Workflow Configuration Service

Introduction:

Workflow Configuration Service is a Web Service Client to LEAD CI System. WCS is essentially a wrapper around Portal (Experiment Builder Portlet) functionality to create and execute experiments. It uses experiment builder API to perform all myLEAD and GPEL interactions, please refer to Portal documentation for further information.

Intended Usage:

1. WCS is primarily used to Configure and Launch Forecast Workflow for Triggered Workflow Use Case Scenarios.
2. WCS is used to configure and launch workflows using VGRADS Scheduling System.
3. WCS is used to set up automated workflow launch and monitoring in association with Workflow Monitoring Services.
4. WCS is used as a workflow system client for testing and debugging purposes.

Configure Workflow:

1. WCS fetches the workflow from GPEL engine by requesting the workflow template id.
2. It iterates through workflow inputs and extracts metadata from input parameters.
3. Queries Data Catalog for needed inputs
4. Sets up the workflow input message

Launch Workflow:

After Workflow inputs are configured WCS, registers the input data products with myLEAD, builds the Workflow input SOAP message and launches the workflow to GPEL Engine.

Wait for Data:

When wait for data option is selected Workflow launch is held until the needed data is available from Data Catalog or a time out of estimated data arrival + 1 hour is reached.

Automated Workflow Monitoring & Email Notification:

WCS service configures a workflow and launches a workflow in monitoring mode with the below specified event format and workflow monitoring service looks at the event and waits for the specified time to receive workflow started and completed events. After the
Workflow complete message is received or time out is reached it send an email to the listed email addresses.

```xml
<wor:monitorWorkflow
xmlns:wor="http://lead.extreme.indiana.edu/namespaces/2006/06/workflow_tracking">
  <wor:notificationSource
    wor:serviceID="urn:qname:http://www.extreme.indiana.edu/lead:WCS"
    wor:workflowID="tag:gpel.leadproject.org,2006:6BD/WRFForecastWithADASIn
tializedData/instance71"
    wor:workflowTimestep="18" wor:workflowNodeID="WCS"/>

  <wor:monitoringDurationInHours>1.5</wor:monitoringDurationInHours>
    <wor:emailTo>aslom@indiana.edu</wor:emailTo>
      <wor:emailTo>smarru@indiana.edu</wor:emailTo>
        <wor:timestamp>2007-01-20T10:53:28-05:00</wor:timestamp>
  </wor:monitorWorkflow>
```

**WCS WSDL:**

```xml
<?xml version='1.0' encoding='utf-8' standalone='yes'?><definitions name='WCS'
  targetNamespace='http://www.extreme.indiana.edu/lead/WCS/
  xmlns:typens='http://www.extreme.indiana.edu/lead/WCS/xsd/
  xmlns:wsdl='http://www.extreme.indiana.edu/lead/WCS/'
  xmlns:crosscutns='http://lead.extreme.indiana.edu/namespaces/2006/lead-crosscut
  parameters/' xmlns:xsd='http://www.w3.org/2001/XMLSchema'
  xmlns:wsa='http://www.w3.org/2005/08/addressing'
  xmlns:wsaw='http://www.w3.org/2006/05/addressing/wsdll'
  xmlns:soap='http://schemas.xmlsoap.org/wsdl/soap/
  xmlns='http://schemas.xmlsoap.org/wsdl/'

  <types>
    <schema elementFormDefault='unqualified'
      targetNamespace='http://www.extreme.indiana.edu/lead/WCS/xsd/
      xmlns='http://www.w3.org/2001/XMLSchema'>

      <annotation>
        <documentation xml:lang='en'>Workflow Configuration Service
        </documentation>
      </annotation>

    <element name='ConfigureLaunchWorkflowInput'
      type='typens:ConfigureLaunchWorkflowInputType'
      <annotation>
```
Inputs to WCS service to configure workflow inputs and launch workflow.

<complexType name='ConfigureLaunchWorkflowInputType'>
  <sequence>
    <element name='Workflow_Template_ID' type='xsd:anyURI'>
      <annotation>
        <documentation xml:lang='en'>
          The workflow ID of the user selected workflow
        </documentation>
      </annotation>
    </element>
    <element name='Workflow_Only_Create' type='xsd:boolean' default='false' minOccurs='0'>
      <annotation>
        <documentation xml:lang='en'>
          Should workflow instance be created but not started?
        </documentation>
      </annotation>
    </element>
    <element name='waitForData' type='xsd:boolean' default='false' minOccurs='0'>
      <annotation>
        <documentation xml:lang='en'>
          EXPERIMENTAL/IDEA: Should wait for data to be available and only then launch workflow?
        </documentation>
      </annotation>
    </element>
  </sequence>
  <element name='monitoringEpr' minOccurs='0'>
    <complexType>
      <annotation>
        <documentation xml:lang='en'>
          Optional: where to send event with monitoring requests
        </documentation>
      </annotation>
      <sequence>
        <any namespace='##any' processContents='lax' minOccurs='0' maxOccurs='unbounded' />
      </sequence>
    </complexType>
  </element>
</complexType>
<element name='monitoringDurationInHours' type='xsd:float' minOccurs='0' />

<element name='monitoringEmailTo' type='xsd:string' minOccurs='0' maxOccurs='10' />

<element name='Domain_Configuration' type='crosscutns:LeadCrosscutParameters' minOccurs='0'>
    <annotation>
        <documentation>Contains partial input to workflow such as crosscut parameters</documentation>
        <appinfo>
        </appinfo>
    </annotation>
</element>

<element name='Workflow_Partial_Input' minOccurs='0'>
    <complexType>
        <annotation>
            <documentation>A partially filled input message to workflow - this message is used by WCS to create a final message sent to a new workflow instance.</documentation>
        </annotation>
        <sequence>
            <any namespace='##any' processContents='lax' minOccurs='0' maxOccurs='unbounded' />
        </sequence>
    </complexType>
</element>

<element name='ConfigureLaunchWorkflowOutput' type='typens:ConfigureLaunchWorkflowOutputType'>
    <annotation>
        <documentation xml:lang='en'>Asynchronous output from WCS service invocation</documentation>
    </annotation>
</element>
<complexType name='ConfigureLaunchWorkflowOutputType'>
  <sequence>
    <element name='Workflow_Launch_Status' type='xsd:string'>
      <annotation>
        <documentation xml:lang='en'>Status message about the workflow launch</documentation>
      </annotation>
    </element>
    <element name='Workflow_Instance_ID' type='xsd:anyURI'>
      <annotation>
        <documentation xml:lang='en'>The workflow instance ID of the created workflow</documentation>
      </annotation>
    </element>
    <element name='Workflow_Input_Message'>
      <complexType>
        <annotation>
          <documentation>Workflow Input Message.</documentation>
        </annotation>
        <sequence>
          <any namespace='##any' processContents='lax' minOccurs='0' maxOccurs='unbounded' />
        </sequence>
      </complexType>
    </element>
  </sequence>
</complexType>

<complexType name='LeadCrosscutParameters'>
  <annotation>
    <documentation xml:lang='en'>List of elements from crosscut namespace (and others)</documentation>
  </annotation>
  <sequence>
    <any namespace='##any' processContents='lax' minOccurs='0' maxOccurs='unbounded' />
  </sequence>
</complexType>
<message name='ConfigureLaunchWorkflowRequestMessage'>
  <part name='ConfigureLaunchWorkflowInput'
    element='typens:ConfigureLaunchWorkflowInput' />
</message>

<message name='ConfigureLaunchWorkflowResponseMessage'>
  <part name='ConfigureLaunchWorkflowOutput'
    element='typens:ConfigureLaunchWorkflowOutput' />
</message>

<portType name='WCS_PortType'>
  <operation name='ConfigureLaunchWorkflow'>
    <input name='ConfigureLaunchWorkflowRequestMessage'
      message='wsdlns:ConfigureLaunchWorkflowRequestMessage' />
    <output name='ConfigureLaunchWorkflowResponseMessage'
      message='wsdlns:ConfigureLaunchWorkflowResponseMessage' />
  </operation>
</portType>

<binding name='WCS_SoapBinding' type='wsdlns:WCS_PortType'>
  <soap:binding style='document' transport='http://schemas.xmlsoap.org/soap/http' />
  <wsaw:UsingAddressing />

  <operation name='ConfigureLaunchWorkflow'>
    <soap:operation soapAction="" />
    <wsaw:Anonymous>optional</wsaw:Anonymous>
    <input name='ConfigureLaunchWorkflowRequestMessage'>
      <soap:body use='literal' />
    </input>
    <output name='ConfigureLaunchWorkflowResponseMessage'>
      <soap:body use='literal' />
    </output>
  </operation>
</binding>
<service name='WCS'>
  <port name='WCS_Port' binding='wsdlns:WCS_SoapBinding'>
    <soap:address location='https://129.79.240.88:9443/wcs' />
  </port>
</service>

</definitions>