PeopleSoft Enterprise CRM provides a general purpose attribute object that lets you dynamically define what information you want to track for each product. An example of an attribute that is required for provisioning or activation is username and password for an email account.</td>
</tr>
</tbody>
</table>

This hierarchical nature of products and services is similar to that provided by some billing systems. For example, portal refers to the components of its product structure as plan, deal, and products. Within BSCS, products are defined as product element templates (which describe product properties, such as password) and product elements (which are associated with a pricing element and a chargeable event, such as placing a call). BSCS refers to plans or bundles as composite products.
In Figure 7, voice mail and call forwarding are only two of many options (roaming, SMS, and so forth) that may be available for wireless but are the only two options made available in the selling package Plan 100.

**Pricing Information**

PeopleSoft Enterprise CRM for Communications provides flexible pricing capability. Pricing can be associated with marketing promotions, customers, regions, and products—in all, the system supports a combination of up to 16 different keys that can be used in determining what pricing to apply to a specific order line. Other pricing attributes include the ability to define multiple discounts based upon volume.

Price lists, which support both recurring and non-recurring prices, are effective dated, allowing service providers to define separate pricing for time-oriented types of promotions, or customer negotiated prices that have an expiration date. During the quote/order entry process, appropriate pricing is automatically applied by the pricing engine, including discounts and giveaways.

In some billing systems, prices are referred to as rate plans and, typically, become part of a contract. In some cases, a price is not actually applied to a customer until a contract is completed; therefore, any discount provided to the customer exists as part of the contract, not the customer record. Such an approach suits the needs of the billing system but does not provide the flexibility required during order capture within a CRM system. Within PeopleSoft Enterprise CRM, discounts or negotiated rates for specific products/services can be defined at the customer level. Such prices are automatically applied during order capture, freeing the agents from having to know what contracted rates do or don’t exist. The ability of the system to automatically apply appropriate pricing streamlines the order capture process and ensures consistent and accurate orders.

Pricing within PeopleSoft Enterprise CRM can be applied at various levels of the product hierarchy. However, the pricing provided to individual components may or may not be applied based upon how a package is defined. Packages can have a
single high-level price, or can be dynamically priced based upon the selection of components within the package, letting you define one product price but have the system “ignore” the price for specific products/services.

Within PeopleSoft Enterprise CRM, you can set up specific usage threshold rates as specific products. For example, you can define disk space as a bundle that contains multiple disk space options, each with discrete prices associated with them, such as 20 MB disk space as $10.00 per month and 100MB as $85.00 per month.

Some billing systems support promotional pricing. However, the pricing is oriented toward tracking usage and accommodating rating engines. Promotions within PeopleSoft Enterprise CRM are geared toward promoting products and services from a customer sales point of view. Within PeopleSoft Enterprise CRM, you can define multiple marketing promotions that target different audiences but provide the same offer, the same products/services at a specific promotional price.

PEOPLESOFT ENTERPRISE INTEGRATION TECHNOLOGY

PeopleSoft Enterprise Integration Broker is based on the PeopleTools platform and is used by all PeopleSoft Enterprise applications for interproduct integration. This same framework is available to integrate to external applications. The prebuilt billing integration points leverage this technology for information delivery and receipt.

PeopleSoft Enterprise Integration Broker requires:

- No additional hardware.
- No new software.
- No new programming languages.
- No consultants to train.
- No additional third-party integration products.

By using PeopleSoft Enterprise Integration Broker, you can securely create complex connections between legacy systems, packaged applications, and trading partners all over the Internet. This hub-and-spoke framework eliminates the need for expensive and time-consuming point-to-point integrations between all your applications while providing an infrastructure focused on reusability and performance.

User-defined cross-application business processes enable integration between systems. The framework enables you to define and map messages and business objects using a GUI development tool. In this way, you can create integrations with an easy, point and click approach, instead of spending time hard-coding functionality.
PeopleSoft Enterprise Integration Broker Overview

PeopleSoft Enterprise Integration Broker is a middleware technology that facilitates messaging among internal systems and trading partners, while managing message structure, message format, and transport disparities. Because of the system’s modular design, many of the elements you develop for integration can be reused in other integrations.

PeopleSoft Enterprise Integration Broker is comprised of two high-level subsystems, Oracle’s PeopleSoft Enterprise Integration Gateway and Oracle’s PeopleSoft Enterprise Integration Engine. The Integration Gateway resides on a PeopleSoft Enterprise Web server, and the Integration Engine is installed on an application server as part of your PeopleSoft Enterprise application.

PeopleSoft Enterprise Integration Gateway

The PeopleSoft Enterprise Integration Gateway is a platform that manages the actual receipt and delivery of messages passed among systems through the PeopleSoft Enterprise Integration Broker. It provides support for the leading TCP/IP protocols used in the marketplace today, and more importantly, provides extensible interfaces for the development of new connectors for communication with legacy, enterprise resource planning (ERP), and Internet-based systems.

PeopleSoft Enterprise Integration Engine

The PeopleSoft Enterprise Integration Engine runs on the application server. It’s tied closely to your PeopleSoft Enterprise application and produces or consumes messages for the application. Rather than communicating directly with other applications, the PeopleSoft Enterprise Integration Engine sends and receives messages through one or more separately installed integration gateways.

Connectors Overview

In the PeopleSoft Enterprise Integration Gateway architecture, listening connectors and target connectors transport messages between integration participants (for example, PORTAL Infranet or AMDOCs billing systems) and the PeopleSoft Enterprise Integration Engine. These connectors support asynchronous, synchronous, and polling-based message handling. Many of the connectors are also configurable, based on user-defined settings at the PeopleSoft Enterprise Integration Gateway and node level.

Target Connectors

Target connectors open communication with other PeopleSoft Enterprise solutions or third-party systems and perform various operations. A target connector may or may not receive a response from the target system during each operation.
Listening Connectors

Listening connectors receive incoming data streams and perform services based on the content of the stream. They are invoked externally by other systems, such as other PeopleSoft Enterprise solutions, third-party systems, and so forth.

PeopleSoft Enterprise Integration Broker Connector Software Development Kit (SDK)

The PeopleSoft Enterprise Integration Gateway provides a fully extensible model for developing new connectors built to the interface specification of the PeopleSoft Enterprise Integration Broker SDK by PeopleSoft Enterprise customers, consultants, application developers, and so forth.

Understanding the Messaging Process Flow

Whether the PeopleSoft Enterprise Integration Engine is dealing with outbound or inbound messages, its primary agents for managing the messages are the asynchronous request handler and the synchronous request handler. These handlers work in the background, examining the definitions supplied with the PeopleSoft Enterprise CRM for Communication Billing Integration Framework and determining how each message should be treated.

Basic Outbound Messaging Flow

• Your application triggers sending the PeopleCode you’ve developed.
• Your PeopleCode program populates and sends the message using a synchronous or asynchronous method or function.
• The method used triggers either the asynchronous request handler or the synchronous request handler in your application’s Integration Engine.
• The handler searches the outbound transaction definitions associated with that message definition to determine the valid target nodes for the message.
• For each outbound transaction found, the handler submits the message to the local gateway, along with transaction information about the target node, and the target connector that should be used to send the message.
• The local gateway transmits the message to the specified target node through the specified target connector.
• If this is a synchronous message, the handler waits for the target node to pass a response message back through the gateway, then returns it to the calling PeopleCode method or function.

Basic Inbound Messaging Flow

• Your application’s local gateway receives a request message from a remote node or gateway, which specifies your application as its target node, and indicates whether the message is to be processed asynchronously or synchronously.
• The local gateway submits the message to your application’s PeopleSoft Enterprise Integration Engine, which searches the inbound transaction definitions to find one associated with the sending node that specifies the same message, version, and transmission type.

• If no matching transaction is found, PeopleSoft Enterprise Integration Engine returns an error message through the gateway to the sending node. If a transaction is found, PeopleSoft Enterprise Integration Engine invokes either the asynchronous request handler or the synchronous request handler as appropriate to handle the message.

• The handler accesses the message definition that matches the inbound message name and passes the message to its associated receiving PeopleCode.
  • The Asynchronous Request Handler invokes the message definition’s subscription PeopleCode.
  • The Synchronous Request Handler invokes the message definition’s OnRequest PeopleCode.

• If this is a synchronous transaction, the handler waits for the receiving PeopleCode to generate and return a response message, then passes it back to the sending node through the gateway.

An Example

Summary of Steps Involved in “Get Bills” Process

The “get bills” process synchronously obtains the latest bill cycle information from the industry billing system when the user clicks on the Get All Bills button. (Note that the number of cycles retrieved is a configurable parameter.)

• The Associated Bills page provides a button to retrieve bills from the billing system.

• The user clicks on the Get Bills or Get All Bills button. The PeopleCode associated with creating the request fires a synchronous outbound message.

• The request handler searches the outbound transaction definitions associated with that “get bill” message definition to determine the valid target nodes for the message, in this case the billing system node.

• For each outbound transaction found, the handler submits the message to the local gateway, along with transaction information about the target node, and the target connector that should be used to send the message.

• The local gateway transmits the message to the specified target node through the specified target connector.

• The handler waits for the target node to pass a response message back through the gateway, and then returns it to the calling PeopleCode method or function to populate the grid.
Figure 8: The “get bills” process synchronously obtains the latest bill cycle information from the industry billing system.

**COMPLETING AN INTEGRATED BILLING CONNECTOR**

**PeopleSoft Enterprise Billing System Integration**

Prior to configuring PeopleSoft Enterprise Integration Broker, you should install PeopleTools and PeopleSoft Internet Architecture (PIA). During the installation of these products, the Integration Engine and the Integration Gateway are automatically installed.

In general, the high-level tasks that will be performed to configure any of the integration scenarios are:

- Define a local Integration Gateway.
- Define a remote Integration Gateway.
- Set up a local node.
- Set up a remote node.
- Set Integration Gateway properties.
  - Define message channels.
  - Define target and listening connectors.
  - Create XML transformations to target needs.
  - Create request message definitions (provided with PeopleSoft Enterprise CRM for Communications).
  - Create reply message definitions (provided with PeopleSoft Enterprise CRM for Communications).
- Define the functional transaction components (provided with PeopleSoft Enterprise CRM for Communications).
PeopleSoft Enterprise solutions provide all the tools required to configure the Integration Gateway as part of the application suite license.

BILLING INTEGRATION EXAMPLES

PeopleSoft Enterprise CRM has been integrated with a number of billing systems, with nearly 70 either planned or implemented independent integrations being performed within communications companies. Of these integrations, over 50 involve communications billing systems, including integrations to: Amdocs, BSCS (formerly LHS), CSG (formerly Kenan), Portal, Convergys, and Progressor.

The following provides brief descriptions of some of the integrations that have been completed or are planned. Note that in many cases, customers take a phased approach to integration, starting with the most critical integration points and often beginning with batch or read-only oriented type of integrations followed by bi-directional synchronous integrations.

The approach taken in the integration example for Portal Infranet described for the Systems Integrator Partner Solution Center could also be applied to any communications billing system.

Integration Examples

- As of late third quarter 2002, a Systems Integrator Partner Solution Center has implemented a subset of the integration points discussed above for demonstration purposes. This subset of integration points includes new account creation as well as bill inquiry and view bill. Figure 9 shows the interface architecture and the customization that was required to interface with the PORTAL intranet billing system. A JSP listener was built and the PeopleSoft Enterprise Integration Broker was configured for Portal since PeopleSoft Enterprise solutions use standard XML, while Portal Infranet uses Java-based APIs.

- An Asian company based in Singapore has implemented a BSCS integration using a combination of database views for read-only access as well as real-time access using MQ Series. The integration was performed by a Big Six consulting firm.

- An existing PeopleSoft Enterprise CRM customer based in Brazil currently has both read-only and bi-directional integration to Amdocs. Most inquiries are performed at a database level. To guarantee 24x7 operation of the call center, some data is replicated from Amdocs to the CRM database, because the Amdocs system is unavailable for two hours per day to complete end-of-day processing.
Integrating with Communications Billing Systems

There are three major areas of integration:

- **Customer data.** New customers can be created within CRM (how customers are typically created) or within Amdocs (customer's legacy business processes). There is a program that updates the CRM database every five minutes with any new customer data entered via Amdocs.

- **Product data.** Product or service data is retrieved from Amdocs. However, packs (similar to packages which are services associated to campaigns) are created in CRM.

- **Billing data.** Billing data resides in Amdocs only and is retrieved synchronously.

When orders are generated from within PeopleSoft Enterprise CRM, service activation occurs as part of the overall process. Service activation occurs from the billing system and upon completion of the process (new account, customer, and service information in billing system and activated), a notification is sent to the customer.

Integration is accomplished using CRM APIs. (This is a Vantive implementation; therefore, VanAPI for Java is used.) Access to Amdocs is accomplished through custom APIs that were created by a consulting firm that did the integrations. These custom APIs call tuxedo services to access data in the Amdocs system. This approach was taken due to high cost of purchasing APIs from Amdocs.

- A cable company in Australia implemented an initial integration with Convergys, accomplished using screen-scraping technology. This company was looking to move to using Convergys APIs for the integrations.

- A long term PeopleSoft Enterprise CRM customer in EMEA currently has a batch upload of billing data from Amdocs to their CRM database (currently Vantive). However, this customer is planning a 60-point integration with Amdocs. This will include billing specific actions such as change bank...
account details, change payment method, change password, change prepaid subscriber information, change billing address, change collection path, change tariff, and change bill cycle. Integrations planned in support of mobile service changes include: deactivate/reactivate subscriber, change address—white pages entry, change MSISDN, change feature, reset mailbox ID, reset SIM security ID, change subscriber status, and change MSISDN status. With the latest release of PeopleSoft Enterprise CRM for Communications, many of the integration points have already been built into the CRM business processes. This customer intends to use a middleware product to directly access Amdocs when they upgrade their CRM system.

CONCLUSION

This document has shown that PeopleSoft Enterprise solutions can help customers in the communications industry that need to integrate with their billing systems.

Oracle’s PeopleSoft Enterprise CRM for Communications Billing Integration Framework provides the following benefits:

- Out of box account and billing functionality specifically built for integrating with best-of-breed billing solutions. Standard product delivering quicker return on investment.
- An open integration technology foundation providing flexibility and protection against proprietary adapter technologies. Adapter technologies work only if adapters are maintained by both connecting applications. IT history tells us that this has been hard to achieve.
- Fast and flexible implementation time providing better return on investment. With prebuilt functionality and easy-to-configure application approach, customers are able to change when the market demand changes.

We are committed to the success of our customers by providing extensive software, consulting, and services partner programs that offer additional technology and vertical expertise as well as integration support.