

Oracle® Communications Service Catalog and Design Solution Designer User's Guide



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

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Preface

This guide describes how to use Oracle Communications Service Catalog and Design - Solution Designer to model your services, and resources. Solution Designer is a design tool designed for business users and domain experts from communications service providers. It unifies and accelerates the creation and delivery of services across Oracle Communications and minimizes the cost of ownership for operators and systems integrators.

Audience

This guide is intended for service specialists, network specialists, inventory specialists, inventory developer and managers who have a understanding of your company's products and services and how they fit into your network solution.

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Diversity and Inclusion

Oracle is fully committed to diversity and inclusion. Oracle respects and values having a diverse workforce that increases thought leadership and innovation. As part of our initiative to build a more inclusive culture that positively impacts our employees, customers, and partners, we are working to remove insensitive terms from our products and documentation. We are also mindful of the necessity to maintain compatibility with our customers' existing technologies and the need to ensure continuity of service as Oracle's offerings and industry standards evolve. Because of these technical constraints, our effort to remove insensitive terms is ongoing and will take time and external cooperation.

1

Getting Started with Solution Designer

Oracle Communications Service Catalog and Design provides a unified environment for designing, testing, and deploying integrated multi-application OSS solutions. Service Catalog and Design offers a visually intuitive and easy-to-use design, enabling business users to configure services through simple drag-and-drop functionality. Its user friendly design and streamlined guided workflows simplify the entire service lifecycle, from initial creation to ongoing management. It simplifies the management and maintenance of services and networks by centralizing service, resource, and network specifications and configurations. Service Catalog and Design comprises the following two components:

- Solution Designer
- Design Studio

Solution Designer

Solution Designer enables you to model services and resources, and the interfaces between them that make up a communications service and network solution. It enables you to create and use solutions quickly by providing a consistent design experience. It enables you to define TM Forum (TMF) aligned (product-service-resource) PSR models to define customer and network services.

Solution Designer provides user journey and persona based design-time user experience. The user interface provides improved efficiency and provides next generation user experience. It brings state-of-the-art, consumer grade user experiences across devices to sophisticated enterprise scenarios.

Service providers can leverage the pre-defined components, specifications, and service templates in the catalog to rapidly assemble and deploy new services. Solution Designer enables service specialists and network specialists to create and manage PSR models that include service models and technology models respectively. You can also create and manage the specifications, data elements, design parameters, characteristics, design policies, and delivery policies to define an end-to-end solution for a service. You don't need specific technical expertise to work in Solution Designer. A PSR model is an information model structured according to TMF principles. A PSR model:

- Shows the relationship of product specifications to customer facing service specifications.
- Shows customer facing service (CFS) specifications as a hierarchical assembly of resource facing service (RFS) specifications, resource specifications, and location specifications.
- Defines the content for aligning architectural interfaces such as design actions on CFSs. By defining a common definition at these interfaces, Solution Designer enforces consistent implementations among the producer, consumer, and intermediate agents such as upstream order definitions and downstream implementations.

The purpose of a model is to visualize an end-to-end solution, to get a high-level understanding of that solution, and to assess changes easily. In Solution Designer, the model shows information received from upstream systems, how it's transformed into the information needed to configure the network for the solution, the related mappings between the upstream

system and the characteristics, the corresponding design and assign policies and the delivery policies.

You can also use Solution Designer to maintain solutions and to change them over time. For example, you can quickly change your solution based on ongoing responses from customers, changes in technology, and market analysis. You use Solution Designer to configure solutions at all levels of solution maturity, and over the lifetime of a solution. As requirements change, and as your communications services evolve, Solution Designer enables you to evolve your solutions.

Design Studio

Design Studio is an integrated tool based on Eclipse IDE. This enables designers and developers to use the fully-featured Java IDE capabilities to further enhance, extend or integrate the solution business logic. This design-time environment enables you to build and configure Oracle service fulfillment and network and resource management solutions. For more information on Design Studio and its capabilities, see *Concepts* guide.

Planning a PSR Model

You consider the following before you start designing your PSR model:

- Which services offered to customers are you modeling?
- Which entities need to be configured in the network, and which types of applications are responsible for updating these entities?
- Which other services and resources are needed to realize the customer facing services? What is the relationship between them?
- What underlying data do you need in order to define entities, data that is significant in the actual implementation of the service? For example, a Mobile Service needs a MSISDN.

About Solution Designer Applications

Solution Designer includes the following applications which you can access and work by using the menu options on the landing page:

Table 1-1 Solution Designer Applications

Application	Description
PSR Models	Create and manage PSR models that include service models and technology models, where you create a design of your service and network model with its design parameters, characteristics, design policies, and delivery policies.
Data Elements	Create and edit data elements that you use to specify data that help define services and resources in the PSR model.
Specifications	Create and manage specifications such as CFS, RFS, resource, and location.

Table 1-1 (Cont.) Solution Designer Applications

Application	Description
Initiatives	Create initiatives and manage initiative life cycles. Anything you create and work on in Solution Designer is part of an initiative.
Domains	Create and manage domains, to organize specifications in meaningful groups or realize the PSR model.
Workspaces	Enables Solution Designer to interact with DevOps engine to generate the requested cartridge.

To navigate between these applications, click **Ask Oracle** at the bottom right.

About Solution Designer User Roles

When you log in to Solution Designer, you enter a user name and a password. Your user name is associated with roles and privileges that determine which applications you can use based on your job responsibilities. To use the Solution Designer application, users need at least one of these roles:

Role	Description
Service Specialist	Can do anything in Solution Designer, except Initiatives and Workspaces. Users with this role can access Specifications, Domains, Data Elements, and PSR Models.
Service Catalog Admin	Can do anything in Solution Designer, including the Initiatives and the Workspaces application. Users with this role can access Initiatives, Workspaces, Specifications, Domains, Data Elements, and PSR Models.

Accessing Solution Designer Application

Solution Designer is a web-based application that you open in a browser. For browser and version compatibility, see *Service Catalog and Design Compatibility Matrix*.

To access Solution Designer, you need a user name and password provided by a Service Catalog and Design system administrator. See "About Authentication" in *Solution Designer Installation Guide* for more information about setting up users and groups.

To access the Solution Designer application, log in with user name and password using the following URL:

```
http://hostname:port/apps/scd/
```

Where

- *hostname* is the Solution Designer host name.
- *port* is the port number where Solution Designer is installed.

About Solution Designer Landing Page

The Solution Designer application's landing page lists the menu options for individual applications. Click any of these applications to work with. On the top-right corner of the landing page, you find a User Menu drop-down list with some options. You can use these options for:

- Opening the Solution Designer application's user's guide using Help.
- Understanding the version of Service Catalog and Design using About.
- Logging out of Solution Designer using Sign Out. This action logs you out of the Solution Designer application and displays the login page.

About Searching

Solution Designer uses a smart filter for searching. Throughout Solution Designer, you can use the Search box to find items. When you click the Search box, suggested search results appear.

You can narrow down a collection of items that you're looking for, by typing in the box to filter the list.

About Naming Rules

To avoid errors when generating cartridges, follow these guidelines for entity IDs:

- You can use uppercase and lowercase letters and numbers.
- Use only a letter for the first character.
- You can have underscores within the ID.
- Don't use hyphens or periods within the ID.

Using Product Accessibility Features

You can use these accessibility features with Oracle Communications Service Catalog and Design:

- Keyboard shortcuts of your operating system and browser
- Accessibility tools of screen readers and your browser

2

Managing Your Design Process with Initiatives

Use initiatives to organize and track your work in Oracle Communications Service Catalog and Design - Solution Designer.

Topics in this document

- [About Initiatives](#)
- [Creating Initiatives](#)
- [Viewing Initiatives](#)
- [Updating Initiatives](#)
- [Lifecycle of Initiatives](#)

About Initiatives

Everything you create and manage in the Solution Designer application is part of an initiative, including PSR models, data elements, specifications, and domains. Having an initiative is a prerequisite to any work you do in the Solution Designer application. Initiatives represent the solution development process that contains a set of capabilities that must be delivered in a given phase of OSS transformation.

Initiatives follow a lifecycle that resembles the development lifecycle of a release, a process to manage your team's work from initial design definition through final approval and release. The contents of an initiative are not available to other initiatives until you release the initiative. You can update the contents such as service model, technology model, Customer Facing Services (CFS), Resource Facing Services (RFS), resources, and data elements, when an initiative is not released. After an initiative is released, you can revise its models, specifications, and reuse domains, and data elements. See "[Revising Specifications](#)" and "[Revising PSR Models](#)" for details.

A service catalog administrator manages the lifecycles of initiatives. Initiative allows various personas to define the solution and publish the artifacts to run-time systems during various testing cycles and eventually to production. Initiatives have the following phases, which you can adapt to your business process:

- **Definition:** Design definition is in progress.
- **Functional Testing:** Functional testing is in progress. You can publish the initiative and perform functional testing by generating the cartridges and deploying it in the respective application such as Oracle Communications Unified Inventory Management (UIM).
- **Acceptance Testing:** Acceptance testing is in progress by deploying the generated cartridges in UIM and provisioning them.
- **Approval:** Approval for rollout is in progress. After an approver reviews the initiative contents and the test results, it is approved for release.
- **Released:** The initiative and its contents are released to production.

You can complete each phase or revert to its previous phase. See "[Lifecycle of Initiatives](#)" for more information.

Creating Initiatives

You create an initiative using the **Initiatives** application.

To create an initiative:

1. In the Solution Designer landing page, click the **Initiatives** application.
2. In the Initiatives application's landing page, click **Create Initiative**. The **Create Initiative General Information** page appears.
3. Enter the following details.
 - **Name:** Name of the initiative.
 - **Planned Release Date:** The date by when the initiative is planned for release.
 - **Description:** A description about the initiative.
4. Click **Create**.

The initiative is created.

Viewing Initiatives

Only a service catalog administrator can view initiatives.

To view an initiative:

1. In the Solution Designer landing page, click the **Initiatives** application.
2. In the Initiatives application's landing page, search for an initiative. You can filter the list by
 - **Initiative Name:** Name of the initiative.
 - **Status:** The current status of the initiative.
 - **Last Updated:** The last updated date of the initiatives.
3. Select an initiative to view or edit it.

The Initiative details page opens. The initiative details page displays the information about the initiatives in different tabs. See "[Updating Initiatives](#)" for information on the different tabs.

Updating Initiatives

Only a service catalog administrator updates and manages initiatives.

To update an initiative:

1. In the Solution Designer landing page, click the **Initiatives** application.
2. In the Initiatives application's landing page, search for an initiative. You can filter the list by **Initiative Name**, **Status**, and **Last Updated**.
3. Select the initiative.

The Initiative details page opens.

Initiative Details

The following information can be viewed or updated in the initiative details page:

- **General Information** tab: View or update the general information of an initiative.
- **Lifecycle** tab: View or manage the lifecycle of an initiative. You transition the initiative from one phase to another phase.

You can discard an initiative only in the **Lifecycle** tab of the **Initiatives** application, when viewing or editing the initiative.

See "[Lifecycle of Initiatives](#)" for more information.

- **Publishing** tab: View the available workspace and publish an initiative to the DevOps engine for generating appropriate cartridges. The DevOps engine has all the plug-ins required by Solution Designer to build the requested cartridge. See "[Publishing Initiatives to the Workspaces](#)" for details on how to publish an initiative to test workspace and production workspace.

 **Note:**

Only test workspaces are listed in the **Publishing** tab.

- **Initiative Items** tab: View the list of initiative items such as domains, service models, technology models, customer facing services, resource facing services, resources, locations, and data elements.

In the Initiative Items tab, you can perform the following actions:

- Select an initiative item to view or update it.
- View the list of errors for initiative items by clicking **View Errors**. View Errors is displayed only when there are errors for that initiative item.
- Click **Delete** to delete an initiative item.
- **Transition History** tab: View the history of the transitions between different phases of an initiative. You can view the comments that were provided while transitioning from one phase to the other. It shows the following information:
 - **State**: The current state of the transition. For example, Complete testing, Approve for testing, Start acceptance testing, Reopen initiative, Reject, Complete functional testing, and so on.
 - **Transition**: The phases, from the start phase to the end phase with its status. The following is an example of transition:

```
Functional Testing/Complete to Acceptance Testing/In progress
```

This means that the functional testing phase of the initiative is complete and the acceptance testing is in progress.
 - **User Name**: The user who transitioned the initiative.
 - **Transition on**: The date and time when the initiative is transitioned.
 - **Comments**: The comments that are provided during the transition.

Lifecycle of Initiatives

Initiatives follow a lifecycle, from definition to release. A service catalog administrator uses the **Initiatives** application to manage each phase in the initiative lifecycle.

You transition the initiative from one phase to another in the **Lifecycle** tab in the **Initiatives** application. When you transition an initiative from one phase to another, you can enter appropriate comments for each action that you perform. For example, in the *Mobile Service* example, if you want to reject an initiative, you can do so and specify the reason for rejection as *Add few scenarios in functional testing* in the comments field. The functional testing team views the rejection reason in the **comments** column in the **Transition History** tab and adds the corresponding scenarios and repeats the functional testing phase.

The following flow diagram explains the lifecycle of an initiative:

Figure 2-1 Lifecycle of an Initiative

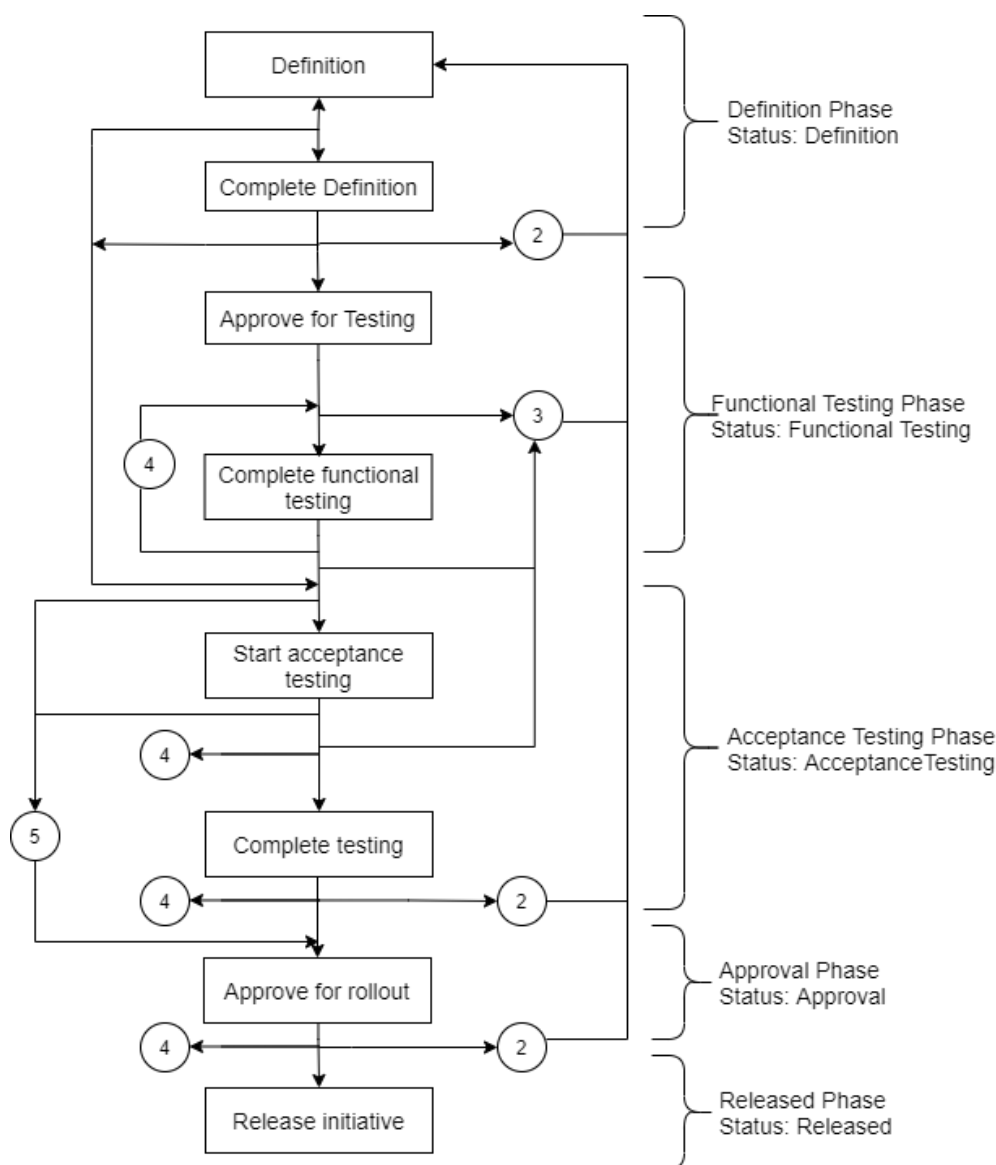


Table 2-1 describes the actions that can be performed in an initiative and their description.

Table 2-1 Actions in Lifecycle of an Initiative

Action	Description
Definition	<p>The initial phase when an initiative is created. You define the initiative items such as domains, PSR models, CFS, RFS, resources, data elements, and locations.</p> <p>The status of the initiative is Definition.</p>
Complete definition	<p>Completes the definition of an initiative and moves the initiative to approve for testing.</p> <p>After defining the models and their items, click Complete definition in the Lifecycle tab and confirm to complete the definition.</p> <p>After completing the definition, you can't edit the initiative's content or publish it to a test workspace until testing is approved.</p> <p>The status of the initiative is Definition.</p>
Approve for testing	<p>Approves the initiative for functional testing.</p> <p>After you click Approve for testing and confirm the approval, the initiative transitions to Functional Testing phase.</p> <p>You can edit the initiative's content or publish it to a test workspace.</p> <p>The status of the initiative is Functional Testing.</p>
Complete functional testing	<p>Completes the functional testing.</p> <p>After the functional testing is completed, click Complete functional testing in the Lifecycle tab and confirm to complete the functional testing. The initiative moves to acceptance testing phase.</p> <p>You can't edit the initiative's content or publish it to a test workspace.</p> <p>The status of the initiative is Functional Testing.</p>
Start acceptance testing	<p>Starts acceptance testing.</p> <p>You can start acceptance testing from the definition phase skipping the functional testing phase. To start the acceptance testing from the definition phase, click Other Actions and select Start acceptance testing.</p> <p>You can't edit the initiative's content. You can publish the initiative to a test workspace.</p> <p>The status of the initiative is Acceptance Testing.</p>
Complete testing	<p>Completes the acceptance testing. This action completes the acceptance testing phase and transitions it to Approve for rollout.</p> <p>You can't edit the initiative's content or publish it to a test workspace.</p> <p>The status of the initiative is Acceptance Testing.</p>

Table 2-1 (Cont.) Actions in Lifecycle of an Initiative

Action	Description
Approve for rollout	<p>Approves the initiative for releasing it to production.</p> <p>After you complete the functional testing phase or start acceptance testing or complete acceptance testing, you can start an approval process for rolling out the initiative. After the review, the approver approves the initiative for releasing it to production.</p> <p>You can't edit the initiative's content or publish it to a test workspace.</p> <p>The status of the initiative is Approval.</p>
Release initiative	<p>Releases the initiative to production. The initiative is published to the production workspace automatically. After the publish operation is successful, the initiative transitions to the Released phase. After the initiative is released, you can clone or revise the associated PSR models, the specifications, or the data elements.</p> <p>You can't edit the initiative's content.</p> <p>The status of the initiative is Released.</p>
Discard initiative	<p>Deletes the initiative.</p> <p>To discard an initiative, click Other Actions and select Discard initiative. This action permanently deletes the initiative and all of its contents including the associated versions of the released items that are created when revising an item.</p>
Reject	<p>Rejects an initiative and moves it to Definition phase. When you are in the Approve for testing phase or the Approve for rollout phase, you can reject the initiative instead of approving. When you reject an initiative, the initiative transitions to the Definition phase.</p> <p>The status of the initiative is Definition.</p>
Reopen initiative	<p>Reopens the initiative to the Definition phase.</p> <p>If testing uncovers any issues, you can reopen an initiative which transitions the initiative to the Definition phase. You may need to republish the initiative to your test workspace. To reopen the initiative, click Other Actions and then select Reopen initiative.</p> <p>The status of the initiative is Definition.</p>
Restart functional testing	<p>Restarts the functional testing phase.</p> <p>If you want to repeat functional testing in any of the phases such as functional testing, acceptance testing, and approval, you can transition the initiative to restart functional testing. You can do so by clicking Other Actions and then selecting Restart functional testing.</p> <p>The status of the initiative is Functional Testing.</p>

About the Definition Phase

In the definition phase, you design the initiative items or the initiative contents such as service model, technology model, domain, customer facing service, resource facing

service, resources, and data elements. In this phase, the initiative and its items have the **Definition** status.

You can complete the definition or stay in definition phase to modify the design. The comments entered while defining the initiative are viewed by the approval team in the **Transition History** tab. A service catalog administrator approves or rejects the initiative for testing.

You can perform the following actions in the Definition phase:

- Complete Definition
- Start acceptance testing
- Discard initiative

After the definition phase is completed, the initiative progresses to approval for testing. An approver reviews the work and can approve or reject the approval request for testing. An approver must be a service catalog administrator.

The approver can perform the following actions when approving the initiative:

- Approve for testing
- Reject
- Discard initiative

See [Table 2-1](#) for more information on the actions that can be performed in the definition phase.

About the Functional Testing Phase

After an approver approves the model definition, the initiative and its contents transition to **Functional Testing**.

In the **Functional Testing** phase, you can publish the model to **Test** workspace. The **Test** workspace publishes the initiative content to the DevOps engine that has all the plug-ins required by Solution Designer to build the requested cartridge. When the publish operation is successful, perform functional testing to ensure the cartridge is deployed in the respective run-time application such as UIM and that the functionality is working as expected. See "[Publishing Initiatives to the Test Workspace](#)" for detailed information on publishing the model to test workspace.

You can perform the following actions in the **Functional Testing** phase:

- Complete functional testing
- Reopen initiative
- Discard initiative

See [Table 2-1](#) for more information on the actions that can be performed in the functional testing phase.

About the Acceptance Testing Phase

You can perform acceptance testing after you complete functional testing or you can directly perform acceptance testing from the **Definition** phase. To start acceptance testing, click **Start acceptance testing**. The status of the initiative and its contents transition to **Acceptance Testing**. The acceptance testing team can then perform acceptance testing.

You can perform the following actions in the **Acceptance Testing** phase:

- Complete testing
- Approve for rollout
- Restart functional testing
- Reopen initiative
- Discard initiative

See [Table 2-1](#) for details on the actions that can be performed in the **Acceptance Testing** phase.

About the Approval Phase

When the initiative progresses to the **Approval** phase, an approver reviews the work and the test results. An approver requires the service catalog administrator application role.

The approver can perform the following actions based on the review:

- Approve for rollout
- Restart functional testing
- Reject
- Discard initiative

See [Table 2-1](#) for details on the actions that are performed in the **Approval** phase.

About the Released Phase

After the initiative is approved, you can release the initiative to production. The contents of the initiative are published to the production workspace. After the publish operation is successful, the initiative and its contents transition to **Released**. See "[Publishing Initiatives to the Production Workspace](#)" for details on publishing the initiative to the production workspace.

After you click **Release initiative** and confirm it in the dialog box, you can't undo a release or reopen a released initiative. The released initiative cannot be reused and the released items cannot be discarded from the application. You can clone or revise the released items as part of a new initiative. Domains, specifications, and data elements from the released initiative are available system-wide.

See [Table 2-1](#) for more information on the actions that can be performed in the released phase.

3

Defining Your PSR Models

Use (product-service-resource) PSR Models in Solution Designer to model network solutions. A PSR Model includes services, resources, and their relationships.

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- [Deleting PSR Models](#)

About PSR Models

You create PSR models in Solution Designer to define end-to-end solutions to cater to customer services. The key principle of PSR models is to decouple commercial offers from technical implementation using the customer facing service (CFS) and the resource facing service (RFS) specifications. When new products or services are launched, the underlying PSR model decouples itself from the frequently changing commercial layer. PSR models provide a CFS layer that has technology agnostic reusable specifications and a RFS layer that has technology specific specifications. PSR models have the following models:

- **Service Models:** Service specialists define an end-to-end design of customer services.
- **Technology Models:** Network specialists define an end-to-end design of technology specific RFSs.

About Service Models

Service models define the relationships between your commercial products, the services that they represent, and the resources that are required to implement the services. A service model contains CFS, RFS, resources, locations, their components, and their configurations such as design parameters, characteristics, parameter mapping, design policies, and delivery policies.

Service models describe how the customer services (CFSs) are designed and delivered. Solution Designer provides a guided user interface to the service specialists to holistically define an end-to-end configuration of customer services. The following are the steps involved in defining a service model:

- Select an initiative.
- Select or create a service domain.
- Build a service model that includes CFS, RFS, resources, location and its components.
- Configure attributes for each of the specifications. You can configure the following for the specifications:
 - The service design parameters required to fulfill the customer service.
 - The list of characteristics that must be defined in the inventory systems.
 - The design parameters mapping to the inventory characteristics to provision the services.
 - The standard and advanced design policies to assign appropriate resources in the inventory system.
 - The delivery policies to ensure the complete delivery of the service.

About Technology Models

Technology models define how commercial products and technical services are related, and they enable you to associate the products that you sell with the technical services and resources that are required to fulfill orders. A technology model contains RFS, its components, resources and their location.

Technology models describe how technology specific RFSs are implemented and provisioned in the network. Solution Designer provides a guided user interface to the network specialists to holistically define an end-to-end configuration of network technologies. The following are the steps involved in defining a technology model:

- Select an initiative.
- Select or create a technology domain.
- Build a technology model that includes RFS, resources, location and its components.
- Configure attributes for each of the specifications. You can configure the following for the specifications:
 - The service design parameters required to fulfill the customer service.
 - The list of characteristics that must be defined in the inventory systems.
 - The design parameters mapping to the inventory characteristics to provision the services.
 - The standard and advanced design policies to assign resources in inventory system.
 - The delivery policies to ensure the complete delivery of the service.

About Guided Process

You can create service models and technology models in Solution Designer using a guided process. The guided process provides an intuitive, user-friendly interface that offers a streamlined process for specialists to create PSR models. The service specialists or the network specialists need not have coding expertise to define PSR

models. The guided process provides a series of sequential steps by dividing the modeling process thereby reducing the effort in creating a model.

In the guided process page:

- The process overview panel on the right side lists the steps involved.
- The triangular notch and the steps indicator (for example 1/4) at the top indicate the currently active step in the guided process.
- Click the steps indicator at the top to expand or collapse it.
- Click **Save** to save your progress in any step.
- Click **Cancel** to discard any of the changes made.

Creating PSR Models using Guided Process

In Solution Designer, you can create PSR models that include service models and technology models. See "[About Service Models](#)" and "[About Technology Models](#)" for more details on service models and technology models.

You can create PSR models using the following approaches:

- Top-down approach: A service specialist creates an end-to-end service model from the CFS, RFS, resources, and locations.
- Bottom-up approach: A service specialist creates the CFS and a network specialist creates the RFS, resources, and locations. The service specialist uses the existing RFS with its hierarchy in the technology model created by the network specialist.

Creating Service Models using Guided Process

To create a service model using the guided process:

1. In the **PSR Models** application, select **Create service model** from the **Actions** drop-down.
The **Create service model** overview page opens that lists the steps involved in creating a service model.
2. Click **Start** to start the guided process and to move to add general information step.
The **Add general information** page opens.

Step 1: Add General Information

To add general information:

1. In the **Add general information** page, enter model name, model ID, description, and initiative. The model ID must follow the naming rules. See "[About Naming Rules](#)" for more information on naming rules.

 **Note:**

You cannot update the initiative or ID after the model is saved for the first time.

2. Click **Continue** to progress to select service domain step.

The **Select service domain** page opens.

Step 2: Select Service Domain

To select a service domain:

1. In the **Select service domain** page, select an existing service domain or create a new service domain. See "[Creating Domains](#)" for more information on how to create a service domain.

 **Note:**

You cannot update the service domain after you add the first entity in the **Build Model** step.

2. Click **Continue** to progress to the build model step.

The **Build model** page opens.

Step 3: Build Model

You start building a service model using CFSs. You can create the following relationships while building the model:

- CFS to location, resource, or RFS.
- RFS to location, resource, or another RFS.
- Resource to location, another resource, or RFS.

To build a service model:

1. In the **Build model** page, click the + symbol on the canvas to add the CFSs.

The **Customer Facing Services** drawer opens.

 **Note:**

The **Customer Facing Services** drawer lists all the CFSs that meet the following criteria:

- CFSs that have the primary domain that match the selected service domain.
- CFSs that have the secondary domains that match the selected service domain.
- CFSs from the released initiatives that match the selected service domain.

2. Select an existing CFS from the list or create a new CFS.

To create a new CFS:

- a. Click **New Customer facing service** in the **Customer Facing Services** drawer.

The **New customer facing service** drawer opens.

- b. Enter name, ID, and description. The ID must be unique and follow the entity naming rules. See "[About Naming Rules](#)" for more information.
- c. Click **Create**.

The CFS is created and added to the canvas. The newly created CFS copies the initiative and the primary domain from the service model's initiative and the service domain.

Associate all the CFSs in the service model by following steps 1 and 2.

3. Click the + symbol on the CFS to add a component to the model. To add a child specification to a CFS, you must create a new component. For example, create a RFS component as a child of the selected CFS. See "[About Components](#)" for more details on components.

To create a new component:

- a. Click **New component** in the **New component** drawer.
The **New component** drawer opens.
- b. Enter **Name, Type, Minimum Cardinality, Maximum Cardinality, Relationship Type, and Description**.
- c. Click **Create**.

The component is added as a child of the selected CFS. You can add multiple components of RFS, resource, and location to any CFS.

 **Note:**

You must create components to add a child specification such as RFS, resource, and locations to CFSs.

4. Based on the relationship that you want to create between CFSs, RFSs, resources, and locations, do one of the following:
 - **Add RFS to the model:** After you add the RFS component in step 3, click the + symbol on the RFS component. In the **Resource Facing Service** drawer, select an existing RFS specification from the list or create a new RFS specification. The **Resource Facing Services** drawer lists all the RFSs that meet the following criteria:
 - RFSs that have the primary domain that match the selected service domain.
 - RFSs that have the secondary domains that match the selected service domain.
 - RFSs from the released initiatives that match the selected service domain.

To create a new RFS:

- a. Click **New resource facing service** in the **Resource Facing Services** drawer.
The **New resource facing service** drawer opens.
- b. Enter name, ID, and description. The ID must be unique and follow entity naming rules. See "[About Naming Rules](#)" for more information.
- c. Click **Create**.

The RFS is created and added to the canvas. The newly created RFS copies the initiative and the primary domain from the service model's initiative and the service domain.

- **Add Resource to the model:** After you add a resource component in step 3, click the + symbol on the resource component. In the **Resources** drawer, select an existing resources specification from the list or create a new resource specification.

When you select or create a resource for logical device component and selected **Exclusive** as the relationship type, you must add only those resources with the following resource types:

- Device Interface Specification
- Custom Object Specification
- Custom Network Address Specification
- IPv4Address Resource Extension
- IPv6Address Resource Extension
- Flow Identifier Specification

If you add any other resource type to the logical device component, the **Publish** operation fails with errors. You must reconfigure the service models to add the specified resource types to the logical device components.

 **Note:**

The **Resources** drawer lists all the resources that meet the following criteria:

- Resources that have the primary domain that match the selected service domain.
- Resources that have the secondary domains that match the selected service domain.
- Resources from the released initiatives that match the selected service domain.

To create a new resource:

- a. Click **New resource** in the **Resources** drawer.

The **New resource** drawer opens.

- b. Enter name, ID, and optional description. The ID must be unique and follow entity naming rules. See "[About Naming Rules](#)" for more information.

Select the type that matches the UIM's resources. For example, connectivity, Flow Identifier. Select the **Delivery action target** check box to mark the resource to be the delivery action target for the delivery policies. Only those resources that have delivery action target selected are available for delivery policies.

- c. Click **Create**.

The resource is created and added to the canvas. Select **Show resources** to view the resource that is added. The newly created resource copies the initiative and the primary domain from the service model's initiative and the service domain.

- **Adding Location to the model:** After you add a location component in step 3, click the + symbol on the location component. In the **Locations** drawer, select the preloaded location specification from the list. You cannot create a new location.
5. Repeat the steps 3 and 4 to add more components and specifications to complete building the service model.

 **Note:**

- When you hover over the entities in the model, Solution Designer highlights the complete relationship hierarchy for that entity.
- Select **Show resources** to view the resources and their components in the canvas.
- To remove a specification from the model, click the specification and click **Remove** in the specification details pop-up. Removing a specification removes it from the canvas but doesn't delete it permanently.
- To delete a component, click the component and click **Delete** in the component details pop-up. Deleting a component deletes the component permanently.
- To delete a relationship between a component and specification, click the three dots on the component and select **Remove link to *child specifications*** where *child specifications* are the specifications that are related to the selected component.

6. After building the service model, click **Continue** to progress to the configure model step.

Step 4: Configure Model

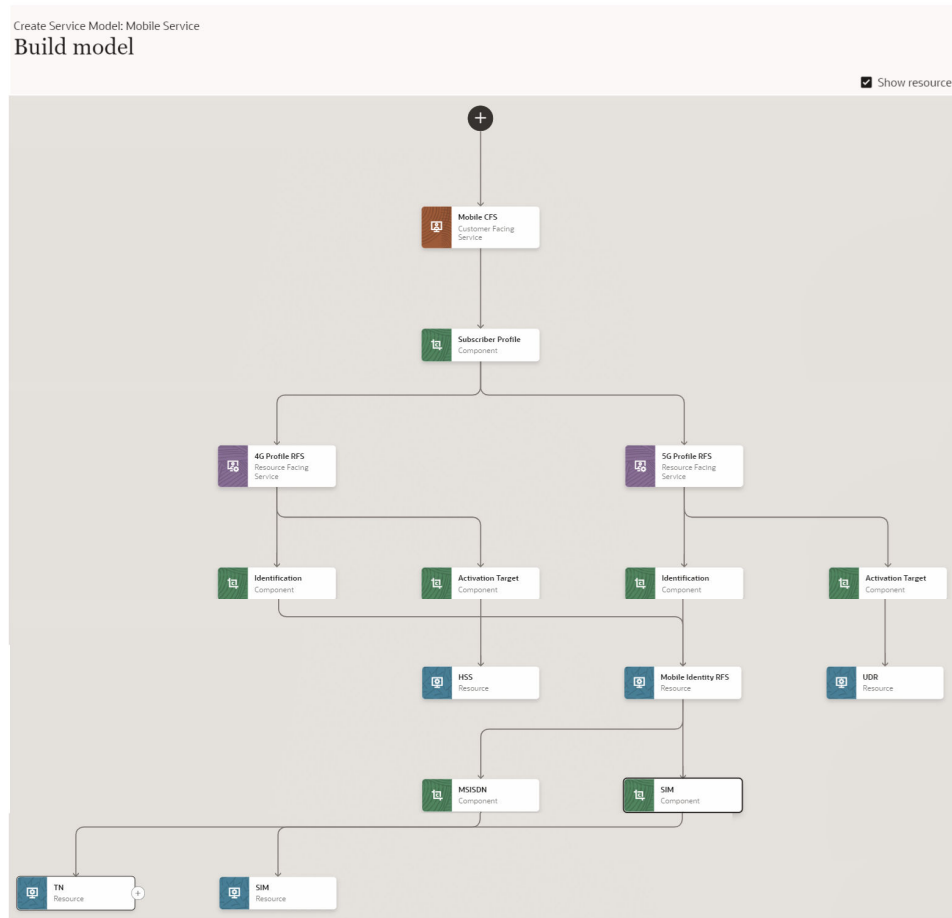
To configure service model:

1. In the **Configure model** page, in the specification configuration, you can configure the following:
 - a. Design Parameters: See "[Defining Design Parameters](#)" for details on how to configure design parameters.
 - b. Entity Characteristics: See "[Defining Entity Characteristics](#)" for details on how to configure entity characteristics.
 - c. Parameter Mapping: See "[Mapping Design Parameters](#)" for details on how to configure parameter mappings.
 - d. Design Policies: See "[Defining Design Policies](#)" for details on how to configure design policies.
 - e. Delivery Policies: See "[Defining Delivery Policies](#)" for details on how to configure delivery policies.
2. Click **Finish** to complete the service model.

Service Models Example

This is a completed service model showing a design for a Mobile Service. The service model shows the component links for the CFSSs, RFSSs, and resources.

Figure 3-1 Example of a Service Model



Releasing a New Mobile Service

To release the *Mobile Service*, follow the steps for top-down approach:

1. Service catalog administrator creates a new initiative *Mobile*.
2. Service specialist creates the service domain *Mobile*.
3. Service specialist creates the *Mobile Service* service model and builds the service model in the diagram [Figure 3-1](#). See "[Creating Service Models using Guided Process](#)" for more information on defining service models.
4. Service specialist creates the design parameters such as *Call waiting*, *Call barring*, *Conferencing*, and *Service Address* for the *Mobile CFS*. The *Service Address* design parameter is a feature group which has *State* and *City* data elements.
5. Service specialist creates design policies using standard and advanced policies for the *Mobile CFS*. For example:
 - a. Standard policy: Select the technology 5G or 4G based on the *State* design parameter.
 - b. Advanced policy: Select UDR in the same *State* as the *5G Profile RFS*. A developer writes the implementation code in the implementation class for the advanced policy and place them in the S3-compatible object store. See

"Extending Solution Designer" in the *Developer's Guide* for details on how to code in the implementation class. Enter the relative path of the object store in the **Advanced policy implementation assets** section in the **General Information** tab of the specification. See "[Defining Design Policies](#)" for more information on defining design policies.

6. Service specialist creates the delivery policies to activate the *Call waiting*, *Call barring*, and *Call conferencing* services in the activation system such as ASAP.
7. Service specialist completes defining the *Mobile Service* service model.
8. Service catalog administrator transitions the initiative through the lifecycle and publishes the initiative to the **Test** workspace. The requested cartridges are generated.
9. You can download and deploy the generated cartridge in the UIM run-time for testing purposes. See "[Publishing Initiatives to the Test Workspace](#)" for more information.
10. After the initiative is approved for rollout, service catalog administrator publishes it to the production workspace. The production cartridges are generated that can be deployed in UIM run-time environment. The initiative transitions to **Released** status after the production cartridges are generated. See "[Lifecycle of Initiatives](#)" and "[Publishing Initiatives to the Production Workspace](#)" for more information.

Upgrading the Mobile Service

After the *Mobile* initiative is released, the product manager decides to add new Closed User Group (CUG) calling product.

The steps for upgrading the *Mobile Service* are as follows:

1. Service catalog administrator creates a new initiative *Mobile Upgrade*.
2. Service specialist revises the *Mobile Service* service model and revises the *Mobile CFS* and *5G Profile RFS*. See "[Revising PSR Models](#)" for more information.
3. Service specialist adds the new CUG parameter to *Mobile CFS* and *5G Profile RFS*.
4. Service specialist creates the design policy to enable the CUG service only for enterprise customers using the standard policy.
5. Service specialist creates the delivery policy to pass the CUG parameter to UDR for *5G Profile RFS*.
6. Service catalog administrator publishes the initiative to the **Test** workspace. The generated cartridges are then deployed in UIM for testing purposes. See "[Publishing Initiatives to the Test Workspace](#)" for more information.
7. After the *Mobile Upgrade* initiative is approved for rollout, service catalog administrator publishes the initiative to the production workspace. The *Mobile Upgrade* initiative transitions to the **Released** status after the *Mobile Upgrade* cartridge is generated. See "[Lifecycle of Initiatives](#)" and "[Publishing Initiatives to the Production Workspace](#)" for more information.

Creating Technology Models using Guided Process

To create a technology model using guided process:

1. In the **PSR Models** page, select **Create technology model** from the **Actions** drop-down.

The **Create technology model** overview page opens and lists the steps involved in creating a technology model.

2. Click **Start** to start the guided process and to move to add general information step.
The **Add general information** page opens.

Step 1: Add General Information

To add general information:

1. In the **Add general information** page, enter the model name, model ID, description, and initiative. The model ID must follow the naming rules. See "[About Naming Rules](#)" for more information.

 **Note:**

You cannot update the initiative or ID after the model is saved for the first time.

2. Click **Continue** to progress to the select technology domain step.
The **Select technology domain** page opens.

Step 2: Select Technology Domain

To select a technology domain:

1. In the **Select technology domain** page, select an existing technology domain or create a new technology domain. See "[Creating Domains](#)" on how to create a technology domain.

 **Note:**

You cannot update the technology domain after you add the first entity in the **Build Model** page.

2. Click **Continue** to progress to the build model step.
The **Build model** page opens.

Step 3: Build Model

You can create the following relationships while building the technology model:

- RFS to location, resource, or another RFS.
- Resource to location, another resource, or RFS.

To build a technology model:

1. In the **Build model** page, click the + symbol on the canvas to add the RFSs.
The **Resource Facing Services** drawer opens.

The **Resource Facing Services** drawer lists all the RFSs that meet the following criteria:

- RFSs that have the primary domain that match the selected service domain.

- RFSs that have the secondary domains that match the selected service domain.
 - RFSs from the released initiatives that match the selected service domain.
2. Select an existing RFSs from the list or create a new RFS.

To create a new RFS:

- a. Click **New resource facing service** in the **Resource Facing Services** drawer.
The **New resource facing service** drawer opens.
- b. Enter name, ID, and description. The ID must be unique and must follow the naming rules. See "[About Naming Rules](#)" for more information.
- c. Click **Create**.

The RFS is created and added to the canvas. The newly created RFS copies its initiative and primary domain from the technology model's initiative and the technology domain.

Associate all the RFSs in the technology model by following steps 1 and 2.

3. Click the + symbol on the RFS to add a component to the model. To add a child specification to an RFS, you must create a new component. For example, create a resource component as a child of the selected RFS. See "[About Components](#)" for more details on components.

To create a new component:

- a. Click **New component** in the **New component** drawer.
The **New component** drawer opens.
- b. Enter **Name, Type, Minimum Cardinality, Maximum Cardinality, Relationship Type, and Description**.
- c. Click **Create**.

The component is added as a child of the selected RFS in the canvas. You can add multiple components of RFS, resource, and location to any RFS.

 **Note:**

You must create components to add a child specification such as RFS, resource, and locations to RFSs.

4. Based on the relationship that you want to create between RFSs, resources, and locations, do one of the following:
 - **Add a resource to the model:** After you add a resource component in step 3, click the + symbol on the resource component. In the **Resources** drawer, select an existing resource specification from the list or create a new resource specification.
When you select or create a resource for logical device component and selected **Exclusive** as the relationship type, you must add only those resources with the following resource types:
 - Device Interface Specification
 - Custom Object Specification
 - Custom Network Address Specification
 - IPv4Address Resource Extension

- IPv6Address Resource Extension
- Flow Identifier Specification

If you add any other resource type to the logical device component, the **Publish** operation fails with errors. You must reconfigure the technology models to add the specified resource types to the logical device components.

The **Resources** drawer lists all the resources that meet the following criteria:

- Resources that have the primary domain that match the selected service domain.
- Resources that have the secondary domains that match the selected service domain.
- Resources from the released initiatives that match the selected service domain.

To create a new resource:

- a. Click **New resource** in the **Resources** drawer.

The **New resource** drawer opens.

- b. Enter name, ID, and optional description. Select the type that matches the UIM's resources. For example, connectivity, Flow Identifier. Select the **Delivery action target** check box to mark the resource to be the delivery action target for the delivery policies. Only those resources that have delivery action target selected are available for delivery policies. See "[About Naming Rules](#)" for naming rules on IDs.

- c. Click **Create**.

The resource is created and added to the canvas. The newly created resource copies its initiative and primary domain from the technology model's initiative and the technology domain.

- **Add a location to the model:** After you add a location component in step 3, click the + symbol on the location component. In the **Locations** drawer, select from the preloaded location specification from the list.
5. Repeat steps 3 and 4 to add more components and the specifications to complete building the technology model as required.

 **Note:**

- When you hover over the entities in the model, Solution Designer highlights the complete relationship hierarchy for that entity.
- To remove an entity from the model, click the entity and click **Remove** in the entity details pop-up.
- To delete a component, click the specification and click **Delete** in the component details pop-up. Deleting a component deletes the component permanently.
- To delete a relationship between a component and specification, click the three dots on the component and select **Remove link to *child specifications*** where *child specifications* are the specifications that are related to the selected component.

6. After building the technology model, click **Continue** to progress to the configure model step.

Step 4: Configure Model

To configure the technology model:

1. In the **Configure model** page, in the specification configuration, configure the following:
 - a. Design Parameters: See "[Defining Design Parameters](#)" for details on how to configure design parameters.
 - b. Entity Characteristics: See "[Defining Entity Characteristics](#)" for details on how to configure entity characteristics.
 - c. Parameter Mapping: See "[Mapping Design Parameters](#)" for details on how to configure parameter mappings.
 - d. Design Policies: See "[Defining Design Policies](#)" for details on how to configure design policies.
 - e. Delivery Policies: See "[Defining Delivery Policies](#)" for details on how to configure delivery policies.
2. Click **Finish** to complete the technology model.

Importing PSR Models

You can import a service model or a technology model that you created in another environment. You can export the model that you created in your test environment and import it into your production environment. You can also download the sample PSR models from Oracle Software Delivery Cloud and import them into your Solution Designer environment.

As a prerequisite, you must have an initiative that is in **Definition** status.

To import a model:

1. In the Solution Designer landing page, click the **PSR Models** application.
In the **PSR Models** application, click **Import**.
The **Import** dialog box opens.
2. You can drag and drop the source file or click the file picker and select a file from your local computer.
3. Select an initiative to which the model should be associated.
4. Click **Import**.
5. Click **Done**.

The imported model is listed in the **PSR Models** page.

Exporting PSR Models

You can export a released PSR model including service models and technology models.

To export a PSR model:

1. In the Solution Designer landing page, click the **PSR Models** application.
2. In the **PSR Models** application, search for the PSR model that you want to export.

The **PSR Models** page opens.

 **Note:**

The PSR model must be in **Released** status to export it.

3. Click the three dots on the PSR model and click **Export**.
The PSR model is downloaded in the JSON format with the file name same as the model name. You can access the exported model file from the web browser's *Downloads* folder.

Viewing PSR Models

To view a PSR model:

1. In the Solution Designer landing page, click the application that you want to work with.
2. Do one of the following:
 - In the **PSR models** application, search for a service or a technology model. You can filter the list by
 - Model Name: Name of the model.
 - Domain: The domain of the model. It can be a service domain or a technology domain.
 - Type: The type of the model (Service Models or Technology Models).
 - Status: The current status of the initiative.
 - Initiative: The initiative of the model.
 - Last Updated: The last updated date of the initiatives.
 - In the **Initiatives** application, search for an initiative and click the **Initiative Items** tab in the initiatives editor page.
3. Select a model to view it.

The model details page opens when the model is in the Acceptance Testing, Approval, or Released status.

The model details page has two tabs:

- **PSR Model:** Displays the complete service or technology model in the canvas.
- **General Information:** Displays the general information of the service or technology model.

The **Create Service Model** or **Create Technology Model** page opens based on the model type when the model is in the Definition or Functional Testing status. The create model page is the guided process page which lets you view or edit the model.

4. Do one of the following:
 - Click **Go to PSR Models** to return to the PSR Models page or **Go to Initiatives** to return to the **Initiatives Items** tab in the initiative editor page.

- Click **Cancel** in the **Create Service Model** page or the **Create Technology Model** page to return to the **PSR Models** page.

Updating PSR Models

You can update the general information, the domain, the model, and the configuration that includes design parameters, entity characteristics, parameter mapping, design policies, and delivery policies. You can update a service model or a technology model only if the model is in the **Definition** or **Functional Testing** to start the guided process and to move to add general information step.

Note:

- You cannot update the initiative or ID after the model is saved for first time.
- You cannot update the domain after you add the first entity in the **Build Model** step.

To update the PSR Model:

1. In the Solution Designer landing page, click the application that you want to work with.
2. Do one of the following:
 - In the **PSR models** application, search for a service model or technology model that is in the status **Definition** or **Functional Testing**.
 - In the **Initiatives** application, search for an initiative and click the **Initiative Items** tab in the initiatives editor page.

Select a model to update it.

The **Create Service Model** page or **Create Technology Model** page opens. If the PSR model has a domain, the **Build model** page opens. If the PSR model does not have a domain, the **Select domain** page opens.

3. You can update the general information, domain, model relationships, and configuration that includes design parameters, entity characteristics, parameter mapping, design policies, and delivery policies.

Note:

You cannot update a domain after you add the first entity in the **Build model** step.

4. After you finish updating the details in all the steps, click **Finish** in the **Configure model** step.

Clicking **Finish** returns to the **PSR Models** page or the **Initiative Items** tab in the initiatives editor page.

Cloning PSR Models

You can clone an existing PSR model that includes service model and technology model and update the details as necessary. Cloning the PSR model copies the PSR model and its details such as general information, domain, model, and configuration. The parameter mapping, design policies, and delivery policies are not copied when cloning a PSR model. The cloning process creates a new copy of the PSR model with the name appended with - *Copy* and you can update the model name. The copy is created within the same initiative. You can update the model name and its details such as the general information, domain, model, and configuration including design parameters, entity characteristics, parameter mapping, design policies, and delivery policies.

To clone a PSR model:

1. In the Solution Designer landing page, click the application that you want to work with.
2. Do one of the following:
 - In the **PSR Models** application, search for a model.
In the PSR models result list page, click **Clone**.
 - In the **PSR Models** application, select a PSR model by searching for it with status Acceptance Testing, Approval, Released.
In the PSR model details page, click **Clone**.
The **Clone Service Model** or **Create Technology Model** pop-up appears.
 - In the **Initiatives** application, search and select an initiative. Click the model in the **Initiative Items** tab in the initiatives editor page.
In the respective models page, click **Clone**.
The **Clone Service Model** or **Create Technology Model** pop-up appears.
3. Enter the ID and update the name, and description as necessary. You must follow entity naming rules. See "[About Naming Rules](#)" for more information.

 **Note:**

- You can't select a new initiative when you clone a PSR model in the **Definition** status.
- You must select a new initiative that is in **Definition** status when you clone a PSR model in the **Released** status.

4. Click **Continue**.

The respective models page opens with all the details in the guided process pages.

You can update general information, domain, model, and configuration including design parameters, entity characteristics, parameter mapping, design policies, and delivery policies.

Revising PSR Models

A service specialist or a network specialist revises a PSR model in the **Released** status. When you revise a PSR model, you create a revision of the model that you attach to an initiative in **Definition** status. The original model definition, which is attached to an initiative in **Released** status, does not change. You can update the details of the revised model such as the configuration, design parameters, entity characteristics, parameter mappings, design policies, delivery policies, and general information. When you delete a revised specification, only the current revision is deleted and the specification is reverted to the previously released version.

To revise a model:

1. In the Solution Designer landing page, click the application that you want to work with.
2. Do one of the following:
 - In the **PSR Models** application, search for a model.
The model is listed in the results section in the PSR Models page.
 - In the **PSR Models** application, select a model by searching for it.
The respective model details page opens.
 - In the **Initiatives** application, search for an initiative and click the **Initiative Items** tab in the initiatives editor page.
3. Click **Revise**.
The **Revise Service Model** or **Revise Technology Model** dialog box opens.
4. Select a different initiative in **Definition** status and click **Continue**.
The **Create Service Model** or **Create Technology Model** page opens.
5. Update the details of the service model or the technology model in the revised model. You can add a new CFS or RFS and build a child hierarchy for the newly created CFS or RFS and configure those newly added specifications.

 **Note:**

If you want to update any specification that includes design parameters, entity characteristics in the model, you must first revise that specification in the **Specifications** application. See "[Revising Specifications](#)" for details on revising specifications.

6. After you update the necessary details, click **Finish** in the **Configure Model** step.
The application returns to the **PSR Models** page or the **Initiative Items** tab in the initiative editor page.

Deleting PSR Models

You can delete a model from the **PSR Models** application or from the **Initiative Items** tab in the **Initiatives** application.

To delete a model:

1. In the Solution Designer landing page, click the application that you want to work with.
2. Do one of the following:
 - In the **PSR Models** application, search for a service model or a technology model.
The model is listed in the results section in the PSR Models page.
 - In the **PSR Models** application, select a PSR model by searching for it.
The respective model details page opens.
 - In the **Initiatives** application, search for an initiative and click the **Initiative Items** tab in the Initiatives details page.
3. Click **Delete**.
A confirmation dialog box appears.
4. Click **Delete** in the confirmation dialog box.
The PSR model is deleted. If you are deleting a revised model, only the current revision is deleted and the model is reverted to the released version.



Note:

You can't delete a model:

- If the associated initiative has completed the definition phase but has not been approved for testing.
- If the associated initiative is in the **Acceptance Testing** phase, the **Approval** phase, or in the **Released** phase.

4

Managing Domains

Use domains in Solution Designer to organize and manage specifications such as Customer Facing Services (CFS), Resource Facing Services (RFS), and resources into meaningful groups.

Topics in this document

- [About Domains](#)
- [Creating Domains](#)
- [Viewing Domains](#)
- [Updating Domains](#)
- [Deleting Domains](#)

About Domains

A domain is a logical group or category that represents a specific area or type of service within the telecommunications industry. It is used to organize and classify the specifications, offerings, and capabilities provided by the service provider. Each domain typically represents a distinct aspect of the telecommunications services, such as voice services, data services, network infrastructure, security, customer support, cloud services, Internet of Things (IoT), or any other relevant category specific to your service offerings.

Domains are divided into service domains and technology domains to provide a granular categorization within a specific domain. A technology domain can reference zero or more service domains. Domains are used for filtering when creating service and technology models. For example, if the *Mobile* service domain is selected, then only those entities belong to the same service domain are available for selection when building the PSR model.

A service specialist manages service domains and technology domains. Domains are a required part of entity definitions in Solution Designer. Each entity belongs to a domain:

Table 4-1 Types of Domain

Domain Type	Description	Specifications
Service	Manage the specifications related to customer services. Service domains represent different types of services that are offered. Examples include Mobile, Broadband, TV, Voice, Cloud Services, and Internet of Things (IoT).	CFS RFS Resource

Table 4-1 (Cont.) Types of Domain

Domain Type	Description	Specifications
Technology	Manage the specifications related to the underlying technologies that are used to implement those customer services. Technology domains represent the different technologies used to deliver the services. Examples include DSL, Fiber, Cable, 5G, LTE, Wi-Fi, and Satellite.	Resource RFS

You can use multiple domains of the appropriate type to help organize your specifications and models. For example, a Mobile Service offering can have a service domain as Mobile and technology domains as 5G, 4G, and so on.

A service domain can be associated with multiple service models and specifications. Similarly a technology domain can be associated with multiple technology models and specifications. The specifications can have one primary domain and multiple secondary domains.

Domains play an important role in realizing a design. After an initiative is released, you can use the domains belonging to that initiative elsewhere in the application.

Creating Domains

You create domains using the **Domains** application, or in **Select service domain** step when creating service models, or in **Select technology domain** step when creating technology models in the guided process.

To create domains:

1. In the Solution Designer landing page, click the **Domains** application.
2. To create domains, do one of the following:
 - In the **Domains** application, click **Create Domain**.
 - In the **PSR Models** application, click **Create Service Domain** in the **Select service domain** step while creating a service model.
 - In the **PSR Models** application, click **Create Technology Domain** in the **Select technology domain** step while creating a technology model.

The **New Domain** drawer appears.

3. Enter the following details:

Table 4-2 New Domain Fields

Name	Required or Optional	Description
Name	Required	Name of the domain. Name must have more than one character.
ID	Required	Id of the domain.

Table 4-2 (Cont.) New Domain Fields

Name	Required or Optional	Description
Type	Required	The type of domain. <ul style="list-style-type: none"> • Service • Technology
Description	Optional	The description of domain.
Associated Service Domains	Optional	The service domains that are associated with the technology domain. This field appears only when you select Technology as the Type .
Implementation Assets	Optional	The relative path of the helper class files. For example, /bucket/helperclass.zip. The helper classes in compressed (zipped) format must be placed in S3-compatible object storage.
Initiative	Required	The initiative that the domain belongs to.

The domain IDs must follow the naming rules. See "[About Naming Rules](#)" for more information on naming rules.

4. Click **Add**.

The domain is created.

Viewing Domains

A Service Specialist views the domains from the Domains application or from the **Initiative Items** tab in the initiatives editor page in the Initiatives application.

To view domains:

1. In the Solution Designer landing page, click the application that you want to work with.
2. Do one of the following:
 - In the **Domains** application, search for a domain using the following criteria:
 - Domain name
 - Type: Service or Technology
 - Status: Lifecycle status
 - Initiatives
 - Last Updated date

The domain result is filtered based on the search criteria.

- In the **Initiatives** application, search for an initiative and click the **Initiative Items** tab in the initiatives editor page.
3. Select a domain to view the details of that domain.

A **Domain** drawer appears.

The following details are displayed:

- **Overview** tab: Shows the details of the domain.
 - **Used by** tab: Shows all the items such as models, domains, and specifications that the domain is associated with. You can filter the results by searching with the item name.
4. After viewing the details, click anywhere outside the dialog box to return to the Domain list page or the initiatives editor page.

Updating Domains

You can update the domain details such as Name, Description, and Associated service domains.

To update a domain:

1. In the Solution Designer landing page, click the application that you want to work with.
2. Do one of the following:
 - In the **Domains** application, search and select a domain.
 - In the **Initiatives** application, search for an initiative and select a domain from the **Initiative Items** tab in the initiatives editor page.

The domain dialog box opens.

3. Click **Edit** and update the name, description, implementation assets, or the associated service domain.
4. Click **Update**.

Note:

You can't update the domain **Type**.

You can't update the domain details in the following scenarios:

- If the associated initiative has completed the definition phase but is not approved for testing.
- If the associated initiative is in the **Acceptance Testing** phase, the **Approval** phase, or the **Released** phase.

Deleting Domains

You delete a domain from the **Domains** application or from the **Initiatives** application.

To delete a domain:

1. In the Solution Designer landing page, click the application that you want to work with.
2. Do one of the following:
 - In the **Domains** application, select a domain.

The domain drawer opens.

- In the **Initiatives** application, search for an initiative and click the **Initiative Items** tab in the initiatives editor page.

3. Click **Delete**.

The domain is deleted if it is not associated with any entities or domains.

 **Note:**

You can't delete a domain:

- If the associated initiative has completed the definition phase but is not approved for testing.
- If the associated initiative is in the **Acceptance Testing** phase, the **Approval** phase, or the **Released** phase.

5

Managing Specifications

Use specifications in Solution Designer to define your services. The specifications include customer facing services (CFS), resource facing services (RFS), resources, and locations.

Topics in this document:

- [About Specifications](#)
- [Creating Specifications](#)
- [Viewing Specifications](#)
- [Updating Specifications](#)
- [Cloning Specifications](#)
- [Revising Specifications](#)
- [Deleting Specifications](#)
- [Configuring Specification Details](#)

About Specifications

A specification is a blueprint that determines the information that you store about a service. The purpose of a specification is to provide a description of the requirements of a service, components of a service, the capability or performance of a service or work to be performed to fulfill a service.

Service specialists and network specialists manage the specifications in Solution Designer. Specifications are the basis for PSR Models you create in Solution Designer to model your network solution. [Table 5-1](#) shows the different types of specifications and who manages them in Solution Designer:

Table 5-1 Specification Types

Specification	Managed by	Description
Customer facing service (CFS)	Service Specialist	CFS represent services from a customer perspective. See " About Customer Facing Services " for more information.
Resource facing service (RFS)	Network Specialist	RFS represent a technical view of a service. See " About Resource Facing Services " for more information.

Table 5-1 (Cont.) Specification Types

Specification	Managed by	Description
Resource	Network Specialist	Resources represent specific objects in the network and inventory that an RFS can consume, reference, or share when the RFS is provisioned. Resources can be physical, such as a port, or logical, such as bandwidth or IP address. See "About Resources" for more information. In the <i>Mobile Service</i> example, the <i>Mobile Identity RFS</i> utilizes the <i>SIM Card</i> resource and <i>TN</i> resource to fulfill the service.
Location	Network Specialist	A physical location for services and resources, such as an office, residence, or city. See "About Locations" for more information.

About Customer Facing Services

CFS represents the commercial view of the services that you provide to your customer that is, the way that a product is realized and delivered to a customer. In the *Mobile Service* example, *Mobile CFS* is the CFS in the PSR model for the *Mobile Service*. You can use the same CFS to fulfill different but similar product offers. For example, the same *Mobile CFS* can be used for *Mobile Service* and *Wireless service*. See ["Service Models Example"](#) for more information.

You define the design parameters for the CFS. Additionally, you associate CFSs with RFSs. For example, you can associate the resource facing services *5G Profile RFS* and *4G Profile RFS* with *Mobile CFS* to fulfill the service.

Use the following set of guidelines when creating CFSs:

- Define CFSs to be customer centric to support multiple products. A CFS can support multiple products if it is not defined for a specific technology.
- Define CFS's design parameters that are important, and hide technology details that are not relevant to a customer.
- Define CFSs to represent domains. For example, the *Mobile CFS* represents the *Mobile* domain and *Wireless* domain.
- Define relationships to RFS, Resources and Locations from CFS. You cannot create a relationship between a CFS and another CFS

About Resource Facing Services

An RFS describes how CFSs are configured. For example, you can fulfill a CFS named *Mobile CFS* using multiple modes of delivery, each represented by an RFS, such as 4G or 5G. You determine the RFS that is used to provide the requested services during the service design.

RFSs are technology-specific but not vendor-specific. They have hierarchical structure and have associations with resources or with other, finer-granulated RFSs. In the

Mobile Service example, the *5G Profile RFS* and *4G Profile RFS* have a child RFS *Mobile Identity RFS* which in turn has an association with the *SIM Card* and *TN* resources to provision the SIM card and telephone number resources from an inventory management systems such Oracle Communications Unified Inventory Management (UIM). See "[Service Models Example](#)" for more information.

About Resources

Resources are entities that are required to provision a service. A resource is a specific object in the network and in the inventory that can be consumed, referenced, or shared by a service when provisioning an RFS. Resources can be physical, such as a port, or logical, such as bandwidth. Examples of resources include IP addresses, VoIP phones, and DSLAM ports. In the *Mobile Service* example, the *TN*, *SIM Card*, and *UDR* are the resources required to fulfill the service.

Resources have associations with other resources. Additionally, you can define resources that you intend to realize in external systems such as supply chain management, activation and so on.

About Locations

Locations define geographic references that are relevant to services or resources. Locations can be specific places, such as a residence or a business, or more general places, such as a city.

In Solution Designer, two locations **Customer Site** and **Service Location** are pre-loaded. You can use the pre-loaded locations in the PSR models but cannot create new locations. For example, in a Fixed line service, a customer premise equipment that is, a telephone instrument must be installed at that customer location. Use the **Customer Site** location in the PSR model to represent the customer location where the CPE must be installed.

About Components

A component represents a specific element needed to complete the entity. You define relationships between the specifications by adding components. When defining a CFS, RFS, or resource, you can add one or more components that reference another entity. This sets a relationship between the entities such that they are associated with each other in your system's processes.

Relationship Types

Each component associated with a specification is defined with a specific relationship type as follows:

- **Exclusive:** At run time, the component can't be shared with other service instances. For example, telephone numbers cannot be used by multiple instances of a mobile service. In *Mobile Service* example, a *Mobile Identity RFS* might have an exclusive component for a telephone number. There's an exclusive relationship between the *Mobile Identity RFS* and the **TelephoneNumber** resource. The Exclusive type defines relationships among CFSs, RFSs, and resources.
- **Shared:** At run time, the component can be shared with other service instances. In *Mobile Service* example, because the UDR can store several subscription data simultaneously (and is not exclusive to any one service), there is a shared relationship between the *5G Profile RFS* and the **UDR** resource. The Shared type defines relationships among CFSs, RFSs, and resources.

- **Reference:** At run time, a target entity references a source entity. For example, in a fixed line service, a **fixed voice CFS** might have a reference component for a service location, which is a physical address.
- **Config hierarchy:** In Oracle Communications Unified Inventory Management (UIM), an intermediate hierarchical structure is referenced at run time. You can use this for a relationship between an RFS and a resource. The **Config hierarchy** type indicates that a UIM realization of a resource component should result in a hierarchy of configuration items and should not generate a UIM entity.

Cardinality

Cardinality determines how many instances of the component that can appear at runtime. In the *Mobile Service* example, there can be multiple telephone numbers required for an enterprise, so the cardinality of **TN** component can be a minimum of 1 and a maximum of 10.

Creating Specifications

A service specialist or a network specialist creates and manages the specifications. You create the specifications using the **Specifications** application or in the **Build Model** step, when creating PSR Models in the guided mode. See "[About Solution Designer Applications](#)" for more information on Solution Designer applications and "[Creating PSR Models using Guided Process](#)" for more information on the guided process.

To create the specifications:

- To create a CFS, see "[Creating Customer Facing Services](#)".
- To create a RFS, see "[Creating Resource Facing Services](#)".
- To create a resource, see "[Creating Resources](#)".



Note:

Two locations **Customer Site** and **Service Location** are pre-loaded in Solution Designer and you cannot create a new location.

Creating Customer Facing Services

A service specialist creates and manages the CFS. A CFS can have RFSs, resources, and locations as its children. For creating and configuring a CFS specification, you must have the following in Solution Designer:

- An initiative. See "[Creating Initiatives](#)" for more details.
- Domains. See "[Creating Domains](#)" for more details.
- RFS, resource, or locations. To configure a CFS, you must create RFS, resource, and locations within the same initiative so they are available for the CFS to build the hierarchical relationship between them.

To create a CFS using the **Specifications** application:

1. In the Solution Designer landing page, click the **Specifications** application.

2. In the **Specifications** application, click **Create Customer Facing Service**.
The **Create Customer Facing Specification** page opens.
3. Enter the following fields:

Table 5-2 New CFS Fields

Name	Required or Optional	Description
Name	Required	Unique name of the CFS. In the <i>Mobile Service</i> example, <i>Mobile CFS</i> is the CFS name.
ID	Required	Unique Id of the CFS.
Start Date	Optional	The starting date of the CFS.
End Date	Optional	The ending date of the CFS.
Primary Domain	Required	The primary service domain. Only one primary domain can be selected for the CFS.
Secondary Domains	Optional	The secondary service domains that are associated with a CFS. Multiple secondary domains can be associated with a CFS. The secondary domains must have the same domain type as of the selected primary domain.
Description	Optional	The description of CFS.
Initiative	Required	The initiative that the CFS belongs to. This CFS is available only for the selected initiative until the initiative is released. Specifications from the released initiative are available system-wide.

 **Note:**

The CFS must have unique ID and follow the naming rules. See "[About Naming Rules](#)" for more information on naming rules.

4. Click **Create and Continue**.
The **Customer Facing Service** editor page opens.
5. You use the following tabs to define the CFS:
 - **Configuration:** Configure the relationship between a CFS specification and the other specifications such as RFSSs, resources, and locations. This builds a hierarchy between the CFS, RFSSs, resources, and locations. See "[Configuring Relationships between Specifications](#)" for details on how to configure the relationships between specifications.
 - **Design Parameters:** Configure the design parameters for the CFS using the existing data elements or create new data elements. Design parameters are carried from the upstream order management systems and you define them in the CFS. See "[Defining Design Parameters](#)" for details on how to define design parameters.
 - **Entity Characteristics:** Configure the characteristics for the CFS using the existing data elements or create new data elements. Data elements are added as

characteristics to realize them in UIM run-time environment. See "[Defining Entity Characteristics](#)" for details on how to define entity characteristics.

- **Parameter Mapping:** Configure the mapping of the design parameters from upstream systems to characteristics in the downstream systems such as UIM and between the child specifications. See "[Mapping Design Parameters](#)" for details on parameter mapping.
 - **Design Policies:** Configure the design policies to provision the services in UIM. UIM provisions the service based on the defined design policies. See "[Defining Design Policies](#)" for details on defining design policies.
 - **Used by:** Lists all the PSR Models that use the CFS.
 - **General Information:** Provides the general information for the CFS. You can add advanced policy implementation assets to a specification. See "[Adding Advanced Policy Implementation Assets](#)" for information on how to add advanced policy implementation assets.
6. Click **Go to Specifications** at the top left to return to the **Specifications** page.

Creating Resource Facing Services

Service specialists or network specialists create and manage RFSs. You can relate an RFS to locations, resources, or another RFS.

For creating and configuring an RFS, you must have the following in Solution Designer:

- An initiative. See "[Creating Initiatives](#)" for more details.
- Domains. See "[Creating Domains](#)" for more details.
- RFS, Resource, or Locations. To configure an RFS, you must create the RFSs, resources, and locations within the same initiative so they are available for the RFS to build the hierarchical relationship between them.

To create an RFS using the **Specifications** application:

1. In the **Specifications** application, select **Create Resource Facing Service** from the **Actions** drop-down list.

The **Create Resource Facing Specification** page opens.

2. Enter the following fields:

Table 5-3 New RFS Fields

Name	Required or Optional	Description
Name	Required	Unique name of an RFS. In the <i>Mobile Service</i> example, <i>4G Profile RFS</i> , <i>5G Profile RFS</i> , and <i>Mobile Identity RFS</i> are the RFS names. See " Service Models Example " for more details.
ID	Required	Unique Id of an RFS.
Start Date	Optional	The starting date of an RFS.
End Date	Optional	The ending date of an RFS.

Table 5-3 (Cont.) New RFS Fields

Name	Required or Optional	Description
Primary Domain	Required	The primary service domain or the technology domain. Only one primary domain can be selected for the RFS.
Secondary Domains	Optional	The secondary domains that are associated with the RFS. Multiple secondary domains can be associated with the RFS. The secondary domains must have the same domain type as that of the selected primary domain.
Description	Optional	The description of the RFS.
Initiative	Required	The initiative that the RFS belongs to. This RFS is available only for the selected initiative across the application until the initiative is released. Specifications from the released initiative are available system-wide.

 **Note:**

The RFS must have unique ID and must follow the naming rules. See "[About Naming Rules](#)" for more information on naming rules.

3. Click **Create and Continue**.

The **Resource Facing Service** editor page opens.

4. You use the following tabs to define the RFS:

- **Configuration:** Configure the relationship between the RFS and the other entities such as RFSs, resources, and locations. This builds a hierarchy between the RFSs, resources, and locations. See "[Configuring Relationships between Specifications](#)" for details on how to configure the relationships between specifications.
- **Design Parameters:** Configure the design parameters for the RFS using the existing data elements or create new data elements. Design parameters are carried from the upstream order management systems and you define them in the RFS. See "[Defining Design Parameters](#)" for details on how to define design parameters.
- **Entity Characteristics:** Configure the characteristics for the RFS using the existing data elements or create new data elements. Data elements are added as characteristics to realize them in UIM run-time environment. See "[Defining Entity Characteristics](#)" for details on how to define entity characteristics.
- **Parameter Mapping:** Configure the mapping of the design parameters from upstream systems to characteristics in the downstream systems such as UIM and between the child specifications. See "[Mapping Design Parameters](#)" for details on parameter mapping.
- **Design Policies:** Configure the design policies to provision the services in UIM. UIM provisions the service based on the defined design policies. See "[Defining Design Policies](#)" for details on defining design policies.

- **Delivery Policies:** Configure the delivery policies which are requests to downstream delivery systems such as activation, supply chain management, and so on, to make changes in the network. See "[Defining Delivery Policies](#)" for details on defining delivery policies.
 - **Used by:** Lists all the entities such as PSR models, specifications and so on that use the RFS.
 - **General Information:** Provides the general information for the RFS. You can add advanced policy implementation assets to a specification. See "[Adding Advanced Policy Implementation Assets](#)" for information on how to add advanced policy implementation assets.
5. Click **Go to Specifications** on the top left to return to the **Specifications** page.

Creating Resources

Network specialists create and manage the resources. You can relate a resource to location, another resource, or RFSs.

For creating and configuring a resource specification, you must have the following in Solution Designer:

- An initiative. See "[Creating Initiatives](#)" for more details.
- Domains. See "[Creating Domains](#)" for more details.
- Resources or Locations. To configure a resource, you must create the child resources, or have locations within the same initiative so they are available for the resource to build the hierarchical relationship between them.

To create a resource using the **Specifications** application:

1. In the Solution Designer landing page, click the **Specifications** application.
2. In the **Specifications** application, click **Create Resource** from the **Actions** drop-down list.

The **Create Resource Specification** page opens.

3. Enter the following fields:

Table 5-4 New Resource Fields

Name	Required or Optional	Description
Name	Required	Unique name of the resource. In the <i>Mobile Service</i> example, <i>TN</i> , <i>SIM Card</i> , and <i>UDR</i> are the resources.
ID	Required	Unique Id of a resource.
Start Date	Optional	The starting date of a resource.
End Date	Optional	The ending date of a resource.
Type	Required	The resource type that matches UIM's resources. For example, connectivity, Flow Identifier. Select Type as Other Resource if the existing types do not meet your business requirements.

Table 5-4 (Cont.) New Resource Fields

Name	Required or Optional	Description
Primary Domain	Required	The primary service domain or the technology domain. Only one primary domain can be selected for a resource.
Secondary Domains	Optional	The secondary domains that are associated with the resource. Multiple secondary domains can be associated with the resource. The secondary domains must have the same domain type as that of the selected primary domain.
Delivery Action Target	Optional	Select the check box to mark a resource to be the delivery action target for the delivery policies. Only those resources that have delivery action target selected are available for the delivery policies. See "Defining Delivery Policies" for more information on how to define delivery policies.
Description	Optional	The description of the resource.
Initiative	Required	The initiative that the resource belongs to. This resource is available only for the selected initiative across the application until the initiative is released. Specifications from the released initiative are available system-wide.

 **Note:**

The resource must have unique ID and follow the naming rules. See ["About Naming Rules"](#) for more information on naming rules.

4. Click **Create and Continue**.
The **Resource** editor page opens.
5. You use the following tabs to define the resources:
 - **Configuration:** Configure the relationship between a resource and the other entities such as resources and locations. This builds a hierarchy between resources and locations. See ["Configuring Relationships between Specifications"](#) for details on how to configure the relationships between specifications.
 - **Design Parameters:** Configure the design parameters for the resource using the existing data elements or create new data elements. Design parameters are carried from the upstream order management systems and you define them in the resource. See ["Defining Design Parameters"](#) for details on how to define design parameters.
 - **Entity Characteristics:** Configure the characteristics for the resource using the existing data elements or create new data elements. Data elements are added as characteristics to realize them in UIM run-time environment. See ["Defining Entity Characteristics"](#) for details on how to define entity characteristics.

- **Parameter Mapping:** Configure the mapping of the design parameters from upstream systems to characteristics in the downstream systems such as UIM and between the child specifications. See "[Mapping Design Parameters](#)" for details on parameter mapping.
 - **Design Policies:** Configure the design policies to provision the services in UIM. UIM provisions the service based on the defined design policies. See "[Defining Design Policies](#)" for details on defining design policies.
 - **Delivery Policies:** Configure the delivery policies which are requests to downstream delivery systems such as activation, supply chain management, and so on, to make changes in the network. See "[Defining Delivery Policies](#)" for details on defining delivery policies.
 - **Used by:** Lists all the PSR Models and specifications that use the specification.
 - **General Information:** Displays the general information of the specification. You can add advanced policy implementation assets to a specification. See "[Adding Advanced Policy Implementation Assets](#)" for information on how to add advanced policy implementation assets.
6. Click **Go to Specifications** on the top left to return to the **Specifications** page.

Adding Advanced Policy Implementation Assets

You can add **Advanced policy implementation assets** by clicking **Add** in the **General Information** tab of a specification.



Note:

You must add an advanced policy implementation assets information when you define advanced policies for that specification. You can add only one advanced policy implementation assets for multiple advanced policies for that specification.

To add advanced policy implementation assets:

1. In the specification editor page, click the **General Information** tab.
2. Click **Add** in the **Advanced policy implementation assets** section.
The **Advanced policy implementation assets** page opens.
3. Enter **Link**. This is the relative path of the S3-compatible object store. For example,

```
/bucket/restOfPath.java
```

The object store is the location where the advanced policy implementation class is placed. When you publish an initiative that has a PSR model, the DevOps engine generates the cartridge artifacts and cartridge workspace. You can download the cartridge workspace and import it into Design Studio Eclipse environment. The cartridge workspace contains a base class and an implementation class named extended designer class. The extended designer class contains the implementation for the advanced policy. After you complete your customized implementation, you must place it in the object store. Then, this relative path is entered in **Link**.

4. Enter **Relates to**. Select the advanced policies for which the implementation code is written.
5. Click **Add**.

The implementation assets details are added to the **General Information** tab. After you add the implementation asset details, the status of the advanced policy moves from **In Progress** to **Ready**. You can add only one advanced policy implementation assets information. You can update or delete the advanced policy implementation assets information.

Viewing Specifications

You can view the specifications from the **Specifications** application or from the **Initiative Items** tab in the **Initiatives** application.

To view the specifications:

1. In the Solution Designer landing page, click the application that you want to work with.
2. Do one of the following:
 - In the **Specifications** application, search for a specification using the following criteria:
 - Specification name
 - Status
 - Initiatives
 - Last Updated

The specification result is filtered based on the search criteria.

Note:

In the specifications results page, click **View Errors** to view the validation errors if any.

- In the **Initiatives** application, search for an initiative and click the **Initiative Items** tab in the initiative editor page.
3. Select a specification to view the details.

The specification editor page opens.
4. You can view the specification details such as configuration, design parameters, entity characteristics, design policies, delivery policies, used by, and general information for the respective specifications in different tabs.
5. Do one of the following:
 - Click the **Go to Specifications** link on the top left to return to the **Specifications** page.
 - Click the **Go to previous page** link on the top left to return to the **Initiatives Items** tab in the initiatives editor page.

Updating Specifications

You can update the configuration, design parameters, entity characteristics, parameter mapping, design policies, delivery policies and general information. You can update the primary domain and the secondary domains if the specification does not have any components or any child specifications associated with it.

**Note:**

You can update a specification only if the associated initiative is in **Definition** status.

To update a specification:

1. In the Solution Designer landing page, click the application that you want to work with.
2. Do one of the following:
 - In the **Specifications** application, search for a specification and open the specification.
 - In the **Initiatives** application, search for an initiative and click the **Initiative Items** tab in the initiatives editor page. Select a specification to update the details.

The specifications editor page opens.

3. You can update the specification configuration, design parameters, characteristics, parameter mappings, design policies, delivery policies, and general information for the respective specifications.
 - **Configuration:** View or update the relationship between the specification entities. This builds a hierarchy between the specification entities. See "[Configuring Relationships between Specifications](#)" for details on configuring specifications.
 - **Design Parameters:** View or update the design parameters for the specifications. See "[Defining Design Parameters](#)" for details on defining design parameters.
 - **Entity Characteristics:** View or update the characteristics for the specifications. See "[Defining Entity Characteristics](#)" for details on defining entity characteristics.
 - **Parameter Mapping:** View or update the parameter mapping. See "[Mapping Design Parameters](#)" for details on parameter mapping.
 - **Design Policies:** View or update the design policies to provision the services. See "[Defining Design Policies](#)" for details on defining design policies.
 - **Delivery Policies:** View or update the delivery policies. Delivery policies are available for RFSs and Resource specifications only. See "[Defining Delivery Policies](#)" for details on defining delivery policies.
 - **Used by:** Lists all the PSR Models and specifications that use the selected specification. Click **View Details** to view the general information of the entity.

- **General Information:** View or update the general information for the selected specification. You can add **Advanced policy implementation assets** by clicking **Add** in the **General Information** tab. See "[Adding Advanced Policy Implementation Assets](#)" for information on how to add advanced policy implementation assets.
4. Do one of the following:
 - Click the **Go to Specifications** link on the top left to return to the **Specifications** page.
 - Click the **Go to previous page** link on the top left to return to the **Initiatives Items** tab in the initiatives editor page or the parent specification page from where this specification is opened.

Cloning Specifications

You clone an existing specification and update the details as necessary. Cloning the specification copies the specification and its details such as the configuration, design parameters, entity characteristics, and general information. The parameter mapping, design policies, and delivery policies are not copied when cloning a specification. The cloning process creates a new copy of the specification with the same name appended with - *Copy* and you can update the specification name. For example, in the *Mobile Service*, the specification *Mobile CFS* is in **Definition** status with an initiative *Mobile Service*. If you clone *Mobile CFS*, a copy is created with the name *Mobile CFS - Copy* with the initiative as *Mobile*. You can update the specification name and its details such as the configuration, design parameters, entity characteristics, and general information.



Note:

You cannot clone a location specification. The location specification is pre-loaded with Customer Site and Service Location.

To clone a specification:

1. In the Solution Designer landing page, click the application that you want to work with.
2. Do one of the following:
 - In the **Specifications** application, search for a specification.
In the specifications result list page, click **Clone**.
The **Clone Specification** pop-up appears. *Specification* includes CFS, RFS, and resource.
 - In the **Specifications** application, search and open the specification.
The specifications editor page opens. Click the **Clone** in the specifications editor page.
The **Clone Specification** pop-up appears. *Specification* includes CFS, RFS, and resource.
 - In the **Initiatives** application, search and select an initiative. Click the specification in the **Initiative Items** tab in the initiatives editor page.
In the Specifications editor page, click **Clone**.

The **Clone Specification** pop-up appears. *Specification* includes CFS, RFS, and resource.

3. Update the name, ID, and description as necessary. See ["About Naming Rules"](#) for more information on naming rules for ID.

 **Note:**

- You can't select a new initiative when you clone a specification in **Definition** status.
- You must select a new initiative that is in **Definition** status when you clone a specification in **Released** status.

4. Click **Continue**.

The specification editor page opens with all the details.

You can update the configuration, design parameters, entity characteristics, and general information. You may configure parameter mapping, design policies, and delivery policies after cloning, as those are not copied when cloning a specification.

Revising Specifications

A service specialist or a network specialist revises a specification in the **Released** status. A service specialist revises a CFS whereas a network specialist revises a RFS, resource, or location specification. When you revise a specification, you create a revision of the specification that you attach to an initiative in **Definition** status. The original specification definition, which is attached to an initiative in **Released** status, does not change. You can update the details of the revised specification such as the configuration, design parameters, entity characteristics, parameter mappings, design policies, delivery policies, and general information. When you delete a revised specification, only the current revision is deleted and the specification is reverted to the previously released version.

In the *Mobile Service* example, you are revising the *Mobile CFS* in the **Released** status to add a new design parameter *Closed User Group (CUG)*. When revising, select a different initiative in **Definition** status, *Mobile Upgrade*. The original specification is associated with *Mobile* initiative and the revised specification is associated with *Mobile Upgrade* initiative. See ["Service Models Example"](#) for more information on the *Mobile Service* example.

To revise a specification:

1. In the Solution Designer landing page, click the application that you want to work with.
2. Do one of the following:
 - In the **Specifications** application, search a specification.
The specification is listed in the results section.
 - In the **Specifications** application, search and open a specification.
 - In the **Initiatives** application, search for an initiative and click the **Initiative Items** tab in the initiatives editor page. Select a specification.

The specification editor page opens.

3. Click **Revise**.

The **Revise Specification** dialog box opens. *Specification* includes CFS, RFS, and resource.

4. Select an initiative that is in the **Definition** status and click **Continue**.

The corresponding specification editor page opens.

5. The configuration, design parameters, entity characteristics, parameter mapping, design policies, delivery policies, and general information can be modified for the revised specification. See "[Updating Specifications](#)" for more information on modifying specification details.

Deleting Specifications

You delete a specification from the **Specifications** application or from the **Initiative Items** tab in the initiatives editor page in the **Initiatives** application.

To delete a specification:

1. In the Solution Designer landing page, click the application that you want to work with.

2. Do one of the following:

- In the **Specifications** application, search a specification.

The specification is listed in the results section.

- In the **Specifications** application, search and open a specification.

The specification editor page opens.

- In the **Initiatives** application, search for an initiative and click the **Initiative Items** tab in the initiatives editor page. Open a specification.

The specification editor page opens.

3. Click **Delete**.

A confirmation dialog box appears.

4. Click **Delete** in the confirmation dialog box.

The specification is deleted if it is not associated with any other specifications or PSR models. If you are deleting a revised specification, only the current revision is deleted and the specification is reverted to the previously released version.



Note:

You can't delete a specification:

- If the associated initiative has completed the definition phase but is not approved for testing.
- If the associated initiative is in the **Acceptance Testing** phase, the **Approval** phase, or the **Released** phase.

Configuring Specification Details

You configure the details of a specification using the tabs in the Specifications page. You can configure the following details for a specification:

- Configure the relationship between the entities.
- Configure the design parameters that come from the upstream order management system.
- Configure the entity characteristics that match the inventory management system.
- Map the design parameters to the entity characteristics to fulfill the order.
- Configure the design policies to assign appropriate resources from the inventory system.
- Configure the delivery policies to send the appropriate details to the delivery systems.

Configuring Relationships between Specifications

You can define the relationships between specifications in the **Configuration** tab in the Specifications page.

You can configure the following relationships between specifications:

- CFS to location, resource, or RFS
- RFS to location, resource, or another RFS
- Resource to location, another resource, or an RFS

You define relationships between specifications by adding components to the specification configuration. A component represents a specific entity that is needed to complete the specification. Each specification requires at least one component to relate the other specifications. For example, a CFS requires at least one component to relate to RFS, resource, or location specification.

To configure the relationships between specifications:

1. In the Solution Designer landing page, click the **Specifications** application.
2. In the **Specifications** application, select a specification by searching for it. The corresponding specification page opens.
3. Click the **Configuration** tab.
4. Do one of the following:
 - Click **Edit Configuration** button if no configuration exists.
 - Click the **Edit** button on the top right to update the existing specification configuration.

The **Edit Configuration** page opens.

5. In the **Edit Configuration** page, click the + symbol to add a component to the configuration. You can create a new component only; you cannot search for any existing components.

To create a new component:

- a. Click **New component** to create a new component.
The **New Component** drawer opens. You can create a new component that relates to the selected specification. For example, if the selected specification is *Mobile CFS*, you can create a *Subscriber Profile RFS* component and then relate the *4G Profile RFS* and *5G Profile RFS* to the component. For each specification that you relate, you must create a corresponding component.
- b. Enter the following details:

Table 5-5 New Component Fields

Name	Required or Optional	Description
Name	Required	Name of the component.
Type	Required	Type of the component such as resource facing service component, resource component, location component.
Minimum Cardinality	Required	The minimum number of instances of the component that can appear at runtime.
Maximum Cardinality	Required	The maximum number of instances of the component that can appear at runtime.
Relationship Type	Required	The relationship type of the component. See " Relationship Types " for the details on relationship types.
Description	Optional	The description of the component.

- c. Click **Create**.

The component is created and added to the **Edit Configuration** page or to the canvas of the service model or the technology model in the guided process.

The component is added as a child of the selected specification in the configuration.

To update the component, click the component and update the details. If you are updating a relationship type, update it first and save the changes in the components page and click **Done** in the **Edit Configuration** page. Reopen the **Edit Configuration** page to update the other details.

See "[About Components](#)" for more information on components.

6. After you add a component, click the + symbol on the component and select an existing specification that matches the type of the component.
7. Repeat the steps 5 and 6 for associating more components and specifications.
8. Click **Done**.

When you hover over the entities in the configuration, Solution Designer highlights the complete relationship hierarchy for that entity.

When you select or create a resource for logical device component and select **Exclusive** as the relationship type, you must add only those resources with the following resource types:

- Device Interface Specification
- Custom Object Specification
- Custom Network Address Specification

- IPv4Address Resource Extension
- IPv6Address Resource Extension
- Flow Identifier Specification

If you add any other resource type to the logical device component, the **Publish** operation fails with errors. You must reconfigure to add the specified resource types to the logical device components.

To remove an entity in the configuration, click the entity and in the entity details drawer, click the **Remove** button. The entity and its children are deleted from the configuration canvas if all the validations are successful.

To delete a component in the configuration, click the component and then click **Delete**. After confirmation, the component and its children are deleted if all the validations are successful.

To delete a relationship between a component and specification, click the three dots on the component and select **Remove link to child specifications** where *child specifications* are the specifications that are related to the selected component. The **Remove link to child specifications** option is available only for its components. For example, if you have selected CFS, then the option is available only for its child RFSs.

Defining Design Parameters

You define the design parameters that are passed from the upstream order management systems to the specifications in Solution Designer. A design parameter identifies the data elements or features that apply to CFSs, RFSs, or resources. Data elements define the data that is necessary to fulfill your service. Feature group is a group of data elements that you want to use together. In the *Mobile Service* example, in *Mobile CFS*, the design parameter *Service Address* can be created as a feature group which has *city* and *state* as its data elements.

You also define the design action mapping for the design parameter. Design action mappings identify which of the design parameters on the specification are exposed in the signatures of operations acting on the entity. For example, the set of design parameters identified as inputs on the Add action will be part of the request to create an instance of the entity.

Design Action Mapping

A design action mapping is an operation that can be invoked on a specification in the context of a service configuration. You can define design actions for CFSs, RFSs, and resources. Action codes represent the specific types of actions permitted for each mapping. For example, an action can include a number of action codes to represent create, disconnect, and remove. Design Action Mapping includes a group of action codes, each of which can be performed against the associated specification. For example, a design parameter can affect change to a customer facing service because it includes the action codes Add, Move, and Delete.

You can select one or more of the following action codes for the design parameter:

- Add
- Change
- Disconnect

- Move
- Resume
- Suspend

You can specify whether a design parameter is required or optional to a specification. For each design action operation, you can select whether the design parameter will be provided as input, output, or both.

The values for each action code are:

- Optional In/Out
- Optional In
- Optional Out
- Required In/Out
- Required In
- Required Out

A set of design parameters is identified as required or optional for a specific action code. For example, in the *Mobile Service* example, if you are creating a new service order, the *MSISDN* design parameter is a required input parameter and also a required output parameter. The value of the *MSISDN* design parameter is required from the upstream order management system and that value must be passed to the downstream inventory management system to provision the service accordingly. In this case, define the design action mapping with action code as **Add** and the **Value** as **Required In/Out**.

After you define the design action mapping in Solution Designer, you can override the existing implementation with your custom implementation using the extended designer class. To write the implementation code for design action mapping, see "Extending Solution Designer" in *Developer's Guide*.

Defining Design Parameters

To define a design parameter:

1. In the Solution Designer landing page, click the application that you want to work with.
2. Do one of the following:
 - In **Specifications** applications, search and open the specification page and click the **Design Parameters** tab.
 - In the **PSR Models** application, in the **Configure Model** step, expand **Design Parameters** and select a specification.

The corresponding specification drawer opens that lists the defined design parameters.

3. Click the + icon to add a new design parameter to the selected specification.
The **New design parameter** drawer opens.
4. Enter a data element, name, and default value. You can select an existing element or create a new element to be a design parameter. Select + **Create Element** or + **Create Feature** in **Data Elements** to create a new data element. See "[Creating Data Elements in Specifications and PSR Models](#)" for more details.
5. Add the design action mapping details:

- a. Select the **Action Code** and **Value** for the design parameter.
 - b. Click the **Submit** to add the design action mapping. Similarly, you can add more design action mappings to the design parameter. To delete a design action mapping, click **Delete**.
6. After you add the design action mapping, click **Add**.
The design parameter is added.
 7. Repeat steps 3 to 6 to define more design parameters.

Editing Design Parameters

To edit a design parameter:

1. Click the design parameter name in the **Design Parameters** tab.
The **Edit design parameter** drawer opens.
2. Edit the data element, name, default value and design action mapping.
To edit the design action mapping, click **Edit** and change the values. Then click **Submit**.
To delete a design action mapping, click **Delete**.
3. Click Save.
The modified design parameter is displayed in the **Design Parameters** tab in the **Specifications** application or in the Design parameters page while configuring the model in the **PSR models** application.

Deleting Design Parameters

To delete a design parameter, click **Delete**. On confirmation, the design parameter is deleted. Deleting a design parameter removes the data element from the specification. The data element remains in the **Data Elements** application so you can reuse that data element in another specification within the same initiative. To delete a data element from the application, you must navigate to the **Data Elements** application and delete them. See "[Deleting Data Elements](#)" for more information.

Defining Entity Characteristics

Entity characteristics are specific types of data with particular properties that you can use in a service in Solution Designer. For example, a characteristic can be an ID, a feature, or a telephone number. You can define data elements or feature groups that are entity characteristics within the CFSs, RFSs, resources, and locations.

To define entity characteristics:

1. In the Solution Designer landing page, click the application that you want to work with.
2. Do one of the following:
 - In **Specifications** applications, search and open the specification page and click the **Entity Characteristics** tab.

The **Entity characteristics** tab page that lists the existing characteristics opens.

- In the **PSR Models** application, in the **Configure Model** step, expand **Entity Characteristics** and select a specification.

The corresponding specification drawer that lists the existing characteristics opens.

 **Note:**

You can search for the characteristics that are defined for the selected specification using name.

3. Enter the details of the characteristics as follows:
 - Enter the name of the entity characteristic.
 - Select an existing data element or create new data element and select it to be the entity characteristic. You can also select or create a new feature group as an entity characteristic. You can create data elements or feature groups within the **Entity Characteristics** tab. See "[Creating New Data Elements and Feature Groups](#)" for more details.
 - Enter a default value for the characteristic.
 - Select **Required** if the entity characteristic must be mapped with the design parameters in the **Parameter Mapping** tab.
 - Select **Changeable** if the entity characteristic changes frequently or if you need to track the life cycle of an entity characteristic. In the *Mobile Service* example, customers often upgrade services for monthly quota. You can select **Changeable** for the *Monthly Quota* characteristic and track the characteristic's history for auditing purposes. When realizing CFSs and RFSs in the UIM run-time application, Solution Designer saves the changeable characteristics to the Service Configuration specifications.
4. Click **Submit**.

The characteristic is added to the specification.
5. Repeat the steps 3 and 4 to define more entity characteristics to the specification.

Editing Entity Characteristics

To edit entity characteristics:

1. In the **Entity Characteristics** tab of a specification, click **Edit**.

The characteristic is editable and you can change the details.

2. Click **Submit**.

The modified entity characteristic is displayed in the **Entity Characteristics** tab in the **Specifications** application or in the Entity Characteristics section while configuring the model in the **PSR models** application.

Deleting Entity Characteristics

To delete an entity characteristic, click the Delete icon next to the entity characteristics in the **Entity Characteristics** tab. On confirmation, the characteristic is deleted from the specification. Deleting an entity characteristic removes the data element from the specification. The data element remains in the **Data Elements** application so you can reuse that data element in another specification within the same initiative. To delete a data element

from the application, you must navigate to the **Data Elements** application and delete them. See "[Deleting Data Elements](#)" for more information.

Mapping Design Parameters

You map the design parameters of a specification to the specification's entity characteristics and the design parameters of its child specification. When mapping parameters, the data elements and feature groups must be of the same type. For example, you must map a design parameter of boolean type to an entity characteristic of boolean type only. When you map design parameters to entity characteristics in Solution Designer, at runtime the value for the mapped parameter is passed from the order management system to the inventory management system to provision the services.

To map design parameters:

1. In the Solution Designer landing page, click the application that you want to work with.
2. Do one of the following:
 - In the **Specifications** application, search and open the specification editor page and click the **Parameter Mapping** tab.
In the **Parameter Mapping** tab, click **Edit**. The **Parameter Mapping** drawer opens.
 - In the **PSR Models** application, in the **Configure Model** step, expand **Parameter Mapping** and select a specification.

The **Parameter Mapping** drawer opens.

3. The **Source** column lists all the defined design parameters and the **Destination** column lists the mapped characteristics or the design parameters. Click **Select Entity** in the **Destination** column to map the design parameter.

Clicking **Select Entity** lists the first 15 parameters where parameters include the characteristics defined for the specification and the available design parameters defined for its immediate child specifications. For those parameters that are not displayed, you must search them by typing the parameter name in the search field.

To define new design parameters for a specification, see "[Defining Design Parameters](#)". To define new entity characteristics, see "[Defining Entity Characteristics](#)".

You can map a source design parameter to multiple destination parameters. You must map a feature group source parameter with only a feature group destination parameter.

 **Note:**

You must map all the required characteristics to the source design parameters.

4. Repeat step 3 to define more mappings.
After you complete the parameter mapping, click **Save**.

The parameter mappings are saved.

To delete a mapping, click delete in the parameters in the **Destination** column.

If you have to perform any mappings other than the available mappings, you can map them by writing the custom code in the extended designer class. To write the code for parameter mappings, see "Extending Solution Designer" in *Developer's Guide*.

Defining Design Policies

You define the design policies to provision the service in UIM. It allows you to define the design and assign conditions, so at runtime, if the condition is met, then the defined logic is run to assign appropriate resources in UIM to fulfill the service. You can manage the following types of design policies in Solution Designer:

- **Standard Policies for Specification Selection:** Define the standard policies within Solution Designer for designing and assigning specification based on the design parameters or characteristics. These are simple policies that have if-then conditions. In the *Mobile Service* example, if the State is *ON*; then select the *5G Profile RFS* else select the *4G Profile RFS*. As another example, based on Service Address, reserve and assign the phone numbers from the range in the inventory.
- **Standard Policies for Naming:** Define the standard policies within Solution Designer for naming policies, when a specification instance is created in the run-time application. You can define a naming policy based on the design parameter, ID, string, or combination of them. The naming policy is applicable only for resource specifications.
- **Advanced Policies:** Define advanced policies in Solution Designer. A developer implements the advanced policies in Design Studio Eclipse environment using the extended designer class. Solution Designer builds the solution with standard policies and advanced policies. In the *Mobile Service* example, select UDR in the same *State* as the *5G Profile RFS* is an advanced policy.

Defining Standard Policies

To define a standard policy:

1. In the Solution Designer landing page, click the application that you want to work with.
2. Do one of the following:
 - In **Specifications** applications, search and open the specification editor page and click the **Design Policies** tab.
The **Design Policies** tab page opens.
 - In the **PSR Models** application, in the **Configure Model** step, expand **Design Policies** and select a specification.
The **Design Policies** drawer opens.
3. In **Design Policies** tab, click the + drop-down and select **Standard policy**.
The **New standard policy** page opens.
4. If you are creating a standard policy for a resource specification, select **Specification selection** as the **Standard policy type**.
Enter the name, description, component, and default value. The **Component** drop-down lists only those components that are related to the selected specification. The **then** part of the condition is displayed based on the component that you select. If you select an RFS component, the **Then** clause is displayed with RFS. The **Default Value** drop-down

lists the specifications that are related to the component that was selected in the **Component** drop-down.

5. In the **Conditions** section, do the following:
 - a. Drag and drop the design parameters and the characteristics from the **Parameters** panel on the right. The **Parameters** panel displays the design parameters and characteristics for that specification and also from its child specifications.

Figure 5-1 illustrates the New standard policy page.

Figure 5-1 New Standard Policy

- b. Select the operator from the available operators. The available operators are Contains, Equals, Not equals, Equal ignore case, Contains ignore case, and Not equal ignore case.
 - c. Select or enter a value in the **Select Value** field that must be validated with the actual value. Select a value if you have to defined valid values for the parameters or enter a value if you do not have valid values defined for design parameters.
6. In the **Then** drop-down, select the option **Create** or **Select**. **Create** option creates the selected specification at runtime. **Select** option selects the specification based on the selected advanced policy in the **Select policy** drop-down at runtime.

Note:

When you select the option **Select** in the **Then** drop-down, that standard policy must have a corresponding advanced policy to select the entity.

7. Click **Add New Group** to add more conditions and repeat steps 5 and 6.
8. Click **Save**.
The standard policy is listed in the **Design Policies** page.
9. Repeat steps 3 to 8 to add more standard policies.

Defining Naming Policies

You can create a naming policy only for resource specifications.

To define a naming policy:

1. In the Solution Designer landing page, click the application that you want to work with.
2. Do one of the following:
 - In **Specifications** applications, search and open a resource specification and click the **Design Policies** tab.
The **Design Policies** tab page opens.
 - In the **PSR Models** application, in the **Configure Model** step, expand **Design Policies** and select a resource specification.
The **Design Policies** drawer opens.
3. In **Design Policies** tab, click the + drop-down and select **Standard policy**.
The **New standard policy** page opens.
4. Select **Naming** as the **Standard policy type**.
Enter the name and description.
5. In the **Settings** section, select **Type** as Design Parameter, ID, or String. When you select Design Parameter, select **Value** from the design parameters defined for that specification. You can specify to use the automatically generate IDs using **ID** type or specify a constant text that must be added to the name using **String** type.
6. Click Submit to add the settings to the naming policy.
7. Repeat steps 5 and 6 to add settings to the naming policy.
The naming policy can have multiple settings and any new settings that you add are appended to the naming preview. Naming preview section displays the preview of the naming policy. For example, the naming preview displays *<ID>naming policy string<DE-DownloadSpeed1>* which means that there are three settings added to the naming policy and they are ID, string, and design parameter.
8. Click **Save**.
The standard policy for naming is listed in the **Design Policies** page.

 **Note:**

You can have only one naming policy for a resource. If you add a new naming policy, you may choose to overwrite the existing policy.

Defining Advanced Policies

To define an advanced policy:

1. In the Solution Designer landing page, click the application that you want to work with.
2. Do one of the following:
 - In **Specifications** applications, search and open the specification editor page and click the **Design Policies** tab.
The Design Policies tab page opens.
 - In the **PSR Models** application, in the **Configure Model** step, expand **Design Policies** and select a specification.

The **Design Policies** drawer opens.

3. In **Design Policies** tab, click the + drop-down and select **Advanced policy**.
The **New advanced policy** page opens.
4. Enter the name, description, component, and default value. The **Component** drop-down lists only those components that are related to the selected specification. The **Default Value** drop-down lists the specifications that are related to the component that was selected in the **Component** drop-down.
5. Enter the notes regarding the policy that you are defining in the **Notes** tab. For example, in *Mobile Service* example, you can enter the notes as Select UDR in the same state as RFS.
6. Click **Save**.
The advanced policy is listed in the **Design Policies** page with the status **In Progress**. After you add the advanced policy implementation assets in the **General Information** tab, the advanced policy status moves to **Ready**.

Advanced Policy Setup Process

Perform the following steps to set up an advanced policy:

1. Add an advanced policy with notes in the **Notes** tab regarding the policy. These notes that you enter are added as comments in the generated extended designer Java class, when you publish the initiative.
2. Publish the initiative to Test workspace. See "[Publishing Initiatives to the Test Workspace](#)" for more information on how to publish an initiative to the test workspace.

The publish operation fails because the advanced policy does not have related Advanced policy implementation assets. The DevOps engine generates cartridge artifacts and cartridge workspace. The cartridge workspace can be downloaded and imported in to Design Studio Eclipse environment. The Design Studio project contains base class and an extended designer class. You can write the code for the advanced policies in the extended designer class. See "Extending Solution Designer" in *Developer's Guide* on how to define advanced policy implementation.

3. Download the cartridge workspace from the failed **Publish** operation.
4. Import the cartridge workspace into Design Studio Eclipse environment. See "Importing Projects" in *Design Studio Modeling Basics Guide* for more information on importing the cartridge workspace into Design Studio.
5. Write the implementation code in the extended designer class in Design Studio Eclipse environment for the advanced policy using the comments and compile them.
6. Place the designer class in the S3-compatible object storage and enter that object store link in the **Advanced policy implementation assets** section in the specification which has the advanced policy.

 **Note:**

When defining the implementation code using the extended designer class, do not include the third party libraries.

7. Save the specification.

8. Republish the initiative to Test workspace and the DevOps engine builds the cartridge including the implementation code in the location specified in **Link** in the **Advanced policy implementation assets** section. You may correct any errors until the **Publish** operation completes.

Editing Design Policies

To edit a design policy:

1. In the Solution Designer landing page, click the application that you want to work with.
2. Open the specification in the **Specifications** application or in the **Configure Model** step in the **PSR Models** application.
3. In the **Design Policies** tab or the **Design Policies** drawer, click the design policy to be edited.

You can edit the details of the policy.

4. Click **Save**.

The modified policy is displayed in the **Design Policies** tab in the specifications editor page or in the design policies while configuring the model in the PSR models application.

Deleting Design Policies

To delete a design policy, click the delete icon for the policy in the **Design Policies** tab. On confirmation, the design policy is deleted from the specification.

Defining Delivery Policies

You define the delivery policies in Solution Designer. Delivery policies are a set of delivery actions that communicate to a delivery system. For example, an activation system performs delivery actions to configure a network; a shipping system performs delivery actions to pick, pack, and ship physical goods; and a workforce management system performs delivery actions to dispatch work to a field technician.

When you define a resource, you can specify that it is a delivery action target. Only those resources which are defined as delivery action targets can be delivery targets in delivery policies. You define a delivery policy for an RFS or a resource that includes a set of delivery parameters, to indicate the parameters that are involved along with the type of delivery action. With multiple delivery policies, you can have delivery actions destined for different types of delivery systems defined against a single specification.

Available delivery types and the corresponding action codes are:

Table 5-6 Delivery Types and Action Codes

Delivery Types	Action Codes
Activation	Activate
	Alter
	Deactivate
NFV Orchestration	Instantiate
	Terminate

Table 5-6 (Cont.) Delivery Types and Action Codes

Delivery Types	Action Codes
Supply Chain Management	Ship Recover
Test	Initiate
Workforce Management	Install Reconfigure Uninstall
All Applications	NA
Partner Gateway	Order Revise Cancel

During service order fulfillment, a design and assign process defined by the design policies produces a service configuration that defines the delivery actions that must be run to fulfill the requested service.

A delivery action represents a unit of work that is performed to realize a resource in a network. A delivery action also defines delivery parameters that describe the work to be done, and these delivery parameters also map to properties of a resource assigned to or referenced by the service configuration. You define the delivery action in Solution Designer by mapping the delivery parameter to the delivery action code and its value. For each delivery action operation, you can select the **Value** field as required or optional, inputs, outputs, or both.

To define a delivery policy:

1. In the Solution Designer landing page, click the application that you want to work with.
2. Do one of the following:
 - In the **Specifications** applications, search for an RFS or a resource and open the specification editor page and click the **Delivery Policies** tab.
The **Delivery Policies** page opens.
 - In the **PSR Models** application, in the **Configure Model** step, expand **Delivery Policies** and select a specification.
The **Delivery Policies** drawer opens.
3. Click the + icon to add a new delivery policy.
A **New delivery policy** drawer opens.
4. Enter a name, a delivery type, a delivery target, and a description. Only those resource specifications which have **Delivery Action Target** set are displayed in the **Delivery Target** drop-down. When defining a delivery policy for an RFS, only those resource specifications that are related as a child to the selected RFS with **Delivery Action Target** set are displayed in the **Delivery Target** drop-down.
5. Add delivery parameters.
To add delivery parameters:

- a. Click the + icon in the **Delivery Parameters** section.
A **New delivery parameter** drawer appears.
 - b. Enter a name and default value. Select an existing data element or create a new data element. See "[Creating New Data Elements and Feature Groups](#)" for more details.
 - c. In the Characteristic Mapping section, select the source characteristic which lists the entity characteristics of the related resource specification. This maps the entity characteristics to the selected delivery parameter.
 - d. In the **Delivery action mapping** section, select **Action Code** and **Value**. Click the submit icon.
The delivery action is added and listed in the delivery action mapping section.
 - e. Click **Save**.
The added delivery parameter is listed in the delivery parameters section in the **New delivery policy** drawer.
 - f. Repeat steps a to e to add more delivery parameters.
6. Click **Save**.
The delivery policy is added and listed in the **Delivery Policies** tab in the **Specifications** application or in the **Delivery Policies** drawer in the **PSR Models** application.

After you define the delivery action mapping in the **Delivery Parameter** in Solution Designer, you can override the existing implementation with your custom implementation using the extended class. To write the implementation code for delivery action mapping, see "Extending Solution Designer" in *Developer's Guide*.

Editing Delivery Policies

To edit a delivery policy:

1. Open the specification in the **Specifications** application or in the **Configure Model** step in the **PSR Models** application.
2. Click the delivery policy to be edited.

You can edit the details.

Note:

You cannot edit the delivery type if the delivery parameters have been defined.

3. Click **Save**.

The modified policy is displayed in **Delivery Policies** in the **Specifications** application or while configuring model in the **PSR Models** application.

Deleting Delivery Policies

To delete a delivery policy, click the delete icon. On confirmation, the delivery policy is deleted.

6

Managing Data Elements

Data elements are specific types of data that you can use in a service in Solution Designer. Feature groups are sets of data elements that you want to use together. A service catalog administrator or a service specialist defines the data elements. The data elements can be defined in the **Data Elements** application or within CFS, RFS, and resources specifications.

Topics in this document:

- [About Data Elements and Feature Groups](#)
- [Creating New Data Elements and Feature Groups](#)
- [Viewing Data Elements](#)
- [Updating Data Elements](#)
- [Revising Data Elements](#)
- [Deleting Data Elements](#)

About Data Elements and Feature Groups

A data element defines the attributes and properties of services and resources. It is a type of data with particular properties. A data element can be, for example, an ID, a feature, a download speed, or a telephone number. Data elements can have the following data types:

Table 6-1 Data Element Types and Description

Data Element Type	Description
Boolean	Contains true and false values.
Date	Enables users to enter or select date values.
Time	Enables users to enter or select time values.
Date and Time	Enables users to enter or select date and time values.
Numeric	Enables users to enter integers. When Numeric type is selected, Settings and Valid Values sections are displayed. In the settings section, you can specify the decimal places, minimum value, and maximum value. In the valid values section, you can specify valid value's name and value.
Secret	Enables you to protect the contents of a text or numeric data element that contains sensitive information. For example, select this type for fields that are used as password fields. When Secret type is selected, Settings section is displayed. In the settings section, you can specify the minimum characters and maximum characters.

Table 6-1 (Cont.) Data Element Types and Description

Data Element Type	Description
Text	Enables you to enter alphanumeric text. When Text type is selected, Settings and Valid Values sections are displayed. In the settings section, you can specify the minimum characters, maximum characters, and regular expression that describes a pattern. In the valid values section, you can specify a valid value's name and value.
Feature Group	Enables you to create a feature group data element. Feature groups are sets of data elements that you want to use together. When Feature Group type is selected, the Data Elements section is displayed. You can select the existing data elements that you want to combine into the feature group.

You can combine data elements into feature groups. You can use the same data element in multiple specifications.

Data elements are used to:

- Provide metadata that enriches the understanding of the services and resources. This metadata can include information like the data type, units of measurement, allowed values, and more.
- Manage the configuration of services and resources with an accurate representation of how services are configured, which resources are allocated, and what settings are applied.
- Describe the details of the network assets and resources, such as the physical location, capacity, manufacturer, and maintenance history.
- Provide the building blocks for describing the specific details of services, resources, and operations.

Creating New Data Elements and Feature Groups

You create data elements and feature groups in the following ways:

- In the **Data Elements** application, you can create the data elements and feature groups. Define data elements and features here if you want to reuse the data elements elsewhere in the application as design parameters, delivery parameters, and entity characteristics within the same initiative. The data elements and features from the released initiative are available system-wide.
- When defining design parameters, delivery parameters, and entity characteristics in the **Specifications** application, you can add a previously defined data element or feature group or create new ones. The data elements and feature groups that you create as design parameters, delivery parameters, and entity characteristics then show up in the **Data Elements** application.

The data elements are available only to those specifications with the same initiative until they are released. Data elements from the released initiative are available system-wide.

Creating Data Elements and Feature Groups in the Data Elements Application

You can create data elements and feature groups in the **Data Elements** application, when creating specifications, and when creating PSR Models.

To create data elements and features in the **Data Elements** application:

1. In the **Data Elements** application, click **Create Data Element**.

The **Create Data Element** page opens.

2. Enter a name, ID, type, initiative, and a description.

3. Click **Create**.

The data element is created and the newly created data element is listed in the **Data Elements** page.

Creating Data Elements in Specifications and PSR Models

You can also create data elements when creating specifications and creating PSR Models. The data elements that you create in the specifications or in the PSR models are added to the **Data Elements** application.

To create data elements in Specifications and the PSR Models:

1. In the Solution Designer landing page, click the application that you want to work with.

2. Do one of the following:

- In the **Specifications** application, in the Specifications details page, in the **Design Parameters** tab, create a new or open an existing design parameter and click **+ Create Element** in the **Data Element** field.
- In the **Specifications** application, in the Specifications details page, in the **Entity Characteristics** tab, create a new or open an existing characteristic and click **+ Create Element** in the **Data Element** field.
- In the **Specifications** application, in the Specifications details page, in the **Delivery Policies** tab, in the **New Delivery Policy** drawer, create a new or open a delivery parameter and click **+ Create Element** in the **Data Element** field.
- In the **PSR Models** application, in the **Configure model** step, in the Specification Configuration, expand the **Design parameters**, select the specification and create a new or open an existing design parameter and click **+ Create Element** in the **Data Element** field.
- In the **PSR Models** application, in the **Configure model** step, in the Specification Configuration, expand the **Entity characteristics**, select the specification, click **+ Create Element** in the **Data Element** field.
- In the **PSR Models** application, in the **Configure model** step, in the Specification Configuration, expand the **Delivery Policies**, select the specification and create a new delivery parameter and click **+ Create Element** in the **Data Element** field.

The **New data element** drawer opens.

3. Enter a name, ID, initiative, and a description. Enter the details in the **Settings** and **Valid Values** based on the type you select.

4. Click **Add**.

The data element is added to the design parameters, the entity characteristics, or the delivery parameters. These data elements are added to the **Data Elements** application and can be managed from the **Data Elements** application.

Creating Feature Groups in Specifications and PSR Models

You can also create feature groups when creating the specifications and creating the PSR Models. The features that you create in the specifications or in the PSR models are added to the **Data Elements** application.

To create Feature Groups in Specifications and the PSR Models:

1. In the Solution Designer landing page, click the application that you want to work with.
2. Do one of the following:
 - In the **Specifications** application, in the Specifications details page, in the **Design Parameters** tab, create a new or open an existing design parameter and click **+ Create Feature** in the **Data Element** field.
 - In the **Specifications** application, in the Specifications details page, in the **Entity Characteristics** tab, create a new or open an existing characteristic and click **+ Create Feature** in the **Data Element** field.
 - In the **Specifications** application, in the Specifications details page, in the **Delivery Policies** tab, in the **New Delivery Policy** drawer, create a new or open a delivery parameter and click **+ Create Feature** in the **Data Element** field.
 - In the **PSR Models** application, in the **Configure model** step, in the Specification Configuration, expand the Design Parameters, select the specification and create a new or open an existing design parameter and click **+ Create Feature** in the **Data Element** field.
 - In the **PSR Models** application, in the **Configure model** step, in the Specification Configuration, expand the Entity characteristics, select the specification, click **+ Create Feature** in the **Data Element** field.
 - In the **PSR Models** application, in the **Configure model** step, in the Specification Configuration, expand the **Delivery Policies**, select the specification and create a new delivery parameter and click **+ Create Feature** in the **Data Element** field.

The **New data feature** drawer opens.

3. Enter a name, ID, initiative, and a description. Enter the details in the **Data Elements** section.

You can select existing data elements or create a new data element to combine them into feature group. See "[Creating Data Elements in Specifications and PSR Models](#)" for more details on creating data elements.

4. Click **Add**.

The feature group is added to the design parameters, the entity characteristics, or the delivery parameters.

Viewing Data Elements

You view the data elements from the following applications:

- **Data Elements** application
- **Initiative Items** tab in the **Initiatives** application

To view data elements:

1. In the Solution Designer landing page, click the application that you want to work with.
2. Do one of the following:
 - In the **Data Elements** application, search for a domain using the following criteria:
 - Data Elements name
 - Type
 - Initiatives
 - Last Updated date

The data elements result is filtered based on the search criteria.

- In the **Initiatives** application, search for an initiative and click the **Initiative Items** tab in the Initiatives editor page.
3. Click a data element name to view the details.

A data element drawer appears with the details of the data element.
4. After viewing the details, click anywhere outside the dialog box to return to the data elements details page or the initiatives editor page.

Updating Data Elements

You update the data element details such as Name, Description, Settings, Valid Values, and Data Elements if the selected data element is a feature group.

To update a data element:

1. Do one of the following:
 - In the **Data Elements** application, search for a data element.

The data elements result is filtered based on the search criteria.
 - In the **Initiatives** application, search for an initiative and click the **Initiative Items** tab in the Initiatives editor page.
2. Click the data element that you want to view.
3. Click **Edit** in the data elements drawer and update the name, description, settings, valid values, and the data elements in case of feature group.
4. Click **Save**.

 **Note:**

You can't update the data element **Type** and **Initiative**.

You can't update the data element's details in the following scenarios:

- If the associated initiative has completed the definition phase but has not been approved for testing.
- If the associated initiative is in the **Acceptance Testing** phase, the **Approval** phase, or the **Released** phase.

Revising Data Elements

You revise a data element in the **Released** status. When you revise a data element, you create a revision of the data element that you attach to an initiative in **Definition** status. The original data element definition, which is attached to an initiative in **Released** status, does not change. You can update the details of the revised data elements. When deleting a revised data element, only the current revision is deleted and the data element is reverted to the previously released version.

To revise a data element:

1. In the Solution Designer landing page, click the application that you want to work with.
2. Do one of the following:
 - In the **Data Elements** application, search for a data element and click to open it.
The data element drawer opens.
 - In the **Initiatives** application, search for an initiative, click the data element that you want to revise in the **Initiative Items** tab in the initiatives editor page.
The data element drawer opens.
3. Click **Revise**.
The **Revise Characteristic** drawer opens.
4. Select a different initiative in the **Definition** status and click **Continue**.
The data element drawer opens with the newly selected initiative.
5. Do one of the following:
 - Click **Edit** to modify the name, description, settings, valid values, and data elements and then click **Save**. The revised version is saved with the updated details.
 - Click **Delete** to delete the current revised version. After confirmation, the revised version of the data element is deleted.

Deleting Data Elements

You delete a data element in the data element's results page or in the details page. Deleting a data element or feature group in the **Data Elements** application deletes it

from the system. You can't delete a data element or feature group that is being used in a released initiative or that is referenced by a specification. For example, if a data element is defined as a design parameter of a specification, you can't delete that data element from the **Data Elements** application.

To delete a data element in the **Data Elements** application:

1. In the Solution Designer landing page, click the application that you want to work with.
2. Do one of the following:
 - In the **Data Elements** application, search for a data element.
The data elements results section is filtered based on the search criteria.
 - In the **Data Elements** application, search for a data element and click to open it.
The data element drawer opens.
 - In the **Initiatives** application, search for an initiative, open the initiative details page, in the **Initiative Items** tab, click the data element that you want to delete.
The data element drawer opens.
3. Click **Delete**.
The delete confirmation dialog box opens.
4. Click **Delete** in the confirmation dialog box.

After confirmation, the data element is deleted if it is not associated with any specifications.

 **Note:**

You can't delete a data element:

- If the data element is associated with any specification.
- If the associated initiative has completed the definition phase but has not been approved for testing.
- If the associated initiative is in the **Acceptance Testing** phase, the **Approval** phase, or the **Released** phase.

7

Publishing Initiatives to the Workspaces

Use workspaces to publish your initiatives for testing the design and launching the initiatives to production.

Topics in this document

- [About Workspaces](#)
- [Viewing Workspaces](#)
- [Managing Connections](#)
- [Publishing Initiatives to the Test Workspace](#)
- [Publishing Initiatives to the Production Workspace](#)

About Workspaces

Workspace is an interface that enables Solution Designer to interact with the DevOps engine and generates the requested cartridge. The DevOps engine has all the plug-ins required by Solution Designer to build the requested cartridge. You can then deploy the cartridge into UIM. A cartridge is a collection of PSR models which includes specifications, characteristics, design parameters, parameter mappings, design policies, and delivery policies that are defined in Solution Designer. The artifacts are compiled into a deployable JAR file.

Workspaces are created during the Solution Designer installation. You can't create, modify, or update the workspaces in Solution Designer. The following workspaces are available in Solution Designer:

- **Non-production or Test workspace:** A workspace where the initiatives are published to the test instance and the test cartridges are generated. These cartridges are deployed in the UIM run-time instances and you can do the functional testing. Based on the functional testing results, you can modify the initiative contents and then perform acceptance testing. The modified initiatives are published again to the test workspace until the initiative content is finalized and passes acceptance testing.
- **Production workspace:** A workspace where the initiatives are published and the production cartridges are generated. After the initiative is released to the production workspace, the DevOps engine generates a production cartridge which in turn is deployed to the UIM run-time instance.

Cartridge Generation Process

You publish an initiative to a test or production workspace. The workspace interacts with UIM Participant. UIM Participant is a micro-service that participates in the workspace operation **Publish**. The UIM participant in turn interacts with the DevOps engine to generate the requested cartridges. After generating the cartridge, the DevOps engine informs the UIM participant and the UIM participant informs the workspace about the status of the request. The location of the generated cartridge artifacts and the location of the cartridge workspace that can be deployed in Design Studio are displayed in the workspace. You can download these cartridge artifacts and deploy them in UIM. See "Deploying Cartridges" in *UIM Cartridge Guide* for more information on deploying cartridges in UIM. You can download the

cartridge workspace and import it into the Design Studio Eclipse environment to code the design and assign logic for advanced policies, define parameters mapping, define logic for design action mapping, define logic for delivery action mapping, and build solution cartridges for OSM and ASAP.

The generated cartridge workspace contains a base class and an extended designer class. A base class is the Java code that the DevOps engine generated to implement the behavior of the specifications and must not be modified. An extended designer class is the Java code which lets you write your custom code for the extension points that are provided in the class. You can do the following in extended designer class:

- Coding the design and assign policies according to your business requirements using advanced policies
- Debugging the existing design and assign policies for any errors including compilation errors

After you complete coding, you can place the extended designer class in the S3-compatible object storage. Enter the object storage's relative path in the **Advanced policy implementation assets** section in the **General Information** tab of a specification. Publish the initiative and the DevOps engine builds the requested cartridge that you can deploy to a run-time environment. See "Extending Solution Designer" in *Developer's Guide* for more information on extended designer class.

You can download the cartridge workspace and import it into the Design Studio Eclipse environment to build solution cartridges for OSM and ASAP. You can do the following in Design Studio:

- Modeling ASAP with the ASDLs and CSDLs generated in the cartridge for the activation system
- Modeling OSM with the Action Parameter Bindings generated in the cartridge

Then you can build and package the cartridge in Design Studio and then deploy it to a run-time environment.

Viewing Workspaces

You must have the service catalog admin role to view the workspaces and manage the connection for the workspaces.

To view the workspace:

1. In the Solution Designer landing page, click the application that you want to work with.
2. In the **Workspaces** application, click the **Test** or **Production** workspace.
The workspace details page opens.
3. The following tabs are displayed:
 - The **Operations** tab lists all the initiatives that are published for the selected workspace.
 - The **Participants** tab lists the participants that are defined for the selected workspace. UIM Participant is the only participant listed. You can't delete the UIM Participant and you cannot define any new participants.
4. You can view the tasks for the published initiative in the **Operations** tab:
 - a. In the Operations tab, click the ID for the published initiative.

The Tasks page opens.

The **Prepare** task prepares the transaction for the UIM Participant and generates the cartridge. If the transaction fails, the **Prepare** task fails.

The **Commit** task commits the transaction. It runs automatically and completes successfully whenever the **Prepare** task is completed.

- b. Click **View Operation** to view the task details.

The **Task Details** drawer appears.

- c. The **Task Details** drawer displays the location of the cartridge and the cartridge workspace in the **Operation Task Message** for the completed task. If the task fails, the **Task Details** drawer displays an appropriate message.
 - d. Close the **Task Details** drawer and click the left arrow to go to the operations details page.
5. You can view the defined participants in the **Participants** tab.
 6. Click **Go to Workspaces** to return to the **Workspaces** page.

Managing Connections

You must have **Service Catalog Admin** user role to manage the connections. Connections specify the details of the applications to which the workspaces connect to perform an action.

You can perform the following tasks in the **Connections** page:

- [Creating New Connections](#)
- [Updating Connections](#)
- [Deleting Connections](#)

Creating New Connections

You must have the service catalog admin user role to create new connections. After you install Solution Designer, you must manually create a connection for the workspaces to publish the initiative content.

To create a new connection:

1. Create an initiative exclusively for creating the connections without any initiative items in it. For example, create an initiative with the name *Connection*. See "[Creating Initiatives](#)" for more details on how to create an initiative.
2. In the **Workspaces** application, click **Manage Connections**.
A **Connections** page opens which lists the available connections.
3. Click **New Connection**.
A **New Connection** page opens.
4. Enter the following details:

Table 7-1 New Connection details

Name	Required or optional	Description
Name	Required	Name of the connection.

Table 7-1 (Cont.) New Connection details

Name	Required or optional	Description
Initiative	Required	Select the initiative that was created exclusively for connections. For example, <i>Connection</i> .
Authentication	Required	Provide authentication details to authenticate the UIM Participant. Enter the ID , Secret , and Token Endpoint URL for the UIM Participant image.
Participant	Required	Add the Participant details. Select the participant ID (UIM), workspace (<i>Test</i> or <i>Production</i>), Scope (<i>/lcm</i>) and the end point URL for the UIM participant (http://uim-participant:8080). You must add two UIM participants one each for the Test and Production workspaces.

5. Click **Create**.
The connection is created and is listed in the **Connections** page.
6. Navigate to the *Connection* Initiative and transition the initiative to **Acceptance Testing** phase.
7. Publish the initiative to the **Test** workspace. You must wait until the publishing status changes to **Up to Date**. See "[Publishing Initiatives to the Test Workspace](#)" for more information on publishing initiatives to the Test workspace.
8. Publish the initiative to the **Production** workspace. Wait until the initiative's status transitions to **Released**. This makes the connection available for the **Publish** operation of other initiatives. See "[Publishing Initiatives to the Production Workspace](#)" for more information on publishing initiatives to the Production workspace.

Updating Connections

You must have **Service Catalog Admin** user role to update the connection details. You may want to update an existing connection to add or update the participant details or to update the authentication details.

To update a connection:

1. In the Solution Designer landing page, click the **Workspaces** application.
2. In the **Workspaces** application, click **Manage Connections**.
The **Connections** page opens.
3. Search and select the connection that you want to update.
The connection details page opens.

4. Update the name, the authentication details, and the participant details.
5. Click **Save**.

The updated connection details are saved.

Deleting Connections

You must have service catalog admin use role to delete a connection.

To delete a connection:

1. In the Solution Designer landing page, click the **Workspaces** application.
2. In the **Workspaces** application, click **Manage Connections**.
The **Connections** page opens.
3. Search for an existing connection and click **Delete**.
A confirmation dialog box appears.
4. Click **Delete** in the confirmation dialog box.

The connection is deleted.

Publishing Initiatives to the Test Workspace

You must have the service catalog administrator role to publish the initiatives. After you complete defining the PSR models and their contents, you transition the initiative from the Definition phase to the Functional Testing phase. After the approver approves the initiative to start functional testing, you can publish the initiative to the **Test** workspace to generate a cartridge. See "[Lifecycle of Initiatives](#)" for more details on various statuses of initiatives.

To publish an initiative to the Test workspace:

1. In the Solution Designer landing page, click the **Initiatives** application.
2. In the **Initiatives** application, search for the initiative and click to open it.

The initiative details page opens.

3. Click the **Publishing** tab.

The **Publishing** details page opens. You see a row with the name **Test** which indicates the **Test** workspace.

4. Click **Publish** in the **Actions** column.

Note:

You will see **Publish** only when the initiative is approved for functional testing, in acceptance testing phase, and before the initiative is approved for rollout. See "[Lifecycle of Initiatives](#)" for more details on various phases of initiatives.

The publishing status transitions from **Never published** to **In Progress**.

You must wait until you receive a pop-up message *Publish successful to workspace Test*. The status changes to **Up to Date**.

 **Note:**

If the publish operation fails, the status changes to **Failed** and you can view the error message in the workspace.

5. You can download the cartridge artifacts, cartridge workspace or view the error message by clicking the **Edit Workspace** in the **Actions** column.
The **Test** workspace details page opens.
6. In the **Operations** tab, locate the initiative that you published. The status of the **Publish** operation is **Complete** or **Failed** in the workspace.
7. Click the ID link that corresponds to your initiative.
The **Tasks** page opens. See "[Viewing Workspaces](#)" for more details on viewing workspaces.
8. Click **View Operation** in the **Commit** row or in the **Prepare** row.
The **Task Details** drawer opens.
9. You see the following in the Task Details:
 - If the **Publish** operation is completed, the location of the cartridge artifacts and the location of the cartridge workspace for the initiative is provided. For example,

Operation Task Message

```
Cartridge artifacts for Mobile initiative is available at
  http://scdapplication:9999/workspaceOperations/v1/
publishOperations/10005/artifacts/cartridges
Cartridge workspace for Mobile initiative is available at
  http://scdapplication:9999/workspaceOperations/v1/
publishOperations/10005/artifacts/workspace
```

You can copy the location and paste it in a web browser to download the cartridge artifacts and deploy it in the UIM run-time environment. You can perform the functional testing and acceptance testing using this generated cartridge.

- If the **Publish** operation is failed, an appropriate error message is displayed with the error code.

You can also download the cartridge workspace. To implement custom code for various extension points, you can download the cartridge workspace which contains the Design Studio projects and import them to Design Studio Eclipse workspace. The cartridge workspace contains base class and an extended designer class. You can code the custom implementation in the extended designer class, and place it in the S3-compatible object storage. See "Extending Solution Designer" in *Developer's Guide*. Enter the relative path of the object storage location in the specification in the **Advanced policy implementation assets** section. The DevOps engine builds the cartridge with the base code and also the implementation code in the extended designer class from the link provided in the **Advanced policy implementation assets** section.

After you correct the errors, you can republish the initiative and follow the steps 1 to 9. You can download the cartridge artifacts on a successful publish operation to deploy it in the run-time environment.

 **Note:**

If the functional testing or acceptance testing uncovers any issues, you update the initiative contents accordingly and republish the initiative to the **Test** Workspace. You can publish the initiative multiple times to the **Test** workspace until your testing is successful.

Publishing Initiatives to the Production Workspace

You must have **Service Catalog Admin** user role to publish initiatives to the **Production** workspace.

To publish an initiative to the Production workspace:

1. In the Solution Designer landing page, click the **Initiatives** application.
2. In the **Initiatives** application, search for the initiative and click to open it.

The initiative details page opens.

3. In the **Lifecycle** tab, click **Release Initiative**.

The initiative's content is automatically published to the **Production** workspace.

4. After the requested cartridge is generated successfully in the **Production** workspace, the initiative's status transitions to **Released**.

If there is an error in the **Publish** operation, the initiative's status remains in **Approval** status. **Release Initiative** is enabled to republish the initiative to the **Production** workspace.

5. You can download the cartridge or view the error message in the **Workspaces** application.
6. To download the cartridge or view the error in **Production** workspace:

- a. In the **Workspaces** application, click the **Production** workspace.

The **Production** workspace details page opens.

- b. In the **Operations** tab, locate the initiative that you published. The status of the publish operation is **Complete** or **Failed**.

- c. Click the ID link that corresponds to your initiative.

The **Tasks** page opens. See "[Viewing Workspaces](#)" for more details on workspaces.

- d. Click **View Operation** in the **Commit** row or in the **Prepare** row.

The **Task Details** drawer opens.

- e. You see the following in the Task Details:

- If the **Publish** operation is completed, the location of the cartridge artifacts and the location of the cartridge workspace for the initiative are provided. For example,

```
Operation Task Message
Cartridge artifacts for Mobile initiative is available at
    http://scdapplication:9999/workspaceOperations/v1/
publishOperations/10005/artifacts/cartridges
Cartridge workspace for Mobile initiative is available at
    http://scdapplication:9999/workspaceOperations/v1/
publishOperations/10005/artifacts/workspace
```

You can copy the location of the cartridge artifacts and paste it in a web browser to download the cartridge and deploy it in UIM run-time production environment. The initiative contents are live in the run-time environment.

You can paste the location of the cartridge workspace in a web browser to download the Design Studio project. You can import this project into Design Studio Eclipse environment and update based on your business use case.

- If the **Publish** operation is failed, an appropriate error message is displayed with the error code.

After you correct the errors, you can release the initiative again in the initiatives application by following the steps from [2](#) to [6](#).

Troubleshooting Issues

This section describes how to troubleshoot issues that you may experience when publishing an initiative.

Configuration Issues

The publish operation of an initiative may fail if the participants are not configured properly. To verify if the connections are set up correctly, see "[Creating New Connections](#)".

The configuration issues may occur in one of the following:

- Incorrect participant information for the connections in the workspace.
- Incorrect UIM Participant deployment configuration.

After you correct the configuration issues, the publish operation mostly succeeds.

Validation Errors

After you fix the configuration issues, the publish operation may fail due to validation errors.

When there are validation errors for the specifications or the PSR Models, error markers appear during transitioning the initiative. You can view the validation errors in the **Initiatives Items** tab in the initiatives editor page and in the specifications results page in the **Specifications** application and fix those errors. After fixing all the validation errors, republish the initiative to the test workspace.

Other Errors

After you fix all the validation errors and have a proper configuration of the UIM participant, the publish operation may fail due to downstream UIM participant issues. You can check the failure reason by navigating to Task Details drawer in the **Tasks** page in the **Workspaces** application. See "[Publishing Initiatives to the Test Workspace](#)" for more details. You can view the reason, fix the issue, and republish the initiative.

If the failure reason is unclear from the **Workspaces** application, you can contact your system administrator to view the logs for the UIM participant, headless design studio, or workspace manager for the detailed failure reason. You can fix those issues and republish the initiative.