Oracle® Communications Billing and Revenue Management

Billing Care SDK Guide



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About This Content

This guide describes how to customize and extend Oracle Communications Billing Care.

Audience

This document is intended for developers and user interface designers.

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Part I

About the Billing Care SDK

This part describes the Billing Care SDK and its architecture. It contains the following chapters:

- About Billing Care SDK
- About Billing Care Architecture
- Migrating Customizations from Billing Care 15.1 or Earlier
- Migrating Number and Currency Formatting Customizations

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1

About Billing Care SDK

Learn about the contents included with the Oracle Communications Billing Care SDK.

Topics in this document:

- About the Billing Care SDK
- Installing the Billing Care SDK

About the Billing Care SDK

The Billing Care SDK provides tools, libraries, and samples that you can use to customize Billing Care. Use the SDK with NetBeans IDE to set up a development environment for customizing Billing Care. The SDK includes the directories listed in Table 1-1.

Table 1-1 Billing Care SDK Directories

Directory	Description
libs	Contains the library JARs required to customize Billing Care.
references	Contains the default versions of the configuration and metadata files used to customize Billing Care. See "About the References Directory" for more information.
samples	Contains code and configuration file samples to assist you in customizing Billing Care. Each sample includes a **README.txt** file describing the implementation in the example.

About the References Directory

The **references** directory contains the default versions of the configuration and metadata files used to customize Billing Care. When customizing Billing Care, you create new versions of many of the files in this directory. These custom files are packaged in the customizations shared library you deploy to the Billing Care domain.

Table 1-2 lists the files in the Billing Care SDK **references** directory.

Table 1-2 Billing Care SDK References Directory Files

File or Directory	Description
ActionMenu.xml	Contains the metadata describing the contents of the **Action** menu in the main Billing Care toolbar. You work with this file to add, remove, rename, or rearrange menu entries. When customizing, create a **CustomActionMenu.xml** file. See "Customizing the Billing Care Actions Menu" for more information.
Configurations.yaml	Contains flags controlling the display of specific account attributes, timeout values, and BRM-related enum mappings. When customizing, create a **CustomConfigurations.xml** file.

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Table 1-2 (Cont.) Billing Care SDK References Directory Files

File or Directory	Description
BillingCareResources_en.xlf	Contains all text labels in the application. You can use this file to change labels in the application. When customizing, create a **customized_en.xlf** file. See "Customizing Billing Care Labels" for more information.
eventtemplates	Contains the metadata describing the fields displayed for BRM events (associated with bill items). You work with event templates to display data from custom usage events or to alter the default template. When you create custom event templates, you must prefix template names with **Custom**. See "Customizing Billing Care Templates" for more information.
newsfeedtemplates	Contains the metadata describing the data displayed in the Newsfeed. You work with Newsfeed templates to alter the default templates. When you create custom event templates, you must prefix template names with **Custom**. See "Customizing Billing Care Templates" for more information.
AuthorizationDataModel	Contains the Oracle Platform Security Services Entitlements Server (OPSS) seed data describing the authorization policies and resources.
registry.js	Contains the definitions for and association between Billing Care views and view models (HTML and JavaScript). When customizing, create a **customRegistry.js** file. See "About the Registry File" for more information.

Installing the Billing Care SDK

Use the Billing Care installer (**BillingCare_generic.jar**) from Oracle Software Delivery Cloud to install the Billing Care SDK and create the **BillingCare_SDK** folder on your NetBeans IDE host. Alternatively, if you included the SDK when installing Billing Care, copy the **BillingCare_SDK** folder from your Billing Care host to your NetBeans IDE host.

See *Billing Care Installation Guide* for more information about downloading and running the Billing Care installer.

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2

About Billing Care Architecture

Learn about the Oracle Communications Billing Care architecture.

Topics in this document:

- Billing Care Architecture Overview
- About the Billing Care REST Framework

Billing Care Architecture Overview

Billing Care is an application deployed to an Oracle WebLogic Server domain. Customizations are deployed to the same domain as a customizations shared library. A Billing Care deployment plan, referencing the customizations shared library, implements your customizations.

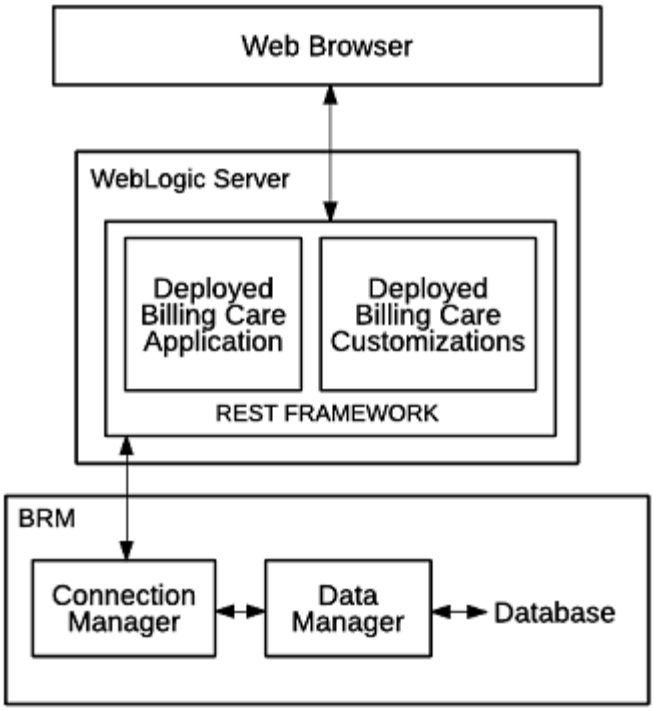
Users connect to Billing Care with a web browser where modules are presented for performing billing and customer care operations. See "About Billing Care Modules" for more information about modules.

Billing Care's REST framework communicates with web browsers and Oracle Communications Billing and Revenue Management (BRM) using a connection pool to the Connection Manager.

Figure 2-1 shows the described architecture in a topological view.

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Figure 2-1 Billing Care Topology



About the Billing Care REST Framework

The REST framework includes several modules to perform billing and customer care transactions with BRM. Each module consists of four tiers, each with its own set of responsibilities:

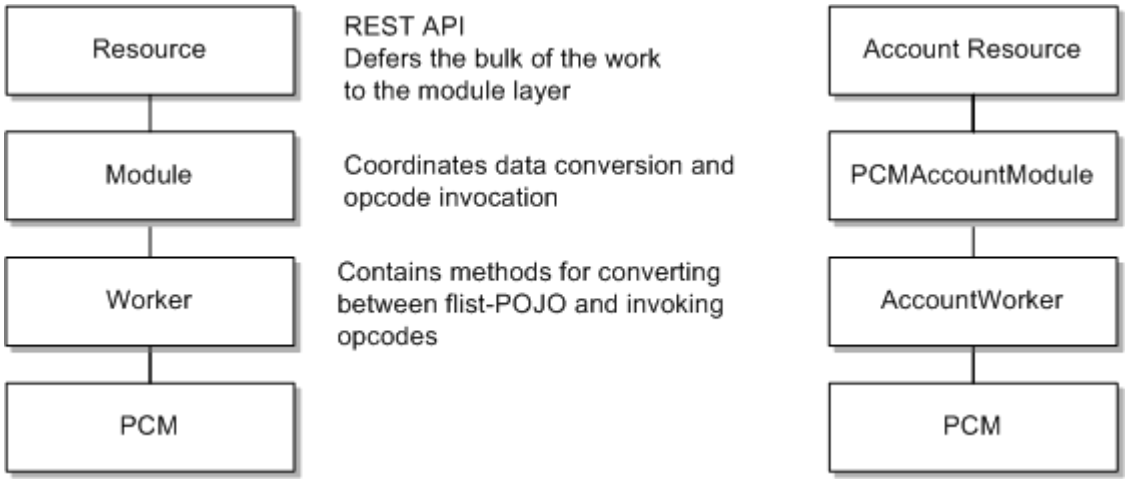
- The Resource tier manages RESTful client requests and responses.
- The Module tier coordinates transformation of RESTful operations and payload into BRM native formats.
- The Worker tier contains methods for converting data between Billing Care and BRM formats.
- The PCM tier manages the connections between Billing Care and the BRM Connection Manager.

Figure 2-2 shows the Billing Care REST framework tiers and a sample account module. The column on the left describes the tiers in general. The column on the right provides a specific example of the tiers for the Account REST module where:

- The Account Resource is the Resource tier.
- The PCMAccountModule is the Module tier.
- The AccountWorker is the Worker tier.
- The PCM tier is represented in the same way in both columns, as connections to BRM are shared by all resources.

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Figure 2-2 Billing Care REST Framework



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3

Migrating Customizations from Billing Care 15.1 or Earlier

Learn how to migrate your custom Oracle Communications Billing Care implementation from 15.1 or earlier versions to the latest version. This chapter provides clear procedures, guidelines, and references for updating customizations, user interface components, and framework integrations to align with the latest Oracle JavaScript Extension Toolkit (JET) standards and extensibility patterns.

Topics in this document:

- About Key UI and Component Updates
- Tasks for Migrating Your Customizations from Billing Care 15.1 or Earlier

About Key UI and Component Updates

Billing Care 15.2 and later includes comprehensive updates across the application, implementing new UI standards, extensive Oracle JET adoption, and streamlined configuration flows to modernize the user experience. Billing Care changed in the following ways:

- **Updated Images**: Custom images have been replaced, where possible, with images from the Oracle JET Image Reference.
- **Validation Framework**: All input validation has been migrated to Oracle JET validators exclusively.
- **Redesigned Views**: Purchase flows, registry configurations, and interface patterns have been refactored to utilize OJET components, improving accessibility and maintainability across the application. Purchase flows have been redesigned into an action menu with four options: New Service, Add to Service, Bundle Transition, and Package Transition.
- **Customer Assets, Collections, and Payments**: Collections, payments, and Customer Assets views have been refactored to replace legacy pop-ups and tables with drawer-based layouts and in-card banners. Partial allocations are now grouped by account number or bill unit.
- **Financial Setup**: Financial setup screens have been changed from dialog boxes to full-page layouts. Hierarchy, payment method, and balance group flows have been redesigned, and separate read-only and edit modes are now provided for tax setup.
- **Code and Framework**: Legacy windows, layouts, and rendering mechanisms have been deprecated.
- **Events Framework**: Event and Newsfeed tables have been changed to use Oracle JET table components. Customization is implemented using JavaScript instead of custom XML configurations, providing greater flexibility.
- **Enhanced CSS Classes and Themes**: CSS classes and theming have been updated to align with Redwood standards and Oracle JET styling conventions.

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Tasks for Migrating Your Customizations from Billing Care 15.1 or Earlier

To migrate your Billing Care customizations:

1. **Update Images**: Replace all project-specific images with Oracle JET library images where possible. See the icons and images from the OJET Image Reference.
2. **Refactor Validation Logic**: Remove all jQuery validators and replace them with Oracle JET validators in all forms and data inputs. See "Migrating jQuery Validators to OJET Validators".

> ⚠ **Caution**
>
> All jQuery validators must be discontinued in customizations.

3. **Update Dialog Boxes and Overlays**: Refactor all dialog boxes to use the Oracle JET dialog pattern with header, body, and footer slots. See "Migrating Overlay Dialog Box Customizations".
4. **Convert Event and Newsfeed Layouts**: Refactor custom event and newsfeed tables to use Oracle JET table components by moving old XML layout logic to JavaScript-driven templates. Add or change columns only through these templates, following SDK guidance for extensibility. See "Migrating Your Newsfeed and Events Framework Customizations".
5. **Apply Theming Standards**: Remove all Alta theme references and adopt standardized theming by leveraging Oracle JET utility classes whenever possible. See "Migrating Your Custom CSS Classes and Themes".
6. **Update Views and Flow Configurations**: Realign registry entries to support modular train-stop configurations for independent purchase and package flows, and update banners, charts, and financial setups to Oracle JET-based implementations. Convert dialog boxes previously rendered in pop-ups (such as Installment, Notification, Deposit, and AR Actions) to use drawer or card layouts accessed via row menus. See "Migrating Your Custom Views ".
7. **Test and Validate**: Render and test all migrated components for correct behavior and accessibility, confirming that customized flows operate as intended in the new framework and validating against supported browsers. See *Compatibility Matrix* for information about the supported browsers.

Migrating jQuery Validators to OJET Validators

When refactoring your validation logic, you must migrate from legacy jQuery implementations to equivalent Oracle JET validators. All custom jQuery validation code must be replaced with the corresponding Oracle JET validator syntax.

An example of a legacy jQuery validator implementation is shown below:

```
var validateResult = $("#emailServiceConfigForm").validate({
    debug: true,
    rules: {
        maxMailboxSize: { number: true },
        maxMessageSize: { number: true },
        maxNumberOfMessages: { digits: true }
    },
```


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```
    messages: {
        maxMailboxSize: { number: common.INVALID_VALUE },
        maxMessageSize: { number: common.INVALID_VALUE },
        maxNumberOfMessages: { digits: common.INVALID_VALUE }
    },
    errorClass: 'validation-error'
});
```

The equivalent OJET validation implementation is shown below:

```
self.decimal1Converter = new ojconverter_nativenumber_1.NumberConverter({
    style: "decimal",
    minimumFractionDigits: 2,
    maximumFractionDigits: 3,
    useGrouping: false
});
```

Migrating Overlay Dialog Box Customizations

In earlier releases, Billing Care dialog boxes were called using the Oracle JET **OverlayContext.open()** API and were often rendered in shared containers (for example, #dlgBase). Templates often combined header, body, and footer HTML in a single structure.

Starting in Billing Care 15.2, all dialog boxes use the Oracle JET dialog component and standard pattern. They render inside a #general-ojet-dialog container, use Oracle JET slot conventions for template structure (header, body, footer), and must be opened using **OverlayContext.openOJETDialog()**. All custom dialog boxes must be updated to use the new Oracle JET dialog API and template structures.

An example of a legacy dialog box migration is shown below:

```
Before (Legacy):

var options = {
  // legacy dialog options
};
overlayContext.open(options, arActionsOverlayView, ARActionsOverlayVM);
ARActionsOverlayVM.render();
// HTML: <div class="overlayBody"></div>

After (OJET):

overlayContext.openOJETDialog(arActionsOverlayView, ARActionsOverlayVM);
ARActionsOverlayVM.render();
// HTML:
<div slot="header">
  Dialog Header Content
</div>
<div slot="body">
  Dialog Body Content
</div>
<div slot="footer">
  Dialog Footer Content (for example, buttons)
</div>
```

> **Note**
>
> Legacy overlay and dialog support has been removed and is not supported. UI issues and lack of compatibility are likely if you do not update the customizations.

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Migrating Your Newsfeed and Events Framework Customizations

You must refactor custom event and Newsfeed tables to use Oracle JET table components. Move any old XML layout logic to JavaScript-driven templates. Add or change columns by updating corresponding templates—not by constructing HTML strings or manipulating the DOM. Define layout selection logic for dynamic or extensible event rendering scenarios.

For more details, see "Customizing the Newsfeed Area ".

> **Note**
>
> Use the OJET extensibility model for tables and events. Manual DOM manipulation is not supported.

Migrating Your Custom CSS Classes and Themes

Billing Care 15.2 and later includes an optimized CSS framework that relies on Oracle JET utility classes. All Alta theme files have been removed, which reduces the custom CSS footprint by up to 98% and makes styles more generalized and reusable.

To migrate your customizations, you must remove legacy references and adhere to the new CSS coding standards by performing the following steps:

1. Audit your custom HTML templates to identify inline styles, Alta theme references (for example, **alta-panel**), and standard Billing Care CSS classes.
2. Remove all Alta theme references from your custom implementations.
3. Replace legacy layout and spacing classes with standard Oracle JET utility classes (such as **oj-flex, oj-panel,** or **oj-sm-margin-2x**) wherever possible.
4. If an Oracle JET utility class cannot achieve the desired styling, create a new custom class using this **.bc**-*classname* standard.

   > **Note**
   >
   > Make sure that you do not use standard Billing Care CSS classes. These classes may change between releases and lead to UI inconsistencies.

5. Extract any remaining inline styles and move them to your custom stylesheet.
6. Do not use inline CSS. Rename your custom classes to follow the **.bc**-*classname* standard and apply them to your HTML elements.

Example: Migrating a Custom Container

In this example, a legacy container uses an Alta class, a standard Billing Care class, and inline styling. During migration, these are replaced with an Oracle JET utility class and a standardized custom **.bc**-*classname*.

Before (Legacy):

```
<div class="alta-panel billing-care-custom-header" style="background-color: #f0f0f0;
border-radius: 4px;">
    <span>Account Details</span>
</div>
```


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After:

```
<div class="oj-panel bc-custom-header">
    <span>Account Details</span>
</div>
CSS

/* Custom Stylesheet */
.bc-custom-header {
    background-color: #f0f0f0;
    border-radius: 4px;
}
```

Migrating Your Custom Views

Billing Care 15.2 and later include redesigns of key user flows, displayed components, and UI patterns to use modular, registry-driven Oracle JET configurations. View configurations and Customization Registry entries must be updated to align with these new standards.

To migrate your custom views, perform the following steps:

1. Audit your legacy custom views to identify pop-ups, non-Oracle JET display components, and consolidated purchase flows.
2. Refactor HTML and ViewModels to use Oracle JET components. Legacy pop-ups (Installments, Notifications, Deposits, AR Actions) must be replaced with drawer or card-based layouts, such as **oj-drawer-popup** or **oj-dialog**, accessed from a row action or menu button. Custom Account Banners, Charts, Newsfeeds, and financial setup screens must also be updated to use Oracle JET-based implementations.
3. Update your Customization Registry (**CustomRegistry.js**) to support modular, train-stop configurations. Legacy routing keys must be replaced with new OJET modular flow keys, such as **purchaseSelectionFrom**, **purchaseSelectionTo**, and **purchaseConfiguration**. Replace any legacy registry or routing keys with the new modular Oracle JET keys. Use the following registry entry snippets as examples for configuring a purchase flow:

```
purchase: {
    wizardView: 'text!templates/purchase/purchaseView.html',
    viewmodel: 'viewmodels/purchase/PurchaseViewModel',
    purchaseObject: 'viewmodels/purchase/PurchaseCatalogue'
},
purchaseSelection: {
    packageview: 'text!templates/purchase/packageSelectionView.html',
    bundleview: 'text!templates/purchase/bundleSelectionView.html',
    packageviewmodel: 'viewmodels/purchase/PackageSelectionViewModel',
    bundleviewmodel: 'viewmodels/purchase/BundleSelectionViewModel'
},
purchaseSelectionFrom: {
    bundletransitionviewmodel: 'viewmodels/purchase/BundleTransitionViewModel',
    bundletransitionview: 'text!templates/purchase/bundleTransitionView.html',
    packagetransitionviewmodel: 'viewmodels/purchase/PackageTransitionViewModel',
    packagetransitionview: 'text!templates/purchase/packageTransitionView.html'
},
purchaseSelectionTo: {
    bundletransitionview: {
        viewmodel: 'viewmodels/purchase/BundleTransitionToViewModel',
        view: 'text!templates/purchase/bundleTransitionToView.html'
    },
    packagetransitionview: {
        viewmodel: 'viewmodels/purchase/PackageTransitionToViewModel',
        view: 'text!templates/purchase/packageTransitionToView.html'
```


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```
    }
},
```

4. Test the updated views to verify accessibility compliance, usability, and compatibility across supported browsers and devices.

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4

Migrating Number and Currency Formatting Customizations

Learn how to migrate your custom Oracle Communications Billing Care number and currency formatting implementations to use Oracle JET number converters and the Billing Care **NumberUtil** utility.

Starting in release 16.26.0, Billing Care uses Oracle JET number conversion for locale-aware formatting and parsing. If your existing Billing Care customizations use legacy **util.js** number or amount formatting methods, you must update them to use **NumberUtil**, Oracle JET converters, and **oj-c-input-number**.

Topics in this document:

- About Number and Currency Formatting Updates
- Tasks for Migrating Number and Currency Formatting Customizations
- Example: Migrating an Amount Customization
- Configuring Accounting-Style Negative Values

About Number and Currency Formatting Updates

Billing Care 16.26.0 includes changes to how numbers, currency amounts, percentages, and localized numeric values are formatted and parsed.

Earlier Billing Care implementations could use custom formatting and parsing methods in **util.js**. These methods formatted numeric values into localized strings, removed formatting before calculations, manipulated signs while formatting values, and performed locale-specific parsing.

Starting in release 16.26.0, Billing Care uses **NumberUtil.js** as the common entry point for number converters. The Oracle JET converters handle locale-specific formatting and parsing, while ViewModels and REST requests keep numeric values independent of the display locale.

When you migrate your customizations to use **NumberUtil**, Oracle JET converters, and **oj-c-input-number**:

- Use **NumberUtil.getCurrencyConverter()** for BRM currency amounts.
- Use **NumberUtil.getDecimalConverter()** for noncurrency decimal values.
- Use **NumberUtil.getPercentConverter()** for percentage values.
- Use the **oj-c-input-number** component for editable and read-only numeric fields.
- Keep values used in calculations, comparisons, and REST requests as numbers.
- Use a converter's **format()** method only when you need to display a formatted number as plain text.
- Use a converter's **parse()** method only when you need to convert a localized string to a number.

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- Compare numeric values directly or use **NumberUtil.amountComparator()** when a component or API requires a comparator.

Migrate customizations that use any of the following legacy methods:

- **formatNumber**
- **convertAmountPositiveToNegative**
- **convertAmountNegativeToPositive**
- **formatAmount**
- **unformatAmount**
- **formatAmountWithAbbr**
- **formatAmountWithoutSymbol**
- **performAmountFormatting**
- **reverseSignAndFormatAmount**
- **unformatPaymentAmount**
- **reformatAmountAndReveseSign**
- **parseAmountBasedOnLocale**
- **unformatLocaleAmountToFloat**
- **amountComparator**

Some legacy methods combine formatting, parsing, or sign manipulation in a single operation. **NumberUtil** does not provide a one-to-one replacement for every method. Instead, keep the underlying value numeric, perform business operations on that numeric value, and let the appropriate Oracle JET converter format or parse the value at the UI boundary.

Tasks for Migrating Number and Currency Formatting Customizations

Complete the following steps to migrate your number and currency formatting customizations:

1. Identify legacy formatting and parsing calls. Search your customized JavaScript and ViewModel files for calls to the affected **util.js** methods.
2. Identify the numeric value type. Determine whether each value represents a currency amount, a noncurrency decimal value, or a percentage.
3. Update ViewModel dependencies. Add **Registry.utilities.numberUtils** to the Asynchronous Module Definition (AMD) dependency list and add **NumberUtil** as a parameter to the ViewModel function. See "Adding NumberUtil to a ViewModel".
4. Create a currency, decimal, or percentage converter for each type of numeric value.
   - For currency values, see "Creating Currency Converters".
   - For decimal and percentage values, see "Creating Decimal and Percentage Converters".
5. Remove formatting from observables and computed values that participate in calculations, comparisons, validation, or REST request creation. See "Keeping Values Numeric".
6. Update numeric UI fields to use **oj-c-input-number** with the appropriate converter for editable and read-only numeric fields. See "Updating Numeric UI Fields".

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7. Replace any manual formatting to use the converter's **format()** method when you need to display a formatted value in plain text. See the following topics:
   - Migrating Formatted Amounts
   - Migrating Amounts Without a Currency Symbol
8. Replace any manual parsing to use the converter's **parse()** method when a customization receives a localized string. Do not parse a value that **oj-c-input-number** already provides as a number. See "Migrating Localized Amount Parsing".
9. Update the sign of numeric values before formatting them. Do not use formatting methods to change the sign. See "Migrating Sign Conversion".
10. Update any amount comparisons to compare numeric values directly. Use **NumberUtil.amountComparator()** when a component or API requires a comparator function. See "Migrating Amount Comparisons".
11. Ensure that REST request payloads contain numeric values instead of locale-formatted strings. See "Keeping REST Payloads Numeric".
12. Verify number formatting and parsing for each locale that your implementation supports. See "Testing the Migration".

Adding NumberUtil to a ViewModel

In your existing customizations, add **NumberUtil** and the Oracle JET input number component to the ViewModel dependencies.

For example:

```
define([
   "jquery",
   "knockout",
   Registry.utilities.numberUtils,
   "oj-c/input-number"
], function ($, ko, NumberUtil) {
   // ViewModel implementation
});
```

Obtain the applicable BRM currency balance element ID before you create a currency converter.

For example:

```
self.resourceId = globalAppContext.currentAccountViewModel()
   .account()
   .currentBillUnit()
   .currency();
```

Creating Currency Converters

Use the **NumberUtil.getCurrencyConverter()** method for currency amounts.

To display an amount without a currency symbol:

```
self.numberConverterWithoutSymbol =
   NumberUtil.getCurrencyConverter({
```


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```
      resourceId: self.resourceId,
      showCurrencySymbol: false
   });
```

To display an amount with a currency symbol:

```
self.numberConverterWithSymbol =
    NumberUtil.getCurrencyConverter({
        resourceId: self.resourceId
    });
```

Use the converter without a currency symbol when the surrounding UI already identifies the currency.

Use the converter with a currency symbol when the displayed text must identify the currency explicitly, such as in messages, notes, subtitles, or tooltips.

Creating Decimal and Percentage Converters

Use a decimal converter for noncurrency numeric values:

```
self.decimalConverter =
   NumberUtil.getDecimalConverter({
      resourceId: self.resourceId
   });
```

Use a percentage converter for percentage values:

```
self.percentConverter =
   NumberUtil.getPercentConverter({
      resourceId: self.resourceId
   });
```

Keeping Values Numeric

Do not store formatted numbers in observables that participate in business logic.

For example, do not initialize an amount as a formatted string and then parse it before every calculation:

```
self.amount =
   ko.observable(util.formatAmountWithoutSymbol(0));

self.total = ko.computed(function () {
   return util.unformatAmount(self.amount()) +
      util.unformatAmount(self.taxAmount());
});
```

Keep the values numeric instead:

```
self.amount = ko.observable(0);
self.taxAmount = ko.observable(0);
```


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```
self.total = ko.computed(function () {
   return self.amount() + self.taxAmount();
});
```

Keeping the values numeric avoids repeated formatting and parsing and prevents locale-specific strings from entering business logic.

Updating Numeric UI Fields

Use **oj-c-input-number** to display or edit numeric values.

For an editable currency amount:

```
<oj-c-input-number
   id="amount" value="{{amount}}"
   required="true" label-hint="[[makepayment.AMOUNT]]"
   aria-label="[[makepayment.AMOUNT]]"
   converter="[[numberConverterWithoutSymbol]]"
   text-align="end">
</oj-c-input-number>
```

For a read-only amount:

```
<oj-c-input-number value="[[amount]]"
   readonly="true"
   converter="[[numberConverterWithoutSymbol]]"
   text-align="right">
</oj-c-input-number>
```

Do not create a separate formatted-string observable when the component can format the numeric value directly.

Migrating Formatted Amounts

If an existing customization formats an amount by calling a utility method, keep the amount numeric and use the currency converter instead.

For example, replace:

```
self.displayAmount =
   util.formatAmount(self.amount());
```

with:

```
self.displayAmount =
   self.numberConverterWithSymbol.format(self.amount());
```

Use the **format()** method only when the application needs a string, such as for the following types of UI content:

- Messages
- Notes

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- Subtitles
- Tooltips
- Other plain-text UI content

When an **oj-c-input-number** component displays the value, assign the converter to the component instead of calling the **format()** method.

Migrating Amounts Without a Currency Symbol

If an existing customization uses the **formatAmountWithoutSymbol** method, create a currency converter with the **showCurrencySymbol** property set to **false**.

For example:

```
self.numberConverterWithoutSymbol =
   NumberUtil.getCurrencyConverter({
      resourceId: self.resourceId,
      showCurrencySymbol: false
   });
```

Then, assign the converter to the applicable Oracle JET component.

Migrating Localized Amount Parsing

If your existing customizations contain values that already exist as numbers, do not parse the values.

For example, if **self.amount()** comes from **oj-c-input-number**, replace:

```
var amount =
   util.unformatAmount(self.amount());
```

with:

```
var amount = self.amount();
```

When another source provides a localized string, use the converter's **parse()** method:

```
var amount =
   self.numberConverterWithoutSymbol.parse(localizedAmount);
```

Apply this approach when you migrate logic that uses any of these methods:

- **unformatAmount**
- **unformatPaymentAmount**
- **parseAmountBasedOnLocale**
- **unformatLocaleAmountToFloat**

Do not manually remove currency symbols, grouping separators, decimal separators, or other locale-specific characters.

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Migrating Sign Conversion

In your existing customizations, keep sign conversion separate from display formatting.

Apply this approach when you migrate logic that uses any of these methods:

- **convertAmountPositiveToNegative**
- **convertAmountNegativeToPositive**
- **reverseSignAndFormatAmount**
- **reformatAmountAndReveseSign**

For example, replace code that changes the sign and formats the value in the same operation:

```
self.formattedAmount =
   util.reverseSignAndFormatAmount(self.amount());
```

with numeric logic:

```
self.reversedAmount = ko.computed(function () {
   return -1 * self.amount(); });
```

Then, let the Oracle JET component format the numeric result:

```
<oj-c-input-number
   value="[[reversedAmount]]"
   readonly="true"
   converter="[[numberConverterWithoutSymbol]]"
   text-align="right">
</oj-c-input-number>
```

Do not convert a number to a formatted string simply to change its sign.

Migrating Amount Comparisons

In your existing customizations, compare numeric amounts directly whenever possible.

For example:

```
if (amount1 < amount2) {
   // Processing
}
```

When a component or API requires a comparator function, use the following method:

```
NumberUtil.amountComparator(amount1, amount2);
```

Do not format or parse values solely to compare them.

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Keeping REST Payloads Numeric

In your existing customizations, send all numeric values in REST requests.

For example:

```
self.toJSON = function () {
   return {
      amount: self.amount(),
      percent: self.percentage() * 100
   };
};
```

Do not send a value produced by the **converter.format()** method or another locale-specific formatting operation.

Locale formatting belongs in the UI. It does not belong in values that Billing Care sends to REST services.

Testing the Migration

After you migrate your customizations, verify the following behavior:

- Editable fields accept valid localized numeric input.
- Read-only fields display numbers correctly.
- Currency symbols appear in the expected position.
- Decimal and grouping separators match the active locale.
- Currency values use the expected decimal scale.
- Positive, negative, and zero values display correctly.
- Accounting-style negative values work correctly when you enable that option.
- Calculations use numeric values.
- Amount comparisons and sorting work correctly.
- REST request payloads contain numeric values.
- Messages, notes, subtitles, and tooltips display formatted values correctly.
- Parsing correctly converts localized strings to numbers.

The key migration principle is to keep numeric business values separate from their localized display. Keep numbers numeric throughout your ViewModels, calculations, comparisons, and REST processing. Apply Oracle JET formatting when Billing Care displays a value, and parse a value only when your customization receives a localized string.

Example: Migrating an Amount Customization

The following example shows a customization that stores a formatted amount, parses it before use, and formats a sign-reversed amount.

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Before

```
self.amountRawValue = ko.observable("0");

self.formattedAdjustAmount = ko.computed(function () {
   if ($.isNumeric(
         util.unformatAmount(self.amountRawValue()))) {
      return util.formatAmountWithoutSymbol(
         -1 * util.unformatAmount(
             self.amountRawValue()
         )
      );
   }

   return util.formatAmountWithoutSymbol(0);
});

accountAdjustmentObj.amount =
   util.unformatAmount(self.amountRawValue());
```

After

Keep the amount and calculated values numeric:

```
self.amount = ko.observable(0);

self.numberConverterWithoutSymbol =
   NumberUtil.getCurrencyConverter({
      resourceId: self.resourceId,
      showCurrencySymbol: false
   });

self.adjustAmount = ko.computed(function () {
   if ($.isNumeric(self.amount())) {
      return -1 * self.amount();
   }

   return 0;
});

accountAdjustmentObj.amount = self.amount();
```

Let Oracle JET format the values in the UI:

```
<oj-c-input-number
   id="adjustmentAmount"
   value="{{amount}}"
   required="true"
   label-hint="[[makepayment.AMOUNT]]"
   converter="[[numberConverterWithoutSymbol]]"
   text-align="end">
</oj-c-input-number>

<oj-c-input-number
```


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```
   id="adjustmentAmountDisplay"
   value="[[adjustAmount]]"
   readonly="true"
   converter="[[numberConverterWithoutSymbol]]"
   text-align="right">
</oj-c-input-number>
```

The migrated implementation keeps both values numeric and applies locale-specific formatting only when Billing Care displays them.

Configuring Accounting-Style Negative Values

Billing Care can display negative numbers with parentheses by using the **force-accounting-parens** configuration property.

For example:

```
billingcare:
   configuration:
      features:
         force-accounting-parens: false
```

When you set the property to **true**, the shared Billing Care number converter displays negative values with parentheses.

For example, the value **-1234.50** displays as **(1,234.50)**.

A currency amount can display as **($1,234.50)**.

The converter also accepts a parenthesized value as input and converts it to the corresponding negative number.

When you leave the property set to **false**, Oracle JET uses the active locale to determine the standard negative-number representation.

After you change the setting, reload Billing Care or start a new UI session so newly created converters use the updated configuration.

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Part II

Basic Billing Care SDK Components

This part describes the basic Billing Care SDK components that you use to customize Oracle Communications Billing Care and the Billing Care REST API. It contains the following chapters:

- Setting Up the Development Environment
- Customizing Billing Care
- Customizing Billing Care Templates
- Customizing Billing Care Themes and Logo
- Editing the Billing Care Configuration File
- Using an Exploded Archive during Customization
- Packaging and Deploying Customizations

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5

Setting Up the Development Environment

Learn how to set up your Integrated Development Environment (IDE) for customizing Oracle Communications Billing Care.

Topics in this document:

- About the Billing Care Development Environment
- Configuring NetBeans IDE for Billing Care Development

About the Billing Care Development Environment

You customize Billing Care using an IDE configured to work with the Oracle WebLogic Server domain on which Billing Care is deployed. Typically, you connect to a development Billing Care domain, perform your customizations, test, and then package and deploy your customizations as a shared library to your production Billing Care domain. Billing Care references the customization shared library when rendering the user interface (UI) and performing Billing Care operations.

To increase efficiency during development and testing, use an exploded archive deployment of your customizations. Exploded archive deployments enable WebLogic Server to reference customized files on a local file system instead of a deployed customization shared library in the domain. You can change the referenced files seen in Billing Care without having to package and deploy a customizations shared library each time you make changes. See "Using an Exploded Archive during Customization" for more information on using exploded archives during customization.

Oracle recommends NetBeans IDE for customizing Billing Care. The following sections explain configuring NetBeans IDE to customize Billing Care. For more information , see the Apache Software Foundation NetBeans IDE website at https://netbeans.apache.org.

Configuring NetBeans IDE for Billing Care Development

To use NetBeans IDE for Billing Care customization, you must complete the following tasks:

- Downloading and Installing NetBeans IDE
- Configuring the NetBeans IDE Connection to WebLogic Server
- Setting Up a Billing Care Customization Project

Downloading and Installing NetBeans IDE

Download and install NetBeans IDE on the same server hosting your Billing Care domain before configuring a connection to your Billing Care WebLogic server.

For detailed instructions, including additional software requirements, on downloading and installing NetBeans IDE, see https://netbeans.org/community/releases/80/install.html.

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Configuring the NetBeans IDE Connection to WebLogic Server

After installing NetBeans IDE, you configure a connection to the running WebLogic Server domain on which Billing Care is deployed. For information on installing Billing Care and starting your domain see *Billing Care Installation Guide*.

To configure a NetBeans IDE connection to the Billing Care domain:

1. Start the NetBeans IDE.
2. Select the **Services** tab.
3. Right-click **Servers** and select **Add Server**.
4. In the **Choose Server** screen, select **Oracle WebLogic Server**. Provide a name in the **Name** field and click **Next**.
5. In the **Server Location** screen, enter the path or browse to the **wlserver** folder of the WebLogic Server installation containing the Billing Care domain, then click **Next**.
6. In the **Instance Properties** screen, provide the path to the domain folder where Billing Care is deployed in the **Domain** field.
7. Enter the **Username** and **Password** for your domain's administrative user, then click **Finish**.

   NetBeans IDE configures the connection to the domain. Verify that the connection is successful by expanding the **Servers** node in the **Services** tab. Your domain should be listed.

Setting Up a Billing Care Customization Project

You perform customizations to Billing Care in a NetBeans IDE project containing the Billing Care SDK. Complete the following required tasks to set up your Billing Care customization project:

- Creating the Billing Care SDK Directory Structure
- Creating the Billing Care NetBeans IDE Project

Creating the Billing Care SDK Directory Structure

The Billing Care customization NetBeans IDE project requires a specific directory structure, described in Table 5-1, for proper packaging of the customizations shared library you build and deploy to the Billing Care domain.

To create the required directory structure on your NetBeans IDE host:

1. Create a project directory (For example, *myproject*).
2. Within your project directory, create the following subdirectories listed in Table 5-1.

Table 5-1 Required Billing Care Customization Directories

Directory	Description
myproject/**web/custom**	Location for **customRegistry.js** and **customModule.properties** used when overriding the default modules.

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Table 5-1 (Cont.) Required Billing Care Customization Directories

Directory	Description
myproject/**web/custom/css**	Location for required CSS files required by your customizations.
myproject/**web/custom/jsons**	Location for any JSON files generated by the Data Model Generator for custom UI elements.
myproject/**web/custom/images**	Recommended location for image files referenced in your HTML and CSS files.
myproject/**web/custom/js**	Location for custom JavaScript files used by your customizations.
myproject/**web/custom/js/templates/***area*/**configure** where *area* is the customization type.	Location for custom HTML files used by your customizations. Create a unique subdirectory in this folder for each customization type. For example, create an **accountCreation** folder for customizations done to the account creation HTML file.
myproject/**web/custom/js/validations/***area*/**configure** where *area* is the customization type.	Location for custom validation files used by your customizations. Create a unique subdirectory in this folder for each customization type. For example, create an **accountCreation** folder for customizations done to the account creation JavaScript files.
myproject/**web/custom/js/viewmodels/***area*/**configure** where *area* is the customization type.	Location for custom view model files used by your customizations. Create a unique subdirectory in this folder for each customization type. For example, create an **accountCreation** folder for customizations done to the account creation view model files.
myproject/**web/lib**	You must copy the contents of the **BillingCare_SDK/libs** folder into the *myproject*/**web/lib** directory where *myproject* is the project directory previously created. The **libs** directory contains the jar files required for customizing Billing Care provided by the Billing Care installer. See "Installing the Billing Care SDK" for information about installing the SDK.
myproject/**web/META-INF**	Location for the manifest file describing the name and version of the shared library containing your customizations.
myproject/**web/resources/public/css**	Location of the **overrides-login.css** file where you specify a custom logo image file for the Billing Care login page.
myproject/**web/resources/public/images**	Location where you copy your custom logo image file used when overriding the default Oracle log on the Billing Care login page.
myproject/**web/resources/translation**	Location of your custom resource bundle.
myproject/**web/WEB-INF/classes/com**	Location of the .class files compiled from any custom Java code used in your customizations. The directory structure in this directory reflects the package name you use in your custom Java code.
myproject/**web/WEB-INF/classes/custom**	Location of the **customModule.properties** file.
myproject/**web/WEB-INF/classes/custom/configurations**	Location where you place your **CustomConfigurations.xml** and **CustomActionMenu.xml** files.

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Table 5-1 (Cont.) Required Billing Care Customization Directories

Directory	Description
myproject/**src**	Create custom Java files in the **src** directory, within any Java Package you want. However, any REST web services you create for Billing Care must be placed within the **com.oracle.communications.brm.cc.ws** package (*myproject*/**src/com/oracle/communications/brm/cc/ws**). This will ensure your REST web service can be deployed within the customizations shared library. Company-specific subpackages are supported and recommended, for example: `com.oracle.communications.brm.cc.ws.`*company* where *company* is your company's name.

Creating the Billing Care NetBeans IDE Project

After creating the Billing Care customization project directory structure and copying the required jars into your *myproject*/**web/lib directory**, create a new project in NetBeans IDE for your customizations.

To create a NetBeans IDE project for your Billing Care customizations:

1. Start the NetBeans IDE.
2. Select the **Projects** tab.
3. Right-click within the **Projects** tab and select **New Project...**.
4. In the **New Project** window, select **Java Web** under **Categories**. Select **Web Application with Existing Sources** under **Projects**.
5. Click **Next**.
6. In the **Name and Location** screen, enter the path or browse to the *myproject* folder where *myproject* is the folder you previously created for your Billing Care customizations. Specify a name and location in the **Project Name** and **Project Folder** fields.

   See "Creating the Billing Care SDK Directory Structure" for information on creating your project folder.
7. Click **Next**.
8. In the **Server and Settings** screen, select the WebLogic Server you previously connected to NetBeans IDE.

   See "Configuring the NetBeans IDE Connection to WebLogic Server" for more information on configuring your NetBeans IDE connection to your Billing Care domain.
9. Click **Next**.
10. In the Existing Sources and Libraries screen, verify the paths to your **Web Page Folder**, **WEB-INF Content**, and **Libraries Folder** are correct.
11. Click **Finish**.

    NetBeans IDE configures the new project. Verify that the project creation is successful by confirming your project is listed in the **Projects** tab.

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6

Customizing Billing Care

Learn about customization concepts for Oracle Communications Billing Care.

Topics in this document:

- About Billing Care Customization Concepts
- About Billing Care Modules
- About the customModule.properties File
- About Customizing Worker Classes
- About the Configuration.xml File
- About the Registry File
- About Billing Care View Model JavaScript Framework
- About Error Handling in REST Operations
- About Custom Resource Authorization

About Billing Care Customization Concepts

You customize Billing Care by modifying or creating configuration files, Java classes, JavaScript, HTML, and CSS. Customizations are performed in NetBeans IDE, packaged into a customizations shared library using the Java jar utility, and deployed to the Billing Care domain as a referenced shared library.

To customize Billing Care, you perform the following tasks:

- Download and install the Billing Care SDK. See "Installing the Billing Care SDK" for information.
- Download and install NetBeans IDE. See "Setting Up the Development Environment" for more information.
- Configure a NetBeans IDE project for your customization. See "Setting Up a Billing Care Customization Project" for more information.
- Connect NetBeans IDE to your development Billing Care domain. See "Configuring the NetBeans IDE Connection to WebLogic Server" for more information.
- Perform your customizations.
- Package and deploy your customizations either as an exploded archive or web application **.war** shared library to your Billing Care domain. See "Using an Exploded Archive during Customization" and "Packaging and Deploying Customizations" for more information.
- Test your customizations.
- Package production customizations in a **.war** file and deploy the shared library to all of your Billing Care instances.

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About Billing Care Modules

Billing Care is composed of unique functional modules. Each module includes an HTML **view** and a JavaScript **view model**. Some modules may also contain a **validation** definition specifying a module's field validation rules.

You configure module definitions in the registry file where a module's view, view model, and validation rules are defined. When you customize a Billing Care module, you create a custom registry file (**customRegistry.js**) defining your module configuration. See "About the Registry File" for more information.

About Views

A view is the visible, interactive manifestation of the view model, written in HTML. The web browser renders a view as a module's user interface (UI). It displays information from the view model, triggers operations on the view model, and updates itself when the data in the view model is changed.

About View Models

A view model is a JavaScript representation of the data and operations for your module. A view model is independent of your page's controls (buttons, menus, fields), which are defined by your HTML view.

You can reuse a view model with multiple views because of this independence. For example, UI interfaces for your customer service representatives (CSRs) and self-care subscribers that expose similar functionality can use the same view model while using unique views to provide different functions to each user, depending on your business requirements.

When you create a custom view model, you create the view model's JavaScript file to support any custom functionality you add to Billing Care. The JavaScript file is referenced in your **customRegistry.js** and packaged and deployed in your Billing Care domain as part of the customizations shared library.

About Data Binding between Views and View Models

Data is synchronized between views and view models within a module through the Knockout open-source library. Data attributes in the view model are exposed as Knockout **Observables**. The various HTML elements in the view bind themselves to these **Observables** so that the server and UI updates are reflected in each other.

About the customModule.properties File

Configure Billing Care to override the default module logic with your customizations by creating a **customModule.properties** file in the *myproject***/web/WEB-INF/classes/custom** folder, where *myproject* is your NetBeans IDE project folder containing your Billing Care customizations.

You can override the default Billing Care logic in the following modules by specifying a customized alternative for each of the following module keys in **customModule.properties**:

- account
- adjustment

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- allocation
- billing
- billunit
- collection
- dispute
- item
- notes
- oauthtoken
- payment
- paymentmethod
- requestinfo
- search
- service
- status
- subscription
- template
- writeoff

Each override you configure must contain an entry of the following format:

billingcare.rest.*modulekey***.module = com.***company***.module.***custom*

where:

- *modulekey* is the module for which you are overriding default logic.
- *company* is the name of the folder in your NetBeans IDE project *myproject***/src** directory structure where you place the source code for your overriding Java classes.
- *custom* is the subdirectory folder name in your NetBeans IDE project *myproject***/src** directory.

For example, if a company named `samplecompany` is overriding the default `account` module with a custom account module named `CustomAccountModule`, use the following entry in **customModule.properties**:

```
billingcare.rest.account.module = com.samplecompany.module.CustomAccountModule
```

This example assumes your custom module Java code is stored in the *myproject***/src/com/samplecompany/modules** directory.

See "Customizing Billing Care Templates" and "Extending and Creating Billing Care REST Resources" for examples of when using a **customModule.properties** file are required.

About Customizing Worker Classes

A worker class is a Java class that defines the operations Billing Care performs when it runs modules or calls REST API endpoints. The Billing Care SDK runs the methods in the worker class to perform these operations.

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You can extend or replace the methods in a worker class by creating a custom worker class and registering it with the worker factory. This approach lets you override default worker classes without changing the code.

> **Note**
>
> When you register a custom worker for a specific worker type, the system uses your custom worker. If you do not register a custom worker, the system uses the default worker class.

To customize and register worker classes in Billing Care SDK:

1. Create a custom worker class.
2. Create a custom module that extends existing Billing Care functionality. For example, create a **CustomAccountModule** class that extends **PCMAccountModule**.
3. In the constructor of your custom module, call the **setWorkerFactory** method to register your custom worker classes. This configuration specifies to use your custom worker classes instead of the default worker classes. In the following example, the system will call the **CustomRegistrationWorker** class rather than the default **RegistrationWorker** class, and the **CustomAccountWorker** class rather than the default **AccountWorker** class:

   ```
   public CustomAccountModule() {
      setWorkerFactory(RegistrationWorker.class,
   CustomRegistrationWorker::new);
      setWorkerFactory(AccountWorker.class, CustomAccountWorker::new);
   }
   ```

4. Obtain a worker instance using the **getWorker** method. For example, call **getWorker(AccountWorker.class)** to retrieve an instance of your custom worker class if registered, or the default worker class otherwise.
5. Update your application configuration to ensure that Billing Care instantiates your custom module instead of the default module during runtime.

About the Configuration.xml File

The **Configurations.xml** file contains flags controlling the display of specific account attributes, timeout values, and BRM-related ENUM mappings. See "Editing the Billing Care Configuration File" for more information.

About the Registry File

The registry file (**Registry.js**) dynamically loads dependencies, which avoids including hard-coded paths for dependencies in the Billing Care files. The registry file provides a default configuration, which the SDK can override.

To override the key and values of the **Registry.js**, create a **customRegistry.js** file with the same given keys but new values. Include only the entries that need to be overridden in the **customRegistry.js** file.

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> **Note**
>
> The key names in the **registry.js** file are subject to change. Refer to the latest packaged **registry.js** file to view the registry key changes and then update your custom code.

Managing Billing Care Modules Using the Registry File

The registry file is strictly a repository for describing a module. The registry has no logic for invoking (displaying) the modules.

The following shows the accountBanner module definition in the default **registry.js**:

```
accountBanner: {
    view: 'text!templates/home/accountBannerView.html',
    viewmodel: 'viewmodels/home/accountBanner/AccountBannerViewModel'
}
```

You create a **customRegistry.js** file when:

- Replacing the view, view model, or validation logic for a Billing Care module. For example, your business requires a different adjustment REST operation from the default Billing Care operation, which also changes the fields defined in the UI. You can create a view model (and optional validation rules) and then create a **customRegistry.js** to reference your files.

  All elements within Billing Care that provide access to the edited module automatically use your custom module.
- Adding custom modules to Billing Care. For example, you develop a new module for a business requirement and add the module to Billing Care.

Because view model references retrieved through the registry are loaded using RequireJS, they must conform to the asynchronous module definition (AMD) format.

> **Note**
>
> The Billing Care view models are the modules' core elements that form the application's body (Home tab, Bills tab, Assets, News Feed) and Billing Care overlays (dialog boxes).
>
> Common functionality across the overlays in Billing Care, including validation, data saving, and navigation between the pages within the overlay, has been captured in a reusable overlay view model that you should use when you create a custom overlay. This helps ensure your module behaves like the rest of Billing Care.

About Billing Care View Model JavaScript Framework

This section provides an overview of the Billing Care JavaScript framework used in view models and how to use an account record key across modules.

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Access to the Open Account

The current account record is critical to most modules in Billing Care and will be equally crucial to any custom modules developed with the SDK. A view model representing the open account can be accessed using the following JavaScript code:

```
globalAppContext.currentAccountViewModel
```

About AJAX Calls

To improve security, the Billing Care SDK requires all AJAX requests to include cross-site request forgery (CSRF) tokens.

You must add CSRF tokens to all your custom AJAX requests sent to the Billing Care SDK. The Billing Care SDK will not authorize your custom AJAX requests without the token.

The following shows sample code for adding a CSRF token to an AJAX request:

```
$.ajax({
   type: "GET",
   dataType: "json",
   url: urlToFetch,
   beforeSend: function (xhr) {
      util.setRequestHeader(xhr)
   },
   contentType: "application/json; charset=utf-8"

}).done(function (data) {

}).fail(function (errorThrown) {

}).always(function () {

});
```

Object IDs

Objects in the BRM database contain a unique identifier called a POID. The Billing Care REST framework refers to these identifiers as *references* or *refs*. Table 6-1 displays a POID and its equivalent reference ID.

Table 6-1 Example POID and Reference ID

POID	Reference ID
0.0.0.1 /service/email12345	0.0.0.1+-service-email+12345

There are reference IDs throughout the Billing Care data model. POIDs are used when interacting with BRM opcode input and output parameter lists (flists), but reference IDs are used in the JavaScript layer.

The POID format is not suitable for a web application, so the REST framework provides two static utility methods (restIdFromPoid and poidFromRestId) for converting a POID to and from its own REST format. Sample syntax for calling the methods is provided below:

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```
String BRMUtility.restIdFromPoid(String poid);
Poid BRMUtility.poidFromRestId(String restId);
```

About Error Handling in REST Operations

Error handling is a crucial aspect of Billing Care REST customization, and it has multiple benefits, for example:

- Indicating the exact error to the application user
- Helping the application developer to debug the issues

The default Billing Care REST operations return an ErrorInfo object with an error code and error message in case of any exception. The error object contains the following components:

- **errorCode**: A key used to retrieve a localized error message from the Billing Care resource bundle.

  > **Note**
  >
  > A custom error code must start from the 70000 series. For example, 70001, 70002, and so on.

- **errorMessage**: The raw error message from the Billing Care REST layer.
- **isValidationError**: A true value indicates the error results from a BRM validation issue (for example, an invalid country is specified).

Invoking Error Handling in Customizations

Invoke method buildErrorInfo() in **ExceptionHelper.java** to build the ErrorInfo object and return the error object to the caller of the REST services when extending the Billing Care REST framework with custom classes.

The method buildErrorInfo() in **ExceptionHelper.java** takes the error code and error message as mandatory arguments and optional parameters like the response status, a Boolean value to indicate validation error, an flist containing error parameters, and a list of error parameters in the order mentioned.

By default, buildErrorInfo() builds and returns an error info object with a Boolean value of **false** for the **isValidationError** attribute and an HTTP response status of **BAD REQUEST (400)**.

About Custom Resource Authorization

Your customizations may require authorization configuration in Oracle Platform Security Services (OPSS). See "Billing Care Security" in the *Security Guide* for information on securing your Billing Care installation.

The following sections provide general guidelines on how to perform authorization for protected resources.

Performing Authorization in the Actions Menu

ActionsMenu.xml contains the tags <permission-key> and <action-key> to authorize menus.

For more information, see "Customizing the Billing Care Actions Menu".

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Performing Authorization on the UI

To perform authorization on custom UI resources:

1. Define new ResourceTypes, Resources, and corresponding actions in the OPSS Server.
2. Add the new ResourceType to **CustomConfigurations.xml**.

   For example, use the following definition when creating two new ResourceTypes that control both your custom REST API (MyCustomRESTResourceType) and your custom views (MyCustomViewResourceType):

```
<keyvals>
   <key>authorizationResourceTypes</key>
   <value>MyCustomRESTResourceType, MyCustomViewResourceType</value>
   <desc>Add comma separated OPSS Resource Types(values) for authorization. Define
these resource types in OPSS. Please note that the key should not be changed here.</
desc>
</keyvals>
```

3. Use the Billing Care JavaScript utility functions listed in Table 6-2 when performing authorization on UI resources.

Table 6-2 Billing Care JavaScript Utility Functions

Resource	Description
util.getAllResourceGrants()	Gets all resource grants for UI authorization.
util.getGrantedActionsByResource(*resourceName*)	Gets granted actions for the given resourceName. For example: `util.getGrantedActionsByResource('PaymentResource);`
util.isGrantedResourceAction(*action*, *resourceName*)	Checks whether the given action is granted for the given resource. For example: `util.isGrantedResourceAction('Make';'PaymentResource')`

Performing Authorization on the REST Framework

To perform authorization on the REST framework:

1. Define ResourceTypes, Resources, and corresponding actions in OPSS Server.
2. In the REST resource operation that requires authorization, call EnforcementUitl.checkAccess() by passing the required subject, Application Name, Action, Resource Type, Resource, Error, and optional UIRequestValue objects as parameters.

   UIRequestValue parameters are optional and used for handling obligations.

> **Note**
>
> EnforcementUitl.checkAccess() returns an ‘ErrorInfo' object with status 401 Unauthorized when no grant exists on the requested resource for the specified action.

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Using REST Authorization without Obligations

To use REST authorization without obligations:

```
Subject subject = Security.getCurrentSubject();

  // create new error object

  EnforcementError error = new EnforcementError(20020,"You are not authorized to save
credit profile");

  EnforcementUtil.checkAccess(subject,
EnforcementConstants.APPLICATION,"make","CreditProfileResourceType","CreditProfileResourc
e",error);
```

Using REST Authorization with Obligations

To use REST authorization with obligations:

```
Subject subject = Security.getCurrentSubject();
  // create new error objects
EnforcementError ERROR_MIN_AMOUNT_LIMIT = new EnforcementError(20014, "The amount fall
short of your authorized limit.");
EnforcementError ERROR_MAX_AMOUNT_LIMIT = new EnforcementError(20015, "The amount
exceeds your authorized limit.");
UIRequestValue minCurrencyLimit = new UIRequestValue("Minimum Currency Adjustment
Amount",
adjustment.getAmount(), ConstraintOperator.LESS_THAN,
ERROR_MIN_AMOUNT_LIMIT);
//If entered amount(UI value) is greater than OPSS 'max currency adjustment limit' then
throw error
UIRequestValue maxCurrencyLimit = new UIRequestValue("Maximum Currency Adjustment
Amount",
adjustment.getAmount(), ConstraintOperator.GREATER_THAN,
ERROR_MAX_AMOUNT_LIMIT);
```


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7

Customizing Billing Care Templates

Learn how to customize Oracle Communications Billing Care account search, event, and Newsfeed templates.

Topics in this document:

- About Billing Care Templates
- Customizing Templates
- Example 1: Event Template Customization
- Example 2: Event Template Customization with New Fields
- Example 3: Newsfeed Template Customization

About Billing Care Templates

Templates define which columns Billing Care displays in account search, event, and Newsfeed results tables and enable you to add and remove displayed data depending on your business requirements. Event templates are specific to the Oracle Billing and Revenue Management (BRM) **/event** storable class. You may use one or more event templates depending on the supported events in BRM. A single template determines the displayed columns in the Newsfeed, and displays data from the **/newsfeed** storable class. The account search template is defined in the **accountSearch.xml** file.

See "Understanding Flists and Storable Classes" and "Creating Custom Fields and Storable Classes" in *BRM Developer's Guide* for more information about BRM storable classes.

Templates can specify both BRM data in storable classes, and data from external sources. If the data you want to display is not provided by default storable classes available in Billing Care, extend the REST framework to retrieve the required data.

A template file contains four types of elements. Each `<columnHeader>` defined in the template file contains a corresponding storable class `<column>` data definition of the type of data contained in the column. The `<filter>` elements define search fields available to the user to filter displayed data. The <sortbyFields > elements specifies field sorting behavior.

Table 7-1 lists the `<columnHeader>` properties in a template file.

Table 7-1 <columnHeader> Properties in Template Files

Property	Description
alignment	String specifying how to align column text with a cell
icon	Boolean specifying if an image icon is used in the header
label	String used as column header label
resizable	Boolean specifying if the column width is resizable by user
sortable	Boolean specifying if the results table is sortable by the column
tooltip	String used for hover over tool tip for the column

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Table 7-1 (Cont.) <columnHeader> Properties in Template Files

Property	Description
visible	Boolean specifying if the column is visible
width	Width of column specified as percentage

Table 7-2 lists the `<column>` properties in a template file. See the **genericTemplate.xml** file included in the *SDK_home*/**references/eventtemplates**, where *SDK_home* is the Billing Care SDK installation directory, for an example of how column properties are specified.

Table 7-2 <column> Properties in Template Files

Property	Description
column name	Specifies the ID used to map between the column header and column definitions.
fields	Specifies the BRM fields that will be displayed in the column.
format	Specifies the format of the text to be displayed. Used exclusively when type is text.
formula	Optional. If specified, the formula is applied on the specified <field> entries. Can be useful to perform math with multiple fields and display the calculated result.
styles	Specifies the CSS style for the data in a given column.
type	Specifies the data type of the column. Billing Care performs formatting appropriate to the data type. Supported data types include: • id • date • time • currency • text • image • multi • Boolean • enum • duration • phoneNumber
types	Used when type is multi, this enables you to specify the data types of the specified fields

Table 7-3 lists the `<filter>` properties in a template file. Each filter contains one or more `<criteria>` definitions using the properties listed.

> **Note**
>
> The filter definition applies only to events templates.

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Table 7-3 <filter> Properties in Template Files

Property	Description
fieldGroups	Groups listed <criteria> together into a single filter.
groupLabel	Specifies the name of the grouped <criteria>.
groupOperator	Supports **AND** and **OR** values for setting the exclusivity of the grouped <criteria> when filtering results.
inputType	Specifies the type of data used in <criteria>.
visible	Boolean specifying if a <criteria> is visible in Billing Care.

Table 7-4 lists the <sortbyFields> properties in a template file.

Table 7-4 <sortbyFields> Properties in Template Files

Property	Description
defaultSort	Specifies the default sorting behavior.
sortingOrder	Specifies either ascending or descending sort order.
sortingPriority	Lists the fields and priority (by order listed) used to sort displayed results

Customizing Templates

You customize the columns displayed for events and in the Newsfeed by creating custom template files and including these templates, and any required Java code extensions, in your deployed customizations shared library.

The Billing Care SDK includes the default templates used by Billing Care in the *SDK_home***/references/eventtemplates** and *SDK_home***/references/newsfeedtemplates** directories, where *SDK_home* is the directory in which you installed the SDK. The account search template is defined in the *SDK_home*/**references/accountSearch.xml** file.

The *SDK_home***/samples/SDKTemplatesCustomization** directory includes sample templates for customized events and the Newsfeed, and sample Java code for extending the REST framework to retrieve additional data. Use these samples as guidelines when creating custom templates and REST extensions. A **README.txt** file is provided with additional detail on creating custom templates.

Customize Event and Newsfeed templates by:

- Removing Columns from a Template
- Adding Columns to a Template
- Extending the REST Framework to Support New Column Fields
- Creating a customModule.properties File

Example procedures for customizing templates are provided in the following reference sections at the end of this chapter:

- Example 1: Event Template Customization
- Example 2: Event Template Customization with New Fields

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- Example 3: Newsfeed Template Customization

Removing Columns from a Template

Remove unwanted events and Newsfeed columns from displaying in Billing Care by either deleting the column entries from the template file for or setting the visible property for the column to **false**.

To remove a column from an event or Newsfeed template and prevent the column from displaying in Billing Care:

1. Make a copy of a default event or Newsfeed template in your *myproject***/web/WEB-INF/classes/custom/eventtemplates** or *myproject***/web/WEB-INF/classes/custom/newsfeedtemplates**, where *myproject* is the directory for your NetBeans IDE customization project. Preface the template name with **Custom**. For example, to customize the template for the **/event/delayed/session/telco/gsm/sms** event, use **CustomserviceTelcoGsmSms_eventDelayedSessionTelcoGsm.xml**.
2. Open your template file in a text editor.
3. Do one of the following:
   - Remove both the `<columnHeader>` and storable class `<column>` elements from your template for the column you want to remove.
   - Set the `<columnHeader>` visible property to **false** for the column you want to hide.
4. Save and close the file.
5. Do one of the following:
   - If you are using an exploded archive for your shared library, log out of and back into Billing Care to verify your updated template. See "About Using an Exploded Archive" for more information about using exploded archives.
   - Package your customizations shared library and deploy it to your Billing Care domain. Redeploy Billing Care and login to verify your updated template. See "Packaging and Deploying Customizations" for more information on packaging and deploying your customizations.

Adding Columns to a Template

Add columns in an events or the Newsfeed template for display in Billing Care by adding elements for the new columns in a template file. The new columns can contain BRM fields in the **/event** or **/newsfeed** storable classes or custom classes. Custom **/event** classes require extension of the REST framework to retrieve required data for display.

To add additional columns in a template and display the column in Billing Care:

1. Make a copy of a default event or Newsfeed template (or create a template for a custom event) in your *myproject***/web/WEB-INF/classes/custom/eventtemplates** or *myproject***/web/WEB-INF/classes/custom/newsfeedtemplates**, where *myproject* is the directory for your NetBeans IDE customization project. Preface the template name with **Custom**. For example, to customize the template for the **/event/delayed/session/telco/gsm/sms** event, use **CustomserviceTelcoGsmSms_eventDelayedSessionTelcoGsm.xml**.
2. Open your template file in a text editor.
3. Add both the `<columnHeader>` and storable class `<column>` elements from your template for the new column you want to add.

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4. Save and close the file.
5. If necessary, extend the REST framework to retrieve any data unavailable in the default storable classes. See "Extending the REST Framework to Support New Column Fields" for more information on extending the REST framework.
6. If necessary, create a **customModule.properties** entry specifying when Billing Care should override a module's default logic with your customizations. See "Creating a customModule.properties File" for more information.
7. Do one of the following:
   - If you are using an exploded archive for your shared library, log out of and back into Billing Care to verify your updated template. See "About Using an Exploded Archive" for more information about using exploded archives.
   - Package your customizations shared library and deploy it to your Billing Care domain. Redeploy Billing Care and login to verify your updated template. See "Packaging and Deploying Customizations" for more information on packaging and deploying your customizations.

Extending the REST Framework to Support New Column Fields

Create custom Java classes to retrieve and display new fields for columns you add. The following procedure provides an overview of the required classes. See the following examples for sample classes:

- Example 2: Event Template Customization with New Fields
- Example 3: Newsfeed Template Customization

To add custom fields to an event template and customize the REST framework to support the new field:

1. Create a custom event template in your NetBeans IDE customization project. See "Adding Columns to a Template" for more information.
2. Create a custom event worker Java class in *myproject*/**src/com/***company*/**templates** to retrieve the data for the new field, where *company* is a folder named for your company, that extends from **com.oracle.communications.brm.cc.modules.pcm.workers.TemplateEventWorker**.
3. Create a custom event template factory Java class in *myproject*/**src/com/***company*/**templates** to return an instance of your custom worker from step 2.
4. Create a custom template module class in *myproject*/**src/com/***company*/**templates** to return an instance of your custom event template factory from step 3.
5. Compile your custom Java classes using NetBeans IDE.
6. Add your customization files to your NetBeans IDE project (*myproject*):
   - Add the **customModule.properties** in the *myproject*/**web/WEB-INF/classes/custom** folder.
   - Add the custom template file in the *myproject*/**web/WEB-INF/classes/custom/eventtemplates** folder.
7. Right-click your NetBeans IDE project and select **Clean and Build**.
8. Package and deploy your custom templates to your Billing Care domain.

   For more information, see "Packaging and Deploying Customizations".
9. Verify your changes in Billing Care.

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Creating a customModule.properties File

Configure an entry in the **customModule.properties** file for each Billing Care module where you override default logic with your customizations. See "About the customModule.properties File" for more information on specifying custom module behavior in **customModule.properties**.

Example 1: Event Template Customization

This example includes changing the events template for SMS usage. In this example procedure:

- The new field `rum_name` is added to show the value of the BRM PIN_FLD_RUM_NAME field. RUM refers to the ratable usage metric in BRM.
- The existing field `destination_network` is removed.

To customize the events template with the stated changes:

1. Create a **CustomserviceTelcoGsmSms_eventDelayedSessionTelcoGsm.xml** template file in the *myproject*/**web/custom/eventtemplates** folder by copying the default **serviceTelcoGsmSms_eventDelayedSessionTelcoGsm.xml** available in the *SDK_home*/**references/eventtemplates** folder.
2. Add new `<columnHeader>` and `<column>` elements to **CustomserviceTelcoGsmSms_eventDelayedSessionTelcoGsm.xml**.

   Add the `<columnHeader>` in the `<column>` in the appropriate location. For example, if you add the `<columnHeader>` as the fifth element, make sure you add the `<column>` as the fifth column element.

   ```
   <columnHeader name="rum_name">
           <label>Rum Name</label>
           <width>10%</width>
           <visible>true</visible>
           <sortable>false</sortable>
           <tooltip>Rum Name of the event</tooltip>
           <resizable>true</resizable>
           <alignment>center</alignment>
       </columnHeader>
   ……..
   <column  name="rum_name">
              <type>text</type>
              <fields>rumName</fields>
           </column>
   ```

3. Remove the existing `destination_network` column from the template by removing the `<columnHeader>` and `<column>` elements named `destination_network` as shown:

   ```
   <columnHeader name="destination_network">
           <label>DESTINATION_NETWORK</label>
           <width>10%</width>
           <visible>true</visible>
           <sortable>true</sortable>
           <tooltip>DESTINATION_NETWORK_HINT</tooltip>
           <resizable>true</resizable>
           <alignment>left</alignment>
       </columnHeader>
   ……..
   ```


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```
<column  name="destination_network">
        <type>text</type>
        <styles>template-subtle-text</styles>
        <fields>telcoInfo.destinationNetwork</fields>
        <types>string</types>
    </column>
```

4. Save your template file.
5. Add your customization files to your NetBeans IDE project folder (*myproject*), by adding the custom template file in the *myproject*/**web/WEB-INF/classes/custom/eventtemplates** folder.
6. Right-click your NetBeans IDE project and select **Clean and Build**.
7. Package and deploy your custom templates to your Billing Care domain.

   For more information, see "Packaging and Deploying Customizations".
8. Verify your changes in Billing Care.

Example 2: Event Template Customization with New Fields

This example shows how to customize the REST code to support a new field. In this example procedure:

- A custom template is created with new `<columnHeader>` and `<column>` elements to display a new column called `adjustments`.
- The `destination_network` column is removed from the template.
- Required custom Java classes are coded to retrieve the new data for display in Billing Care

To add and delete fields in the event template and customize the REST code to support the new field:

1. Create a **CustomserviceTelcoGsmSms_eventDelayedSessionTelcoGsm.xml** template file in the *myproject*/**web/custom/eventtemplates** folder by copying the default **serviceTelcoGsmSms_eventDelayedSessionTelcoGsm.xml** available in the *SDK_home*/**references/eventtemplates** folder.
2. Add a new `<columnHeader>` and `<column>` for Event Adjustments to the XML file.

   Make sure you add the `<columnHeader>` and `<column>` in the appropriate location. For example if you have added the `<columnHeader>` as the fifth element, make sure you add the `<column>` as the fifth column element.

```
<columnHeader name="adjustments">
        <label>Event Adjustments</label>
        <width>10%</width>
        <visible>true</visible>
        <sortable>false</sortable>
        <tooltip>Event Adjustments</tooltip>
        <resizable>true</resizable>
        <alignment>left</alignment>
    </columnHeader>
……..

<column  name="adjustments">
           <type>currency</type>
           <format>{0}</format>
            <fields>accountObj</fields>
```


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```
            <fields>id</fields>
        </column>
```

3. Remove the existing `destination_network` column from the template by removing the `<columnHeader>` and `<column>` elements named `destination_network` as shown:

```
<columnHeader name="destination_network">
        <label>DESTINATION_NETWORK</label>
        <width>10%</width>
        <visible>true</visible>
        <sortable>true</sortable>
        <tooltip>DESTINATION_NETWORK_HINT</tooltip>
        <resizable>true</resizable>
        <alignment>left</alignment>
    </columnHeader>
……..
   <column  name="destination_network">
            <type>text</type>
            <styles>template-subtle-text</styles>
            <fields>telcoInfo.destinationNetwork</fields>
            <types>string</types>
        </column>
```

4. Save your template file.

5. To add custom logic to retrieve the data needed for the adjustments column, create a custom **TemplateMyCustomEventWorker** class.

   In this example, a new BRM opcode AR_RESOURCE_AGGREGATION is called to retrieve the adjustment made for an event, which overrides the **processFieldForColumnName()** method of the default **TemplateEventWorker** class. If the column name is adjustments, then the opcode AR_RESOURCE_AGGREGATION is called:

```
public class TemplateMyCustomEventWorker extends TemplateEventWorker{

 @Override
protected void processFieldForColumnName(ColumnarRecord.Entries.Cells viCol, String
storableClassType, FList flist, ColumnarRecord.Entries row, String field, Object
value) throws Exception {
if ("adjustments".equalsIgnoreCase(viCol.getName())) {
             if (field.equals("id")) {
             Poid acctPoid =flist.get(FldAccountObj.getInst());
             Poid eventPoid =flist.get(FldPoid.getInst());
             FList inputFlist = new FList();
             inputFlist.set(FldPoid.getInst(),acctPoid);
             inputFlist.set(FldPoid.getInst(),acctPoid);
             FList eventInfo = new FList();
             eventInfo.set(FldPoid.getInst(),eventPoid);
             inputFlist.setElement(FldEvents.getInst(), 0, eventInfo);
             FList outFlist = opcode(PortalOp.AR_RESOURCE_AGGREGATION, inputFlist);
             BigDecimal adjustAmount = getAdjustmenAmount(outFlist);
                viCol.getArgs().add(adjustAmount.toString());
             }
         }else {
             super.processFieldForColumnName(viCol, storableClassType, flist, row,
field, value);
         }
    }
        private BigDecimal getAdjustmenAmount(FList flist) throws EBufException {
        BigDecimal amountAdjustValue = new BigDecimal(0);
        if (flist.hasField(FldResults.getInst())) {
            SparseArray resultsArray = flist.get(FldResults.getInst());
            Enumeration results = resultsArray.elements();
```


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```
            while (results.hasMoreElements()) {
                FList balFlist = (FList) results.nextElement();
                if (balFlist.hasField(FldAdjusted.getInst()) &&
balFlist.hasField(FldResourceId.getInst())) {
                    Integer resourceId = balFlist.get(FldResourceId.getInst());
                    if (BEIDManager.isCurrency(resourceId) ) {
                        amountAdjustValue = balFlist.get(FldAdjusted.getInst());
                        break;
                    }
                }
            }
        }
        return amountAdjustValue;
    }
}
```

6. Create a custom **CustomTemplateFactory** class and override its **getTemplate()** method to return the **TemplateMyCustomEventWorker** class (instead of the default **TemplateEventWorker.java** class):

```
public class CustomTemplateFactory extends TemplateFactory {

    @Override
    public TemplateBaseWorker getTemplateWorker(String templateType){
         if(BillingCareConstants.EVENT.equalsIgnoreCase(templateType)){
             return new TemplateMyCustomEventWorker();
         }else {
             return super.getTemplateWorker(templateType);
         }
    }
}
```

7. Create a custom template module class by extending the **PCMTemplateModule** class to override the **getTemplate()** method to return the new **CustomTemplateFactory**:

```
 public class CustomPCMTemplateModule extends PCMTemplateModule {
      @Override
    protected TemplateFactory getTemplateFactoryInstance(){
       return  new CustomTemplateFactory();
       }
}
```

8. In the NetBeans IDE, create a new Java project with all the mentioned Java files and XML files in the appropriate folders and include the jars required to compile and build the project.
9. Add your customization files to your NetBeans IDE project folder (*myproject*):
   - Add an entry in the **customModule.properties** in the *myproject*/**web/WEB-INF/classes/custom** folder to override the default template module as follows:

     ```
     billingcare.rest.template.module=com.company.modules.CustomPCMTemplateModule
     ```

     where *company* is the company name used in your *myproject*/**src** directory.
   - Add the custom template file in the *myproject*/**web/WEB-INF/classes/custom/eventtemplates** folder.
10. Right-click your NetBeans IDE project and select **Clean and Build**.
11. Package and deploy your custom templates to your Billing Care domain.

    For more information, see "Packaging and Deploying Customizations".
12. Verify your changes in Billing Care.

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Example 3: Newsfeed Template Customization

The following procedure shows how to customize the Newsfeed template by providing an example of adding a new column named `billStatus`. In this example procedure:

- A custom template is created with new `<columnHeader>` and `<column>` elements to display a new column called billStatus.
- Required custom Java classes are coded to retrieve the new data for display in Billing Care

To add a field in the Newsfeed template and customize the REST code to support the new field:

1. Create a **Customnewsfeed.xml** template file in the *myproject*/**web/custom/newsfeedtemplates** folder by copying the default **newsfeed.xml** available in the *SDK_home*/**reference/newsfeedtemplates** folder.
2. Add a new `<columnHeader>` and `<column>` in the XML file **Customnewsfeed.xml**.

   In this example, the field `object` is added as a BRM field to retrieve the billStatus of a **/bill** object.

```
    <columnHeader name="billStatus">
        <label>Bill Status</label>
        <width>10%</width>
        <visible>true</visible>
        <sortable>false</sortable>
        <tooltip>Status of the Bill</tooltip>
        <resizable>true</resizable>
        <alignment>left</alignment>
    </columnHeader>
……..
<column  name="billStatus">
           <type>text</type>
           <fields>object</fields>
        </column>
```

3. Save your template file.
4. Create a custom **TemplateMyCustomNewsfeedWorker** class to add custom logic to retrieve the data needed for the billStatus column.

   In this example, a new BRM opcode PCM_OP_READ_READS opcode is used to retrieve the status of a bill object, then overrides the **processFieldForColumnName()** method of the **TemplateNewsfeedWorker** class. This method checks if the column name is **billStatus**. If so, then the method gets the FLD_DUE amount by calling the opcode PCM_OP_READ_READS.

```
public class TemplateMyCustomNewsfeedWorker extends TemplateNewsFeedWorker {
    @Override
    protected void processFieldForColumnName(ColumnarRecord.Entries.Cells viCol,
String storableClassType, FList flist, ColumnarRecord.Entries row, String field,
Object value) throws Exception {
                    if ("billStatus".equalsIgnoreCase(viCol.getName())) {
                    if (flist.hasField(FldObject.getInst())) {
                      String billType = null;
                      billType = flist.get(FldObject.getInst()).getType();
                      if (billType != null && billType.equalsIgnoreCase("/bill")) {
                        FList billDueinputFList = new FList();
                        billDueinputFList.set(FldPoid.getInst(),
flist.get(FldObject.getInst()));
```


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```
                        billDueinputFList.set(FldDue.getInst());
                        FList billDueOutputFList = opcode(PortalOp.READ_FLDS,
billDueinputFList);
                          BigDecimal billDue =
billDueOutputFList.get(FldDue.getInst());
                        if (!billDue.equals( BigDecimal.ZERO)) {
                          viCol.getArgs().add("Pending");
                          return;
                        } else {
                          viCol.getArgs().add("Paid");
                          return;
                        }
                      }
                    }else {
                          viCol.getArgs().add("");
                      }
            }else {
                super.processFieldForColumnName(viCol, storableClassType, flist, row,
field, value);
            }
    }
}
```

5. Create a custom **CustomTemplateFactory** Java class and override the **getTemplate()** method to return the **TemplateMyCustomNewsfeedWorker** Java class (instead of the default **TemplateNewsfeedWorker** Java class).

```
public class CustomTemplateFactory extends TemplateFactory {

    @Override
    public TemplateBaseWorker getTemplateWorker(String templateType){
         if(BillingCareConstants.NEWSFEED.equalsIgnoreCase(templateType)){
             return new TemplateMyCustomNewsfeedWorker();
         } else {
             return super.getTemplateWorker(templateType);
         }
   }
}
```

6. Create a custom template module class by extending the **PCMTemplateModule** Java class and overriding its **getTemplate()** method:

```
public class CustomPCMTemplateModule extends PCMTemplateModule {

    @Override
    protected TemplateFactory getTemplateFactoryInstance(){
       return new CustomTemplateFactory();
   }
}
```

7. In the NetBeans IDE, create a new Java project with all the mentioned Java files and XML files in the appropriate folders and include the jars required to compile and build the project.
8. Add your customization files to your NetBeans IDE project folder (*myproject*):
   - Add the **customModule.properties** in the *myproject***/web/WEB-INF/classes/custom** folder.
   - Add the custom template file in the *myproject***/web/WEB-INF/classes/custom/eventtemplates** folder.
9. Right-click your NetBeans IDE project and select **Clean and Build**.
10. Package and deploy your custom templates to your Billing Care domain.

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For more information, see "Packaging and Deploying Customizations".

11. Verify your changes in Billing Care.

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8

Customizing Billing Care Themes and Logo

Learn how to customize the appearance of Oracle Communications Billing Care by using themes and changing the login screen logo.

Topics in this document:

- About Billing Care Themes and Logo
- About Customizing Billing Care Themes
- Adding a New Theme
- Overriding Themes
- Setting Which Billing Care Theme to Use
- Changing the Default Logo

About Billing Care Themes and Logo

Billing Care includes two theme cascading style sheet (CSS) that determine the Billing Care look and feel. CSS enables you to alter Billing Care's appearance (for example, colors and fonts) for your business needs. By default, **theme_alta.css** is enabled. An alternative theme named **theme_default.css** is also included. An entry in the registry file specifies which CSS file Billing Care uses.

Additionally, override CSS files can be used to change the appearance of specific elements in Billing Care when needed. For example, the Billing Care login page uses a CSS that specifies the displayed logo graphic file. See "Changing the Default Logo" for more information on using a custom logo.

The Billing Care SDK includes sample CSS files named **customTheme.css** and **override.css** in the *SDK_home*/**samples/Themes/css** directory, where *SDK_home* is the directory where you installed the SDK. Use these files when creating custom themes and overrides to change the Billing Care look and feel.

> **Note**
>
> The **theme_default.css** and **theme_alta.css** files are not included in the Billing Care SDK. To retrieve these files for customization, set the desired theme using the registry file, then view and download the CSS using your browsers development tools.

About Customizing Billing Care Themes

You can customize Billing Care in the following ways:

- Adding a New Theme
- Overriding Themes
- Setting Which Billing Care Theme to Use

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Adding a New Theme

Add a new theme to Billing Care by creating a CSS file and including it in your customizations shared library. The SDK includes a sample custom theme named **customTheme.css** in the *SDK_home*/**samples/Themes/css** directory, where *SDK_home* is the directory where you installed the SDK. Use this sample theme when creating your custom theme.

To add a theme:

1. Create a new CSS file (for example, **mytheme.css**).
2. Copy your custom CSS file to the *myproject*/**web/css** directory, where *myproject* is the NetBeans IDE project directory containing your Billing Care customizations.
3. Set Billing Care to use your custom theme in the registry file and deploy your custom theme to your Billing Care domain. See "Setting Which Billing Care Theme to Use" for instructions on specifying a theme in the registry and deploying your theme in the Billing Care domain.

Overriding Themes

You can override and add styles to the existing theme's CSS file. Billing Care applies the registry's configured theme first, then applies any override theme modifications. The SDK includes a sample override CSS file named **override.css** in the *SDK_home*/**samples/Themes/css** directory, where *SDK_home* is the directory where you installed the SDK.

To override and add styles to an existing theme:

1. Write a CSS file that overrides or adds styles (for example, **theme_custom.css**).
2. In the **customRegistry.js** file, add an entry under **cssFiles** for your override CSS file in the **others** parameter as shown in Example 8-1. See "About the Registry File" for more information on how to create a custom registry file.
3. Copy your override CSS file to the *myproject*/**web/css** directory, where *myproject* is the NetBeans IDE project directory containing your Billing Care customizations.
4. Confirm Billing Care is configured to use your custom theme and overrides in the registry file and deploy your overrides to the Billing Care domain. See "Setting Which Billing Care Theme to Use" for instructions on specifying a theme in the registry and deploying your theme to the Billing Care domain.

Example 8-1 Theme Override Registry File Example

```
var CustomRegistry= {
   cssFiles: {
      themeCss: 'css/theme_default.css', //switching among the existing themes
      others: ['css/theme_custom.css'] //then overriding/adding to it
   }
};
```

Setting Which Billing Care Theme to Use

Switch between themes by adding an entry in **customRegistry.js** using the same key as used in **Registry.js**, which points to the required theme's CSS file. See "About the Registry File" for information on creating the **customRegistry.js** file and including it in your shared library for deployment to your Billing Care domain.

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Example 8-2 shows the entry in the registry file where a custom theme is specified.

Example 8-2 Billing Care Theme Registry Entry

```
var CustomRegistry= {
cssFiles: {
themeCss:   'css/theme_default.css'
}
 };
```

To switch Billing Care themes:

1. Create a **customRegistry.js** file in a text editor. See "About the Registry File" for more information on how to create a custom registry file.
2. Update the **customRegistry.js** file specifying your CSS file in the **themeCss** entry.
3. Save and close the file.
4. Do one of the following:
   - If you are using an exploded archive for your shared library, log out of and back into Billing Care to see the new theme. See "About Using an Exploded Archive" for more information about using exploded archives.
   - Package your customizations shared library and deploy it to your Billing Care domain. Redeploy Billing Care and login to see the new theme. See "Packaging and Deploying Customizations" for more information on packaging and deploying your customizations.

Changing the Default Logo

By default, Billing Care displays the Oracle logo on the login page and in the header section that appears after you login.

To change the default logo:

1. Copy your custom logo into the *myproject*/**web/resources/public/images** directory, where *myproject* is the NetBeans IDE project directory containing your Billing Care customizations.
2. To change the default logo that appears on the login page, do the following:
   a. Using the NetBeans IDE text editor, create an **overrides-login.css** file in the *myproject*/**web/resources/public/css** directory.

      Ensure that the **overrides-login.css** file contains the location and size of your custom logo image file as shown in Example 8-3.

   b. Adjust the margin, width, height, and float values in **overrides-login.css** so that your image renders properly.

   c. Save and close the file.
3. To change the default logo in the header section that appears after you login, do the following:
   a. Using the NetBeans IDE text editor, create an **overrides.css** file in the *myproject*/**web/css** directory.

   b. Add the entries as shown in Example 8-3.

   c. Change the following entry:

      ```
      background: url("../images/imagefile") no-repeat;!important;
      ```


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To this:

```
    background: url(""../../resources/public/images/imagefile") no-repeat !
important;
```

where *imagefile* references your custom logo image file located in your NetBeans project.

d. Adjust the margin, width, height, and float values in **overrides.css** so that your image renders properly.

e. Save and close the file.

4. Do one of the following:

   - If you are using an exploded archive for your shared library, log out of and back into Billing Care to see the new theme. See "About Using an Exploded Archive" for more information about using exploded archives.
   - Package your customizations shared library and deploy it to your Billing Care domain. Redeploy Billing Care and login to see the new theme. See "Packaging and Deploying Customizations" for more information on packaging and deploying your customizations.

Example 8-3 Sample overrides-login.css File

```
/**
   This is the CSS where an SDK developer can do out of box logo header changes.
   Below example shows how to override the oracle logo that comes with
   default Billing Care package.
**/
#logoHeader{
    height: auto;
}
#logoHeader .row .col span.logo-oracle {
    background: url("../images/star-shape.png") no-repeat;
    margin: -3px 24px 0 12px;
    width: 100px;
    height: 80px;
    float: left;
}
```


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9

Editing the Billing Care Configuration File

Learn how to customize the Oracle Communications Billing Care interface by creating a custom version of the **Configurations.xml** file.

Topics in this document:

- About the Billing Care Configuration File
- Creating a Custom Configuration File
- Default Configuration File Entries

About the Billing Care Configuration File

The **Configurations.xml** file controls the following elements of Billing Care:

- Mappings that determine what values are displayed for module keys. See Table 9-1.
- Flags for showing or hiding module elements. See Table 9-2.
- Threshold values for connection timeouts and pagination. See Table 9-3.
- Registry values that determine how Billing Care renders modules. See Table 9-4.
- Keyval categories displayed in the newsfeed. See Table 9-5.

Creating a Custom Configuration File

To change default behavior, create a **CustomConfigurations.xml** file, and package it in the customizations shared library that you deploy to the Billing Care domain.

To create a **CustomConfigurations.xml** file:

1. Copy the *SDK_home***/references/Configurations.xml** file to the *myproject***/web/custom/configurations** directory.

   where:

   - *SDK_home* is the directory in which you installed the Billing Care SDK.
   - *myproject* is your NetBeans IDE Billing Care customizations project.

2. Open the **CustomConfigurations.xml** file, and edit the entries you want to change.

   For a list of the default configuration file entries, see "Default Configuration File Entries".

3. Save and close the file.

4. Include the **CustomConfigurations.xml** file when you package your customizations shared library for deployment to your Billing Care domain.

   For more information on packaging and deploying your customizations, see "Packaging and Deploying Customizations".

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Default Configuration File Entries

The following tables show the default values in the **Configurations.xml** file.

Table 9-1 lists the configurable mappings and their default values.

Table 9-1 Mapping Values in Configuration File

Configuration Key and Description	Default Values	Types
account.contact.phone.types Phone types displayed in the Account Profile overlay. Permits adding, rearranging, and renaming the phone types.	<mapping> <key>account.contact.phone.types</key> <map> <id>1</id> <key>HOME</key> </map> <map> <id>2</id> <key>WORK</key> </map> <map> <id>3</id> <key>FAX</key> </map> <map> <id>4</id> <key>PAGER</key> </map> <map> <id>5</id> <key>MOBILE</key> </map> <map> <id>6</id> <key>POP</key> </map> <map> <id>7</id> <key>SUPPORT</key> </map> <desc></desc> </mapping>	**id:** Number. **key:** String (must match appropriate key in the Billing Care resource bundle).

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Table 9-1 (Cont.) Mapping Values in Configuration File

Configuration Key and Description	Default Values	Types
account.contact.types Contact types displayed in the Account Profile overlay. Permits adding, rearranging, and renaming the contact types.	`<mapping>` `<key>account.contact.types</key>` `<map>` `<id>1</id>` `<key>PRIMARY</key>` `</map>` `<map>` `<id>2</id>` `<key>ADDITIONAL</key>` `</map>` `<map>` `<id>3</id>` `<key>ACCOUNTHOLDER</key>` `</map>` `<desc></desc>` `</mapping>`	**id:** Number. **key:** String (must match appropriate key in the Billing Care resource bundle).
account.customer.types Customer types displayed in the Account Profile overlay. Permits adding, rearranging, and renaming the customer types.	`<mapping>` `<key>account.customer.types</key>` `<map>` `<id>1</id>` `<key>PLATINUM</key>` `</map>` `<map>` `<id>2</id>` `<key>GOLD</key>` `</map>` `<map>` `<id>3</id>` `<key>SILVER</key>` `</map>` `<map>` `<id>4</id>` `<key>BRONZE</key>` `</map>` `<desc></desc>` `</mapping>`	**id:** Number. **key:** String (must match appropriate key in the Billing Care resource bundle).

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Table 9-1 (Cont.) Mapping Values in Configuration File

Configuration Key and Description	Default Values	Types
account.locale.mapping Because browser and BRM language codes are different, this configuration acts like a mapping.	<mapping> <key>account.locale.mapping</key> <map> <id>cs</id> <key>cz</key> </map> <map> <id>bg</id> <key>bg_BG</key> </map> <map> <id>hr</id> <key>hr_HR</key> </map> <map> <id>sl</id> <key>sl_SI</key> </map> <map> <id>nb</id> <key>no</key> </map> <map> <id>nn</id> <key>no_NY</key> </map> <map> <id>sv</id> <key>sve</key> </map> <map> <id>en_GB</id> <key>en_GB</key> </map> <map> <id>he</id> <key>iw_IL</key> </map> <desc></desc> </mapping>	**id:** String that represents the browser language. **key:** String that represents the BRM language (BRM locale value).

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Table 9-1 (Cont.) Mapping Values in Configuration File

Configuration Key and Description	Default Values	Types
account.status.types Status types displayed in the Account Status overlay and the account banner. Permits rearranging and renaming the status types.	`<mapping>` `<key>account.status.types</key>` `<map>` `<id>10100</id>` `<key>ACTIVE</key>` `</map>` `<map>` `<id>10102</id>` `<key>INACTIVE</key>` `</map>` `<map>` `<id>10103</id>` `<key>CLOSED</key>` `</map>` `<desc></desc>` `</mapping>`	**id:** Number. **key:** String (must match appropriate key in the Billing Care resource bundle).

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Table 9-1 (Cont.) Mapping Values in Configuration File

Configuration Key and Description	Default Values	Types
account.taxExemptions.types Tax exemption types displayed in the Tax Setup overlay. Permits adding, rearranging, and renaming the tax exemptions. **Note:** Make sure BRM supports the tax exemption when you add a new type.	<mapping> <key>account.taxExemptions.types</key> <map> <id>0</id> <key>FEDERAL</key> </map> <map> <id>1</id> <key>STATE</key> </map> <map> <id>2</id> <key>COUNTRY</key> </map> <map> <id>3</id> <key>CITY</key> </map> <map> <id>4</id> <key>SECONDARY_COUNTRY</key> </map> <map> <id>5</id> <key>SECONDARY_CITY</key> </map> <map> <id>6</id> <key>TERRITORY</key> </map> <map> <id>7</id> <key>SECONDARY_STATE</key> </map> <map> <id>8</id> <key>DISTRICT</key> </map> <map> <id>9</id> <key>SECONDARY_FEDERAL</key> </map> <desc></desc> </mapping>	**id:** Number. **key:** String (must match appropriate key in the Billing Care resource bundle).

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Table 9-1 (Cont.) Mapping Values in Configuration File

Configuration Key and Description	Default Values	Types
billUnit.accountingTypes Accounting types in the Bill Unit overlay. Permits adding, rearranging, and renaming the accounting types. **Note:** By default, BRM supports only balance forward and open item accounting. Before adding an accounting type, do the necessary customizations in BRM.	`<mapping>` `<key>billUnit.accountingTypes</key>` `<map>` `<id>1</id>` `<key>OPEN_ITEM</key>` `</map>` `<map>` `<id>2</id>` `<key>BALANCE_FORWARD</key>` `</map>` `<desc></desc>` `</mapping>`	**id:** Number. **key:** String (must match appropriate key in the Billing Care resource bundle).
billUnit.billingFrequencyInMonths Billing frequency in the Bill Unit overlay. Permits adding, rearranging, and renaming the billing frequency. **Example:** An SDK developer can add "6 months" as an option in the drop-down.	`<mapping>` `<key>billUnit.billingFrequencyInMonths</key>` `<map>` `<id>1</id>` `<key>MONTHLY</key>` `</map>` `<map>` `<id>2</id>` `<key>BI_MONTHLY</key>` `</map>` `<map>` `<id>3</id>` `<key>QUARTERLY</key>` `</map>` `<map>` `<id>12</id>` `<key>ANNUAL</key>` `</map>` `<desc></desc>` `</mapping>`	**id:** Number. **key:** String (must match appropriate key in the Billing Care resource bundle).
billUnit.correctiveInvoiceType Corrective invoice types supported for bill units.	`<mapping>` `<key>billUnit.correctiveInvoiceType</key>` `<map>` `<id>0</id>` `<key>REPLACEMENT_INVOICE</key>` `</map>` `<map>` `<id>4</id>` `<key>CORRECTIVE_INVOICE</key>` `</map>` `<desc></desc>` `</mapping>`	**id:** Number. **key:** String (must match appropriate key in the Billing Care resource bundle).

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Table 9-1 (Cont.) Mapping Values in Configuration File

Configuration Key and Description	Default Values	Types
billunit.status The status type that represents the state of the bill units in collections. Permits rearranging and renaming of the values.	<mapping> <key>billunit.status</key> <map> <id>0</id> <key>DEFUNCT</key> </map> <map> <id>10100</id> <key>ACTIVE</key> </map> <map> <id>10200</id> <key>INACTIVE</key> </map> <map> <id>10300</id> <key>CLOSED</key> </map> <desc></desc> </mapping>	**id:** Number. **key:** String (must match appropriate key in the Billing Care resource bundle).
collections.action.status Displays the action status for collections.	<mapping> <key>collections.action.status</key> <map> <id>0</id> <key>PENDING</key> </map> <map> <id>1</id> <key>CANCELLED</key> </map> <map> <id>2</id> <key>COMPLETED</key> </map> <map> <id>5</id> <key>WAITING_FOR_DEPENDENTS</key> </map> <desc></desc> </mapping>	**id:** Number. **key:** String (must match appropriate key in the Billing Care resource bundle).

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Table 9-1 (Cont.) Mapping Values in Configuration File

Configuration Key and Description	Default Values	Types
device.sim.status The state of the Subscriber Identity Module (SIM) in the device.	`<mapping>` `<key>device.sim.status</key>` `<map>` `<id>1</id>` `<key>NEW</key>` `</map>` `<map>` `<id>2</id>` `<key>RELEASED</key>` `</map>` `<desc></desc>` `</mapping>`	**id:** Number. **key:** String.
device.sim.networkElement The available wireless network element that is used for associating the SIM or the device number (NUM) with the Telco service.	`<mapping>` `<key>device.sim.networkElement</key>` `<map>` `<id>sample_network_element_1</id>` `<key>SAMPLE_NETWORK_ELEMENT_1</key>` `</map>` `<map>` `<id>sample_network_element_2</id>` `<key>SAMPLE_NETWORK_ELEMENT_2</key>` `</map>` `<desc></desc>` `</mapping>`	id: String. **key:** String.
device.num.status The status type that represents the state of the device number.	`<mapping>` `<key>device.num.status</key>` `<map>` `<id>1</id>` `<key>NEW</key>` `</map>` `<map>` `<id>4</id>` `<key>UNASSIGNED</key>` `</map>` `<desc></desc>` `</mapping>`	**id:** Number. **key:** String.
device.num.category The default number of categories for the device number.	`<mapping>` `<key>device.num.category</key>` `<map>` `<id>0</id>` `<key>NONE</key>` `</map>` `<map>` `<id>1</id>` `<key>RESERVED</key>` `</map>` `<desc></desc>` `</mapping>`	**id:** Number. **key:** String.

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Table 9-1 (Cont.) Mapping Values in Configuration File

Configuration Key and Description	Default Values	Types
device.num.vanity The value of the vanity key that is used for the device number.	`<mapping>` `<key>device.num.vanity</key>` `<map>` `<id>0</id>` `<key>NONE</key>` `</map>` `<map>` `<id>1</id>` `<key>SAMPLE_VANITY_1</key>` `</map>` `<map>` `<id>2</id>` `<key>SAMPLE_VANITY_2</key>` `</map>` `<desc></desc>` `</mapping>`	**id:** Number. **key:** String.
payment.debit.accountTypes Direct debit accounting types displayed in the Payment Setup, Make Payment, and Bill Unit overlays. Permits adding, rearranging, and renaming the direct debit types. **Note:** Adding an accounting type to Billing Care also requires customizations in BRM.	`<mapping>` `<key>payment.debit.accountTypes</key>` `<map>` `<id>1</id>` `<key>ACCOUNT_TYPE_CHECKING</key>` `</map>` `<map>` `<id>2</id>` `<key>ACCOUNT_TYPE_SAVINGS</key>` `</map>` `<map>` `<id>3</id>` `<key>ACCOUNT_TYPE_CORPORATE</key>` `</map>` `<desc></desc>` `</mapping>`	**id:** Number. **key:** String (must match appropriate key in the Billing Care resource bundle).
paymentMethods.invoice.deliverPreferTypes Invoice delivery preferences in the Payment Setup and Bill Unit overlays. Permits adding, rearranging, and renaming the delivery preferences. **Note:** BRM supports the key **FAX** with the ID **2** as a preference type. You can add this mapping to the **CustomConfigurations.xml** file.	`<mapping>` `<key>paymentMethods.invoice.deliverPreferTypes</key>` `<map>` `<id>0</id>` `<key>EMAIL</key>` `</map>` `<map>` `<id>1</id>` `<key>POSTAL</key>` `</map>` `<desc></desc>` `</mapping>`	**id:** Number. **key:** String (must match appropriate key in the Billing Care resource bundle).

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Table 9-1 (Cont.) Mapping Values in Configuration File

Configuration Key and Description	Default Values	Types
product.customization.delayed.reasons Reasons for product or discount activation delays.	<mapping> <key>product.customization.delayed.reasons</key> <map> <id>2</id> <key>WAITING_FOR_NETWORK_CONFIGURATION</key> </map> <map> <id>4</id> <key>WAITING_FOR_MAINTENANCE</key> </map> <map> <id>1</id> <key>WAITING_FOR_INSTALLATION</key> </map> <desc></desc> </mapping>	**id:** Number. **key:** String (must match appropriate key in the Billing Care resource bundle).
serviceTypes.icons Service icons to display in the asset cards. An icon exists for account products and for GSM services. If no icon is provided for a service, the default icon is used. The image can be placed in any folder but must be in the WAR file. Optimum image dimension is 116 x 116 pixels.	<mapping> <key>serviceTypes.icons</key> <map> <id>serviceIp</id> <key>resources/images/star-shape.png</key> </map> <map> <id>serviceEmail</id> <key>resources/images/star-shape.png</key> </map> <map> <id>accountProduct</id> <key>resources/images/hexagon-shape.png</key> </map> <map> <id>serviceTelcoGsm</id> <key>resources/images/audio-call.png</key> </map> <map> <id>defaultService</id> <key>resources/images/star-shape.png</key> </map> <desc></desc> </mapping>	**id:** String. **key:** Icon associated with the specified service.

Table 9-2 lists the configurable flags and their default values.

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Table 9-2 Flags in Configuration File

Configuration Key and Description	Default Values	Types
accountbanner.showcurrencycode Flag that determines whether the ISO currency code (such as USD) is displayed in the account banner.	`<flags>` `<key>accountbanner.showcurrencycode</key>` `<value>false</value>` `<desc></desc>` `</flags>`	**key:** String. **value:** Boolean. If the value is **true**, the code is displayed. Default value is **false**.
account.contact.showsalutation Flag that determines whether the salutation field is displayed in the account profile, the account banner, and all dialog titles.	`<flags>` `<key>account.contact.showsalutation</key>` `<value>false</value>` `<desc></desc>` `</flags>`	**key:** String. **value:** Boolean. If the value is **true**, the field is displayed. Default value is **false**.
batch.payments.autoprocess Flag that determines whether batch payment files uploaded in the UI are automatically processed.	`<flags>` `<key>batch.payments.autoprocess</key>` `<value>false</value>` `<desc></desc>` `</flags>`	**key:** String. **value:** Boolean. If the value is **true**, the files are automatically processed. Default value is **false**.
billinvoice.use.modaldialog Flag that determines whether invoices viewed in Billing Care are display in a dialog box.	`<flags>` `<key>billinvoice.use.modaldialog</key>` `<value>false</value>` `<desc></desc>` `</flags>`	**key:** String. **value:** Boolean. If the value is **true**, invoices are display in a dialog box. Default value is **false**.
graph.notes.indicators Flag that determines whether notes indicators are displayed on top of graphs. When accounts have lots of activity or lots of notes, too many indicators may be shown. Setting this value to false enables you to remove the indicators, reducing visual clutter.	`<flags>` `<key>graph.notes.indicators</key>` `<value>true</value>` `<desc></desc>` `</flags>`	**key:** String. **value:** Boolean. If the value is **false**, the indicators are not displayed. Default value is **true**.
request.record.failure Flag that determines whether to record in the BRM database all Billing Care REST API transactions that failed. Only requests that are changing resources are recorded.	`<flags>` `<key>request.record.failure</key>` `<value>false</value>` `<desc></desc>` `</flags>`	**key:** String. **value:** Boolean. If the value is **true**, failed transactions are recorded. Default value is **false**.

Table 9-3 lists the configurable thresholds and their default values.

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Table 9-3 Thresholds in Configuration File

Configuration Key and Description	Default Values	Types
accountsearch.limit Number of account search results shown by default. The number of search results shown can be increased or decreased by editing the **value** field. **Note:** The limit set for the account search results must be a non-zero positive integer.	<thresholds> <key>accountsearch.limit</key> <value>50</value> <desc> </desc> </thresholds>	**key:** String. **value:** Number.
assets.servicetypes.size Maximum number of service types shown by default in Assets section. Additional service types can be shown by clicking a Show More link.	<thresholds> <key>assets.servicetypes.size</key> <value>6</value> <desc></desc> </thresholds>	**key:** String. **value:** Number.
balances.services.size Maximum number of services shown by default in Balances section. Additional services can be shown by clicking a Show More link.	<thresholds> <key>balances.services.size</key> <value>4</value> <desc></desc> </thresholds>	**key:** String. **value:** Number.
batch.payments.threshold Maximum percentage of payments in a batch that can be suspended. If this value is exceeded, batch processing stops.	<thresholds> <key>batch.payments.threshold</key> <value>50</value> <desc></desc> </thresholds>	**key:** String. **value:** Number.
collections.pagination Maximum number of collections bill units displayed in a table on a page. For example, if 150 records exist, only the first 25 are initially displayed. When you click **Show More**, the next 25 are retrieved and appended to the initial results. You can repeat this to retrieve the remaining records.	<thresholds> <key>collections.pagination.size</key> <value>25</value> <desc></desc> </thresholds>	**key:** String. **value:** Number.
creditcard.alert.expirydays Number of days before credit card expiration that an alert is shown in the card tile in Make Payment and Payment Setup overlays.	<thresholds> <key>creditcard.alert.expirydays</key> <value>60</value> <desc></desc> </thresholds>	**key:** String. **value:** Number.

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Table 9-3 (Cont.) Thresholds in Configuration File

Configuration Key and Description	Default Values	Types
devicesearch.limit Number of records to be retrieved in device search dialog. By default, 50 records are displayed. The number of search results shown can be increased or decreased by editing the **value** field. **Note:**The limit set for the device search results must be a non-zero positive integer.	`<thresholds>` `<key>devicesearch.limit</key>` `<value>50</value>` `<desc>` `</desc>` `</thresholds>`	**key:** String. **value:** Number.
package.alert.expirydays Number of days before expiration a package can be purchased during account creation or add-on package purchase.	`<thresholds>` `<key>package.alert.expirydays</key>` `<value>60</value>` `<desc></desc>` `</thresholds>`	**key:** String. **value:** Number.
pagination.size Maximum number of records initially displayed in a table on a page. For example, if 150 records exist, only the first 50 are initially displayed. When you click Show More, the next 50 are retrieved and appended to the initial results. Clicking Show More one more time retrieves the final 50. All 150 records are now displayed.	`<thresholds>` `<key>pagination.size</key>` `<value>50</value>` `<desc></desc>` `</thresholds>`	**key:** String. **value:** Number.
paymentsuspense.pagination.size Maximum number of records initially displayed in a table on a page in the payment suspense search results. For example, if 50 records exist, only the first 25 are initially retrieved and displayed. To see the next 25 records, you must click Show More.	`<thresholds>` `<key>paymentsuspense.pagination.size</key>` `<value>25</value>` `<desc></desc>` `</thresholds>`	**key:** String. **value:** Number.

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Table 9-3 (Cont.) Thresholds in Configuration File

Configuration Key and Description	Default Values	Types
pcm.connection.timeout Maximum number of milliseconds in which an opcode must return results before the connection times out. If you change this value, you must restart the server to reinitialize the connection pool.	`<thresholds>` `<key>pcm.connection.timeout</key>` `<value>15000</value>` `<desc></desc>` `</thresholds>`	**key:** String. **value:** Number.
recent.records.size Maximum number of recently opened accounts displayed in the Search overlay.	`<thresholds>` `<key>recent.records.size</key>` `<value>5</value>` `<desc></desc>` `</thresholds>`	**key:** String. **value:** Number.
session.timeout.advancewarningtime Advance warning time for session time out in seconds.	`<thresholds>` `<key>session.timeout.advancewarningtime</key>` `<value>60</value>` `<desc></desc>` `</thresholds>`	**key:** String. **value:** Number.
roles.batchsize Maximum number of roles that can be retrieved in a batch when a search operation is performed to find roles; for example, roles with permissions to manage suspended payments. **Note:** There will no visible changes to the UI for any change made for role batch size retrieval.	`<thresholds>` `<key>roles.batchsize</key>` `<value>100</value>` `<desc></desc>` `</thresholds>`	**key:** String. **value:** Number.

Table 9-4 lists the configurable registry keys and their default values.

Table 9-4 Registry Entries in Configuration File

Configuration Key and Description	Default Values	Types
accountBannerSections Sections displayed in the account banner. Permits rearranging (by modifying the order of the registry keys), deleting, and adding sections. See "Customizing the Billing Care Account Banner".	`<keyvals>` `<key>accountBannerSections</key>` `<value>accountBannerContact,accountBannerAccountInfo,accountBannerCollections,accountBannerBillUnits,accountBannerVIPInfo</value>` `<desc></desc>` `</keyvals>`	**key:** String. **value:** Comma-separated strings.

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Table 9-4 (Cont.) Registry Entries in Configuration File

Configuration Key and Description	Default Values	Types
accountCreation.packageList Name of the package list containing the packages displayed during account creation. Default is **CSR**. To enable Billing Care to display a different package list, replace the default package list name with one of the following package list names: • **default**, which displays packages from the default-new package list • Any custom package list name If no package list name is specified, packages from the default-new package list are displayed.	<keyvals> <key>accountCreation.packageList</key> <value>CSR</value> <desc></desc> </keyvals>	**key** String. **value:** String.
accountCreation.tabs Account creation framework configuration used to render train stops and labels for the footer. The key is also used as a registry entry to fetch views or view models for the corresponding train stops.	<keyvals> <key>accountCreation.tabs</key> <value> [{"key": "generalInfo", "value":{ "label":"PROFILE", "msg":"COMPLETE_PROFILE_THEN", "title":"PROFILE_SHORT_DESCRIPTION" } }, {"key": "accountCreationSelect", "value":{ "label":"SELECT", "msg":"SELECT_THEN" } }, {"key": "accountCreationConfigure", "value": { "label" : "CONFIGURE", "msg" : "COMPLETE_CONFIGURATION_THEN", "title": "CONFIGURE_SHORT_DESCRIPTION" } }, {"key": "accountCreationPay", "value": { "label" : "PAY", "msg" : "COMPLETE_PAYMENTINFORMATION_THEN", "title": "PAY_SHORT_DESCRIPTION" } }] </value> <desc></desc> </keyvals>	**key:** String. **value:** String.

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Table 9-4 (Cont.) Registry Entries in Configuration File

Configuration Key and Description	Default Values	Types
accountCreation.tagsMapping Mapping for tagging a package.	`<keyvals>` `<key>accountCreation.tagsMapping</key>` `<value>[{"key": ".*GSM.*|.*[Mm]obile.*", "value":"Mobile"},` `{"key": ".*[Cc]able.*", "value":"Cable,TV"},` `{"key": ".*[Ff]iber.*|.*[Ww]eb.*|.*GPRS.*", "value": "Internet"},` `{"key": ".*[Cc]orporate.*", "value": "Corporate"},` `{"key": ".*[Tt]ax.*", "value": "Tax"},` `{"key": "*", "value": "Uncategorized"}]` `</value>` `<desc></desc>` `</keyvals>`	**key:** String. **value:** Regular expression. The key is a regular expression to match the package name or **Uncategorized**, and the value is the tag name. If a package name matches the regular expression, it is tagged with the corresponding tags. Packages that do not match mapping rules are categorized under the **"*"** pattern value.
authorizationResourceTypes Custom authorization resource types. The resource types should be defined in OPSS.	`<keyvals>` `<key>authorizationResourceTypes</key>` `<value></value>` `<desc></desc>` `</keyvals>`	**key** String. **value:** Comma-separated string. **Note:** The key should not be changed here.
batchPaymentsDateFormat Format of batch payment date. The default supports the following date formats: 23-December-30 23-December-2030 To abbreviate the month, change **MMMM** to **MMM**, which supports the following date formats: 23-Dec-30 23-Dec-2030 To use four digits instead of two for the date, change **y** to **yyyy**.	`<keyvals>` `<key>batchPaymentsDateFormat</key>` `<value>d-MMMM-y</value>` `<desc></desc>` `</keyvals>`	**key:** String. **value:** String.
batchPaymentsDirectoryName Batch payment parent directory name.	`<keyvals>` `<key>batchPaymentsDirectoryName</key>` `<value>BatchPaymentFiles</value>` `<desc></desc>` `</keyvals>`	**key:** String. **value:** String.

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Table 9-4 (Cont.) Registry Entries in Configuration File

Configuration Key and Description	Default Values	Types
batchPaymentsTabs List of tabs displayed in the batch payments page.	`<keyvals>` `<key>batchPaymentsTabs</key>` `<value>[{"id": "active", "label": "ACTIVE"},{"id": "history", "label": "HISTORY"}]</value>` `<desc></desc>` `</keyvals>`	**id:** String. **key:** String.
batchPaymentTypes Supported batch payment types. By default, the following payment types are supported: • Cash • Check • Failed • Interbank transfer • Postal order • Wire transfer	`<keyvals>` `<key>batchPaymentTypes</key>` `<value>[{"type": "Cash Payment Batch","code": "10011","templateName":"cash_payment_template.pit"}, {"type": "Check Payment Batch","code": "10012","templateName":"check_payment_template.pit"}, {"type": "Wire-Transfer Payment Batch","code": "10013","templateName":"wire-transfer_payment_template.pit"},{"type": "Inter Bank Payment order Payment Batch","code": "10014","templateName":"interbankpayorder_payment_template.pit"},{"type": "Postal order Payment Batch","code": "10015","templateName":"postalorder_payment_template.pit"},{"type": "Failed Payment Batch","code": "10017","templateName":"failed_payment_template.pit"}]</value>` `<desc></desc>` `</keyvals>`	**key:** String. **value:** String (includes payment type, payment ID, and the name of a template file (.pit) for batch processing).
brmserver.timezone The time zone configuration for displaying the time in Billing Care. Use one of these options for the time zone: • **Location:** Enter the time zone name (from the time zone database) in the format *areallocation*, such as America/New_York. Use this format if your time zone supports Daylight Saving Time (DST). • **UTC Offset:** Enter the UTC offset value, such as +0430. Use this format if the time zone is fixed. If the value is empty, the WebLogic Server's time zone is used.	`<keyvals>` `<key>brmserver.timezone</key>` `<value>America/Los_Angeles</value>` `<desc></desc>` `</keyvals>`	**key:** String. **value:** String.

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Table 9-4 (Cont.) Registry Entries in Configuration File

Configuration Key and Description	Default Values	Types
collections.icon Displays the Collections icon.	<keyvals> <key>collections.icon</key> <value>[{"key": "*", "value":"resources/images/collections.png"}]</value> <desc></desc> </keyvals>	**key:** String. **value:** Complex array containing an icon.
cssFiles All available CSS files. **"activeTheme" : true** represents the active theme.	<keyvals> <key>cssFiles</key> <value>{"availablethemes": [{"name" :"css/theme_.css" ,"activeTheme" : true}, {"name" :"css/theme_default.css", "activeTheme" : false}]}</value> <desc></desc> </keyvals>	**key:** String. **value:** Boolean.
financialSetup.tabs Used to configure the page navigator. Order of each entry is the order in which the tabs are shown.	<keyvals> <key>financialSetup.tabs</key> <value>[{"key": "paymentMethods", "editable": false, "subcontent":[{"key":"newPaymentMethod", "editable": true}, {"key":"editPaymentMethod", "editable": true}]} , {"key":"billUnits","editable": false,"subcontent": [{"key":"newBillUnit", "editable": true},{"key": "editBillUnit", "editable": true}]},{"key": "taxSetup", "editable": true}]</value> <desc></desc> </keyvals>	**key:** String. **value:** Boolean. **"editable": true** shows the Apply or Cancel link with a save message after saving. **"editable": false** shows the Close button.
organizationHierarchyTypes Organization hierarchy types include the name, ID, and icon.	<keyvals> <key>organizationHierarchyTypes</key> <value> [{"key": "site", "value":{"name":"SITE","value": 1,"icon":"resources/images/site.png"}}, {"key": "legalEntity", "value": {"name":"LEGAL_ENTITY","value": 2,"icon":"resources/images/legal-entity.png"}}, {"key": "billingAccount", "value": {"name" : "BILLING_ACCOUNT","value": 3,"icon" : "resources/images/billing-account.png"}}, {"key": "serviceAccount", "value": {"name" : "SERVICE_ACCOUNT","value": 4,"icon" : "resources/images/service-accounts.png"}}] </value> <desc></desc> </keyvals>	**key:** String. **value:** Complex array containing type, ID, and an icon.

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Table 9-4 (Cont.) Registry Entries in Configuration File

Configuration Key and Description	Default Values	Types
paymentsuspense.excludedpaymenttypes Comma-separated list of payment types excluded from the payment suspense flow. By default, credit card and direct debit payment types (that is, 10003, 10005) are excluded because they are BRM-initiated.	`<keyvals>` `<key>paymentsuspense.excludedpaymenttypes</key>` `<value>10003,10005</value>` `<desc></desc>` `</keyvals>`	**key:** String. **value:** String.
paymentSuspense.reasonMapping Mapping for two-tier suspense reason filtering. The key is a regular expression to match the detailed reason description, and the value is the higher-level reason. If a reason description matches the regular expression, the reason is grouped with corresponding higher-level reasons. Otherwise, it is grouped under **Uncategorized**. If an icon property is available in a resource path, corresponding grouped payments are shown with it. Otherwise, uncategorized icons are shown by default. **Note:** The **"*"** key should be the last entry in the value because it is the broadest group.	`<keyvals>` `<key>paymentSuspense.reasonMapping</key>` `</value>[` `{"key": ".*[Tt]echnical.*", "value":"Technical", "icon": "resources/images/unable-to-process-icon.png"}` `,` `{"key": ".*[Bb]usiness.*", "value":"Business", "icon": "resources/images/business-rule-match-icon.png"}` `,` `{"key": ".*[Mm]ultiple.*", "value": "Unable to Process", "icon": "resources/images/unable-to-process-icon.png"}` `,` `{"key": "*", "value": "Unclassified", "icon": "resources/images/unable-to-process-icon.png"}` `]</value>` `<desc></desc>` `</keyvals>`	**key:** Regular expression. **value:** String.

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Table 9-4 (Cont.) Registry Entries in Configuration File

Configuration Key and Description	Default Values	Types
paymentTypes Registry keys for rendering payment type views in the Bill Unit screen, Payment Methods screen, and Make Payment dialog box. This is also used for retrieving localized values from XLF files. Though **paymentTypes** has an entry for **invoice**, when this is used in the Make Payment dialog box, invoice payments are ignored while the payment method view is rendered. **Note**: Do not change these values unless you are removing a payment type not used in your environment.	`<mapping>` `<key>paymentTypes</key>` `<map>` `<id>10003</id>` `<key>creditCard</key>` `</map>` `<map>` `<id>10005</id>` `<key>directDebit</key>` `</map>` `<map>` `<id>10001</id>` `<key>invoice</key>` `</map>` `<map>` `<id>10018</id>` `<key>sepa</key>` `</map>` `<map>` `<id>0</id>` `<key>noPaymentMethod</key>` `</map>` `<desc></desc>` `</mapping>`	**id:** Number. **key:** String (must match appropriate key in the Billing Care resource bundle).
purchase.bundleTagsMapping Mapping for tagging the bundle.	`<keyvals>` `<key>purchase.bundleTagsMapping</key>` `<value>[{"key": ".*GSM.*|.*[Mm]obile.*", "value":"Mobile"},` `{"key": ".*[Cc]able.*", "value":"Cable,TV"},` `{"key": ".*[Ff]iber.*|.*[Ww]eb.*|.*GPRS.*", "value": "Internet"},` `{"key": ".*[Cc]orporate.*", "value": "Corporate"},` `{"key": ".*[Tt]ax.*", "value": "Tax"},` `{"key": ".*[Dd]iscount*.", "value": "Discounts"},` `{"key": ".*[Ii]nternet*.", "value": "Internet"},` `{"key": "*", "value": "Uncategorized"}]` `</value>` `<desc></desc>` `</keyvals>`	**key:** Regular expression. **value:** String. The key is a regular expression to match the bundle name or **Uncategorized**, and the value is the tag name. If a bundle name matches the regular expression, the bundle is tagged with the corresponding tags. Bundles that do not match mapping rules are categorized under the **"*"** pattern value.

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Table 9-4 (Cont.) Registry Entries in Configuration File

Configuration Key and Description	Default Values	Types
purchase.packageList Name of the package list containing the packages displayed during purchase of an add-on package. Default is **default**. To enable Billing Care to display a different package list, replace the default package list name with one of the following package list names: • **CSR**, which displays packages from the default-new package list • Any custom package list name If no package list name is specified, packages from the default-new package list are displayed.	`<keyvals>` `<key>purchase.packageList</key>` `<value>default</value>` `<desc></desc>` `</keyvals>`	**key:** String. **value:** String. Default value is **default**. Other possible value is **CSR**. If the package list name is not specified, packages from the default-new list are displayed.
purchase.tabs Product catalog framework configuration used to render the train stops and labels for the footer. The keys are also used as registry entries to fetch views or view models for the corresponding train stops.	`<keyvals>` `<key>purchase.tabs</key>` `<value>` `[` `{"key": "purchaseSelection", "value":{` `"label":"SELECT",` `"msg":"SELECT_PURCHASE",` `"title":"SELECT_SHORT_DESCRIPTION"` `}` `}` `,` `{"key": "purchaseConfiguration", "value": {` `"label" : "CONFIGURE",` `"msg" : "COMPLETE_CONFIGURATION_THEN",` `"title": "CONFIGURE_SHORT_DESCRIPTION",` `"disabled": true` `}` `}` `]` `</value>` `<desc></desc>` `</keyvals>`	**key:** String. **value:** Complex string containing a label, message, and title.

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Table 9-4 (Cont.) Registry Entries in Configuration File

Configuration Key and Description	Default Values	Types
search.options	`<keyvals>` `<key>search.options</key>` `<value>[{"searchTemplateKey": "accountSearch", "searchTemplateName":"SEARCH_OPTION_ACCOUNTS", "defaultSearch": true}]</value>` `<desc></desc>` `</keyvals>`	**key:** String. **value:** String. *searchTemplateKey* acts as the value of the search drop-down option. The value of *searchTemplateKey* (that is, accountSearch) acts as the search template name The *searchTemplateName* value corresponds to the text of the search drop-down option. The value of *searchTemplateName* (that is, SEARCH_OPTION_ACCOUNTS) corresponds to a key in the resource bundle.

Table 9-5 lists the configurable keyval categories and their default values.

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Table 9-5 Keyvals in Configuration File

Configuration Key and Description	Default Value	Type
newsfeed.categories	<keyvals> <key>newsfeed.categories</key> <value>[{"key":"ALL","newsfeedTypes": "ADJUSTMENT:true, NCR_ADJUSTMENT:true, OPEN_DISPUTE:true, CLOSED_DISPUTE:true, WRITEOFF:true, REFUND:true, COLLECTIONS:true, PAYMENT:true, PAYMENT_REVERSAL:true, PAYMENT_METHOD_ASSIGNMENT_CHANGE:true, PAYINFO:true, NAMEINFO:true, ACCT_STATUS:true, BILLINFO:true, BILLINFO_CREATED:true, BILLINFO_DELETED:true, DEFERRED:true, SRVC_STATUS:true, SRV_TO_DEV:true, PURCHASE:true, CANCEL:true, CORRECTIVE_BILL:true, RECURRING_CHARGE:true, BILL_ISSUED:true, BILL_ISSUED_MID_CYCLE:true, ONE_TIME_CHARGE:true", "selected": true},{"key": "AR", "newsfeedTypes": "ADJUSTMENT:true, NCR_ADJUSTMENT:true, OPEN_DISPUTE:true, CLOSED_DISPUTE:true, WRITEOFF:true, REFUND:true, COLLECTIONS:true"}, {"key":"PAYMENTS","newsfeedTypes": "PAYMENT:true, PAYMENT_REVERSAL:true, PAYMENT_METHOD_ASSIGNMENT_CHANGE:true, PAYINFO:true"}, {"key":"CHARGES","newsfeedTypes": "PURCHASE:true, CANCEL:true, CORRECTIVE_BILL:true, RECURRING_CHARGE:true, BILL_ISSUED:true, BILL_ISSUED_MID_CYCLE:true, ONE_TIME_CHARGE:true"}, {"key":"ACCOUNT","newsfeedTypes": "NAMEINFO:true, ACCT_STATUS:true, DEFERRED:true, SRVC_STATUS:true, SRV_TO_DEV:true, BILLINFO:true, BILLINFO_CREATED:true, BILLINFO_DELETED:true"}]</value> <desc></desc> </keyvals>	**key:** String. **value:** String (must match appropriate key in the Billing Care resource bundle). See "Customizing Billing Care Templates".

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10

Using an Exploded Archive during Customization

Learn how to use an exploded archive when customizing Oracle Communications Billing Care.

Topics in this document:

- About Using an Exploded Archive
- Configuring WebLogic Server to Use an Exploded Archive

About Using an Exploded Archive

You deploy Billing Care customizations as a customizations shared library to the same Oracle WebLogic Server domain where Billing Care is running. During customization, Oracle recommends using an exploded archive containing your shared library. An exploded archive represents your customizations in a local file system instead of a packaged archive (**.war**).

Using an exploded archive of your customizations enables you to update them and automatically deploy them to the Billing Care domain without having to package your customizations' shared library after each change. Your Billing Care customizations can be viewed by logging out and back into Billing Care in the web browser.

Use exploded archives during development and testing of your customizations. For production instances of Billing Care, package your customizations as a **.war** file and deploy this file using WebLogic Server administration tools to your Billing Care domain. See "Packaging and Deploying Customizations" for more information on packaging and deploying production customizations.

Configuring WebLogic Server to Use an Exploded Archive

To use an exploded archive with WebLogic Server, configure your Billing Care domain with the location of your previously created NetBeans IDE project. The project location acts as the exploded archive of the customizations shared library and is used by Billing Care to display your customizations.

Configure WebLogic Server to use your exploded archive shared library by completing the following procedures:

- Creating a Manifest for your Shared Library
- Creating a New Deployment Plan for Billing Care with your Shared Library
- Deploying your Shared Library on your Billing Care Domain
- Redeploying Billing Care to Use your Shared Library

Creating a Manifest for your Shared Library

WebLogic Server requires a manifest file (**MANIFEST.mf**) for your exploded archive. The manifest includes information about the customizations shared library contained in the exploded archive including the entries listed in Table 10-1.

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For more information on JAR manifests, see the Java documentation at https://docs.oracle.com/en/java/javase/21/docs/specs/jar/jar.html#jar-manifest.

Table 10-1 MANIFEST.mf Entries for Billing Care Customization

Entry	Description
Manifest-Version	Numerical version of the manifest file
Built-By	Name of library builder
Specification-Title	String that defines the title of the extension specification
Specification-Version	String that defines the version of the extension specification
Implementation-Title	String that defines the title of the extension implementation
Implementation-Version	String that defines the version of the extension implementation
Implementation-Vendor	String that defines the vendor of the extension implementation
Extension-Name	String that defines a unique of the extension

To create a **MANIFEST.mf** file for your exploded archive:

1. Start NetBeans IDE.
2. Select the **Files** tab.
3. Expand the project directory to view the *myproject***/web/META-INF/** directory where *myproject* is the previously created project directory.
4. Right-click the **META-INF** folder and select **New**.
5. Select **Other**.
6. Under **Categories**, select **Other**.
7. Under **File Types**, select **Empty File**.
8. Click **Next**.
9. In the **File Name** field, enter **MANIFEST.MF**.
10. Click **Finish**.

    The **MANIFEST.MF** file is shown in the NetBeans IDE text editor.
11. Create your manifest file with the entries shown in Table 10-1. A sample manifest file is shown in Example 10-1.

> **Note**
>
> Oracle recommends you use **Specification-Title** and **Extension-Name** values clearly identifying your shared library as a development version.

12. Click **File**, then **Save**.

Example 10-1 Sample MANIFEST.MF File for Billing Care Customizations

```
Manifest-Version: 1.0
Built-By: Oracle
Specification-Title: BillingCareSDKDevelopment
Specification-Version: 1.0
Implementation-Title: Custom SDK WAR file for Billing Care
Implementation-Version: 1.0
```


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```
Implementation-Vendor: Oracle
Extension-Name: BillingCareSDKDevelopment
```

Rebuilding your Project after Creating the Manifest File

Rebuild your Billing Care customization project in NetBeans IDE after creating and saving your manifest file.

To rebuild your project in NetBeans IDE:

1. Click the **Projects** tab.
2. Right-click your project.
3. Select **Clean and Build**.

Creating a New Deployment Plan for Billing Care with your Shared Library

Create a new Billing Care deployment plan that includes your customizations shared library. The deployment plan includes an entry for your customizations shared library referencing the exploded archive NetBeans IDE project. When the Billing Care application starts, the exploded archive contents are also loaded providing access to your customizations.

See "Deployment Plans" in *Oracle Fusion Middleware Developing Applications for Oracle WebLogic Server*for more information on deployment plans.

To create a new deployment plan:

1. Start NetBeans IDE.
2. Select the **Files** tab.
3. Right-click the **myproject** folder and select **New**.
4. Select **Other**.
5. Under **Categories**, select **Other**.
6. Under **File Types**, select **Empty File**.
7. Click **Next**.
8. In the **File Name** field, enter a name for your deployment plan with an **.xml** extension. For example:

   ```
   billingCareSDKDeploymentPlan.xml
   ```

9. Click **Finish**.

   The deployment plan is shown in the NetBeans IDE text editor.

10. Create your deployment plan using the sample shown in Example 10-2.

> **Note**
>
> Use the same string in the **Custom-LibraryName** element in your deployment plan as the **Extension-Name** parameter in the **MANIFEST.MF** file you previously created. For example, the string in the sample files provided is:
>
> ```
> BillingCareSDKDevelopment
> ```

11. Click **File**, then **Save**.

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Example 10-2 Sample Billing Care Customizations Deployment Plan

```
<?xml version="1.0" encoding="UTF-8"?>
<deployment-plan xmlns="http://xmlns.oracle.com/weblogic/deployment-plan"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://
xmlns.oracle.com/weblogic/deployment-plan http://xmlns.oracle.com/weblogic/deployment-
plan/1.0/deployment-plan.xsd" global-variables="false">
   <application-name>BillingCare.war</application-name>
   <variable-definition>
      <variable>
         <name>Custom-ImplementationVersion</name>
         <value xsi:nil="false">1.0</value>
      </variable>
      <variable>
         <name>Custom-SpecificationVersion</name>
         <value xsi:nil="false">1.0</value>
      </variable>
      <variable>
         <name>Custom-LibraryName</name>
         <value xsi:nil="false">BillingCareSDKDevelopment</value>
      </variable>
      <variable>
         <name>Custom-ExactMatch</name>
         <value xsi:nil="false">true</value>
      </variable>
      <variable>
         <name>Custom-ContextPath</name>
         <value />
      </variable>
   </variable-definition>
   <module-override>
      <module-name>BillingCare.war</module-name>
      <module-type>war</module-type>
      <module-descriptor external="true">
         <root-element>weblogic-web-app</root-element>
         <uri>WEB-INF/weblogic.xml</uri>
         <variable-assignment>
            <name>Custom-LibraryName</name>
            <xpath>/weblogic-web-app/library-ref/library-name</xpath>
         </variable-assignment>
      </module-descriptor>
   </module-override>
</deployment-plan>
```

Deploying your Shared Library on your Billing Care Domain

After creating your manifest file and new deployment plan for Billing Care, deploy the exploded archive shared library to your Billing Care domain.

To deploy your shared library to your Billing Care domain:

1. Log in to WebLogic Server Remote Console.
2. Click **Monitoring Tree**, then **Deployments**, and then **Application Management**.

   A page with a list of installed Java EE applications and standalone application modules appears.
3. Select the **BillingCare** deployment.
4. Click **Stop** and then **Force Stop Now** to stop Billing Care.
5. Click **Edit tree**, then **Deployments**, and then **Libraries**.

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6. Click **+New**.
7. Enter the **Name** using the same string used in the **Custom-LibraryName** element in the deployment plan, and the **Extension-Name** parameter in the **MANIFEST.MF** file you previously created.

   For example, the string in the sample files provided is:

   ```
   BillingCareSDKDevelopment
   ```
8. In **Targets**, select **AdminServer** and move it to the **Chosen** section.
9. In **Source** field, click the upload option and upload the **.war** file.
10. Click **+Create**.
11. Once the changes are applied, go to the shopping cart, and then click **Commit Changes**.

Redeploying Billing Care to Use your Shared Library

After deploying the exploded archive as a customizations shared library, redeploy Billing Care using the new deployment plan created in "Creating a New Deployment Plan for Billing Care with your Shared Library". Redeploying Billing Care using the new deployment plan configures Billing Care to use the exploded archive customizations shared library in your NetBeans IDE project and restarts Billing Care.

After successful deployment, customize Billing Care by editing the configuration files in the NetBeans IDE project.

To redeploy Billing Care:

1. Log in to WebLogic Server Remote Console.
2. Click **Monitoring Tree**, then **Deployments**, and then **Application Management**.

   A page with a list of installed Java EE applications and standalone application modules appears.
3. In the table, select **BillingCare**.
4. Click **Update/Redeploy** and do one of the following:
   - If your updated deployment plan is located on the server containing WebLogic Server, select **Update Deployment Plan on Server** and enter the location of the file in the **Plan Path** field.
   - If your updated deployment plan is located on your local machine, select **Update Deployment Plan on Local Machine** and click Choose File

     to browse to the file or enter the file name in the **Plan** field.
5. Enter (or browse to) the location of your new deployment plan (for example, the **myproject** folder), and select the new deployment plan.
6. Click **Done**.
7. Select **BillingCare**, then click **Start**, and then select **Servicing all requests**.
8. Ensure that **BillingCare** is set to **Active**.

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11

Packaging and Deploying Customizations

Learn how to deploy Oracle Communications Billing Care customizations to production Billing Care domains.

Topics in this document:

- About Packaging and Deploying Customizations for Production
- Creating Production Versions of the Manifest File and Deployment Plan
- Using the Java JAR Utility to Package Your Shared Library
- Deploying the Shared Library .war
- Redeploying Billing Care to Use your Shared Library

About Packaging and Deploying Customizations for Production

After testing and verifying your Billing Care customizations, create a packaged archive (**.war**) file of your exploded archive shared library to deploy in your production Billing Care domain. Using a **.war** containing your customizations enables you to quickly deploy your customizations to multiple Billing Care instances.

Deploying customizations to production environments requires that you complete the following procedures:

- Creating Production Versions of the Manifest File and Deployment Plan
- Using the Java JAR Utility to Package Your Shared Library
- Deploying the Shared Library .war
- Redeploying Billing Care to Use Your Shared Library

Creating Production Versions of the Manifest File and Deployment Plan

Before running the jar command, create production versions of the manifest file and deployment plan.

To create production manifest and deployment plan files:

1. In a terminal session, change directory to the *myproject***/web/META-INF** directory, where *myproject* is the NetBeans IDE project directory containing your Billing Care customizations.
2. Create a copy of the **MANIFEST.MF** file in the *myproject***/build/web** directory in the *myproject***/web/META-INF directory** named **manifest.txt**.
3. Open the **manifest.txt** file in an editor.
4. Edit the values of the **Custom-LibraryName** and the **Extension-Name** parameters to a string for your production shared library. For example:

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```
BillingCareCustomizations
```

See "Creating a Manifest for your Shared Library" for more information on creating a manifest file for your shared library.

5. Save and close the **manifest.txt** file.
6. Copy the edited **manifest.txt** file to the *myproject*/**build/web** directory.
7. Create a copy of the deployment plan you created for your exploded archive shared library deployment in "Creating a New Deployment Plan for Billing Care with your Shared Library" named **prodplan.xml**. Use this deployment plan for your production Billing Care deployments.
8. Edit the **Custom-LibraryName** element in **prodplan.xml** using the same string you provided in step 4.

> **Note**
>
> Use the same string in the **Custom-LibraryName** element in your deployment plan as the **Extension-Name** parameter in the **MANIFEST.MF** file you previously created. For example, the string in this procedure is:
>
> ```
> BillingCareCustomizations
> ```

9. Save and close the **prodplan.xml** file.

Using the Java JAR Utility to Package Your Shared Library

The JAR command packages all of the required contents of your exploded archive shared library into a **.war** file that can be deployed in the Oracle WebLogic Remote Console.

For more information on the Java JAR utility, see https://docs.oracle.com/en/java/javase/21/docs/specs/man/jar.html.

To create your **BillingCareCustomizations.war** using the jar utility:

1. In a terminal session, change directory to the *myproject*/**build/web** directory, where *myproject* is the NetBeans IDE project directory containing your Billing Care customizations.
2. Verify that the **manifest.txt** file is in the directory.
3. Run the following JAR command to package the **manifest.txt** file and the subfolders contained in your *myproject*/**web** directory into a **.war** file:

   ```
   jar cfm BillingCareCustomizations.war manifest.txt css custom js lib resources WEB-INF
   ```

4. Verify that the **BillingCareCustomizations.war** is created.

Deploying the Shared Library .war

After creating your **BillingCareCustomization.war** and production deployment plan, deploy the **.war** in your Billing Care domain.

To deploy your shared library in your Billing Care domain:

1. Log in to WebLogic Server Remote Console.

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2. Click **Monitoring Tree**, then **Deployments**, and then **Application Management**.

   A page with a list of installed Java EE applications and standalone application modules appears.
3. Select the **BillingCare** deployment.
4. Click **Stop** and then **Force Stop Now** to stop Billing Care.
5. Click **Edit tree**, then **Deployments**, and then **Libraries**.
6. Click **+New**.
7. Enter the **Name** using the same string used in the **Custom-LibraryName** element in the deployment plan and the **Extension-Name** parameter in the **MANIFEST.MF** file you previously created.

   For example, the string in the sample files provided is:

   ```
   BillingCareCustomizations
   ```
8. In **Targets**, select **AdminServer** and move it to the **Chosen** section.
9. In **Source** field, click the upload option and upload the **BillingCareCustomization.war** file.
10. Click **+Create**.
11. Once the changes are applied, go to the shopping cart, and then click **Commit Changes**.

Redeploying Billing Care to Use Your Shared Library

After deploying the **BillingCareCustomizations.war**, redeploy Billing Care using the production deployment plan. Redeploying Billing Care using the production plan restarts and configures Billing Care to use the **.war** shared library you previously deployed.

To redeploy Billing Care:

1. Log in to WebLogic Server Remote Console.
2. Click **Monitoring Tree**, then **Deployments**, and then **Application Management**.

   A page with a list of installed Java EE applications and standalone application modules appears.
3. In the table, select **BillingCare**.
4. Click **Update/Redeploy** and do one of the following:
   - If your updated deployment plan is located on the server containing WebLogic Server, select **Update Deployment Plan on Server** and enter the location of the file in the **Plan Path** field.
   - If your updated deployment plan is located on your local machine, select **Update Deployment Plan on Local Machine** and click Choose File

     to browse to the file or enter the file name in the **Plan** field.
5. Enter (or browse to) the location of your production deployment plan, **prodplan.xml**, and select the new deployment plan.
6. Click **Done**.
7. Select **BillingCare**, then click **Start**, and then select **Servicing all requests**.

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8. Ensure that **BillingCare** is set to **Active**.

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Part III

Customizing Billing Care Windows and Fields

This part includes instructions for customizing the windows and fields in Oracle Communications Billing Care GUI. It contains the following chapters:

- Customizing the Billing Care Account Home Page
- Customizing the Billing Care Account Banner
- Customizing the Balances Area
- Customizing Billing Care to Enable Noncurrency Adjustments for Expired Sub-Balances
- Adding Custom Payment Types
- Customizing the Make a Payment Window
- Displaying Success Toast Messages in Billing Care
- Customizing Purchase Deal and Assets Action Menu
- Customizing Billing Care to Display Child Accounts
- Customizing Billing Care Invoice Presentation
- Adding an Event Details Column to the Events Table
- Customizing Reason Codes List in Event Adjustments
- Restricting Debit and Credit Event Adjustment Options
- Customizing Billing Care to Display Only Event Adjustments
- Customizing Account Creation Service Fields
- Creating Custom Billing Care Credit Profiles
- Customizing the Billing Care Actions Menu
- Opening Custom Views From Landing Page
- Customizing Billing Care Labels
- Customizing Billing Care to Disable Links in the Bills Tab
- Separating Event Adjustment Amount and Percentage Fields
- Embedding Billing Care Windows in External Applications
- Customizing the Batch Window
- Customizing the Events Dialog Box
- Customizing the Newsfeed Area

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12

Customizing the Billing Care Account Home Page

Learn how to use the Oracle Communications Billing Care SDK to customize the Billing Care account home page.

Topics in this document:

- Customizing the Billing Care Account Home Page
- About Customizing the Billing Care Home Tab
- About Customizing the Bills Graph

Customizing the Billing Care Account Home Page

You can customize the Billing Care account home page in the following ways:

- Add links to the Billing Care **Home** tab for switching between a summary and detailed view of a customer's account balance. See "About Customizing the Billing Care Home Tab".
- Customize the data displayed in the Bills graph. See "About Customizing the Bills Graph".

About Customizing the Billing Care Home Tab

The Billing Care **Home** tab provides a high-level overview of an account's assets, account history, current balances, and News Feed of account and status change activity. The **Bill Unit** section of the **Home** tab displays detailed information about the amount due for a bill, such as the amount past due, the unallocated payments, the unallocated accounts receivable, the amount owed for this billing cycle, and the total due.

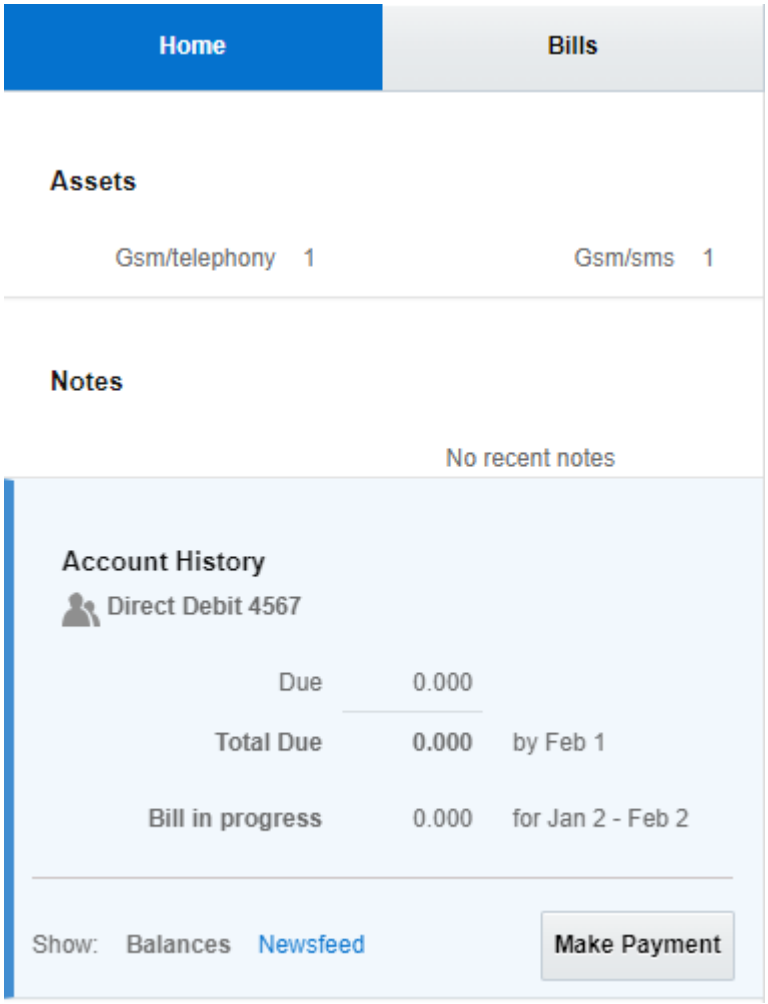
You can customize the Billing Care **Home** tab to display:

- Summary account balance information in its **Bill Unit** section
- Detailed account balance information in its **Bill Unit** section
- Links for switching between the summary and detailed views on the **Home** tab

For example, Figure 12-1 shows a **Home** tab with links for switching between summary and detailed views of a bill unit.

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Figure 12-1 Home Tab with Sample Summary and Detailed Links



Adding the ability to switch between the summary view and the detailed view requires you to create the resources used by the **Bill Unit** section. For example, you need to create multiple views, a view model, and a custom CSS file for displaying a bill unit's account balance information correctly. See "Customizing Billing Care" for more information about customizing Billing Care resources

The Billing Care SDK includes sample **Home** tab customizations, including a **README.txt** file explaining the samples, in the *SDK_home***/samples/HomeTabCustomization** directory, where *SDK_home* is the directory in which you installed the Billing Care SDK. Use these samples when developing your own customizations.

Customizing the Billing Care Home Tab

To customize the Billing Care **Home** tab to display summary and detailed bill unit information:

1. Create a view that contains links to the summary and detailed views. See "Creating a Summary and Detailed Link View".
2. Create a view for displaying summary information for all bill units in an account. See "Creating an All Bill Units Summary View".

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3. Create a view for displaying summary information for a single bill unit. See "Creating a Bill Unit Summary View".
4. Create a custom view model for the Billing Care **Home** tab. See "Creating a HomeTabBillUnitsViewModel".
5. Override the registry values for the Billing Care **Home** tab. See "Configuring the Custom Home Tab in the Registry".
6. Modify the appearance of the Billing Care **Home** tab. See "Overriding the Billing Care Home Tab Theme".

Creating a Summary and Detailed Link View

Create a view that displays the links to your summary bill unit view and detailed bill unit view. These links should appear at the top of the Billing Care **Home** tab. See "About Views" for more information about views.

To create a view that displays the **Summary** and **Detailed** links:

1. Create a **switchLinkView.html** file in the *myproject*/*projectname*/**web/custom/templates/** directory.
2. Add criteria to the view for displaying a **Summary** link and a **Detailed** link. For example:

```
<div id="switchViewHeader" class="bu-switch-view-section">
   <div id="switchLinks" style="display:flex; justify-content:space-
around">
      <a href="javascript:void(0);" id="summary_link" class="sidebar-news-
feed-link" data-bind="click: $root.viewSwitched">Summary</a>
      <a href="javascript:void(0);" id="detailed_link" class="sidebar-news-
feed-link" data-bind="click: $root.viewSwitched">Detailed</a>
   </div>
</div>
```

3. Save the file in your NetBeans IDE project.

Creating an All Bill Units Summary View

Billing Care uses an HTML view file to render the **Bill Unit** section of the **Home** tab. When an account contains multiple bill units, the **Bill Unit** section displays a panel that details the amount due for all bill units. You can create a custom view that displays summary information for all bill units, such as the total account balance for all bill units.

A sample **allBillUnitSummaryView.html** file is provided in the *SDK_home*/**samples/HomeTabCustomization/web/custom/templates** directory. Use this sample to create a view for displaying summary information for all bill units in an account.

To create a view for displaying summary balance information for all bill units in an account:

1. Create an **allBillUnitSummaryView.html** file in the *myproject*/**web/custom/js/viewmodels/templates/***area*/ directory, where *area* is the customization type.
2. Define the fields to display in the summary view for all bill units in an account.

   For example, this shows how to add a **Total Account Balance** field that displays the total account balance for all bill units.

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> **Note**
>
> In this example, the **Total Account Balance** field is the custom field. The other code is mandatory for the Billing Care SDK to work and should not be changed.

```
<div class="css_table streatch_width marginTop10px">
   <div class="css_table marginBottom10px">
      <div class="css_row">
         <h3 class="css_cell text_left_align tab_heading marginBottom6px"
            role="heading" id="homeTab_AllBillUnitsWithCnt"
            data-bind = "text : '<%= homeTab.ALL_BILL_UNITS %> (' +
numBillingUnits() + ')' " >
         </h3>
      </div>
   </div>

   <!-- Custom field : START -->
   <div class="tab-area-table-section-3-left tab-area-table-section-3-left-
no-margin marginTop10px marginBottom10px">
      <div class="tab-area-table-left fontBold">Total Account Balance
      </div>
      <div class="tab-area-table-right-note">
      </div>
      <div class="tab-area-table-right redColor numberFormat"
         id="totalAccountBalance" data-bind="text : totalAccountBalance">
      </div>
   </div>
   <!-- Custom field : END -->

   <div id="bu_footer_all" class="css_row streatch_width tab-area-section-
more tab-area-section-more-2" data-bind="visible : showAllBUFooter ">
      <a role="button" id="makePymt" title="<%= homeTab.MAKE_PAYMENT_TITLE
%>"
         tabindex="0" class="cmd-button"
         data-bind="click : openMakePaymentsDlg ,event: {keypress :
openMakePaymentsDlgOnKeypress},authorize_command:{make:'hide',
resource:PAYMENT_RESOURCE, action:MAKE_ACTION}">
         <%= homeTab.MAKE_PAYMENT %>
      </a>
   </div>
</div>
```

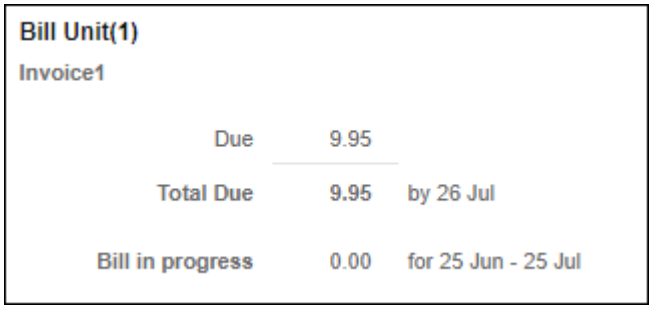
3. Save the file in your NetBeans IDE project.

Creating a Bill Unit Summary View

Billing Care uses an HTML view file to render the **Bill Unit** section of the **Home** tab. When an account contains a single bill unit, the **Bill Unit** section displays a detailed view of the amount due for the bill unit. You can create a custom view for the Bill Unit section that displays summary information for a bill unit, as shown in Figure 12-2.

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Figure 12-2 Bill Unit Summary Information



A sample **BillUnitSummaryView.html** file is provided in the *SDK_home***/samples/HomeTabCustomization/web/custom/templates** directory. Use this sample to create a view for displaying summary information for a bill unit.

To create a view for displaying summary balance information for a bill unit:

1. Create a **BillUnitSummaryView.html** file in the *myproject***/web/custom/js/viewmodels/templates/***area***/** directory, where *area* is the customization type.
2. Add criteria to the view for displaying summary account balance information, such as the amount due and total due.
3. Save the file in your NetBeans IDE project.

Overriding the Billing Care Home Tab Theme

You must override the appearance of the Billing Care **Home** tab to make room for the new **Detailed** and **Summary** links you created in "Creating a Summary and Detailed Link View". See "Customizing Billing Care Themes and Logo" for more information about CSS files.

A sample override CSS file named **override.css** is provided in the *SDK_home***/samples/Themes/css** directory, where *SDK_home* is the directory in which you installed the SDK. Use this sample to create a custom CSS file.

To override the theme used by the Billing Care **Home** tab:

1. Create an **override.css** file in the *myproject***/web/css** directory, where *myproject* is the NetBeans IDE project directory containing your Billing Care customizations.
2. Add entries to the CSS file for overriding styles in the Billing Care **Home** tab.

```
.bu-switch-view-section {
   border-bottom: 1px solid #CCC4C4;
   padding: 10px 0 10px 0;
   width: 100%;
}
```

3. In the **customRegistry.js** file, add an entry under **cssFiles** for your override CSS file in the **others** parameter. For example:

```
var CustomRegistry= {
   cssFiles: {
      themeCss: 'css/theme_default.css',
```


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```
      others: ['css/override.css']
   };
```

Configuring the Custom Home Tab in the Registry

After creating the required views and custom view model, create a custom module entry in the **customRegistry.js** file to use when opening the Billing Care **Home** tab. Billing Care uses the custom views and view model instead of the default entries when rendering the **Home** tab.

A sample **customRegistry.js** file is provided in the *SDK_home***/samples/HomeTabCustomization/web/custom** directory, where *SDK_home* is the Billing Care SDK installation directory. Use this sample to create the **customRegistry.js** file with your custom views.

To add an entry in the **customRegistry.js** file:

1. Create a **customRegistry.js** file in *myproject***/web/custom** by copying the reference registry file.
2. Define the custom views and view models in the file. For example:

```
var CustomRegistry = {
   homeTabBillUnits: {
      viewmodel: 'custom/viewmodels/CustomHomeTabBillUnitsViewModel.js'
   },
   summaryViews: {
      switchView: 'text!../custom/templates/switchLinkView.html',
      allBUSummaryView: 'text!../custom/templates/
allBillUnitSummaryView.html',
      individualBUSummaryView: 'text!../custom/templates/
billUnitSummaryView.html',
   },
};
```

3. Save the file in your NetBeans IDE project.

Creating a HomeTabBillUnitsViewModel

Billing Care uses the **HomeTabBillUnitsViewModel.js** file to define what fields to display in the Billing Care **Home** tab. The fields defined in the view model are bound in the HTML file used to render the custom view or page. See "About View Models" for more information about Billing Care view models.

A sample **CustomHomeTabBillUnitsViewModel.js** file is provided in the *SDK_home***/samples/HomeTabCustomization/web/custom/viewmodels** directory. Use this sample create a custom view model.

To create a custom view model for the Billing Care **Home** tab:

1. Create a **CustomHomeTabBillUnitsViewModel.js** file in the *myproject***/web/custom/js/viewmodels/customHomeTab** directory, where *myproject* is the folder containing your NetBeans IDE project.
2. Define the custom fields in this file, as required.
3. Save the file in your NetBeans IDE project.

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About Customizing the Bills Graph

The Bills graph provides a visual overview of account activity, including billing and customer interactions. The horizontal axis shows information about the last 12 bills and the bill in progress. The vertical axis shows account information regarding customer communication and A/R.

You can customize the information displayed in the Bills graph based on your requirements.

Customizing Bills Graph

To customize the Bills graph:

1. Create a custom view model to define the override for the default **Home** tab. See "Creating Custom Home Tab View Model".
2. Create a custom view model to define the override for the Bills graph based on your requirements. For example, create a file named **CenterViewModel.js** in the *myproject*/**web/custom/viewmodels** directory, where *myproject* is the folder containing your NetBeans IDE project. See "About View Models" for more information on creating view models.
3. Create a custom view model HTML template for overriding the Bills graph. See "Creating Custom View Model HTML Template for Customizing Bills Graph".
4. Create a **customRegistry.js** file configuring Billing Care to use your custom view models. See "Configuring Custom View Models for Customizing Bills Graph in the Registry".
5. Package and deploy your customization to your Billing Care domain using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

Creating Custom Home Tab View Model

Billing Care uses **HomeTabBillUnitsViewModel** to determine how to the display the **Home** tab. To change the **Home** tab, create a custom view model, such as **CustomHomeTabBillUnitsViewModel**, that contains overrides for the default display.

To create a custom **Home** tab view model:

1. Create the **CustomHomeTabBillUnitsViewModel.js** file in the *myproject*/**web/custom/viewmodels/homeTab** directory.
2. Open the **CustomHomeTabBillUnitsViewModel.js** file using a text editor and add the following code:

```
define([
    'jquery',
    'underscore',
    'knockout',
    'knockout-mapping',
    Registry.base.viewmodel,
    'viewmodels/hometab/HomeTabBillUnitsViewModel'
],
    function ($, _, ko, komapping, BaseViewModel, HomeTabBillUnitsViewModel)
{
      function CustomHomeTabBillUnitsViewModel() {
       HomeTabBillUnitsViewModel.apply(this, arguments);
       var self = this;
```


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```
       /* This function overrides OOTB renderGraph function to replace the
Bills graph and balances
        * section from the desired custom view.
        */
       self.renderGraph = function () {

           /* This is the function which renders the custom View model (
referred to CenterSectionViewModel in the CustomRegistry)
            * replacing the bills graph section.
           */
           self.renderCenterSection();

           /* This is the function which renders the custom View ( referred
to customView in the CustomRegistry balances entry)
            * replacing the OOTB balances section.
           */
           self.renderBalances();

       };

       self.renderCenterSection = function(){
         // The centerSection is the CustomRegistry entry which refers to the
Custom section replacing OOTB Bills Graph Section.
           require([CustomRegistry.centerSection.viewmodel,
CustomRegistry.centerSection.view],
             function (CurrentViewModel, page) {
                 var template = _.template(page);
                 // HTML id where the Bills and Graph is attached to DOM is
"chartContent"
                 // The custom view needs to be attached to same place for
replacing OOTb Bills Graph section
                 var mainDiv = document.getElementById("chartContent");
                 $(mainDiv).empty();
                 var viewElem = $(mainDiv).get(0);
                 ko.cleanNode(viewElem);
                 $(mainDiv).append(template);
                 var currentVM = new CurrentViewModel();
                 // This initialize method will contain basic steps to render
the CustomViewModel
                 currentVM.initialize();
                 ko.applyBindings(currentVM, viewElem);
             });
       };
      }
      CustomHomeTabBillUnitsViewModel.prototype = new
HomeTabBillUnitsViewModel();
      return CustomHomeTabBillUnitsViewModel;
    }
);
```

3. Save the file in your NetBeans IDE project.

Creating Custom View Model HTML Template for Customizing Bills Graph

Billing Care uses an HTML view file to customize the Bills graph in the **Home** tab. The template file contains the override for the Bills graph as defined in the custom view model.

To create a custom view model HTML template for customizing the Bills graph:

1. Create the **centerView.html** file in the *myproject*/**web/custom/templates** directory.

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2. Define the override for the center section of the **Home** tab by using the **centerView.html** file.
3. Save the file in your NetBeans IDE project.

Configuring Custom View Models for Customizing Bills Graph in the Registry

Create custom entries in your **customRegistry.js** file. Billing Care uses the custom view models instead of the default entries and renders the custom Bills graph in the **Home** tab.

To configure the custom view model entries to customize the Bills Graph section in the registry:

1. Create a **customRegistry.js** file in *myproject***/web/custom/** directory.
2. Define the custom view models in this file:

```
var CustomRegistry = {
  homeTabBillUnits: {
   viewmodel: 'custom/viewmodels/homeTab/CustomHomeTabBillUnitsViewModel.js' //
CustomViewModel which will handle replacing of the OOTB Hometab bills graph
with custom view
  },
  centerSection : {
   view: 'text!../custom/templates/centerView.html', // This is the custom
view which would replace the OOTB bills graph section
   viewmodel: 'custom/viewmodels/CenterViewModel.js' // This is the custom
view model which handles rendering of custom view replacing the OOTB bills
graph section
  }
};
```

3. Save the file in your NetBeans IDE project.

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13

Customizing the Billing Care Account Banner

Learn how to customize the Oracle Communications Billing Care Account Banner.

Topics in this document:

- About the Billing Care Account Banner
- Customizing the Billing Care Account Banner
- Rearranging Account Banner Tiles
- Removing Account Banner Tiles
- Extending the Account Navigation Banner

About the Billing Care Account Banner

The Account Banner displays the following default set of views as tiles in the Billing Care interface listed in Table 13-1.

Table 13-1 Default Billing Care Account Banner Tiles

Tile Registry Key	Description
accountBannerContact	Displays account contact information
accountBannerAccountInfo	Displays account information such as plan and status
accountBannerCollections	Displays account collections information
accountBannerBillUnits	Displays a summary of account bill unit information
accountBannerVIPInfo	Displays account VIP status if applicable

Each tile displays the information from the Billing Care module responsible for the type of data. For example, the **accountBannerContact** tile displays data from the account module.

The `accountBannerSections` key in the Billing Care registry file contains the list of tiles to display in the Account Banner.

Customizing the Billing Care Account Banner

Customize the Account Banner tiles by:

- Rearranging Account Banner Tiles
- Removing Account Banner Tiles

Creating custom tiles requires the creation of the resources required by the tile. For example, you may need to create a custom module, or view model and possibly CSS, to display custom tile information correctly. See "About Billing Care Modules" for more information on Billing Care modules and the resources you need to create when using custom tiles.

The Billing Care SDK includes sample Account Banner customizations, including a **README.txt** file explaining the samples, in the *SDK_home***/samples/AccountBanner**

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directory, where *SDK_home* is the directory where you installed the Billing Care SDK. Use these samples when developing your own Account Banner customizations.

Creating Configuration Files for Account Banner Customization

The Account Banner tiles displayed, and their display order, are defined in the Billing Care configuration file, **Configurations.xml**. This file includes key values specifying which tiles to display, and their order, in the **accountBannerSections** key as shown in Example 13-1.

Example 13-1 Configurations.xml accountBannerSections Sample

```
<configuration key="accountBannerSections">

<value>accountBannerContact,accountBannerAccountInfo,accountBannerCollections,accountBannerBillUnits,accountBannerVIPInfo</value>
</configuration>
```

Each value represents a tile and is a key in the default registry file, **registry.js**. The **registry.js** file defines views and view models. For example, Example 13-2 shows the view definition in the registry for the **accountBannerVIPInfo** tile.

Example 13-2 registry.js Account Banner Tile Entry Sample

```
accountBannerVIPInfo: {
   view: 'text!templates/home/accountBanner/vipInfoView.html'
}
```

The Billing Care SDK includes the default configuration file (**Configurations.xml**) and the default registry file (**registry.js**) in the *SDK_home***/references** directory, where *SDK_home* is the location where you installed the SDK.

To customize the Account Banner, you create a custom version of the Billing Care configuration file named **CustomConfigurations.xml**, and a custom version of the registry file named **customRegistry.js**. The custom configuration file specifies your tiles to display and their display order. The custom registry file includes view and view model definitions for each tile you want to display.

To customize the account banner:

1. Copy the default **Configurations.xml** file from *SDK_home***/references** to a custom configuration file named **CustomConfigurations.xml** in your *myproject***/web/WEB-INF/classes/custom/configurations** directory, where myproject is your NetBeans IDE project containing your Billing Care customizations.
2. Copy the default **registry.js** file from *SDK_home***/references** to a custom registry file named **customRegistry.js** in your *myproject***/web/custom** directory, where *myproject* is your NetBeans IDE project containing your Billing Care customizations.
3. Edit the **accountBannerSections** key in the **CustomConfigurations.xml** file with your customizations as described in the following sections.
4. If adding new tiles, define the view and view model for your new tiles in the **customRegistry.js** file.
5. Add your customization files to your NetBeans IDE project (*myproject*):
   - Add the **CustomConfigurations.xml** file in the *myproject***/web/WEB-INF/custom/configurations** folder.
   - Add the **customRegistry.js** file in the *myproject***/web/custom/** folder.

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- Add any new view HTML files to support your custom tile in the *myproject***/web/custom** folder.
- Add any new JavaScript to support your custom view model in the *myproject***/web/js** directory.
- Add any new CSS to support your custom view in the *myproject***/web/css** directory. Custom CSS must be properly configured in the registry to override the default CSS. See "Overriding Themes" for more information on overriding the default CSS.

6. Right-click your NetBeans IDE project and select **Clean and Build**.
7. Package and deploy your Account Banner customizations to your Billing Care domain.

   For more information, see "Packaging and Deploying Customizations".
8. Verify your changes in Billing Care.

Rearranging Account Banner Tiles

The tile display order in the Account Banner is defined by the order of the listed values in the accountBannerSections key in the **CustomConfigurations.xml** file.

To rearrange the tile order in the Account Banner:

1. Open the **CustomConfigurations.xml** file in your *myproject***/web/WEB-INF/custom/configurations** directory, where *myproject* is your NetBeans IDE project containing your Billing Care customizations in an editor.
2. Edit the accountBannerSections key in the **CustomConfigurations.xml** file listing the Account Banner tiles in the order you want displayed in Billing Care.

   For example, if you want the **accountBannerVIPInfo** tile to be displayed first, change the following **accountBannerSections** key value from:

   ```
   <value>accountBannerAccountInfo,accountBannerContact,accountBannerCollections,accountBannerBillUnits,accountBannerVIPInfo</value>
   ```

   to:

   ```
   <value>accountBannerVIPInfo,
   accountBannerAccountInfo,accountBannerContact,accountBannerCollections,accountBannerBillUnits</value>
   ```
3. Save and close your **CustomConfigurations.xml** file.
4. Right-click your NetBeans IDE project and select **Clean and Build**.
5. Package and deploy your Account Banner customizations to your Billing Care domain.

   For more information, see "Packaging and Deploying Customizations".
6. Verify your changes in Billing Care.

Removing Account Banner Tiles

The tiles displayed in the Account Banner are defined by the included values in the accountBannerSections key in the **CustomConfigurations.xml** file.

To remove a tile from the Account Banner:

1. Open the **CustomConfigurations.xml** file in your *myproject***/web/WEB-INF/classes/custom/configurations** directory, where *myproject* is your NetBeans IDE project containing your Billing Care customizations with an editor.

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2. Edit the accountBannerSections key in the **CustomConfigurations.xml** file, removing the Account Banner tiles you do not want displayed in Billing Care.

   For example, to remove the **accountBannerVIPInfo** tile, change the following accountBannerSections key value from:

   ```
   <value>accountBannerAccountInfo,accountBannerContact,accountBannerCollections,account
   BannerBillUnits,accountBannerVIPInfo</value>
   ```

   to:

   ```
   <value>accountBannerAccountInfo,accountBannerContact,accountBannerCollections,account
   BannerBillUnits</value>
   ```

3. Save and close your **CustomConfigurations.xml** file.
4. Right-click your NetBeans IDE project and select **Clean and Build**.
5. Package and deploy your Account Banner customizations to your Billing Care domain.

   For more information, see "Packaging and Deploying Customizations".
6. Verify your changes in Billing Care.

Extending the Account Navigation Banner

In addition to rearranging or removing default tiles, you can use the Navigation Banner sample SDK to extend the account banner with additional custom buttons, label-value pairs, and navigation routes. This allows you to:

- Add custom buttons for launching dialogs or new views (for example, adding a Payments button that opens the All Payments dialog box).
- Display additional label-value pairs specific to your organization's needs (for example, displaying a customer's current loyalty tier or status).
- Register custom navigation routes and dialog logic (for example, creating a route for a custom full-page view similar to existing installments or deposits).
- Modify the display by updating view templates and view models

The SDK sample is located in *SDK_home***/samples/NavigationBanner**, where *SDK_home* is the directory where you installed the Billing Care SDK, and includes:

- **customDialogViewModel.js, customFullPageViewModel.js, customNavigationViewModel.js,** and **customRouterViewModel.js** (view models)
- **customRouterHelper.js**
- **customButtonsView.html**, **customDialogView.html**, **customFullPageView.html**, and **customLabelsView.html** (templates)
- **customRegistry.js**
- A **README.txt** with usage instructions.

Adding Custom Buttons and Fields

To add a custom button to the Account Banner:

1. Open the *SDK_home***/NavigationBanner/web/custom/js/viewmodels/navigationBanner/customNavigationViewModel.js** to define the list of custom buttons to be added to the navigation banner, specifying each button's label, ID, and click handler function.

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```
self.customNavigationButtonsList = [{id: "custom-page", label: "Custom Page",
onOjAction: self.openFullPageView},
            {id: "custom-dialog", label: "Custom Dialog", onOjAction:
self.openDialogView}];
```

You can add as many buttons as needed by repeating the **<button>** element with different **click** bindings.

2. In your view model which is located in *SDK_home*/**NavigationBanner/web/custom/js/viewmodels/navigationBanner/customNavigationViewModel.js**, define functions to handle the click events for each custom button you included in your template. Each handler should implement the logic for the corresponding action, such as opening a dialog or a full-page view.

```
define(['knockout'], function(ko) {
  function CustomNavigationViewModel() {
    var self = this;

    // Handler for dialog
    self.openCustomDialog = function() {
      // Insert dialog-opening logic
    };

    // Handler for full page
    self.openCustomFullPage = function() {
      // Insert navigation logic for full page view
    };
  }
  return CustomNavigationViewModel;
});
```

These functions set the behavior for your new buttons. Follow the pattern in the SDK sample for consistency.

3. (Optional) To open new full-page views from a custom button, extend your custom router view model and helper, as demonstrated in the SDK sample (**customRouterViewModel.js**, **customRouterHelper.js**).

4. Open your *myproject*/**web/custom/customRegistry.js** file and register your custom navigation banner module:

```
var CustomRegistry = {
    navigationBanner: {
        viewmodel: './custom/js/viewmodels/navigationBanner/
CustomNavigationViewModel.js',

    },
    customNavigationBannerOptions: {
        extensionButtonsView: 'text!templates/customButtonsView.html'
    },
    router: {
        viewmodel: '../custom/js/viewmodels/router/customRouterViewModel'
    },
    customFullPage: {
        view: 'text!templates/customFullPageView.html',
        viewmodel: '../custom/js/viewmodels/customFullPage/customFullPageViewModel'
    },
    customDialogView: {
        view: 'text!templates/customDialogView.html',
        viewmodel: '../custom/js/viewmodels/customDialogView/customDialogViewModel'
    }
};
```


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> **Note**
>
> If you have other custom modules (for example, for custom router logic), include those in the same CustomRegistry object according to the SDK sample structure.

5. Package your customizations and deploy them according to the instructions in the "Packaging and Deploying Customizations".
6. Log in to Billing Care and verify that your custom account banner appears.

Adding Custom Label-Value Pairs

To add custom label-value pairs to the account banner for information such as customer segments, statuses, or other business attributes, follow these steps:

1. In your view model (for example, **CustomNavigationViewModel.js**), update the **customNavigationBannerValueList** array to include the custom labels and values you want to display.

   ```
   self.customNavigationBannerValueList = [{label: "Check", value: "Value"}];
   ```

2. Open your custom navigation banner HTML template file (for example, *SDK_home*/**samples/NavigationBanner/web/templates/customLabelsView.html** in **web/custom/js/templates/**). Add a label and bind the value using Knockout syntax.

   ```
   <label>Custom Value:</label>
   <span data-bind="text: customValue"></span>

   <label>Customer Tier:</label>
   <span data-bind="text: customerTier"></span>
   ```

3. You can define and bind as many custom pairs as required to support your organization's requirements. Each observable in the view model corresponds to a **** or similar UI element in the template.
4. Open your *myproject*/**web/custom/customRegistry.js** file and register your custom navigation banner module:

   ```
   var CustomRegistry = {
     navigationBanner: {
           viewmodel: './custom/js/viewmodels/navigationBanner/
   CustomNavigationViewModel.js',
       },
       customNavigationBannerOptions: {
           extensionLabelView: 'text!templates/customLabelsView.html',
       },
     // ...other custom module entries...
   };
   ```

> **Note**
>
> If you have other custom modules (for example, for custom router logic), include those in the same CustomRegistry object according to the SDK sample structure.

5. Package your customizations and deploy them according to the instructions in the "Packaging and Deploying Customizations".
6. Log in to Billing Care and verify that your custom label-value pairs appear as expected on the account banner.

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14

Customizing the Balances Area

Learn how to use the Oracle Communications Billing Care SDK to customize the **Balances** area in the Billing Care account home page.

Topics in this document:

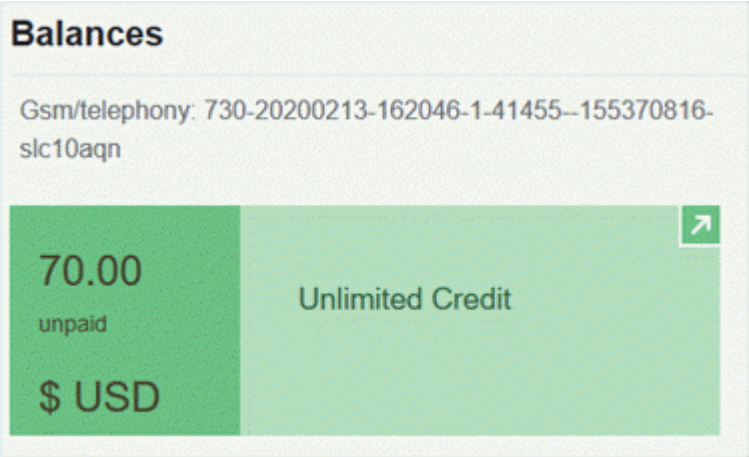
- About Customizing the Balances Area
- Replacing the Balances Area with Custom Account Information
- Customizing the Data Displayed in the Balances Area

About Customizing the Balances Area

The **Balances** area of the Billing Care account home page shows what the customer owes and what credit limits the customer has. It shows the customer's currency balance, which is shown in green and has a currency symbol, and noncurrency balance, which is shown in blue.

Figure 14-1 shows the **Balances** area for a sample customer.

Figure 14-1 Balances Area in Account Home Page



You can customize the **Balances** area in the following ways:

- Remove it completely and replace it with custom account information. See "Replacing the Balances Area with Custom Account Information".
- Customize the data that is displayed in it. See "Customizing the Data Displayed in the Balances Area".

Replacing the Balances Area with Custom Account Information

You can remove the **Balances** area from the Billing Care account home page and display custom account information instead. This requires you to create the resources used by the

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Balances area. For example, you need to create a view and view model for displaying your custom account information correctly. See "Customizing Billing Care" for more information about customizing Billing Care resources.

The Billing Care SDK includes sample **Balances** area customizations, including a **README.txt** file explaining the samples, in the *SDK_home*/**samples/BalancesCustomization** directory, where *SDK_home* is the directory in which you installed the Billing Care SDK. Use these samples when developing your own customizations.

Customizing the Balances Area

To remove the **Balances** area from the Billing Care account home page and display custom account information instead:

1. Create a view for displaying your custom account information . See "Creating a View for the Balances Area".
2. Create a custom view model for your custom account information. See "Creating a Custom Balances Area View Model".
3. Override the registry values for the Billing Care **Balances** tab. See "Configuring the Custom Balances Area in the Registry".

Creating a View for the Balances Area

Billing Care uses an HTML view file to render the **Balances** area of the account home page. You can create a custom view that displays custom account information rather than balance information.

A sample **balances.html** file is provided in the *SDK_home*/**samples/BalancesCustomization/web/custom/templates** directory. Use this sample to create a view for displaying your custom account information.

To create a view for the **Balances** area:

1. Create a **balances.html** file in the *myproject*/**web/custom/js/viewmodels/templates/***area*/**configure** directory, where *area* is the customization type.
2. Define the fields to display in your view.
3. Save the file in your NetBeans IDE project.

Creating a Custom Balances Area View Model

Billing Care uses the **balances.js** file to define what fields to display in the Billing Care **Balances** area. The fields defined in the view model are bound in the HTML file used to render the custom view or page. See "About View Models" for more information about Billing Care view models.

A sample **balances.js** file is provided in the *SDK_home*/**samples/BalancesCustomization/web/custom/viewmodels** directory. Use this sample create a custom view model.

To create a custom view model for the Billing Care **Home** tab:

1. Create a **balances.js** file in the *myproject*/**web/custom/js/viewmodels/BalancesCustomization** directory, where *myproject* is the folder containing your NetBeans IDE project.
2. Define the custom fields in this file, as required.

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3. Save the file in your NetBeans IDE project.

Configuring the Custom Balances Area in the Registry

After creating your custom view and view model, create a custom module entry in the **customRegistry.js** file to use when displaying the **Balances** area on the Billing Care account home page. Billing Care uses the custom view and view model instead of the default entries when rendering the **Balances** area.

A sample **customRegistry.js** file is provided in the *SDK_home*/**samples/BalancesCustomization/web/custom** directory, where *SDK_home* is the Billing Care SDK installation directory. Use this sample to create the **customRegistry.js** file with your custom views.

To add an entry in the **customRegistry.js** file:

1. Create a **customRegistry.js** file in *myproject*/**web/custom** by copying the reference registry file.
2. Define the custom view and view model in the file. For example:

```
var CustomRegistry = {
   balances: {
      view: 'text!../custom/templates/customView.html',
      viewmodel: 'custom/viewmodels/CustomViewModel.js'
   },
};
```

3. Save the file in your NetBeans IDE project.

Customizing the Data Displayed in the Balances Area

To customize the data that is displayed in the **Balances** area:

1. Create a custom view model to define the override for the **Balances** area based on your requirement, such as **CustomBalancesViewModel.js**, in the *myproject*/**web/custom/viewmodels** directory. See "About View Models" for information on creating the view models.
2. Create a custom Balances view model HTML Template. See "Creating Custom View Model HTML Template for the Balances Area".
3. Create a **customRegistry.js** file configuring Billing Care to use your custom view model. See "Adding customBalancesView and CustomBalancesViewModel to the Registry".
4. Package and deploy your customization to your Billing Care domain using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

Creating Custom View Model HTML Template for the Balances Area

Billing Care uses an HTML view file to customize the **Balances** area in the Home tab. The template file contains the override for the **Balances** area as defined in the custom view model.

To create a custom view model HTML template for customizing **Balances** area:

1. Create the **customBalancesView.html** file in the *myproject*/**web/custom/templates** directory.

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2. Define the override for the **Balances** area in the **customBalancesView.html** file in HTML required for rendering in this file.
3. Save the file in your NetBeans IDE project.

Adding customBalancesView and CustomBalancesViewModel to the Registry

Create a custom entry in your **customRegistry.js** file. Billing Care uses the custom view model instead of the default entry and renders the Balances section in the Home tab. See "About the Registry File" for more information.

To configure custom view model to customize the **Balances** area in the registry:

1. Create a **customRegistry.js** file in *myproject*/**web/custom/** directory.
2. Define the custom view model in this file:

```
var CustomRegistry = {
  balances: {
   view: 'text!../custom/templates/customBalancesView.html', // This is the custom
view which would replace the OOTB balances section
   viewmodel: 'custom/viewmodels/CustomBalancesViewModel.js' // This is the custom
view model which handles rendering of custom view replacing the OOTB balances
section
  },
};
```

3. Save the file in your NetBeans IDE project.

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15

Customizing Billing Care to Enable Noncurrency Adjustments for Expired Sub-Balances

Learn how to customize the Oracle Communications Billing Care Noncurrency Balance Details dialog box to enable adjustments to expired noncurrency sub-balances.

Topics in this document:

- About Noncurrency Sub-Balance Adjustments
- Customizing Billing Care to Enable Adjustments to Expired Noncurrency Sub-Balances

About Noncurrency Sub-Balance Adjustments

By default, Billing Care disables the **Adjust bucket** menu item in the Noncurrency Balance Details dialog box for expired noncurrency sub-balances.

You can enable **Adjust bucket** using the Billing Care SDK, allowing users to update expired noncurrency sub-balances.

Customizing Billing Care to Enable Adjustments to Expired Noncurrency Sub-Balances

To customize Billing Care to enable adjusting expired sub-balances for noncurrency resources:

1. Create a customization project. See "Setting Up a Billing Care Customization Project" for more details.
2. Create a custom view model to enable **Adjust bucket** for expired noncurrency sub-balances. See "Creating a Custom View Model to Enable the Adjust Bucket for Expired Noncurrency Sub-Balances" for more information.
3. Override the registry values for your custom view model. See "Configuring the Registry to use Your Custom Noncurrency Balance View Model" for more information.
4. Package and deploy your customizations using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

The Billing Care SDK includes samples that you can use for developing your own customizations in the *SDK_home*/**samples/NonCurrencyPastBalanceUpdates** directory. The sample includes a custom view model, a **customRegistry.js** file, and a **README.txt** file explaining how to use the sample files.

Creating a Custom View Model to Enable the Adjust Bucket for Expired Noncurrency Sub-Balances

Billing Care uses a view model to define how to display screens in Billing Care. You must create a custom view model such as **CustomNonCurrencyViewModel**. This will contain the

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details to enable **Adjust bucket** for expired noncurrency sub-balances in the Noncurrency Balance Details dialog box. A sample is located in *SDK_home***/samples/NonCurrencyPastBalanceUpdates/web/custom/viewmodels/balances/CustomNonCurrencyBalanceViewModel.js**.

See "About View Models" for more information about Billing Care view models.

To create a custom view model that enables adjustments to expired noncurrency sub-balances:

1. Create the **CustomNonCurrencyBalanceViewModel.js** file in the *myproject***/web/custom/js/viewmodels** directory, where *myproject* is the folder containing your NetBeans IDE project.
2. In the file, add the following code, ensuring you set the **isPastBalanceUpdate** parameter to **true**:

```
Define([
‘jquery’,
‘underscore’,
‘knockout’,
‘knockout-mapping’,
‘viewmodels/balances/NonCurrencyBalanceViewModel’
], function ($, -, ko, komapping, BaseViewModel){

function CustomNonCurrencyBalanceViewModel(){
     BaseViewModel.apply(this, arguments);
     var self = this;
     self.isPastBalanceUpdate=true;
}

CustomNoncurrencyBalanceViewModel.prototype = new BaseViewModel();
return CustomNonCurrencyBalanceViewModel;
});
```

3. Save the file in your NetBeans IDE project.

Configuring the Registry to use Your Custom Noncurrency Balance View Model

Create a custom module entry in the **customRegistry.js** file to point to your custom view model. This configures Billing Care to use the custom noncurrency balance view model instead of the default one. A sample is located in *SDK_home***/samples/NonCurrencyPastBalanceUpdates/web/custom/customRegistry.js**.

To add your custom view model to the registry:

1. Create a **customRegistry.js** file in *myproject***/web/custom/** directory.
2. Specify the custom noncurrency balance view model in this file. For example:

```
balances: {
    containedViewModel: '../custom/viewmodels/balances/
CustomNonCurrencyBalanceViewModel'
}
```

3. Save the file in your NetBeans IDE project.

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16

Adding Custom Payment Types

Learn how to add the custom payment types that you configured in Oracle Communications Billing and Revenue Management (BRM) to Oracle Communications Billing Care.

Topics in this document:

- About Custom Payment Types
- Creating Custom Payment Types in BRM
- Customizing Billing Care to Support Custom BRM Payment Types
- Extending the Billing Care Data Model with XSD and JSON Files
- Adding the XSD and JSON Files to NetBeans Project
- Enabling Custom Payment Types in Batch Payment Processing
- Deploying Customizations

About Custom Payment Types

Billing Care supports the following default payment types:

- Credit Card
- Debit Card
- Cash
- Check
- Wire-Transfer
- Interbank Payment Order
- Postal Order

BRM supports the creation of custom payment types, such as cryptocurrency, required by your business. Use the SDK to customize Billing Care to support custom payment types configured in your BRM. Adding custom BRM payment types to Billing Care enables the payment type to be selected when creating new accounts, adding payment methods, or processing manual payments.

Creating Custom Payment Types in BRM

Create custom BRM payment types using the Developer Center. This section provides a high-level overview of the process, including a general overview of creating and updating the required objects and classes. For detailed information on using Developer Center to create custom payment types, see "Creating Custom Fields and Storable Classes" in *BRM Developer's Guide*.

To create a custom payment type in BRM:

1. Create the custom payment type payment and reversal event subclasses. See "Creating Custom Payment Type Event Subclasses" for more information.

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2. Update the BRM **/config/paymenttool** object with the required custom payment fields. See "Updating the /config/paymenttool Object with Custom Payment Types" for more information.
3. Update the BRM **/config/payment object** with the custom payment and reversal events. See "Updating the /config/payment Object with Custom Payment Type Event" for more information.

Creating Custom Payment Type Event Subclasses

To create the custom payment type event subclasses:

1. Start Developer Center.
2. Open the Class Browser.
3. Select the **/event/billing/payment**, **/event/billing/reversal**, and **/event/billing/refund** classes sequentially.
4. Create the following new subclasses in the above classes:
   - **/event/billing/payment/external**
   - **/event/billing/reversal/external**
   - **/event/billing/refund/external**
   - **/event/billing/payment/external**/*payment_type*
   - **/event/billing/reversal/external**/*payment_type*
   - **/event/billing/refund/external**/*payment_type*

   where *payment_type* is the name of your custom payment type.
5. Commit the new subclasses.

To add the required fields to the new custom payment type subclasses:

1. Select the **/event/billing/payment/external/***payment_type* class.
2. Add the required fields for the custom payment type to the payment subclass. For example, if you are creating a new check payment type, add the PIN_FLD_CHECK_ID field.
3. Commit the subclass changes to the database.
4. Select the **/event/billing/reversal/external/***payment_type* class.
5. Add the required fields for the custom payment type to the reversal subclass. For example, if you are creating a new check payment type, add the PIN_FLD_CHECK_ID field.
6. Select the **/event/billing/refund/external/***payment_type* class.
7. Add the required fields for the custom payment type to the refund subclass. For example, if you are creating a new check payment type, add the PIN_FLD_CHECK_ID field.
8. Commit the subclass changes to the database.
9. To make the custom fields available in your application, refer to the steps in "Making Custom Fields Available to Your Applications" in *Developer's Guide*.

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Updating the /config/paymenttool Object with Custom Payment Types

Billing Care uses the **/config/paymenttool** object configuration to determine each payment type's required fields. Update this object with the required fields for your custom payment type after creating the subclasses.

To update the **/config/paymenttool** object:

1. In the Object Browser, select **/config/paymenttool**.
2. Find the **/config/paymenttool** object with a FLD_NAME value of **PaymentTool payment Types: Default**.
3. Copy the **/config/paymenttool** object into the Opcode Work Bench.
4. Add the required custom payment type fields to the object. Example 16-1 shows a sample flist for a new payment type with ID 11000 named External Check. This payment type has a new field called PIN_FLD_CHECK_ID.
5. Use WRITE_FLDS with **flag=32** to update the object with the new fields for your custom payment type.

Example 16-1 Sample /config/paymenttool fields for External Check Payment Type

```
0 PIN_FLD_POID                      POID [0] 0.0.0.1 /config/paymenttool  8398   0
  0 PIN_FLD_PAY_TYPES                ARRAY [11000] allocated 2, used 2
  1     PIN_FLD_NAME                   STR [0] "External Check"
  1     PIN_FLD_PAYMENTTOOL_FIELDS   ARRAY [0] allocated 4, used 4
  2         PIN_FLD_BATCH_TYPE         INT [0] 0
  2         PIN_FLD_COLUMN_NAME        STR [0] "check_No"
  2         PIN_FLD_FIELD_NAME         STR [0] "PIN_FLD_CHECK_ID"
  2         PIN_FLD_PURPOSE            INT [0] 0
  1   PIN_FLD_PAYMENTTOOL_FIELDS ARRAY [1] allocated 4, used 4
  2   PIN_FLD_BATCH_TYPE         INT [0] 1
  2   PIN_FLD_COLUMN_NAME        STR [0] "check_No"
  2   PIN_FLD_FIELD_NAME         STR [0] "PIN_FLD_CHECK_ID"
  2   PIN_FLD_PURPOSE            INT [0] 1
```

Updating the /config/payment Object with Custom Payment Type Event

BRM stores payment events in the **/config/payment** object. Update this object with the new payment, reversal, and refund events you created for custom payment type.

To update the **/config/payment** object:

1. In the Object Browser, select **/config/payment**.
2. Copy the **/config/payment** object into the Opcode Work Bench.
3. Add the required custom payment events to the object. Example 16-2 shows a sample flist for a new **/event/billing/payment/external/check** and **/event/billing/refund/external/check** events.
4. Use WRITE_FLDS with **flag=32** to update the object with the new fields for your custom payment type.
5. Stop and start your BRM services.

Example 16-2 Sample /config/payment fields for External Check Payment Type

```
 0 PIN_FLD_POID                     POID [0] 0.0.0.1 /config/payment 200 0
  0 PIN_FLD_PAY_TYPES                ARRAY [11000] allocated 4, used 4
  1     PIN_FLD_PAYINFO_TYPE           STR [0] "/payinfo"
```


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```
1     PIN_FLD_PAYMENT_EVENT_TYPE     STR [0]
"/event/billing/payment/external/check"
1     PIN_FLD_REFUND_EVENT_TYPE      STR [0]
"/event/billing/refund/external/check"
1     PIN_FLD_OPCODES              ARRAY [0] allocated 4, used 4
2         PIN_FLD_EVENT_TYPE         STR [0] ""
2         PIN_FLD_FLAGS              INT [0] 0
2         PIN_FLD_NAME               STR [0] "PCM_OP_INVALID"
2         PIN_FLD_OPCODE             INT [0] 0
1     PIN_FLD_OPCODES              ARRAY [1] allocated 4, used 4
2         PIN_FLD_EVENT_TYPE         STR [0] ""
2         PIN_FLD_FLAGS              INT [0] 0
2         PIN_FLD_NAME               STR [0] "PCM_OP_INVALID"
2         PIN_FLD_OPCODE             INT [0] 0
1     PIN_FLD_OPCODES              ARRAY [2] allocated 4, used 4
2         PIN_FLD_EVENT_TYPE         STR [0] ""
2         PIN_FLD_FLAGS              INT [0] 0
2         PIN_FLD_NAME               STR [0] "PCM_OP_INVALID"
2         PIN_FLD_OPCODE             INT [0] 0
```

Customizing Billing Care to Support Custom BRM Payment Types

The Billing Care SDK includes a sample custom payment type customization in the *SDK_home***/samples/CustomPaymentMethodType** directory, where *SDK_home* is the directory where you installed the SDK. Use this sample to assist you in customizing Billing Care with custom payment types.

Extending the Billing Care Data Model with XSD and JSON Files

The Billing Care SDK includes a Data Model Generator utility for generating the required XSD and JSON files containing the custom payment type definitions. The Data Model Generator is located in the *SDK_home***/samples/data_model_generator** directory. Use this sample to assist you in customizing Billing Care with custom payment types.

> **Note**
>
> The Data Model Generator utility requires an **Infranet.properties** file configured with BRM connection information in the local user's home directory. The utility connects to the BRM system defined in this file to retrieve the object configuration before generating the required XSD and JSON files. See "Configuring Additional Settings in the Infranet.properties File" in *Billing Care Installation Guide* for more information.

To create the required XSD and JSON files for your custom payment type:

1. Open a command-line interface on the system where the Billing Care SDK is installed.
2. Change to the *SDK_home***/samples/data_model_generator** directory.
3. Run the **DatamodelGenerator.bat** (Windows) or **DataModelGenerator.sh** (Linux) script to generate the XSD and JSON files.

The Data Model Generator outputs the **extensionDataModel.jar** containing the XSD files and an XSD file containing the definition of your custom payment type. Add these files to your

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NetBeans IDE project. See "Adding the XSD and JSON Files to NetBeans Project" for more information on adding the files to your project.

Adding the XSD and JSON Files to NetBeans Project

To add the **extensionDataModel.jar** containing the XSD files for your custom payment type, and the JSON files created by the Data Model Generator:

1. Add the **extensionDataModel.jar** to your Billing Care customization NetBeans IDE project using the NetBeans Library Manager.
2. Copy the JSON file to *myproject***/web/custom/js/autoui/jsons** where *myproject* is the project directory of your Billing Care customizations NetBeans IDE project.
3. Deploy your custom payment type customizations. See "Deploying Customizations" for more information.

Enabling Custom Payment Types in Batch Payment Processing

Batch payment files using custom payment types require the creation of a template file (**.pit**) before processing by Billing Care. Default template files are provided in *SDK_home***/references/paymentbatchtemplates**. Use a default template to create a template file supporting your custom payment types.

To create a custom payment type template file for batch processing:

1. Copy an existing default template file from the SDK references directory.
2. Rename the file for your custom payment type.
3. Open the file in a text editor.
4. Update the template file by customizing the sections described in Table 16-1 as needed. You must provide a unique Batch Name for your custom payment type batch file. Example 16-3 shows sample template file for a custom external payment batch.
5. Copy the custom payment type batch file into the *Middleware_home*/**BatchPaymentTemplates** directory, where *Middleware_home* is the home directory of the Oracle WebLogic Server installation where Billing Care is installed. This is the default location for unprocessed batch payment files. The Billing Care installation enables you to specify an alternative location. Confirm with your administrator to determine where your templates folder is located.

Table 16-1 Configurable Fields in Batch Payment Template File

Section	Description
Import	Contains the Batch Name, Data Type, and Start Row fields used to identify the batch type, data type, and file row to start processing from.
Delimiter	Contains a list of supported delimiters. Set the delimiter used in your custom payment type batch file by changing the value of the proper delimiter to **1**. By default, the delimiter is set to **Tab**.
Header	Contains fields used to specify whether to import the file header, and the header start and end rows.
Footer	Contains fields used to specify whether to import the file footer, and the footer start and end rows.

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Example 16-3 Sample Custom External Check Payment Batch Template File

```
# Modifying this file is not recommended.
[Import]
Batch Name External Check Payment Batch
Data Type    0
Start Row    1
[Delimiter]
Comma    0
Consecutive    0
Other    0
Semicolon    0
Space    0
MultiSpaces    0
Tab    1
OtherSep
Qualifier    \"
[Link]
[Header]
ImportHeaderData    0
HeaderStart Row    1
HeaderEnd Row    1
[Header Link]
[Footer]
ImportFooterData    0
FooterStart Row    1
FooterEnd Row    1
[Footer Link]
```

Deploying Customizations

Package and deploy your customizations using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

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17

Customizing the Make a Payment Window

Learn how to use the Oracle Communications Billing Care SDK to customize the fields displayed in the Billing Care **Make a Payment** window according to the selected payment method.

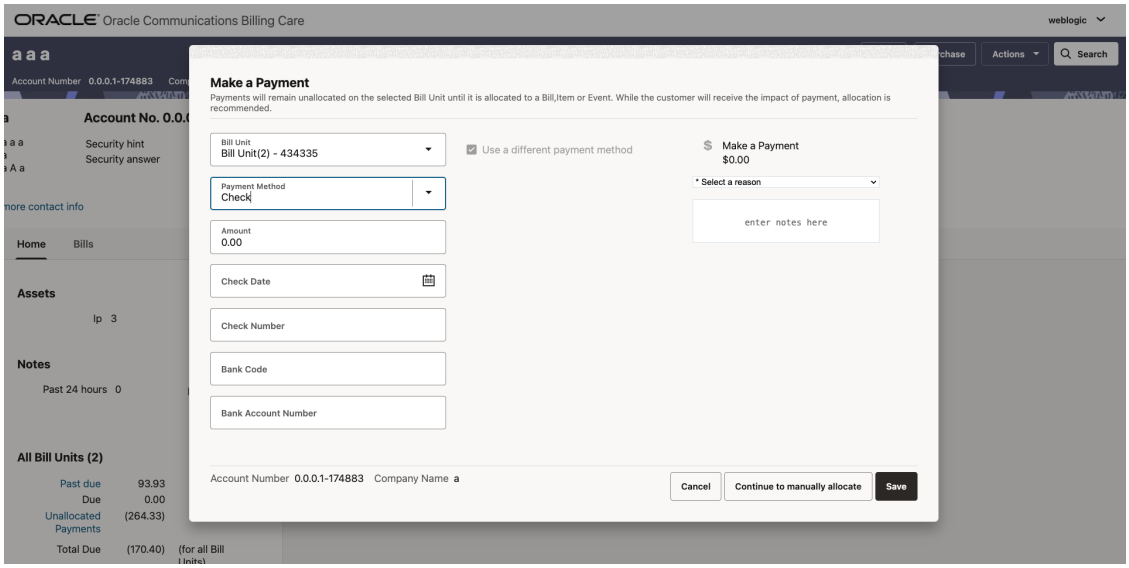
Topics in this document:

- About the Make a Payment Window
- Customizing the Fields Displayed for a Payment Method

About the Make a Payment Window

The Billing Care **Make a Payment** window displays different fields based on the payment method selected by the user. For example, a credit card payment method contains the **Card number**, **CVV2/CID**, and **Card expiration** fields, but the check payment method contains the **Check Date**, **Check Number**, **Bank Code**, and **Bank Account Number** fields. The figure below shows the fields for the check payment method.

Figure 17-1 Check Payment Type Fields



You can customize the **Make a Payment** window in one or more of the following ways:

- Modify or remove existing fields based on the payment method
- Add custom fields based on the payment method
- Specify whether a field is optional or mandatory
- Specify the valid range of dates for fields with a **date** data type

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- Validate whether a user has entered all required information for a specified payment method

Customizing the Fields Displayed for a Payment Method

The Billing Care SDK includes sample payment customizations, including a **README.txt** file explaining the samples, in the *SDK_home***/samples/ValidationOnPaymentInfo** directory, where *SDK_home* is the directory where you installed the Billing Care SDK. Use these samples when developing your own payment customizations.

To customize which fields are displayed in the **Make a Payment** window based on the payment method:

1. Create a custom view model for the **Make a Payment** window. See "Creating a Custom View Model for a Payment Method".
2. Override the registry value for the Billing Care payment type. See "Configuring the Custom Payment Type in the Registry".
3. Package and deploy your payment type changes. See "Packaging and Deploying Customizations".

Creating a Custom View Model for a Payment Method

Billing Care uses **AutoGeneratedUIViewModel.js** to render the UI fields specific to each payment method. Customizing the Billing Care fields displayed for each payment method requires overriding the default view model behavior.

> **Note**
>
> Billing Care 15.2 has migrated all UI components and input validation to Oracle JET. If you are migrating a legacy payment screen customization that previously used jQuery validators or Alta UI components, you must update your custom view models to use Oracle JET standards. For more information, see "Migrating Customizations from Billing Care 15.1 or Earlier".

A sample **CustomAutoGeneratedUIVM.js** file is provided in the *SDK_home***/samples/ValidationOnPaymentInfo/web/custom/viewmodels/payment** directory. The sample file does the following based on the field name or payment method:

- For check payment methods, changes the **bankCode** field to a drop-down list of bank names. It does this by using the **oj-select-single** tag. For more information, see "Select (Single)" in *OJET Cookbook Forms*.
- Specifies that fields with a **string** data type are mandatory. It does this by using the **required** attribute.
- Specifies a valid date range of 15 days before the current date through 15 days after the current date for all fields with a **date** data type.
- Validates that users have entered values into all mandatory fields. It does this by overriding the **isValid** function.

To create a custom view model for a Billing Care payment type:

1. Create the **CustomAutoGeneratedUIVM.js** file in the *myproject***/web/custom/viewmodels** directory, where *myproject* is the folder containing your NetBeans IDE project.

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2. Make your changes to the **preAddElement** function, which is called after the DOM element is created but before it is added to the actual DOM.

   The **README.txt** file in *SDK_home*/**samples/ValidationOnPaymentInfo** contains details on how the **preAddElement** function works and the functions it accepts.

3. Save the file in your NetBeans IDE project.

Configuring the Custom Payment Type in the Registry

Create a custom module entry in the **customRegistry.js** file to use when rendering the **Make a Payment** window for a particular payment method.

A sample **customRegistry.js** file is provided in the *SDK_home*/**samples/ValidationOnPaymentInfo/web/custom** directory, where *SDK_home* is the Billing Care SDK installation directory. Use this sample to create the **customRegistry.js** file with your custom view model.

To add an entry in the **customRegistry.js** file:

1. Create a **customRegistry.js** file in *myproject*/**web/custom** by copying the reference registry file.
2. Specify to use your custom view model. For example:

```
varCustomRegistry = {
   customPaymentType: {
      customViewModel: '../custom/viewmodels/payment/
CustomAutoGeneratedUIVM'
   }
};
```

3. Close and save the **customRegistry.js** file.
4. Save the file in your NetBeans IDE project.

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18

Displaying Success Toast Messages in Billing Care

Learn how to customize Oracle Communications Billing Care to display a toast message when a user submits a payment or adjustment successfully.

Topics in this document:

- About Displaying Success Toast Messages
- Adding Success Toast Messages to Billing Care Screens

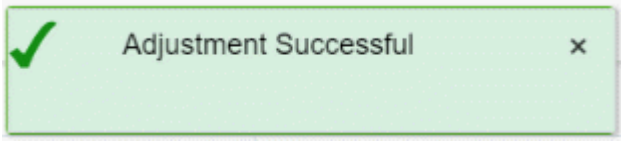
About Displaying Success Toast Messages

Billing Care displays error messages when an adjustment or payment transaction fails. If there is no message and control moves to the next screen, it implicitly means that the transaction was successful.

To have Billing Care explicitly display success messages for these transactions, customize Billing Care to display a Success toast message after each successful adjustment or payment. Success toast messages appear at the top of the page and then disappear after a few seconds.

Figure 18-1 shows a sample toast message for a successful adjustment.

Figure 18-1 Sample Success Toast Message



Adding Success Toast Messages to Billing Care Screens

To add Success toast messages to your Billing Care payment and adjustment screens:

1. Create a custom view HTML file for rendering the Success toast message. See "Creating a Success Toast Message View".
2. Create a custom view model for each payment and adjustment screen in which to display the Success toast message. See "Creating a Custom View Model for Your Payment and Adjustment Screens".
3. Create a custom view model for the Success toast message. See "Creating a Custom View Model for Success Toast Messages".
4. Override the registry values for your custom view and view models. See "Configuring the Registry for Success Toast Messages".

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5. Update the path to the green check mark graphic in the **overrides.css** file. See "Specifying the Path to Check Mark Graphic".
6. Package and deploy your Billing Care SDK. See "Packaging and Deploying Customizations".

The Billing Care SDK includes a sample Success toast message, including a **README.txt** file explaining the sample, in the *SDK_home***/samples/CustomToastMessages** directory, where *SDK_home* is the directory where you installed the Billing Care SDK. Use these samples when developing your own customizations.

Creating a Success Toast Message View

Create an HTML view file for rendering the Success toast message on Billing Care screens. For more information about views, see "About Views".

A sample **toastMessagesView.html** file is provided in the *SDK_home***/samples/CustomToastMessages/web/custom/templates/toastMessages** directory. Use this sample to create your own custom HTML file.

To create a view for rendering the Success toast message:

1. Create a **toastMessagesView.html** file in your *myproject***/web/custom/templates/toastMessages/** directory.
2. In the file, specify the type of message to display on the Billing Care screen. To do so, use the **oj-messages** component and set its **display** attribute to **notification**. For example:

```
<divid="successMsg" style="display:none;">
   <oj-messages id="oj-messages-id" messages="[[messagesDataprovider]]"
display="notification"
       position='{"my":{"vertical" :"top", "horizontal":
"center"},
       "at": {"vertical": "top", "horizontal": "center"}}'>

   </oj-messages>
</div>
```

   For more information about the **oj-messages** component, see "Messages" in *OJET Cookbook Forms*.
3. Save the file in your NetBeans IDE project.

Creating a Custom View Model for Success Toast Messages

Create a view model that specifies the text to display in the Success toast message as well as how long Billing Care waits before closing the message.

A sample **toastMessagesViewModel.js** file is provided in the *SDK_home***/samples/CustomToastMessages/web/custom/js/viewmodels/toastMessages** directory. The sample view model file specifies to do the following:

- Display the text "*message* **Successful**" in the Success toast message, where *message* is the Billing Care screen-dependent text defined in the payment or adjustment view model (see "Creating a Custom View Model for Your Payment and Adjustment Screens").
- Automatically close the Success toast message after 6000 milliseconds (6 seconds).

To create a custom view model for the Success toast message:

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1. Create the **toastMessagesViewModel.js** file in your *myproject*/**web/custom/js/viewmodels/toastMessages** directory, where *myproject* is the folder containing your NetBeans IDE project.
2. In the file's **successMessageData** function, specify the text to display and how long to wait before closing the message:

```
this.successMessageData=function(){
   return [{
      summary: message + " Successful",
      autoTimeout: parseInt(6000)
   }];
}.bind(this);
```

3. Save the file in your NetBeans IDE project.

Creating a Custom View Model for Your Payment and Adjustment Screens

To customize a Billing Care adjustment or payment screen to display a Success toast message, create a custom view model that contains overrides for the default display.

The Billing Care SDK includes sample custom view models for the payment and adjustment screens listed in Table 18-1. The sample files are located in *SDK_home*/**samples/CustomToastMessages/web/custom/js/viewmodels/***path*, where *path* is the view model directory and file name in Table 18-1. The sample files specify the screen-specific text to include in the toast message, such as **Adjustment**, **Payment**, or **Suspense Payment**.

Table 18-1 Payment and Adjustment Screens that Support Success Toast Messages

Billing Care Screen	View Model Directory and File Name
Account Adjustment screen See "Making Currency Adjustment" in *Billing Care Online Help*.	**accountAdjustment/CustomAccountAdjustmentViewModel.js**
Allocate Adjustment screen with Advanced View See "Allocating Currency Adjustments" in *Billing Care Online Help*.	**allocateAdjustment/CustomAllocateAdjustmentAdvancedViewModel.js**
Allocate Adjustment screen with Simple View See "Allocating Currency Adjustments" in *Billing Care Online Help*.	**allocateAdjustment/CustomAllocateAdjustmentViewModel.js**
Bill Adjustment screen See "Adjusting a Bill" in *Billing Care Online Help*.	**allocateBillAdjustment/CustomAllocateBillAdjustmentViewModel.js**
Allocate Payment screen with Advanced View See "Allocating a Payment" in *Billing Care Online Help*.	**allocatePayment/CustomAllocatePaymentAdvancedViewModel.js**
Allocate Payment screen with Simple View See "Allocating a Payment" in *Billing Care Online Help*.	**allocatePayment/CustomAllocatePaymentViewModel.js**

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Table 18-1 (Cont.) Payment and Adjustment Screens that Support Success Toast Messages

Billing Care Screen	View Model Directory and File Name
Make a Payment screen See "Making a Payment" in *Billing Care Online Help*.	**allocatePayment/CustomMakePaymentViewModel.js**
Bill Adjustment screen See "Adjusting a Bill" in *Billing Care Online Help*.	**billAdjustment/CustomBillAdjustmentViewModel.js**
Event Adjustment screen See "Adjusting an Event" in *Billing Care Online Help*.	**eventAdjustment/CustomEventAdjustmentViewModel.js**
Item Adjustment screen See "Adjusting an Item" in *Billing Care Online Help*.	**itemAdjustment/CustomItemAdjustmentViewModel.js**
Make a Payment screen See "Making a Payment" in *Billing Care Online Help*.	**makePayment/CustomMakePaymentViewModel.js**
Make a Suspense Payment screen See "Working with Suspended Payments" in *Billing Care Online Help*.	**makePaymentSuspense/ CustomMakePaymentSuspenseOverlayViewModel.js**
Noncurrency Adjustment screen See "Making a Noncurrency Adjustment" in *Billing Care Online Help*.	**nonCurrencyAdjustment/ CustomNonCurrencyAdjustmentViewModel.js**

To create a custom view model for a Billing Care payment or adjustment screen:

1. Create a custom view model file (*myproject*/**web/custom/js/viewmodels/***path* directory, where *path* is the view model directory and file name in Table 18-1).
2. Set **message** to the screen-specific text you want displayed in the Success toast message. For example:

```
functionCustomEventAdjustmentViewModel() {
   EventAdjustmentViewModel.apply(this, arguments);
   var self = this;
   self.msg = null;

   // This is to enable rendering a toast message on successful 'event
adjustment' action
   self.showToastMessages = function (data) {
      var message = "Adjustment";
      // example for calling custom methods to render the success toast
message
      self.msg = new ToastMessageVM(message);
      self.msg.loadMessage();
   };
}
```

3. Save the file in your NetBeans IDE project.

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Configuring the Registry for Success Toast Messages

To configure Billing Care to use your custom view and view models when rendering the payment and adjustment screens:

1. Create a **customRegistry.js** file in *myproject*/**web/custom** by copying the reference registry file.

   > **Note**
   >
   > A sample **customRegistry.js** file is provided in the *SDK_home*/**samples/CustomToastMessages/web/custom** directory.

2. Specify to use your custom view and view models for the payment and adjustment screens.

   The following shows sample entries in the **customRegistry.js** file for overriding the toast message view, the toast message view model, all adjustment view models, and all payment view models:

```
varCustomRegistry = {

   toastMessages: {
      view: '../custom/templates/toastMessages/
toastMessagesView.html',
      viewmodel: '../custom/js/viewmodels/toastMessages/
ToastMessagesViewModel'
   },
   makePayment: {
      viewmodel: '../custom/js/viewmodels/makePayment/
CustomMakePaymentViewModel'
   },
   allocatePayment: {
      simpleviewmodel: '../custom/js/viewmodels/allocatePayment/
CustomAllocatePaymentViewModel',
      advancedviewmodel: '../custom/js/viewmodels/allocatePayment/
CustomAllocatePaymentAdvancedViewModel'
   },
   makePaymentSuspense: {
      overlayviewmodel: '../custom/js/viewmodels/makePaymentSuspense/
CustomMakePaymentSuspenseOverlayViewModel'
   },
   itemAdjustment: {
      viewmodel: '../custom/js/viewmodels/itemAdjustment/
CustomItemAdjustmentViewModel'
   },
   eventAdjustment: {
      viewmodel: '../custom/js/viewmodels/eventAdjustment/
CustomEventAdjustmentViewModel'
   },
   accountAdjustment: {
      viewmodel: '../custom/js/viewmodels/accountAdjustment/
CustomAccountAdjustmentViewModel'
   },
```


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```
   billAdjustment: {
      viewmodel: '../custom/js/viewmodels/billAdjustment/
CustomBillAdjustmentViewModel'
   },
   allocateBillAdjustment: {
      viewmodel: '../custom/js/viewmodels/allocateBillAdjustment/
CustomAllocateBillAdjustmentViewModel'
   },
   allocateAdjustment: {
      simpleviewmodel: '../custom/js/viewmodels/allocateAdjustment/
CustomAllocateAdjustmentViewModel',
      advancedviewmodel :'../custom/js/viewmodels/allocateAdjustment/
CustomAllocateAdjustmentAdvancedViewModel'
   },
   nonCurrencyAdjustment: {
      viewmodel: '../custom/js/viewmodels/nonCurrencyAdjustment/
CustomNonCurrencyAdjustmentViewModel'
   }
};
```

3. Save the **customRegistry.js** file in your NetBeans IDE project.

Specifying the Path to Check Mark Graphic

The Billing Care SDK includes a sample green check mark graphic that you can include in your toast messages. The sample graphic is located in the *SDK_home***/samples/CustomToastMessages/web/custom/resources/images** directory.

You can include this graphic in your toast messages or create your own graphic. You can also change the colors, font size, and border used in the toast message.

To specify the path to the check mark graphic:

1. Copy the contents from the sample **overrides.css** file to your *myproject***/web/custom/css/overrides.css** file.
2. In the file, update the **background-image** URL to the relative path of your graphic:

```
.oj-messages-notification .oj-message-header {
    background-image: url(../resources/images/green-check.png);
    background-color: #d7efdf;
    font-size: large;
    height: 40px;
    background-repeat: no-repeat;
    background-position: left;
```

3. (Optional) Make any other customizations to the toast message.
4. Save and close the file.

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Customizing Purchase Deal and Assets Action Menu

Learn how to customize how you configure deals and display the **Actions** menu in Oracle Communications Billing Care.

Topics in this document:

- About Customizing Purchase Deal Configuration and Assets Action Menu
- Customizing Purchase Deal Configuration
- Customizing Assets Action Menu
- Deploying Customizations

About Customizing Purchase Deal Configuration and Assets Action Menu

You configure new or additional deals added to an account by clicking Configure in the Purchase Catalogue screen. Your deals may require additional fields for capturing custom configuration attributes during the purchase.

You can customize Billing Care to add custom fields for configuring the deal purchase and display the newly added custom fields in the assets action menu by using the Billing Care SDK.

For more information, see the following:

- Customizing Purchase Deal Configuration
- Customizing Assets Action Menu

Customizing Purchase Deal Configuration

The Billing Care SDK includes the sample SDK in the *SDK_home*/**samples/PurchaseDealAndAssetsActionMenuCustomization** directory, where *SDK_home* is the directory where you installed the SDK. Extend the sample with additional fields if required by your business. Use this sample to assist you in customizing the deal purchase configuration in Billing Care.

To customize the purchase deal configuration:

1. Extend the Billing Care data model by creating the custom data model JAR file (for example,**customDataModel.jar**) and add the JAR file to your Billing Care customization NetBeans IDE project. See "Extending the Data Model With the XSD and Java Class files" for more information.
2. Create custom purchase configuration view models to override the default purchase configuration flow. See "Creating a Custom Purchase Deal Configuration View Model" for more information.

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3. Create a custom view model HTML template to display the fields in the Configure screen during deal purchase. See "Creating Custom Purchase Configure View Model HTML Templates" for more information.
4. Deploy your custom payment type projects to your application server. See "Deploying Customizations" for more information.

Extending the Data Model With the XSD and Java Class files

To extend the data model with the XSD and Java class files:

1. Create the **customPurchaseBundle.xsd** file by using the sample **customPurchaseBundle.xsd** file in the *SDK_home***/samples/PurchaseDealAndAssetsActionMenuCustomization/customSchema/** directory. The sample **customPurchaseBundle.xsd** file includes the following custom fields: **productDescription** and **overridingAmount**.
2. Create the **jaxb_bindings.xml** file by using the sample **jaxb_bindings.xml** file in the *SDK_home***/samples/PurchaseDealAndAssetsActionMenuCustomization/customSchema/** directory.
3. Generate a JAXB class from the schema by using XJC.

   XJC is not available as part of Java, hence create a **lib** folder with the following jars:

   jax-xjc, **jaxb-impl**, **jakarta.xml.bind**, and **jakarta.activation**

   ```
   java -cp class_path_to_libraries com.sun.tools.xjc.Driver path_of_XSDfile -p
   package_path -b bindings_file
   ```

   where:

   - *class_path_to_libraries* is the **lib** which has the **jakarta.xml.bind**, **jaxb-impl**, **jakarta.xml.bind**, and **jakarta.activation**.
   - *path_of_XSD_file* is the path to the **customPurchaseBundle.xsd** file.
   - *package_path* is the path to the Billing Care package.
   - *bindings_file* is the path to the **jaxb_bindings.xml** file.

   For example:

   ```
   java -cp "..\lib\*" com.sun.tools.xjc.Driver . -p
   com.oracle.communications.brm.cc.model -b jaxb_bindings.xml
   ```

   The **customPurchaseBundle.java** file is created in the directory in which the **jaxb_bindings.xml** and **customPurchaseBundle.xsd** files are stored.
4. Create a Java class file by running the following command:

   ```
   javac java_file_Path -cp path to dataModel.jar;path to jakarta.xml.bind-api.jar
   ```

   where:

   - *path to dataModel.jar* is the path to the **dataModel.jar** available in Billing Care.
   - *path to jakarta.xml.bind-api.jar* is the path to the **jakarta.xml.bind-api.jar** that was added in lib folder.

   For example:

   ```
   javac com\oracle\communications\brm\cc\model\* -cp
   "..\..\lib\dataModel.jar;..\..\lib\jakarta.xml.bind-api.jar"
   ```

   The **CustomPurchaseBundle.class** file is generated.

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5. Do one of the following:
   - If you already have a customized data model JAR file, add the **CustomPurchaseBundle.class** to that JAR file.
   - If the customized data model JAR is not available, create a **customDataModel.jar** by running the following command:

     ```
     jar -cf customDataModel.jar com\*
     ```
6. Copy the customized data model jar file (for example,**customDataModel.jar**) to your Billing Care customization NetBeans IDE project *myproject***/web/lib** directory where *myproject* is the project directory of your Billing Care customizations NetBeans IDE project.

Creating a Custom Purchase Deal Configuration View Model

Billing Care uses the **PurchaseConfigurationViewModel** and **PurchaseViewModel** to define the purchase configuration flow for the deal purchase. You must create these view models containing the override functions.

The **PurchaseConfigurationViewModel** contains the **processBundlePurchasePayload()** function, which captures the values entered in the custom fields in the Configure page and adds it to the accountModel as array. The **PurchaseViewModel** contains the **purchaseBundle()** function, which retrieves the data and calls the Custom REST Resource. The **CustomAccountResource** handles the custom REST call by accepting the **customPurchaseBundle** from the user interface.

See "About View Models" for more information about Billing Care view models.

The sample **CustomPurchaseConfigurationViewModel.js** and **CustomPurchaseViewModel.js** files are provided in the *SDK_home***/samples/PurchaseDealAndAssetsActionMenuCustomization/web/custom/viewmodels** directory. These samples contain the necessary override functions to add custom fields for purchase deal configuration. Use these samples to create the custom purchase deal configuration view models.

To create the purchase deal configuration view models with the override functions:

1. Create a **CustomPurchaseConfigurationViewModel.js** file in *myproject***/web/custom/viewModels** directory, where *myproject* is the folder containing your NetBeans IDE project.
2. Create a **CustomPurchaseViewModel.js** file in *myproject***/web/custom/viewModels** directory.
3. Save the files in your NetBeans IDE project.

Creating Custom Purchase Configure View Model HTML Templates

Billing Care uses an HTML view file to render the Configure screen in the purchase flow. You must create a custom purchase configuration view model HTML template to display any additional fields during new or additional deals purchase configuration. The template file contains the additional fields defined in the custom purchase configuration view model created in "Creating a Custom Purchase Deal Configuration View Model".

A sample **purchaseConfigureAdditionalFieldsView.html** file is provided in the *SDK_home***/samples/PurchaseDealAndAssetsActionMenuCustomization** directory. This sample defines how to render additional attributes for the purchase configuration. Use this sample to create a custom purchase configuration HTML template for displaying the additional fields required for the deal purchase configuration.

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To create a purchase configuration HTML template for rendering the additional fields you need to capture:

1. Create a **purchaseConfigureAdditionalFieldsView.html** file in *myproject***/web/custom/templates** directory.
2. Define the new fields in HTML required for rendering in this file.
3. Save the file in your NetBeans IDE project.

Customizing Assets Action Menu

The Billing Care SDK includes a sample custom assets action menu in the *SDK_home***/samples/PurchaseDealAndAssetsActionMenuCustomization** directory. Use this sample to assist you in customizing the assets action menu to display the newly added custom fields for purchasing deals in Billing Care.

To customize the assets action menu:

1. Create a custom asset view model to override the default assets action menu view. See "Creating a Custom Asset View Model" for more information.
2. Create custom view model HTML templates for customizing the assets action menu. See "Creating Custom Asset View Model HTML Templates" for more information.
3. Deploy your custom payment type projects to your application server. See "Deploying Customizations" for more information.

Creating a Custom Asset View Model

Billing Care uses **AssetViewModel** to define the assets action menu. You must create a custom asset view model containing the override **editProductParams()** function. The **editProductParams()** function renders links for each product in the assets card to edit the product details.

See "About View Models" for more information about Billing Care view models.

The sample **CustomAssetViewModel.js** is provided in the *SDK_home***/samples/PurchaseDealAndAssetsActionMenuCustomization/web/custom/viewmodels** directory. This sample contains the necessary overrides for the default assets action menu. Use this sample to create the custom view models for retrieving and displaying the custom fields in the assets action menu.

To create the asset view model with the override functions:

1. Create a **CustomAssetViewModel.js** file in *myproject***/web/custom/viewModels** directory, where *myproject* is the folder containing your NetBeans IDE project.
2. Save the file in your NetBeans IDE project.

Creating Custom Asset View Model HTML Templates

Billing Care uses an HTML view file to customize the assets action menu. You must create a custom asset view model HTML template to display any custom fields that you added for the deal purchase configuration. The template file contains the additional fields defined in the custom asset view model created in "Creating a Custom Asset View Model".

The sample **editProductParametersView.html** and **customAssetsActionMenuOptions.html** files are provided in the *SDK_home***/samples/PurchaseDealAndAssetsActionMenuCustomization** directory. The

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editProductParametersView.html file defines how to render the additional attributes when the custom **Change Product Parameters** entry is selected from the assets action menu. The **customAssetsActionMenuOptions.html** file defines the assets action menu options to be displayed. Use these samples to create the custom asset view HTML templates for customizing the assets action menu.

In the sample **customAssetsActionMenuOptions.html** file, the custom menu entry to be displayed is added in the <!-- Custom Menu Entry for Assets Action Menu SDK : START --> section. In the sample **editProductParametersView.html** file, the product parameters for the custom menu are listed in the "<!-- Dialog Contents for the Product Parameters : Added for Assets Actions Menu SDK : START -->" section.

To create an asset view HTML template:

1. Create a **editProductParametersView.html** file in *myproject*/**web/custom/templates** directory.
2. Define the new fields in HTML required for rendering in this file.
3. Save the file in your NetBeans IDE project.
4. Create a **customAssetsActionMenuOptions.html** file in *myproject*/**web/custom/templates** directory.
5. Define the new fields in HTML required for rendering in this file.
6. Save the file in your NetBeans IDE project.

Deploying Customizations

Package and deploy your customizations using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

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Customizing Billing Care to Display Child Accounts

Learn how to customize Oracle Communications Billing Care to display child accounts in the Organization Hierarchy screen of the parent account.

Topics in this document:

- About Displaying Child Accounts
- Customizing Billing Care to Display Child Accounts
- Customizing the Organization Hierarchy Screen
- Creating Custom View Models
- Configuring a Custom Module in the Registry
- Adding the Data Model JAR File
- Deploying Customizations

About Displaying Child Accounts

By default, Billing Care does not display the list of child accounts from the parent account.

However, you can customize Billing Care to display the list of child accounts in the Organization Hierarchy screen of the parent account by using the Billing Care SDK. This lets you view the list of child accounts and also navigate to the child accounts from the parent account.

You can view the list of child accounts by clicking the **Show Children** link in the Organization Hierarchy screen of the parent account.

Customizing Billing Care to Display Child Accounts

This section provides a high level overview of the process on how to customize Billing Care to display the list of child accounts in the Organization Hierarchy screen.

To customize Billing Care to display child accounts:

1. Create a java class to retrieve the child accounts from Oracle Communications Billing and Revenue Management (BRM) and display them from the Organization Hierarchy screen of the parent account. See "Customizing the Organization Hierarchy Screen" for more information.
2. Create custom view models to define the display of the Organization Hierarchy screen. See "Creating Custom View Models" for more information.
3. Create a **customRegistry.js** file configuring Billing Care to use the custom view models created in step 2. See "Configuring a Custom Module in the Registry" for more information.
4. Add the data model JAR file to your NetBeans IDE project. See "Adding the Data Model JAR File" for more information.

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5. Deploy your customization to your Billing Care domain. See "Deploying Customizations" for more information.

Customizing the Organization Hierarchy Screen

Customize the Organization Hierarchy screen by creating a custom resource class containing the logic to retrieve and display all the child accounts for a parent account.

To customize the Organization Hierarchy screen:

1. Create a **CustomHierarchyResource.java** file in *myproject*/**projectname/src/java/com/rest/sdk**, where *myproject* is the folder containing your NetBeans IDE project, using the sample shown in Example 20-1.

   You can extend the REST framework to call BRM opcodes (for example, PCM_OP_SEARCH) to retrieve the child account details from BRM by using account numbers. See "Extending and Creating Billing Care REST Resources" for more information about extending the REST framework.

2. Save the file in your NetBeans IDE project.

3. Copy the file to **com.oracle.communications.brm.cc.ws package** (*myproject*/**src/com/oracle/communications/brm/cc/ws**).

Example 20-1 Sample CustomHierarchyResource.java Class

```
/**
* Custom hierarchy resource
*
*/
@Path("hierarchy")
public class CustomHierarchyResource {
    /**
     * sample rest API to retrieve child accounts
     * refer to the documentation for more details.
     * @return String
     */
     private static CCLogger logger =
    CCLogger.getCCLogger(CustomHierarchyResource.class);
    @Path("/children/{id}")
    @GET
    @Produces({"application/xml", "application/json"})
    public String getChildAccountsInHierarchy(@PathParam("id") String id) {
        logger.entering("CustomHierarchyResource", "getChildAccountsInHierarchy");
        try {
//method implementation to fetch child accounts goes here. Refer to documentation for
more details.
            System.out.println("Custom Hierarchy Resource "+id);
        } catch (ApplicationException e) {
            ExceptionHelper.handleException(e);
        }
        logger.exiting("CustomHierarchyResource",
 "getChildAccountsInHierarchy");
       ChildrenAccount obj = new ChildrenAccount(id,"Dummy Account");
        return obj;
    }
}
```


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Creating Custom View Models

Billing Care uses view model to define the display of the Organization Hierarchy screen. You must create the custom view model **CustomOrganizationHierarchyViewModel** containing overrides for the default Organization Hierarchy screen. See "About View Models" for more information about Billing Care view models.

The sample **customOrganization HierarchyViewModel.js** file is provided in the *SDK_home*/**samples/DisplayChildAccountsInHierarchy/web/js/viewmodel** directory. Use the samples to create the custom view models for displaying child accounts.

To create custom view models:

1. Create the **customOrganizationHierarchyViewModel.js** file in the *myproject*/**web/custom/js/viewmodels/***area*/**configure** directory, where *area* is the customization type.
2. Save the files in your NetBeans IDE project.

The view model **customOrganizationHierarchyViewModel.js** adds the required HTML from the JS side and applies binding to the same for Show All Children button.

Configuring a Custom Module in the Registry

Create a custom organization hierarchy module entry in your **customRegistry.js** file for displaying child accounts from the parent account. Billing Care uses the custom module instead of the default entry and renders the Organization Hierarchy screen containing your custom fields. See "About the Registry File" for more information.

To create a custom module entry in the registry:

1. Create a **customRegistry.js** file in *myproject*/**web/custom/**.
2. Define the custom organization hierarchy module in this file. Example 20-2 shows a definition of the custom organization hierarchy module in the registry using the SDK samples.
3. Save the file in your NetBeans IDE project.

Example 20-2 Sample Custom Organization Hierarchy Registry Entry

```
var CustomRegistry = {

    organizationHierarchy: {
        viewmodel: 'viewmodel/CustomOrganizationHierarchyViewModel',
        removeFromHierarchyOverlayView:
 'text!templates/organizationHierarchy/overlays/removeFromHierarchyOverlayView.html',
        removeFromHierarchyOverlayViewModel: 'overlayviewmodels/organizationHierarchy/
RemoveFromHierarchyOverlayViewModel',
    }
};
```

Adding the Data Model JAR File

To add the data model JAR file to your NetBeans IDE project, copy the **extensionDataModel.jar** from *SDK_home*/**libs** to your Billing Care customization NetBeans IDE project (*myproject*/**web/lib**).

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Deploying Customizations

Package and deploy your customizations using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

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Customizing Billing Care Invoice Presentation

Learn how to customize how Oracle Communications Billing Care retrieves and presents invoices for display.

Topics in this document:

- About Billing Care Invoice Presentation
- Customizing Billing Care Invoice Presentation
- Presenting Invoices in a Dialog Box
- Retrieving Invoices from Third-Party Repositories

About Billing Care Invoice Presentation

Billing Care retrieves invoices from external invoice repositories, such as Oracle Analytics Publisher, and displays the supported invoice formats (for example, PDF and HTML) in the web browser. When a user views an invoice, Billing Care retrieves the invoice identifier for the active bill unit from BRM and sends a request to the invoice repository for the invoice document.

By default, BRM integrates with Oracle Analytics Publisher for generating and storing PDF invoices of customer bill units retrievable in Billing Care. See "Using Oracle Analytics Publisher for Invoicing" in *BRM Designing and Generating Invoices* for more information on this integration.

Customizing Billing Care Invoice Presentation

Customize Billing Care invoice presentation in the following ways using the Billing Care SDK:

- Presenting Invoices in a Dialog Box
- Retrieving Invoices from Third-Party Repositories

The Billing Care SDK includes sample invoice presentation customizations in the *SDK_home*/**samples/InvoiceRepository** directory, where *SDK_home* is the directory where you installed the SDK. Use the samples as guidelines for developing your own customizations.

Setting Up NetBeans IDE for Customizing Invoice Presentation

Customizing Billing Care invoice presentation requires overriding default view model (**BillInvoiceViewModel.js**) behavior and adding the custom JavaScript to the customizations shared library deployed to the Billing Care domain. See "About Billing Care Modules" for more information on how view models use JavaScript to perform functions.

See "Setting Up the Development Environment" for information on setting up NetBeans IDE. See "Packaging and Deploying Customizations" for more information on packaging and deploying your invoice presentation changes.

To customize Billing Care invoice presentation:

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1. Create a **customModule.properties** file in your *myproject***/web/WEB-INF/classes/custom/** directory, where *myproject* is your NetBeans IDE project containing your Billing Care customizations. This file will contain a reference to the location of the custom Java classes you create.
2. Copy the default **registry.js** file from *SDK_home***/references** to a custom registry file named **customregistry.js** in your *myproject***/web/custom** directory. This file contains the billInvoice module definition using your custom view model (JavaScript).
3. Customize invoice presentation by creating the Java classes and necessary resources (JavaScript view model) as described in the following sections.
4. Add your customization files to your NetBeans IDE project (*myproject*). Add new JavaScript to support your custom view model in the *myproject***/web/js/viewmodels/billinvoice** directory.
5. Right-click your NetBeans IDE project and select **Clean and Build**.
6. Package and deploy your invoice presentation customizations to your Billing Care domain.

   For more information, see "Packaging and Deploying Customizations".
7. Verify your changes in Billing Care.

Presenting Invoices in a Dialog Box

The default invoice presentation displays PDF invoices in an iframe (inline frame) within the active Billing Care browser window. Billing Care also supports presentation of invoices in a dialog box.

To present invoices in a dialog box:

1. In a text editor, open your **CustomConfigurations.xml** file. This file contains configuration entries for Billing Care behavior. See "Creating a Custom Configuration File" for more information on creating a custom configuration file in your NetBeans IDE project.
2. Set the value for the **billinvoice.use.modaldialog** flag to **true** as shown:

```
<flags>
        <key>billinvoice.use.modaldialog</key>
        <value>false</value>
        <desc>If value is true then displays the bill invoice in a modal
        dialog.</desc>
</flags>
```

3. Save the configuration file.
4. Do one of the following:
   - If you are using an exploded archive for your shared library, log out of and back into Billing Care to see the new theme. See "About Using an Exploded Archive" for more information about using exploded archives.
   - Package your customizations shared library and deploy it to your Billing Care domain. Redeploy Billing Care and login to see the new theme. See "Packaging and Deploying Customizations" for more information on packaging and deploying your customizations.
5. Verify your changes in Billing Care.

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Retrieving Invoices from Third-Party Repositories

By default, Billing Care retrieves invoices from Oracle Analytics Publisher. The logic to retrieve an invoice identifier for the active bill unit and request the PDF invoice from Oracle Analytics Publisher is contained in the PCMBillModule class. This class contains the following methods:

- getInvoicePDF(*String id*)

  It contains the code to invoke the worker method to retrieve the Invoice ID and template name from the bill ID passed from BRM.

- runReport (*String invoiceId,String templateName*)

  This method is called from the getInvoicePDF method. It contains the code to retrieve the PDF invoice from Oracle Analytics Publisher using the invoice ID and template name by calling the Oracle Analytics Publisher web service.

To use an invoice repository other than Oracle Analytics Publisher, override the getInvoicePDF and runReport methods in the PCMBillModule class.

The override implementation depends on how your invoice repository's API retrieves and sends invoices to external clients. A simple REST example is included in the SDK and includes:

- A sample Java class (**CustomPCMBillModule.java**), which extends runReport to connect to a basic local invoice file system repository. This class is located in the *SDK_home***/samples/InvoiceRepository/rest/src/com/oracle** directory.
- A test resource Java class to use with **CustomPCMBillModule.java**, which provides a local file PDF for retrieval. This class is located in the *SDK_home***/samples/InvoiceRepository/TestResource/src/com/oracle** directory.

To retrieve an invoice from a repository other than Oracle Analytics Publisher:

1. Create a **CustomPCMBillModule.java** file in the *myproject***/src/** directory, where *myproject* is your NetBeans IDE project containing your Billing Care customizations, to override the original **PCMBillModule**.

   Use the sample provided in the SDK as an example. Your implementation will depend on your invoice repository's API.

2. Compile your custom classes using NetBeans IDE.
3. Add your customization files to your NetBeans IDE project (*myproject*):
   - Add an entry in the **customModule.properties** in the *myproject***/web/WEB-INF/classes/custom** folder to override the default billing module as follows:

     `billingcare.rest.billing.module=com.`*company*`.modules.CustomPCMBillModule`

     where *company* is the company name used in your *myproject***/src** directory.
4. Right-click your NetBeans IDE project and select **Clean and Build**.
5. Package and deploy your invoice presentation customizations to your Billing Care domain.

   For more information, see "Packaging and Deploying Customizations".
6. Verify your changes in Billing Care.

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Adding an Event Details Column to the Events Table

Learn how to add an extra column to the Oracle Communications Billing Care Event Details table to display event details.

Topics in this document:

- About the Events Table
- About Adding an Event Details Column to the Events Table
- Adding an Event Details Column to the Events Table
- About the Sample Files
- Creating the Event Details Column in the Events Table Using the Sample

About the Events Table

You can view the usage events for a bill in the Events table. See "Working with Events" in *Billing Care Online Help* for more information about viewing this table.

About Adding an Event Details Column to the Events Table

You can add an additional column called "Event Details" to the Events table. This column will contain a **View** link for each event in the table. When you click the **View** link, a dialog box displays the event flist for the event. The dialog box also contains a **Copy** button which copies the entire flist.

Adding an Event Details Column to the Events Table

Billing Care provides an SDK sample to enable adding the event details column into the table. You can use the sample files to implement the new column using your own custom project.

About the Sample Files

The sample is located in the *SDK_home*/**samples/EventDialogCustomizations** directory, where *SDK_home* is the directory where the SDK is installed. This directory contains a **readme.txt** file and directories containing supporting files.

The sample contains the following supporting files:

- In the *SDK_home*/**samples/SampleSDK/EventDialogCustomizations/web/custom** directory:
  - **customRegistry.js**: This file supplies a sample entry to include the custom view model code.
- In the *SDK_home*/**samples/SampleSDK/EventDialogCustomizations/web/custom/viewmodels/events** directory:

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  - **CustomEventsViewModel.js**: This file contains code to implement the custom view model with the Event Details column.
- In the *SDK_home*/**samples/EventDialogCustomizations/src/java/com/oracle/communications/brm/cc/ws** directory:
  - **CustomEventResource.java**: This file contains the REST call to retrieve the event details.
  - **CustomEventWorker.java**: This code calls the appropriate opcode and reads the event object.

Creating the Event Details Column in the Events Table Using the Sample

1. Create a custom web project named, for example, EventDialogCustomizations.
2. Copy the sample **CustomEventResource.java** file to the **com/oracle/communications/brm/cc/ws** directory in your project to incorporate a new REST method.
3. Copy the sample **CustomEventWorker.java** file to the **com/oracle/communications/brm/cc/ws** directory in your project to introduce logic for calling the opcode to read event objects.
4. Add your custom project, for example, EventDialogCustomizations, to the **web/custom/customRegistry.js** file in your project to override the standard view model file. See "About the Registry File" for more information.
5. Copy the sample **CustomEventsViewmodel.js** file to your project to customize the viewmodel file to include an additional column and dialog in the DOM.
6. Create a **MANIFEST.MF** file in the **src/conf** folder using the instructions in "Creating a Manifest for your Shared Library".
   You can use the *SDK_home*/**samples/FiltersAndCustomHeaders/src/conf/MANIFEST.MF** file as a sample.
7. Use the instructions in "Packaging and Deploying Customizations" to create a production deployment plan and a **.war** file containing your customizations.

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Customizing Reason Codes List in Event Adjustments

Learn how to customize the Oracle Communications Billing Care Event Adjustments dialog box to display specific reason codes.

Topics in this document:

- About Displaying Reason Codes
- Customizing Reason Codes List in Event Adjustments
- Creating the Custom Event Adjustment View Model
- Configuring the Custom Purchase View Model in the Registry
- Deploying Customizations

About Displaying Reason Codes

By default, all the reason codes configured for adjustments are displayed in the Event Adjustment dialog box. When you perform adjustments for events, you can select a reason code from this list to specify the reason for the adjustment.

Customizing Reason Codes List in Event Adjustments

You can customize the Event Adjustment dialog box using OPSS policies to display only specific reason codes in the list.

To customize the reason codes list displayed in the Event Adjustments dialog box:

1. Create a custom ResourceType and Resource for reason codes in the OPSS Server. For example, ReasonCodeResourceType, ReasonCodeResource.
2. Define the reason codes as corresponding actions for the ResourceType in the OPSS Server.
   You can specify Reason ID as the action name when you define the actions.
3. Add the new ResourceType to the **CustomConfigurations.xml** file. For example:

```
<keyvals>
<key>authorizationResourceTypes</key>
<value>ReasonCodeResourceType</value>
<desc>Add comma separated OPSS Resource Types(values) for authorization.
Also these resource types should be defined in OPSS.
Please note that the key should not be changed here.
</desc>
</keyvals>
```

4. Create a custom view model to define the display of Event Adjustment dialog box. See "Creating the Custom Event Adjustment View Model" for more information.
5. Create a **customRegistry.js** file to configure Billing Care to use the custom view model that you created. See "Configuring the Custom Event Adjustment View Model in the Registry" for more information.

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6. Deploy your custom event adjustment project to your application server. See "Deploying Customizations" for more information.

Creating the Custom Event Adjustment View Model

Billing Care uses view model to define the display of the screens in Billing Care. You must create the custom view model, **CustomEventAdjustmentViewModel**, containing the details to customize the display of reason codes in the Event Adjustment dialog box.

See "About View Models" for more information about Billing Care view models.

To create the custom event adjustment view model:

1. Create the **customEventAdjustmentViewModel.js** file in *myproject***/web/custom/viewmodels** directory, where *myproject* is the folder containing your NetBeans IDE project.
2. Add the following code in the **customEventAdjustmentViewModel.js** file using a text editor:

```
define(['jquery', 'knockout', 'ojs/ojarraydataprovider',
    'viewmodels/ARActions/adjustments/EventAdjustmentViewModel'
],
        function($, ko, ArrayDataProvider, EventAdjustmentViewModel) {
            function customEventAdjustmentViewModel() {
                EventAdjustmentViewModel.apply(this, arguments);
                var self = this;
                self.reasonCodesDP = ko.computed(function() {
                let reasonsArray = [];
                if (self.domainId() !== null) {
                       self.selectedReasonCode(null);
                       let reasonCodes =
Configurations.getReasonCodes(self.domainId());
                  let filterReasonCodes = [];
                  for (let i = 0; i < reasonCodes.length; i++) {
                    if(util.isGrantedResourceAction(reasonCodes[i].ReasonID,
"ReasonCodeResource")){   //Use newly created resource here
                    filterReasonCodes.push(reasonCodes[i]);
                    }
                  }

                  if (Array.isArray(filterReasonCodes)) {
                    reasonsArray = filterReasonCodes.map(item => ({
                        value: String(item.ReasonID),
                        label: item.Reason
                    }));
                  }
                }
                return new ArrayDataProvider(reasonsArray, {keyAttributes: 'value'});
                });
            }
            customEventAdjustmentViewModel.prototype = new
EventAdjustmentViewModel();
            return  customEventAdjustmentViewModel;
        });
```

3. Save the file in your NetBeans IDE project.

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Configuring the Custom Event Adjustment View Model in the Registry

After creating the required custom view model, create a custom event adjustment view model entry in the **customRegistry.js** file. Billing Care uses the custom event adjustment view model instead of the default event adjustment view model during adjustments and renders the Event Adjustment dialog box containing your customization.

To create the custom event adjustment view model entry in the registry:

1. Create a **customRegistry.js** file in *myproject***/web/custom/** directory.
2. Define the custom event adjustment view model in this file. For example:

```
eventAdjustment: {
       viewmodel: 'custom/viewmodels/customEventAdjustmentViewModel.js'
   }
```

3. Save the file in your NetBeans IDE project.

Deploying Customizations

Package and deploy your customizations using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

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Restricting Debit and Credit Event Adjustment Options

Learn how to customize Oracle Communications Billing Care to restrict debit and credit adjustment options in the Event Adjustment dialog box based on user roles.

Topics in this document:

- About Debit and Credit Event Adjustments
- Restricting Debit and Credit Adjustment for Events
- Creating a Custom View Model for Restricting Debit and Credit Adjustments
- Configuring the Custom View Model for Debit and Credit Adjustments

About Debit and Credit Event Adjustments

To perform debit or credit event adjustments, you enter the adjustment amount in the **Adjustment** field in the Event Adjustment dialog box. For credit adjustment, you enter a positive amount or percentage. For debit adjustment or to increase the amount due, you enter a negative amount. You can restrict the debit or credit event adjustments based on user roles by customizing Billing Care using the SDK and OPSS policies.

Restricting Debit and Credit Adjustment for Events

You can customize the Event Adjustment dialog box using OPSS policies to restrict the debit and credit adjustment options for events based on user roles.

To customize debit and credit adjustment options in the Event Adjustment dialog box:

1. Define a new ResourceType in the OPSS Server. For example, AdjustmentActionResourceType.
2. Define the debit and credit options as corresponding actions for the ResourceType in the OPSS Server.
3. Add the new ResourceType to the **CustomConfigurations.xml** file. For example:

```
<keyvals>
<key>authorizationResourceTypes</key>
<value>AdjustmentActionResourceType</value>
<desc>Add comma separated OPSS Resource Types(values) for authorization.
Also these resource types should be defined in OPSS.
Please note that the key should not be changed here.
</desc>
</keyvals>
```

4. Create a custom view model to define the display of Event Adjustment dialog box. See "Creating a Custom View Model for Restricting Debit and Credit Adjustments" for more information.

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5. Create a **customRegistry.js** file to configure Billing Care to use the custom view model that you created. See "Configuring the Custom View Model for Debit and Credit Adjustments" for more information.
6. Deploy your customizations using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

Creating a Custom View Model for Restricting Debit and Credit Adjustments

Billing Care uses view model to define the display of the screens in Billing Care. You must create or update the custom view model, **CustomEventAdjustmentViewModel**, and add the details containing the logic to check if the adjustment is a debit or credit adjustment and determine if that adjustment is allowed for the specific user role.

See "About View Models" for more information about Billing Care view models.

To create a custom model for customizing debit and credit event adjustment options:

1. Create or update the **customEventAdjustmentViewModel.js** file in *myproject*/**web/custom/viewmodels** directory, where *myproject* is the folder containing your NetBeans IDE project.
2. Add the following code in the **customEventAdjustmentViewModel.js** file using a text editor:

```
define(['jquery', 'knockout',
    'viewmodels/ARActions/adjustments/EventAdjustmentViewModel'
],
        function($, ko, EventAdjustmentViewModel) {

            function customEventAdjustmentViewModel() {
                EventAdjustmentViewModel.apply(this, arguments);
                self = this;
                self.isValid = function () {
                    var actionName;
                    if (self.adjustmentAmount() < 0)
                        actionName = "Debit"; // write debit action name created in
OPSS
                    else
                        actionName = "Credit"; // write credit action name created
in OPSS

                    if (self.checkValidationGroupEventAdj() && self.note.isValid()) {
                        // Write resource name which includes credit and debit
actions
                        if (!util.isGrantedResourceAction(actionName,
"customResource")) {
                            alert(actionName + " adjustment is not allowed");
                            return false;
                        }
                        return true;
                    }
                    return false;
                };
            }
            customEventAdjustmentViewModel.prototype = new
EventAdjustmentViewModel();
            return  customEventAdjustmentViewModel;
        });
```


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3. Save the file in your NetBeans IDE project.

Configuring the Custom View Model for Debit and Credit Adjustments

After creating or updating the required custom view model, ensure that the custom event adjustment view model entry is created in the **customRegistry.js** file. Billing Care uses the custom event adjustment view model instead of the default event adjustment view model during adjustments and renders the Event Adjustment dialog box containing your customization.

To create the custom event adjustment view model entry in the registry:

1. Create a **customRegistry.js** file in *myproject*/**web/custom/** directory.
2. Define the custom event adjustment view model in this file. For example:

```
eventAdjustment: {
       viewmodel: 'custom/viewmodels/customEventAdjustmentViewModel.js'
   }
```

3. Save the file in your NetBeans IDE project.

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Customizing Billing Care to Display Only Event Adjustments

Learn how to customize Oracle Communications Billing Care to display only event adjustments in the Bills section for performing adjustments.

Topics in this document:

- About Displaying Event Adjustments
- Customizing Billing Care to Display Only Event Adjustments
- Creating Custom View Models to Display Only Event Adjustments
- Configuring Custom Bill and Bill Item View Models in the Registry

About Displaying Event Adjustments

By default, Billing Care display all the adjustment options, such as bill, item, and event, for performing adjustments. However, you can customize Billing Care to display only the list of event adjustment options and hide bill and item adjustment options by using the Billing Care SDK. This lets you perform only event adjustments for the selected account.

Customizing Billing Care to Display Only Event Adjustments

You can customize Billing Care using OPSS policies to display only event adjustments for performing adjustments.

To customize Billing Care to display only event adjustments:

1. Create a custom ResourceType and Resource for event adjustments in the OPSS server. For example, AdjustmentResourceType, AdjustmentResource.
2. Define Make as the corresponding action for the custom ResourceType in the OPSS server.
3. Add the new ResourceType to the **CustomConfigurations.xml** file. For example:

```
        <key>authorizationResourceTypes</key>
        <value>customResourceType</value>
        <desc>Add comma separated OPSS Resource Types(values) for
authorization.
            Also these resource types should be defined in OPSS.
            Please note that the key should not be changed here.
        </desc>
    </keyvals>
```

   See "Editing the Billing Care Configuration File" for customization of the **configurations.xml** file.
4. Create custom view models containing overrides to hide bill and item adjustments. See "Creating Custom View Models to Display Only Event Adjustments" for more information.

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5. Create a **customRegistry.js** file configuring Billing Care to use the custom view models that you created. See "Configuring Custom Bill and Bill Item View Models in the Registry" for more information.
6. Deploy your customizations using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

Creating Custom View Models to Display Only Event Adjustments

Billing Care uses view model to define the display of the Item Adjustment, Bill Adjustment, and Event Adjustment dialog boxes. You must create the custom view models, **CustomBillItemChargesViewModel** and **CustomBillChargesViewModel**, containing overrides to hide bill and item adjustments. See "About View Models" for more information about Billing Care view models.

To create custom view models to display only event adjustments:

1. Create the **customBillItemChargesViewModel.js** and **customBillChargesViewModel.js** files in the *myproject*/**web/custom/js/viewmodels** directory, where *myproject* is the folder containing your NetBeans IDE project.
2. Add the following code in the **customBillItemChargesViewModel.js** file using a text editor:

```
define(['jquery', 'knockout',
    'viewmodels/billMainPanel/BillItemChargesViewModel'
],
        function($, ko, BillItemChargesViewModel) {

            function CustomBillItemChargesViewModel() {
                BillItemChargesViewModel.apply(this, arguments);
                self = this;
                self.showARActionMenu = function(data, event) {

                     self.__proto__.showARActionMenu(data,event);

                    // write custom action name and resource. Item adjustment
can be hide by not granting make permission to customResource.
                    if (!util.isGrantedResourceAction("make",
"customResource")){
                        $("#billItemFlyoverNewAdjustment").hide();
                    }
                };

            }
            CustomBillItemChargesViewModel.prototype = new
BillItemChargesViewModel();
            return  CustomBillItemChargesViewModel;
        });
```

3. Save the file in your NetBeans IDE project.
4. Add the following code in the **customBillChargesViewModel.js** file using a text editor:

```
define(['jquery', 'knockout',
    'viewmodels/billtab/BillChargesViewModel'
],
        function($, ko, BillChargesViewModel) {
            function customBillChargesViewModel() {
                BillChargesViewModel.apply(this, arguments);
```


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```
                $(function() {
                    var myVar = setInterval(function() {
                        if ($('#adjustbillListMenu').length > 0)
                        {

                            // write custom action name and resource. Bill
adjustment
                            //can be hide by not granting make permission to
customResource.
                            if (!util.isGrantedResourceAction("make",
"customResource")) {
                               $('#adjustbillListMenu').remove();

                                 if
($("#actionsmenu").next().children("li.ui-menu-item").length < 1) {
                                  $("#actionsmenu").children("span").remove();
                                 }
                            clearInterval(myVar);
                        }
                    }, 20);

                });

            }
            customBillChargesViewModel.prototype = new
BillChargesViewModel();
            return  customBillChargesViewModel;
        });
```

5. Save the file in your NetBeans IDE project.

Configuring Custom Bill and Bill Item View Models in the Registry

After creating **CustomBillItemChargesViewModel** and **CustomBillChargesViewModel** view models, create custom view model entries in the **customRegistry.js** file to use when performing adjustments. Billing Care uses the custom bill tab view model and bill item charges view model instead of the default entries when rendering the Adjustments screen.

To create custom view model entries in a **customRegistry.js** file:

1. Create a **customRegistry.js** file in *myproject*/**web/custom** by copying the reference registry file.
2. Define the entries referencing the custom view models in this file. For example:

```
billTab: {


billChargesViewModel:'custom/js/viewmodels/customBillChargesViewModel.js'

    },

     billItemCharges: {

        viewmodel: 'custom/js/viewmodels/customBillItemChargesViewModel.js'
    }
```

3. Save the file in your NetBeans IDE project.

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Customizing Account Creation Service Fields

Learn how to add custom account creation fields to Oracle Communications Billing Care for capturing required service configuration information.

Topics in this document:

- About Customizing Account Creation
- Creating Custom Search View Models
- Creating a Custom Service View Model HTML Template
- Adding Validation to Custom Service Fields
- Configuring a Custom Module in the Registry
- Deploying Customizations

About Customizing Account Creation

Users create new subscriber accounts by clicking **New Account** on the Billing Care home page. New accounts require creating new subscriber profiles, selecting offers, and configuring services and payments. Your offers may require additional fields for capturing custom service configuration attributes during account creation.

Use the Billing Care SDK to customize new account service configuration to capture such information. For example, use the SDK to add fields for capturing mailbox message limits to set when configuring a messaging service. The SDK includes a sample for adding fields to account creation in *SDK_home***/samples/AccountCreation_CustomizeServices**, where *SDK_home* is the Billing Care SDK installation directory.

Adding custom service configuration fields requires:

1. Creating Custom View Models
2. Creating a Custom Service View Model HTML Template
3. Adding Validation to Custom Service Fields
4. Configuring a Custom Module in the Registry
5. Deploying Customizations

Creating Custom View Models

Billing Care renders account creation screens using view models that define graphical elements including service configuration fields. See "About View Models" for a description of view models. Adding additional fields for account creation requires:

- Extending the New Account Configuration View Model
- Creating a Custom Service Configuration View Model

Both view models must be included in your NetBeans IDE project in the *myproject***/web/custom/viewmodels/accountCreation/configure** folder where *myproject* is the base

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directory of your Net Beans IDE project. See "Setting Up the Development Environment" for more information on setting up your project.

Extending the New Account Configuration View Model

Billing Care uses **NewAccountConfigureViewModel.js** during account creation to identify configurable services. This file selects a registry key based on the service being configured and maps this registry key to a module (view, view model, and validator) configuration defined in the registry. Billing Care then renders the appropriate service configuration screen based on the mapped module during account creation.

Adding additional fields to capture during service configuration requires extending **NewAccountConfigureViewModel.js** with additional registry keys for custom services. This enables Billing Care to select the correct registry key defining the custom service configuration.

A sample **CustomNewAccountConfigureViewModel.js** file is provided in the *SDK_home*/**samples/AccountCreation_CustomizeServices/web/custom/js/viewmodels/accountCreation/configure** directory.

To extend **NewAccountConfigureViewModel.js**:

1. Create a **CustomNewAccountConfigureViewModel.js** file in *myproject*/**web/custom/js/viewmodels/***area*/**configure** where *myproject* is the folder containing your NetBeans IDE project and *area* is the customization type.
2. Define new registry keys that map to Oracle Communications Billing and Revenue Management (BRM) service types. Example 26-1 shows an additional registry key definition for **/service/email**.
3. Save the file in your NetBeans IDE project.

Example 26-1 Sample New Account Configure View Model

```
define(['knockout', 'underscore', 'viewmodels/accountCreation/configure/
NewAccountConfigureViewModel'], function(ko, _, NewAccountConfigureViewModel) {
    function CustomNewAccountConfigureViewModel() {
        NewAccountConfigureViewModel.apply(this, arguments);

        var self = this;

        /**
         * Get registryKey for service type from the activePageKey.
         * @param {type} apKey
         * @returns {String}
         */
        self.getRegistryKeyForServiceType = function(apKey){
            var registryKey = null;
            if(apKey != null && apKey.indexOf("/service/telco") !== -1){
                registryKey = "telcoServiceConfiguration";
            }else if(apKey != null && apKey.indexOf("/service/email") !== -1){
                registryKey = "emailServiceConfiguration";
            }
            return registryKey;
        };

    }

    CustomNewAccountConfigureViewModel.prototype = new NewAccountConfigureViewModel();
    return CustomNewAccountConfigureViewModel;
});
```


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Creating a Custom Service Configuration View Model

Billing Care uses a service configuration view model to define what fields to capture during service configuration. The fields defined in the service configuration view model are bound in the HTML file used to render the service configuration screen. You must create a custom service configuration view model to capture additional fields during account creation for any custom services.

A sample **CustomEmailServiceConfigurationViewModel.js** file is provided in the *SDK_home***/samples/AccountCreation_CustomizeServices/web/custom/js/viewmodels/accountCreation/configure** directory. This sample defines three mailbox attributes usable for a custom messaging service. Use this sample to create a custom service configuration view model for defining the fields required by your service.

To create a custom service configuration view model defining the additional fields you need to capture:

1. Create a **CustomServiceConfigurationViewModel.js** file in *myproject***/web/custom/js/viewmodels/***area***/configure** where *myproject* is the folder containing your NetBeans IDE project and *area* is the customization type.
2. Define the new fields required for capture in this file.
3. Define the BRM service type using the **@class** property in the **self.isValid** function in this file. Following are the supported @class services:

   com.oracle.communications.brm.cc.model.ServiceEmailType
   com.oracle.communications.brm.cc.model.ServiceBroadbandType
   com.oracle.communications.brm.cc.model.ServiceDataType
   com.oracle.communications.brm.cc.model.ServiceLdapType
   com.oracle.communications.brm.cc.model.ServiceMmsType
   com.oracle.communications.brm.cc.model.ServiceEmailType
   com.oracle.communications.brm.cc.model.ServiceProviderType
   com.oracle.communications.brm.cc.model.ServiceSpcontentType
   com.oracle.communications.brm.cc.model.ServiceInstantchatType
   com.oracle.communications.brm.cc.model.ServicePsmcontentproviderType
   com.oracle.communications.brm.cc.model.ServiceContentproviderType
   com.oracle.communications.brm.cc.model.ServiceConfchatType
   com.oracle.communications.brm.cc.model.ServiceProviderProdType
   com.oracle.communications.brm.cc.model.ServiceInternettvType
   com.oracle.communications.brm.cc.model.ServiceAdminClientType
   com.oracle.communications.brm.cc.model.ServiceCableType
   com.oracle.communications.brm.cc.model.ServiceVideochatType
   com.oracle.communications.brm.cc.model.ServiceCloudType
   com.oracle.communications.brm.cc.model.ServiceStreamType
   com.oracle.communications.brm.cc.model.ServiceTelephonyType
   com.oracle.communications.brm.cc.model.ServiceContentType
   com.oracle.communications.brm.cc.model.ServicePcmClientType
   com.oracle.communications.brm.cc.model.ServiceIpType
   com.oracle.communications.brm.cc.model.ServiceSsgType
   com.oracle.communications.brm.cc.model.ServiceFaxType
   com.oracle.communications.brm.cc.model.ServiceSettlementType
   com.oracle.communications.brm.cc.model.ServiceVpdnType
   com.oracle.communications.brm.cc.model.ServiceTelcoType

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com.oracle.communications.brm.cc.model.ServiceTelcoVoipType
com.oracle.communications.brm.cc.model.ServiceTelcoGprsType
com.oracle.communications.brm.cc.model.ServiceTelcoGsmType

4. Save the file in your NetBeans IDE project.

Creating a Custom Service View Model HTML Template

Billing Care uses an HTML view file to render the service configuration screen during account creation. You must create a custom service view model HTML template to display any additional fields during service configuration. The template file contains the additional fields defined in the custom service configuration view model created in "Creating a Custom Service Configuration View Model".

A sample **customEmailServiceConfigView.html** file is provided in the *SDK_home***/samples/AccountCreation_CustomizeServices/web/custom/templates/accountCreation/configure** directory where *SDK_home* is the Billing Care SDK installation directory. This sample defines how to render three mailbox attributes usable for a custom messaging service and the data binding values. Use this sample to create a custom service configuration HTML template for displaying the fields required by your service.

To create a custom service configuration HTML template for rendering the additional fields you need to capture:

1. Create a **CustomServiceConfigView.html** file in *myproject***/web/custom/templates/***area***/configure** where *myproject* is the folder containing your NetBeans IDE project and *area* is the customization type.
2. Define the new fields in HTML required for rendering in this file.
3. Save the file in your NetBeans IDE project.

Adding Validation to Custom Service Fields

Billing Care uses Oracle JET components and validators to validate field entries in the service configuration screen during account creation.

To ensure that entered values are properly formatted, you must define Oracle JET validators in your custom service configuration view model (see Creating a Custom Service View Model HTML Template) and bind them directly to the fields in your custom HTML template (see "Creating a Custom Service View Model HTML Template").

For an example of how to define Oracle JET validators and execute validation logic, refer to the **CustomEmailServiceConfigurationViewModel.js** sample file located in the *SDK_home***/samples/AccountCreation_CustomizeServices/web/custom/js/viewmodels/accountCreation/configure** directory.

In this sample, validators such as **NumberConverter** are defined and validated as follows:

```
self.decimal1Converter = new ojconverter_nativenumber_1.NumberConverter({
            style: "decimal",
            minimumFractionDigits: 2,
            maximumFractionDigits: 3,
            useGrouping: false
        });
...
mailBoxSize.validate().then((res1)=> {
                maxMessageSize.validate().then((res2)=> {
                    maxNumberOfMessages.validate().then((res3)=> {
```


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```
                        if(res1 === 'valid' && res2 === 'valid' && res3 === 'valid'){
...
```

For additional examples of Oracle JET validation logic and HTML bindings, see "Migrating jQuery Validators to OJET Validators".

Configuring a Custom Module in the Registry

After creating the required custom view models, HTML template, and validator, create a custom account creation module entry in the **customRegistry.js** file to use when creating a new account. Billing Care uses the custom account creation module instead of the default entry during account creation and renders the service configuration screen containing your custom fields.

A sample **customRegistry.js** file is provided in the *SDK_home***/samples/AccountCreation_CustomizeServices/web/custom** directory. This sample defines the custom account creation module containing the previously referenced sample view models, HTML template, and validator.

To create a custom account creation module entry in the **customRegistry.js** file:

1. Create a **customRegistry.js** file in *myproject***/web/custom/** where *myproject* is the folder containing your NetBeans IDE project.
2. Define the custom account creation module in this file. Example 26-2 shows a definition of the custom account creation module in the registry using the SDK samples.
3. Save the file in your NetBeans IDE project.

Example 26-2 Sample Custom Account Creation Module Registry Entry

```
var CustomRegistry = {
    accountCreationConfigure: {
        viewmodel: '../custom/js/viewmodels/accountCreation/configure/
CustomNewAccountConfigureViewModel',
        emailServiceConfiguration:{
            view:    'text!../custom/templates/accountCreation/configure/
customEmailServiceConfigView.html',
            viewmodel:   '../custom/js/viewmodels/accountCreation/configure/
CustomEmailServiceConfigurationViewModel',
        }
   }
};
```

Deploying Customizations

Package and deploy your customizations using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

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Creating Custom Billing Care Credit Profiles

Learn how to customize Oracle Communications Billing Care to store subscriber credit profiles.

Topics in this document:

- About Credit Profiles
- Customizing Billing Care to Store Credit Profiles
- Creating Custom Profile Storable Classes in BRM
- Extending the Billing Care Data Model with XSD and JSON Files
- Adding the Required Files to the NetBeans Project
- Deploying Customizations

About Credit Profiles

Billing Care uses credit profiles to store subscriber information related to credit worthiness including social security numbers and credit scores. By default, Billing Care does not store or display credit profile information. You customize Billing Care to display credit profile information stored in Oracle Communications Billing and Revenue Management (BRM) using the SDK.

Customizing Billing Care to Store Credit Profiles

Support for credit profiles requires customizations in both BRM and Billing Care.

To add credit profile support in Billing Care:

1. Create the required credit profile objects in BRM by importing the SDK sample configuration or manually creating the objects using Developer Center. See "Creating Custom Profile Storable Classes in BRM" for more information.
2. Generate the required XSD and JSON files using the Data Model Generator utility. See "Extending the Billing Care Data Model with XSD and JSON Files" for more information.
3. Add the generated XSD, JSON, and Java JAR files to your NetBeans IDE project. See "Adding the Required Files to the NetBeans Project" for more information.
4. Deploy your custom payment-type projects to your application server. See "Deploying Customizations" for more information.

The Billing Care SDK includes a sample credit profile customization in the *SDK_home***/samples/EndToEndUseCase** directory. The credit profile sample stores only the social security number and credit score. Extend the sample with additional fields if required by your business. Use this sample to assist you in customizing Billing Care with credit profile support.

Creating Custom Profile Storable Classes in BRM

Credit profile support requires creating the credit profile object in the BRM database where Billing Care stores subscriber credit profile data. The SDK sample includes a PODL file containing the credit profile object definitions which can be imported into BRM using the

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pin_deploy utility. Alternatively, you can create the required objects manually using Developer Center.

To create the credit profile object in the BRM database, select one of the following methods:

- Importing Credit Profile Class Definitions into BRM
- Creating Credit Profile Objects Using Developer Center

Importing Credit Profile Class Definitions into BRM

To import the sample PODL definition file into BRM:

1. Copy the **credit_profileObj.podl** file located in *SDK_home***/samples/EndToEndUseCase/BRM_CreditProfileObject** to your *BRM_home***/test** folder, where *BRM_home* is the home directory of your BRM installation.
2. Run the following command:

   ```
   pin_deploy create credit_ProfileObj.podl
   ```

3. Start Developer Center.
4. Open the Class Browser and verify that the **/profile/credit_check** object is present.

The SDK sample includes a pre-compiled JAR file that must be added to your NetBeans IDE project for Billing Care to use the new credit profile class. This JAR is located in the *SDK_home***/samples/EndToEndUseCase/web/WEB-INF/lib** folder.

Creating Credit Profile Objects Using Developer Center

Use Developer Center to manually create the credit profile object and fields in BRM. See "Creating the Credit Profile Class and Field " for more information on using Developer Center to create the required object and fields.

If you choose to create the credit profile class manually, you must use the **Generate Custom Fields Source** utility to create source files containing the new custom fields. Compile these source files into a JAR file and add the JAR file to your NetBeans IDE project. See "Generating the Required JAR File and Infranet.properties" for more information on generating the required JAR file.

Creating the Credit Profile Class and Field

Create the credit profile object and fields in BRM using Developer Center. This section provides a high level overview of the process including a general overview on how to create and update the required objects. For detailed information on using the Developer Center to create a custom credit profile see "Creating Custom Fields and Storable Classes" in *BRM Developer's Guide*.

To create the credit profile class:

1. Start Developer Center.
2. Open the Class Browser.
3. Create the **/profile/credit_check** class.
4. Commit the new class.

To create the required fields for the new credit profile class:

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1. Open the Storable Class Editor.
2. Create the required fields listed in Table 27-1 for the credit profile class.

Table 27-1 /profile/credit_check Class Fields

Field	Type
PIN_FLD_CREDIT_INFO	SUBSTRUCT
PIN_FLD_SSN	STRING
PIN_FLD_CREDIT_SCORE	INT

3. Commit the subclass changes to the database.

To add the created fields to the new credit profile class:

1. Open the Class Browser.
2. Select the **/profile/credit_check** class.
3. Add the fields listed in Table 27-1 to the credit profile class.
4. Commit the subclass changes to the database.

Generating the Required JAR File and Infranet.properties

To create the required JAR containing the compiled credit profile Java source code:

1. Open the Class Browser.
2. Select the **/profile/credit_check** class.
3. Select **File** and then select **Generate Custom Fields Source**. See "Making Custom Fields Available to Your Applications" in *BRM Developer's Guide*.

   The utility generates the required Java class files and the **InfranetPropertiesAdditions.properties** file.
4. Copy the contents of the **InfranetPropertiesAdditions.properties** file into the **Infranet.properties** file located in the home directory of the Billing Care WebLogic Server administrative user.
5. Compile the Java class files into a JAR file named **Custom.jar**. Include the *SDK_home***/libs/pcm.jar** file in the classpath option when compiling.

Extending the Billing Care Data Model with XSD and JSON Files

The Billing Care SDK includes a Data Model Generator utility for generating the required XSD and JSON files containing the credit profile definitions. The Data Model Generator is located in the *SDK_home***/samples/data_model_generator** directory.

> **Note**
>
> The Data Model Generator utility requires an **Infranet.properties** file configured with BRM connection information in the local user's home directory. The utility connects to the BRM system defined in this file to retrieve the object configuration before generating the required XSD and JSON files. See "Configuring Additional Settings in the Infranet.properties File" in *Billing Care Installation Guide* for more information.

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To create the required XSD and JSON files for credit profile:

1. Open a command-line interface on the system where the Billing Care SDK is installed.
2. Change to the *SDK_home***/samples/data_model_generator** directory.
3. Run the **DatamodelGenerator.bat** (Windows) or **DataModelGenerator.sh** (Linux) script to generate the XSD and JSON files.

The Data Model Generator outputs the **extensionDataModel.jar** containing the XSD files and an XSD file containing the definition of your custom payment type. Add these files to your NetBeans IDE project. See "Adding the Required Files to the NetBeans Project" for more information on adding the files to your project.

Adding the Required Files to the NetBeans Project

The EndToEndUseCase sample includes sample customized JavaScript view modules (views, view models, validators, and HTML view template files) for Billing Care to properly render the credit profile in the account banner. Additionally, the sample also includes customized Action Menu and Configuration XML files enabling the entry and display of credit profile fields.

Sample JavaScript and configuration files can be customized to your needs. See "About Billing Care Modules" for more information on customizing view modules. See "Customizing the Billing Care Actions Menu" and "Editing the Billing Care Configuration File" for more information about customizing the configuration files.

The following sections indicate the locations for where the sample files should be added in your NetBeans IDE project. Place customized versions of the view module or configuration files in the same locations. See "Setting Up a Billing Care Customization Project" for more information on creating the proper project directory structure.

Updating the MANIFEST.MF File

To update the NetBeans IDE project **MANIFEST.MF** file:

1. Open your project's **MANIFEST.MF** file and append the contents of the *SDK_home***/samples/EndToEndUseCase/src/conf/MANIFEST.MF** to the end of the file.
2. Save the file.

Adding the Required View Module and Configuration Files

To add the sample view module and configuration files to your NetBeans IDE project, copy the files located in *SDK_home***/samples/EndToEndUseCase/** into their corresponding NetBeans IDE project directories.

For example, copy the *SDK_home***/samples/EndToEndUseCase/web/custom** directory to your *myproject***/web/custom** directory.

Adding the Required JAR and JSON Files

To add required JAR files to your NetBeans IDE project:

1. Copy the **extensionDataModel.jar** and **Custom.jar** to your Billing Care customization NetBeans IDE project *myproject***/web/lib** directory where *myproject* is the project directory of your Billing Care customizations NetBeans IDE project.

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2. Copy the JSON file to *myproject*/**web/custom/jsons** where *myproject* is the project directory of your Billing Care customizations NetBeans IDE project.

Deploying Customizations

Package and deploy your customizations using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

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Customizing the Billing Care Actions Menu

Learn how to use the Oracle Communications Billing Care SDK to customize the Billing Care **Actions** menu.

Topics in this document:

- About the Billing Care Actions Menu
- About Customizing the Actions Menu
- Removing Actions Menu Items
- Rearranging Actions Menu Items
- Renaming Actions Menu and Submenu Items
- Adding Actions Menu Items
- Adding Action Menu Items in Payment Suspense

About the Billing Care Actions Menu

The Billing Care **Actions** menu is defined in XML format. Example 28-1 shows a sample portion of the XML **Actions** menu definition file. The `<menu>` tags represent a menu, and the `<item>` tags inside `<menu>` tags represent the submenus of that menu.

Example 28-1 Sample Portion of the Actions Menu Definitions XML File

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<menu-definition xmlns="http://xmlns.oracle.com/cgbu/schemas/BusinessObjs">
    <menu id="menu-general">
        <header-key>actions_menu.ACCOUNT</header-key>
        <contents>
            <item id="menu-item-account-profile">
                <label-key>actions_menu.ACCOUNT_PROFILE</label-key>
                <description-key>actions_menu.ACCOUNT_PROFILE_SHORT_DESCRIPTION</
description-key>
                <!--"permission-key" and "action-key" are used for enabling/disabling
menu using Authorization
                    The corresponding values should not be modified.
                    This applies to every entry in the xml
                -->
                <permission-key>AccountResource</permission-key>
                <action-key>View</action-key>
                <version>1.0</version>
            </item>
            <item id="menu-item-account-status">
                <label-key>actions_menu.ACCOUNT_STATUS</label-key>
                <description-key>actions_menu.ACCOUNT_STATUS_SHORT_DESCRIPTION</
description-key>
                <permission-key>AccountResource</permission-key>
                <action-key>Transition</action-key>
                <version>1.0</version>
            </item>
        </contents>
    </menu>
```


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```
    <menu id="menu-pay">
        <header-key>actions_menu.PAYMENTS</header-key>
        <contents>
            <item id="menu-item-make-payment">
                <label-key>actions_menu.MAKE_PAYMENT</label-key>
                <description-key>actions_menu.MAKE_PAYMENT_SHORT_DESCRIPTION</
description-key
                <permission-key>PaymentResource</permission-key>
                <action-key>Make</action-key>
                <version>1.0</version>
            </item>
            <item id="menu-item-allocate-payment">
                <label-key>actions_menu.ALLOCATE</label-key>
                <description-key>actions_menu.ALLOCATE_SHORT_DESCRIPTION</description-
key>
                <permission-key>PaymentResource</permission-key>
                <action-key>Allocate</action-key>
                <version>1.0</version>
            </item>
        </contents>
    </menu>
</menu-definition>
```

The following **Actions** menu element definitions are provided to assist you with customizing the **Actions** menu:

- **action-key** holds the action value for the corresponding resource (for example, Make, Allocate, and so on).
- **contents.item.label-key** represents the resource bundle key for entries within the submenus.
- **description-key** represents a submenu description that appears below a menu label.
- **header-key** represents the resource bundle key for the entries in the **Actions** menu (Account, Payments, and so on) and the header within the submenus.
- **id** is used as the element ID for the menus and anchor links representing the menu entries. This may be useful for the associated JavaScript code that you can write for custom menu entries.
- **label-key** represents the menu label.
- **permission-key** reflects the authorization key that controls access to the menu entry. This is used to hold the resource value (for example, PaymentResource, AdjustmentResource, and so on).

Mapping Label and Description Key Values to the Resource Bundle

The label-key and description-key values use either the text string included within the tag, or a referenced value mapped to the Billing Care resource bundle. When mapping these keys to the resource bundle, use the following format:

`actions_menu.`*`trans-unit ID`*

where *trans-unit ID* represents the label defined in the resource bundle. See "Customizing Billing Care Labels" for more information on customizing the resource bundle for your environment.

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About Customizing the Actions Menu

You can customize the **Actions** menu in the following ways:

- Removing Actions Menu Items
- Rearranging Actions Menu Items
- Renaming Actions Menu and Submenu Items
- Adding Actions Menu Items

The Billing Care SDK includes a sample **Actions** menu customization in the *SDK_home*/**samples/ActionMenu** directory. Use this sample to assist you in customizing the **Actions** menu.

Setting Up NetBeans IDE for Customizing the Actions Menu

Customizing Billing Care **Actions** menu requires creating a custom XML configuration file (**CustomActionMenu.xml**). This file contains the configuration for your custom menu structure.

To customize Billing Care invoice presentation:

1. Copy the default **ActionMenu.xml** file from *SDK_home*/**references** to a custom file named **CustomActionMenu.xml** in your *myproject*/**web/WEB-INF/custom/configurations** directory.
2. Customize the **Actions** menu by using the **CustomActionMenu.xml** file as described in the following sections.
3. Save and close the **CustomActionMenu.xml** file.
4. Right-click your NetBeans IDE project and select **Clean and Build**.
5. Package and deploy your invoice presentation customizations to your Billing Care domain.

   For more information, see "Packaging and Deploying Customizations".
6. Verify your changes in Billing Care.

Removing Actions Menu Items

Use the following procedures to remove **Actions** menu items:

- Removing an Existing Actions Menu Submenu
- Removing an Existing Actions Menu

Removing an Existing Actions Menu Submenu

To remove an existing **Actions** menu submenu:

1. Open the **CustomActionMenu.xml** file in an editor.
2. Delete the corresponding `<item>` element in **CustomActionMenu.xml** for the submenu you want to remove.

   For example, to remove **Account Status** from **Account** menu, remove the following `<item>` element:

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```
<item id="menu-item-account-status">
   <label-key>actions_menu.ACCOUNT_STATUS</label-key>
   <permission-key>AccountResource</permission-key>
   <action-key>Transition</action-key>
   <version>1.0</version>
</item>
```

3. Save and close the **CustomActionMenu.xml** file.
4. Right-click your NetBeans IDE project and select **Clean and Build**.
5. Package and deploy your invoice presentation customizations to your Billing Care domain.

   For more information, see "Packaging and Deploying Customizations".
6. Verify your changes in Billing Care.

Removing an Existing Actions Menu

To remove an existing menu:

1. Open the **CustomActionMenu.xml** file in an editor.
2. Delete the corresponding <menu> block for the menu you want to remove.

   For example, to remove the **Account** menu, remove the following <menu> element:

```
<menu id="menu-general">
       <header-key>actions_menu.ACCOUNT</header-key>
       <contents>
           <item id="menu-item-account-profile">
               <label-key>actions_menu.ACCOUNT_PROFILE</label-key>
               <!--"permission-key" and "action-key" are used for enabling/disabling
menu using Authorization
                   The corresponding values should not be modified.
                   This applies to every entry in the xml
               -->
               <permission-key>AccountResource</permission-key>
               <action-key>View</action-key>
               <version>1.0</version>
           </item>
           <item id="menu-item-account-status">
               <label-key>actions_menu.ACCOUNT_STATUS</label-key>
               <permission-key>AccountResource</permission-key>
               <action-key>Transition</action-key>
               <version>1.0</version>
           </item>
       </contents>
   </menu>
```

3. Save and close to **CustomActionMenu.xml** file.
4. Package and deploy your invoice presentation customizations to your Billing Care domain.

   For more information, see "Packaging and Deploying Customizations".
5. Verify your changes in Billing Care.

Rearranging Actions Menu Items

Use the following procedures to remove **Actions** menu items:

- Rearranging Actions Menu Submenu Items
- Rearranging Actions Menu Items

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Rearranging Actions Menu Submenu Items

To rearrange **Actions** menu submenu items:

1. Open the **CustomActionMenu.xml** file in an editor.
2. Change the order of corresponding submenu **<item>** tags.

   For example, to get **Account Status** first and then **Account Profile** second in the **Account** menu:

```
<menu id="menu-general">
        <header-key>actions_menu.ACCOUNT</header-key>
        <contents>
            <!-- Account status comes first -->
            <item id="menu-item-account-status">
                <label-key>actions_menu.ACCOUNT_STATUS</label-key>
                <permission-key>AccountResource</permission-key>
                <action-key>Transition</action-key>
                <version>1.0</version>
            </item>
            <item id="menu-item-account-profile">
                <label-key>actions_menu.ACCOUNT_PROFILE</label-key>
                <!--"permission-key" and "action-key" are used for enabling/
disabling menu using Authorization
                    The corresponding values should not be modified.
                    This applies to every entry in the xml
                -->
                <permission-key>AccountResource</permission-key>
                <action-key>View</action-key>
                <version>1.0</version>
            </item>
        </contents>
    </menu>
```

3. Save and close to **CustomActionMenu.xml** file.
4. Right-click your NetBeans IDE project and select **Clean and Build**.
5. Package and deploy your invoice presentation customizations to your Billing Care domain.

   For more information, see "Packaging and Deploying Customizations".
6. Verify your changes in Billing Care.

Rearranging Actions Menu Items

To rearrange **Actions** menu items:

1. Open the **CustomActionMenu.xml** file in an editor.
2. Change the order of corresponding `<menu>` tags to the order you want the menus to be displayed.

   For example, to get **Payments** as the first menu and **Account** as the second menu:

```
<menu id="menu-pay">
    <!--content of Payments menu -->
 </menu>
 <menu id="menu-general">
     <!--content of Account menu -->
 </menu>
```

3. Save and close to **CustomActionMenu.xml** file.

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4. Right-click your NetBeans IDE project and select **Clean and Build**.
5. Package and deploy your invoice presentation customizations to your Billing Care domain.

   For more information, see "Packaging and Deploying Customizations".
6. Verify your changes in Billing Care.

Renaming Actions Menu and Submenu Items

Use the following procedures to rename **Actions** menu items:

- Renaming Actions Menu Submenu Items
- Renaming Actions Menu Items

Renaming Actions Menu Submenu Items

To rename an **Actions** menu submenu item:

1. Open the **CustomActionMenu.xml** file in an editor.
2. Change the value of `<label-key>` for the submenu item you want to rename.
3. Save and close to **CustomActionMenu.xml** file.
4. Right-click your NetBeans IDE project and select **Clean and Build**.
5. Package and deploy your invoice presentation customizations to your Billing Care domain.

   For more information, see "Packaging and Deploying Customizations".
6. Verify your changes in Billing Care.

Renaming Actions Menu Items

To rename an **Actions** menu item:

1. Open the **CustomActionMenu.xml** file in an editor.
2. Change the value of `<header-key>` for the menu item you want to rename. Note the header key for the menu changed.
3. Save and close to **CustomActionMenu.xml** file.
4. Find the header key in the resource bundle and follow the steps in "Customizing the Resource Bundle" to rename the **Actions** menu items.
5. Right-click your NetBeans IDE project and select **Clean and Build**.
6. Package and deploy your invoice presentation customizations to your Billing Care domain.

   For more information, see "Packaging and Deploying Customizations".
7. Verify your changes in Billing Care.

Adding Actions Menu Items

Adding **Actions** menu and submenu items requires you to add new `<menu>` and `<item>` elements in your **CustomActionMenu.xml** file and create a custom view model to support your new menus and submenus.

To add **Actions** menu or submenu items:

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1. Open the **CustomActionMenu.xml** file in an editor.
2. Add new `<menu>` and `<item>` elements as required under the `<!-- existing content remains -->` comment.

   For example:

```
<!-- Custom block to be added in the CustomActionsMenu.xml -->
    <menu id="menu-pay">
        <header-key>actions_menu.PAYMENTS</header-key>
        <contents>
           <!-- existing content remains -->
            <!-- Add  a new menu item under payments -->
            <item id="menu-item-new-custom-item">
                <label-key>New Custom Menu Item</label-key>
                <permission-key>PaymentResource</permission-key>
                <!-- If we are not using ant existing action-key, this
NewCustomActionKey must be configured in the OPSS environment -->
                <action-key>NewCustomActionKey</action-key>
                <version>1.0</version>
            </item>
        </contents>
    </menu>
```

3. Create a new custom view model file to support the new **Actions** menu items you created (for example, **customMenuViewModel.js**) in the *myproject*/**web/js** directory where *myproject* is the NetBeans IDE project containing your Billing Care customizations.
4. Write and bind click events in the custom view model file using the same ids that you used in the **CustomActionMenu.xml** file:

```
$('#menu-item-new-custom-item').click(function(e){
   //implementation goes here.
   }
);
```

5. If your menu or submenu additions require custom logic, extend Billing Care using the SDK to support the required functions. See "Extending and Creating Billing Care REST Resources" for more information on extending Billing Care.
6. Copy the default **registry.js** file from *SDK_home*/**references** to a custom registry file named **customRegistry.js** in your *myproject*/**web/custom** directory, where *myproject* is your NetBeans IDE project containing your Billing Care customizations. This file contains the module definition using your custom view model (JavaScript).
7. Add the definition for your custom view model in the **customRegistry.js** file, located in your *myproject*/**web/custom** directory.

   For example:

```
var CustomRegistry = {
   customActionMenus: {
      viewmodel: '../custom/viewmodels/MenuEventHandlerViewModel'
   }
};
```

8. Right-click your NetBeans IDE project and select **Clean and Build**.
9. Package and deploy your invoice presentation customizations to your Billing Care domain.

   For more information, see "Packaging and Deploying Customizations".
10. Verify your changes in Billing Care.

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Adding Action Menu Items in Payment Suspense

The Payment Suspense action menu can be customized with additional menu items. To add custom Payment Suspense action menu items, use the same procedure described in "Adding Actions Menu Items".

The Billing Care SDK includes a sample Payment Suspense **Actions** menu customization in the *SDK_home*/**samples/PaymentSuspenseDetailsActionsMenu** directory. Use this sample to assist you in customizing the Payment Suspense **Actions** menu.

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Opening Custom Views From Landing Page

Learn how to customize Oracle Communications Billing Care to open custom views in full screen mode or dialog boxes from the landing page.

Topics in this document:

- About Customizing the Landing Page
- Customizing the Landing Page
- Opening Custom Views in Full Screen Mode
- Opening a Dialog Box From Landing Page

About Customizing the Landing Page

Billing Care displays default views and pages in full screen mode. You can customize Billing Care to open custom views and pages from the landing page in full screen mode by using the Billing Care SDK and routers. You can also open a custom dialog box from the landing page by using the Billing Care SDK.

Customizing the Landing Page

To add custom buttons to the landing page for opening a custom view or dialog box, you must customize the landing page.

To customize the landing page:

1. Create a custom landing page view model for extending the default landing page. See "Creating a Custom Landing Page View Model".
2. Create a custom landing page view model HTML template for displaying custom buttons on the landing page. See "Creating a Custom Landing Page View Model HTML Template".

Creating a Custom Landing Page View Model

Billing Care uses a landing page view model to define the buttons displayed in the landing page. The buttons are bound in the HTML file used to render the landing page. To add custom buttons to the landing page, create a custom landing page view model.

A sample **LandingPageExtensionViewModel.js** file is provided in the *SDK_home***/samples/LandingPageCustomizations/web/custom/js/viewmodels/home** directory. This sample defines the custom buttons and methods to open custom views or pages (in full screen mode) and dialog boxes from the landing page. Use this sample to extend the landing page view model for defining the custom views, pages, or dialog boxes required by your service.

To create a custom landing page view model:

1. Create a **LandingPageExtensionViewModel.js** file in the *myproject***/web/custom/js/viewmodels/home** directory, where *myproject* is the folder containing your NetBeans IDE project.

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2. Define the custom buttons, as required.
3. Save the file in your NetBeans IDE project.

Creating a Custom Landing Page View Model HTML Template

Billing Care uses an HTML view file to render the landing page. To display your custom buttons for opening custom views, pages, or dialog boxes, you create a custom landing page view model HTML template.

A sample **LandingPageExtensionView.html** file is provided in the *SDK_home***/samples/LandingPageCustomizations/web/custom/templates/home** directory. This sample defines how to render the custom buttons in the landing page. Use this sample to create a custom landing page HTML template for opening the custom views or dialog boxes from the landing page.

To create a custom landing page view model HTML template:

1. Create a **LandingPageExtensionView.html** file in the *myproject***/web/custom/js/templates/home** directory.
2. Define the custom buttons in HTML required for rendering in this file.
3. Save the file in your NetBeans IDE project.

Opening Custom Views in Full Screen Mode

You can add custom views or pages and directly open them from the landing page in full screen mode.

To open custom views in full screen mode:

1. Customize the landing page, if you have not done so already. See "Customizing the Landing Page".
2. Create a custom view model to define your custom view or page. See "Creating a Custom Full Page View Model".
3. Create a custom view model HTML template to render your custom view or page in the full screen mode. See "Creating a Custom Full Page View Model HTML Template".
4. Create a custom router view model to call the custom router helper when users click the custom button that you created. See "Creating a Custom Router View Model".
5. Create a custom router helper to add a router-specific functions that display the custom view in full screen mode when users click the custom button. See "Creating a Custom Router Helper ".
6. Create a **customRegistry.js** file to configure Billing Care to use the custom view models that you created. See "Configuring the Custom Full Page View Model in the Registry".
7. Package and deploy your customization to your Billing Care domain using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

Creating a Custom Full Page View Model

Billing Care uses the view model to define the fields to capture in your custom view or page. The fields defined in the view model are bound in the HTML file used to render the custom view or page. You must create a custom view model to define your custom view or page.

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A sample **customFullPageViewModel.js** file is provided in the *SDK_home***/samples/LandingPageCustomizations/web/custom/js/viewmodels/customFullPage** directory. Use this sample to extend the default view model for defining the custom view or page required by your service.

To create a custom full page view model:

1. Create a **customFullPageViewModel.js** file in the *myproject***/web/custom/js/viewmodels/customFullPage** directory.
2. Define the custom fields in this file as required.
3. Save the file in your NetBeans IDE project.

Creating a Custom Full Page View Model HTML Template

Billing Care uses an HTML view file to render your custom view or page. You must create a custom full page view model HTML template to display the custom view or page in the full screen mode. The template file contains the custom fields as defined in the custom full page view model created in "Creating a Custom Full Page View Model".

A sample **customFullPageView.html** file is provided in the *SDK_home***/samples/LandingPageCustomizations/web/custom/templates/customFullPage** directory. Use this sample to create a custom full page HTML template for rendering the custom views or pages you want to view in the full screen mode.

To create a custom full page view model HTML template:

1. Create a **customFullPageView.html** file in the *myproject***/web/custom/js/templates/customFullPage** directory.
2. Define the custom fields in HTML required for rendering in this file.
3. Save the file in your NetBeans IDE project.

Creating a Custom Router View Model

Billing Care uses a router view model to call the route helper, a set of router-specific functions, to complete the routing request. You can define these functions to open the custom view or page in the full screen mode.

You can use the sample **customRouterViewModel.js** file in the *SDK_home***/samples/LandingPageCustomizations/web/custom/js/viewmodels/router** directory to create your router view model.

To create a custom router view model:

1. Create a **customRouterViewModel.js** file in the *myproject***/web/custom/js/viewmodels/router** directory.
2. Define the functions for opening the custom view or page in the full screen mode as required.
3. Save the file in your NetBeans IDE project.

Creating a Custom Router Helper

You must create a custom router helper to view your custom views or pages in the full screen mode. You can use the sample **customRouterHelper.js** file in the *SDK_home***/samples/**

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LandingPageCustomizations/web/custom/js/viewmodels/router directory to create your router helper.

To create a custom router helper:

1. Create a **customRouterHelper.js** file in the *myproject***/web/custom/js/viewmodels/router** directory.
2. Define the functions for opening the custom view or page in the full screen mode as required.
3. Save the file in your NetBeans IDE project.

Configuring the Custom Full Page View Model in the Registry

After creating the required custom view model, create a custom module entry in the **customRegistry.js** file to use when opening the custom views or pages. Billing Care uses the custom view model instead of the default entry when rendering the specific screen.

A sample **customRegistry.js** file is provided in the *SDK_home***/samples/LandingPageCustomizations/web/custom** directory. Use this sample to create the **customRegistry.js** file containing your custom view model.

To create a custom view model entry in the registry:

1. Create a **customRegistry.js** file in *myproject***/web/custom** by copying the reference registry file.
2. Define the custom view models in the file. For example:

```
var CustomRegistry = {
   landingPageView: {
      viewExtension: 'text!custom/../../custom/templates/home/
landingPageExtensionView.html',
      viewmodel: '../custom/js/viewmodels/home/
LandingPageExtensionViewModel'
   },
   router: {
      viewmodel: '../custom/js/viewmodels/router/customRouterViewModel'
   },
   customFullPage: {
      view: 'text!../custom/templates/customFullPage/
customFullPageView.html',
      viewmodel: '../custom/js/viewmodels/customFullPage/
customFullPageViewModel'
   }
};
```

3. Save the file in your NetBeans IDE project.

Opening a Dialog Box From Landing Page

You can open a custom dialog box by clicking the custom button on the landing page.

To open a custom dialog box from the landing page:

1. Create a custom landing page view model and custom landing page view model HTML template for displaying custom button on the landing page. See "Customizing the Landing Page".

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2. Create a custom dialog view model to define your custom dialog box. See "Creating a Custom Dialog View Model".
3. Create a custom dialog view model HTML template for rendering your custom dialog box. See "Creating a Custom Dialog View Model HTML Template".
4. Create a **customRegistry.js** file to configure Billing Care to use the custom view model that you created. See "Configuring the Custom Dialog View Model in the Registry".
5. Package and deploy your customization to your Billing Care domain using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

Creating a Custom Dialog View Model

Billing Care uses the view model to define the fields to capture in your custom dialog box. The fields defined in the view model are bound in the HTML file used to render the custom dialog box. You must create a custom view model to define your custom dialog box.

A sample **customDialogViewModel.js** file is provided in the *SDK_home***/samples/LandingPageCustomizations/web/custom/js/viewmodels/customDialogView** directory. Use this sample to extend the default view model for defining the custom dialog box required by your service.

To create a custom dialog view model:

1. Create a **customDialogViewModel.js** file in the *myproject***/web/custom/js/viewmodels/customDialogView** directory.
2. Define the custom fields in this file as required.
3. Save the file in your NetBeans IDE project.

Creating a Custom Dialog View Model HTML Template

Billing Care uses an HTML view file to render your custom dialog box. You must create a custom dialog view model HTML template to display the custom dialog box in full screen mode. The template file contains the custom fields as defined in the custom dialog view model created in "Creating a Custom Dialog View Model".

A sample **customDialogView.html** file is provided in the *SDK_home***/samples/LandingPageCustomizations/web/custom/templates/customDialogView** directory. Use this sample to create a custom dialog HTML template for rendering the custom dialog box you want to view from the landing page.

To create a custom dialog view model HTML template:

1. Create a **customDialogView.html** file in the *myproject***/web/custom/js/templates/customDialogView** directory.
2. Define the custom fields in HTML required for rendering in this file.
3. Save the file in your NetBeans IDE project.

Configuring the Custom Dialog View Model in the Registry

After creating the required custom view model, create a custom module entry in the **customRegistry.js** file to use when opening the custom dialog box. Billing Care uses the custom view model instead of the default entry when rendering the specific screen.

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A sample **customRegistry.js** file is provided in the *SDK_home*/**samples/LandingPageCustomizations/web/custom** directory. Use this sample to create the **customRegistry.js** file containing your custom view model.

To create a custom dialog view model entry in the registry:

1. Create a **customRegistry.js** file in *myproject*/**web/custom** by copying the reference registry file.
2. Define the custom view models in the file. For example:

```
var CustomRegistry = {
   landingPageView: {
      viewExtension: 'text!custom/../../custom/templates/home/
landingPageExtensionView.html',
      viewmodel: '../custom/js/viewmodels/home/LandingPageExtensionViewModel'
   },
   customDialogView: {
      view: 'text!../custom/templates/customDialogView/customDialogView.html',
      viewmodel: '../custom/js/viewmodels/customDialogView/customDialogViewModel'
   }
};
```

3. Save the file in your NetBeans IDE project.

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30

Customizing Billing Care Labels

Learn how to use the SDK to customize Oracle Communications Billing Care labels.

Topics in this document:

- About the Billing Care Resource Bundle
- Customizing the Resource Bundle
- Localizing Billing Care into Other Languages

About the Billing Care Resource Bundle

Billing Care uses an XML Localization Interchange File Format (XLF) file resource bundle for customization of Billing Care labels and localization. The default English language XLF file (**BillingCareResources_en.xlf**) is available in the *SDK_home***/references** folder, where *SDK_home* is the directory where you installed the SDK. This file contains Billing Care key-value mappings for Billing Care labels, organized into functional group elements.

Customizing the Resource Bundle

Customize the Billing Care labels by creating a custom XLF file containing your label values. After creating your XLF file, use the **orai18n-js.jar**, included in the Billing Care SDK, to generate the required JavaScript files for the customizations shared library deployed in the Billing Care domain.

The following XLF customizations are supported:

- Modifying Existing Labels
- Adding New Labels

Creating a Custom XLF File

Label customizations are configured in a custom XLF file.

To create a custom XLF file:

1. Create the **customized_en.xlf** file in your *myproject***/web/resources/translation/** directory, where *myproject* is your NetBeans IDE project containing your Billing Care customizations.
2. Open the **customized_en.xlf** file in an editor and add the following text:

```
<?xml version="1.0" encoding="utf-8" ?>
<xliff version="1.0">
<file original="test_en.js" source-language="EN-US" target-language="EN-US"
datatype="JavaScript">
<header/>
<body>
</body>
</file>
</xliff>
```


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Modifying Existing Labels

Modify an existing label by adding a group element in your custom XLF file containing <trans-unit> elements for the labels you are changing. <trans-unit> elements specify the source and target of a label to modify. For more information on the <trans-unit> element, see:

http://docs.oasis-open.org/xliff/v1.2/os/xliff-core.html#trans-unit

Example 30-1 shows a sample <trans-unit> element.

Example 30-1 Sample trans-unit Element for Modifying an Existing Label

```
<group id="common" restype="common">
   <trans-unit id="INVALID_VALUE" translate="yes">
      <source>Invalid MODIFIED</source>
      <target>Invalid MODIFIED</target>
   </trans-unit>
</group>
```

To modify existing labels:

1. In the body section of the **customized_en.xlf** file, add a group element with the same name as the label you want to update (for example, common).
2. Add a <trans-unit> element using the same label name as the default label you are modifying.
3. Add the new custom label (for example, Invalid MODIFIED).
4. Save your **customized_en.xlf** file.

Adding New Labels

Add new labels by adding a custom_extensions group containing your new labels in your **customized_en.xlf** file.

Example 30-2 shows a sample new <group> element.

Example 30-2 Sample group Element for Adding New Label

```
<group>
<group id="custom_extensions" restype="sdk">
<trans-unit id="TEST_CUSTOM" translate="yes">
<source>Custom New Value</source>
<target>Custom New Value</target>
</trans-unit>
</group>
```

To add a new label:

1. Add a new <group> element with a **custom_extensions** <group id> value in your **customized_en.xlf** file inside the <body> element. See the **BillingCareResources_en.xlf** file for group element examples.

> **Note**
>
> The <group id> must be **custom_extensions**.

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2. Add the new labels inside your `<group>` element.
3. Save your **customized_en.xlf** file.

Creating Required JavaScript Files for Deployment

After completing your label customizations, generate the required JavaScript files to add to your customizations shared library deployed to the Billing Care domain.

To generate the required JavaScript files:

1. Add the **customized_en.xlf** and default **BillingCareResources_en.xlf** files to the *myproject*/**web/resources/translation** folder, where *myproject* is the NetBeans IDE project folder containing your Billing Care customizations.
2. Open a shell or command window, and change directory to the *myproject*/**web/resources/translation** folder.
3. Enter the following command using an absolute path to **orai18n-js.jar**.

   ```
   java –jar full_path/orai18n-js.jar –from XLF –to JS -file
   BillingCareResources_en.xlf Customized_en.xlf
   ```

   where *full_path* is the directory where **orail8n-js.jar** is stored. This JAR is included in the *SDK_home*/**libs** directory.

   Two JavaScript files are created. One file contains the default resources of Billing Care, and the other file contains your customizations.
4. Delete the **BillingCareResources_en.xlf** file.
5. Package and deploy your resource bundle customizations to your Billing Care domain.

   For more information, see "Packaging and Deploying Customizations".
6. Verify your changes in Billing Care.

Localizing Billing Care into Other Languages

You can customize Billing Care to use alternative language labels by translating the **BillingCareResources_en.xlf** file into another language. For example, create a file named **BillingCareResources_is.xlf** to localize Billing Care in Icelandic.

To configure Billing Care with an alternative language localization:

1. Translate the **BillingCareResources_en.xlf** file into a version specific to the language you are enabling. For example, create a file named **BillingCareResources**_*XX*.**xlf**, where *XX* is the two-character language code you are enabling.
2. Copy the **BillingCareResources**_*XX*.**xlf** file to the *myproject*/**web/resources/translation** directory, where *myproject* is your NetBeans IDE project directory containing your Billing Care customizations.
3. Run the conversion utility using **orail8n-js.jar** to create the JavaScript for the language you are enabling:

   ```
   java -jar full_path/orai18n-js.jar -from XLF -to JS -file BillingCareResources_XX.xlf
   ```

   where *full_path* is the directory where **orail8n-js.jar** is stored. This JAR is included in the *SDK_home*/**libs** directory.
4. Package and deploy your resource bundle customizations to your Billing Care domain.

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For more information, see "Packaging and Deploying Customizations".

5. Verify your changes in Billing Care.

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Customizing Billing Care to Disable Links in the Bills Tab

Learn how to customize Oracle Communications Billing Care to disable the **Charges not related to services** link and the link to child accounts in the **Bills** tab, **My Charges** area, and Payment Details dialog box.

Topics in this document:

- About Disabling Links
- Disabling Links in the Bills Tab
- Creating Custom View Models to Disable Links in the Bills Tab
- Configuring Custom Bill, Charges, and Payment Detail View Models in the Registry

About Disabling Links

By default, Billing Care displays the link to child accounts in the **Bills** tab, **My Charges** area, and Payment Details dialog box to navigate to the child accounts and the **Charges not related to services** link in the **My Charges** area to view the account-level charges.

However, you can customize Billing Care to disable these links displayed in the parent account by using the Billing Care SDK.

Disabling Links in the Bills Tab

You can customize Billing Care using the Billing Care SDK to disable the following:

- Link to the child accounts in the **Bills** tab and Payment Details dialog box.
- **Charges not related to services** link in the **My Charges** area in the **Bills** tab.

To customize Billing Care to disable links in the **Bills** tab:

1. Create a custom ResourceType and Resource in the OPSS server for disabling links. For example, BillsResourceType, BillsResource.
2. Define the corresponding action for the custom ResourceType in the OPSS server.
3. Add the new ResourceType to the **CustomConfigurations.xml** file. For example:

```
</keyvals>
   <key>authorizationResourceTypes</key>
   <value>BillsResourceType</value>
   <desc>Add comma separated OPSS Resource Types(values) for authorization. Also
these resource types should be defined in OPSS. Please note that the key should not
be changed here.</desc>
</keyvals>
```

   See "Editing the Billing Care Configuration File" for customization of the **configurations.xml** file.

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4. Create custom view models containing overrides to hide the link in the **Bills** tab. See "Creating Custom View Models to Disable Links in the Bills Tab" for more information.
5. Create a **customRegistry.js** file configuring Billing Care to use the custom view models that you created. See "Configuring Custom Bill, Charges, and Payment Detail View Models in the Registry" for more information.
6. Deploy your customizations using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

Creating Custom View Models to Disable Links in the Bills Tab

Billing Care uses view model to define the display of the **Bills** tab, **My Charges** area, and Payment Details dialog box. You must create or update the custom view models, **CustomPaymentDetailsViewModel** , **CustomBillDetailsViewModel**, and **CustomBillChargesViewModel**, containing overrides to disable **Charges not related to services** link and link to child accounts in these screens. See "About View Models" for more information about Billing Care view models.

To create custom view models to disable links in the **Bills** tab:

1. Create or update the **customPaymentDetailsViewModel.js** , **customBillDetailsViewModel.js** , and **customBillChargesViewModel.js** files in the *myproject*/**web/custom/js/viewmodels** directory, where *myproject* is the folder containing your NetBeans IDE project.
2. To disable link to child accounts, do the following:
   a. Add the following code in the **customPaymentDetailsViewModel.js** file using a text editor:

```
define(['jquery', 'knockout',
    'viewmodels/payment/allocations/PaymentDetailsViewModel'
],
        function($, ko, PaymentDetailsViewModel) {

            function customPaymentDetailsViewModel() {
                PaymentDetailsViewModel.apply(this, arguments);
                $(function() {
                    var myVar = setInterval(function() {
                        if ($("strong:contains(Associated to)").length > 0)
                        {
                            if
(!util.isGrantedResourceAction("parentAccountLink", "customResource")){
                               $("strong:contains(Associated
to)").each(function() {
                                    $(this).next().off("click");
                                });
                            }
                            clearInterval(myVar);
                        }

                    }, 20);

                });

            }
     customPaymentDetailsViewModel.prototype = new PaymentDetailsViewModel();
            return  customPaymentDetailsViewModel;
        });
```

   b. Save the file in your NetBeans IDE project.

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c. Add the following code in the **customBillDetailsViewModel.js** file using a text editor:

```
define(['jquery', 'knockout',
    'viewmodels/billtab/BillDetailsViewModel'
],
        function($, ko, BillDetailsViewModel) {
            function customBillDetailsViewModel() {
                BillDetailsViewModel.apply(this, arguments);
                $(function() {
                    var myVar = setInterval(function() {
                        if ($("a#childAccountLink").length > 0)
                        {
                            if
(!util.isGrantedResourceAction("parentAccountLink", "customResource")) {
                                $("a#childAccountLink").each(function(index)
{
                                    $(this).off("click");
                                });
                            }
                            clearInterval(myVar);
                        }
                    }, 20);
                });
            }
            customBillDetailsViewModel.prototype = new
BillDetailsViewModel();
            return  customBillDetailsViewModel;
        });
```

d. Save the file in your NetBeans IDE project.

e. Add the following code in the **customBillChargesViewModel.js** file using a text editor:

```
define(['jquery', 'knockout',
    'viewmodels/billtab/BillChargesViewModel'
],
        function($, ko, BillChargesViewModel) {
            function customBillChargesViewModel() {
                BillChargesViewModel.apply(this, arguments);
                $(function() {
                    var myVar = setInterval(function() {
                        if ($('#adjustbillListMenu').length > 0)
                        {

                          if (!util.isGrantedResourceAction("parentAccountLink",
"customResource")) {
                               if ($("a#parentAccountLink").length > 0) {
                                   $("a#parentAccountLink").off("click");
                               });
                            }
                            clearInterval(myVar);
                        }
                    }, 20);

                });

            }
            customBillChargesViewModel.prototype = new
BillChargesViewModel();
            return  customBillChargesViewModel;
        });
```

f. Save the file in your NetBeans IDE project.

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3. To disable **Charges not related to services** link in the **My Charges** area, do the following:

   a. Update the code in the **customBillChargesViewModel.js** file using a text editor as follows:

```
define(['jquery', 'knockout',
    'viewmodels/billtab/BillChargesViewModel'
],
        function($, ko, BillChargesViewModel) {
            function customBillChargesViewModel() {
                BillChargesViewModel.apply(this, arguments);
                $(function() {
                    var myVar = setInterval(function() {
                        if ($('#adjustbillListMenu').length > 0 || $
("a#parentAccountLink").length >
0)
                        {

                          if (!util.isGrantedResourceAction("parentAccountLink",
"customResource")) {
                                if ($("a#parentAccountLink").length > 0) {
                                    $("a#parentAccountLink").off("click");
                                });
                            }
                            clearInterval(myVar);
                        }
                    }, 20);

                });
                $(function() {
                    var myVar = setInterval(function() {
                        if ($('#accountChargesHeader').length > 0 )
                        {
                        if (!util.isGrantedResourceAction("otherCharges",
"customResource")){
                                    $('#accountChargesHeader').remove();
                                    $('#accountCharges').remove();
                                }
                                    clearInterval(myVar);
                                }

                            }, 40);

                        });

                $(function() {
                    var myVar = setInterval(function() {
                        if ($('#otherAccountChargesHeader').length > 0 )
                                {
                        if (!util.isGrantedResourceAction("otherCharges",
"customResource")){
                                    $('#otherAccountChargesHeader').remove();
                                    $('#otherAccountCharges').remove();
                                }
                                    clearInterval(myVar);
                                }

                            }, 40);

                        });

            }
            customBillChargesViewModel.prototype = new
```


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```
BillChargesViewModel();
            return  customBillChargesViewModel;
        });
```

b. Save the file in your NetBeans IDE project.

c. Add the following function to the code in the **customBillDetailsViewModel.js** file using a text editor:

```
self.openChildAccount = function(data, event) {
                    if (!util.isGrantedResourceAction("parentAccountLink",
"customResource")) {
                        return false;
                    }
                    self.__proto__.openChildAccount(data, event);
                };
```

d. Save the file in your NetBeans IDE project.

Configuring Custom Bill, Charges, and Payment Detail View Models in the Registry

After creating or updating the **CustomPaymentDetailsViewModel** , **CustomBillDetailsViewModel**, and **CustomBillChargesViewModel** view models, create the custom view model entries in the **customRegistry.js** file to use the custom view models when displaying bill and payment details. Billing Care uses the custom bill tab and payment details view models instead of the default entries when displaying the bill and payment details.

To create the bill tab, bill charges, and payment details view model entries in a **customRegistry.js** file:

1. Create a **customRegistry.js** file in *myproject*/**web/custom** .
2. Define the entries referencing the custom view models in this file. For example:

```
billTab: {

        billChargesViewModel:
'custom/js/viewmodel/customBillChargesViewModel.js'

        billDetailsViewModel:
'custom/js/viewmodels/CustomBillDetailsViewModel.js'

    }

 allocatePaymentDetails: {
        viewmodel: 'custom/js/viewmodels/CustomPaymentDetailsViewModel.js'
    }
```

3. Save the file in your NetBeans IDE project.

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Separating Event Adjustment Amount and Percentage Fields

Learn how to customize the Oracle Communications Billing Care Event Adjustment dialog box to provide separate adjustment amount and percentage fields.

Topics in this document:

- About Event Adjustments using Amount and Percentage
- Separating Amount and Percentage Fields
- Creating Custom View Model to Separate Amount and Percentage Fields
- Adding CustomEventAdjustmentViewModel to the Registry

About Event Adjustments using Amount and Percentage

The Billing Care Event Adjustment dialog box provides only one field, the **Adjustment** field, in which to enter an adjustment amount or percentage for an event.

You can customize the dialog box to display separate amount adjustment and percent adjustment fields by using the Billing Care SDK. You can also make the fields independent of each other, such that entering a value in one field disables the other field.

Separating Amount and Percentage Fields

To separate the amount and percentage fields in the Event Adjustment dialog box:

1. Create a custom view model for the Event Adjustment dialog box. See "Creating Custom View Model to Separate Amount and Percentage Fields".
2. Create a **customRegistry.js** file that configures Billing Care to use your custom view model. See "Adding CustomEventAdjustmentViewModel to the Registry".
3. Package and deploy your customization to your Billing Care domain using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

Creating Custom View Model to Separate Amount and Percentage Fields

Billing Care uses the **EventAdjustmentViewModel.js** file to determine what fields to display in the Event Adjustment dialog box. The fields defined in the view model are bound in the HTML file used to render the custom view or page. To change what fields are displayed, create a custom view model, such as **CustomEventAdjustmentViewModel.js**, that overrides the dialog box's default display. See "About View Models" for more information about Billing Care view models.

To create a custom view model for the Event Adjustment dialog box:

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1. Create a **CustomEventAdjustmentViewModel.js** file in the *myproject*/**web/custom/viewmodels/ARActions/adjustments** directory, where *myproject* is the folder containing your NetBeans IDE project.
2. Open the **CustomEventAdjustmentViewModel.js** file using a text editor and define your custom fields. For example:

```
define(['jquery', 'knockout',
    'viewmodels/ARActions/adjustments/EventAdjustmentViewModel'],
        function ($, ko, EventAdjustmentViewModel) {

            function CustomEventAdjustmentViewModel() {
                EventAdjustmentViewModel.apply(this, arguments);
                self = this;
                self.percentValue = 0;
                self.amountValue = 0;
self.adjustmentPercentage = ko.observable(0).extend({notify:
"always"}).extend({numeric: 2});
                self.amountStateController = ko.computed(function () {
                    if ((Number(self.adjustmentAmount()) === 0) &&
                            (Number(self.adjustmentPercentage()) === 0)) {
                        self.enablePercentage(true);
                        self.enableAmount(true);
                    } else if (Number(self.adjustmentPercentage()) === 0) {
                        self.enablePercentage(false);
                        self.enableAmount(true);
                    } else {
                        self.enablePercentage(true);
                        self.enableAmount(false);
                    }
                });
            }
            CustomEventAdjustmentViewModel.prototype = new
EventAdjustmentViewModel();
            return  CustomEventAdjustmentViewModel;
   }
);
```

3. Save the file in your NetBeans IDE project.

Adding CustomEventAdjustmentViewModel to the Registry

Configure Billing Care to override the default **EventAdjustmentViewModel** with your custom view model when rendering the Event Adjustment dialog box. To do so, add the name and path to your custom view model to the **customRegistry.js** file. For more information about the registry file, see "About the Registry File".

To add CustomEventAdjustmentViewModel to the registry:

1. Create a **customRegistry.js** file in the *myproject*/**web/custom/** directory.
2. Add the following lines to the file:

```
eventAdjustment: {
   viewmodel: 'custom/viewmodels/ARActions/adjustments/
```


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```
CustomEventAdjustmentViewModel'
}
```

3. Save the file in your NetBeans IDE project.

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Embedding Billing Care Windows in External Applications

Learn how to use the SDK to embed Oracle Communications Billing Care windows in external applications such as customer relationship management (CRM) applications or online account management interfaces.

Topics in this document:

- About Embeddable Billing Care Windows
- Embedding Billing Care Windows
- Configuring Security for External Application Access

About Embeddable Billing Care Windows

Billing Care supports embedding windows into CRM applications and online account management interfaces using inline frames (iframe) or pop-up windows. Embedding windows gives external applications direct access to Billing Care functionality without requiring complex integration.

Subscriber information stored in your Oracle Communications Billing and Revenue Management (BRM) system, and Billing Care account management windows, can be displayed in external applications without creating custom interfaces for retrieving such data or performing account management actions.

Use this functionality to expose Billing Care windows in your application's business workflow. For example, configure your CRM application to display the Billing Care payments interface when adding a new payment type for a subscriber.

The following Billing Care windows can be exposed and embedded in external applications:

- Account Adjustment
- Account Profile
- Account Status
- Account Transactions Graph
- Account Transactions Table
- Billing Information
- Financial Setup (including Payment Methods)
- Make a Payment
- Payments Summary
- Purchased Products
- Write Off Account
- Purchase Package/Purchase Deal

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See the relevant chapter in *Billing Care Online Help* for more information on each window and what account actions can be performed.

Embedding Billing Care Windows

Embedding Billing Care windows in external applications requires the following:

- Understanding the index_embedded.html File
- Configuring Your External Application to Access Billing Care

You can embed Billing Care windows in test installations not using Oracle Identity and Access Management (IAM) when developing your external application integration. User authentication and resource authorization are not required with test installations. Billing Care displays the requested window without requiring credentials. See "About Test Installations" and "Configuring WebLogic Server for a Test Installation" in *Billing Care Installation Guide* for more information on test installations.

Production Billing Care installations require IAM. An external application and its users must be authenticated and authorized by Billing Care before embedded windows can be displayed. See "Configuring Security for External Application Access" for information on embedding Billing Care windows in external applications in production installations.

Understanding the index_embedded.html File

External applications call the **index_embedded.html** file when retrieving a Billing Care window for display. By default, Billing Care exposes this file without additional configuration on the application server.

This file contains the information required by Billing Care to render the requested window properly for the queried account. External applications send Billing Care an index_embedded.html URL request containing a unique query string for the required window, and the account or bill numbers for the subscriber using the following format:

`https://host:port/bc/index_embedded.html#query_string`

where:

- *host* is the Billing Care application host.
- *port* is the port on which Billing Care is listening on.
- *query_string* is the string containing the desired embeddable window and account and bill details. You can use either account ID or account number, and bill ID or bill number in the request.

If you are using account ID and bill ID in the request, the *query_string* format is:

`Window?accountId=BRM_db#+-account+AccountID&billId=BRM_db+-bill+BillID`

where:

- *Window* is the requested window for the queried account.
- *BRM_db#* is the BRM database number containing the queried account or bill.
- *AccountID* is the unique BRM subscriber account ID to query.
- *BillID* is the bill ID to query when requesting bill-related windows.

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For example, to request the Billing Information overlay for the BRM bill number 0.0.0.1-1115086, owned by the BRM account number 0.0.0.1-1117902, use the following URL request:

```
https://example.com:7001/bc/index_embedded.html#overlay/billDetails?accountId=0.0.0.1+-account+1117902&billId=0.0.0.1+-bill+1115086
```

If you are using account number and bill number in the request, the query_string format is:

Window`?accountId=`*AccountNumber*`&billId=`*BillNumber*

For example, to request the Billing Information overlay for the BRM bill number B1-8839, owned by the BRM account number 123456, use the following URL request:

```
https://example.com:7001/bc/index_embedded.html#overlay/billDetails?accountId=123456&billId=B1-8839
```

> **Note**
>
> Embedded windows do not include the Billing Care application banner, search functionality, or Actions menu.

Table 33-1 lists the URL request strings used to call each embeddable Billing Care window.

Table 33-1 Sample URL Request Query Strings for Embeddable Billing Care windows

Window	Sample URL Query String Used by External Application
Account Adjustment	`https://example.com:7001/bc/index_embedded.html#overlay/accountAdjustment?accountId=`*BRM_db*`+-account+`*AccountID*
Account Profile	`https://example.com:7001/bc/index_embedded.html#overlay/generalInfo?accountId=`*BRM_db*`+-account+`*AccountID*
Account Status	`https://example.com:7001/bc/index_embedded.html#overlay/accountStatusChange?accountId=`*BRM_db*`+-account+`*AccountID*
Account Transactions Table	`https://example.com:7001/bc/index_embedded.html#newsfeed?accountId=`*BRM_db*`+-account+`*AccountID*
Account Transactions Graph	`https://example.com:7001/bc/index_embedded.html#billUnitGraph?accountId=`*BRM_db*`+-account+`*AccountID*
Billing Information	`https://example.com:7001/bc/index_embedded.html#/billDetails?accountId=`*BRM_db*`+-account+`*AccountID*`&`*billId=BRM_db*`+-bill+`*BillID* If only the account ID is passed then the Bill in progress bill is shown. If any specific bill must shown, the bill id must be passed.
Financial Setup	`https://example.com:7001/bc/index_embedded.html#overlay/paymentMethods?accountId=`*BRM_db*`+-account+`*AccountID*

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Table 33-1 (Cont.) Sample URL Request Query Strings for Embeddable Billing Care windows

Window	Sample URL Query String Used by External Application
Make a Payment	`https://example.com:7001/bc/index_embedded.html#overlay/makePayment?accountId=BRM_db+-account+AccountID`
Payments Summary	`https://example.com:7001/bc/index_embedded.html#newsfeed/payments?accountId=BRM_db+-account+AccountID`
Purchased Products	`https://example.com:7001/bc/index_embedded.html#customerAssets?accountId=BRM_db+-account+AccountID`
Write Off Account	`https://example.com:7001/bc/index_embedded.html#overlay/writeOffAccount?accountId=BRM_db+-account+AccountID`
Purchase Package/Purchase Deal	`https://example.com:7001/bc/index_embedded.html#overlay/purchase?accountId=BRM_db+-account+AccountID`

Configuring Your External Application to Access Billing Care

Configure external applications to request an embeddable Billing Care window by creating a link on the application's window, from where users initiate the request. For example, create a clickable text, image, or button on your application's window with an html href attribute containing the embeddable window overlay listed in Table 33-1.

Example 33-1 contains sample html code for a text link which opens the Account Status window in a new window.

Example 33-1 Sample Account Status Window Link Code

```
<a href ="http://example.com:7001/bc/index_embedded.html#overlay/accountStatusChange?
accountId=0.0.0.1+-account+1117902" onclick="openWindow(this.href);
                return false;">Click to open Account status Dialog</a>
```

Configuring Security for External Application Access

Production Billing Care installations use Oracle Identity and Access Management (IAM) to authenticate users using single sign-on (SSO) and authorize access to Billing Care windows and resources. You must configure the required authentication and authorization policies in IAM before embedding Billing Care windows in external applications in production environments. Doing so enables embedded windows to be displayed without requiring Billing Care user credentials and ensures that a failed permissions error message is not displayed on the embedded window.

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> **Note**
>
> With configured IAM, Billing Care returns an error message if the user or external application does not have the correct permissions to access or view the requested embedded window. For example, if the external user or application has not been configured with access to the Billing Care payments resource, the following error message error message is displayed:
>
> ```
> You do not have permission to make payments
> ```

Billing Care enforces a single security configuration of user access and resource permissions for both the native Billing Care application and any embedded windows exposed within external applications.

See "Billing Care Preinstallation Tasks" in *Billing Care Installation Guide* for more information on installing the required IAM components for a secure Billing Care installation, and "Implementing Billing Care Security" in *BRM Security Guide* for more information on how to configure authentication and authorization for external users and applications.

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Customizing the Batch Window

Learn how to customize the Billing Care batch payment functionality using the Oracle Communications Billing Care SDK. You can:

- Adding a Custom Column While Creating a Batch or a Batch Template
- Implementing a Drop-Down List for Payment Search
- Implementing Custom Drop-Down Lists for Batches and Batch Templates

Adding a Custom Column While Creating a Batch or a Batch Template

You can customize batch payments in Billing Care by adding custom columns during batch and template creation.

To add a custom column:

1. Create a custom view model to add a new column in the Create Batch and Create Template windows. See "Creating a View Model for the Custom Creation Columns".
2. Override the registry value for the Billing Care batch payments. See "Configuring the Custom Columns in the Registry".
3. Package and deploy your SDK using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

Creating a View Model for the Custom Creation Columns

The Billing Care SDK includes samples that you can use for developing your own customizations in the *SDK_home*/**samples/BatchGridCustomization/web/custom/viewmodels/CustomBatchPaymentViewModel.js** directory, where *SDK_home* is the Billing Care SDK installation directory.

To create a custom view model for adding a custom column:

1. Create a new project dedicated to your customization. See "Setting Up a Billing Care Customization Project" for more information.
2. Create a **CustomBatchPaymentViewModel.js** file to extend the default functionality.
3. Implement the **util.gridFields** function to define the new custom column. Within this function, specify the column name (key), applicable batch types (batchType), and any additional relevant details.

   For example:

```
util.gridFields : function(){
  let startFixedFields = [
    {key:'PIN_FLD_CUSTOM_COLUMN',batchType:
[BATCH_TYPE_PAYMENT,BATCH_TYPE_REFUND,BATCH_TYPE_REVERSAL]},
    {key:'PIN_FLD_ACCOUNT_NO',batchType:
[BATCH_TYPE_PAYMENT,BATCH_TYPE_REFUND,BATCH_TYPE_REVERSAL]},
    {key:'PIN_FLD_BILL_NO',batchType:[BATCH_TYPE_PAYMENT,BATCH_TYPE_REFUND]},
```


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```
    {key:'PIN_FLD_PAYMENT_TRANS_ID',batchType:[BATCH_TYPE_REVERSAL]},
    {key:'PIN_FLD_PAYMENT_AMOUNT',batchType:
[BATCH_TYPE_PAYMENT,BATCH_TYPE_REFUND,BATCH_TYPE_REVERSAL]} ,
    {key:'PIN_FLD_DUE',batchType:[BATCH_TYPE_PAYMENT]},
{key:'PIN_FLD_END_T',batchType:[BATCH_TYPE_REVERSAL]}];
  let endFixedFields = [
    {key:'PIN_FLD_CHANNEL_ID',batchType:[BATCH_TYPE_PAYMENT]},
    {key:'PIN_FLD_STATUS',batchType:[BATCH_TYPE_PAYMENT]},
    {key:'PIN_FLD_DESCR',batchType:
[BATCH_TYPE_PAYMENT,BATCH_TYPE_REFUND,BATCH_TYPE_REVERSAL]},
    {key:'STATUS',batchType:
[BATCH_TYPE_PAYMENT,BATCH_TYPE_REFUND,BATCH_TYPE_REVERSAL]},
    {key:'STATUS_DESCRIPTION',batchType:[BATCH_TYPE_PAYMENT]},
    {key:'PIN_FLD_REASON_ID',batchType:[BATCH_TYPE_PAYMENT]},
    {key:'ALLOCATION',batchType:[BATCH_TYPE_PAYMENT]},
    {key:'DEFERRED_ALLOCATION',batchType:[BATCH_TYPE_PAYMENT]},
    {key:'PIN_FLD_FIRST_NAME',batchType:[BATCH_TYPE_PAYMENT,BATCH_TYPE_REVERSAL]},
    {key:'PIN_FLD_LAST_NAME',batchType:[BATCH_TYPE_PAYMENT,BATCH_TYPE_REVERSAL]}];
  return {startFixedFields,endFixedFields};
}
```

This example defines a column named PIN_FLD_CUSTOM_COLUMN applicable to all batch types (payments, refunds, and reversals). You can modify the **batchType** array to restrict the column's visibility.

4. Create **CustomBatchPaymentCreateBatchViewModel** to add a new column in the Create Batch window. In **batchRecordMap**, add a new column **customColumn** in the BATCHRECORD_COLUMNS array with your new column name as the value, for example, PIN_FLD_CUSTOM_COLUMN. This field will be applicable for all types of batch payments, refunds and reversals. You can update this array and map based on your specific requirements.

```
self.BATCHRECORD_COLUMNS = ["accountNumber", "amount", "allocationDeferred",
"payInfo", "billNumber","channelId","paymentId","customColumn"];
self.batchRecordMap = new Map([
    ["accountNumber", "PIN_FLD_ACCOUNT_NO"],
    ["amount", "PIN_FLD_PAYMENT_AMOUNT"],
    ["allocationDeferred", "DEFERRED_ALLOCATION"],
    ["billNumber", "PIN_FLD_BILL_NO"],
    ["channelId","PIN_FLD_CHANNEL_ID"],
    ["comment","PIN_FLD_DESCR"],
    ["paymentId", "PIN_FLD_PAYMENT_TRANS_ID"],
    ["customColumn","PIN_FLD_CUSTOM_COLUMN"]
]);
```

5. You can customize the resource bundle. For more information, see "Customizing the Resource Bundle". Following is a sample **trans-unit** element for the configuration in this section.

```
<group id="batchPaymentCreateBatch" restype="batchPaymentCreateBatch">
        <trans-unit id="PIN_FLD_CUSTOM_COLUMN" translate="yes">
               <source>PIN_FLD_CUSTOM_COLUMN</source>
               <target>customColumn</target>
        </trans-unit>
</group>
```

6. If you want to make the custom column available in the REST API, modify the XSD file to reflect the added column. See "Adding the XSD and JSON Files to NetBeans Project" for more information on adding the files to your project.

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Configuring the Custom Columns in the Registry

Create a custom module entry in the **customRegistry.js** file to add custom columns during batch creation or template creation in Batch Payments in Billing Care.

A sample **customRegistry.js** file is provided in the *SDK_home*/**samples/BatchGridCustomization/web/custom** directory, where *SDK_home* is the Billing Care SDK installation directory. Use this sample to create the **customRegistry.js** file for your custom view model.

To add an entry in the **customRegistry.js** file:

1. Create a **customRegistry.js** file in *myproject*/**web/custom** by copying the reference registry file.
2. Specify to use your custom view model. For example:

```
batchPayment: {
    viewmodel: '../custom/viewmodels/CustomBatchPaymentViewModel'
},
```

3. Close and save the **customRegistry.js** file.

Implementing a Drop-Down List for Payment Search

You can modify the payment search functionality to include a drop-down list for filtering payments based on a specific field.

To modify the payment search functionality:

1. Create a custom view model to add a drop-down list for filtering payments. See "Creating a View Model for Custom Payment Search".
2. Override the payment search functionality to customize the appearance of the custom drop-down list. See "Override the Payment Search Appearance and Behavior".
3. Override the registry value for the Billing Care payment type. See "Configuring the Custom Payment Search in the Registry".
4. Package and deploy your SDK using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

Creating a View Model for Custom Payment Search

The Billing Care SDK includes samples that you can use for developing your own customizations in the *SDK_home*/**samples/BatchGridCustomization/web/js/viewmodel/CustomPaymentSearchViewModel.js** directory, where *SDK_home* is the Billing Care SDK installation directory.

To create a custom view model for custom payment search:

1. Create a new project dedicated to your customization or use your existing customization project. See "Setting Up a Billing Care Customization Project" for more information.
2. Create a **CustomPaymentSearchViewModel.js** file to extend the default functionality.
3. Override the **initialize** function to modify the search field behavior. Within this function, customize a specific search field to incorporate the drop-down list functionality.

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For example:

```
self.initialize = function () {
  var idx = 0;
  if (self.payType() !== CC_TYPE_PAYMENT && self.payType() !== DD_TYPE_PAYMENT) {
      for (var index = 0; index < self.paymentSpecificColumns().length; index++) {
          if (self.paymentSpecificFields()[index].includes("PIN_FLD_EFFECTIVE_T") ||
              self.paymentSpecificFields()[index] === "PIN_FLD_REASON_CODE") {
              continue;
          }
          let type = 0;
          let dataProvider = [];
          if (self.paymentSpecificFields()[index] === "PIN_FLD_BANK_CODE") {
              type = 1;
              dataProvider = [
                  { "label": "0001",
                    "value": "0001" },
                  { "label": "0002",
                    "value": "0002" },
                  { "label": "0003",
                    "value": "0003" },
                  { "label": "0004",
                    "value": "0004" },
                  { "label": "0005",
                    "value": "0005" },
                  { "label": "0006",
                    "value": "0006" }];
          }
          self["observable" + idx.toString()] = ko.observable("");
          batchColumnDataProvider.push({
             value: self.paymentSpecificColumns()[index].toLowerCase().replace(/ /g,
"_") + idx.toString(),
              label: self.paymentSpecificColumns()[index],
              type: type,
              observableVariable: self["observable" + idx.toString()],
              dataProvider: new oj.ArrayDataProvider(dataProvider, {keyAttributes:
"label"})
          });
          idx++;
        }
    }
  self.paymentColumnsDataProvider(new oj.ArrayDataProvider(batchColumnDataProvider,
{keyAttributes: "value"}));
};
```

This example demonstrates how to modify the PIN_FLD_BANK_CODE field to display as a drop-down list. By setting the "type" to "1" and providing a "data-provider" with a list of options, you can populate the drop-down with the desired values.

4. If you want to make the custom column available in the REST API, modify the XSD file to reflect the added column. See "Adding the XSD and JSON Files to NetBeans Project" for more information on adding the files to your project.

Override the Payment Search Appearance and Behavior

To customize the appearance of the custom drop-down list, override the payment search CSS styles:

1. Create a custom **overrides.css** file in the *myproject*/**web/custom/css** directory. You can find a sample file in the *SDK_home*/**samples/BatchGridCustomization/web/custom/css** directory.

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2. To define styles to customize the appearance and behavior of the drop-down list, add CSS similar to the following:

```
.search-overlay {
  border: 1px solid;
  bottom: 0;
  display: block;
  left: 10%;
  position: fixed;
  right: 0;
  top: 2%;
  width: 80%;
  z-index: 999;
  height: 80%;
}
#payment_type_columns oj-select-single{
  border: 1px solid #CCCCCC;
  border-radius: 4px;
}
.payment_id_search div div input{
  width: 100% !important;
  font-size: 12px;
}
#payment_type_columns oj-select-single div div input{
  border : none !important;
}
```

Configuring the Custom Payment Search in the Registry

Create a custom module entry in the **customRegistry.js** file to include a drop-down menu for filtering payments based on a specific field in Batch Payments in Billing Care.

A sample **customRegistry.js** file is provided in the *SDK_home*/**samples/BatchGridCustomization/web/custom** directory, where *SDK_home* is the Billing Care SDK installation directory. Use this sample to create the **customRegistry.js** file with your custom view model.

To add an entry in the **customRegistry.js** file:

1. Create a **customRegistry.js** file in *myproject*/**web/custom** by copying the reference registry file.
2. Specify to use your custom view model. For example:

```
paymentSearch: {
    viewmodel: 'viewmodel/CustomPaymentSearchViewModel'
}
```

3. Close and save the **customRegistry.js** file.

Implementing Custom Drop-Down Lists for Batches and Batch Templates

You can customize Billing Care batch payments by adding drop-down lists for specific fields during batch or template creation.

To create custom drop-down lists for batches and templates:

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1. Create a custom view model to add custom drop-down lists in the Create Batch and Create Template windows. See "Creating a View Model for Custom Drop-Down Lists".
2. Override the registry value. See "Configuring a Custom Input Drop-Down List in the Registry ".
3. Package and deploy your SDK using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

Creating a View Model for Custom Drop-Down Lists

The Billing Care SDK includes samples that you can use for developing your own customizations in the *SDK_home*/**samples/BatchGridCustomization/web/custom/viewmodels/CustomBatchPaymentCreateBatchViewModel.js** directory, where *SDK_home* is the Billing Care SDK installation directory.

To create a custom view model for custom drop-down lists:

1. Create a new project dedicated to your customization or use your existing customization. See "Setting Up a Billing Care Customization Project" for more information.
2. Create a **CustomBatchPaymentCreateBatchViewModel.js** file to extend the default functionality and do the following:
   a. Initialize an **inputColumnMap** to define custom input types for specific columns. The **inputColumnMap** should be a Map object where the key is the column name and the value is an object containing the **inputType** (for example, "dropdown") and **dataProviderArray** (an array of options for the dropdown).
      `

      ```
      self.inputColumnMap.set("PIN_FLD_ACCOUNT_NO", {inputType: "dropdown",
      dataProviderArray: [
          {label: "0.0.0.1-447805"},
          {label: "0.0.0.1-88073"},
          {label: "0.0.0.1-228562"}]});
      self.inputColumnMap.set("PIN_FLD_RECEIPT_NO_1", {inputType: "dropdown",
      dataProviderArray: [
          {label: "QBX121-2"},
          {label: "ZS129-12"},
          {label: "BQ2123-21"}]});
      ```

   b. Implement the **generateInputElement** function to dynamically generate input elements based on the **inputColumnMap**.
3. If you want to make the custom column available in the REST API, modify the XSD file to reflect the added column. See "Adding the XSD and JSON Files to NetBeans Project" for more information on adding the files to your project.

Configuring a Custom Input Drop-Down List in the Registry

Create a custom module entry in the **customRegistry.js** file to create a custom input drop-down list for specified fields in batch payments in Billing Care.

A sample **customRegistry.js** file is provided in the *SDK_home*/**samples/BatchGridCustomization/web/custom** directory, where *SDK_home* is the Billing Care SDK installation directory. Use this sample to create the **customRegistry.js** file with your custom view model.

To add an entry in the **customRegistry.js** file:

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1. Create a **customRegistry.js** file in *myproject*/**web/custom** by copying the reference registry file.
2. Specify to use your custom view model. For example:

```
createBatch: {
    viewmodel: '../custom/viewmodels/customColumnCreateBatchViewModel'
}
```

3. Save and close the **customRegistry.js** file.

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Customizing the Events Dialog Box

Learn how to customize the Events dialog box in Oracle Communications Billing Care. The Events dialog box displays event information for an account or bill. Use this sample to extend the Events dialog box with additional fields and custom APIs according to your business requirements.

Topics in this document:

- About Customizing the Events Dialog Box
- Customizing the Events Dialog Box

About Customizing the Events Dialog Box

Billing Care displays event information for an account or bill in the Events dialog box. You can use the Billing Care SDK to customize Billing Care to include additional fields in the response payload for the Get Events REST request. You can also add a custom REST endpoint to fetch an event's flist, introduce concealable columns like Account Number or Event Details, and apply different styling options to generic columns like Start date and End date.

You can use the SDK to:

- Add new columns (for example, **Account Number** or **Event Details**) to the Events table
- Add a **View** link to display event flist details in a dialog box
- Add a **Copy** button in the dialog box to allow users to copy the entire flist
- Add a new template (**installmentDebit**) to configure views specifically for events of type **/event/billing/installment/debit**
- Apply different styling options for the generic events template's **Start date** and **End date** columns by overriding the template
- Implement concealable or conditionally visible columns
- Apply custom styling to event columns
- Extend or override business logic using view models
- Fetch event-specific data using custom REST endpoints

The Billing Care SDK includes a sample that demonstrates how to add custom columns, provide extended event information, and display event details using a custom dialog box.

For more information about viewing the Events dialog box, see "Working with Events" in *Billing Care Online Help*.

About the Sample Files

The SDK sample for customizing the Events dialog box is located in *SDK_home***/samples/EventsDialog**, where *SDK_home* is the SDK installation directory.

The customization files provided in this sample are:

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- **EventsDialog/web/custom/customRegistry.js**: Adds an entry to override the default view model JavaScript files.
- **EventsDialog/web/js/viewmodels/CustomEventsViewModel.js**: Contains the logic for the different UI customizations.
- **EventsDialog/src/java/custom/CustomModule.properties**: Contains the new mapping for the EventModule.
- Custom modules, all located in the **EventsDialog/src/java/com/oracle/communications/brm/cc** directory:
  - **CustomEventResource.java**: A new REST service for getting event object details.
  - **modules/CustomEventModule.java**: Implements the custom event module mapping.
  - **modules/pcm/workers/CustomEventWorker.java**: Carries out the custom logic for the APIs.

Customizing the Events Dialog Box

To extend the Events dialog box with additional fields or links that call a custom endpoint, you must customize the underlying view models, templates, and back-end logic.

To customize the Events dialog box:

1. Create a custom web project in your NetBeans IDE (for example, **EventsDialogCustomizations**).
2. (Optional) Create the custom back-end files for extending the API payload. See "Creating Custom Event Back-End Files".
3. (Optional) Create a custom events view model for rendering the new data. See "Creating a Custom Event View Model".
4. Create a custom events HTML template for displaying custom columns. See "Creating Custom Event View Model HTML Templates".
5. Create a **customRegistry.js** file to configure Billing Care to use the custom view models you created. See "Configuring the Custom Event View Model in the Registry ".
6. Create a **MANIFEST.MF** file in the **src/conf** folder using the instructions in "Creating a Manifest for your Shared Library".
7. Use the instructions in "Packaging and Deploying Customizations" to create a production deployment plan and a **.war** file containing your customizations.

Creating Custom Event Back-End Files

Billing Care uses the REST API to retrieve event details to display in the Events dialog box. To fetch an extended event flist, you must create custom back-end resource and worker files to process the custom logic.

Sample back-end files are provided in the *SDK_home***/samples/EventsDialog/src** directory. This sample defines the new mappings for the event module and the custom logic required to fetch the raw payload. Use this sample to extend the API for the custom data required by your service.

To create custom event back-end files:

1. To customize the Events dialog box to fetch an event's flist and populate a custom **Account Number** field, copy **CustomModule.properties**, **CustomEventModule.java**,

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CustomEventResource.java, and **CustomEventWorker.java** from the sample directory to your custom project's **src** directory according to the standard directory structure.

2. Define the custom logic in **CustomEventWorker.java** and **CustomEventResource.java** to fetch and return the event flist data as a JSON response. For example:

```
public class CustomEventResource {
    @GET
    @Produces(MediaType.APPLICATION_JSON)
    public Response getCustomEventDetails(...) {
        // Add custom logic to fetch the raw event Flist from the database
        // and return it as a JSON response to the Billing Care UI.
    }
}
```

3. Save the files in your NetBeans IDE project.

Creating a Custom Event View Model

Billing Care uses a view model to define the fields and logic captured in the Events dialog box. The fields defined in the view model are bound in the HTML file used to render the dialog box. To add custom columns or a **Copy** button, create a custom events view model.

A sample **CustomEventsViewModel.js** file is provided in the *SDK_home***/samples/EventsDialog/web/custom/js/viewmodels** directory. Use this sample to extend the default view model for defining the custom columns or invoking the custom API required by your service.

To create a custom events view model:

1. Copy the **CustomEventsViewModel.js** file from the sample directory to the *myproject***/web/custom/js/viewmodels** directory, where *myproject* is the folder containing your NetBeans IDE project.
2. Define the logic for your custom columns and API invocations as required.
3. Save the file in your NetBeans IDE project.

Creating Custom Event View Model HTML Templates

Billing Care uses an HTML view file to render the Events dialog box. To display your custom columns or apply different styling to the Start Date and End Date fields, you create custom HTML templates.

To create a custom view model HTML template for customizing the Events dialog box:

1. Create your custom HTML file (for example, **installmentDebit.html**) in the *myproject***/web/custom/templates** directory.
2. Define the custom columns, such as **Account Number** and **Event Details**, in HTML as required for rendering in this file.
3. Save the file in your NetBeans IDE project.

Configuring the Custom Event View Model in the Registry

After creating the required custom view model and templates, create a custom module entry in the **customRegistry.js** file to use when opening the Events dialog box. Billing Care uses the custom view model instead of the default entry when rendering the dialog box.

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A sample **customRegistry.js** file is provided in the *SDK_home*/**samples/EventsDialog/web/custom** directory. Use this sample to create the registry file containing your custom overrides.

To create a custom view model entry in the registry:

1. Create or copy the **customRegistry.js** file from the sample directory to *myproject*/**web/custom**.
2. Define the custom view model and template entries in the file. For example:

```
var CustomRegistry = {
    events: {
        viewmodel: 'custom/js/viewmodels/events/CustomEventsViewModel.js'
    }
    // Add additional template registration as required for your custom HTML files
};
```

3. Save the file in your NetBeans IDE project.

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Customizing the Newsfeed Area

Learn how to use the Oracle Communications Billing Care SDK to customize the Newsfeed area on the Billing Care account home page.

Topics in this document:

- About Customizing the Newsfeed Area
- Customizing the Newsfeed Area

About Customizing the Newsfeed Area

The Newsfeed area of the Billing Care account home page shows a timeline of account events, such as recurring charges, bills issued, and overdue notifications. Each entry displays details such as the date, event type, and amount, along with additional descriptive fields. The Newsfeed area supports filtering and sorting by bill unit, category, or event name.

You can customize the Newsfeed area in the following ways:

- Add columns to display custom information.
- Introduce new custom Newsfeed filters based on Newsfeed type.
- Configure handling for existing or custom Newsfeed events.

The Billing Care SDK includes sample Newsfeed area customizations. Use these samples when developing your own customizations.

About the Sample Files

The SDK sample for customizing the Newsfeed is located in *SDK_home***/samples/Newsfeed**, where *SDK_home* is the SDK installation directory.

The customization files provided in this sample are:

- **Newsfeed/web/custom/customRegistry.js**: Adds an entry to override the default view model JavaScript files.
- **Newsfeed/web/js/viewmodels/CustomNewsfeedViewModel.js**: Contains the logic for the UI customizations, including adding a new **Bill** column and handling the custom newsfeed type **127**.
- **Newsfeed/src/java/custom/CustomModule.properties**: Contains the new mapping for the Newsfeed module.
- **Newsfeed/src/java/custom/configurations/CustomConfigurations.xml**: Defines the extra newsfeed type **Custom Bucket** and maps it to the corresponding view model key.
- Custom modules, all located in the **Newsfeed/src/java/com/oracle/communications/brm/cc** directory:
  - **modules/CustomNewsfeedModule.java**: Modifies the API response to include the data required for the new Bill column.

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- **modules/pcm/workers/CustomNewsfeedWorker.java**: Carries out the custom data retrieval logic for the additional field.

Customizing the Newsfeed Area

To extend the Newsfeed area with additional columns (such as a Bill column) or new filter categories, you must customize the underlying view models, HTML templates, configuration files, and back-end logic.

To customize the Newsfeed area:

1. Create a custom web project in your NetBeans IDE.
2. (Optional) Create the custom back-end files to define the logic for the additional fields. See "Creating Custom Newsfeed Back-End Files (Optional)".
3. (Optional) Create a custom view model to render the new data and handle custom UI logic. See "Creating a Custom Newsfeed View Model".
4. Configure custom newsfeed types and filters in the configuration file. See "Introducing Custom Newsfeed Types and Filters".
5. Create a **customRegistry.js** file to configure Billing Care to use your custom view model. See "Configuring the Custom Newsfeed View Model in the Registry".
6. Create a **MANIFEST.MF** file in the **src/conf** folder using the instructions in "Creating a Manifest for your Shared Library".
7. Use the instructions in "Packaging and Deploying Customizations" to create a production deployment plan and a **.war** file containing your customizations.

Creating Custom Newsfeed Back-End Files (Optional)

Billing Care uses Java back-end files to define logic for API responses. Perform this step only if you want to add a link or field that calls a custom API. The sample SDK files create an additional Bill field and add a custom newsfeed type (ID **127**) in the API responses, but you can customize the files to meet your business needs.

To create custom newsfeed back-end files:

1. Copy **CustomNewsfeedModule.java** and **CustomNewsfeedWorker.java** from the *SDK_home*/**samples/Newsfeed/src** directory to your custom project's back-end **src** directory. The **CustomNewsfeedModule.java** file is located in the **Newsfeed/src/java/com/oracle/communications/brm/cc/modules** directory and the worker file is in the **Newsfeed/src/java/com/oracle/communications/brm/cc/modules/pcm/workers** directory.
2. Configure the custom logic in these files to define the additional **Bill** field and handle the custom newsfeed type (ID 127) logic.
3. Save the files in your NetBeans IDE project.

Creating a Custom Newsfeed View Model

Billing Care uses a view model to define how to display the table and fields in the Newsfeed area. The fields defined in the view model are bound in the default HTML file used to render the table. To add custom columns, such as a Bill column, or to handle custom newsfeed types, create a custom newsfeed view model.

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A sample **CustomNewsfeedViewModel.js** file is provided in the *SDK_home***/samples/Newsfeed/web/custom/viewmodels** directory. Use this sample to extend the default view model for defining your custom columns or calling the logic required by your service. In this sample, the data for the new column is populated by the **populateEventSpecificDetails** function, which is also responsible for handling custom newsfeed events with type **127**.

To create a custom newsfeed view model:

1. Copy the **CustomNewsfeedViewModel.js** file from the sample directory to the *myproject***/web/custom/js/viewmodels/NewsfeedCustomization** directory in your NetBeans IDE project.
2. Configure the view model to add the **Bill** column and ensure the **populateEventSpecificDetails** function processes the bill field and handles type 127 events.
3. Save the file in your NetBeans IDE project.

Introducing Custom Newsfeed Types and Filters

You can define custom Newsfeed types and filter categories to support new event types and allow advanced filtering in the Newsfeed area. When a new type is added to the configuration, a corresponding filter category is automatically created in the Newsfeed filter.

To introduce new Newsfeed types and filters:

1. To enable users to filter by custom Newsfeed events in the UI, you must define the new filter category in the configuration file.
   a. Copy or edit the **CustomConfigurations.xml** file in your custom project.
   b. Configure your custom Newsfeed type by adding it to the **newsfeed.categories** key. For example, add the **Custom Bucket** entry to the JSON string value:

```
<keyvals>
    <key>newsfeed.categories</key>
    <value>[{"key":"DENY","newsfeedTypes": ""},
        {"key":"Custom Bucket", "newsfeedTypes": "CUSTOM_NEWSFEED"},
        {"key":"AR", "newsfeedTypes": "ADJUSTMENT, NCR_ADJUSTMENT, OPEN_DISPUTE,
CLOSED_DISPUTE, WRITEOFF, WRITEOFF_REVERSAL, REFUND, COLLECTIONS, LIMIT_CHANGE"},
        {"key":"PAYMENTS","newsfeedTypes": "PAYMENT, PAYMENT_REVERSAL,
PAYMENT_METHOD_ASSIGNMENT_CHANGE, PAYINFO"},
        {"key":"CHARGES","newsfeedTypes": "PURCHASE, CANCEL, OFFER_STATUS ,
CORRECTIVE_BILL, RECURRING_CHARGE, BILL_ISSUED, BILL_ISSUED_MID_CYCLE,
ONE_TIME_CHARGE, TRANSITION"},
        {"key":"ACCOUNT","newsfeedTypes": "NAMEINFO, ACCT_STATUS, DEFERRED,
SRVC_STATUS,  SRV_TO_DEV, BILLINFO, BILLINFO_CREATED, BILLINFO_DELETED,
BALANCE_GROUP_TRANSFER, SHARING_GROUPS"}]</value>
    <desc>Within the newsfeed, sub-categories for various newsfeed categories</
desc>
</keyvals>
```

2. To link the new type to your UI logic, you must define it in the view model.
   a. Open your **CustomNewsfeedViewModel.js** file.
   b. Configure the **self.NEWSFEED_TYPES** object by adding your custom type key. For example:

```
self.NEWSFEED_TYPES = {
    // ... existing types ...
    CUSTOM_NEWSFEED: 127
};
```


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3. Save your configuration and view model files in your NetBeans IDE project.

Configuring the Custom Newsfeed View Model in the Registry

After creating your custom HTML view and view model, you must register them in the Billing Care registry to ensure your changes are applied to the Newsfeed area.

To configure the custom Newsfeed area in the registry:

1. Create or edit the **customRegistry.js** file in the *myproject*/**web/custom** directory.
2. Configure the mapping for your custom Newsfeed area view and view model. For example:

```
var CustomRegistry = {
    newsfeed: {
        view: 'text!../custom/templates/customNewsfeedView.html',
        viewmodel: 'custom/viewmodels/customNewsfeedViewModel.js'
    }
};
```

3. Save the file in your NetBeans IDE project.

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Part IV

Customizing Searches and Filters in Billing Care

This part describes how to customize the search and filter functionality in Oracle Communications Billing Care. It contains the following chapters:

- Searching for Accounts by Payment ID
- Filtering Bundles Available for Purchase
- Filtering Start and End Dates for Additional Purchase
- Customizing Search Filter for Suspended Payments
- Exporting Billing Care Search Results

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Searching for Accounts by Payment ID

Learn how to customize the Oracle Communications Billing Care account search screen to support searches by Payment ID.

Topics in this document:

- About Account Searches in Billing Care
- Adding a Payment ID Field to the Account Search Screen
- Naming the Custom Account Search Template in the CustomConfigurations.xml File
- Creating a Custom Account Search Template
- Creating a Custom Account Search View Model
- Creating a Custom Search View Model
- Creating a Custom Router View Model
- Creating a Custom Router Helper
- Creating a Custom Account Search View Model HTML Template
- Replacing the Default Method for Showing Recently Opened Accounts
- Configuring a Custom Module in the Registry
- Creating a customized_en.xlf File Entry for Payment ID Search Field
- Getting Payment Item POIDs from BRM
- Deploying Customizations

About Account Searches in Billing Care

The Billing Care account search screen includes multiple fields on which searches can be performed. For example, you can search for accounts by entering account numbers, last names, or addresses in designated fields on the screen. The default account search screen does not, however, support searches by payment ID.

Adding a Payment ID Field to the Account Search Screen

To enable users to search for accounts by payment ID, you can add a **Payment ID** field to the account search screen.

To add a Payment ID field to the Billing Care account search screen:

1. Specify the name of the custom account search template in the **CustomConfigurations.xml** file. See "Naming the Custom Account Search Template in the CustomConfigurations.xml File".
2. Create the custom account search template containing the payment ID search criteria. See "Creating a Custom Account Search Template".
3. Create a custom account search view model to override the default Billing Care account search behavior. See "Creating a Custom Account Search View Model".

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4. Create a custom search view model to display the related payment details when an account is opened from the results of a search based on payment ID. See "Creating a Custom Search View Model".
5. Create a custom router view model to accept a query parameter and route to a custom router helper function when users search for an account by payment ID. See "Creating a Custom Router View Model".
6. Create a custom router helper to add a function that displays the related payment details when an account is opened from the results of a search based on payment ID. See "Creating a Custom Router Helper ".
7. Create the account search view model HTML template to display the new **Payment ID** search field. See "Creating a Custom Account Search View Model HTML Template".
8. Replace the default method for listing the most recently opened account in the account search screen. See "Replacing the Default Method for Showing Recently Opened Accounts".
9. Create a **customRegistry.js** file configuring Billing Care to use the custom account search view model created in step 3. See "Configuring a Custom Module in the Registry".
10. Create a **customized_en.xlf** file containing a localizable value for the new Payment ID search field in the Billing Care account search screen. See "Creating a customized_en.xlf File Entry for Payment ID Search Field".
11. Configure Billing Care to get the appropriate payment item Portal object ID (POID) from BRM when users search for an account by payment ID. See "Getting Payment Item POIDs from BRM".

Naming the Custom Account Search Template in the CustomConfigurations.xml File

Before creating a custom search template to search for accounts by payment ID, you must specify the template's name in the custom Billing Care configuration file.

To name the custom account search template in the **CustomConfigurations.xml** file:

1. If your system does not have a **CustomConfigurations.xml** file, create the file. See "Creating a Custom Configuration File".
2. Open the **CustomConfigurations.xml** file in an editor.

> **Note**
>
> By default, the **CustomConfigurations.xml** file is in the *myproject***/web/custom/configurations/** directory, where *myproject* is your NetBeans IDE Billing Care customizations project.

3. In the file's **search.options** key, specify a name for your custom account search template.

   Example 37-1 shows the **search.options** key with **My Custom Search** specified as the search template name:
4. Set the default search option using the **defaultSearch** attribute.
5. Save the file in your NetBeans IDE project.

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Example 37-1 CustomConfigurations.xml search.options Key with "My Custom Search" as Search Template Name

```
 [{"searchTemplateKey": "accountSearch", "searchTemplateName":"SEARCH_OPTION_ACCOUNTS",
"defaultSearch": false},{"searchTemplateKey": "CustomAccountSearch",
"searchTemplateName":"My Custom Search", "defaultSearch": true}]
```

Creating a Custom Account Search Template

The Billing Care account search screen uses a template that defines what search fields to display. To add the **Payment ID** field in the account search screen, you must create a custom account search template containing the **Payment ID** field in the **filter** element in your NetBeans IDE project.

For more information on customizing templates, see "Customizing Billing Care Templates".

When creating your custom account search template, use the reference **accountSearch.xml** template file located in the *SDK_home***/references** directory.

To create an account search template with the **Payment ID** field:

1. Create a custom account search template file for the account search screen by using the reference example in *myproject***/src/custom**.

   Use a descriptive name for your file such as **CustomAccountSearch.xml**.

2. Define the **Payment ID** criteria in the **filter** element.

   Example 37-2 shows the code to add for the **Payment ID** filter.

3. Add a column in the **CustomAccountSearch.xml** file to store payment item POIDs, which are used to open the appropriate payment details overlay for accounts returned by searches based on payment IDs.

   Example 37-3 shows the code to add for the payment item POID column.

4. Save the file in your NetBeans IDE project.

Example 37-2 Payment ID Filter

```
<criteria name="paymentID">
    <label></label>
    <inputType>Text</inputType>
    <width>245</width>
    <placeHolder>PAYMENTID</placeHolder>
    <fieldKey>payment.transId</fieldKey>
    <storableClass>eventBillingPayment</storableClass>
    <visible>true</visible>
```

Example 37-3 Payment Item POID Column

```
<column name="eventId">
   <type>text</type>
   <fields>itemObj</fields>
</column>
<columnHeader name="eventId">
   <label>EVENT_ID_UC</label>
   <width>15%</width>
   <visible>true</visible>
   <sortable>false</sortable>
   <tooltip>EVENT_ID_UC</tooltip>
   <resizable>false</resizable>
   <alignment>left</alignment>
</column>
```


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Creating a Custom Account Search View Model

Billing Care uses an account search view model to define account search behavior.

Create a custom account search view model containing the **Payment ID** search filter by using the sample **customAccountSearch.js** file. This sample contains the override functions to add payment ID criteria to the custom account search template.

To create a custom account search view model:

1. Copy the *SDK_home***/samples/AccountSearchCustomization/web/custom/js/viewmodels/search/customAccountSearch.js** file to the *myproject***/web/custom/js/viewmodels/***area***/configure** directory.

   where *area* is the customization type (for example, **accountSearch** for customizations done to account search view model files).

2. Include the **customAccountSearch.js** file when you package your customizations shared library for deployment to your Billing Care domain.

   For more information, see "Packaging and Deploying Customizations".

Creating a Custom Search View Model

Billing Care uses a search view model to open an account from the results of an account search.

Create a custom search view model to support searches based on payment IDs by using the sample **customSearchViewModel.js** file in the Billing Care SDK. This sample contains code that displays the payment details overlay when an account is opened from the results of a search based on a payment ID.

To create a custom search view model:

1. Copy the *SDK_home***/samples/AccountSearchCustomization/web/custom/js/viewmodels/customSearchViewModel.js** file to the *myproject***/web/custom/js/viewmodels/***area***/configure** directory.
2. Include the **customSearchViewModel.js** file when you package your customizations shared library for deployment to your Billing Care domain.

   For more information, see "Packaging and Deploying Customizations".

Creating a Custom Router View Model

Billing Care uses a router view model to route patterns to a function.

Create a custom router view model to support searches based on payment IDs by using the sample **customRouterViewModel.js** file in the Billing Care SDK. This sample contains code that overrides the default open account router URL to accept a payment item POID as a query parameter when an account search is based on a payment ID.

To create a custom router view model:

1. Copy the *SDK_home***/samples/AccountSearchCustomization/web/custom/js/viewmodels/customRouterViewModel.js** file to the *myproject***/web/custom/js/viewmodels/***area***/configure** directory.

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2. Include the **customRouterViewModel.js** file when you package your customizations shared library for deployment to your Billing Care domain.

   For more information, see "Packaging and Deploying Customizations".

Creating a Custom Router Helper

In Billing Care, a router helper routes the router view model request to a function that opens an account.

Create a custom router helper to support searches based on payment IDs by using the sample **customRouterHelper.js** file in the Billing Care SDK. This sample contains code that routes the router view model request to a function that displays the related payment details when an account is opened from the results of a search based on payment ID.

To create a custom router helper:

1. Copy the *SDK_home***/samples/AccountSearchCustomization/web/custom/js/routers/customRouterHelper.js** file to the *myproject***/web/custom/js/viewmodels/***area***/configure** directory.
2. Include the **customRouterHelper.js** file when you package your customizations shared library for deployment to your Billing Care domain.

   For more information, see "Packaging and Deploying Customizations".

Creating a Custom Account Search View Model HTML Template

Billing Care uses an HTML view file to render the account search screen during. You must create a custom account search view model HTML template to display the **Payment ID** search field.

A sample **customAccountSearch.html** file is provided in the *SDK_home***/samples/AccountSearchCustomization/web/custom/templates/search** directory. Use this sample to create a custom account search HTML template for displaying the **Payment ID** search field and the required data binding.

To create a custom account search HTML template for rendering the **Payment ID** field:

1. Create a **customAccountSearch.html** file in the *myproject***/web/custom/js/templates/***area***/configure** directory.
2. Define the **Payment ID** field in HTML required for rendering in this file.
3. Save the file in your NetBeans IDE project.

Replacing the Default Method for Showing Recently Opened Accounts

When you open an account from the default search results and then return to the search screen, the recently opened account is listed at the bottom of the screen.

To continue listing the most recently opened account after customizing the account search template, replace the **RecentRecordsModel.js** file in your NetBeans IDE Billing Care customizations project with the sample **customRecentRecordsModel.js** file. This sample contains an updated method that supports the recently opened account feature in the custom account search flow.

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To replace the default method for showing recently opened accounts:

1. Copy the *SDK_home***/samples/AccountSearchCustomization/web/custom/js/viewmodels/customRecentRecordsModel.js** file to the *myproject***/web/custom/js/viewmodels/***area***/configure** directory.
2. Include the **customRecentRecordsModel.js** file when you package your customizations shared library for deployment to your Billing Care domain.

   For more information, see "Packaging and Deploying Customizations".

Configuring a Custom Module in the Registry

After creating the required custom account search view model, create a custom module entry in the **customRegistry.js** file to use when searching for accounts. Billing Care uses the custom account search module instead of the default entry when rendering the account search screen.

A sample **registry.js** file is provided in the *SDK_home***/references** directory, where *SDK_home* is the directory in which you installed the Billing Care SDK. Use this sample to create the **customRegistry.js** file containing your custom account search module.

To create a custom account search module entry in a **customRegistry.js** file:

1. Create a **customRegistry.js** file in *myproject***/web/custom** by copying the reference registry file.
2. Define the custom account search module referencing the custom view model and HTML template previously created.

   Example 37-4 shows a definition of the custom account creation module in the registry.
3. Save the file in your NetBeans IDE project.

Example 37-4 Sample Custom Account Search Module Registry Entry

```
var CustomRegistry = {
  customAccountSearch: {
    view : 'text!../custom/templates/search/customAccountSearch.html',
    viewmodel: '../custom/js/viewmodels/search/customAccountSearch'
  },
   search: {
    viewmodel: '../custom/js/viewmodels/customSearchViewModel'
  },
   router: {
    viewmodel: '../custom/js/viewmodels/customRouterViewModel'
  },
   recentRecords: {
    recentRecordsModel: '../../../custom/js/viewmodels/customRecentRecordsModel'
  }
};
```

Creating a customized_en.xlf File Entry for Payment ID Search Field

You must provide a localized English entry for the **Payment ID** search field in the **customized_en.xlf** file to provide a translatable text string in Billing Care.

For more information on the **customized_en.xlf** file and how to add a new entry, see "Customizing Billing Care Labels".

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Example 37-5 shows a sample entry for the Payment ID field to add in the **customized_en.xlf** file.

Example 37-5 Sample Payment ID XLF Entry

```
<trans-unit id="PAYMENT_ID_UC" translate="yes">
        <source>Payment ID</source>
             <target>Payment ID</target>
                   <note from="dev">
                        Comments for file
                   </note>
</trans-unit>
```

Getting Payment Item POIDs from BRM

When users search for an account by payment ID, Billing Care must get the payment item POID so that it can display the appropriate payment details when the account is opened.

To configure Billing Care to get payment item POIDs from BRM:

1. Add a **customModule.properties** file containing the following entry to the *myproject***/web/WEB-INF/classes/custom** directory:

   ```
   billingcare.rest.template.module = rest.CustomPCMTemplateModule
   ```

   This entry instructs Billing Care to load the **CustomPCMTemplateModule** class instead of the default **PCMTemplateModule** class.

   The *SDK_home***/samples/AccountSearchCustomization/src/java/custom/customModule.properties** sample file contains this entry, where *SDK_home* is the directory in which you installed the Billing Care SDK.

   For more information about the custom module properties file, see "About the customModule.properties File".

2. Create a custom **PCMTemplateModule** Java class named **CustomPCMTemplateModule** and override its **getRecordsForTemplate()** method to return the **TemplateMyCustomAccountSearchWorker** Java class instead of the default **TemplateAccountSearchWorker** Java class.

   For a sample of the required override code, see the *SDK_home***/samples/AccountSearchCustomization/src/java/rest/CustomPCMTemplateModule.java** sample class.

   > **Note**
   >
   > Save the custom class in the **rest** folder containing the sample class.

   For more information, see "Customizing Billing Care Templates".

3. Create a custom template worker Java class named **TemplateMyCustomAccountSearchWorker** that gets the corresponding payment item POID from BRM when users search for accounts by payment ID.

   For a sample of the required override code, see the *SDK_home***/samples/AccountSearchCustomization/src/java/rest/TemplateMyCustomAccountSearchWorker.java** sample class.

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> **Note**
>
> Save the custom class in the **rest** folder containing the sample class.

For more information, see "Customizing Billing Care Templates".

Deploying Customizations

Package and deploy your customizations using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

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Filtering Bundles Available for Purchase

Learn how to customize Oracle Communications Billing Care to filter the bundles displayed in the Purchase Catalog screen.

Topics in this document:

- About Filtering Bundles
- Filtering Bundles List in Billing Care
- Creating CustomPCMSubscriptionModule.java Class
- Creating a CustomSubscriptionWorker.java Class
- Updating the customModule.properties File

About Filtering Bundles

In BRM, the PCM_OP_CUST_POL_GET_DEALS opcode enables you to retrieve a customized list of bundles from the BRM database for customer purchase. Similarly, you can retrieve the bundles from the BRM database and filter the list of bundles available for purchase in Billing Care by using the Billing Care SDK. For example, you can customize Billing Care to display only the manually added discount bundles in the bundles list.

Filtering Bundles List in Billing Care

To filter the bundles list in Billing Care:

1. Create a custom template model to override the default subscription flow. See "Creating CustomPCMSubscriptionModule.java Class " for more information.
2. Create a custom template worker class to add custom logic to the subscription flow. See "Creating a CustomSubscriptionWorker.java Class" for more information.
3. Add your customization files to your NetBeans IDE project. See "Updating the customModule.properties File" for more information.
4. Deploy your customizations using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

Creating CustomPCMSubscriptionModule.java Class

Create a custom subscription module class, **CustomPCMSubscriptionModule.java**, and override the **getBundles( )** method.

To create the **CustomPCMSubscriptionModule.java** class:

1. Create the **CustomPCMSubscriptionModule.java** file in *myproject*/**/src/java/com/rest/sdk**, where *myproject* is the folder containing the NetBeans IDE project containing your Billing Care customizations.
2. Override the **getBundles( )** method as shown in this example:

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```
@Override
    public BundleList getBundles(String id, String expand) {
          //method code
  }
```

3. Save the file in your NetBeans IDE project.

Creating a CustomSubscriptionWorker.java Class

Create a custom template worker class containing logic to retrieve and filter the bundles available for purchase.

To create the **CustomSubscriptionWorker.java** class:

1. Create the **CustomSubscriptionWorker.java** file in *myproject*/*projectname*/**src/java/com/rest/sdk**.
2. Override the following methods as appropriate:
   - **convertToInputFListToGetBundleList( ).** This method takes the service type as input and returns the input flist. For example, you can pass "0.0.0.1+-service-email+62503" as an input to retrieve only the bundles that are associated with the service type, **email**.
   - **invokeOpcodeToGetBundleList( ).**This method takes the flist returned by the **convertToInputFListToGetBundleList( )** method as input and triggers the PCM_OP_CUST_POL_GET_DEALS opcode to return the output flist.
   - **convertToOutputFListToGetBundleList( ).** This method takes the flist returned by the **invokeOpcodeToGetBundleList( )** method and a flag that indicates whether charge or discount offers to be retrieved as input and returns the list of bundles associated with the service type.
3. Save the file in your NetBeans IDE project.

Updating the customModule.properties File

Create or update the custom module property file to override the default subscription module logic with your customizations.

To update the custom module property file:

1. Open the **customModule.properties** file in *myproject/projectname*/**src/java/custom**.
2. Add the following entry:

   ```
   billingcare.rest.subscription.module=com.rest.sdk.CustomPCMSubscriptionModule
   ```

3. Save the file in your NetBeans IDE project.

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Filtering Start and End Dates for Additional Purchase

Learn how to customize Oracle Communications Billing Care to filter the **Purchase**, **Recurring (cycle)**, and **Usage** start and end dates that are displayed during additional purchase configuration.

Topics in this document:

- About Customizing Purchase Configuration
- Filtering Start and End Date Options
- Creating a Custom Purchase Deal Configuration View Model
- Configuring the Custom Purchase Configuration View Model in the registry

About Customizing Purchase Configuration

You configure new or additional products or services added to an account by clicking **Configure** in the Purchase Catalogue screen. In the **Configure** screen, multiple start and end date options are displayed for configuring activation, recurring cycles, and usage of the selected product or service.

You can customize Billing Care to filter these start and end date options to display only calendar days for the start date and the number of months for the end date by using the Billing Care SDK. You can also hide the **Recurring (cycle)** and **Usage** sections by using the Billing Care SDK.

Filtering Start and End Date Options

You can customize the purchase configuration screen using the Billing Care SDK to display only the specific start and end date options for activation, recurring fees, and usage of the selected additional product or service.

To filter start and end date options:

1. Create a custom purchase configuration view model to override the default purchase configuration flow. See "Creating a Custom Purchase Deal Configuration View Model" for more information.
2. Configure the custom purchase configuration view model entry in the **customRegistry.js** file to use the custom view model that you created. See "Configuring the Custom Purchase Configuration View Model in the registry" for more information.
3. Deploy your custom project to your application server by using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

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Creating a Custom Purchase Deal Configuration View Model

Billing Care uses view model to define the display of the screens in Billing Care. You must create or update the custom view model, **CustomPurchaseConfigurationViewModel**, and add the details containing the logic to filter **Purchase**, **Recurring (cycle)**, and **Usage** start and end dates.

See "About View Models" for more information about Billing Care view models.

To create a custom purchase deal configuration view model:

1. Create or update the **customPurchaseConfigurationViewModel.js** file in *myproject*/**web/custom/viewmodels** directory, where *myproject* is the folder containing your NetBeans IDE project.
2. Add the following code in the **customPurchaseConfigurationViewModel.js** file using a text editor:

```
define(['knockout',
    'jquery',
    'underscore',
    Registry.accountCreation.wizardBase,
    Registry.accountCreationConfigure.purchaseConfiguration.validator,
    'viewmodels/accountCreation/configure/PurchaseConfigurationViewModel',
    'ojs/ojcore', 'ojs/ojknockout', 'ojs/ojdatetimepicker',
'ojs/ojcheckboxset', 'knockout-extension'],
        function (ko, $, _, WizardBaseViewModel,
ProductCustomizationValidator, PurchaseConfigurationViewModel, oj) {
            function CustomPurchaseConfigurationViewModel() {
                PurchaseConfigurationViewModel.apply(this, arguments);
...
...
            }
            CustomPurchaseConfigurationViewModel.prototype = new
PurchaseConfigurationViewModel();
            return CustomPurchaseConfigurationViewModel;
        }
);

//   Below observable arrays hold the options to be shown in the Product
Configuration Screen
//   Each entry in the Observable Array is stored as an Object which has
three attributes
//   label : the text which will be shown in the UI dropdown
//   value : this attribute stores the value of the option used in viewmodel
to create the JSON to be sent to REST
//   disable : this attribute tells the dropdown whether it will be enabled
to click or not
//   The SUPERSET for the dropdown options in OOTB is below.
//      ([
//           {label: util.getLocalizedValue(productCustomization, 'TODAY'),
value:TODAY,disable: ko.observable(false)},
//           {label: util.getLocalizedValue(productCustomization, 'NEVER'),
value:NEVER,disable: ko.observable(false)},
//           {label: util.getLocalizedValue(productCustomization,
'WHEN_PURCHASE_ACTIVATION_BEGINS'),value:WHEN_PURCHASE_ACTIVATION_BEGINS,
disable: ko.observable(false)},
//           {label: util.getLocalizedValue(productCustomization,
'CALENDAR_DAY'),value:CALENDER_DAY, disable: ko.observable(false)},
//           {label: util.getLocalizedValue(productCustomization,
'CYCLES_AFTER_ACTIVATION'),value:CYCLES_AFTER_ACTIVATION, disable:
```


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```
ko.observable(false)},
//           {label: util.getLocalizedValue(productCustomization,
'MONTHS_AFTER_ACTIVATION'),value:MONTHS_AFTER_ACTIVATION, disable:
ko.observable(false)},
//           {label: util.getLocalizedValue(productCustomization,
'DAYS_AFTER_ACTIVATION'),value:DAYS_AFTER_ACTIVATION, disable:
ko.observable(false)},
//           {label: util.getLocalizedValue(productCustomization,
'HOURS_AFTER_ACTIVATION'),value:HOURS_AFTER_ACTIVATION, disable:
ko.observable(false)},
//           {label: util.getLocalizedValue(productCustomization,
'MINUTES_AFTER_ACTIVATION'),value:MINUTES_AFTER_ACTIVATION, disable:
ko.observable(false)},
//           {label: util.getLocalizedValue(productCustomization,
'SECONDS_AFTER_ACTIVATION'),value:SECONDS_AFTER_ACTIVATION, disable:
ko.observable(false)}
//       ]);
//     The values which are used in VM for JSON creation are :
//     NOTE : do not override these variables
//           var TODAY = "today";
//           var CALENDAR_DAY = "calendar-day";
//           var NEVER = "never";
//           var SECONDS_AFTER_ACTIVATION = "seconds";
//           var MINUTES_AFTER_ACTIVATION = "minutes";
//           var DAYS_AFTER_ACTIVATION = "days";
//           var HOURS_AFTER_ACTIVATION = "hours";
//           var MONTHS_AFTER_ACTIVATION = "months";
//           var CYCLES_AFTER_ACTIVATION = "cycles";
//           var
WHEN_PURCHASE_ACTIVATION_BEGINS="when-purchase-activation-begins";

    self.productActivationDateOptions - observable array which should be
overridden dropdown options for Product Activation
    self.productDeactivationDateOptions - observable array which should be
overridden dropdown options for Product De-activation
    self.productStartCycleDateOptions - observable array which should be
overridden dropdown options for Cycle/Recurring Start
    self.productStopCycleDateOptions - observable array which should be
overridden dropdown options for Cycle/Recurring Stop
    self.productStartUsageDateOptions - observable array which should be
overridden dropdown options for Usage Start
    self.productStopUsageDateOptions - observable array which should be
overridden dropdown options for Usage Stop
```

3. Modify the following entries in the file as required to filter the date options displayed in the Configure screen:

   - productActivationDateOptions
   - productDeactivationDateOptions
   - productStartCycleDateOptions
   - productStopCycleDateOptions
   - productStartUsageDateOptions
   - productStopUsageDateOptions

   For example, if product deactivation list in the Configure screen has to be modified to include only CYCLES_AFTER_ACTIVATION and MONTHS_AFTER_ACTIVATION options, override the **productDeactivationDateOptions** entry in the file to include only these options:

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```
self.productDeactivationDateOptions = ko.observableArray([
                    {label: util.getLocalizedValue(productCustomization,
'CYCLES_AFTER_ACTIVATION'), value: 'cycles', disable: ko.observable(false)},
                    {label: util.getLocalizedValue(productCustomization,
'MONTHS_AFTER_ACTIVATION'), value: 'months', disable: ko.observable(false)},
                ]);
```

4. (Optional) To hide the complete **Recurring (cycle)** section, set the **showProductConfigureCycleSection** entry in the file to **false**:

```
self.showProductConfigureCycleSection = ko.observable(false);
```

5. (Optional) To hide the complete **Usage** section, set the **showProductConfigureUsageSection** entry in the file to **false**:

```
self.showProductConfigureUsageSection = ko.observable(false);

    // BRM mandates that -
    // Cycle/Usage START is always greater than or equal to Purchase START
    // Cycle/Usage END is always less than or equal to Purchase END
    // If Cycle/Usage section is hidden, then their START and END must be set
same
    // as that of Purchase START and END
    // Override Cycle/Usage variables as below to map it to Purchase

    self.cycleStart = ko.computed(function(){
        return self.purchaseStart();
    });
    self.cycleEnd = ko.computed(function(){
        return self.purchaseEnd();
    });
    self.cycleEndRelativeValue = ko.computed(function(){
        return self.purchaseDeactivationRelativeValue();
    });
    self.usageStart = ko.computed(function(){
        return self.purchaseStart();
    });
    self.usageEnd = ko.computed(function(){
        return self.purchaseEnd();
    });
    self.usageEndRelativeValue = ko.computed(function(){
        return self.purchaseDeactivationRelativeValue();
    });
```

6. Save the file in your NetBeans IDE project.

Configuring the Custom Purchase Configuration View Model in the registry

After creating the required custom view model, create a custom purchase configuration view model entry in the **customRegistry.js** file. Billing Care uses the custom purchase configuration view model instead of the default view model during additional product purchase and renders the Configure screen containing your customization.

To create the custom purchase configuration view model entry in the registry:

1. Create a **customRegistry.js** file in *myproject***/web/custom/** directory.
2. Define the custom purchase configuration view model in this file. For example:

```
accountCreationConfigure: {
        purchaseConfiguration:
```


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```
                {
                    viewmodel: "custom/viewmodels/
CustomPurchaseConfigurationViewModel.js"
                },
    },
```

3. Save the file in your NetBeans IDE project.

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Customizing Search Filter for Suspended Payments

Learn how to customize the Oracle Communications Billing Care search filter to find suspended payments.

Topics in this document:

- About Suspended Payment Search Filter
- Adding Search Criteria
- Creating a CustompaymentSuspenseSearch.xml File
- Creating a CustomTemplatePaymentSuspenseWorker.java Class
- Creating a CustomPCMTemplateModule.java Class
- Creating a customModule.properties File
- Updating Registry
- Updating customPaymentSuspenseSearchView.html
- Updating View Model
- Localizing New Criteria into Other Languages
- Creating Deployment Plan
- Creating .war File

About Suspended Payment Search Filter

Oracle Communications Billing and Revenue Management (BRM) automatically suspends subscriber payments that do not include sufficient information to associate the payment with an account. For example, BRM suspends payments made to unidentifiable accounts or incorrect bill numbers.

You can use the Payment filter to find suspended payments. To narrow your suspended payment search results, use the filters provided under Payment, Suspense, and Account groups. Each search group has a set of default search criteria. See the discussion about working with suspended payments in Oracle Communications Billing Care Online Help for more information on searching suspended payments.

Adding Search Criteria

Search filter includes groups and criteria. You can add custom criteria to the following groups to customize search filter:

- Payment
- Suspense
- Account

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To add search criteria to search groups:

1. Create a template with new search criteria. See "Creating a CustompaymentSuspenseSearch.xml File" for more information.
2. Create a java class file to add custom logic. See "Creating a CustomTemplatePaymentSuspenseWorker.java Class" for more information.
3. Create a custom template module class file to override default search criteria. See "Creating a CustomPCMTemplateModule.java Class" for information.
4. Create a properties file to mention the custom Template Module class. See "Creating a customModule.properties File" for more information.
5. Add an entry in the registry to override the out-of-the-box view and filter files. See "Updating Registry" for more information.
6. Add new criteria for payment suspense search to the interface. See "Updating customPaymentSuspenseSearchView.html" for more information.
7. Edit view model to handle new criteria. See "Updating View Model" for more information.
8. Localize the new criteria to other languages. See "Localizing New Criteria into Other Languages" for more information.
9. Create a deployment plan for your customizations. See "Creating Deployment Plan" for more information.
10. Create a **.war** file to deploy your customizations. See "Creating .war File" for more information.

Creating a CustompaymentSuspenseSearch.xml File

Create a copy of the default template **paymentSuspenseSearch.xml** file and add new search criteria to the filter section of the file.

To create a custom payment suspense search template:

1. Copy **paymentSuspenseSearch.xml** file from *SDK_home*/**BillingCareSDK/references/paymentsuspensetemplates** directory to *myproject/projectname*/**src/java/custom/paymentsuspensetemplates** directory,

   where:

   - *SDK_home* is the Billing Care SDK installation directory
   - *myproject* is the folder containing your NetBeans IDE project
   - *projectname* is the name of your custom project. For example, SuspenseSearchFilter.
2. Rename the copied XML file to **CustompaymentSuspenseSearch.xml**.
3. Edit **CustompaymentSuspenseSearch.xml** and add the new search criteria in the filter section of the XML file. Example 40-1 shows an example of adding bank account criteria to the filter.
4. Save the file in your NetBeans IDE project.

Example 40-1 Sample Search Criteria in CustompaymentSuspenseSearch.xml

```
<filter>
.....
.....
.....
<criteria name="bankAccountNo">
            <inputType>Text</inputType>
```


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```
            <fieldKey>checkInfo.bankAccountNo</fieldKey>
            <storableClass>/event/billing/payment</storableClass>
        </criteria>……..
……..  ……
</filter>
```

> **Note**
>
> Ensure the storable class for new criteria is base class. In this example, base class is **/event/billing/payment**. Do not add the subclass directly, such as **/event/billing/payment/check**.

Creating a CustomTemplatePaymentSuspenseWorker.java Class

Create a custom template worker class containing logic to search suspense payments based on new criteria. A sample **CustomTemplatePaymentSuspenseWorker.java** file is provided in the *SDK_home*/**BillingCareSDK/samples/PaymentSuspenseSearchFilter /src/java/custom/com/rest/sdk** directory.

To create a custom payment suspense worker class:

1. Create a **CustomTemplatePaymentSuspenseWorker.java** file in *myproject/projectname/***src/java/com/rest/sdk**.
2. Override **buildPaymentSuspenseInputFList** and **constructFilterForInputFlist** as shown in the sample **CustomTemplatePaymentSuspenseWorker.java** file.
3. Add the custom storable classes for the payment based on the new payment criteria subclass. Example 40-2 shows an example of adding bank account criteria to the filter.
4. Save the file in your NetBeans IDE project.

Example 40-2 Sample Custom Payment Suspense Storable Class

```
if (strKey.contains("cashInfo")) {
                        if (!storableClass.equals("") && !storableClass.equals("/cash"))
{
                            return null;
                        }
                        storableClass = "/cash";
```

Creating a CustomPCMTemplateModule.java Class

Create a custom template module class and override the **getRecordsForTemplate()** method.

To create a custom template module class:

1. Create **CustomPCMTemplateModule.java** file in *myproject*/**/src/java/com/rest/sdk**.
2. Override the **getRecordsForTemplate()** method as shown in Example 40-3.
3. Call **CustomTemplatePaymentSuspenseWorker.java** class as shown in Example 40-4.
4. Save the file in your NetBeans IDE project.

Example 40-3 Override getRecordsForTemplate()

```
@Override
    public List<ColumnarRecord> getRecordsForTemplate(String templateType, String id,
String secondaryId, int offset, int limit, SearchCriterias searchCriteria,
```


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```
List<GenericTemplate.SortbyFields> sortByFields) {
        PortalContext ctx = null;
        try {
            BaseOps baseOps = getBaseOps();
            if (baseOps instanceof PCMBaseOps) {
                ctx = BRMUtility.getConnection();
                ((PCMBaseOps) baseOps).setContext(ctx);
            }
        }
    }
```

Example 40-4

```
if (templateType.equalsIgnoreCase("paymentsuspensesearch")) {
                templateWorker = new CustomTemplatePaymentSuspenseWorker();
            }
```

Creating a customModule.properties File

Create a custom module property file to override the default module logic with your customizations.

To create a custom module property file:

1. Create **customModule.properties** file in *myproject/projectname/***src/java/custom**.
2. Add the following entry:

   `billingcare.rest.template.module = com.rest.sdk.CustomPCMTemplateModule`
3. Save the file in your NetBeans IDE project.

Updating Registry

After creating the required custom view model, add a custom module entry in the **customRegistry.js** file to include the new criteria to the filter. Use the correct registry key to add the custom module in the **customRegistry.js** file.

The available registry keys are:

- paymentFilter
- suspenseFilter
- accountFilter

To add an entry in the **customRegistry.js** file:

1. Edit the **customRegistry.js** file in *myproject/projectname/***web/custom**.
2. Add an entry as shown in Example 40-5. In this example, the customRegistry contains accountFilter registry key because the new criteria is added to account group of filter section.
3. Save the file in your NetBeans IDE project.

Example 40-5 Sample Custom Payment Suspense Module Registry Entry to Filter Accounts

```
var CustomRegistry = {    paymentSuspenseSearch: {
      view: 'text!../custom/templates/paymentSuspense/
customPaymentSuspenseSearchView.html',
      accountFilter:  'custom/viewmodels/paymentSuspense/
```


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```
customPaymentSuspenseSearchAccountFilterViewModel.js'
   }
};
```

Updating customPaymentSuspenseSearchView.html

Customize **customPaymentSuspenseSearchView.html** to add a new criteria for payment suspense search.

To add new criteria for payment suspense search in the **customPaymentSuspenseSearchView.html** file:

1. Edit the **customPaymentSuspenseSearchView.html** file in *myproject/projectname*/**web/custom/templates/paymentSuspense**.
2. Add new criteria for payment suspense search as shown in Example 40-6.
3. Save the file in your NetBeans IDE project.

Example 40-6 Sample Custom Payment Suspense Search View Criteria

```
<div class="oj-row filter-header">
                    <div class="oj-col oj-lg-12">
                        <label id="payment-filter-bank-account-number-label" data-
bind="text: bankAccountNoHeading, attr: {'for': 'selected-bill-account-number'}"
class="payment-suspense-search-filter-label"></label>
                    </div>
                </div>
                <div class="oj-row">
                    <div class="oj-col oj-lg-12">
                        <div id="selected-bank-account-number" class="items-wrapper"
data-bind="foreach: bankAccountNo">
                            <div class="token-item">
                                <span data-bind="text: $data, attr: {title: $data}"></
span>
                                <i class="icon" tabindex="0" data-
bind="click: $parent.removeBankAccountNo, event:
{ keyup : $parent.removeBankAccountNoOnEnterOrSpace} "></i>
                            </div>
                        </div>
                    </div>
                </div>
```

Updating View Model

Update the view model to handle new criteria. For example, update **CustomPaymentSuspenseSearchAccountFilterViewModel.js** to handle new criteria in account group. If a criteria is added to suspense or payment group then update the corresponding custom view model.

The available filter view models are:

- PaymentSuspenseSearchPaymentFilterViewModel
- PaymentSuspenseSearchSuspenseFilterViewModel
- PaymentSuspenseSearchAccountFilterViewModel

To update a view model:

1. Go to *myproject/projectname*/**web/custom/viewmodels/paymentSuspense**.

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2. Edit view model to handle new criteria as shown in Example 40-7.
3. Save the file in your NetBeans IDE project.

Example 40-7 Sample Custom Payment Suspense Search Account Filter View Model

```
define(['jquery', 'knockout',
   'viewmodels/paymentSuspense/PaymentSuspenseSearchAccountFilterViewModel'
],
        function ($, ko,PaymentSuspenseSearchAccountFilterViewModel) {
            function customPaymentSuspenseSearchAccountFilterViewModel() {
                PaymentSuspenseSearchAccountFilterViewModel.apply(this, arguments);
….
..}
```

> **Note**
>
> The reset and sync functions should be available in all view models. Entries present in each function are dependent on the search criteria. You can change the name of the function and entries as per search criteria.

Localizing New Criteria into Other Languages

Localize the new criteria headings and label into other languages. See "Customizing the Resource Bundle" for more information.

Creating Deployment Plan

Create a production deployment plan named **plan.xml** for your production Billing Care deployment. See "Packaging and Deploying Customizations" for more information.

Creating .war File

Create a **.war** file containing your customizations to deploy to multiple Billing Care instances. See "Packaging and Deploying Customizations" for more information.

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Exporting Billing Care Search Results

Learn how to enable the export of Oracle Communications Billing Care accounts, events, and payments search results to PDF files by using the SDK.

Topics in this document:

- About Billing Care Search
- Enabling Search Results Export with the SDK
- Creating Custom Search Templates
- Creating Custom Search View Models
- Configuring Custom Search Modules in the Registry
- Deploying Customizations

About Billing Care Search

Billing Care provides search functionality for querying accounts, subscriber events, and payments. By default, Billing Care search results cannot be exported. Results are viewable only in the Billing Care application.

Enabling Search Results Export with the SDK

The SDK provides the ability to expose an embedded export link on Billing Care search results screens. Use the SDK to enable export links in the Billing Care search screens.

The Billing Care SDK includes sample search results export implementation in the *SDK_home***/samples/SaveSearchResults** directory. Use the samples as a guideline for enabling search results export.

To enable search results export to PDF in Billing Care:

1. Create custom search templates with the element **saveResults** set to **true** to enable the **Export** link. See "Creating Custom Search Templates" for more information.
2. Create custom search view models containing the **savetoFile** function. See "Creating Custom Search View Models" for more information.
3. Create a **customRegistry.js** file configuring Billing Care to use the custom search view models created in step 2. See "Configuring Custom Search Modules in the Registry" for more information.
4. Deploy your customizations to your application server. See "Deploying Customizations" for more information.

Creating Custom Search Templates

Each Billing Care search screen (accounts, events, and payments) uses a template that defines what information to display. By default, the **saveResults** element is set to false in each search template, which hides the **Export** link. To enable the **Export** link in each search screen,

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you must create custom search templates for each search screen you want to enable export for in your NetBeans IDE project.

See "Customizing Billing Care Templates" for more information on customizing templates.

The SDK includes sample accounts, events, and payments search templates in *SDK_home*/**samples/SaveSearchResults/src/java/custom**. Use this sample as an example on how to configure Billing Care to enable only complete allocation of suspended payments.

To enable the search screen **Export** link Billing Care:

1. Create custom template files for each search screen using the SDK samples in *myproject*/**src/custom** where *myproject* is the folder containing your NetBeans IDE project.
2. In each search screen XML template file set the **saveResults** element to **true**.
3. Save the file in your NetBeans IDE project.

Creating Custom Search View Models

Billing Care uses search view models to define search screen behavior. You must create custom accounts, events, and payments view models containing the **savetoFile** function to enable search results export to PDF.

See "About View Models" for more information about Billing Care view models.

The following sample view models in the *SDK_home*/**samples/SaveSearchResults/web/js/viewmodels** directory contain the **savetoFile** function for enabling search results export:

- **CustomEventsViewModel.js**
- **CustomPaymentSuspenseSearchViewModel.js**
- **CustomSearchViewModel.js**

Use the sample view models to create your custom models.

To create a custom search view models with enabled **Export** links:

1. Create the required custom search view model JavaScript files in *myproject*/**web/custom/js/viewmodels/***area*/**configure** where *myproject* is the folder containing your NetBeans IDE project and *area* is the customization type (for example, **search**).
2. Include the **savetoFile** function in your custom search view models.
3. Save the file in your NetBeans IDE project.

Configuring Custom Search Modules in the Registry

After creating the required custom search view models, create custom module entries in the **customRegistry.js** file to use when using Billing Care search screens. Billing Care uses the custom search modules instead of the default entries when searching.

A sample **customRegistry.js** file is provided in the *SDK_home*/**samples/SaveSearchResults/web/custom** directory where *SDK_home* is the Billing Care SDK installation directory. This sample defines the custom search modules containing the search results export functionality.

To create custom search module entries in the **customRegistry.js** file:

1. Create a **customRegistry.js** file in *myproject*/**web/custom/** where *myproject* is the folder containing your NetBeans IDE project.

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2. Define the custom search modules in this file. Example 41-1 shows a definition of custom modules for accounts, events, and payments module in the registry using the SDK samples.
3. Save the file in your NetBeans IDE project.

Example 41-1 Sample Custom Search Modules Registry Entry

```
var CustomRegistry = {
        search: {
        viewmodel: 'viewmodels/CustomSearchViewModel'
    },
            events: {
        viewmodel: 'viewmodels/CustomEventsViewModel'
    },
        paymentSuspenseSearch: {
        viewmodel: 'viewmodels/CustomPaymentSuspenseSearchViewModel'
    }
};
```

Deploying Customizations

Package and deploy your customizations using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

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Part V

Controlling Access to Billing Care Functionality

This part describes how to limit user access to screens, fields, and functionality in Oracle Communications Billing Care. It contains the following chapters:

- Limiting Event Adjustments Entered by CSRs
- Setting Adjustment Limit for Event Adjustments
- Enabling Authorization in Test Installations
- Restricting Bundle Validity Based on Roles
- Restricting Additional Bundles Purchase Based on Roles
- Making Notes Mandatory for Additional Product Purchase
- Customizing Suspended Payment Allocations
- Disabling Event Adjustment Options Based on Roles
- Logging Additional CSR Activity Details

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Limiting Event Adjustment Percentage Entered by CSRs

Learn how to limit the event adjustment percentage entered by CSRs using the Oracle Communications Billing Care SDK and OPSS policies.

Topics in this document:

- About Adjustments
- Limiting Event Adjustments Entered by CSRs
- Updating CustomExtendAdjustmentModule.java Class
- Creating CustomAdjustmentWorker.java Class
- Creating a customized_en.xlf File Entry for the Error Message

About Adjustments

Typically, CSRs perform the adjustments to satisfy an unhappy customer or correct a problem. For example, a CSR might give an adjustment when the entire monthly fee is charged for a service that was unavailable for a few days. You customize Billing Care to limit the percentage of event adjustment allowed for a CSR by using the SDK and OPSS policies.

Limiting Event Adjustments Entered by CSRs

To limit the event adjustment percentage entered by a CSR:

1. Add an obligation for the OPSS authorization policy; for example, Maximum Adjustment Amount Percentage. For more information on adding obligations, see the OPSS documentation.
2. Update the **CustomExtendAdjustmentModule.java** class file to override the default event adjustment flow. See "Updating CustomExtendAdjustmentModule.java Class" for more information.
3. Create a custom adjustment worker class to add custom logic. See "Creating CustomAdjustmentWorker.java Class" for more information.
4. Create or update the **customized_en.xlf** file to add an error code and message for limiting adjustments. See "Creating a customized_en.xlf File Entry for the Error Message" for more information.

Updating CustomExtendAdjustmentModule.java Class

Update the **CustomExtendAdjustmentModule.java** class to override the **adjustEvent ( )** method.

To update the **CustomExtendAdjustmentModule.java** class:

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1. Open the **CustomExtendAdjustmentModule.java** file in *myproject*/*projectname*/**src/java/com/rest/sdk**.
2. Override the **adjustEvent ( )** method as shown in this example:

```
@Override
public void adjustEvent(AdjustmentEvent adjustEvent) {
CustomAdjustmentWorker worker = new CustomAdjustmentWorker();
boolean isAllowed;

isAllowed = worker.isAllowedForAdjustment(adjustEvent);
if (isAllowed) {
super.adjustEvent(adjustEvent);
} else {
ExceptionHelper.buildErrorInfo(70001,
"More than allowed Percentage", Response.Status.BAD_REQUEST);
}
}
```

3. Save the file in your NetBeans IDE project.

Creating CustomAdjustmentWorker.java Class

Create a custom template worker class containing logic to calculate the percentage of adjustment allowed and limit the adjustment amount entered by a CSR in Billing Care if it is more than the percentage allowed.

To create the **CustomAdjustmentWorker.java** Class:

1. Create the **CustomAdjustmentWorker.java** file in *myproject*/**src/java/com/rest/sdk**.
2. Extend **AdjustmentWorker** as shown in this example:

```
public class CustomAdjustmentWorker extends AdjustmentWorker {

/*
 *Check if the amount is more than allowed percentage
 */

public boolean isAllowedForAdjustment(AdjustmentEvent adjustEvent){
boolean isAllowed = true;

//Get total amount available for adjustment from BRM
BigDecimal availableAmountForAdjustment =
getAvailableAmountForEventAdjustment(adjustEvent);

//String configured as obligation in OPSS Admin
String obligationString = "Maximum Adjustment Amount Percentage";
Subject subject = Security.getCurrentSubject();
String action = "Make";
Map<String, String> env = new HashMap<>(0);
Map<String, String> obligationNameValueMap = new HashMap<>();
Integer obligationPer = 0;

//Getting obligation allowed percentage value from OPSS
String resourceString = "BillingCare" + "/" +
"AdjustmentCurrencyResourceType" + "/" + "AdjustmentResource";
try {
PepResponse response =
PepRequestFactoryImpl.getPepRequestFactory().newPepRequest(subject, action,
resourceString, env).decide();
Map<String, Obligation> obligations = response.getObligations();
for (String name : obligations.keySet()) {
```


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```
obligationNameValueMap = obligations.get(name).getStringValues();
obligationPer =
Integer.parseInt(obligationNameValueMap.get(obligationString));
break;
}

} catch (PepException ex) {
Logger.getLogger(AdjustmentWorker.class.getName()).log(Level.SEVERE, null,
ex);
}

//Calculate the allowed amount using obligationPer retrieved from OPSS and
availableAmountForAdjustment retrieved from BRM
double allowedAmountInDouble = (obligationPer *
availableAmountForAdjustment.doubleValue()) / 100;
BigDecimal allowedAmount = new BigDecimal(allowedAmountInDouble);

//If amount is greater than allowed amount return false
//Note: Please handle the decimal case as per the requirement if only first
2 decimal needed etc..

if(adjustBill.getAmount().compareTo(allowedAmount)==1)
{
isAllowed=false;
}

return isAllowed;

}
```

> **Note**
>
> The JAR files required for this customization are available in the *SDK_home*/**libs** directory.

3. Save the file in your NetBeans IDE project.

Creating a customized_en.xlf File Entry for the Error Message

You must provide a localized English entry for the new adjustment error code and message in the **customized_en.xlf** file to provide a translatable text string in Billing Care. For more information on the **customized_en.xlf** file and how to add a new entry, see "Customizing Billing Care Labels".

This example shows a sample entry for the error code and message to add in the **customized_en.xlf** file:

```
<?xml version="1.0" encoding="utf-8" ?>
<xliff version="1.0">
    <file original="test_en.js" source-language="EN-US"
          target-language="EN-US" datatype="JavaScript">
        <header/>
        <body>
            <group id="errors" restype="errors">
                <trans-unit id="70001" translate="yes">
                    <source>More than allowed Percentage.</source>
                    <target>More than allowed Percentage.</target>
                </trans-unit>
            </group>
```


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```
        </body>
    </file>
</xliff>
```

> **Note**
>
> For custom error codes, the series must start from 70000; for example, 70001, 70002, and so on.

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Setting Adjustment Limit for Event Adjustments

Learn how to customize Oracle Communications Billing Care to set the maximum adjustment limit based on the currency resources used for event adjustments.

Topics in this document:

- About Adjustment Limits
- Setting Event Adjustment Limit for CSRs
- Creating customAdjustmentResource.java Class
- Creating the Custom Event Adjustment View Model
- Configuring the Custom Event Adjustment View Model in the Registry

About Adjustment Limits

Typically, customer service representatives (CSRs) perform the adjustments by providing the adjustment amount to be applied for the customer. You can set an adjustment limit for a CSR to control the adjustment amount entered by the CSR. For event adjustments, you can customize Billing Care to set the maximum adjustment limit allowed for a CSR based on the currency resources used for the adjustments. For example, you can set an adjustment limit of $10 for USD and 5 euro for EUR for a CSR to perform event adjustments.

Setting Event Adjustment Limit for CSRs

To set the event adjustment limit for a CSR:

1. If not already created, create a custom ResourceType and Resource (for example, AdjustmentResourceType, AdjustmentResource) with the adjustment action in the OPSS Server and add the ResourceType to the **CustomConfigurations.xml** file. See "Creating a Custom Configuration File" for more information.
2. Add an obligation (for example, Maximum Adjustment Limit) in the custom adjustment resource with a string (for example, 840, the currency code for US dollars) for a policy using OPSS. For more information on adding obligations, see the OPSS documentation.
3. Set the maximum adjustment limit you want to allow for the CSR for a currency resource as the obligation value in the OPSS Server. For example, $10 for USD.
4. Create a custom REST resource to validate the adjustment amount entered in the Event Adjustment dialog box. See "Creating customAdjustmentResource.java Class" for more information.
5. Create or update the **CustomEventAdjustmentViewModel.js** class file to override the default event adjustment flow. See "Creating the Custom Event Adjustment View Model" for more information.

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6. Configure the custom view model entry in the **customRegistry.js** file to use the custom view model that you created or updated. See "Configuring the Custom Event Adjustment View Model in the Registry" for more information.
7. Deploy your customizations using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".
8. Verify the changes in Billing Care by doing the following:
   a. Log into Billing Care as a CSR who has adjustments action granted and maximum adjustment limit set.
   b. In the Events dialog box, select events and click **Adjust**.
      The Event Adjustment dialog box appears.
   c. Select an adjustment option and enter the adjustment amount you want to adjust.

   If the amount entered is less than the obligation value, the specified amount is adjusted. If the amount entered is more than the obligation value, an error message is displayed. For example: "You have exceeded the maximum adjustment limit for this currency."

Creating customAdjustmentResource.java Class

You can override the existing event adjustment flow with your customization by using REST resources. Create a custom resource Java class to validate the event adjustment amount against the obligation value.

To create the **customAdjustmentResource.java** class:

1. Create the **customAdjustmentResource.java** class file in *myproject*/*projectname*/**src/java/com/oracle/communications/brm/cc/ws/account**, where *myproject* is your NetBeans IDE Billing Care customizations project and *projectname* is the name of your custom project.
2. Add the following code in the **customAdjustmentResource.java** class file using a text editor:

```
//Create a custom REST with class named as "customAdjustmentResource"
// Add method "adjustEvent" which takes parameter "AdjustmentEvent"
//This custom REST validates entered amount to adjust with the obligation and
then calls the OOTB REST resource.
@Path("customadjustment")
public class CustomAdjustmentResource {

    @Context
    HttpServletRequest servletRequest;

    @Path("/event")
    @POST
    @Consumes({MediaType.APPLICATION_JSON, MediaType.APPLICATION_XML})
    public void eventAdjustment(AdjustmentEvent adjustEvent) throws
JSONException, IOException {

    UIRequestValue maxAdjustmentLimit = new
UIRequestValue(adjustEvent.getResourceId().toString(),
                    adjustEvent.getAmount(), ConstraintOperator.GREATER_THAN,
                    new EnforcementError(40010,"For this currency you have
exceed Max adjustment limit."));
    //Checks if user is not super csr and UI value is greater than OPSS
obligation value and throws error "For this currency you have exceed Max
limit."
    if (!EnforcementUtil.isResourceGranted(servletRequest, subject,
```


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```
"BillingCare", EnforcementConstants.SUPERUSER_RESOURCE)) {
       EnforcementUtil.checkAccess(subject, "BillingCare", "adjustment",
        "AdjustmentResourceType","AdjustmentResource",
       new EnforcementError(20000, "You do not have permission to perform an
adjustment."), maxAdjustmentLimit);
    }
   }

   /*
    *After validating maximum validity end month criteria invoke out of the
box code to perform adjustment.
    */

 }
```

3. Save the file in your NetBeans IDE project.

Creating the Custom Event Adjustment View Model

Billing Care uses view model to define the display of the screens in Billing Care. You must create or update the custom view model, **CustomEventAdjustmentViewModel**, containing the details to set the adjustment limit for CSRs performing event adjustments.

See "About View Models" for more information about Billing Care view models.

To create the custom event adjustment view model:

1. Create or update the **customEventAdjustmentViewModel.js** file in the *myproject*/**web/custom/viewmodels** directory, where *myproject* is the folder containing your NetBeans IDE project.
2. Add the following code in the **customEventAdjustmentViewModel.js** file using a text editor:

```
define(['knockout', 'jquery', 'underscore',
Registry.accountCreation.wizardBase,
'viewmodels/ARActions/adjustments/EventAdjustmentViewModel'],
        function (ko, $, _, WizardBaseViewModel, EventAdjustmentViewModel) {
            customEventAdjustmentViewModel.prototype = new
WizardBaseViewModel();
            function customEventAdjustmentViewModel() {
                EventAdjustmentViewModel.apply(this, arguments);
                var self = this;

                self.persistData = function (eventAdjustmentObj) {
                    var ajaxDef = $.ajax({
                        type: "POST",
                        url: baseURL + "/customadjustment/event/",
                        data: ko.toJSON(eventAdjustmentObj),
                        contentType: "application/json; charset=utf-8",
                        dataType: "json",
                        processData: false
                    });

                   ajaxDef.done(function (completeResponse) {

                    });

                    ajaxDef.fail(function (errorThrown) {
                        alert(errorThrown.responseJSON.errorMessage);
                    });
```


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```
                return ajaxDef;
            };


        }
        return customEventAdjustmentViewModel;
    });
```

3. Save the file in your NetBeans IDE project.

Configuring the Custom Event Adjustment View Model in the Registry

After creating the required custom view model, create a custom event adjustment view model entry in the **customRegistry.js** file. Billing Care uses the custom event adjustment view model instead of the default event adjustment view model during adjustments and renders the Event Adjustment dialog box containing your customization.

To create the custom event adjustment view model entry in the registry:

1. Create a **customRegistry.js** file in the *myproject***/web/custom/** directory.
2. Define the custom event adjustment view model in this file. For example:

```
eventAdjustment: {
   viewmodel: 'custom/viewmodels/customEventAdjustmentViewModel.js'
}
```

3. Save the file in your NetBeans IDE project.

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Enabling Authorization in Test Installations

Learn how to use the SDK to enable authorization in an Oracle Communications Billing Care test installation.

Topics in this document:

- About Enabling Authorization in Test Installations
- Enabling Authorization in Test Installations
- Modifying Default Authorization Policies
- Adding Custom Authorization Resources and Actions
- Deploying Customizations

About Enabling Authorization in Test Installations

You use authorization to grant users the privileges appropriate for their job functions, while denying access to other functionality. Billing Care uses Oracle Platform Security Services (OPSS) to handle all authorization tasks.

By default, Billing Care test installations are installed without OPSS. The authorization feature is also disabled in the test installations. This enables the testing Billing Care instances to connect directly to your BRM system using the native WebLogic server user management.

However, if you want to test authorization in your Billing Care test installation without installing OPSS, you can enable authorization in Billing Care by using the Billing Care SDK. See "Enabling Authorization in Test Installations".

> **Note**
>
> Use the Billing Care SDK to enable authorization only in your test or development installation. Do not use this customization in production installations.

Enabling Authorization in Test Installations

This section provides a high level overview of the process on how to enable authorization in a Billing Care test installation by using the Billing Care SDK.

The Billing Care SDK includes a sample OPSS manager (**CustomOPSSManager**) in the *SDK_home***/samples** directory, where *SDK_home* is the directory where you installed the SDK. This sample contains the necessary configuration to enable authorization. Use this sample to enable authorization in the Billing Care test installation.

To enable authorization in the Billing Care test installation:

1. Using the *SDK_home***/samples/CustomOPSSManager** directory, create a NetBeans IDE project with the same folder structure of the **CustomOPSSManager** directory. See "Creating the Billing Care NetBeans IDE Project" for more information.

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2. (Optional) Modify the default authorization policies in your **CustomConfigurations.xml** file. See "Modifying Default Authorization Policies" for more information.
3. (Optional) Add custom authorization resources or actions in your **CustomConfigurations.xml** file. See "Adding Custom Authorization Resources and Actions" for more information.
4. Deploy your customizations to your Billing Care domain. See "Deploying Customizations" for more information.

Modifying Default Authorization Policies

To modify default authorization policies:

1. In a text editor, open the *myproject*/**src/java/custom/configurations/CustomConfigurations.xml** file, where *myproject* is the NetBeans IDE project that you created using the sample OPSS manager.
2. Search for the authorizationJSON key in the file:

```
<keyvals>
   <key>authorizationJSON</key>
   <value>[{"extension":null,"resourceName":"SuperUserResource","grantedActions":
[],"deniedActions":["ANY"]},...</value>
   <desc>...</desc>
</keyvals>
```

3. Change the default actions for the authorization resources in the authorizationJSON key value as required.

   To authorize the logged in user to perform adjustments, change the actions for the adjustment resource as shown in the following example:

```
{"extension":null,"resourceName":"AdjustmentResource","grantedActions":
["Allocate","Make"],"deniedActions":[]}
```

   To deny the logged in user to perform adjustments, change the actions for the adjustment resource as shown in the following example:

```
{"extension":null,"resourceName":"AdjustmentResource","grantedActions":
[],"deniedActions":["Allocate","Make"]}
```

   See the discussion about Billing Care authorization resources in *Billing Care Security Guide* for more information on the default authorization resources and actions supported in Billing Care.

4. Change or add transaction limits (obligations) for authorization by doing the following:
   a. Search for the transaction limit mapping in the file. For example:

```
<mapping>
   <key>weblogic</key>
   <map>
      <id>Maximum Currency Adjustment Amount</id>
      <key>4</key>
   </map>
...
   <desc>Obligation mapping for user. If there are multiple users for which
obligation has to be mapped replicate the mapping section change the key to the
username to which obligation is required.
         Also edit the obligation values as per requirement. Note that the
obligation field that is the id should be as per BillingCare documentation.
```


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```
   </desc>
</mapping>
```

b. Change transaction limit values for authorizing users as required. For example, to authorize the WebLogic user to make payment only up to $50, change the maximum payment amount value under the WebLogic key to 50 in the mapping:

```
<key>weblogic</key>
<map>
   <id>Maximum Payment Amount</id>
   <key>50</key>
</map>
```

> **Note**
>
> Do not change the mapping ID for the transaction limit; for example, Maximum Currency Adjustment Amount.

c. (Optional) Add new transaction limits for authorizing users as required. See the discussion about policies on transaction limits in *Billing Care Security Guide* for the list of transaction limits supported in Billing Care.

5. Save and close the file.

Adding Custom Authorization Resources and Actions

To add custom authorization resources and actions:

1. In a text editor, open the *myproject*/**src/java/custom/configurations/CustomConfigurations.xml** file, where *myproject* is the NetBeans IDE project that you created using the sample OPSS manager.
2. Search for the authorizationJSON key in the file:

```
<keyvals>
   <key>authorizationJSON</key>
   <value>[{"extension":null,"resourceName":"SuperUserResource","grantedActions":
[],"deniedActions":["ANY"]},...</value>
   <desc>...</desc>
</keyvals>
```

3. Add custom authorization resources and actions in the authorizationJSON key value as required. For example, to authorize the logged in user to view invoices, add the authorize resource and action as shown in the following example:

```
{"extension":null,"resourceName":"InvoiceImageResource","grantedActions":
["View"],"deniedActions":[]}
```

> **Note**
>
> Ensure that the key value structure is the same.
>
> When you migrate from the Billing Care test installation to the production installation, make sure that the custom resources are added in OPSS.

4. Save and close the file.

See "About Custom Resource Authorization" for more information.

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Deploying Customizations

Package and deploy your customizations using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

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Restricting Bundle Validity Based on Roles

Learn how to restrict the validity or end date set by CSRs while purchasing additional products or services.

Topics in this document:

- About Restricting Bundle Validity
- Restricting Bundle Validity
- Creating CustomAccountResource.java Class
- Creating a Custom Purchase View Model
- Configuring the Custom Purchase View Model in the Registry

About Restricting Bundle Validity

Typically, CSRs set the validity or end date of a product or service in a bundle (**/deal** object) during purchase. For additional purchases, you can customize Billing Care to restrict the validity or end date set by the CSR based on the CSR's role by using the OPSS policies and the Billing Care SDK.

For example, for an additional discount purchased from a bundle, you can allow a CSR with the super user role to set an end date up to a maximum of 12 months, and allow a CSR with a basic role to set an end date only up to a maximum of 6 months.

Restricting Bundle Validity

You can customize the **Purchase Catalogue** screen using OPSS policies to restrict the end date set by CSRs for additional purchases.

To restrict bundle validity:

1. Define a new ResourceType and Resource in the OPSS Server for restricting bundle validity, such as DealResourceType and DealResource.
2. Define purchase as the corresponding action for the ResourceType in the OPSS Server.
3. Associate the new resource that you created to a CSR who has permission to purchase products or services.
4. Add the new ResourceType to the **CustomConfigurations.xml** file. For example:

```
<keyvals>
   <key>authorizationResourceTypes</key>
   <value>DealResourceType</value>
   <desc>Add comma separated OPSS Resource Types(values) for authorization.
         Also these resource types should be defined in OPSS.
         Please note that the key should not be changed here.
   </desc>
</keyvals>
```


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5. To set the validity allowed for a CSR, add an obligation with a string (for example, maximum validity end month) for a policy using OPSS and set a numeric value to the string (for example, 6).
6. Create a custom REST resource for validating the end date entered in the Purchase Catalogue screen. See "Creating CustomAccountResource.java Class" for more information.
7. Create a custom view model to override the default additional purchase logic with your customization. See "Creating a Custom Purchase View Model" for more information.
8. Create a **customRegistry.js** file to configure Billing Care to use the custom view model that you created. See "Configuring the Custom Purchase View Model in the Registry" for more information.
9. Deploy your customizations using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".
10. Verify your changes in Billing Care by doing the following:
    a. Log in to Billing Care as a CSR who has the permission to purchase products or services and obligation to validate end date during purchase.
    b. Purchase an additional charge or discount offer. For more information, see the Billing Care Online Help.
    c. In the Configure screen, enter an end date for the purchased offer.

    If the end date exceeds the end date specified in the obligation associated with the CSR, an error is displayed. If it matches or less than the end date in the obligation, CSR is allowed to configure the offer.

Creating CustomAccountResource.java Class

Create a custom resource Java class to get the list of all customized charge offers and discount offers in Billing Care and validate their end dates.

To create the **customAccountResource.java** class:

1. Create the **CustomAccountResource.java** file in *myproject/projectname*/**lsrc/java/com/oracle/communications/brm/cc/ws/account**, where *myproject* is your NetBeans IDE Billing Care customizations project and *projectname* is the name of your custom project.
2. Add the following code in the **CustomAccountResource.java** file using a text editor:

```
//This custom REST validates the deal end month with the obligation and then
calls the OOTB REST resource.

@Path("customaccounts")
public class CustomAccountResource {

    @Context
    HttpServletRequest servletRequest;

    @Path("{id}/custombundle")
    @POST
    @Consumes({MediaType.APPLICATION_JSON, MediaType.APPLICATION_XML})
    public void purchaseCustomizedBundle(@PathParam("id") String id,
CustomizedBundleForPurchase custbundle) throws JSONException, IOException {


/*
*  Get the list of all CustomizedChargeOffers using
```


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```
getCustomizedChargeOffers() method of CustomizedBundleForPurchase class.
*/
List <CustomizedChargeOffers> custoffer =
custbundle.getCustomizedChargeOffers();
            List <CustomizedDiscountOffers> custDistOffer =
custbundle.getCustomizedDiscountOffers();

/*
*  Iterate through each charge offer and get the purchaseEnd months and
validate the same against OPSS obligation
*/
for (CustomizedChargeOffers i : custoffer)
{
purchaseEnd=i.getPurchaseEnd();
months=purchaseEnd.getUnitSettings().getOffset();


UIRequestValue maxValidityEndMonthLimit = new UIRequestValue("Maximum
validity end month",
  new BigDecimal(months), ConstraintOperator.GREATER_THAN,
new EnforcementError(40002,"Maximum validity end month exceeded"));

//Checks if user is not super csr and UI value is greater than OPSS
obligation value and throws error "Maximum validity end month exceeded"
if (!EnforcementUtil.isResourceGranted(servletRequest, subject,
"BillingCare", EnforcementConstants.SUPERUSER_RESOURCE)) {
   EnforcementUtil.checkAccess(subject, "BillingCare", "Purchase",
"DealResourceType","DealResource",
error, maxValidityEndMonthLimit);
}
}

Repeat the above validations for all the discount offers as well by
iterating through custDistOffer.


/*
*After validating maximum validity end month criteria invoke out of the
box code to perform purchase.In below steps
*we have used jersey clients to achieve the same.
*/

1. Create a new Jersey Client
2. Create a webresource passing the baseURI (
host:port/bc/webresources/v1.0/accounts/id/bundle ).
3. Convert custbundle java object to json object.

String scheme = servletRequest.getScheme();             // http or https
String serverName = servletRequest.getServerName();     // hostname.com
int serverPort = servletRequest.getServerPort();        // port
String BASE_URI = scheme + " + serverName + ":" + serverPort + "/bc/webresources/
v1.0/accounts/";
Client client = Client.create();
ObjectMapper mapper = new ObjectMapper();
String jsonInString = mapper.writeValueAsString(custbundle);
JSONObject object = new JSONObject(jsonInString);

javax.servlet.http.Cookie[] cookies=servletRequest.getCookies();
WebResource webResource2 =
client.resource(BASE_URI).path(id).path("bundle");
WebResource.Builder webresourceBuilder =
webResource2.accept(MediaType.APPLICATION_JSON);
```


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```
Cookie cookieObject =null;

for(javax.servlet.http.Cookie cookie: cookies)
        {
            if(cookie.getName().contains("JSESSIONID"))
            {
                cookieObject = new
Cookie(cookie.getName(),cookie.getValue());
                webresourceBuilder.cookie(cookieObject);
            }
        }
webresourceBuilder.post(ClientResponse.class, object);

}
}
```

3. Save the file in your NetBeans IDE project.

Creating a Custom Purchase View Model

Billing Care uses view model to define the display of the screens in Billing Care. You must create or update the custom view model, **CustomPurchaseViewModel**, and add the details containing the logic to validate the end date for offers and allow purchase.

See "About View Models" for more information about Billing Care view models.

To create a custom purchase view model:

1. Create or update the **customPurchaseViewModel.js** file in *myproject*/**web/custom/viewmodels** directory.
2. Add the following code in the **customPurchaseViewModel.js** file using a text editor:

```
 define(['knockout',
        'jquery',
        'underscore',
        Registry.accountCreation.wizardBase,
        'viewmodels/purchase/PurchaseViewModel',
        Registry.purchase.wizardView,
        'viewmodels/purchase/PurchaseCatalogue'
       ],
        function (ko, $, _, WizardBaseViewModel, PurchaseViewModel,
wizardTempl, PurchaseCatalogue) {


            CustomPurchaseViewModel.prototype = new WizardBaseViewModel();

            function CustomPurchaseViewModel(title, content, messages) {
                WizardBaseViewModel.apply(this, arguments);
                PurchaseViewModel.apply(this, arguments);

                var self = this;
                self.sharedData = {};
                self.purchaseCatalogue = new PurchaseCatalogue();

                self.purchaseBundle = function (stepObj) {
                    var id = self.sharedData.selectedServiceId ||
globalAppContext.currentAccountViewModel().account().id();
                    var urlToFetch = baseURL + "/customaccounts/" + id +
"/custombundle";
                    var data  =
ko.toJSON(self.purchaseCatalogue.bundlePurchaseData);
```


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```
                        util.showBusyCursor();
                        var ajaxDef = $.ajax({
                            type: "POST",
                            url: urlToFetch,
                            data: data,
                            contentType: "application/json; charset=utf-8",
                            dataType: "json",
                            processData: false
                        });
                        ajaxDef.done(function (completeResponse) {
                            self.updateStatus(stepObj, 'confirmation');
                            EventNotifier.assetsUpdated.dispatch("all");
                            EventNotifier.billUnitsUpdated.dispatch();
                            self.isInProgress(false);
                            util.resetCursor();
                            self.close();
                        });
                        ajaxDef.fail(function (errorThrown) {
                            alert(util.getLocalizedValue(purchasePackage,
"UNABLE_TO_PURCHASE_BUNDLE"));
                            self.updateStatus(stepObj, 'error');
                            self.isInProgress(false);
                            util.resetCursor();
                        });
                        return ajaxDef;
                    };
                }
                return CustomPurchaseViewModel;
            });
```

3. Save the file in your NetBeans IDE project.

Configuring the Custom Purchase View Model in the Registry

After creating the required custom view model, create a custom purchase view model entry in the **customRegistry.js** file. Billing Care uses the custom purchase view model instead of the default view model during additional product purchase and renders the Purchase Add on Deal Confirmation screen containing your customization.

To create the custom purchase view model entry in the registry:

1. Create a **customRegistry.js** file in *myproject***/web/custom/** directory.
2. Define the custom purchase view model in this file. For example:

```
purchaseConfiguration: {
   viewModel: 'custom/viewModels/purchase/customPurchaseViewModel.js'
}
```

3. Save the file in your NetBeans IDE project.

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Restricting Additional Bundles Purchase Based on Roles

Learn how to customize Oracle Communications Billing Care to restrict the purchase of additional bundles based on user roles or permissions.

Topics in this document:

- About Restricting Bundles
- Restricting Bundles Based on Roles
- Creating the Custom Bundle Selection View Model
- Configuring the Custom Bundle Selection View Model in the Registry

About Restricting Bundles

By default, the Billing Care **Purchase Catalogue** screen displays all bundles (**/deal** objects) retrieved from the BRM database. Customer service representatives (CSRs) can select these bundles for purchase. You can customize Billing Care to display any additional bundles that can be purchased based on a CSR's role or permission.

Restricting Bundles Based on Roles

You can use the Billing Care SDK and OPSS policies to customize the **Purchase Catalogue** screen to display bundles for additional purchase based on CSR roles or permissions.

To restrict the bundles displayed for additional purchase:

1. Define a new ResourceType and Resource for bundles in the OPSS Server, such as DealNameResourceType and DealNameResource.
2. Add the new ResourceType to the **CustomConfigurations.xml** file. For example:

```
<keyvals>
   <key>authorizationResourceTypes</key>
   <value>DealnameResourceType</value>
   <desc>Add comma separated OPSS Resource Types(values) for authorization.
         Also these resource types should be defined in OPSS.
         Please note that the key should not be changed here.
   </desc>
</keyvals>
```

   For more information about updating the **CustomConfigurations.xml** file, see "Editing the Billing Care Configuration File".
3. Create a custom view model to define the display of bundles in the **Purchase Catalogue** screen. See "Creating the Custom Bundle Selection View Model".
4. Configure Billing Care to use the custom view model that you created. See "Configuring the Custom Bundle Selection View Model in the Registry".

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5. Deploy your customizations using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

Creating the Custom Bundle Selection View Model

Billing Care uses view models to define the display of screens in Billing Care. You must create the custom view model, **customBundleSectionViewModel**, containing the details to customize the display of bundles in the **Purchase Catalogue** screen for additional purchase.

See "About View Models" for more information about Billing Care view models.

To create the custom bundle selection view model:

1. Create the **customBundleSectionViewModel.js** file in *myproject***/web/custom/viewmodels/purchase** directory, where *myproject* is the folder containing your NetBeans IDE project.
2. Add the following code in the **customBundleSectionViewModel.js** file using a text editor:

```
define(['knockout',
    'jquery',
    'underscore',
    Registry.accountCreation.wizardBase,
    'viewmodels/purchase/BundleSelectionViewModel'
    ],
       function(ko, $, _, WizardBaseViewModel, BundleSelectionViewModel) {
          customBundleSelectionViewModel.prototype = new WizardBaseViewModel();
          function customBundleSelectionViewModel(params) {
             BundleSelectionViewModel.apply(this, arguments);
             var self = this;
             self.filterDealsList = function(loadedData) {
                1. call the function
util.getGrantedActionsByResource("DealNameResource") and store its return
                   value in an array (eg. arr).
                2. make a set and store array in set.
                3. run a loop from var i =0 to i = loadedData.bundle.length and
check the value of loadedData.bundle[i].name in set.
                4. if value is not present in set then remove it from
loadedData.bundle also.
                5. return the modified loadedData .
             };
          }
          return customBundleSelectionViewModel;
       );
```

3. Save the file in your NetBeans IDE project.

Configuring the Custom Bundle Selection View Model in the Registry

After creating the required custom view model, create a custom bundle selection view model entry in the **customRegistry.js** file. Billing Care uses the custom bundle selection module instead of the default view model during additional purchase and renders the **Purchase Catalogue** screen containing your customization.

To create the custom bundle selection view model entry in the registry:

1. Create a **customRegistry.js** file in your *myproject***/web/custom/** directory.
2. Define the custom event adjustment module in this file. For example:

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```
var CustomRegistry = {
   purchaseSelection: {
      bundleviewmodel: 'custom/viewmodels/purchase/customBundleSectionViewModel.js'
   }
};
```

3. Save the file in your NetBeans IDE project.

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Making Notes Field Mandatory

Learn how to make the **Notes** field mandatory for additional product purchase and event adjustments in Oracle Communications Billing Care.

Topics in this document:

- Making Notes Mandatory for Additional Product Purchase
- Making Notes Mandatory for Event Adjustments

Making Notes Mandatory for Additional Product Purchase

You can use the Billing Care SDK to make the **Notes** field mandatory on the **Purchase Add on Deal Confirmation** screen.

To make the **Notes** field mandatory:

1. Create a custom view model to override the default view of the Purchase Add on Deal Confirmation screen. See "Creating a Custom Purchase Deal View Model" for more information.
2. Create a **customRegistry.js** file to configure Billing Care to use the custom view model that you created. See "Configuring the Custom Purchase View Model in the Registry" for more information.
3. Deploy your customizations using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

Creating a Custom Purchase Deal View Model

Billing Care uses view model to define the display of the screens in Billing Care. You must create or update the custom view model, **CustomPurchaseViewModel**, and add the details containing the logic to make the **Notes** field mandatory.

See "About View Models" for more information about Billing Care view models.

To create a custom purchase deal view model:

1. Create or update the **CustomPurchaseViewModel.js** file in *myproject*/**web/custom/viewmodels** directory, where *myproject* is the folder containing your NetBeans IDE project.
2. Add the following code in the **CustomPurchaseViewModel.js** file using a text editor:

```
define(['jquery', 'knockout',
'viewmodels/purchase/PurchaseConfigurationViewModel'],
        function ($, ko, PurchaseConfigurationViewModel) {

            function customPurchaseViewModel() {
                PurchaseConfigurationViewModel.apply(this, arguments);
                self = this;

                self.isValid = function () {
                     $("#enterNotesTextArea").attr('name',
```


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```
'enterNotesWithoutReason');
                    if (self.note.isValid() && self.note.validator &&
self.note.validator.form() && self.note.comments.comment() ) {
                        return true;
                    }
                    return false;
                };

            }
            customPurchaseViewModel.prototype = new
PurchaseConfigurationViewModel();
            return  customPurchaseViewModel;
        });
```

3. Save the file in your NetBeans IDE project.

Configuring the Custom Purchase View Model in the Registry

After creating the required custom view model, create a custom purchase view model entry in the **customRegistry.js** file. Billing Care uses the custom purchase view model instead of the default view model during additional product purchase and renders the Purchase Add on Deal Confirmation screen containing your customization.

To create the custom purchase view model entry in the registry:

1. Create a **customRegistry.js** file in *myproject***/web/custom/** directory.
2. Define the custom purchase module in this file. For example:

```
purchaseConfiguration: {
   viewmodel: 'custom/viewmodels/customPurchaseViewModel.js'
}
```

3. Save the file in your NetBeans IDE project.

Making Notes Mandatory for Event Adjustments

You can use the Billing Care SDK to make the **Notes** field mandatory in the Event Adjustment dialog box.

To make the **Notes** field mandatory:

1. Create a custom view model to override the default view of the Event Adjustment dialog box. See "Creating a Custom Event Adjustment View Model" for more information.
2. Create a **customRegistry.js** file to configure Billing Care to use the custom view model that you created. See "Configuring the Custom Event Adjustment View Model in the Registry" for more information.
3. Deploy your customizations using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

Creating a Custom Event Adjustment View Model

Billing Care uses view models to define the display of its screens. You must create or update the custom view model, **CustomEventAdjustmentViewModel**, and add the details containing the logic to make the **Notes** field mandatory.

See "About View Models" for more information about Billing Care view models.

To create a custom purchase deal view model:

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1. Create or update the **customEventAdjustmentViewModel.js** file in the *myproject*/**web/custom/viewmodels** directory, where *myproject* is the folder containing your NetBeans IDE project.
2. Add the following code in the **customEventAdjustmentViewModel.js** file using a text editor:

```
define(['jquery', 'knockout',
    'viewmodels/ARActions/adjustments/EventAdjustmentViewModel'
],
        function($, ko, EventAdjustmentViewModel) {

            function customEventAdjustmentViewModel() {
                EventAdjustmentViewModel.apply(this, arguments);
                self = this;
                self.isValid = function() {

     /**
      * Here "if(isGranted)" condition is added for authorization.
      * create customAction in resource and use it in below function
      * util.isGrantedResourceAction("customAction", "NoteResource");
      *
      * Use below line directly without "if(isGranted)" condition if OPSS enforcement
is not needed
      * $("#enterNotesTextArea").attr('name', 'enterNotesWithoutReason');
      *
      */


                    var isGranted = util.isGrantedResourceAction("customAction",
"NoteResource");
                    if (isGranted) {
                       $("#enterNotesTextArea").attr('name',
'enterNotesWithoutReason');
                    }
                    if (self.note.isValid() && self.validator &&
                       self.validator.form()) {
                          return true;
                       }
                     return false;
                };
            }
            customEventAdjustmentViewModel.prototype = new
EventAdjustmentViewModel();
            return  customEventAdjustmentViewModel;
        });
```

3. Save the file in your NetBeans IDE project.

Configuring the Custom Event Adjustment View Model in the Registry

After creating the required custom view model, create a custom event adjustment model entry in the **customRegistry.js** file. Billing Care uses the custom event adjustment view model instead of the default event adjustment view model during adjustments and renders the Event Adjustment dialog box containing your customization.

To create the custom event adjustment view model entry in the registry:

1. Create a **customRegistry.js** file in the *myproject*/**web/custom/** directory.
2. Define the custom event adjustment module in this file. For example:

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```
eventAdjustment: {
   viewmodel: 'custom/viewmodels/customEventAdjustmentViewModel.js'
}
```

3. Save the file in your NetBeans IDE project.

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Customizing Suspended Payment Allocations

Learn how to customize how Oracle Communications Billing Care allocates partial suspended payments.

Topics in this document:

- About Suspended Payment Allocation
- Forbidding Partial Allocation of Suspended Payments
- Creating a CustomPCMPaymentModule.java Class
- Creating a Custom Payment Suspense View Model
- Creating a customModule.properties File
- Configuring a Custom Module in the Registry
- Deploying Customizations

About Suspended Payment Allocation

Oracle Communications Billing and Revenue Management (BRM) automatically suspends subscriber payments that do not meet certain criteria when the optional Suspense Manager is installed. For example, BRM suspends payments made to unidentifiable bill numbers.

Payments administrators use Billing Care to correct payments for either automatic or manual allocation to the intended bill or account. By default, Billing Care enables either partial or complete allocation of a suspended payment to a subscriber's bill or account. See "Working with Suspended Payments" in *Billing Care Online Help* for more information on using Billing Care to manage suspended payments.

Forbidding Partial Allocation of Suspended Payments

You can forbid partial allocation of suspended payments using the Billing Care SDK if your business policies require only complete allocation of suspended payments. Billing Care will reject attempted allocations of any suspended payment amount that does not match the amount of the entire suspended payment.

The SDK includes a sample for configuring Billing Care to reject partial suspended payment allocation in *SDK_home***/samples/partialSuspenseAllocation**. Use this sample as an example on how to configure Billing Care to enable only complete allocation of suspended payments.

To forbid the partial allocation of suspended payments in Billing Care:

1. Create a java class that prevents partial allocation of suspended payments in Billing Care. See "Creating a CustomPCMPaymentModule.java Class" for more information.
2. Create a custom payment suspense view model to override the default Billing Care allocation behavior. See "Creating a Custom Payment Suspense View Model" for more information.

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3. Create a **customModule.properties** file configuring Billing Care to override the default payment module logic with the custom payment module created in step 1. See "Creating a customModule.properties File" for more information.
4. Create a **customRegistry.js** file configuring Billing Care to use the custom payment suspense view model created in step 4. See "Configuring a Custom Module in the Registry" for more information.
5. Deploy your customizations to your application server. See "Deploying Customizations" for more information.

Creating a CustomPCMPaymentModule.java Class

Configure Billing Care to forbid partial allocation of suspended payments by creating a custom payment module class containing logic to reject partial allocations.

A sample **CustomPCMPaymentModule.java** file is provided in the *SDK_home***/samples/partialSuspenseAllocation/src/java/custom/com/rest/sdk** directory where *SDK_home* is the Billing Care SDK installation directory. This sample contains logic forbidding partial suspended payment allocation.

To create a custom payment module class:

1. Create a **CustomPCMPaymentModule.java** file in *myproject***/src/com/rest/sdk** where *myproject* is the folder containing your NetBeans IDE project.
2. Save the file in your NetBeans IDE project.

Creating a Custom Payment Suspense View Model

Billing Care uses a payment suspense view model to define suspended payment allocation behavior. You must create a custom payment suspense view model containing overrides for the **save** function.

See "About View Models" for more information about Billing Care view models.

A sample **CustomPaymentSuspenseDetailsAllocationViewModel.js** file is provided in the *SDK_home***/samples/partialSuspenseAllocation/web/custom/js/viewmodel** directory. This sample contains the necessary override functions to forbid partial suspended payment allocation. Use this sample to create a custom payment suspense view model.

To create a custom payment suspense view model with partial suspended payment override functions:

1. Create a **CustomPaymentSuspenseDetailsAllocationViewModel.js** file in *myproject***/web/custom/js/viewmodels/***area***/configure** where *myproject* is the folder containing your NetBeans IDE project and *area* is the customization type.
2. Save the file in your NetBeans IDE project.

Creating a customModule.properties File

After creating the required custom payment suspense model, create a custom module entry in the **customRegistry.js** file to use when allocating suspended payments. Billing Care uses the custom payment suspense module instead of the default entry during suspended payment allocation.

A sample **customModule.properties** file is provided in the *SDK_home***/samples/partialSuspenseAllocation/src/java/custom** directory. This sample contains an override

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entry for using the previously created custom payment module. See "About the customModule.properties File" for more information about this file.

To create a custom payment suspense override in the **customModule.properties** file:

1. Create a **customModule.properties** file in *myproject***/web/WEB-INF/classes/custom** where *myproject* is the folder containing your NetBeans IDE project.
2. Specify the custom payment module override in the file. Example 48-1 shows an example of an override where the custom class is located in the **./custom/com/rest/sdk/CustomPCMPaymentModule** directory relative to the location of the **customModule.properties** file.
3. Save the file in your NetBeans IDE project.

Example 48-1 Sample Custom Payment Suspense customModule.properties Entry

```
billingcare.rest.payment.module=custom.com.rest.sdk.CustomPCMPaymentModule
```

Configuring a Custom Module in the Registry

After creating the required custom payment suspense view model, create a custom module entry in the **customRegistry.js** file to use when allocating suspended payments. Billing Care uses the custom payment suspense module instead of the default entry during suspended payment allocation and prevents partial allocations.

A sample **customRegistry.js** file is provided in the *SDK_home***/samples/partialSuspenseAllocation/web/custom** directory. This sample defines the custom payment suspense module containing the previously created custom payment suspense view model.

To create a custom payment suspense module entry in the **customRegistry.js** file:

1. Create a **customRegistry.js** file in *myproject***/web/custom/** where *myproject* is the folder containing your NetBeans IDE project.
2. Define the custom payment suspense module in this file. Example 48-2 shows a definition of the custom account creation module in the registry using the SDK samples.
3. Save the file in your NetBeans IDE project.

Example 48-2 Sample Custom Payment Suspense Module Registry Entry

```
var CustomRegistry = {
     paymentSuspenseAllocation: {
        allocationViewModel: '../custom/js/viewmodel/
CustomPaymentSuspenseDetailsAllocationViewModel'
    }
};
```

Deploying Customizations

Package and deploy your customizations using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

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Disabling Event Adjustment Options Based on Roles

Learn how to customize Oracle Communications Billing Care to support the disabling of event adjustment options based on customer service representatives (CSRs) roles.

Topics in this document:

- About Event Adjustment Options
- Disabling Event Adjustment Options Based on User Roles
- Creating a Custom View Model for Disabling Adjustment Options
- Configuring the Custom View Model for Disabling Event Adjustment Options

About Event Adjustment Options

By default, the following options in the Event Adjustment dialog box are enabled and CSRs can select these options to adjust events:

- **Adjust amount and tax**
- **Adjust amount only**
- **Adjust tax only**

CSRs can also backdate an adjustment if required. You can customize Billing Care using the SDK to disable these options based on the user roles.

Disabling Event Adjustment Options Based on User Roles

You can customize the Event Adjustment dialog box using the SDK and Oracle Platform Security Services Entitlements Server (OPSS) policies to disable or enable the event adjustment options.

To disable the event adjustment or backdate options in the Event Adjustments dialog box:

1. Define a new ResourceType and Resource for event adjustment options in the OPSS Server. For example, EventAdjustmentResourceType, EventAdjustmentResource .
2. Define the following as corresponding actions for the ResourceType in the OPSS Server as required:
    - AmountAndTax
    - AmountOnly
    - TaxOnly
    - backDateEventAdjustment
3. Associate the new Resource to the new ResourceType.
4. Add the new ResourceType to the **CustomConfigurations.xml** file. For example:

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```
<keyvals>
   <key>authorizationResourceTypes</key>
   <value>EventAdjustmentResourceType</value>
   <desc>Add comma separated OPSS Resource Types(values) for authorization. Also
these resource types should be defined in OPSS. Please note that the key should not
be changed here.</desc>
</keyvals>
```

5. Create a custom view model to disable the options in the Event Adjustment dialog box. See "Creating a Custom View Model for Disabling Adjustment Options" for more information.
6. Create a **customRegistry.js** file to configure Billing Care to use the custom view model that you created. See "Configuring the Custom View Model for Disabling Event Adjustment Options".
7. Deploy your customizations using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

Creating a Custom View Model for Disabling Adjustment Options

Billing Care uses view model to define the display of the screens in Billing Care. You must create or update the custom view model, **CustomEventAdjustmentViewModel**, and add the details to customize the display of event adjustment or backdate options in the Event Adjustment dialog box.

See "About View Models" for more information about Billing Care view models.

To create a custom model for disabling event adjustment or backdate options:

1. Create or update the **customEventAdjustmentViewModel.js** file in *myproject*/**web/custom/viewmodels** directory, where *myproject* is the folder containing your NetBeans IDE project.
2. To disable the amount and tax adjustment options based on the user role, add the following code in the **customEventAdjustmentViewModel.js** file using a text editor:

```
define(['jquery',
    'underscore',
    'knockout',
    'knockout-mapping',
    'viewmodels/ARActions/adjustments/EventAdjustmentViewModel'

],
        function ($, _, ko, komapping, EventAdjustmentViewModel) {
            function customEventAdjustmentViewModel() {
                EventAdjustmentViewModel.apply(this, arguments);


                $(function() {
                        var myVar=    setInterval(function() {

                                    if($('#lblAdjustAmountAndTax').length>0)
                                    {

if(!util.isGrantedResourceAction('AmountAndTax','EventAdjustmentResource'))
                                       {

$('#lblAdjustAmountAndTax').parent().hide();
                                       }

if(!util.isGrantedResourceAction('AmountOnly','EventAdjustmentResource'))
```


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```
                                        {

$('#lblAdjustAmountOnly').parent().hide();
                                        }

if(!util.isGrantedResourceAction('TaxOnly','EventAdjustmentResource'))
                                        {

$('#lblAdjustTaxOnly').parent().hide();
                                        }
                                        clearInterval(myVar);
                                    }

                                }, 20);

                        });

            }
            customEventAdjustmentViewModel.prototype = new
EventAdjustmentViewModel();
            return customEventAdjustmentViewModel;
        });
```

3. To disable the backdate option based on the user role, add the following code in the **customEventAdjustmentViewModel.js** file using a text editor:

```
define(['jquery', 'knockout',
    'viewmodels/ARActions/adjustments/EventAdjustmentViewModel'
],
        function($, ko, EventAdjustmentViewModel) {
            function CustomEventAdjustmentViewModel() {
                EventAdjustmentViewModel.apply(this, arguments);
                $(function() {
                    var myVar1 = setInterval(function() {
                        if ($('#eventAdjustmentEffectiveDate').length > 0)
                        {
                            if
(!util.isGrantedResourceAction("backDateEventAdjustment", "customResource"))
{

$('#eventAdjustmentEffectiveDate').attr('disabled', true);

$("#eventAdjustmentEffectiveDate").next("img").off("click")
                            }
                            clearInterval(myVar1);
                        }
                    }, 40);
                });
            }
            CustomEventAdjustmentViewModel.prototype = new
EventAdjustmentViewModel();
            return  CustomEventAdjustmentViewModel;
        });
```

4. Save the file in your NetBeans IDE project.

Configuring the Custom View Model for Disabling Event Adjustment Options

After creating or updating the required custom view model, ensure that the custom event adjustment view model entry is created in the **customRegistry.js** file. Billing Care uses the

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custom event adjustment view model instead of the default event adjustment view model during adjustments and renders the Event Adjustment dialog box containing your customization.

To create the custom event adjustment view model entry in the registry:

1. Create a **customRegistry.js** file in *myproject***/web/custom/** directory.
2. Define the custom event adjustment view model entry in this file. For example:

```
eventAdjustment: {
   viewmodel: 'custom/viewmodels/customEventAdjustmentViewModel.js'
}
```

3. Save the file in your NetBeans IDE project.

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Logging Additional CSR Activity Details

Learn how to enhance user activity tracking in Oracle Communications Billing Care by capturing and logging detailed customer service representative (CSR) information, including client IP address.

This chapter outlines how you can override additional CSR activity details in the Billing Care SDK.

Topics in this document:

- About User Context Fields in the /user_activity Object
- Overriding the Default User Context

About User Context Fields in the /user_activity Object

You can customize Billing Care to store user context information, such as the CSR's client machine IP address, in **/user_activity** object fields. You can override the following fields using the Billing Care SDK:

- PIN_FLD_API_USER: Contains the Web Services Manager user.
- PIN_FLD_EXTERNAL_USER: Contains the external CSR's login or ID. By default, it is set to the external login ID.
- PIN_FLD_NAP_IP_ADDRESS: Contains the client machine's IP address. By default, Billing Care attempts to set it to the client machine's IP address by looking up the X-Forwarded-For header value. If it is not found, it is set to the Billing Care service's IP address.
- PIN_FLD_CORRELATION_ID: Contains an ID to tag for collating an operation.

Overriding the Default User Context

Configure the Billing Care user context information to use the logic from your custom request module:

1. Open the *myproject***/web/WEB-INF/classes/custom/customModule.properties** file in a text editor, where *myproject* is the location of your NetBeans IDE Billing Care customizations project.
2. Add the following entry to the file, where *base_location* is the package name where the module implementation class is placed, for example, *myproject***.com.rest.sdk**:

   ```
   billingcare.rest.baseops.module = base_location.CustomPCMBaseOps
   ```

3. Save and close the **customModule.properties** file.
4. Create a **CustomPCMBaseOps.java** file in the location you entered into the **customModule.properties** file, for example, *myproject***/com/rest/sdk**.
5. In the file, override the **addcontextInfo()** method with your customizations to add one or more of the user context fields above.

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For a sample, see the *SDK_home***/samples/AddingContextInfo/src/java/com/rest/sdk/worker/CustomPCMBaseOps.java** file, where *SDK_home* is the directory in which you installed the Billing Care SDK.

6. Package and deploy your Billing Care SDK. See "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

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Part VI

Customizing the Billing Care REST API

This part describes how to customize the Oracle Communications Billing Care REST API. It contains the following chapters:

- Using Custom OAuth Providers with Billing Care REST API
- Extending and Creating Billing Care REST Resources
- Extending REST API Response Objects
- Recording Billing Care REST API Request Failures

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Using Custom OAuth Providers with Billing Care REST API

Learn how to customize the Billing Care REST API to authenticate your client applications with an OAuth token management tool other than Oracle Access Manager.

Topics in this document:

- About OAuth Token Management Tools
- Creating a Custom Token Module
- Adding a Custom OAuth Token Module to the customModule.properties File

About OAuth Token Management Tools

The Billing Care REST API authenticates requests from your client applications by using OAuth 2.0. By default, it uses Oracle Access Manager to generate, manage, and validate OAuth tokens. However, you can customize the Billing Care REST API to use a different OAuth token management tool by using the Billing Care SDK.

For more information about the Billing Care REST API, see *REST API Reference for Billing Care*.

The Billing Care SDK includes samples that you can use for developing your own customizations in the *SDK_home*/**samples/OAuthTokenCustomization** directory, where *SDK_home* is the Billing Care SDK installation directory.

To use a different OAuth token management tool with the Billing Care REST API:

1. Create a custom OAuth token module that defines the logic for generating and validating OAuth access tokens. See "Creating a Custom Token Module".
2. Create wrapper Java classes. These classes reflect the JSON or XML response specification for your OAuth token management tool, which are required to convert the response into a Java Object for further actions. The variables in the wrapper classes will vary according to the different fields that the response contains.

   You can use the sample wrapper files in the *SDK_home*/**samples/OAuthTokenCustomization/src/java/com/oracle/communications/brm/sdk/model** directory for guidance.
3. Configure the Billing Care REST API to use your custom OAuth token module. See "Adding a Custom OAuth Token Module to the customModule.properties File".
4. Deploy your customizations as a shared library to the Billing Care REST API. See "Packaging and Deploying Customizations".

> **Note**
>
> Ensure that any third-party libraries or JARs required by the OAuth token management tool are packaged in the SDK **.war** file.

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Creating a Custom Token Module

Create a new **CustomTokenModule.java** class that extends the default **PCMOAuthTokenModule.java** class. The new class should override the token management logic used in the default class's **queryAccessToken()** and **validateToken()** methods.

To create a custom token module:

1. Create a **CustomTokenModule.java** file in your *myproject***/src/com/oracle/communications/brm/sdk/modules/** directory, where *myproject* is the IDE project folder containing your Billing Care REST API customizations.
2. Open the **CustomTokenModule.java** file in an editor.
3. Override the **queryAccessToken()** method to implement the logic for sending a request to create an OAuth 2.0 token with your OAuth token management tool. This method needs to return a response with the token.

   For example:

```
@Override
public Response queryAccessToken(HttpServletRequest servletRequest) throws
ApplicationException, JsonProcessingException {
    logger.entering("queryAccessToken");
    loadOAUTHAttributes();
    String BASE_64_CREDENTIALS = servletRequest.getHeader(HttpHeaders.AUTHORIZATION);

    Feature feature = new LoggingFeature(logger.getLogger(), Level.FINE,
        LoggingFeature.Verbosity.PAYLOAD_ANY, null);
    Client client = ClientBuilder.newBuilder().register(feature).build();

    System.setProperty("sun.net.http.allowRestrictedHeaders", "true");
    Response response = client.target(OAM_OAUTH_URL + "/token")
        .queryParam("grant_type", "CLIENT_CREDENTIALS")
        .queryParam("scope", OAM_OAUTH_BC_RESOURCE_SCOPE)
        .request()
        .header(HttpHeaders.AUTHORIZATION, BASE_64_CREDENTIALS)
        .header(HttpHeaders.CONTENT_TYPE, MediaType.APPLICATION_FORM_URLENCODED)
        .header("X-OAUTH-IDENTITY-DOMAIN-NAME", OAM_OAUTH_ID_DOMAIN)
        .post(Entity.entity("", MediaType.APPLICATION_FORM_URLENCODED),
Response.class);
    String responseString = response.readEntity(String.class);
    ObjectMapper mapper = new ObjectMapper();
    Response.ResponseBuilder builder;
    if (response.getStatus() == Response.Status.OK.getStatusCode()) {
        OAuthTokenWrapper tokenWrapper = mapper.readValue(responseString,
OAuthTokenWrapper.class);
        builder = Response.status(response.getStatus()).entity(tokenWrapper);
    } else {
        OAuthTokenErrorMsgWrapper tokenErrorMsgWrapper =
mapper.readValue(responseString, OAuthTokenErrorMsgWrapper.class);
        builder = Response.status(response.getStatus()).entity(tokenErrorMsgWrapper);
    }
    logger.exiting("queryAccessToken");
    return builder.build();

}
```

4. Override the **validateToken()** method to use the OAuth token returned in step 2 for validation. If validation is successful, this method needs to return the CLIENT_ID.

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The CLIENT_ID must then be added to the Oracle Unified Directory and assigned to groups according to their expected permissions.

This example shows remote validation using Oracle Access Manager to validate the token, but your implementation can validate the token locally without a REST API call.

```
@Override
public String validateToken(HttpServletRequest servletRequest) throws
InvalidTokenException, JsonProcessingException {
    logger.entering("validateToken");
    loadOAUTHAttributes();
    String clientId = "";
    String token = getTokenFromRequest(servletRequest);

    Feature feature = new LoggingFeature(logger.getLogger(), Level.INFO,
LoggingFeature.Verbosity.PAYLOAD_ANY, null);
    Client client = ClientBuilder.newBuilder().register(feature).build();

    System.setProperty("sun.net.http.allowRestrictedHeaders", "true");
    Response response = client.target(OAM_OAUTH_URL + "/token/info")
        .queryParam("access_token", token)
        .request()
        .header("X-OAUTH-IDENTITY-DOMAIN-NAME", OAM_OAUTH_ID_DOMAIN)
        .header(HttpHeaders.CONTENT_TYPE, MediaType.APPLICATION_JSON)
        .get(Response.class);
    ObjectMapper objectMapper = new ObjectMapper();
    if (response.getStatus() == Response.Status.OK.getStatusCode()) {
        String responseString = response.readEntity(String.class);
        objectMapper.configure(DeserializationFeature.FAIL_ON_UNKNOWN_PROPERTIES,
false);

objectMapper.configure(JsonParser.Feature.ALLOW_BACKSLASH_ESCAPING_ANY_CHARACTER,
true);
        objectMapper.configure(JsonParser.Feature.ALLOW_UNQUOTED_CONTROL_CHARS,
true);
        OAuthTokenValidationWrapper validationResponse = objectMapper.readValue(
            responseString, OAuthTokenValidationWrapper.class);
        clientId = validationResponse.client;
    } else {
        logger.exiting("validateToken");
        throw new InvalidTokenException(response.readEntity(String.class));
    }
    logger.exiting("validateToken");
    return clientId;
}
```

5. Save the file in your NetBeans IDE project.

Adding a Custom OAuth Token Module to the customModule.properties File

Configure the Billing Care REST API to use your custom OAuth token module by editing the **customModule.properties** file. See "About the customModule.properties File" for more information.

To add a custom OAuth token module:

1. Open the *myproject*/**src/java/custom/customModule.properties** file in a text editor.
2. Add the following entry:

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```
billingcare.rest.oauthtoken.module=com.oracle.communications.brm.sdk.modules.CustomTo
kenModule
```

3. Save the file in your NetBeans IDE project.

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Extending and Creating Billing Care REST Resources

Learn how to extend the Oracle Communications Billing Care REST framework and create new REST resources for use with Billing Care.

Topics in this document:

- About Extending and Creating Billing Care REST Resources
- About Billing Care Sample SDK REST Customizations
- Extending REST Services to Filter Custom Headers
- Extending REST Services

About Extending and Creating Billing Care REST Resources

Billing Care supports extending the REST framework and creating new REST resources as required by your business needs. The following customizations are supported:

- Manipulating Workflow

  For example, customizing Billing Care to invoke different Oracle Communications Billing and Revenue Management (BRM) opcodes, either for data retrieval or persistence. A typical scenario is a customer who has created a custom opcode similar to one provided by Oracle but with alternate business logic that cannot not otherwise be provided through the associated policy opcode. An alternate scenario might involve invocation of an API from an application other than BRM.

- Payload Manipulation

  For example, manipulating or inspecting the payload before invocation of an opcode. An example scenario involves a web service that returns an error condition after validating the payload, before invoking the opcode. Another scenario might involve custom logic applied to the data before submission of a payload to BRM.

- Filtering Custom HTTP Headers

  For example, adding a filter that intercepts HTTP requests and makes decisions based on the custom HTTP header value. An example scenario involves a filter that checks whether an order ID passed in the HTTP header is a duplicate and, if so, rejects the request.

- Creating New REST Resources

  For example, a new REST resource used by a customized module to retrieve additional data for display.

About Billing Care Sample SDK REST Customizations

The Billing Care SDK contains the following example REST customizations located in the *SDK_home***/samples/REST_Scenarios/src/java/com/rest/sdk**, where *SDK_home* is the directory where you installed the SDK:

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- To call a new opcode in a customized module, refer to **CustomNewOpCodeBillUnitModule.java** and **CustomBillUnitWorker.java**.
- To modify data sent to BRM, refer to **CustomPaymentModule.java**.
- To alter the application logic or support subclassing ready to use module classes, refer to **CustomExtendAdjustmentModule.java**.

For more information on invoking BRM opcodes through the Java API, see "About the PCM API" in *BRM Developer's Guide* and *Billing Care Java API Reference*.

Extending REST Services to Filter Custom Headers

You can extend the Billing Care REST framework to process custom headers sent in HTTP requests and responses and then perform additional functionality such as order tracking. You do this by adding filters to the Billing Care SDK that do the following:

- Intercept HTTP requests before they are sent to the resource, and then make decisions based on the header value. For example, a filter could check whether the request is a duplicate and, if so, reject the request.
- Intercept HTTP responses before they are sent to the client, and then make decisions based on the header value. For example, a filter could construct tracking objects and persist them in the BRM database.

To customize the Billing Care REST framework to support custom headers, perform these tasks:

1. Creating a Custom Storable Class in the BRM Data Dictionary
2. Processing Billing Care REST API Requests and Responses
3. Configuring WebLogic Server to Use an Exploded Archive
4. Sending a Test HTTP Request with the Custom Header

> **Note**
>
> The samples that are referenced in this document use predefined Order ID patterns to simulate duplicate request identification and depend on BRM base opcodes for simple order management.

Creating a Custom Storable Class in the BRM Data Dictionary

If you want to persist the custom header data in the BRM database, create a custom storable class.

To create a custom storable class:

1. In the Oracle DM configuration file (*BRM_home***/sys/dm_oracle/pin.conf**), do this:
   - Set the **dd_write_enable_objects** entry to **1**. This allows you to create, edit, and delete custom storable classes in the data dictionary.
   - Set the **sm_oracle_ddl** entry to **1**. This configures the Oracle DM to run Data Definition Languages (DDLs) when updating object types in data dictionary tables.

```
- dm dd_write_enable_objects 1
- dm sm_oracle_ddl 1
```


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2. Create a PODL storable class definition file for your custom storable class. For example, create a file named **order_tracker.podl**.

   You can refer to the sample PODL file (*SDK_home***/samples/FiltersAndCustomHeaders/order_tracker.podl**) when creating your storable class definition. In the sample PODL file, ensure that you replace all instances of **__TABLESPACE__** with the name of the tablespace in which to store the header data.

3. Run **pin_deploy** in verify mode to see the changes that will be caused by importing new storable class definitions and to verify that there are no conflicts.

   ```
   pin_deploy verify fileName
   ```

   where *fileName* is the file name of the storable class definition, such as **order_tracker.podl**.

4. Import the definition for your custom storable class into the BRM data dictionary:

   ```
   pin_deploy create fileName
   ```

See "pin_deploy" and "Creating Custom Fields and Storable Classes" in *BRM Developer's Guide* for more information about using the utility.

Processing Billing Care REST API Requests and Responses

Create a filter and wrapper object for retrieving and processing your custom headers.

1. Create a custom filter object that reads the request headers, resource paths, and attributes as well as the response status codes. Add functionality for making decisions based on the header value.

   You can refer to the sample filter object (*SDK_home***/samples/FiltersAndCustomHeaders/src/java/com/oracle/communications/brm/cc/util/CustomHeaderSampleFilter.java**) when creating your filter object.

2. Create a wrapper object that intercepts Billing Care REST API responses before they are submitted to the client.

   You can refer to the sample wrapper Java class (*SDK_home***/samples/FiltersAndCustomHeaders/src/java/com/oracle/communications/brm/cc/util/MultiReadResponseWrapper.java**) when creating your wrapper Java class.

Configuring WebLogic Server to Use an Exploded Archive

To configure WebLogic server to use an exploded archive:

1. Create a manifest file by following the instructions in "Creating a Manifest for your Shared Library".

   You can use the *SDK_home***/samples/FiltersAndCustomHeaders/src/conf/MANIFEST.MF** file as a sample.

2. Create a deployment plan by following the instructions in "Creating a New Deployment Plan for Billing Care with your Shared Library".

   The following shows a sample deployment plan:

   ```
   <?xml version='1.0' encoding='UTF-8'?>
   <deployment-plan xmlns="http://xmlns.oracle.com/weblogic/deployment-plan"
                    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
                    xsi:schemaLocation="http://xmlns.oracle.com/weblogic/
   deployment-plan http://xmlns.oracle.com/weblogic/deployment-plan/1.0/
   ```


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```
deployment-plan.xsd"
                 global-variables="false">
    <application-name>BillingCareREST.war</application-name>
    <variable-definition>
        <variable>
            <name>SDKLibraryName</name>
            <value>BillingCareCustomizations</value>
        </variable>
        <variable>
            <name>CUSTOM_HEADER_FILTER_NAME</name>
            <value>CustomHeaderSampleFilter</value>
        </variable>
        <variable>
            <name>CUSTOM_HEADER_FILTER_CLASS_NAME</name>

<value>com.oracle.communications.brm.cc.util.CustomHeaderSampleFilter</
value>
        </variable>
        <variable>
            <name>CUSTOM_HEADER_FILTER_URL_PATTERN</name>
            <value>/webresources/v1.0/*</value>
        </variable>
    </variable-definition>
    <module-override>
        <module-name>BillingCareREST.war</module-name>
        <module-type>war</module-type>
        <module-descriptor external="true">
            <root-element>weblogic-web-app</root-element>
            <uri>WEB-INF/weblogic.xml</uri>
            <variable-assignment>
                <name>SDKLibraryName</name>
                <xpath>/weblogic-web-app/library-ref/library-name</xpath>
                <operation>add</operation>
            </variable-assignment>
        </module-descriptor>
        <module-descriptor external="true">
            <root-element>web-app</root-element>
            <uri>WEB-INF/web.xml</uri>
            <variable-assignment>
                <name>CUSTOM_HEADER_FILTER_NAME</name>
                <xpath>/web-app/filter/filter-name</xpath>
                <operation>add</operation>
            </variable-assignment>
            <variable-assignment>
                <name>CUSTOM_HEADER_FILTER_CLASS_NAME</name>
                <xpath>/web-app/filter/[filter-
name="CustomHeaderSampleFilter"]/filter-class</xpath>
                <operation>add</operation>
            </variable-assignment>
            <variable-assignment>
                <name>CUSTOM_HEADER_FILTER_NAME</name>
                <xpath>/web-app/filter-mapping/filter-name</xpath>
                <operation>add</operation>
            </variable-assignment>
            <variable-assignment>
                <name>CUSTOM_HEADER_FILTER_URL_PATTERN</name>
```


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```
                <xpath>/web-app/filter-mapping/[filter-
name="CustomHeaderSampleFilter"]/url-pattern</xpath>
                <operation>add</operation>
            </variable-assignment>
        </module-descriptor>
    </module-override>
</deployment-plan>
```

3. Deploy the exploded archive shared library to your Billing Care domain by following the instructions in "Deploying your Shared Library on your Billing Care Domain".
4. Redeploy Billing Care using the deployment plan you created in step 2. To do so, follow the instructions in "Redeploying Billing Care to Use Your Shared Library".

Sending a Test HTTP Request with the Custom Header

Verify that your filter processes the custom header correctly by sending a test HTTP request to the Billing Care REST API. For more information, see *REST API Reference for Billing Care*.

For example, you could submit this POST request to the **/accounts** resource using cURL:

```
curl -X POST \
'https://hostname:port/bcws/webresources/v1.0/accounts' \
-H 'content-type: application/json' \
-H 'Accept: application/json' \
-H 'customHeader: value' \
-d
'{"locale":"en_US","customerTypeCode":"","organizationHierarchyTypeCode":"-1",
"securityCode1":"","securityCode2":"","contacts":
[{"firstName":"a","lastName":"a","middleName":"a","salutation":"","address":"a
","city":"a","company":"a","emailAddress":"","state":"a","zip":"a","deleted":f
alse,"newlyCreated":true,"elem":1,"contactType":"Primary","country":"IN","phon
enumbers":[]}],"billUnits":[{"name":"Bill

Unit(1)","billingFrequencyInMonths":1,"accountingType":2,"accountingCycleDom":
1,"currency":"840","balanceGroups":
[],"paymentType":"10001","walletPaymentInstrumentIndex":0}],"paymentMethod":
[{"invoice":{"details":{"invoiceId":"inv-
a-4","deliveryPrefer":"1","emailAddr":"","name":"a

a","address":"a","city":"a","state":"a","zip":"a","country":"IN"}},"paymentTyp
e":"10001"}]}'
```

where:

- *hostname*:*port* is the host and port number on which the Billing Care REST API instance is deployed and running.
- *customHeader* is the name of your custom header.
- *value* is a sample value to send with the custom header.

Extending REST Services

To extend REST services:

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1. Create the Java classes and necessary resources (views, view models, CSS, validations) in the appropriate *myproject*/**src/***package* directory for your implementation (for example, *myproject*/**src/com/***company*/**billingcare** where *company* is the name of your company).

   You can implement new functionality, override existing functionality, or add functionality by extending the Billing Care classes (from the JAR files added to CLASSPATH).

   > **Note**
   >
   > Any REST resources you create for Billing Care must be placed within the **com.oracle.communications.brm.cc.ws** package (*myproject*/**src/com/oracle/communications/brm/cc/ws**). This ensures that your REST resource can be deployed within the customizations shared library.

2. Compile the new Java classes.
3. Create a **customModule.properties** file in your *myproject*/**web/WEB-INF/classes/custom/** directory, where *myproject* is your NetBeans IDE project containing your Billing Care customizations. This file will contain a reference to the location of the custom Java classes you create. See "About the customModule.properties File" for more information about specifying module overrides with **customModule.properties**.
4. Copy the default **registry.js** file from *SDK_home*/**BillingCare_SDK/references** to a custom registry file named **customRegistry.js** in your *myproject*/**web/custom** directory, where *myproject* is your NetBeans IDE project containing your Billing Care customizations. This file contains the module definitions for your custom view models (JavaScript). See "About the Registry File" for more information on using a custom registry file.
5. Add your customization files to your NetBeans IDE project (*myproject*):
   - Add any JavaScript to support your custom view models in the *myproject*/**web/js** directory.
6. Right-click your NetBeans IDE project and select **Clean and Build**.
7. Package and deploy your customizations to your Billing Care domain.

   For more information, see "Packaging and Deploying Customizations".
8. Verify your changes in Billing Care.

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Extending REST API Request Objects

Learn how to enhance Billing Care REST API requests by overriding out-of-the-box fields within the input fields using extended payload data.

Topics in this document:

- Example: Overriding FldProgramName in REST API Requests

Example: Overriding FldProgramName in REST API Requests

In Billing Care REST API requests, the **FldProgramName** is set to "Billing Care" by default. The following example shows you how to override this default string value using the **PurchaseAndCancellationExtension** SDK sample.

This functionality is applicable to the following API endpoints:

- Add a Bundle to an Account: POST ...accounts/{id}/bundle
- Update a Service's Status: PUT ...statusupdate/service/{id}
- Update an Offer's Status: PUT ...statusupdate/offers/

To customize the program name associated with your API requests:

1. Create a *myproject***/web/WEB-INF/classes/custom/customModule.properties** file containing the following entries:

   ```
   billingcare.rest.account.module=com.oracle.communications.brm.sdk.modules.CustomAccountModule

   billingcare.rest.status.module=com.oracle.communications.brm.sdk.modules.CustomStatusModule
   ```

2. Create a *myproject***/src/java/com/oracle/ communications/brm/sdk/modules/ CustomAccountModule.java** file. This Java class extends **PCMAccountModule**.
3. Create a *myproject***/src/java/com/oracle/ communications/brm/sdk/modules/ CustomStatusModule.java** file. This Java class extends **PCMStatusModule**.
4. Override the **purchaseBundle()** method in **CustomAccountModule.java** to override the "programName" input field which will be added as a part of extension field in request payload. For a sample of the override code, see *SDK_home***/samples/ PurchaseAndCancellationExtension/src/java/com/oracle/communications/brm/sdk/ modules/CustomAccountModule.java** sample class.
5. Override the **changeStatus()** and **changeOffersStatus()** methods in **CustomStatusModule.java** to override "programName" input field which will be added as a part of extension field in request payload. For a sample of the override code, see *SDK_home***/samples/PurchaseAndCancellationExtension//src/java/com/oracle/ communications/brm/sdk/modules/CustomStatusModule.java** sample class.
6. Add the directories from *SDK_home***/libs** to the extension project's classpath.
7. Package and deploy your customizations using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

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The following shows a sample payload for sending "programName" as an extended attribute during bundle purchase.

```
{
   "id":"0.0.0.1+-deal+155748",
   "name":"aaa Balance",
   "customizedChargeOffers":[
      {
         "name":"aaa Due",
         "description":"",
         "baseChargeOfferRef":{
            "id":"0.0.0.1+-product+158628",
            "uri":null
         }
      }
   ],
   "customizedDiscountOffers":[

   ],
   "extension":{
      "programName":"12121212"
   },
   "effective":null
}
```


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Extending REST API Response Objects

Learn how to extend the Oracle Communications Billing Care REST API to return data from BRM storable objects in its response objects.

Topics in this document:

- About Enriching REST API Response Objects
- Enriching Response Objects
- Example: Enriching the Response Object for the Account Module

About Enriching REST API Response Objects

You can extend the Billing Care REST API to return complex data, such as all data stored in a BRM storable class, in a JAXB-annotated class. For example, it could return all fields in an **/account** object or the **/profile** object linked with an account.

When you extend the BRM REST API to enrich response data, it returns object information in the **extension** field of response objects in JSON or XML format.

The Billing Care SDK includes a sample response object customization, including a **README.txt** file explaining the sample, in the *SDK_home***/samples/ExtensionFields** directory where *SDK_home* is the directory in which you installed the Billing Care SDK. Use this sample when developing your own customizations.

For more information about the Billing Care REST API, see *REST API Reference for Billing Care*.

Enriching Response Objects

To customize the Billing Care REST API to enrich response objects:

1. Create an extended Java class to hold your fields in a single object. For example, create a Java class named *className***Extension.java**.
2. Add JAXB annotations that indicate how to translate the fields in your extended Java class.
3. Create an **ObjectFactory** Java class that provides the factory method for creating an object of your extended class.
4. Create a **package-info** Java class that provides name space information to JAXB.
5. Create a custom module that extends the default BRM module and overrides its default method.

   The custom module should do the following:

   - Invoke default methods
   - Fetch additional data from the BRM database
   - Wrap the additional data in the extended Java class object
   - Set the additional data in the **extension** field

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6. Create a **customModule.properties** file that specifies the resource group your custom module will override.

   For more information, see "About the customModule.properties File".

7. (Optional) To serialize the data added through your extended Java class in XML format, create **JAXBContext** with the default package "**com.oracle.communications.brm.cc.model**" and include the custom package that holds the extended field Java objects. You can do this by using a provider of Jersey that implements the **ContextResolver<T>** interface.

8. Package and deploy your SDK as a shared library to *SDK_home***/libs/BillingCareREST.war** using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

   To support responses in XML format, register your **ContextResolver** provider with Jersey.

Example: Enriching the Response Object for the Account Module

In the Billing Care REST API, the **Get Details for an Account** endpoint returns account details such as contact information, billing profiles, registered payment methods, and so on. The following example shows how to enrich the REST API response for the account module so that it returns other fields from the **/account** database object, such as PIN_FLD_AAC_ACCESS, PIN_FLD_AAC_PACKAGE, and PIN_FLD_AAC_PROMO_CODE.

To extend the response object for the account module so that it retrieves additional fields:

1. Open the *myproject***/web/WEB-INF/classes/custom/customModule.properties** file in a text editor.

2. Add the following entry, where *company* is the company name used in your *myproject***/src** directory.

   ```
   billingcare.rest.account.module=com.company.modules.CustomAccountModule
   ```

3. Create a **CustomAccountModule.java** file in your *myproject***/src/modules** directory, where *myproject* is your NetBeans IDE project folder containing your Billing Care REST API customizations.

   This Java class extends **PCMAccountModule** and appends all fields from the specified **/account** object to the extension key in the response object.

   For a sample of the override code, see the *SDK_home***/samples/ExtensionFields/src/java/com/oracle/communications/brm/sdk/modules/CustomAccountModule.java** sample class.

4. Create an **AccountExtension.java** file that defines the fields to return in the extension object.

   For a sample of the code, see the *SDK_home***/samples/ExtensionFields/src/java/com/oracle/communications/brm/sdk/model/AccountExtension.java** sample class.

5. Create an **ObjectFactory** Java class that programmatically constructs new instances of the Java representation for XML content. The Java representation of XML content can consist of schema-derived interfaces and classes representing the binding of schema type definitions, element declarations, and model groups.

   For a sample of the code, see the *SDK_home***/samples/ExtensionFields/src/java/com/oracle/communications/brm/sdk/model/ObjectFactory.java** sample class.

6. Create a **package-info** Java class that provides name space information to the JAXB model class defined in the **com.oracle.communications.brm.sdk.model** package.

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For a sample of the code, see the *SDK_home*/**samples/ExtensionFields/src/java/com/oracle/communications/brm/sdk/model/package-info.java** sample class.

7. If you want the Billing Care REST API to be able to send the response in XML format, create a custom **JAXBContextProvider** Java class that understands Billing Care-defined default and custom response objects and converts them into XML format.

   For a sample of the override code, see the *SDK_home*/**samples/ExtensionFields/src/java/com/oracle/communications/brm/sdk/util/CustomJAXBContextProvider.java** sample class.

8. Package and deploy your customizations using one of the methods described in "Using an Exploded Archive during Customization" or "Packaging and Deploying Customizations".

   The following shows a sample deployment plan that links the SDK **.war** as a shared library to the Billing Care REST API. It also adds a Jersey Provider package to the existing list of packages for identifying resource classes, which is required to support serialization in XML format.

```
<deployment-plan xmlns="http://xmlns.example.com/weblogic/deployment-plan"
                 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
                 xsi:schemaLocation="http://xmlns.example.com/weblogic/
deployment-plan http://xmlns.example.com/weblogic/deployment-plan/1.0/
deployment-plan.xsd"
                 global-variables="false">
    <application-name>BillingCareREST.war</application-name>
    <variable-definition>
        <variable>
            <name>SDKLibraryName</name>
            <value>BillingCareCustomizations</value>
        </variable>
        <variable>
            <name>PROVIDER_PACKAGE</name>

<value>com.oracle.communications.brm.cc.ws,com.oracle.communications.brm.cc
.authentication,com.oracle.communications.brm.sdk.util</value>
        </variable>
    </variable-definition>
    <module-override>
        <module-name>BillingCareREST.war</module-name>
        <module-type>war</module-type>
        <module-descriptor external="true">
            <root-element>weblogic-web-app</root-element>
            <uri>WEB-INF/weblogic.xml</uri>
            <variable-assignment>
                <name>SDKLibraryName</name>
                <xpath>/weblogic-web-app/library-ref/library-name</xpath>
                <operation>add</operation>
            </variable-assignment>
        </module-descriptor>
        <module-descriptor external="true">
            <root-element>web-app</root-element>
            <uri>WEB-INF/web.xml</uri>
            <variable-assignment>
                <name>PROVIDER_PACKAGE</name>
                <xpath>/web-app/servlet[servlet-name='jersey']/init-
param[param-name='jersey.config.server.provider.packages']/param-value</
xpath>
```


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```
                    <operation>replace</operation>
                </variable-assignment>
            </module-descriptor>
        </module-override>
    </deployment-plan>
```


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Recording Billing Care REST API Request Failures

Learn how to customize the Oracle Communications Billing Care REST API to record information about request failures in the Oracle Communications Billing and Revenue Management (BRM) database.

Topics in this document:

- About Recording Billing Care REST API Request Failures
- Enabling the Recording of REST Request Failures
- Customizing REST Request Failure Details

About Recording Billing Care REST API Request Failures

Billing Care REST API requests may occasionally fail to process completely. For example, a payment request could fail due to an incorrect account address or because a network connection dropped. You can configure the Billing Care REST API to store information about failed REST requests in the BRM database, so you can view them for analysis and reporting, or reprocess them at a later time.

When a Billing Care REST API request fails, BRM stores the following details about the failure in **/request/failed/rest** objects:

- The request's basic header information, such as Content-Type, Accept, and Content-Length
- The request payload, removing any sensitive information such as card numbers and expiration dates

In multischema systems, the object is stored in the schema in which the failed request occurred. For more information about the **/request/failed/rest** object, see *Storable Class Reference*.

To enable the Billing Care REST API to record request failures, see "Enabling the Recording of REST Request Failures".

To customize the details recorded for a REST request failure, see "Customizing REST Request Failure Details".

Enabling the Recording of REST Request Failures

To enable the Billing Care REST API to record details about REST request failures:

1. If your system does not have a **CustomConfigurations.xml** file, create the file. See "Creating a Custom Configuration File".
2. Open the **CustomConfigurations.xml** file in an editor.

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> **Note**
>
> By default, the **CustomConfigurations.xml** file is in the *myproject***/src/java/custom/configurations** directory, where *myproject* is your NetBeans IDE Billing Care customizations project.

3. In the file, set the **request.record.failure** key to **true**:

```
<flags>
   <key>request.record.failure</key>
   <value>true</value>
</flags>
```

4. Save and close your **CustomConfigurations.xml** file.
5. Save the file in your NetBeans IDE project.

Customizing REST Request Failure Details

You can customize the Billing Care REST API to perform additional tasks when recording request failures, such as:

- Storing additional headers from the failed request
- Removing additional sensitive data from the request payload
- Changing how the request payload is serialized for storage in the **/request/failed/rest** object
- Overriding fields in the **/request/failed/rest** object
- Specifying to record request failures for only specified Billing Care REST API endpoints

To customize the details recorded for a REST request failure:

1. Customize the logic for recording request failures. See "Customizing the Request Record Logic".
2. Customize which headers to record and the information to remove from request payloads. See "Customizing the Headers and Payload to Record".
3. Configure the Billing Care REST API to use your custom logic for recording request failures. See "Overriding the Default Request Record Logic".

The Billing Care SDK includes sample Record Request customizations, including a **README.txt** file explaining the samples, in the *SDK_home***/samples/RecordRequestsCustomization** directory, where *SDK_home* is the directory in which you installed the Billing Care SDK. Use these samples when developing your own Record Request customizations.

Customizing the Request Record Logic

To customize the logic for recording request failures:

1. Create a **CustomPCMRequestInfoModule.java** file in your *myproject***/src/java/com/oracle/communications/brm/sdk** directory, where *myproject* is the folder containing your NetBeans IDE project.

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> **Note**
>
> A sample **CustomPCMRequestInfoModule.java** file is provided in the *SDK_home*/**samples/RecordRequestsCustomization/src/java/com/oracle/communications/brm/sdk** directory.

2. In the file, implement your custom logic by overriding the **recordFailure( )** method.

   The sample logic below calls the custom method from **customRecordFailureWorker** to do the following:

   - Record additional headers
   - Remove additional information from the request payload
   - Create an input flist for the PCM_OP_ACT_REQUEST_OPCODE opcode
   - Call the PCM_OP_ACT_REQUEST_OPCODE opcode to record the failed request in a **/request/failed/rest** object

```
@override
public void recordFailure(String id, String descr, String correlationId, String
errorCode, Exception ex, Object payload) throws EBufException {
    if(!BRMUtility.getRecordFailureFlag()){
        return;
    }
    PortalContext ctx = null;
    BaseOps baseops = getBaseOps();
    try {
        if (baseOps instanceof PCMBaseOps) {
            logger.fine("Setting BRM Connection Object to BaseOps");
            ctx = BRMUtility.getConnection();
            ((PCMBaseOps) baseOps).setContext(ctx);
        }
        HttpServletRequest request = getUserContext().getRequest();
        CustomRequestInfoWorker customRecordFailureWorker = new
CustomRequestInfoWorker();
        customRecordFailureWorker.setBaseOps(baseops);
        customRecordFailureWorker.setUserContext(getUserContext());
        Map<String, String> headerInfoMap = new HashMap<>();
        customRecordFailureWorker.addHeaders(request, headerInfoMap);
        int partial =
customRecordFailureWorker.truncateSensitiveInfo(payload);
        String payloadStr = customRecordFailureWorker.preparePayload(payload,
request);
        FList inputFList =
customRecordFailureWorker.convertToInputFListForRecordFailure(id, correlationId,
partial, errorCode, ex, headerInfoMap, payloadStr, request, descr);
        customRecordFailureWorker.invokeRequestCreate(inputFList);
    } catch (EBufException excp) {
        throw excp;
    } finally {
        if (ctx != null) {
            BRMUtility.releaseConnection(ctx);
        }
    }
}
```

3. Save the file in your NetBeans IDE project.

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Customizing the Headers and Payload to Record

You can customize the Billing Care REST API to record additional headers or to remove additional information from the request payload. To do so, perform the following:

1. Copy the sample **CustomRequestInfoWorker.java** file from the *SDK_home***/samples/RecordRequestsCustomization/src/java/com/oracle/communications/brm/sdk** directory to your *myproject***/src/java/com/oracle/communications/brm/sdk** directory.
2. To add custom headers to the operation failure record, override the **addHeaders( )** method. For example:

```
@Override
public void addHeaders(HttpServletRequest request, Map<String, String>
headerInfoMap) {
   super.addHeaders(request, headerInfoMap);
   //Your custom logic here
   logger.fine("Adding custom headers");
}
```

3. To modify what information is removed from the request payload, override the **truncateSensitiveInfo( )** method. This method must return **isPayloadPartial** when sensitive information is removed from the payload. For example:

```
@Override
public int truncateSensitiveInfo(Object payloadObj) {
   int isPayloadPartial = super.truncateSensitiveInfo(payloadObj);
   logger.fine("Truncating sensitive information from payload");
   //Your Custom Logic here
   return isPayloadPartial;
}
```

4. Save the file in your NetBeans IDE project.

Overriding the Default Request Record Logic

You configure the Billing Care REST API to use the logic from your custom request module rather than the default request module by editing the **customModule.properties** file.

To override the default Billing Care REST API request record logic:

1. Open the **customModule.properties** file from the *myproject***/src/java/custom** directory.
2. Add the following entry to the file:

```
billingcare.rest.requestinfo.module=com.oracle.communications.brm.sdk.CustomPCMRequestInfoModule
```

3. Save and close the **customModule.properties** file.
4. Save the file in your NetBeans IDE project.
5. Package and deploy your Billing Care SDK. See "Packaging and Deploying Customizations".

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