# Oracle® Enterprise Manager Cloud Control

## ServiceNow REST Connector Installation and Configuration Guide

ORACLE®

Oracle Enterprise Manager Cloud Control ServiceNow REST Connector Installation and Configuration Guide, for Enterprise Manager 13c Release 5

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# Contents

## Preface

## 1   Introduction to the Connector

## 2   Installing and Configuring the Connector

# 3    Creating ServiceNow Tickets

# 4    Using Default Templates

# 5    Enabling SSL for HTTPS

# Index

# Preface

This *Connector Configuration* guide provides the information that you require to configure Management Connectors that integrate Enterprise Manager with other management tools and help desk systems.

## Audience

This guide is written for Oracle Database system administrators who want to configure Management Connectors to enable integration between Enterprise Manager and other systems.

You should already be familiar with Oracle Enterprise Manager.

## Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at `http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc`.

**Access to Oracle Support**

Oracle customers have access to electronic support through My Oracle Support. For information, visit `http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info` or visit `http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs` if you are hearing impaired.

## Related Resources

For more information, see the following books in the Oracle Enterprise Manager documentation set:

- *Oracle Enterprise Manager Cloud Control Basic Installation Guide*

- *Oracle Enterprise Manager Cloud Control Advanced Installation and Configuration Guide*

- *Oracle Enterprise Manager Cloud Control Administrator's Guide*

- *Oracle Enterprise Manager Cloud Control Upgrade Guide*

- *Oracle Enterprise Manager Framework, Host, and Services Metric Reference Manual*

- *Oracle Enterprise Manager Command Line Interface*

- *Oracle Enterprise Manager Cloud Control Extensibility Programmer's Guide*

- *Oracle Database 2 Day DBA*

The latest versions of this and other Oracle Enterprise Manager documentation can be found at:

`http://docs.oracle.com/en/enterprise-manager/`

To download free release notes, installation documentation, white papers, or other collateral, please visit the Oracle Technology Network (OTN). You must register online before using OTN; registration is free and can be done at:

http://otn.oracle.com/membership/

If you already have a user name and password for OTN, then you can go directly to the documentation section of the OTN Web site at:

http://otn.oracle.com/documentation/

# Conventions

The following text conventions are used in this document:

| Convention | Meaning |
| --- | --- |
| **boldface** | Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary. |
| *italic* | Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values. |
| `monospace` | Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter. |

# 1

# Introduction to the Connector

The Oracle Management Connector for ServiceNow integrates ServiceNow with Enterprise Manager through a REST connection. Using this connector, you can create and update a ticket for any incident created in Enterprise Manager.

The ticket generated by the connector contains the relevant information about the Enterprise Manager incident, including a link to the Enterprise Manager console to enable helpdesk analysts leverage Enterprise Manager's diagnostic and resolution features to resolve the incident. In Enterprise Manager, the ticket ID and its link to navigate to the ServiceNow Ticket is shown in the context of the incident. This easily enables Enterprise Manager administrators to quickly access the ticket.

> **✐ Note:**
>
> Before proceeding, see the Using Incident Management chapter in the *Oracle Enterprise Manager Cloud Control Administrator's Guide* to understand the event and incident management concepts.

The following sections explain various ServiceNow Connector concepts that you must understand before you start using the ServiceNow Connector.

- Versions Supported
- Ticket Generation Contents
- Auto Ticketing
- Manual Ticketing
- Ticket Templates
- Grace Period
- Retry

## Versions Supported

The ServiceNow Connector communicates through version 2 of the Table REST API component of ServiceNow, which is available starting with the Geneva release. The ticketing connector functions with Oracle Enterprise Manager Cloud Control 13*c* Release 5 (13.5.0.0.0) and later versions.

## Ticket Generation Contents

The ticket generated by the connector contains the relevant information about the Enterprise Manager incident, including a link to the Enterprise Manager console to enable help desk analysts leverage Enterprise Manager's diagnostic and resolution features to resolve the incident.

In Enterprise Manger, the ticket ID, and link to the ServiceNow ticket isshown in the context of the incident. This provides Enterprise Manager administrators an easy way to quickly access the ticket.

## Auto Ticketing

Auto ticketing refers to creating or updating tickets automatically for any matching rule(s) in Enterprise Manager. You can define a set of event or incident rules for which tickets must be opened/updated for changes in underlying event or incident attributes. For example, changing event severity from Warning to Critical can update the associated ticket.

> **See Also:**
>
> Using Incident Management chapter in the *Oracle Enterprise Manager Cloud Control Administrator's Guide*.

After the ticket is opened, any subsequent update of the incident attributes or underlying event attributes, such as a change in underlying events severity, updates the ticket. After the incident is cleared in Enterprise Manager, the ticket is updated and you can optionally close the ticket in ServiceNow.

> **See Also:**
>
> Automatically Creating a Ticket

## Manual Ticketing

From the Enterprise Manager console, you can manually open a ServiceNow ticket based on an open incident in Enterprise Manager. The ServiceNow Connector populates the ticket with details based on the incident and the ticket template selected.

> **See Also:**
>
> Manually Creating a Ticket

## Ticket Templates

Ticket templates are XML transformation style sheets that transform Enterprise Manager incidents to a ServiceNow ticket format before the requests are sent to ServiceNow. A ticket template specifies how an Enterprise Manager incident and its associated event attributes can be mapped to the ticket attributes of ServiceNow.

In Auto Ticketing, while setting up a rule, you select a configured connector and select the ticket template from the template list. The selected ticket template is used when a

ticketing request is sent to ServiceNow. For manual ticketing, you have to select a connector instance and ticket template before submitting a request for ticket creation.

The ServiceNow Connector includes some out-of-box default ticket templates. You can customize default templates according to your functional needs. Oracle recommends that you back up these factory-built templates before customizing them.

> ✎ **See Also:**
>
> Using Default Templates

# Grace Period

The grace period enables you to prevent creating a large number of tickets for frequently created incidents due to reoccurrence of the same event.

For example, an event is raised and causes an incident to be created in Enterprise Manager. The rule defined to create the ticket enforces the ticket to be created in ServiceNow. If the grace period is one hour and the event is cleared at 10:00 a.m., this clears the incident and ticket. If the same event reoccurs before 11:00 a.m. and enforces creation of another incident, the grace period functionality stops creation of a new ticket for this and reopens the same ticket instead.

# Retry

The "Retry" section, available on the connector configuration page, enables you to specify whether a failed ticketing request needs to be retried within a configurable expiration time.

Enabling the Retry option gives you the option of specifying whether you want to resend a ticketing request if the request fails the first time and specifying the time period after which you want to abandon the retry. Enterprise Manager retries every 2 minutes until the request is successful or the retry interval expires.

# 2

# Installing and Configuring the Connector

This chapter provides the following information for setting up and configuring the ServiceNow Connector and related tasks:

- Prerequisites
- Installing the Connector
- Creating a Connector Instance
- Configuring the Connector
- Enabling or Disabling the Connector
- Providing General Settings
- Working with Ticket Templates
- Deleting the Connector

## Prerequisites

The ServiceNow Connector communicates through ServiceNow's Table REST API. Before using the ServiceNow Connector, ensure that you meet the following prerequisites:

- ServiceNow User exists with the "ITIL" role applied.
- Add the "Root Certificate Authority - Entrust.net Certification Authority (2048)" certificate as described in Enabling SSL for HTTPS.
- My Oracle Support Preferred Credentials are set. To set the credentials, perform the following steps:

  1. From the Enterprise Manager console Setup menu, select **My Oracle Support**, then **Set Credentials**.

  2. Enter the user name and password information, then click **Apply**.

  3. From the Enterprise Manager console Setup menu, select **Extensibility**, then **Self Update**.

  4. From the Self Update page, look for the ServiceNow REST Ticketing connector in the table list. If it does not appear, go to the next step.

  5. Click **Check Updates** to schedule a job to collect the metadata for the connector, as shown in the image below.

> ✏ **See Also:**
>
> Refer to the Setting Up Self Update section in the *Oracle Enterprise Manager Cloud Control Administrator's Guide* for more details.

> ✏ **Note:**
>
> You can also set up Self Update in offline mode. See the Applying an Update in Offline Mode section in the *Oracle Enterprise Manager Cloud Control Administrator's Guide* for details.



# Installing the Connector

This section provides the procedure required to download and install (apply) the connector. The ServiceNow connector is not included out-of-the-box, so you need to download it from the Oracle Enterprise Manager store. All connectors in the Enterprise Manager store are available on the Self Update page for downloading.

To install the connector:

1. From the Enterprise Manager console Setup menu, select **Setup**, then select **Extensibility**, then select **Self Update**.

2. Click on the **Management Connector** link in the **Type** column.

   The ServiceNow connectors appear in the list with a status of Available.

3. Click on the appropriate ServiceNow connector to select it, and then click **Download**.

   The Schedule Download window appears, where you can determine when the download should be performed.

4. Click **Select** to download immediately.

   If you want to schedule the download for a later time, specify the date and time when the download should occur, and click **Select**. You will need to return and finish the remainder of this procedure after the scheduled download date and time.

5. If necessary, refresh the screen until the status of the connector changes to Downloaded.

6. Click on the ServiceNow REST Ticketing connector to select it, then click **Apply**.

   After you respond to the prompt to confirm the operation, a page appears that indicates the request has been submitted.

7. Refresh the screen until the status of the connector changes from **Apply Scheduled** to **Applied**.

# Creating a Connector Instance

To use the ServiceNow connector, you need to create one or more instances of this connector type. A connector instance refers to the configured instance of the connector with specific details, such as connector name, User name, Password and so forth of the ServiceNow instance. Multiple connector instances for the same connector type are supported, which provides the flexibility to configure multiple ServiceNow instances with Enterprise Manager.

For example, since Enterprise Manager is monitoring production targets and test targets, you can then create two instances of the connector and configure Enterprise Manager so that incidents from production targets create tickets in one connector instance, and incidents from test targets create tickets in the second connector instance.

To create a connector instance:

1. From the Enterprise Manager console, click **Setup**.

2. Select **Extensibility** in the pane.

3. Select **Management Connectors** in the left pane.

4. Select a connector type from the Create Connector drop-down list and click the **Go** button.

5. Enter the connector name and description on the next screen and click **OK**.

   The connector instance appears as unconfigured on the Management Connectors page, shown in the image below.

   **Figure 2-1    Management Connectors Page**



# Configuring the Connector

Perform the following steps for basic configuration:

1. As Super Administrator, from the Enterprise Manager console, click **Setup.**

2. Click **Extensibility**, then **Management Connectors**.

   The Management Connectors page appears that lists all created connector instances.

   > **Note:**
   >
   > The status column with a green tick mark indicates that the connector is already configured.

3. Click the **Configure** button for the ServiceNow. The General tab of the Configure Management Connector page appears.

4. Provide the required settings. See "Providing General Settings" for details.

5. Click **OK.**

   The Management Connectors page reappears. The row for the ServiceNow Connector should have a check mark in the Status column, as shown in the figure below.
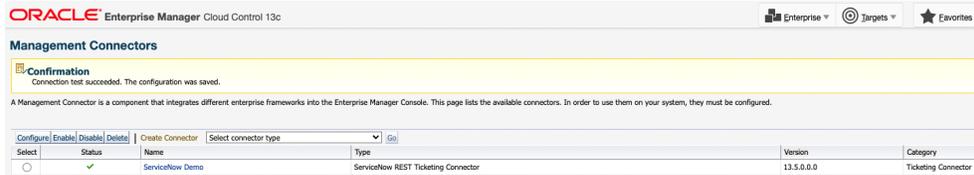


6. **Optional:** Register any customized templates using the `emctl` command from the `ORACLE_HOME/bin` directory, where `ORACLE_HOME` is the Oracle home directory of OMS.

   You can view all ticket templates by clicking the Ticket Templates tab.

# Enabling or Disabling the Connector

You can enable or disable a connector instance without needing to reconfigure or remove the connector from the system.

You can enable or disable a connector from the Management Connector page by selecting the connector and clicking either the **Enable** or **Disable** button. After a connector is disabled, you will see a red cross icon under the Status column. By default, the connector instance is enabled as soon as it is configured.

> ✏ **Note:**
>
> Only enabled connectors are available for ticketing operations.

# Providing General Settings

The following sections explain how to provide various configuration details for the General tab of the Configure Management Connector page, shown in the image below.

# Connection Settings

The ServiceNow Connector communicates with the Service Desk through their Web services. Mandatory fields are indicated with an asterisk ( * ).

- **WebService End Points** — End points to `createTicket`, `updateTicket`, and `getTicketwebservices` exposed by ServiceNow. Each of these have a variable called 'subdomain' that needs to be updated with your ServiceNow subdomain.

- **Username**— The username to the account you are using to connect to ServiceNow. This is the account tickets will be created under in ServiceNow.

- **Password**— The password to the account you are using to connect to ServiceNow.

- **Incident Number**— An existing Ticket ID to test the connection to the ServiceNow system. The ticket does not need to be open.

# Web Console Settings

Web Console settings are required if you want the connector to provide links to ServiceNow tickets created by Enterprise Manager in the context of an incident.

To enable this functionality, provide the following Web console settings.

- **Enable web console** — Check this box to enable launching of the ServiceNow incident page within context from Enterprise Manager.

- **ServiceNow Subdomain** — The subdomain of your ServiceNow account.

# Grace Period

You can enable and disable the grace period and configure its value. By default, the grace period is disabled. See Grace Period for details. This setting applies to all incidents the ServiceNow Connector processes. The grace period interval accepts the number of hours as any integer value. For example, 1 or 2.

## Retry

You can enable and disable the Retry option and configure its interval value. By default, the Retry is disabled. See Retry for details. This setting applies to all incidents in the ServiceNow Connector processes. The retry period interval accepts the number of hours as any integer value. For example, - 1 or 2.

# Working with Ticket Templates

When a connector instance is created in Enterprise Manager, all associated templates are available for ticket create/update operations. There are three default ServiceNow templates:

- serviceNowIncidentCreateAndUpdate.xsl
- serviceNowCreateUpdateAndClose.xsl
- serviceNowCreateUpdateAndResolve.xsl

> 💡 **Tip:**
>
> See Template Process for detailed information about these templates.

The following sections provide information about adding, viewing, removing, and replacing ticket templates.

## Adding Ticket Templates

You need to add ticket templates before they are recognized in Enterprise Manager. The connector provides out-of-box templates that are automatically registered when the connector instance is created. If you want to edit these, you can do so directly in Enterprise Manager. However, if you need to use a new template (other than one out-of-box), you need to register the new template using the emctl command. You can then edit the template in Enterprise Manager. See Editing Templates for more information.

To add and register a template:

1. Ensure that you have execute privilege on emctl and the ability to read the ticket template.

2. For each template, run the following emctl register_template connector command:

```
$ORACLE_HOME/bin/emctl register_template connector
[-t <template.xml>]
[-repos_pwd <repos password>]
[-cname <connectorName>]
[-iname <internalName>]
[-tname <templateName>]
[-ttype <templateType>]
[-d <description>]
```

Where:

```
-t            Template(full path)
-repos_pwd    Enterprise Manager Root (SYSMAN) Password
-cname        Connector Name
-iname        Template Internal Name
-tname        Template Name Displayed
-ttype        Template Type
              <templateType> 1 - inbound transformation
              <templateType> 2 - outbound transformation
              <templateType> 3 - XML outbound transformation
-d            Description
```

**Example 2-1    Template Registration**

The following command adds a new outbound template (newTemplate.xsl) for a connector instance with the name ServiceNow Connector Instance:

```
emctl register_template connector
-t <template.xml>
-repos_pwd <repos password>
-cname "ServiceNow Connector Instance"
-iname "newTemplate"
-tname "newTemplateOutbound"
-ttype 2
-d "Demo template"
```

# Viewing Template Code

To view template code, do the following:

1.  Select the connector instance and go to the Configure Management Connector page.

2.  Select the **Template** tab, as shown in the image below.



3.  Click a template name or click **View** to view the XSLT code for the template.

The ticket templates are in XSLT format. A basic knowledge of XSLT is required to understand the code.

# Removing a Template

To remove a template, do the following:

1.  Select the connector instance and go to the Configure Management Connector page.

2.  Select the **Template** tab.

3.  Select the template and click **Delete**.

4. Click **Yes** to confirm the delete operation.

> **Note:**
>
> If the template you delete has an incident rule associated with it, ticketing will not function for this particular incident rule after the deletion.

## Editing Templates

To edit an existing ticket template, do the following:

1. Select the connector instance and go to the Configure Management Connector page.

2. Select the **Template** tab.

3. Select the template and click **Edit**.

4. Edit the Description and Template Contents fields as needed, then click **Save**.

The ticket template is automatically registered. Saving the registered template updates it in the repository.

## Restoring Templates

After you edit or customize a template, you can restore it to its previous default contents if needed by performing the following steps.

> **Note:**
>
> You can restore out-of-box templates that you have may edited or customized to their default values.

1. Select the connector instance and go to the Configure Management Connector page.

2. Select the **Template** tab.

3. Select the template and click **Restore**.

4. Click **Yes** in the confirmation page that appears in order to restore.

## Deleting the Connector

You can delete a connector from the Management Connector page by selecting the connector and clicking the **Delete** button. After a connector is deleted, all associated incident rules are no longer configured for ticketing operations.

Additionally, if the connector deleted is the only connector instance of that connector type, the corresponding connector type is also deleted.

> **✎ Note:**
>
> The above rule is not applicable to the out-of-box connector type.

# 3

# Creating ServiceNow Tickets

You can create tickets automatically or manually. The following sections explain how to create both types.

- Automatically Creating a Ticket
- Manually Creating a Ticket

> **✎ Note:**
>
> At least one ticketing connector must be configured and enabled in order to create a ticket using either method.

## Automatically Creating a Ticket

To automatically create a ticket in ServiceNow, you need to create a rule that specifies the event or incident condition on which the ticket should be created. In this rule, you also specify the ticket template to be used with the ServiceNow connector.

To create a rule to automatically create a ticket in ServiceNow:

1. From the Enterprise Manager console, click **Setup**, then **Incidents** and **Incident Rules**.

2. Click **Create Rule Set**. On the Create Rule Set page, enter a name and description.

3. Click the **Rules** tab.

   As you proceed below, the wizard interface explains various rules and their usage. For detailed information, refer to the Using Incident Management chapter in the *Oracle Enterprise Manager Cloud Control Administrator's Guide.*

   - For **events** —

     This is the typical option to choose to create a ticket for an event, such as a target down availability event.

     Click **Create** and select **Incoming events or updates to events** as a type of rule to create from the pop-up window. Follow the steps below to create a rule.

   - For **incidents** —

     Click **Create** and select **Newly created incidents or updates to incidents** as a type of rule to create from the pop-up window. Follow the steps below to create a rule.

4. While configuring the above rule under the Add Actions page:

   - For **events** —

     Select the **Create Incident** check box. This makes the Create Ticket option visible. Then, select the **Create Ticket** check box. It will display the combo box to select Connector Type, name, and template.

   - For **incidents** —

You can use this option to create tickets based on incident attributes, such as priority 1 incidents or incidents based on fatal or critical severity.

Select the **Create Ticket** check box. It will display the combo box to select Connector Type, name, and template.

Figure 3-1 shows the Add Actions page for events, and Figure 3-2 shows the Add Actions page for incidents.

**Figure 3-1    Add Actions Page for Events**

**Figure 3-2    Add Actions Page for Incidents**



5.  After selecting an appropriate connector and template, click **Save**.

The following process occurs after you create the event or incident rule:

*   A request is sent to the ServiceNow Connector when an incident is created due to an event that matches your rule.

*   The ticket is created or updated on the ServiceNow system.

*   In Enterprise Manager, the incident is annotated with a comment on the Updates tab to indicate that a ticket was created or updated, as shown in Figure 3-3. Additionally, the incident is updated with the ticket ID, ticket status, and ticket URL under the Incident Tracking section.

A ticket is updated if there is an existing active ticket for an incident. Figure 3-4 shows the ticket in ServiceNow.

**Figure 3-3    Incident Comments**
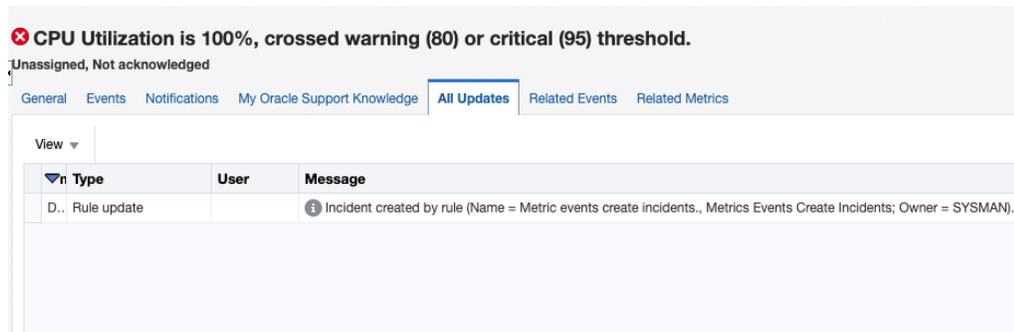


**Figure 3-4    ServiceNow Ticket**
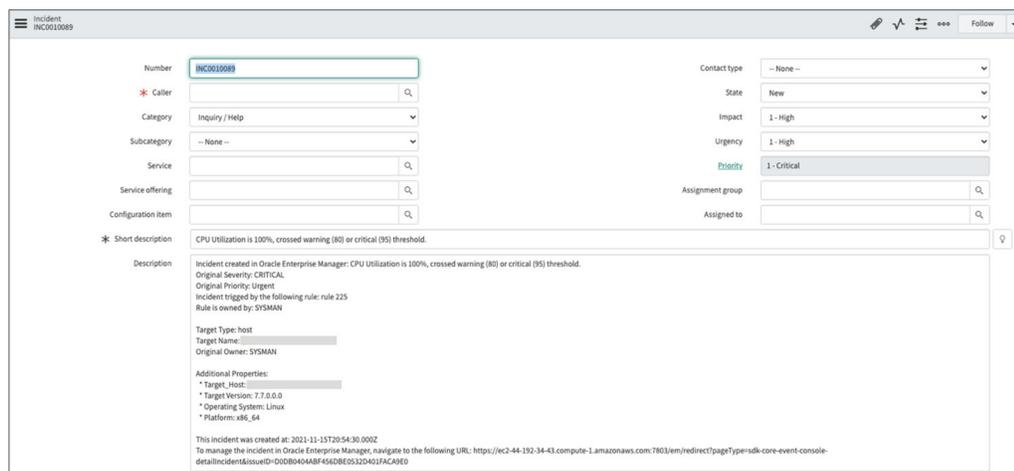


# Manually Creating a Ticket

Perform the following steps to manually create a ticket:

1.  From the Enterprise menu of the Enterprise Manager console, select **Monitoring**, then **Incident Manager**.

    The Incident Manager page appears, showing all open incidents.

2.  Select any incident from the list in the table.

3.  In the Tracking section, click **More**, then **Create Ticket**, as shown in Figure 3-5.

**Figure 3-5    Tracking Section of Incident Manager**



4. In the Create Ticket pop-up window, select a ticket template from the Template Name drop-down menu as shown in Figure 3-6, then click **OK**.

   If you do not see the desired template, you can add one using the emctl command. See Adding Ticket Templates.

**Figure 3-6    Create Ticket Pop-up Window**



If creating ticket is successful, the ticket ID appears in the tracking section for the incident. If the Web console settings are configured and enabled, the ticket ID appears as a link to the ticket page in ServiceNow.

# 4

# Using Default Templates

This chapter provides details on the default ticket templates shipped along with the ServiceNow Connector. The ticket templates specify the mappings between an Enterprise Manager incident and underlying event attributes and ServiceNow ticket attributes.

- Template Process
- Reading Ticket Templates
- Customizing Ticket Templates
- Defining New Templates

## Template Process

All out-of-box templates cause the following actions to occur when a you create a ticket for an incident:

- Write incident information to `Description` (ServiceNow ticket description).
- Set the ServiceNow ticket short description based on the incident message.

The out-of-box templates are as follows:

- `serviceNowIncidentCreateAndUpdate.xsl`
- `serviceNowIncidentCreateUpdateAndClose.xsl`
- `serviceNowIncidentCreateUpdateAndResolve.xsl`

**`serviceNowIncidentCreateAndUpdate.xsl`**

This template will create Oracle Enterprise Incidents as tickets in ServiceNow. If the severity is clear in Oracle Enterprise Manager, it will update the ServiceNow ticket notes, but not the status.

**`serviceNowIncidentCreateUpdateAndClose.xsl`**

This template will create Oracle Enterprise Incidents as tickets in ServiceNow. If the severity is clear in Oracle Enterprise Manager, it will update the ServiceNow ticket notes and set the status to closed.

**`serviceNowIncidentCreateUpdateAndResolve.xsl`**

This template will create Oracle Enterprise Incidents as tickets in ServiceNow. If the severity is clear in Oracle Enterprise Manager, it will update the ServiceNow ticket notes and set the status to resolved.

## Reading Ticket Templates

The following table illustrates the creation of a ticket using `serviceNowCreateUpdateAndClose.xsl`. This illustration will help you to read a ticket template. In the tables, * denotes a literal string and ** indicates `if the attribute applies`.

Additionally, the table also shows ServiceNow ticket attributes and corresponding Enterprise Manager incident values for ticket creation mappings.

Ticket creation mappings are the same for `serviceNowCreateAndUpdate.xsl` and `serviceNowCreateUpdateAndResolve.xsl`

> **Note:**
>
> ServiceNow Ticket Attributes for which no values are needed are not mentioned in the table.

| ServiceNow Ticket Attributes | Enterprise Manager incident Attributes | Value |
| --- | --- | --- |
| Impact | $severity | This is the measure of the business critical of the affected service. This maps directly to the severity of the Oracle Enterprise Manager incident. |
| urgency | $priority | This is the extent to which the resolution of the incident can bear delay. This maps directly to the priority of the Oracle Enterprise Manager incident. |
| short_description | Summary | Summary – The details about the incident that has fired |

| ServiceNow Ticket Attributes | Enterprise Manager incident Attributes | Value |
|---|---|---|
| description | Summary<br>Severity Code<br>Priority<br>Notification Rule Name<br>Notification Rule Owner<br>Target Type<br>Target Name<br>Obj Owner<br>Target Properties<br>Last Updated Date<br>Incident URL | Summary – The details about the incident that has fired<br><br>Severity Code – The severity of the incident in Oracle Enterprise Manager<br><br>Priority – The priority of the incident in Oracle Enterprise Manager<br><br>Notification Rule Name – Name of the rule that created the ticket (Auto ticketing only)<br><br>Notification Rule Owner – Name of the user that owns the rule that created the ticket (Auto ticketing only)<br><br>Target Type – The type of target that the incident fired on<br><br>Target Name – The name of the target that the incident fired on<br><br>Obj Owner – Name of the user that owns the object the incident is fired on<br><br>Target Properties – Additional names and values about the incident. Includes things like host, version, OS and platform<br><br>Last Updated Date – Date the incident was created in Oracle Enterprise Manager<br><br>Incident URL – A URL link that directs the user to the Oracle Enterprise Manager Incident |

Use the mapping table above as a reference to read the following XSLT file.

```
<?xml version="1.0" encoding="UTF-8"?>
<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform" xmlns:emcf="http://
xmlns.oracle.com/sysman/connector" version="1.0">
  <xsl:template match="emcf:EMIncident">
    <!-- Please remember to backup all files before editing -->
    <!--
        This area is where variables are set to be used in the rest of the template.
        By default, there are three variables set:
          * Action: Used to figure out if the connector is 'creating' or 'updating' or
'closing' the ServiceNow Ticket.
          * Severity: Used to set the Impact of the ServiceNow ticket.
          * Priority: Used to set the Urgency of the ServiceNow ticket.

          If you want to add or change variables, do so below.
      -->
    <xsl:variable name="action">
      <xsl:choose>
        <xsl:when test="normalize-space(emcf:TicketID) = ''">CREATE</xsl:when>
```

```
        <xsl:when test="(emcf:SystemAttributes/emcf:SeverityCode =
'CLEAR')">CLOSE</xsl:when>
        <xsl:otherwise>UPDATE</xsl:otherwise>
      </xsl:choose>
    </xsl:variable>
    <xsl:variable name="severity">
      <xsl:choose>
        <xsl:when test="emcf:SystemAttributes/emcf:SeverityCode = 'FATAL'">1</
xsl:when>
        <xsl:when test="emcf:SystemAttributes/emcf:SeverityCode = 'CRITICAL'">1</
xsl:when>
        <xsl:when test="emcf:SystemAttributes/emcf:SeverityCode = 'WARNING'">2</
xsl:when>
        <xsl:when test="emcf:SystemAttributes/emcf:SeverityCode = 'ADVISORY'">2</
xsl:when>
        <xsl:otherwise>3</xsl:otherwise>
      </xsl:choose>
    </xsl:variable>
    <xsl:variable name="priority">
      <xsl:choose>
        <xsl:when test="emcf:SystemAttributes/emcf:Priority = 'Urgent'">1</
xsl:when>
        <xsl:when test="emcf:SystemAttributes/emcf:Priority = 'Very High'">2</
xsl:when>
        <xsl:when test="emcf:SystemAttributes/emcf:Priority = 'High'">2</
xsl:when>
        <xsl:when test="emcf:SystemAttributes/emcf:Priority = 'Medium'">3</
xsl:when>
        <xsl:when test="emcf:SystemAttributes/emcf:Priority = 'Low'">3</xsl:when>
        <xsl:otherwise>3</xsl:otherwise>
      </xsl:choose>
    </xsl:variable>
    <Message>
      <!--
          The following areas (Method, Variables, and Headers) should not be
edited.
          They are used to make communication work between Oracle Enterprise
Manager and ServiceNow.
        -->
      <Method>
        <xsl:choose>
          <xsl:when test="$action = 'CREATE'">POST</xsl:when>
          <xsl:when test="$action = 'UPDATE'">PUT</xsl:when>
          <xsl:when test="$action = 'CLOSE'">PUT</xsl:when>
          <xsl:otherwise>ERROR</xsl:otherwise>
        </xsl:choose>
      </Method>
      <Variables>
        <Variable>
          <Name>TKT_KEY</Name>
          <Value>
            <xsl:value-of select="translate(substring-after(substring-
before(emcf:TicketID, ')'), '(' ) ,'ABCDEF','abcdef')" />
          </Value>
        </Variable>
      </Variables>
      <Headers></Headers>
      <!--
          The body is used to send data to ServiceNow. By default, the connector
sends data either 'On Create', 'On Update', or 'On Close'.
```

Fields that are sent when the ticket is created are found under the following
header: <xsl:if test="$action = 'CREATE'">
        Fields that are sent when the ticket is updated are found under the following
header: <xsl:if test="$action = 'UPDATE'">
        Fields that are sent when the ticket is closed are found under the following
header: <xsl:if test="$action = 'CLOSE'">

        There are a number of fields that are sent by default, but there are also a
number of fields that are not.
        These fields require manual configuration and are commented out below.
        To enable these fields, fill in the data required, and remove the comment
brackets.

        Example:
        If you wanted to add a "Caller" of "John Smith" who has an ID of "john.smith"
you would uncomment that line and replace "CALLER-ID" with "john.smith".
        The new line would look like this:
          <string name="caller_id">john.smith</string>
        -->
      <Body>
        <object>
          <xsl:if test="$action = 'CREATE'">
            <!--
              Priority in ServiceNow is calculated based on impact and urgency (the
following two fields).
              This is how they are mapped:
                Impact 1 (High) & Urgency 1 (High) = Priority 1 (Critical)
                Impact 1 (High) & Urgency 2 (Medium) = Priority 2 (High)
                Impact 1 (High) & Urgency 3 (Low) = Priority 3 (Moderate)
                Impact 2 (Medium) & Urgency 1 (High) = Priority 2 (High)
                Impact 2 (Medium) & Urgency 2 (Medium) = Priority 3 (Moderate)
                Impact 2 (Medium) & Urgency 3 (Low) = Priority 4 (Low)
                Impact 3 (Low) & Urgency 1 (High) = Priority 3 (Moderate)
                Impact 3 (Low) & Urgency 2 (Medium) = Priority 4 (Low)
                Impact 3 (Low) & Urgency 3 (Low) = Priority 5 (Planning)

              The default mappings of "impact" are based on the severity of the Oracle
Enterprise Manager incident. They are set in the severity variable above.
              The default mappings of "urgency" are based on the priority of the
Oracle Enterprise Manager incident. They are set in the priority variable above.
            -->
            <!-- This is the measure of the business criticality of the affected
service. This maps directly to the "severity" of the Oracle Enterprise Manager
incident. -->
            <string name="impact">
              <xsl:value-of select="$severity" />
            </string>
            <!-- This is the extent to which resolution of the incident can bear
delay. This maps directly to the "priority" of the Oracle Enterprise Manager incident.
-->
            <string name="urgency">
              <xsl:value-of select="$priority" />
            </string>
            <!-- This is a brief description of the incident in Oracle Enterprise
Manager. -->
            <string name="short_description">
              <xsl:value-of select="emcf:SystemAttributes/emcf:Summary" />
            </string>
            <!-- This is a detailed description of the incident in Oracle Enterprise
Manager. -->
            <string name="description">Incident created in Oracle Enterprise Manager:

```
<xsl:value-of select="emcf:SystemAttributes/emcf:Summary" />
Original Severity: <xsl:value-of select="emcf:SystemAttributes/
emcf:SeverityCode" />
Original Priority: <xsl:value-of select="emcf:SystemAttributes/emcf:Priority" />
<xsl:choose>
  <xsl:when test="normalize-space(emcf:NotificationRuleName) != ''">
Incident trigged by the following rule: <xsl:value-of
select="emcf:NotificationRuleName" />
  </xsl:when>
</xsl:choose>
<xsl:choose>
  <xsl:when test="normalize-space(emcf:NotificationRuleOwner) != ''">
Rule is owned by: <xsl:value-of select="emcf:NotificationRuleOwner" />
  </xsl:when>
</xsl:choose>

Target Type: <xsl:value-of select="emcf:SystemAttributes/emcf:SourceInfo/
emcf:TargetInfo/emcf:TargetType" />
Target Name: <xsl:value-of select="emcf:SystemAttributes/emcf:SourceInfo/
emcf:TargetInfo/emcf:TargetName" />
Original Owner: <xsl:value-of select="emcf:SystemAttributes/emcf:SourceInfo/
emcf:SourceObjInfo/emcf:ObjOwner" />

Additional Properties: <xsl:for-each select="emcf:SystemAttributes/
emcf:SourceInfo/emcf:TargetInfo/emcf:TargetProperty">
  * <xsl:value-of select="./emcf:Name" />: <xsl:value-of select="./emcf:Value" />
</xsl:for-each>

This incident was created at: <xsl:value-of select="emcf:SystemAttributes/
emcf:LastUpdatedDate" />
To manage the incident in Oracle Enterprise Manager, navigate to the following
URL: <xsl:value-of select="emcf:SystemAttributes/emcf:IncidentURL" /></string>
            <!-- Uncomment category below if you have created a custom category
for EM Incidents in ServiceNow.  Change the text "EM Incident" to the name of
your custom category if you have created your own.  To create a category in
ServiceNow, create a new incident or click on an existing incident. Right click
the label "Category" (not the drop-down box), then select "Configure Choices."
Enter the name of the new category, then click "Add." -->
            <!--
              <string name="category">EM Incident</string>
            -->
            <!-- This is the person who reported or is affected by the incident.
To lookup a user ID enter ServiceNow, go to System Security > Users and select
the user you want. Copy the "User ID" field and replace "CALLER-ID" below. -->
            <!--
              <string name="caller_id">CALLER-ID</string>
            -->
            <!-- This is the subcategory the incident will be filed under.
Ensure the subcategory is a valid subcategory of "category" listed above.
Replace "SUBCATEGORY-NAME" with the name of the subcategory. -->
            <!--
              <string name="subcategory">SUBCATEGORY-NAME</string>
            -->
            <!-- This is the service affected by the incident. Replace "SERVICE-
NAME" with the name of the service. -->
            <!--
              <string name="business_service">SERVICE-NAME</string>
            -->
            <!-- This is the item or service affected by the incident. In
ServiceNow this is labeled as "Configuration Item". Replace "CONFIGURATION-ITEM-
NAME" with the name of the configuration item. -->
```

```
          <!--
            <string name="cmdb_ci">CONFIGURATION-ITEM-NAME</string>
          -->
          <!-- This describes how the incident was reported. Replace "CONTACT-TYPE"
with the type of contact used. -->
          <!--
            <string name="contact_type">CONTACT-TYPE</string>
          -->
          <!-- This is the group that the incident is assigned to. Replace
"ASSIGNMENT-GROUP-NAME" with the name of the assignment group. -->
          <!--
            <string name="assignment_group">ASSIGNMENT-GROUP-NAME</string>
          -->
          <!-- This is the user the incident is assigned to. To lookup a user ID
enter ServiceNow, go to System Security > Users and select the user you want. Copy the
"User ID" field and replace "CALLER-ID" below. -->
          <!--
            <string name="assigned_to">USER-ID</string>
          -->
          <!-- This is the ID of the parent incident (if one exists). Parent
incidents can be used to collect incidents for the same root issue. Replace "PARENT-
ISSUE-ID" with the ID of the parent incident. -->
          <!--
            <string name="parent_incident">PARENT-ISSUE-ID</string>
          -->
          <!-- This is the ID of the related problem (if one exists). A problem is a
cause of more than one incident. Replace "PROBLEM-ID" with the ID of the related
problem. -->
          <!--
            <string name="problem_id">PROBLEM-ID</string>
          -->
          <!-- This is the ID of the related change request (if one exists). Replace
"CHANGE-REQUEST-ID" with the ID of the related change request. -->
          <!--
            <string name="rfc">CHANGE-REQUEST-ID</string>
          -->
          <!-- This is the ID of the change request that caused the incident (if one
exists). Replace "CHANGE-REQUEST-ID" with the ID of the related change request that
caused the incident. -->
          <!--
            <string name="caused_by">CHANGE-REQUEST-ID</string>
          -->
          <!-- If set to true, this field will automatically create a draft of a
knowledge article when the incident is closed. Uncomment to enable. -->
          <!--
            <string name="knowledge">true</string>
          -->
          <!-- This is where the caller or service is located. Replace "LOCATION"
with the string related with the location of the incident. -->
          <!--
            <string name="location">LOCATION</string>
          -->
        </xsl:if>
        <xsl:if test="$action = 'UPDATE'">
          <!--
            Priority in ServiceNow is calculated based on impact and urgency (the
following two fields).
              This is how they are mapped:
                Impact 1 (High) & Urgency 1 (High) = Priority 1 (Critical)
                Impact 1 (High) & Urgency 2 (Medium) = Priority 2 (High)
                Impact 1 (High) & Urgency 3 (Low) = Priority 3 (Moderate)
```

```
                      Impact 2 (Medium) & Urgency 1 (High) = Priority 2 (High)
                      Impact 2 (Medium) & Urgency 2 (Medium) = Priority 3 (Moderate)
                      Impact 2 (Medium) & Urgency 3 (Low) = Priority 4 (Low)
                      Impact 3 (Low) & Urgency 1 (High) = Priority 3 (Moderate)
                      Impact 3 (Low) & Urgency 2 (Medium) = Priority 4 (Low)
                      Impact 3 (Low) & Urgency 3 (Low) = Priority 5 (Planning)


                The default mappings of "impact" are based on the severity of the
Oracle Enterprise Manager incident. They are set in the severity variable above.
                The default mappings of "urgency" are based on the priority of the
Oracle Enterprise Manager incident. They are set in the priority variable above.
                -->
                <!-- This is the measure of the business criticality of the affected
service. This maps directly to the "severity" of the Oracle Enterprise Manager
incident. -->
                <string name="impact">
                  <xsl:value-of select="$severity" />
                </string>
                <!-- This is the extent to which resolution of the incident can bear
delay. This maps directly to the "priority" of the Oracle Enterprise Manager
incident. -->
                <string name="urgency">
                  <xsl:value-of select="$priority" />
                </string>
                <!-- <string name="work_notes">This leaves a note on the ticket to
give more details of work done.</string> -->
                <string name="work_notes">The incident was updated in Oracle
Enterprise Manager.
<xsl:value-of select="emcf:SystemAttributes/emcf:Summary" />

Severity in Oracle Enterprise Manager is currently: <xsl:value-of
select="emcf:SystemAttributes/emcf:SeverityCode" />. Impact is now <xsl:value-of
select="$severity" />.
Priority in Oracle Enterprise Manager is currently: <xsl:value-of
select="emcf:SystemAttributes/emcf:Priority" />. Urgency is now <xsl:value-of
select="$priority" />.
Owner in Oracle Enterprise Manager is currently: <xsl:value-of
select="emcf:SystemAttributes/emcf:SourceInfo/emcf:SourceObjInfo/
emcf:ObjOwner" />

This incident was updated in Oracle Enterprise Manager at: <xsl:value-of
select="emcf:SystemAttributes/emcf:LastUpdatedDate" /></string>
                </xsl:if>
                <xsl:if test="$action = 'CLOSE'">
                  <!-- This is the state of the ticket. By default, this is "7" which
is equivalent to closed. -->
                  <number name="state">7</number>
                  <!-- This is the code used to described why the ticket was resolved
or closed. -->
                  <string name="close_code">Closed/Resolved by Caller</string>
                  <!-- This leaves a note on the ticket to give more details of why
the ticket was resolved or closed. -->
                  <string name="close_notes">Ticket has been closed by Oracle
Enterprise Manager.</string>
                  <!-- This leaves a note on the ticket to give more details of work
done. -->
                  <string name="work_notes">The incident was updated in Oracle
Enterprise Manager.
<xsl:value-of select="emcf:SystemAttributes/emcf:Summary" />

Severity in Oracle Enterprise Manager is currently: <xsl:value-of
```

```
select="emcf:SystemAttributes/emcf:SeverityCode" />
Priority in Oracle Enterprise Manager is currently: <xsl:value-of
select="emcf:SystemAttributes/emcf:Priority" />
Owner in Oracle Enterprise Manager is currently: <xsl:value-of
select="emcf:SystemAttributes/emcf:SourceInfo/emcf:SourceObjInfo/emcf:ObjOwner" />

This incident was updated in Oracle Enterprise Manager at: <xsl:value-of
select="emcf:SystemAttributes/emcf:LastUpdatedDate" />
Ticket has been closed by Oracle Enterprise Manager.</string>
            <!-- This is the person who closed or resolved the ticket. To lookup a
user ID enter ServiceNow, go to System Security > Users and select the user you want.
Copy the "User ID" field and replace "USER-ID" below. -->
            <!--
              <string name="resolved_by">USER-ID</string>
            -->
          </xsl:if>
        </object>
      </Body>
    </Message>
  </xsl:template>
</xsl:stylesheet>
```

# Customizing Ticket Templates

If the out-of-box ticket templates do not satisfy your requirements, you can modify them. To do this, Oracle recommends that you use one of the existing templates as the base template. Copy this ticket template to a new file, modify, and register the new ticket template.

You can edit a template directly on Enterprise Manager instead of using the EM CLI command. See Editing Templates and Restoring Templates for more information.

In most cases, when you modify the ticket template, you might only be changing the mappings. The following examples illustrate this concept:

**Example 4-1    Create knowledge base article to closed ServiceNow ticket**

ServiceNow allows you to create a knowledge base article once a ticket is closed. To enable this for all tickets created by Oracle Enterprise Manager, find the following code in the template and remove the comment brackets (<!-- and -->) and set the date:

```
<!--
<string name="knowledge">true</string>
-->
```

**Example 4-2    Change Warning tickets to be High Impact**

ServiceNow calculates priority based off the values of impact (based on Oracle Enterprise Manager severity) and priority (based on Oracle Enterprise Manager urgency). In this example, we want to amplify the priority by saying a 'Warning' in Oracle Enterprise Manager is a 'High' impact in ServiceNow. By default, it is set to 'Medium'.

To do that we need to find our variable for severity, which is located at the top of the template. Find the following code:

```
<xsl:variable name="severity">
 <xsl:choose>
  <xsl:when test="emcf:SystemAttributes/emcf:SeverityCode =  'FATAL'">1</
xsl:when>
  <xsl:when test="emcf:SystemAttributes/emcf:SeverityCode = 'CRITICAL'">1</
xsl:when>
```

```
   <xsl:when test="emcf:SystemAttributes/emcf:SeverityCode = 'WARNING'">2</
xsl:when>
   <xsl:when test="emcf:SystemAttributes/emcf:SeverityCode = 'ADVISORY'">2</
xsl:when>
   <xsl:otherwise>3</xsl:otherwise>
 </xsl:choose>
</xsl:variable>
```

Notice right now, a severity of warning is set to 2. That means that the impact is a medium in ServiceNow. If we want to raise that impact, we simply need to change that 2 to a 1. Now all warning tickets will have higher impact, affecting their priority in ServiceNow.

# Defining New Templates

The out-of-box templates are based on the default forms. If the new ticket templates you define are based on these forms, Customizing Ticket Templates applies.

However, if you use a different form, you need to define a new ticket template.

**Enterprise Manager Attributes**

Table 4-1 provides the Enterprise Manager fields that you can map when using ServiceNow:

**Table 4-1    Enterprise Manager Attributes**

| Data Fields | Description |
| --- | --- |
| SystemAttributes/Owner | For auto-ticketing, this is the incident rule owner. |
| TicketID | Identifies the ticket associated with the current incident (available after ticket creation). |
| TargetType | Type of target that the incident is associated with, such as `host`. |
| TargetName | Name of the target that the incident is associated with. For example, `Database1` or `stadc40.example.com`. |
| TargetProperties | TargetProperties store environmental or usage context information specific to the target. For example, for Host Target, the name /value pair of TargetProperties are:<br>• Comment — Host running the management service and repository.<br>• Contact — John Doe<br>• Deployment Type — Production<br>• Line of Business — Development<br>• Location — Redwood Shores<br>These are out-of-box user-defined target properties. If additional target properties are added, they are displayed with ticket information. |
| SystemAttributes/Summary | Description of the incident. For example: CPU Utilization is 100%, crossed warning (80) or critical (95) threshold. |
| Priority | Priority of the incident from **low** to **urgent** |
| SystemAttributes/Severity | Severity of the incident: `critical`, `warning`, `clear`, or `down`. |
| CollectionTime | Timestamp of an incident occurrence. |

**Table 4-1    (Cont.) Enterprise Manager Attributes**

| Data Fields | Description |
| --- | --- |
| SystemAttributes/IncidentURL | URL to the incident details page of the incident. |
| NotificationRuleName | Name of the incident rule that generated the notification during auto-ticketing. |
| TargetTimezone | Timezone of the target associated with the incident. |
| SystemAttributes/Acknowledge | A flag indicating whether or not the incident has been acknowledged. |
| SystemAttributes/AutoClose | A flag indicating if an incident is auto closed by the system, or it has to be manually closed by users. |
| SystemAttributes/Category | An optional list of categories of the incidents. |
| SystemAttributes/CreationDate | The time when the incident is created by associating event to incident. |
| SystemAttributes/Escalated | A flag indicating whether or not the incident has been escalated. |
| SystemAttributes/EscalationLevel | The hierarchical level of escalation that has been made to this incident. |
| SystemAttributes/IncidentID | The ID of an incident. |
| SystemAttributes/LastModifiedBy | User who last modified the incident. |
| SystemAttributes/LastUpdatedDate | The time when the incident is last updated. |
| SystemAttributes/Priority | The priority order in which the issue should be resolved. |
| SystemAttributes/ResolutionState | The attribute used to track where the incident is in terms of resolution. |
| SystemAttributes/SeverityCode | Internal Severity value of the current event. |
| SystemAttributes/TicketStatus | If an external ticket is associated with the incident, the status of the ticket as assigned at an external help desk system, and updated in EM. |
| SystemAttributes/UpdatedAttributes | Updated Attributes of an Incident. |

**Format for Creating Ticket Templates**

To create ticket templates for custom ServiceNow forms, adhere to the following format:

**Example 4-3    Template Format for Custom ServiceNow Forms**

```
<?xml version="1.0" encoding="UTF-8"?>
<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform" xmlns:emcf="http://
xmlns.oracle.com/sysman/connector" version="1.0">
  <xsl:template match="emcf:EMIncident">
* [Insert any variables needed here]
  <Message>
     <Method>
       <xsl:choose>
         <xsl:when test="$action = 'CREATE'">POST</xsl:when>
         <xsl:when test="$action = 'UPDATE'">PUT</xsl:when>
```

```
          <xsl:when test="$action = 'CLOSE'">PUT</xsl:when>
          <xsl:otherwise>ERROR</xsl:otherwise>
        </xsl:choose>
      </Method>
      <Variables>
        <Variable>
          <Name>TKT_KEY</Name>
          <Value>
            <xsl:value-of select="translate(substring-after(substring-
before(emcf:TicketID, ')'), '(' ) ,'ABCDEF','abcdef')" />
          </Value>
        </Variable>
      </Variables>
      <Headers></Headers>
      <Body>
* [Insert body changes (details you are sending to ServiceNow) here]
      </Body>
  </Message>
 </xsl:template>
</xsl:stylesheet>
```

# 5
# Enabling SSL for HTTPS

The ServiceNow REST Ticketing Connector supports `HTTPS` protocol. This chapter describes how to establish a connection between the external ticketing system and Enterprise Manager:

- Importing the Server Certificate on Enterprise Manager

## Importing the Server Certificate on Enterprise Manager

1. Obtain the root certificate listed under *Root Certificate Authority - Entrust Root Certification Authority - G2*, as shown in the following ServiceNow article:

   ```
   https://hi.service-now.com/kb_view.do?sysparm_article=KB0563633
   ```

2. Append the external Certificate Authority's certificate to:

   ```
   $INSTANCE_HOME/sysman/config/b64LocalCertificate.txt
   ```

3. Ensure that only the following is appended to the b64LocalCertificate.txt file (that is, do not include blank lines or comments or any other special characters):

   ```
   -----BEGIN CERTIFICATE----- <<<Certificate in Base64 format>>> -----END
            CERTIFICATE-----
   ```

4. Restart the OMS. Run the following commands:

   ```
   emctl stop oms
   emctl start oms
   ```

> **Note:**
>
> Do not run the `emctl secure oms/agent` command after adding the external certificate to the `b64LocalCertificate.txt` file. If you run the `emctl secure` command later, then repeat the steps 1 through 3 to make sure the external certificate exists on the `b64certificate.txt` file.

# Index

## C

creating, *3-4*

## F

format for creating
    ServiceNow ticket templates, *2-6*
format for creating ticket tamplates, *4-1*

## S

ServiceNow Connector
    Customizing ticket templates, *4-9*
    defalt template, *4-1*
    format for creating, *2-6*

## T

templates, *2-6*
    customizing ticket templates, *4-9*
tickets
    creating manually, *3-4*