Oracle Business Activity Monitoring Implementation and User Guide

Oracle FLEXCUBE Investor Servicing

Release 12.0.3.0.0

[April] [2014]

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1. Introduction

1.1 Need for Real Time Business Activity Monitoring

In today's highly competitive service-oriented business climate, operational managers and executives require real-time visibility into the status of their process networks. Whether their business is shipping widgets or trading electronic assets, operations managers are now guaranteeing customers flawless execution 24x7—for these innovators, instant visibility is the new state-of-the-art for enterprise processes. The demand however, is not for granular visibility into the individual lower level events and exceptions that a process generates in the due course of its execution. The need is for analyzing the emanating process information and computing the higher-level complex event aggregates, thresholds, identifying causal relationships between different event types, complex temporal event patterns, root-cause behavior identification etc. Once the said analytics have been processed, managers expect a channel in place for real-time delivery of the analyzed information and a platform to enable joint-collaborative problem resolution that aid business process optimization. This white paper attempts to detail the types of challenges that exist in the realm of enterprise process optimization and how technologies like Oracle BAM help address the problem.

1.2 Benefits of ORACLE BAM

Oracle Business Activity Monitoring (Oracle BAM) gives business executives the ability to monitor their business services and processes in the enterprise, to correlate KPIs down to the actual business process themselves, and most important, to change business processes quickly or to take corrective action if the business environment changes. Oracle BAM is a complete solution for building real-time operational dashboards and monitoring and alerting applications over the Web. Using this technology, business users get the ability to build interactive, real-time dashboards and proactive alerts to monitor their business services and processes.

Oracle Business Activity Monitoring (Oracle BAM) is a key technology component of Oracle Fusion Middleware and Service-Oriented Architecture. Oracle BAM satisfies a growing need to enable Business Executives, and more specifically operations managers, to improve their decision-making processes by first getting a real time view of the business events occurring in their enterprise, and second using the derived intelligence to analyze and improve the efficiency of their business processes. For instance, organizations that run distributed global supply chains with Just-in-Time inventory practices have the need to continually monitor their inventory levels and to correlate them to the bill of materials and replenishment requests they have sent to their suppliers and logistics partner to continually ensure that they have a balanced flow of parts and inventory throughout their entire supply chain. Similarly, telecommunications companies who are provisioning new services and new customers want to continually monitor their provisioning processes that touch hundreds of operational systems to ensure that they have an up-to-the minute view of the status of outstanding customer service requests. Business Activity Monitoring provides customers with the ability to instrument their ERP/Business Applications, Legacy Systems, and Business Processes to monitor Business Events; to correlate these Business Events with each other; and to understand their impact on the Key Performance Indicators that affect the Business. It, therefore, improves the visibility that Business Executives have on the important operational elements of their business to continually improve the efficiency of their Business Processes.

2. Document Overview

The document talks about the following:

- Installation of Oracle BAM
- Creating Data Objects & Sample Reports
- Integrating BAM with BPEL Process
- Demo on FCIS Redemption Work Flow

3. Requirements

Integrating Oracle Business Activity Monitoring with Oracle FLEXCUBE Investor Servicing Process flows.

4. Prerequisites

This section explains the requirements which must be met before you start installation.

4.1 Software System Requirements

4.1.1 General Software Requirements

All machines on which Oracle Business Activity Monitoring (for a production Environment) components are installed require the following software:

- Microsoft Windows Server Intel x86 versions supported:
- Microsoft Windows 2000 Server (with SP4 or higher)
- Microsoft Windows 2000 Advanced Server (with SP4 or higher)
- Microsoft Windows 2000 Datacenter Server (with SP4 or higher)
- Microsoft Windows Server 2003 Standard Edition
- Microsoft Windows Server 2003 Enterprise Edition
- Microsoft Windows Server 2003 Datacenter Edition
- Microsoft Windows Server 2003 R2, Standard Edition
- Microsoft Windows Server 2003 R2, Enterprise Edition
- Microsoft Windows Server 2003 R2, Datacenter Edition

Enterprise Link is not supported on Microsoft Windows Server 2003 R2 platforms.

If you are installing on a Microsoft Windows 2000 platform running Terminal Services, Terminal Services must be in Administration Mode, not Application Server Mode. See the article, HOW TO: Install Terminal Services in Remote Administration Mode in Windows 2000: http://support.microsoft.com/?id=30662

Microsoft .NET Framework 1.1, Service Pack 1 is required on all servers except for the Oracle Database Server. This component will be installed on your system automatically if it is not already present.

Internet Information Service (IIS) 5.0 or above must be installed before running the Oracle Business Activity Monitoring installation. The Oracle Business Activity Monitoring server installation must be able to stop and restart the IIS service, or the installation cannot be completed.

Oracle 10g Release 1 must be installed and BAM installer will ask for SYS password to create BAM User in the database.

For more detailed information, Please check Oracle Bam Installation Document.

4.2 Hardware

Specification	Minimum	Notes

CPU	2 GHz	Actual requirements depend on the on patterns of use in the target environment.
RAM	1GB	
Disk Space	2 GB	This is sufficient if the selected database system is installed on another machine. The database server machine must have sufficient space for the selected database system. The requirements for registry data are quite modest. Each GB typically provides for registration of several thousand additional entities. So disk performance is more significant.

5. Installation

5.1 Oracle Business Activity Monitoring Setup

5.1.1 Introduction

1. Database Installation is Completed
2. Microsoft Internet Information Service (IIS) 5.0 or above is installed and configured
3. Microsoft .NET Framework 1.1, Service Pack 1 is installed (optional, BAM Installer will Install this if not available)

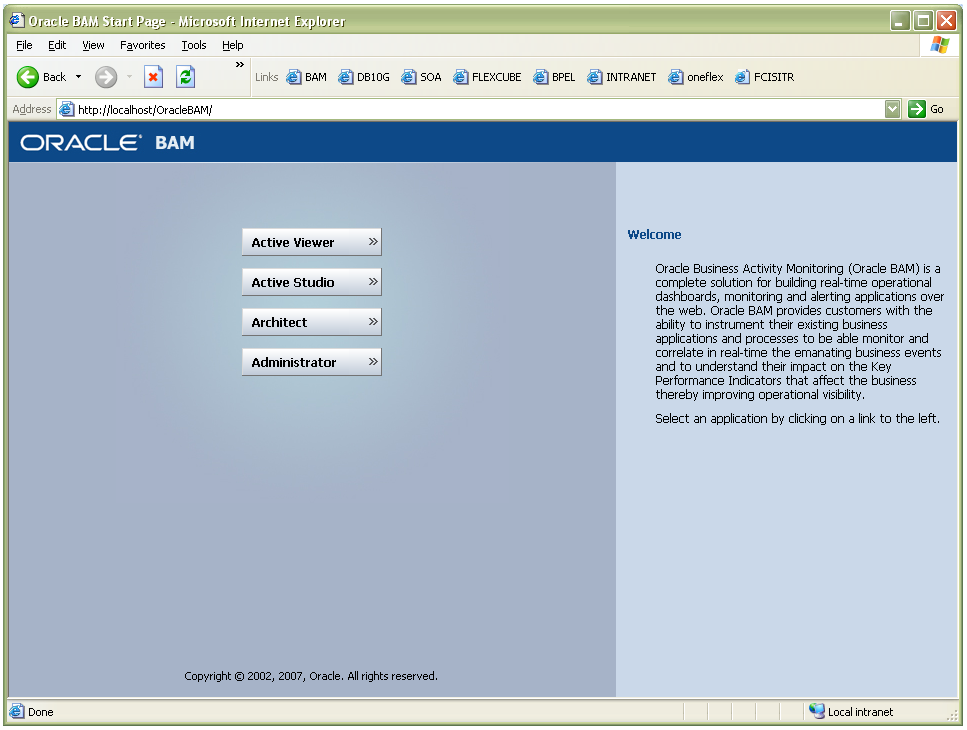
5.1.2 Steps for installing BAM

Oracle Business Activity Monitoring Software and installation document can be downloaded from http://www.oracle.com/technology/products/integration/bam/index.html.

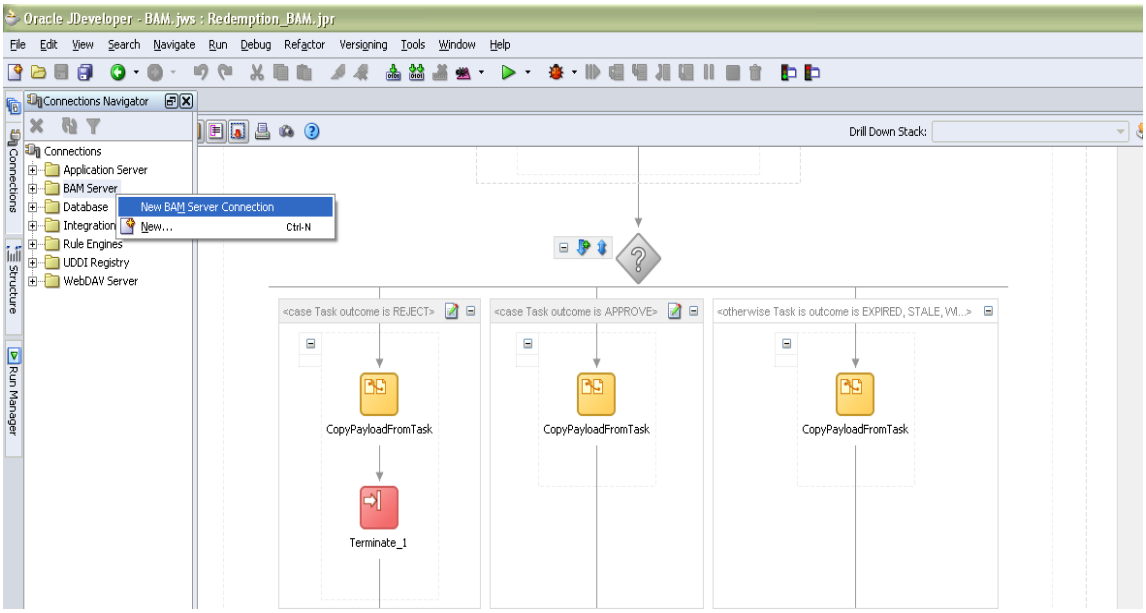
6. Connecting BPEL to BAM Server

6.1 Starting the BAM Server

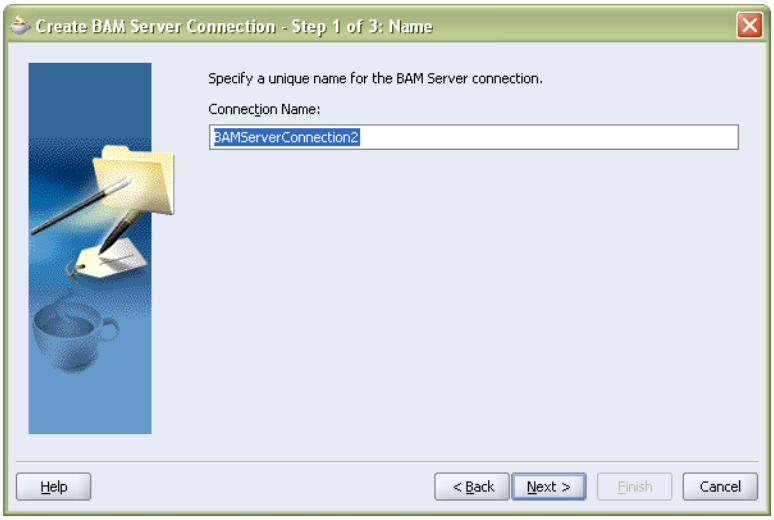
Run startOracleBAM.bat available C:\OracleBAM\BAM\ to start all the services. BAM starts up will be accessible in http://<HostName>/OracleBAM.

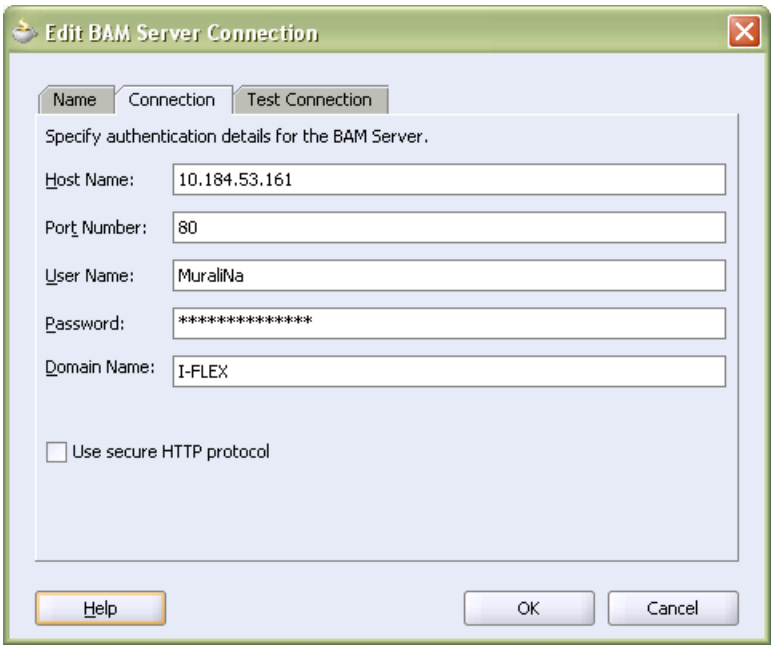


6.2 Creating a BAM Connection in Jdeveloper

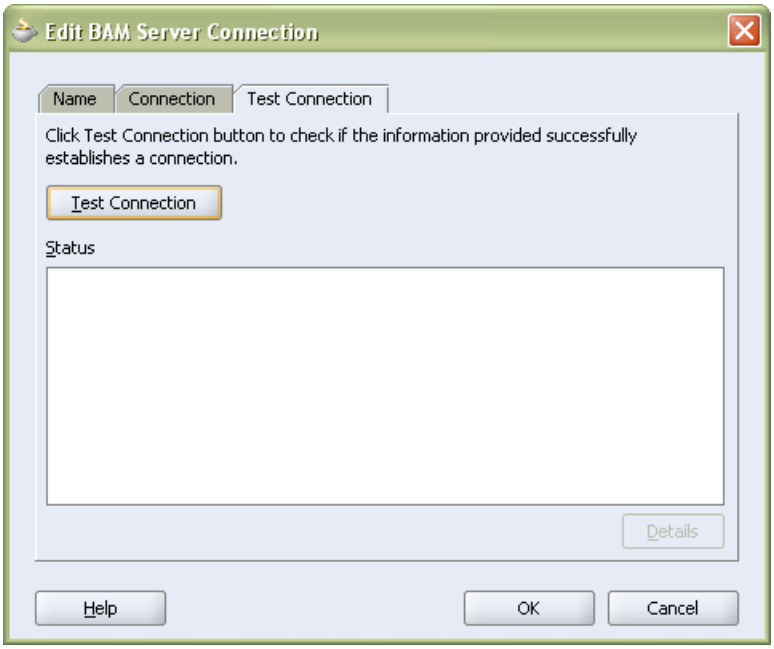


1. In Jdeveloper go to the Connection Panel and right click on BAM Server and click on New BAM Server Connection.

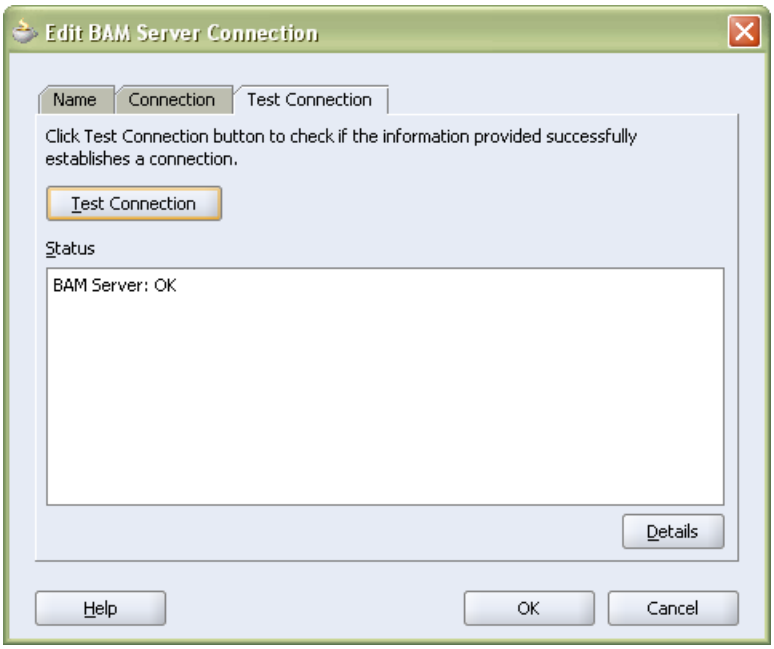




2. Enter the Bam server details and click on ok.



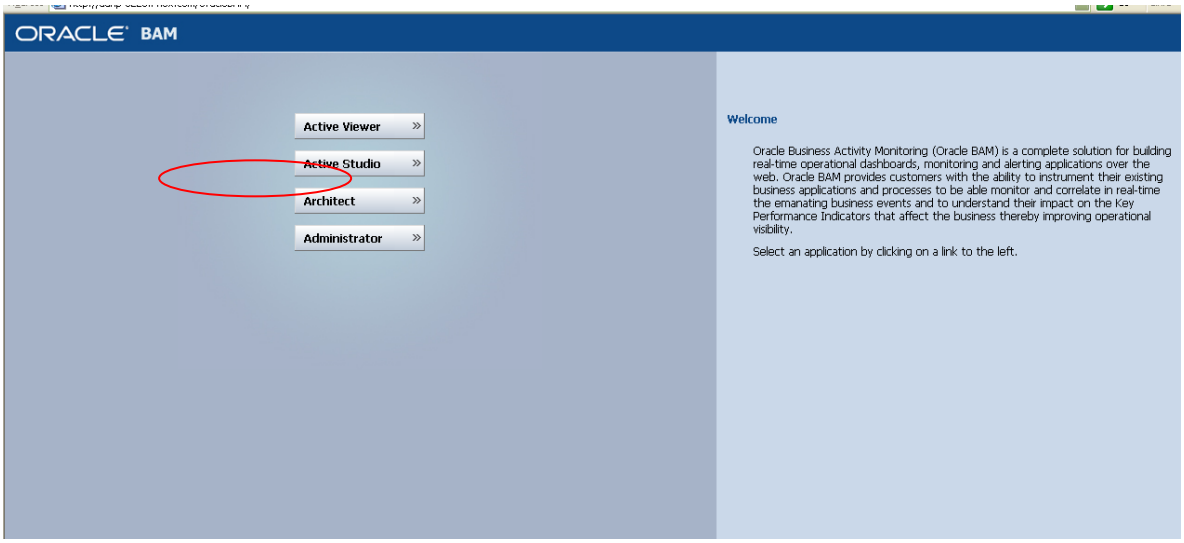
3. Click on Test Connection to check the status.



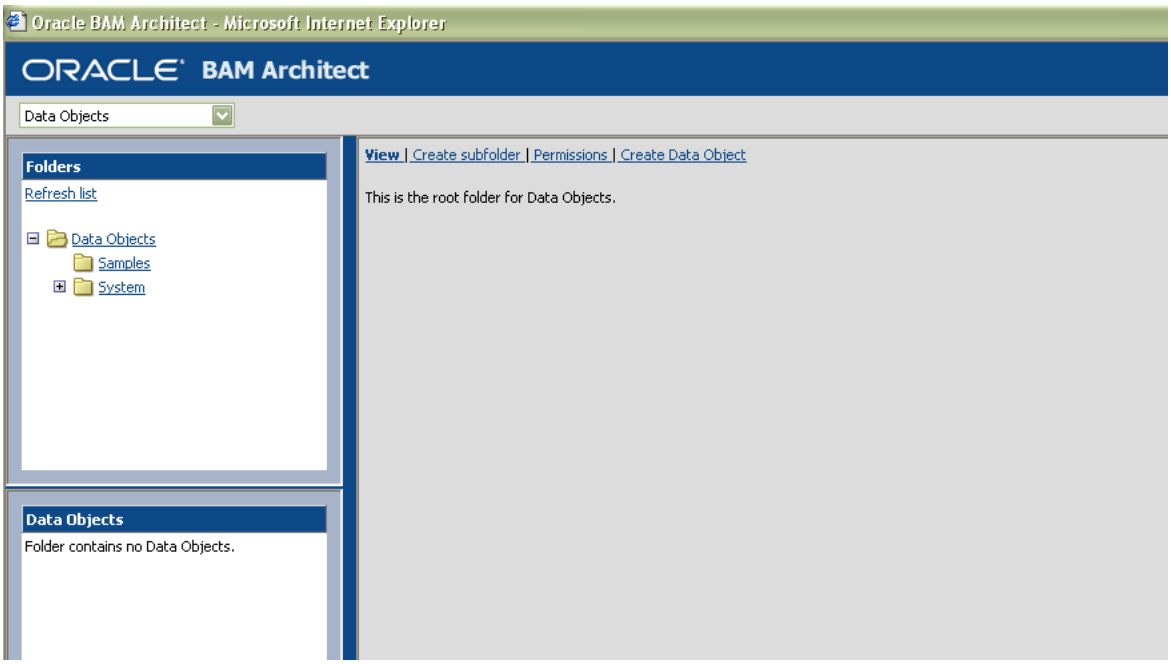
4. Click on Ok.

6.3 Creating BAM Data Objects

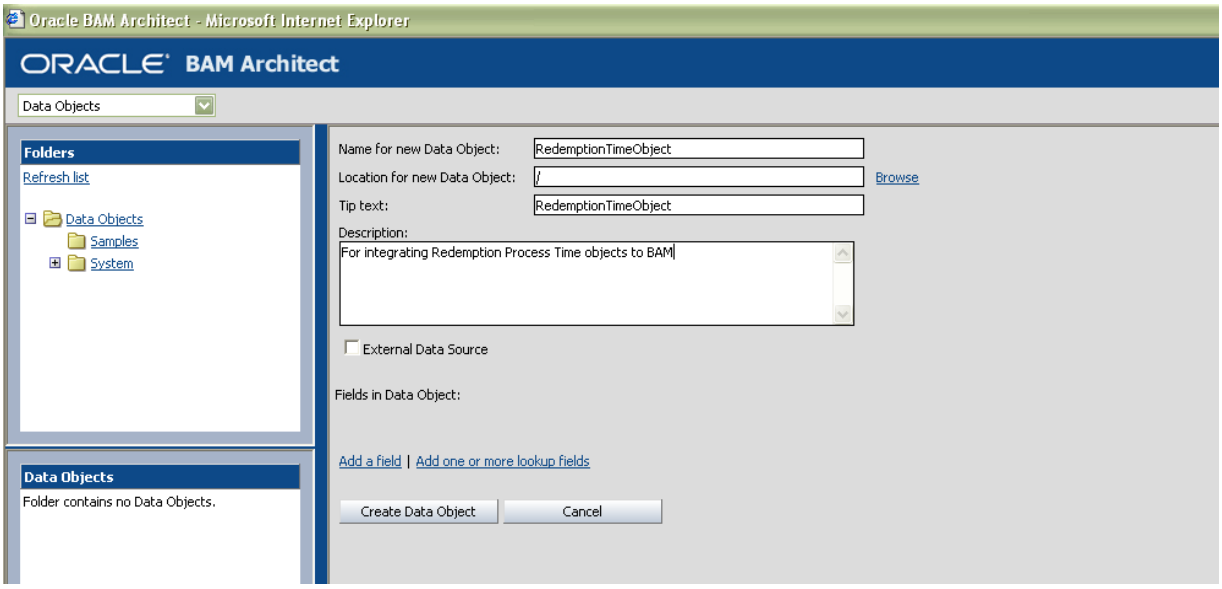
1. Go to the BAM Startup page.



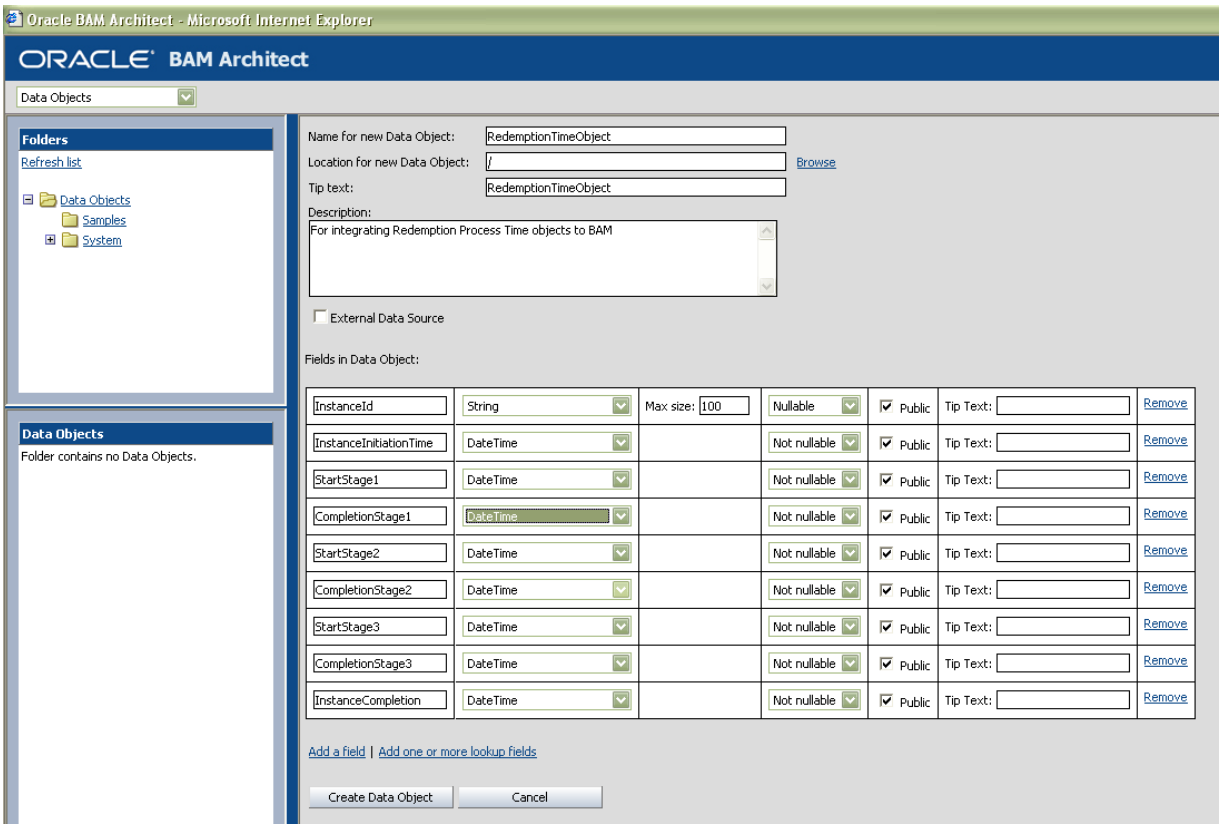
2. Click on Architect



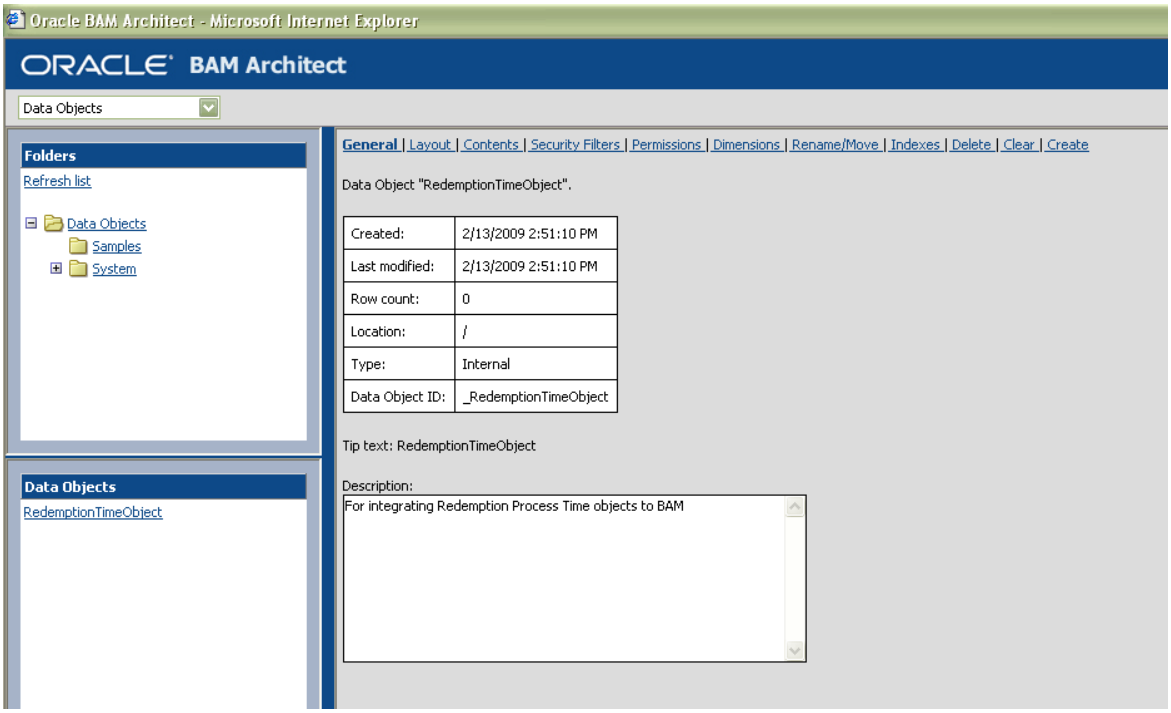
3. Click on Create Data Objects



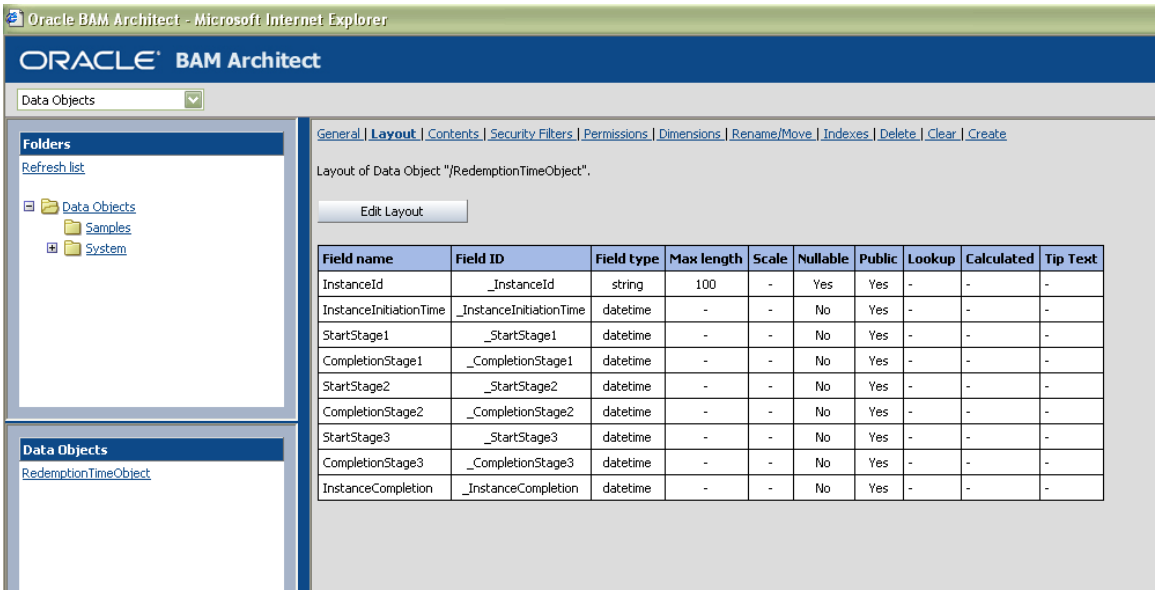
4. Click on add fields .



5. Enter the Fields in data objects and click on CreateDateObjects button

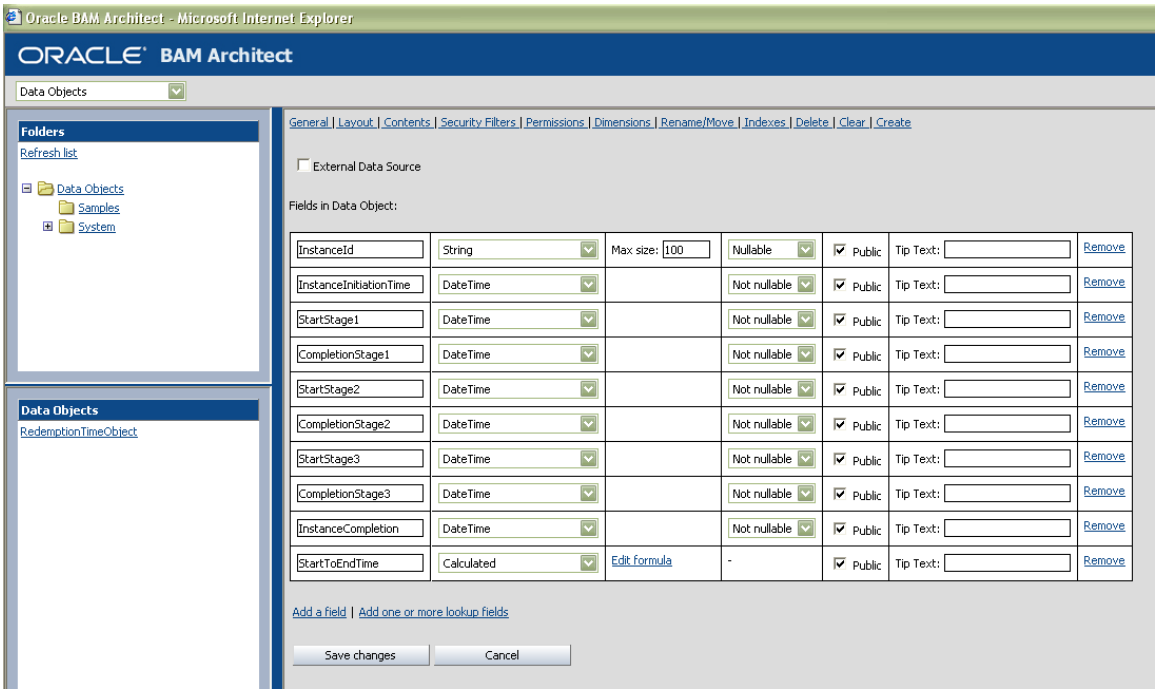


6. Data object created and click on LayOut to view the Fields

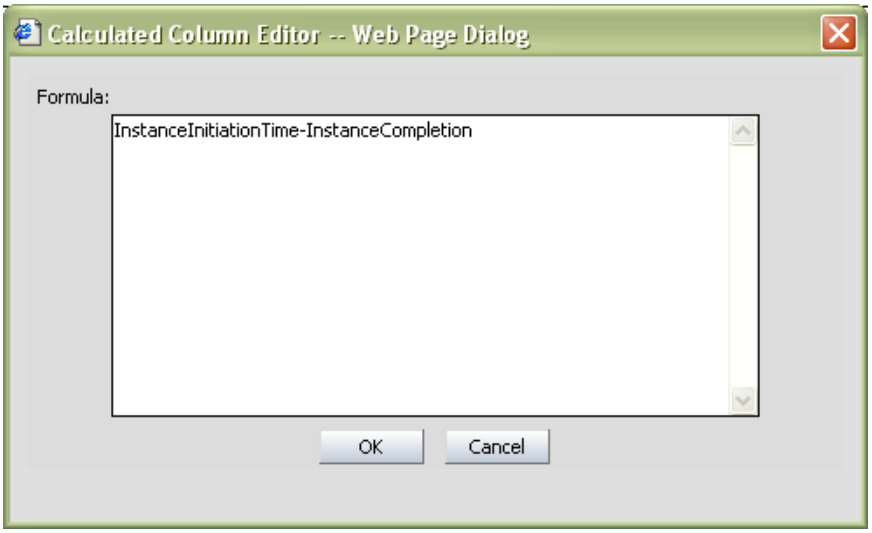


Field name	Field ID	Field type	Max length	Scale	Nullable	Public	Lookup	Calculated	Tip Text
InstanceId	_InstanceId	string	100	-	Yes	Yes	-	-	-
InstanceInitiationTime	_InstanceInitiationTime	datetime	-	-	No	Yes	-	-	-
StartStage1	_StartStage1	datetime	-	-	No	Yes	-	-	-
CompletionStage1	_CompletionStage1	datetime	-	-	No	Yes	-	-	-
StartStage2	_StartStage2	datetime	-	-	No	Yes	-	-	-
CompletionStage2	_CompletionStage2	datetime	-	-	No	Yes	-	-	-
StartStage3	_StartStage3	datetime	-	-	No	Yes	-	-	-
CompletionStage3	_CompletionStage3	datetime	-	-	No	Yes	-	-	-
InstanceCompletion	_InstanceCompletion	datetime	-	-	No	Yes	-	-	-

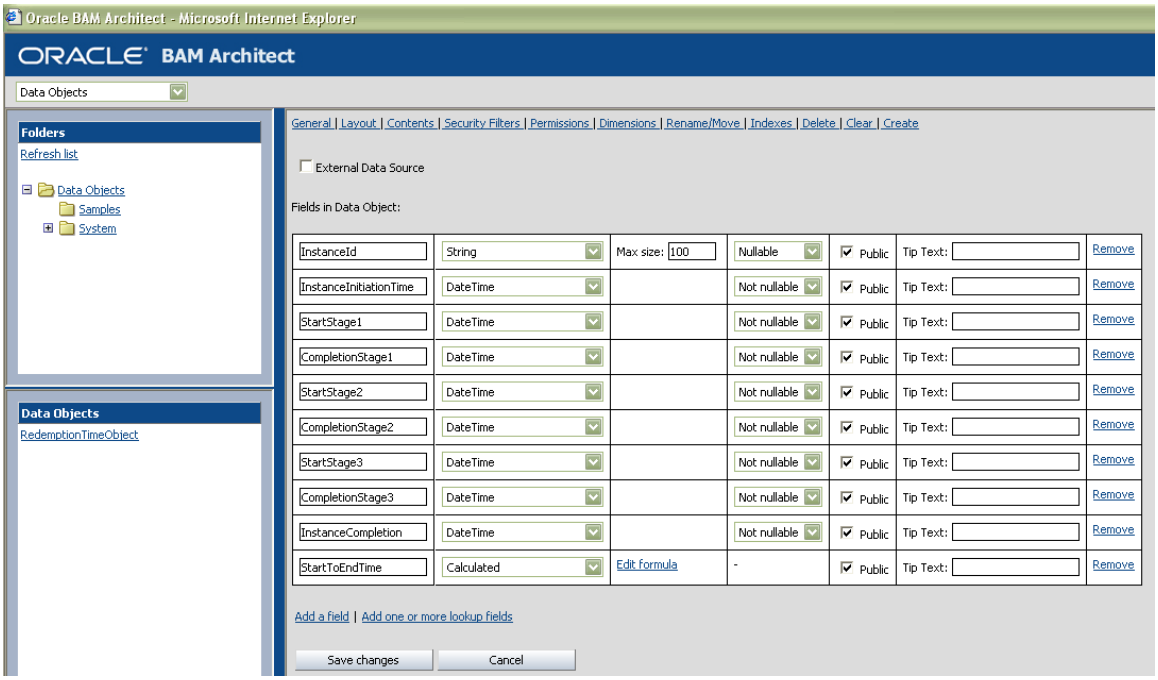
7. Click on edit layout to add or remove fields



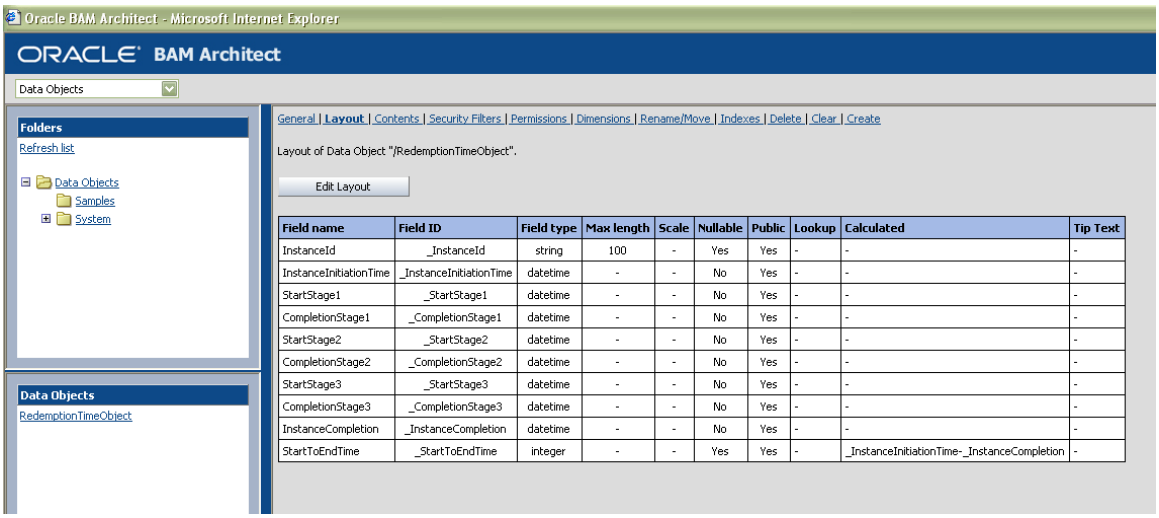
8. To add a formula field to the data object select field type as calculated and click on edit formula.



9. Click on ok.



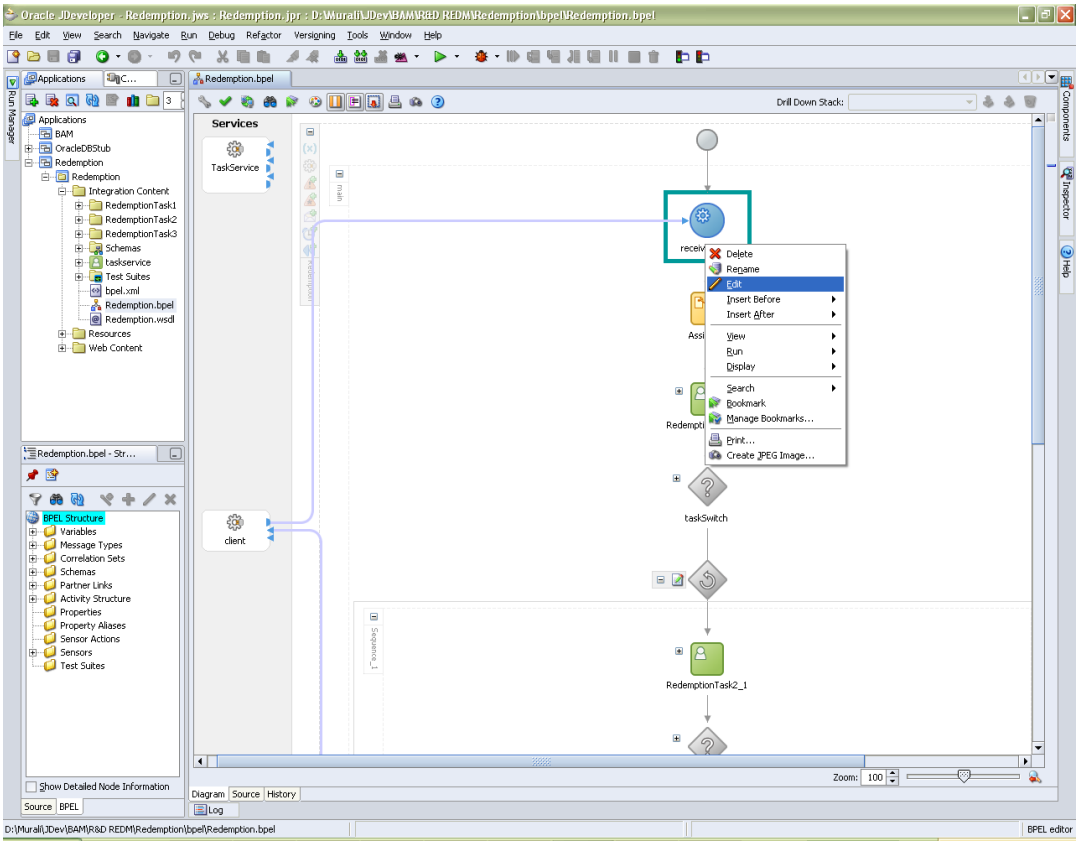
10. Click on save changes.

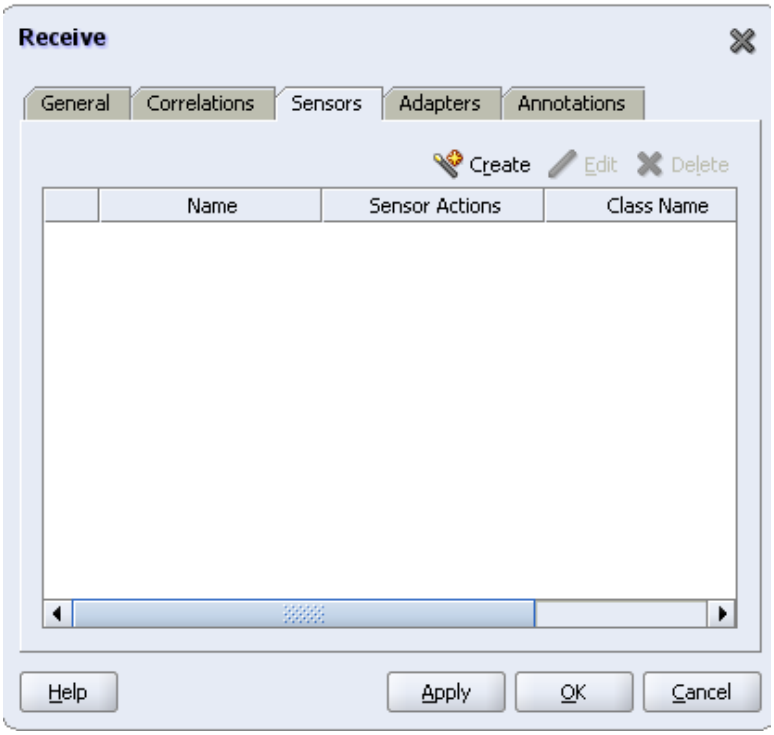


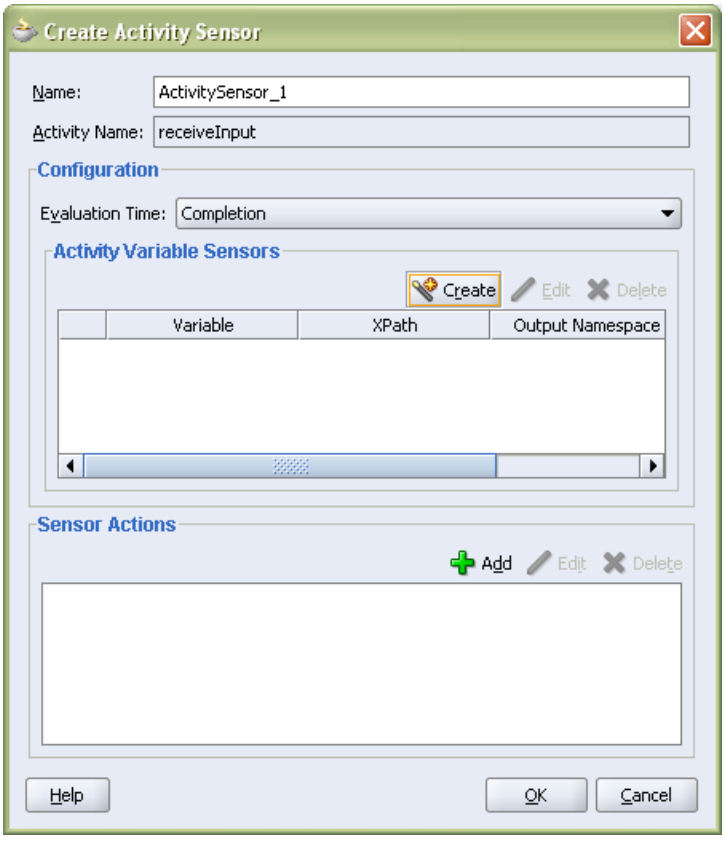
Field name	Field ID	Field type	Max length	Scale	Nullable	Public	Lookup	Calculated	Tip Text
InstanceId	_InstanceId	string	100	-	Yes	Yes	-	-	-
InstanceInitiationTime	_InstanceInitiationTime	datetime	-	-	No	Yes	-	-	-
StartStage1	_StartStage1	datetime	-	-	No	Yes	-	-	-
CompletionStage1	_CompletionStage1	datetime	-	-	No	Yes	-	-	-
StartStage2	_StartStage2	datetime	-	-	No	Yes	-	-	-
CompletionStage2	_CompletionStage2	datetime	-	-	No	Yes	-	-	-
StartStage3	_StartStage3	datetime	-	-	No	Yes	-	-	-
CompletionStage3	_CompletionStage3	datetime	-	-	No	Yes	-	-	-
InstanceCompletion	_InstanceCompletion	datetime	-	-	No	Yes	-	-	-
StartToEndTime	_StartToEndTime	integer	-	-	Yes	Yes	-	_InstanceInitiationTime-_InstanceCompletion	-

6.4 Integrating BAM Data Objects with BPEL Process:

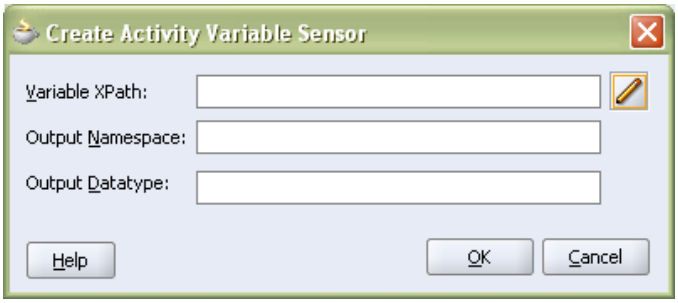
6.4.1 Creating a BAM Sensor

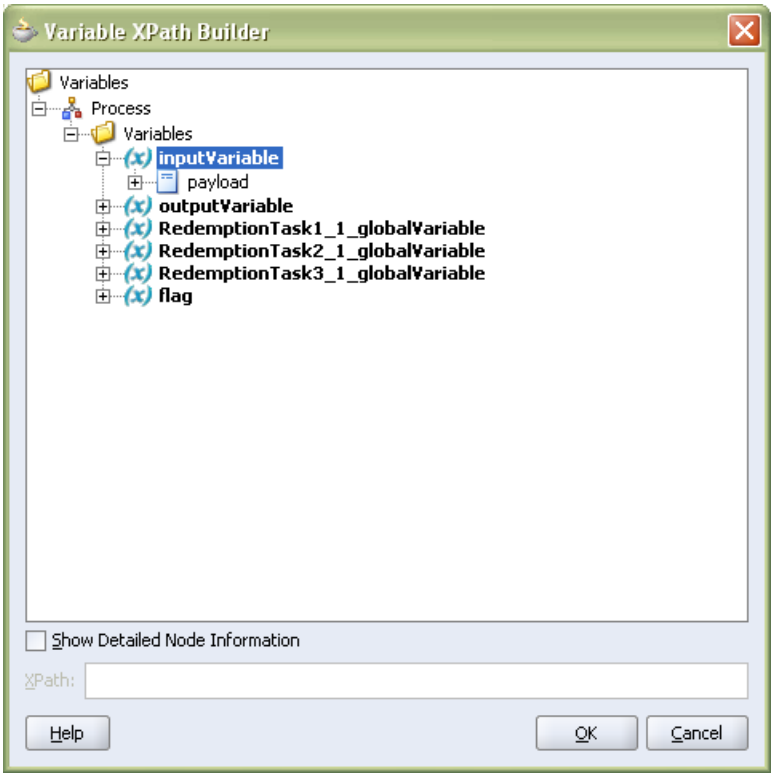






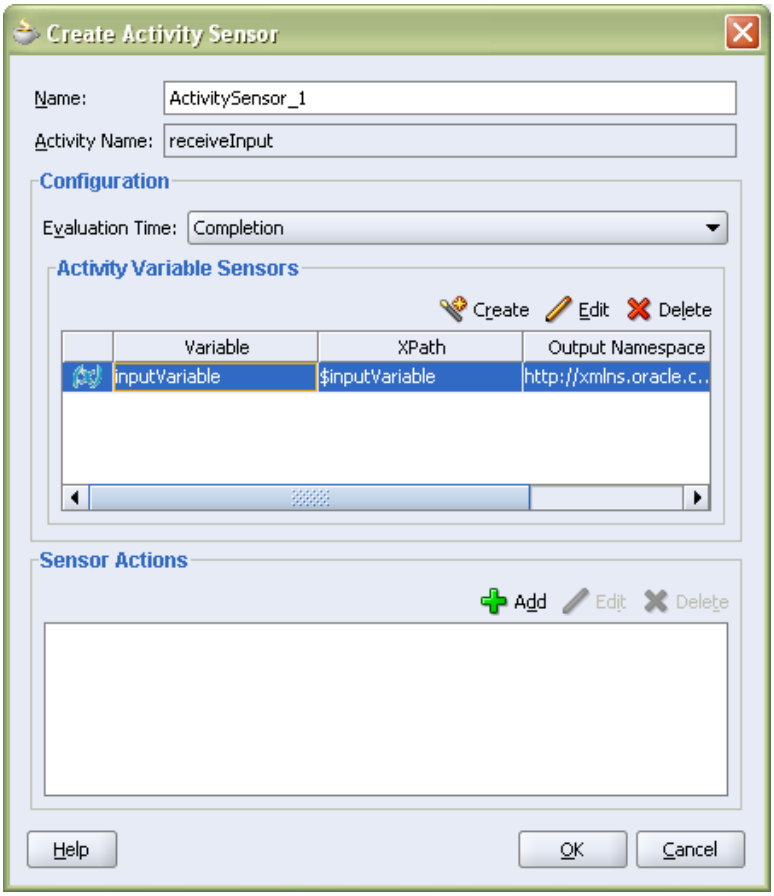
1. Click on create.



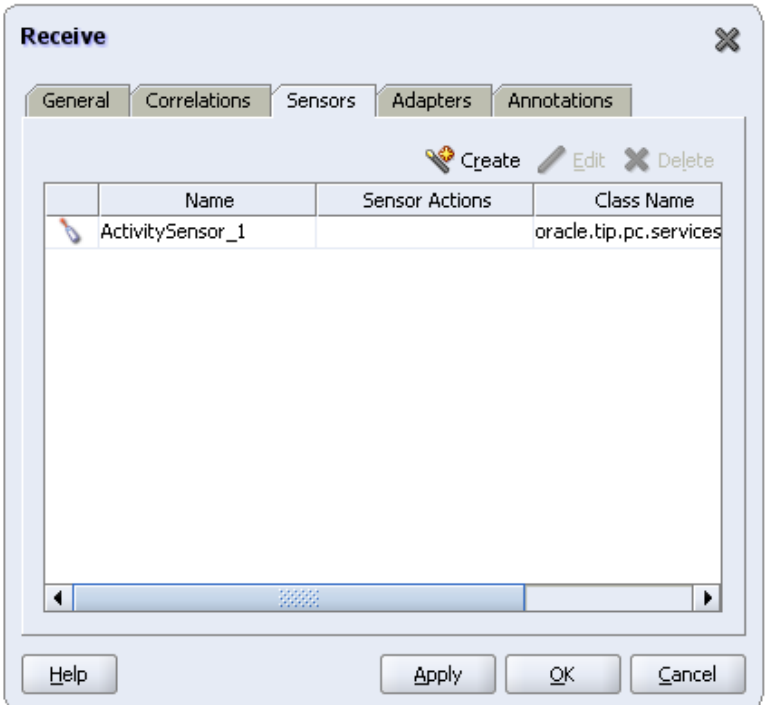


2. Select the variable.

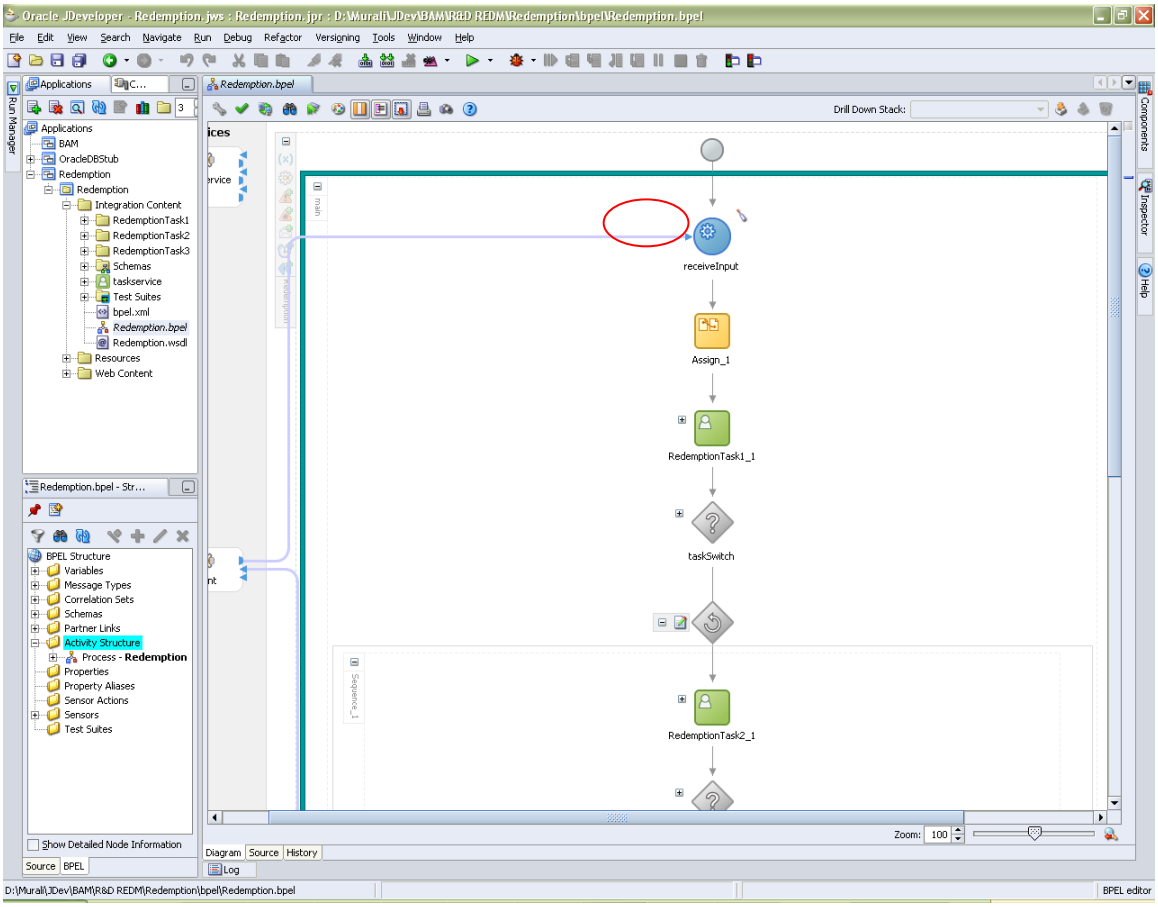
3. Click on ok.


Create Activity Sensor
Name:
ActivitySensor_1
Activity Name:
receiveInput
Configuration
Evaluation Time:
Completion
Activity Variable Sensors
Create
Edit
Delete
Variable
XPath
Output Namespace
inputVariable
$inputVariable
http://xmlns.oracle.c..
Sensor Actions
Add
Edit
Delete
Help
OK
Cancel

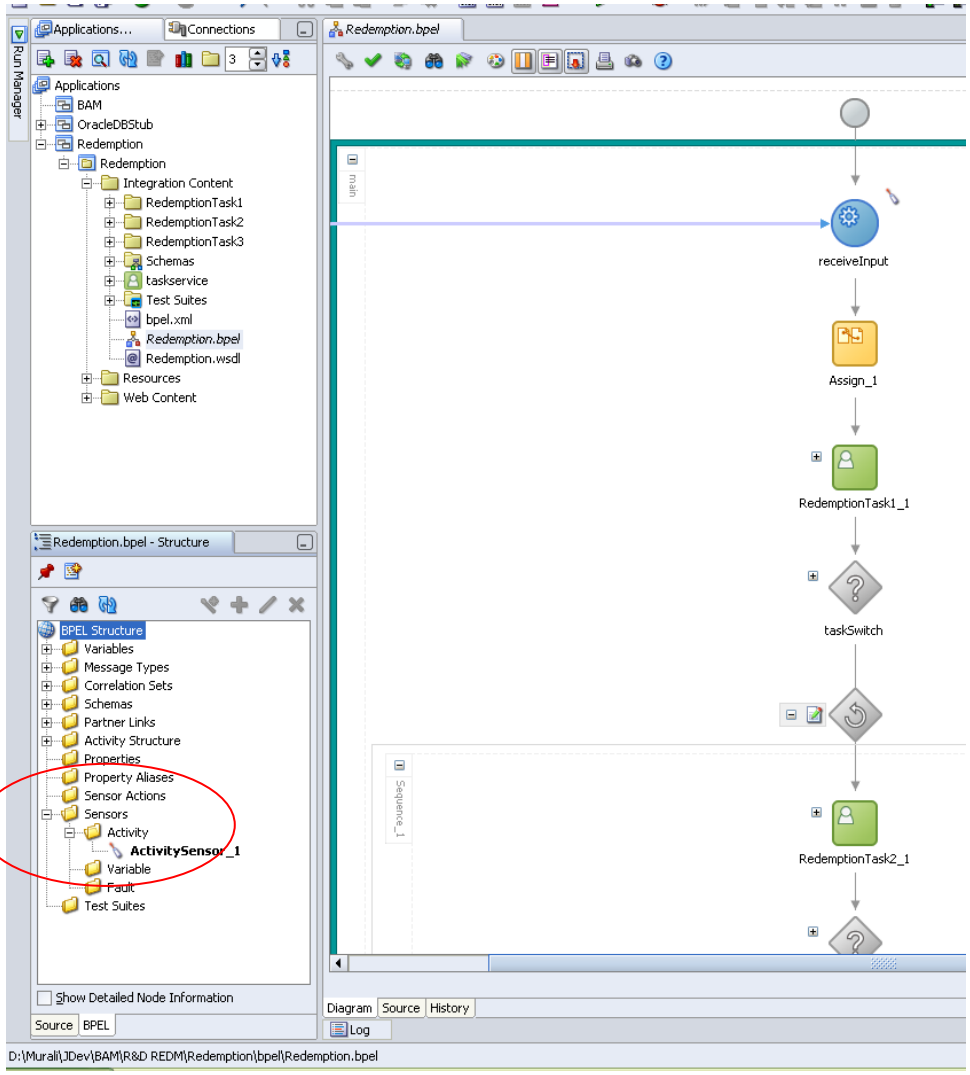
4. Click on ok.



5. Click on Apply & Ok.

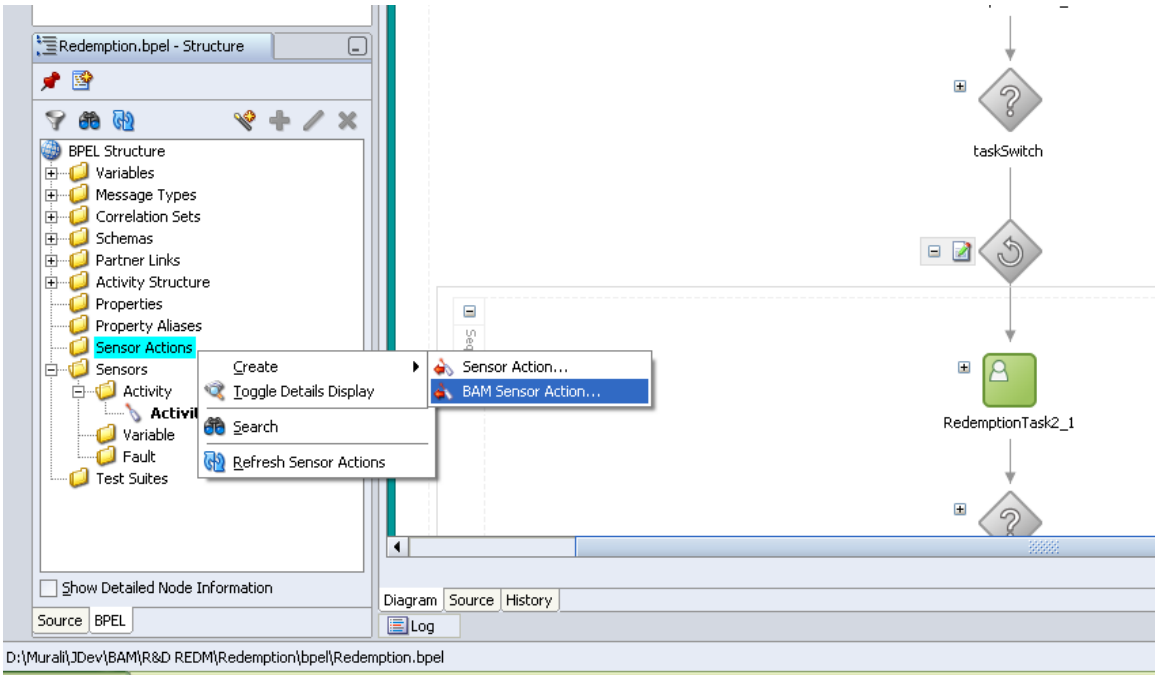


6. Sensor icon near the component.

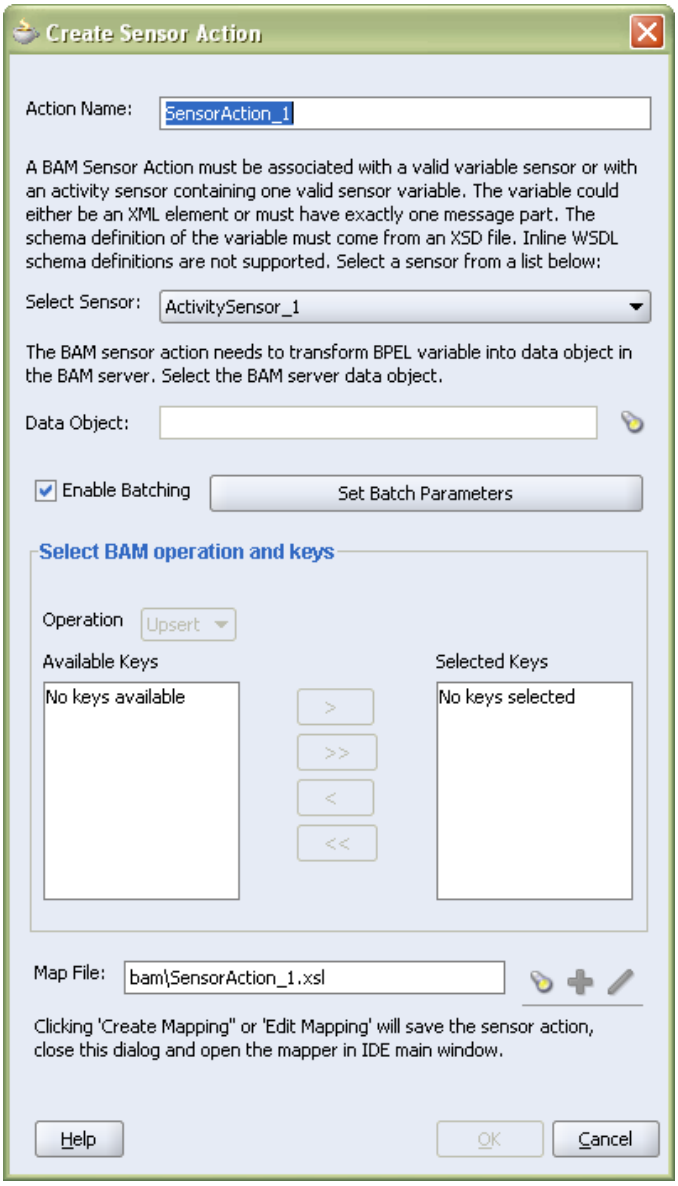


7. Click on Refresh in BPEL Structure to see the created activity sensor.

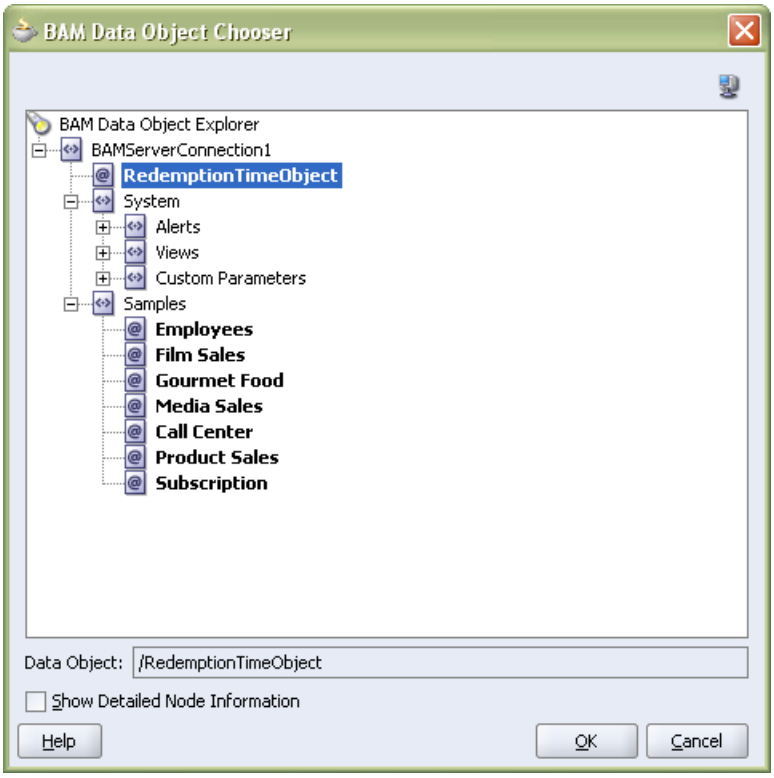
6.4.2 Creating a Bam Sensor Action And Mapping:



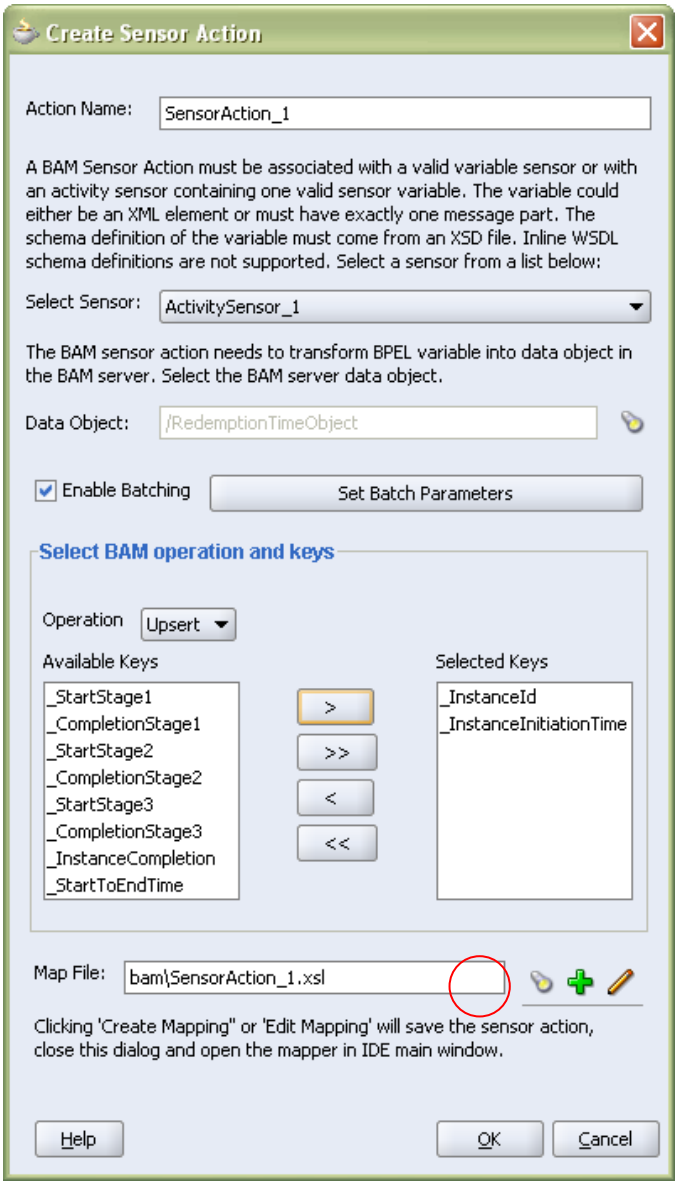
1. Right click on Sensor Actions -> Create -> BAM Sensor Action.



2. Click on Browse Button of Data Object.

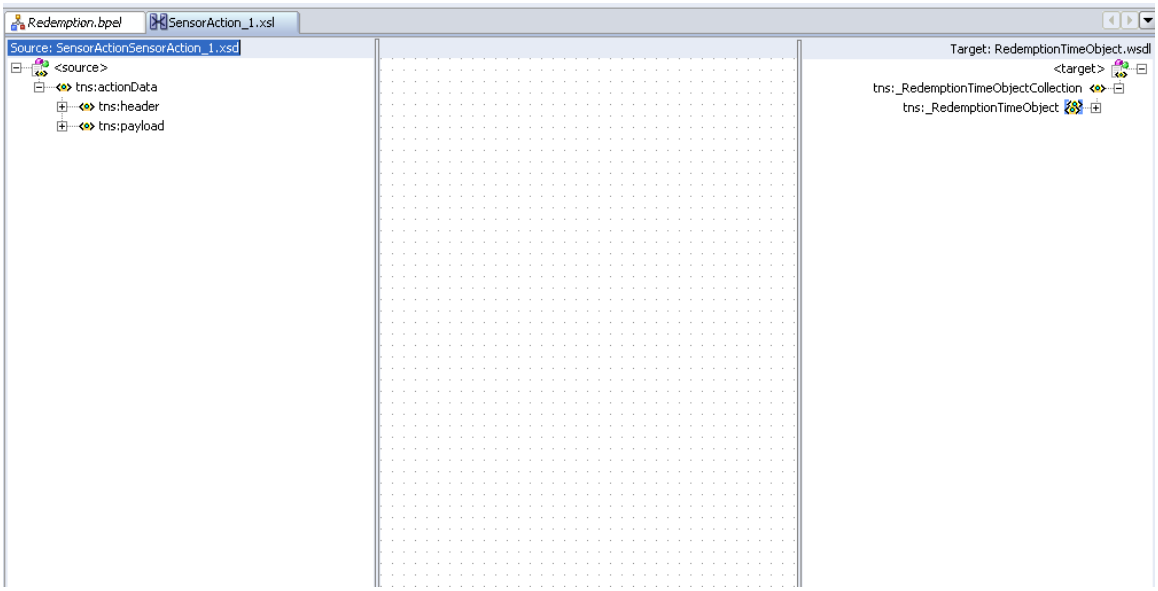


3. Select the Redemption Time object and click ok.

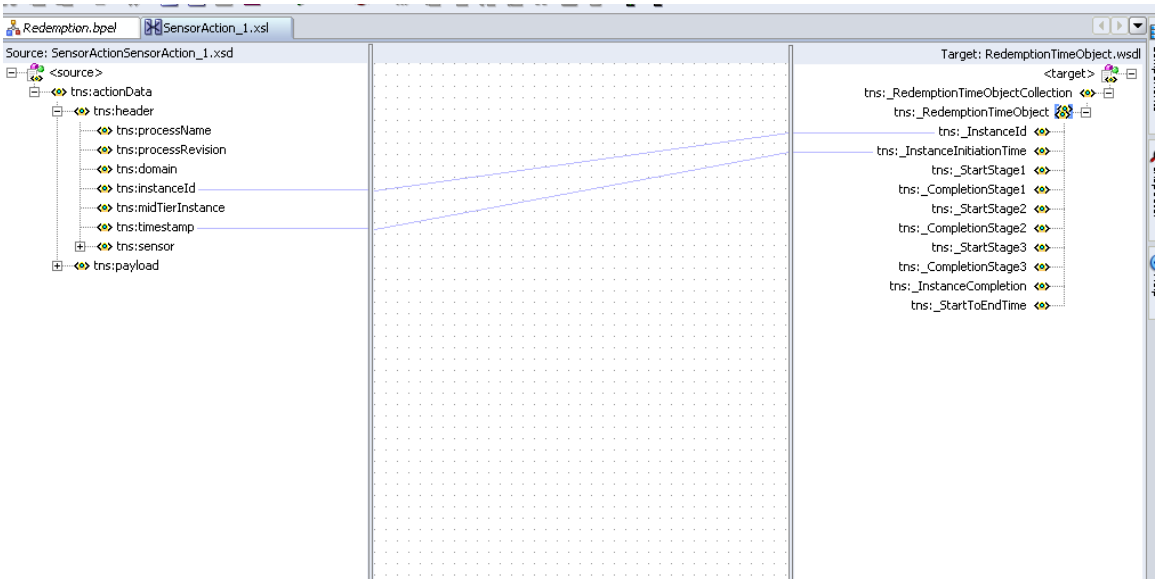


4. Select the fields from to the list and move to the select keys list.
5. Click on Create (+) button to create the SensorAction_1.xsl for edit click the edit button.

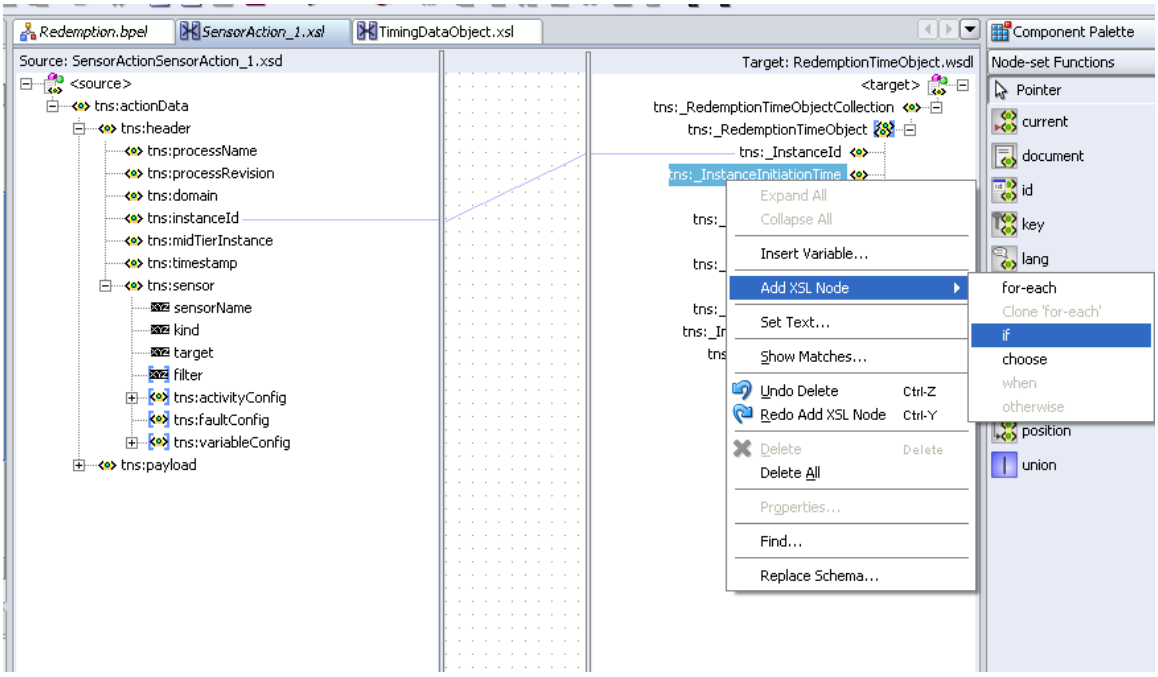
6.4.3 Creating Mapping File

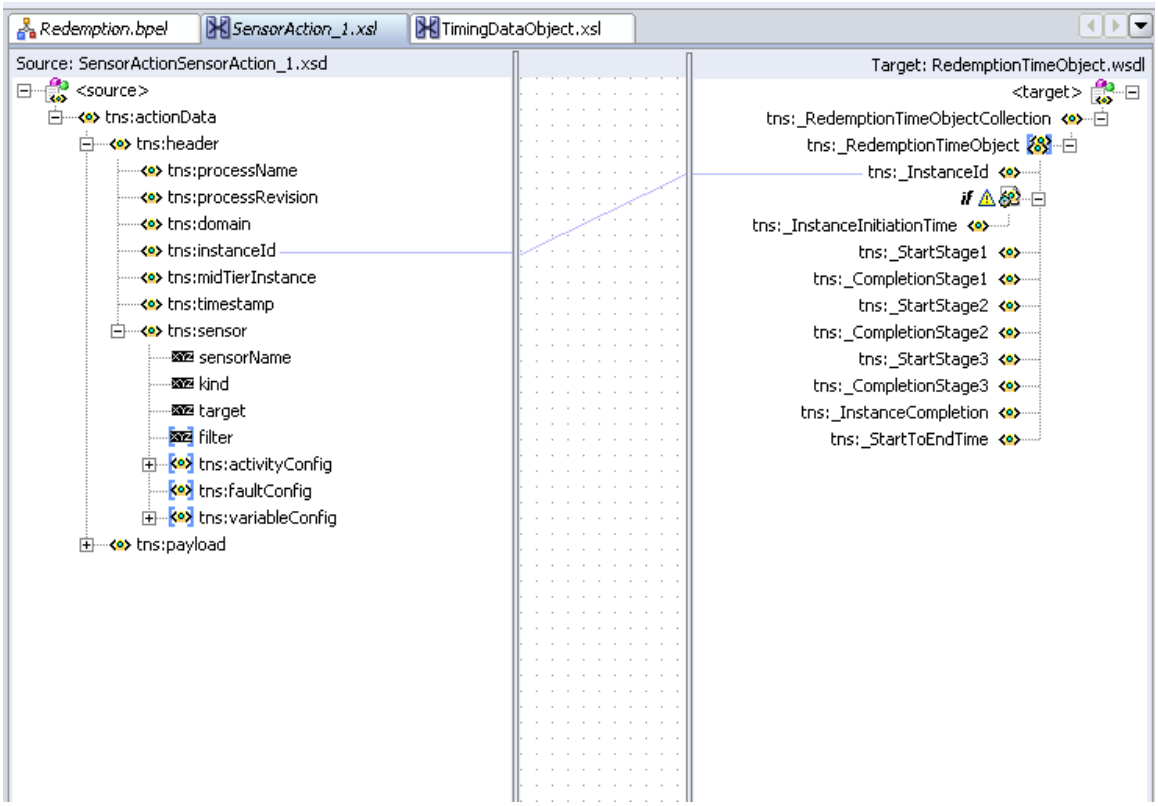


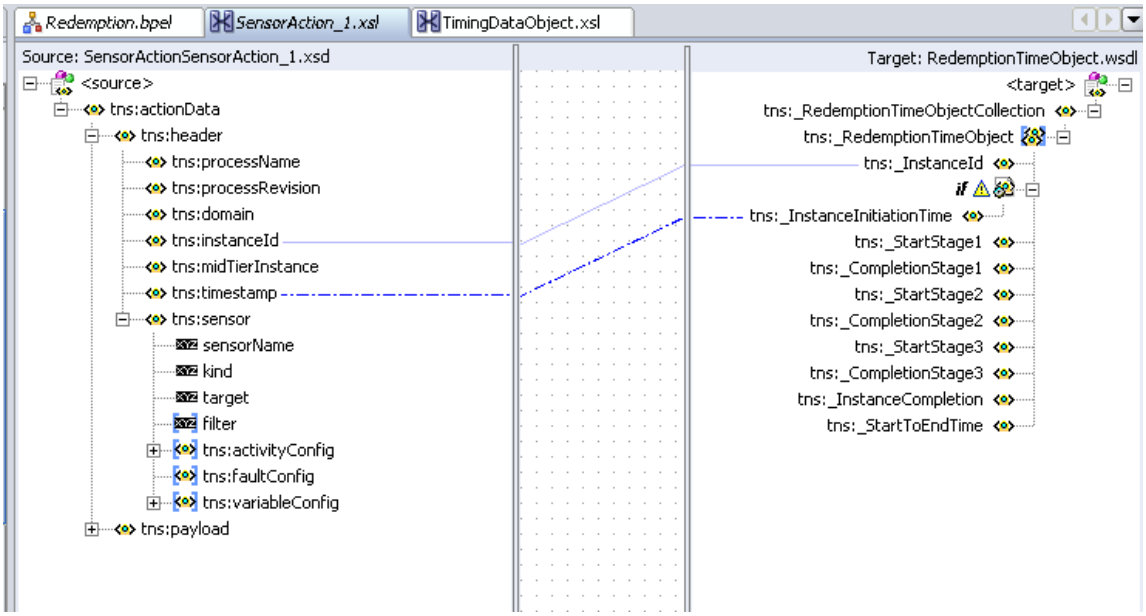
1. SensorAction_1.xsl mapping file will be opened.

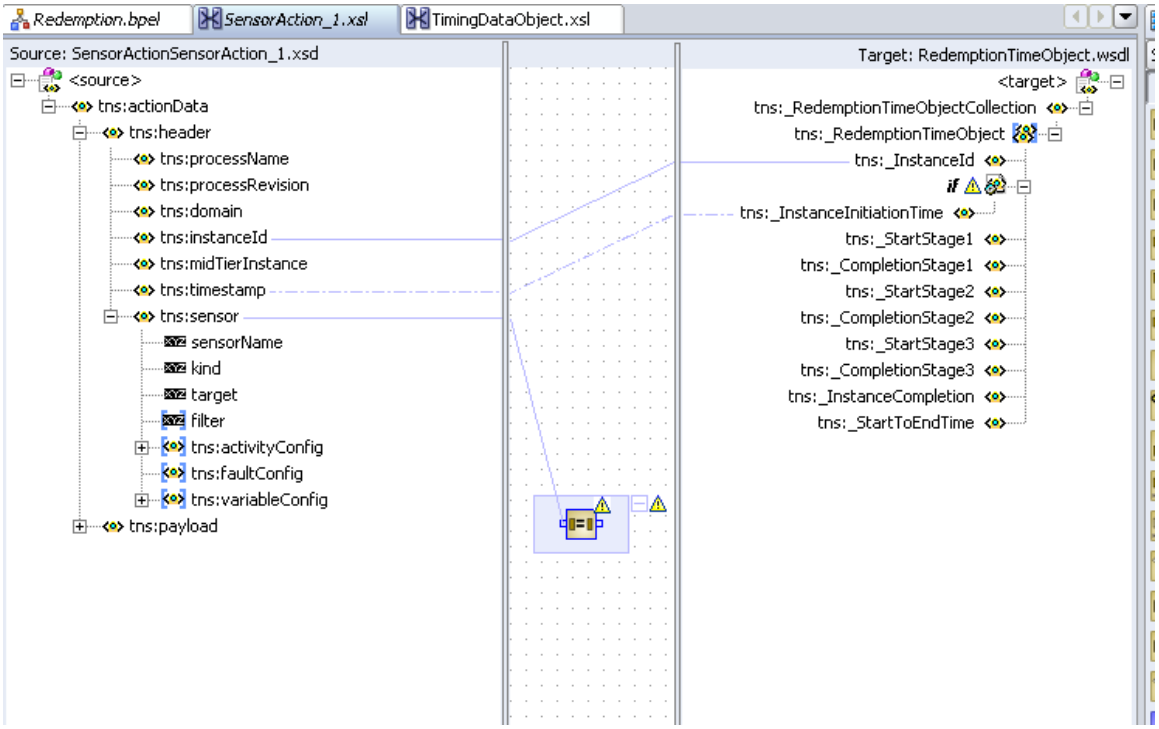


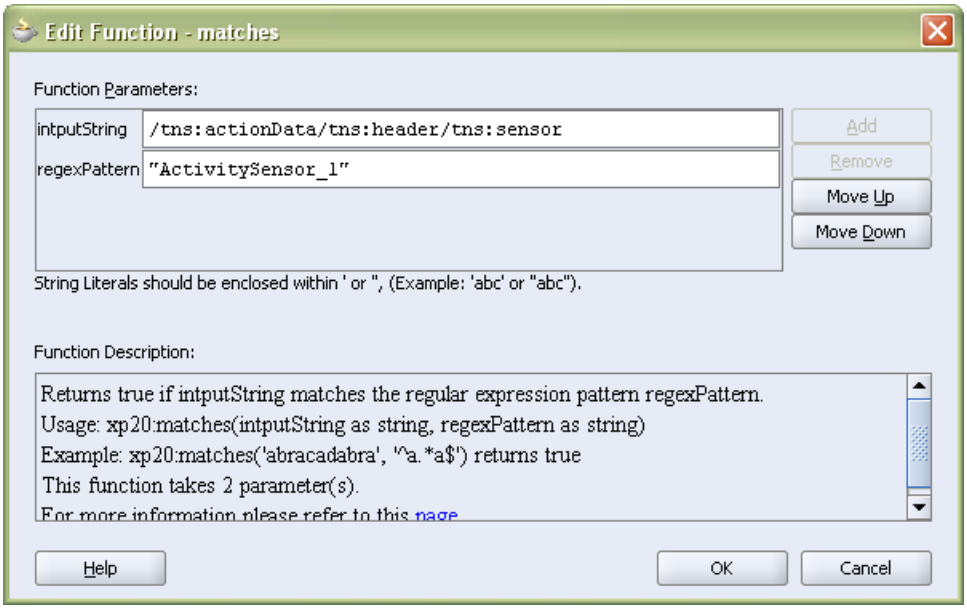
2. Map the InstanceId and Time stap to the corresponding field.
3. Create as many sensor action and sensors to map all values to all the bam objects.

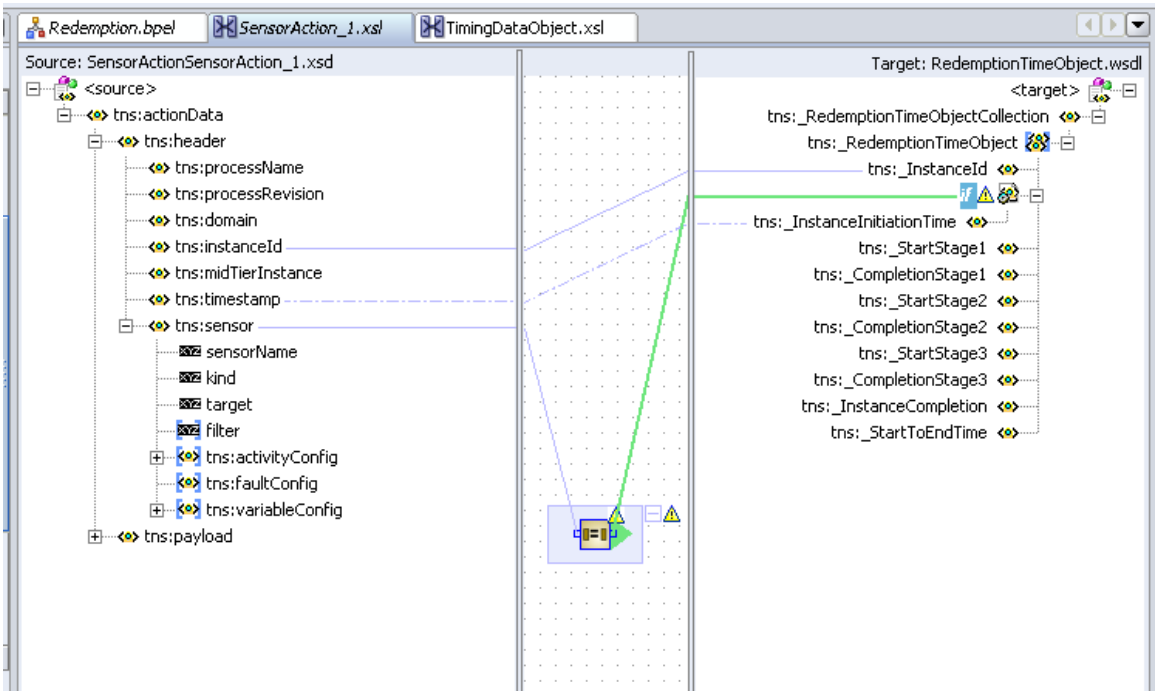

Redemption.bpel
SensorAction_1.xsl
TimingDataObject.xsl
Source: SensorActionSensorAction_1.xsd
<source>
tns:actionData
tns:header
tns:processName
tns:processRevision
tns:domain
tns:instanceId
tns:midTierInstance
tns:timestamp
tns:sensor
sensorName
kind
target
filter
tns:activityConfig
tns:faultConfig
tns:variableConfig
tns:payload
Target: RedemptionTimeObject.wsdl
<target>
tns:_RedemptionTimeObjectCollection
tns:_RedemptionTimeObject
tns:_InstanceId
tns:_InstanceInitiationTime
Expand All
Collapse All
Insert Variable...
Add XSL Node
Set Text...
Show Matches...
Undo Delete Ctrl-Z
Redo Add XSL Node Ctrl-Y
Delete Delete
Delete All
Properties...
Find...
Replace Schema...
for-each
Clone 'for-each'
if
choose
when
otherwise
Component Palette
Node-set Functions
Pointer
current
document
id
key
lang
position
union


Redemption.bpel
SensorAction_1.xsl
TimingDataObject.xsl
Source: SensorActionSensorAction_1.xsd
<source>
tns:actionData
tns:header
tns:processName
tns:processRevision
tns:domain
tns:instanceId
tns:midTierInstance
tns:timestamp
tns:sensor
sensorName
kind
target
filter
tns:activityConfig
tns:faultConfig
tns:variableConfig
tns:payload
Target: RedemptionTimeObject.wsdl
<target>
tns:_RedemptionTimeObjectCollection
tns:_RedemptionTimeObject
tns:_InstanceId
if
tns:_InstanceInitiationTime
tns:_StartStage1
tns:_CompletionStage1
tns:_StartStage2
tns:_CompletionStage2
tns:_StartStage3
tns:_CompletionStage3
tns:_InstanceCompletion
tns:_StartToEndTime

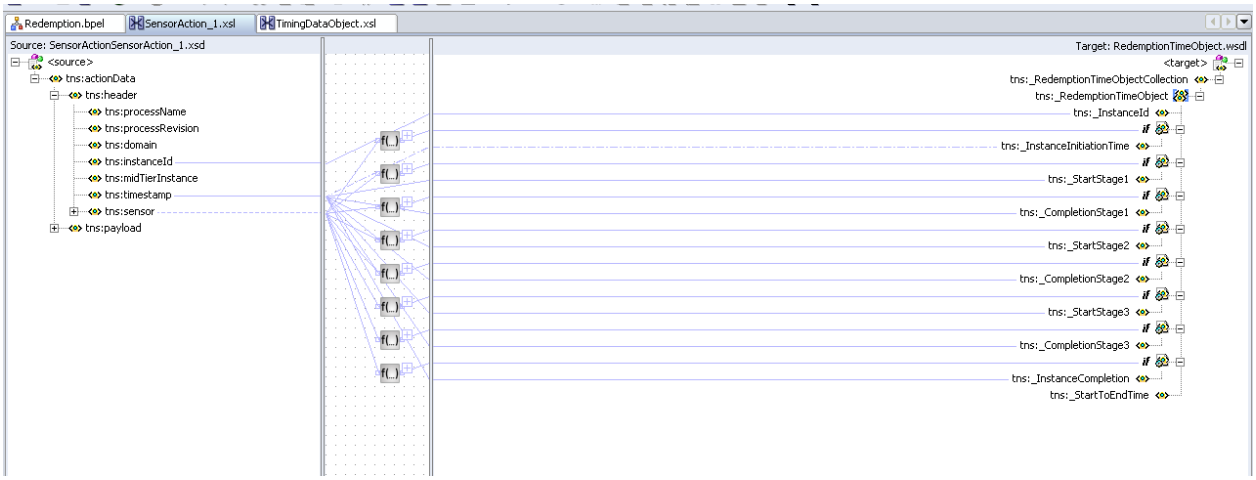

Redemption.bpel
SensorAction_1.xsl
TimingDataObject.xsl
Source: SensorActionSensorAction_1.xsd
<source>
tns:actionData
tns:header
tns:processName
tns:processRevision
tns:domain
tns:instanceId
tns:midTierInstance
tns:timestamp
tns:sensor
sensorName
kind
target
filter
tns:activityConfig
tns:faultConfig
tns:variableConfig
tns:payload
Target: RedemptionTimeObject.wsdl
<target>
tns:_RedemptionTimeObjectCollection
tns:_RedemptionTimeObject
tns:_InstanceId
if
tns:_InstanceInitiationTime
tns:_StartStage1
tns:_CompletionStage1
tns:_StartStage2
tns:_CompletionStage2
tns:_StartStage3
tns:_CompletionStage3
tns:_InstanceCompletion
tns:_StartToEndTime


Redemption.bpel
SensorAction_1.xsl
TimingDataObject.xsl
Source: SensorActionSensorAction_1.xsd
<source>
tns:actionData
tns:header
tns:processName
tns:processRevision
tns:domain
tns:instanceId
tns:midTierInstance
tns:timestamp
tns:sensor
sensorName
kind
target
filter
tns:activityConfig
tns:faultConfig
tns:variableConfig
tns:payload
Target: RedemptionTimeObject.wsdl
<target>
tns:_RedemptionTimeObjectCollection
tns:_RedemptionTimeObject
tns:_InstanceId
if
tns:_InstanceInitiationTime
tns:_StartStage1
tns:_CompletionStage1
tns:_StartStage2
tns:_CompletionStage2
tns:_StartStage3
tns:_CompletionStage3
tns:_InstanceCompletion
tns:_StartToEndTime


Edit Function - matches
Function Parameters:
intputString
/tns:actionData/tns:header/tns:sensor
regexPattern
"ActivitySensor_1"
Add
Remove
Move Up
Move Down
String Literals should be enclosed within ' or ", (Example: 'abc' or "abc").
Function Description:
Returns true if intputString matches the regular expression pattern regexPattern.
Usage: xp20:matches(intputString as string, regexPattern as string)
Example: xp20:matches('abracadabra', '^a.*a$') returns true
This function takes 2 parameter(s).
For more information please refer to this page
Help
OK
Cancel

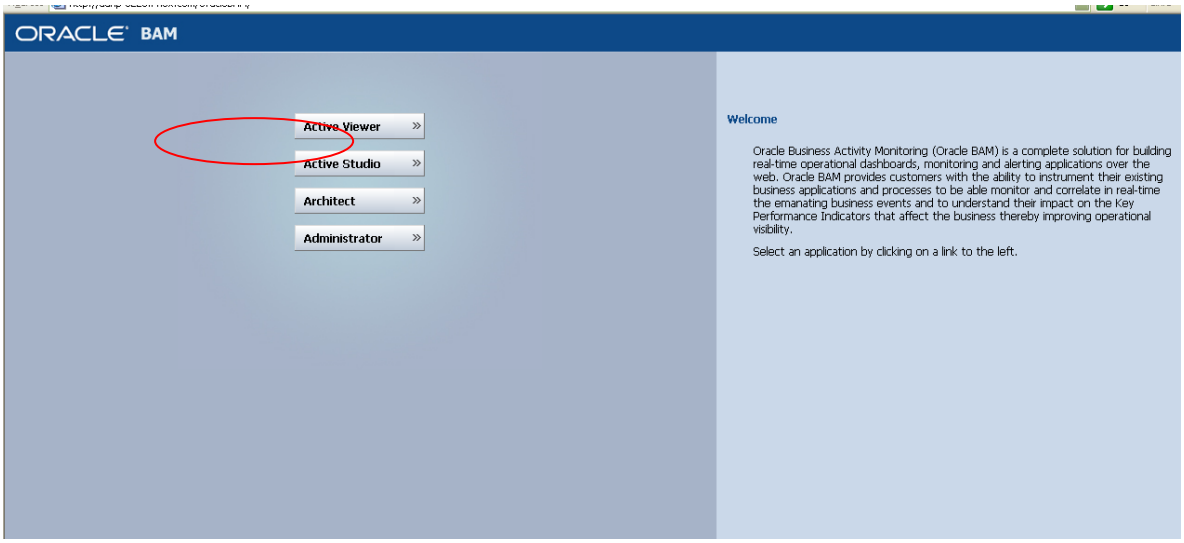

Redemption.bpel
SensorAction_1.xsl
TimingDataObject.xsl
Source: SensorActionSensorAction_1.xsd
<source>
tns:actionData
tns:header
tns:processName
tns:processRevision
tns:domain
tns:instanceId
tns:midTierInstance
tns:timestamp
tns:sensor
sensorName
kind
target
filter
tns:activityConfig
tns:faultConfig
tns:variableConfig
tns:payload
Target: RedemptionTimeObject.wsdl
<target>
tns:_RedemptionTimeObjectCollection
tns:_RedemptionTimeObject
tns:_InstanceId
tns:_InstanceInitiationTime
tns:_StartStage1
tns:_CompletionStage1
tns:_StartStage2
tns:_CompletionStage2
tns:_StartStage3
tns:_CompletionStage3
tns:_InstanceCompletion
tns:_StartToEndTime

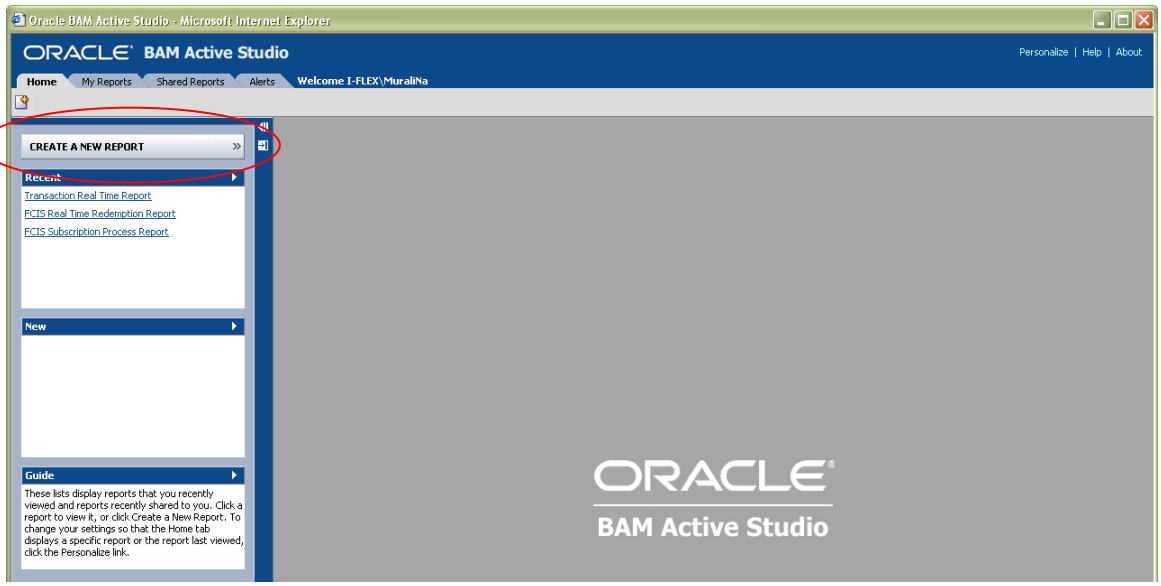
4. Use if conditions to check the sensor name if you want to create one sensor action for all sensors.
5. Use matches component to match the sensor name and pass time stamp value to the respective dataobject.
6. Map All.



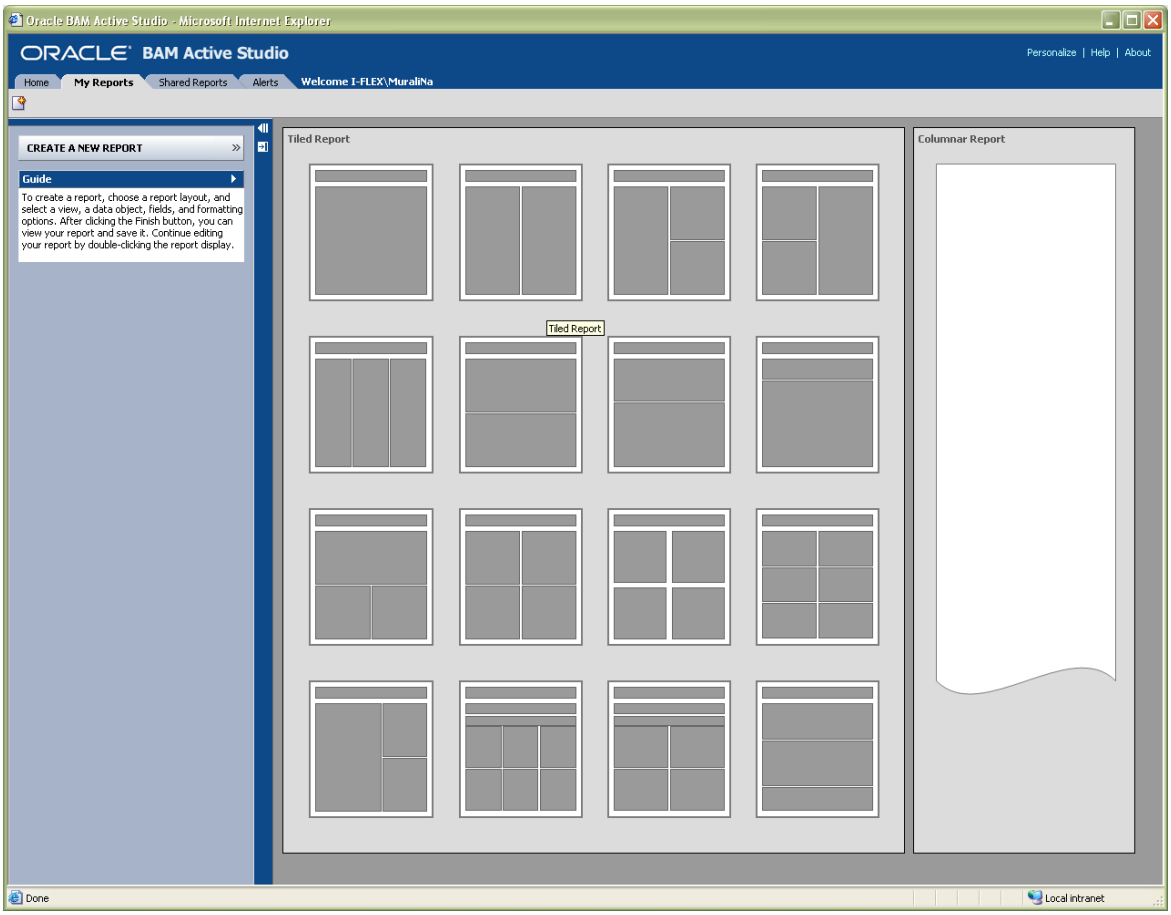
6.5 Creating Real time reports in BAM

1. Go to the BAM Start Page

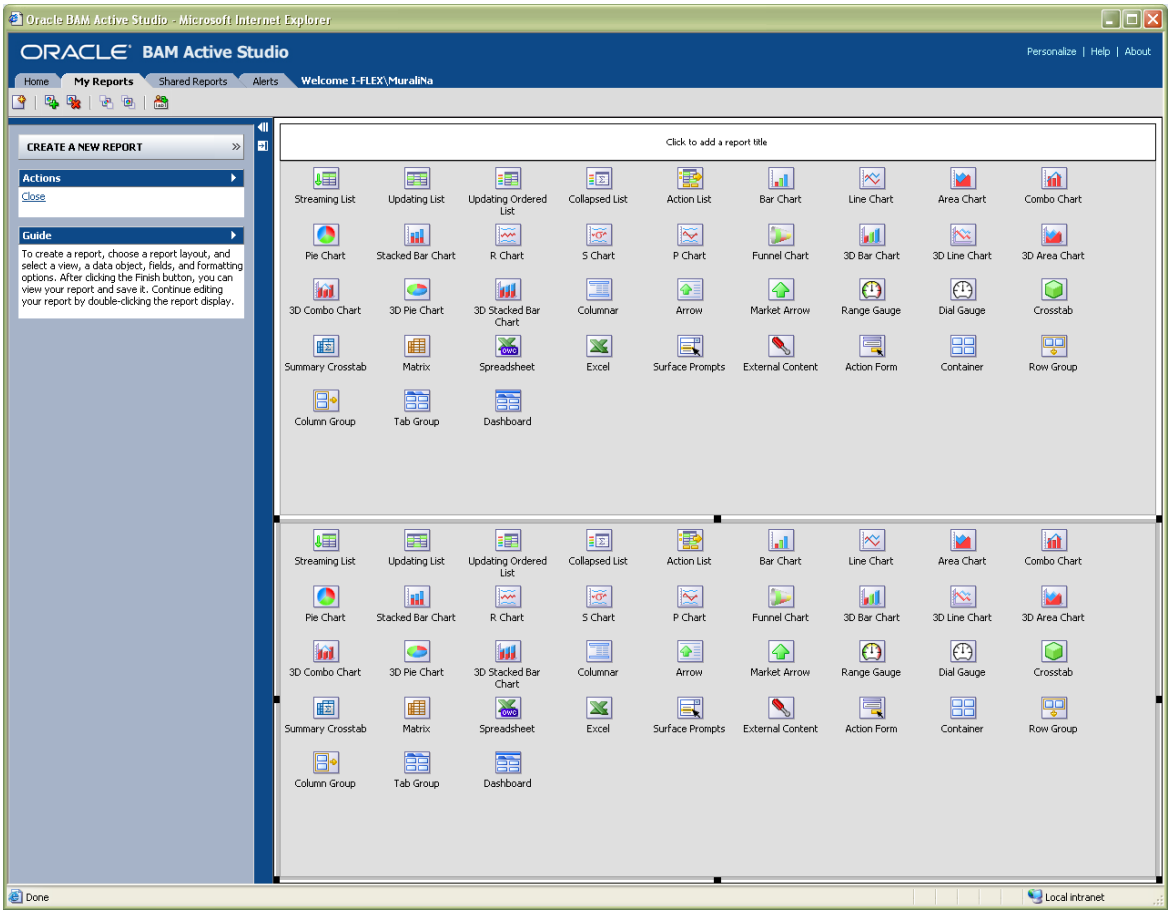




2. Click on Create a new report

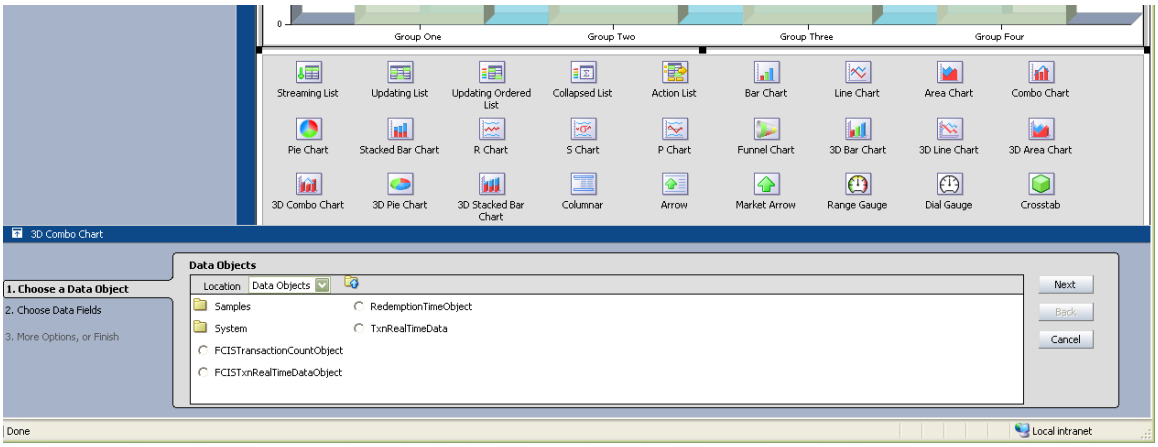


3. Click on any of the available template.

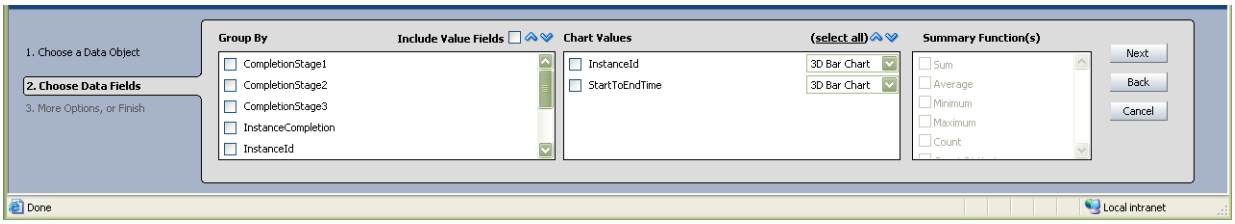


4. Enter the report title by click the Title Bar.

5. Double click on any of the report diagram template.



6. Select the data object for the report and click next.



7. Select the group value and chart value and click next and click finish.

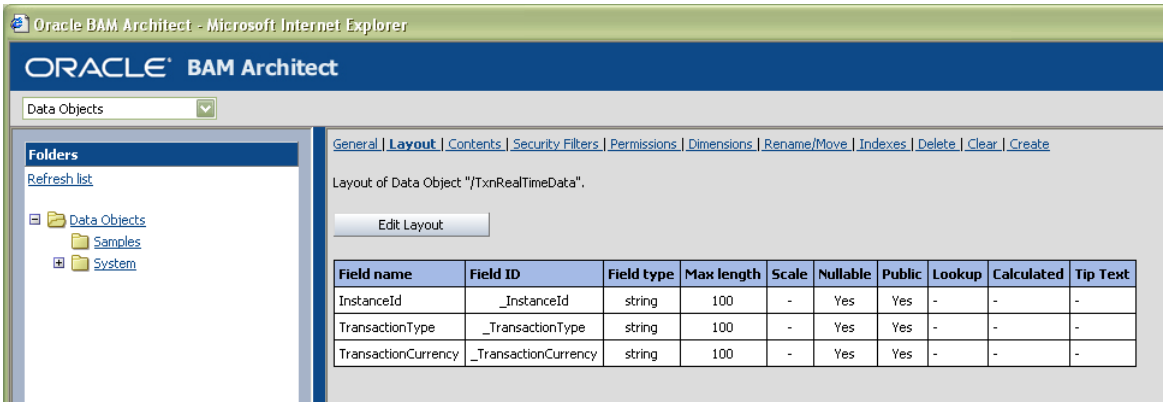
6.6 Oracle BAM Demo on FCIS Redemption

6.6.1 Introduction

Integrating Oracle BAM with FCIS Redemption process to create a Report based on Number of Redemption transactions completed grouped by Transaction currency.

6.6.2 Creating Data Objects

Create a data object with Instanceid, TransactionType and Transaction Currency the Data fields as explained in Section 6.3 (say TxnRealTimeData)



6.6.3 Modifying TXN.xml of Application Server

Modify the txn.xml to add txnBamFields in the transaction PayLoad.(txn.xml will be available in <Application>FCJNeoWeb\WEB-INF\classes\com\iflex\fcc\handlers)

<txnBamFields>

<txnCurrency/>

<txnBamFields>

As a child of </transaction>

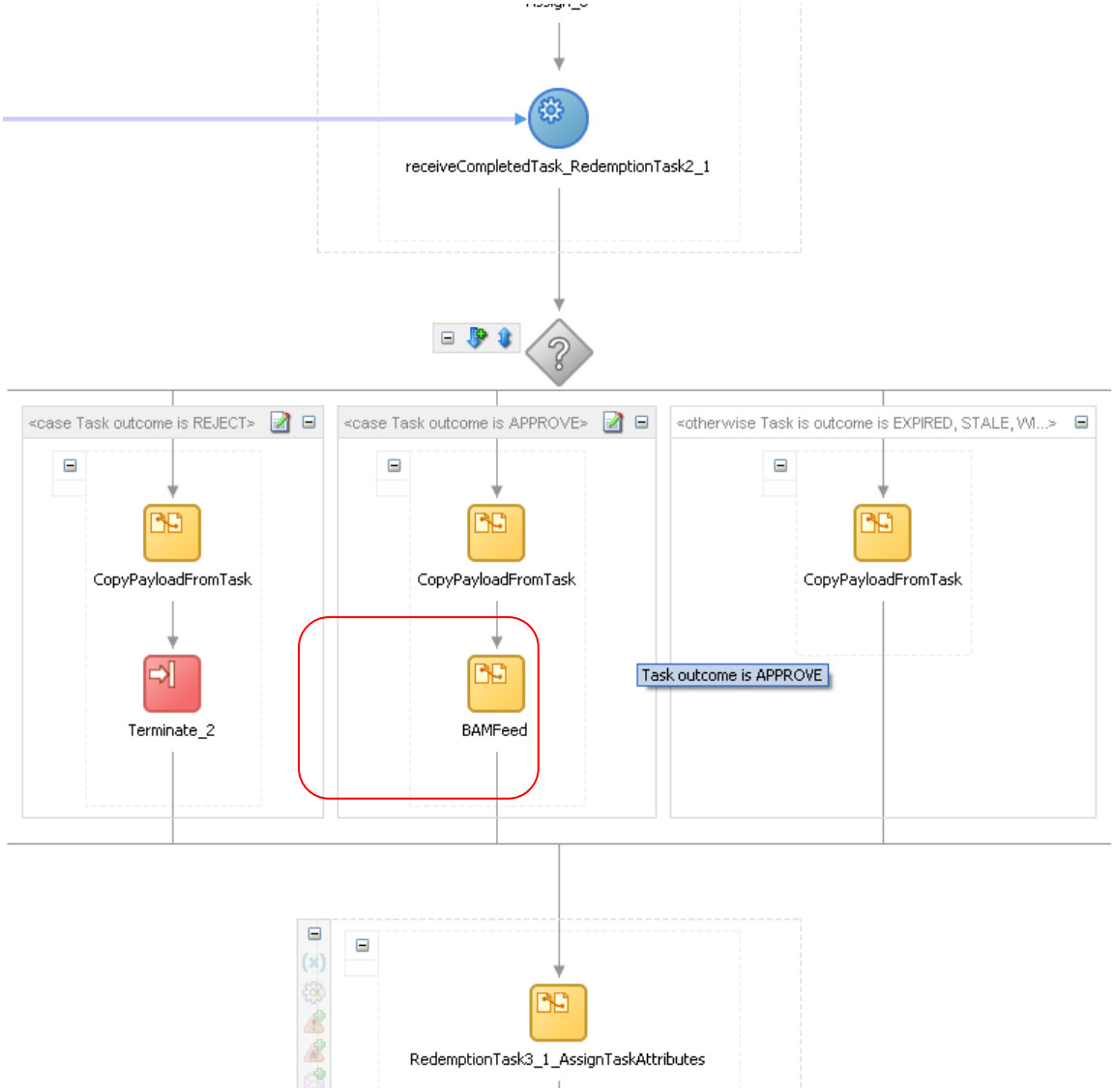
6.6.4 Modifying FCISRedemption Process

Modify the txn.xsd of the redemption process and add an element txnBAMFIelds and a child element txnCurrency of type string

```
<element name="txnBamFields">

        <complexType>

          <sequence>

            <element name="txnCurrency" type="xsd:string">

            </element>

        </sequence>

        </complexType>

 </element>
```

Add a new assign component after Copy Payload of HumanTask_2 as shown below and copy the transaction currency to txnBamFields\txnCurrency.

```
<copy>

<from variable="outputVariable"

part="payload"
query="/ns1:transaction/ns1:transactionData/ns1:moduleData/FCUBS_REQ_ENV/FCUBS_BOD
Y/VW_CONSTXNTBL/TRANSACTIONCURRENCY"/>

<to variable="outputVariable" part="payload"

query="/ns1:transaction/ns1:txnBamFields/ns1:txnCurrency"/>

</copy>
```



6.6.5 Creating BAM Connection from Jdeveloper

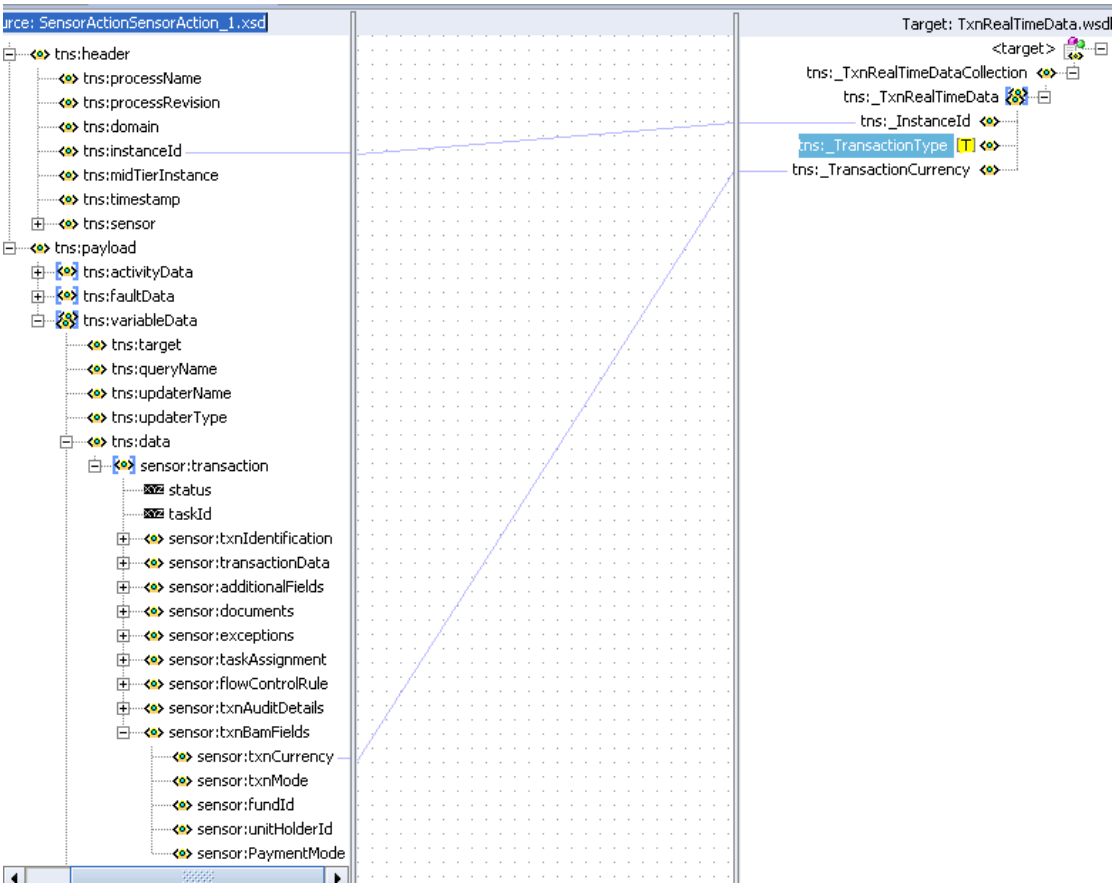
Refer 6.2 to create a Bam connection to the new data object.

6.6.6 Adding a BAM Sensor and Sensor Action

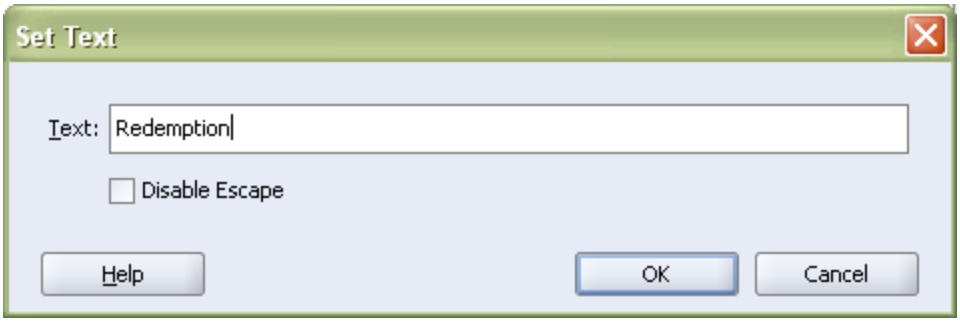
Add a sensor to callBackClient. Refer 6.4.1 and 6.4.2 to create Sensor and Sensor Action.

6.6.7 Creating a Mapping file

1. Add a new mapping file and map the instance id and transaction currency to BAM Data object field as shown in the fig.(Refer 6.4.3 for more details).



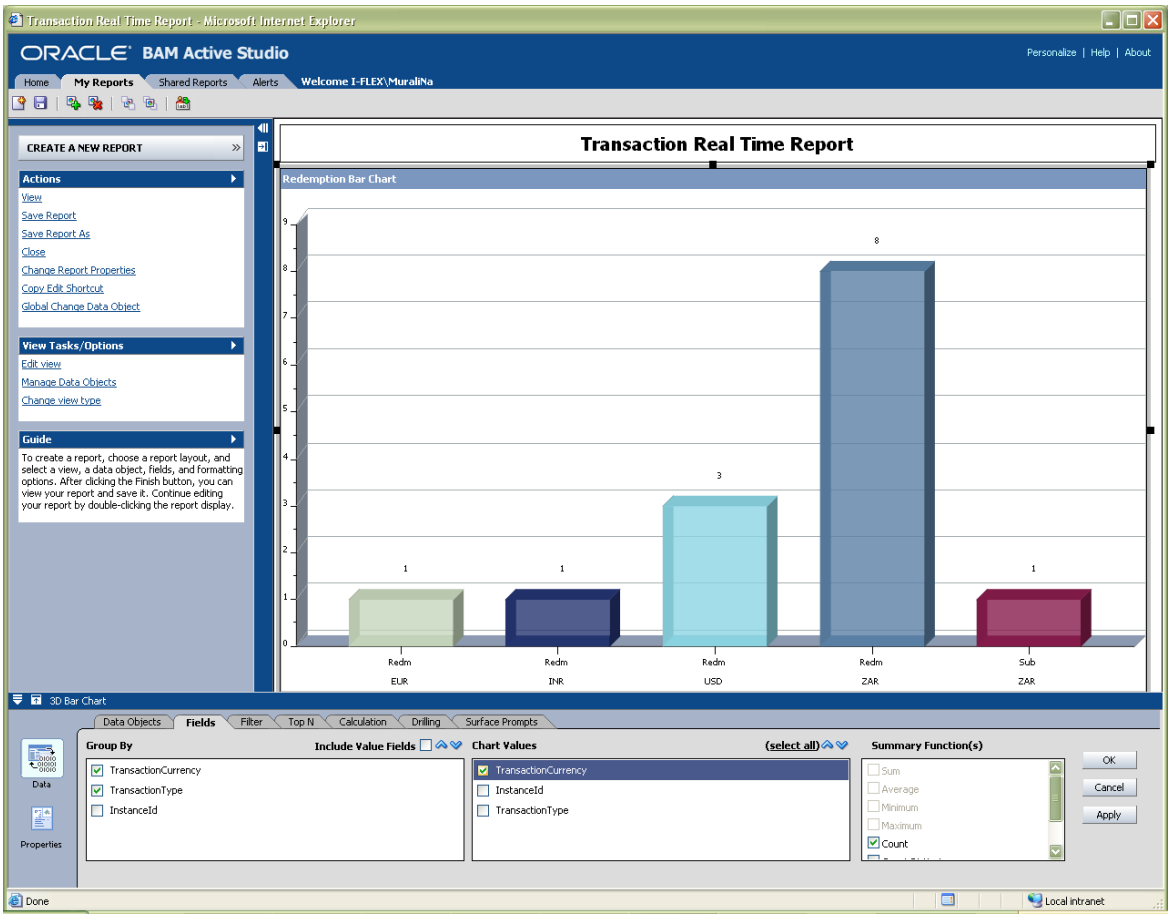
2. Right click on Transaction Type to and click on set text and enter the value for the transaction type (Redemption).



3. Save the process and deploy.

6.6.8 Creating Real-time Reports

Create a report as shown below:



For more details on how to create a report refer: 6.5

Redemption_BAMTX NCCYDEMO.zip

Attached ZIP contains complete sources of BAM related changes to FCIS Redemption Process. Before deploying make sure that you have created BAM Data object with Name: TxnRealTimeData is available.

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