



# Red Hat Process Automation Manager 7.1

Designing and building cases for case  
management



# Red Hat Process Automation Manager 7.1 Designing and building cases for case management

---

Red Hat Customer Content Services  
brms-docs@redhat.com

## Legal Notice

Copyright © 2020 Red Hat, Inc.

The text of and illustrations in this document are licensed by Red Hat under a Creative Commons Attribution–Share Alike 3.0 Unported license ("CC-BY-SA"). An explanation of CC-BY-SA is available at

<http://creativecommons.org/licenses/by-sa/3.0/>

. In accordance with CC-BY-SA, if you distribute this document or an adaptation of it, you must provide the URL for the original version.

Red Hat, as the licensor of this document, waives the right to enforce, and agrees not to assert, Section 4d of CC-BY-SA to the fullest extent permitted by applicable law.

Red Hat, Red Hat Enterprise Linux, the Shadowman logo, the Red Hat logo, JBoss, OpenShift, Fedora, the Infinity logo, and RHCE are trademarks of Red Hat, Inc., registered in the United States and other countries.

Linux<sup>®</sup> is the registered trademark of Linus Torvalds in the United States and other countries.

Java<sup>®</sup> is a registered trademark of Oracle and/or its affiliates.

XFS<sup>®</sup> is a trademark of Silicon Graphics International Corp. or its subsidiaries in the United States and/or other countries.

MySQL<sup>®</sup> is a registered trademark of MySQL AB in the United States, the European Union and other countries.

Node.js<sup>®</sup> is an official trademark of Joyent. Red Hat is not formally related to or endorsed by the official Joyent Node.js open source or commercial project.

The OpenStack<sup>®</sup> Word Mark and OpenStack logo are either registered trademarks/service marks or trademarks/service marks of the OpenStack Foundation, in the United States and other countries and are used with the OpenStack Foundation's permission. We are not affiliated with, endorsed or sponsored by the OpenStack Foundation, or the OpenStack community.

All other trademarks are the property of their respective owners.

## Abstract

This document describes how to design and build case management assets in Red Hat Process Automation Manager 7.1.

## Table of Contents

<b>PREFACE</b> .....	<b>3</b>
<b>CHAPTER 1. CASE MANAGEMENT</b> .....	<b>4</b>
<b>CHAPTER 2. CREATING A CASE</b> .....	<b>6</b>
<b>CHAPTER 3. DESIGNING A CASE</b> .....	<b>7</b>
<b>CHAPTER 4. CASE FILE</b> .....	<b>11</b>
<b>CHAPTER 5. CREATING SUB CASES IN CASE MANAGEMENT PROJECTS</b> .....	<b>12</b>
5.1. CONFIGURING SUBCASES .....	12
<b>CHAPTER 6. AD HOC AND DYNAMIC TASKS</b> .....	<b>15</b>
6.1. ADDING AD HOC TASKS .....	15
<b>CHAPTER 7. STARTING DYNAMIC TASKS AND PROCESSES</b> .....	<b>16</b>
<b>CHAPTER 8. ADDING DYNAMIC TASKS AND PROCESSES TO A CASE USING THE API</b> .....	<b>20</b>
8.1. CREATING A DYNAMIC USER TASK USING THE REST API .....	20
8.2. CREATING A DYNAMIC SERVICE TASK USING THE REST API .....	22
8.3. CREATING A DYNAMIC SUBPROCESS USING THE REST API .....	23
<b>CHAPTER 9. CASE ROLES</b> .....	<b>25</b>
9.1. CREATING CASE ROLES .....	26
9.2. ROLE AUTHORIZATION .....	27
9.3. ASSIGNING A TASK TO A ROLE .....	27
9.4. MODIFYING CASE ROLE ASSIGNMENTS DURING RUN TIME USING SHOWCASE .....	28
9.5. MODIFYING CASE ROLE ASSIGNMENTS DURING RUN TIME USING REST API .....	30
<b>CHAPTER 10. STAGES</b> .....	<b>33</b>
10.1. DEFINING A STAGE .....	33
10.2. CONFIGURING STAGE ACTIVATION AND COMPLETION CONDITIONS .....	34
10.3. ADDING A DYNAMIC TASK TO A STAGE .....	35
<b>CHAPTER 11. MILESTONES</b> .....	<b>38</b>
11.1. MILESTONE CONFIGURATION AND TRIGGERING .....	38
<b>CHAPTER 12. RULES IN CASE MANAGEMENT</b> .....	<b>40</b>
12.1. USING RULES TO DRIVE CASES .....	40
<b>CHAPTER 13. CASE MANAGEMENT SHOWCASE APPLICATION</b> .....	<b>45</b>
Showcase Support .....	45
13.1. INSTALLING AND LOGGING IN TO THE SHOWCASE APPLICATION .....	45
13.2. STARTING AN IT ORDERS CASE IN THE SHOWCASE APPLICATION .....	47
<b>CHAPTER 14. CASE MANAGEMENT SECURITY</b> .....	<b>49</b>
14.1. CONFIGURING SECURITY FOR CASE MANAGEMENT .....	49
<b>CHAPTER 15. CLOSING CASES</b> .....	<b>51</b>
15.1. CLOSING A CASE USING THE PROCESS SERVER REST API .....	51
15.2. CLOSING A CASE IN THE SHOWCASE APPLICATION .....	51
<b>CHAPTER 16. CANCELING OR DESTROYING A CASE</b> .....	<b>53</b>
<b>APPENDIX A. VERSIONING INFORMATION</b> .....	<b>54</b>



---

## PREFACE

As a developer, you can configure assets in Red Hat Process Automation Manager for case management using Business Central.

Case management differs from Business Process Management (BPM), in that it focuses on the actual data being handled throughout the case and less on the sequence of steps taken to complete a goal. Case data is the most important piece of information in case handling, while business context and decision-making is in the hands of the human case worker.

Red Hat Process Automation Manager includes the IT Orders sample project in Business Central. This project is referred to throughout this document to explain case management concepts and provide examples. You can import the project in Business Central, deploy the project to the Process Server, and start IT Orders cases using this project using the Showcase application.

Use this document to configure and design case management assets.

### Prerequisites

- Red Hat JBoss Enterprise Application Platform 7.1.0 installed. See [Red Hat JBoss EAP 7.1.0 Installation Guide](#).
- Red Hat Process Automation Manager installed. For more information about installation, see [Planning a Red Hat Process Automation Manager installation](#).
- Red Hat Process Automation Manager is running and you can log in to Business Central with the **user** role. For more information about users and permissions, see [Planning a Red Hat Process Automation Manager installation](#).
- The Showcase application is deployed. For information about how to install and log in to Showcase, see [Getting started with case management](#).

## CHAPTER 1. CASE MANAGEMENT

Case management is an extension of Business Process Management (BPM) that enables you to manage adaptable business processes.

BPM is a management practice for automating tasks that are repeatable and have a common pattern, with a focus on optimization by perfecting a process. Business processes are usually modeled with clearly defined paths leading to a business goal, often with a starting point that is structurally connected to build an end-to-end flow of work and data. This requires a lot of predictability, usually based on mass-production principles. However, many real-world applications cannot be described completely from start to finish (including all possible paths, deviations, and exceptions). Moreover, using a process-oriented approach in certain cases may lead to complex solutions that are hard to maintain.

Case management provides problem resolution for non-repeatable, unpredictable processes as opposed to the efficiency-oriented approach of BPM for routine, predictable tasks. It manages one-off situations when the process cannot be predicted in advance. Case definition usually consists of loosely coupled process fragments that can be connected directly or indirectly to lead to certain milestones and ultimately a business goal, while the process is managed dynamically in response to changes that occur during run time.

In Red Hat Process Automation Manager, case management includes the following core process engine features:

- Case file instance
- A **Per case** runtime strategy
- Case comments
- Milestones
- Stages
- Ad hoc fragments
- Dynamic tasks and processes
- Case identifier (correlation key)
- Case lifecycle (close, reopen, cancel, destroy)

In Red Hat Process Automation Manager, case management authoring uses Business Process Model and Notation (BPMN2) rather than Case Management Model and Notation (CMMN) for both modeling and execution. This means that there is no need to choose between BPM or case management; you can use both, taking advantage of your existing knowledge of BPM, while also benefiting from the dynamic capabilities of case management.

Case definition is always an ad hoc process definition and does not require an explicit start node. The case definition is the main entry point for the business use case.

Process definition can still be introduced as a supporting construct of the case and can be invoked either as defined in the case definition or dynamically to bring in additional processing when required. A case definition defines the following new objects, though they are not all mandatory or required for every case:

- Activities (required)



- Case file (required)
- Milestones
- Roles
- Stages

## CHAPTER 2. CREATING A CASE

A case project is a type of project in Business Central that is configured for case management. When you create a new case project, the following configurations are set automatically in Business Central:

- Runtime strategy is set to **Per Case** in order to correctly initialize the Process Server.
- Case file and documentsmarshallers are configured. Thesemarshallers serialize case file data and attached documents across the entire case.
- **WorkDefinition.wid** files are created in the project and its packages to ensure case-related nodes such as **Milestone** and **Cases** are available in the case definition design palette.

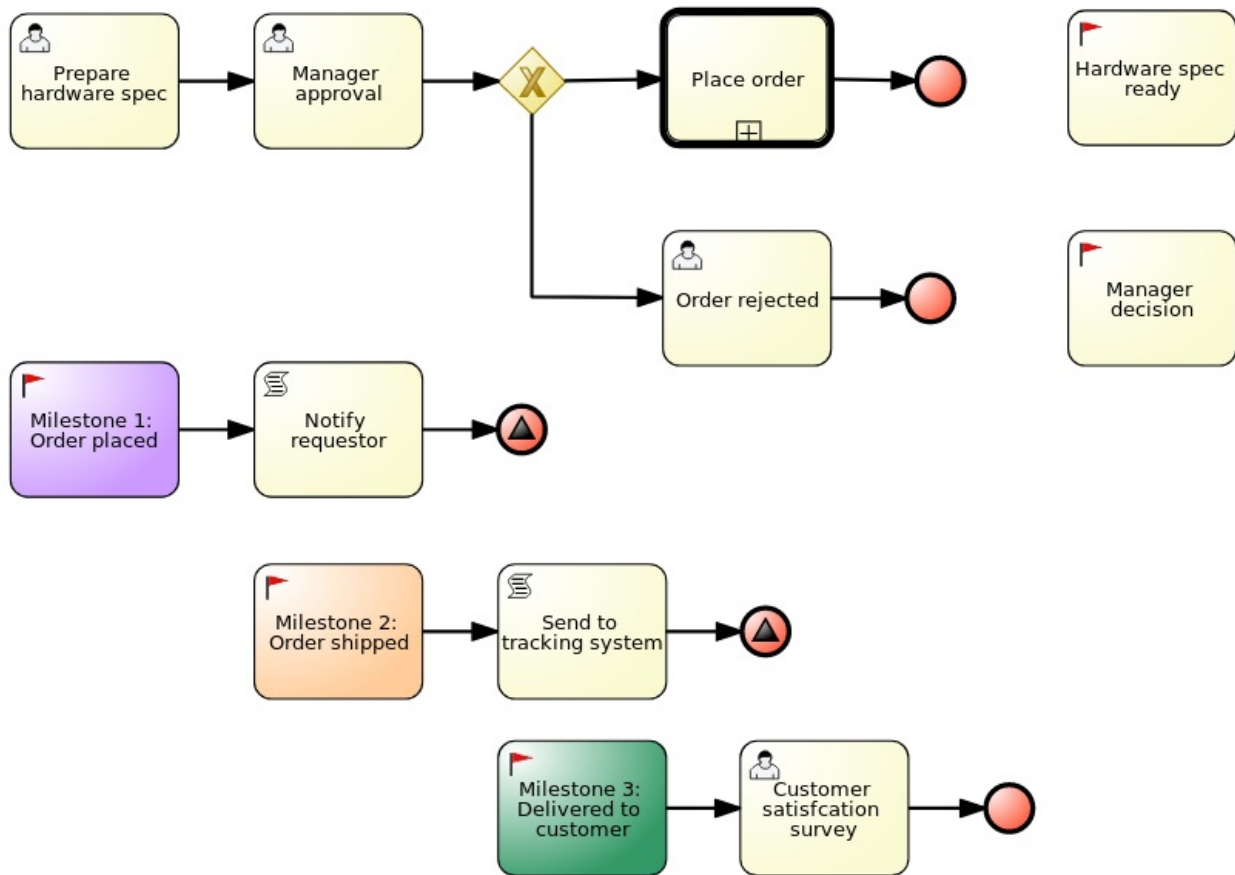
### Procedure

1. In the **MySpace** space in Business Central, click the down arrow next to the **Add Project → Case project**.
2. In the **Add Project** wizard, complete the required project information and click **Add**.
3. To check that the case project has been set up correctly, click **Settings → Deployments**.
4. Verify that the **Runtime Strategy** is set to **Per case** and that the **Marshalling Strategies** include a case file marshaller and a documents marshaller.

## CHAPTER 3. DESIGNING A CASE

Cases are designed using the process designer in Business Central. The case design is the basis of case management and sets out the specific goals and tasks for each case. The case flow can be modified dynamically during run time by adding dynamic tasks or processes.

To demonstrate how to design a case, Red Hat Process Automation Manager includes the IT Orders sample project in Business Central, which includes the following case definition:



You can refer to and interact with this case definition by importing the sample project in Business Central.

### Prerequisite

You have followed the procedure in [Chapter 2, Creating a case](#) to create a new case in Business Central.

### Procedure

1. In the **Assets** window, click **Add Asset** in the upper-right corner of the project perspective and select **Case definition**.
2. Complete the required information in the **Create new Case definition** window:
  - **name:** The name of the case. This is usually the subject of the case or project that is being case managed.
  - **package:** The location in which case file is to be created.
  - **Case ID prefix (optional):** A configurable prefix that enables you to easily distinguish different types of cases. The prefix is followed by a generated ID in the format **ID-**

**XXXXXXXXXX**, where **XXXXXXXXXX** is a generated number that provides a unique ID for the case instance. If a prefix is not provided, the default prefix is **CASE** and generates instances with the following identifiers:

**CASE-0000000001**

**CASE-0000000002**


**CASE-0000000003**

If a prefix is set to something else, such as **IT** for example, the following identifiers are generated:

**IT-0000000001**


**IT-0000000002**

**IT-0000000003**

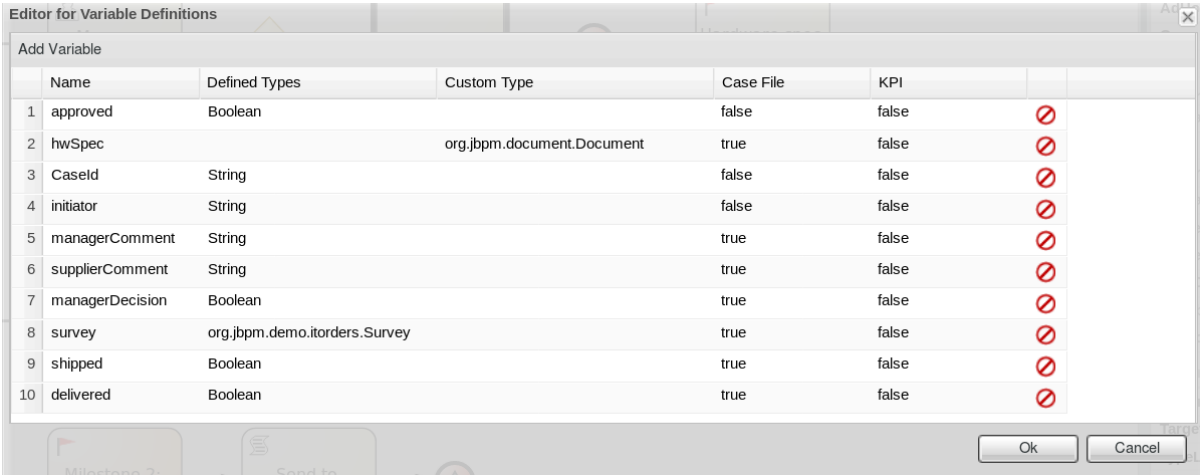
3. Click **Ok** to open the process designer. The designer creates a **WorkDefinition** file that includes the work items required for case definition. These appear as usable objects in the process designer **Object Library**, accessible by clicking the  in the upper-left corner of the designer.











Verify that the process designer includes the **Milestones** and **Cases** objects by either checking the **Object Library** dock on the left side of the process designer, or by checking the **WorkDefinition** file under **Work Item Definitions** in the **Project Explorer** window on the left side of Business Central.

4. Define process-level and case-level variables.

Click the  arrow on the right side of the designer to open the **Properties** panel. Click the down arrow next to **Variable Definitions** to open the **Editor for Variable Definitions**.

**Figure 3.1. IT Orders variables**



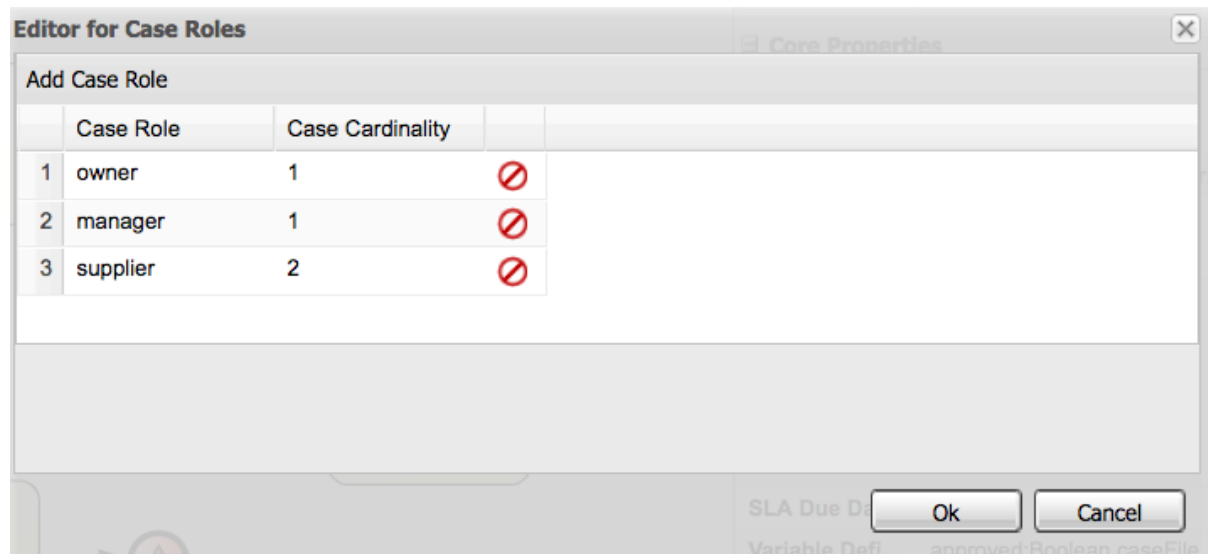
Add Variable						
	Name	Defined Types	Custom Type	Case File	KPI	
1	approved	Boolean		false	false	
2	hwSpec		org.jbpm.document.Document	true	false	
3	CaseId	String		false	false	
4	initiator	String		false	false	
5	managerComment	String		true	false	
6	supplierComment	String		true	false	
7	managerDecision	Boolean		true	false	
8	survey	org.jbpm.demo.itorders.Survey		true	false	
9	shipped	Boolean		true	false	
10	delivered	Boolean		true	false	

In the IT Orders sample project, you can see that certain variables are identified as **Case File**. A case file variable is stored in the case file itself and promotes reuse of the case file data rather than copying it across multiple process instances. For example, the **hwSpec** variable is available to all processes within the case and is accessible directly from the case file even after the case instance is closed.

For more information about the case file, see [Chapter 4, Case file](#) .

5. To define the roles involved in the case, click  to open the **Properties** menu on the right side of the designer and open the **Editor for Case Roles**. Click **Add Case Role** to add case roles. The IT Orders sample case management project includes the following roles:

Figure 3.2. ITOrders Case Roles



- **owner**: The employee who is making the hardware order request. There can be only one person assigned to this role.
- **manager**: The employee's manager; the person who will approve or deny the requested hardware. The role cardinality is set to **1**, which means that only one person or group can be assigned to this role.
- **supplier**: The available suppliers of IT hardware in the system. There is usually more than one supplier.

For more information about creating case roles, see [Chapter 9, Case roles](#).

6. Define the work item to be triggered when a new case starts. Because case definition is an ad hoc process definition, it does not require an explicit start node. Nodes that have no incoming connections are marked as **Adhoc Autostart** and are automatically triggered when a new case instance is started.

By default, the process designer includes a **Milestone** object configured as **Adhoc autostart** in the palette. Modify this object or replace it with another work item such as a user task or script task to be triggered when a new case is started.

In the IT Orders example, the **Prepare hardware spec** user task and the **Milestone 1: Order placed** milestones are configured as **Adhoc autostart**, and are automatically triggered when a new case instance is started.

7. Define a subprocess.
- In the IT Orders example, the **place-order** process is a separate business process that is carried out by the supplier. This is a reusable process that occurs during the course of case execution.
- From the project menu, click **Add Asset** → **Business Process** to create a new business process. Define the name and package for the new process and click **Ok**.

- b. Define the process that is a subprocess within the case. For example, the IT Orders **Place order** process is a simple user task that applies to the supplier group and receives the relevant order data and case variables directly from the case file.
8. Add a milestone to the case definition by selecting **Milestone** from the **Object Library** and dragging it on to the process designer.
9. Create an evaluation condition for the milestone based on a case file variable that determines when the milestone is completed. From the **Properties** menu on the right, open the **Data Inputs and Assignments** window and click **Add** to add a new condition.  
In the IT Orders case, the status of **Milestone 1: Order placed** depends on the condition **org.kie.api.runtime.process.CaseData(data.get("ordered") == true)**. This means that a case variable named **ordered** exists with the value **true**, and it is configured on the milestone in the following way:

**Milestone 1: Order placed Data I/O** ×

Data Inputs and Assignments + Add

Name	Data Type	Source	
Condition	String	"org.kie.ap..."	🗑️

Data Outputs and Assignments + Add

Cancel Save

For more information about the milestones in the IT Orders case, see [Getting started with case management](#).

To learn more about milestones, see [Chapter 11, Milestones](#).

The IT Orders case can be closed after all milestone sequences are completed. However, due to the ad hoc nature of cases, the case could be reopened if, for example, the order was never received by the customer or the item is faulty. Tasks can be re-triggered or added to the case definition as required, even during run time.

For more information about ad hoc processes, see [Chapter 6, Ad hoc and dynamic tasks](#).

## CHAPTER 4. CASE FILE

A case instance is a single instance of a case definition and should encapsulate the given business context. All case instance data is stored in the case file, which is accessible to all process instances that might participate in the given case instance. Each case instance and its case file is completely isolated from the other cases. Only case instance participants can access the case file.

A case file is used in case management as a repository of data for the entire case instance. It contains all roles, the object itself, the data map, and any other data. The case can be closed and reopened at a later date with the same case file attached. A case instance can be closed at any time and does not require a specific resolution in order to be "completed".

Importantly, the case file can also include documentation in the form of embedded documentation, references, PDF attachments, web links, and so on.

## CHAPTER 5. CREATING SUB CASES IN CASE MANAGEMENT PROJECTS

Subcases give you the flexibility to compose advanced cases that consists of other cases. This means that you can split large and complex cases into multiple layers of abstraction and even multiple case projects. This is similar to splitting a process into multiple subprocesses.

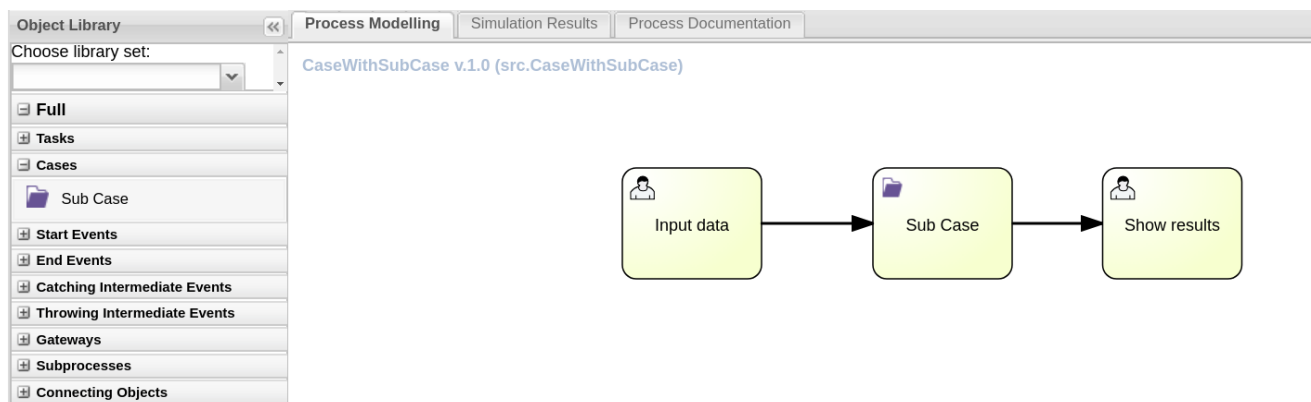
A subcase is another case definition that is invoked from within another case instance or a regular process instance. It has all of the capabilities of a regular case instance:

- It has a dedicated case file.
- It is isolated from any other case instance.
- It has its own set of case roles.
- It has its own case prefix.

### 5.1. CONFIGURING SUBCASES

You can add subcases to your case definition using the process designer. A subcase is another case within your case project, similar to having a subprocess within your process. Subcases can also be added to a regular business process, which enables you to start a case from within a process instance.




The **Sub Case** asset can be found in the case definition process designer **Object Library** under **Cases**:



#### Prerequisite

- A case management process has been created and configured in Business Central.

#### Procedure

1. With your case process open in the process designer, click  to open the **Object Library** on the left side of the design palette.
2. Click **Cases** to open the object menu and drag the **Sub Case** data object on to the design palette and add it to the case definition.
3. Click  to open the **Properties** panel and click **Assignments** to open the data assignment editor. Alternatively, click  on the **Sub Case** node in the design palette. The **Sub Case Data I/O** window supports the following set of input parameters to properly configure and start the subcase:



## Sub Case Data I/O



## Data Inputs and Assignments

+ Add

Name	Data Type	Source	
UserRole_	String ▼	▼	
Independent	String ▼	▼	
GroupRole_	String ▼	▼	
DestroyOnAbort	String ▼	▼	
DataAccess_	String ▼	▼	
DeploymentId	String ▼	▼	
Data_	String ▼	▼	
CaseDefinitionId	String ▼	▼	

## Data Outputs and Assignments

+ Add

Name	Data Type	Target	
CaseId	String ▼	▼	

Cancel Save

**Independent**

Optional indicator that tells the process engine if the case instance is independent. If it is independent, the main case instance will not wait for its completion. This property is **false** by default.

**GroupRole\_XXX**

Optional group to case role mapping. The role names belonging to this case instance can be referenced here, meaning that participants of the main case can be mapped to participants of the subcase. This means that whatever group was assigned to the main case will be automatically assigned to subcase, where **XXX** is the role name and the **value** is the group role assignment.

**DataAccess\_XXX**

Optional data access restrictions where **XXX** is the name of data item and the **value** is the access restrictions.

**DestroyOnAbort**

Optional indicator that tells the process engine what to do when the subcase activity is aborted: cancel or destroy the subcase. This defaults to **true**, which destroys the subcase and removes the case file.

**UserRole\_XXX**

Optional user to case role mapping. You can reference the case instance role names here, meaning that an owner of the main case can be mapped to an owner of the subcase.

Whoever was assigned to main case will be automatically assigned to the subcase, where **XXX** is the role name and **value** is the user role assignment.

**Data\_XXX**

Optional data mapping from this case instance or business process to a subcase, where **XXX** is the name of the data in subcase being targeted. This can be given as many times as needed.

**DeploymentId**

Optional deployment ID (or container ID in context of Process Server) that indicates where the targeted case definition is located.

**CaseDefinitionId**

The mandatory case definition ID to be started.

4. Regardless of the settings of the **Independent** flag, there will always be output variable available named:

**CaseId**

This is the case instance ID of the subcases after it is started.

## CHAPTER 6. AD HOC AND DYNAMIC TASKS

You can use case management to carry out tasks in an ad hoc way, rather than following a strict end-to-end process. Tasks can also be added to a case dynamically during run time when required.

Ad hoc tasks are defined in the case modeling phase. Ad hoc tasks that are not configured as **Adhoc autostart** are optional and may or may not be worked on during a case. Therefore, they must be triggered by a signal event or by Java API to be available to be worked on during a case.

Dynamic tasks are defined during the case execution and are not present in the case definition model. Dynamic tasks address specific needs that arise during the case. They can be added to the case and worked on at any time using a case application, as demonstrated in the Red Hat Process Automation Manager Showcase application. Dynamic tasks can also be added by Java and Remote API calls.

Dynamic tasks can be user or service activities, while ad hoc tasks can be any type of task.

Dynamic processes are any reusable sub-process from a case project.

Ad hoc nodes with no incoming connections can be configured with the **Adhoc autostart** property, which is a property of the node itself. These tasks are triggered automatically when the case instance is started.


### 6.1. ADDING AD HOC TASKS

Ad hoc tasks are optional tasks that are configured in a case definition. Because they are ad hoc, they must be triggered in some way, usually by a signal event or Java API call.

#### Prerequisite

- A case project has been created in Business Central.
- A case definition has been created.

#### Procedure

1. In the process designer, click  to open the **Object Library** on the left of the design palette.
2. From the list, select a task that you want to add to the case definition as an ad hoc task. For example, you might want to add a user task to fill out a warranty claim if goods that are received are faulty. A warranty claim may or may not need to be completed during the course of the case, but it is available to be performed in an ad hoc way if required.
3. Configure the ad hoc task properties in the **Properties** panel on the right.
4. Trigger the task during run time using a Java API call. For example, the **Order rejected** ad hoc task is triggered by the following API call: **CaseService.triggerAdHocFragment**

## CHAPTER 7. STARTING DYNAMIC TASKS AND PROCESSES

You can add dynamic tasks and processes to a case during run time. Dynamic actions are a way to address changing situations, where an unanticipated change during the case requires a new task or process to be incorporated into the case.

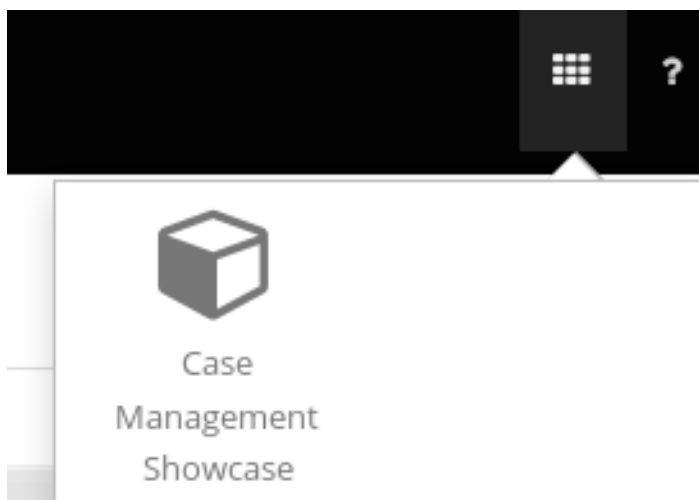
Use a case application to add a dynamic task during run time. For demonstration purposes, the Business Central distribution includes a Showcase application where you can start a new dynamic task or process for the IT Orders application. For more information about installing and running the Showcase application, see [Chapter 13, Case management Showcase application](#).

### Prerequisites

- The Process Server is deployed and connected to Business Central.
- The IT Orders project is deployed to Process Server.
- The Showcase application **.war** file has been deployed alongside Business Central.

### Procedure

1. With the IT Orders project deployed and running in the Process Server, in a web browser, navigate to the Showcase login page <http://localhost:8080/rhpam-case-mgmt-showcase/>. Alternatively, if you have configured Business Central to display the **Apps launcher** button, use it to open a new browser window with the Showcase login page.



For instructions on how to configure the **Apps launcher** button in Business Central see [Section 13.1, "Installing and logging in to the Showcase application"](#).


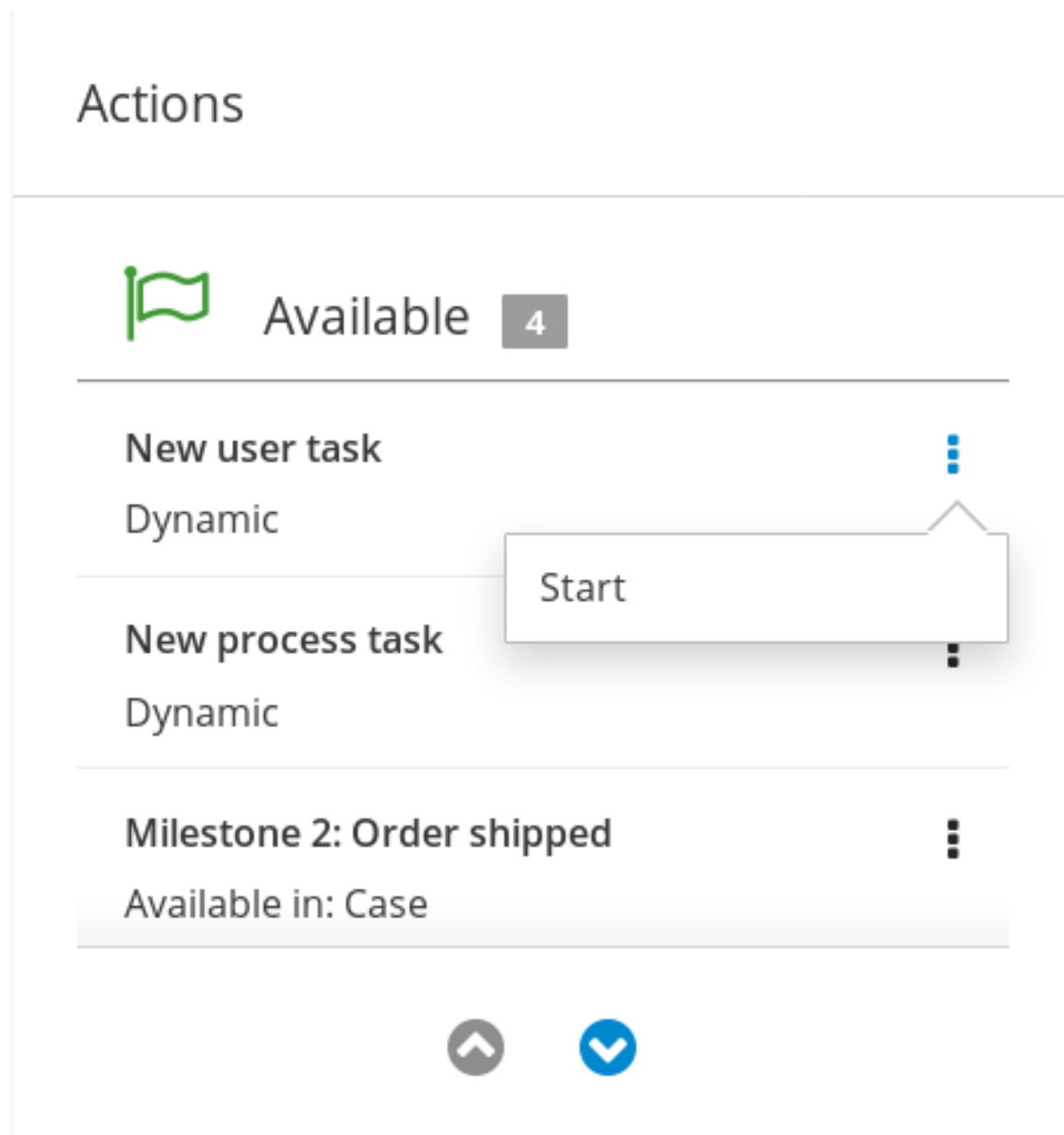
2. Log in to the Showcase application using your Business Central login credentials.
3. Select an active case instance from the list to open it.
4. Under **Overview** → **Actions** → **Available**, click the  button next to **New user task** or **New process task** to add a new task or process task.

Figure 7.1. Showcase dynamic actions



- To create a dynamic user task, start a **New user task** and complete the required information:

**New user task**
✕

**Name \***

**Description**

**Users**

**Groups**

**Stage** Nothing selected ▾

Cancel
Add Task

- To create a dynamic process task, start a **New process task** and complete the required information:

**New process task**
✕

**Name \***

**Process id \*** Nothing selected ▾

**Stage** Nothing selected ▾

Cancel
Add Task

- To view a dynamic user task in Business Central, click **Menu** → **Track** → **Task Inbox**. The user task that was added dynamically using the Showcase application appears in the **Task Inbox** of users assigned to the task during task creation.

Task Inbox ↻

---

Active filters: Status: Ready, InProgress, Reserved ✕ [Save Filters](#) | [Clear All](#)

Task	Process Definition Id	Status	Created On	Actions
NewDynamicTask	itorders.orderhardwa...	Reserved	22-May-2018 19:20:38	⋮

10 Items ▾

⏪
⏩
1 of 1
⏴
⏵

- Click the dynamic task in the **Task Inbox** to open the task. A number of action tabs are available from this page.

- b. Using the actions available under the task tabs, you can begin working on the task.
  - c. In the Showcase application, click the refresh button in the upper-right corner. Case tasks and processes that are in progress appear under **Overview → Actions → In progress**.
  - d. When you have completed working on the task, click the **Complete** button under the **Work** tab.
  - e. In the Showcase application, click the refresh button in the upper-right corner. The completed task appears under **Overview → Actions → Completed**.
6. To view a dynamic process task in Business Central, click **Menu → Manage → Process Instances**.

Home » Manage Process Instances

Manage Process Instances New Process Instance

Active filters: State: Active Save Filters | Clear All

<input type="checkbox"/>	Id	Name	Description	Version	Last update	Errors	Actions
<input checked="" type="checkbox"/>	2	place-order	Order #{Caselid}	1.0	22-May-2018 1...	0	⋮
<input type="checkbox"/>	1	Order for IT ha...	Order for IT ha...	1.0	22-May-2018 1...	0	⋮

- a. Click the dynamic process instance in the list of available process instances to view information about the process instance.
- b. In the Showcase application, click the refresh button in the upper-right corner. Case tasks and processes that are in progress appear under **Overview → Actions → In progress**.

## CHAPTER 8. ADDING DYNAMIC TASKS AND PROCESSES TO A CASE USING THE API

You can add dynamic tasks and processes to a case during run time to address unforeseen changes that can occur during the lifecycle of a case. Dynamic activities are not defined in the case definition and therefore they cannot be signaled the way that a defined ad hoc task or process can.

You can add the following dynamic activities to a case:

- User tasks
- Service tasks (any type that is implemented as a work item)
- Reusable subprocesses

Dynamic user and service tasks are added to a case instance and immediately executed. Depending on the nature of a dynamic task, it might start and wait for completion (user task) or directly complete after execution (service task). For dynamic subprocesses, the process engine requires a KJAR containing the process definition for that dynamic process to locate the process by its ID and execute it. This subprocess belongs to the case and has access to all of the data in the case file.

You can use the Swagger REST API application to create dynamic tasks and subprocesses.

### Prerequisite

You are logged in to Business Central and a case instance has been started using the Showcase application. For more information about using Showcase, see [Case management Showcase application](#).

### Procedure

1. In a web browser, open the following URL:  
<http://localhost:8080/kie-server/docs>
2. Open the list of available endpoints under **Case instances :: Case Management**
3. Locate the **POST** method endpoints for creating dynamic activities.

<b>POST</b>	<code>/server/containers/{id}/cases/instances/{caseId}/tasks</code>	Adds dynamic task (user or service depending on the payload) to case instance
<b>POST</b>	<code>/server/containers/{id}/cases/instances/{caseId}/stages/{caseStageId}/tasks</code>	Adds dynamic task (user or service depending on the payload) to given stage within case instance
<b>POST</b>	<code>/server/containers/{id}/cases/instances/{caseId}/processes/{pId}</code>	Adds dynamic subprocess identified by process id to case instance
<b>POST</b>	<code>/server/containers/{id}/cases/instances/{caseId}/stages/{caseStageId}/processes/{pId}</code>	Adds dynamic subprocess identified by process id to stage within case instance

4. Click the REST endpoint required to create the dynamic task or process to open the documentation.
5. Click **Try it out** and provide the parameters and body required to create the dynamic activity.
6. Click **Execute** to create the dynamic task or subprocess using the REST API.

### 8.1. CREATING A DYNAMIC USER TASK USING THE REST API

You can create a dynamic user task during case run time using the REST API. To create a dynamic user task, the following information must be given:

- Task name



- Task description (optional, but recommended)
- Actors or groups (or both)
- Input data

Use the following procedure to create a dynamic user task for the IT Orders sample project available in Business Central using the Swagger REST API tool. The same endpoint can be used for REST API without Swagger.

## Prerequisite

You are logged in to Business Central and an IT Orders case instance has been started using the Showcase application. For more information about using Showcase, see [Case management Showcase application](#).

## Procedure

1. In a web browser, open the following URL:  
<http://localhost:8080/kie-server/docs>.
2. Open the list of available endpoints under **Case instances :: Case Management**
3. Click click the following **POST** method endpoint to open the details:  
**/server/containers/{id}/cases/instances/{caseId}/tasks**
4. Click **Try it out** to complete the following parameters:

**Table 8.1. Parameters**

Name	Description
<b>id</b>	<b>itorders</b>
<b>caseId</b>	<b>IT-0000000001</b>

### body

```
{
  "name" : "RequestManagerApproval",
  "data" : {
    "reason" : "Fixed hardware spec",
    "caseFile_hwSpec" : "#{caseFile_hwSpec}"
  },
  "description" : "Ask for manager approval again",
  "actors" : "manager",
  "groups" : ""
}
```

5. In the Swagger application, click **Execute** to create the dynamic task.

This procedure creates a new user task associated with case **IT-0000000001**. The task is assigned to the person assigned to the **manager** case role. This task has two input variables:

- **reason**
- **caseFile\_hwSpec**: defined as an expression to allow run time capturing of process or case data.

Depending on the task, a form might be defined to provide a user-friendly UI for the task, which can be looked up by task name. In the IT Orders case, the **RequestManagerApproval** task includes the form **RequestManagerApproval-taskform.form** in its KJAR.

After it is created, the task appears in the assignee's **Task Inbox** in Business Central.

## 8.2. CREATING A DYNAMIC SERVICE TASK USING THE REST API

Service tasks are generally less complex than user tasks, although they might need more data to execute properly. Service tasks require following information:

- **name**: The name of the activity.
- **nodeType**: The type of node that will be used to find the work item handler.
- **data**: The map of the data to properly deal with execution.

You can create a dynamic service task during case run time with the same endpoint as a user task, but with a different body payload.

Use the following procedure use the Swagger REST API to create a dynamic service task for the IT Orders sample project available in Business Central . The same endpoint can be used for REST API without Swagger.

### Prerequisite

You are logged in to Business Central and an IT Orders case instance has been started using the Showcase application. For more information about using Showcase, see [Case management Showcase application](#).

### Procedure

1. In a web browser, open the following URL:  
<http://localhost:8080/kie-server/docs>
2. Open the list of available endpoints under **Case instances :: Case Management**
3. Click click the following **POST** method endpoint to open the details:  
**/server/containers/{id}/cases/instances/{caseId}/stages/{caseStagId}/tasks**
4. Click **Try it out** and complete the following parameters:

Table 8.2. Parameters

Name	Description
<b>id</b>	<b>itorders</b>
<b>caseId</b>	<b>IT-000000001</b>

body

```

{
  "name" : "InvokeService",
  "data" : {
    "Parameter" : "Fixed hardware spec",
    "Interface" : "org.jbpm.demo.itorders.services.ITOrderService",
    "Operation" : "printMessage",
    "ParameterType" : "java.lang.String"
  },
  "nodeType" : "Service Task"
}

```

5. In the Swagger application, click **Execute** to create the dynamic task.

In this example, a Java-based service is executed. It consists of an interface with the public class **org.jbpm.demo.itorders.services.ITOrderService**, public **printMessage** method with a single **String** argument. Upon execution, the parameter value is passed to the method for execution.

Numbers and names and other types of data given to create service tasks depend on the implementation of a service task's handler. In the provided example, the **org.jbpm.process.workitem.bpmn2.ServiceTaskHandler** handler is used.



#### NOTE

For any custom service tasks, ensure the handler is registered in the deployment descriptor in the **Work Item Handlers** section, where the name is same as the **nodeType** used for creating a dynamic service task.

## 8.3. CREATING A DYNAMIC SUBPROCESS USING THE REST API

When creating a dynamic subprocess, only optional data is provided; there are no special parameters as there are when creating dynamic tasks.

Use the following procedure use the Swagger REST API to create a dynamic subprocess task for the IT Orders sample project available in Business Central . The same endpoint can be used for REST API without Swagger.

### Prerequisite

You are logged in to Business Central and an IT Orders case instance has been started using the Showcase application. For more information about using Showcase, see [Case management Showcase application](#).

### Procedure

1. In a web browser, open the following URL:  
<http://localhost:8080/kie-server/docs>.
2. Open the list of available endpoints under **Case instances :: Case Management**
3. Click click the following **POST** method endpoint to open the details:  
**/server/containers/{id}/cases/instances/{caseId}/processes/{pld}**
4. Click **Try it out** and complete the following parameters:

Table 8.3. Parameters

Name	Description
<b>id</b>	<b>itorders</b>
<b>caseId</b>	<b>IT-0000000001</b>
<b>pId</b>	<b>itorders-data.place-order</b>

The **pId** is the process ID of the subprocess to be created.

**body**

```
{  
  "placedOrder" : "Manually"  
}
```

5. In the Swagger application, click **Execute** to start the dynamic subprocess.

In this example, the **place-order** subprocess has been started in the IT Orders case with the case ID **IT-0000000001**. You can see this process in Business Central under **Menu → Manage → Process Instances**.

If the described example has executed correctly, the **place-order** process appears in the list of process instances. Open the details of the process and note that the correlation key for the process includes the IT Orders case instance ID, and the **Process Variables** list includes the variable **placedOrder** with the value **Manually**, as delivered in the REST API body.

## CHAPTER 9. CASE ROLES

Case roles provide an additional layer of abstraction for user participation in case handling. Roles, users, and groups are used for different purposes in case management.

### Role

Roles drive the authorization for the case instance, and can be used for user activity assignments. The only role that is predefined is **Owner**. A user or one or more groups can be assigned to the owner role. The owner is whoever the case belongs to. Roles are not restricted to a single set of people or groups as part of case definition. Roles should always be used for task assignment rather than assigning a specific user or group in order to ensure the case remains dynamic.

### Group

A group is a number of people who are able to carry out a particular task or have a set of specified responsibilities. There can be any number of people assigned to a group, and a group can be assigned to a role. Members of a group can be added or changed at any time, which is why a group should never be hardcoded to a particular task.

### User

A user is an individual who can be given a particular task by assigning them a role or adding them to a group.

The following illustrate how the preceding case management concepts apply to a hotel reservation.

- Role = **Guest**
- Group = **Receptionist, Maid**
- User = **Marilyn**

The role assignment (**Guest**) affects the specific work of the case and is unique to all case instances. The number of users or groups that can be assigned to a role is limited by the **Case Cardinality**, which is set during role creation in the process designer. For example, there may be only one guest in a hotel reservation case, or there may be two suppliers of IT hardware as in the IT Orders sample project.

When the roles are defined, case management must ensure that these are not hardcoded to single set of people or groups as part of case definition and that they can differ for each case instance. This is where case role assignments become important. Role assignments can be assigned or removed in the following ways:

- When a case starts.
- At any given point in time while a case is active.
- Removed at any given point in time while a case is active.

The second and third options do not alter the task assignments for active tasks.

Roles are optional and not a case requirement, however, you should use roles within case definitions.



### IMPORTANT

Always use roles for task assignments instead of actual user or group names. This ensures the case remains dynamic and actual user or group assignment can be made as late as possible.

Roles are assigned to users or groups and authorized to perform tasks when a case instance is started either in an application or by using the REST API.

For more information about how to assign and authorize roles, see

## 9.1. CREATING CASE ROLES

You can create and define case roles in the case definition when designing the case in the process designer. Case roles are configured on the case definition level to keep them separate from the actors involved in handling the case instance. Roles can be assigned to user tasks or used as contact references throughout the case lifecycle, but they are not defined in the case as a specific user or group of users.

Case instances include the individuals that are actually handling the case work and it is recommended that roles are assigned when starting a new case instance. In order to keep cases flexible, case role assignment can be modified during case run time, although doing so will have no effect on tasks already created based on the previous role assignment. The actor assigned to a role is flexible but the role itself remains the same for each case.

### Prerequisite

- You have created a case project in Business Central and added a case definition asset.
- The case definition asset is open in the process designer.

### Procedure


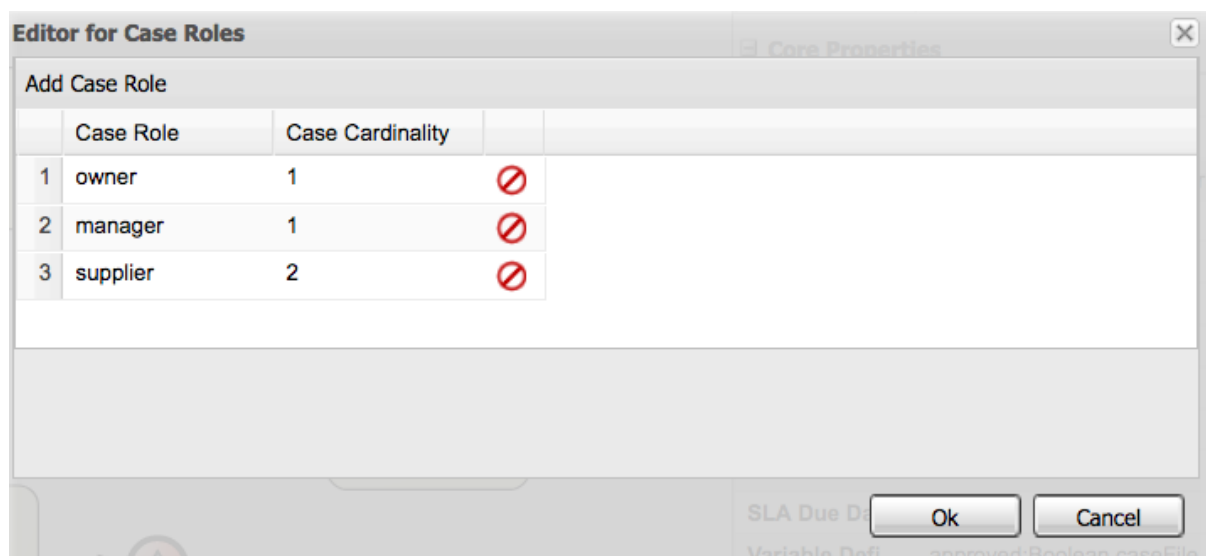
1. To define the roles involved in the case, click  to open the **Properties** menu on the right side of the designer and open the **Editor for Case Roles**
2. Click **Add Case Role** to add a case roles.  
The case role requires a name for the role and a case cardinality. Case cardinality is the number of actors that can be assigned to the role in any case instance. For example, the IT Orders sample case management project includes the following roles:

Figure 9.1. ITOrders Case Roles



In this example, there can only be one actor (a user or a group) assigned as the case **owner** and only one actor assigned to the **manager** role. The **supplier** role can have two actors assigned. Depending on the case, there can be any number of actors assigned a particular role based on

the configured case cardinality of the role.

## 9.2. ROLE AUTHORIZATION

Roles are authorized to perform certain case management tasks when starting a new case instance using the Showcase application or the REST API.

Use the following procedure to start a new IT Orders case using the REST API.

### Prerequisite

- The IT Orders sample project has been imported in Business Central and deployed to the Process Server.

### Procedure

1. Create a **POST** REST API call with the following endpoint:  
<http://host:port/kie-server/services/rest/server/containers/itorders/cases/itorders.orderhardware/instances>
  - **itorders**: The container alias that has been deployed to the Process Server.
  - **itorders.orderhardware**: The name of the case definition.
2. Provide the following role configuration in the request body:

```
{
  "case-data" : { },
  "case-user-assignments" : {
    "owner" : "cami",
    "manager" : "cami"
  },
  "case-group-assignments" : {
    "supplier" : "IT"
  }
}
```

This starts a new case with defined roles, as well as autostart activities, which are started and ready to be worked on. Two of the roles are user assignments (**owner** and **manager**) and the third is a group assignment (**supplier**).

After the case instance is successfully started, the case instance returns the case ID: **IT-0000000001**.

For information about how to start a new case instance using the Showcase application, see [Section 13.2, "Starting an IT Orders case in the Showcase application"](#).

## 9.3. ASSIGNING A TASK TO A ROLE



Case management processes need to be as flexible as possible to accommodate changes that can happen dynamically during run time. This includes changing user assignments for new case instances or for active cases. For this reason, ensure that you do not hard-code roles to a single set of users or groups in the case definition. Instead, role assignments can be defined on the task nodes in the case definition, with users or groups assigned to the roles on case creation.

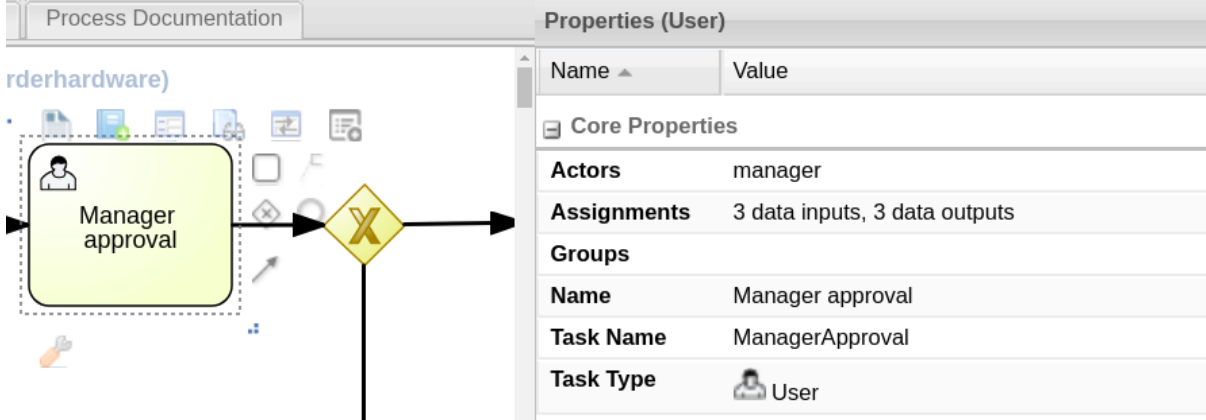
Use the following procedure to assign a case role to a task in the case definition.

## Prerequisite


A case definition has been created with case roles configured at the case definition level. For more information about creating case roles, see [Creating case roles](#).

## Procedure

1. Click  to open the **Object Library** on the left side of the process designer.
2. Open the **Tasks** list and drag the user or service task you want to add to your case definition on to the process design palette.
3. With the task node selected, click  to open the **Properties** panel on the right side of the designer.
4. Click the field next to the **Actors** property and type the name of the role to which the task will be assigned. You can use the **Groups** property in the same way to for group assignments. For example, in the IT Orders sample project, the **Manager approval** user task is assigned to the **manager** role:



The screenshot shows the 'Properties (User)' panel for a task named 'Manager approval'. The 'Actors' property is set to 'manager'. Other properties include 'Assignments' (3 data inputs, 3 data outputs), 'Groups' (empty), 'Name' (Manager approval), 'Task Name' (ManagerApproval), and 'Task Type' (User).

Name	Value
<b>Core Properties</b>	
<b>Actors</b>	manager
<b>Assignments</b>	3 data inputs, 3 data outputs
<b>Groups</b>	
<b>Name</b>	Manager approval
<b>Task Name</b>	ManagerApproval
<b>Task Type</b>	 User

In this example, after the **Prepare hardware spec** user task has been completed the user assigned to the **manager** role will receive the **Manager approval** task in their **Task Inbox** in Business Central.

The user assigned to the role can be changed during the case run time, but the task itself continues to have the same role assignment. For example, the person originally assigned to the **manager** role might need to take time off (if they become ill, for example), or they might unexpectedly leave the company. To respond to this change in circumstances, you can edit the **manager** role assignment so that someone else can be assigned the tasks associated with that role.

For information about how to change role assignments during case run time, see [Modifying case role assignments during run time using Showcase](#) or [Modifying case role assignments during run time using REST API](#).

## 9.4. MODIFYING CASE ROLE ASSIGNMENTS DURING RUN TIME USING SHOWCASE

You can change case instance role assignments during case run time using the Showcase application. Roles are defined in the case definition and assigned to tasks in the case lifecycle. Roles cannot change during run time because they are predefined, but you can change the actors assigned to the roles to change who is responsible for carrying out case tasks.

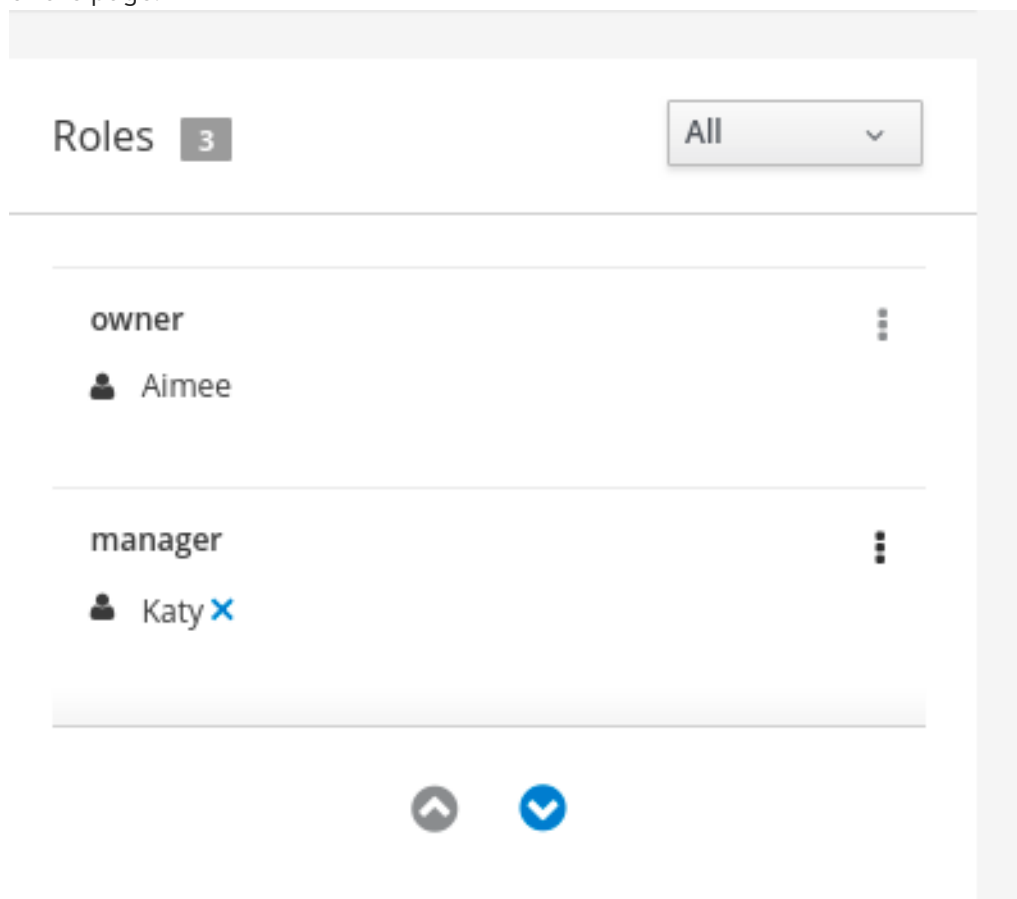





## Prerequisite

There is an active case instance with users or groups already assigned to at least one case role.

## Procedure

1. In the Showcase application, click the case you want to work on in the **Case list** to open the case overview.
2. Locate the role assignment that you want to change in the **Roles** box in the lower-right corner of the page.



3. To remove a single user or group from the role assignment, click the  next to the assignment. In the confirmation window, click **Remove** to remove the user or group from the role.
4. To remove all role assignments from a role, click the  next to the role and select the **Remove all assignments** option. In the confirmation window, click **Remove** to remove all user and group assignments from the role.
5. To change the role assignment from one user or group to another, click the  next to the role and select the **Edit** option.
6. In the **Edit role assignment** window, delete the name of the assignee that you want to remove from the role assignment. Type the name of the user you want to assign to the role into the **User** field or the group you want to assign in the **Group** field.  
At least one user or group must be assigned when editing a role assignment.
7. Click **Assign** to complete the role assignment.

## 9.5. MODIFYING CASE ROLE ASSIGNMENTS DURING RUN TIME USING REST API

You can change case instance role assignments during case run time using the REST API or Swagger application. Roles are defined in the case definition and assigned to tasks in the case lifecycle. Roles cannot change during run time because they are predefined, but you can change the actors assigned to the roles to change who is responsible for carrying out case tasks.

The following procedure includes examples based on the IT Orders sample project. You can use the same REST API endpoints in the Swagger application or any other REST API client, or using Curl.

### Prerequisite

An IT Orders case instance has been started with **owner**, **manager**, and **supplier** roles already assigned to actors.

### Procedure

1. Retrieve the list of current role assignments using a **GET** request on the following endpoint:  
<http://localhost:8080/kie-server/services/rest/server/containers/{id}/cases/instances/{caseId}/roles>

Table 9.1. Parameters

Name	Description
<b>id</b>	<b>itorders</b>
<b>caseId</b>	<b>IT-0000000001</b>

This returns the following response:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<case-role-assignment-list>
  <role-assignments>
    <name>owner</name>
    <users>Aimee</users>
  </role-assignments>
  <role-assignments>
    <name>manager</name>
    <users>Katy</users>
  </role-assignments>
  <role-assignments>
    <name>supplier</name>
    <groups>Lenovo</groups>
  </role-assignments>
</case-role-assignment-list>
```

2. To change the user assigned to the **manager** role, you must first remove the role assignment from the user **Katy** using **DELETE**.  
**/server/containers/{id}/cases/instances/{caseId}/roles/{caseRoleName}**

Include the following information in the Swagger client request:

Table 9.2. Parameters

Name	Description
<b>id</b>	<b>itorders</b>
<b>caseId</b>	<b>IT-0000000001</b>
<b>caseRoleName</b>	<b>manager</b>
<b>user</b>	<b>Katy</b>

Click **Execute**.

- Execute the **GET** request from the first step again to check that the **manager** role no longer has a user assigned:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<case-role-assignment-list>
  <role-assignments>
    <name>owner</name>
    <users>Aimee</users>
  </role-assignments>
  <role-assignments>
    <name>manager</name>
  </role-assignments>
  <role-assignments>
    <name>supplier</name>
    <groups>Lenovo</groups>
  </role-assignments>
</case-role-assignment-list>
```

- Assign the user **Cami** to the **manager** role using a **PUT** request on the following endpoint: `/server/containers/{id}/cases/instances/{caseId}/roles/{caseRoleName}`

Include the following information in the Swagger client request:

Table 9.3. Parameters

Name	Description
<b>id</b>	<b>itorders</b>
<b>caseId</b>	<b>IT-0000000001</b>
<b>caseRoleName</b>	<b>manager</b>
<b>user</b>	<b>Cami</b>

Click **Execute**.

5. Execute the **GET** request from the first step again to check that the **manager** role is now assigned to **Cami**:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<case-role-assignment-list>
  <role-assignments>
    <name>owner</name>
    <users>Aimee</users>
  </role-assignments>
  <role-assignments>
    <name>manager</name>
    <users>Cami</users>
  </role-assignments>
  <role-assignments>
    <name>supplier</name>
    <groups>Lenovo</groups>
  </role-assignments>
</case-role-assignment-list>
```

## CHAPTER 10. STAGES

Case management stages are a collection of tasks. A stage is an ad hoc subprocess that can be defined using the process designer and may include other case management nodes, such as a milestone. A milestone can also be configured as completed when a stage or a number of stages are completed. Therefore, a milestone may be activated or achieved by the completion of a stage, and a stage may include a milestone or a number of milestones.

For example, in a patient triage case, the first stage may consist of observing and noting any obvious physical symptoms or a description from the patient of what their symptoms are, followed by a second stage for tests, and a third for diagnosis and treatment.

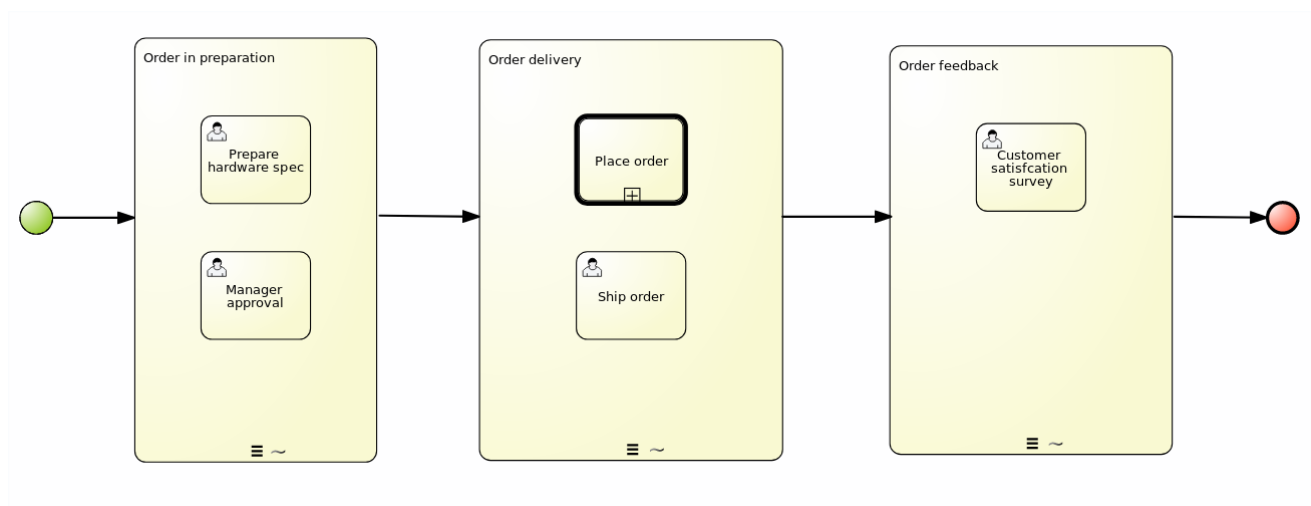
There are three ways to complete a stage:

- By completion condition.
- By terminal end event.
- By setting the **AdHocCompletionCondition** to **autocomplete**, which will automatically complete the stage when there are no active tasks left in the stage.

### 10.1. DEFINING A STAGE

A stage can be modeled in BPMN2 using the process designer. Stages are a way of grouping related tasks in a way that clearly defines activities that, if the stage is activated, must complete before the next stage of the case commences. For example, the IT Orders case definition described in [Chapter 3, Designing a case](#) can also be defined using stages in the following way:


**Figure 10.1. IT Orders project stages example**



#### Prerequisites

- You have followed the procedure in [Chapter 2, Creating a case](#) to create a new case in Business Central.
- You have started a case definition and defined any other required case nodes described in [Chapter 3, Designing a case](#). Stages must be triggered by another node within a case definition, so at least one other node must be configured in the designer before the stage can be started.

#### Procedure

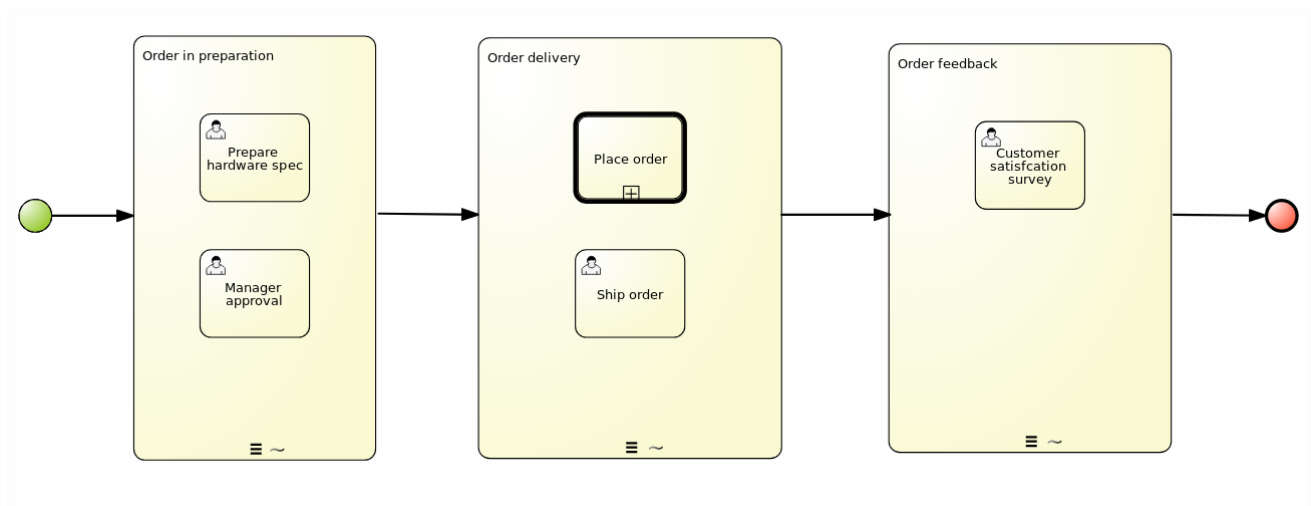
1. From the process designer, click  on the left of the palette to open the **Object Library**. Open the **Subprocesses** object list, drag and drop an **Ad-Hoc** node onto the design canvas and provide a name for the stage node.
2. Define how the stage is activated:
  - If the stage is being activated by an incoming node, connect the stage with a sequence flow line from the incoming node.
  - If the stage is instead being activated by a signal event, configure the **SignalRef** on the signal node with the name of the stage that you configured in the first step.
  - Alternatively, configure the **AdHocActivationCondition** property to activate the stage when the condition has been met.
3. Re-size the node as required to provide room to add the task nodes for the stage.
4. Add the relevant tasks to the stage and configure them as required.
5. (Optional) Configure a completion condition for the stage. As an ad hoc subprocess, stages are configured as **autocomplete** by default, which means that the stage will automatically complete and trigger the next activity in the case definition once all instances in the stage are no longer active.  
To change the completion condition, select the stage node and open the **Properties** panel on the right. Modify the **AdhocCompletionCondition** property field in the with a free-form Drools expression for the completion condition you require. For more information about stage completion conditions, see [Section 10.2, "Configuring stage activation and completion conditions"](#).
6. Once the stage has been configured, connect it to the next activity in the case definition using a sequence flow line.

## 10.2. CONFIGURING STAGE ACTIVATION AND COMPLETION CONDITIONS

Stages can be triggered by a start node, intermediate node, or manually using an API call.

You can configure stages with both activation and completion conditions using free-form Drools rules, the same way that milestone completion conditions are configured. For example, in the IT Orders sample project, the **Milestone 2: Order shipped** completion condition (`org.kie.api.runtime.process.CaseData(data.get("shipped") == true)`) can also be used as the completion condition for the **Order delivery** stage represented here:

Figure 10.2. IT Orders project stages example




Activation conditions can also be configured using a free-form Drools rule to configure the **AdHocActivationCondition** property to activate a stage.

### Prerequisite

- You have created a case definition in the Business Central process designer.
- You have added an ad hoc subprocess to the case definition that is to be used as a stage.

### Procedure

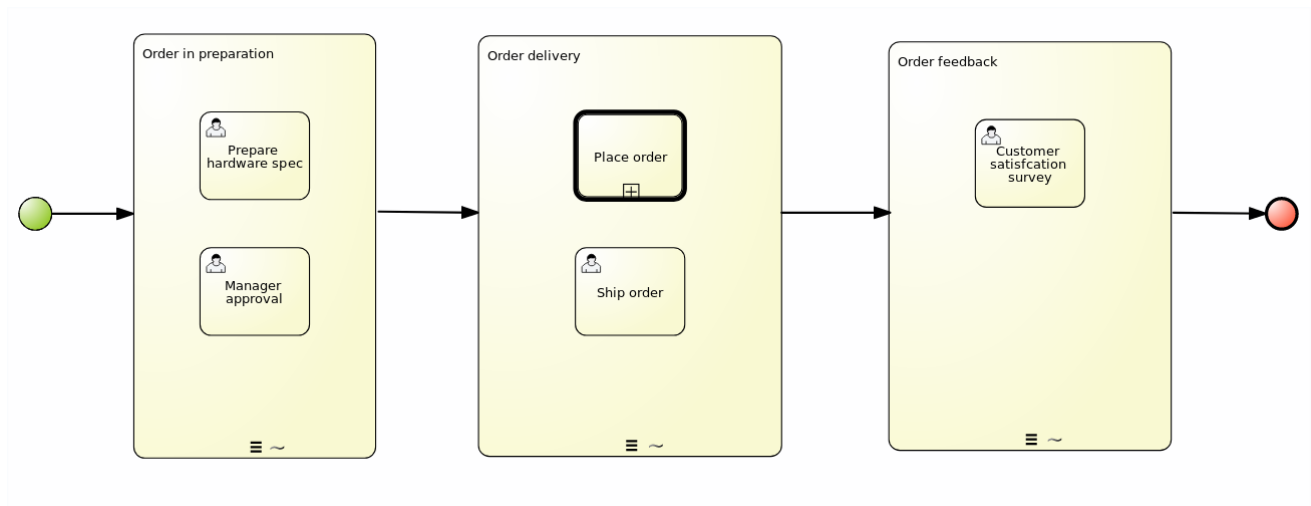
1. With the stage selected on the case design canvas, click  to open the **Properties** panel on the right.
2. Open the **AdHocActivationCondition** property editor to define an activation condition for the start node. For example, **autostart: true** to make the stage automatically activated when a new case instance is started.
3. The **AdHocCompletionCondition** is set to **autocomplete** by default. To change this, open the property editor to define a completion condition using a free-form Drools expression. For example, **org.kie.api.runtime.process.CaseData(data.get("ordered") == true)** to activate the second stage in the example shown previously.

For more examples and information about the conditions used in the IT Orders sample project, see [Getting started with case management](#).

## 10.3. ADDING A DYNAMIC TASK TO A STAGE

Dynamic tasks can be added to a case stage during run time using a REST API request. This is similar to adding a dynamic task to a case instance, but you must also define the **caseStageId** of the stage to which the task is added.

The IT Orders sample case project can be defined using stages instead of milestones.



Use the following procedure to add a dynamic task to a stage in the IT Orders sample project available in Business Central using the Swagger REST API tool. The same endpoint can be used for REST API without Swagger.

### Prerequisite

- The IT Orders sample project BPMN2 case definition has been reconfigured to use stages instead of milestones, as demonstrated in the provided example. For information about configuring stages for case management, see [Defining a stage](#).

### Procedure

1. Start a new case using the Showcase application. For more information about using Showcase, see [Case management Showcase application](#).

Because this case is designed using stages, the case details page shows stage tracking:

Back to case list > IT-0000000001 Refresh

Order for IT hardware (PAMadmin) Order in preparation Order delivery Order feedback Complete

Overview

Case Details	Actions
<p><b>Description</b> Order for IT hardware</p>	<p><span>Available</span> <span>4</span> <span style="margin-left: 100px;"><span>In progress</span> <span>2</span></span></p>

The first stage starts automatically when the case instance is created.

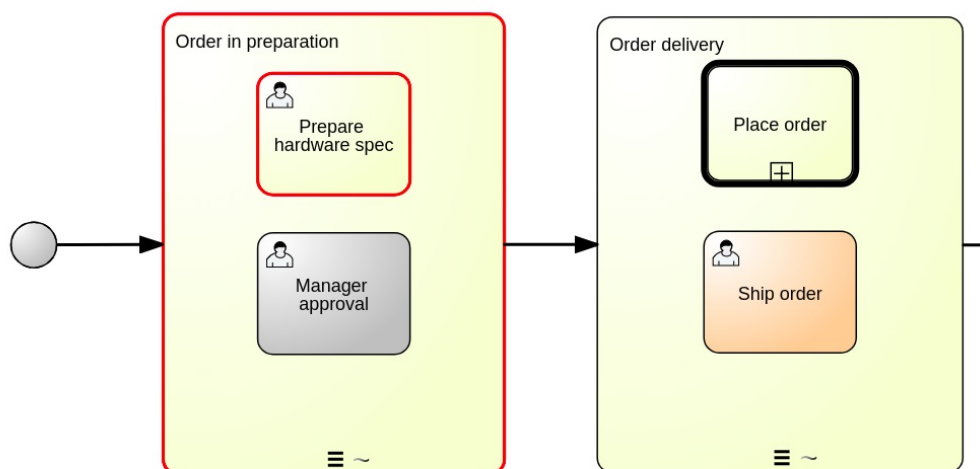
2. As a **manager** user, approve the hardware specification in Business Central under **Menu** → **Track** → **Task Inbox**, then check the progress of the case.
  - a. In Business Central, click **Menu** → **Manage** → **Process Instances** and open the active case instance **IT-0000000001**.
  - b. Click **Diagram** to see the case progress diagram:



## 1 - Order for IT hardware

Instance Details    Process Variables    Documents    Logs    Diagram

Order for IT hardware v.1.0 (src.orderhardware2)



- In a web browser, open the following URL:  
<http://localhost:8080/kie-server/docs>.
- Open the list of available endpoints under **Case instances :: Case Management**
- Click click the following **POST** method endpoint to open the details:  
`/server/containers/{id}/cases/instances/{caseId}/stages/{caseStageId}/tasks`
- Click **Try it out** to complete the following parameters:

Table 10.1. Parameters

Name	Description
<b>id</b>	<b>itorders</b>
<b>caseId</b>	<b>IT-000000001</b>
<b>caseStageId</b>	<b>Order delivery</b>

The **caseStageId** is the name of the stage in the case definition where the dynamic task is to be created.

#### body

This can be any dynamic or service task payload. See [Creating a dynamic subprocess using the REST API](#) or [Creating a dynamic service task using the REST API](#) for examples.

After the dynamic task has been added to the stage, it must be completed in order for the stage to complete and for the case process to move on to the next item in the case flow.

## CHAPTER 11. MILESTONES

Milestones are a special service task that can be configured in the case definition designer by adding the milestone node to the process designer palette. When creating a new case definition, a milestone configured as **Adhoc autostart** is included on the design palette by default.

Case management milestones usually occurs at the end of a stage, but they can also be the result of achieving other milestones. A milestone always requires a condition to be defined in order to track progress. Milestones react to case file data when data is added to a case. A milestone represents a single point of achievement within the case instance. It can be used to flag certain events, which can be useful for KPI tracking or identifying the tasks that are still to be completed.

Milestones can have three states:

- Active - The condition has been defined on the milestone but it has not been met.
- Completed - The milestone condition has been met, the milestone has been achieved, and the case can proceed to the next task.
- Terminated - The milestone is no longer a part of the case process and is no longer required.

While a milestone is available or completed it can be triggered manually using a signal or can be automatically started (by configuring **Adhoc autostart**) when a case instance starts. Milestones can be triggered as many times as required, however, it is directly achieved when the condition is met.


### 11.1. MILESTONE CONFIGURATION AND TRIGGERING

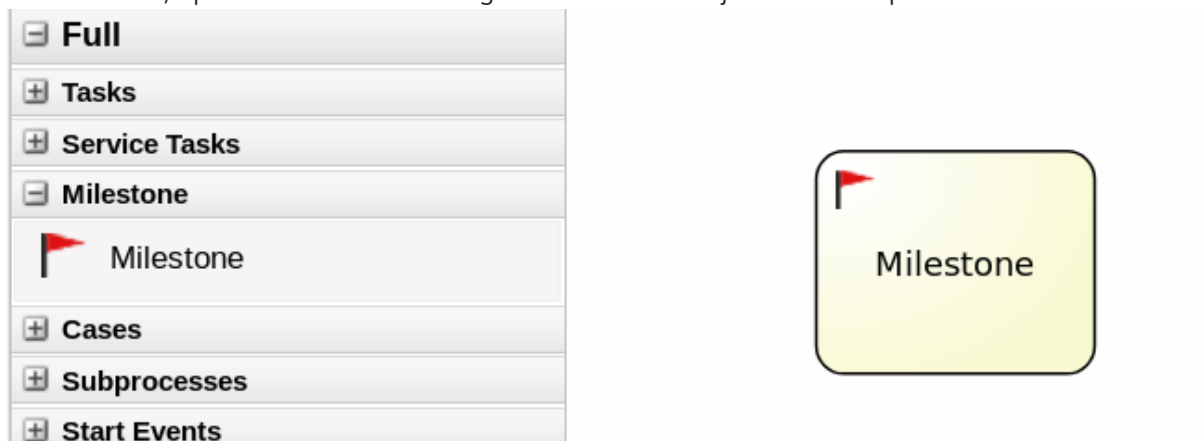
Case milestones can be configured to start automatically when a case instance starts or they can triggered using a signal, which is configured manually during the case design.


#### Prerequisite

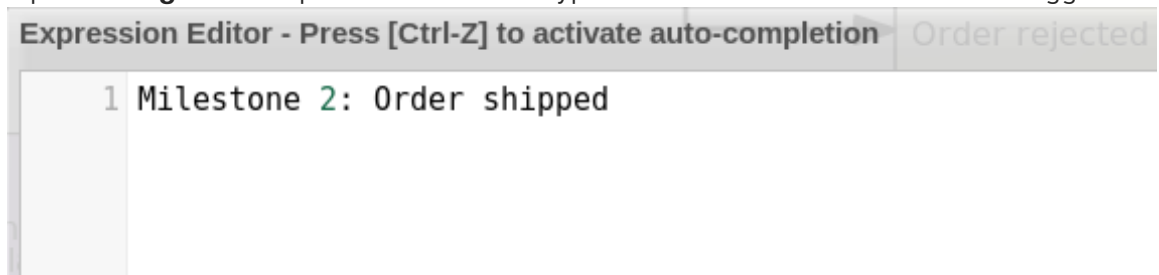
- A case project has been created in Business Central.
- A case definition has been created.

#### Procedure

1. In the process designer, click  to open the **Object Library** on the left of the design palette.
2. From the list, open **Milestone** and drag the **Milestone** object onto the palette.



3. With the milestone node selected, click  to open the **Properties** panel on the right.
4. Open **Assignments** to add a completion condition. Milestones include a **condition** parameter by default.
5. To define the completion condition for the milestone, select **Constant** from the list. The condition must be provided using the Drools syntax.
6. Configure the **Adhoc autostart** property.
  - Set this property to **true** for milestones that are required to start automatically when a case instance starts.
  - Set this property to **false** for milestones that are to be triggered by a signal event.
7. **(Optional)** Configure a signal event to trigger a milestone once a case goal has been reached.
  - a. With the signal event selected in the case design palette, open the **Properties** panel on the right.
  - b. Set the **Signal Scope** property to **Process Instance**.
  - c. Open the **SignalRef** expression editor and type the name of the milestone to be triggered.



Click **Ok** to finish.

## CHAPTER 12. RULES IN CASE MANAGEMENT

Cases are data-driven, rather than following a sequential flow. The steps required to resolve a case rely on data, which is provided by people involved in the case, or the system can be configured to trigger further actions based on the data available. In the latter case, you can use business rules to decide what further actions are required for the case to continue or reach a resolution.

Data can be inserted into the case file at any point during the case. The process engine constantly monitors case file data, meaning that rules react to data that is contained in the case file. Using rules to monitor and respond to changes in the case file data provides a level of automation that drives cases forward.

### 12.1. USING RULES TO DRIVE CASES

Refer to the the case management IT Orders sample scenario in Business Central.

Suppose that the particular hardware specification provided by the supplier is incorrect or invalid. The supplier needs to provide a new, valid order so that the case can continue. Rather than wait for the manager to reject the invalid specification and create a new request for the supplier, you can create a business rule that will react immediately when the case data indicates that the provided specification is invalid. It can then create a new hardware specification request for the supplier.

The following procedure demonstrates how to create and use a business rule to execute the described scenario.

#### Prerequisites

- The IT Orders sample project is open in Business Central, but it is not deployed to the Process Server.
- The **ServiceRegistry** is part of the **jbpm-services-api** module, and must be available on the class path.



#### NOTE

If building the project outside of Business Central, the following dependencies must be added to the project:

- **org.jbpm:jbpm-services-api**
- **org.jbpm:jbpm-case-mgmt-api**

#### Procedure

1. Create the following business rule file called **validate-document.drl**:

```
package defaultPackage;

import java.util.Map;
import java.util.HashMap;
import org.jbpm.casemgmt.api.CaseService;
import org.jbpm.casemgmt.api.model.instance.CaseFileInstance;
import org.jbpm.document.Document;
import org.jbpm.services.api.service.ServiceRegistry;
```

```

rule "Invalid document name - reupload"
when
    $caseData : CaseFileInstance()
    Document(name == "invalid.pdf") from $caseData.getData("hwSpec")

then

    System.out.println("Hardware specification is invalid");
    $caseData.remove("hwSpec");
    update($caseData);
    CaseService caseService = (CaseService)
    ServiceRegistry.get().service(ServiceRegistry.CASE_SERVICE);
    caseService.triggerAdHocFragment($caseData.getCaseld(), "Prepare hardware spec",
    null);
end

```

This business rule detects when a file named **invalid.pdf** is uploaded to the case file. It then removes the **invalid.pdf** document and creates a new instance of the **Prepare hardware spec** user task.

2. Click **Build**, then **Deploy** to deploy the IT Orders project.
3. Create a file called **invalid.pdf** and save it locally.
4. Create a file called `valid-spec.pdf` and save it locally.
5. Open the IT Orders project in Business Central under **Menu → Projects → IT Orders**.
6. Click **Import Asset** in the upper-right corner of the page.
7. Upload the **validate-document.drl** file to the **default** package (**src/main/resources**).

**Create new Import Asset**
×

**Import Asset \***

**Package**

<default>
▼

**Please select a file to upload**

📎

+ Ok
Cancel

The **validate-document.drl** rule is shown in the rule editor. Click **Save** or close to exit the rule editor.

8. Open the Showcase application by either clicking the **Apps launcher** (if it is installed), or go to <http://localhost:8080/rhpam-case-mgmt-showcase/jbpm-cm.html>.

- Start a new case for the IT Orders project.  
In this example, Aimee is the case **owner**, Katy is the **manager**, and the supplier group is **supplier**.

**Start Case**
✕

**Case Name \***

Order for IT hardware ▼

**Case Owner \***



Aimee

**Role Assignments i**

Role Name	Users	Groups
manager	<div style="border: 1px solid #ccc; padding: 2px;">Katy</div>	<div style="border: 1px solid #ccc; padding: 2px;"></div>
supplier	<div style="border: 1px solid #ccc; padding: 2px;"></div>	<div style="border: 1px solid #ccc; padding: 2px; border-color: #0070C0;">supplier</div>

Cancel

Start

- Log out of Business Central, and log back in as a user that belongs to the **supplier** group.
- Go to **Menu → Track → Task Inbox**.
- Open the **Prepare hardware spec** task and click **Claim**. This assigns the task to the logged in user.
- Click **Start** and click  to locate the **invalid.pdf** hardware specification file. Click  to upload the file.

RED HAT PROCESS AUTOMATION MANAGER
Menu ▾
Lenovo ▾

[Home](#) » [Task Inbox](#) » Task: 1

1 - Prepare hardware spec
↻ | ✕

[Work](#) | [Details](#) | [Assignments](#) | [Comments](#) | [Logs](#)

**Upload hardware specification \***

invalid.pdf
📄 ⬆️

Save

Release

Complete

Click **Complete**.

Instead of the **Task Inbox** showing the **Prepare hardware spec** as **Complete**, it shows as **Ready**.

14. In Showcase, click **Refresh** in the upper-right corner. Notice that a **Prepare hardware task** appears in the **Completed** column and another appears in the **In Progress** column.

Actions

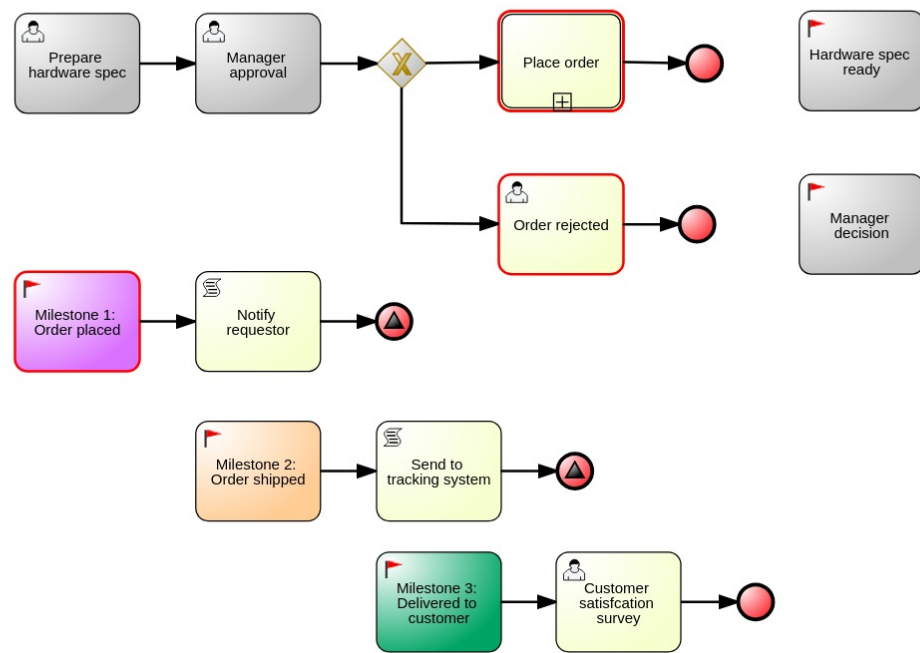
Available <span>4</span>	In progress <span>4</span>	Completed <span>2</span>
<p><b>New user task</b> Dynamic</p>	<p><b>Milestone 1: Order placed</b> 13/07/2018 ( Milestone )</p>	<p><b>Hardware spec ready</b> 13/07/2018 ( Milestone )</p>
<p><b>New process task</b> Dynamic</p>	<p><b>Manager decision</b> 13/07/2018 ( Milestone )</p>	<p><b>Prepare hardware spec</b> 13/07/2018 ( Human Task )</p>
<p><b>Milestone 2: Order shipped</b> Available in: Case</p>	<p><b>Prepare hardware spec</b> 13/07/2018 ( Human Task )</p>	

This is because the first **Prepare hardware spec** task has been completed with the specification file **invalid.pdf**. As a result, the business rule causes the task and file to be discarded, and a new user task created.

15. In the Business Central **Task Inbox**, repeat steps 12 and 13, but upload the **valid-spec.pdf** file instead of **invalid.pdf**.
16. Log out of Business Central and log back in again as **Katy**.
17. Go to **Menu** → **Track** → **Task Inbox**. There are two **Manager approval** tasks for Katy, one with the **invalid.pdf** hardware specification file, the other with the **valid-spec.pdf** file.
18. Open, claim, and complete each task:
- Check the **approve** box for the task that includes the **valid-spec.pdf** file, then click **Complete**.
  - Do not check the **approve** box on the task with the **invalid.pdf** file, then click **Complete**.
19. Go to **Menu** → **Manage** → **Process Instances** and open the **Order for IT hardware** process instance.
20. Open the **Diagram** tab. Note that the process both **Order rejected** and **Place order** tasks as completed.

## 1 - Order for IT hardware

Order for IT hardware v.1.0 (jtorders.orderhardware)



Similarly, the case details page in Showcase lists two **Manager approval** tasks in the **Completed** column.

### Related information

- For information about how to configure the **Apps launcher** for Showcase, see [Section 13.1, "Installing and logging in to the Showcase application"](#).



## CHAPTER 13. CASE MANAGEMENT SHOWCASE APPLICATION

The Showcase application is included in the Red Hat Process Automation Manager distribution to demonstrate the capabilities of case management in an application environment. Showcase is intended to be used as a proof of concept that aims to show the interaction between business process management (BPM) and case management. You can use the application to start/close, monitor, and interact with cases.

Showcase must be installed in addition to the Business Central application and Process Server. The Showcase application is required to start new case instances, however the case work is still performed in Business Central.

After a case instance is created and is being worked on, you can monitor the case in the Showcase by clicking the case in the **Case List** to open the case **Overview** page.

### Showcase Support

The Showcase application is not an integral part of Red Hat Process Automation Manager and is intended for demonstration purposes for case management. Showcase is provided to encourage customers to adopt and modify it to work for their specific needs. The content of the application itself does not carry product-specific Service Level Agreements (SLAs). We encourage you to report issues, request for enhancements, and any other feedback for consideration in Showcase updates.

Red Hat Support will provide guidance on the use of this template on a commercially reasonable basis for its intended use, excluding the provided example UI code provided within.



#### NOTE

[Production support](#) is limited to the Red Hat Process Automation Manager distribution.

## 13.1. INSTALLING AND LOGGING IN TO THE SHOWCASE APPLICATION

The Showcase application is included with the Red Hat Process Automation Manager 7.1 distribution in the add-ons Zip file. The purpose of this application is to demonstrate the functionality of case management in Red Hat Process Automation Manager and enable you to interact with cases created in Business Central. You can install the Showcase application in a Red Hat JBoss Enterprise Application Platform instance or on OpenShift. This procedure describes how to install the Showcase application in Red Hat JBoss EAP.

### Prerequisites

- Business Central and Process Server are installed in an Red Hat JBoss EAP instance.
- You have created a user with **kie-server** and **user** roles. Only users with the **user** role are able to log in to the Showcase application. Users also require the **kie-server** role to perform remote operations on the running Process Server.
- Business Central is not running.

### Procedure

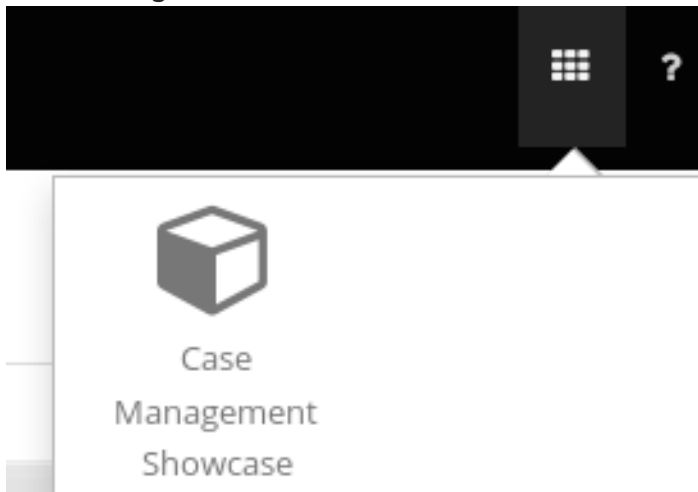
1. Navigate to the [Software Downloads](#) page in the Red Hat Customer Portal (login required), and select the product and version from the drop-down options:
  - Product: Red Hat Process Automation Manager

- Version: 7.1
2. Download **Red Hat Process Automation Manager 7.0.0 Add Ons(rhpam-7.1.0-add-ons.zip)**.
  3. Extract the (**rhpam-7.1.0-add-ons.zip**). file. The (**rhpam-7.0-case-mgmt-showcase-eap7-deployable.zip**). file is in the unzipped directory.
  4. Extract the (**rhpam-7.0-case-mgmt-showcase-eap7-deployable.zip**). archive to a temporary directory. In the following examples this directory is called **TEMP\_DIR**.
  5. Copy the contents of the **\_TEMP\_DIR/rhpam-7.0-case-mgmt-showcase-eap7-deployable/jboss-eap-7.1** directory to **EAP\_HOME**.  
When asked to overwrite files or merge directories, select **Yes**.

**WARNING**

Ensure the names of the Red Hat Process Automation Manager deployments you are copying do not conflict with your existing deployments in the Red Hat JBoss EAP instance.

6. Add the following system property to your deployment's **EAP\_HOME/jboss-eap-7.1/standalone/configuration/standalone-full.xml** file: **<property name="org.jbpm.casemgmt.showcase.url" value="/rhpam-case-mgmt-showcase"/>**
7. In a terminal window, enter the following command to start Business Central:  
**EAP\_HOME/bin/standalone.sh -c standalone-full.xml**
8. In a web browser, enter **localhost:8080/business-central**.  
If Red Hat Process Automation Manager has been configured to run from a domain name, replace **localhost** with the domain name, for example:  
<http://www.example.com:8080/business-central>
9. In the upper-right corner in Business Central, click the **Apps launcher** button to launch the **Case Management Showcase** in a new browser window.



10. Log in to the Showcase application using your Business Central user credentials.

## 13.2. STARTING AN IT ORDERS CASE IN THE SHOWCASE APPLICATION

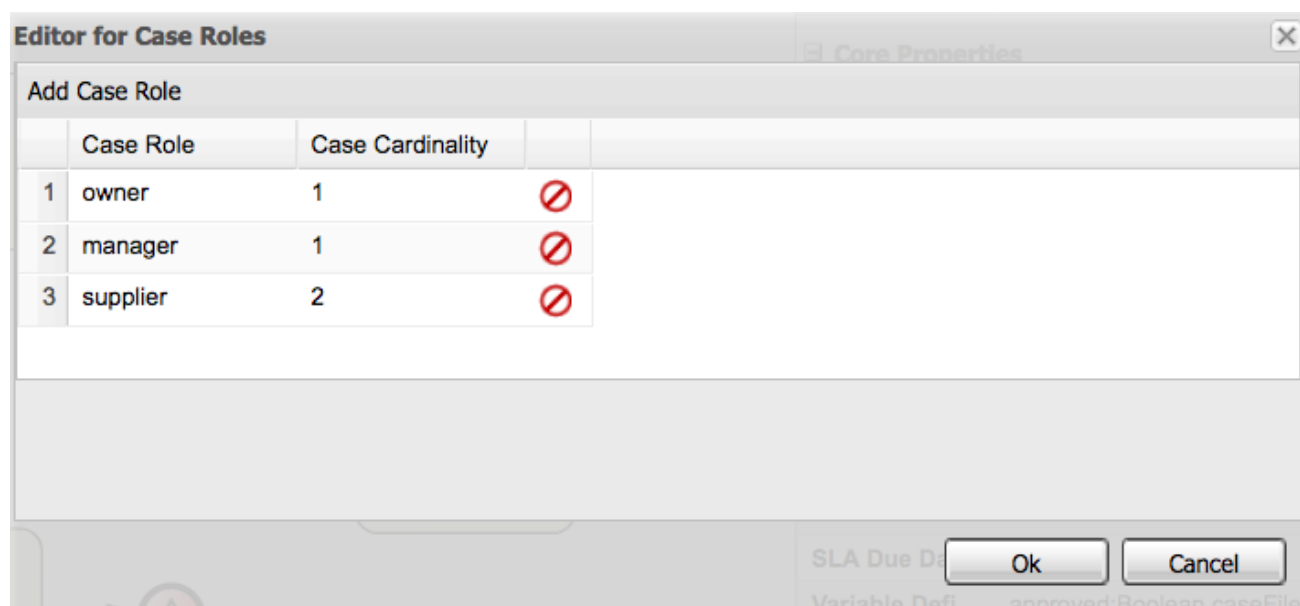
You can start a new case instance for the IT Orders sample case management project in the Showcase application.

The IT Orders sample case management project includes the following roles:

- **owner** - the employee who is making the hardware order request. There can be only one of these roles.
- **manager** - the employee's manager; the person who will approve or deny the requested hardware. There is only one manager in the IT Orders project.
- **supplier** - the available suppliers of IT hardware in the system. There is usually more than one supplier.

These roles are configured at the case definition level:

Figure 13.1. ITOrders Case Roles



Assign users or groups to these roles when starting a new case file instance.

### Prerequisites

- You have imported and deployed the IT Orders sample project in Business Central.
- You have installed and logged in to the Showcase application as instructed in [Section 13.1, "Installing and logging in to the Showcase application"](#).

### Procedure

1. In the Showcase application, start a new case instance by clicking the **Start Case** button.
2. Select the **Order for IT hardware** case name from the list and complete the role information as shown:

**Start Case**
✕

**Case Name \***

Order for IT hardware
▾

**Case Owner \***

Aimee

**Role Assignments i**

Role Name	Users	Groups
manager	<div style="border: 1px solid #ccc; padding: 2px;">Katy</div>	<div style="border: 1px solid #ccc; padding: 2px;"></div>
supplier	<div style="border: 1px solid #ccc; padding: 2px;"></div>	<div style="border: 1px solid #ccc; padding: 2px; border-color: #007bff;">supplier</div>

Cancel

Start

In this example, Aimee is the case **owner**, Katy is the **manager**, and the supplier group is **supplier**.

3. Click **Start** to start the case instance.
4. Select the case from the **Case List**. The **Overview** page opens. From the **Overview** page, you can monitor the case progress, add comments, start new dynamic tasks and processes, and complete and close cases.

[Back to case list](#) > IT-0000000001
[Refresh](#)

Order for IT hardware (Aimee) [Cancel](#) ⋮

[Overview](#)

**Case Details**

**Description**  
Order for IT hardware

**Status**  
Open

**Owner**  
Aimee

**Started**  
18/07/2018

**Actions**

🚩 Available 4

🚩 In progress 4

🚩 Completed 0

**New user task**  
Dynamic

**New process task**  
Dynamic

**Milestone 2: Order shipped**  
Available in: Case

**Prepare hardware spec**  
18/07/2018 ( Human Task )

**Milestone 1: Order placed**  
18/07/2018 ( Milestone )

**Hardware spec ready**  
18/07/2018 ( Milestone )

🕒 No actions found

**Milestones** ⌵

🚩 Hardware spec ready

**Comments** ⌵

👤

+

**Roles** 3 All ▾

**owner**

👤 Aimee



## NOTE

Cases can be started and closed using the Showcase application, but they cannot be reopened using this application. You can only reopen a case using a JMS or REST API call.

## CHAPTER 14. CASE MANAGEMENT SECURITY

Cases are configured at the case definition level with case roles. These are generic participants that are involved in case handling. These roles can be assigned to user tasks or used as contact references. Roles are not hard-coded to specific users or groups to keep the case definition independent of the actual actors involved in any given case instance. You can modify case role assignments at any time as long as case instance is active, though modifying a role assignment does not affect tasks already created based on the previous role assignment.

Case instance security is enabled by default. The case definition prevents case data from being accessed by users who do not belong to the case. Unless a user has a case role assignment (either assigned as user or a group member) then they are not able to access the case instance.

Case security is one of the reasons why it is recommended that you assign case roles when starting a case instance, as this will prevent tasks being assigned to users who should not have access to the case.

### 14.1. CONFIGURING SECURITY FOR CASE MANAGEMENT

You can turn off case instance authorization by setting the following system property to **false**:

**org.jbpm.cases.auth.enabled**

This system property is just one of the security components for case instances. In addition, you can configure case operations at the execution server level using the **case-authorization.properties** file, available at the root of the class path of the execution server application (**kie-server.war/WEB-INF/classes**).

Using a simple configuration file for all possible case definitions encourages you to think about case management as domain-specific. **AuthorizationManager** for case security is pluggable, which allows you to include custom code for specific security handling.

You can restrict the following case instance operations to case roles:

- **CANCEL\_CASE**
- **DESTROY\_CASE**
- **REOPEN\_CASE**
- **ADD\_TASK\_TO\_CASE**
- **ADD\_PROCESS\_TO\_CASE**
- **ADD\_DATA**
- **REMOVE\_DATA**
- **MODIFY\_ROLE\_ASSIGNMENT**
- **MODIFY\_COMMENT**

#### Prerequisite

The Red Hat Process Automation Manager Process Server is not running.

#### Procedure

1. Open **JBOSS\_HOME/standalone/deployments/kie-server.war/WEB-INF/classes/case-authorization.properties** file in your preferred editor.

By default, the file contains the following operation restrictions:

```
CLOSE_CASE=owner,admin  
CANCEL_CASE=owner,admin  
DESTROY_CASE=owner,admin  
REOPEN_CASE=owner,admin
```

2. You can add or remove role permissions for these operations.
  - a. To remove permission for a role to perform an operation, remove it from the list of authorized roles for that operation in the **case-authorization.properties** file. For example, removing the **admin** role from the **CLOSE\_CASE** operation restricts permission to close a case to the case owner for all cases.
  - b. To give a role permission to perform a case operation, add it to the list of authorized roles for that operation in the **case-authorization.properties** file. For example, to allow anyone with the **manager** role to perform a **CLOSE\_CASE** operation, add it to the list of roles, separated by a comma:  
**CLOSE\_CASE=owner,admin,manager**
3. To add role restrictions to other case operations listed in the file, remove the **#** from the line and list the role names in the following format:  
**OPERATION=role1,role2,roleN**  
  
Operations in the file that begin with **#** have restrictions ignored and can be performed by anyone involved in the case.
4. When you have finished assigning role permissions, save and close the **case-authorization.properties** file.
5. Start the execution server.  
The case authorization settings apply to all cases on the execution server.

## CHAPTER 15. CLOSING CASES

A case instance can be completed when there are no more activities to be performed and the business goal is achieved, or it can be closed prematurely. Usually the case owner closes the case when all work is completed and the case goals have been met. When you close a case, consider adding a comment about why the case instance is being closed. A closed case can be reopened later with the same case ID if required.

You can close case instances remotely using Process Server REST API requests or directly in the Showcase application.

### 15.1. CLOSING A CASE USING THE PROCESS SERVER REST API

You can use a REST API request to close a case instance. Red Hat Process Automation Manager includes the Swagger client, which includes endpoints and documentation for REST API requests. Alternatively, you can use the same endpoints to make API calls using your preferred client or Curl.

#### Prerequisites

- A case instance has been started using Showcase.
- You are able to authenticate API requests as a user with the **admin** role.

#### Procedure

1. Open the Swagger REST API client in a web browser:  
**localhost:8080/kie-server/docs**
2. Under **Case Instances :: Case Management**, open the **POST** request with the following endpoint:  
**/server/containers/{id}/cases/instances/{caseId}**
3. Click **Try it out** and fill in the required parameters:

**Table 15.1. Parameters**

Name	Description
<b>id</b>	<b>itorders</b>
<b>caseId</b>	<b>IT-0000000001</b>

4. Optionally, you can include a comment to be included in the case file. To leave a comment, type it into the **body** text field as a **String**.
5. Click **Execute** to close the case.
6. To confirm the case is closed, open the Showcase application and change the case list status to **Closed**.



### 15.2. CLOSING A CASE IN THE SHOWCASE APPLICATION

You can use the Showcase application to close a case instance at any time. From Showcase, you can easily view the details of the case or leave a comment before closing it.

## Prerequisite

You are logged in to the Showcase application and are the owner or administrator for a case instance that you want to close.

## Procedure

1. In the Showcase application, locate the case instance you want to close from the list of case instances.
2. To close the case without viewing the details first, click the three dots (  ) at the end of the row and click **Close**.
3. To close the case from the case details page, click the case in the list to open it. From the case overview page you can add comments to the case and verify that you are closing the correct case based on the case information.
4. Click the three dots (  ) in the upper-right corner of the page and click **Close** to close the case.
5. Click **Back to Case List** in the upper-left corner of the page to return to the Showcase case list view.
6. Click the drop-down list next to **Status** and select **Canceled** to view the list of closed and canceled cases.



## CHAPTER 16. CANCELING OR DESTROYING A CASE

Cases can be canceled if they are no longer required and do not require any case work to be performed. Cases that are canceled can be reopened later with the same case instance ID and case file data. In some cases, you might want to permanently destroy a case so that it cannot be reopened.

Cases can only be canceled or destroyed using an API request. Red Hat Process Automation Manager includes the Swagger client, which includes endpoints and documentation for REST API requests. Alternatively, you can use the same endpoints to make API calls using your preferred client or Curl.

### Prerequisites

- A case instance has been started using Showcase.
- You are able to authenticate API requests as a user with the **admin** role.

### Procedure

1. Open the Swagger REST API client in a web browser:  
**localhost:8080/kie-server/docs**
2. Under **Case Instances :: Case Management**, open the **DELETE** request with the following endpoint:  
**/server/containers/{id}/cases/instances/{caseId}**

You can cancel a case using the **DELETE** request. Optionally, you can also destroy the case using the **destroy** parameter.

3. Click **Try it out** and fill in the required parameters:

**Table 16.1. Parameters**

Name	Description
<b>id</b>	<b>itorders</b>
<b>caseId</b>	<b>IT-0000000001</b>
<b>destroy</b>	<b>true</b>  (Optional. Permanently destroys the case. This parameter is <b>false</b> by default.)

4. Click **Execute** to cancel (or destroy) the case.
5. To confirm the case is canceled, open the Showcase application and change the case list status to **Canceled**. If the case has been destroyed, it will no longer appear in any case list.

## APPENDIX A. VERSIONING INFORMATION

Documentation last updated on Friday, May 22, 2020.