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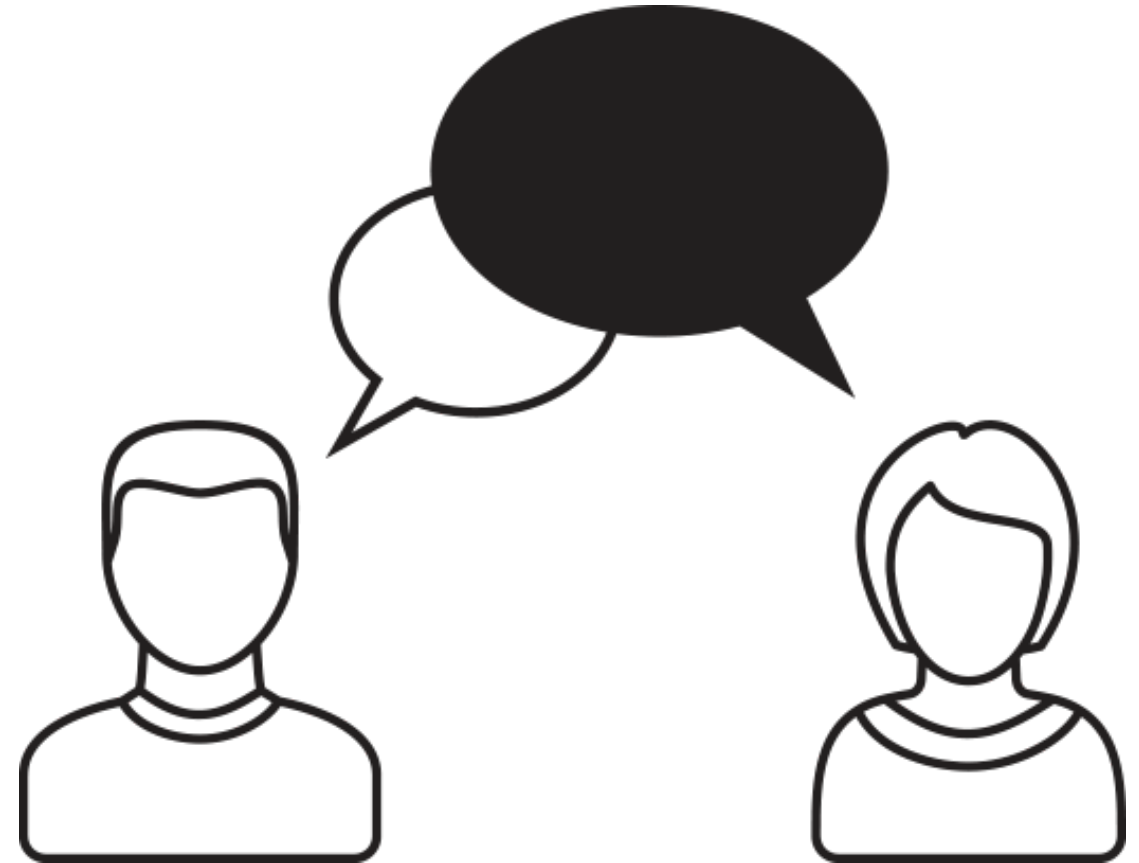
Building a Web Service | Lab

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Introductions

- Take 5 Minutes
- Turn to a Person Near You
- Introduce Yourself



Agenda

- What is Web Service
- CA PPM Web Services
- How to access CA PPM Web Services
- Building a NSQL based Web Service
 - Exercise
- Consuming the NSQL based Web Service
 - Exercise
- Consuming a Non CA PPM Web Service
 - Exercise

Web Services

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Web Services

- In Simple terms –
- A web service is a method that can be accessed by other programs over the web (HTTP).
- Web services are designed to allow applications built using different technologies to communicate with each other without issues.
- Examples –
 - Weather.com providing weather information
 - Various search engines

CA PPM Web Service

The XML Open Gateway (XOG) is the SOAP based CA PPM Web Service interface that can be used to:

- Import/Export data
- Move configuration data between CA PPM environments
- Initiate processes in CA PPM
- Execute NSQL queries via the Query API

XOG uses Extensible Markup Language (XML), Simple Object Access Protocol (SOAP) and Web Services Description Language (WSDL) to exchange information with other applications.

- XML is the format used for the XOG requests.
- WSDL is used to describe the available XOG services and the format of the XOG document.
- SOAP is the protocol used to send the XOG requests.

CA PPM Web Service

- XOG provides the Web services for –
 - Object
 - Includes Services for most of the out of box objects (and custom objects through CustomObjectInstances)
 - Read and Write Services
 - InvokeAction
 - Admin actions that are outside of data import/export
 - Flush Cache
 - Invoke Processes
 - Queries
 - A Web service is created for each NSQL query
 - Execute NSQL query and export data
- WSDLs describe the available XOG services and indicates how to communicate with them.

CA PPM Web Service

- How to Access XOG WSDL
- XOG WSDL can be accessed at the below URL on your CA PPM server



Clicking a link displays all included services



Displays the WSDL as HTML

Save the WSDL as XML

Building a NSQL based Web Service

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Exercise – Building a NSQL based Web Service

- Create NSQL Query
- Input Query Name and ID (ID = regou_source_qry)
- Paste NSQL Query

Query Properties: General

Query Name: Project Summary Query

Query ID: regou_source_qry

Available for User Portlets:

Content Source: Customer

Category: [--Select--]

Description:

Save and Continue Save And Return Return



Query: Project Summary Query - NSQL

```

NSQL
SELECT
@SELECT:DIM:USER_DEF:IMPLIED:PRJ:INV.ID:PRJID@,
@SELECT:DIM_PROP:USER_DEF:IMPLIED:PRJ:INV.NAME:PRJNAME@,
@SELECT:DIM_PROP:USER_DEF:IMPLIED:PRJ:MGR.USER_ID:MGRID@,
@SELECT:DIM_PROP:USER_DEF:IMPLIED:PRJ:MGR.FULL_NAME:PRJMGR@,
@SELECT:DIM_PROP:USER_DEF:IMPLIED:PRJ:Count(*):TEAMCOUNT@
FROM
INV_INVESTMENTS INV
JOIN PRIEAM PT ON INV.ID = PT.PRPROJECTID
JOIN SRM_RESOURCES MGR ON MGR.USER_ID = INV.MANAGER_ID
WHERE INV.ODF_OBJECT_CODE = 'project'
AND @FILTER@
GROUP BY INV.ID, INV.NAME, MGR.USER_ID, MGR.FULL_NAME
HAVING @HAVING_FILTER@

```

- Save and Continue

Exercise – Building a NSQL based Web Service

- CA PPM creates a Web Service for the NSQL query you just built!
- Click on below link –
- <http://<servername:port>/niku/wsd/Query>
- ID = regou_source_qry is displayed
- Clicking the link displays the WSDL



Consuming a NSQL based Web Service

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Exercise – Consuming a NSQL based Web Service

- Create a process with the intention of using a GEL script
- Here are two example scripts
 - Consume the NSQL query using the SOAPTagLibrary's Tags
 - Consume the NSQL query using Java as the SOAP client



Consume Web Service - NSQL with Tags.xml



Consume Web Service - NSQL with Java.xml

Exercise – Consuming a NSQL based Web Service

- The basis of the SOAPTagLibrary script is the invoke tag

```
<!--Execute Request-->
<core:catch var="soapError">
  <soap:invoke endpoint="internal" var="soapResult">
    <soap:message>
      <soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xog="http://www.niku.com/xog">
        <soapenv:Header>
          <xog:Auth>
            <xog:SessionID>${sessionID}</xog:SessionID>
          </xog:Auth>
        </soapenv:Header>
        <soapenv:Body>
          <gel:include select="$loadContent"/>
        </soapenv:Body>
      </soapenv:Envelope>
    </soap:message>
  </soap:invoke>
</core:catch>
<core:if test="${!empty(soapError)}">
  <gel:log level="WARN">Problem performing SOAP call!</gel:log>
  <gel:log level="ERROR">${soapError}</gel:log>
</core:if>
```

Exercise – Consuming a NSQL based Web Service

- The basis of the Java SOAP client script is to create a Java `java.net.URL` instance, get the connection and manually set the headers and perform the POST

```

<core:new var="soapUrl" className="java.net.URL">
  <core:arg type="java.lang.String" value="{soapEndPoint}" />
</core:new>
<core:invoke var="connection" on="{soapUrl}" method="openConnection"/>
<core:expr value="{connection.setDoOutput(true)}" />
<core:expr value="{connection.setRequestMethod('POST')}" />
<core:expr value="{connection.setRequestProperty('Content-type', 'text/xml; charset=utf-8')}" />
<core:expr value="{connection.setRequestProperty('SOAPAction', soapAction)}" />

<!-- Write request XML to connection's OutputStream -->
<core:invoke var="outputStream" on="{connection}" method="getOutputStream" />
<core:new var="outputStreamWriter" className="java.io.OutputStreamWriter">
  <core:arg type="java.io.OutputStream" value="{outputStream}" />
</core:new>
<core:expr value="{outputStreamWriter.write(requestXml)}" />
<core:expr value="{outputStreamWriter.close()}" />

<!-- Read in the response from SOAP endpoint -->
<core:invoke var="inputStream" on="{connection}" method="getInputStream" />
<gel:parse var="soapResult" file="{inputStream}" />

```


NSQL Scripts Code Review

- Questions or comments about the examples

Consuming Non-CA PPM based Web Service

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Exercise – Consuming any SOAP based Web Service

- Here are two more examples of scripts that consume non-CA-PPM web services. One uses the SOAPTagLibrary tag and the other uses Java as the SOAP client



Consume Web Service - Weather with Tags.xml



Consume Web Service - Weather with Java.xml

Non-CA-PPM Scripts Code Review

- Questions or comments about the examples

Questions?



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- Enter **Description**
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