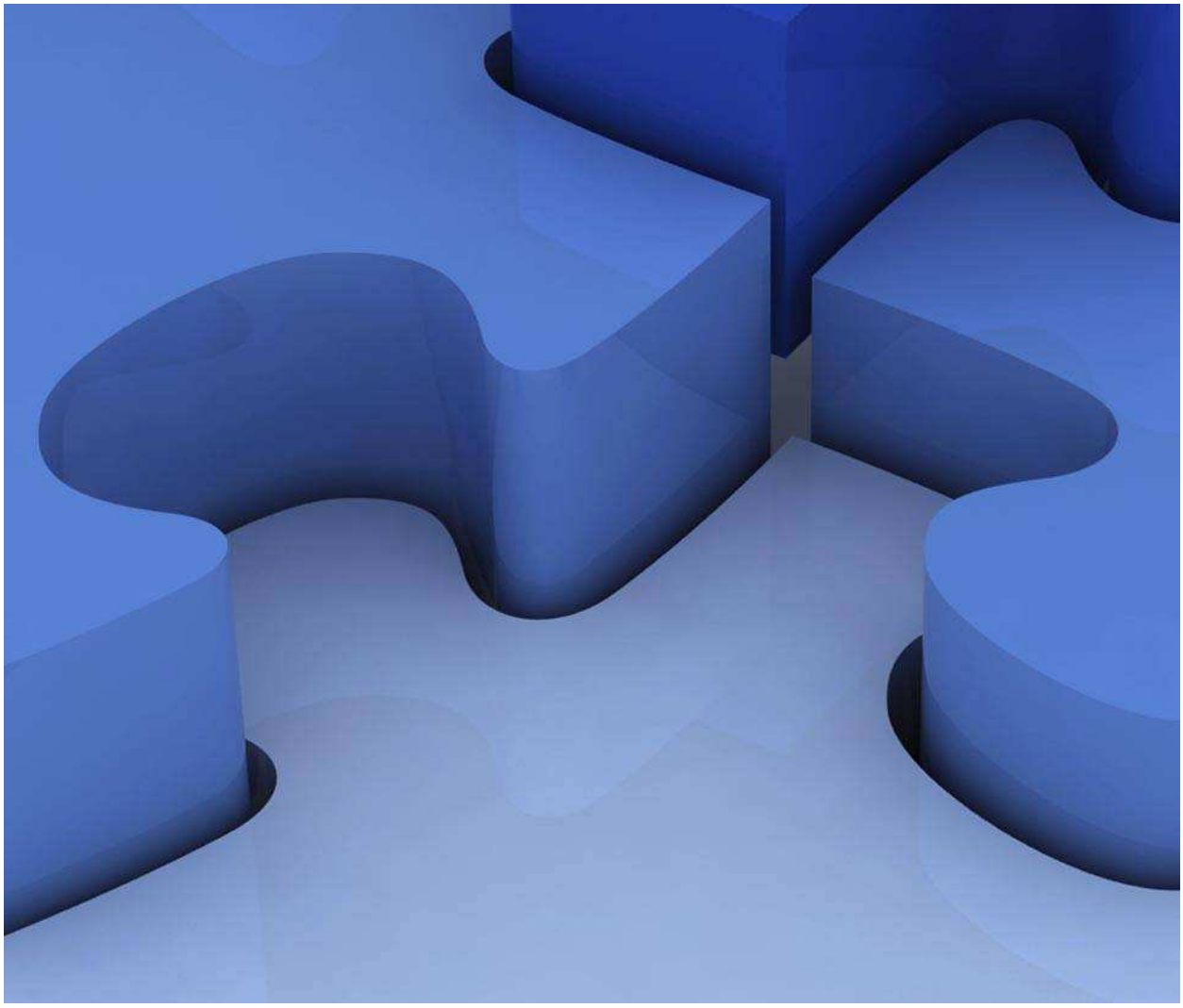
ERICSSON

Ericsson Catalog Manager

Operations and Maintenance - B

Product Documentation



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Icons used in the Documentation

Tip: Indicates alternative ways of achieving the same goal or of facilitating the work.

Important: Indicates an action that must be performed to prevent equipment damage, software corruption, data loss or service interruption.

Attention: Indicates a hazard where incorrect handling could result in product or system failure, or loss of software or data.

Stop: Indicates that action must be avoided to protect equipment, software, data or service.

Table of Contents

1 Business Configuration

1.1 Standard Features

ECM has some standard features. Click the link to view the corresponding description:

1.1.1 Quick Start

`Under Construction . . .`

Access to the **Tasks** pane is based on user privileges. For more information about privileges and user groups, refer to the Privileges and User Groups (on page 65).

Commercial Modelling

Item	Description
Product Offering	Accesses the **Product Offering** page.
All Items	Accesses the **Items** page to allow for searching all catalog items..
Rules	

Technical Configuration

Item	Description
Catalog Rule	
Code Table	
Default Settings	
Characteristic Specification	
Resource Specification	
Product Specification	
Resource Facing Specification	
Customer Facing Specification	
Rule Specification	
Product Account Specification	
Association Type	
Information Model	

Item	Description
Hierarchy	
Context	
Business Date Model	
Business Date Definition	
Market Segment	

Catalog Change Management

Item	Description
Project	
Request	

Pricing and Taxes

Item	Description
Price Logic Algorithm	
Tariff Specification	
Tax Object	
Tax Model	
Charge Type	

Administration

Item	Description
Event Log	
Work List Manager	

Import / Export

Item	Description
Import Catalog	
Export Catalog	

Product Lifecycle

Item	Description
Template	
Stage	
Participant	
Microflow	

1.1.2 Menu Bar

The Ercisson Catalog Manager menu bar resides on the top of all ECM application pages.

Tasks

- **Identify which project is currently opened.**
  Refer to the value of **Current Project** link. If no project is opened, the link displays **No Current Project**.
- **Close the current project.**
  Click **Current Project > Close.**. The **Project** page with the **Project Search** pane is displayed.
- **Manage a project.**
  Click **Current Project > Manage**. The **Project** page with the **Details** of the current project is displayed providing the ability to edit, validate or publish the project.
- **Switch to another project.**
  Click **Current Project > Switch**. The **Project** page with the **Project Search** pane is displayed.
- **Access ECM help.**
  Click **Help**.
- **Hide the Ericsson Catalog Manager menu bar.**
  Click **User Name > Preferences**.
- **Set the number of rows per page to be displayed in results panes.**
  Click **User Name > Preferences**.
- **Switch to another application.**
  Click **User Name > Switch**.

  
  This option is available with the appropriate privileges.
- **Logout from Ericsson Catalog Manager.**
  Click **User Name > Logout**

1.1.3 Navigation Aid

A navigation aid, also known as a **breadcrumb trail**, appears horizontally on the top of all ECM pages below the menu bar. Breadcrumbs provide a trail for the user to follow back to the starting or entry point.

Example

Overview / **Product Offering** / **Bundle-Product-Offering** / New Charactersic ()

The breadcrumb allows users to keep track of their location within the application. It also provides links back to each previous page the user navigated through to get to the current page or — in hierarchical site structures — the parent pages of the current one.

There are two types of breadcrumbs:

- Location breadcrumbs are static and show where the page is located in the application hierarchy.
- Attribute breadcrumbs give information about the current page.

1.1.4 Search

Search Pane

A customized left-hand **Search** pane exists throughout the ECM application. From this pane, searches for catalog items, such as specifications and elements, can be performed.

The **Search** pane typically provides the ability to search specifications by common attributes such as **Code**, **Type**, **Name**, **Status**, **Start Date** and **End Date**.

Two filters are available on the **Search** pane:

- **Search within current project ... or ... (Include only items from current project)**
  Click this check-box to display all the specifications from the current project having **any Status** (`Definition` or `Active`).
- **Include all items from all projects**
  Click this check-box to display all the specifications from all projects having **any Status** with no restriction on effective and expiry dates.

If the **Search within current project** check-box is checked, the **Include all items from all projects**check-box is unchecked and becomes disabled.

Search Results

The **Specification Search results** pane displays a list of specifications or catalog items resulting from the search performed typically showing such attributes as **Label**, **Code**, **Type**, **Subtype**, **Status**, **Start Date** and **End Date** of the specification.

The number of rows displayed is dependent on the **Rows per Page** setting configured from the **User Name > Preferences** link of the ECM menu bar.

At the bottom of the page, links are available to navigate to the **next** or to the **previous** set of results.

By default, upon entry into a **Specification Search** page, all the specifications from other projects with an `Active` status that are **effective** at the current time, as well as all the specifications with any status of the current (open) project are displayed.

This pane also provides common options such as **New**, **Delete** and **Copy** to maintain catalog specifications.

1.1.5 Column Headers

The following standard properties are provided on the column header of any lists of data:

- Sort Ascending
- Sort Descending
- Configure Sort…
- Auto Fit All Columns
- Auto Fit
- Columns
  Sub menu options are available to hide or show columns related to the specification.
- Group by `<column header>`
  Groups the list (rows) by the selected column header.
- Ungroup
  Removes any existing grouping of the list.
- Freeze `<column header>`
  Locks the selected column header in place when horizontal scrolling is used to view other columns in the results list.

1.1.6 Tasks

`Under Construction . . .`

Access to the **Tasks** pane is based on user privileges. For more information about users, groups and privileges, refer to the **Privileges** and **User Groups** sections.

Item	Description
Due Date	
Task	

1.2 Project

Navigation

Home Page > Quick Start > Catalog Change Management > Project

Alternatively, a Project page can be accessed from the **Current Project** link of the ECM menu bar.

For more information about projects, refer to Project (on page 66).

Tasks

The following is a list of tasks associated with a project. The configuration of a project is also outlined in Configure Sample Plan - Pay As You Go.

- **Search for a project.**
  Enter search criteria in the **Search** pane. Click **Search**. For more information, refer to the Search (on page 12).
- **Create a new project.**
  From the **Project Search (List)** pane, click **New**.

  
  Before creating a project, review with the appropriate business group to determine what kind of project is to be created. Marketing groups handle product offers. Charging groups handle tariff elements.
- **Delete a project.**
  From the **Project Search (List)** pane, select one or multiple project(s). Click **Delete**.
- **Open a project (set as current).**
  From the **Project Search (List)** pane, select a project. Click **Open**.

  
  The **Open** link only sets the selected project as the current project which is reflected in the **Current Project** link of the ECM menu bar. The **Open** link does not invoke the edit mode of the project as is done by the **Manage** link.

Manage a project

View product items of the current project
From the **Product Items** tab, view the product specifications and entities that belong to the project.

Edit a project
From the **Project Search (List)** pane, select a project. Click **Manage**. A page is opened to provide the ability to modify the selected project. Click **Edit** and enter or modify details on the **Details** tab.


Active projects cannot be modified.

Create an error correction project
Click this check-box to create a project in order to make corrections for an entity in the past.

Validate the entity specifications configured in the project
On the project detail pages of the current project, click **Validate**. For more information, refer to Entity Validation (on page 105).

Publish the project data to CIL (Common Information Layer)
On the project detail pages of the current project, click **Publish**. When a project is complete and ready for operation, the configuration changes need to be published.

Publishing can done on CDAL/CIL. For more information, refer to Publish to CIL.

Publishing to CDAL/CIL is performed when ECM is configured with the Ericsson Charging component. For more information, refer to Configure Charging Component (on page 62).

This page contains the following tabs. Click the link to view the corresponding description:

1.2.1 Details

Item	Description
Code	A unique identifier for the project.
Status	Values include: `Definition | Development | Conception | Evaluation | Testing | Launch Product | Active` Once a project is active, this field is disabled.
Name	Name of the project.
Effective Date	The effective date of the project.
Parent Project	
Label	Label for the project.
Description	Full description of the project.
Owner	
External Identifier	Identifier of an external system receiving the project information.

1.2.2 Domain

Displays a list of domains.

1.2.3 Assignment

Displays the object assigned to the current project.

An object can be assigned to another project.

The project objects can be exported.

Item
Object Type
Catalog Object
Status
Start Date
End Date
New End Date
Name
Label

1.3 Product Offering

Navigation

Home Page > Quick Start > Commercial Modelling > Product Offering

For more information about product offerings, refer to Product Model (on page 66) and Product Offering Specification (on page 72).

Tasks

The following is a list of tasks associated with a product offering. The configuration of a product offering is also outlined in Configure Sample Plan - Pay As You Go.

Manage a product offering

Search for the entity
Enter search criteria in the **Search** pane. Click **Search**. For more information, refer to the Search (on page 12).

Create a new entity
From the **Entity Search Results (List)** pane, click **New**.

Open the entity
From the **Entity Search Results (List)** pane, click **>** or double-click on the entity row.

Copy the entity
From the **Entity Search Results (List)** pane, selected the entity row and click **Copy**. All relationships and values of the selected entity, except for the **Code** value, are copied allowing for new input, thus creating a brand new entity and not a version of it.

Delete the entity

From the **Entity Search Results (List)** pane, select one or multiple entity row(s) and click **Delete**.

Manage versions of the entity

Open a version of the entity
From the opened entity page, click **Version Project: Product View**. From the **Time Slices** dialogue, select the desired time slice. Click **Open**. The time slice (version) of the entity with all its values and relationships is displayed

Copy a version of the entity
From the opened entity page, click **Version Project: Product View**. From the **Time Slices** dialogue, select the desired time slice. Click **Copy**. The values and relationships of the selected time slice are inherited into a new time slice.

Create a new version of the entity
From the opened entity page, click **Version Project: Product View**. From the **Time Slices** dialogue, select the desired time slice. Click **New**. The values and relationships of the selected time slice are **not** inherited into a new time slice, however, the attributes of the entity including any characteristic item attributes are inherited.

For more information about versioning of entities, refer to versioning Examples (on page 113).

Manage characteristic attributes

Add a characteristic item attribute
From the **Characteristics** tab, in the **List of Item Attribute** section, click **New**. For more information, refer to Characteristic Item Attribute (on page 56).

Delete a characteristic item attribute
From the **General Info** tab, in the **Characteristics > Item Attribute** section, select one or multiple item attribute(s) and click **Delete**.

Add a characteristic override attribute
From the **General Info** tab, in the **Characteristics > Override Attributes** section, click **New**. For more information, refer to Characteristic Override Attribute (on page 56).

Delete a characteristic override attribute
From the **General Info** tab, in the **Characteristics > Override Attributes** section, select one or multiple override attribute(s) and click **Delete**.

Manage product offering prices and charges

Add a price
From the **Prices** tab, click **New**. The New Price dialogue appears. Enter the

pricing data and **Save**.

Delete a price
From the **Prices** tab, select one or multiple price(s). Click **Delete**.

Manage entity relationships

The **Relations** tab is displayed if the entity is **allowed** to have relations. Validation rules check if relationship cardinality rules (one to one or one to many) are followed. For more information on the different kinds of relationships, refer to Entity Relationships (on page 99).

Add a relationship
Click **New** in the appropriate section [**Contains** | **Characteristics** | **Requires** | **Optional** | **Monitoring**] for the relationship being configured The New Relationship dialogue appears. Select the child specification **Type** and select one or multiple child specification(s). Click **Save**.

Delete a relationship
Select one or multiple relationship(s) from the appropriate relationship section. Click **Delete**.

Manage attachments

Add an attachment
From the **Attachments** tab, click **New**. The New Attachment dialogue appears. Enter the data relating to the attachment. **Browse** and select the file. Click **Upload** and **Save**.

Delete an attachment
From the **Attachments** tab, select one or multiple attachment(s). Click **Delete**.

Manage images

Add an image
From the **Images** tab, click **New**. The New Image dialogue appears. Enter the data relating to the image. **Browse** and select the file. Click **Upload** and **Save**.

Delete an image
From the **Images** tab, select one or multiple image(s). Click **Delete**.

View parent relations

From the **Usages** tab, view the list of other (parent) specifications and entities that are using the current specification.

Manage rules

Future ... Under Construction ...

Manage domains

Future ... Under Construction ...

Manage groups

Future ... Under Construction ...

Manage business dates

Future ... Under Construction ...

Manage market segments

Future ... Under Construction ...

Manage hiearchies

Future ... Under Construction ...

This page contains the following tabs. Click the link to view the corresponding description:

1.3.1 General Info

Item	Description
Code	A unique internal identifier for the product offering.
Label	The label field is used to hold the marketing name of the product offering.
Effective From	The first day that the offer can be ordered by customers.
Effective To	The last day that the offer can be ordered by customers.
Business Dates	
Description	Full description of the offer.
Offer Type	Common business configuration enumeration for offer type.
Offer Subtype	Common business configuration enumeration for offer subtype.
Short Code	Short code identifier of the offer.
Category	Common business configuration enumeration for offer classification. A category represents how the product is sold. A sale

Item	Description
	means no further commitment from the provider, for example, a phone accessory. A service means on going supportable service where the service provider is responsible. For a lease or rent, the service provider expects to get the equipment back and there are terms and conditions.
Rank	The order to display offers. **Future: To be replaced by product priority.**
Orderable Min / Max	Represents the cardinality of the number of times a product can be ordered on the same contract. It can also be enforced with a rule. **Future: To be removed as a fixed attribute.**
Grace Date	The date marking the end of the grace period for a customer to order.
Family	Common business configuration enumeration for offer family.
Sell Indicator	True or False. Order can be started by selecting this offer.
Term	The duration of the term.
Term Units	The units of measurement of the term.
Shared	Offer can be shared between subscribers. Other product can use items within this service, for example, free minutes.
Advanced Configuration	
External Identifier	Identifier of an external system receiving the product offering information.
Domains	
Descriptions	
Actions	
Invisible	
Version	Version number of the edit of the product offering specification.
Status	Status of the product offering specification.

1.3.2 Characteristics

The following specifications have the **Characteristics** tab:

- Product Offering
- Product Specification
- Customer Facing Service Specification
- Resource Facing Service Specification
- Resource Specification
- Characteristic Specification

1.3.3 Relations

Relationship	Specification Allowed
Contains	Product Offering | Product Specification | Customer Facing Service Specification | Resource Facing Service Specification
Characteristics	Product Offering | Product Specification | Customer Facing Service Specification | Resource Facing Service Specification | Resource Specification
Requires	Product Offering | Product Specification | Customer Facing Service Specification | Resource Facing Service Specification
Optional	Product Offering
Monitoring	Product Specification

Item	Description
Type	
Subtype	
Label	
Code	

1.3.4 Prices

Item	Description
Product Offering Price Code	
Status	
PLA ID	
PLA Type	
Name	
Label	
Discount Type	
Discount Target Charge	
Chargeable Quantity	
Unit of Measurement	
Percentage	
Value	

1.3.5 Attachments

Item	Description
Attachment Code	
Type	
Status	
Cancel	
Name	
Start Date	
End Date	
Project	
File	

1.3.6 Images

Item	Description
Image Code	
Type	
Status	
Cancel	
Name	
Label	
Start Date	
End Date	
Size	
Project	
File	

1.3.7 Availability

1.3.8 Market Segment

Item	Description
xxx	

Item	Description
xxx	
xxx	

1.3.9 Rules

Item	Description
xxx	
xxx	
xxx	

1.4 Product Specification

Navigation

Home Page > Quick Start > Technical Configuration > Product Specification

For more information about product specifications, refer to Product Model (on page 66) and Product Specification (on page 75).

Tasks

The following is a list of tasks associated with a product specification. The configuration of a product specification is also outlined in Configure Sample Plan - Pay As You Go.

Manage the product specification entity

Search for the entity
Enter search criteria in the **Search** pane. Click **Search**. For more information, refer to the Search (on page 12).

Create a new entity
From the **Entity Search Results (List)** pane, click **New**.

Open the entity
From the **Entity Search Results (List)** pane, click **>** or double-click on the entity row.

Copy the entity
From the **Entity Search Results (List)** pane, selected the entity row and click **Copy**. All relationships and values of the selected entity, except for the **Code** value, are copied allowing for new input, thus creating a brand new entity and not a version of it.

Delete the entity

From the **Entity Search Results (List)** pane, select one or multiple entity row(s) and click **Delete**.

Manage versions of the entity

Open a version of the entity
From the opened entity page, click **Version Project: Product View**. From the **Time Slices** dialogue, select the desired time slice. Click **Open**. The time slice (version) of the entity with all its values and relationships is displayed

Copy a version of the entity
From the opened entity page, click **Version Project: Product View**. From the **Time Slices** dialogue, select the desired time slice. Click **Copy**. The values and relationships of the selected time slice are inherited into a new time slice.

Create a new version of the entity
From the opened entity page, click **Version Project: Product View**. From the **Time Slices** dialogue, select the desired time slice. Click **New**. The values and relationships of the selected time slice are **not** inherited into a new time slice, however, the attributes of the entity including any characteristic item attributes are inherited.

For more information about versioning of entities, refer to versioning Examples (on page 113).

Manage characteristic attributes

Add a characteristic item attribute
From the **Characteristics** tab, in the **List of Item Attribute** section, click **New**. For more information, refer to Characteristic Item Attribute (on page 56).

Delete a characteristic item attribute
From the **General Info** tab, in the **Characteristics > Item Attribute** section, select one or multiple item attribute(s) and click **Delete**.

Add a characteristic override attribute
From the **General Info** tab, in the **Characteristics > Override Attributes** section, click **New**. For more information, refer to Characteristic Override Attribute (on page 56).

Delete a characteristic override attribute
From the **General Info** tab, in the **Characteristics > Override Attributes** section, select one or multiple override attribute(s) and click **Delete**.

Manage entity relationships

The **Relations** tab is displayed if the entity is **allowed** to have relations. Validation rules check if relationship cardinality rules (one to one or one to many) are fol-

lowed. For more information on the different kinds of relationships, refer to Entity Relationships (on page 99).

Add a relationship
Click **New** in the appropriate section [**Contains** | **Characteristics** | **Requires** | **Optional** | **Monitoring**] for the relationship being configured The New Relationship dialogue appears. Select the child specification **Type** and select one or multiple child specification(s). Click **Save**.

Delete a relationship
Select one or multiple relationship(s) from the appropriate relationship section. Click **Delete**.

Manage attachments

Add an attachment
From the **Attachments** tab, click **New**. The New Attachment dialogue appears. Enter the data relating to the attachment. **Browse** and select the file. Click **Upload** and **Save**.

Delete an attachment
From the **Attachments** tab, select one or multiple attachment(s). Click **Delete**.

Manage images

Add an image
From the **Images** tab, click **New**. The New Image dialogue appears. Enter the data relating to the image. **Browse** and select the file. Click **Upload** and **Save**.

Delete an image
From the **Images** tab, select one or multiple image(s). Click **Delete**.

View parent relations

From the **Usages** tab, view the list of other (parent) specifications and entities that are using the current specification.

Manage rules

Future ... Under Construction ...

This page contains the following tabs. Click the link to view the corresponding description:

1.4.1 General Info (PS)

Item	Description
Code	A unique internal identifier for the product specification.
Label	The label field is used to hold the marketing name of the product .
Effective From	The first day that the product can be ordered by customers.
Effective To	The last day that the product can be ordered by customers.
Description	Full description of the product.
Product Type	Common business configuration enumeration for product type.
Product Subtype	Common business configuration enumeration for product subtype.
Short Code	Short code identifier for the product specification.
Category	Common business configuration enumeration for product classification. A category represents how the product is sold. A sale means no further commitment from the provider, for example, a phone accessory. A service means on going supportable service where the service provider is responsible. For a lease or rent, the service provider expects to get the equipment back and there are terms and conditions.
Rank	The order to display products. **Future: To be replaced by product priority.**
Shared	The field specifies if a product can be shared between subscribers. Other product can use items within this service, for example, free minutes.
Orderable Min / Max	Represents the cardinality of the number of times a product can be ordered on the same contract. It can also be enforced with a rule. **Future: To be removed as a fixed attribute.**
Supplier	Name of the supplier.
Manufacturer	Name of the manufacturer of the product
Grace Date	The date marking the end of the grace period for a customer to order a product.
Family	Common business configuration enumeration for product family.
? Product Technology	Common business configuration enumeration for the product technology.
External Identifier	Identifier of an external system receiving the product information.

Item	Description
Version	Version number of the edit of the product specification.
Status	Status of the product specification.

1.4.2 Relations

Relationship	Specification Allowed
Contains	Product Offering | Product Specification | Customer Facing Service Specification | Resource Facing Service Specification
Characteristics	Product Offering | Product Specification | Customer Facing Service Specification | Resource Facing Service Specification | Resource Specification
Requires	Product Offering | Product Specification | Customer Facing Service Specification | Resource Facing Service Specification
Optional	Product Offering
Monitoring	Product Specification

Item	Description
Type	
Subtype	
Label	
Code	

1.4.3 Attachments

Item	Description
Attachment Code	
Type	
Status	
Cancel	
Name	
Start Date	
End Date	
Project	
File	

1.4.4 Images

Item	Description
Image Code	
Type	
Status	
Cancel	
Name	
Label	
Start Date	
End Date	
Size	
Project	
File	

1.4.5 Usage

Item	Description
Object Type	
Object Code	
Label	

1.5 Customer Facing Service Specification

Navigation

Home Page > Quick Start > Technical Configuration > Customer Facing Specification

For more information about customer facing service specifications, refer to Product Model (on page 66) and Customer Facing Service Specification (on page 77).

Tasks

The following is a list of tasks associated with a customer facing service specification. The configuration of a customer facing service specification is also outlined in Configure Sample Plan - Pay As You Go.

Manage the customer facing service specification entity

Search for the entity
Enter search criteria in the **Search** pane. Click **Search**. For more information, refer to the Search (on page 12).

Create a new entity
From the **Entity Search Results (List)** pane, click **New**.

Open the entity
From the **Entity Search Results (List)** pane, click **>** or double-click on the entity row.

Copy the entity
From the **Entity Search Results (List)** pane, selected the entity row and click **Copy**. All relationships and values of the selected entity, except for the **Code** value, are copied allowing for new input, thus creating a brand new entity and not a version of it.

Delete the entity
From the **Entity Search Results (List)** pane, select one or multiple entity row(s) and click **Delete**.

Manage versions of the entity

Open a version of the entity
From the opened entity page, click **Version Project: Product View**. From the **Time Slices** dialogue, select the desired time slice. Click **Open**. The time slice (version) of the entity with all its values and relationships is displayed

Copy a version of the entity
From the opened entity page, click **Version Project: Product View**. From the **Time Slices** dialogue, select the desired time slice. Click **Copy**. The values and relationships of the selected time slice are inherited into a new time slice.

Create a new version of the entity
From the opened entity page, click **Version Project: Product View**. From the **Time Slices** dialogue, select the desired time slice. Click **New**. The values and relationships of the selected time slice are **not** inherited into a new time slice, however, the attributes of the entity including any characteristic item attributes are inherited.

For more information about versioning of entities, refer to versioning Examples (on page 113).

Manage characteristic attributes

Add a characteristic item attribute
From the **Characteristics** tab, in the **List of Item Attribute** section, click **New**. For more information, refer to Characteristic Item Attribute (on page 56).

Delete a characteristic item attribute
From the **General Info** tab, in the **Characteristics > Item Attribute** section, select one or multiple item attribute(s) and click **Delete**.

Add a characteristic override attribute
From the **General Info** tab, in the **Characteristics > Override Attributes** section, click **New**. For more information, refer to Characteristic Override Attribute (on page 56).

Delete a characteristic override attribute
From the **General Info** tab, in the **Characteristics > Override Attributes** section, select one or multiple override attribute(s) and click **Delete**.

Manage entity relationships

The **Relations** tab is displayed if the entity is **allowed** to have relations. Validation rules check if relationship cardinality rules (one to one or one to many) are followed. For more information on the different kinds of relationships, refer to Entity Relationships (on page 99).

Add a relationship
Click **New** in the appropriate section [**Contains** | **Characteristics** | **Requires** | **Optional** | **Monitoring**] for the relationship being configured The New Relationship dialogue appears. Select the child specification **Type** and select one or multiple child specification(s). Click **Save**.

Delete a relationship
Select one or multiple relationship(s) from the appropriate relationship section. Click **Delete**.

Manage attachments

Add an attachment
From the **Attachments** tab, click **New**. The New Attachment dialogue appears. Enter the data relating to the attachment. **Browse** and select the file. Click **Upload** and **Save**.

Delete an attachment
From the **Attachments** tab, select one or multiple attachment(s). Click **Delete**.

Manage images

Add an image
From the **Images** tab, click **New**. The New Image dialogue appears. Enter the data relating to the image. **Browse** and select the file. Click **Upload** and **Save**.

Delete an image
From the **Images** tab, select one or multiple image(s). Click **Delete**.

View parent relations

From the **Usages** tab, view the list of other (parent) specifications and entities that are using the current specification.

Manage evaluation functions

Add an evaluation function
From the **Services** tab, click **Add**. The Evaluation Function page appears. Select the evaluation function(s).

Delete an evaluation function
From the **Services** tab, select one or multiple evaluation function(s). Click **Delete**.

This page contains the following tabs. Click the link to view the corresponding description:

1.5.1 General Info (CFS)

Attribute Name	Description
Code	A unique internal identifier for the customer facing service specification.
Label	The label field is used to hold the marketing name of the customer facing service.
Effective From	The first day that the customer facing service can be ordered by customers.
Effective To	The last day that the customer facing service can be ordered by customers.
Description	Full description of the customer facing service.
Short Code	Short code identifier of the customer facing service specification.
Category	Common business configuration enumeration for service classification.
? Service Type	Common business configuration enumeration for service type.
? Service Subtype	Common business configuration enumeration for service subtype.

Attribute Name	Description
External Identifier	Identifier of an external system receiving the customer facing service information.
Version	Version number of the edit of the customer facing service specification.
Status	Status of the customer facing service specification.

1.5.2 Relations

Relationship	Specification Allowed
Contains	Product Offering | Product Specification | Customer Facing Service Specification | Resource Facing Service Specification
Characteristics	Product Offering | Product Specification | Customer Facing Service Specification | Resource Facing Service Specification | Resource Specification
Requires	Product Offering | Product Specification | Customer Facing Service Specification | Resource Facing Service Specification
Optional	Product Offering
Monitoring	Product Specification

Item	Description
Type	
Subtype	
Label	
Code	

1.5.3 Attachments

Item	Description
Attachment Code	
Type	
Status	
Cancel	
Name	
Start Date	
End Date	
Project	

Item	Description
File	

1.5.4 Images

Item	Description
Image Code	
Type	
Status	
Cancel	
Name	
Label	
Start Date	
End Date	
Size	
Project	
File	

1.5.5 Usage

Item	Description
Object Type	
Object Code	
Label	

1.5.6 Services (EF)

Item	Description
Evaluation Function Name	
Description	
Parameters	

1.6 Resource Facing Service Specification

Navigation

Home Page > Quick Start > Technical Configuration > Resource Facing Specification

For more information about resource facing service specifications, refer to Product Model (on page 66) and Resource Facing Service Specification (on page 78).

Tasks

The following is a list of tasks associated with a resource facing service specification. The configuration of a resource facing service specification is also outlined in Configure Sample Plan - Pay As You Go.

Manage the resource facing service specification entity

Search for the entity
Enter search criteria in the **Search** pane. Click **Search**. For more information, refer to the Search (on page 12).

Create a new entity
From the **Entity Search Results (List)** pane, click **New**.

Open the entity
From the **Entity Search Results (List)** pane, click **>** or double-click on the entity row.

Copy the entity
From the **Entity Search Results (List)** pane, selected the entity row and click **Copy**. All relationships and values of the selected entity, except for the **Code** value, are copied allowing for new input, thus creating a brand new entity and not a version of it.

Delete the entity
From the **Entity Search Results (List)** pane, select one or multiple entity row(s) and click **Delete**.

Manage versions of the entity

Open a version of the entity
From the opened entity page, click **Version Project: Product View**. From the **Time Slices** dialogue, select the desired time slice. Click **Open**. The time slice (version) of the entity with all its values and relationships is displayed

Copy a version of the entity
From the opened entity page, click **Version Project: Product View**. From the **Time Slices** dialogue, select the desired time slice. Click **Copy**. The values and relationships of the selected time slice are inherited into a new time slice.

Create a new version of the entity
From the opened entity page, click **Version Project: Product View**. From the **Time Slices** dialogue, select the desired time slice. Click **New**. The values and relationships of the selected time slice are **not** inherited into a new time slice, however, the attributes of the entity including any characteristic item attributes are inherited.

For more information about versioning of entities, refer to versioning Examples (on page 113).

Manage characteristic attributes

Add a characteristic item attribute
From the **Characteristics** tab, in the **List of Item Attribute** section, click **New**. For more information, refer to Characteristic Item Attribute (on page 56).

Delete a characteristic item attribute
From the **General Info** tab, in the **Characteristics > Item Attribute** section, select one or multiple item attribute(s) and click **Delete**.

Add a characteristic override attribute
From the **General Info** tab, in the **Characteristics > Override Attributes** section, click **New**. For more information, refer to Characteristic Override Attribute (on page 56).

Delete a characteristic override attribute
From the **General Info** tab, in the **Characteristics > Override Attributes** section, select one or multiple override attribute(s) and click **Delete**.

Manage entity relationships

The **Relations** tab is displayed if the entity is **allowed** to have relations. Validation rules check if relationship cardinality rules (one to one or one to many) are followed. For more information on the different kinds of relationships, refer to Entity Relationships (on page 99).

Add a relationship
Click **New** in the appropriate section [**Contains** | **Characteristics** | **Requires** | **Optional** | **Monitoring**] for the relationship being configured The New Relationship dialogue appears. Select the child specification **Type** and select one or multiple child specification(s). Click **Save**.

Delete a relationship
Select one or multiple relationship(s) from the appropriate relationship section. Click **Delete**.

Manage attachments

Add an attachment
From the **Attachments** tab, click **New**. The New Attachment dialogue appears. Enter the data relating to the attachment. **Browse** and select the file. Click **Upload** and **Save**.

Delete an attachment
From the **Attachments** tab, select one or multiple attachment(s). Click **Delete**.

Manage images

Add an image
From the **Images** tab, click **New**. The New Image dialogue appears. Enter the data relating to the image. **Browse** and select the file. Click **Upload** and **Save**.

Delete an image
From the **Images** tab, select one or multiple image(s). Click **Delete**.

View parent relations

From the **Usages** tab, view the list of other (parent) specifications and entities that are using the current specification.

Manage charging services

Add a charging service
From the **Services** tab, click **Add**. he Charging Services Result page appears. Select one charging services.

Only one charging service can be assigned to a resource facing specification.

Delete a charging service
From the **Services** tab, select one or multiple charging service(s). Click **Delete**.

This page contains the following tabs. Click the link to view the corresponding description:

1.6.1 General Info (RFS)

Attribute Name	Description
Code	A unique internal identifier for the resource facing service specification.
Label	The label field is used to hold the marketing name of the resource facing service.

Attribute Name	Description
Effective From	The first day that the resource facing service can be ordered by customers.
Effective To	The last day that the resource facing service can be ordered by customers.
Description	Full description of the resource facing service.
Resource Type	Common business configuration enumeration for resource type.
Resource Subtype	Common business configuration enumeration for resource subtype.
Short Code	Short code identifier of the resource facing service specification.
Category	Common business configuration enumeration for service classification.
External Identifier	Identifier of an external system receiving the resource facing service information.
Version	Version number of the edit of the resource facing service specification.
Status	Status of the resource facing service specification.

1.6.2 Relations

Relationship	Specification Allowed
Contains	Product Offering | Product Specification | Customer Facing Service Specification | Resource Facing Service Specification
Characteristics	Product Offering | Product Specification | Customer Facing Service Specification | Resource Facing Service Specification | Resource Specification
Requires	Product Offering | Product Specification | Customer Facing Service Specification | Resource Facing Service Specification
Optional	Product Offering
Monitoring	Product Specification

Item	Description
Type	
Subtype	
Label	
Code	

1.6.3 Attachments

Item	Description
Attachment Code	
Type	
Status	
Cancel	
Name	
Start Date	
End Date	
Project	
File	

1.6.4 Services (CS)

Item	Description
Name	
Description	

1.7 Resource Specification

Navigation

Home Page > Quick Start > Technical Configuration > Resource Specification

For more information about resource specifications, refer to Product Model (on page 66) and Resource Specification (on page 79).

Tasks

The following is a list of tasks associated with a resource specification. The configuration of a resource specification is also outlined in Configure Sample Plan - Pay As You Go.

Manage the resource specification entity

Search for the entity
Enter search criteria in the **Search** pane. Click **Search**. For more information, refer to the Search (on page 12).

Create a new entity
From the **Entity Search Results (List)** pane, click **New**.

Open the entity
From the **Entity Search Results (List)** pane, click **>** or double-click on the entity row.

Copy the entity
From the **Entity Search Results (List)** pane, selected the entity row and click **Copy**. All relationships and values of the selected entity, except for the **Code** value, are copied allowing for new input, thus creating a brand new entity and not a version of it.

Delete the entity
From the **Entity Search Results (List)** pane, select one or multiple entity row(s) and click **Delete**.

Manage versions of the entity

Open a version of the entity
From the opened entity page, click **Version Project: Product View**. From the **Time Slices** dialogue, select the desired time slice. Click **Open**. The time slice (version) of the entity with all its values and relationships is displayed

Copy a version of the entity
From the opened entity page, click **Version Project: Product View**. From the **Time Slices** dialogue, select the desired time slice. Click **Copy**. The values and relationships of the selected time slice are inherited into a new time slice.

Create a new version of the entity
From the opened entity page, click **Version Project: Product View**. From the **Time Slices** dialogue, select the desired time slice. Click **New**. The values and relationships of the selected time slice are **not** inherited into a new time slice, however, the attributes of the entity including any characteristic item attributes are inherited.

For more information about versioning of entities, refer to versioning Examples (on page 113).

Manage characteristic attributes

Add a characteristic item attribute
From the **Characteristics** tab, in the **List of Item Attribute** section, click **New**. For more information, refer to Characteristic Item Attribute (on page 56).

Delete a characteristic item attribute
From the **General Info** tab, in the **Characteristics > Item Attribute** section, select one or multiple item attribute(s) and click **Delete**.

Add a characteristic override attribute
From the **General Info** tab, in the **Characteristics > Override Attributes** section, click **New**. For more information, refer to Characteristic Override Attribute (on page 56).

Delete a characteristic override attribute
From the **General Info** tab, in the **Characteristics > Override Attributes** section, select one or multiple override attribute(s) and click **Delete**.

Manage entity relationships

The **Relations** tab is displayed if the entity is **allowed** to have relations. Validation rules check if relationship cardinality rules (one to one or one to many) are followed. For more information on the different kinds of relationships, refer to Entity Relationships (on page 99).

Add a relationship
Click **New** in the appropriate section [**Contains** | **Characteristics** | **Requires** | **Optional** | **Monitoring**] for the relationship being configured The New Relationship dialogue appears. Select the child specification **Type** and select one or multiple child specification(s). Click **Save**.

Delete a relationship
Select one or multiple relationship(s) from the appropriate relationship section. Click **Delete**.

Manage attachments

Add an attachment
From the **Attachments** tab, click **New**. The New Attachment dialogue appears. Enter the data relating to the attachment. **Browse** and select the file. Click **Upload** and **Save**.

Delete an attachment
From the **Attachments** tab, select one or multiple attachment(s). Click **Delete**.

Manage images

Add an image
From the **Images** tab, click **New**. The New Image dialogue appears. Enter the data relating to the image. **Browse** and select the file. Click **Upload** and **Save**.

Delete an image
From the **Images** tab, select one or multiple image(s). Click **Delete**.

View parent relations

From the **Usages** tab, view the list of other (parent) specifications and entities that are using the current specification.

This page contains the following tabs. Click the link to view the corresponding description:

1.7.1 General Info (RS)

Attribute Name	Description
Code	A unique internal identifier for the resource specification.
Label	The label field is used to hold the marketing name of the resource.
Effective From	The first day that the resource can be ordered by customers.
Effective To	The last day that the resource can be ordered by customers.
Description	Full description of the resource.
Resource Type	Common business configuration enumeration for resource type.
Resource Subtype	Common business configuration enumeration for resource subtype.
Resource Role	`Under construction . . .`
External Identifier	Identifier of an external system receiving the resource information.
Version	Version number of the edit of the resource specification.
Status	Status of the resource specification.

1.7.2 Relations

Relationship	Specification Allowed
Contains	Product Offering | Product Specification | Customer Facing Service Specification | Resource Facing Service Specification
Characteristics	Product Offering | Product Specification | Customer Facing Service Specification | Resource Facing Service Specification | Resource Specification
Requires	Product Offering | Product Specification | Customer Facing Service Specification | Resource Facing Service Specification
Optional	Product Offering
Monitoring	Product Specification

Item	Description
Type	

Item	Description
Subtype	
Label	
Code	

1.7.3 Attachments

Item	Description
Attachment Code	
Type	
Status	
Cancel	
Name	
Start Date	
End Date	
Project	
File	

1.7.4 Images

Item	Description
Image Code	
Type	
Status	
Cancel	
Name	
Label	
Start Date	
End Date	
Size	
Project	
File	

1.7.5 Usage

Item	Description
Object Type	
Object Code	
Label	

1.8 Characteristic Specification

Navigation

Home Page > Quick Start > Technical Configuration > Characteristic Specification

For more information about resource specifications, refer to Product Model (on page 66) and Characteristic Specification (on page 80).

Tasks

The following is a list of tasks associated with a characteristic specification. The configuration of a characteristic specification is also outlined in Configure Sample Plan - Pay As You Go.

Manage the characteristic specification entity

Search for the entity
Enter search criteria in the **Search** pane. Click **Search**. For more information, refer to the Search (on page 12).

Create a new entity
From the **Entity Search Results (List)** pane, click **New**.

Open the entity
From the **Entity Search Results (List)** pane, click **>** or double-click on the entity row.

Copy the entity
From the **Entity Search Results (List)** pane, selected the entity row and click **Copy**. All relationships and values of the selected entity, except for the **Code** value, are copied allowing for new input, thus creating a brand new entity and not a version of it.

Delete the entity
From the **Entity Search Results (List)** pane, select one or multiple entity row(s) and click **Delete**.

Manage versions of the entity

Open a version of the entity
From the opened entity page, click **Version Project: Product View**. From the **Time Slices** dialogue, select the desired time slice. Click **Open**. The time slice (version) of the entity with all its values and relationships is displayed

Copy a version of the entity
From the opened entity page, click **Version Project: Product View**. From the **Time Slices** dialogue, select the desired time slice. Click **Copy**. The values and relationships of the selected time slice are inherited into a new time slice.

Create a new version of the entity
From the opened entity page, click **Version Project: Product View**. From the **Time Slices** dialogue, select the desired time slice. Click **New**. The values and relationships of the selected time slice are **not** inherited into a new time slice, however, the attributes of the entity including any characteristic item attributes are inherited.

For more information about versioning of entities, refer to versioning Examples (on page 113).

Manage characteristic attributes

Add a characteristic item attribute
From the **Characteristics** tab, in the **List of Item Attribute** section, click **New**. For more information, refer to Characteristic Item Attribute (on page 56).

Delete a characteristic item attribute
From the **General Info** tab, in the **Characteristics > Item Attribute** section, select one or multiple item attribute(s) and click **Delete**.

Add a characteristic override attribute
From the **General Info** tab, in the **Characteristics > Override Attributes** section, click **New**. For more information, refer to Characteristic Override Attribute (on page 56).

Delete a characteristic override attribute
From the **General Info** tab, in the **Characteristics > Override Attributes** section, select one or multiple override attribute(s) and click **Delete**.

Manage attachments

Add an attachment
From the **Attachments** tab, click **New**. The New Attachment dialogue appears. Enter the data relating to the attachment. **Browse** and select the file. Click **Upload** and **Save**.

Delete an attachment
From the **Attachments** tab, select one or multiple attachment(s). Click **Delete**.

Manage images

Add an image
From the **Images** tab, click **New**. The New Image dialogue appears. Enter the data relating to the image. **Browse** and select the file. Click **Upload** and **Save**.

Delete an image
From the **Images** tab, select one or multiple image(s). Click **Delete**.

View parent relations

From the **Usages** tab, view the list of other (parent) specifications and entities that are using the current specification.

This page contains the following tabs. Click the link to view the corresponding description:

1.8.1 General Info (CHRCT)

Attribute Name	Description
Code	A unique internal identifier for the characteristic specification.
Label	
Effective From	
Effective To	
Description	Full description of the characteristic.
Characteristic Owner ID	
Category	Common business configuration enumeration for service classification.
External Identifier	Identifier of an external system receiving the characteristic information.
Version	Version number of the edit of the characteristic specification.
Status	Status of the characteristic specification.

1.8.2 Attachments

Item	Description
Attachment Code	
Type	

Item	Description
Status	
Cancel	
Name	
Start Date	
End Date	
Project	
File	

1.8.3 Images

Item	Description
Image Code	
Type	
Status	
Cancel	
Name	
Label	
Start Date	
End Date	
Size	
Project	
File	

1.8.4 Usage

Item	Description
Object Type	
Object Code	
Label	

1.9 Product Account Specification

Navigation

Home Page > Quick Start > Technical Configuration > Product Account Specification

For more information about product account specifications, refer to Product Model (on page 66) and Product Account Specification (on page 81).

Tasks

The following is a list of tasks associated with a product account specification. The configuration of a product account specification is also outlined in Configure Sample Plan - Pay As You Go.

Manage the product account specification entity

Search for the entity
Enter search criteria in the **Search** pane. Click **Search**. For more information, refer to the Search (on page 12).

Create a new entity
From the **Entity Search Results (List)** pane, click **New**.

Open the entity
From the **Entity Search Results (List)** pane, click **>** or double-click on the entity row.

Copy the entity
From the **Entity Search Results (List)** pane, selected the entity row and click **Copy**. All relationships and values of the selected entity, except for the **Code** value, are copied allowing for new input, thus creating a brand new entity and not a version of it.

Delete the entity
From the **Entity Search Results (List)** pane, select one or multiple entity row(s) and click **Delete**.

Manage versions of the entity

Open a version of the entity
From the opened entity page, click **Version Project: Product View**. From the **Time Slices** dialogue, select the desired time slice. Click **Open**. The time slice (version) of the entity with all its values and relationships is displayed

Copy a version of the entity
From the opened entity page, click **Version Project: Product View**. From the **Time Slices** dialogue, select the desired time slice. Click **Copy**. The values and relationships of the selected time slice are inherited into a new time slice.

Create a new version of the entity
From the opened entity page, click **Version Project: Product View**. From the **Time Slices** dialogue, select the desired time slice. Click **New**. The values and relationships of the selected time slice are **not** inherited into a new time slice, however, the attributes of the entity including any characteristic item attributes are inherited.

For more information about versioning of entities, refer to versioning Examples (on page 113).

Update product account specification details

Enter values in the product account specification header section. Click **Save**

Manage thresholds

From more information about thresholds, refer to Threshold Conditions and Actions (on page 82).
Add a threshold
From the **Thresholds** section of the product account specification details page, click **New**.

Delete a threshold
From the **Thresholds** section of the product account specification details page, select one or multiple threshold(s). Click **Delete**

Update threshold details and actions

Enter values in the threshold header section. Click **Save**.

Add an action

From the **Actions** section of the **Thresholds** page, click **New**.
Delete an action

From the **Actions** section of the **Thresholds** page, select one or multiple action(s). Click **Delete**.

This page contains the following dialogue pages. Click the link to view the corresponding description:

1.9.1 Product Account Specification Details

Item	Description
Code	A unique internal identifier for the product account specification.
Name	The name of the product account specification.

Item	Description
Type	This attribute is used when interpreting reports about product account value changes. Currently, there are these types of product accounts: `Free Unit | Postpaid | Prepaid | Counter` Future enhancements may include values to identify whether a changed amount shall be invoiced or not.
Status	Status of the product account specification.
Visibility	Indicates if the product account can be found and accessed during execution from another product other than the product that introduced the product account. It can have two values: `Product | Contract`
Effective From	The first day that the product account specification is effective.
Effective To	The last day that the product account specification is effective.
Description	Full description of the product account specification and the product account.
Unit of Measurement	Defines the unit of measurement of the value of the product account and other applicable attributes such as initial, minimum and maximum values and should match with consumed units reported in the usage events and rating units. The relevant units of measurements are: `GBs (Count) | Hours (Duration) | KBs (Count)| MBs (Count)| MMS(Event) | Minutes (Duration) | Months (Duration) | SMS(Event) | Seconds (Duration) | Years (Duration)`
Initial Value	The setup starting value of the product account. It can be reset by product offering. This is the amount set for a product account value at instantiation. If no initial value is specified, then the product account value is set to zero at instantiation.
Min Value	This attribute defines the lowest possible value of the product account. The product value cannot be lower than the **Min Value** . When the **Min Value** is reached the product account is considered to be **empty**.
Max value	This attribute defines the highest possible value of the product account. The product account value cannot be higher than the **Max Value**. When the **Max Value** is reached the product account is considered to be **full**.
External Identifier	Identifier of an external system receiving the product account specification information.
Version	Version number of the edit of the product account specification.

1.9.2 Thresholds

Attribute Name	Description
Name	Name of the threshold. May be used by Notification and CPM.

Attribute Name	Description
Condition	Values include`Reaching or Passing from Above |Reaching or Passing from Below`. Capabilities required to handle the threshold logic is owned by the charging component.
Threshold Value	The threshold value can be personalized. It must be defined in the allowed range of the account minimum and maximum. The default valued is defined in the product specification. Capabilities required to handle the threshold logic is owned by the charging component. This attribute can be personalized by CPM.
Type	Values include `Unit | Percent`.

1.10 Price Logic Algorithm

Navigation

Home Page > Quick Start > Pricing & Tax > Price Logic Algorithm

For more information about product logic algorithms, refer to Price Logic Algorithm Specification (on page 83).

1.10.1 Price Logic Algorithm Specification

Item	Description
Code (ID)	A unique internal identifier for the price logic algorithm specification.
Name	The name of the price logic algorithm specification.
Effective From	The effective date of the price logic algorithm specification time slice.
Effective To	The effective end date of the price logic algorithm specification time slice.
Description	A full description of the price logic algorithm specification.
External Identifier	Identifier of an external system receiving the product offering information.
Version	Version number of the edit.
State	Status of the price logic algorithm specification.

1.10.2 PLA Type Properties

1.10.3 Pricing Type Properties (Rating Logic - No Condition)

1.10.4 Pricing Type Properties (Rating Logic - With Condition)

1.11 Tariff Specification

Navigation

Home Page > Quick Start > Pricing & Tax > Tariff Specification

For more information about tariff specifications, refer to Product Model (on page 66) and Tariff Elements (on page 88).

Tasks

The following is a list of tasks associated with a tariff specification. The configuration of a tariff specification is also outlined in Configure Sample Plan - Pay As You Go.

Manage the tariff specification entity

Search for tariff specification, tariff elements and tariff groups
Enter the search criteria in the **Search** pane. Click **Search**. For more information, refer to the Search (on page 12)

Create a new tariff specification
From the **Entity Search Results (List)** pane, click **New**. From the **New Tariff Selection** dialogue, select **Type** `Specification`. Select the **Tariff Type** and **Save**.

Create a new tariff element
From the **Entity Search Results (List)** pane, click **New**. From the **New Tariff Selection** dialogue, select **Type** `Element`. Select the **Tariff Type**. Select the **Specification** and **Save**.

Create a new tariff group
From the **Entity Search Results (List)** pane, click **New**. From the **New Tariff Selection** dialogue, select **Type** `Group`. Select the **Tariff Type** and **Save**.

Open the tariff specification entity
From the **Entity Search Results (List)** pane, click **>** or double-click on the entity row.

Delete the tariff specification entity
From the **Entity Search Results (List)** pane, select one or multiple entity row(s) and click **Delete**.

Copy the tariff specification entity
(Future) Copy all tariff related objects and entities (tariff element specifications, tariff elements, tariff element groups, price logic algorithm specification and price logic algorithm).

Import/Export the tariff specification entity
(Future) Import and export all tariff related objects and entities (tariff element specifications, tariff elements, tariff element groups, price logic algorithm specification and price logic algorithm).

TBD ... Validation Rules for Delete

Manage versions of the entity

Open a version of the entity
From the opened entity page, click **Version Project: Product View**. From the **Time Slices** dialogue, select the desired time slice. Click **Open**. The time slice (version) of the entity with all its values and relationships is displayed

Copy a version of the entity
From the opened entity page, click **Version Project: Product View**. From the **Time Slices** dialogue, select the desired time slice. Click **Copy**. The values and relationships of the selected time slice are inherited into a new time slice.

Create a new version of the entity
From the opened entity page, click **Version Project: Product View**. From the **Time Slices** dialogue, select the desired time slice. Click **New**. The values and relationships of the selected time slice are **not** inherited into a new time slice, however, the attributes of the entity including any characteristic item attributes are inherited.

For more information about versioning of entities, refer to versioning Examples (on page 113).

1.11.1 TariffTime_Spec (ECM Predefined)

Item	Description
Code	A unique internal identifier for the tariff element specification `TariffTime_Spec`.
Name	Name of the tariff element specification `TariffTime_Spec`.
Tariff Type	`Tariff Time | Tariff Zone | Tariff Zone Origin |Tariff Zone Destination | QoS`
Status	`Definition | Active`

Item	Description
Effective Date (From)	
Effect Date (To)	
Description	Full description of the tariff element specification.
Table with Column Attributes	
Name	`timeOfDay | dayOfWeek | holidays | specialDays | customDates`
Data Type	`Charging Function |Tariff Type` **Note:** The value `Charging Function` represents the evaluation functions with parameters that are exposed by the charging component.

Data Source	Charging Functions as per predefined specification:
	`'eventTimeWithinTimeInterval (List of TimeIntervals)'`
	`'eventTimeWithinDayOfWeek (List of DoWs)'`
	`'eventTimeWithinDate (List of Dates)'`
	Note:
	If a new specification is created, the list of charging functions is restricted to those that access simple parameters such as string, boolean, integer, decimal, date and date time.

Description	

1.11.2 Tariff Element

Each Tariff Element page is based on a tariff specification and each tariff specification is associated to a tariff type. The attributes of the tariff element are inherited from the base tariff element specification.

Functionality

The **Conditions** section provides:

- **Add New**
  For a tariff element of zone origin and destination, add a new phone number prefixes or locations.
  For a tariff element zone, add new tariff elements for origin or destination.
- **Delete**
  Delete any existing row.

Note:
Common holidays are configured in COBA, for example `$COBA/coba/common/holidays/Newyear`.

1.11.3 Tariff Specification Detail

The following types of tariff specifications can be created:

- Tariff Time
- Tariff Zone
- Tariff Zone Origin
- Tariff Zone Destination
- QoS

The following table lists the attributes **common** to all tariff specifications.

Common Attributes of Tariff Element Specifications

Attribute Name	Type	Mandatory	Description
Code	String	Y	A unique internal identifier for the tariff element specification.
Name	String	Y	Name of the tariff element specification.
Tariff Type			`Tariff Time`, `Tariff Zone`, `Tariff Zone Origin`, `Tariff Zone Destination`,`QoS`
Status			`Definition | Active`
Effective Date (From)	Date	Y	
Effect Date (To)	Date		
Description	String (1024)	Y	Full description of the tariff element specification.

Functionality

This table section of the tariff element specification provides the ability to defined the attributes for the instances of the tariff element specification, that is the tariff element.

- Click the **(+) Add** icon to add a new row to define a new set of column attributes.
- Click the **(x) Delete** icon to delete a row of column attributes.

Table with Column Attributes	
Item	**Description**
Name	This is the name of the column that is to be displayed in the **Conditions** section of the tariff element based on the tariff element specification.
Data Type	`Charging Function |Tariff Type` **Note:**

Table with Column Attributes			
Item			**Description**
			The value `Charging Function`represents the evaluation functions with parameters that are exposed by the charging component.
Data Source			If **Data Type** is `Tariff Type` then values include: `Tariff Time | Tariff Zone | Tariff Zone Origin |Tariff Zone Destination | QoS` If **Data Type** is `Charging Function` then values include:`setupFee | linearRate | tieredRate | applyRate | chargingInterval| eventTimeWithinTimeInterval | eventTimeWithinDayOfWeek | eventTimeWithinDate | sendNotification | isServiceId | genericFunction | isTrafficCase | E164OriginInListBestMatch | E164DestinationInListBestMatch (` If a new specification is created, the list of charging functions is restricted to those that access simple parameters such as string, boolean, integer, decimal, date and date time.
Description			This is the description of the column that is to be displayed in the **Conditions** section of the tariff element based on the tariff element specification.

1.11.4 Tariff Group

Each Tariff Group page is based and tariff type. It defines which tariff specification and element relationships are to be grouped. The attributes of the tariff element are inherited from the base tariff element specification.

Functionality

The **Tariff Elements** section provides:

- **Add New**
  Add a new tariff specification and element to be grouped.
- **Delete**
  Delete any existing row.

Item	Description
Code (ID)	A unique internal identifier for the tariff element group.
Name (Label)	Name of the tariff element group.
Tariff Type	`Tariff Time`, `Tariff Zone`, `QoS`
Status	

Item	Description
Effective Date (From)	
Effect Date (To)	
Description	Full description of the tariff element group.
Table with Column Attributes	
Specification	Full description of the tariff element specification.
Name	Name of the tariff element.
Description	

1.12 Characteristic Item Attribute

Tasks

```
Under Construction . . .
```

1.13 Characteristic Override Attribute

Tasks

```
Under Construction . . .
```

The following specifications have the **Override Attributes** section:

- Product Offering
- Product Specification
- Customer Facing Service Specification
- Resource Facing Service Specification
- Resource Specification
- Characteristic Specification

Attribute Name	Description
Source Attribute Code	
Override Item Code	
Override Attribute Code	

1.14 Versioning

Navigation

Access via the **Version Project** link of any item page of an entity that handles versioning.

Tasks

Search for a version of the entity
By default, the List of Time Slices dialogue displays:

- **defined** versions of the entity in the current project with a reference to the project and project status
- **active** versions of the entity identified as `Production View`

Search for other versions of the entity by using the **Start Date**, **End Date** and **Project** query fields.

Create a new a version of the entity
Select the desired time slice. Click **New**. The values and relationships of the selected time slice are not inherited into the new time slice, however, the attributes of the entity including any characteristic item attributes are inherited.

Open a version of the entity

Select the desired time slice. Click **Open**. The item attribute values and relationships of the selected time slice are shown along with any characteristic item attributes that were created for this entity version.

1.15 Import Charging Capabilities

Navigation

Home Page > Quick Start > Import / Export > Import Charging Capabilities

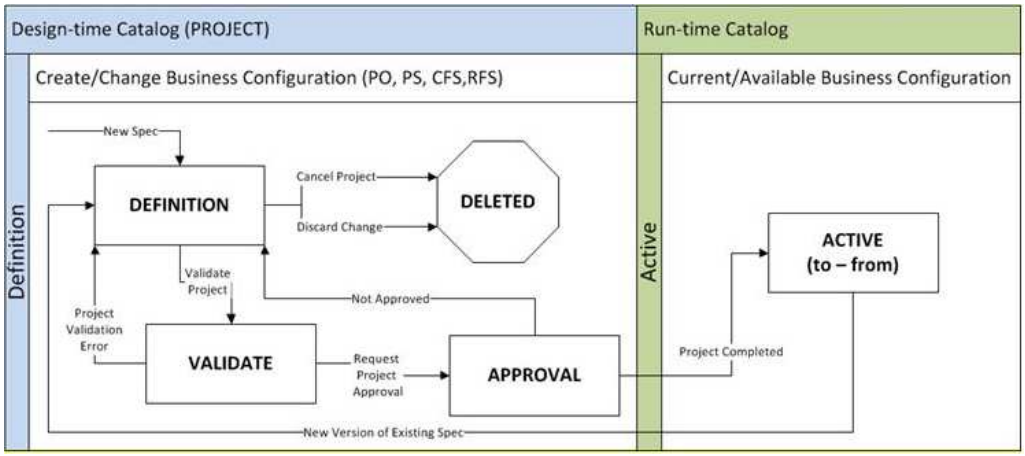
For more information about importing the charging capabilities (functions exposed and supported by the charging component), refer to Charging Capabilities (on page 133).

Tasks

- **Import charging capabilities**
  Click **Import** . All the charging capabilities are updated with the latest definitions from the charging web services.

1.16 Configure and Read Catalog - Component Workflow

The design time environment of catalog provides a means to configure catalog data. The run time environment provides access to read catalog data. For more information about the design time and run time environments of catalog, refer to Catalog Environments (on page 64).



1.16.1 Configure Catalog

The following scenario shows the workflow among various components for the business configuration of a usage plan product offering (without pricing) in ECM.

Some of the activities described in this table conform to the price model of the Ericsson Charging component. For this set up, the system configuration variable `PSCM_USE_CHARGE_PRICE` is set to `True`. For more information, refer to Configure Charging Component (on page 62).

Activity	ECM	CPM	CDAL/ CIL	Charging
Upload the service capabilities (load customer facing and resource facing services) using the charging interface.	X			X
Define common business configuration data in COBA. Use the interface to load the data into ECM.	X	X	X	X
Edit the COBA data. Use the interface to load the data into ECM.	X	X	X	X
Create a project and open the project.	X			
Create a product offering specification.	X			
Create product specification.	X			

Activity	ECM	CPM	CDAL/ CIL	Char-ging
Create customer facing and resource facing service specifications. • Link the customer facing service specification (to be used by the product) to the product specification. • Link other capabilities to be used by the product such as notifications and rules.	X			
Create characteristics (custom attributes) for resource specifications.	X			
Create a resource specification and assign characteristics to the resource facing specification.	X			
Relate entities. Select a parent specification, add a relationship, select a relationship type and select a child specification.	X			
Validate a project.	X			
Publish a project to CDAL and CIL. Interested components fetch and cache the specification data of the project from the database via CDAL and CIL.	X	X	X	X
Reuse a specification. Create a product specification with a relationship to a customer facing service specification that already has a product specification.	X			
Correct an existing specification. Open a project, select an existing specification and change it. Validate and publish the project.	X			X
Correct an existing specification with various configuration periods. Open a project, select an existing specification. Select the time slice and change it. Validate and publish the project.	X			X

1.16.2 Read Catalog

The following scenario shows the workflow among various components when reading information related to a usage plan product offering (without pricing).

CDAL/CIL is used to conform to the price model of the Ericsson Charging component. For this set up, the system configuration variable `PSCM_USE_CHARGE_PRICE` is set to `True`. For more information, refer to Configure Charging Component (on page 62).

Activity	CPM	ECM	CDAL / CIL	Char-ging
Get product offering information.	X	X	X	X
Get product information.	X	X	X	X
Get customer facing and resource facing service information.	X	X	X	X
Get resource information.	X	X	X	X
Get characteristics information.	X	X	X	X
Get expanded product offering information. Call ECM interface using the expanded flag to get information on a product offering and to also get all the information on all its child relationships.	X	X	X	X

2 System Administration

2.1 Configure Charging Capabilities

Configure the web services for the charging capabilities.

Prerequisites

Access to the **System Configuration** application.

The service and charging capabilities described below conform to the price model of the Ericsson Charging component. For this set up, the system configuration variable `PSCM_USE_CHARGE_PRICE` is set to `True`. For more information, refer to Configure Charging Component (on page 62).

1. From the **BSSF_PSCM** application node, click the **Services** icon.
2. In the **Show Node Label**, select `By Full Name`.
3. If required, sort the **Node** column and search for:
   - `bmarp.wsInterface.capabilityGroupService`
   - `bmarp.wsInterface.funcitonDefinitionService`
   - `bmarp.wsInterface.serviceDetermination`
4. **Capability Group Service**

   Expand the `bmarp.wsInterface.capabilityGroupService` node, and select the port sub-node `portHTTP`. In the **Provider Settings** section, update **Location** `http://localhost:xxxx/charging/capabilities/{groupName}` :
   - Set the `localhost`.
   - Set the port number (`xxxx`).
     For example, `http://vmx1067.ete.ka.sw.ericsson.se:8080/charging/capabilities/{groupName}`.
5. **Function Definition Service**

   Expand the `bmarp.wsInterface.funcitonDefinitionService` node, and select the port sub-node `serviceDeterminationPortHTTP`. In the **Provider Settings** section, update **Location** `http://localhost:xxxx/charging/capabilities/FunctionDefinitions` :
   - Set the `localhost`.
   - Set the port number (`xxxx`).
     For example, `http://vmx1067.ete.ka.sw.ericsson.se:8080/charging/capabilities/FunctionDefinitions`.
6. **Service Determination Service**

Expand the `bmarp.wsInterface.serviceDetermination` node, and select the port sub-node `serviceDeterminationPortHTTP`. In the **Provider Settings** section, update **Location** `http://localhost:xxxx/charging/capabilities/ServiceIdentification` :

- Set the `localhost`.
- Set the port number (`xxxx`).
  For example, `http://vmx1067.ete.ka.sw.ericsson.se:8080/charging/capabilities/ServiceIdentification`.

2.2 Configure Charging Component

Configure the charging component used by ECM.

Prerequisites Access to the **System Configuration** application.

1. Click the **System** icon.
2. Click the **Config Variables** tab.
3. Select variable name `PSCM_USE_CHARGE_PRICE`.

   True
   Click to check.
   Result: An operator using the charging data and pricing model of the Ericsson Charging component requires the system configuration variable PSCM_USE_CHARGE_PRICE to be set to true. This enables the following pricing and charging related features:
   - price logic algorithm
   - tariff element
   - product offering price
   - product account specification
   - import charging capabilities
   - charging services component of the resource facing service specification
   - evaluation function component of the customer facing service specification

   False
   Click to un-check.
   Result: An operator using the charging data and pricing model of an external charging component requires the system configuration variable PSCM_USE_CHARGE_PRICE to be set to false. This suppresses the pricing and charging related features listed above. The product offering price items are replaced by the base catalog charge items.

3 Concepts

3.1 Overview

ECM (Ericsson Catalog Manager) is a product catalog management system that allows service providers to create and manage products, services and business data. Product teams can define new product offerings and specifications by using predefined technical specifications and provisioning processes. Customer service representatives (CSRs) find relevant customer solutions through an automated product selection search engine.

Ericsson Catalog Manager is a unique platform that supports the product lifecycle from offer creation to fulfillment. This catalog management system easily integrates with surrounding OSS/BSS solutions, providing key catalog features that include:

- **Centralized Catalog**
  Use a single, consistent source of offerings, specifications and underlying business rules to simplify product management and drive fulfillment, charging and assurance.
- **Graphical Designer Tool**
  Create and assemble components into product specifications.
- **Scalable Run Time Access**
  Allow OSS/BSS and network systems to access catalog data in real time.

ECM stores, versions and publishes technical service and resource definitions and specifications related to commercial product offerings and charging components.

ECM automatically links commercial products with the technical services and resources to ensure synchronization and integrity of service data. Products and services can be bundled into a single offering in various combinations - one customer, one order, one bill. Functionality exists in the catalog to deal with demands to continuously change and personalize complex offerings.

ECM provides the tools to design and implement catalog models and maintain catalog properties such as rules, relationships and attributes. Functional specifications along with rules and work flows are used to ensure that the processing of products and services is executed consistently and accurately for the appropriate period.

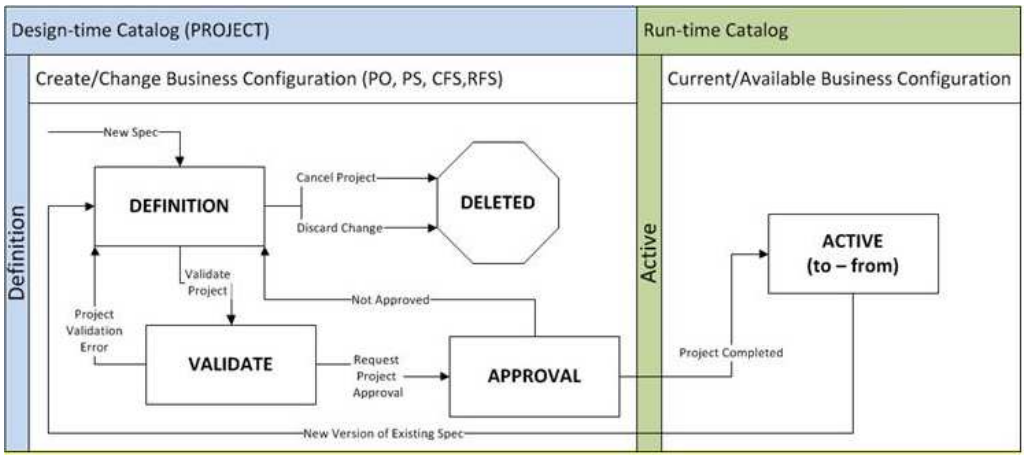
ECM is compliant with the SID Model. The catalog models specification details used for customer care, charging and invoicing components.

Two types of catalogs are available and supported by ECM:

- Commercial product catalogs which deal with commercial and financial specifications, contracts, rules for quotes and orders
- Technical product catalogs, also referred to as rule editors, which deal with the technical specifications of resources, services and products.

3.2 Catalog Environments

ECM has two principal environments: **Design Time** and **Run Time**



Design Time - Configure Catalog

- A GUI provides the means to design and configure business catalog data.. The configuration includes the set up of specifications and characteristics related to products, customer and resource facing services, resources, tariff elements, prices, rating logic and product accounts. Other data required by external systems such as network, provisioning, charging and billing details can also be configured.
- Access to common business configuration datafrom the COBA component.
- Access to normalized service parameters, protocols and service usage records is provided from the charging component.
- The compliancy of structural relationships between specifications is validated to maintain product modelling consistency.
- Product configurations published and promoted to the run time environment.
- The base catalog product model can be extended by adding characteristics (custom attributes) and their values.

For a sample workflow of design time catalog, refer to Configure Catalog (on page 58).

Run Time - Read Catalog

- Access the CDAL infrastructure environment is provided to read catalog data and provide information access activities.
- Product catalog configuration data can only be viewed. It cannot be changed from the run time environment.

For a sample workflow of run time catalog, refer to Read Catalog (on page 59).

3.3 Privileges and User Groups

User privileges are permissions assigned to a user, specifying allowable actions in the ECM application. Privileges can customize or restrict views, menu item selections and functionality.

User groups are used by system administrators to allocate privileges or permissions that define what a user can see and what a user can do in the application.

Privileges and user groups are configured in the User Profile Management application. The privileges of a user are defined by the privileges of the groups to which it belongs. The groups and privileges of each operator will differ for each ECM installation.

The user groups listed below are supported out of the box by ECM. Whether all user groups are used or not used is dependent on a specific environment. A user will not have access to the ECM application unless the user is assigned to at least one of these groups. A user that does not belong to any group will receive a login error message stating that the user is not authorized to access the application. Each group can be preconfigured with certain privileges.

User Group	Definition
System Administrator (ad)	This user supports all of the day-to-day configurations and setup required to keep the system running efficiently. This user is responsible for: • adding and removing users from the system • debugging user technical problems • logging and reporting bugs back to support teams
Project Management (pm)	This user can create and monitor projects to milestones and target completion dates and can assign user groups to stages and tasks and approve the completion of each stage.
Product Line Management (pd)	This user is responsible for making sure that the product offering being launched to market is complete and competitive.
Product (Data) Modeller or Business Configuration Engineer (dm)	This user creates and manages the product offerings and all entities in ECM.
Marketing (mk)	This user is responsible for product offering descriptions and pricing and is involved in the design stage of the offer creation.
Information Technology (it)	This user is responsible for providing the test and production environment details required by ECM to publish the product offering.
Revenue Assurance (fn)	This user is responsible for the general ledgers and lifecycle actions for non payment and payment limits.

User Group	Definition
Quality Assurance Testing (qa)	This user will test that the active product offering definition is correct and that all charging and billing details, life cycles, notifications, announcements and number lists are working as expected for the customer as defined by the marketing and business configuration groups.
Network Engineering (ne)	This user sets up the network to facilitate the product offering definition.
Business Analyst (ba)	This user reviews and advises on the details of the product offering.
Billing System Specialist (bs)	This user configures and confirms all billing related attributes within the product offering.

3.4 Project

All changes that need to be made to ECM entities and specifications must be managed using a project as a change control facility. Updates to the catalog cannot be done outside of a project.

All new and modified entities are added to the project with a status of `Definition`.

When a project has been reviewed and it is ready to be put into operation, it can be validated, then published. Once a project is published, the project and all the entities contained within it are set with a status of `Active` and available for other components to access.

Note:
A project cannot be versioned.

For more information about the project attributes and configuration, refer to Project (on page 13).

ECM projects can be managed by Product Lifecycle Designer (PLD) which can provide more complex and configurable workflows.

3.5 Catalog Model

3.5.1 Product Model

The product model contains all the product business configuration entities of a service provider which includes product offerings, product specifications, customer facing service specifications, resource facing service specifications and resource specifications. The product model is originally built by creating metadata-based

data structures in a software development environment. The product model is bound to the metadata of user interfaces.

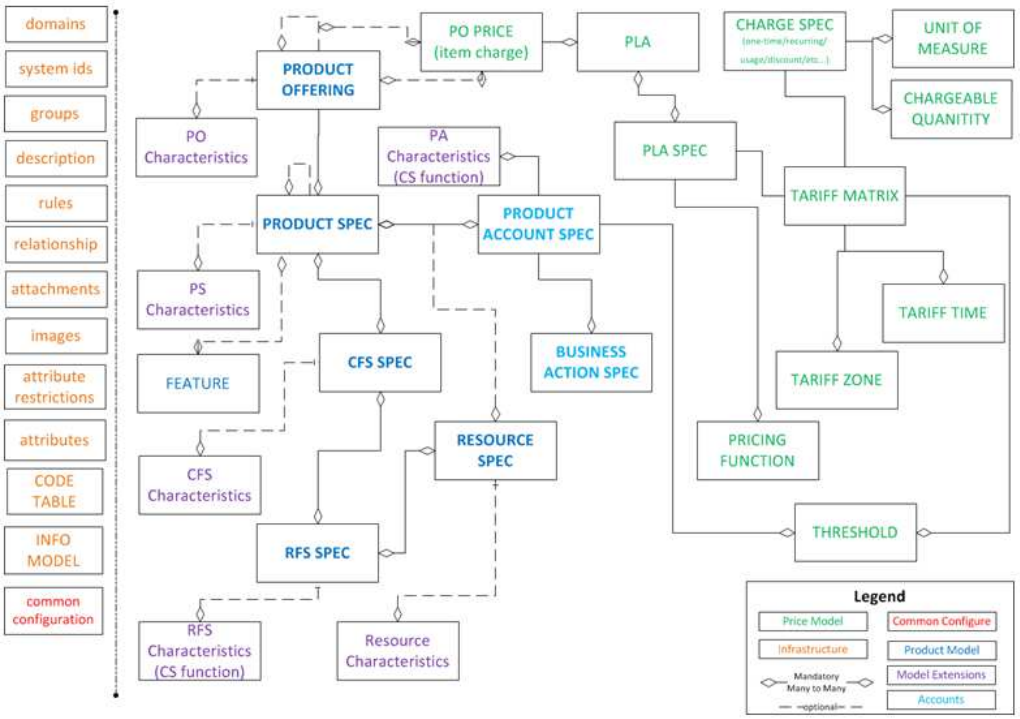
The structure of a product model entity, a **specification**, is built from a generic non-exposed structural base definition, namely a **specification type** which itself is comprised of a **specification base** and a **specification relation**. Each entity (specification) is described by the specification type which is defined in the base catalog model. In the physical model, entities are stored as catalog items.

All user-created specifications are copies (instances) of a specification type.

ECM Information Model

For more information about the configuration of the product model entities, refer to Business Configuration (on page 9).

This catalog model shows a product model connected with a pricing model. The pricing model shown here conforms to the pricing model of the Ericsson Charging component and not necessarily to that of other external charging systems.



The entities described in the table are used in the model with strict relationships as shown in the diagram. Each entity inherits from the specification type and includes an infrastructure.

Product Model Entity	Description
Specification	The base from which entities are extended. Any object created by the service provider user and persists in ECM. It uses specification type as

Product Model Entity	Description
	a foundation and it is the master service object used as a common source for data by external systems.
Base Model Entities Not Exposed to User Interface	
Specification Base	This data structure is defined in ECM providing the base definition of an entity which includes a list of attributes and default values. Each specification base will have at least one specification type.
Specification Relation	This data structure is defined in ECM providing the validation logic for all relationships between specification types and their cardinality.
Specification Type	This data structure is defined in ECM providing the template of an entity as the combination of a specification base and specification relation which includes the list of attributes, default values, rules and relationships.
Characteristic Specification	This data structure is defined in ECM and is the base from which characteristic entities are extended. The characteristic specification is an extension of a specification.
Product Model Entities Visible to ECM User (Business Configuration Engineer)	
Product Offering (PO)	This entity is a specification type used to represent the overall sellable product. It represents tangible and intangible goods and services made available for a certain price to the market in the form of product catalogs. This ABE is also responsible for targeting market segments based on the appropriate market strategy.
Product Specification (PS)	This entity is a specification type used to represent the product definition and it characteristics. It defines the functionality and characteristics of product offerings made available to the market.
Customer Facing Service Specification (CFS)	This entity is a specification type used to represent customer facing characteristics of a service specification.
Resource Facing Service Specification (RFS)	This entity is a specification type used to represent resource facing characteristics of a service specification.
Resource Specification (RS)	This entity is a specification type used to represent an identifiable characteristic of the service that is required to support the service definition, for example, a serial number or phone number. This ABE contains entities that define the invariant characteristics and behavior of each type of resource entities. This enables multiple instances to be derived from a single specification entity.

Product Model Entity	Description
Characteristics (CHRCT)	This entity is a specification type used to represent generic characteristic definitions for extending any product offering, product specification, customer/resource facing service specification and resource specification. The predefined characteristics must be assigned to a specification, only when necessary, when a product is being built.
Entities Related to Time Limited Products	
Product Offering Priority Specification (PPS)	The product offering priority specification in ECM is used as a default for the product offering priority in CPM. In CPM, it can be personalized.

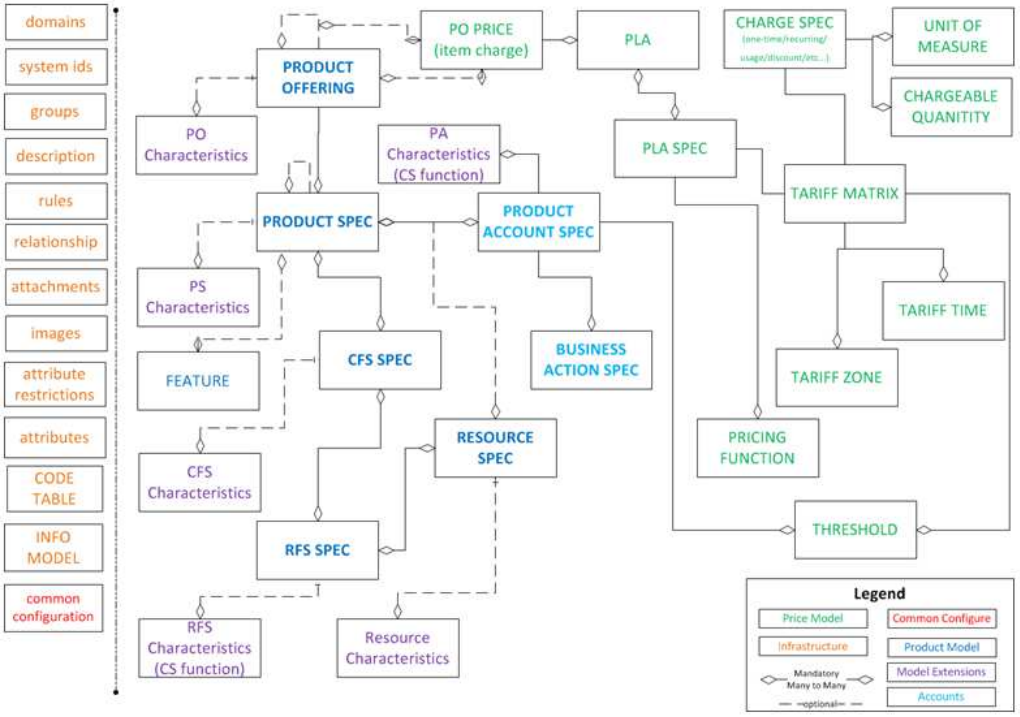
3.5.2 Price Model

The price model contains all the business configuration entities related to pricing, charging and rating.

ECM Information Model

For more information about the configuration of the price model entities, refer to Business Configuration (on page 9).

This catalog model shows a product model connected with a price model. The price model shown here conforms to the price model of the Ericsson Charging component and not necessarily to that of other external charging systems.



The entities described in the table are used in the model with strict relationships as shown in the diagram. Each entity inherits from the specification type and includes an infrastructure.

The price model entities in this table conform to the price model of the Ericsson Charging component. For this case, the system configuration variable `PSCM_USE_CHARGE_PRICE` is set to `True`.

Price Model Entity	Description
Product Account Specification (PAS)	The product account specification defines and holds the static information of a product account.
Threshold (Specification) (THS)	The threshold specification defines the threshold values, conditions and rules used for charging. Thresholds are extensions to the product account specification. **Figure:** Product Account Threshold Information Model
Price Logic Algorithm Specific-	A price logic algorithm specification specifies the logic, functions and its associated arguments that are used to get the result that can be applied on a product account.

Price Model Entity	Description
ation (PLAS)	

3.5.3 Level of Customization

It is possible to update the attributes of an entity (specification) and create a new version of the entity.

It is possible to support the creation of new attributes and extensions to entities. However, It is not possible to directly extend the base definition of the entity, that is, the specification type.

It is possible to add values to an entity and remove values from an entity within the **Code Table** or **Info Models** features of ECM.

3.5.4 Extending

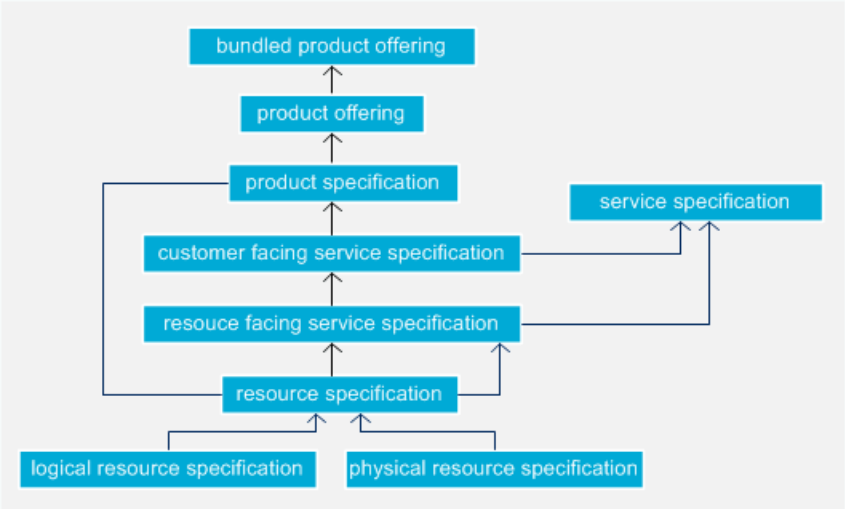
Extension changes must be done within a project during ECM run time. These extensions or model variations and the logic behind them are not understood by other components natively. Only the predefined attributes are pre-integrated to components.

It is possible to add a name and value to each specification. For example, a product offering that needs to have two different external identifiers requires another attribute be added to store the second external identifier, since the product model only provides one attribute for an external identifier. The additional attribute will be shown in the extension section of the specification details GUI.

A group of attributes can be included together by defining a new **characteristic specification** and assigning name and value pair attributes to it. The characteristic specification can be assigned to any product offering, product specification, customer/resource facing service specification or resource specification and it can be reused.

3.6 Entities

The product model entities used to design and configure business product offerings have a set of predefined system attributes. However, ECM supports the creation of new custom attributes to extend entities.



3.6.1 Product Model Entities

3.6.1.1 Product Offering Specification

Each product offering specification has a predefined base catalog definition.

A product offering specification defines the different variations of product offerings (products) that can be marketed and sold to customers. It represents tangible and intangible goods and services made available for a certain price to the market.

The product offering specification includes the **product offering price** which is linked to the price logic algorithm. For more information on price logic algorithms, refer to Price Logic Algorithm Specification (on page 83).

Product Offering

A product offering is instantiated from a product offering specification which contains a product specification and its associated product account specification. Product offerings are the highest parent level in the product model and the starting point for selling products.

Product

A product is an instantiated product offering. A product account is instantiated by instantiating the product offering. For more information on product accounts, refer to Product Account Specification (on page 81).

Types

Many types of product offerings can be created for the market, such as plans, promotions, add-ons and discounts.

- A **discount** product inherits its properties from the base product as defined in the discount product offering.
- An **add-on** offering is attached to a base product offering via a relationship configuration. A product offering must be contracted first before an add-on product offering can be attached.
- A **bundle** product offering typically groups products across product families, for example, the Quad Play Bundle includes mobile, internet, TV, home phone.
- A **package** or **plan** product offering is usually a grouping of products within the same product family.
- A **time limited** product offering can have predefined characteristics on a the validity period. For example, the effective start date can be personalized and set during the a order process and it can be a fixed date or a variable date which can be set when the customer wants it to start.

Examples

Pay As You Go Plan, Silver Line Plan, Gold Nugget Plan

Rules

At least one of the following relationships must exist as defined by the product offering model:

- a product offering specification (composite/bundle) is linked to another product offering specification
- a product offering specification (simple) is linked to a product specification

A composite product offering cannot have a direct relationship with a product specification. It can only have a relationship with other product offerings, either simple or composite. Each simple product offering must have a relationship with a product specification.

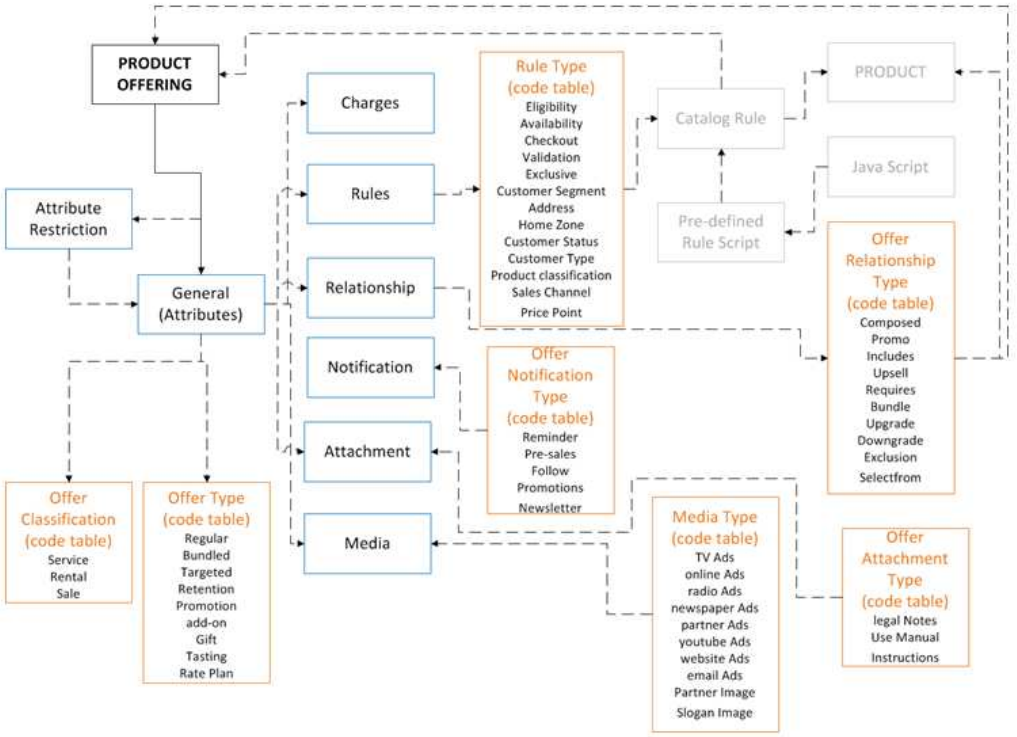
If an add-on product offering is already assigned to a product offering, it is not available again for the same product offering, but it is available for other product offerings.

It is valid to have an add-on product offering assigned to more than one product offering.

It is valid for a product offering to have multiple add-on product offerings.

Model

For more information about product offering specification attributes and configuration, refer to Product Offering (on page 16).



3.6.1.1.1 Product Offering Priority Specification

Each product offering priority specification has a predefined base catalog definition.

The product offering priority specification only controls the relative ranking of each product offering. It is not assigned any priority values. The product offering is not modified by a change in its priority.

ECM only publishes the priorities and sorting order. CPM creates the priority values based on the product offering of the order using a predefined algorithm.

Model

Item	Description
Code	A unique internal identifier for the product offering priority specification.
Name	Name of the product offering priority specification.
Effective From Date	The first day that the offer can be ordered by customers.
Effective To Date	The last day that the offer can be ordered by customers.
Description	Full description of the product offering priority.
Product Offering Priority Type	A common business configuration enumeration for the product offering priority type.
Product Offering Priority Subtype	Base | Discount
Relative Order []	A list of ordered product offering identifiers delimited by commas.
Common Parent Specification ID	The common specification that has overlapping offers, typically a customer facing service specification.
Product Offering Type	Base | Discount
External Identifier	Not shown on GUI. Identifier of an external system receiving the product offering priority information.
Version	Version number of the edit of the product offering priority specification.
State	Status of the product offering priority specification.

3.6.1.2 Product Specification

Each product specification has a predefined base catalog definition.

A product specification defines the functionality and characteristics of product offerings made available to the market.

A product specification defines what a services does and all of the features it contains.

Each product specification must have at least one to one relationship to a simple product offering. A product specification can be sold without a product offering.

Examples

Regional Talk - Voice, Domestic Text - SMS, Data Streaming

A product specification is enriched by a Product Account Specification (on page 81).

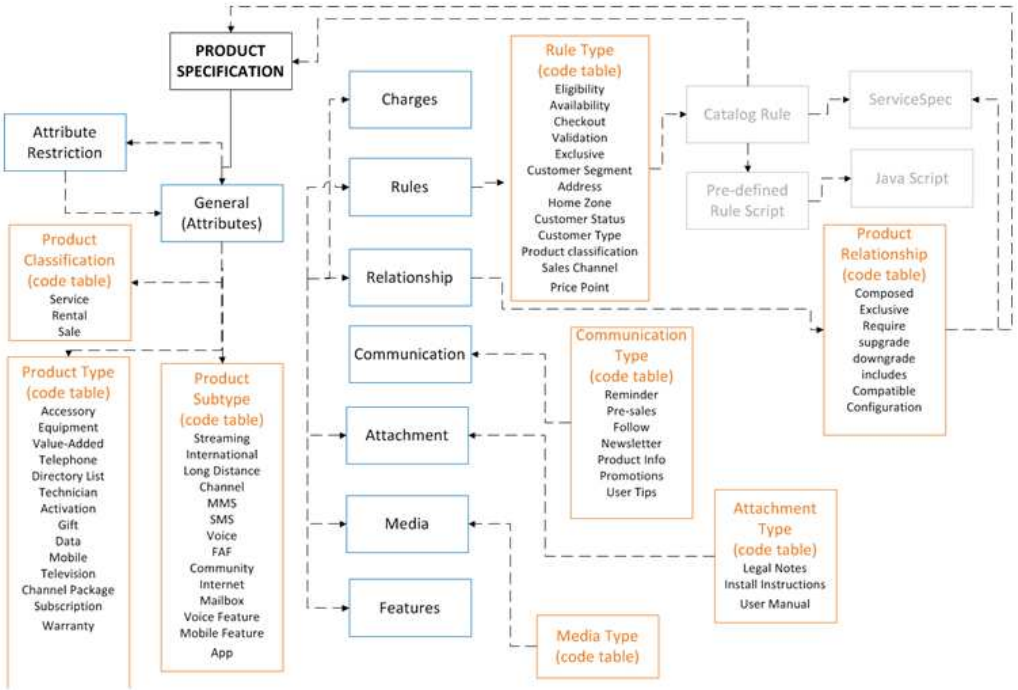
Each product specification has a type. Currently, there are two types: **Base** and **Discount**.

Refer to example Product Specification with Product Account Specification.

ECM ensures that a Price Logic Algorithm Specification (on page 83) included in the product specification suits the type of service the product specification monitors and the units of measurement (UoM) that is specified for the product account specification. For example, a product specification monitoring a voice service and the product account specification counting consumption in seconds should use the price logic algorithm specification that is calculating discount for the usage in seconds.

Model

For more information about product specification attributes and configuration, refer to Product Specification (on page 23).



3.6.1.3 Customer Facing Service Specification

Each customer facing service specification has a predefined base catalog definition.

Customer facing service specifications make the service identifiable based on a network event. The service parameter conditions define what the service can do.

Service Capabilities

The service capabilities described below conform to the price model of the Ericsson Charging component. For this set up, the system configuration variable `PSCM_USE_CHARGE_PRICE` is set to `True`. For more information, refer to Configure Charging Component (on page 62).

ECM uses the service capability definitions that are retrieved from the charging component to build customer facing service specifications. The charging component interface provides the following information:

- differentiating normalized parameter name
- condition/expression used on normalized parameters

ECM has the functionality to connect a customer facing service to one or several **evaluation functions** and to configure the parameters of these functions. The charging component exposes a set of evaluation functions.

For more information on evaluation functions, refer to Service Determination (on page 126) and Evaluation Functions (on page 130).

For more information on charging capabilities, refer to Charging Capabilities (on page 133).

Examples

Voice Domestic, Voice International, Voice Roaming

For more examples, refer to Configure Sample Plan - Pay As You Go.

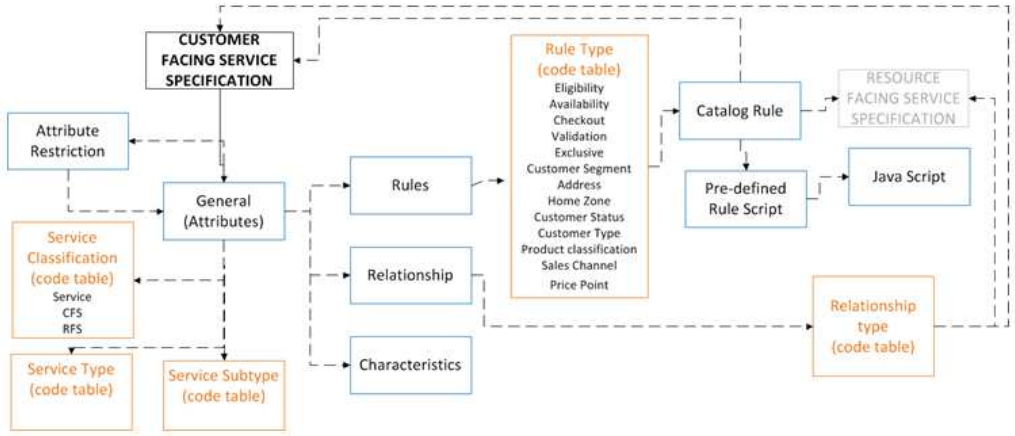
Rules

At least one resource facing service specification must be connected to a customer facing specification.

Several customer facing services may be connected to the same resource facing service specification. For example, a service provider could have a customer facing service for “Voice Domestic” and “Voice International” configured as separate products both requiring a separate customer facing service. When a call is made to an international destination, the charging component handles any overlapping of customer facing services choices when processing the product selection for the subscriber.

Model

For more information about customer facing service specification attributes and configuration, refer to Customer Facing Service Specification (on page 28).



3.6.1.4 Resource Facing Service Specification

Each resource facing service specification has a predefined base catalog definition. There are two different categories of resources:

- physical resource which can have logical resources
- logical resources which cannot have physical resources

Service Capabilities

The service capabilities described below conform to the price model of the Ericsson Charging component. For this set up, the system configuration variable `PSCM_USE_CHARGE_PRICE` is set to `True`. For more information, refer to Configure Charging Component (on page 62).

ECM uses the service capability definitions that are retrieved from the charging component to build resource facing service specifications. A resource facing service specification is used to store normalized service parameters, service usage record specification (SUS) and protocols. The following information is provided from the charging component interface:

- Protocol Name
- Service Capability Name
- Service Capability ID
- Service Capability Description
- SUS (Service Usage Record Spec) Name
- SUS ID
- SUS Description
- Normalized Service Parameters

A resource facing service specification can be connected to one charging protocol which is handled by the charging component and exposed through a set of charging services.

For more information on charging services, refer to Service Determination (on page 126) and Service Determination (on page 126).

Examples

Offline Circuit Switched Voice, CAPv2 Voice, Offline Circuit Switched SMS, CAPv3 SMS, Offline Packed Switche Data, Gy, Data.

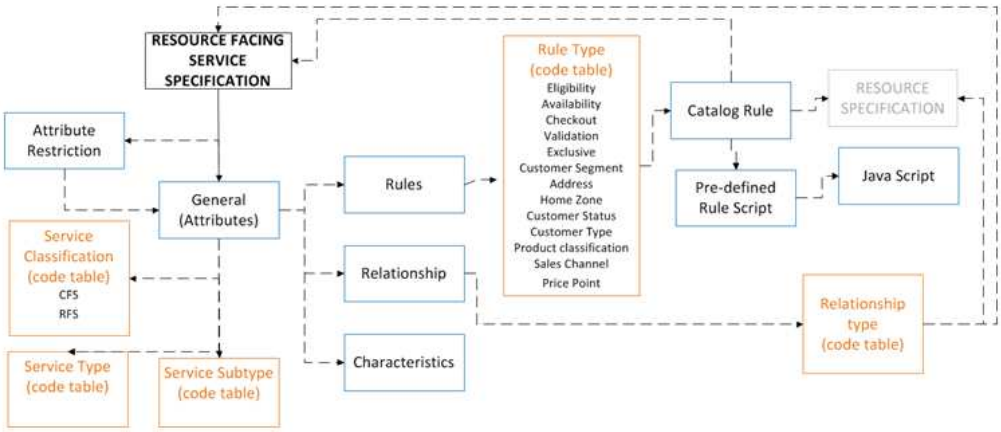
For more examples, refer to Configure Sample Plan - Pay As You Go.

Rules

Only one charging service can be connected to a resource facing service.

Model

For more information about resource facing service specification attributes and configurations, refer to Resource Facing Service Specification (on page 34).



3.6.1.5 Resource Specification

Each resource specification has a predefined base catalog definition.

All resources have a status.

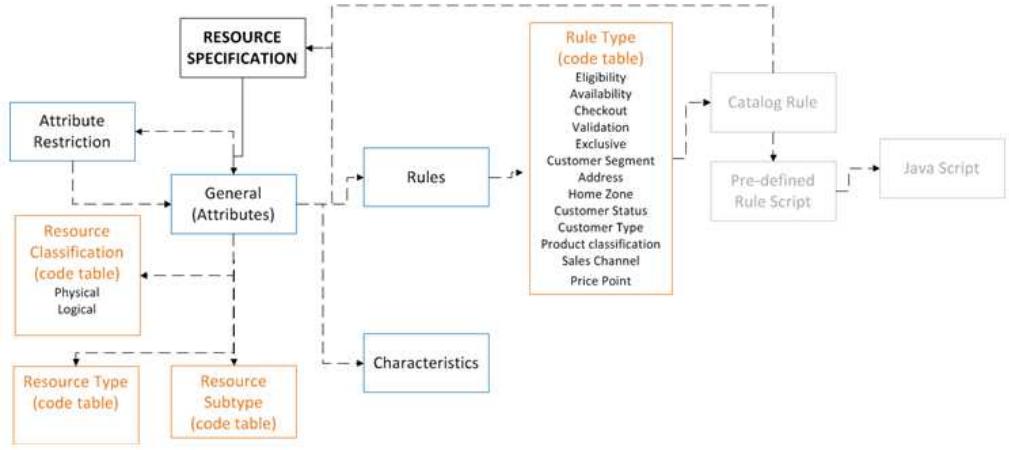
Examples

Phones (Blackberry, iPhone, Samsung), Phone Number (MSISDN), SIM Card

For more examples, refer to Configure Sample Plan - Pay As You Go.

Model

For more information about resource specification attributes and configuration, refer to Resource Specification (on page 38).



3.6.1.6 Characteristic Specification

Characteristics have the additional attributes and the characteristics value define the default values and ranges of possible values for a characteristic.

The product model includes generic characteristic definitions for extending any product offering, product specification, service specification or resource specification.

The predefined characteristics are assigned to specifications, if necessary, when a product offering or products is being configured.

Examples

Numbering Scheme (phone number format), Serial Number, PIN, Priority (used to determine which product offering/product specification has a higher or lower rank during product selection when two products have the same capability characteristics), Minimum and Maximum (contains a value representing the amount that minimum and maximum amounts that can be ordered), Brand (manufacturer or trademark)

For more information about characteristic specification attributes and configuration, refer to Characteristic Specification (on page 43).

3.6.2 Price Model Entities

The price model entities described in this section conform to the price model of the Ericsson Charging component and not necessarily to that of other external charging systems.

3.6.2.1 Product Account Specification

The product account specification defines and holds the static information of a product account. When a product account is instantiated it refers to the product account specification to acquire this static information. A default (initial) value can be set for a product account in the product account specification. This value can be overridden at a product offering instantiation.

Product Account

The main purpose of a product account is to be a storage container of values. Every product account has a relation to a product account specification where it gets its properties. The product account belongs to a product and it is instantiated together with the product. At instantiation every product gets a product account ID which is unique within a contract.

The value of a product account can represent the following:

- An asset that can be used, for example, a prepaid account or a bonus value.
- A debt that will be invoiced.
- A registration of a previous usage, for example, a consumption that will be invoiced or a counter that counts towards a limit.

The following principals of a product account value apply:

- A positive value represents an asset for the subscriber or units that can be used.
- A negative value represents a debt for the subscriber or units that have been used.
- A consumption or charge decreases the value.
- An added allowance or a credit increases the value of an account.
- The minimum and maximum values of a product account are optional and can be personalized.

Types

Note: Currently, the product account value is only used to hold the amount of **free units** that can be used by the discount product.

Rules

The product account type is used as filter when selecting a product account specification to be included in a product specification.

For more information about product account specification attributes and configuration, refer to Product Account Specification (on page 47).

The product account specification contains the following extension properties:

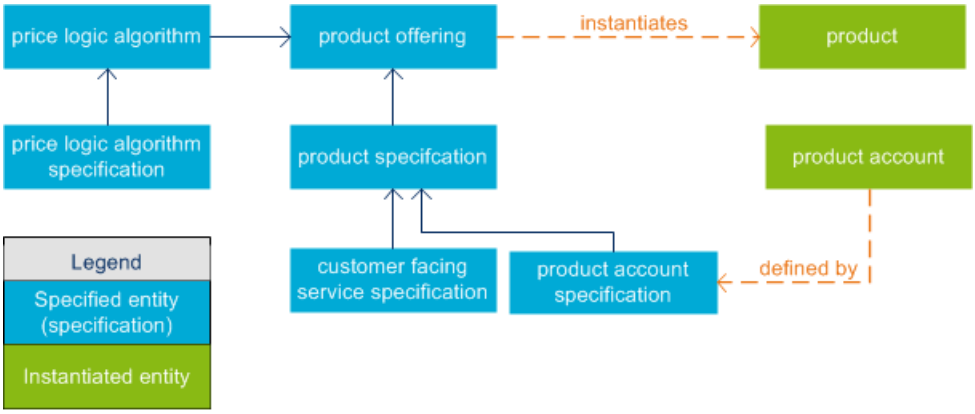
3.6.2.1.1 Instantiation of Product and Product Account

The product account is instantiated, based on its product account specification, when the product is instantiated.

The product account specification is a part of the product specification and the product account is a part of the instantiated product. The product offering and entities related to the product offering control the instantiation of the product.

Product account IDs are generated by CPM for all product accounts in a product, when the product is instantiated. Product account information is stored on CIL by CPM. The charging component will find it when needed (for example, in the processing of a charged event or a balance inquiry) and instantiate the product accounts with the specified product account ID.

Personalized values can be set at instantiation.



3.6.2.1.2 Threshold Conditions and Actions

A threshold is an extension to the product account specification. It is possible to define one or several thresholds for a product account and so each product account specification can have multiple thresholds. Each threshold can have multiple actions.

A threshold value can be specified as a fixed value or as a percentage of another value. When reaching or passing a threshold value from above or below, the threshold condition is met.

Threshold Conditions

At the time of a threshold evaluation, the account value is compared with the threshold value taking into consideration the following:

- the passing of the threshold value
- the direction of the passing, that is, from above or below

A product account value that measures usage typically starts from zero and meets the condition “reaching/passing above” when it has reached or passed above the threshold value

A product account value that holds a resource typically starts from a certain value (for example, 100 SMS) and receives deductions. It meets the condition “reaching/passing below” when it has is reached or passed below the threshold value.

Threshold Action

The threshold action determines the action to perform when the threshold condition is met.

An example of such an action is a send notification which may require a parameter such as a template identifier to specify the format of the message notification. The appropriate message can be configured in a product specification or product offering. The available messages can be provided by a notification system.

For more information about threshold and action attributes and configuration, refer to Thresholds (on page 49).

3.6.2.1.3 Free Units

Products with free units introduce the concept of discount products and product accounts.

A discount product calculates the discounted price, which in the case of a free unit product it is calculated to zero. The discounted price is reported in the event as the "price to pay".

The discount product contains a product account. The value of the product account is initially set to the amount of free units. The value is decreased as free units are consumed and when the product account is empty the discount product is not used. The product account can be refilled at any time, before or after becoming empty.

3.6.2.2 Price Logic Algorithm Specification

Each price logic algorithm specification has a predefined base catalog definition.

Price logic algorithm specifications specify the logic and functions and its associated arguments that are used to get the result to be applied on a product account. A Product Account Specification (on page 47) can be associated to a price logic algorithm specification as a parameter in the pricing type properties, for example, when using an action like `linearRate` or `addAccount`.

A price logic algorithm specification uses Tariff Elements (on page 88) to define rating logic and it also defines the charging properties for a product specification **(currently, indirectly through the product offering; in the future, directly to a product specification)**, that is, all the dimensions for the tariff matrix and rating function. It consists of:

- type of charge (one-time, recurring, usage, discount)
- type of pricing (fixed amount, rating logic)
- chargeable quantity, unit of measurement, frequency of charge, prorating property
- a product account specification for the charge
- a list of columns for the tariff matrix, where each column is a tariff element type
- the boundaries of the tariff matrix.

- the pricing functions and any parameters that can be configured at the price logic algorithm specification level

In the price logic algorithm specification, the tariff element is configured to the tariff matrix (depending on the usability decision, for example, for a pricing type as rating logic with condition) and the rating functions are added (linear or tiered, as imported from the charging capabilities).

ECM is aware of the fields in the Charging Functions (on page 134) in order to setup the matrix and the rating functions so that the charging component can rate the usage event.

The price logic algorithm specification is linked to one or many product specification(s) **(currently, indirectly through the product offering; in the future, directly to a product specification)**. Sometimes the same pricing scheme might be used for different product offers.

Also, multiple price logic algorithm specification can be linked to a product specification **(currently, indirectly through the product offering; in the future, directly to a product specification)**, for example, if multiple usage charges are to be applied or different product offers are created for a product specification with different usage tariffs.

Price Logic Algorithm

A price logic algorithm is the pricing component of the product offering and it inherits its properties from a price logic algorithm specification. Most of the parameters of a price logic algorithm cannot be changed, with the exception of the attribute values of the pricing cells (tariff matrix).

Examples

Price Logic Algorithm for a Voice Usage Charge		
type of charge	usage	
type of pricing	rating logic	
chargeable quantity	call duration	
units of measurement	minutes	
tariff matrix dimensions	tariff time (peak, off-peak)	tariff zone (zone 1)
rating functions	linear rating	linear rating

Rules

Only price logic algorithm specifications that are in definition from the current project or price logic algorithm specifications that are active are allowed to be used to create the price logic algorithm element. Refer toSpecification and Instance (on page 110). The price logic algorithm specification versions that can be selected are shown with the version and the effective from and to date period.

At least one price logic algorithm must be linked to a product offering.

Consistency rules apply. The product specification is typically linked to a service specification which contains information about the type of service, the chargeable quantity and the unit of measurement. ECM ensures that only price logic algorithm specifications that are compatible with the quantity and unit of measurement are linked to product specification. For example, it is not allowed to link a price logic algorithm specification for data volume to a duration-based service.

Model

For more information about price logic algorithm specification attributes and configuration, refer to Price Logic Algorithm (on page 50).

The price logic algorithm is related to:

- price logic algorithm specification
- product specification
- normalized usage specification

Instances and Versions

When a product offer (which is based on a product offering and product specification) is sold, the price logic algorithm (instance) is created based on the price logic algorithm specification that is linked to the product specification **(currently, indirectly through the product offering; in the future, directly to a product specification)**. From here, **... to be confirm ...** ECM has to fill out the:

- remaining rating parameters (for example, price per interval)
- currency and rounding
- tax handling

Changing the attribute values, such as a price, of a price logic algorithm leads to the creation of a new version of the price logic algorithm. However, the product offering does not refer to a specific version of the price logic algorithm and as such a price change affects all contracts that have the product offering. Consequently, ECM informs the charging component of any changes to the price logic algorithm. The charging component notes the used price logic algorithm and the valid version in the charged events.

Since it is possible to create different product offerings out of one product offering/ product specification, the different product offerings will have their price logic algorithms derived from the same price logic algorithm specification. When changing a price logic algorithm specification (new version), no price logic algorithm is impacted.

A price logic algorithm specification exists for different kinds of charge:

- one-time
- recurring
- discount
- usage
  For the usage price logic algorithm specification, there can be various pricing type properties, such as:
  - time based
  - zone based
  - time/zone based

Consequently, different kinds of price logic algorithms are available. A price logic algorithm can be created based on a certain price logic algorithm specification with enabled fields for name, description, effective dates and pricing values. All attribute values configured at the price logic algorithm specification level would be visible at the price logic algorithm level and the attribute values are allowed to be to configured. **Future:** Some parameters will not be configurable at the price logic algorithm level.

ECM supports the ability to trigger multiple rating functions for the same condition in a price logic algorithm specification for usage charging.

In the price logic algorithm specification, the following configurations can be set:

- references to (composite) tariff elements
- combine the (composite) tariff elements to the tariff matrix
- define the rating function to be used on each cell in the tariff matrix

In the price logic algorithm, the following configurations can be set:

- the parameter values for each pricing cell in the tariff matrix for the given rating function

The reason for this method of configuration is that the actual charge attribute values are changed more often than the structure or the rating function itself, for example, reduce the rates from 11 cents per minute to 10 cents per minute.

However, if a structural change, for example, a new tariff zone is required or the rate function needs to be changed for a given tariff matrix cell, then a new version of the price logic algorithm specification needs to be created and released.

For those product offers where the changed price logic algorithm specification shall be used, a new price logic algorithm version must be released. It needs to take the changes in the new price logic algorithm specification version into account, for example, configured prices for new cells or set parameter values for changed rate functions. However, releasing a new price logic algorithm version means changing the usage price for a given product offer and all products created from this product offer. Hence the product offer references the price logic algorithm only and not a certain version of the price logic algorithm.

Multiple Price Logic Algorithms

ECM provides the ability to apply multiple usage charges per usage event by linking multiple price logic algorithm specifications to a product offering/product specification. On the product offering (instance) it is then possible to select one or many of the price logic algorithm specifications for creating its own price logic algorithm.

This concept allows applying multiple price setups for one product offer where the different setups could have completely different price logic algorithms.

Many use cases are supported by this concept, such as:

1. Fee and usage charges
   There are examples where service providers apply a fee and a separate usage charge.
2. Base and additional charges

The service provider wants to split the charges to present what portion is for the home network usage and what portion is for the other networks (interconnect).

3. Received charges
   The service provider needs to forward, post and tax external charges (net and gross) separately, for example, TAP-IN content). Additionally, surcharges (on different parts of the external charges) might be applied or home (own) charge(s) might be applied (TA-MTC charging for the roaming call forwarding leg).
4. Multiple charges on different units of measure
   Separate charges for duration, uplink, downlink, total volume, events, external charges.
5. Different or separate charges for classification changes
   Quality of service change, location change, tariff time change, etc.
6. Sponsoring, shared cost
   Multiple parties are impacted.

Some of the listed use cases have optional portions that apply only in certain scenarios, like the case of interconnect. In order to support this option, the price logic algorithm specification must also be able to support this option.

A price logic algorithm specification must be complete, that is, a match must be found for all possible traffic scenarios. It is not desirable to have any missed setup in the configuration, otherwise the charging component cannot find a usage price (for example, a gap in the tariff time configuration) and consequently the event is rejected.

So, for the case where multiple price logic algorithms are assigned to a product offering it should be possible to mark some of the price logic algorithms/price logic algorithm specifications as “optional”. This means, they do not need to be completely configured. Only those situations that shall result in a further charge need to be listed, for example, it makes no sense to list national zones when applying an additional interconnect charge.

If a price logic algorithm specification is marked as optional, then the charging component will not reject the event, if no charge can be applied.

Discount Functions

The price logic algorithm specification can be configured for discount product offerings using discount functions.

3.6.2.2.1 Discount Functions

A discount can be given as a:

- discounted price (for example, pay 10 cents per minute instead of the base 15 cents per minute))
- discount amount (for example, get 20 cents off the normal per minute price)
- discount percentage (for example, get 15% off on domestic calls).

These discount functions are supported and executed if the subscriber buys the discount product and makes the call entitled for the discount.

The values of the discount function are specified in the price logic algorithm connected to the discount product offering.

The base price is the result of the rating according to the price logic algorithm specification attached to the base product specification. It is always calculated. However, it is not applied on the product account until the discount product(s) are considered. Depending on the type of discount, the discount price logic algorithm specification could reuse the price logic algorithm specification of the base products and simply apply the discount to the rate calculated using the base price logic algorithm specification.

Price logic algorithm specifications define the conditions (Tariff Elements (on page 88)) that are applicable for the discount. For example, an on-net discount is given only if the called party belongs to the same network as the calling party.

ECM is able to combine existing tariff elements or create new tariff elements to define conditions applicable for the discount. Different tariff elements are combined to a matrix and the discount function is added to each pricing cell of the tariff matrix.

The discount function defines how the discount will be applied on the base price calculated by the rating function of the base product, for example, the discount can be given as discount value or discounted price.

The price logic algorithm specification identifies the product account specification ID to update with the rated units and the operation to be performed on it. In the case of a free unit product account, it will be a “decrease” operation.

3.6.2.3 Tariff Elements

The overall architecture of tariff elements is described as follows:

- A tariff element specification specifies a tariff element
- A tariff element describes one dimension of a rating matrix.
- A rating matrix is configured in ECM and consists of one or more tariff elements (dimensions)

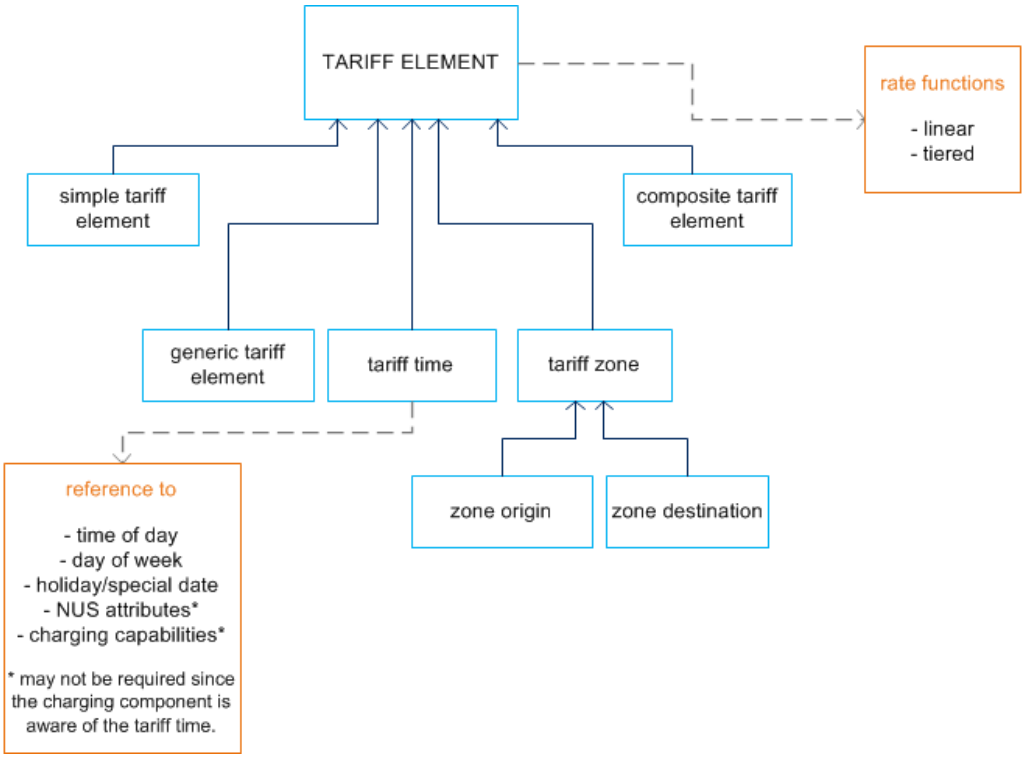
Tariff Element Specification

Predefined Catalog Tariff Element Specification

The implementation of ECM provides a predefined tariff element specification of tariff type `TariffTime_Spec`with attributes for time of day, days of week and special days. This predefined specification allows the service provider to create a tariff time elements to configure time intervals, select the days of the week and identify holidays, special days or any other custom dates for the purposes of rating and charging.

Model

For more information about tariff specification attributes and configuration, refer to Tariff Specification (on page 51).



Tariff Element

A tariff element is an instance based on a tariff element specification. The tariff element can be used at a higher level.

Tariff Elements (TE) and Composite Tariff Elements (CTE) for tariff time are managed in ECM and the configuration considers the following:

- normalized usage specification
- charging capabilities

Tariff Element Types

Tariff Elements Types (TET) are imported into ECM as charging capabilities from the charging component.

- Tariff Time (on page 94)
- Tariff Zone (on page 96)
- Quality of Service (on page 97)
- Type of Usage

Tariff Element Group

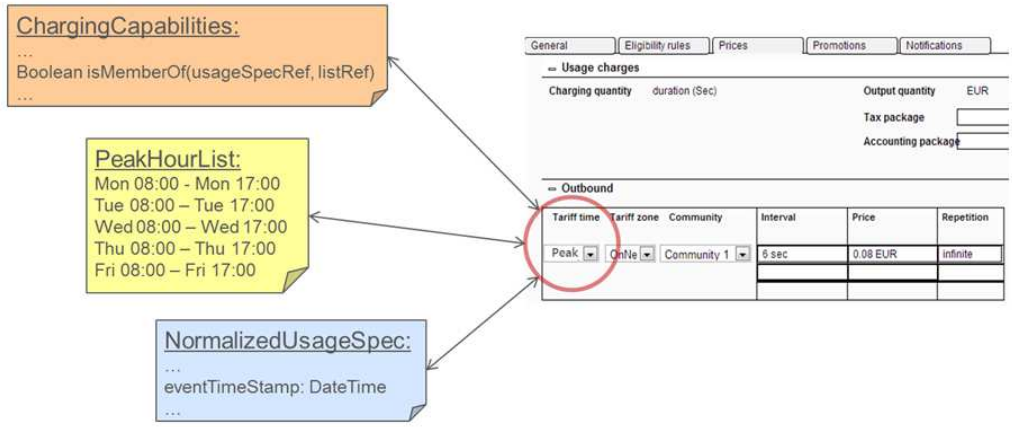
The tariff element group does not have a specification. It consists of a tariff type which defines what type of tariff elements can be added.

Rules

A consistency check is performed on the CTE level, that is, to ensure complete time coverage and complete zone coverage.

Rating Rule Dimensions

ECM has a mechanism to connect charging capabilities, configure common tariff specifications and normalized usage specification fields used when constructing rating rules.

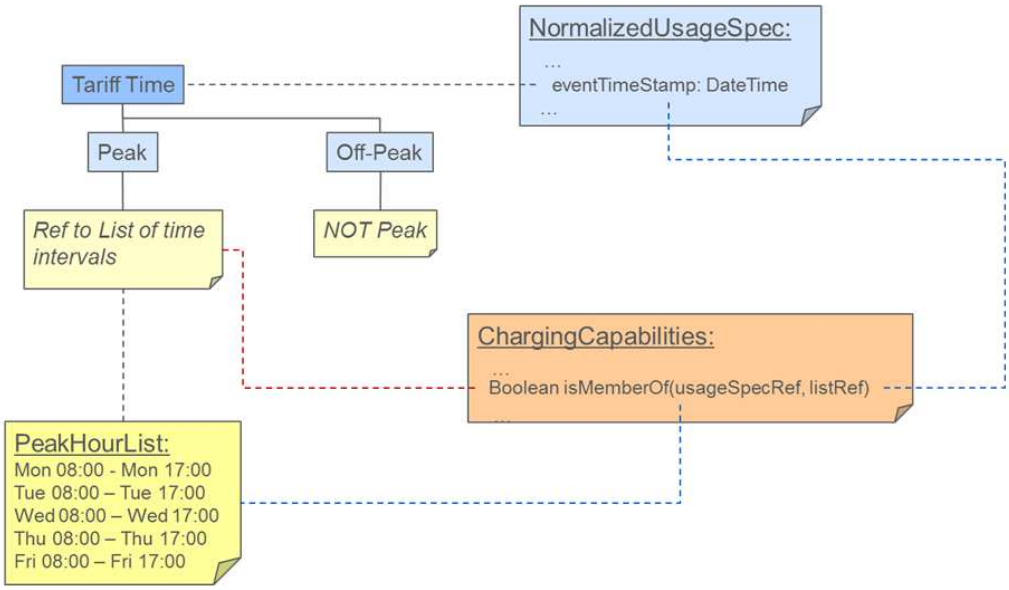


To be able to rate for different tariff time intervals, that is peak and off-peak times, consider the following:

- The time intervals for peak hour are defined by a list in ECM.
- The field to match towards the list of time intervals is specified as `eventTimeStamp` in the normalized usage specification schema.
- The function used in the charging component to match the list of time intervals towards a DateTime field in the normalized usage event is called `isMemberOf()`.

A tariff element can be seen as a way of defining reusable building blocks that can be combined to create rules for a certain rating function. Different types of tariff elements are supported. A set of these rules are defined and connected to the product offering/product specification via a reference to the price logic algorithm.

This is an example of a tariff element for a simplified tariff time:



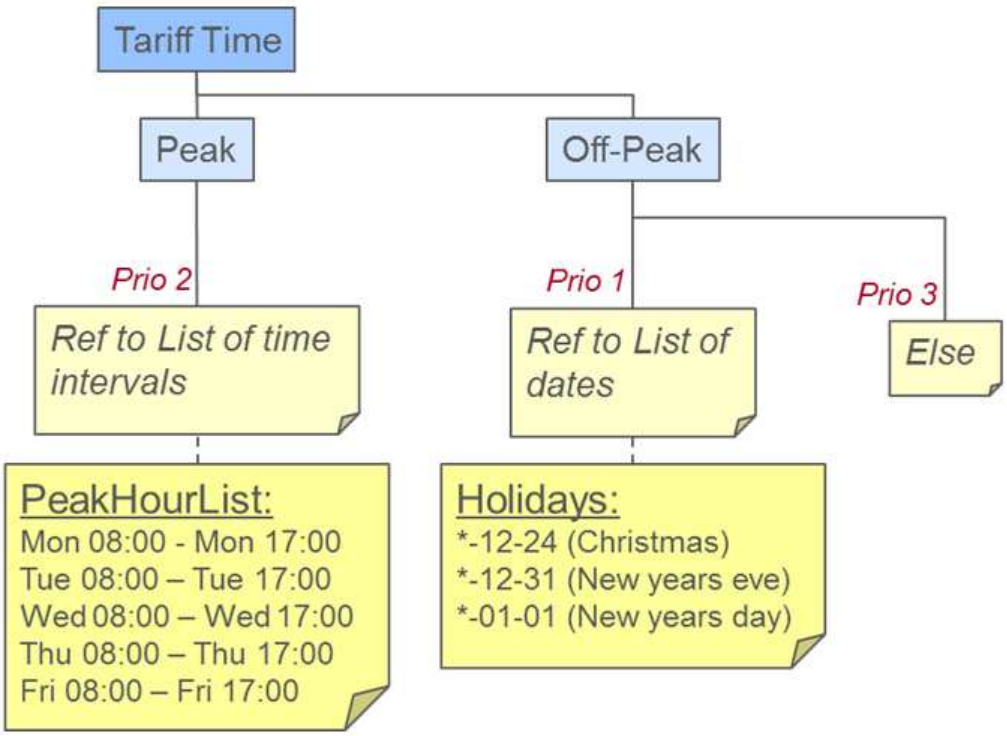
The tariff element for the simplified tariff time has one node for **Peak**and another one for **Off-Peak**. The tariff element references the `eventTimeStamp` field within the normalized usage specification. The “Peak” node has a reference to a list of time intervals defining peak hour.

Composite Tariff Elements

Consider a more complex tariff element structure:

Tariff Time	**Time of Day**	**Day of Week**	**Special Days**
Peak	08:00 - 17:00	Monday | Tuesday | Wednesday | Thursday | Friday	
Off-Peak	Else *	Else	Christmas Day | New Year’s Eve | New Year’s Day

Building a tariff element for this structure may look like this:



In this case there is a need to have a priority on how the different conditions in the tariff element are evaluated to get the correct behavior. This priority must be assigned to atomic tariff elements.

The tariff elements are optional to use in the rating rules. There might be cases where the product is broken down in a detailed level that the linear/tiered function can be directly applied without considering further conditions in the rating rules.

The packaging of tariff elements allows for the reuse of the configuration. For example, there might be different product offers using exactly the same tariff time definitions. Therefore, ECM offers the functionality to package tariff times to composite tariff times. Besides the reusability aspect, another advantage is that ECM can offer advanced consistency checks, like tariff time coverage.

* **Else** in the **Off-Peak - Time of Day** above, in this context is the catch all for all settings that do not match Peak. Thus, the execution order (priority) must be defined as well.

Versioning

Another aspect of building packages is the consideration of versioning. Let's say, that the definition of peak hours changes and has been updated. This would automatically change all product offers using the original peak definition. Late arriving calls would be rated and charged incorrectly. In this case, the versioning of packages can be helpful, if the simple entity is copied into the package. Otherwise, each single entity would need to be versioned and the charging component would have to point to the version of each single entity to justify the calculated

charge. For this approach a tariff element may be unique only within its composite tariff element.

Generic Tariff Elements

The tariff element type **tariff time** is implemented using generic tariff elements. This means ECM and the charging component does not treat tariff time differently from other generic tariff elements and does not have to access tariff time as a dedicated entity using the PSCM CDAL interface.

Here is an outline of the benefits of a generic tariff element model:

- generic tariff model can include both of these GUI forms:
  - a custom GUI for the tariff time and tariff zone specifications (pre-configured)
  - a generic GUI for other tariff element specifications (defined at runtime)
- generic charging rules

Note:
By using generic tariff elements, ECM can generate charging rules and the charging component can consume them generically.

Service providers can have other requirements for defining a usage price based on criteria such as:

- family and friends
- global/special number lists
- communities
- VPNs

To support these kinds of use cases, a generic tariff element concept is introduced. A new tariff element type is defined by:

- name, ID, version, description, …
- a reference to a normalized usage specification (entity from CEL Avro schema)
- a reference to a member function (for example, `is network address` as defined in the charging capabilities)
- a reference to a comparison function (for example, `equals` as defined in the charging capabilities)
- the definition of the comparison values, which is either open, a dedicated reference component or just a certain data type (for example, free text)
- References to the normalized usage spec for justification *:
  - identified composite tariff element and version
  - identified simple tariff element

  * An alternative approach would be to have a flexible list in the normalized usage specification, where the charging component identifies all matching tariff elements. However, since the business logic is related to those fields like aggregation in invoicing, it is favorable to have dedicated fields in the normalized usage specification that can easily being addressed, for instance, in aggregation rules.

Furthermore, when creating a new tariff element type with the corresponding GUI in the charging component, the listed elements might already be supplied, that is predefined, or left (partially) opened to be configured in ECM. ECM provides the ability to create generic tariff element type instances, that is, generic

tariff elements. In order to release a generic tariff element, all parameters not already predefined in the generic tariff element type must be provided.

The composition pattern will be supported for generic tariff elements, a list of simple generic tariff elements.

- any composite generic tariff element has an ID, name, description, etc.
- list of generic tariff elements

The composite/atomic tariff elements are used as “dimensions/dimension column” for the tariff matrix.

The following sections describe the tariff element types:

3.6.2.3.1 Tariff Time

The dimension tariff time defines a price that depends on when the usage takes place, for example, off-peak and on-peak time.

Time dependent characteristics include:

Characteristic	Description
Time of Day	This defines a period of a day in the range from [00:00:00 - 23:59:59]
Day(s) of Week	This defines the day(s) within a week [Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday]
Holidays	This defines statutory holidays which can be configured as a yearly fixed date recurrence (for example, Christmas Day) or as a per year configuration (for example, Easter Monday or Thanksgiving). Common holidays are configured in COBA, for example `$COBA/coba/common/holidays/Newyear`.
Special Days	These are days with special handling and meaning, but are not holidays, for example, Valentine’s Day on February 14th. Some special days might be at the same day every year, some might span over several days and some might be flexible.

Future

For certain markets it may be necessary to change the tariff time on a daily basis. The versioning of the tariff time entity would be able to handle this special requirement.

Note: The tariff time entity may have extra attributes such as a policy for how the charging component handles calls and sessions crossing tariff times. However, it is recommended that the configuration of crossing tariff time borders be handled by a general setting in the charging component.

Examples

The following is a list of tariff specification, elements and groups related to tariff time:

Tariff Time Element Specification

Tariff Time Element Specification		
Attribute Name		**Value**
Name		`Standard Tariff Time Specification`
Tariff Type		`Tariff Time`
Attributes		
Name	**Data Type**	**Data Source**
`Time of Day`	`Charging Function`	`eventTimeWithinTimeInterval (List of TimeIntervals)`
`Day of Week`	`Charging Function`	`eventTimeWithinDayOfWeek (List of DoWs)`
`Special Day`	`Charging Function`	`eventTimeWithinDate (List of Dates)`

Tariff Time Elements (OFF-PEAK and PEAK) based on the Tariff Element Specification

Tariff Element - 1		
Attribute Name		**Value**
Name		`OFF-PEAK` (used at a higher level)
Tariff Type		`Tariff Time` (inherited from specification)
Time Intervals		
Name	**Time**	**Days**
`Time Interval 1`	`19:00 – 08:00`	`Saturday, Sunday`
Holidays		
Name	**Exclude**	
`Christmas`	`No`	

Tariff Element - 2	
Attribute Name	**Value**
Name	PEAK (used at a higher level)

Tariff Type		`Tariff Time` (inherited from specification)
Time Intervals		
Name	**Time**	**Days**
`Time Interval 1`	`08:00 - 19:00`	`Monday, Tuesday, Wednesday, Thursday, Friday`
Holidays		
Name	**Exclude**	
`Christmas`	`Yes`	

Tariff Element Group of Tariff Time

Tariff Element Group - 1		
Attribute Name	**Value**	
Name	`Standard Residential Tariff Time`	
Tariff Type	`Tariff Time`	
Group Elements		
Specification	**Name**	**Description**
`Standard Tariff Time Specification`	`OFF-PEAK`	`19:00 – 08:00 Saturday, Sunday, plus Christmas`
`Standard Tariff Time Specification`	`PEAK`	`08:00 - 19:00 Monday, Tuesday, Wednesday, Thursday, Friday`

3.6.2.3.2 Tariff Zone

The dimension tariff zone defines a price that depends on where the usage takes place, for example, domestic and international.

Zone dependent characteristics include:

Characteristic	**Description**
Origin	The definition of where the call or session originates
Destination	The definition of where the call or session terminates.
Tariff Zone	This is a combination of origin and destination.

In some cases where a network spans a large area the service provider may want to distinguish in the price configuration where the call or session has originated. For example, in the case of GSM, the Cell Global Identify can be used for this purpose. For other cases, the origin within the home network is irrelevant, thus only destination specific tariff zone configuration is necessary.

Typically, the destination is relevant in the case of telephony. Sometimes service providers, such as fixed line operators, distinguish destinations within the home network, for example, a local call versus a long distance call. Usually, service providers charge special rates for international calls and calls to special destinations like satellite providers or added value services such as a weather forecast service.

Origins and destinations are typically not qualified completely, for example, all called numbers to Germany (+49) are charged the same price. **(Future)** Thus, there is a need to handle overlapping zone definitions, using a most matching approach.

Simple Tariff Zone

A simple tariff zone consists of an origin list or a destination list or an origin and destination list.

A simple tariff zone is a specialization of a tariff element. Thus, a composite tariff zone consists of composite tariff zones and simple tariff zones.

3.6.2.3.3 Quality of Service

Typically, Quality of Service (QoS) is not just a simple parameter, but a structure with several attributes, for example QoS delay, QoS mean throughput, QoS peak throughput, QoS precedence, QoS reliability.

3.7 Entity Attributes

Most entity attributes (parameters) are implemented as **characteristics** in accordance with the SID model to allow for transparent transfer on protocols and to allow for easy expansion with new attributes. By this, attributes can be illustrated as located inside entities, while formally being characteristics connected to entities. Whether an attribute is designed as characteristic or not is specified in the entity descriptions.

Attributes describe the properties and characteristics of entities. Attributes that are added to a specification data structure (specification type) impact all instances of the specification. Entities have attributes that can support versioning.

3.7.1 Attribute Types

Attribute Type	Description
System	A system attribute or a system-defined attribute is an attribute that is pre-set by the system or system integrator. It cannot be removed. It can be visible or invisible to the user and it can have edit rules for setting values in the specification UI.
User	A user attribute or user-defined dynamic attribute is an attribute that is added by the user during ECM run time. It is visible for setting values in the specification UI.
Technical	A technical attribute is an attribute that is added by the user during ECM run time. Generally, it is invisible to the user in the specification UI.
Characteristic	A characteristic attribute is an attribute that is added by the user during ECM run-time. This type of attribute is defined when an instance of the characteristic specification has been created by the used. It is acquired by other specifications when a characteristic relationship is created.

3.7.2 Relationship Attributes

Attribute Name	Description
Quantity Max	Defines the maximum allowed cardinality.
Quantity Min	Defines the minimum allowed cardinality.
Default Cardinality	Default cardinality
Type	Type of relationship

3.7.3 Characteristic Relationship Attributes

Attribute Name	Description
Quantity Max	Defines the maximum allowed cardinality.
Quantity Min	Defines the minimum allowed cardinality.
Default Cardinality	Default cardinality
Type	Type of relationship
Characteristic Usage Type	Describes choices for where the related characteristic is used, for example, ECM, CPM. This can be modified by the user at a later time.

3.8 Entity Relationships

The purpose of relationships is to define the business logic between entities. Relationships define the overall composition or possible compositions of product offerings and there underlying entities.

One of the attributes of an entity is used to determine a type of relationship with another entity. A set of relationship types is predefined in the product model.

Relationship Type	Purpose of Relationship in the Specification	Description in the Specification Type
Contains	Used in downstream systems.	Defines the “contains” relationships that are allowed during business configuration design.
Optional	Used in downstream systems.	Defines the “optional” relationships that are allowed during business configuration design.
Requires	Used in downstream systems.	Defines the “requires” relationships that are allowed during business configuration design.
Characteristic	Used in downstream systems and defines the characteristics used for additional attributes for capturing information, for example, in the ordering stage.	Defines the “characteristic” relationships that are allowed during business specification design.

Each relationship has a parent and child endpoint which is significant in understanding the meaning of the relationship. A relationship can have attributes added to it in order to store relationship data.

A relationship can have rules assigned to it. The rules are used to ensure that all entity relationships are consistent with the product model. ECM ensures that the relationship between the parent and the child matches the product model relationships. These rules can be used for exception, exclusion cases or additional logic.

There is a list of relationships between specification types that are defined by the system. The list defines relationship restrictions, that is, the relationships that are allowed to be created between specifications during business specification design time (product configuration).

Relationship type logic and rules on relationships are executed at order time. Only the product model relationship restrictions are enforced at product configuration design time.

The following table shows the system defined relationships between specification types:

Parent Specification Type	Target Specification Type	Cardinality	Relationship Type
Product Offering	Characteristic Specification	[0..n]	Characteristic
	Product Offering	[0..n]	Contains
	Product Specification	[0..n]	Contains
	Product Offering	[0..n]	Requires
	Product Specification	[0..n]	Requires
	Product Offering	[0..n]	Optional
	Product Offering	[0..n]	Discount For
	Product Offering Price / Price Logic Algorithm	[0..n]	Item Charge
Product Specification	Characteristic Specification	[0..n]	Characteristic
	Product Specification	[0..n]	Contains
	Customer Facing Service Specification	[0..n]	Contains
	Resource Specification	[0..n]	Contains
	Product Specification	[0..n]	Requires
	Customer Facing Service Specification	[0..n]	Requires
	Resource Specification	[0..n]	Requires
	Customer Facing Service Specification	[0..n]	Monitors
	Product Account Specification	[0..n]	Contains
Customer Facing Service Specification	Characteristic Specification	[0..n]	Characteristic
	Resource Facing Service Specification	[0..n]	Contains
	Resource Facing Service Specification	[0..n]	Requires

Parent Specification Type	Target Specification Type	Cardinality	Relationship Type
Resource Facing Service Specification	Characteristic Specification	[0..n]	Characteristic
	Resource Specification	[1..n]	Contains
	Resource Specification	[0..n]	Requires
Resource Specification	Characteristic Specification	[0..n]	Characteristic
Product Account Specification	Threshold (not stored as specification, but as an extension to product account specification		
	Characteristic Specification	[0..n]	Characteristic

3.8.1 Contains

During product configuration design time, when a parent specification is selected that has this relationship type, it must contain (include) the necessary child specification, otherwise the product offering composition or the configuration of the specifications is not valid.

This type of relationship is used to automatically include child specifications attached to the parent specification when a product offering or product is added to an order, a cart or the customer inventory.

This relationship type is evaluated by the checkout process and the order validation routines to ensure quotes and orders are consistent.

3.8.2 Requires

During product configuration design time, when a parent specification is selected that has this relationship type, it requires that one instance of the child specification is in the customer inventory, otherwise the product offering composition or the configuration of the specifications is not valid.

This type of relationship instigates a search to be performed for the child specification in the customer inventory, quotes and orders. If the child specification is not found then it is automatically included in quotes and orders.

This relationship type is evaluated by the checkout process and the order validation routines to ensure quotes and orders are consistent.

3.8.3 Characteristic

A characteristic relationship associates the specification to the characteristics. Each characteristic carries the characteristic category and the characteristic type.

The characteristic category identifies to which specifications the characteristics are exposed, for example, customer facing or resource facing specifications.

The characteristic type identifies who defines the characteristics, for example, user resources, system resources, provider resources.

3.8.4 Optional

Currently, an optional relationship is only valid between two product offerings.

When a product offering with this type of relationship is selected, then the child specification (other product offering) can be included in the quote and the order, as an additional offer that can be sold to the customer. These offers can be presented to customers so they can select the service level that suits them.

3.8.5 Monitors

The relationship **Monitors** is used in the sense that a discount product specification has a reference to the customer facing service specification that it monitors defined in the base product specification.

3.8.6 Base and Discount

Each product specification has a type. The product offering inherits the type from the product specification. It is needed for selecting between a base and a discount product offering/product specification in ECM and CPM.

An existing base product offering/product specification does not change when a discount product offering/product specification is created, neither does an existing base product change when a discount product is instantiated. When defining the discount product offering/product specification in ECM, the relationship to the base product offering/product specification is defined as well.

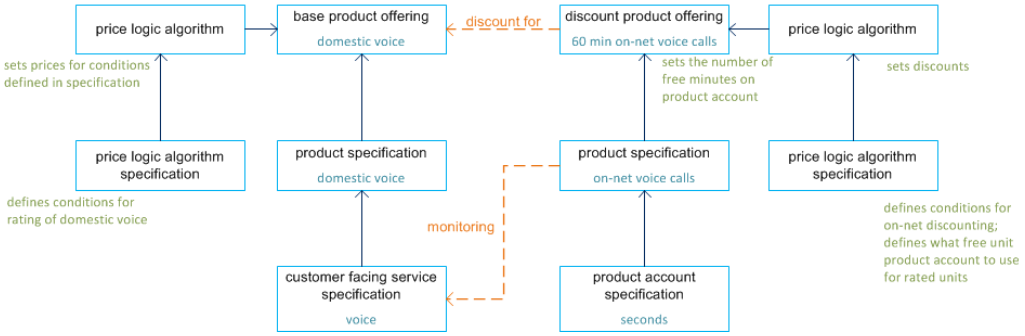
The discount logic and structure is defined in the discount price logic algorithm specification while the actual discount values are set in the price logic algorithm.

Relationship Type	Purpose of Relationship in the Specification	Description in the Specification Type
Discount For	Used in downstream systems.	

Relationship Type	Purpose of Relationship in the Specification	Description in the Specification Type
Monitoring	Used in downstream systems.	

A discount product offering/product specification has the same structure as the base product offering/product specification.

For more information on how to configure a discount product offering, refer to Create a Discount Product Offering.



3.9 Entity Properties

3.9.1 Personalization

Personalization means to set another value on an attribute other than the default value set in the product offering or product specification. The new value is then set under the product structure rather than under the product offering/product specification structure.

There is a property on the attributes of product specifications and product offerings that allows the CSR (Customer Service Representative) or the subscriber to override the value in CPM. For each personalized value, some restrictions on the value can be imposed.

A personalized value can optionally be set at product instantiation (when it is sold) and optionally be altered during the existence of the product, where "altered" in this context means set, changed or removed. If a personal value is removed, the default value from the product offering or product specification is used.

Some attributes that can be personalized have default values, others do not. An example of an attribute with a default value is the monthly broadband consumption during roaming. An example of an attribute without a default value is the birthdate of a subscriber.

For each attribute that can be personalized the following applies in general:

- In the product part of the product model there is an entity that stores the personalized value.
- In the product offering part of the product model there is an entity that stores a value that can, later on, be personalized.
- In the product specification part of the product model there is an indication for each attribute that can be personalized whether personalization is allowed or not. Further authorization rules for personalization are handled by each domain component and are not visible in the product model.
- Personalized values are within the allowed value range for an attribute.

Examples

A service provider wants to offer a discounted rate for customer birthdays. Refer to the following example of Personalization.

Currently, the following entities can be assigned personal values.

- Price (price logic algorithm specification argument)
  This allows setting individual prices for every product instance.
  The price can be set on the product specification (price logic algorithm specification), the product offering (price logic algorithm) and the product level. For a contract, the price to apply is the one set on product level. If it does not exist, it is the price set on product offering level and if this one does not exist, it is the value set on the product specification level (default).
  If a large number of contracts have the same individual price it is recommended to create a new product offering for that purpose. This product offering can then include the same product specification used for default pricing.
- Product Offering Priority (product offering attribute)
  This will allow setting the individual priority for a product offering. If not set on the product level, the priority defined on the product offering level applies.
- Initial Product Account Value
  This allows setting individual values to the the initial product account value. This can be used, for example, to assign a free usage or a usage to a limited price. The product account specification can have the initial product account value set as product account specification characteristic (default value). This value can be overridden on the product offering level. It is possible to set an individual value to the initial value at product offering instantiation. If not set at the product offering instantiation, the initial value set on the product offering level should apply. If this one does not exist, the value set on the product specification level should be used (default).
- Minimum and Maximum allowed Value on a Product Account
  A product account can have a default minimum and maximum value set as part of the product account specification. It is possible to override these values at instantiation. If not set at instantiation, the values defined in the product account specification (included in the product specification) apply.
- Discount Amount and Percentage (price logic algorithm specification argument)

The individual discount amount or discount percentage can be set at instantiation of a discount product offering. The discount amount and percentage set at the discount product offering level are overridden in this case. If not set at the instantiation, the discount amount and percentage set at the discount product offering level apply.

- Other arguments like Special Dates (price logic algorithm specification argument)
  Other arguments can be included in the price logic algorithm specification that can impact rating, like a special date. A special date can be set to a specific date at the product offering level (price logic algorithm), like Christmas or a subscriber's birthday date, at the product offering instantiation.

3.9.2 Override from Parent Specification

It is possible for the parent specification to override the value set on a child or grandchild specification. For example, set the initial value in the product account specification from the product offering.

3.10 Entity Validation

Entities and the relationships between entities are validated before being published.

Parent Child Relationship Rules

In order to establish a relationship between a parent specification and a child specification, the child specification must either:

a. Already exist as a published specification
   or
b. If it is not published, it must exist in the same project as the parent specification

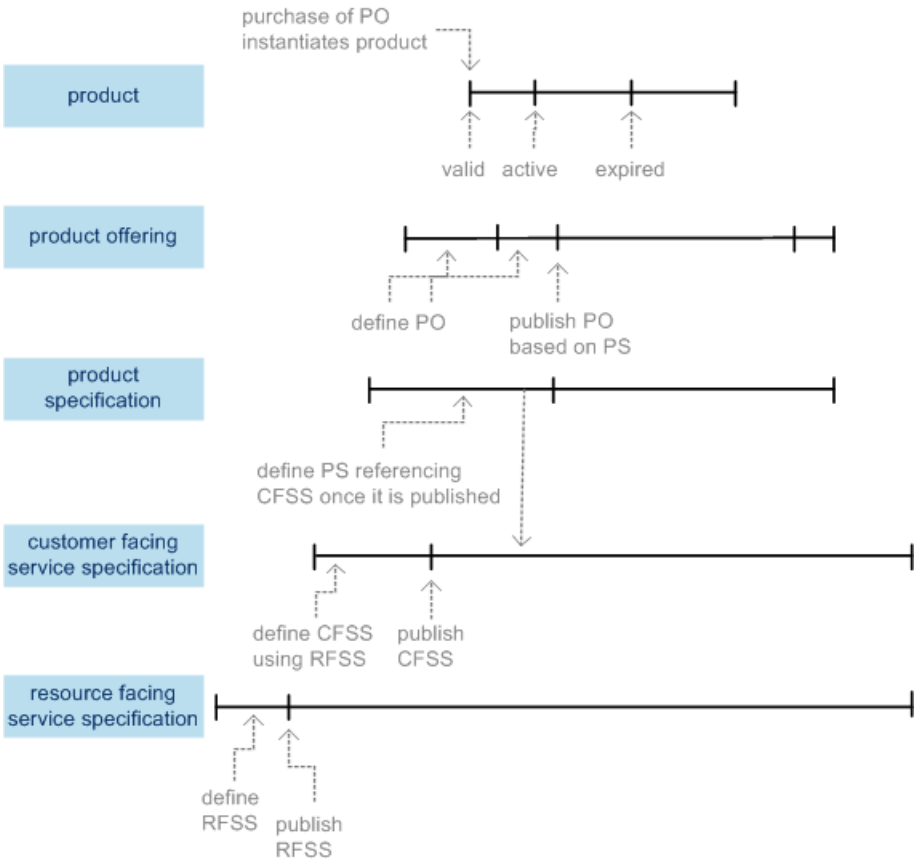
The child specification must have an equal or larger validity time period than the parent specification.

Product and Service Rules

1. A customer facing service specification must have at least one resource facing service specification.
2. A product specification with a service category must have at least one customer facing service specification.
3. A product specification with a service product type must have at least one customer facing service.
4. A product offering (on page 72) must have at least one relationship to a product offering or a product specification.

Scenario

Simplified View of Entity Validity Relations



1. A definition of a resource facing service is published.
2. A new customer facing service is defined referencing the previous resource facing service.
3. A product specification definition is started before the customer facing service is published.
4. The customer facing service is published.
5. The product specification can reference the customer facing service and then it can be published.
6. At a later time, a product offering is defined, published and refers to the product specification.
7. A product is bought and instantiated with two balances and becomes valid.
8. The product is time limited and becomes active and is eventually expired.

3.11 Entity Rules

Rules can be defined to validate input of values of specifications, to ensure that all entity relationships are consistent with the product model, to find the availability or eligibility of products and to enforce valid compositions of product offerings.

Rules can be executed at various levels of ECM, for example, during product configuration design time or order time.

Each entity is bound by any of the rules described its corresponding description section of the entity.

The following table lists the types of rules and at what level they can be executed:

Rule Type	Level	Purpose	Description
Entity Relationship Validation	Entity / Design	Structural rules that define which relationships are allowed to be created on instances of specification types during specification design time in the ECM GUI.	Structural rules are incorporated in the catalog model design. These rules are defined in the base definitions of specification types.
Entity Relationship Evaluation	Basket	The relationships between specifications must fulfill the purpose of the relationship type (contains, requires, optional).	Each relationship type invokes a rule process to include other specifications in the basket or to verify that other specifications exist in the basket. This ensures the correct composition of the product offering or product.
Availability	Entity / Attribute	To support browsing ECM.	**This rule is not applied in the ECM GUI.**
Eligibility	Entity / Attribute / Basket	To support browsing ECM and adding to cart in ECM.	**This rule is not applied in the ECM GUI.**
Consistency and Validation	Attribute / Design	These are attribute level rules that check the validity of the input. They are executed during specification design time in the ECM GUI.	For system defined attributes, rules can be created during development using metadata rule sets. For user defined attributes that are created by adding attributes to the base definition of the specification type, rules can be defined in run time rule sets. **Future:** For user defined attributes that are created by adding attributes to instances of specification types, rules can be defined.

3.11.1 Structural

Structural rules are incorporated in the physical model design.

3.11.2 Entity Relationship

Entity relationship rules are defined in base specification type definitions.

These rules are applied when specifications are added and removed from a basket during order time.

3.11.3 Availability

Availability rules help to determine how and where a product offering can be purchased. For example, a product is only available if the customer segment is residential.

Availability rules filter ECM product offering results in that they are executed during ECM browsing to build an order and to ensure the customer is only viewing products they are allowed to select.

Browsing ECM without constraints, before products are added, products are displayed based on start and end dates, geographic regions, customer types, customer segments, etc.

ECM supports the following generic rule guidelines:

1. Determine if two or more products are compatible or not compatible with each other and if products can be used together or not used together. For example, it is required to purchase a gold level plan before an international long distance value added product offering is made available.
2. Determine the cardinality of a product or service, that is, determine how many times a product can be selected.
3. Determine the service address or location, which has network service characteristics, to identify which various levels of product offerings are supported. For example, an internet product with DSL modem, 1 km from CO will not be allowed the highest speed product offering since internet speed for DSL decreases with distance.

3.11.4 Eligibility

Eligibility rules filter ECM browsing results of product offerings based on who is purchasing, when the purchase is made and under constraints of a customer.

When a product is added to the basket, validations are done to ensure that it is compatible with all of other products in the basket or customer inventory.

Eligibility rules are evaluated during product selection and browsing of ECM. Eligibility rules are not evaluated by ECM.

ECM supports the following generic rule guidelines:

1. Determine if a customer type is allowed to order a product or service. For example, product offering prices are only shown to business customer types.

2. Product offerings are only offered for a specific condition. For example, if the term of a previously purchased product has not completed, a customer is not eligible to select a product or a customer is eligible for a promotional product offer (discount) since the customer has used 1 GB of data in the previous month.

3.11.5 Consistency and Validation

Consistency and validation rules are used to ensure that product offerings are built with the correct composition. They are used at product configuration design time only and never used at run time. Service provider users do not use these rules.

ECM supports the following type of validation rules:

1. Validate that the parent and child relationships are consistent with the information product model.
2. Validate the combination of attributes. For example, Attribute A with Value X is acceptable with Attribute B with Value Y.
3. Validate mandatory attribute.

3.11.6 Dynamic Rule Sets

Rule sets are used for data initialization, validation, and permissions. They can be evaluated against a source data object (document, data structure or top-level user interfaces) and its extensions. Individual rules are defined per data object node. Depending on the type, rules can be defined on the top node or its immediate data type child nodes.

- Rule sets are stored in the database.
- More than one rule set can be created for the same object.
- Rules are defined as JavaScript expressions or functions.
- Rule sets are not versioned.
- Individual rules are defined per attribute.

A feature to configure rules sets is available to service provider business configuration engineers or the application developers and integrators of Ericsson. The rules can apply to the customer service order basket application or ECM.

Initialization Rule Sets

- A rule set is created with each source specification.
- Different rule sets can be created for specification types.
- Using the Condition field of Rule Sets Details page, a script can be defined that checks for specification type and specification subtype.
- Rules are created at model to initialize leafs of specifications based on specification type and subtype.

Validation and Permission Rule Sets

- Data type validation is supported in ECM.

- Non-optional fields and validation errors are shown for dynamic document leafs.
- Allows creating new rules during run time.

3.11.7 Specification and Instance

Some entity **specifications** have an associated entity **instance** that can be configured in ECM. For example, both the *"price logic algorithm "* **specification** and the *"price logic algorithm"* **element** are configured in ECM.

For any specification in ECM which has an associated instance (element) in ECM, a change to the specification will not be applied to any instance that is currently using the specification. In such a case, the instance would need to be recreated to inherit the latest changes made to the specification.

In the future, a more robust solution may be implemented to produce a warning message when a specification is being changed that has instances using it.

It is important to note that in a standard live business environment, a specification would normally go through an approval process before it is activated. Then, instances would be created only after the specification is active. And since an active specification cannot be changed (only a new version of it can be created), the issue of instances inheriting specification changes would not be prevalent.

3.12 Versioning

Versioning can be described as a mechanism to control the changes performed on business entities. Entities with a defined version represent a specific state in a time period.

Versioning is useful for the following reasons:

- To identify and track the changes of an entity when it transitions through its life cycle.
- To control changes performed on entities.
- To support functions such as rating, invoicing, customer care.
- To support backlog (late arrival) processing.
- To support re-rating of events after an error correction or change in business rules.
- To provide information about the active state of the entity at a given period of time to an operation, such as product selection in charging or product offering selection in customer care.

An entity is versioned as a whole and not at each individual attribute of the entity.

The following versioning principals exist in ECM:

- Version information is supported by ECM when processing, storing and retrieving entities.

- A version of an entity can be searched and selected by using the effective date attributes of the entity.
- Entities can be corrected, for example, for the purpose of re-rating. The version providing the correction overrides any existing versions.
- Versioning changes can be made to multiple entities within one project.

Pricing Entities

The price model entities described below conform to the price model of the Ericsson Charging component. For this set up, the system configuration variable `PSCM_USE_CHARGE_PRICE` is set to `True`. For more information, refer to Configure Charging Component (on page 62).

Versioning of Tariff Elements, Tariff Zones and Price Logic Algorithms

In the case of tariff zones, versioning is important for the processing of late arriving events. Assume a tariff change takes place at 00:00 and an event happens before 00:00, but the event arrived after 00:00. The requirement is that the event is charged with the tariff that was valid when it happened and not when it was processed. Thus, changes on an origin/destination list should not be released without creating a new version of the list. If versioning was not a consideration, a change in an origin/destination list would become valid automatically in all tariffs where such a list is referenced and this could be an undesirable outcome. Therefore, a tariff zone refers to a version of an origin/destination list. For usability reasons it is desirable for ECM to present a list of possible impacted tariff zones when changing an origin/destination list.

The same argument holds true in the relationship between composite and simple tariff zones. When releasing a new version of a simple tariff zone this change has no effect as long as the composite tariff zone still refers to the old version. Again, it is desirable for ECM to present a list of all impacted composite tariff zones.

The price logic algorithm specification also references the versions of tariff elements. Thus, a new version of the price logic algorithm specification is needed for a new version of a composite tariff zone. Assume that the composite tariff zone version contains more tariff zones than the former version. Now, the reasoning becomes obvious. Additional configuration in the price logic algorithm specification is needed for the additional combinations of tariff elements.

An alternate approach is that (composite) tariff zones are versioned together with their origin/destination lists. In this case, only consistent (composite) tariff zones can be released. Then, the price logic algorithm specification might reference the (composite) tariff zone only, which would allow for non-structural changes not impacting the price logic algorithm specification. However, creating a new version would mean to copy the last version of the (composite) tariff zone with all its elements. This could be a notable amount of data.

The new version of the price logic algorithm specification also requires a new version of the price logic algorithm element in order to set the prices. However, new versions of price logic algorithm elements are possible without changing the price logic algorithm specification.

3.12.1 Versioned Entities

The entities in the following table are versioned.

Entity Name
Product Offering Specification
Product Offering Priority Specification
Product Specification
Customer Facing Specification
Resource Facing Specification
Resource Specification
Characteristic Specification
Product Account Specification
Price Logic Algorithm Specification
Price Logic Algorithm Element
Tariff Element
Tariff Element Group

3.12.2 Attributes of Versioning

The full version and lifecycle of an entity is represented by the following set of attributes:

Attribute	Description
Version Number	The version number is a **system generated unique identifier** of the version of an entity. Each entity instance thereby holds its own version number series. It is based on the UTC (epoch) **time stamp** when the entity is created or modified. This time stamp is useful for back tracking changes or identifying when a change was made.
Effective From	The **Effective From** date time stamp is a mandatory field. It is inclusive which means the entity is valid from this time.
Effective To	The **Effective To** date time stamp is an optional field. It is exclusive which means the entity is valid up to but not including the time.

Note:
The time stamp is represented as: `YYYYMMDDTHHMMSS<Time Zone>`

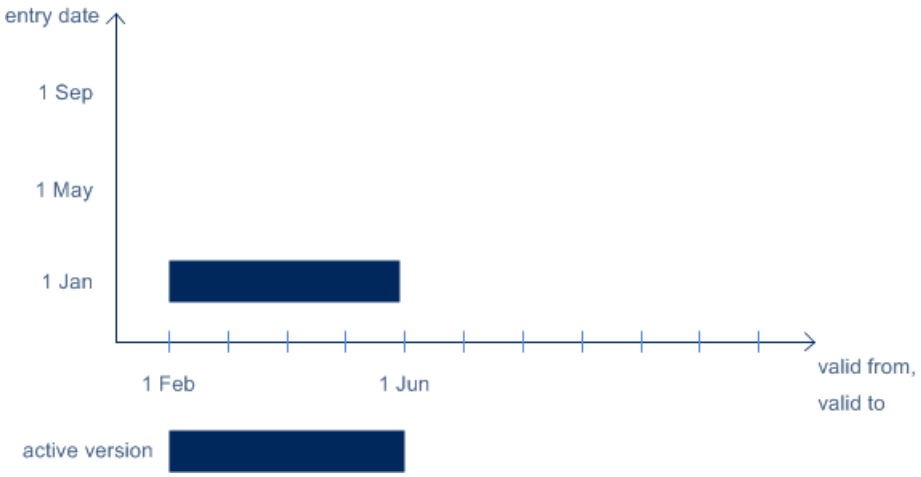
- Time Zone = Z if it is in UTC
- Time Zone = + hh:mm if it is before UTC
- Time Zone = - hh:mm if it is after UTC

- Examples: 20130906T130745+0100, 20131206T140343-0600

3.12.3 Examples

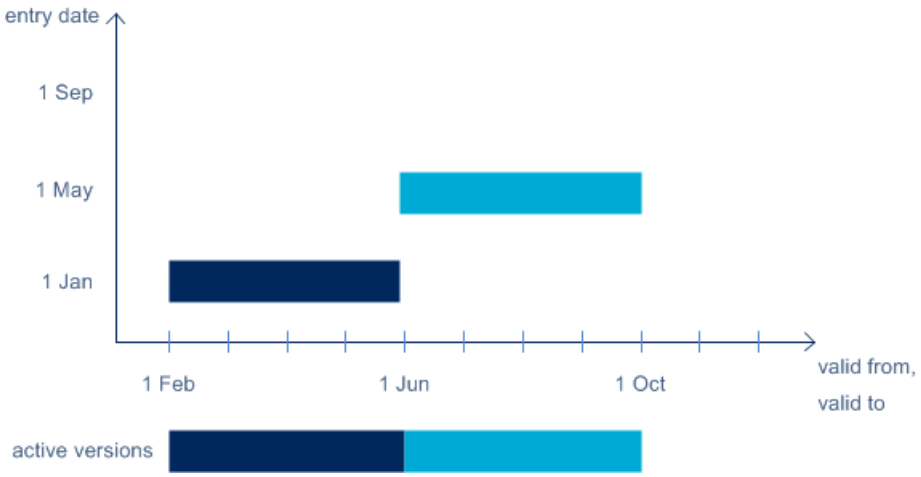
3.12.3.1 Version Change with No Overlap

On January 1st product offering 1 is configured in project A. The product offering has several attributes and they are valid from February 1st to May 31st. The project is published and the version of the product offering is stored in the database with an active status.



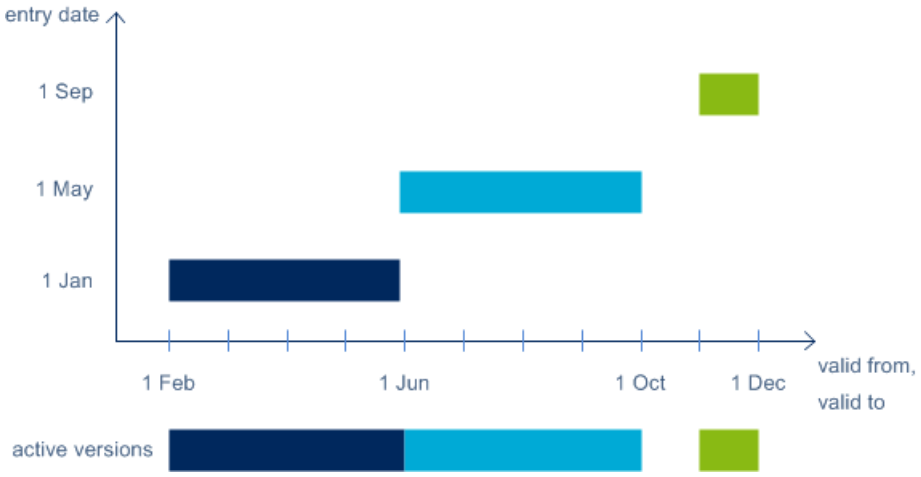
On May 1st the attributes of product offering 1 are changed in project B. The attributes are valid from June 1st to September 30th. The project is published and the new version of the product offering is stored in the database with an active status. The old version is also stored in the database.

The next time there is a version change for product offering 1, **two active times slices** are shown.



On September 1st the attributes of product offering 1 are changed again in project C. The attributes are valid from November 1st to November 30th. The project is published and the new version of the product offering is stored in the database with an active status. The previous versions are also stored in the database.

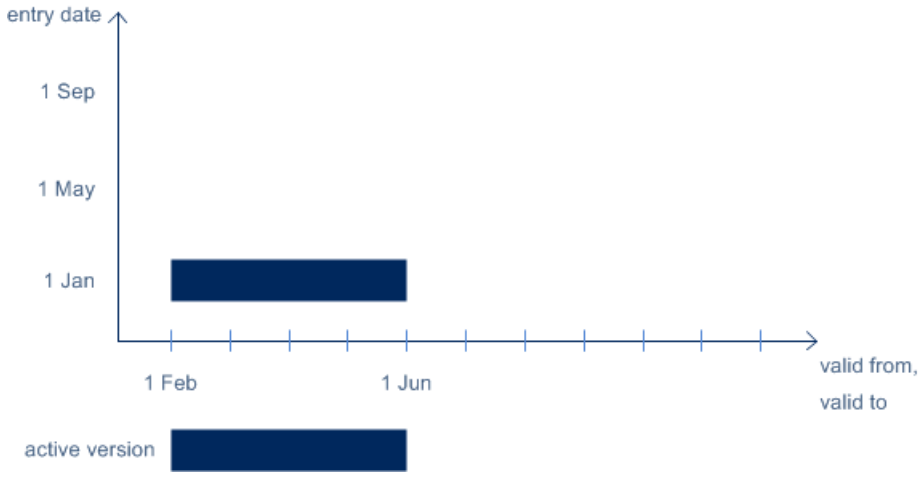
The next time there is a version change for product offering 1, **three active times slices** are shown.



Note:
There is a gap between the second and third version which is allowed.

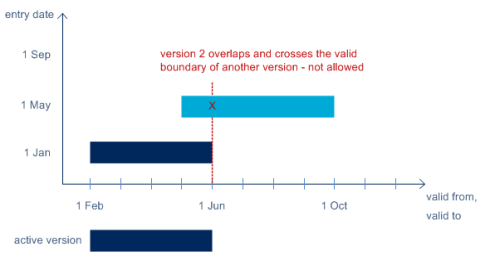
3.12.3.2 Version Change with Overlap

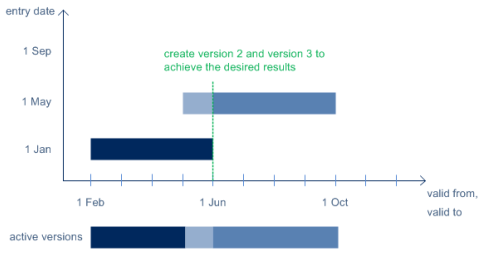
On January 1st product specification B is configured in project A. It is valid from February 1st to May 31st. The project is published and the version of the product specification B is stored with an active status.



On May 1st, version 2 of product specification B is created with a valid period from May 1st to September 30th. This is not allowed as the period crosses over the valid period boundary of version 1 which ends on May 31st. Instead version 2 is created from May 1st to May 31st and version 3 is created from June 1th to September 30th. The project is published and the version of the product specification B is stored with an active status.

Next time a version change is done on product specification B, **three active time slices** will be shown.

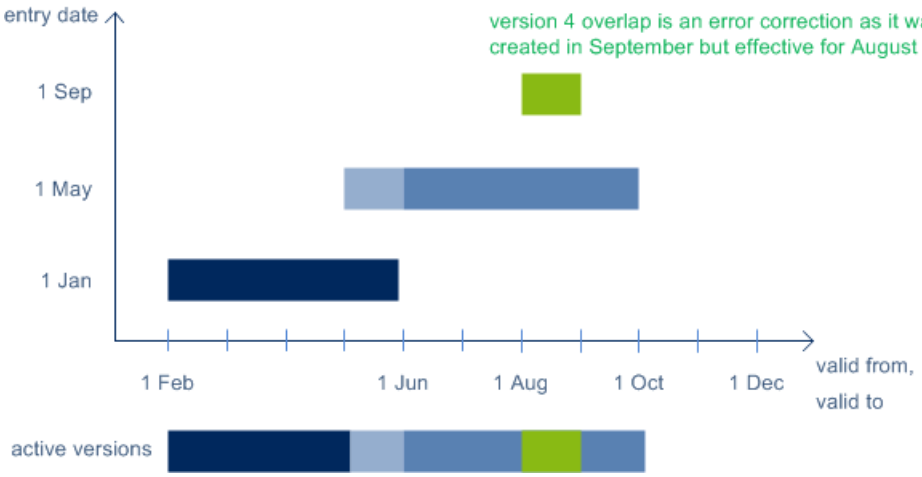




On September 1st, version 4 of product specification B is created with a valid period from August 1st to August 31st. This is allowed as the overlap does not cross the valid period boundaries of any previous versions. This version is also an error correction as it is created on September 1st and set effective for August

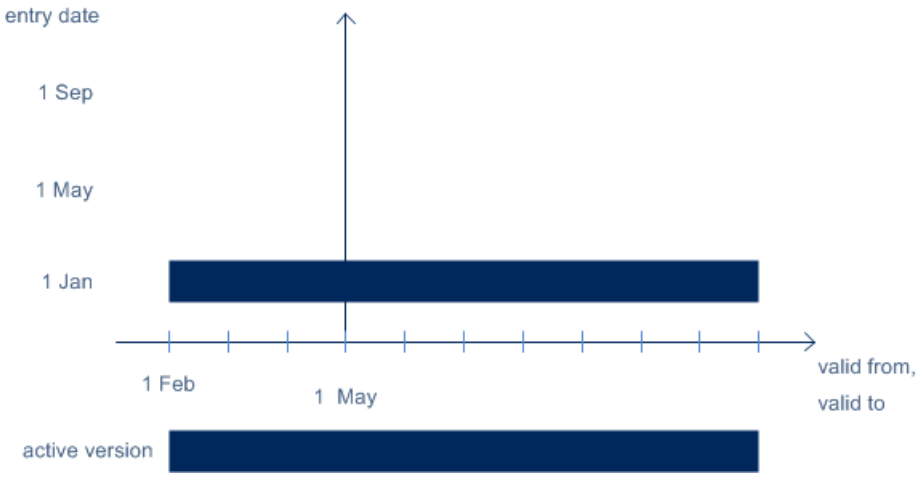
1st. The project is published and the version of the product specification is stored with an active status.

Next time a version change is done on product specification B, **five active time slices** will be shown.



3.12.3.3 Error Correction Scenario

On January 1st, customer facing service specification C was configured in project A. It is valid with one active version effective from February 1st and has no expiry date.

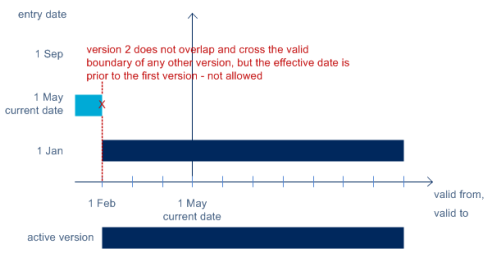


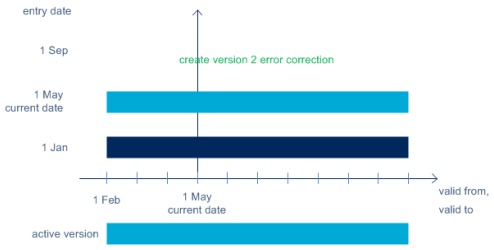
On May 1st (current date), a project is created with version 2 of customer facing service specification C with an effective date of January 1st to January 31st. The valid period of version 2 does not overlap and cross the boundary of any other

version, but the effective date is prior to the first version, the active version published above. This is not allowed.

So, version 2 is modified to be effective from February 1st and with no expiry date. The error correction is allowed.

The project is published and the version of the customer facing service specification C is stored with an active status. The next time a version is created for customer facing service specification C, **one active time slice** will appear as the second version completely overwrote the first version. When the February 1st time slice is opened the attributes and values related to version 2 appear.





PO = product offering

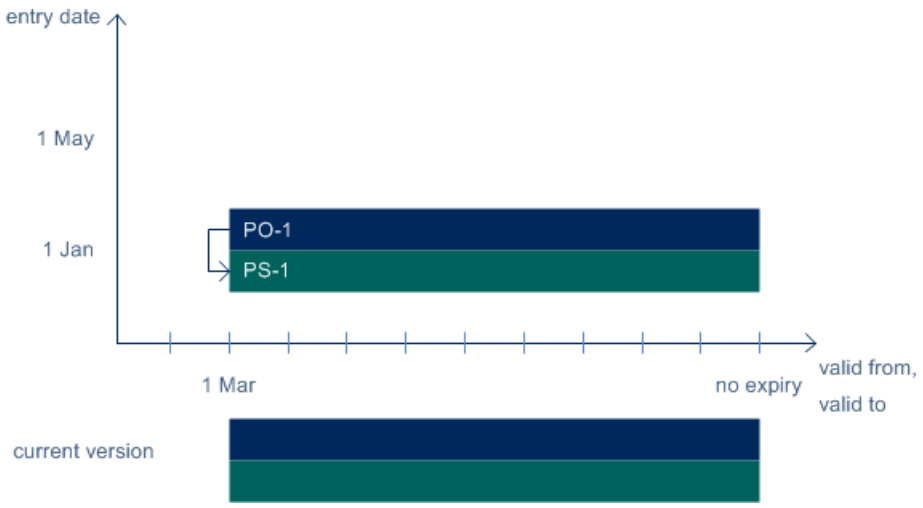
1. At time **Blue1** a new **PO Id = 1** is configured and will be effective at time **Orange1**.
2. At time **Green2** a product is ordered and a product with **Product Id = 11** related to **PO Id = 1** is processed at time **Blue2**.

3. At time **Purple3** an event happens and is processed at time **Blue3**. The configuration v1 which is effective from **Orange1** will be valid. The price will be 5 cents.
4. At time **Blue4** the configuration for **PO Id = 1** is corrected with a new price which will be effective at time **Orange4** but valid from time **Orange1**.
5. At time **Purple5** an event happens and is processed at time **Blue5**. The configuration v2 which is effective from **Orange4** will be valid. The price will be 4 cents.
6. At time **Purple6** an event happens and is processed at time **Blue6**. The configuration v2 which is effective from **Orange4** will be valid. The price will be 4 cents.

3.12.3.4 Parent Child Relationship

Create the **first version** of a product offering.

1. Create a project `Version-Project-1`.
2. Create a product offering `PO-1` with an **Term Units** `Day(s)` and make it effective from `1-Mar to blank`.
3. Create a product specification `PS-1` with **Family** `Mobile` effective from `1-Mar to blank`.
4. Add a **Contains** relationship from `PO-1` to `PS-1`.
5. Publish and set active.



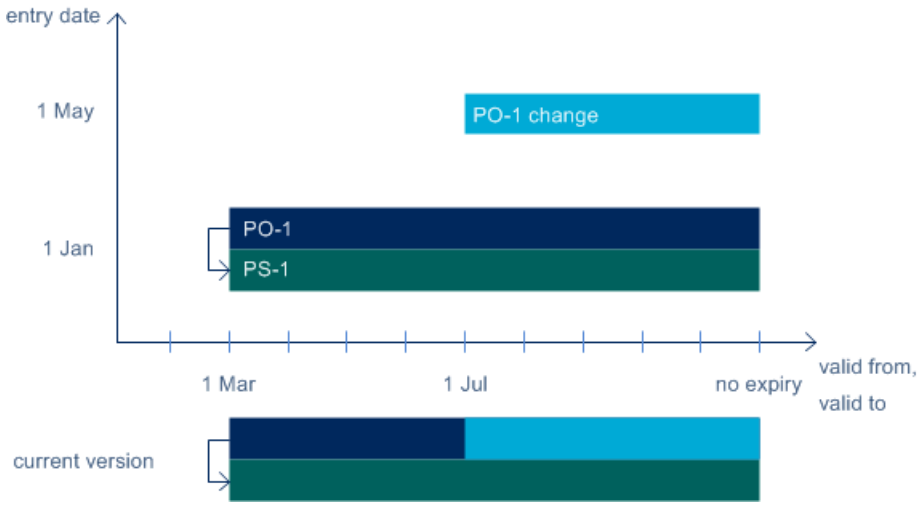
Next >

Create a **second version** of the product offering by making a **copy** of the first version times slice.

1. Create a project `Version-Project-2`.

2. From the **List of Product Offerings** search pane, search for product offerings using **Include all items in all projects** to search for **active** product offerings.
3. Select and open product offering `PO-1`. Click **Version Project: Production View**.
4. From the **Time Slices** dialogue, select the time slice for the period from `1-Mar to blank | Production View (Active)`.
5. Click **Copy** and make this version (time slice) effective from `1-Jul to blank` and **Save**.

   This time slice inherits the values and relationships (if effective for the period of the new time slice) from the `1-Mar to blank` time slice. That is, the **Term Units** is set to `Day(s)` and there exists a relationship to `PS-1`.
6. Change the **Term Units** is to `Hours(s)` and **Save**.
7. Create a product specification `PS-2` with **Family** `Internet` effective from `1-Mar to 31-Mar`.
8. From the **List of Product Offerings** search pane, search for the product offerings using **Search within current project** to search for `PO-1` with **definition** status within `Version-Project-2`.
9. Select and open product offering `PO-1`.
   Note: Alternatively, click **Version Project: Production View** and select the time slice for the period from `1-Mar to blank | Version-Project-2(Definition)` and click **Open**.
10. Add a **Contains** relationship from `PO-1` to `PS-2`. .....
    This relationship assignment is allowed and saved. But, upon leaving and returning to PO-1 > Relations tab and refresh, PS-2 is not found.
11. Publish and set active.



Next >

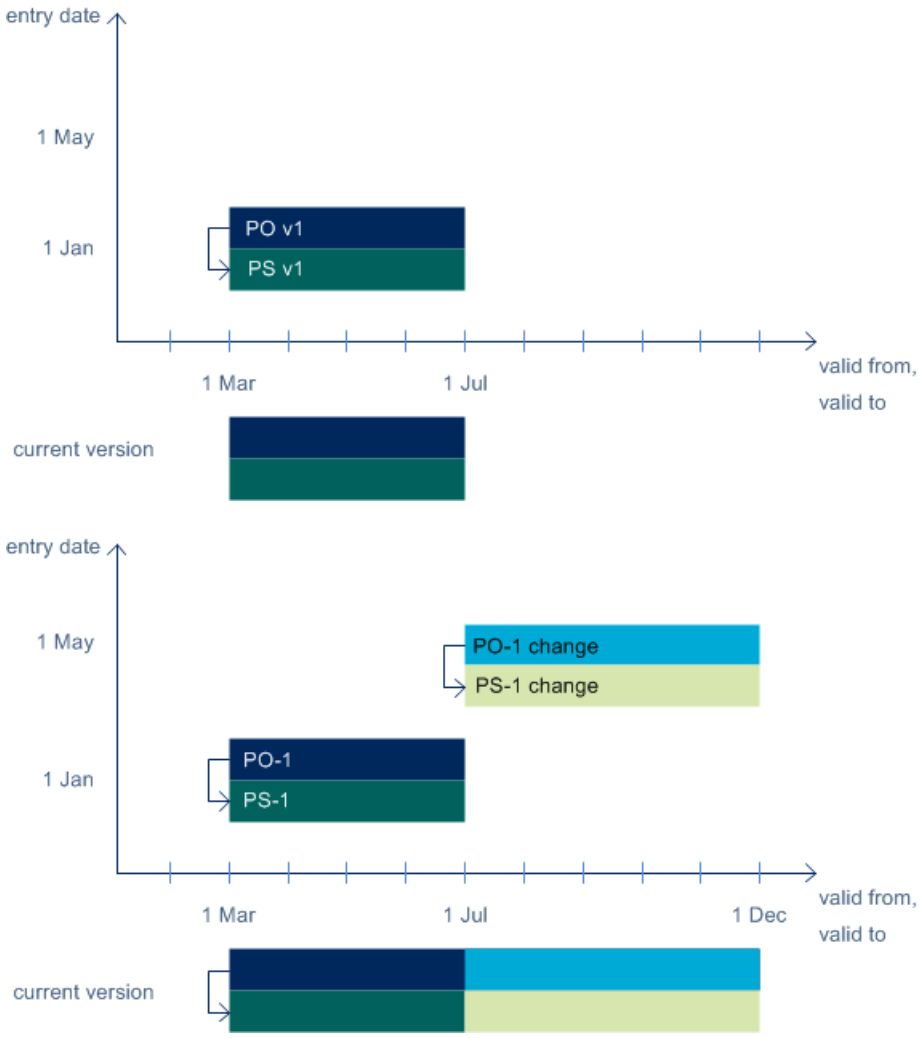
Create a **third version** of the product offering. **Delete** the incorrect definition. Recreate the third version by using the **new** option.

1. Create a project `Version-Project-3`.
2. From the **List of Product Offerings** search pane, search for product offerings using **Include all items in all projects** to search for **active** product offerings.
3. Select and open product offering `PO-1`. Click **Version Project: Production View**.
4. From the **Time Slices** dialogue, select the time slice for the period from `1-Jul to blank | Production View (Active)`.
5. Click **Copy** and make this version (time slice) effective from `1-Sep to blank` and **Save**.

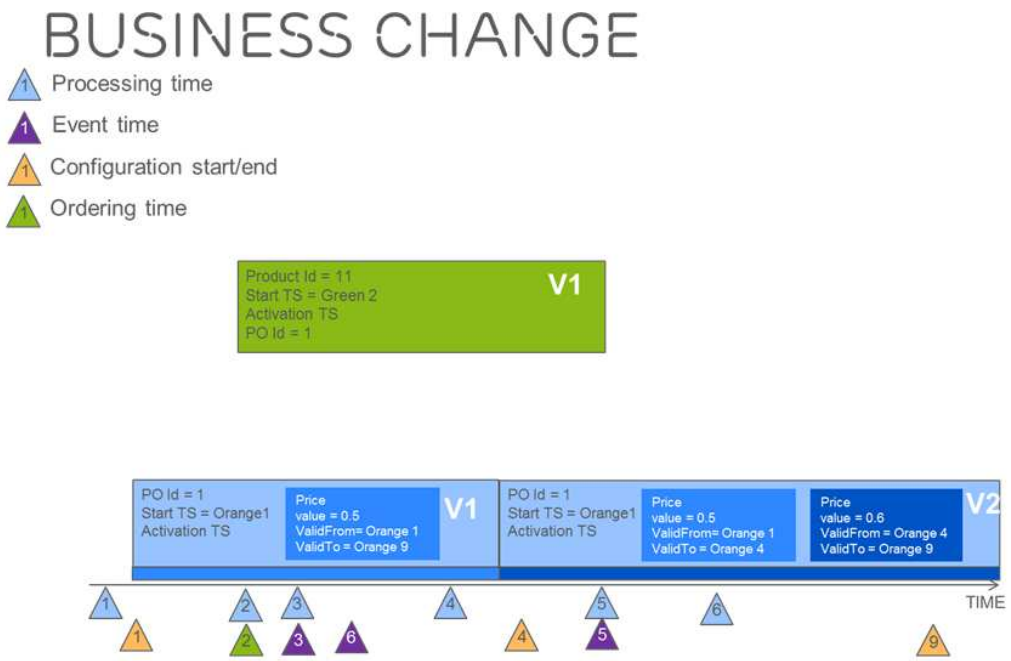
   This time slice inherits the values and relationships (if effective for the period of the new time slice) from the `1-Jul to blank` time slice. That is, the **Term Units** is set to `Hour(s)` and there exists a relationship to `PS-1`. However, since `PS-2` is valid from `1-Mar to 31-Mar`, the relationship to `PS-2` is not inherited.
6. Change the **Term Units** to `Months(s)`. **Save** and exit.
7. From the **List of Product Offerings** search pane, search for product offerings using **Search within current project** to search for `PO-1` with **definition** status within `Version-Project-3`
8. Click **Delete**. The 3rd version in **definition is deleted** and all its relationships. The previous two times slices remain active.
9. From the **List of Product Offerings** search pane, search for product offerings using **Include all items in all projects** to search for **active** product offerings.
10. Select and open product offering `PO-1`. Click **Version Project: Production View**.
11. From the **Time Slices** dialogue, select the time slice for the period from `1-Jul to blank`.
12. Click **New** and make this version (time slice) effective from `1-Sep to blank` and **Save**.

    This time slice does not inherit from any time slice.
13. Update item values and set relationships as desired.

14. Publish and set active.



3.12.3.5 Business Change Scenario



PO = product offering

1. At time **Blue1** a new **PO Id = 1** is configured and will be effective at time **Orange1**.
2. At time **Green2** a product is ordered and a product with **Product Id = 11** related to **PO Id = 1** is processed at time **Blue2**.
3. At time **Purple3** an event happens and is processed at time **Blue3**. The configuration v1 which is effective from **Orange1** will be valid. The price will be 5 cents.
4. At time **Blue4** the configuration for **PO Id = 1** is added with a new price which will be effective at time **Orange4** and valid from time **Orange4**. The old price will still be valid from time **Orange1** until time **Orange4**. The new version v2 will contain both old and new price with respective validity.
5. At time **Purple5** an event happens and is processed at time **Blue5**. The configuration v2 which is effective from **Orange4** will be valid. The price will be 6 cents since the event occurred between time **Orange4** and **Orange9**.
6. At time **Purple6** an event happens and is processed at time **Blue6**. The configuration v2 which is effective from **Orange4** will be valid. The price will be 5 cents since the event occurred between time **Orange1** and **Orange4**.

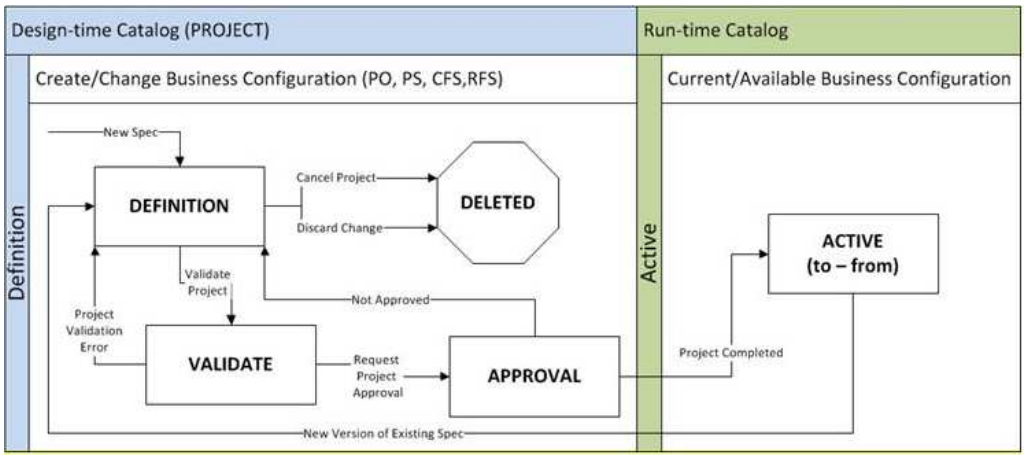
3.13 Product Life Cycle

ECM provides the ability to define time limits on product entities. A valid from and to period range can be set.

- The **Valid From Date** is inclusive which means the entity is valid from this time.
- The **Valid To Date** is exclusive which means the entity is valid up to but not including this time.
  Note: In the case of a product offering, these dates indicate when the offer is available for customer contracting.

The creation and modification of product entities go through a project lifecycle in the design-time of catalog. The status of the project and its entities are set to **definition** . When the project is complete, the status of the entities are set to **active** for run-time of catalog. In the **future**, the PLM (Product Lifecycle Managment) process may also have an **approval** status.

Only active specifications are published.



A product offering can be sold during its validity period. A product associated to a product offering / product specification may exist in the customer product inventory long after a sales period and as such the product offering / product specification remain as active.

A product can be removed during the rating process or become active during the consumption of another product. Each product has one of the following lifecycle statuses:

- **Valid**: A product is valid if the current date is within the validity period and before the active start date of the product. In this status, the product can be assigned, but cannot be consumed.
- **Active**: A product is active if the current date is within the validity period, if it is identical to or later than the active start date and if the current date is before the active expiration date. An active product can be assigned and can be consumed.
- **Expired**: If the current date is identical to the expiration date or if it is later, the product has expired and can no longer be consumed

3.14 Thresholds and Notifications

ECM provides the ability to create product offerings with thresholds that can trigger notifications. This functionality gives a service provider the possibility to provide a variety of highly customized product offerings.

For example, a product SMS 100 could generate a notification event when a threshold condition has been met. The communication channel management entity might then trigger a warning message like “You have 20 SMS remaining”. This message can be configured and the thresholds can be personalized at the time of the product purchase (instantiation). Information on the event is stored in a historical database.

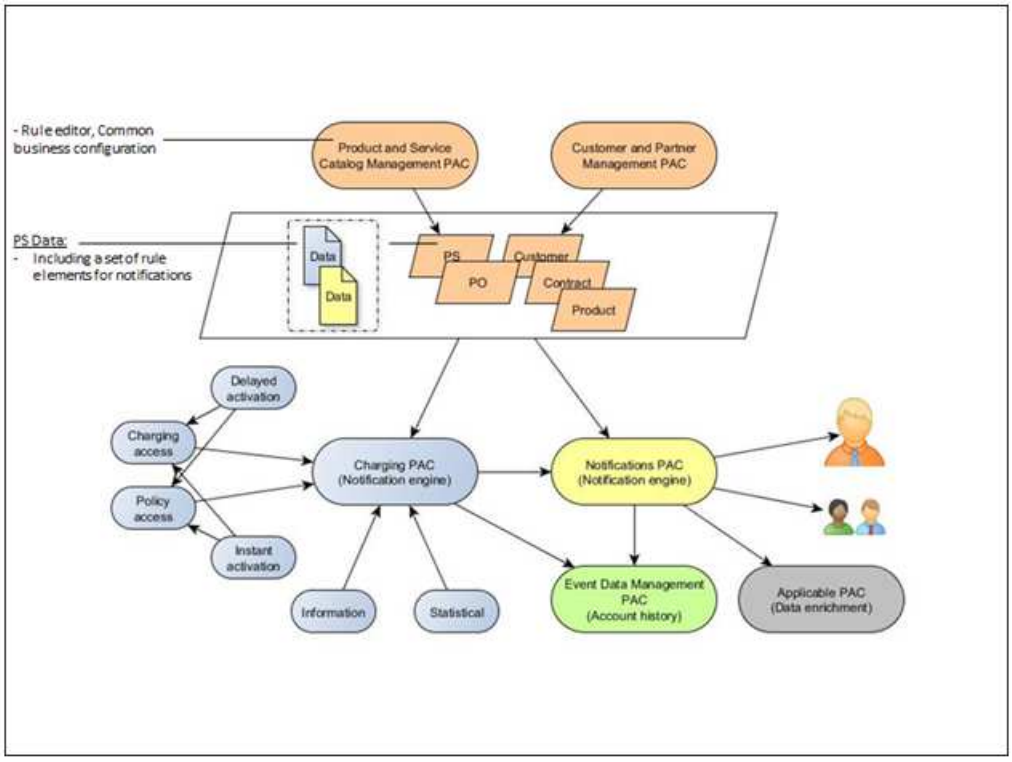
ECM provides the ability to configure these thresholds used by the charging component and to configure the actions to be performed when the threshold condition is met. The configuration of the threshold and action are done in a product account specification.

Input data from ECM and a CPM component can be made available to both charging and notification components. Notification trigger events that are initiated by a threshold condition in the charging component are sent to a communication channel management entity for further processing. At the same time, the threshold condition initiates a reporting event for account history purposes and sends it to an event data management component.

Most of the information that is needed by a notification component can be obtained from the product specification, product offering and personalization data.

- ECM is responsible for the configuration and definition of the threshold parameters and rules.
- The charging component detects the actual trigger event for a threshold condition.

- A notification component provides a proper notification message to the applicable consumer (subscriber or application).

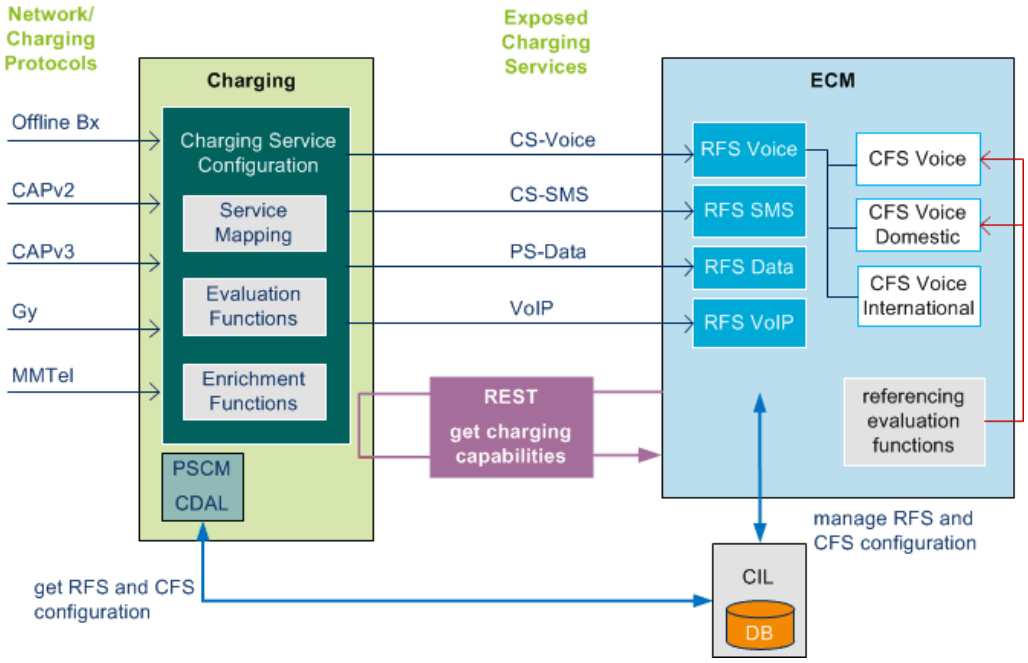


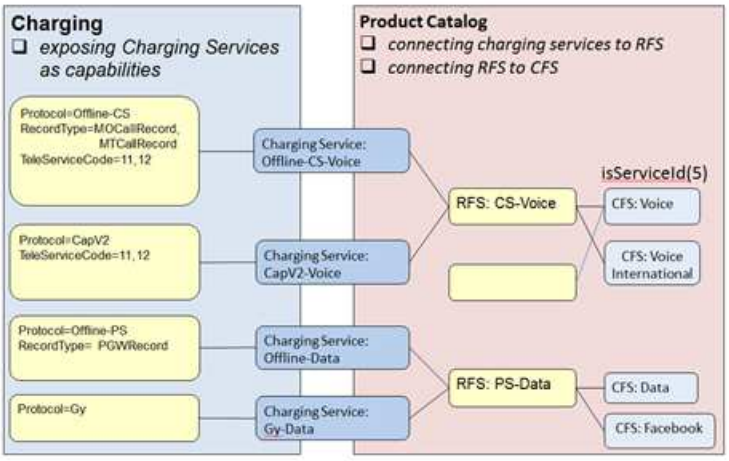
3.15 Basic Rating and Charging

The content of the following sections conform to the price model of the Ericsson Charging component. For this set up, the system configuration variable `PSCM_USE_CHARGE_PRICE` is set to `True`. For more information, refer to Configure Charging Component (on page 62).

3.15.1 Service Determination

Service determination is a process where the content of a network event is analyzed in order to determine what service a customer has used. Thus, service determination is the process of determining one or several customer facing services based on an event on a network/charging component protocol.





3.15.1.1 Charging Services

A charging service is the charging view of a specific resource facing service exposed by one or several network protocols. A charging service provides a higher abstraction level of the network protocols and the basic services used on those protocols

Examples of Charging Services

- Offline CS (Circuit Switched) Voice
- Online CS (Circuit Switched) Voice
- Offline PS (Packet Switched) Data

Charging Service Parameters

Parameter	Data Type
Parameter	Data Type
Charging Service ID	String (64)
Charging Service Name	String (128)
Description	String (256)

Existing charging protocol support:

- Offline CDRs structured according to 3GPP 29.298 (Bx)

Alternate charging protocol support:

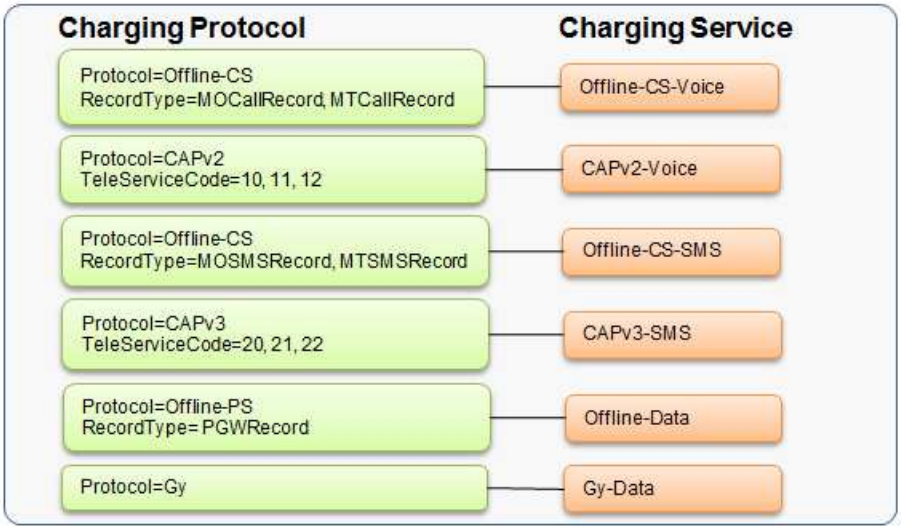
- Online charging protocols like CAPv2, CS1+, Gy, MMTel, etc.

The charging component processes the events or CDRs that are received on the network. This requires that the charging protocols are associated with a resource facing service so that the correct customer facing service and corresponding products can be selected for the charged subscriber.

Each charging service maps to one or several network/charging protocols.

One charging service can be connected to one resource facing service.

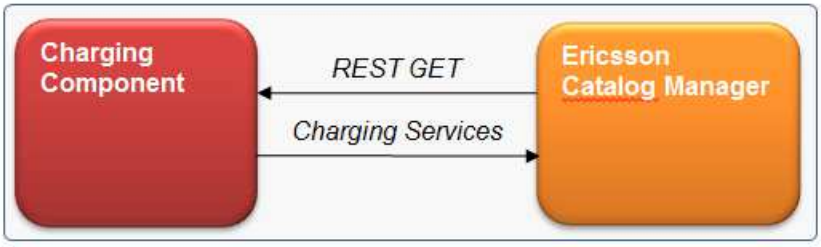
The concept of the charging service is introduced to avoid having to expose the low-level protocol/CDR parameters in ECM. The resource facing services are not mirrored in the charging component because there can be resource facing service defined in ECM that have no connection to charging.



Sample Mapping of Charging Protocol Parameters to Charging Services

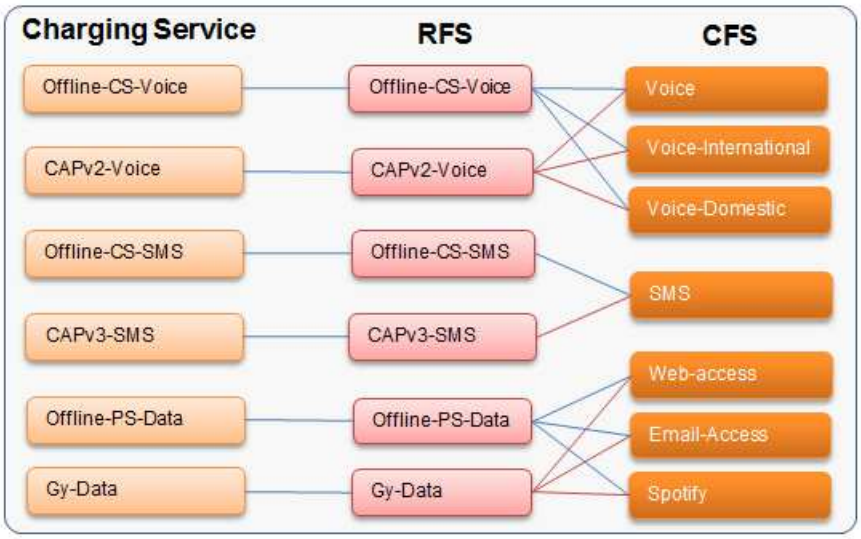
The mapping from a charging protocol to a charging service is configurable in the charging component. A default configuration can be provided as a deliverable from in the charging component, but this configuration must be able to be changed or extended according to the needs of the service provider. Since the charging service configuration is not regarded as business configuration, the latest version of this configuration should always apply. It is assumed that a change to an existing charging service is only done to correct potential faults. As such, there is no need to support earlier and possibly faulty versions of these charging services.

The charging services supported by the charging component are exposed as capabilities and these capabilities are fetched by ECM using a REST-based interface.



ECM Fetches Charging Services from Charging Component

ECM provides the GUI to support the configuration of connecting charging services to resource facing services. There is a one-to-one mapping between a charging service and a resource facing service.



Connection of Charging Service to Resource Facing Service

Since the charging services are configurable in the charging component, a higher level of abstraction of this configuration is defined in ECM. For example, there may be a common CS-Voice service containing both Offline-CS-Voice and CAPv2-Voice. The charging component fetches the resource facing service configuration including the connected charging services and customer facing services to determine which customer facing service(s) apply for a certain network event or CDR.

3.15.1.2 Service Selection Filters

Service filtering is the concept of applying a filter on the customer facing service (on page 77) . The filter specifies a condition that is fulfilled in order to select that customer facing service. By doing this filtering on the customer facing service it avoids checking if a service is applicable as a condition in the price logic algorithm specification, at a later stage. This means that service selection can lead to a simplified price logic algorithm specification on the product level.

A set of service selection rules can be seen as an evaluation of the conditions of one row in the tariff matrix. If the conditions at the customer facing service level are evaluated as true, the customer facing service is selected. The rules for identifying the customer facing service use a set of Evaluation Functions (on page 130).

Each function operates on one or several NUS fields that are predefined and controlled by the charging component. Each evaluation function returns either “true” or “false”. ECM controls the value that should be compared towards the NUS field(s). This value is the only input parameter needed to be provided to the evaluation function. Different kinds of data types are supported for the input parameters, as well the use of a reference, for example, a list that contains elements of a certain data type.

Example

Service Selection – Filtering and Matching

An operator wants to offer voice calls to domestic on-net destinations as a separate product. This would imply that this product would be handled by a separate customer facing service. This means that it must be possible to apply a filter on the customer facing service so that it will only be selected for the domestic on-net destinations.

COBA has a home network list that contains a list of strings reflecting the leading digits of the destination numbers (or routing numbers in case an MNP lookup has been performed). The numbers in the list are configured in a way so that the “best match” is used as matching criteria.

The customer facing service “Domestic On-Net Voice” is created and configured with a selection function exposed by charging to perform the list lookup. The function exposed by the charging component could be defined as: `DestinationNumberInListBestMatch(List_ref)`

3.15.1.3 Evaluation Functions

ECM defines the rules for identifying the customer facing service using a set of evaluation functions. These evaluation functions are exposed by the charging component as part of the charging services. At runtime, charging executes the evaluation functions when processing event records in order to identify the service (customer facing service).

Evaluation functions are managed from the **Service** tab of the customer facing service specification. From here, one or several evaluation functions can be connected to a customer facing service.

For each evaluation function selected in the customer facing service specification, the parameters can be configured.

Rules

The list of evaluation functions available for a customer facing service specification is based on the relationship to the attached resource facing service specification and its charging services.

For a customer facing service specification with multiple resource facing services having multiple evaluation functions, only the “intersecting common” evaluation functions associated with the relationship are allowed.

3.15.2 Rating for Linear and Tiered Pricing

ECM offers the ability to set up usage charge prices depending on different conditions, for example a tariff time or a tariff zone, in the form of linear or tiered rate functions.

With the implementation of ECM one **predefined tariff element** specification is provided. It is has a tariff type of tariff time.

ECM supports these types of tariffs:

1. tariff time
2. tariff zone
3. quality of service

ECM provides the ability to define these types of tariff related objects:

1. tariff element specifications for different tariff types
2. tariff elements for different tariff types
3. tariff zone origin specifications
4. tariff zone origin elements
5. tariff zone destination specifications
6. tariff zone destination elements
7. tariff element groups for different tariff types

Note: The tariff time tariff element specification is predefined and delivered upon deployment.

Charging functions are used to match normalized usage specification fields and to validate event date and times within various period intervals.

Price logic algorithm specifications for different kinds of charges are available such as one-time, recurring, discount and time or zoned based usage. A price logic algorithm can be created based on a certain price logic algorithm specification with the ability to add pricing values.

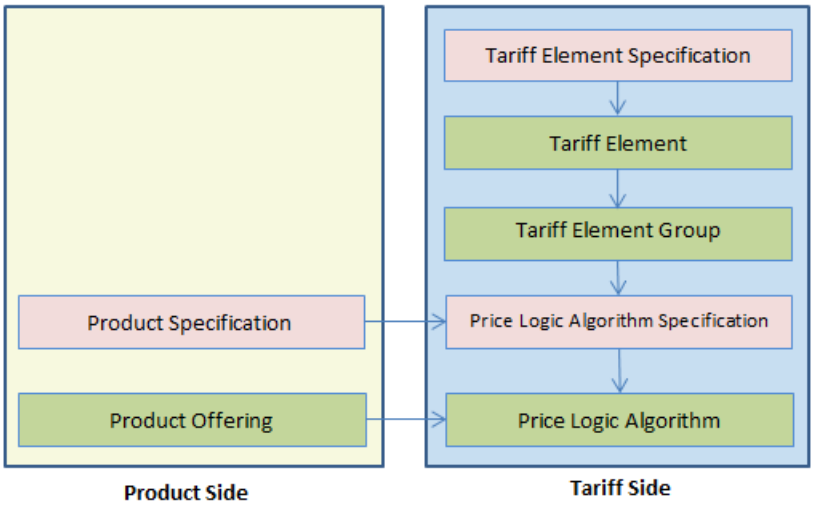
Tariff elements can be copied and versioned and used in a price logic algorithm.
.

A product offering can be linked to a price logic algorithm.

Once a project is published, the tariff objects are published in the format that is compatible with the charging component.

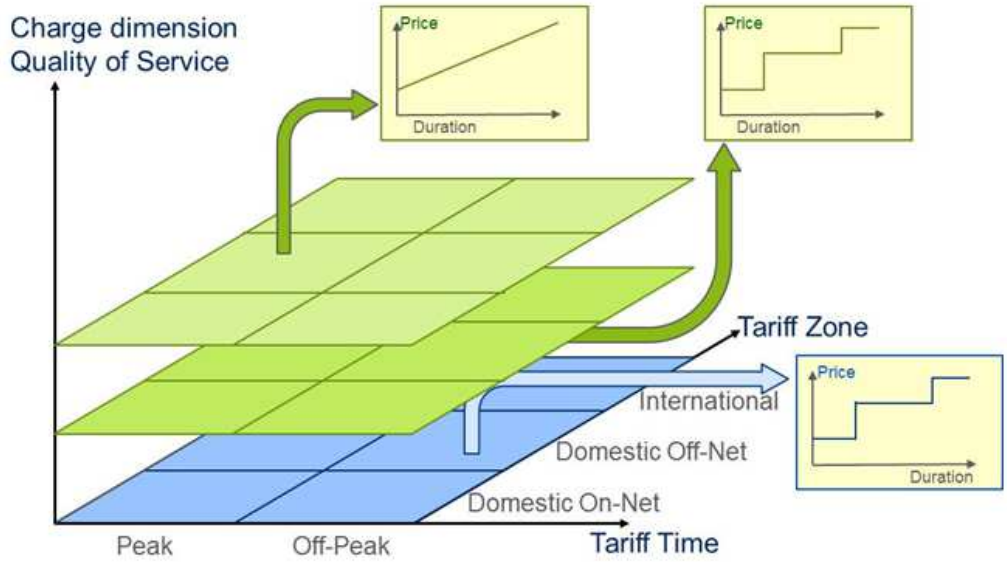
From ECM, all tariff objects can be exported or imported.

The following is a model of the relationship between tariff elements and product specifications:



Multiple Rating Dimensions

ECM has the ability to configure tariff elements for charging components that support multi-dimensional rating functions that depends on multiple dimensions.



This figure illustrates an example of a three dimensional rating configuration with the following rating capabilities:

1. Linear and tiered pricing models represented by the different rating function graphs.

2. The price can depend on the values of different dimensions of input parameters to the rating function. The figure shows three dimensions – tariff time, tariff zone and quality of service.

3.15.2.1 Charging Capabilities

Charging capabilities are comprised of entities and functions exposed and supported by the charging component. They are required by ECM for certain configurations, such as the construction of rating rules as defined in a rating matrix.

ECM provides an interface to fetch (import) and update all the charging capabilities with the latest definitions from the charging web services.

In general, the following areas are affected by the use of charging functions:

- Service Determination
- Tariff Element Construction
- Pricing
- Threshold Actions

Used in ECM

Charging capabilities include the following types of functions used in various ECM configurations:

- charging services for resource facing service specifications
- evaluation functions for customer facing service specifications
- charging functions, such a rating functions (linear/tiered) and discount functions, as well as tariff types and actions to be used in the construction of tariff specifications and elements for both tariff type time and zone
- low-level comparison/matching functions (for example, `equals()`, `isMemberOf()`)
- functions to configure actions and discount functions for price logic algorithms
- functions to configure threshold actions and product account attributes like units of measurement, minimum and maximum values to support product accounts

Examples

Examples of charging functions include:

- accountReset
- discountPriceForLinearRate
- eventTimeWithinDayOfWee
- isCGIinList
- linearRate
- notification
- setupFee

Discounts

The charging component exposes what kind of discount functions it supports. This could be different mathematical operations to be performed on the base price to get a discounted price. Refer to Price Logic Algorithm Specification (on page 83).

ECM provides the ability to build the conditions for when a certain discount should apply by using tariff elements. The charging component exposes what comparison operations it supports so that ECM can build the discount rules. For example, to build the rule to apply a certain discount for off-peak hours, the charging component has to support the operation for checking if the event time stamp is within off-peak time or not.

Data Types

ECM also supports data types for charging capabilities. The charging component exposes a function with a certain template ID as the data type. In ECM, when the user selects the function, a list of global lists is displayed based on the template ID. ECM then sends the list ID selected by the user back to the charging component.

Future

Functions available for PLA recurrent events definition will be defined according to the Recurring Capabilities Interface Specification, and will belong to the Recurring Capability group.

The following functions are in the scope of 4A-1,2 and 4B-1:

"accountReset",

"accountAdd",

"notification",

"carryOver",

"carryOverWithReset"

“fee” – for PLA only

Note:

"accountReset", "accountAdd", "notification" are in the 4A-1 scope; "carryOver", "carryOverWithReset" are added for the 4A-2 scope; “fee” is added for the 4B-1 scope

Please see Appendix B for the full definition.

3.15.2.2 Charging Functions

Charging functions are used to match normalized usage specification fields and to validate event date and times within various period intervals.

ECM provides list types that support elements of the data types needed for tariff time. There are lists of time intervals and lists of dates. List instances can be fetched by the charging component using PSCM CDAL and used in the evaluation functions such as EventTimeStampWithinTimeInterval(listRef).

1. A charging function with two parameters is provided. The first parameter is a number and the second is a date. The tariff element specification for QoS has a column bound to the function. When creating a new tariff element for QoS, the GUI presents two columns corresponding to the two parameters.
2. Charging functions with one parameter of the following type are provided:
   - boolean

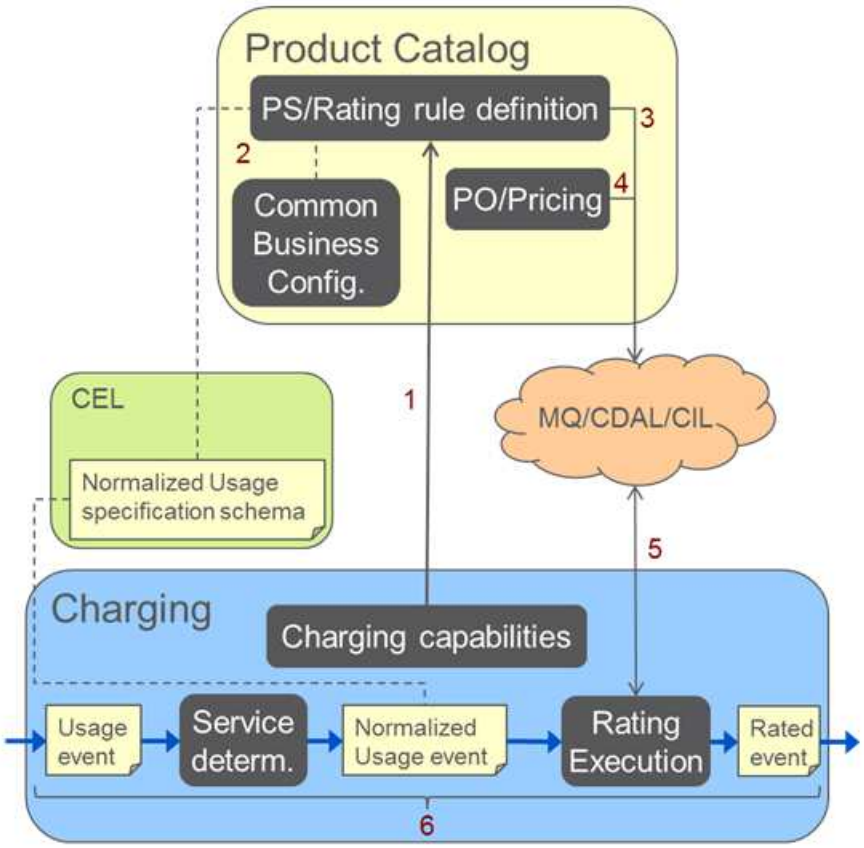
- string
- integer
- decimal
- date
- date time
- reference list (a global list or private enumeration)

Charging Function	Description
isServiceId	Matches the normalization usage specification service ID field. **Condition**
sendNotification	Sends notification to the user. **Action**
genericFunction	This is a generic function for testing. **Action**
eventTimeWithinDate	Checks if the event time is within a date. **Condition**
eventTimeWithinDayOfWeek	Checks if the event time is within a day of the week range. **Condition**
eventTimeWithinTimeInterval	Checks if the event time is within a time interval. **Condition**
notDates	Checks if the value is not a date value in the list of dates. **Condition**

3.15.2.3 Configuration of Rating Rules

ECM is responsible for the definition and configuration of rating logic and rules as it is related to product specifications. The execution of the rating logic is done by the charging component.

This diagram describes the interaction between the ECM and the charging component when defining the rating logic for a product specification and when specifying the price for a product offering:



1. ECM fetches the charging capabilities, the functions exposed and supported by the charging component. These functions are used for different purposes such as the selection of customer facing services, the matching of tariff types and tariff elements, threshold actions, rating functions (linear or tiered).
2. ECM creates the price logic algorithm specification containing the rating rules to be used for the product. The rules reference functions exposed by the charging component, parameters from the normalized usage specification and tariff elements created in ECM to distinguish usage charge relevant aspects like tariff time and zone. Price parameters are set in the product offering selected.
3. ECM creates a product specification and links the rating rules (price logic algorithm specification) to be used for product usage charging. Only those price logic algorithms correspond to the .resource facing service can be linked to the product specification (for example, from the unit of measure and from the charging capabilities). The complete product specification is then published.
4. ECM creates the product offering and sets the relevant price parameters. The product offering is then published.

5. The charging component uses the product specification, the product offering and the tariff elements to construct the rating rule logic to be executed.
6. The charging component executes the actual rating rules applied on the usage events that are received for a subscriber that has bought the corresponding product.

3.15.2.4 Normalized Usage Specification

The price logic algorithm specification, as SID defines it, is related to the usage specification. The rating function converts a chargeable quantity having a certain unit of measurement, for example, duration [seconds], data volume [byte], net charge [$] into a monetary amount (€). This means that the input for the rating function is coming from the usage event, which is specified through the usage specification.

This is not only true for the rating function, but it is also true for several tariff elements such as the call timestamp which is used to calculate the tariff time or determine the call origin and dialled number to derive the tariff zone.

There is one normalized usage specification that is an internal representation of usage events coming from different external sources. ECM and the charging component must be aware of those fields in the normalized usage specification. ECM setups the matrix and the rating functions and the charging component accesses the right attributes from the usage event.

The Common Event Library supports all components by handling an Avro based schema that describes the structure of the common events, such as a usage event. This translates to the usage specification in SID. The charging component operates on this structure and ECM uses the common usage event definition to specify for the charging component which attributes to use for tariff element identification and the rating function application.

3.15.3 Charging by Tariff Zones

ECM provides the ability to configure usage prices dependent on a tariff zones.

Typically, a subscriber pays different usage charges depending on where caller is located and to what destination the call is made. The charge also depends on the product used as there are different charges for voice, SMS, MMS and data services. Finally, a usage charge also depends on whether the service event is originated or terminated traffic. That is, receiving a voice call, SMS or MMS has a different cost than initiating these events.

ECM provides the configuration of tariff zone specifications using the generic tariff element model. See **Generic Tariff Elements** section.

ECM supports elements of the data types needed for the destination lists and origin lists. These lists can be fetched by Charging using PSCM CDAL.

Tariff zone tariff types are listed as follows:

- tariff zone origin
- tariff zone destination
- tariff zone

Tariff zone functions linked to tariff zone origin and tariff zone destination are listed as follows:

- E164DestinationInListBestMatch
- E164OriginInListBestMatch

For tariff zone, the following tariff elements can be constructed:

- tariff zone origin specification (generic way)
- tariff zone destination spec (generic way)
- tariff zone origin element (generic GUI)
- tariff zone destination element (generic GUI)
- tariff zone group
- use tariff zone in price logic algorithm

Global lists are referenced for tariff zone origin and tariff zone destination.

For more information on how to configure tariff elements and tariff zones, refer to **Operation and Maintenance > Business Configuration > Tariff Elements**.

A tariff zone consists of:

- Name, ID, External ID, Description, Version
- Priority
- Reference to origin list and version (reference is conditional)
- Reference to destination list and version (reference is conditional)

A tariff zone contains an origin list is given or a destination list or both.

A composite tariff zone consists of:

- Name, ID, External ID, Description, Version
- References to composite tariff zones
- References to tariff zones

3.15.3.1 Origin and Destination Dependent Charging

Origin and Destination Dependent Charging

In the case of voice services like telephony, SMS and MMS, operators typically charge depending on the origin and destination and they also distinguish between originated and terminated scenarios.

Origin Dependent Charging

Origin dependent charging means different charges are applied depending on the region where the call or session originates.

The following have an impact on origin dependent charging:

- from a region in the home network
- multiple country HPMN

- national roaming
- international roaming
- from a special location such as a plane or a ship

Destination Dependent Charging

Destination dependent charging means the application of usage charges depends on the destination where a call, session or event has terminated.

In the case of voice, SMS, MMS and fax services the destination is typically a called E.164 phone number.

In the case of data services, the destination is typically an APN, forwarding the data traffic within the Internet, but it could also be URI, IPv4, IPv6 or Email addresses.

Thus, depending on the service used different types of resources must be supported. For the purpose of flexibility, it is possible to support all resource types within the destination configuration, that is, to support all available numbering schemes.

The following have an impact on destination dependent charging:

- home terminated call (on-net)
- national mobile terminated call
- national PSTN terminated call
- international mobile terminated call
- international PSTN terminated call
- call to special number
  - emergency call
  - mailbox
  - service number (value added services)
  - free phone number
  - service number with fixed tariffs
  - service number with open tariffs
  - Virtual Private Network (VPN)
  - international networks and satellite network
  - per call - subscriber dials a specific prefix
  - global lists
  - personalized lists like friends and family

3.15.3.2 Origin and Destination List Definitions

The following is a definition of a destination list:

- Name, ID, External ID, Description, Version
- Numbering Scheme ("match required" option is configurable)
- List Elements
- Reference to normalized usage specification field
- Reference to Comparison Function (for example, `BestMatch`)
- Optional
  - References to global lists, priority
  - Reference to special functions (for example, `IsHomeTerminated`, `isMailbox`), priority

3.15.3.3 Originating and Terminating Traffic

Originating Traffic

The price lists of many operators are in the form of matrixes, on one axis the (grouped) origins and on the other the (grouped) destinations. Different prices are listed per cell depending on the service (product) used. To meet this requirement, the zone definition is able to combine origin and destinations.

Additionally, as can be seen from most price lists, there is a requirement to group which is covered by the composition of tariff zones.

Terminating Traffic

Terminated traffic is mainly related to traditional circuit switched services like voice, SMS, Fax, MMS (although these service can be served via IP protocol, as well). However, data services are typically charged per volume and not taken into account how the connection was established.

Terminating traffic is either:

- Free of charge (when residing in the HPMN)
- Charged for the forwarding leg abroad
- Charged for termination leg within the HPMN

3.15.3.4 Common Business Configuration

Area	Name	Explanation
Numbering Scheme	E.164/X.213	Numbering scheme for telephone numbers. Can be used for MSRN, MSC, S/GGSN, PSTN/ISDN and Location number as well.
	IMSI	Numbering scheme for International Mobile Subscriber Identity. Can be also used to identify PLMN and PLMN owned nodes.
	IPv4	Numbering scheme for IPv4 numbers
	IPv6	Numbering scheme for IPv6 numbers
	CGI	Numbering scheme for Cell Global Identity (MCC_MNC_LAC_CI)
	APN	Numbering scheme for Access Point Name
	NAI	Numbering scheme for Network Access Identifier as needed for IMS.
	SIP URI	Public User Identity for SIP services
Countries	IAC	International Access codes per Country
	CC	Country Code per Country
	MCC	Mobile Country Code per Country
Network	NDC	National Destination Code per network

Area	Name	Explanation
	MNC	Mobile National Code per network
Home Network	MSC	List of Mobile Switching Centers
	SGSN	List of Serving GPRS Support Nodes
	GGSN	List of Gateway GPRS Support Nodes
	HLR/HSS	List of Home Location Registers/Home Subscriber Servers
	LAC	List of Home Location Codes

3.15.3.5 Domestic Roaming

Domestic roaming means that a subscriber is using the network of another operator within the country of the home network. Typically, the other operator sends location information to the home operator identified by MNCs (Mobile Network Codes).

The charging component exposes a function `isCGIinList(listref)`that ECM can use in the configuration of tariff elements. The tariff elements are then used by the charging component to be able to charge differently based on the location of a caller. This function may, for example, reference two global lists stored in COBA.

Example of Global Lists for Home and Roaming Network

Global List	Description
ownCgis	This list contains mobile global IDs for the home (own) network.
domesticRoamingCgis	This list contains mobile global IDs for the roaming partners in the home (own) country.

The mobile global IDs are expressed in `MCC-MNC-LAC-CI` format where the `MNC`, `LAC` and `CI` are optional parts. For example, only `MCC-MNC` may be required for domestic roaming purposes.

In the configuration of the tariff element, the function call `isCGIinList(domesticRoamingCGIs)` is used for the domestic roaming case and `isCGIinList(ownCgis)` for the own home network case.

Future: The charging component will expose more functions to handle different tariffs based on the destination of the call.

Sample Lists

These lists contain only 3 digit MNCs, but may also contain 2 digit MNCs.

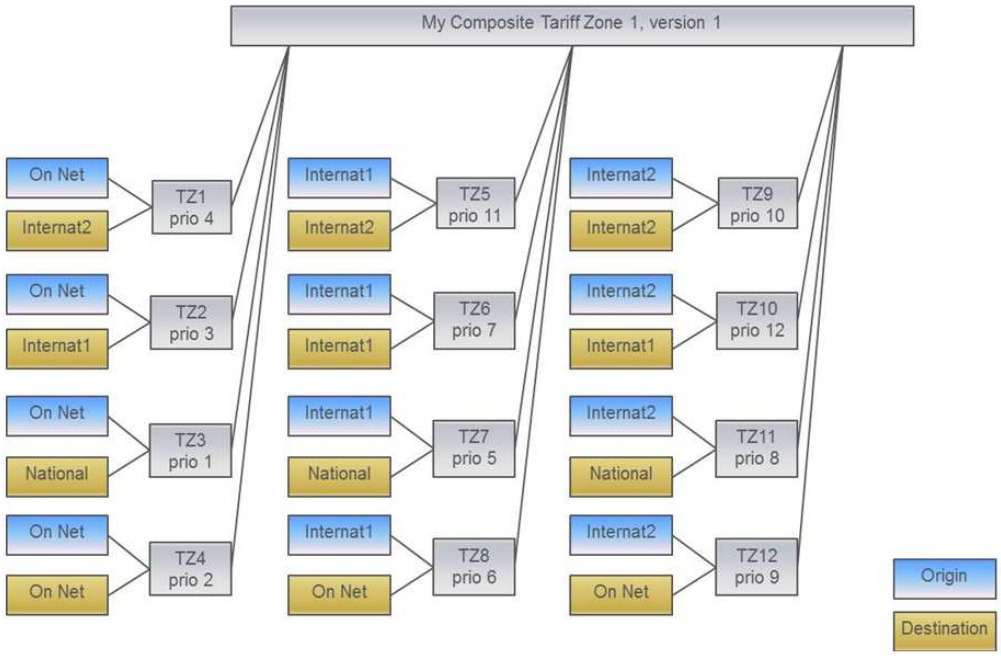
Lable = OwnCgis Template ID = E164Number	**Label = DomesticRoamingCgis Template ID = E164Number**
310-031 310-220 310-270 310-210 310-260 310-200 310-250 310-160 310-240 310-660 310-230 310-300 310-280 310-330 310-800 310-310	310-002 312-190 311-880 311-870 311-490 310-120 316-010

3.15.3.6 Example of Composite Tariff Zone

This example depicts a composite tariff zone configuration where 12 different tariff zones are distinguished resulting in different usage charges.

Note that the priority given in this example is organized accordingly to the anticipated probability of tariff zone hits. However, since a hit in a tariff zone means a match for the exit criteria of the algorithm, the priority must ensure that the most relevant tariff zones are evaluated first, for example, emergency numbers.

... To be replaced by Visio graphic ...



Origins

There are three different tariff elements at the lowest level for origins:

- `On Net`
- `Internat1`
- `Internat2`

Each of these origins have a dedicated list that defines the list of location identifiers (MCC_MNC_...) that should match to classify the origin to be of a certain type.

Destinations

There are four different tariff elements at the lowest level for destinations:

- `On Net`
- `National`
- `Internat1`
- `Internat2`

Each of these destinations have a dedicated list that defines the list of destination numbers (CC_NDC_...) that should match to classify the destination to be of a certain type.

The following atomic tariff elements (aliases for the function evaluations) can be assigned:

```
O r i g i n O n N e t                    =
originLocationInListBestMatch(origOnNetListRef)
O r i g i n I n t e r n a t 1             =
```

```
originLocationInListBestMatch(origInternat1ListRef)
O r i g i n I n t e r n a t 2                =
originLocationInListBestMatch(origInternat2ListRef)
```

```
DestOnNet = destinationInListBestMatch(destOnNetListRef)
D e s t N a t i o n a l                      =
destinationInListBestMatch(destNationalListRef)
D e s t I n t e r n a t 1                    =
destinationInListBestMatch(destInternat1ListRef)
D e s t I n t e r n a t 2                    =
destinationInListBestMatch(destInternat2ListRef)
```

To be able to build the tariff zone level it is necessary to extend the generic tariff element concept. It is also necessary to be able to build a new atomic tariff element using a logical AND expression containing other atomic tariff elements. This would mean:

```
TZ1 = OriginOnNet AND DestInternat2
TZ2 = OriginOnNet AND DestInternat1
TZ3 = OriginOnNet AND DestNational
TZ4 = OriginOnNet AND DestOnNet
TZ5 = OriginInternat1 AND DestInternat2
TZ6 = OriginInternat1 AND DestInternat1
TZ7 = OriginInternat1 AND DestNational
TZ8 = OriginInternat1 AND DestOnNet
TZ9 = OriginInternat2 AND DestInternat2
TZ10 = OriginInternat2 AND DestInternat1T
Z11 = OriginInternat2 AND DestNational
TZ12 = OriginInternat2 AND DestOnNet
```

Then, build the composite tariff zone which is just a grouping of the different atomic tariff zones TZ1, TZ2, etc.

```
MyCompositeTariffZone1 = {TZ1, TZ2, TZ3, TZ4, TZ5, TZ6,
TZ7, TZ8, TZ9, TZ10, TZ11, TZ12}
```

Now MyCompositeTariffZone1 can be used in the price logic algorithm specification.

Alternative

An alternative to composing the tariff zones as described above could be to introduce two different composite tariff elements, one for destinations and another one for origins. Then the combinations of these are defined in the price logic algorithm specification. This would require two columns in the price logic algorithm specification instead of one. Below is an example how those composite tariff elements could look like:

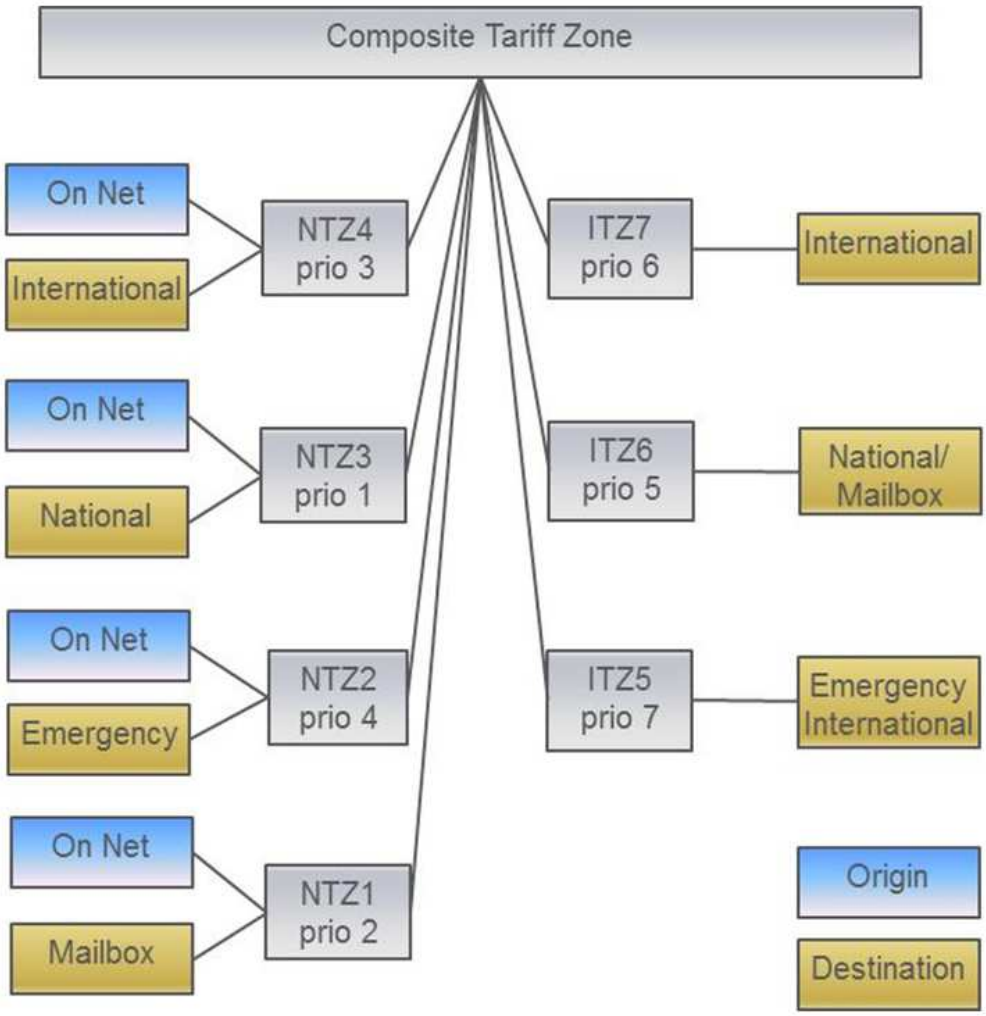
```
Destination = {DestInternat2, DestInternat1, DestNational,
DestOnNet}Origin    =    {OriginOnNet,    OriginInternat1,
OriginInternat2}
```

3.15.3.7 Example of Composite Tariff Zone with Special Zones

In this example, only On Net origin lists (national) exist.

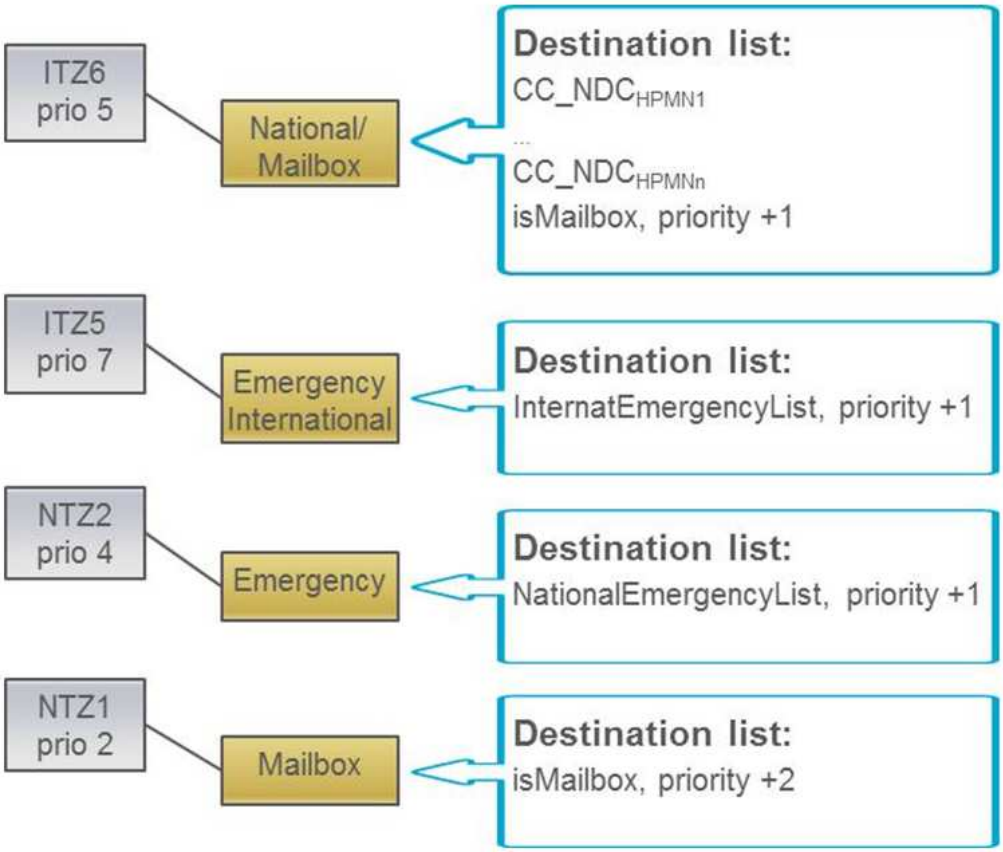
Note:
The reason that no origin lists are needed for the tariff zones that are meant for roaming abroad (ITZ5-7) is that zones NTZ1- 4 cover the national scenarios completely and have higher priority in the execution order. This means, if zone NTZ1-4 do not match, then it must have been an international roaming scenario.

... To be replaced by Visio graphic ...



It is assumed that global lists exist for the national emergency and for the international emergency numbers. Furthermore, it is assumed that the charging component offers the capabilities to check for calls to the mailbox:

... To be replaced by Visio graphic ...



Note:
The special zones in this example consists mainly of references, either to global emergency number lists or to charging capabilities like checking for calls to the own mailbox.

4 Interfaces and Services

In the design-time environment, ECM provides the GUI to configure product specifications and entities. These configurations are published by ECM to a run-time environment. ECM uses interfaces to retrieve information from other components and external systems. ECM also provides interfaces to allow other components to retrieve data from ECM.

The interfaces provided by ECM are modelled according to the following logic:

- Functions
  The functionality that ECM provides is structured according to logical groups that are derived from the business logic. These logical groups are referred to as **functions**.
- Services
  Each function is exposed as a **service** (or public application service). This service is the functionality or behavior of the component that is visible outside of the component, both to other components and to external systems.
- Interfaces (on page 147)
  The services of a function are made available through a set of **interfaces**. These interfaces are available for integration to both, other components and external systems.

All interfaces (APIs), whether they are used in design-time or run-time catalog environment, use the REST style and format. All APIs follow these rules:

- Accept a list of product identifiers.
- Accept a single product identifier.
- Accept simple filter criteria and return one product identifier or a list of product identifiers.
- Accept complex filter criteria and return one product identifier or a list of product identifiers.
- Return error if no results are found for a given input criteria.

4.1 Interfaces

4.1.1 RESTful Web Services

Web services are used to integrate internal applications with each other or with external systems. RESTful Web services are based on the concept of resources: each data record is accessible as a resource, through which it can be created, read, or written. Each resource is identified by a uniform resource identifier (URI).

The message body containing the request and its parameters is encoded in the JSON format.

REST Syntax

The URL consists of the follow components:

```
http://<DOMAIN>:<PORT>/<PAC>/<URI>/<ID>?<PARAMETERS>
```

where

- **<DOMAIN>** is the web domain or IP address.
- **<PORT>** is the port number of the server (8080).
- **<PAC>** is the software component name (for example, `cwf/ECM`).
- **<URI>** is the path name of resource (entity) in the model (for example, `/..
  ./productoffering`).
- **<ID>** is the unique identifier of the resource (entity) (for example, `/PO1`).
- **?** is the separator from the URL definition and input to system.
- **<PARAMETERS>** are given as input to the interface and are used to filter the results. Different parameters are separated by an ampersand **(&)**.

Examples

The following is a request for all product offerings:

```
GET http://localhost:8080/cwf/ecm/productOffering/
```

The following is a request for all customer facing service specifications:

```
GET http://localhost:8080/cwf/ecm/customerFacingServiceSpecification
```

The following is a request for a customer facing service specifications by ID:

```
GET
http://localhost:8080/cwf/ecm/customerFacingServiceSpecification/OfflineVoiceCFSS
```

Methods

Each catalog item interface will support the GET operation.

Note:
Other operations such as PUT, POST, DELETE and PATCH are also described in this table.

Method	Description
GET	Read request for a data representation of the specified resource or collection. Response will return all resource(s) data values. There is no effect on the data.
PUT	Used to add a new resource, or FULL replacement update request for existing resources; where full replacement for existing resource is applied against project, by clearing any existing project changes to resource and adding requested changes in project. For update, any values not set in request that exist in current "Active" version are removed/discontinued by end-dating them. This is useful to create a resource, or update all existing resource values, or removing characteristics/associations. **Note:** PUT cannot be used to update resources in another project.
POST	Used to add a new resource, or PARTIAL replacement update request for existing resource; where partial replacement for existing resource is first applied against project “Definition” version, if it exists, otherwise against

Method	Description
	“Active” resource from previously activated project(s). This is useful to create a resource, or update an existing resource values, or appending subordinate data to resource, or update action. This is not useful for removing subordinate data such as characteristics/associations/attachments. **Note:** POST cannot be used to update resources in another project.
PATCH	Used to apply PARTIAL modifications to a resource. Modify version request on existing resource by FULL replacement of resources version, or subordinate component; where full replacement for existing resource is applied against project, by clearing any existing project changes to resource version and adding requested changes in project. Any values not set in request that exist in current "Active" version are to be removed/discontinued by end-dating them. The dates of the version must be an exact match. This is useful to update all existing resource values, or removing characteristics/associations.
DELETE	Used to remove specified resource.

All data is exchanged using the Avro data structure definition for the item.
All Items are identified by their URI.

Operation	SQL	HTTP
Read	Select	GET
Create	Insert	PUT / POST
Update	Update	PUT / POST / PATCH
Delete	Delete	DELETE

Header

The header contains the interface version information to be used. It not specified, the latest version is used.

Response Codes

ECM REST API uses the standard HTTP response/status/error codes:

Response Codes Table

Response Codes	Description	POST	GET	PUT	DELETE	PATCH
200	“OK” - The request has succeeded. Header Notes: None Body Notes: The requested resource will be returned in the body.	X	X	X		X
201	“Created” - The request has created a new resource. Header Notes: The `Location` header contains	X				

Response Codes	Description	POST	GET	PUT	DELETE	PATCH
	the URI of the newly created resource. Body Notes: The response returns an entity describing the newly created resource.					
204	“No Content” - The request succeeded, but there is no data to return. Header Notes: None Body Notes: No body is allowed.	X		X	X	X
301	“Moved Permanently” - The requested resource has moved permanently. Header Notes: The `Location` header contains the URI of the new location. Body Notes: The body may contain the new resource location.		X			
302	“Found” - The requested resource should be accessed through this location, but the resource actually lives at another location. This is typically used to set up an alias. Header Notes: The `Location` header contains the URI of the resource. Body Notes: The body may contain the new resource location.		X			
400	“Bad Request” - The request was badly formed. This is commonly used for creating or updating a resource, but the data was incomplete or incorrect. Header Notes: The Reason-Phrase sent with the HTTP status header may contain information on the error. Body Notes: The response may contain more information of the underlying error that occurred in addition to the Reason- Phrase.	X	X	X	X	X
401	“Unauthorized” - The request requires user authentication to access this resource. If the request contains invalid authentication data, this code is sent. Header Notes: At least one authentication mechanism is specified in the WWW-Authenticate header. The Reason-Phrase sent with the HTTP status header may contain information on the error. Body Notes: The response may contain more information of the underlying error that occurred in addition to the Reason- Phrase.	X	X	X	X	X

Response Codes	Description	POST	GET	PUT	DELETE	PATCH
403	“Forbidden” - The request is not allowed because the server is refusing to fill the request. A common reason for this is that the resource does not support the requested functionality. Header Notes: The Reason-Phrase sent with the HTTP status header may contain information on the error. Body Notes: The response may contain more information of the underlying error that occurred in addition to the Reason- Phrase.	X	X	X	X	X
404	“Not Found” - The requested resource does not exist. Header Notes: None Body Notes: None	X	X	X	X	X
405	“Method Not Allowed” – The request used an HTTP method that is not supported for the resource because the API specification does not allow this method. If the resource does not support the functionality but it is a valid API operation, then a 403 is returned. Header Notes: The `Allow` header lists the supported HTTP methods for this resource. Body Notes: None	X	X	X	X	X
406	“Not acceptable” - The server does not support the content representation delivered in the accept header of the request. Header Notes: None Body Notes: None	X	X	X		X
409	“Conflict” - For example, if concurrent update is made on the resource. Header Notes: None Body Notes: None	X		X	X	X
412	“Precondition failed” - If evaluation of some header fields failed, like Etag. Header Notes: None Body Notes: None	X		X		X
415	“Unsupported Media Type” - If the representation of request’s data is not supported. Header Notes: None Body Notes: None	X		X		X
500	“Internal Server Error” - An internal server error has occurred.	X	X	X	X	X

Response Codes	Description	POST	GET	PUT	DELETE	PATCH
	Header Notes: None Body Notes: None					
503	"Service Unavailable" – The HTTP server is up, but the REST service is not available. Typically this is caused by server overloading. Header Notes: The Retry-After header Body Notes: None	X	X	X	X	X

Input Parameters

The various input parameter actions can be combined) using the ampersand "&". The resulting response output will be intersection of the functionality.

Example of input parameters:

```
/productoffering/RequestResponse/PO1?field=Associations,Name&_expand=POPrice,ProductSpecification
```

Search Filters

Search filtering is supported on the read (GET) operation. To filter the results use the parameters `<field name>=<value>` with comma separator between field names. The field will always using the `AND` condition to perform search.

The filters can only be used on the entity level.

Example of search filter:

```
/productoffering?name=PO1,type=Plan
```

Expand Associations

For the read and search operations (GET), the child links/relationships (associations) can be expanded to show entity details instead of a link reference. The `expand` option when set to `true` expands all relationships regardless of the child specification type and when set to a `specification type name` expands only for that type of child specification.

Examples of expand:

```
/productoffering/PO1?expand=ProductSpecification

/productoffering/PO1?expand=true
```

Change Control Project

The change control project is used by all methods to view and make changes to catalog definitions. The `project` parameter must be passed in to all PUT, POST, PATCH methods and the change included in the request will be made in and controlled by project. The `project` parameter is optional for the GET method. If the `project` parameter is used the "Definition" version of resources are returned.

Examples of project parameter:

```
/productoffering/PO1?project=PAYG
```

Note: Without the project parameter, the GET will only return "Active" resources.

4.1.1.1 Product Offering

REST API Service

ProductOffering

URI

```
ecm.ProductDomain.ProductOfferingABE.ProductOffering
```

REST Example

```
http://localhost:8080/cwf/ecm/productOffering
```

Avro Schema

Product Offering

```
{
  "namespace" :
"com.ericsson.bss.conceptwave.ecm.ProductDomain.ProductOfferingABE",
ecm  "type" : "record",
  "name" : "ProductOffering",
  "fields" : [
    { "name" : "id",
      "type" : "string" },
    { "name" : "versions",
      "type" : [
        "null",
        { "type" : "array",
          "items" : [
"null","com.ericsson.bss.conceptwave.ecm.ProductDomain.ProductOfferingABE.ProductOfferingVersion"
 ] }
ecm      ]
    }
  ]
}
```

ProductOfferingVersion

```
{
  "namespace" :
"com.ericsson.bss.conceptwave.ecm.ProductDomain.ProductOfferingABE",ecm  "type"
: "record",
  "name" : "ProductOfferingVersion",
  "fields" : [
    { "name" : "id",
      "type" : "string" },
    { "name" : "externalIdentifiers",
      "type" : [
        "null",
        { "type" : "array",
          "items" : [
"null","com.ericsson.bss.conceptwave.ecm.CommonBusinessEntitiesDomain.DataTypes.externalIdentifier"
 ] }
ecm
      ]
    },
    { "name" : "name",
      "type" : [ "null", "string"] },
    { "name" : "description",
      "type" : [ "null", "string"] },
    { "name" : "state",
      "type" : [ "null", "string"] },
```

```
    { "name" : "version",
      "type" : "string" },
    { "name" : "validFor",
      "type" : [ "null",
"com.ericsson.bss.conceptwave.ecm.CommonBusinessEntitiesDomain.DataTypes.TimePeriod"]
 },
    { "name" : "sellFor",
      "type" : [ "null", "
"com.ericsson.bss.conceptwave.ecm.CommonBusinessEntitiesDomain.DataTypes.TimePeriod"]
 },
    { "name" : "specificationType",
      "type" : [ "null", "string"] },
    { "name" : "specificationSubtype",
      "type" : [ "null", "string"] },
    { "name" : "family",
      "type" : [ "null", "string"] },
    { "name" : "category",
      "type" : [ "null", "string"] },
    { "name" : "sellIndicator",
      "type" : [ "null", "boolean"] },
    { "name" : "shared",
      "type" : [ "null", "boolean"] },
    { "name" : "Characteristics",
      "type" : [
        "null",
        { "type" : "array",
          "items" : [ "null","
com.ericsson.bss.conceptwave.ecm.CommonBusinessEntitiesDomain.RootBusinessEntitiesABE.CharacteristicABE.CharacteristicValue"
 ] }
      ]
    },
    { "name" : "Associations",
      "type" : [
        "null",
        { "type" : "array",
          "items" : [ "null","
com.ericsson.bss.conceptwave.ecm.CommonBusinessEntitiesDomain.RootBusinessEntitiesABE.AssociationABE.Association"
 ] }
      ]
    },
    { "name" : "documents",
      "type" : [
        "null",
        { "type" : "array",
          "items" : [ "null","
com.ericsson.bss.conceptwave.ecm.CommonBusinessEntitiesDomain.DataTypes.SpecificationAttachment"
 ] }
      ]
    },
    { "name" : "media",
      "type" : [
        "null",
        { "type" : "array",
          "items" : [ "null","
com.ericsson.bss.conceptwave.ecm.CommonBusinessEntitiesDomain.DataTypes.SpecificationImage"
 ] }
      ]
    },
    { "name" : "productOfferingPrices",
      "type" : [
        "null",
        { "type" : "array",
```

```
          "items" : [ "null","string" ] }
      ]
    }
  ]
}
```

Path Parameters

Parameter	Description
Id	The Id, for example PO-ServiceLine

JSON Parameters

Parameter	Mandatory/ Optional	Type	Length	Query	Description
Id	Mandatory	String		X	A unique identification of the product offering **RULE…..**
externalIdentifiers	Optional	Array(externalIdentifiers)			3rd party reference that corresponds to Id.
name	Mandatory	Array		X	The name of the product offering
description	Mandatory	String		X	A description of the product offering
state	Optional	String(enum)			The status of the product offering in product lifecycle of the catalog project
version	Optional	String		X	A String the represents a particular form or variant of the entity, usual the date of the variant.

Parameter	Mandatory/ Optional	Type	Length	Query	Description
validFor	Mandatory	TimePeriod		X	The effective peroid for which the version is producing the wanted result.
...tbd ... sellFor	Mandatory	TimePeriod		X	The Peroid for which the version is keep or offered for sale.
specification-Type	Optional	String (Enum)		X	Reflecting or typifying a certain line of Product
specification-Subtype	Optional	String (Enum)		X	Subdividing the typified product type in more sub classifications
family	Optional	String (Enum)		X	The parent of a group of related things which the entity is categorized with - typically family is aligned to business unit. Mobile, fix-line, etc.
category	Optional	String (Enum)		X	The a division of Product Offering by selling classification. Sale, Service, Rental, Lease
sellIndicator	Optional	Boolean		X	Indicator used by selling system, or sales-

Parameter	Mandatory/ Optional	Type	Length	Query	Description
					person to say if Product Offering can be used stand alone or not.
shared	Optional	Boolean		X	Indicator used by Product Model to says if the entity can be shared by other entities
Characteristics	Optional	Array (CharacteristicValue)		X	A list of distinguishing features or quality that as a whole describes the entity
Associations	Mandatory	Array (Association)			The connection or relation between 2 entities and type that describes that relationship. Possible: Product Offering, Product Specification, Rule: Must have 1 and only 1 PS association
Documents	Optional	Array (Attachment)			Attachments that used for support the product such as installation instructions, legal notes, user guides, etc.

Parameter	Mandatory/ Optional	Type	Length	Query	Description
Media	Optional	Array (Image)			Attachments such as images and videos that are used to product pictures, brand, advertise, promote, partner a Product Offering
productOfferingPrices	Optional	Array (ProductOfferPrices)			The list of prices that apply to the Product Offering
productCategories	Optional	Array			The reference to the Product Catalog Hierarchy

The following requests regarding product offerings are available:

4.1.1.1.1 Read: GET /ProductOffering

Returns product offering data.

JSON Example 1

Get all product offerings.

```
GET http://localhost:8080/cwf/ecm/productOffering
```

Request

```
... tbd
```

Response

```
... tbd
```

JSON Example 2

Get the Pay As You Go product offering.

GET http://localhost:8080/cwf/ecm/productOffering/PAYG

```
{
    "ResponseProductOffering":
    {
        "results":
        [
```

```
{
    "id": "PAYG",
    "versions":
    [
        {
            "id": "PAYG",
            "name": "Pay As You Go Talk Plan",
            "description": "Voice and Texting on per usage pricing",

            "state": "DEF",
            "version": "1",
            "validFor":
            {
                "startDateTime": "2014-05-16T04:00:00.000Z"
            },
            "sellFor":
            {
            },
            "specificationType": "ProductOffering",
            "specificationSubtype": "Plan",
            "family": "Mobile",
            "category": "Service",
            "sellIndicator": true,
            "shared": false,
            "Characteristics":
            [
                {
                    "id": "CW_SPECTYPE",
                    "validFor":
                    {
                    },
                    "value": "type_ProductOffering"
                },
                {
                    "id": "CW_MDTYPE",
                    "validFor":
                    {
                    },
                    "value": "ecm.data.ProductOffering"
                },
                {
                    "id": "CW_DISABLEPUBLISH",
                    "validFor":
                    {
                    },
                    "value": "0"
                },
                {
                    "id": "CW_IMPLICITCREATE",
                    "validFor":
                    {
                    },
                    "value": "1"
                },
                {
                    "id": "CW_URI",
                    "validFor":
                    {
                    },
                    "value": "ecm/productoffering/"
                }
            ],
```

```
                        "Associations":
                        [
                            {
                                "validFor":
                                {
                                },
                                "targetSpecificationId": "BundlePS",
                              "targetSpecificationType": "ProductSpecification",

                                "associationType": "contains"
                            },
                            {
                                "validFor":
                                {
                                },
                                "targetSpecificationId": "SMSPO",
                                "targetSpecificationType": "ProductOffering",
                                "associationType": "contains"
                            },
                            {
                                "validFor":
                                {
                                },
                                "targetSpecificationId": "VoicePO",
                                "targetSpecificationType": "ProductOffering",
                                "associationType": "contains"
                            },
                            {
                                "validFor":
                                {
                                },
                                "targetSpecificationId": "pps_PAYG",
                                "associationType": "priority"
                            }
                        ]
                    }
                ]
            }
        ]
    }
}
```

JSON Example 3

Get the Pay As You Go product offering expanding the product specification.

GET http://localhost:8080/cwf/api/services-IProductOffering/PAYG/?expand=ProductSpecification,ProductOffering

```
{
    "ResponseProductOffering":
    {
        "results":
        [
            {
                "id": "PAYG",
                "versions":
                [
                    {
                        "id": "PAYG",
                        "externalIdentifiers":
                        {
                        },
```

```
"name": "Pay As You Go Talk Plan",
"description": "Voice and Texting on per usage pricing",

"state": "DEF",
"version": "1",
"validFor":
{
    "startDateTime": "2014-05-16T04:00:00.000Z"
},
"sellFor":
{
},
"specificationType": "ProductOffering",
"specificationSubtype": "Plan",
"family": "Mobile",
"category": "Service",
"sellIndicator": true,
"shared": false,
"Characteristics":
[
    {
        "id": "CW_SPECTYPE",
        "validFor":
        {
        },
        "value": "type_ProductOffering"
    },
    {
        "id": "CW_MDTYPE",
        "validFor":
        {
        },
        "value": "ecm.data.ProductOffering"
    },
    {
        "id": "CW_DISABLEPUBLISH",
        "validFor":
        {
        },
        "value": "0"
    },
    {
        "id": "CW_IMPLICITCREATE",
        "validFor":
        {
        },
        "value": "1"
    },
    {
        "id": "CW_URI",
        "validFor":
        {
        },
        "value": "ecm/productoffering/"
    }
],
"Associations":
[
    {
        "productNumber": "BundlePS",
        "versions":
        [
```

```
                                    {
                                        "productNumber": "BundlePS",
                                        "externalIdentifiers":
                                        {
                                        },
                                        "name": "Bundle",
                                        "description": "Bundle",
                                        "state": "DEF",
                                        "version": "1",
                                        "validFor":
                                        {
                                            "startDateTime":
"2014-05-16T04:00:00.000Z"
                                        },
                                        "specificationType":
"ProductSpecification",
                                        "specificationSubtype": "Plan",
                                        "family": "Mobile",
                                        "category": "Service",
                                        "tariffTimeTimeZoneType": "CTZ",
                                        "Characteristics":
                                        {
                                        },
                                        "Associations":
                                        [
                                            {
                                                "validFor":
                                                {
                                                },
                                                "targetSpecificationId":
"pps_BundlePS",
                                                "associationType": "priority",
                                                "Characteristics":
                                                {
                                                }
                                            }
                                        ],
                                        "documents":
                                        {
                                        },
                                        "media":
                                        {
                                        }
                                    }
                                ]
                            },
                            {
                                "id": "SMSPO",
                                "versions":
                                [
                                    {
                                        "id": "SMSPO",
                                        "externalIdentifiers":
                                        {
                                        },
                                        "name": "Pay-As-You-Go SMS",
                                        "description": "Pay for SMS as you use
them for",
                                        "state": "DEF",
                                        "version": "1",
                                        "validFor":
                                        {
```

```
                                    "startDateTime":
"2014-05-16T04:00:00.000Z"
                                },
                                "sellFor":
                                {
                                },
                                "specificationType": "ProductOffering",
                                "specificationSubtype": "Product",
                                "family": "Mobile",
                                "category": "Service",
                                "Characteristics":
                                [
                                    {
                                        "id": "CW_SPECTYPE",
                                        "validFor":
                                        {
                                        },
                                        "value": "type_ProductOffering"
                                    },
                                    {
                                        "id": "CW_MDTYPE",
                                        "validFor":
                                        {
                                        },
                                     "value": "ecm.data.ProductOffering"

                                    },
                                    {
                                        "id": "CW_DISABLEPUBLISH",
                                        "validFor":
                                        {
                                        },
                                        "value": "0"
                                    },
                                    {
                                        "id": "CW_IMPLICITCREATE",
                                        "validFor":
                                        {
                                        },
                                        "value": "1"
                                    },
                                    {
                                        "id": "CW_URI",
                                        "validFor":
                                        {
                                        },
                                        "value": "ecm/productoffering/"
                                    }
                                ],
                                "Associations":
                                [
                                    {
                                        "productNumber": "SMSPS",
                                        "versions":
                                        [
                                            {
                                               "productNumber": "SMSPS",

                                                "externalIdentifiers":
                                                {
                                                },
                                                "name": "SMS",
```


```
                                                    "state": "DEF",
                                                    "version": "1",
                                                    "validFor":
                                                    {
                                                        "startDateTime":
"2014-05-16T04:00:00.000Z"
                                                    },
                                                    "specificationType":
"ProductSpecification",
                                                    "specificationSubtype":
"Service",
                                                    "family": "Mobile",
                                                    "category": "Service",
                                                   "tariffTimeTimeZoneType":
 "CTZ",
                                                    "Characteristics":
                                                    {
                                                    },
                                                    "Associations":
                                                    [
                                                        {
                                                            "validFor":
                                                            {
                                                            },
"targetSpecificationId": "SMSCFS",
"targetSpecificationType": "CustomerFacingServiceSpec",
                                                              "associationType":
 "contains",
                                                              "Characteristics":
                                                                {
                                                                }
                                                        },
                                                        {
                                                            "validFor":
                                                            {
                                                            },
"targetSpecificationId": "SMSPAS",
"targetSpecificationType": "ProductAccountSpec",
                                                              "associationType":
 "contains",
                                                              "Characteristics":
                                                                {
                                                                }
                                                        },
                                                        {
                                                            "validFor":
                                                            {
                                                            },
"targetSpecificationId": "pps_SMSPS",
                                                              "associationType":
 "priority",
                                                              "Characteristics":
                                                                {
                                                                }
```

```
                                                                },
                                                                {
                                                                    "validFor":
                                                                    {
                                                                    },
"targetSpecificationId": "PhoneNumber",
"targetSpecificationType": "ResourceSpecification",
                                                                    "associationType":
 "requires",
                                                                    "Characteristics":
                                                                    {
                                                                    }
                                                                }
                                                            ],
                                                            "documents":
                                                            {
                                                            },
                                                            "media":
                                                            {
                                                            }
                                                        }
                                                    ]
                                                },
                                                {
                                                    "validFor":
                                                    {
                                                    },
                                                    "targetSpecificationId":
"pps_SMSPO",
                                                    "associationType": "priority"
                                                }
                                            ],
                                            "documents":
                                            {
                                            },
                                            "media":
                                            {
                                            },
                                            "productOfferingPrices":
                                            [
                                                {
                                                    "id": "SMSUsagePrice",
                                                    "versions":
                                                    [
                                                        {
                                                            "id": "SMSUsagePrice",
                                                            "externalIdentifiers":
                                                            {
                                                            },
                                                            "name": "SMSUsagePrice",
                                                            "state": "DEF",
                                                            "plaId": "PAYG SMS Usage
 Fee 1",
                                                            "version": "1",
                                                            "validFor":
                                                            {
                                                                "startDateTime":
"2014-05-16T04:00:00.000Z"
```

```
                                                    },
                                                    "prices":
                                                    {
                                                    },
                                                    "Characteristics":
                                                    {
                                                    },
                                                    "Associations":
                                                    {
                                                    },
                                                    "discountInformation":
                                                    {
                                                       "discountTargetType":

                                                        {
                                                        },

"discountSpecificTargets":
                                                        {
                                                        }
                                                    }
                                                }
                                            ]
                                        }
                                    ]
                                }
                            ]
                        },
                        {
                            "id": "VoicePO",
                            "versions":
                            [
                                {
                                    "id": "VoicePO",
                                    "externalIdentifiers":
                                    {
                                    },
                                    "name": "Pay As You Go Talk - Domestic",

                                    "description": "Pay for voice calls as
you make them.",
                                    "state": "DEF",
                                    "version": "1",
                                    "validFor":
                                    {
                                        "startDateTime":
"2014-05-16T04:00:00.000Z"
                                    },
                                    "sellFor":
                                    {
                                    },
                                    "specificationType": "ProductOffering",
                                    "specificationSubtype": "Product",
                                    "family": "Mobile",
                                    "category": "Service",
                                    "shared": false,
                                    "Characteristics":
                                    [
                                        {
                                            "id": "CW_SPECTYPE",
                                            "validFor":
                                            {
```

```
                    },
                    "value": "type_ProductOffering"
                },
                {
                    "id": "CW_MDTYPE",
                    "validFor":
                    {
                    },
                 "value": "ecm.data.ProductOffering"

                },
                {
                    "id": "CW_DISABLEPUBLISH",
                    "validFor":
                    {
                    },
                    "value": "0"
                },
                {
                    "id": "CW_IMPLICITCREATE",
                    "validFor":
                    {
                    },
                    "value": "1"
                },
                {
                    "id": "CW_URI",
                    "validFor":
                    {
                    },
                    "value": "ecm/productoffering/"
                }
            ],
            "Associations":
            [
                {
                    "productNumber": "VoicePS",
                    "versions":
                    [
                        {
                         "productNumber": "VoicePS",

                            "externalIdentifiers":
                            {
                            },
                           "name": "Strictly Voice",

                            "state": "DEF",
                            "version": "1",
                            "validFor":
                            {
                                "startDateTime":
"2014-05-16T04:00:00.000Z"

                            },
                            "specificationType":
"ProductSpecification",

                           "specificationSubtype":
"Service",

                            "family": "Mobile",
                            "category": "Service",
                          "tariffTimeTimeZoneType":

 "CTZ",
```

```
                                                                "Characteristics":
                                                                {
                                                                },
                                                                "Associations":
                                                                [
                                                                    {
                                                                        "validFor":
                                                                        {
                                                                        },
"targetSpecificationId": "OfflineVoiceCFS",

"targetSpecificationType": "CustomerFacingServiceSpec",
                                                                      "associationType":
 "contains",
                                                                      "Characteristics":

                                                                        {
                                                                        }
                                                                    },
                                                                    {
                                                                        "validFor":
                                                                        {
                                                                        },
"targetSpecificationId": "PhoneNumber",

"targetSpecificationType": "ResourceSpecification",
                                                                      "associationType":
 "contains",
                                                                      "Characteristics":

                                                                        {
                                                                        }
                                                                    },
                                                                    {
                                                                        "validFor":
                                                                        {
                                                                        },
"targetSpecificationId": "VoicePAS",

"targetSpecificationType": "ProductAccountSpec",
                                                                      "associationType":
 "contains",
                                                                      "Characteristics":

                                                                        {
                                                                        }
                                                                    },
                                                                    {
                                                                        "validFor":
                                                                        {
                                                                        },
"targetSpecificationId": "pps_VoicePS",
                                                                      "associationType":
 "priority",
                                                                      "Characteristics":

                                                                        {
                                                                        }
```


```
                                    }
                                ],
                                "documents":
                                {
                                },
                                "media":
                                {
                                }
                            }
                        ]
                    },
                    {
                        "validFor":
                        {
                        },
                        "targetSpecificationId":
"pps_VoicePO",
                        "associationType": "priority"
                    }
                ],
                "documents":
                {
                },
                "media":
                {
                },
                "productOfferingPrices":
                [
                    {
                        "id": "VoiceUsagePrice",
                        "versions":
                        [
                            {
                               "id": "VoiceUsagePrice",

                                "externalIdentifiers":
                                {
                                },
                              "name": "VoiceUsagePrice",

                                "state": "DEF",
                             "plaId": "PAYG Voice Usage
 Fee 1",
                                "version": "1",
                                "validFor":
                                {
                                    "startDateTime":
"2014-05-16T04:00:00.000Z"
                                },
                                "prices":
                                {
                                },
                                "Characteristics":
                                {
                                },
                                "Associations":
                                {
                                },
                                "discountInformation":
                                {
                                   "discountTargetType":
```

```
                                                                {
                                                                },

"discountSpecificTargets":
                                                                {
                                                                }
                                                            }
                                                        }
                                                    ]
                                                }
                                            ]
                                        }
                                    ]
                                },
                                {
                                    "validFor":
                                    {
                                    },
                                    "targetSpecificationId": "pps_PAYG",
                                    "associationType": "priority"
                                }
                            ],
                            "documents":
                            {
                            },
                            "media":
                            {
                            },
                            "productOfferingPrices":
                            {
                            }
                        }
                    ]
                }
            ]
        }
}
```

4.1.1.2 Product Category

4.1.1.3 Product Offering Price

4.1.1.4 Characteristic Specification

4.1.1.5 Product Specification

4.1.1.6 Customer Facing Service Specification

4.1.1.7 Resource Facing Service Specification

4.1.1.8 Resource Specification

4.1.1.9 Product Account Specification

4.1.1.10 Threshold

4.1.1.11 Business Interaction

4.1.1.12 Threshold Action

4.1.1.13 Recurrence Specification

4.1.1.14 Price Logic Algorithm

4.1.1.15 Tariff Element

4.1.1.16 Tariff Element Specification

4.1.1.17 Tariff Element Group

5 Glossary

Abbreviation / Term	Description
3PP	Third-Party Product
Adapter	A plug-in used as a communication link between a component and an external system. An adapter the logic to communicate and map data to a target system.
ABE	An Aggregate Business Entity that can be decomposed to other sub-entities.
API	Application Programming Interface
Attribute	A single parameter contained in an entity.
Barring Service	Barring services are the safest way to manage costs. Telecom operators provide a range of barring services, at least those defined by FICORA. These services allow you to prevent all calls or messages to certain types of numbers as well as the reception of calls and messages from these numbers.
BSS	Business Support Systems
Catalog Model	The catalog representation of a logical model. The catalog model has a 1-1 mapping to the logical model.
CDR	Charging Data Record
Characteristic Specification (CS)	The base from which characteristic entities are extended. The characteristic specification extends a specification.
CLI	Command Line Interface
CS	Circuit Switched
Consume	Use or execute a product in the context of rating and charging.
Customer Facing Service Specification (CFSS)	A specification type used to represent customer facing characteristics of a service specification.
ECM	Ericsson Catalog Manager is the marketed name of the Ericson application. This is the catalog employed to configure product domain business entity information. Two types of product catalogs are available: • Commercial product catalogs deal with commercial and financial specifications. • Technical product catalogs (also referred to as rule editors), deal with the technical specification of resources, services and products.
EDM	Event Data Management

Abbreviation / Term	Description
EMA	Ericsson Multi Activation
ERE	Ericsson Rating Engine
Event	A successful publication of any collection of objects in one project.
FPS	Fulfillment Plan Specification
Gy	The on-line charging interface between the GGSN and the online charging system (OCS)
GGSN	The gateway GPRS support node (GGSN) is a main component of the GPRS network. The GGSN is responsible for the internetworking between the GPRS network and external packet switched networks, like the Internet and X.25 networks.
GPRS	The GPRS core network is the central part of the general packet radio service (GPRS) which allows 2G, 3G and WCDMA mobile networks to transmit IP packets to external networks such as the Internet. The GPRS system is an integrated part of the GSM network switching subsystem.
IMS	IP Multimedia System
Logical Model	The entire model defined by grouping all specification types together, defined by ECM, used as a unified representation of specifications.
MMTel	Multi Media Telephony
MNP	Mobile Number Portability
NUS	Normalized Usage Specification
Order	An order is a commitment on the part of the customer to purchase products and services at a specific price. Orders can be generated from quotes or created directly by sales people, call center agents and sales administrators. Orders can be created and placed all at once, or developed in stages as the customer clarifies the configuration of the items, requests availability, payment information, shipping information, and other details. When the order is complete, the end user submits it.
Packet Switched (PS)	Packet Switched
Physical Model	Framework of database tables used to store the definitions like specification types and specification.
PLM	The Product Lifecycle Management provides a process to enable change requests for catalog items (specifications) to be processed into a live production environment.

Abbreviation / Term	Description
Product Offering (PO)	A specification type used to represent the overall sellable product. It represents tangible and intangible goods and services made available for a certain price to the market in the form of product catalogs. This ABE is also responsible for targeting market segments based on the appropriate market strategy.
Product Specification (PS)	A specification type used to represent the product definition and it characteristics. It defines the functionality and characteristics of product offerings made available to the market.
Project	A container facility used for change control of the specifications. A project allows the creation of brand new specifications or new versions of existing specifications. Examples of projects: • Add new product offering charges • Make corrections in a product offering • Create a new product offer or bundle • Create a holiday promotional offer
QoS	Quality of Service
Quote	A quote is an offer to a customer for specific products and services at a specific price. Quotes can be generated by end users such as call center agents, sales representatives and sales administrators. The quote may include products and services (configured to show the customer-selected attributes), effective dates, price lists, any discounts by line item and by account and the price per item.
Resource Facing Service Specification (RFSS)	A specification type used to represent resource facing characteristics of a service specification.
Resource Specification (RS)	A specification type used to represent an identifiable characteristic of the service that is required to support the service definition, for example, a serial number or phone number. The Resource Specification ABE contains entities that define the invariant characteristics and behavior of each type of resource entities. This enables multiple instances to be derived from a single specification entity.
SID Model	Shared Information Data Model
SUS	Service Usage Record Specification
REST	Representational State Transfer

Abbreviation / Term	Description
Relationship Type	A property of a relationship such as contains, optional or mandatory.
Service Specification	A specification type used to consolidate the customer facing and resource facing definition of a product. The service specification ABE contains entities that define the invariant characteristics and behavior of both types of service entities. This enables multiple instances to be derived from a single specification entity. In this derivation, each instance will use the invariant characteristics and behavior defined in its associated template. Entities in this ABE focus on adherence to standards, distinguishing features of a service, dependencies (both physical and logical, as well as on other services), quality, and cost. In general, entities in this ABE enable services to be bound to Products and run using Resources.
SID	Shared Information/Data Model or SID is a unified reference data model providing a single set of terms for business objects in telecommunications.
Specification	The base from which entities are extended. Any object created by the service provider and persists in the catalog. It uses specification type as a foundation and it is the master service object used as a common source for data by external systems.
Specification Base	Defined in the catalog providing the base definition of an entity which includes a list of attributes and default values. Each specification base will have at least one specification type.
Specification Type	Defined in the catalog providing the base definition of an entity which includes a list of attributes, default values, rules and relationships. Each entity is described by a specification type in the catalog logical model. In the physical model, entities are stored as items. The specification type is composed of 2 parts: specification base and relation.
Specification Relationship	Defined in the catalog providing the validation logic for all associations between specification types and their cardinality.
SPOC	Single Point of Configuration
Structural Relationship	A defined allowable link between entities which can carry the property of relationship type.
TAS	Technical Action Specifications

The pricing, charging and rating content of the tables below conform to the pricing model of the Ericsson Charging component and not necessarily to that of other external charging systems.

Term	Description
Tariff Element Type (TET)	An entity type used to span a matrix for different usage price combinations. Well known entity types include tariff time and tariff zone.
Tariff Time (TT)	The price depends on when a call is made or a session is set up, for example, peak and off-peak time.
Tariff Zone (TZ)	The price depends on the home network of the called party, for example, domestic on-net, domestic off-net or international.
Quality of Service (QoS)	For example audio and video quality or the available bandwidth.
Tariff Element Specification	A tariff element specification specifies a tariff element (instance).
Tariff Element (TE)	A tariff element describes one dimension of a rating matrix. It is a particular form of a tariff element type. For example, in the case of a tariff zone, a tariff element could be an origin and destination combination, or for a tariff time, it could be a list of “time of days” combined with a list of “day of weeks”.
Tariff Element Value (TEV)	This is the value of a tariff element, for example, tariff zone “domestic on-net” = MCC_MNC 49171 x CC_NDC 49171, taking from the usage spec the location information as origin and the routed normalized number for the destination.
Composite Tariff Element (CTE)	A package of TEVs of TE of one type. May be used for consistence (e.g. avoid incompleteness, no overlapping of its ingredients), can be reused and individually versioned. Note that overlapping might be supported for some TEPs, if and only if a clear priority for the matching entries can be defined. Alternatively all matching entries might be charged. Incompleteness might be needed for add-on product offers, where the basic price is applied, if no price is defined for certain TEV combinations
Rating Matrix	Configured in ECM and consists of one or more tariff elements.
Tariff Matrix (TM)	The matrix of all combinations that is created out different TET. Each dimension of the matrix is given by a CTE or TE. Such a matrix can be converted in a Tariff Table (CTE/TE equals to column). An alternative representation is a Tariff Tree, where the TEVs are presented by one or more levels in the tree.

Term	Description
Rating Function (RF)	A function converting a chargeable quantity having a certain unit of measurement (e.g. duration [sec]) into a price. Examples are linear and tiered rating function.
Rating Function Parameter (RFP)	The parameters of the RF (e.g.: a, b for the linear function ax+b). Also the values from the NUS for input are defined here.
Rating Function Parameter Value (RFPV)	The concrete parameter values for a given RF (e.g. 5x+20)
Price Logic Algorithm spec	A price logic algorithm specification is a filled out TM, where for each cell a RF is given and some RFPVs might be filled out already
Price Logic Algorithm (PLA)	The PLA adds to the price logic algorithm specification the RFPVs, such that a complete usage price configuration is given
Rating Rule	One cell in the PLA matrix. It gives the price for one combination of TEVs
Normalized Usage Spec (NUS)	An internal representation of usage events coming from different external sources
Charging Capabilities (CC)	The Charging Capabilities comprise entities like supported CFS, rate functions (linear/tiered), “low-level” comparison functions (equals(), isMemberOf() from Charging. This information is needed to PC to construct the Rating Rules.

Term	Description
Usage Type UT	New (generic) Tariff Element introduced to identify different usage scenarios like originating traffic, terminating traffic and event.
Origin List OL	Entity introduced to identify where the usage traffic was originated
Destination List DL	Entity introduced to identify the destination of the usage traffic
Tariff Zone TZ	Combination of OL and DL to identify the geographical zone of the usage traffic
Composite Tariff Zone CTZ	Combination of CTZs and TZs to span a complete zone matrix for the price list.

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