Documentation

IBM Workload Scheduler plug-in for SAP NetWeaver Java

SAP® Certified
Integration with SAP NetWeaver®

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CHANGE HISTORY

Version	Date of change	Change detail
1.0	April 20 2016	Initial version by M. Sanders

1. INTRODUCTION AND ARCHITECTURE

The IBM Workload Scheduler integration with SAP NetWeaver Java provides the capability to submit and monitor jobs in the SAP NetWeaver Java AS by leveraging the JXBP interface (Java eXternal Interface for Background Processing), which comprises of several web services. IBM Workload Scheduler will carry out the following activities in the SAP NetWeaver Java AS:

- Start jobs (immediately)
- Monitor running jobs
- Cancel running jobs
- Access information about jobs (job status, job log, job properties, and so on)
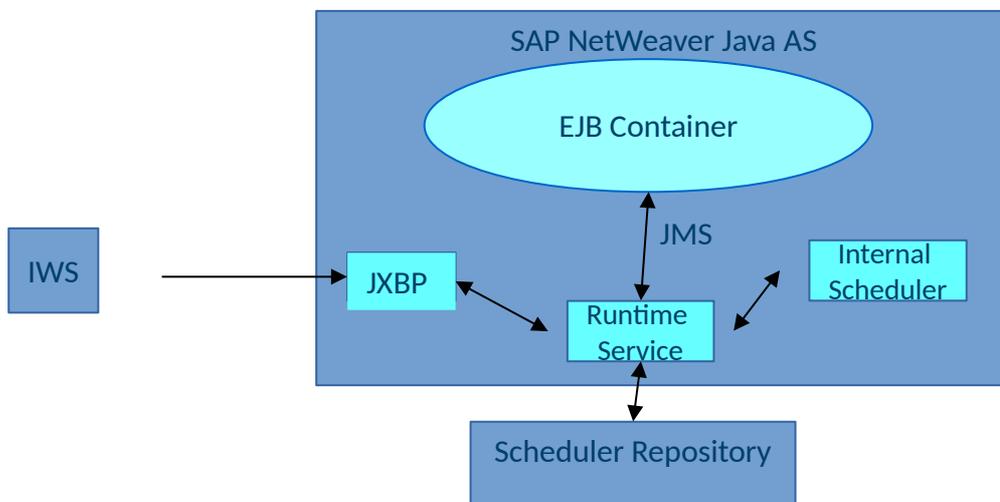
Jobs in the SAP NetWeaver Java AS are implemented as message-driven JobBeans. A JobBean is executed when it receives a Java Messaging Service (JMS) message from the *Runtime Service*. The execution of these JobBeans is handled by the EJB container.

The *Runtime Service* controls all runtime aspects of a job and can be controlled from either the Internal Scheduler or the JXBP interface. It handles the execution of jobs on the server node where it is running, provides error handling, and maintains job definitions and job runtime information, such as job parameters and log files.

2. REGISTERING IBM WORKLOAD SCHEDULER IN SAP NETWEAVER JAVA

Perform the following steps to register IBM Workload Scheduler as an *External Scheduler* in the SAP NetWeaver Java AS:

- Logon to the SAP NetWeaver Administrator, and choose *Operations -> Jobs -> Java Scheduler*.
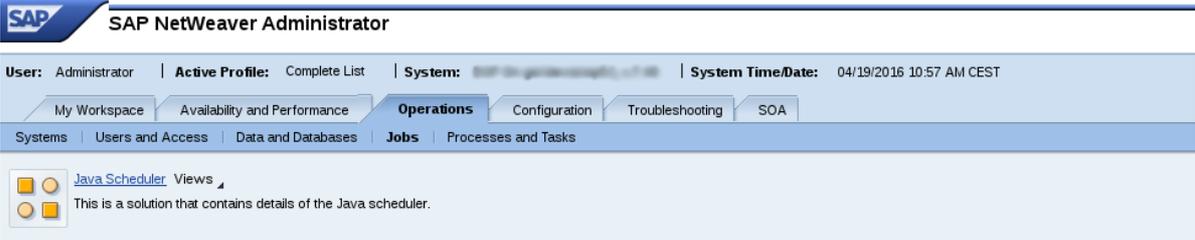
- Choose *External Schedulers -> Add* to enter the configuration data for IBM Workload Scheduler. The following dialog window is displayed.
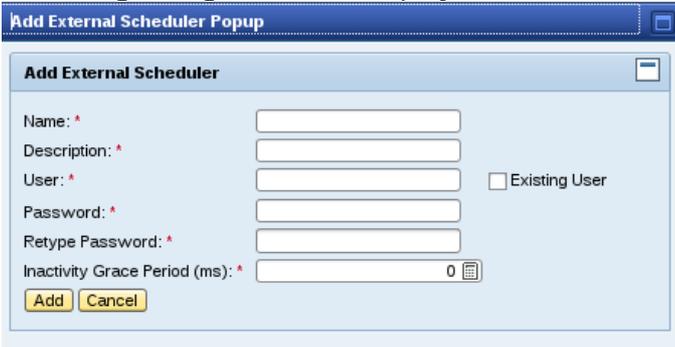
- Enter the following data:

    - *Name* and *Description* of the External Scheduler (f.e. IWS / IBM Workload Scheduler)

    - *User* : IBM Workload Scheduler accesses the Java system via a certain user. With this user the Java scheduler recognizes the external scheduler. The user entry depends on if there has already been a user defined and if the AS Java system is a standalone system or a double-stack system. If it is a standalone system you can reuse an existing user by selecting *Existing User* and providing the user name. The alternative is to create a new user by supplying a user name and password.

        In a dual-stack system, it is not possible to create a new user in the Java stack of the system. Therefore, in this case, you have to select *Existing User*.

    - *Inactivity grace period* : As soon as an external scheduler is registered, it occupies resources on the server. If the external scheduler does not connect to the Java system for a longer period, it would unnecessarily occupy system resources. To prevent this, you can supply an inactivity grace period. If the external scheduler does not connect again within this interval, the resources are released for other purposes.

- Finally, select *Add*

3. INSTALLING AND CONFIGURING THE PLUG-IN FOR SAP NETWEAVER JAVA

The following prerequisites must be met in order to use the IBM Workload Scheduler plug-in for SAP NetWeaver Java.

- IBM Workload Scheduler 9.1 or later
- IBM Dynamic Workload Console 9.1 or later
- SAP NetWeaver Java 7.10 or later

To install and configure the IBM Workload Scheduler plug-in for SAP NetWeaver Java, perform the following steps:

- Copy *com.ibm.scheduling.agent.sapjxbp_<version>.jar* to the *<TWA_HOME>/TWS/applicationJobPlugIn* folder on either the Master Domain Manager or a Dynamic Domain Manager

- Copy *com.ibm.scheduling.agent.sapjxbp_<version>.jar* to the *<TWA_HOME>/TWS/JavaExt/eclipse/plugins* folder on the Dynamic Agent that will run the SAP NetWeaver Java jobs

- Modify *config.ini* located in *<TWA_HOME>/TWS/JavaExt/eclipse/configuration* on the Dynamic Agent that will run the SAP NetWeaver Java jobs. At the end of the line that starts with "osgi.bundles=", add the following:
  ",com.ibm.scheduling.agent.sapjxbp@4:start"

- Restart the WebSphere Application Server of either the Master Domain Manager or the Dynamic Domain Manager.

- Restart the Dynamic Agent

- Restart the Dynamic Workload Console

4. DEFINING A SAP NETWEAVER JAVA JOB

From the Dynamic Workload Console, you can define a SAP NetWeaver Java job as follows:

- In the Dynamic Workload Console navigation tree, expand *Administration* and select *Manage Workload Definitions*.

- Specify the name of the engine. Subsequently, the Workload Designer is displayed.

- In the Working List panel, select *New -> Job Definition -> ERP -> SAP NetWeaver Java*.

- On the *SAP NetWeaver Java* panel, fill in the job details

  - **Hostname** (*) : Hostname of the SAP NetWeaver Java AS

  - **Port** (*) : Port on which the SAP NetWeaver Java server is listening. The default port is 50000 + 100 * *instance_number* + *port_instance*, where *instance_number* is a two digit number from 00 to 99 specifying the number of central instance and dialog instances and *port_instance* is 0 for HTTP and 1 for HTTPS.

  - **Username** (*) : The name of the user authorized to access the SAP NetWeaver Java AS. This user was defined in Registering IBM Workload Scheduler in *SAP NetWeaver Java*

  - **Password** (*) : The password that is associated with the user authorized to access the SAP NetWeaver Java AS.

  - **Use SSL** (*) : Select whether SSL/TLS is used for the connection to the SAP NetWeaver Java AS.

Note : if SSL/TLS is used for the connection to the SAP NetWeaver Java AS, you will need to create a Java keystore (JKS) containing the certificate of the SAP NetWeaver Java AS. Please refer to Appendix A for more information

  - To validate the connection, click *Test Connection*.

  - **Jobname**: Fill in the SAP NetWeaver Java job name. Alternatively, you can click the *Select...* button to retrieve the defined jobs on SAP NetWeaver Java AS. The use of wildcard characters (* and ?) is allowed.

  - **Retention** (*) : A SAP NetWeaver Java job has a retention period denoting the number of days that a job record is persisted in the SAP database. To prevent database overflow caused by too many job logs, the retention period can be configured per job or globally for all jobs. A value of -1 means indefinite.

  - **Polling period** (*) : The monitoring frequency determines how often the job is monitored. The default value is 10 seconds.

  - **Timeout** (*): The monitoring time determines for how long the job is monitored. If the job hasn't finished by the end of the timeout interval, the job is marked as ABEND. The default value is 7200 seconds.

- (*) These parameters can also be supplied in a common properties file *SAPJXBPJobExecutor.properties* located in *<TWA_HOME>/TWS/JavaExt/cfg* on the Dynamic Agent that will run the SAP NetWeaver Java jobs. Values from the job definition (if provided) override the values in the properties file.

SAP NETWEAVER JAVA (9.3.0.02) - JAVA#JAVA_DEMO

Select an Action ▼

General | Affinity | Recovery Options | **SAP NetWeaver Java**

Server Information

Hostname	java
Port	53000
Username	IWS
Password	•••••••••••••••••••••• ...

☐ Use SSL

Test Connection

Job Details

* Job name	SleepJobDemo
Retention	-1
Polling period	10
Timeout	7200

Select ...

Job Parameters

Filter ✖

	Name	▲Value	▲
➖	sleepTime	5000	

➕

Alternatively, the *composer* command line can be used to define the job.

Example:

```
JAVA#JAVA_DEMO

TASK

<?xml version="1.0" encoding="UTF-8"?>

<jsdl:jobDefinition xmlns:jsdl="http://www.ibm.com/xmlns/prod/scheduling/1.0/jsdl"
xmlns:jsdlsapjxbp="http://www.ibm.com/xmlns/prod/scheduling/1.0/jsdlsapjxbp" name="SAPJXBP">

  <jsdl:application name="sapjxbp">

    <jsdlsapjxbp:sapjxbp>

      <jsdlsapjxbp:SAPJXBPParameters>

        <jsdlsapjxbp:SAPJXBPParms>

          <jsdlsapjxbp:serverInformation>

            <jsdlsapjxbp:hostname>XXXXXX</jsdlsapjxbp:hostname>

            <jsdlsapjxbp:port>XXXXXX</jsdlsapjxbp:port>

            <jsdlsapjxbp:username>IWS</jsdlsapjxbp:username>

            <jsdlsapjxbp:password>{aes}lkOLhRypOSA/NXSilozQd00kxS7j0EPE=</jsdlsapjxbp:password>

          </jsdlsapjxbp:serverInformation>

          <jsdlsapjxbp:jobDetails>

            <jsdlsapjxbp:jobname>SleepJobDemo</jsdlsapjxbp:jobname>

            <jsdlsapjxbp:retention>-1</jsdlsapjxbp:retention>

            <jsdlsapjxbp:pollingPeriod>10</jsdlsapjxbp:pollingPeriod>

            <jsdlsapjxbp:pollingTimeout>7200</jsdlsapjxbp:pollingTimeout>

          </jsdlsapjxbp:jobDetails>

          <jsdlsapjxbp:jobParameters>

            <jsdlsapjxbp:parametersValues>

              <jsdlsapjxbp:parametersValue key="sleepTime">5000</jsdlsapjxbp:parametersValue>

            </jsdlsapjxbp:parametersValues>

          </jsdlsapjxbp:jobParameters>

        </jsdlsapjxbp:SAPJXBPParms>

      </jsdlsapjxbp:SAPJXBPParameters>

    </jsdlsapjxbp:sapjxbp>

  </jsdl:application>

</jsdl:jobDefinition>

DESCRIPTION "Added by composer."

RECOVERY STOP
```

5. MONITORING A SAP NETWEAVER JAVA JOB

Like regular jobs, you can monitor SAP NetWeaver Java jobs by using either the Dynamic Workload Console or the *conman* command line.

Plan Name: Current Plan

@#@.@JAVA@

Status	Internal Status	Job	Job Type	Workstation (Job)	Job Stream	Workstation (Job Stream)
✓ Successful	SUCC	JAVA_DEMO	SAP NetWeaver Java	JAVA	JOBS	JAVA

Extended job properties can be displayed using either the Dynamic Workload Console or the *conman* command line using the « *;props* » option.

'JAVA_DEMO' Properties

Action	
▼ Maximum Duration	
Length of Time	
Action	
Deadline	
Repeat Range	
▼ Extra Information	
Application Name	sap.com/SampleJobsApplication
End Time	2016-04-20T14:20:50.566+02:00
Hostname	
Job Definition ID	ec6eeaaca57a11e58902000012488af3
Job Description	Description of SleepJobDemo
Job ID	4ebc9fc106f211e6921c000012488af2
Job Name	SleepJobDemo
Job Status	COMPLETED
Node	Server 00 30_3067440
Port	
Retention Period	-1
Return Code	0
Scheduler ID	0e9e5f58062411e6c40c000012488af2
Start Time	2016-04-20T14:20:45.476+02:00
Submit Date	2016-04-20T14:20:45.421+02:00
User	IWS
actualSleepTime	5060
sleepTime	5000
▼ SAP NetWeaver Java	
hostname	
jobname	SleepJobDemo
parameters	[[sleepTime, 5000]]
password	
pollingPeriod	10
pollingTimeout	7200
port	
retention	-1
ssl	false
username	IWS

6. APPENDIX A : IMPORTING A CERTIFICATE INTO A JAVA KEYSTORE (JKS)

In order to use SSL/TLS for the connection to the SAP NetWeaver Java AS, you will need to create a Java keystore (JKS) containing the certificate of the SAP NetWeaver Java AS and add this keystore to the configuration of the Dynamic Agent.

Perform the following steps:

- Export the certificate from the SAP NetWeaver Java AS using Internet Explorer or Firefox

- Create a new keystore on the Dynamic Agent by launching the following command:
<TWA_HOME>/TWS/JavaExt/jre/jre/bin/keytool -genkey -alias jxbpstore -keystore <TWA_HOME>/TWS/ITA/cpa/config/jxbp.jks

- Import the certificate in the keystore as follows:
<TWA_HOME>/TWS/JavaExt/jre/jre/bin/keytool -import -file cert_dir/cert_name -alias jxbp -keystore <TWA_HOME>/TWS/ITA/cpa/config/jxbp.jks

- Open the *<TWA_HOME>/TWS/ITA/cpa/config/JobManager.ini* file, and locate the *JVMOptions*.

- Change the *JVMOptions* as follows:

JVMOptions = -Dsun.net.inetaddr.ttl=30
-Djavax.net.ssl.trustStore=<TWA_HOME>/TWS/ITA/cpa/config/jxbp.jks
-Djavax.net.ssl.trustStorePassword=<password>

- Restart the Dynamic Agent