PTC Technical Specialists E-Newsletter
Date: April 2010

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PTC Product Focus

What's New in Pro/Engineer Wildfire 5.0 Industrial Design

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PTC Product Focus

Using Web Services with Windchill

Many web services are provided with Windchill PDMLink and are readily available for use. Although there are many available, it's possible that the library of services available does not meet the needs of the project. As such, it may be a requirement to create a new web service from scratch. This newsletter will demonstrate how to explore the available web services in Windchill PDMLink and describe a method for rapidly defining new web services using Windchill InfoEngine.

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Automatic Surface Creation Using Reverse Engineering Extension

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Tips of the Month

Exploring Available Web Services

As a starting point, this newsletter will examine existing web services both from an internal application and management perspective as well as the more familiar, externally facing methodologies typically associated with web service deployment and use the Web Service Definition Language (WSDL). Both methods will be explored.

Task Delegate Exploration

To examine web services within the Windchill PDMLink application setting the Task Delegate Administrator provides quick access to browse available web services. The Task Delegate will be used to identify the resource driving the web service call which can then be readily explored in detail.

To begin, login to the Site – Utilities tab and navigate to the Task Delegate Administrator. From the Task Delegate Administrator select the Repository Type to be com.ptc.windchill. This will contrain the type of Task Delegates you wish to view to be those associated with the Windchill PDMLink application as opposed to LDAP or other types of delegates.

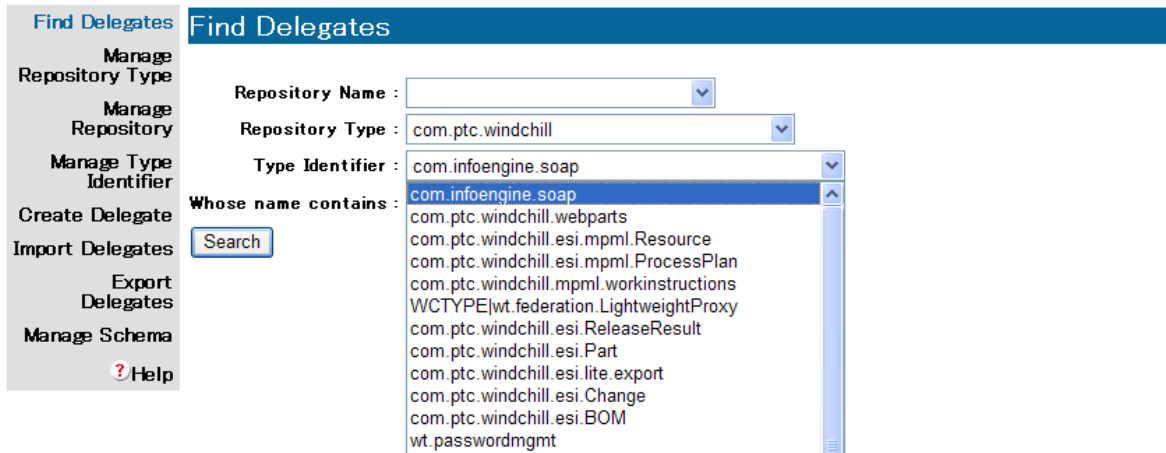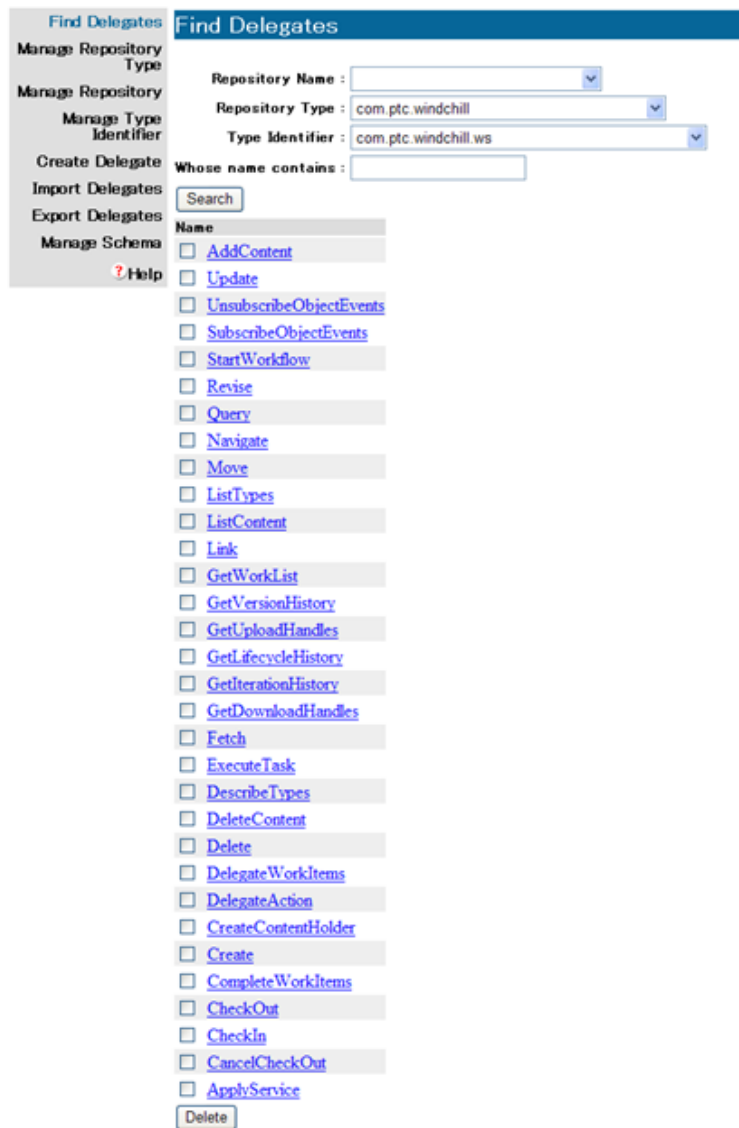By default, the Type Identifier will be selected as com.infoengine.soap. A Type Identifier is a logical grouping to identify categories of Type Delegates. By selecting the drop down, a wide array of Type Identifiers becomes available.

Notice Type Identifiers such as com.ptc.windchill.webparts which is associated with Windchill WebParts for Sharepoint; com.ptc.windchill.esi.Part which is associated with ESI Part related operations. Note that the list of Type Identifiers is implementation specific and depending on both the products and modules included in the installation in addition to any uniquely created Type Identifiers may result in a different listing than indicated in the screenshot.

To explore further, select the Type Identifier com.ptc.winchill.ws. This Type Identifier is provided as part of the Windchill PDMLink application and provides many examples to browse. After selecting the Repository Type to be com.ptc.windchill and the Type Identifier to be com.ptc.windchill.ws, click on the Search button to retrieve the constituent Task Delegates.

In the future, the search can be further constrained using the Whose name contains free text field to match on a search string. In the meantime, the list returned will look as follows:

As an example, navigate to the Task Delegate GetWorkList. As its name implies, this Task Delegate can be used via a web service implementation to retrieve a user's work list from Windchill PDMLink. Note that not all naming conventions are straight forward and require further examination to determine the exact behavior. To that end, notice when the GetWorkList item is selected, the supporting resources are identified.

```
Find Delegates        Update Delegate
Manage Repository
          Type
                          *Name :  GetWorkList
Manage Repository
                    *Repository Type :  com.ptc.windchill          ▼
Manage Type
     Identifier          Type Identifier :  com.ptc.windchill.ws        ▼
Create Delegate            *Source URL :  /com/ptc/windchill/ws/GetWorkList.xml
Import Delegates           Description :
Export Delegates                              OK
Manage Schema
          ? Help
```

Note that the Name, Source URL, and optional Description are now identified. In this example, no Description is provided but would be a useful place to record information to help inform consumers of the Task Delegates of their functions. Notice the reference to the Source URL which in this case is an InfoEngine Task. To examine further navigate in the Windchill installation point to the tasks directory which houses the resource. As a shortcut this is identified as <windchill_loadpoint>/tasks/<Source URL> which in this case is /com/ptc/windchill/ws/GetWorkList.xml. This newsletter has included this file for reference below:

```
<?xml version="1.0" standalone="yes"?>
<%@taglib uri="http://www.ptc.com/infoengine/taglib/core" prefix="ie"%>
<%@page import="wt.adapter.BasicWebjectDelegate"%>
<%@page import="wt.org.WTPrincipal"%>
<%@page import="wt.session.SessionHelper"%>

<!--com.infoengine.soap.rpc.def

Retrieves the list of uncompleted work items associated with a specific user.

@param string userUfid The UFID of the user, null selects calling user
@param string[] propertyNames Names of the properties to be returned in each object
@return com.ptc.windchill.ws.GenericBusinessObject[] ${output[*]} The uncompleted work items

-->

<%
String userUfid = (String)getParam ("userUfid");

if ( userUfid == null ) {
  try {
    userUfid = BasicWebjectDelegate.getUfid (SessionHelper.getPrincipal ());
  }
  catch ( Exception e ) {
    throw new IEException (e);
  }
}
%>

<ie:webject name="Apply-Service" type="OBJ">
 <ie:param name="instance" data="${@FORM[]supporting-adapter[*]}"
        valueSeparator=";" delim=";"/>
 <ie:param name="service" data="wt.workflow.work.WorkflowHelper"/>
 <ie:param name="method" data="getUncompletedWorkItems"/>
 <ie:param name="arg" data="wt.org.WTPrincipal='<%=userUfid%>'"/>
 <ie:param name="group_in" data="@FORM"/>
 <ie:param name="attribute" data="${@FORM[]propertyNames[*]}" delim=","/>
 <ie:param name="group_out" data="output"/>
</ie:webject>
```

Upon examination of the InfoEngine task, more information is provided indicating the purpose of this task and the associated input: Retrieves the list of uncompleted work items associated with a specific user. For further details regarding the function of the task please refer to the InfoEngine Administrator's Guide and the InfoEngine User's Guide.

To find more web services available, continue to browse the Task Delegates by browsing other Type Identifiers and navigating to other Task Delegates as indicated in the newsletter. Many examples are provided to use as building blocks for later sections in the document.

Viewing the WSDL

To examine Windchill PDMLink web services external to the Windchill application, a WSDL is available to identify key characteristics of the available web services. This section will continue to build upon the previous section using the same example GetWorkList function.
The WSDL is available via http via the Windchill PDMLink application. Here is the shortcut to the associated WSDL:

http://<windchill_host>/Windchill/servlet/SimpleTaskDispatcher?CLASS=com.ptc.winchill.ws

Note that this resource will display all of the available web service operations available in the class. In the Task Delegate vernacular, the Type Identifier corresponds to the class or web service where the Task Delegate corresponds to the operation. To see the WSDL for other classes, simply change the value of the CLASS variable in the URL supplied above to the corresponding Type Identifier.

Attached are a couple relevant snippets corresponding to the GetWorkList function described previously.

```
<message name="GetWorkListRequestMsg">
  <part name="userUfid" type="xsd:string" />
  <part name="propertyNames" type="wc:ArrayOfstring" />
</message>


<operation name="GetWorkList">
  <documentation>Retrieves the list of uncompleted work items associated with a specific user.</documentation>
  <input message="wc:GetWorkListRequestMsg" />
  <output message="wc:GetWorkListResponseMsg" />
</operation>
```

Notice from the message name element, the inputs are identified as described previously in the supporting InfoEngine Task. Further the description has been populated.

To explore further simply browse by operation or navigate to other web services to find other operations available.

Creating a New Web Service using InfoEngine Tasks

Using the methods explored previously in the newsletter creating new web services is simply a reversal of the process. In this case, start with a Windchill InfoEngine task. Once the task has

been authored and verified, there are a couple key elements to add. Recall from the GetWorkList example task that the XML header was immediately followed by the following section:

```
<!--com.infoengine.soap.rpc.def

Retrieves the list of uncompleted work items associated with a specific user.

@param string userUfid The UFID of the user, null selects calling user
@param string[] propertyNames Names of the properties to be returned in each object
@return com.ptc.windchill.ws.GenericBusinessObject[] ${output[*]} The uncompleted work items

-->
```

These values are registered by the Windchill application and rendered to the appropriate WSDL schema to support proper web service interaction. As such, the description is contained in the free text, the inputs are defined in the param field and the return is described as the output list of Windchill objects. For more detail, consult the Windchill Customizer's Guide and the InfoEngine Administrator's Guide.

The scope of this document is constrained to registering InfoEngine tasks with the Task Delegate Administrator to be serviced as Windchill web services. As such, specific details on how to crate InfoEngine tasks will not be covered. For more information on InfoEngine tasks, consult the InfoEngine User's Guide.

To register the task with Windchill, first return to the Task Delegate Administrator application. Now, first create a new Type Identifier to house the new Task Delegate. The new Type Identifier should be chosen to properly describe and house the type of operations the new web service will support and further helps to differentiate those operations shipped with the product versus those created unique to the implementation. To create a new Type Identifier, click on the hyperlink Manage Type Identifier. On the resulting form, populate with relevant values. Note that these will be Windchill functions and as such the Repository Type should be chosen as a com.ptc.windchill. An example is provided.

Note that the super-type is not required. Further, the naming convention used maintains the com.ptc.windchill and appends the specific identification to the end. To complete, click on the Create button.

Upon successful creation of the Type Identifier next add the Task Delegate. Click on the Create Delegate hyperlink. With the newly create Type Identifier selected, create the corresponding Type Delegate. Example values are provided below but should be tailored to the function. Note that the Repository Type and Type Identifier are consistently identified. Further another useful convention is to create a new directory structure for the supporting InfoEngine tasks to sequester these tasks from those that ship with the Windchill PDMLink product. In this case, a directory was identified as ext which corresponds to a directory created on the Windchill PDMLink application host as <windchill_loadpoint>/tasks/ext

Now that the InfoEngine task is created properly and registered properly as a Task Delegate, the supporting WSDL can be retrieved by simply reusing the previous URL and supplying the newly created Type Identifier as the class variable. In the example provided, this would be as follows: http://<windchill_host>/Windchill/servlet/SimpleTaskDispatcher?CLASS=com.ptc.winchill.examples

The new web service is now ready for use.

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Announcements

PTC Tips & Techniques Newsletter Archives

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We have been eagerly anticipating the debut of the new electronic version of Profiles Magazine and now it is here! This new web site will supplement the print edition of the magazine and will provide new useful features not feasible with paper media. e-Profiles will provide you with 24x7, worldwide access to key information previously available exclusively in the print version. "Tips & Tricks," a popular feature pioneered by Pro/USER, has also moved to the web and will be expanded as the site matures.

Please take a few minutes to check out this new web site. We don't think you will be disappointed.

http://profilesmagazine.com/

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Upcoming Events & Training Class Schedules

Upcoming, 2010   Your local Pro/Engineer User Groups
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June 6 – 9, 2010   Orlando, FL USA
PTC/USER World Event
http://www.ptcuser.org/

Events

Our seminars and conferences seek to provide you with relevant information regarding product development trends in your industry as well as innovative software learning experiences. Think of them as a constructive day off where you can share experiences and swap ideas with your peers.

If you can't manage to get away, we'll bring it to you. Check back often for regularly scheduled live webcast events.

You're Invited to Attend…

Please visit the PTC Education Services website for the latest training information including course descriptions, schedules, locations, and pricing.

- Attend a course at any PTC Center and receive a free copy of Pro/ENGINEER Wildfire Student Edition!

    http://www.ptc.com/services/edserv/index.htm

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Virtual Classrooms provide interactive learning with a trained PTC instructor in convenient and manageable sessions that last approximately 4 hours over a series of days. It's easy to join a class right from your desk using a phone or voice-over IP technology.

Sessions are performed just like a traditional ILT (including interactive exercises where you and the instructor can work on lab exercises together) and feature some of our most popular ILT courses. These sessions cover the exact same material as the traditional ILT in-center courses. Also look for some of our most frequently requested mini-topics delivered in the same format that are only an hour - two hours in duration.

If you have any questions about these sessions or would like to see getting other courses, not on this list, on the schedule please feel free to contact me for more details. They are a great way to bring training to you without you having to worry about location or being out from work for long stretches.

You can register for these sessions just as you would for any normal ILT class either by:

1. calling order admin at http://www.ptc.com/services/edserv/training/registra.htm or

2. you can go to PTC University directly at http://www.ptc.com/learning and submit a registration request directly. All you have to do is search the catalog by typing in "virtual" in the search field and you will see a listing.

PTC

Note: This PTC E-Newsletter will continue to be used for the following:

1) Inform you on events related to PTC products (user groups, conferences, training schedules, etc.)

2) Educate you on solutions that are available at PTC

3) Tips & Techniques using PTC Products

Note: These messages are compiled in the local PTC office and will be distributed via e-mail.

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