



Process Definition Tool

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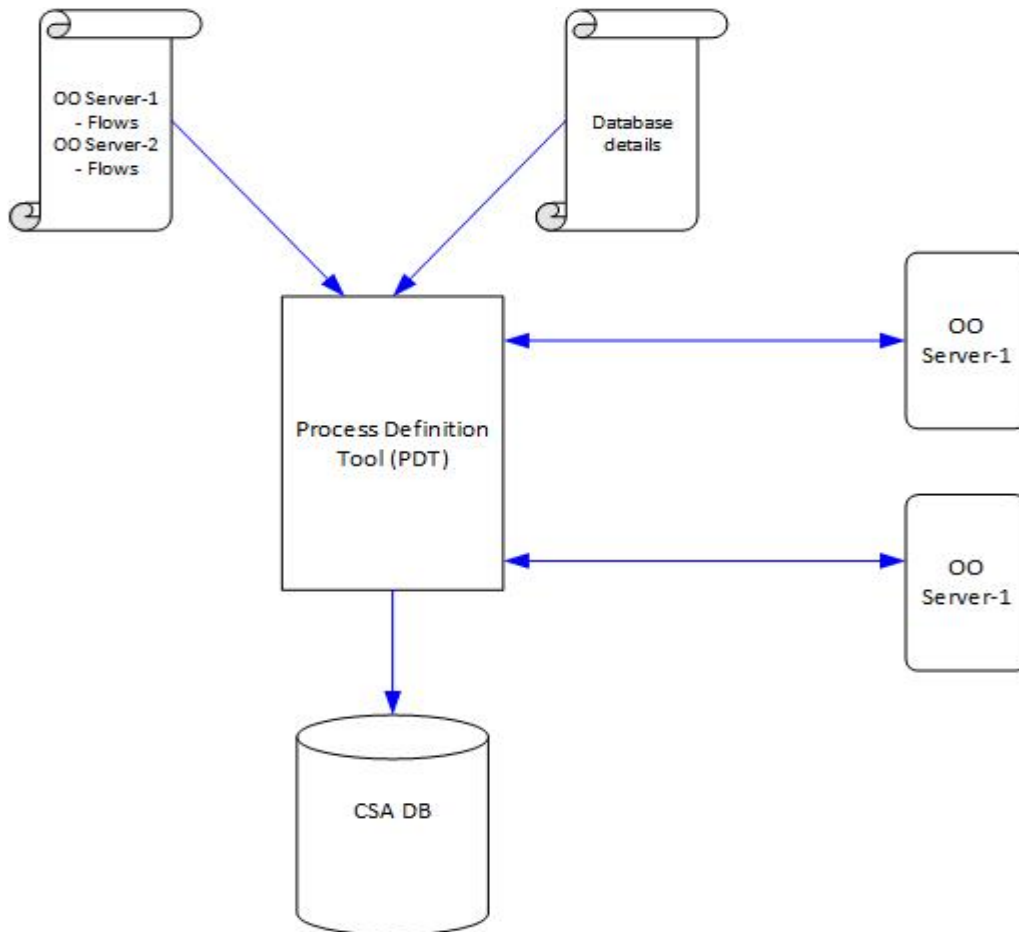
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Overview

The Process Definition Tool is part of the HPE Cloud Service Automation (CSA) installation. For more information, see the *Cloud Service Automation Configuration Guide*.

The Process Definition Tool (PDT) is a command line tool used for importing HPE Operations Orchestration (OO) flow signature-related information into the CSA database so that this information is stored locally. The imported flow signatures are used during the creation of a service design or a resource offering and when adding a resource synchronization action or an external approval type.

The PDT works by querying the flow definitions of one or more OO servers and then writing to the CSA DB. The information about the OO server, the flows, and the database is provided through an XML input file and java properties file respectively. PDT runs an initial validation of the input XML file to ensure the syntax is correct and that the database credentials are valid. The PDT then scans the OO machine listed in the input XML file sequentially and queries the OO machine for requesting information about the OO flows. The PDT then writes information about the OO flow to the CSA DB.



The PDT creates a log file titled `process-defn-tool.log` in the current working directory. This logs all the interactions between the tool and the OO server as well as the database. To find out more about how to interpret the log files, see [Understanding the Log File](#) in this document.

Basic Configuration Steps

Before running PDT for the first time, complete the following steps:

1. Import the CSA OO content to the OO server.
2. Export the OO certificate to a file.
3. Import the OO certificate information to the Java truststore.
4. Create input files for PDT using the `-g` option.

- Update the appropriate database file with the correct credentials and URL.
- Update the `HPOOInput.xml` file with the correct OO URL, user credentials, truststore location, truststore password with the correct value for all the `<ooengine/>` tags defined within the file.

For step-by-step configuration instructions, see [Installing CSA Content on an OO Server](#).

Input Files Syntax

There are two input files needed for PDT:

- Database Configuration File
- This database configuration file provides connection information about the CSA DB being used. The file uses the Java properties file syntax. The properties in the file describe the type of database (`db.type`), jdbc URL to access the database (`db.url`), database user (`db.user`), and the password (`db.password`). It is recommended that the database password be encrypted in CSA format. The password can be encrypted by running the PDT with the `-e/` encrypt option. If a plain text password is used, the PDT will overwrite the input properties file with the encrypted password.
- If there is uncertainty about the exact database URL, review the standalone XML file. See [Troubleshooting](#) for more information.
- OO Input File
- The OO input file provides information about one or more OO server(s) and the OO flow information stored in the OO servers. The OO input file uses XML syntax to describe the OO server and the flows.
- The root tag is `<ooengines/>`. The direct children of the root tag use the tag `<ooengine/>`. There can be one or more of the `<ooengine/>` tags. Each of the `<ooengine/>` tags contains information about a single OO server and the OO flows that needs to be imported from them. For PDT to interact with an OO server in a secure manner, the tool needs information about the access URL of the server, user credentials, and Java truststore information (see step 3 in **Basic Configuration Steps** above).

`<ooengine/>` Attributes

- The attributes of `<ooengine/>` tags are used for providing this information. These attributes are:

Attribute	Description
<code>accessPointType</code>	An optional parameter which, by default, is assumed to be of the type URL. The other possible values are <code>EXTERNAL_APPROVAL</code> or <code>RESOURCE_POOL_SYNC</code> .
<code>name</code>	The unique identifier for the process engine that was created in CSA. This value may be needed in the future if engine information needs to be updated.
<code>url</code>	The URL for the OO Central Web Service. Check to make sure that the port information is correct.
<code>truststore</code>	The truststore in which the OO Certificate Authority's root certificate has been imported. Having an incorrect value for the truststore or its password is a common error when running the PDT.
<code>truststorepassword</code>	<ul style="list-style-type: none"> The password of the truststore which needs to be encrypted in CSA encryption format. PDT provides a <code>-e/</code> encrypt option that allows encryption of a clear text word. If a clear text word is provided in place of an encrypted one, PDT will overwrite the clear text word with the encrypted one.
<code>username</code>	The OO Central user name that has access to the OO machine for reading information about the OO flows. Typically this is a user with admin rights.
<code>password</code>	The password for the OO Central user. This password needs to be encrypted like the truststore password. If a clear text password is provided in place of an encrypted one, PDT will overwrite the clear text word with the encrypted one.
<code>update</code>	Set to true when information about the <code><ooengine/></code> attribute needs to be updated in the database (<code>url</code> , <code>username</code> , <code>password</code>).
<code>delete</code>	Set to true when an unused process engine and all unused flows that are part of it need to be deleted.

`<oofolder/>` Attributes

Each <ooengine/> element contains one more <folder/> elements. The <folder/> elements specify the OO flow information that needs to be imported into the OO server. The attributes for <folder/> are:

- path
- flow
- recursive
- update
- delete

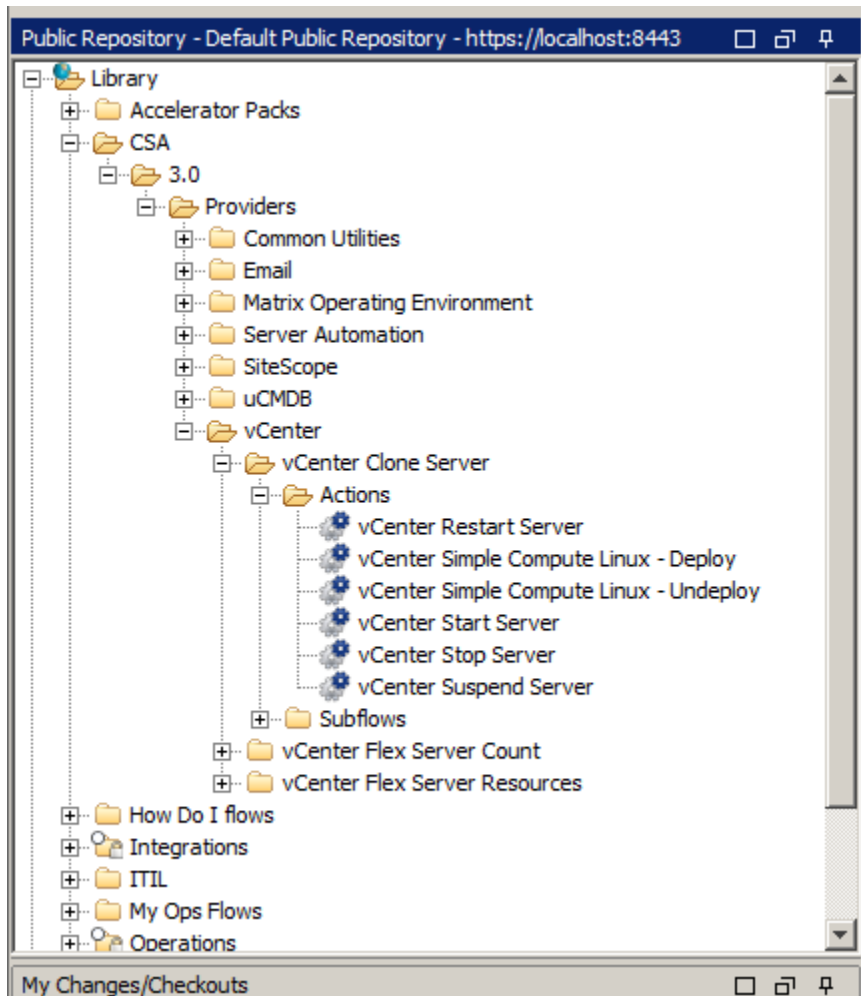
Path specifies a folder or a flow on the OO server. If the **path** points to a folder on OO server, then the PDT by default would create definitions for all the flows in that folder.

The attributes **flow**, **recursive**, **update**, and **delete** can have only **true** or **false** values. By default, these attributes are set to **false**. If the **flow** attribute is set to **true**, it means that the attribute path points to a single flow rather than a folder containing a set of flows. If the attribute **recursive** is set to **true**, then PDT will create definitions not only in the flows in the same folder but also in all subfolders of the folder specified in the path attribute.

If a definition for a flow already exists on the CSA system, the tool will leave that definition unchanged unless the **update** or **delete** attributes are set to **true**. A **true** value for the **update** attribute will result in updating the process definition for the corresponding flow. A **true** value for the **delete** attribute will result in the deletion of the process definition, provided it is unused.

Usage Examples

The following screenshot shows OO flow information stored on an OO server:



To import all the flows under the 'Actions' folder for the first time

```
<folder path="/Library/CSA/3.0/Providers/vCenter/vCenter Clone Server/Actions"/>
```

To update the existing definitions corresponding to all the flows in the folder

The tool will update an existing definition if one already exists on the system; otherwise, it will create a new one.

```
<folder path="/Library/CSA/3.0/Providers/vCenter/vCenter Clone Server/Actions"update="true"/>
```

To delete the definitions that already exist on the system that correspond to flows in the 'Actions' folder

```
<folder path="/Library/CSA/3.0/Providers/vCenter/vCenter Clone Server/Actions"delete="true"/>
```

To import all the flows and folders under a root folder 'Providers,' we set the recursive flag to true

```
<folder path="/Library/CSA/3.0/Providers"recursive="true"/>
```

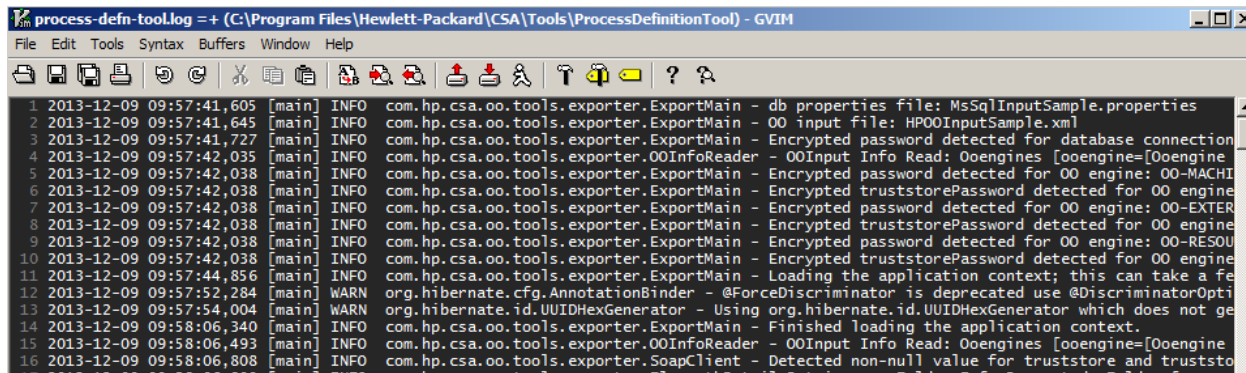
To create a definition for a single flow

In this example: /Library/CSA/3.0/Providers/vCenter/vCenter Clone Server/Actions/vCenter Start Server, the flow flag is set to **true** as shown below:

```
<folder path="/Library/CSA/3.0/Providers/vCenter/vCenter Clone Server/Actions/vCenter Start Server"flow="true"/>
```

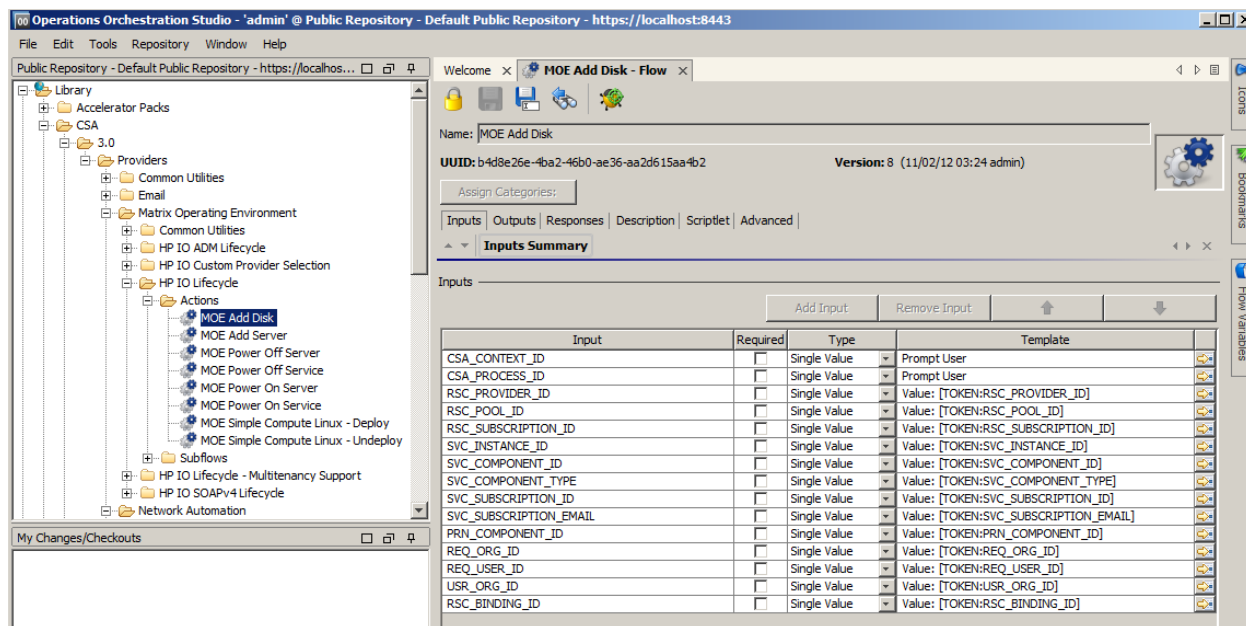
Understanding the Log File

The PDT logs the interaction of the OO server and the database in the process-defn-tool.log file. The log file is generated in the current working directory and is useful for debugging. Typical log file content is shown below:



```
process-defn-tool.log =+ (C:\Program Files\Hewlett-Packard\CSA\Tools\ProcessDefinitionTool) - GVIM
File Edit Tools Syntax Buffers Window Help
1 2013-12-09 09:57:41,605 [main] INFO com.hp.csa.oo.tools.exporter.ExportMain - db properties file: MsSqlInputSample.properties
2 2013-12-09 09:57:41,645 [main] INFO com.hp.csa.oo.tools.exporter.ExportMain - OO input file: HPOOInputSample.xml
3 2013-12-09 09:57:41,727 [main] INFO com.hp.csa.oo.tools.exporter.ExportMain - Encrypted password detected for database connection
4 2013-12-09 09:57:42,035 [main] INFO com.hp.csa.oo.tools.exporter.OOInfoReader - OOInput Info Read: Ooengines [oengine=[Ooengine
5 2013-12-09 09:57:42,038 [main] INFO com.hp.csa.oo.tools.exporter.ExportMain - Encrypted password detected for OO engine: OO-MACHI
6 2013-12-09 09:57:42,038 [main] INFO com.hp.csa.oo.tools.exporter.ExportMain - Encrypted truststorePassword detected for OO engine
7 2013-12-09 09:57:42,038 [main] INFO com.hp.csa.oo.tools.exporter.ExportMain - Encrypted password detected for OO engine: OO-EXTER
8 2013-12-09 09:57:42,038 [main] INFO com.hp.csa.oo.tools.exporter.ExportMain - Encrypted truststorePassword detected for OO engine
9 2013-12-09 09:57:42,038 [main] INFO com.hp.csa.oo.tools.exporter.ExportMain - Encrypted password detected for OO engine: OO-RESOU
10 2013-12-09 09:57:42,038 [main] INFO com.hp.csa.oo.tools.exporter.ExportMain - Encrypted truststorePassword detected for OO engine
11 2013-12-09 09:57:42,038 [main] INFO com.hp.csa.oo.tools.exporter.ExportMain - Loading the application context; this can take a fe
12 2013-12-09 09:57:52,284 [main] WARN org.hibernate.cfg.AnnotationBinder - @ForceDiscriminator is deprecated use @DiscriminatorOpti
13 2013-12-09 09:57:54,004 [main] WARN org.hibernate.id.UUIDHexGenerator - Using org.hibernate.id.UUIDHexGenerator which does not ge
14 2013-12-09 09:58:06,340 [main] INFO com.hp.csa.oo.tools.exporter.ExportMain - Finished loading the application context.
15 2013-12-09 09:58:06,493 [main] INFO com.hp.csa.oo.tools.exporter.OOInfoReader - OOInput Info Read: Ooengines [oengine=[Ooengine
16 2013-12-09 09:58:06,808 [main] INFO com.hp.csa.oo.tools.exporter.SoapClient - Detected non-null value for truststore and trustst
```

Further examination of the log file shows all the flows that get imported when a process definition is executed. Below is a screenshot of an OO flow and the log file contents when that flow gets imported into CSA as a process definition.



Input	Required	Type	Template
CSA_CONTEXT_ID	<input type="checkbox"/>	Single Value	Prompt User
CSA_PROCESS_ID	<input type="checkbox"/>	Single Value	Prompt User
RSC_PROVIDER_ID	<input type="checkbox"/>	Single Value	Value: [TOKEN:RSC_PROVIDER_ID]
RSC_POOL_ID	<input type="checkbox"/>	Single Value	Value: [TOKEN:RSC_POOL_ID]
RSC_SUBSCRIPTION_ID	<input type="checkbox"/>	Single Value	Value: [TOKEN:RSC_SUBSCRIPTION_ID]
SVC_INSTANCE_ID	<input type="checkbox"/>	Single Value	Value: [TOKEN:SVC_INSTANCE_ID]
SVC_COMPONENT_ID	<input type="checkbox"/>	Single Value	Value: [TOKEN:SVC_COMPONENT_ID]
SVC_COMPONENT_TYPE	<input type="checkbox"/>	Single Value	Value: [TOKEN:SVC_COMPONENT_TYPE]
SVC_SUBSCRIPTION_ID	<input type="checkbox"/>	Single Value	Value: [TOKEN:SVC_SUBSCRIPTION_ID]
SVC_SUBSCRIPTION_EMAIL	<input type="checkbox"/>	Single Value	Value: [TOKEN:SVC_SUBSCRIPTION_EMAIL]
PRN_COMPONENT_ID	<input type="checkbox"/>	Single Value	Value: [TOKEN:PRN_COMPONENT_ID]
REQ_ORG_ID	<input type="checkbox"/>	Single Value	Value: [TOKEN:REQ_ORG_ID]
REQ_USER_ID	<input type="checkbox"/>	Single Value	Value: [TOKEN:REQ_USER_ID]
USR_ORG_ID	<input type="checkbox"/>	Single Value	Value: [TOKEN:USR_ORG_ID]
RSC_BINDING_ID	<input type="checkbox"/>	Single Value	Value: [TOKEN:RSC_BINDING_ID]

Shown below are the log file contents when that flow is retrieved from the OO server:

```

17 2013-12-09 09:58:06,809 [main] INFO com.hp.csa.oo.tools.exporter.FlowpathDetailsRetriever - Folder Info Requested: Folder [recurs
ive=false, path=/Library/CSA/3.0/Providers/Matrix Operating Environment/HP IO Lifecycle/Actions, flow=false, update=false, regex=n
ull]
18 2013-12-09 09:58:07,907 [main] INFO com.hp.csa.oo.tools.exporter.FlowpathDetailsRetriever - Flow Detail returned (non recursive):
OOFlowDetail [parameters=[FlowParameter [name=CSA_CONTEXT_ID, description=, defaultValue=null, listType=-1], FlowParameter [name=
CSA_PROCESS_ID, description=, defaultValue=null, listType=-1], FlowParameter [name=RSC_PROVIDER_ID, description=, defaultValue=[TO
KEN:RSC_PROVIDER_ID], listType=-1], FlowParameter [name=RSC_POOL_ID, description=, defaultValue=[TOKEN:RSC_POOL_ID], listType=-1],
FlowParameter [name=RSC_SUBSCRIPTION_ID, description=, defaultValue=[TOKEN:RSC_SUBSCRIPTION_ID], listType=-1], FlowParameter [nam
e=SVC_INSTANCE_ID, description=, defaultValue=[TOKEN:SVC_INSTANCE_ID], listType=-1], FlowParameter [name=SVC_COMPONENT_ID, descrip
tion=, defaultValue=[TOKEN:SVC_COMPONENT_ID], listType=-1], FlowParameter [name=SVC_COMPONENT_TYPE, description=, defaultValue=[TO
KEN:SVC_COMPONENT_TYPE], listType=-1], FlowParameter [name=SVC_SUBSCRIPTION_ID, description=, defaultValue=[TOKEN:SVC_SUBSCRIPTION
_ID], listType=-1], FlowParameter [name=SVC_SUBSCRIPTION_EMAIL, description=, defaultValue=[TOKEN:SVC_SUBSCRIPTION_EMAIL], listTyp
e=-1], FlowParameter [name=PRN_COMPONENT_ID, description=, defaultValue=[TOKEN:PRN_COMPONENT_ID], listType=-1], FlowParameter [nam
e=REQ_ORG_ID, description=, defaultValue=[TOKEN:REQ_ORG_ID], listType=-1], FlowParameter [name=REQ_USER_ID, description=, defaultV
alue=[TOKEN:REQ_USER_ID], listType=-1], FlowParameter [name=USR_ORG_ID, description=, defaultValue=[TOKEN:USR_ORG_ID], listType=-1
], FlowParameter [name=RSC_BINDING_ID, description=, defaultValue=[TOKEN:RSC_BINDING_ID], listType=-1]], name=MOE Add Disk, path=/
Library/CSA/3.0/Providers/Matrix Operating Environment/HP IO Lifecycle/Actions, uuid=b4d8e26e-4ba2-46b0-ae36-aa2d615aa4b2]
19

```

Line 18 of the log file above shows that the tool retrieved information about the flow /Library/CSA/3.0/Providers/Matrix Operating Environment/IO Lifecycle/Actions/MOE Add/MOE Add Disk and the flow name can be reconstructed by concatenating values for **path** and **name** in this line. Line 18 also contains information about the attributes that are being retrieved for this particular flow (CSA_CONTEXT_ID, CSA_PROCESS_ID...) and the default value of these properties. The uuid listed is the UUID of the flow on the OO server that CSA will use to invoke this particular flow when communicating to the OO engine.

Once the information related to all the flows in a folder is retrieved, definitions corresponding to these flows are created and written to the database. A sample screenshot of lines representing the log is shown below:

```

175 2013-12-16 15:09:44,887 [main] INFO com.hp.csa.oo.tools.exporter.ProcessDefinitionUtils - Create/Update
function definitions in OO Server for: https://localhost:8443/PAS/services/WSCentralService
176 2013-12-16 15:09:45,059 [main] INFO com.hp.csa.oo.tools.exporter.ProcessDefinitionUtils - Created function
definition for flow : /Library/CSA/3.0/Providers/Matrix Operating Environment/HP IO Lifecycle/Actions/MOE Add
Disk
177 2013-12-16 15:09:45,377 [main] INFO com.hp.csa.oo.tools.exporter.ProcessDefinitionUtils - Created function
definition for flow : /Library/CSA/3.0/Providers/Matrix Operating Environment/HP IO Lifecycle/Actions/MOE Add
Server
178 2013-12-16 15:09:45,570 [main] INFO com.hp.csa.oo.tools.exporter.ProcessDefinitionUtils - Created function
definition for flow : /Library/CSA/3.0/Providers/Matrix Operating Environment/HP IO Lifecycle/Actions/MOE
Power Off Server
179 2013-12-16 15:09:45,960 [main] INFO com.hp.csa.oo.tools.exporter.ProcessDefinitionUtils - Created function
definition for flow : /Library/CSA/3.0/Providers/Matrix Operating Environment/HP IO Lifecycle/Actions/MOE
Power Off Service
180 2013-12-16 15:09:46,226 [main] INFO com.hp.csa.oo.tools.exporter.ProcessDefinitionUtils - Created function
definition for flow : /Library/CSA/3.0/Providers/Matrix Operating Environment/HP IO Lifecycle/Actions/MOE
Power On Server
181 2013-12-16 15:09:46,414 [main] INFO com.hp.csa.oo.tools.exporter.ProcessDefinitionUtils - Created function
definition for flow : /Library/CSA/3.0/Providers/Matrix Operating Environment/HP IO Lifecycle/Actions/MOE
Power On Service

```

Once all the flows within an <ooengine/> element are processed, the PDT tool writes the statistics about the operation to the log file, including the number of definitions created, updated, and deleted based on the input. A sample screenshot of lines representing this information in the log file is shown below:

```

298 2013-12-16 15:10:24,938 [main] INFO com.hp.csa.oo.tools.exporter.ProcessDefinitionUtils -
Finished importing process definitions from OO flows at https://localhost:8443/PAS/services/
WSCentralService
299 2013-12-16 15:10:24,938 [main] INFO com.hp.csa.oo.tools.exporter.ProcessDefinitionUtils -
Total number of process definitions created: 122
300 2013-12-16 15:10:24,938 [main] INFO com.hp.csa.oo.tools.exporter.ProcessDefinitionUtils -
Total number of process definitions updated: 0
301 2013-12-16 15:10:24,938 [main] INFO com.hp.csa.oo.tools.exporter.ProcessDefinitionUtils -
Total number of process definitions deleted: 0

```

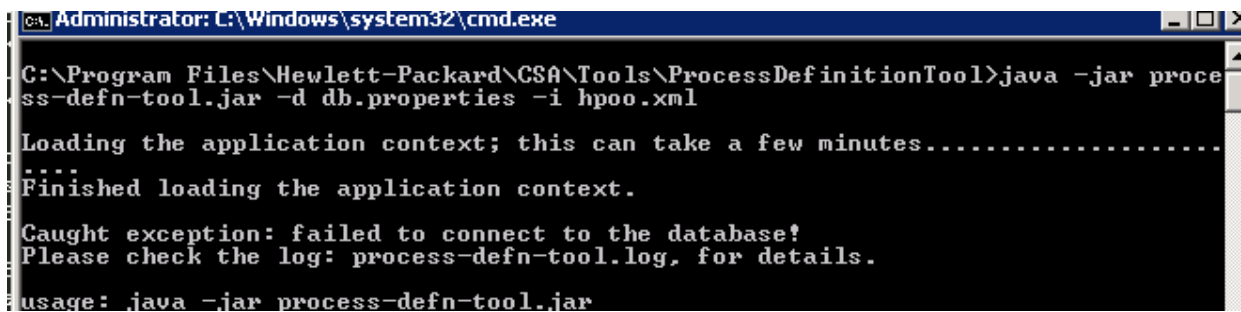
Troubleshooting

Following is a list of typical errors that cause failures when running the PDT.

Incorrect database URL

One of the first tasks of the PDT is to make sure that the database URL and credentials are correct. In cases where a database login URL is incorrect because of an invalid database name, both the console and the log files display appropriate error messages as shown below.

Console error message:



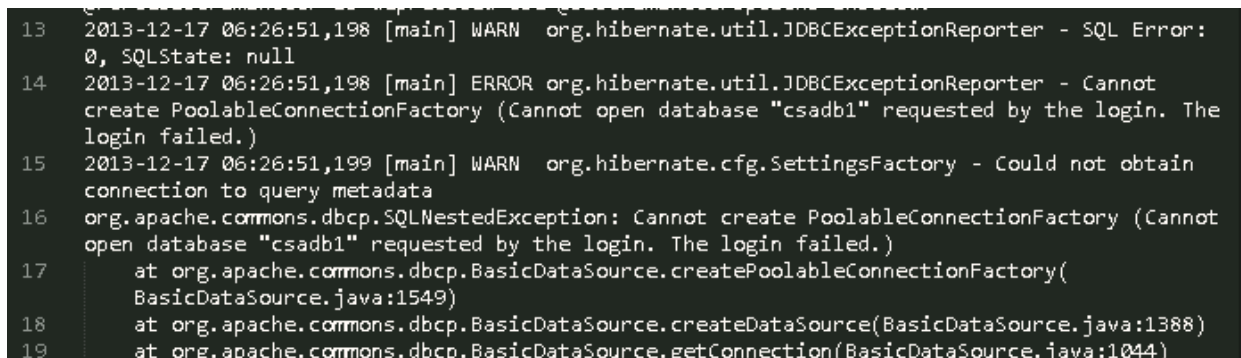
```
Administrator: C:\Windows\system32\cmd.exe
C:\Program Files\Hewlett-Packard\CSA\Tools\ProcessDefinitionTool>java -jar process-defn-tool.jar -d db.properties -i hpool.xml

Loading the application context; this can take a few minutes.....
Finished loading the application context.

Caught exception: failed to connect to the database!
Please check the log: process-defn-tool.log, for details.

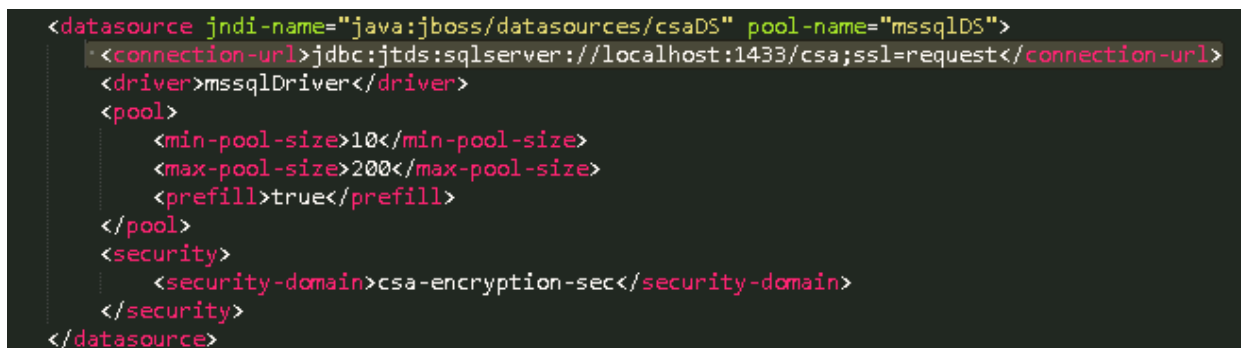
usage: java -jar process-defn-tool.jar
```

A typical log file error message:



```
13 2013-12-17 06:26:51,198 [main] WARN org.hibernate.util.JDBCExceptionReporter - SQL Error:
0, SQLState: null
14 2013-12-17 06:26:51,198 [main] ERROR org.hibernate.util.JDBCExceptionReporter - Cannot
create PoolableConnectionFactory (Cannot open database "csadb1" requested by the login. The
login failed.)
15 2013-12-17 06:26:51,199 [main] WARN org.hibernate.cfg.SettingsFactory - Could not obtain
connection to query metadata
16 org.apache.commons.dbcp.SQLNestedException: Cannot create PoolableConnectionFactory (Cannot
open database "csadb1" requested by the login. The login failed.)
17 at org.apache.commons.dbcp.BasicDataSource.createPoolableConnectionFactory(
BasicDataSource.java:1549)
18 at org.apache.commons.dbcp.BasicDataSource.createDataSource(BasicDataSource.java:1388)
19 at org.apache.commons.dbcp.BasicDataSource.getConnection(BasicDataSource.java:1044)
```

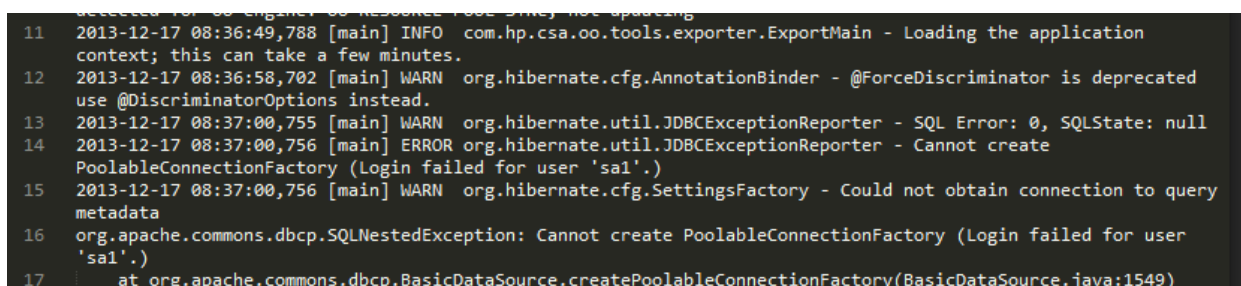
If you are unsure if you have the correct database URL configured, review the standalone.xml file for the CSA JBoss server. The database URL used for the CSA installation is usually listed under <datasource/> with attribute jndi-name="java:jboss/datasources/csaDS." A sample screenshot containing that information is shown below:



```
<datasource jndi-name="java:jboss/datasources/csaDS" pool-name="mssqlDS">
  <connection-url>jdbc:jtds:sqlserver://localhost:1433/csa;ssl=request</connection-url>
  <driver>mssqlDriver</driver>
  <pool>
    <min-pool-size>10</min-pool-size>
    <max-pool-size>200</max-pool-size>
    <prefill>>true</prefill>
  </pool>
  <security>
    <security-domain>csa-encryption-sec</security-domain>
  </security>
</datasource>
```

Incorrect database user credentials

The error message displayed on the console in the case of an invalid database is similar to that of an invalid database URL. Looking at the log file allows you to differentiate a database credential error from that of an invalid database URL. A screenshot displaying this error in the log file is shown below:



```
11 2013-12-17 08:36:49,788 [main] INFO com.hp.csa.oo.tools.exporter.ExportMain - Loading the application
context; this can take a few minutes.
12 2013-12-17 08:36:58,702 [main] WARN org.hibernate.cfg.AnnotationBinder - @ForceDiscriminator is deprecated
use @DiscriminatorOptions instead.
13 2013-12-17 08:37:00,755 [main] WARN org.hibernate.util.JDBCExceptionReporter - SQL Error: 0, SQLState: null
14 2013-12-17 08:37:00,756 [main] ERROR org.hibernate.util.JDBCExceptionReporter - Cannot create
PoolableConnectionFactory (Login failed for user 'sa1'.)
15 2013-12-17 08:37:00,756 [main] WARN org.hibernate.cfg.SettingsFactory - Could not obtain connection to query
metadata
16 org.apache.commons.dbcp.SQLNestedException: Cannot create PoolableConnectionFactory (Login failed for user
'sa1'.)
17 at org.apache.commons.dbcp.BasicDataSource.createPoolableConnectionFactory(BasicDataSource.java:1549)
```

Incorrect truststore location

```
C:\Program Files\Hewlett-Packard\CSA\Tools\ProcessDefinitionTool>java -jar process-defn-tool.jar -d db.properties -i hpoo.xml

Loading the application context; this can take a few minutes.....
Finished loading the application context.

Caught exception: javax.net.ssl.SSLException: java.lang.RuntimeException: Unexpected error: java.security.InvalidAlgorithmParameterException: the trustAnchors parameter must be non-empty
Please check the log: process-defn-tool.log, for details.
```

```
18 2013-12-17 09:35:03,016 [main] ERROR com.hp.csa.oo.tools.exporter.ExportMain - ; nested
exception is:
19     javax.net.ssl.SSLException: java.lang.RuntimeException: Unexpected error: java.
security.InvalidAlgorithmParameterException: the trustAnchors parameter must be non-
empty
20 AxisFault
21     faultCode: {http://schemas.xmlsoap.org/soap/envelope/}Server.userException
22     faultSubcode:
23     faultString: javax.net.ssl.SSLException: java.lang.RuntimeException: Unexpected error:
java.security.InvalidAlgorithmParameterException: the trustAnchors parameter must be non-
empty
24     faultActor:
25     faultNode:
26     faultDetail:
27     {http://xml.apache.org/axis/}stackTrace:javax.net.ssl.SSLException: java.lang.
RuntimeException: Unexpected error: java.security.InvalidAlgorithmParameterException:
the trustAnchors parameter must be non-empty
```

In most cases this truststore attribute value should be the same as the value for `csaTruststore` in the `csa.properties` file.

```
45 #These properties represent the SSL trust store configuration of CSA. The truststore format
46 csaTruststore=C:/Program Files/Java/jre7/lib/security/cacerts
47 csaTruststorePassword=ENC(nN+R6mj8YZKzjsSp1fefs+2rDTEXI8AI)
48
49
```

When the issue is an invalid certificate:

```
C:\Administrator: C:\Windows\system32\cmd.exe
C:\Program Files\Hewlett-Packard\CSA\Tools\ProcessDefinitionTool>java -jar process-defn-tool.jar -d db.properties -i hpoo.xml

Loading the application context; this can take a few minutes.....
Finished loading the application context.

Caught exception: javax.net.ssl.SSLHandshakeException: sun.security.validator.ValidatorException: PKIX path building failed: sun.security.provider.certpath.SunCertPathBuilderException: unable to find valid certification path to requested target
Please check the log: process-defn-tool.log, for details.

usage: java -jar process-defn-tool.jar
```



```

update-true; regex=mail]
145 2013-12-17 09:53:28,657 [main] ERROR com.hp.csa.oo.tools.exporter.ExportMain - ; nested
exception is:
146   javax.net.ssl.SSLHandshakeException: sun.security.validator.ValidatorException: PKIX
path building failed: sun.security.provider.certpath.SunCertPathBuilderException:
unable to find valid certification path to requested target
147 AxisFault
148   faultCode: {http://schemas.xmlsoap.org/soap/envelope/}Server.userException
149   faultSubcode:
150   faultString: javax.net.ssl.SSLHandshakeException: sun.security.validator.
ValidatorException: PKIX path building failed: sun.security.provider.certpath.
SunCertPathBuilderException: unable to find valid certification path to requested target
151   faultActor:
152   faultNode:
153   faultDetail:
154   {http://xml.apache.org/axis/}stackTrace:javax.net.ssl.SSLHandshakeException: sun.
security.validator.ValidatorException: PKIX path building failed: sun.security.
provider.certpath.SunCertPathBuilderException: unable to find valid certification
path to requested target

```

Incorrect truststore credentials

```

Administrator: C:\Windows\system32\cmd.exe
C:\Program Files\Hewlett-Packard\CSA\Tools\ProcessDefinitionTool>java -jar proces
s-defn-tool.jar -d db.properties -i hpoo.xml

Loading the application context; this can take a few minutes.....
Finished loading the application context.

Caught exception: java.net.SocketException: java.security.NoSuchAlgorithmException: Error constructing implementation (algorithm: Default, provider: SunJSSE, class: sun.security.ssl.SSLContextImpl$DefaultSSLContext)
Please check the log: process-defn-tool.log, for details.

```

```

18 2013-12-17 10:05:47,116 [main] ERROR com.hp.csa.oo.tools.exporter.ExportMain - ; nested exception is:
19   java.net.SocketException: java.security.NoSuchAlgorithmException: Error constructing implementation (algorithm:
Default, provider: SunJSSE, class: sun.security.ssl.SSLContextImpl$DefaultSSLContext)
20 AxisFault
21   faultCode: {http://schemas.xmlsoap.org/soap/envelope/}Server.userException
22   faultSubcode:
23   faultString: java.net.SocketException: java.security.NoSuchAlgorithmException: Error constructing implementation (
algorithm: Default, provider: SunJSSE, class: sun.security.ssl.SSLContextImpl$DefaultSSLContext)
24   faultActor:
25   faultNode:
26   faultDetail:
27   {http://xml.apache.org/axis/}stackTrace:java.net.SocketException: java.security.NoSuchAlgorithmException: Error
constructing implementation (algorithm: Default, provider: SunJSSE, class: sun.security.ssl.
SSLContextImpl$DefaultSSLContext)
28   at javax.net.ssl.DefaultSSLContextFactory.throwException(Unknown Source)
29   at javax.net.ssl.DefaultSSLContextFactory.createSocket(Unknown Source)

```

Incorrect OO credentials

```

C:\Program Files\Hewlett-Packard\CSA\Tools\ProcessDefinitionTool>
C:\Program Files\Hewlett-Packard\CSA\Tools\ProcessDefinitionTool>java -jar proces
s-defn-tool.jar -d db.properties -i hpoo.xml

Loading the application context; this can take a few minutes.....
Finished loading the application context.

Caught exception: Failure: User was not authenticated. Please see log file for details.
Invalid username or password
Please check the log: process-defn-tool.log, for details.

```

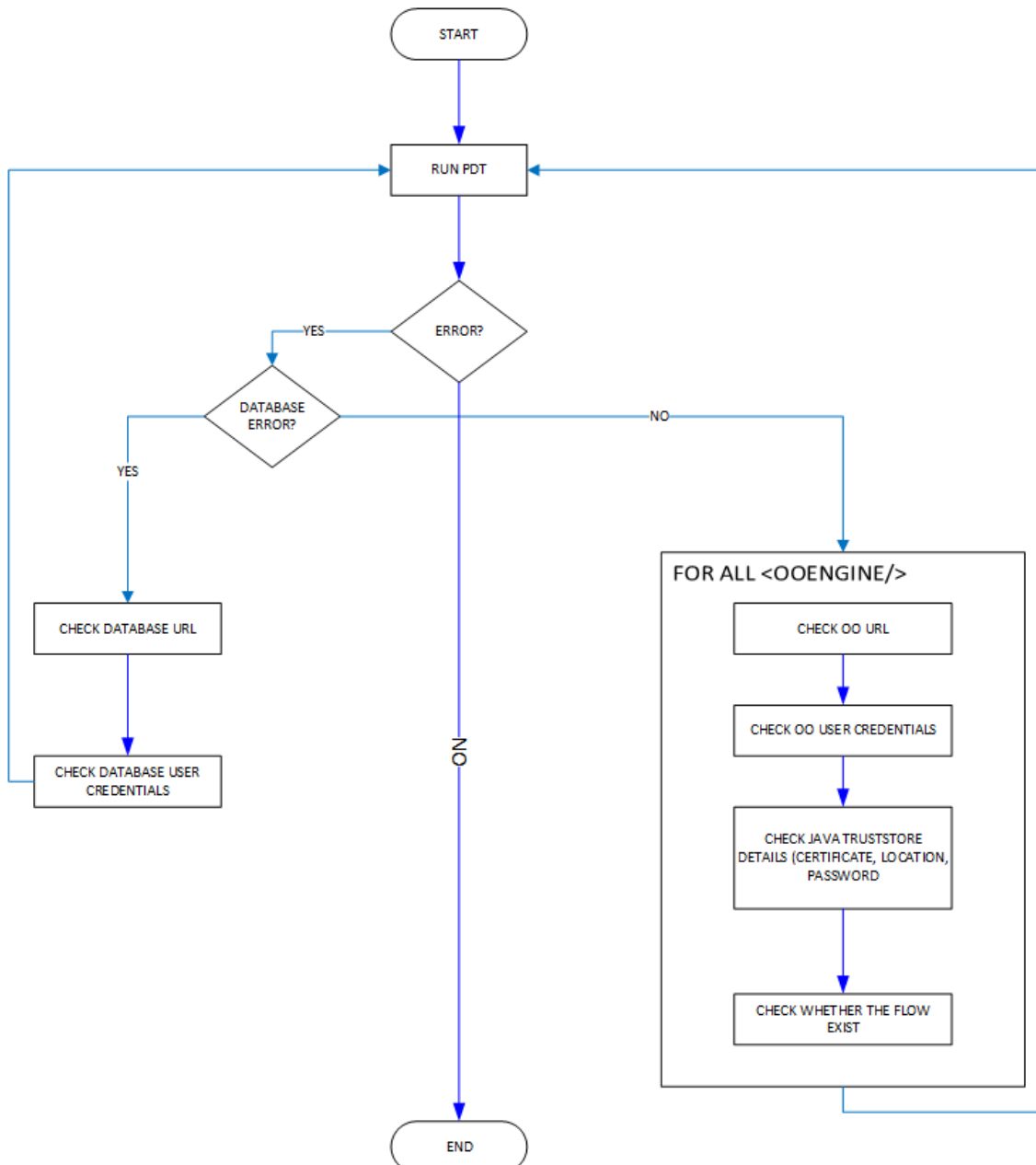
```

Lifecycle/Actions, flow=false, update=false, regex=null]
18 2013-12-17 10:35:51,595 [main] ERROR com.hp.csa.oo.tools.exporter.ExportMain - Failure: User was not
authenticated. Please see log file for details.
19 Invalid username or password
20 AxisFault
21 faultCode: {http://xml.apache.org/axis/}Authentication
22 faultSubcode:
23 faultString: Failure: User was not authenticated. Please see log file for details.
24 Invalid username or password
25 faultActor:
26 faultNode:
27 faultDetail:
28 {http://xml.apache.org/axis/}hostname:brdc-vm21
29
30 Failure: User was not authenticated. Please see log file for details.
31 Invalid username or password
32 at org.apache.axis.message.SOAPFaultBuilder.createFault(SOAPFaultBuilder.java:222)
33 at org.apache.axis.message.SOAPFaultBuilder.endElement(SOAPFaultBuilder.java:129)

```

Incorrect flow location

The following flowchart summarizes steps for debugging errors encountered while running the PDT:

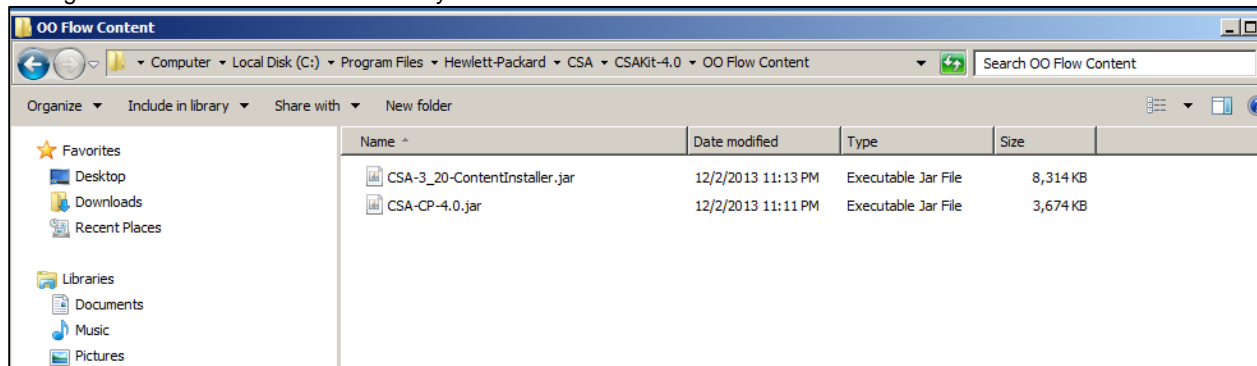


Best Practices

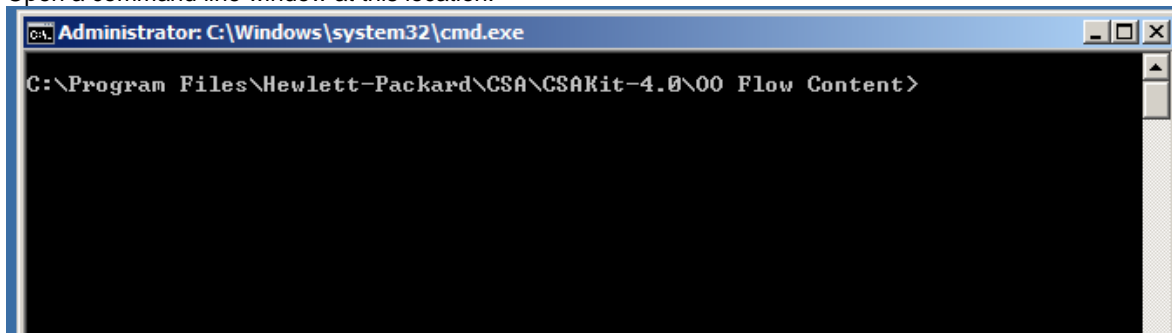
- If your objective is to just create definitions for the OO content that comes with CSA, the sample files generated with the `-g` option will be sufficient. The user credentials for the database, database URL are the attributes that need to be updated in the database file. The attributes of `<ooengine/>` in the input XML file need to be updated, but not the contents of any of the `<folder/>` attributes within the `<ooengine/>`.
- You can have multiple `<ooengines/>` with the same OO URL, multiple user credentials, etc., but the name attribute value for each `<ooengine/>` must be unique. In many ways it is ideal to have different OO engines configured for various types of flows.
- The PDT can be executed to update the existing definitions. Definitions get updated only when properties of the flow (typically under the **Actions** folder) change and not when any of the sub flows invoked by the main flow change.
- Process definitions are uniquely defined by their names. A process definition name is the entire path name for the OO flow (for ex: `/Library/CSA/3.0/Providers/vCenter/vCenter Clone Server/Actions/vCenter Start Server`). A process definition is created with an associated process engine. To create another process definition with the same name but on a different OO server, you need to delete the existing process definition and then add a new definition as part of the new engine.
- Review the `process-defn-tool.log` file for additional details about process definitions.

Installing CSA Content on an OO Server

1. Change to the OO Flow Content directory under CSAKit-4.0:



2. Open a command line window at this location:



- Run the content installer help as shown below. Doing so displays options for running the content jar file.

```

Administrator: C:\Windows\system32\cmd.exe
C:\Program Files\Hewlett-Packard\CSA\CSAKit-4.0\OO Flow Content>java -jar CSA-3_20-ContentInstaller.jar -help
-----
Launcher Process ID: <10560>
-----

Processing stopped, reason: Help Requested

Help options:
  Basic Usage:    '-help'
  Advanced Usage: '-helpAll'

Usage:
  java -jar CSA-3_20-ContentInstaller.jar  -centralPassword <password>
                                           [-centralURL <url>]
                                           [-centralUsername <username>]
                                           [-home <iconclude_home>]
                                           [-ras <RAS URL>]
                                           [-repo <localRepo>]
                                           [-ep <encryptedRepoPassword>]
                                           [-nopublish]
                                           [-nostream]
                                           [-manifest]
                                           [-version]
                                           [-locale <language>]
                                           [-forceInstall]
                                           [-continueOnRASError]
                                           [-proxyHost]
                                           [-proxyPort]
                                           [-proxyUsername]
                                           [-proxyPassword]
                                           [-rasChunkSize]
                                           [-rasTimeout]

  -home                OO folder. Default: 'ICONCLUDE_HOME' environment variable.
  -centralURL          Default is 'https://localhost:8443'
  -centralUsername     Default is 'admin'
  -centralPassword     Password to use. Required.

```

- A typical invocation of the content jar for an OO server running locally is shown below (in this example the server password is admin).

```

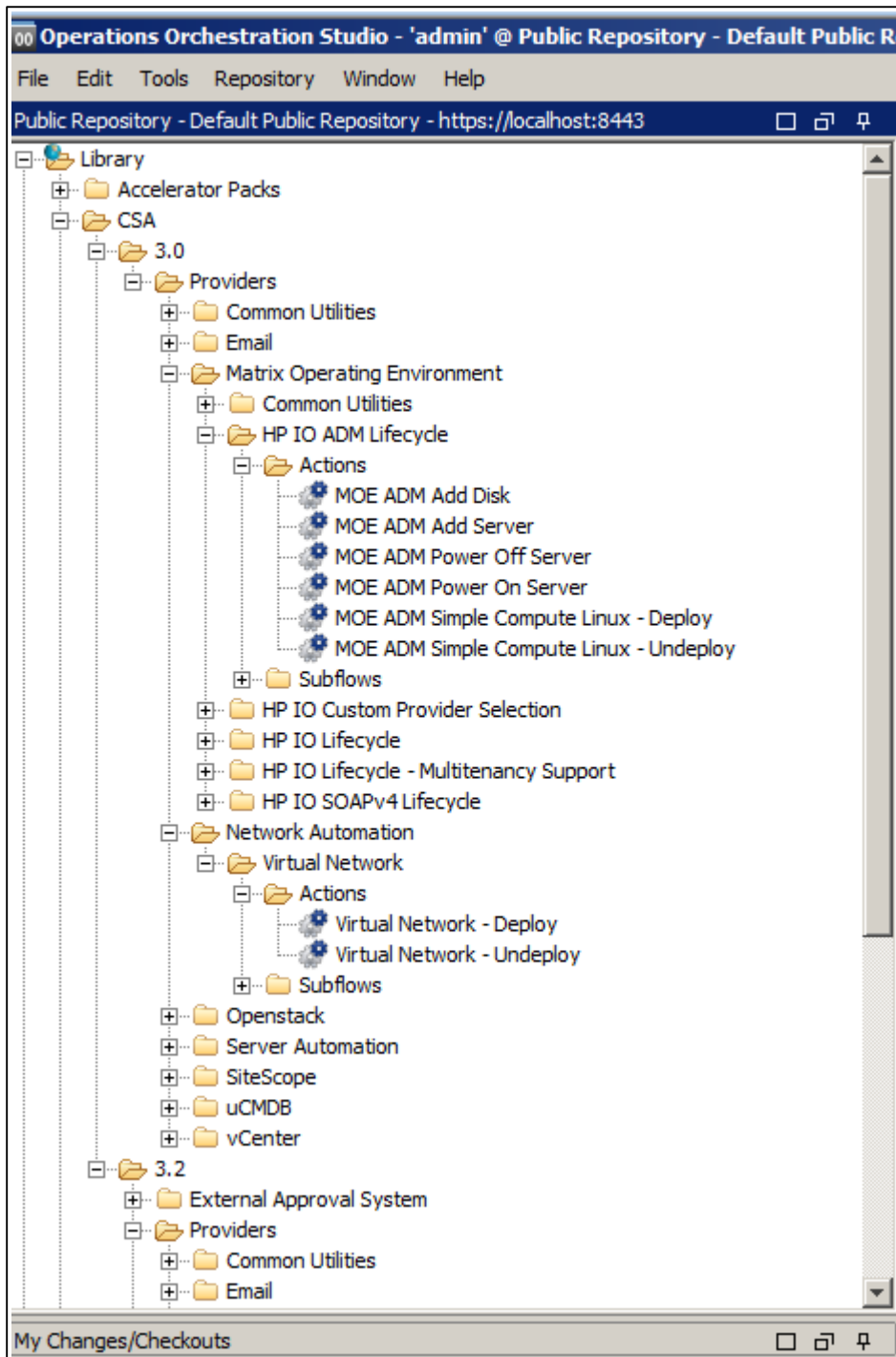
Administrator: C:\Windows\system32\cmd.exe
C:\Program Files\Hewlett-Packard\CSA\CSAKit-4.0\OO Flow Content>dir
Volume in drive C has no label.
Volume Serial Number is F08E-458B

Directory of C:\Program Files\Hewlett-Packard\CSA\CSAKit-4.0\OO Flow Content
12/02/2013  11:13 PM    <DIR>          .
12/02/2013  11:13 PM    <DIR>          ..
12/02/2013  11:13 PM             8,513,290 CSA-3_20-ContentInstaller.jar
12/02/2013  11:11 PM             3,761,256 CSA-CP-4.0.jar
                2 File(s)      12,274,546 bytes
                2 Dir(s)   60,246,552,576 bytes free

C:\Program Files\Hewlett-Packard\CSA\CSAKit-4.0\OO Flow Content>java -jar CSA-3_20-ContentInstaller.jar -centralPassword admin_

```

5. This action should import OO flow content to the OO server. Open OO Studio and you will see the CSA Content imported to a folder under CSA.



- Change to the directory where the PDT is installed and invoke PDT help as shown:

```
Administrator: C:\Windows\system32\cmd.exe
C:\Program Files\Hewlett-Packard\CSA\Tools\ProcessDefinitionTool>java -jar process-defn-tool.jar -h

usage: java -jar process-defn-tool.jar
       [-h] ! [-e <password to encrypt>] ! [-g]!
       ! [-v <OO Info input file>]
       ! [-d <db properties file> -i <OO Info input file> ! -p <process engine info input>]
       [-l <space separated Oracle JDBC jar Files>]

process-defn-tool - This tool will synchronize CDA Actions / OO flows into CSA as process definitions.
-d,--dbprops <db properties file>
-e,--encrypt <arg>                Encrypt the given password
-g,--generate                      Generate sample input files for the tool
-h,--help                          Print this usage information
-i,--ooinput <OO Info input file>
-l,--libs <arg>                    Oracle library files
-p,--engines <Process Engine Info input file>
-v,--validate <arg>              Validate an OO Info Input XML
For more information, refer to the Installation and Configuration Guide.

C:\Program Files\Hewlett-Packard\CSA\Tools\ProcessDefinitionTool>_
```

- Running the PDT with the `-g` option generates the sample file needed for the initial run.

```
Administrator: C:\Windows\system32\cmd.exe
C:\Program Files\Hewlett-Packard\CSA\Tools\ProcessDefinitionTool>java -jar process-defn-tool.jar -g

Generated the following sample input files:
  HPOOInputSample.xml (for providing OO Info)
  ProcessEngineInputSample.xml (for providing CDA Info)
  OracleInputSample.properties (for providing Oracle DB info)
  MsSqlInputSample.properties (for providing MSSQL DB info)
  PostgreSQLInputSample.properties (for providing PostgreSQL DB info)

Refer to the Installation and Configuration Guide for more information on these files.

C:\Program Files\Hewlett-Packard\CSA\Tools\ProcessDefinitionTool>_
```

- The file `HPOOInputSample.xml` contains information about all the OO flow contents. The sample file that gets generated contains three `<ooengine>` instances.

```
<ooengine
  name="OO-MACHINE-NAME"
  uri="https://localhost:8443/PAS/services/WSCentralService"
  truststore="C:/Program Files/Java/jre7/lib/security/cacerts"
  truststorePassword="ENC(q6ctyVrBrqWIp107R00q58CrZh8tzPkP)"
  username="admin"
  password="ENC(0KnPim+0x/CEVeJJMpLnIg==)">
  <!-- To import all the flows under a single folder, use the syntax
  <folder path="/path/to/folder">, as shown below
  -->
  <folder path="/Library/CSA/3.0/Providers/Matrix Operating Environment/HP IO Lifecycle/Actions"/>
  <folder path="/Library/CSA/3.0/Providers/Matrix Operating Environment/HP IO Lifecycle - Multitenancy Support/Actions"/>
  <folder path="/Library/CSA/3.0/Providers/Matrix Operating Environment/HP IO ADM Lifecycle/Actions"/>
  <folder path="/Library/CSA/3.0/Providers/Server Automation/ADM Application Deployment/Actions"/>
  <folder path="/Library/CSA/3.0/Providers/Server Automation/DMA Workflows Deployment/Actions"/>
  <folder path="/Library/CSA/3.0/Providers/Server Automation/Manage Servers/Actions"/>
  <folder path="/Library/CSA/3.0/Providers/SiteScope/Server Monitoring/Actions"/>
  <folder path="/Library/CSA/3.0/Providers/uCMDB/Configuration Management/Actions"/>
  <folder path="/Library/CSA/3.0/Providers/vCenter/vCenter Clone Server/Actions" update="true" />
  <folder path="/Library/CSA/3.0/Providers/vCenter/vCenter Flex Server Count/Actions" update="true" />
  <folder path="/Library/CSA/3.0/Providers/vCenter/vCenter Flex Server Resources/Actions" update="true" />
  <folder path="/Library/CSA/3.0/Providers/Matrix Operating Environment/HP IO Custom Provider Selection/Actions"/>
```

```

<ooengine
  accessPointType="EXTERNAL_APPROVAL"
  name="OO-EXTERNAL-APPROVAL"
  uri="https://localhost:8443/PAS/services/wSCentralService"
  truststore="C:/Program Files/Java/jre7/lib/security/cacerts"
  truststorePassword="ENC(q6ctyVrBrqWIp107R00q58CrZh8tzPkP)"
  username="admin"
  password="ENC(0KnPim+0x/CEVeJJMpLnIg==)">

  <folder flow="true" path="/Library/CSA/3.2/External Approval System/Service Manager/Actions/SM Initiate Request Appro

</ooengine>
<ooengine
  accessPointType="RESOURCE_POOL_SYNC"
  name="OO-RESOURCE-POOL-SYNC"
  uri="https://localhost:8443/PAS/services/wSCentralService"
  truststore="C:/Program Files/Java/jre7/lib/security/cacerts"
  truststorePassword="ENC(q6ctyVrBrqWIp107R00q58CrZh8tzPkP)"
  username="admin"
  password="ENC(0KnPim+0x/CEVeJJMpLnIg==)">

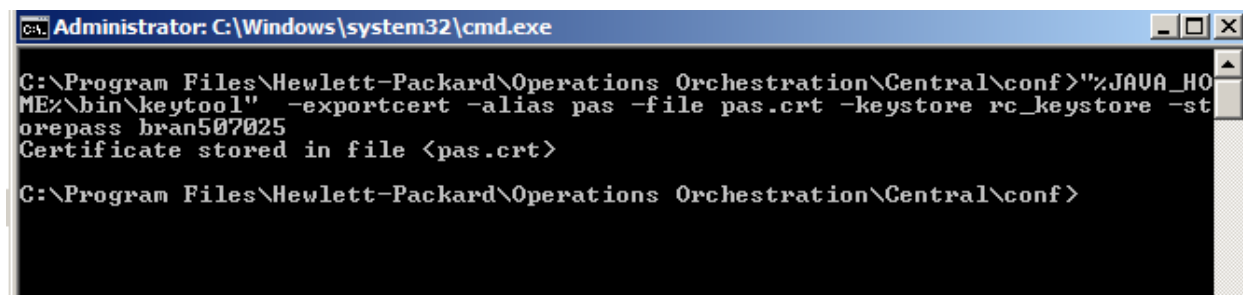
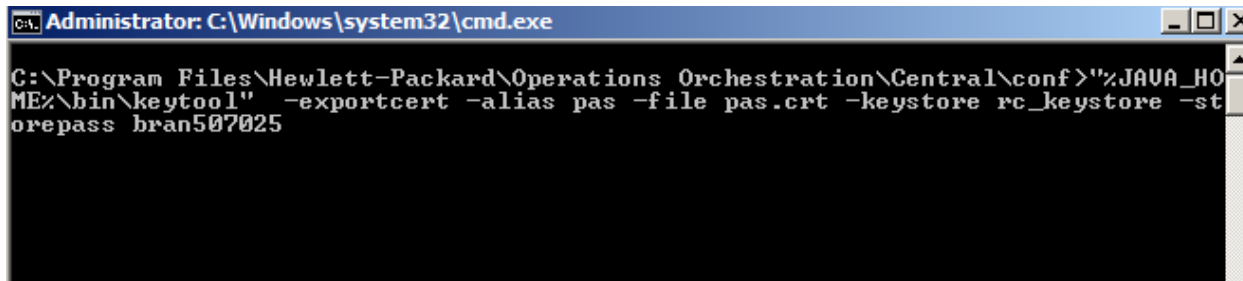
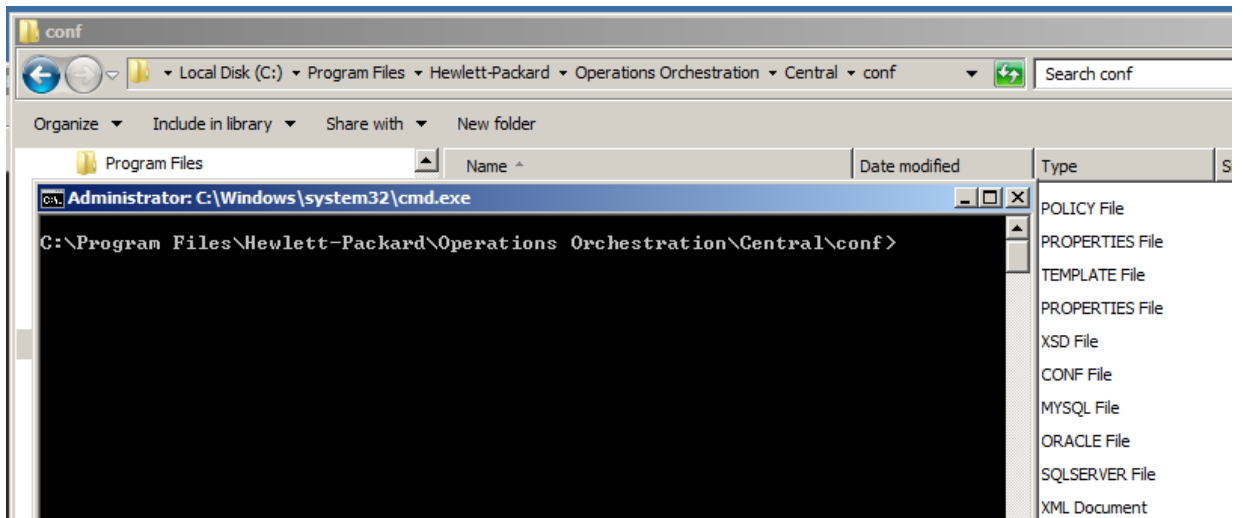
  <folder path="/Library/CSA/3.2/Resource Pool Sync/Actions" recursive="true" update="true" />

</ooengine>

```

- Before updating truststore and truststorepassword for all these <ooengine/>instances, make sure the OO certificate-related information is copied to the Java truststore used for running the tool.

For OO 9.x version:



```
Administrator: Command Prompt
C:\Program Files\Java\jre7\lib\security>copy "C:\Program Files\Hewlett-Packard\Operations Orchestration\Central\conf\pas.crt" .
```

```
Administrator: Command Prompt
C:\Program Files\Java\jre7\lib\security>copy "C:\Program Files\Hewlett-Packard\Operations Orchestration\Central\conf\pas.crt" .
1 file(s) copied.

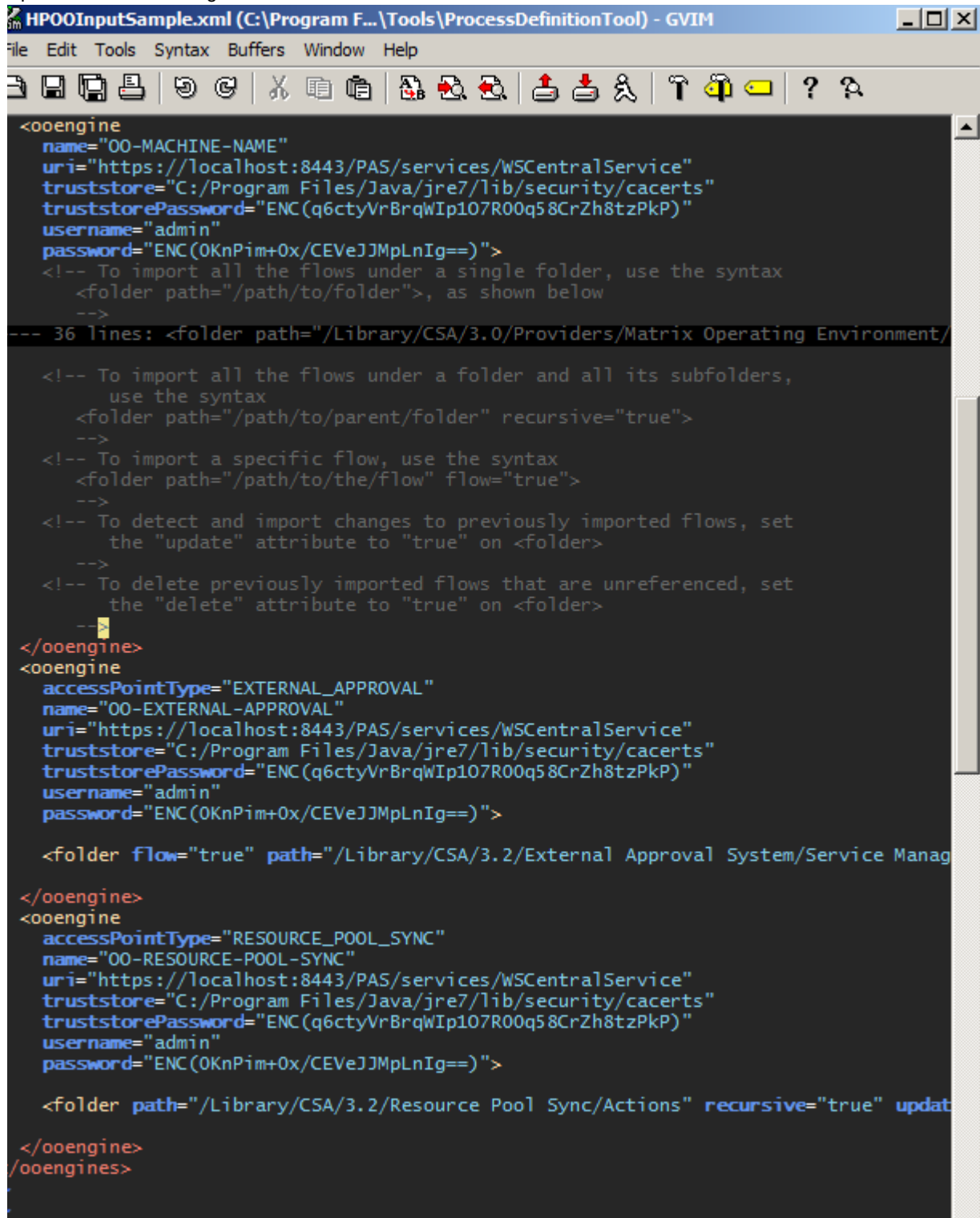
C:\Program Files\Java\jre7\lib\security>"%JAVA_HOME%\bin\keytool" -importcert -alias pas -file pas.crt -keystore cacerts -storepass changeit
Owner: CN=opsware.com, OU=Process Automation System, O=PAS, L=Bellevue, ST=WA, C=US
Issuer: CN=opsware.com, OU=Process Automation System, O=PAS, L=Bellevue, ST=WA, C=US
Serial number: 4d7eacd7
Valid from: Mon Mar 14 17:03:35 PDT 2011 until: Fri Jul 01 17:03:35 PDT 2016
Certificate fingerprints:
    MD5: 13:74:5A:65:9D:86:82:46:CD:67:37:58:4F:4E:8C:8B
    SHA1: 43:2E:A0:FB:10:19:CC:80:8E:8D:65:BA:36:C1:D2:DA:01:FD:B3:24
    SHA256: 7D:10:71:30:D5:55:C5:30:0C:16:B7:B0:E9:02:D7:04:93:35:65:82:D5:66:DB:DF:6B:38:2A:C3:AA:33:B4:89
Signature algorithm name: MD5withRSA
Version: 3
Trust this certificate? [no]: yes
Certificate was added to keystore

C:\Program Files\Java\jre7\lib\security>
```

For OO 10.x version, the only differences from 9.x version are shown below:

	OO 9.x	OO 10.x
Alias (used to export OO SSL certificate)	pas	tomcat
Password (used to export OO SSL certificate)	bran507025	changeit
Keystore location	<ICONCLUDE_HOME>/Central/conf/rc_keystore	<ICONCLUDE_HOME>/Central/var/security/keystore
PROCESS_ENGINE_VERSION (used to identify the OO version interacting with CSA)	9	Displays the exact version, e.g., 10.02 would display 10.02.

10. Update all of the <ooengine/> truststore attribute locations with the value of cacerts.



```
HPOOInputSample.xml (C:\Program F... \Tools\ProcessDefinitionTool) - GVIM
File Edit Tools Syntax Buffers Window Help
[Icons]
<ooengine
  name="OO-MACHINE-NAME"
  uri="https://localhost:8443/PAS/services/WSCentralService"
  truststore="C:/Program Files/Java/jre7/lib/security/cacerts"
  truststorePassword="ENC(q6ctyVrBrqWIp107R00q58CrZh8tzPkP)"
  username="admin"
  password="ENC(0KnPim+0x/CEVeJJMpLnIg==)">
  <!-- To import all the flows under a single folder, use the syntax
  <folder path="/path/to/folder">, as shown below
  -->
  --- 36 lines: <folder path="/Library/CSA/3.0/Providers/Matrix Operating Environment/

  <!-- To import all the flows under a folder and all its subfolders,
  use the syntax
  <folder path="/path/to/parent/folder" recursive="true">
  -->
  <!-- To import a specific flow, use the syntax
  <folder path="/path/to/the/flow" flow="true">
  -->
  <!-- To detect and import changes to previously imported flows, set
  the "update" attribute to "true" on <folder>
  -->
  <!-- To delete previously imported flows that are unreferenced, set
  the "delete" attribute to "true" on <folder>
  -->
</ooengine>
<ooengine
  accessPointType="EXTERNAL_APPROVAL"
  name="OO-EXTERNAL-APPROVAL"
  uri="https://localhost:8443/PAS/services/WSCentralService"
  truststore="C:/Program Files/Java/jre7/lib/security/cacerts"
  truststorePassword="ENC(q6ctyVrBrqWIp107R00q58CrZh8tzPkP)"
  username="admin"
  password="ENC(0KnPim+0x/CEVeJJMpLnIg==)">

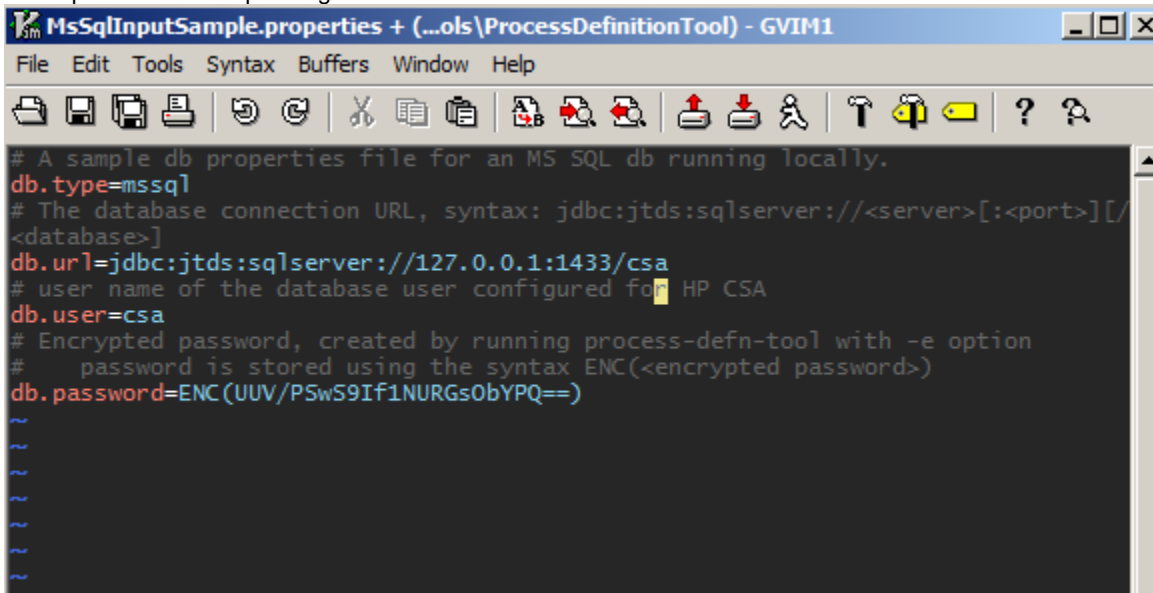
  <folder flow="true" path="/Library/CSA/3.2/External Approval System/Service Manag

</ooengine>
<ooengine
  accessPointType="RESOURCE_POOL_SYNC"
  name="OO-RESOURCE-POOL-SYNC"
  uri="https://localhost:8443/PAS/services/WSCentralService"
  truststore="C:/Program Files/Java/jre7/lib/security/cacerts"
  truststorePassword="ENC(q6ctyVrBrqWIp107R00q58CrZh8tzPkP)"
  username="admin"
  password="ENC(0KnPim+0x/CEVeJJMpLnIg==)">

  <folder path="/Library/CSA/3.2/Resource Pool Sync/Actions" recursive="true" updat

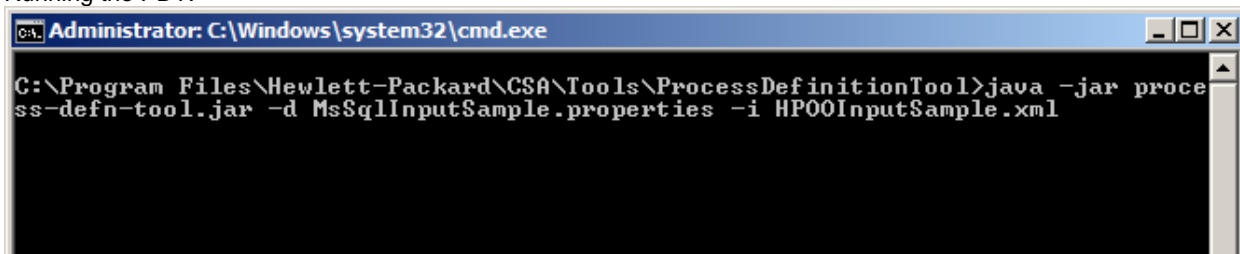
</ooengine>
/ooengines>
.
```

11. Now update the corresponding database file:



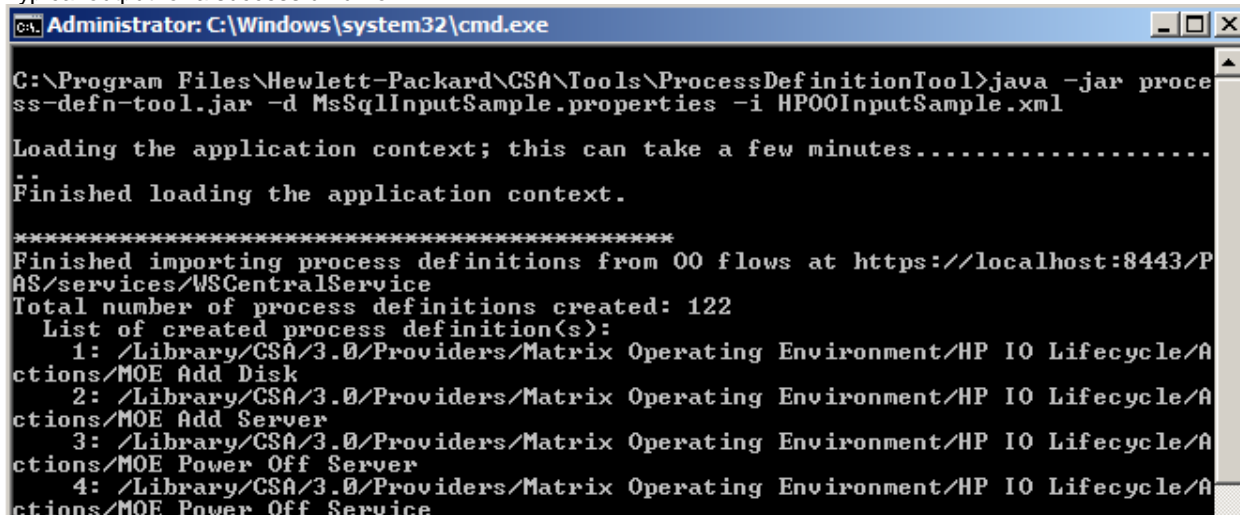
```
MsSqlInputSample.properties + (...ols\ProcessDefinitionTool) - GVIM1
File Edit Tools Syntax Buffers Window Help
# A sample db properties file for an MS SQL db running locally.
db.type=mssql
# The database connection URL, syntax: jdbc:jtds:sqlserver://<server>[:<port>]/
<database>]
db.url=jdbc:jtds:sqlserver://127.0.0.1:1433/csa
# user name of the database user configured for HP CSA
db.user=csa
# Encrypted password, created by running process-defn-tool with -e option
# password is stored using the syntax ENC(<encrypted password>)
db.password=ENC(UUV/PSwS9If1NURGsObYPQ==)
~
~
~
~
~
~
```

12. Running the PDT:



```
Administrator: C:\Windows\system32\cmd.exe
C:\Program Files\Hewlett-Packard\CSA\Tools\ProcessDefinitionTool>java -jar proces-
s-defn-tool.jar -d MsSqlInputSample.properties -i HPO0InputSample.xml
```

13. Typical output for a successful run of PDT:



```
Administrator: C:\Windows\system32\cmd.exe
C:\Program Files\Hewlett-Packard\CSA\Tools\ProcessDefinitionTool>java -jar proces-
s-defn-tool.jar -d MsSqlInputSample.properties -i HPO0InputSample.xml
Loading the application context; this can take a few minutes.....
..
Finished loading the application context.
*****
Finished importing process definitions from 00 flows at https://localhost:8443/P
AS/services/WSCentralService
Total number of process definitions created: 122
List of created process definition(s):
1: /Library/CSA/3.0/Providers/Matrix Operating Environment/HP IO Lifecycle/A
ctions/MOE Add Disk
2: /Library/CSA/3.0/Providers/Matrix Operating Environment/HP IO Lifecycle/A
ctions/MOE Add Server
3: /Library/CSA/3.0/Providers/Matrix Operating Environment/HP IO Lifecycle/A
ctions/MOE Power Off Server
4: /Library/CSA/3.0/Providers/Matrix Operating Environment/HP IO Lifecycle/A
ctions/MOE Power Off Service
```

```

120: /Library/CSA/3.2/Providers/uCMDB/Configuration Management/Actions/uCMDB
Delete
121: /Library/CSA/3.2/Providers/Network Automation/Virtual Network/Actions/V
irtual Network - Deploy
122: /Library/CSA/3.2/Providers/Network Automation/Virtual Network/Actions/V
irtual Network - Undeploy

Total number of process definitions updated: 0
Total number of process definitions deleted: 0

*****
Finished importing process definitions from 00 flows at https://localhost:8443/P
AS/services/WSCentralService
Total number of process definitions created: 1
List of created process definition(s):
1: /Library/CSA/3.2/External Approval System/Service Manager/Actions/SM Init
iate Request Approval

Total number of process definitions updated: 0
Total number of process definitions deleted: 0

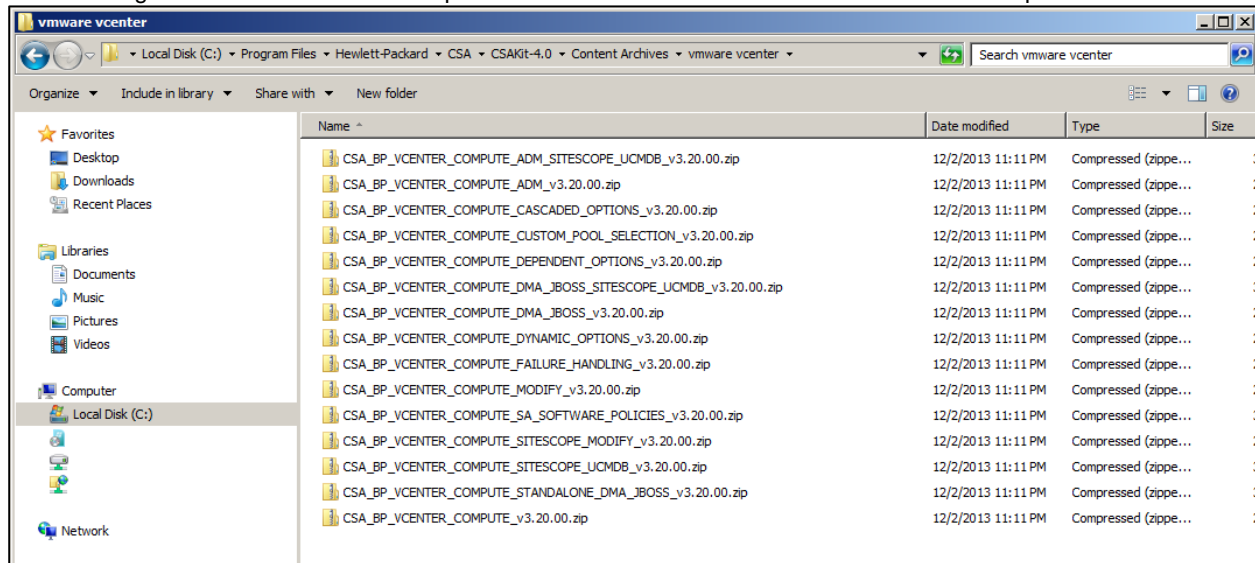
*****
Finished importing process definitions from 00 flows at https://localhost:8443/P
AS/services/WSCentralService
Total number of process definitions created: 1
List of created process definition(s):
1: /Library/CSA/3.2/Resource Pool Sync/Actions/UCenter Sync Resource Capacit
y

Total number of process definitions updated: 0
Total number of process definitions deleted: 0

*****
C:\Program Files\Hewlett-Packard\CSA\Tools\ProcessDefinitionTool>_

```

14. The following screenshot shows an example of some of the archive files that are available for import after CSA is installed.



15. Import a service design through the Console UI:

- a. In the Sequenced Designs view where All Designs displays, click the gear icon and select **Import Design**.
- b. In the Import Design dialog, select or specify the **Archive File** (.zip file) that contains the service design you want to import.
- c. Select an **Option**:
 - i. **Import** - Imports a new service design and its associated resource offerings from the selected archive file, if it does not already exist. This action does not update existing service designs. You cannot import a service design if it has the same internal name as the existing service design.
 - ii. **Update** - Imports an existing service design and its associated resource offerings from the selected archive file. If the service design already exists, this action updates (overwrites) existing service design versions. If the service design does not exist, this action will add it to CSA. Check **Preserve Originals** to create a

backup copy of the existing service design. The backup copy will be saved with "Superseded" and the date appended to the display name of the service design.

- d. Click **Preview** to see a report of prospective results for the import process, including information about the artifacts and their status.
- e. Click **Import** and wait for the confirmation message. Click **View Detailed Report** to see a summary and details of the import process, including information about the artifacts and their status.
- f. Click **Close**. The new version is listed in the **All Designs** area.

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If you have comments about this document, you can send them to clouddocs@hpe.com.

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