BPEL Monitor API and Tool User Manual

Introduction

BPEL Monitor API and tool contains BPEL Monitoring API library and a lightweight command line monitoring tool using this library. User can use BPEL Monitoring API to build a monitoring system such as one with web consoles. The command line monitoring tool demonstrates a way to use the API to do management tasks interactively.

Install

- Create a directory (eg. bpelsemonitor) in filesystem, and extract the content of bpelMonitorTool.zip to it. it shows a structure like below (assuming you have created bpelsemonitor)

```
bpelmonitor/
        scripts/
            runbpelmonitor.sh
            setClassPath.sh
        docs/
            BPELMonitor_UserManual.pdf
        lib/
            jbi-admin-common.jar
            common-util.jar
            jbi.jar
            crl.jar
        monitorcommand.properties
        bpelmonitor-api.jar
        bpelmonitor-tool.jar
```

- Using BPEL Monitor API

  To use BPEL Monitor API alone in your own application, you need bpelmonitor-api.jar and all the jars in lib/

- Using the Command Line Tool of BPEL monitoring

  A command line tool for bpel monitoring is included and ready for use:

  - Modify monitorcommand.properties for values suitable for your environment
  - For Unix, make script executable by :

    cd scripts

    chmod a+x runbpelmonitor.sh

execute runbpelmonitor.sh in in scripts directory

- For windows:

  execute runbpelmonitor.bat in in scripts directory

Using Command Line BPEL Monitoring Tool

- Start Glassfish, bpelse, change the MonitorEnabled to true in bpelse property sheet .

  [Note] To monitor a BPEL project using the command line tool, the project should be deployed after MonitorEnabled is set to true, otherwise, the 'a' commands may not produce correct results

- cd to bpelmonitor/scripts, execute runbpelmonitor.sh

  It shows a list of commands available to use :

```
[a] Show deployed bpel processes
(su="suName")

[b] Show bpel instances status
([processId="string"]    [status="running|completed|suspended|
terminated|faulted"] [instid="instanceId"]
[max="maximumInstances"] [sort="startTime|endTime|updatedTime"]
[order="asc|desc"])

[c] Show activity status on bpel instance
(instid="instanceId")

[f] Show instance fault
(instid="instanceId")

[s] Suspend bpel instance
([instid="instanceId1|instanceId2|instanceId3|..."]
[processId="string"] [csv="The CSV File"])

[r] Resume bpel instance
([instid="instanceId1|instanceId2|instanceId3|..."]
[processId="string"] [csv="The CSV File"])

[t] Terminate bpel instance
([instid="instanceId1|instanceId2|instanceId3|..."]
[processId="string"] [csv="The CSV File"])

[l] List bpel variables
(instid="instanceId" [varname="variableName"] )

[v] View bpel variable value
(instid="instanceId" varid="variableId")

[k] Change bpel variable value
(instid="instanceId" varid="variableId" newval="theNewValue"
```

```
[part="partName"] [xpath="theXpathToTheLeafNodeToChange"] )

[ch] Show invokee bpel instances status
(instid="instanceId" [actid="invokeActivityId"] )

[pr] Show invoker bpel instances status
(instid="instanceId" [actid="receiveActivityId"] )

[h] Help
[e] Exit
```

After the prompt ">", you can type the letter of the command. Type 'help' or 'h' for help or examples

[Note] Type 'help' or 'h' shows the list of command again. At the end, it has :

Press: m + <RET> for examples.

Press: other key + <RET> to return.

If you type 'm' (means MORE) and hit Return, it shows examples and usage of the command.

Always type 'help' or 'h' to see the commnand list.

- Usage Pattern:

1. The required and optional params for a command are shown on the second line of the command, eg.

[b] Show bpel instances status

([processId="string"] [status="running|completed|suspended|terminated|faulted"] [instid="instanceId"]

[max="maximumInstances"] [sort="startTime|endTime|updatedTime"] [order="asc|desc"])

'b' is the command letter, processId, status and instid all are optional because they are enclosed by []

2. Specifying param and value pair by paramName="Value", the double quotes are required for value, no space between and after '='.
3. Type command and its params in one line, or using '\' to continue to next line
4. Specify mulitple value for a parm using '|', for example:

   >b status="running|completed"

5. You can direct the output to a file in file system, either in append or overwrite mode, you can do that for every command in the same way, the output to the console is unchanged, additionally, it writes to the specific file in specific mode, eg:

- Writing the output to the file given full path of the file, overwriting

the file if file exists:

>b status="running" >"c:\work\output.txt" <RET>

- Writing the output to the file given full path of the file, appending to the file if file exists:
  >b status="running" >"c:\work\output.txt"+ <RET>

Monitoring User Cases

This section provides some typical use cases for the command line monitoring tool

UC-1 Show Deployed BPEL processes

>a su="ForEachJbi-ForEachBpel"

BPEL Process ID

{http://enterprise.netbeans.org/bpel/forEach_branches2}forEach_branches2

{http://enterprise.netbeans.org/bpel/forEach_branches1}forEach_branches1

{http://enterprise.netbeans.org/bpel/forEach_basic}forEach_basic

{http://enterprise.netbeans.org/bpel/forEach_branches3}forEach_branches3

{http://www.seebeyond.com/eInsight/forEach_seq1}echo

{http://www.seebeyond.com/eInsight/forEach_seq4}echo

{http://www.seebeyond.com/eInsight/forEach_seq3}echo

{http://enterprise.netbeans.org/bpel/forEach_basic2}forEach_basic2

{http://www.seebeyond.com/eInsight/forEach_seq2}echo

{http://www.seebeyond.com/eInsight/forEach_seq5}echo

UC-2 Show BPEL instances status

Use the 'b' command to show bpel instances status

[b] Show bpel instances status

([processId="string"] [status="running|completed|suspended|terminated|faulted"] [instid="instanceId"])

UC-2.1 Show all bpel instances created when Monitoring is enabled by just type 'b'

>b

Instance Id | Status | Start Time | End Time | Updated Time | Lasted in seconds | Process Name

```
==========================================|==================|
==========================|==========================|
==========================|==========================|
==========================

192.168.0.117:56c78a28:11594f3ffe2:-7c98      | COMPLETED       | 2007-10-12 17:15:30.95    |
2007-10-12 17:15:31.007   | 2007-10-12 17:15:31.007   | 0.057              | {http://enterprise.netbe
                          |           |               |      |                  |
| ns.org/bpel/forEach_basi
                          |           |               |      |                  |
| }forEach_basic
192.168.0.117:56c78a28:11594f3ffe2:-7c97      | COMPLETED       | 2007-10-12 17:15:31.042   |
2007-10-12 17:15:31.086   | 2007-10-12 17:15:31.086   | 0.044              | {http://enterprise.netbe
                          |           |               |      |                  |
| ns.org/bpel/forEach_basi
                          |           |               |      |                  |
| }forEach_basic
192.168.0.117:56c78a28:11594f3ffe2:-7c96      | COMPLETED       | 2007-10-12 17:15:31.072   |
2007-10-12 17:15:31.314   | 2007-10-12 17:15:31.314   | 0.242              | {http://enterprise.netbe
                          |           |               |      |                  |
| ns.org/bpel/forEach_basi
                          |           |               |      |                  |
| }forEach_basic
192.168.0.117:56c78a28:11594f3ffe2:-7c95      | COMPLETED       | 2007-10-12 17:15:31.096   |
2007-10-12 17:15:31.126   | 2007-10-12 17:15:31.126   | 0.03               | {http://enterprise.netbe
                          |           |               |      |                  |
| ns.org/bpel/forEach_basi
                          |           |               |      |                  |
| }forEach_basic
```

Note 1: If the result seesms not clear on the console because the font and width limit of the console that causes the lines to wrap, please direct the result to a text file like below, this applies to all commands

>b >"../result.txt"

You will still see the output on the console, but the result.txt will be written to the parent directory of script/ in this case, you can use both absolute path or relative path to specify the file name

Note 2: If the specified output file name ends with ".csv", the file will be written as CSV file which can be used in Suspend/Resume/Terminate command with csv="The CSV File" option.

>b status="running" >"../result.csv"

The ../result.csv will be a csv file and you may do suspend/resume/terminate use this file :

>s csv="../result.csv"

>r csv="../result.csv"

>t csv=”../result.csv"

UC-2.2 Show status and info for a single BPEL instance

>b instid="192.168.0.117:56c78a28:11594f3ffe2:-7c8f"

UC-2.3 Show all bpel instances of a process and/or in certain states

>b processid="{http://enterprise.netbens.org/bpel/forEach_basi
{http://enterprise.netbeans.org/bpel/forEach_basic}forEach_basic" \

status="running|completed"

The above command gets the info for all running or completed intances of process name:
{http://enterprise.netbens.org/bpel/forEach_basi{http://enterprise.netbeans.org/bpel/forEach_basic}
forEach_basic

Note 3: Use “\” to type command in multiple lines (like the above example), this applies to all commands

UC-2.4 Use sort, order and max to handle large number of instances

Note 5: Use param: “max”, “sort”, “order” to limit the number of resuls with sorting. The maximum instances returned is 1000 if no “max” is specified, user can specify “max” (e.g. max=”500”), and “sort” (startTime|endTime|updatedTime) and order of the sort (asc|desc). If “max” is not specified and the qualifying instances number exceeds 1000, a message will appear to remind user selecting the appropriate sorting and maximum return:

>b

The total count of instances is :1,708, please specify max, sort and order

Command executed :79 ms

>b max="2000" sort="updatedTime" order="desc"

UC-3 Show BPEL Activity status

Use the 'c' command to show bpel instance activity status

[c] Show activity status on bpel instance

(instid="instanceId")

>cinstid="192.168.0.117:-1fb51aa2:115d7f098c9:-7b50"

UC-4 Show BPEL Instanc fault details

Use the 'f' command to show a faulted bpel instance details
When an instance is fauled (>b status=”faulted”), you can see its faul details using:

[f] Show instance fault
(instid="instanceId")

>f instid="192.168.0.117:-1fb51aa2:115d7f098c9:-7b85"

You can see what activities ar faulted using the 'c' command. Not all activity faults result in instance fault, for instance if a fault is handled by a scope, then it will not be propagated to the process level.

UC-5 Suspend multiple intances

Use the 's' command to suspend mulitple instances

UC-5.1 Suspend instances using instanceIds

[s] Suspend bpel instance

([instid="instanceId1|instanceId2|instanceId3|..."] processId=”string” csv=”The CSV File”)

>s instid="192.168.0.117:-1fb51aa2:115d7f098c9:-7b85|192.168.0.117:-1fb51aa2:115d7f098c9:-7b85"

If the instances are completed or failed or the instance id specified is not correct, a message will show as below:

Fail to suspend instance:192.168.0.117:-1fb51aa2:115d7f098c9:-7b85

The instance :192.168.0.117:-1fb51aa2:115d7f098c9:-7b85 might be completed or faulted, please check the instance status

In such case, it is better to use 'b' command to check the specific instance status

>b instid="192.168.0.117:-1fb51aa2:115d7f098c9:-7b85"

UC-5.2 Suspend instances using processId

Use processId to suspend all running instances for a bpel process

>s processId=""{http://www.seebeyond.com/eInsight/CopyTest}CopyName"

UC-5.3 Suspend instances using CSV File

Please see UC-2.1 [note 3], batch suspend can be done using a CSV File

UC-6 Resume multiple intances

Use the 'r' command to suspend mulitple instances

UC-6.1 Resume instances using instanceIds

[r] Resume bpel instance

(instid="instanceId1|instanceId2|instanceId3|..." processId=”string” csv=”The CSV File”)

Similar to UC-5, error messsage will show if an instance is not in 'SUSPENDED' status

UC-6.2 Resume instances using processId, similar to UC-5.2

UC-6.3 Resume instances using CSV File, similar to UC-5.3

UC-7 Terminate multiple intances

Use the 't' command to terminate mulitple instances

UC-7.1 Terminate instances using instanceIds

[t] Terminate bpel instance

(instid="instanceId1|instanceId2|instanceId3|..." processId=”string” csv=”The CSV File”)

Similar to UC-5 and UC-6, error messsage will show if an instance is already 'TERMINATED', 'COMPLETED' or 'FAULTED'

UC-7.2 Terminate instances using processId, similar to UC-5.2, UC-6.2

UC-6.3 Terminate instances using CSV File, similar to UC-5.3, UC-6.3

UC-8 View bpel variable values

Use the 'l' and 'v' commands in conjunction to view current value for bpel instance variables

[l] List bpel variables

(instid="instanceId" [varname="variableName"])

[v] View bpel variable value

(instid="instanceId" varid="variableId")

'l ' command shows available variables in their respective scops (expressed in xpath)

>l instid="192.168.0.117:757d7361:115d8cdb431:-7fdc"

Variable Name Variable Id Scope Xpath

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NewWSDLOperationIn 1000001 /bpws:process

'v' command shows a specific variable in an instanc, variable is identified by its variable id (varid)

>v instid="192.168.0.117:757d7361:115d8cdb431:-7fdc" varid="1000001"

UC-9 Change variable value in a SUSPENDED bpel instance

Use 'k' command to change a ***suspended*** bpel instance value, the instance must be suspended using 's' before its variable value can be changed using this command

[k] Change bpel variable value

(instid="instanceId" varid="variableId" newval="theNewValue" [part="partName"] [xpath="theXpathToTheLeafNodeToChange"])

In the example below we show the variable before the change and after the change to explain how 'k' command should be used

>v instid="192.168.0.117:757d7361:115d8cdb431:-7fb9" varid="1000001"

Variable value

<?xml version="1.0" encoding="UTF-8"?><jbi:message xmlns:msgns="http://j2ee.net beans.org/wsdl/newWSDL" name="input1" type="msgns:newWSDLOperationRequest" vers ion="1.0" xmlns:jbi="http://java.sun.com/xml/ns/jbi/wsdl-11-wrapper"><jbi:part> <test:contact xmlns:test="http://xml.netbeans.org/schema/test">

<test:id>

<test:firstname>?string?</test:firstname>

<test:lastname>?string?</test:lastname>

</test:id>

<test:loc>

<test:address>?string?</test:address>

<test:email>?string?</test:email>

</test:loc>

</test:contact></jbi:part></jbi:message>

>k instid="192.168.0.117:757d7361:115d8cdb431:-7fb9" varid="1000001" part="part 1" newval="newval" xpath="test:id/test:firstname"

Successfully changed variable value

Check out the new value: v instid="192.168.0.117:757d7361:115d8cdb431:-7fb9" va rid="1000001"

> v instid="192.168.0.117:757d7361:115d8cdb431:-7fb9" varid="1000001"

Variable value

<?xml version="1.0" encoding="UTF-8"?><jbi:message xmlns:msgns="http://j2ee.net beans.org/wsdl/newWSDL" name="input1" type="msgns:newWSDLOperationRequest" vers ion="1.0" xmlns:jbi="http://java.sun.com/xml/ns/jbi/wsdl-11-wrapper"><jbi:part> <test:contact xmlns:test="http://xml.netbeans.org/schema/test">

<test:id>

<test:firstname>newval</test:firstname>

<test:lastname>?string?</test:lastname>

</test:id>

<test:loc>

<test:address>?string?</test:address>

<test:email>?string?</test:email>

</test:loc>

</test:contact></jbi:part></jbi:message>

[Note]

1. **Specify a value to change simple type variable or the leaf node of a complex type variable**
2. **A common mistake of specifying xpath is the xpath includes the root element of the variable (In the above example, test:contact). Since variable's context node is the root element already, the root element itself should not be specified :**

   Incorrect: test:contact/test:id/test:firstname

   Incorrect: /test:contact/test:id/test:firstname

   Incorrect: /test:id/test:firstname

   Correct: test:id/test:firstname

UC-10 Show status of invoker BPEL instances

Use 'pr' to navigate from an invokee bpel instance to the invoker bpel instance related by an invoke- receive pair

BP 1 (invoke) --> BP 2 (receive), if BP 2's instance id is known, this command can get the status information of BP 1 instance

[pr] Show invoker bpel instances status

(instid="instanceId" [actid="receiveActivityId"])

>pr instid="192.168.0.117:-bdaf3e2:1165f0cbd9a:-7ed0"

actid is an optional param to specify the receive acitivity id if BP 2 has more than 1 receive activities, if ommited, all invokers for all receives will be returned

UC-11 Show status of invokee BPEL instances

Use 'ch' to navigate from an invoker bpel instance to the invokee bpel instance related by an invoke- receive pair

BP 1 (invoke) --> BP 2 (receive), if BP 1's instance id is known, this command can get the status information of BP 2 instance

[ch] Show invokee bpel instances status

(instid="instanceId" [actid="receiveActivityId"])

>ch instid="192.168.0.117:-bdaf3e2:1165f0cbd9a:-7ed0"

actid is an optional param to specify the receive acitivity id if BP 1 has more than 1 invoke activities, if ommited, all invokees for all invokes will be returned

Clustering Support

Clustering is supported on both BPELManagmentServiceAPI and the command line monitoring tool.

To use clustering on API, specify ' target' on the API, target is the name of a cluster, eg. “cluster1”. If target==null, the API works as the single server mode.

To use clustering on comman line monitoring tool, specify “`TargetName”on monitorcommand.properties.`