

# Oracle® Communications Billing and Revenue Management

## PDC REST Services Manager Integration Guide



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The Oracle logo, consisting of a solid red square with the word "ORACLE" in white, uppercase, sans-serif font centered within it.

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Oracle Communications Billing and Revenue Management PDC REST Services Manager Integration Guide, Release 15.0

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# Preface

This guide describes how to use Pricing Design Center (PDC) REST Services Manager to integrate PDC with product catalog software.

This guide has been updated to include changes and new feature content added for release 15.0.1.

## Audience

This guide is intended for system administrators and those involved in system integration.

## Documentation Accessibility

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## Diversity and Inclusion

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# 1

## PDC REST Services Manager Overview

You integrate Oracle Communications Pricing Design Center (PDC) with an enterprise product catalog by using PDC REST Services Manager.

Topics in this document:

- [About PDC REST Services Manager](#)
- [About Setting Up PDC REST Services Manager](#)
- [About Monitoring PDC REST Services Manager](#)

### About PDC REST Services Manager

PDC REST Services Manager integrates an enterprise product catalog, such as Oracle Digital Experience for Communications Launch Experience, with PDC. This enables you to create a variety of product offerings in your enterprise product catalog and then have all the rating and billing performed by PDC and Oracle Communications Billing and Revenue Management (BRM).

You can synchronize the following elements from an enterprise product catalog to PDC:

- One-time, recurring, and usage charges, with or without discounts
- Charge and discount offers with one-time, recurring, usage, and rollover charges and discounts (without selectors and product specifications)
- Quantity and tier-based pricing and discounting
- Quantity ranges (without common properties)
- Pricing tags
- Effective dates for charges and discounts
- Noncurrency balance credits, with or without one-time or recurring fees and overages
- Discounts used as counters for noncurrency balance credits to charge overage fees
- Validity periods for discounts and noncurrency balance credits
- Shared discounts
- Charges based on event and service attributes
- Generic selectors and charge selectors
- Charge selectors with value maps
- Packages and bundles containing multiple charge offers and discounts
- Subscription terms for packages and bundles
- Custom attributes (also called product specification characteristics or product specification attributes)

 **Note:**

To include custom attributes in product offerings synchronized from your enterprise product catalog, you must first create the attributes in a configuration template file and import the file into PDC. See "Configuring Product Specification Attributes for Pricing Components" in *PDC Creating Product Offerings*.

Throughout all interactions, you can log, trace, and collect metrics for messages passing through the system. You can use this data to troubleshoot errors and monitor the system's overall health. See "[Monitoring PDC REST Services Manager](#)".

## About the PDC REST API

The Pricing Design Center REST API uses JSON-formatted messages to facilitate interaction with Pricing Design Center through the REST architecture. This API is integrated into the PDC REST Services Manager package.

For Launch-to-PDC integration, this REST API enables you to efficiently administer PDC data through RESTful communication. This integration streamlines the communication process and significantly enhances the flexibility and scalability of PDC interactions.

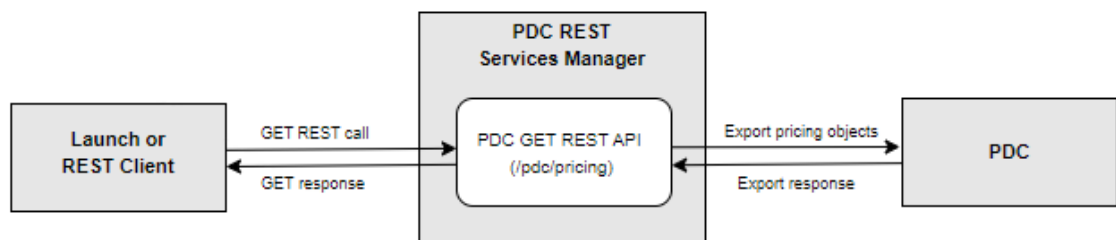
The PDC REST API offers a comprehensive set of operations to manage PDC objects, including CREATE, UPDATE, DELETE, and GET.

The PDC REST API uses the PDC server Import and Export APIs to consistently manage PDC objects. The Import API facilitates the incorporation of external data into the PDC system, while the Export API enables the extraction of PDC data for external consumption.

For more information about the Pricing Design Center REST API, see [REST API Reference for Pricing Design Center](#).

[Figure 1-1](#) displays the process the system uses for GET requests.

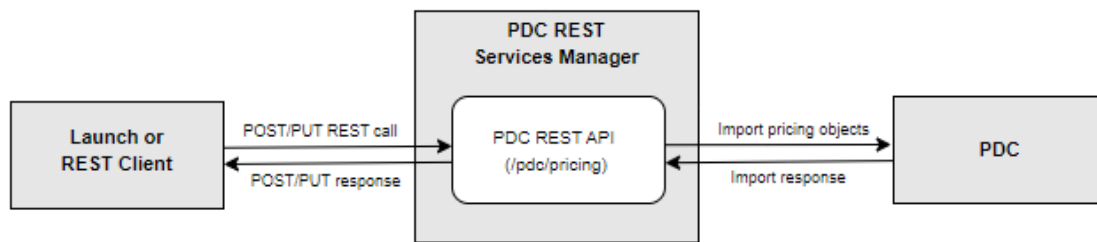
**Figure 1-1 Data Flow for PDC REST API GET Requests**



1. The client sends a request to the PDC REST API to view PDC data. This request can include type or name to retrieve specific PDC data.
2. PDC REST API transforms the data from JSON into PDC objects and calls the PDC Export API.
3. The PDC Export API returns the data to the PDC REST API.
4. PDC REST API transforms the PDC data to JSON and returns the response with a status code if the data is fetched successfully from PDC. Otherwise, it throws an error with a message.

Figure 1-2 displays the process the system uses for POST and PUT requests.

**Figure 1-2 Data Flow for PDC REST API POST and PUT Requests**



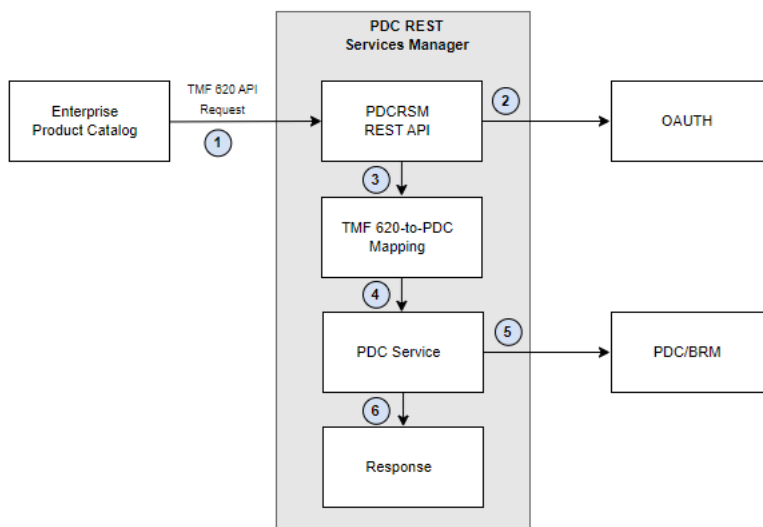
1. The client sends a request to PDC REST API to create or update PDC data. This request includes the pricing information in JSON payload.
2. PDC REST API transforms the data from JSON into PDC objects and calls the PDC Import API.
3. The PDC Import API returns the data to the PDC REST API.
4. PDC REST API returns the response with '201' status code if the data is created or updated successfully in PDC. Otherwise, it throws an error with a message.

## About the PDC TMF 620 API

The enterprise product catalog publishes the product offering objects to registered billing-spoke systems using the PDC TMF 620 API. PDC REST Services Manager synchronizes this data and transforms it into charge offers, discount offers, bundles, and packages in the PDC-BRM system.

Figure 1-3 shows the PDC REST Services Manager architecture and its integration points with the enterprise product catalog and PDC.

**Figure 1-3 PDC REST Services Manager Architecture for TMF 620 API**





In this figure, PDC REST Services Manager, the enterprise product catalog, and PDC interact as follows:

1. The enterprise product catalog sends a request to PDC REST Services Manager to create, edit, view, or delete a Product Offering, Product Offering Price, or Product Specification. This communication can be encrypted using TLS. This request will include a TMF 620-compliant payload with product definitions, pricing information, and so on.
2. PDC REST Services Manager uses OAuth 2.0 to authenticate the request from the enterprise product catalog.
3. PDC REST Services Manager transforms the data from TMF objects to PDC objects.
4. PDC REST Services Manager submits the transformed data to PDC.
5. The data is synchronized from PDC to BRM.
6. PDC REST Services Manager returns the response with a status code and response body if the object is created successfully in PDC. Otherwise, it throws an exception with a message.

For more information, see [REST API Reference for Pricing Design Center TMF 620 API](#).

## About Setting Up PDC REST Services Manager

You set up PDC REST Services Manager by performing the following high-level tasks:

1. Install PDC REST Services Manager. See "Installing Only PDC REST Services Manager" in *PDC Installation Guide*.
2. Set up PDC REST Services Manager security. This includes setting up authentication for requests from your enterprise product catalog with OAuth and securing communication between PDC REST Services Manager and other applications with TLS and T3S protocols. See "PDC REST Services Manager Security" in *BRM Security Guide*.
3. Create setup components in all applications, then map the product offerings from the TMF 620 API fields in your enterprise product catalog to equivalent fields in PDC and BRM. See "[Mapping Product Offerings](#)".

## About Monitoring PDC REST Services Manager

You can monitor PDC REST Services Manager to confirm successful integration, track overall system health, and troubleshoot issues.

Monitoring PDC REST Services Manager involves the following tasks:

- Monitoring system logs. See "[About Logging](#)".
- Tracing events with tools like Zipkin. See "[About Tracing](#)".
- Monitoring metrics with tools like Prometheus. See "[About Metrics](#)".
- Monitoring system status. See "[About Monitoring System Health](#)".

# 2

## Securing PDC REST Services Manager Communications

You can secure inbound and outbound communications with Oracle Communications Pricing Design Center (PDC) REST Services Manager.

Topics in this document:

- [About Securing PDC REST Services Manager Communications](#)
- [Requesting an OAuth Access Token from Oracle Identity Cloud Service](#)
- [Requesting an OAuth Access Token from Oracle Access Management](#)

### About Securing PDC REST Services Manager Communications

PDC REST Services Manager uses the following security protocols to secure inbound and outbound requests:

- **OAuth 2.0:** Authenticates your enterprise product catalog's identity and authorizes it to access the PDC REST Services Manager API by validating an OAuth access token passed in the header of every HTTP/HTTPS request to the PDC REST Services Manager API.

You can enable OAuth for PDC REST Services Manager using Oracle Identity Cloud Service or Oracle Access Management.

See either "[Requesting an OAuth Access Token from Oracle Identity Cloud Service](#)" or "[Requesting an OAuth Access Token from Oracle Access Management](#)" for information about requesting an access token.

- **TLS:** Secures communication from your enterprise product catalog to PDC REST Services Manager.
- **T3S:** Secures communication from PDC REST Services Manager to PDC.

See "PDC REST Services Manager Security" in *BRM Security Guide* for information about configuring PDC REST Services Manager security.

### Requesting an OAuth Access Token from Oracle Identity Cloud Service

Request an OAuth access token from Oracle Identity Cloud Service to include in requests to the PDC REST Services Manager APIs. For more information, see "[Generate Access Token and Other OAuth Runtime Tokens to Access the Resource](#)" in *REST API for Oracle Identity Cloud Service*.

To request an OAuth access token using cURL, use the following format for your HTTP/HTTPS request to the Oracle Identity Cloud Service URL:

```
curl -i
      -H "Authorization: Basic encoded_credentials" \
```

```
-H "Content-Type: application/x-www-form-urlencoded;charset=UTF-8" \
--request POST https://idcs_hostname/oauth2/v1/token \
-d 'grant_type=client_credentials&scope=https://primaryAudience/scope'
```

where:

- *encoded\_credentials* is either the client ID and client secret (*clientID:clientSecret*) or user name and password (*username:password*) in Base64-encoded format.
- *idcs\_hostname* is the host name of your Oracle Identity Cloud Service instance.
- *primaryAudience* is the host name and port of your confidential application.
- *scope* is one of the following:
  - **pubevent**: Authorizes access to the Publish Event endpoint.
  - **metrics**: Authorizes access to the Metrics endpoint.

After you submit the request, Oracle Identity Cloud Service returns an OAuth access token. Your client must pass this OAuth access token in the header of every HTTP/HTTPS request sent to the PDC REST Services Manager.

## Requesting an OAuth Access Token from Oracle Access Management

You create an access token for OAuth authentication by submitting a request to the **Create Access Token Flow** endpoint of the Oracle Access Management OAuth REST API. For more information, see ["Create Access Token Flow"](#) in *REST API for OAuth in Oracle Access Manager*.

To request an OAuth access token, use cURL to send an HTTP/HTTPS request to the Oracle Access Management URL:

```
curl -i --header 'Authorization: Basic encoded_admin' \
  --header "Content-Type: application/x-www-form-urlencoded;charset=UTF-8" \
  \
  --header "X-OAUTH-IDENTITY-DOMAIN-NAME: identity_domain" \
  --request POST http://oam_host:oam_port/oauth2/rest/token \
  --data-
urlencode "grant_type=CLIENT_CREDENTIALS&scope=resource_server.scope"
```

where:

- *encoded\_admin* is the base64-encoded format of the Oracle Access Management administrator user name and password.
- *identity\_domain* is the name of the OAuth identity domain created in Oracle Access Management for PDC REST Services Manager.
- *oam\_host:oam\_port* is the host name and port for the Oracle Access Management server.
- *resource\_server* is the name of the Oracle Access Management resource server created for PDC REST Services Manager.
- *scope* is the name of a scope.

The following shows an example cURL request for creating an OAuth access token for the **PDC\_RSM\_domain** identity domain, **PDCRSMResourceServer** resource server, and **all** scope:

```
curl --location --header 'Authorization: Basic encoded_admin' \  
      --header "Content-Type: application/x-www-form-urlencoded;charset=UTF-8" \  
 \  
      --header "X-OAUTH-IDENTITY-DOMAIN-NAME: PDC_RSM_Domain" \  
      --request POST http://oam_host:oam_port/oauth2/rest/token \  
      --data-urlencode \  
      "grant_type=CLIENT_CREDENTIALS&scope=PDCRSMResourceServer.all"
```

If the request is successful, Oracle Access Management returns something similar to this:

```
{  
  "access_token": "access_token",  
  "token_type": "Bearer", "expires_in": 3600  
}
```

Your client must pass this OAuth access token in the header of every HTTP/HTTPS request sent to PDC REST Services Manager.

# 3

## Mapping Product Offerings

Learn how to map product offering data in Oracle Communications Pricing Design Center (PDC) REST Services Manager, so it can transform the TMF 620 data to PDC and Oracle Communications Billing and Revenue Management (BRM) data. For more information, see [REST API Reference for Pricing Design Center TMF 620 API](#).

Topics in this document:

- [About Mapping Product Offerings](#)
- [Mapping Setup Components](#)
- [Mapping Custom Attributes from TMF 620 to PDC](#)
- [Mapping Charge Offers from TMF 620 to PDC](#)
- [PDC Charge Offer Default Values](#)
- [Mapping Discount Offers from TMF 620 to PDC](#)
- [PDC Discount Offer Default Values](#)
- [Mapping Pricing Components from TMF620 to PDC](#)
- [Mapping Generic Selectors and Charge Selectors from TMF 620 to PDC](#)
- [Mapping Objects Not Supported](#)

### About Mapping Product Offerings

To enable PDC REST Services Manager to transform your product offering data, you must first create setup components in BRM, PDC, and the enterprise product catalog, then map the TMF 620 data from your enterprise product catalog to PDC.

 **Note:**

PDC REST Services Manager supports only the base TMF 620 specifications, along with select vendors' extensions based on business drivers. Your enterprise product catalog vendor is responsible for defining and publishing any TMF 620 vendor-specific API extensions. Your vendor's published TMF 620 API will include the TMF 620 ProductOffering payload, ProductOfferingPrice payload, and other payloads as well as the notification event payloads that PDC REST Services Manager or any other consumer of the enterprise product catalog must support.

The following sections show the mappings between TMF 620 data and the PDC and BRM data schema. They also list the default values for PDC and BRM data fields when TMF 620 has no corresponding field.

# Mapping Setup Components

In BRM, setup components are the prerequisite data you configure before creating product offerings. You create some setup components in BRM and then synchronize them with PDC, and you create other setup components in PDC. There is no synchronization flow between PDC or BRM and the enterprise product catalog for setup components. You must create them independently in PDC and the enterprise product catalog, and configure your enterprise product catalog to send data in the TMF 620 payload that matches what you have created in PDC.

**Table 3-1** lists the setup components you configure in BRM and PDC before creating your product offerings. It details how PDC REST Services Manager maps data in the TMF 620 payload to the setup components.

**Table 3-1 Setup Component Mapping**

Setup Component	Mapping Details
Services	<p>BRM includes preconfigured services, and you can create custom services. You synchronize services from BRM to PDC with the <b>syncPDC</b> utility. See "Setting Up Service and Event Definitions" in <i>PDC Creating Product Offerings</i> for more information.</p> <p>In the TMF 620 payload, your enterprise product catalog must send case-sensitive values in the <b>name</b> property of the <b>ServiceSpecification</b> object that are identical to the BRM services names.</p>
Ratable Usage Metrics (RUMs)	<p>In BRM, a RUM specifies the units for measuring events and how to calculate the measurement. You can base a measurement on any data captured in an event, such as how long a session lasted or the number of bytes downloaded during a session.</p> <p>You create RUMs in PDC. See "Configuring Ratable Usage Metrics (RUMs)" in <i>PDC Creating Product Offerings</i>.</p> <p>In the TMF 620 payload, for usage charges, your enterprise product catalog must send case-sensitive values in the <b>units</b> property of the <b>Quantity</b> object that are identical to RUM names.</p> <p>For one-time or recurring charges, PDC REST Services Manager automatically selects the <b>Occurrence</b> RUM.</p>
Service-event map	<p>In BRM, the service-event map lets you configure which charge events can be used for a service and which RUMs can be used for each service-event combination. The service-event map links each supported service to the events that can have charges configured for that service.</p> <p>You create the service-event map in PDC. See "Setting Up the Service-Event Map" in <i>PDC Creating Product Offerings</i>.</p> <p>PDC REST Services Manager uses the <b>application-eventConfig.yaml</b> configuration file to map TMF 620 notifications from your enterprise product catalog to BRM event names. See "Configuring Mapping of TMF 620 priceType to BRM Event Names" in <i>PDC Installation Guide</i> for details about configuring the mappings in this file.</p>

**Table 3-1 (Cont.) Setup Component Mapping**

Setup Component	Mapping Details
Balance elements	<p>In BRM, a balance element represents one of the following:</p> <ul style="list-style-type: none"> <li>• A currency or noncurrency asset of economic value, such as US dollars or included minutes</li> <li>• A counter that tracks items such as dollars spent or minutes talked</li> </ul> <p>You configure balance elements in PDC. See "Configuring Balance Elements" in <i>PDC Creating Product Offerings</i>.</p> <p>In the TMF 620 payload:</p> <ul style="list-style-type: none"> <li>• For currency balance elements, your enterprise product catalog must send case-sensitive ISO 4217 standard 3-character currency codes in the <b>unit</b> property of the <b>Money</b> object that are identical to the PDC balance element IDs.</li> <li>• For noncurrency balance elements, your enterprise product catalog must send case-sensitive values in the <b>units</b> property of the <b>unitOfMeasure</b> object that are identical to PDC noncurrency balance element names.</li> </ul>
Tax codes	<p>In BRM, a tax code indicates which tax to apply on the price of the product offering.</p> <p>You create and modify tax codes in PDC then publish them to rating engines with the <b>ImportExportPricing</b> utility. See "Creating Tax Codes" in <i>BRM Calculating Taxes</i>.</p> <p>In the TMF 620 payload, your enterprise product catalog must send case-sensitive values in the <b>taxCode</b> property of the <b>Tax</b> object in the extended <b>ProductOfferingPriceOracle</b> object that are identical to the BRM tax code names.</p>
General ledger (G/L) IDs	<p>In BRM, G/L IDs ensure that charges are reported to the correct account in your company's general ledger.</p> <p>You create G/L IDs in BRM and synchronize them to PDC with the <b>SyncPDC</b> utility. See "About G/L IDs" in <i>BRM Collecting General Ledger Data</i>.</p> <p>In the TMF 620 payload, your enterprise product catalog must send case-sensitive values in the <b>glid</b> property of the extended <b>ProductOfferingPriceOracle</b> object that are identical to the BRM G/L ID description.</p>

For more information about these setup components, and others, see "About Setup Components" in *PDC Creating Product Offerings*.

## Mapping Custom Attributes from TMF 620 to PDC

[Table 3-2](#) shows how to map custom attributes (also called product specification attributes or product specification characteristics) data from TMF 620 fields to PDC fields.

**Table 3-2 TMF 620 Custom Attribute Mappings for PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductSpecification	ProductSpecificationOracle	ProductSpecificationOracle.name	productSpecCharacteristicTemplates.name	ProductSpecification Template Name.
ProductSpecification	ProductSpecificationOracle	ProductSpecificationOracle.PriceType	productSpecCharacteristicTemplates.pricingObjectType	Defines type of ProductSpecification
ProductSpecCharacteristic	ProductSpecCharacteristicOracle	ProductSpecificationOracle.ProductSpecCharacteristicOracle.name	productSpecCharacteristics.name	Name of the Characteristics
ProductSpecCharacteristic	ProductSpecCharacteristicOracle	ProductSpecificationOracle.ProductSpecCharacteristicOracle.type	productSpecCharacteristics.type	Type of the Characteristics
ProductSpecCharacteristicValue	ProductSpecCharacteristicValueOracle	ProductSpecificationOracle.ProductSpecCharacteristicOracle.ProductSpecCharacteristicValueOracle[n].value	productSpecCharacteristics.values	Value of the Characteristics

## Mapping Charge Offers from TMF 620 to PDC

Table 3-3 shows how to map charge offer data from TMF 620 fields to PDC fields.

**Table 3-3 Mapping a ChargeRatePlan from TMF 620 to PDC REST Services Manager for a one-time, recurring or usage charge offer**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.id	chargeRatePlanJXB.name	ChargeRatePlan Name
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.eventCandidate.name	ChargeRatePlanJXB.eventName	Event Name
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.validFor.startDateTime ProductOfferingPrice.validFor.endDateTime	chargeRatePlan.subscriberCurrency.crpRelDateRange.absoluteDateRange.startDate chargeRatePlan.subscriberCurrency.crpRelDateRange.absoluteDateRange.endDate	Start Date End Date



**Table 3-3 (Cont.) Mapping a ChargeRatePlan from TMF 620 to PDC REST Services Manager for a one-time, recurring or usage charge offer**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.rumCandidate.name	<p><b>One-time charge:</b>                      chargeRatePlan.subscriberCurrency.crpRelDateRange.crpCompositePopModel.oneTimePopModel.rumName</p> <p><b>Recurring charge:</b>                      chargeRatePlan.subscriberCurrency.crpRelDateRange.crpCompositePopModel.recurringPopModel.rumName</p> <p><b>Usage Charge</b>                      subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.PriceTier.RumName</p>	Rum Name

**Table 3-3 (Cont.) Mapping a ChargeRatePlan from TMF 620 to PDC REST Services Manager for a one-time, recurring or usage charge offer**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.POPAlteration.ProductPriceValue.DutyFreeAmount.Value	<p><b>One-time charge:</b> chargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.oneTimePopModel.priceTier.tierRange.oneTimeCharge.price</p> <p><b>Recurring charge:</b> chargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.recurringPopModel.priceTier.tierRange.recurringcharge.price</p> <p><b>Usage Fixed Charge:</b> subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.priceTierRange.FixedCharge.Price</p> <p><b>Usage Scaled Charge:</b> subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.priceTierRange.ScaledCharge.Price</p>	Price

**Table 3-3 (Cont.) Mapping a ChargeRatePlan from TMF 620 to PDC REST Services Manager for a one-time, recurring or usage charge offer**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.POPAlteration.ProductPriceValue.DutyFreeAmount.Unit	<p><b>One-time charge:</b> chargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.oneTimePopModel.priceTier.tierRange.oneTimeCharge.balanceElementNumCode</p> <p><b>Recurring charge:</b> chargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.recurringPopModel.priceTier.tierRange.recurringcharge.balanceElementNumCode</p> <p><b>Usage fixed charges</b> PricingObjectsJXB.ChargeRatePlanJXB.subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.priceTierRange.FixedCharge.balanceElementNumCode</p> <p><b>Usage Scaled charges</b> PricingObjectsJXB.ChargeRatePlanJXB.subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.priceTierRange.ScaledCharge.balanceElementNumCode</p>	Balance Element Num Code
ProductOfferingPrice	ProductOfferingPriceOracle.TaxItemOracle	productOfferingPrice.tax[n].taxCode	chargeRatePlan.taxCode	TAX Code

**Table 3-3 (Cont.) Mapping a ChargeRatePlan from TMF 620 to PDC REST Services Manager for a one-time, recurring or usage charge offer**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.POPAlteration.UnitOfMeasure.Quantity.units	<p><b>One-time charge:</b> chargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.oneTimePopModel.priceTier.tierRange.oneTimeCharge.unitOfMeasure</p> <p><b>Recurring charge:</b> chargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.recurringPopModel.priceTier.tierRange.recurringCharge.unitOfMeasure</p> <p><b>Usage fixed charge:</b> ChargeRatePlanJXB.subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.priceTierRange.FixedCharge.unitOfMeasure</p> <p><b>Usage Scaled charges</b> PricingObjectsJXB.ChargeRatePlanJXB.subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.priceTierRange.ScaledCharge.unitOfMeasure</p>	Unit Of Measure

**Table 3-3 (Cont.) Mapping a ChargeRatePlan from TMF 620 to PDC REST Services Manager for a one-time, recurring or usage charge offer**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.glid	<p><b>One-time charge:</b> chargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.oneTimePopModel.priceTier.tierRange.oneTimeCharge.glid</p> <p><b>Recurring charge:</b> chargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.recurringPopModel.priceTier.tierRange.recurringCharge.glid</p> <p><b>Usage Charges</b> subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.priceTierRange.ScaledCharge.glid</p>	Glid

Table 3-3 shows how to map a charge rate plan from TMF 620 to PDC REST Services Manager for a one-time or recurring tier-based charge offer.

**Table 3-4 Mapping a charge rate plan from TMF 620 to PDC REST Services Manager for a one-time or recurring tier-based charge offer**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.id	chargeRatePlanJXB.name	ChargeRatePlan Name
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.eventCandidate.name	ChargeRatePlanJXB.eventName	Event Name

**Table 3-4 (Cont.) Mapping a charge rate plan from TMF 620 to PDC REST Services Manager for a one-time or recurring tier-based charge offer**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.rumCandidate.name	<b>One-time charge:</b> chargeRatePlan.subscriberCurrency.crpRelDateRange.crpCompositePopModel.oneTimePopModel.rumName  <b>Recurring charge:</b> chargeRatePlan.subscriberCurrency.crpRelDateRange.crpCompositePopModel.recurringPopModel.rumName	Rum Name

**Table 3-4 (Cont.) Mapping a charge rate plan from TMF 620 to PDC REST Services Manager for a one-time or recurring tier-based charge offer**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle.PricingLogicAlgorithmOracle	ProductOfferingPrice.pricingLogicAlgorithmOracle.TierRange.ProductOfferingPriceTierRanges[n].POPAlteration[n].ProductPriceValue.DutyFreeAmount.Value	<p><b>One-time charge:</b> chargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.oneTimePopModel.priceTier.tierRange.oneTimeCharge.price</p> <p><b>Recurring charge:</b> chargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.recurringPopModel.priceTier.tierRange.recurringcharge.price</p> <p><b>Usage Fixed Charge:</b> subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.priceTierRange.FixedCharge.Price</p> <p><b>Usage Scaled Charge:</b> subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.priceTierRange.ScaledCharge.Price</p>	Price

**Table 3-4 (Cont.) Mapping a charge rate plan from TMF 620 to PDC REST Services Manager for a one-time or recurring tier-based charge offer**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle.PricingLogicAlgorithmOracle	ProductOfferingPrice..pricingLogicAlgorithmOracle.TierRange.ProductOfferingPriceTierRanges[n].POPAlteration[n].ProductPriceValue.DutyFreeAmount.Unit	<p><b>One-time charge:</b> chargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.oneTimePopModel.priceTier.tierRange.oneTimeCharge.balanceElementNumCode</p> <p><b>Recurring charge:</b> chargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.recurringPopModel.priceTier.tierRange.recurringcharge.balanceElementNumCode</p> <p><b>Usage fixed charges</b> PricingObjectsJXB.ChargeRatePlanJXB.subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.priceTierRange.FixedCharge.balanceElementNumCode</p> <p><b>Usage Scaled charges</b> PricingObjectsJXB.ChargeRatePlanJXB.subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.priceTierRange.ScaledCharge.balanceElementNumCode</p>	Balance Element Num Code



**Table 3-4 (Cont.) Mapping a charge rate plan from TMF 620 to PDC REST Services Manager for a one-time or recurring tier-based charge offer**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle.PricingLogicAlgorithmOracle	productOfferingPrice.pricingLogicAlgorithmOracle.TierRange[n].minQuantity	<p><b>One-time charge:</b> PricingObjectsJXB.chargeRatePlan[n].subscriberCurrency.crpRelDateRange.crpCompositePopModel.oneTimePopModel.oneTimePriceTier.lowerBound</p> <p><b>Recurring charge:</b> PricingObjectsJXB.chargeRatePlan[n].subscriberCurrency.crpRelDateRange.crpCompositePopModel.recurringPopModel.priceTier.lowerBound</p> <p><b>Usage charge:</b> PricingObjectsJXB.chargeRatePlan[n].subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.lowerBound</p>	LowerBound

**Table 3-4 (Cont.) Mapping a charge rate plan from TMF 620 to PDC REST Services Manager for a one-time or recurring tier-based charge offer**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle.PricingLogicAlgorithmOracle	productOfferingPrice.pricingLogicAlgorithmOracle.TierRange.ProductOfferingPriceTierRanges[n].maxQuantity	<p><b>One-time charge:</b> PricingObjectsJXB.chargeRatePlan[n].subscriberCurrency.crpRelDateRange.crpCompositePopModel.oneTimePopModel.oneTimePriceTier.tierRange[n].upperBound</p> <p><b>Recurring charge:</b> PricingObjectsJXB.chargeRatePlan[n].subscriberCurrency.crpRelDateRange.crpCompositePopModel.recurringPopModel.priceTier.tierRange[n].upperBound</p> <p><b>Usage charge:</b> PricingObjectsJXB.chargeRatePlan[n].subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.tierRange[n].upperBound</p>	UpperBound
ProductOfferingPrice	ProductOfferingPriceOracle.TaxItemOracle	productOfferingPrice.tax[n].taxCode	chargeRatePlan.taxCode	TAX Code

**Table 3-4 (Cont.) Mapping a charge rate plan from TMF 620 to PDC REST Services Manager for a one-time or recurring tier-based charge offer**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle.PricingLogicAlgorithmOracle	productOfferingPrice.pricingLogicAlgorithmOracle.tierRange.productOfferingPriceTierRanges[n].POPAlteration[n].UnitOfMeasure.Quantity.units	<p><b>One-time charge:</b> chargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.oneTimePopModel.priceTier.tierRange.oneTimeCharge.unitOfMeasure</p> <p><b>Recurring charge:</b> chargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.recurringPopModel.priceTier.tierRange.recurringCharge.unitOfMeasure</p> <p><b>Usage fixed charge:</b> ChargeRatePlanJXB.subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.priceTierRange.FixedCharge.unitOfMeasure</p> <p><b>Usage Scaled charges</b> PricingObjectsJXB.ChargeRatePlanJXB.subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.priceTierRange.ScaledCharge.unitOfMeasure</p>	Unit Of Measure

**Table 3-4 (Cont.) Mapping a charge rate plan from TMF 620 to PDC REST Services Manager for a one-time or recurring tier-based charge offer**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle.PricingLogicAlgorithmOracle	ProductOfferingPrice.pricingLogicAlgorithmOracle.tierRange.productOfferingPriceTierRanges[n].priceAlteration[n].price.unitOfMeasure.amount	PricingObjectsJXB.ChargeRatePlanJXB.subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.priceTierRange[n].scaledCharge.incrementStep	incrementStep
ProductOfferingPrice	ProductOfferingPriceOracle.PricingLogicAlgorithmOracle	productOfferingPrice.pricingLogicAlgorithmOracle.TierRange.ProductOfferingPriceTierRanges.priceAlteration.glid	<p><b>One-time charge:</b> chargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.oneTimePopModel.priceTier.tierRange[n].oneTimeCharge.glid</p> <p><b>Recurring charge:</b> chargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.oneTimePopModel.priceTier.tierRange[n].recurringCharge.glid</p> <p><b>Usage scaled charge:</b> chargeRatePlanJXB.subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.tierRange[n].scaledCharge.glid</p>	Glid

**Table 3-4 (Cont.) Mapping a charge rate plan from TMF 620 to PDC REST Services Manager for a one-time or recurring tier-based charge offer**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle.PricingLogicAlgorithmOracle	productOfferingPrice.pricingLogicAlgorithmOracle.TierRange.ProductOfferingPriceTierRanges[n].priceAlteration[n].price.pricetag.description	<p><b>One-time charge:</b> chargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.oneTimePopModel.priceTier.tierRange[n].oneTimeCharge.priceTag.description</p> <p><b>Recurring charge:</b> chargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.oneTimePopModel.priceTier.tierRange[n].recurringCharge.priceTag.description</p> <p><b>Usage scaled charge:</b> chargeRatePlanJXB.subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.tierRange[n].scaledCharge.priceTag.description</p>	PriceTag description

**Table 3-4 (Cont.) Mapping a charge rate plan from TMF 620 to PDC REST Services Manager for a one-time or recurring tier-based charge offer**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle.PricingLogicAlgorithmOracle	productOfferingPrice.pricingLogicAlgorithmOracle.TierRange.ProductOfferingPriceTierRanges[n].priceAlteration[n].price.pricetag.attributeName	<p><b>One-time charge:</b> chargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.oneTimePopModel.priceTier.tierRange[n].oneTimeCharge.pricetag.attributeName</p> <p><b>Recurring charge:</b> chargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.oneTimePopModel.priceTier.tierRange[n].recurringCharge.pricetag.attributeName</p> <p><b>Usage scaled charge:</b> chargeRatePlanJXB.subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.tierRange[n].scaledCharge.pricetag.attributeName</p>	PriceTag AttributeName

**Table 3-4 (Cont.) Mapping a charge rate plan from TMF 620 to PDC REST Services Manager for a one-time or recurring tier-based charge offer**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle.PricingLogicAlgorithmOracle	ProductOfferingPrice.pricingLogicAlgorithmOracle.TierRange.ProductOfferingPriceTierRanges[n].priceAlteration[n].price.pricetag.tagScope	<p><b>One-time charge:</b> chargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.oneTimePopModel.priceTier.tierRange[n].oneTimeCharge.priceTag.tagScope</p> <p><b>Recurring charge:</b> chargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.oneTimePopModel.priceTier.tierRange[n].recurringCharge.priceTag.tagScope</p> <p><b>Usage scaled charge:</b> chargeRatePlanJXB.subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.tierRange[n].scaledCharge.priceTag.tagScope</p>	PriceTag Scope

**Table 3-4 (Cont.) Mapping a charge rate plan from TMF 620 to PDC REST Services Manager for a one-time or recurring tier-based charge offer**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle.PricingLogicAlgorithmOracle	ProductOfferingPrice.pricingLogicAlgorithmOracle.TierRange.ProductOfferingPriceTierRanges[n].priceAlteration[n].price.pricetag.tagName	<p><b>One-time charge:</b> chargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.oneTimePopModel.priceTier.tierRange[n].oneTimeCharge.priceTag.tagName</p> <p><b>Recurring charge:</b> chargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.oneTimePopModel.priceTier.tierRange[n].recurringCharge.priceTag.tagName</p> <p><b>Usage scaled charge:</b> chargeRatePlanJXB.subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.tierRange[n].scaledCharge.priceTag.tagName</p>	PriceTag Name
ProductOfferingPrice	ProductOfferingPriceOracle.PricingLogicAlgorithmOracle	productOfferingPriceOracle.PricingLogicAlgorithmOracle.validFor.startDateTime	chargeRatePlanJxb.subscriberCurrency.ChargeRateRelDateRangeJXB.CR AbsoluteDateRangeJXB.StartDate	Start Date
ProductOfferingPrice	ProductOfferingPriceOracle.PricingLogicAlgorithmOracle	productOfferingPriceOracle.PricingLogicAlgorithmOracle.validFor.endDateTime	chargeRatePlanJxb.subscriberCurrency.ChargeRateRelDateRangeJXB.CR AbsoluteDateRangeJXB.EndDate	End Date

Table 3-5 shows how to map an allowance for a charge rate plan from TMF 620 to PDC REST Services Manager.



**Table 3-5 Mapping an Allowance for a Charge Rate Plan from TMF 620 to PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TMF620 Field	PDC Field	PDC Description
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPriceOracle. POPAlterationOracle[n].AllowanceValidityOracle.unit	<p><b>One-time charge:</b> PricingObjectsJXB.ChargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.oneTimePopModel.priceTier.tierRange.oneTimeCharge.PriceValidity.RelativeEndOffsetUnit</p> <p><b>Recurring charge:</b> PricingObjectsJXB.ChargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.recurringPopModel.priceTier.tierRange.recurringCharge.PriceValidity.RelativeEndOffsetUnit</p> <p><b>Usage fixed charge:</b> PricingObjectsJXB.ChargeRatePlanJXB.subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.priceTierRange.FixedCharge.PriceValidity.RelativeEndOffsetUnit</p> <p><b>Usage Scaled charge:</b> PricingObjectsJXB.ChargeRatePlanJXB.subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.priceTierRange.ScaledCharge.PriceValidity.RelativeEndOffsetUnit</p>	Indicates the amount of allowance validity

**Table 3-5 (Cont.) Mapping an Allowance for a Charge Rate Plan from TMF 620 to PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TMF620 Field	PDC Field	PDC Description
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPriceOracle. POPAlterationOracle[n].AllowanceValidityOracle.value	<p><b>One-time charge:</b> PricingObjectsJXB.ChargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.oneTimePopModel.priceTier.tierRange.oneTimeCharge.PriceValidity.RelativeEndOffset</p> <p><b>Recurring charge:</b> PricingObjectsJXB.ChargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.recurringPopModel.priceTier.tierRange.recurringCharge.PriceValidity.RelativeEndOffset</p> <p><b>Usage fixed charge:</b> PricingObjectsJXB.ChargeRatePlanJXB.subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.priceTierRange.FixedCharge.PriceValidity.RelativeEndOffset</p> <p><b>Usage Scaled charge:</b> PricingObjectsJXB.ChargeRatePlanJXB.subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.priceTierRange.ScaledCharge.PriceValidity.RelativeEndOffset</p>	Indicates the unit of allowance validity

Table 3-6 shows how to map an alteration offer from TMF 620 to PDC REST Services Manager.

**Table 3-6 Mapping an Alteration Offer from TMF 620 to PDC REST Services Manager**

TMF Base Object	TMF 620 Field	PDC Field
ProductOffering	ProductOffering.Id	AlterationOfferingJXB.internalId
ProductOffering	ProductOffering.name	AlterationOfferingJXB.name
ProductOffering	ProductOffering.description	AlterationOfferingJXB.description
ProductOffering	ProductOffering.ValidFor	AlterationOfferingJXB.timeRange
Product Specification	ProductSpecification.Id	AlterationOfferingJXB.productSpecName
ProductOfferingPrice	ProductOfferingPrice.Id	AlterationRatePlanJXB.internalId
ProductOfferingPrice	ProductOfferingPrice.name	AlterationRatePlanJXB.name

**Table 3-6 (Cont.) Mapping an Alteration Offer from TMF 620 to PDC REST Services Manager**

TMF Base Object	TMF 620 Field	PDC Field
ProductOfferingPrice	ProductOfferingPrice.ValidFor	AlterationRatePlanJXB.subscribeCurrency/absoluteDateRange
ProductOfferingPrice	ProductOfferingPrice.POPAlteration[*]/Price/DutyFreeAmount.unit	AlterationRatePlanJXB.alterationRatePlan[n].arpDateRange/alterationPopModel/fixedAlteration
ProductOfferingPrice	ProductOfferingPrice.POPAlteration[*]/Price/DutyFreeAmount.Value	AlterationRatePlanJXB.arpDateRange/alterationPopModel/percentAlteration

Table 3-7 shows how to map a distribution offer from TMF620 to PDC REST Services Manager.

**Table 3-7 Mapping a Distribution Offer from TMF620 to PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOffering	ProductOfferingOracle	ProductOffering.Id	distributionOffering.internalId	Charge Share Offer ID
ProductOffering	ProductOfferingOracle	ProductOffering.name	distributionOffering.name	Charge Share Offer name
ProductOffering	ProductOfferingOracle	ProductOffering.description	distributionOffering.description	Charge Share Offer description
ProductOffering	ProductOfferingOracle	ProductOfferingOracle.EventCandidate.Name	distributionOffering.distributionEventMap.eventName	Charge Share Offer event name
ProductOffering	ProductOfferingOracle	ProductOfferingOracle.ServiceCandidate.Name	distributionOffering.productSpecName	Charge Share Offer service candidate
ProductOffering	ProductOfferingOracle	ProductOfferingOracle.ServiceCandidate.Id	distributionOffering.productSpecName	Charge Share Offer service candidate

Table 3-8 shows how to map Product Offering (expand and non-expand product offering price for charge offer) from TMF 620 to PDC REST Services Manager.

**Table 3-8 Mapping Product Offering (Expand and Non-Expand PoP for Charge Offer) from TMF 620 to PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TF 620 Field	PDC Field	PDC Field Description	Comments
ProductOffering	ProductOfferingOracle	ProductOfferingOracle.Name	ChargeOfferingJXB.name	ChargeOffer Name	NA
ProductOffering	ProductOfferingOracle	ProductOfferingOracle.Id	ChargeOfferingJXB.name	ChargeOffer Name	NA
ProductOffering	ProductOfferingOracle	ProductOfferingOracle.Description	ChargeOfferingJXB.description	ChargeOffer Description	NA

**Table 3-8 (Cont.) Mapping Product Offering (Expand and Non-Expand PoP for Charge Offer) from TMF 620 to PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TF 620 Field	PDC Field	PDC Field Description	Comments
ProductOffering	ProductOffering Oracle	ProductOffering Oracle.@type	NA	NA	Default value for ProductOffering Oracle.@type is ProductOffering Oracle
ProductOffering	ProductOffering Oracle	ProductOffering Oracle.@baseType	NA	NA	Default value for ProductOffering Oracle.@baseType is ProductOffering
ProductOffering	ProductOffering Oracle	ProductOffering Oracle.IsSellable	NA	NA	Default value for ProductOffering Oracle.IsSellable is false
ProductOffering	ProductOffering Oracle	ProductOffering Oracle.IsBundle	NA	NA	Default value for ProductOffering Oracle.IsBundle is false
ProductOffering	ProductOffering Oracle	ProductOffering Oracle.LifeCycleStatus	NA	NA	Default value for ProductOffering Oracle.LifeCycleStatus is active
ProductOffering	ProductOffering Oracle	ProductOffering Oracle.version	NA	NA	Default value is 1.0
ProductOffering	ProductOffering Oracle	ProductOffering Oracle.lastUpdate	ChargeOffering JXB.LastModifiedDate	ChargeOffer LastModifiedDate	NA
ProductOffering	ProductOffering Oracle	ProductOffering Oracle.ServiceCandidate.Name	ChargeOffering JXB.ProductSpecName	ChargeOffer ProductSpecification Name	NA
ProductOffering	ProductOffering Oracle	ProductOffering Oracle.ServiceCandidate.Id	ChargeOffering JXB.ProductSpecName	ChargeOffer ProductSpecification Name	NA
ProductOffering	ProductOffering Oracle	ProductOffering Oracle.href	{{Server_url }}: {{ port }} / productOffering / ChargeOffering JXB.name	NA	NA

**Table 3-8 (Cont.) Mapping Product Offering (Expand and Non-Expand PoP for Charge Offer) from TMF 620 to PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TF 620 Field	PDC Field	PDC Field Description	Comments
ProductOffering	ProductOffering Oracle	ProductOffering Oracle.ProductOfferingPrice.@type	NA	NA	Default Value for ProductOffering Oracle.productOfferingPrice.@type is ProductOffering PriceRefOracle
ProductOffering	ProductOffering Oracle	ProductOffering Oracle.ProductOfferingPrice.Id	chargeEventMapJxb.chargeRatePlanName	ChargeRatePlan Name	NA
ProductOffering	ProductOffering Oracle	ProductOffering Oracle.ProductOfferingPrice.Name	chargeEventMapJXB.chargeRatePlanName	ChargeRatePlan Name	NA
ProductOffering	ProductOffering Oracle	ProductOffering Oracle.ProductOfferingPrice.href	{{ Server_url }}: {{ port}} / productOffering / chargeEventMapJxb.chargeRatePlanName	NA	NA
ProductOffering	ProductOffering Oracle	ProductOffering Oracle.ProductOfferingPrice.@type	NA	NA	Default Value for ProductOffering Oracle.productOfferingPrice.@type is ProductOffering PriceOracle
ProductOffering	ProductOffering Oracle	ProductOffering Oracle.ProductOfferingPrice.@baseType	NA	NA	Default Value for ProductOffering Oracle.productOfferingPrice.@type is ProductOffering Price
ProductOffering	ProductOffering Oracle	ProductOffering Oracle.ProductOfferingPrice.Name	ChargeRatePlanJXB.name	ChargeRatePlan Name	NA
ProductOffering	ProductOffering Oracle	ProductOffering Oracle.ProductOfferingPrice.Id	ChargeRatePlanJXB.name	ChargeRatePlan Name	NA
ProductOffering	ProductOffering Oracle	ProductOffering Oracle.ProductOfferingPrice.Is Sellable	NA	NA	Default Value for ProductOffering Oracle.productOfferingPrice.Is Sellable is false

**Table 3-8 (Cont.) Mapping Product Offering (Expand and Non-Expand PoP for Charge Offer) from TMF 620 to PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TF 620 Field	PDC Field	PDC Field Description	Comments
ProductOffering	ProductOffering Oracle	ProductOffering Oracle.ProductOfferingPrice.Is Bundle	NA	NA	Default Value for ProductOffering Oracle.productOfferingPrice.Is Bundle is false
ProductOffering	ProductOffering Oracle	ProductOffering Oracle.ProductOfferingPrice.LifeCycleStatus	NA	NA	Default Value for ProductOffering Oracle.productOfferingPrice.LifeCycleStatus is active
ProductOffering	ProductOffering Oracle	ProductOffering Oracle.ProductOfferingPrice.version	NA	NA	Default value is 1.0
ProductOffering	ProductOffering Oracle	ProductOffering Oracle.ProductOfferingPrice.lastUpdate	ChargeRatePlanJXB.LastModifiedDate	NA	NA
ProductOffering	ProductOffering Oracle	ProductOffering Oracle.ProductOfferingPrice.RumCandidate.name	ChargeRatePlanJXB.RumCandidate.Name	NA	NA
ProductOffering	ProductOffering Oracle	ProductOffering Oracle.ProductOfferingPrice.EventCandidate.Name	ChargeRatePlanJXB.EventName	NA	NA
ProductOffering	ProductOffering Oracle	ProductOffering Oracle.ProductOfferingPrice.TaxOracle.Id	ChargeRatePlanJXB.TaxCode.Name	NA	NA
ProductOffering	ProductOffering Oracle	ProductOffering Oracle.ProductOfferingPrice.TaxOracle.TaxTime	ChargeRatePlanJXB.TaxTime	NA	NA

Table 3-9 shows how to map an alteration rate plan for a charge offer from TMF 620 to PDC REST Services Manager for one-time or recurring charges.

**Table 3-9 Mapping an Alteration Rate Plan for a Charge Offer from TMF 620 to PDC REST Services Manager for one-time or recurring charge**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.id	alterationRatePlan.internalID	Alteration Rate Plan Internal ID
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.name	alterationRatePlan.name	Alteration Rate Plan Name
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.PriceType	NA	Price Type
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.ValidFor.startDateTime	alterationRatePlan.subscriberCurrency/absoluteDateRange.startDate	Start Date
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.ValidFor.endDateTime	alterationRatePlan.subscriberCurrency/absoluteDateRange.endDate	End Date
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.POPAlteration[*]/Price/DutyFreeAmount.unit	alterationRatePlan.arpDateRange/alterationPopModel / fixedAlteration.balanceElementNumCode	Fixed Alteration Balance Element Numeric Code
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.POPAlteration[*]/Price/DutyFreeAmount.value	alterationRatePlan.arpDateRange/alterationPopModel / fixedAlteration.price	Fixed Alteration Price
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.POPAlteration[*]/Price/DutyFreeAmount.unit	alterationRatePlan.arpDateRange/alterationPopModel / percentAlteration.balanceElementNumCode	Percent Alteration Balance Element Numeric Code
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.POPAlteration[*]/Price/DutyFreeAmount.value	alterationRatePlan.arpDateRange/alterationPopModel / percentAlteration.price	Percent Alteration Price
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice[n].name	alterationRatePlan[n].name	Alteration Rate Plan Name
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice[n].name	alterationOffering.alterationEventMap.alterationRatePlanName	Alteration Rate Plan Name
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice[n].description	alterationRatePlan[n].description	Alteration Rate Plan Description

**Table 3-9 (Cont.) Mapping an Alteration Rate Plan for a Charge Offer from TMF 620 to PDC REST Services Manager for one-time or recurring charge**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle.TimePeriodOracle	productOfferingPrice[n].validFor.startDateTime	alterationRatePlan[n].arpDateRange.startDate	Start Date
ProductOfferingPrice	ProductOfferingPriceOracle.TimePeriodOracle	productOfferingPrice[n].validFor.endDateTime	alterationRatePlan[n].arpDateRange.endDate	End Date
ProductOfferingPrice	ProductOfferingPriceOracle.Money	productOfferingPrice[n].price.unit	alterationRatePlan[n].arpDateRange...balanceElementNumCode	Balance Element Num Code
ProductOfferingPrice	ProductOfferingPriceOracle.Money	productOfferingPrice[n].price.unit	alterationRatePlan[n].arpDateRange...currencyCode	Currency Code
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice[n].glid	alterationRatePlan[n].arpDateRange.alterationConfiguration.arpCompositePopModel.alterationPopModel.priceTier.tierRange.fixedAlteration.glid	Glid
ProductOfferingPrice	ProductOfferingPriceOracle.Money	productOfferingPrice[n].price.value	alterationRatePlan[n].arpDateRange.alterationConfiguration.arpCompositePopModel.alterationPopModel.priceTier.tierRange.fixedAlteration.price	Fixed Price
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice[n].price.value	alterationRatePlan[n].arpDateRange.alterationConfiguration.arpCompositePopModel.alterationPopModel.priceTier.tierRange.percentAlteration.price	Percentage Price value
ProductOfferingPrice	ProductOfferingPriceOracle.TaxItemOracle	productOfferingPrice[n].tax[n].taxCode	alterationRatePlan[n].arpDateRange.alterationConfiguration.arpCompositePopModel.alterationPopModel.priceTier.tierRange.fixedAlteration.taxcode	TAX Code

Table 3-10 shows how to map rollovers from TMF 620 to PDC REST Services Manager.



**Table 3-10 Mapping Rollovers from TMF 620 to PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice[n].PriceType	NA	Price Type
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice[n].name	rolloverRatePlan[n].name	Rollover Rate Plan Name
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.POPAlterationOracle[n].rollOverPrice.rolloverCount	rolloverRatePlan[n].dateRange.rolloverPopModel.rolloverCharge.rolloverCount	Rollover count
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.POPAlterationOracle[n].rollOverPrice.rolloverMaxUnits	rolloverRatePlan[n].dateRange.rolloverPopModel.rolloverCharge.rolloverMaxUnits	Rollover Max Units
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.POPAlterationOracle[n].rollOverPrice.rolloverUnits	rolloverRatePlan[n].dateRange.rolloverPopModel.rolloverCharge.rolloverUnits	Rollover Units
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.POPAlterationOracle[n].rollOverPrice.Units	rolloverRatePlan[n].dateRange.rolloverPopModel.rolloverCharge.balanceElementNumCode	Balance Element Num Code
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.POPAlterationOracle[n].UnitOfMeasure	rolloverRatePlan[n].dateRange.rolloverPopModel.rolloverCharge.unitOfMeasure	Unit of Measure

Table 3-11 shows how to map proration settings for a charge offer from TMF620 to PDC REST Services Manager for a recurring charge.

**Table 3-11 (15.0.1) Mapping Proration settings for a Charge Offer from TMF620 to PDC REST Services Manager for Recurring charge**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOffering	ProductOfferingOracle	ProductOffering.POPEventMap.prorateFirst	chargeOffering.chargeEventMap.prorateFirst	When purchased mid-cycle
ProductOffering	ProductOfferingOracle	ProductOffering.POPEventMap.prorateLast	chargeOffering.chargeEventMap.prorateLast	When cancelled mid-cycle
ProductOffering	ProductOfferingOracle	ProductOffering.POPEventMap.prorateCycle	chargeOffering.chargeEventMap.prorateCycle	When the Cycle change

Table 3-12 shows how to map the isProration attribute for a charge rate plan from TMF620 to PDC REST Services Manager for a recurring charge.

**Table 3-12 (15.0.1) Mapping isProration attribute for Charge Rate Plan from TMF620 to PDC REST Services Manager for a Recurring charge**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.isProratable	chargeRatePlan.subscriberCurrency.crpRelDateRange.crpCompositePopModel.recurringPopModel.priceTier.tierRange.recurringCharge.proratable	Proratable Value for BI

Table 3-13 shows how to map validity or scale rounding settings for a charge offer from TMF620 to PDC REST Services Manager.

**Table 3-13 (15.0.1) Mapping Validity/Scale Rounding settings for Charge Offer from TMF620 to PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOffering	ProductOfferingOracle	ProductOffering.validityRounding	chargeOffering.validityRounding	ValidityRounding
ProductOffering	ProductOfferingOracle	ProductOffering.scaleRounding	chargeOffering.scaleRounding	ScaleRounding

Table 3-14 shows how to map billing cycle settings for a charge rate plan from TMF620 to PDC REST Services Manager for a recurring charge.

**Table 3-14 (15.0.1) Mapping Billing Cycle settings for Charge Rate Plan from TMF620 to PDC REST Services Manager for a Recurring charge**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.billingCycle.cycleFeeFlag	chargeRatePlanJXB.cycleFeeFlag	Cycle Fee Flag
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.billingCycle.billOffset	chargeRatePlanJXB.billOffset	Bill Offset
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.billingCycle.billOffsetUnit	chargeRatePlanJXB.billOffsetUnit	Bill Offset Unit

Table 3-15 shows how to map triggers for alteration rate plan from TMF620 to PDC REST Services Manager.

**Table 3-15 (15.0.1) Mapping Triggers for Alteration Rate Plan from TMF620 to PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.triggers.name	triggerSpec.name	Trigger Name
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.triggers.pricingProfileName	triggerSpec.pricingProfileName	Trigger Pricing Profile Name
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.triggers.obsolete	triggerSpec.obsolete	NA
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.triggers.quantityExpression	triggerSpec.quantityTriggerExpression	NA
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.triggers.quantityExpression.operator	triggerSpec.quantityTriggerExpression.operator	NA
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.triggers.quantityExpression.value	triggerSpec.quantityTriggerExpression.value	NA
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.triggers.chargeExpression	triggerSpec.chargeTriggerExpression	NA
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.triggers.chargeExpression.operator	triggerSpec.chargeTriggerExpression.operator	NA
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.triggers.chargeExpression.value	triggerSpec.chargeTriggerExpression.value	NA
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.triggers.balanceExpression	triggerSpec.balanceTriggerExpression	NA
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.triggers.balanceExpression.operator	triggerSpec.balanceTriggerExpression.operator	NA
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.triggers.balanceExpression.value	triggerSpec.balanceTriggerExpression.value	NA
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.triggers.balanceExpression.memberBalance	triggerSpec.balanceTriggerExpression.memberBalance	NA
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.triggers.balanceExpression.units	triggerSpec.balanceTriggerExpression.units	NA
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.triggers.balanceExpression.includeReservations	triggerSpec.balanceTriggerExpression.includeReservations	NA

**Table 3-15 (Cont.) (15.0.1) Mapping Triggers for Alteration Rate Plan from TMF620 to PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.triggers.complexTriggerExpression.operator	triggerSpec.complexTriggerExpression.operator	NA
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.triggers.complexTriggerExpression.value	triggerSpec.complexTriggerExpression.value	NA
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.triggers.complexTriggerExpression.binaryExpression	triggerSpec.complexTriggerExpression.binaryExpression	NA
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.triggers.complexTriggerExpression.binaryExpression.binaryOperator	triggerSpec.complexTriggerExpression.binaryExpression.binaryOperator	NA
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.triggers.complexTriggerExpression.binaryExpression.leftOperand	triggerSpec.complexTriggerExpression.binaryExpression.leftOperand	NA
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.triggers.complexTriggerExpression.binaryExpression.rightOperand	triggerSpec.complexTriggerExpression.binaryExpression.rightOperand	NA

Table 3-16 shows how to map a distribution rate plan from PDC TMF620 to PDC REST Services Manager for charge share.

**Table 3-16 (15.0.1) Mapping Distribution Rate Plan from PDC TMF620 to PDC REST Services Manager for Charge Share**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.POPAlteration[*]/Price/DutyFreeAmount.value	distributionRatePlan.drpDateRange.distributionConfiguration.drpCompositePopModel.alterationPopModel.priceTier.tierRange.percentAlteration.price	Percentage Alteration Price
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.id	distributionRatePlan.internalID	Distribution Rate Plan Internal ID
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.name	distributionRatePlan.name	Distribution Rate Plan Name

**Table 3-16 (Cont.) (15.0.1) Mapping Distribution Rate Plan from PDC TMF620 to PDC REST Services Manager for Charge Share**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.POPAlteration[*]/Price/DutyFreeAmount.unit	distributionRatePlan.drpDateRange.distributionConfiguration.drpCompositePopModel.alterationPopModel.priceTier.tierRange.percentAlteration.balanceElementNumCode	Percentage Distribution Balance Element Numeric Code
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.POPAlteration[*]/Price/DutyFreeAmount.value	distributionRatePlan.drpDateRange.distributionConfiguration.drpCompositePopModel.alterationPopModel.priceTier.tierRange.fixedAlteration.price	Fixed Distribution Price
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.PriceType	NA	Price Type
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.ValidFor.endDateTime	distributionRatePlan.drpDateRange.endDate	End Date
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.ValidFor.startDateTime	distributionRatePlan.drpDateRange.startDate	Start Date
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice[n].description	distributionRatePlan[n].description	Distribution Rate Plan Description
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice[n].glid	distributionRatePlan.drpDateRange.distributionConfiguration.drpCompositePopModel.alterationPopModel.priceTier.tierRange.percentageAlteration.glid	Glid
ProductOfferingPrice	ProductOfferingPriceOracle.TaxItemOracle	productOfferingPrice[n].tax[n].taxCode	distributionRatePlan.taxcode	TAX Code
ProductOfferingPrice	ProductOfferingPriceOracle.PricingLogicAlgorithmOracle	productOfferingPriceOracle.PricingLogicAlgorithmOracle.validFor.startDateTime	distributionRatePlan.drpDateRange.startDate	End Date for Distribution Rate plan containing tiers
ProductOfferingPrice	ProductOfferingPriceOracle.PricingLogicAlgorithmOracle	productOfferingPriceOracle.PricingLogicAlgorithmOracle.validFor.endDateTime	distributionRatePlan.drpDateRange.endDate	Start Date for Distribution Rate plan containing tiers

**Table 3-16 (Cont.) (15.0.1) Mapping Distribution Rate Plan from PDC TMF620 to PDC REST Services Manager for Charge Share**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle.PricingLogicAlgorithmOracle	productOfferingPrice.pricingLogicAlgorithmOracle.TierRange.ProductOfferingPriceTierRanges.priceAlteration.glid	distributionRatePlan.drpDateRange.distributionConfiguration.drpCompositePopModel.alterationPopModel.priceTier.tierRange[n].percentAlteration.glid	glid for Distribution Rate plan containing tiers
ProductOfferingPrice	ProductOfferingPriceOracle.PricingLogicAlgorithmOracle	productOfferingPrice.pricingLogicAlgorithmOracle.tierRange.productOfferingPriceTierRanges[n].POPAlteration[n].UnitOfMeasure.Quantity.units	distributionRatePlan.drpDateRange.distributionConfiguration.drpCompositePopModel.alterationPopModel.priceTier.tierRange[n].percentAlteration.unitOfMeasure	Unit Of Measure for Distribution Rate plan containing tiers
ProductOfferingPrice	ProductOfferingPriceOracle.PricingLogicAlgorithmOracle	productOfferingPrice.pricingLogicAlgorithmOracle.tierRange.ProductOfferingPriceTierRanges[n].maxQuantity	distributionRatePlan.drpDateRange.distributionConfiguration.drpCompositePopModel.alterationPopModel.priceTier.tierRange[n].upperBound	Upper bound
ProductOfferingPrice	ProductOfferingPriceOracle.PricingLogicAlgorithmOracle	productOfferingPrice.pricingLogicAlgorithmOracle.tierRange[n].minQuantity	distributionRatePlan.drpDateRange.distributionConfiguration.drpCompositePopModel.alterationPopModel.priceTier.lowerBound	Lower Bound
ProductOfferingPrice	ProductOfferingPriceOracle.PricingLogicAlgorithmOracle	ProductOfferingPrice.pricingLogicAlgorithmOracle.tierRange.ProductOfferingPriceTierRanges[n].POPAlteration[n].ProductPriceValue.DutyFreeAmount.Unit	distributionRatePlan.drpDateRange.distributionConfiguration.drpCompositePopModel.alterationPopModel.priceTier.tierRange[n].percentAlteration.balanceElementNumCode	Balance Element Numeric Code for Distribution Rate plan containing tiers
ProductOfferingPrice	ProductOfferingPriceOracle.PricingLogicAlgorithmOracle	ProductOfferingPrice.pricingLogicAlgorithmOracle.tierRange.ProductOfferingPriceTierRanges[n].POPAlteration[n].ProductPriceValue.DutyFreeAmount.Value	distributionRatePlan.drpDateRange.distributionConfiguration.drpCompositePopModel.alterationPopModel.priceTier.tierRange[n].percentAlteration.price	Price for Distribution Rate plan containing tiers

**Table 3-16 (Cont.) (15.0.1) Mapping Distribution Rate Plan from PDC TMF620 to PDC REST Services Manager for Charge Share**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.discountRules[i].ruleName	distributionRatePlan.drpDateRange.distributionConfiguration.name	Discount Rules
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.discountRules[i].triggerName	distributionRatePlan.drpDateRange.distributionConfiguration.triggerSpecName	Triggers
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.discountRules[i].filterName[i]	distributionRatePlan.drpDateRange.distributionConfiguration.chargeSelectorSpecName	Filters

## PDC Charge Offer Default Values

Table 3-17 lists the default values for PDC charge offer fields when TMF 620 has no corresponding field.

**Table 3-17 PDC Charge Offer Default Values**

PDC Field	Default Value
chargeOffering.applicableQuantity	ApplicableQuantityJXB.REMAINING
chargeOffering.expiryNotification	true
chargeOffering.subscriptionDueNotification	true
chargeOffering.chargeEventMap.incrementQuantity	BigDecimal.valueOf(1)
chargeOffering.chargeEventMap.incrementQuantityUnit	NONE
chargeOffering.chargeEventMap.minQuantity	BigDecimal.valueOf(0)
chargeOffering.chargeEventMap.minQuantityUnit	NONE
chargeOffering.chargeEventMap.prorateFirst	ProrationValueJXB.PRORATE_CHARGE
chargeOffering.chargeEventMap.prorateLast	ProrationValueJXB.PRORATE_CHARGE
chargeOffering.chargeEventMap.prorateCycle	ProrationValueJXB.PRORATE_CHARGE
chargeOffering.chargeEventMap.roundingMode	RoundingModeJXB.NEAREST
chargeOffering.chargeEventMap.timezoneMode	TimeZoneModeJXB.EVENT
chargeOffering.chargeEventMap.validIfCancelled	true
chargeOffering.chargeEventMap.validIfInactive	true
chargeOffering.chargeEventMap.validIfSuspendedActive	true
chargeOffering.pricingProfileName	Product Offering

Table 3-18 describes the PDC charge rate plan default values for PDC RSM.

**Table 3-18 PDC Charge Rate Plan Default Values**

PDC Field	Default Value
chargeRatePlan.applicableQtyTreatment	ApplicableQuantityTreatmentJXB.CONTINUOUS
chargeRatePlan.applicableQuantity	ApplicableQuantityJXB.ORIGINAL
chargeRatePlan.billOffset	BigInteger.valueOf(0)
chargeRatePlan.cycleFeeFlag	BigInteger.valueOf(0)
chargeRatePlan.permittedType	PermittedTypeJXB.PRODUCT
chargeRatePlan.pricingProfileName	ONE TIME/ RECURRING - Subscription USAGE - Convergent Usage
chargeRatePlan.subscriberCurrency.crpRelDateRange...priceTier.distributionMethod	pricingType - TIERED - DistributionMethodJXB.FROM_BAL_IMPACT pricingType - SIMPLE - DistributionMethodJXB.NONE
chargeRatePlan.subscriberCurrency.crpRelDateRange...tierRange...discountable	ONE TIME/ RECURRING - true
chargeRatePlan.subscriberCurrency.crpRelDateRange...tierRange...impactType	ONE TIME/ RECURRING - SCALED
chargeRatePlan.subscriberCurrency.crpRelDateRange...tierRange...incrementRounding	USAGE - IncrementRoundingJXB.NONE
chargeRatePlan.subscriberCurrency.crpRelDateRange...tierRange...priceType	PriceTypeJXB.CONSUMPTION
chargeRatePlan.subscriberCurrency.crpRelDateRange...tierRange...proratable	RECURRING - true
chargeRatePlan.subscriberCurrency.crpRelDateRange...tierRange.enforceCreditLimit	ONE TIME/ RECURRING - CreditLimitJXB.NORMAL USAGE - CreditLimitJXB.DEFAULT
chargeRatePlan.todMode	TODModeJXB.START_TIME
chargeRatePlan.subscriberCurrency.crpRelDateRange...tierRange...unitOfMeasure	UnitOfMeasureJXB.NONE
chargeRatePlan.subscriberCurrency.crpRelDateRange...tierRange...isDiscountable	false
chargeRatePlan.subscriberCurrency.crpRelDateRange...tierRange...priceType	PriceTypeJXB.GRANT
chargeRatePlan.subscriberCurrency.crpRelDateRange...tierRange...relativeStartOffset	-1

## Mapping Discount Offers from TMF 620 to PDC

Table 3-19 shows how to map discount offer data from TMF 620 fields to PDC fields.



**Table 3-19 Mapping Discount Offer Data from TMF 620 Fields to PDC Fields**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field
ProductOfferingPrice	PricingLogicAlgorithmOracle	ProductOfferingPrice.PricingLogicAlgorithmOracle.TierRange.ProductOfferingPriceOracle.maxQuantity	PricingObjectsJXB.AlterationRatePlanJXB.ArpdRateRange.AlterationConfiguration.ArpdCompositePopModel.AlterationPopModel.PriceTier.TierBasis.ChargeTierExpression
ProductOfferingPrice	PricingLogicAlgorithmOracle	if (ProductOfferingPrice.PricingLogicAlgorithmOracle.TierRange.ProductOfferingPriceOracle.POPAlterationOracle.ProductPriceValueOracle.DutyFreeAmount.Unit) is a currency code	PricingObjectsJXB.AlterationRatePlanJXB.ArpdRateRange.AlterationConfiguration.ArpdCompositePopModel.AlterationPopModel.PriceTier.TierRange.PercentAlteration.AlterationBasedOn.ChargeBasisExpression
ProductOfferingPrice	PricingLogicAlgorithmOracle	if (ProductOfferingPrice.PricingLogicAlgorithmOracle.TierRange.ProductOfferingPriceOracle.POPAlterationOracle.ProductPriceValueOracle.DutyFreeAmount.Unit) is a non-currency code	PricingObjectsJXB.AlterationRatePlanJXB.ArpdRateRange.AlterationConfiguration.ArpdCompositePopModel.AlterationPopModel.PriceTier.TierRange.FixedAlteration.AlterationBasedOn.QuantityBasisExpression
ProductOfferingPrice	PricingLogicAlgorithmOracle	if (ProductOfferingPrice.PricingLogicAlgorithmOracle.TierRange.ProductOfferingPriceOracle.QuantityExpression) is present	PricingObjectsJXB.AlterationRatePlanJXB.ArpdRateRange.AlterationConfiguration.ArpdCompositePopModel.AlterationPopModel.PriceTier.TierBasis.QuantityTierExpression
ProductOfferingPrice	PricingLogicAlgorithmOracle	if (ProductOfferingPrice.PricingLogicAlgorithmOracle.TierRange.ProductOfferingPriceOracle.QuantityExpression) is present	Set PricingObjectsJXB.AlterationRatePlanJXB.ArpdRateRange.AlterationConfiguration.ArpdCompositePopModel.AlterationPopModel.PriceTier.TierRange.PercentAlteration.AlterationBasedOn.ChargeBasisExpression.UseTierComponent as True

**Table 3-19 (Cont.) Mapping Discount Offer Data from TMF 620 Fields to PDC Fields**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field
ProductOfferingPrice	PricingLogicAlgorithmOracle	if (ProductOfferingPrice.PricingLogicAlgorithmOracle.TierRange.ProductOfferingPriceOracle.QuantityExpression) is present	Set PricingObjectsJXB.AlterationRatePlanJXB.ArpdRateRange.AlterationConfiguration.ArpdCompositePopModel.AlterationPopModel.PriceTier.TierRange.FixedAlteration.AlterationBasedOn.QuantityBasisExpression.UseTierComponent as True
ProductOfferingPrice	PricingLogicAlgorithmOracle	ProductOfferingPrice.getName()	PricingObjectsJXB.AlterationRatePlanJXB.Name
ProductOfferingPrice	PricingLogicAlgorithmOracle	ProductOfferingPrice.PricingLogicAlgorithmOracle.TierRange.ProductOfferingPriceOracle.maxQuantity	PricingObjectsJXB.AlterationRatePlanJXB.ArpdRateRange.AlterationConfiguration.ArpdCompositePopModel.AlterationPopModel.PriceTier.TierRange.UpperBound.NumberAlterationTbExpressionJXB
ProductOfferingPrice	PricingLogicAlgorithmOracle	ProductOfferingPrice.PricingLogicAlgorithmOracle.TierRange.ProductOfferingPriceOracle.POPAlterationOracle.ProductPriceValueOracle.DutyFreeAmount.Unit	PricingObjectsJXB.AlterationRatePlanJXB.ArpdRateRange.AlterationConfiguration.ArpdCompositePopModel.AlterationPopModel.PriceTier.TierRange.FixedAlteration.BalanceElementNumCode
ProductOfferingPrice	PricingLogicAlgorithmOracle	ProductOfferingPrice.PricingLogicAlgorithmOracle.TierRange.ProductOfferingPriceOracle.POPAlterationOracle.ProductPriceValueOracle.DutyFreeAmount.Value	PricingObjectsJXB.AlterationRatePlanJXB.ArpdRateRange.AlterationConfiguration.ArpdCompositePopModel.AlterationPopModel.PriceTier.TierRange.FixedAlteration.Price
ProductOfferingPrice	PricingLogicAlgorithmOracle	ProductOfferingPrice.PricingLogicAlgorithmOracle.TierRange.ProductOfferingPriceOracle.POPAlterationOracle.ProductPriceValueOracle.Percentage	PricingObjectsJXB.AlterationRatePlanJXB.ArpdRateRange.AlterationConfiguration.ArpdCompositePopModel.AlterationPopModel.PriceTier.TierRange.PercentAlteration.Price

**Table 3-19 (Cont.) Mapping Discount Offer Data from TMF 620 Fields to PDC Fields**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field
ProductOfferingPrice	PricingLogicAlgorithmOracle	ProductOfferingPrice.PricingLogicAlgorithmOracle.TierRange.ProductOfferingPriceOracle.POPAlterationOracle.UnitOfMeasure.Amount	PricingObjectsJXB.AlterationRatePlanJXB.ArpdRateRange.AlterationConfiguration.ArpdCompositePopModel.AlterationPopModel.PriceTier.TierRange.FixedAlteration.IncrementStep
ProductOfferingPrice	PricingLogicAlgorithmOracle	ProductOfferingPrice.PricingLogicAlgorithmOracle.TierRange.ProductOfferingPriceOracle.QuantityExpression.Resource	PricingObjectsJXB.AlterationRatePlanJXB.ArpdRateRange.AlterationConfiguration.ArpdCompositePopModel.AlterationPopModel.PriceTier.TierRange.UpperBound.BalanceTBExpression.BalanceElementNumCode
ProductOfferingPrice	PricingLogicAlgorithmOracle	ProductOfferingPrice.PricingLogicAlgorithmOracle.TierRange.ProductOfferingPriceOracle.QuantityExpression.Type	PricingObjectsJXB.AlterationRatePlanJXB.ArpdRateRange.AlterationConfiguration.ArpdCompositePopModel.AlterationPopModel.PriceTier.TierRange.UpperBound.BalanceTBExpression.MemberBalance

Table 3-20 shows how to map proration settings for a discount offer from TMF620 to PDC REST Services Manager for a recurring or usage charge.

**Table 3-20 (15.0.1) Mapping Proration settings for Discount Offer from TMF620 to PDC REST Services Manager for Recurring/Usage Charge**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOffering	ProductOfferingOracle	ProductOffering.POPEventMap.validAtStartNotValidAtEnd	alterationOffering.alterationEventMap.validAtStartNotValidAtEnd	When Discount Is Valid From Mid-cycle
ProductOffering	ProductOfferingOracle	ProductOffering.POPEventMap.notValidAtStartValidAtEnd	alterationOffering.alterationEventMap.notValidAtStartValidAtEnd	When Discount Is Valid To Mid-cycle
ProductOffering	ProductOfferingOracle	ProductOffering.POPEventMap.notValidAtStartNotValidAtEnd	alterationOffering.alterationEventMap.notValidAtStartNotValidAtEnd	When Discount Is Valid For Part Of Cycle

Table 3-21 shows how to map discount rules for an alteration rate plan from TMF620 to PDC REST Services Manager.

**Table 3-21 (15.0.1) Mapping Discount Rules for Alteration Rate Plan from TMF620 to PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.discountRules[i].ruleName	alterationRatePlan[n].arpDateRange.alterationConfiguration[i].name	Rule Name
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.discountRules[i].triggerName	alterationRatePlan[n].arpDateRange.alterationConfiguration[i].triggerSpecName	Trigger Name
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.discountRules[i].filterName[i]	alterationRatePlan[n].arpDateRange.alterationConfiguration[i].chargeSelectorSpecName	Filter Name
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.discountRules[i].applicableChargeQuantity	alterationRatePlan[n].arpDateRange.alterationConfiguration[i].applicableChargeAndQuantity	Applicable Charge and Quantity
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.discountRules[i].POPAlteration[*]/Price/DutyFreeAmount.unit	<b>Percentage Alteration:</b> alterationRatePlan.arpDateRange/alterationPopModel/percentAlteration.balanceElementNumCode <b>Fixed Alteration:</b> alterationRatePlan.arpDateRange/alterationPopModel/fixAlteration.balanceElementNumCode	Alteration Balance Element Numeric Code
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.discountRules[i].POPAlteration[*]/Price/DutyFreeAmount.value	<b>Percentage Alteration:</b> alterationRatePlan.arpDateRange/alterationPopModel/percentAlteration.price <b>Fixed Alteration:</b> alterationRatePlan.arpDateRange/alterationPopModel/fixAlteration.price	Alteration Price

**Table 3-21 (Cont.) (15.0.1) Mapping Discount Rules for Alteration Rate Plan from TMF620 to PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.discountRules[i].pricingLogicAlgorithm[i].tierRange.productOfferingPriceTierRanges[n].minQuantity	alterationRatePlan[n].arpCompositePopModel.alterationPopModel.priceTier.lowerBound.numberTBExpression.value	Min Quantity
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.discountRules[i].pricingLogicAlgorithm[i].tierRange.productOfferingPriceTierRanges[n].maxQuantity	alterationRatePlan[n].arpCompositePopModel.alterationPopModel.priceTier.tierRange[n].upperBound.numberTBExpression.value	Max Quantity
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.discountRules[i].pricingLogicAlgorithm[i].tierRange.productOfferingPriceTierRanges.priceAlteration.price.dutyFreeAmount.value	<b>Percent Alteration:</b> alterationRatePlan[n].arpCompositePopModel.alterationPopModel.priceTier.tierRange[n].percentAlteration.price <b>Fixed Alteration:</b> alterationRatePlan[n].arpCompositePopModel.alterationPopModel.priceTier.tierRange[n].fixedAlteration.price	Alteration Price
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.discountRules[i].pricingLogicAlgorithm[i].tierRange.productOfferingPriceTierRanges.priceAlteration.price.dutyFreeAmount.unit	<b>Percent Alteration:</b> alterationRatePlan[n].arpCompositePopModel.alterationPopModel.priceTier.tierRange[n].percentAlteration.balanceElementNumCode <b>Fixed Alteration:</b> alterationRatePlan[n].arpCompositePopModel.alterationPopModel.priceTier.tierRange[n].fixedAlteration.balanceElementNumCode	Alteration Balance Element Code
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPrice.discountRules[i].pricingLogicAlgorithm[i].distributionMethod	alterationRatePlan[n].arpCompositePopModel.alterationPopModel.priceTier.distributionMethod	Distribution Method

Table 3-22 shows how to map a discount selector from TMF620 to PDC REST Services Manager.

**Table 3-22 (15.0.1) Mapping of Discount Selector from TMF620 to PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.constraint.constraintRule.name	alterationRatePlanSelector.validityPeriod.rule.name	Alteration Selector Rule Name
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.constraint.constraintRule.productOfferingPrice.name	alterationRatePlanSelector.validityPeriod.rule.result.resultName	Alteration Selector Rule Result Name
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.constraint.constraintRule.productOfferingPrice.priceAlteration.price.dutyFreeAmount.unit	<b>Percentage Alteration:</b> alterationRatePlan.arpDateRange/alterationPopModel / percentAlteration.balanceElementNumCode <b>Fixed Alteration:</b> alterationRatePlan.arpDateRange/alterationPopModel / fixedAlteration.balanceElementNumCode	Alteration Selector Rule Charge Balance Element
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.constraint.constraintRule.productOfferingPrice.priceAlteration.price.dutyFreeAmount.value	<b>Percentage Alteration:</b> alterationRatePlan.arpDateRange/alterationPopModel / percentAlteration.price <b>Fixed Alteration:</b> alterationRatePlan.arpDateRange/alterationPopModel / fixedAlteration.price	Alteration Selector Rule Charge Price

**Table 3-22 (Cont.) (15.0.1) Mapping of Discount Selector from TMF620 to PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.constraint.constraintRule.ValueRelationshipOracle.fieldKind	alterationRateplanSelector.validityPeriod.rule. If NOT LogicalOperator is used then <ul style="list-style-type: none"> <li>complexAAExpressionJXB.attributeAnalyzeRExpressionsJXB.fieldToValueExpression.fieldKind</li> </ul> else <ul style="list-style-type: none"> <li>fieldToValueExpression.fieldKind</li> </ul>	Alteration Selector FieldKind
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.constraint.constraintRule.ValueRelationshipOracle.fieldName	alterationRateplanSelector.validityPeriod.rule. If NOT LogicalOperator is used then <ul style="list-style-type: none"> <li>complexAAExpressionJXB.attributeAnalyzeRExpressionsJXB.fieldToValueExpression.fieldName</li> </ul> else <ul style="list-style-type: none"> <li>fieldToValueExpression.fieldName</li> </ul>	Alteration Selector FieldName
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.constraint.constraintRule.ValueRelationshipOracle.fieldValue	alterationRateplanSelector.validityPeriod.rule. If NOT LogicalOperator is used then <ul style="list-style-type: none"> <li>complexAAExpressionJXB.attributeAnalyzeRExpressionsJXB.fieldToValueExpression.fieldValue</li> </ul> else <ul style="list-style-type: none"> <li>fieldToValueExpression.fieldValue</li> </ul>	Alteration Selector FieldValue

**Table 3-22 (Cont.) (15.0.1) Mapping of Discount Selector from TMF620 to PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.constraint.constraintRule.ValueRelationshipOracle.operation	alterationRateplanSelector.validityPeriod.rule. If NOT LogicalOperator is used then <ul style="list-style-type: none"> <li>complexAAExpressionJXB.getOperator() + "_"</li> </ul> + complexAAExpressionJXB.attributeAnalyzerExpressionsJXB.fieldToValueExpression.operation else <ul style="list-style-type: none"> <li>fieldToValueExpression.operation</li> </ul>	Alteration Selector Field Operation
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.constraint.constraintRule.ValueRelationshipOracle.separator	alterationRateplanSelector.validityPeriod.rule. If NOT LogicalOperator is used then <ul style="list-style-type: none"> <li>complexAAExpressionJXB.attributeAnalyzerExpressionsJXB.fieldToValueExpression.separator</li> </ul> else <ul style="list-style-type: none"> <li>fieldToValueExpression.separator</li> </ul>	Alteration Selector Field Separator
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.constraint.constraintRule.ValueRelationshipOracle.operator	alterationRateplanSelector.validityPeriod.rule. If NOT LogicalOperator is used then <ul style="list-style-type: none"> <li>complexAAExpressionJXB.operator</li> </ul>	Alteration Selector Field Operator
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.constraint.name	alterationRateplanSelector.name	Alteration Selector Name



**Table 3-22 (Cont.) (15.0.1) Mapping of Discount Selector from TMF620 to PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.constraint.validFor	alterationRateplanSelector.validityPeriod.validFrom	Validity for Discount selector
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.constraint.stereoType	alterationRateplanSelector.stereoType	Alteration Selector StereoType
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.eventCandidate.name	alterationRateplanSelector.eventSpecName	Alteration Selector Event Name
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.serviceCandidate.name	alterationRateplanSelector.productSpecName	Alteration Selector ProductSpec Name
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.id	alterationRateplanSelector.name	Alteration Selector Name
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.name	alterationRateplanSelector.name	Alteration Selector Name

Table 3-23 shows how to map an account level charge or discount offers from TMF620 to PDC REST Services Manager.

**Table 3-23 (15.0.1) Mapping of Account level Charge or Discount Offers from TMF620 to PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOffering	ProductOfferingOracle	ProductOfferingOracle.serviceCandidate.name	ChargeOfferingJXB.customerSpecName	Account level CO/DO
ProductOffering	ProductOfferingOracle	ProductOfferingOracle.serviceCandidate.ID	ChargeOfferingJXB.customerSpecName	Account level CO/DO

## PDC Discount Offer Default Values

Table 3-24 lists the default values for PDC discount offer fields when TMF 620 has no corresponding field.

**Table 3-24 PDC Discount Offer Default Values for PDC REST Services Manager**

PDC Field	Default Value
alterationOffering.applicableQuantity	ApplicableQuantityJXB.REMAINING
alterationOffering.alterationEventMap.ValidAtStartNotValidAtEnd	AlterationProrationValueJXB.PRORATE_DISCOUNT
alterationOffering.alterationEventMap.NotValidAtStartValidAtEnd	AlterationProrationValueJXB.PRORATE_DISCOUNT

**Table 3-24 (Cont.) PDC Discount Offer Default Values for PDC REST Services Manager**

PDC Field	Default Value
alterationOffering.alterationEventMap.NotValidAtStartNotValidAtEnd	AlterationProrationValueJXB.PRORATE_DISCOUNT
alterationOffering.alterationEventMap.Snowball	false
alterationOffering.alterationEventMap.validIfCancelled	false
alterationOffering.alterationEventMap.validIfInactive	false
alterationOffering.alterationEventMap.validIfSuspendedActive	true
alterationOffering.pricingProfileName	Product Offering
alterationOffering.PriceListName	Default
alterationOffering.OfferType	OfferTypeJXB.SUBSCRIPTION
alterationOffering.OwnMin	-1
alterationOffering.OwnMax	-1
alterationOffering.PurchaseMin	-1
alterationOffering.PurchaseMax	-1

Table 3-25 describes the PDC discount rate plan default values for PDC REST Services Manager.

**Table 3-25 PDC Discount Rate Plan Default Values for PDC REST Services Manager**

PDC Field	Default Value
chargeRatePlan.applicableQtyTreatment	ApplicableQuantityTreatmentJXB.CONTINUOUS
chargeRatePlan.applicableQuantity	ApplicableQuantityJXB.ORIGINAL
chargeRatePlan.billOffset	BigInteger.valueOf(0)
chargeRatePlan.cycleFeeFlag	BigInteger.valueOf(0)
chargeRatePlan.permittedType	PermittedTypeJXB.PRODUCT
chargeRatePlan.pricingProfileName	ONE TIME/ RECURRING - Subscription USAGE - Convergent Usage
chargeRatePlan.subscriberCurrency.crpRelDateRange...priceTier.distributionMethod	pricingType - TIERED - DistributionMethodJXB.FROM_BAL_IMPACT pricingType - SIMPLE - DistributionMethodJXB.NONE
chargeRatePlan.subscriberCurrency.crpRelDateRange...tierRange...discountable	ONE TIME/ RECURRING - true
chargeRatePlan.subscriberCurrency.crpRelDateRange...tierRange...impactType	ONE TIME/ RECURRING - SCALED
chargeRatePlan.subscriberCurrency.crpRelDateRange...tierRange...incrementRounding	USAGE - IncrementRoundingJXB.NONE
chargeRatePlan.subscriberCurrency.crpRelDateRange...tierRange...priceType	PriceTypeJXB.CONSUMPTION
chargeRatePlan.subscriberCurrency.crpRelDateRange...tierRange...proratable	RECURRING - true
chargeRatePlan.subscriberCurrency.crpRelDateRange...tierRange.enforceCreditLimit	ONE TIME/ RECURRING - CreditLimitJXB.NORMAL USAGE - CreditLimitJXB.DEFAULT

**Table 3-25 (Cont.) PDC Discount Rate Plan Default Values for PDC REST Services Manager**

PDC Field	Default Value
chargeRatePlan.todMode	TODModeJXB.START_TIME
chargeRatePlan.subscriberCurrency.crpRelDateRange...tierRange...unitOfMeasure	UnitOfMeasureJXB.NONE
chargeRatePlan.subscriberCurrency.crpRelDateRange...tierRange...isDiscountable	false
chargeRatePlan.subscriberCurrency.crpRelDateRange...tierRange...priceType	PriceTypeJXB.GRANT
chargeRatePlan.subscriberCurrency.crpRelDateRange...tierRange...relativeStartOffset	-1

## Mapping Pricing Components from TMF620 to PDC

Table 3-26 shows how to map price tags for Charge Offer from TMF 620 fields to PDC fields.

**Table 3-26 Mapping Price Tags for Charge Offer from TMF 620 to PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TMF620 Field	PDC Field	PDC Description
ProductOffering	ProductOfferingOracle	ProductOfferingOracle.PriceTag[n].attributeName	chargeOffering.priceTag[n].attributeName	Price Tag Attribute Name
ProductOffering	ProductOfferingOracle	ProductOfferingOracle.PriceTag[n].count	chargeOffering.priceTag[n].count	Price Tag Count
ProductOffering	ProductOfferingOracle	ProductOfferingOracle.PriceTag[n].defaultValue	chargeOffering.priceTag[n].defaultValue	Price Tag Default Value
ProductOffering	ProductOfferingOracle	ProductOfferingOracle.PriceTag[n].description	chargeOffering.priceTag[n].description	Price Tag Description
ProductOffering	ProductOfferingOracle	ProductOfferingOracle.PriceTag[n].tagName	chargeOffering.priceTag[n].tagName	Price Tag Name
ProductOffering	ProductOfferingOracle	ProductOfferingOracle.PriceTag[n].tagScope	chargeOffering.priceTag[n].tagScope	Price Tag Scope

Table 3-27 shows how to map price tags for Alteration Offer from TMF 620 fields to PDC fields.

**Table 3-27 Mapping Price Tags for Alteration Offer from TMF 620 to PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TMF620 Field	PDC Field	PDC Description
ProductOffering	ProductOfferingOracle	ProductOfferingOracle.PriceTag[n].attributeName	alterationOffering.priceTag[n].attributeName	Price Tag Attribute Name
ProductOffering	ProductOfferingOracle	ProductOfferingOracle.PriceTag[n].count	alterationOffering.priceTag[n].count	Price Tag Count
ProductOffering	ProductOfferingOracle	ProductOfferingOracle.PriceTag[n].defaultValue	alterationOffering.priceTag[n].defaultValue	Price Tag Default Value
ProductOffering	ProductOfferingOracle	ProductOfferingOracle.PriceTag[n].description	alterationOffering.priceTag[n].description	Price Tag Description
ProductOffering	ProductOfferingOracle	ProductOfferingOracle.PriceTag[n].tagName	alterationOffering.priceTag[n].tagName	Price Tag Name
ProductOffering	ProductOfferingOracle	ProductOfferingOracle.PriceTag[n].tagScope	chargeOffering.priceTag[n].tagScope	Price Tag Scope

Table 3-28 shows how to map price tags for charge rate plan from TMF 620 to PDC REST Services Manager.

**Table 3-28 Mapping Price Tags for Charge Rate Plan from TMF 620 to PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TMF620 Field	PDC Field	PDC Description
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPriceOracle.POPAlterationOracle[n]. ProductPriceValueOracle.PriceTag.attributeName	<p><b>One time charge:</b> PricingObjectsJXB.ChargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.oneTimePopModel.priceTier.tierRange.oneTimeCharge.priceTag.attributeName</p> <p><b>Recurring charge:</b> PricingObjectsJXB.ChargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.recurringPopModel.priceTier.tierRange.recurringCharge.priceTag.attributeName</p> <p><b>Usage fixed charge:</b> PricingObjectsJXB.ChargeRatePlanJXB.subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.priceTierRange.FixedCharge.priceTag.attributeName</p> <p><b>Usage Scaled charge:</b> PricingObjectsJXB.ChargeRatePlanJXB.subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.priceTierRange.ScaledCharge.priceTag.attributeName</p>	Price Tag Attribute Name

**Table 3-28 (Cont.) Mapping Price Tags for Charge Rate Plan from TMF 620 to PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TMF620 Field	PDC Field	PDC Description
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPriceOracle.POPAlterationOracle[n]. ProductPriceValueOracle.PriceTag.description	<p><b>One time charge:</b> PricingObjectsJXB.ChargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.oneTimePopModel.priceTier.tierRange.oneTimeCharge.priceTag.Description</p> <p><b>Recurring charge:</b> PricingObjectsJXB.ChargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.recurringPopModel.priceTier.tierRange.recurringCharge.priceTag.Description</p> <p><b>Usage fixed charge:</b> PricingObjectsJXB.ChargeRatePlanJXB.subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.priceTierRange.FixedCharge.priceTag.Description</p> <p><b>Usage Scaled charge:</b> PricingObjectsJXB.ChargeRatePlanJXB.subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.priceTierRange.ScaledCharge.priceTag.Description</p>	Price Tag Description

**Table 3-28 (Cont.) Mapping Price Tags for Charge Rate Plan from TMF 620 to PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TMF620 Field	PDC Field	PDC Description
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPriceOracle.POPAlterationOracle[n]. ProductPriceValueOracle.PriceTag.tagName	<p><b>One time charge:</b> PricingObjectsJXB.ChargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.oneTimePopModel.priceTier.tierRange.oneTimeCharge.priceTag.tagName</p> <p><b>Recurring charge:</b> PricingObjectsJXB.ChargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.recurringPopModel.priceTier.tierRange.recurringCharge.priceTag.tagName</p> <p><b>Usage fixed charge:</b> PricingObjectsJXB.ChargeRatePlanJXB.subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.priceTierRange.FixedCharge.priceTag.tagName</p> <p><b>Usage Scaled charge:</b> PricingObjectsJXB.ChargeRatePlanJXB.subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.priceTierRange.ScaledCharge.priceTag.tagName</p>	Price Tag name
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPriceOracle.POPAlterationOracle[n]. ProductPriceValueOracle.PriceTag.tagScope	<p><b>One time charge:</b> PricingObjectsJXB.ChargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.oneTimePopModel.priceTier.tierRange.oneTimeCharge.priceTag.tagScope</p> <p><b>Recurring charge:</b> PricingObjectsJXB.ChargeRatePlanJXB.subscriberCurrency.crpCompositePopModel.recurringPopModel.priceTier.tierRange.recurringCharge.priceTag.tagScope</p> <p><b>Usage fixed charge:</b> PricingObjectsJXB.ChargeRatePlanJXB.subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.priceTierRange.FixedCharge.priceTag.tagScope</p> <p><b>Usage Scaled charge:</b> PricingObjectsJXB.ChargeRatePlanJXB.subscriberCurrency.applicableRum.crpRelDateRange.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.priceTierRange.ScaledCharge.priceTag.tagScope</p>	Price Tag Scope

Table 3-29 shows how to map price tags for alteration rate plan from TMF 620 to PDC REST Services Manager.

**Table 3-29 Mapping Price Tags for Alteration Rate Plan from TMF 620 to PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TMF620 Field	PDC Field	PDC Description
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPriceOracle.POPAlterationOracle[n]. ProductPriceValueOracle. PriceTag.attributeName	<b>Fixed Discount:</b> PricingObjectsJXB.AlterationRatePlanJXB.arpDateRange.alterationConfiguration.arpCompositePopModel.alterationPopModel.priceTier.tierRange.priceTag.fixedAlteration.attributeName <b>Percentage Discount:</b> PricingObjectsJXB.AlterationRatePlanJXB.arpDateRange.alterationConfiguration.arpCompositePopModel.alterationPopModel.priceTier.tierRange.priceTag.percentAlteration.attributeName	Price Tag Attribute Name
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPriceOracle.POPAlterationOracle[n]. ProductPriceValueOracle. PriceTag.description	<b>Fixed Discount:</b> PricingObjectsJXB.AlterationRatePlanJXB.arpDateRange.alterationConfiguration.arpCompositePopModel.alterationPopModel.priceTier.tierRange.priceTag.fixedAlteration.description <b>Percentage Discount:</b> PricingObjectsJXB.AlterationRatePlanJXB.arpDateRange.alterationConfiguration.arpCompositePopModel.alterationPopModel.priceTier.tierRange.priceTag.percentAlteration.description	Price Tag Description
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPriceOracle.POPAlterationOracle[n]. ProductPriceValueOracle. PriceTag.tagName	<b>Fixed Discount:</b> PricingObjectsJXB.AlterationRatePlanJXB.arpDateRange.alterationConfiguration.arpCompositePopModel.alterationPopModel.priceTier.tierRange.priceTag.fixedAlteration.tagName <b>Percentage Discount:</b> PricingObjectsJXB.AlterationRatePlanJXB.arpDateRange.alterationConfiguration.arpCompositePopModel.alterationPopModel.priceTier.tierRange.priceTag.percentAlteration.tagName	Price Tag name



**Table 3-29 (Cont.) Mapping Price Tags for Alteration Rate Plan from TMF 620 to PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TMF620 Field	PDC Field	PDC Description
ProductOfferingPrice	ProductOfferingPriceOracle	ProductOfferingPriceOracle. POPAlterationOracle[n]. ProductPriceValueOracle. PriceTag.tagScope	<b>Fixed Discount:</b> PricingObjectsJXB.AlterationRatePlanJXB.arpDateRange.alterationConfiguration.arpCompositePopModel.alterationPopModel.priceTier.tierRange.priceTag.fixedAlteration.tagScope <b>Percentage Discount:</b> PricingObjectsJXB.AlterationRatePlanJXB.arpDateRange.alterationConfiguration.arpCompositePopModel.alterationPopModel.priceTier.tierRange.priceTag.percentAlteration.tagScope	Price Tag Sc

## Mapping Generic Selectors and Charge Selectors from TMF 620 to PDC

Table 3-30 shows how to map Generic Selectors and Charge Selectors from TMF 620 fields to PDC fields.

**Table 3-30 TMF 620 Generic Selector Mappings for PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TMF620 Field	PDC Field	PDC Description
ProductOfferingPrice	ProductOfferingPriceOracle.ConstraintOracle	productOfferingPrice.constraint.name	genericSelector.name chargeRatePlan.subscriberCurrency.applicableRum.crpRelDateRange.genericSelector.name	Generic Selector Name
ProductOfferingPrice	ProductOfferingPriceOracle.ConstraintOracle	productOfferingPrice.constraint.stereoType	genericSelector.stereoType	StereoType
ProductOfferingPrice	ProductOfferingPriceOracle.ConstraintOracle.ServiceSpecificationRef	productOfferingPrice.constraint.serviceSpecification.name	genericSelector.productSpecName	Generic Selector Product Specification Name
ProductOfferingPrice	ProductOfferingPriceOracle.ConstraintOracle.ConstraintRuleOracle	productOfferingPrice.constraint.constraintRule.selectorProductOfferingPrice.name	genericSelector.rule.result.resultName {OR} chargeRatePlan.subscriberCurrency.applicableRum.crpRelDateRange.genericSelector.results.name	Generic Selector Rule Result Name

**Table 3-30 (Cont.) TMF 620 Generic Selector Mappings for PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TMF620 Field	PDC Field	PDC Description
ProductOfferingPrice	ProductOfferingPriceOracle.ConstraintRuleOracle	productOfferingPrice.constraintRule.selectorProductOfferingPrice.priceAlteration.price.dutyFreeAmount.unit	chargeRatePlan.subscriberCurrency.applicableRum.crpRelDateRange.genericSelector.results.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.scaledCharge.balanceElementNumCode	Balance Element Num Code
ProductOfferingPrice	ProductOfferingPriceOracle.ConstraintRuleOracle	productOfferingPrice.constraintRule.selectorProductOfferingPrice.priceAlteration.price.dutyFreeAmount.value	chargeRatePlan.subscriberCurrency.applicableRum.crpRelDateRange.genericSelector.results.crpCompositePopModel.usageChargePopModel.priceTier.priceTierValidityPeriod.scaledCharge.price	Price
ProductOfferingPrice	ProductOfferingPriceOracle.ConstraintRuleOracle	productOfferingPrice.constraintRule.valueRelationship.fieldKind	genericSelector.validityPeriod.rule. If NOT LogicalOperator is used then <ul style="list-style-type: none"> <li>complexAAExpressionJXB.attributeAnalyzerExpressionsJXB.fieldToValueExpression.fieldKind</li> </ul> else <ul style="list-style-type: none"> <li>fieldToValueExpression.fieldKind</li> </ul>	Generic Selector Rule Field Kind
ProductOfferingPrice	ProductOfferingPriceOracle.ConstraintRuleOracle	productOfferingPrice.constraintRule.valueRelationship.fieldName	genericSelector.validityPeriod.rule. If NOT LogicalOperator is used then <ul style="list-style-type: none"> <li>complexAAExpressionJXB.attributeAnalyzerExpressionsJXB.fieldToValueExpression.fieldName</li> </ul> else <ul style="list-style-type: none"> <li>fieldToValueExpression.fieldName</li> </ul>	Generic Selector Rule Field Name
ProductOfferingPrice	ProductOfferingPriceOracle.ConstraintRuleOracle	productOfferingPrice.constraintRule.valueRelationship.fieldValue	genericSelector.validityPeriod.rule. If NOT LogicalOperator is used then <ul style="list-style-type: none"> <li>complexAAExpressionJXB.attributeAnalyzerExpressionsJXB.fieldToValueExpression.fieldValue</li> </ul> else <ul style="list-style-type: none"> <li>fieldToValueExpression.fieldValue</li> </ul>	Generic Selector Rule Field Value

**Table 3-30 (Cont.) TMF 620 Generic Selector Mappings for PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TMF620 Field	PDC Field	PDC Description
ProductOfferingPrice	ProductOfferingPriceOracle.ConstraintRuleOracle	productOfferingPrice.constraintRule.valueRelationship.operation	genericSelector.validityPeriod.rule. If NOT LogicalOperator is used then <ul style="list-style-type: none"> <li>complexAAExpressionJXB.getOperator()+ "_"</li> </ul> + complexAAExpressionJXB.attributeAnalyzerExpressionsJXB.fieldToValueExpression.operation else <ul style="list-style-type: none"> <li>fieldToValueExpression.operation</li> </ul>	Generic Selector Rule Operation
ProductOfferingPrice	ProductOfferingPriceOracle.ConstraintRuleOracle	productOfferingPrice.constraintRule.valueRelationship.separator	genericSelector.validityPeriod.rule. If NOT LogicalOperator is used then <ul style="list-style-type: none"> <li>complexAAExpressionJXB.attributeAnalyzerExpressionsJXB.fieldToValueExpression.separator</li> </ul> else <ul style="list-style-type: none"> <li>fieldToValueExpression.separator</li> </ul>	Generic Selector Rule Separator

Table 3-31 shows how to map charge selectors from TMF 620 to PDC REST Services Manager.

**Table 3-31 TMF 620 Charge Selector Mappings for PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.constraint.constraintRule.name	chargeRateplanSelector.validityPeriod.rule.name	ChargeSelector Rule Name
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.constraint.constraintRule.productOfferingPrice.name	chargeRateplanSelector.validityPeriod.rule.result.resultName	ChargeSelector Rule Result Name

Table 3-31 (Cont.) TMF 620 Charge Selector Mappings for PDC REST Services Manager

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.constraint.constraintRule.productOfferingPrice.priceAlteration.price.dutyFreeAmount.unit	<p><b>RECURRING:</b> chargeRatePlan.subscriberCurrency.crpRelDateRange.crpCompositePopModel.recurringPopModel.priceTier.tierRange.recurringCharge.balanceElementNumCode</p> <p><b>ONETIME:</b> chargeRatePlan.subscriberCurrency.crpRelDateRange.crpCompositePopModel.oneTimePopModel.priceTier.tierRange.oneTimeCharge.balanceElementNumCode</p>	ChargeSelector or Rule Charge Balance Element
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.constraint.constraintRule.productOfferingPrice.priceAlteration.price.dutyFreeAmount.value	<p><b>RECURRING:</b> chargeRatePlan.subscriberCurrency.crpRelDateRange.crpCompositePopModel.recurringPopModel.priceTier.tierRange.recurringCharge.price</p> <p><b>ONETIME:</b> chargeRatePlan.subscriberCurrency.crpRelDateRange.crpCompositePopModel.oneTimePopModel.priceTier.tierRange.oneTimeCharge.price</p>	ChargeSelector or Rule Charge Price
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.constraint.constraintRule.valueRelationship.fieldKind	<p>chargeRateplanSelector.validityPeriod.rule. If NOT LogicalOperator is used then</p> <ul style="list-style-type: none"> <li>complexAAExpressionJXB.attributeAnalyzerExpressionsJXB.fieldToValueExpression.fieldKind</li> </ul> <p>else</p> <ul style="list-style-type: none"> <li>fieldToValueExpression.fieldKind</li> </ul>	ChargeSelector or FieldKind
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.constraint.constraintRule.valueRelationship.fieldName	<p>chargeRateplanSelector.validityPeriod.rule. If NOT LogicalOperator is used then</p> <ul style="list-style-type: none"> <li>complexAAExpressionJXB.attributeAnalyzerExpressionsJXB.fieldToValueExpression.fieldName</li> </ul> <p>else</p> <ul style="list-style-type: none"> <li>fieldToValueExpression.fieldName</li> </ul>	ChargeSelector or FieldName

**Table 3-31 (Cont.) TMF 620 Charge Selector Mappings for PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.constraint.constraintRule.valueRelationship.fieldValue	chargeRateplanSelector.validityPeriod.rule. If NOT LogicalOperator is used then <ul style="list-style-type: none"> <li>complexAAExpressionJXB.attributeAnalyzerExpressionsJXB.fieldToValueExpression.fieldValue</li> </ul> else <ul style="list-style-type: none"> <li>fieldToValueExpression.fieldValue</li> </ul>	ChargeSelector FieldValue
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.constraint.constraintRule.valueRelationship.operation	chargeRateplanSelector.validityPeriod.rule. If NOT LogicalOperator is used then <ul style="list-style-type: none"> <li>complexAAExpressionJXB.getOperator()+ " _"</li> </ul> + complexAAExpressionJXB.attributeAnalyzerExpressionsJXB.fieldToValueExpression.operation else <ul style="list-style-type: none"> <li>fieldToValueExpression.operation</li> </ul>	ChargeSelector Field Operation
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.constraint.constraintRule.valueRelationship.separator	chargeRateplanSelector.validityPeriod.rule. If NOT LogicalOperator is used then <ul style="list-style-type: none"> <li>complexAAExpressionJXB.attributeAnalyzerExpressionsJXB.fieldToValueExpression.separator</li> </ul> else <ul style="list-style-type: none"> <li>fieldToValueExpression.separator</li> </ul>	ChargeSelector Field Separator
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.constraint.name	chargeRateplanSelector.name	ChargeSelector Name
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.constraint.stereoType	chargeRateplanSelector.stereoType	ChargeSelector Stereotype
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.eventCandidate.name	chargeRateplanSelector.eventSpecName	ChargeSelector Event Name
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.serviceCandidate.name	chargeRatePlanSelector.productSpecName	ChargeSelector ProductSpec Name
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.id	chargeRateplanSelector.name	ChargeSelector Name

**Table 3-31 (Cont.) TMF 620 Charge Selector Mappings for PDC REST Services Manager**

TMF Base Object	TMF Extended Object	TMF 620 Field	PDC Field	PDC Field Description
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.name	chargeRateplanSelector.name	ChargeSelector Name
ProductOfferingPrice	ProductOfferingPriceOracle	productOfferingPrice.priceType	EventAttributeSpecJXB.EventType.name	ChargeSelector EventType

## Mapping Objects Not Supported

Table 3-32 lists the mapping objects that are not supported in TMF 620.

**Table 3-32 Mapping Objects not Supported in PDC TMF 620**

TMF620 Objects Not supported in TMF620	Support
Packages and bundles containing multiple charge offers and discounts	No
Subscription terms for packages and bundles	No
Discounts used as counters for noncurrency balance credits to charge overage fees	No
Charge selectors with value maps	No

# 4

## Monitoring PDC REST Services Manager

You can use logs, tracing, metrics, and system health data to monitor Oracle Communications Pricing Design Center (PDC) REST Services Manager.

Topics in this document:

- [About Logging](#)
- [About Tracing](#)
- [About Metrics](#)
- [About Monitoring System Health](#)

### About Logging

You can review the PDC REST Services Manager logs to troubleshoot errors and monitor system activity.

PDC REST Services Manager uses the Apache Log4j Java logging utility to log information and errors about the following:

- Start up and shut down activity
- Interaction with other applications at integration points while processing publication events. This includes interactions with PDC, Oracle Identity Cloud Service, and your enterprise product catalog.
- Authorization requests
- Authentication requests
- Tracing (see "[About Tracing](#)")

You access the logs as the user who installed PDC REST Services Manager. See "[Accessing the Logs](#)".

The logs support the standard Log4j logging levels. By default, the framework log levels are set to **INFO**, and the application log levels are set to **DEBUG**. You can change the levels after installation. For example, setting the log levels to **ALL** allows you to log detailed authentication or authorization errors for Helidon security providers. See "[Changing the Log Levels](#)".

You can configure the format of the logs. See "[Configuring the Log Format](#)".

By default, PDC REST Services Manager routes Java logging to the Log4j log manager. After setting up PDC REST Services Manager, you can change the log manager. See "[Changing the Default Log Manager](#)".

For information about Java logging, see "[Java Logging Overview](#)" in *Java Platform, Standard Edition Core Libraries*. For information about Log4j, see <https://logging.apache.org/log4j/2.x/manual/index.html>.

Oracle recommends using automated log file rotation for PDC REST Services Manager logs. For information about configuring log file rotation, see My Oracle Support article 2087525.1 at [https://support.oracle.com/knowledge/Oracle%20Linux%20and%20Virtualization/2087525\\_1.html](https://support.oracle.com/knowledge/Oracle%20Linux%20and%20Virtualization/2087525_1.html).

## Accessing the Logs

You access the logs to monitor and troubleshoot your system.

To access the logs:

1. Log in to the system where PDC REST Services Manager was installed as the installation user.
2. Run the following command:

```
tail -f PDC_RSM_home/log/rsm.log
```

where *PDC\_RSM\_home* is the directory in which you installed PDC REST Services Manager.

### 500FreeMinutes

```
2020-09-05T20:19:28.399-0700 START RestServicesManager.sh
pdcrsm-6f88869785-vtbw2 pdcrsm 2020-11-13T15:58:06.702Z | INFO |
9fcdb109-8682-4368-b4d5-b5b720alaf77 | 548aee87-5ef0-4c1a-b8c8-d2b8a8c6fb40 |
500FreeMinutes | 4ca071fde65d2a61 | pool-3-thread-1 |
ctPublishEventServiceImpl | Processing Publish Event 548aee87-5ef0-4c1a-b8c8-
d2b8a8c6fb40->500FreeMinutes
pdcrsm-6f88869785-vtbw2 pdcrsm 2020-11-13T15:58:07.303Z | INFO |
9fcdb109-8682-4368-b4d5-b5b720alaf77 | 548aee87-5ef0-4c1a-b8c8-d2b8a8c6fb40 |
500FreeMinutes | 4ca071fde65d2a61 | pool-3-thread-1 |
ductOfferingServiceLaunch | Retrieving ProductOffering for ID
OOO_DayTech201_OOO
pdcrsm-6f88869785-vtbw2 pdcrsm 2020-11-13T15:58:09.088Z | INFO |
9fcdb109-8682-4368-b4d5-b5b720alaf77 | 548aee87-5ef0-4c1a-b8c8-d2b8a8c6fb40 |
500FreeMinutes | 4ca071fde65d2a61 | pool-3-thread-1
| .c.b.i.d.PdcRmiConnection | Attempting to connect to PDC using t3s://pdc-
service:8002 ...
pdcrsm-6f88869785-vtbw2 pdcrsm Handshake failed: TLSv1.3, error = No
appropriate protocol (protocol is disabled or cipher suites are inappropriate)
pdcrsm-6f88869785-vtbw2 pdcrsm Handshake succeeded: TLSv1.2
pdcrsm-6f88869785-vtbw2 pdcrsm 2020-11-13T15:58:12.437Z | INFO |
9fcdb109-8682-4368-b4d5-b5b720alaf77 | 548aee87-5ef0-4c1a-b8c8-d2b8a8c6fb40 |
500FreeMinutes | 4ca071fde65d2a61 | pool-3-thread-1 |
c.b.i.d.PdcDatasourceImpl | Checking if PDC object with the name
"500FreeMinutes" exists
pdcrsm-6f88869785-vtbw2 pdcrsm 2020-11-13T15:58:12.479Z | INFO |
9fcdb109-8682-4368-b4d5-b5b720alaf77 | 548aee87-5ef0-4c1a-b8c8-d2b8a8c6fb40 |
500FreeMinutes | 4ca071fde65d2a61 | pool-3-thread-1 |
o.c.b.i.s.PdcServiceImpl | Updating the PDC object "500FreeMinutes"
pdcrsm-6f88869785-vtbw2 pdcrsm 2020-11-13T15:58:16.134Z | INFO |
9fcdb109-8682-4368-b4d5-b5b720alaf77 | 548aee87-5ef0-4c1a-b8c8-d2b8a8c6fb40 |
500FreeMinutes | 4ca071fde65d2a61 | pool-3-thread-1 |
o.c.b.i.s.PdcServiceImpl | PDC object successfully updated for
"500FreeMinutes"
```

See "[Configuring the Log Format](#)" for information about the format of the logs.



## Changing the Log Levels

You can change the global log level and the level for PDC REST Services Manager application-specific log entries.

To change the log levels:

1. Open the `PDC_RSM_home/apps/conf/logging-config.yaml` file in a text editor, where `PDC_RSM_home` is the directory in which you installed PDC REST Services Manager.
2. To change the global log level:
  - a. Search for the following property: `-name: ROOT_LOG_LEVEL`.
  - b. Set the value to `"${env:ROOT_LOG_LEVEL:-LEVEL}"`, where `LEVEL` is the new log level.
3. To change the PDC REST Services Manager application log level:
  - a. Search for the following property: `-name: PDC_RSM_LOG_LEVEL`.
  - b. Set the value to `"${env:PDC_RSM_LOG_LEVEL:-LEVEL}"`, where `LEVEL` is the new log level.
4. Save and close the file.
5. Restart PDC REST Services Manager using the control script located in the `bin` directory:

```
PDC_RSM_home/apps/bin/RestServicesManager.sh restart
```

The following shows sample entries in the `logging-config.yaml` file, with the relevant lines and default values in bold:

```
Configuration:
  name: Default

Properties:
  Property:
    - name: ROOT_LOG_LEVEL
      value: "${env:ROOT_LOG_LEVEL:-INFO}"
    - name: PDC_RSM_LOG_LEVEL
      value: "${env:PDC_RSM_LOG_LEVEL:-INFO}"

Appenders:
  Console:
    name: LogToConsole
    target: SYSTEM_OUT
    PatternLayout:
      Pattern: "%d{ISO8601_OFFSET_DATE_TIME_HHCMM} | %5p | %X{eventId} |
%X{projectId} | %X{productOfferId} | %X{traceId} | %-20.20thread |
%-25.25logger{25} | %m%n"

loggers:
  Root:
    level: "${ROOT_LOG_LEVEL}"
    AppenderRef:
      - ref: LogToConsole

Logger:
```

```

- name: io.jaegertracing.internal.JaegerSpan
  level: error
  AppenderRef:
    - ref: LogToConsole
- name: io.jaegertracing.internal.reporters
  level: warn
  AppenderRef:
    - ref: LogToConsole
- name: oracle.communications
  level: "${PDC_RSM_LOG_LEVEL}"
  additivity: false
  AppenderRef:
    - ref: LogToConsole

```

 **Note:**

The Zipkin tracing logs that appear under **Logger** are filtered from the logs, so you do not need to adjust their levels.

## Configuring the Log Format

Configure the log format to change the order and number of elements that appear in the logs.

The default log format is:

```
%d{ISO8601_OFFSET_DATE_TIME_HHMM} | %5p | %X{eventId} | %X{projectId} |
%X{productOfferId} | %X{traceId} | %-20.20thread | %-25.25logger{25} | %m%n
```

where:

- **%d** is the date and time of the log, in ISO 8601 format.
- **%5p** is the log level. See "[Changing the Log Levels](#)".
- **eventId**, **projectId**, **productOfferId**, and **traceId** are tags added for tracing events and objects through the system. See "[Using Trace Tags to Troubleshoot Issues](#)".
- **%-20.20thread** is the thread pool for the logged event.
- **%-25.25logger** is the service logging the event.
- **%m%n** is the message associated with the event.

To configure the log format:

1. Open the `PDC_RSM_home/apps/conf/logging-config.yaml` file in a text editor, where `PDC_RSM_home` is the directory in which you installed PDC REST Services Manager.
2. Under **Appenders**, locate the **PatternLayout** property.
3. In the value for **Pattern**, change the order of the elements or remove any unwanted elements.

 **Note:**

Removing elements from the logs might reduce your ability to troubleshoot issues and trace messages.

4. Save and close the file.
5. Restart PDC REST Services Manager using the control script located in the **bin** directory:

```
PDC_RSM_home/apps/bin/RestServicesManager.sh restart
```

## Changing the Default Log Manager

By default, PDC REST Services Manager uses the Log4J Log Manager. You can change this after configuring PDC REST Services Manager.

To change the log manager, run the following command:

```
Java_home/bin/java -Djava.util.logging.manager=logManager
```

where:

- *Java\_home* is the directory where you installed the latest compatible version of Java.
- *logManager* is the log manager you want to use. By default, this is set to **org.apache.logging.log4j.jul.LogManager** when you install PDC REST Services Manager. To use your system default, leave this empty.

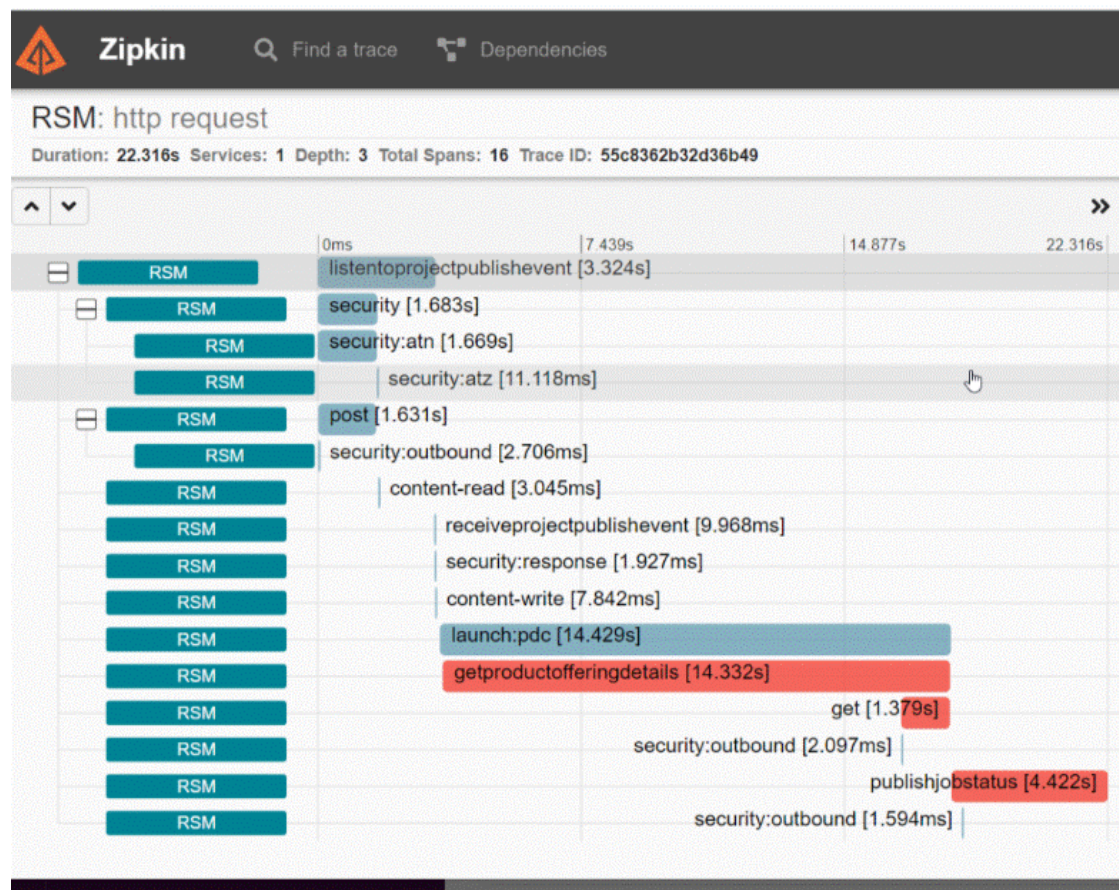
## About Tracing

You can trace the flow of messages through PDC REST Services Manager by using the Zipkin tracer integrated with the Helidon framework, or another transaction tracing tool of your choice.

Helidon is a collection of Java libraries used by PDC REST Services Manager. Zipkin is an open-source tracing system integrated with Helidon. You can use the Zipkin interface to monitor the PDC REST Services Manager traces.

[Figure 4-1](#) shows an example of tracing an event through the system in the Zipkin tracer.

Figure 4-1 Example Event Tracing



For more information about Helidon and Zipkin, see:

- The Helidon project website: <https://helidon.io/>
- The discussion of Zipkin tracing in the Helidon documentation: [https://helidon.io/docs/v2/#/se/tracing/02\\_zipkin](https://helidon.io/docs/v2/#/se/tracing/02_zipkin)
- The Zipkin website: <https://zipkin.io/>

To set up tracing in PDC REST Services Manager:

1. Do one of the following:
  - Install Zipkin. See the Zipkin Quickstart documentation: <https://zipkin.io/pages/quickstart.html>.
  - Integrate Zipkin tracing with Helidon SE. See the Helidon SE Tracing Guide documentation: [https://helidon.io/docs/v2/#/se/guides/06\\_tracing](https://helidon.io/docs/v2/#/se/guides/06_tracing).
2. Enable Zipkin tracing in PDC REST Services Manager. See "Enabling Tracing in PDC REST Services Manager".
3. Optionally, add trace tags to help troubleshoot and trace messages and objects through the system. See "Using Trace Tags to Troubleshoot Issues".

Afterward, you can start tracing the flow of messages by using the Zipkin UI or Zipkin API.

## Enabling Tracing in PDC REST Services Manager

To enable tracing:

1. Configure tracing in your Helidon project, as described in the Helidon documentation: [https://helidon.io/docs/latest/#/mp/tracing/01\\_tracing](https://helidon.io/docs/latest/#/mp/tracing/01_tracing).
2. Open the `PDC_RSM_home/apps/conf/application.yaml` file in a text editor, where `PDC_RSM_home` is the directory in which you installed PDC REST Services Manager.
3. Under **tracing**, set **enabled** to **true**.

The following is a sample of the **tracing** section in the **application.yaml** file:

```
tracing:
  enabled: true
  service: "rsm"
  host: "localhost"
  paths:
    - path: "/metrics"
      enabled: false
  propagation: "zipkin"
  log-spans: true
  max-queue-size: 42
  flush-interval-ms: 10001
```

4. Save and close the **application.yaml** file.
5. Restart PDC REST Services Manager by running the following command from the `PDC_RSM_home/apps/bin` directory:

```
./RestServicesManager.sh restart
```

## Using Trace Tags to Troubleshoot Issues

Instead of reading through logs to identify and troubleshoot issues, you can use trace tags in PDC REST Services Manager to correlate logs and traces.

PDC REST Services Manager tags events with the following trace tags:

- **publishId**: A general tag for the event. In the example below, this is the first **id**.
- **eventId**: A tag for the event that is specific to PDC REST Services Manager. In the example below, this is the **eventId**.
- **projectId**: A tag for the project in the enterprise product catalog. In the example below, this is the ID under **project**.
- **productOfferId**: A tag for a product offering. The example below shows the ID under each entry in the **projectItems** array.
- **productSpecificationId**: A tag for product specifications. This does not appear in the example below but would appear in log messages. You use the **productOfferId** tag to filter logs and locate related **productSpecificationId** tags as needed.

The following shows an example event for publishing updates to two product offerings from an enterprise product catalog to PDC. To illustrate an error scenario, a URL in the payload for the

**testInit4Offer** product offering has become corrupt. The IDs corresponding to trace tags are shown in bold.

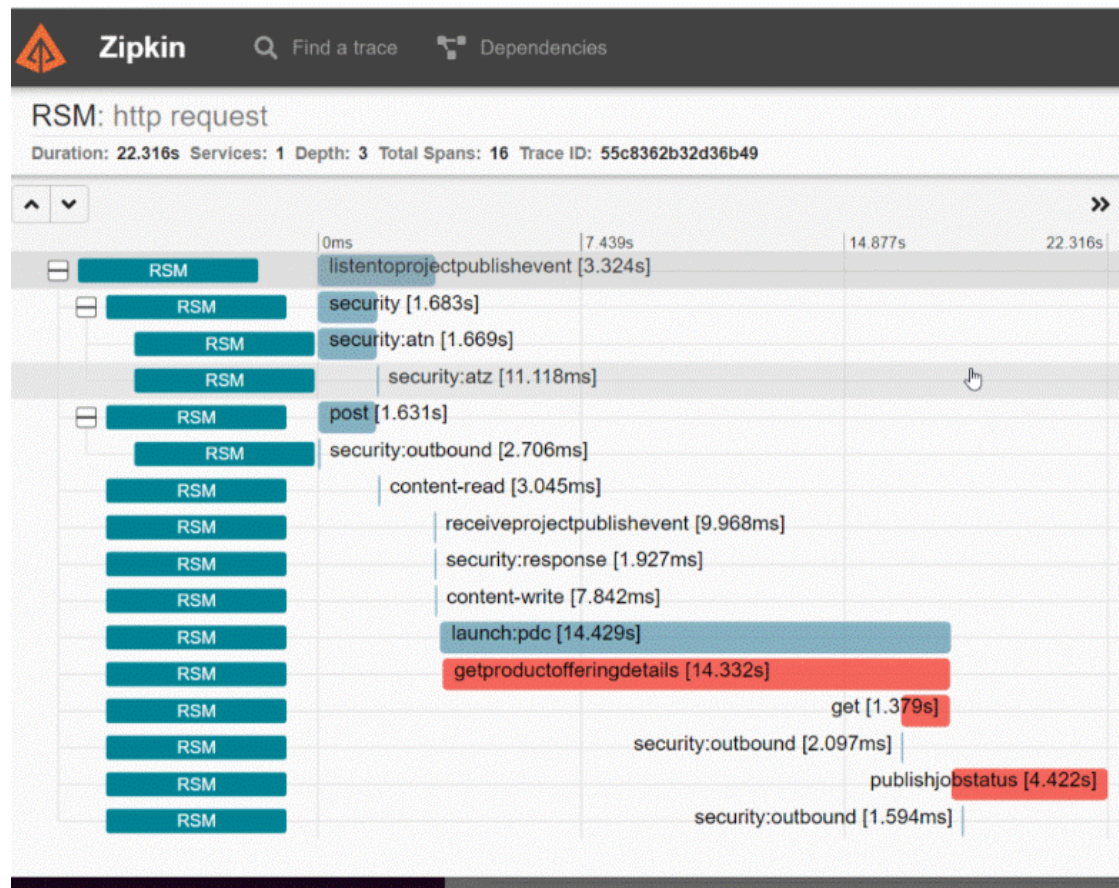
```
{
  "id": "d64066bd-2954-4f43-b8f2-69603c88c683",
  "eventId": "ea09ae5a-8098-4fb2-b634-ee8048b9cc1d",
  "eventTime": "2030-11-18T09:31:50.001Z",
  "eventType": "projectPublishEvent",
  "correlationId": "UC4Fcfc6a70f-60f5-456c-93d5-d8e038215201",
  "domain": "productCatalogManagement",
  "timeOccurred": "2030-11-18T09:31:50.001Z",
  "event": {
    "project": {
      "id": "demopackage11",
      "lifecycleStatus": "IN_DESIGN",
      "name": "Project01",
      "acknowledgementUrl": "http://host:port/mobile/custom/PublishingAPI",
      "projectItems": [
        {
          "id": "55c8362b32d36b49",
          "href": "http://host:port/mobile/custom/catalogManagement/
productOffering/testSuccess",
          "name": "testSuccess",
          "version": "1.0",
          "@referredType": "ProductOfferingOracle"
        },
        {
          "id": "55c8362b32d36b55",
          "href": "http://host:port/mobile/custom/CORRUPTDATA/productOffering/
testInit4Offer",
          "name": "100Minutes",
          "version": "1.0",
          "@referredType": "ProductOfferingOracle"
        }
      ]
    }
  }
}
```

## Trace Tags in Tracer Tools

After submitting the event, you can follow its progress and look for the trace tags in a tracer tool like Zipkin.

Figure 4-2 shows excerpts from a tracer. You can immediately see that the error occurred in the GET request of the getProductOfferingDetails operation. You can expand the trace spans to get the IDs for the event and the object in question, then search in the logs for those tags, as well as the span and trace IDs, to troubleshoot the issue.

Figure 4-2 Sample Tracer Excerpts



The following is the same data for listenToProjectPublishEvent and getProductOfferingDetails in JSON format, with the relevant IDs in the tags arrays in bold:

```
{
  "traceID": "55c8362b32d36b49",
  "spanID": "bad2ef5f3ff26084",
  "flags": 1,
  "operationName": "listenToProjectPublishEvent",
  "references": [
    {
      "refType": "CHILD_OF",
      "traceID": "f2f902949ee8e661",
      "spanID": "8ce5e8f8cda38d3b"
    }
  ],
  "startTime": 1605709909244000,
  "duration": 18160,
  "tags": [
    {
      "key": "eventId",
      "type": "string",
      "value": "ea09ae5a-8098-4fb2-b634-ee8048b9cc1d"
    }
  ],
  {
```

```
        "key": "http.status_code",
        "type": "int64",
        "value": 201
    },
    {
        "key": "component",
        "type": "string",
        "value": "jaxrs"
    },
    {
        "key": "span.kind",
        "type": "string",
        "value": "server"
    },
    {
        "key": "http.url",
        "type": "string",
        "value": "http://host:port/productCatalogManagement/v1/
projectPublishEvent"
    },
    {
        "key": "http.method",
        "type": "string",
        "value": "POST"
    },
    {
        "key": "projectId",
        "type": "string",
        "value": "demopackage11"
    },
    {
        "key": "publishId",
        "type": "string",
        "value": "d64066bd-2954-4f43-b8f2-69603c88c683"
    },
    {
        "key": "internal.span.format",
        "type": "string",
        "value": "Zipkin"
    }
],
"logs": [],
"processID": "p1",
"warnings": null
},
...
{
    "traceID": "f2f902949ee8e661",
    "spans": [
        {
            "traceID": "f2f902949ee8e661",
            "spanID": "03031b1c18e679f2",
            "flags": 1,
            "operationName": "getProductOfferingDetails",
            "references": [
                {
```



```
        "refType": "CHILD_OF",
        "traceID": "f2f902949ee8e661",
        "spanID": "528a32ac350706e2"
    }
],
"startTime": 1605709909256000,
"duration": 688729,
"tags": [
    {
        "key": "productOfferId",
        "type": "string",
        "value": "testInit40ffer"
    },
    {
        "key": "internal.span.format",
        "type": "string",
        "value": "Zipkin"
    }
],
"logs": [],
"processID": "p1",
"warnings": null
},
{
    "traceID": "f2f902949ee8e661",
    "spanID": "303707dcd9c9d1ef",
    "flags": 1,
    "operationName": "getProductOfferingDetails",
    "references": [
        {
            "refType": "CHILD_OF",
            "traceID": "f2f902949ee8e661",
            "spanID": "d1d2c068248a5542"
        }
    ],
    "startTime": 1605709909277000,
    "duration": 529234,
    "tags": [
        {
            "key": "error",
            "type": "bool",
            "value": true
        },
        {
            "key": "productOfferId",
            "type": "string",
            "value": "testInit40ffer"
        },
        {
            "key": "internal.span.format",
            "type": "string",
            "value": "Zipkin"
        }
    ],
    "logs": [
        {
```

```

        "timestamp": 1605709909807000,
        "fields": [
          {
            "key": "event",
            "type": "string",
            "value": "error"
          },
          {
            "key": "error.object",
            "type": "string",
            "value":
"oracle.communications.brm.integration.exceptions.EccServiceException"
          }
        ]
      },
      "processID": "p1",
      "warnings": null
    }
  ]
}

```

## Trace Tags in Logs

After finding the trace tags in the tracer tool, you can search the logs for them. You can do simple searches in the raw log data or search and filter by the tags using a logging tool, such as Grafana Loki.

The trace tags appear in the following format in PDC REST Service Manager logs:

```

yyyy-MM-dd'T'HH:mm:ss.SSSXXX, UTC | level | eventId | projectId |
productOfferId | traceId | thread | logging service | message

```

The following shows the success message in the logs for updating the **testInit4Offer** product, with the relevant trace tags from the event in bold:

```

2030-10-11T11:34:36,231+05:30 | INFO | ea09ae5a-8098-4fb2-b634-ee8048b9cc1d |
demopackage11 | testInit4Offer | 55c8362b32d36b49 | pool-4-thread-1 |
ctPublishEventServiceImpl | Processing Publish Event ea09ae5a-8098-4fb2-b634-
ee8048b9cc1d->testInit4Offer

```

For the **testInit4Offer** product, the following error log appears:

```

2020-11-18T14:31:49.814Z | ERROR | ea09ae5a-8098-4fb2-b634-ee8048b9cc1d |
demopackage11 | testInit4Offer | f2f902949ee8e661 | pool-3-thread-4
| .s.LaunchPdcItemPublisher | Error calling API service 'Product Offering
Service' for 'testInit4Offer'. Status Code: 404 Error: '

```

Based on this message and what you saw in the tracer, you would know that PDC REST Services Manager couldn't call the enterprise product catalog to request information about the **testInit4Offer** product offering. Expanding and inspecting the GET span in the tracer would reveal the corrupt URL. You could then review the message from your enterprise product catalog to confirm and make appropriate changes to resolve the issue.

## About Metrics

You can monitor the PDC REST Services Manager metrics by using the Metrics REST endpoint. The metrics count successful and failed messages passing through the PDC REST Services Manager integration points.

Use a monitoring tool that scrapes metrics data, such as Prometheus, to monitor the metrics available from the PDC REST Services Manager Metrics endpoint. You can get the metrics in plain text format, which is compatible with Prometheus, or JSON format. See "[Checking Access to Metrics](#)" for information about accessing the metrics endpoint and requesting different formats. For more information about Prometheus, see: <https://prometheus.io/>.

[Table 4-1](#) shows the available metrics.

**Table 4-1 PDC REST Services Manager Metrics**

Metric	Description	Example
http-request-duration	The total return time taken for executing HTTP Resource by Method Type and Status Code.	For total time taken for executing <b>/productOffering</b> Resource on HTTP GET: http_request_duration("path=productOffering", "method=GET")
http-request-total	The total return requests for HTTP Resource by Method Type and Status Code.	For total number of requests made for <b>/productOffering</b> Resource on HTTP GET with 200 Status: http_request_total("path=productOffering", "method=GET", "statusCode=200")

You can also use built-in Helidon metrics. See the Helidon documentation for more information: [https://helidon.io/docs/latest/#/mp/metrics/01\\_introduction](https://helidon.io/docs/latest/#/mp/metrics/01_introduction).

## Installing Prometheus

Follow the instructions in this section to install Prometheus Operator. Prometheus Operator is an extension to Kubernetes that manages Prometheus monitoring instances in a more automated and effective way. It optimizes the running of Prometheus with Kubernetes, while retaining the native configuration options of Kubernetes. For more information on installing Prometheus, See "[Installation](#)" in the Prometheus documentation.

Topics in this section:

- [Prerequisites Required before Installing Prometheus](#)
- [Downloading the Prometheus Operator Helm Chart](#)
- [Installing Prometheus Operator](#)

### Prerequisites Required before Installing Prometheus

Before you install Prometheus, you must fulfil the following prerequisites in your system:

- You must have Kubernetes cluster running before you start configuring Prometheus operator.

- Helm software must be configured.
- You must create a namespace for monitoring. You can do this with the following command:

```
kubectl create namespace monitoring
```

- You must set up HTTP proxy on all cluster nodes. You can do this with the following command:

```
export HTTP_PROXY="proxy_host:proxy_port"
export HTTPS_PROXY=$HTTP_PROXY
```

- Git must be installed on client node from where the helm chart will be run. If not, use `yum install git-all` with sudo user to install Git.

## Downloading the Prometheus Operator Helm Chart

Follow the following commands to download the Prometheus Operator Helm Chart:

```
helm repo add stable https://charts.helm.sh/stable
helm repo add prometheus-community https://prometheus-community.github.io/
helm-charts
helm repo update
helm fetch prometheus-community/kube-prometheus-stack
```



### Note:

Use the following command to remove proxy settings while installing the Prometheus operator with helm chart:

```
unset HTTP_PROXY
unset HTTPS_PROXY
```

## Installing Prometheus Operator

1. To install Prometheus operator, You must create the **override-values.yaml** file including service modification, alert rules, and Grafana alerts. The following are the contents of the **override-values.yaml**:

```
additionalPrometheusRulesMap:
  - rule-name: PDC-RSM-rule
    groups:
      - name: pdc-rsm-alert-rules
        rules:
          - alert: CPU_UsageWarning
            annotations:
              message: CPU has reached 80% utilization
              expr: avg without(cpu) (rate(node_cpu_seconds_total{job="node-
exporter", instance="100.77.52.71:9100", mode!="idle"}[5m])) > 0.8
              for: 5m
              labels:
```

```

        severity: critical
    - alert: Memory_UsageWarning
      annotations:
        message: Memory has reached 80% utilization
        expr: node_memory_MemTotal_bytes{job="node-exporter",
instance="100.77.52.71:9100"} - node_memory_MemFree_bytes{job="node-
exporter", instance="100.77.52.71:9100"} -
node_memory_Cached_bytes{job="node-exporter",instance="100.77.52.71:9100"}
- node_memory_Buffers_bytes{job="node-exporter",
instance="100.77.52.71:9100"} > 22322927872
        for: 5m
        labels:
          severity: critical
alertmanager:
  service:
    type: LoadBalancer
grafana:
  service:
    type: LoadBalancer
  grafana.ini:
    smtp:
      enabled: true
      host: internal-mail-router.example.com:25
      user: "xxxxx.xxxxx@example.com"
      password: "password"
      skip_verify: true
prometheus:
  service:
    type: LoadBalancer

```

2. Install the Prometheus operator with kube-prometheus-stack chart in the monitoring namespace with the following command:

```
helm install prometheus kube-prometheus-stack --values override-
values.yaml -n monitoring
```

3. Verify the installation and its components with the following command:

```
kubectl get all -n monitoring
```

## Checking Access to Metrics

You can access the PDC REST Services Manager metrics from any tool that can access REST API endpoints using an OAuth token generated by Oracle Identity Cloud Service for PDC REST Services Manager. You can check whether you have access by using cURL commands.

To check whether you have access to the PDC REST Services Manager metrics:

1. In the command line on the system where cURL and your scraping tool are installed, export your OAuth access token with the following command:

```
export TOKEN=OAuth_metrics_token
```

where *OAuth\_metrics\_token* is the token you requested for the Metrics endpoint in ["Requesting an OAuth Access Token from Oracle Identity Cloud Service"](#).

2. Enter one of the following commands:

- To get the metrics in plain text format:

```
curl --insecure -H "Authorization: Bearer $TOKEN" https://hostname:port/metrics
```

where:

- *hostname* is the URL for the PDC REST Services Manager server.
- *port* is the TLS port for the PDC REST Services Manager server.

- To get the metrics in JSON format:

```
curl --insecure -H "Authorization: Bearer $TOKEN" -H "Accept: application/json" https://hostname:port/metrics
```

## Service Monitor Configuration

PDC REST Services Manager supports Helidon provided metrics endpoint. Prometheus can directly read from the **/metrics** endpoint which is exposed by the PDC REST Services Manager to fetch System and Application Metrics. Service Monitor describes and manages monitoring targets to be scraped by Prometheus, which then understands what applications have to be scraped.

To enable Service Monitor Configuration, you must follow these steps:

1. Create a **pdcrsm-sm.yaml** file with the following content:

```
apiVersion: monitoring.coreos.com/v1
kind: ServiceMonitor
metadata:
  annotations:
    meta.helm.sh/release-name: pdcrsm-(release version)
    meta.helm.sh/release-namespace: op
  labels:
    app.kubernetes.io/managed-by: Helm
    app.kubernetes.io/name: pdcrsm-(release version)
    app.kubernetes.io/version: (release version)
    chart: pdcrsm-(release version)
    heritage: Helm
    release: prometheus
  name: pdcrsm-monitoring
  namespace: monitoring
spec:
  endpoints:
    - path: /metrics
      port: ocpdcrsm-port
  namespaceSelector:
    matchNames:
      - op
  selector:
    matchLabels:
      app.kubernetes.io/name: pdcrsm
```

 **Note:**

You must modify the *release-name* and *namespace* according to the PDC REST Services Manager deployment.

2. Use the following command to apply your changes:

```
kubectl apply -f pdcrsm-sm.yaml -n monitoring
```

3. You can verify if Prometheus is scraping the endpoints by navigating to the Prometheus user interface and clicking on *Targets* under the *Status* drop down menu. Ensure to refresh the page.

## About Monitoring System Health

You can assess the health of the PDC REST Services Manager system by monitoring the process status and overall rates of failure in logs, traces, and metrics.

To monitor process status, use the control script in *PDC\_RSM\_home/apps/bin* directory, where *PDC\_RSM\_home* is the directory in which you installed PDC REST Services Manager:

```
RestServicesManager.sh status
```

To maintain an active system, Oracle recommends using a service from your operating system, such as **systemd** on Linux, to automatically start, monitor, and restart the PDC REST Services Manager system.