How To Enable Business Workflow for SAP NetWeaver Gateway

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**Typographic Conventions**

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<td>Variable user entry. Angle brackets indicate that you replace these words and characters with appropriate entries to make entries in the system.</td>
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**Icons**

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1. Business Scenario

With SAP NetWeaver Gateway, you can expose your workflow tasks from SAP Business Workflow as lightweight RESTful services. This integration between SAP NetWeaver Gateway and Business Workflow aims at providing a way for your business workflow users to work on the workflow items on any device or platform through SAP NetWeaver Gateway (referred as Gateway in this guide).

2. Background Information

The picture below shows you a typical flow of the process where the backend system sends the work items from Business Workflow to SAP NetWeaver Gateway periodically through bgRFC. Frontend applications (e.g. mobile applications) can then execute on these work items through the RESTful services on SAP NetWeaver Gateway.

![Diagram of process flow]

3. Prerequisites

The following are required to be installed or ready before using this How-To Guide:

- Administrator access to a SAP NetWeaver Gateway system.
- A SAP ERP system with Business Workflow (referred as backend in this document) and the corresponding SAP NetWeaver Gateway package (Backend Event Publisher – BEP) installed. Please refer to the installation manual for the requirements of the installation and configuration procedure.
- A workflow is created in the backend. The workflow has to have at least 1 user decision task. Refer to or create a sample workflow described in section 5.1 as a preparation for the guide.
- Configuration for using assertion ticket has already been setup between Gateway and the backend. This is for passing on the logon ticket from Gateway to the backend. For detail on how to setup this up, please refer to the installation and configuration guide in [http://help.sap.com](http://help.sap.com).
- Firefox with REST Client installed for testing the RESTful services.
4. Step-by-Step Procedure

There are 5 major steps you will have to go through in order to enable the Gateway scenario for your backend. Sections 4.1 to 4.5 show you how these steps should be done.

4.1 Preparing your workflow for Gateway scenario

If you don’t already have a workflow to work with, please create one. For reference, we will use a sample workflow described in Appendix 5.1. To enable the workflow for Gateway scenario, we will first need to define Workflow Pattern Customization.

1. Logon to the backend system where your business workflow is located.
2. Go to transaction SPRO. Click on the button SAP Reference IMG.


4. On the next screen, select Applications under Dialog Structure. Then click on the button New Entries. Enter the following:
   - Application ID:   GWWF1 <or any unique id you want>
   - Application Descript:  <a description to the application>

   Click on Save. Create a customizing request if prompted.

5. Double click on Workflow ID under Dialog Structure. Click on the button New Entries. Enter the following:
   - Workflow ID:   WS99900237 <refer to sample workflow for the workflow ID>
Click on Save.

6. Double click on Tasks in the Dialog Structure column on the left. Then click on the button New Entries. Enter the following in the corresponding fields.
   - Sub-Workflow ID: WS99900237 < same as Workflow ID if there is no sub-workflow >
   - Workflow Task ID: TS00008267 < refer to sample workflow, the Task ID of the user decision step >
   - Workflow step: 4 < the step ID of the user decision task in workflow >
   - Groupware Object Typ: Task
   - Recipient Role Type: < Press F4 and select a role, e.g. APPROVER >
   - Task Agent’s Role Ty: < Press F4 and select a role, e.g. APPROVER >

Hit Enter to ensure the inputs are valid. Click on Save.

4.2 Defining communication between Gateway and Backend

Before we can define the communication between Gateway and the Backend system, we have to setup bgRFC in the backend. The following steps guide you how to configure standard bgRFC configuration in Backend System.

1. Logon to the backend system, go to transaction SM59.
2. Define Supervisor Destination BGRFC_SUPERVISOR with connection Type “3” or “L”.

Note:
If you choose “3”, please choose No for load-balancing and do not enter any value for Target host and System number.
If you choose “L”, the reference for the logical connection should be “NONE” or initial (blank).

3. Enter user, password for the logon info. Be reminded that the user you enter needs to at least have authorizations in the SAP_BC_BGRFC_SUPERVISOR role or is assigned with the role.

7. Go to transaction SBGRFCCONF.

9. Enter a server name with F4 help and save.

Note:
Either inbound or outbound scheduler requires 3 dialog work processes per each scheduler. This workflow scenario only requires Outbound scheduler.

10. On Supervisor Destination tab, click on Change Button and enter the RFC Destination created in step 1. Then press the save button.
In the next steps, you will need to configure the Backend Event Publisher (BEP) in the backend system to define the connection between the Backend and Gateway through bgRFC.

11. Still in the backend system, go to transaction SPRO and click on the button SAP Reference IMG.


13. This will bring us to the RFC Destination transaction (i.e. SM59). In the window of Configuration of RFC Connections, click on the Create button.

14. We now need to create a bgRFC destination. Enter the followings to the corresponding fields.
   - RFC Destination: BEP_BGRFC_DEST <or any name you want>
   - Connection Type: 3
   - Description 1: bgRFC for Backend Event Publisher <or your own description>

Then hit Enter.
15. Under the tab Technical Settings, enter the host info of the system where Gateway is located.
   - Target Host:  < hostname of the Gateway box >
   - System Number:  < system # of the Gateway box >

16. Click on the tab Logon & Security. Enter the Logon info for logging on to the Gateway box. Click on Save to save the changes.

17. Click on the tab Special Options. Under the area of Select qRFC Version, select 1 bgRFC for qRFC Version.
18. Click Save. A dialog of “Warning about selection of qRFC version” will be displayed. Click on Yes to proceed.

19. On the bottom of the screen, you should see a message “Destination BEP_BGRFC_DEST saved”. Click on the button Connection Test to test the destination. A successful test should look like below.

20. Go to transaction SPRO and click on SAP Reference IMG. Open SAP Customizing Implementation Guide → SAP NetWeaver → SP NetWeaver Gateway Business Suite Enablement → Connection Settings to SAP NetWeaver Gateway. Click on Execute next to SAP NetWeaver Gateway Settings.
21. In the window of Change View “Gateway Settings”: Overview, click on New Entries. Then enter the followings in the corresponding fields.
   - Destination System: W64 < i.e. System ID of your Gateway box >
   - Client: 100 < i.e. Client Number in your Gateway box >
   - System Alias: W64_GWDEMO < an unique alias name >
   - RFC Destination: BEP_BGRFC_DEST < the bgRFC destination created in step 11 of this section >

22. Click on Save. Create your Customizing Request when prompted.

23. Go back to transaction SPRO and open SAP Reference IMG.

24. Open SAP Customizing Implementation Guide → SAP NetWeaver → SAP NetWeaver Gateway Business Suite Enablement → Backend Event Publisher Administration → Event General Definition. Click on the Activity icon next to Event Definition.
25. In the Change View “Event Definition”: Overview window, select Event definition under Dialog Structure and click on the button New Entries.

26. Enter the following in the Event definition table.
   - Event ID: WORKFLOW
   - Active: < check this to enable the event for Gateway >
   - Event Description: < enter your description >

27. Click on Save. Create a Customizing Request when prompted.

4.3 Setting up Subscription from Gateway to Backend

Now we can have Gateway subscribe to the backend system so that it can retrieve the workflow items later on.

1. Logon to the Gateway box. Then go to transaction SM59. You will need to create a RFC destination to the backend system of Business Workflow if you don’t have one yet. Create a destination with the info below (you can skip this part if the destination has already been created during your installation):
   - RFC destination: <Backend SID>CLNT<client #> (in this case, IDDCLNT800)
   - Connection Type: 3
   - Target Host: < hostname to your Workflow backend >
   - System Number: < system # of your Workflow backend >

Save and test the connection to make sure it works.
How To Enable Business Workflow for SAP NetWeaver Gateway

2. Go to transaction SPRO and open SAP Reference IMG.

4. Click on the button New Entries. Define a SAP system alias with info below:
   - SAP System Alias: IDD800 < or any unique name you want >
   - Description: < any description >
   - RFC Destination: < choose the RFC destination defined in step 1 >
   
   Click on Save.

5. Go to transaction SPRO and open SAP Reference IMG.


7. In the table, select the row IWF_SUBSCRIPTION. Then under Dialog Structure, double click on Assign GSDO.
8. Depends on the activity of your workflow, you should add the following GSDO context to IWF_SUBSCRIPTION. Click on New Entries to enter them.

   a) For Dialog Activity Tasks:
      - GSDO Type: IWF_SUBSCRIPTION
      - GSDO Context: IWF_ACTIVITY_TASK_GW

   b) For User Decision Tasks:
      - GSDO Type: IWF_SUBSCRIPTION
      - GSDO Context: IWF_USER_DECISION_TASK_GW

   Hit Enter (hit twice if it complains about namespace). The result should look like below if you have both dialog activity tasks and user decision tasks.

9. Double click on Assign SAP System Aliases. Click on the button New Entries. On the SAP System Alias field, press F4 and select the system alias you have defined in step 4 (e.g. IDD800).
   Click on Save to save the changes.

10. Go back to transaction SPRO. Open SAP Reference IMG.

11. Open SAP Customizing Implementation Guide → SAP NetWeaver → Gateway → Configuration → Subscription Settings. Click on the Activity icon next to Maintain Subscription Settings for GSDO.
12. Click on New Entries. Depends on the activity of your workflow, enter the following to the table.
   a. For Dialog Activity Tasks:
      - GSDO Type:    IWF_ACTIVITY_TASK_GW
      - SAP System Alias:  < press F4 to choose the alias defined in step 4 >
      - Event Group:    WORKFLOW
      - Description:    < enter your description >
   b. For User Decision Tasks:
      - GSDO Type:    IWF_USER_DECISION_TASK_GW
      - SAP System Alias:  < press F4 to choose the alias defined in step 4 >
      - Event Group:    WORKFLOW
      - Description:    < enter your description >

Click Save to save the settings.

13. Select the row IWF_USER_DECISION_TASK_GW and double click on Assign Backend Events. Click on New Entries and enable an Event ID in the format of <Workflow ID><Step ID in 10 digits> (e.g. WS999002370000000004). Click on Save.

Repeat the same step for all the tasks under IWF_ACTIVITY_TASK_GW if you have any.
14. Now we can issue a subscription request to Gateway for Workflow. We will use the REST client for Firefox to demo how to do so. Start Firefox, click on Tools → REST Client. In the drop-down box of Method, choose POST. Then enter a URL with the format below in the text field:

c. **For Dialog Activity Tasks:**
   
   \[
   \text{http://<Gateway~hostname>:<Gateway~host~http~port>/sap/opu/sdata/sap/wfactivitytaskprocessing/SubscriptionCollection?format=xml}
   \]
   
   For example:
   
   \[
   \text{http://usphlrig15.phl.sap.corp:8001/sap/opu/sdata/sap/wfactivitytaskprocessing/SubscriptionCollection?format=xml}
   \]

d. **For User Decision Tasks:**
   
   \[
   \text{http://<Gateway~hostname>:<Gateway~host~http~port>/sap/opu/sdata/sap/wfdecisiontaskprocessing/SubscriptionCollection?format=xml}
   \]
   
   For example:
   
   \[
   \text{http://usphlrig15.phl.sap.corp:8001/sap/opu/sdata/sap/wfdecisiontaskprocessing/SubscriptionCollection?format=xml}
   \]

   Click on the Login button and enter your username and password to login to the Gateway box. This will add an Authorization header to the request.

   **Click on the Add Request Header button. Add a header:**
   
   - **Name:** x-requested-with
   - **Value:** XMLHttpRequest

   In the Request Body area, enter an XML like below:
   
   \[
   \text{<atom:entry xmlns:atom="http://www.w3.org/2005/Atom">}
   \text{<atom:id/>}
   \text{<atom:title>Gateway~subscription</atom:title>}
   \text{<atom:author/>}
   \text{<atom:updated/>}
   \text{<atom:content~type="application/xml">}
   \text{<d:deliveryAddress>urn:sap-com:channel:IDDCLNT800:http</d:deliveryAddress>}
   \text{<d:collection>WorkflowTaskCollection</d:collection>}
   \text{<d:filter/></d:filter>}
   \text{</m:properties>}
   \text{</atom:content>}
   \text{</atom:entry>}
   \]

   **Note:** in the tag \text{<d:deliveryAddress>}, \text{IDDCLNT800} is the RFC destination name you have defined in step 1 of this section.
Then click on the Send button to post the subscription request.

4.4 Notifying Gateway on new Workflow items

In order for Gateway to retrieve the items created in the workflow it subscribes to, we need to run 2 built-in reports in the backend system for generating the notification. These reports should be run periodically as scheduled background jobs.

1. Before scheduling background jobs for the reports, we need to define OSP Filters for the execution of a report. To do so, logon to the backend system. Then go to transaction SPRO and open SAP Reference IMG.


3. In the Change View “Business Scenario”: Overview window, double click on Business Scenario in the Dialog Structure column. On the right hand side, select the table row OSP. Then double click on Filter Basic Data on the Dialog Structure column on the left.
4. On the filter table that opens up, select the row OSP_DELTA. Then double click on Filter settings in the Dialog Structure column on the left.

5. Click on the New Entries button. On the next screen, enter the followings:
   - TASK: TS00008267 < Task ID in your workflow >
   - WORKFLOW_STEP: 4 < Step ID of the activity in your workflow>

   Click on Save.

6. On the Dialog Structure column, double click on Filter Basic Data. Select the row OSP_FULL and double click on Filter settings.

7. Click on the New Entries button. Enter the following:
   - TASK: TS00008267 < Task ID in your workflow >
   - WORKFLOW_STEP: 4 < Step ID of the activity in your workflow>

   Click on Save.
8. Now we can execute the reports in Backend to push the notifications to Gateway. Go to transaction SE38. Execute the report RSWNSEL.

![ABAP Editor: Initial Screen]

9. Enter the followings in the corresponding field.
   - Scenario: OSP
   - Filter: OSP_Full
   
   Click on Execute.

![Program RSWNSEL]

10. Upon successful execution, you should be able to see the number of new notification being retrieved.

![Program RSWNSEL]

11. Go back to SE38. Execute the report /IWWRK/R_WF_ITEM_SELECTION_GW.
12. These 2 reports should be scheduled to run in background periodically so Gateway is able to retrieve the new items in Workflow on a regular basis. To do so, go to transaction SM36. Click on the button Job Wizard.

13. Follow through the steps in Job Wizard to create a background job that executes 2 ABAP programs below. Also, remember to set this job to run periodically **every 15 minutes**.

<table>
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<tr>
<td>RSWNSEL</td>
<td>OSP_DELTA</td>
</tr>
<tr>
<td>/IWWRK/R_WF_ITEM_SELECTION_GW</td>
<td>&lt; irrelevant &gt;</td>
</tr>
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</table>

**Remark:** remember to create the variant for OSP_DELTA before scheduling the job. To do so, go to SE38 and create a variant for RSWNSEL.

### 4.5 Executing Workflow items through RESTful services

At this point, the configurations required are basically done. We can now test the workflow operations through the RESTful services from Gateway.

1. To get a list of Tasks created in the workflow, issue a GET request to the following URL to the Gateway box:

   a. **For Dialog Activity Tasks:**
      
      http://< Hostname of Gateway box >:< HTTP port of Gateway box >
      
      /sap/opu/sdata/sap/wfactortaskprocessing/WorkflowTaskCollection?$format=xml

   b. **For User Decision Tasks:**
http://< Hostname of Gateway box >:< HTTP port of Gateway box >
/sap/opu/sdata/sap/wfdecisiontaskprocessing/WorkflowTaskCollection?$format=xml

You should be able to get a collection of tasks like below.

2. To get a decision list of a particular work item, you can issue a GET request to the following URL:

a. For Dialog Activity Tasks:

http://< Hostname of Gateway box >:< HTTP port of Gateway box >
/sap/opu/sdata/sap/wfactivitytaskprocessing/WorkflowTaskCollection(value='[work item id]',scheme_id='IWD_ACTIVITY_TASK_GW',scheme_agency_id='[scheme agency id]')/DecisionOptions/?$format=xml

[work item id] = the <d:value> value of the task from step 1

b. For User Decision Tasks:

http://< Hostname of Gateway box >:< HTTP port of Gateway box >
/sap/opu/sdata/sap/wfdecisiontaskprocessing/WorkflowTaskCollection(value='[work item id]',scheme_id='IWF_USER_DECISION_TASK_GW',scheme_agency_id='[scheme agency id]')/DecisionOptions/?$format=xml

[Scheme Agency ID] = the <d:scheme_agency_id> value of the task from step 1
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For example:
http://usphrlrig15.phl.sap.corp:8001/sap/opu/sdata/sap/wfdecisiontaskprocessing/WorkflowTaskCollection(value='000000946651',scheme_id='IWF_USER_DECISION_TASK_GW',scheme_agency_id='IDD800')/DecisionOptions/?$format=xml

You will get a list of decision available for this work item like below.

3. To apply a decision (e.g. approve) to the work item, you can issue a POST request to the URL below.

   a. For Dialog Activity Tasks:

      http://< Hostname of Gateway >:< HTTP port of Gateway >/sap/opu/sdata/sap/wfactivitytaskprocessing/DecisionOption_ApplyDecision?value=[work item id]&scheme_id=IWD_ACTIVITY_TASK_GW&scheme_agency_id=[scheme agency id]&dec_key=[dec_key]

   b. For User Decision Tasks:

      http://< Hostname of Gateway >:< HTTP port of Gateway >/sap/opu/sdata/sap/wfdecisiontaskprocessing/DecisionOption_ApplyDecision?value=[work item id]&scheme_id=IWD_ACTIVITY_TASK_GW&scheme_agency_id=[scheme agency id]&dec_key=[dec_key]

   [work item id ] = the <d:value> value of the task
   [Scheme Agency ID] = the <d:scheme_agency_id> value of the task
[dec_key] = the <d:dec_key> value of the decision item

For example:
http://usphlrig15.phl.sap.corp:8001/sap/opu/sdata/sap/wfdecisiontaskprocessing/DecisionOption_ApplyDecision?value=000000946651&scheme_id=IWF_USER_DECISION_TASK_GW&scheme_agency_id=IDD800&dec_key=0001

We suggest you use Firefox REST Client to test this operation. In the POST request header, you will need 2 headers:
1. Authorization: < click on the Login button to add your login info >
2. Header x-requested-with with value XMLHttpRequest

For any other operations you may want to apply to the RESTful services of your workflow, please refer to the online help (SAP NetWeaver Gateway Workflow Guide) from http://help.sap.com.
5. Appendix

5.1 Sample Workflow used in this How-To Guide

Through this How-To Guide, we use the following sample workflow to explain how the Gateway scenario works. Below you can find the detail about this sample workflow.

Design of the workflow: 1 User Decision step. Step ID is 000004. Workflow ID is WS99900237.

Task ID of the user decision step is TS00008267.