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PTC Product Focus

Customizing the Windchill R7.0 Search Results

The search pages in Windchill R7.0 are defined using the Dynamic Client Architecture, an XML-based application definition tool designed to make Windchill’s user interfaces more configurable. This article will cover making changes to several aspects of the search results. The good news is that we won’t have to touch a single line of Java code!

The Search Interface

Here is an example of the Search Interface that is part of PDMLink:

Note the four highlighted areas on this partial page:

- The criteria area (red)
- The results table (blue)
- The actions at the top of the results table (green)
- The actions in each row of the table (black)

The DCA Search Configurations

All of the configurations related to creating the search page layout exist in the directory [wt.home]/[com.ptc.core.ca.co.common.config.directory]/com/ptc/windchill/enterprise/search. The entries in square brackets are entries in the Windchill server's wt.properties file.

The primary id we are interested in is the one called 'simpleFrame.search.all'. This is the DCA ID that produces the search component. This component is embedded into each of the Windchill applications – PDMLink, ProjectLink, and Windchill PDM.

The ID 'simpleFrame.search.all' provides a *pattern* for the creation of a search results page devoid of references to specific Windchill object types. The pattern defines the basic look and feel of the search page (for instance, the criteria area appears above the results table, the component that launches that actual search request is a button instead of a simple hyperlink, the table allows multi-select operations, the table allows paging through the result set 15 items at a time instead of waiting for hundreds or even thousands of items to be rendered, etc.) When the pattern needs something from the current object (which will be defined as part of the request for 'simpleFrame.search.all'), it will use an Include or Extend element that tells DCA to find a particular element ID given the current context of the DCA request. Each object type known to the system will provide an element of this same name to provide any object specific information.

So what we need is the set of those included IDs that define the object specific components so we can change their content:

- Criteria area – **elementGroup.objectSpecificAttributes**
- Results Table column definitions - **elementGroup.compositeTable.searchResults**
- Results Table header toolbar - **actionList.tableSelectionOperations.search**
- Results Table row toolbar - **actionList.tableRowOperations**

Changing the Criteria Area

Let's look at an example of the search criteria area using the wt.part.WTPart object type.

The screenshot shows the Windchill search interface. At the top, there are navigation tabs: Home, Product, Project, Change, Library, Organization, Site. Below these are links for Overview, Assignments, Updates, Checked-Out Work, Meetings, Notebook, Subscriptions, Reports, Utilities. The main search area is titled 'Advanced Search' and includes a 'Saved Searches' dropdown. The search criteria section is highlighted with a red box and contains the following fields:

- Keyword:** [Text Input]
- Part Name:** [Text Input] **Number:** [Text Input]
- Results Per Page:** 15
- Search In:** All Contexts (dropdown) Apply selection only to contexts I'm a member of.
- Search For:** Part (dropdown) [Change...]
- Modified:** -- Select Range -- (dropdown) From: [Date Picker] MM/DD/YYYY To: [Date Picker] MM/DD/YYYY
- Created:** -- Select Range -- (dropdown) From: [Date Picker] MM/DD/YYYY To: [Date Picker] MM/DD/YYYY
- Modified By:** [Text Input] [Find...] [Clear]
- State:** -- No Selection -- (dropdown)
- Created By:** [Text Input] [Find...] [Clear]
- Version:** [Text Input]
- Checked Out By:** [Text Input] [Find...] [Clear]
- Source:** -- No Selection -- (dropdown)
- View:** [Text Input] [Browse...] [Clear]

At the bottom of the criteria area, there is a 'Show More Attributes' link and 'Search', 'Save', and 'Clear' buttons.

This is the out of the box page for wt.part.WTPart. The two highlight boxes will be explained shortly. In the file (com/ptc/windchill/enterprise/part/search.xml), we find

```
<ElementGroup id="elementGroup.objectSpecificAttributes">
  <Extend ref="revisionControlled:elementGroup.objectSpecificAttributes"/>
  <Insert ref=":layoutRow.spacer"/>
  <LayoutRow id="rowAttr4">
    <Insert ref=":property.source" sticky="%[context#sticky]"/>
    <Insert ref=":elementgroup.picker.view" context.populateAttribute="viewName"
context.populateAttribute2="view.id" if="%[context#pjl_standalone]==false"/>
  </LayoutRow>
  <Insert ref=":layoutRow.spacer"/>
  <LayoutRow id="orgRow">
    <Insert ref=":elementgroup.picker.organization" context.populateAttribute="orgName"
context.populateAttribute2="organization.id"
if="%[property#wt.properties#wt.org.OrganizationOwned.displayOrganization]==true"/>
    <Insert ref=":property.partType" sticky="%[context#sticky]"
if="%[context#appId]==%[:Windchill]"/>
  </LayoutRow>
</ElementGroup>
```

Take special note of the bolded lines. These are the key elements that make up the criteria area layout.

The first one is the `<Extend>` element that references *revisionControlled:elementGroup.objectSpecificAttributes*. This `<Extend>` is represented on the screenshot by the red box. Everything in that red box is defined because wt.part.WTPart is a revisionControlled object. This allows a developer to create a standardized criteria section for a particular class, type or interface that can be used by other objects. It insures consistency because they can all use the same predefined component instead of having to redefine it for each object type. If you change the content of *revisionControlled:elementGroup.objectSpecificAttributes*, then every object that uses it will change immediately. The *revisionControlled:elementGroup.objectSpecificAttributes* element is currently defined in com/ptc/windchill/enterprise/revisioncontrolled/search.xml.

The rest of the highlighted lines are for specific attributes defined only for wt.part.WTPart – note that there are four of them. Wait a second! There are only two fields on the screenshot! Look at the entries for *elementgroup.picker.organization* and *property.partType*. They both contain a fragment *if= "...something..."*. This allows conditional inclusion of a field based on the state of the application that is running. The *elementgroup.picker.organization* field is only included if the wt.properties entry *wt.org.OrganizationOwned.displayOrganization* is set to true. The *property.partType* field is only included if the application ID context setting is NOT ‘Windchill’, meaning that it will not show up in PDMLink or ProjectLink. This is why there are only two fields inside the blue box.

So, if you have extended wt.part.WTPart with the TypeManager to add, say another twenty attributes, you can control how those new attributes are going to be displayed in the criteria area instead of relying on the alphabetized spreadsheet approach used by the “Show More Attributes” link. The way to do this is to add more layout rows to the criteria area.

Since the criteria fields for *Source* and *View* are side by side in the same row of the layout, we’ll probably want to maintain this two-by-two arrangement. For every two additional attributes, create a new LayoutRow like this:

```

<LayoutRow id="part0001">
  <Insert ref=":newpartpropertyA"/>
  <Insert ref=":newpartpropertyB"/>
</LayoutRow>

```

Be sure that the id is unique from all other layout rows. Also, you will have to have defined the <Property> elements for whatever new attributes you have added. See the property.xml file in the same directory as the search.xml file we are currently editing for several examples of <Property> elements.

If you wish to hide Source or View, merely remove the <Insert> element that refers to those property definitions.

Changing the Results Table Column Definitions

In a similar manner to the criteria section, we can add or remove columns from the search results table. Here is a sample search results for wt.part.WTPart:

The screenshot shows a search results interface with a table of 30 items. The table has the following columns: Name, Number, Actions, Context, Version, State, and Modified. The items listed are:

Name	Number	Actions	Context	Version	State	Modified
BOTTOM SLIDER	GC000025		GOLF_CART	A	In Work	02/25/2005
BOTTOM SLIDER CAP	GC000026		GOLF_CART	A	In Work	02/25/2005
UPPER SLIDER	GC000027		GOLF_CART	A	In Work	02/25/2005
UPPER BAG HOLDER	GC000028		GOLF_CART	A	In Work	02/25/2005
HANDLE	GC000029		GOLF_CART	A	In Work	02/25/2005
CARD HOLDER	GC000030		GOLF_CART	A	In Work	02/25/2005
WHEELS_ASSEM	GC000031		GOLF_CART	A	In Work	02/25/2005
WHEEL AXLE	GC000032		GOLF_CART	A	In Work	02/25/2005
BEARING AXLE	GC000033		GOLF_CART	A	In Work	02/25/2005
WHEEL HUB	GC000035		GOLF_CART	A	In Work	02/25/2005
LT_ARM	GC000039		GOLF_CART	A	In Work	02/25/2005
WHEEL ASSY	GC000040		GOLF_CART	A	In Work	11/13/2004
LOWER SUPPORT	GC000019		GOLF_CART	A	In Work	02/25/2005
LOWER SUPP BAR	GC000020		GOLF_CART	A	In Work	02/25/2005
LOWER BAG HOLDER	GC000022		GOLF_CART	A	In Work	02/25/2005

The interface also includes search filters for Modified By, Created By, Checked Out By, State, and View, along with buttons for Search, Save, and Clear.

We are interested in changing the columns that appear in this table. Say we want to add Source into this layout. The DCA fragments that controls the column list in the pattern is

elementGroup.compositeTable.searchResults. Unlike the criteria area, there is no specific *elementGroup.compositeTable.searchResults* element defined within the `com/ptc/windchill/enterprise/part/search.xml` file. This means that DCA will find *elementGroup.compositeTable.searchResults* in a superclass or interface definition. In this case, it will be found for the interface `revisionControlled`, in `com/ptc/windchill/enterprise/revisioncontrolled/search.xml`. The fragment looks like this:

```
<CompositeTable id="compositeTable.searchResults.%[context#type]">
<Extend ref=":compositeTable.searchResults.base"/>
<Insert ref=":elementGroup.nameAndImage.compositeTableColumns"/>
<CompositeColumn show=":property.number">
<Label resource="###com.ptc.core.foundation.persistable.client.persistableResource:NUMBER_LBL"/>
<Insert ref=":layoutRow.sortingActions"/>
</CompositeColumn>
<CompositeColumn show=":actionList.tableRowOperations" if="%[context#isPicker]!=true">
<Label resource="###com.ptc.core.foundation.persistable.client.persistableResource:ACTION_LBL"/>
</CompositeColumn>
<Insert ref=":compositeColumn.thumbnail">
<DrawHandler class="%[:classCoDrawController]">
<Check value="%[property#wvs.properties#wvs.enabled]==true"/>
<Check value="%[preference#user#/com/ptc/wvs/thumbnailsOnWCSearch]==true"/>
</DrawHandler>
</Insert>
<CompositeColumn show=":property.containerName">
<Label resource="###com.ptc.core.foundation.persistable.client.persistableResource:CONTAINER_LBL"/>
<Insert ref=":layoutRow.sortingActions"/>
</CompositeColumn>
<CompositeColumn show=":property.versionlineage">
<Label resource="###com.ptc.windchill.enterprise.config.dca.enterpriseResource:VERSION_LBL"/>
<Insert ref=":layoutRow.sortingActions"/>
</CompositeColumn>
<CompositeColumn show=":property.lifecyclestate">
<Label resource="###com.ptc.core.foundation.persistable.client.persistableResource:LIFECYCLESTATE_LBL"/>
<Insert ref=":layoutRow.sortingActions"/>
</CompositeColumn>
<CompositeColumn show=":property.updatestamp">
<Label resource="###com.ptc.core.foundation.persistable.client.persistableResource:UPDATESTAMP_LBL"/>
<Insert ref=":layoutRow.sortingActions"/>
</CompositeColumn>
<CompositeColumn show=":property.picker.organization"
if="%[property#wt.properties#wt.org.OrganizationOwned.displayOrganization]==true">
<Label resource="###com.ptc.core.foundation.principal.group.organization.client.wtorgResource:ORGANIZATION_NAME_LBL"/>
</CompositeColumn>
</CompositeTable>
```

Let's assume we want Source to appear before the containerName column. Since there is no Source field defined for other revisionControlled objects, we need to make this configuration specific to `wt.part.WTPart`. Copy this fragment from `revisionControlled/search.xml` into `part/search.xml`. Then, add a `<CompositeColumn>` fragment like this to have Source appear:

```
<CompositeColumn show=":property.source">
<Label resource="Source"/>
<Insert ref=":layoutRow.sortingActions"/>
</CompositeColumn>
```

Add this just before the line

```
<CompositeColumn show=":property.containerName">
```

Should the particular attribute not make sense to sort on, merely omit the line:

```
<Insert ref=":layoutRow.sortingActions/>
```

Refresh the Search Page, change the Type to Part, and press Search. You will probably get a page that looks like this:

Source: -- No Selection -- View: Browse... Clear

[Show More Attributes](#)

Search Save Clear

[Refine Search](#)

Search Results (30 items)

Copy to Clipboard Add to Project

All	Name	Number	Actions	Context	Version	State	Modified	Source
<input type="checkbox"/>	BOTTOM_SLIDER	GC000025		GOLF_CART	A	In Work	02/25/2005	Make
<input type="checkbox"/>	BOTTOM_SLIDER_CAP	GC000026		GOLF_CART	A	In Work	02/25/2005	Make
<input type="checkbox"/>	UPPER_SLIDER	GC000027		GOLF_CART	A	In Work	02/25/2005	Make
<input type="checkbox"/>	UPPER_BAG HOLDER	GC000028		GOLF_CART	A	In Work	02/25/2005	Make
<input type="checkbox"/>	HANDLE	GC000029		GOLF_CART	A	In Work	02/25/2005	Make
<input type="checkbox"/>	CARD HOLDER	GC000030		GOLF_CART	A	In Work	02/25/2005	Make
<input type="checkbox"/>	WHEELS_ASSEM	GC000031		GOLF_CART	A	In Work	02/25/2005	Make
<input type="checkbox"/>	WHEEL_AXLE	GC000032		GOLF_CART	A	In Work	02/25/2005	Make
<input type="checkbox"/>	BEARING_AXLE	GC000033		GOLF_CART	A	In Work	02/25/2005	Make
<input type="checkbox"/>	WHEEL_HUB	GC000035		GOLF_CART	A	In Work	02/25/2005	Make
<input type="checkbox"/>	LT_ARM	GC000039		GOLF_CART	A	In Work	02/25/2005	Make
<input type="checkbox"/>	WHEEL_ASSY	GC000040		GOLF_CART	A	In Work	11/13/2004	Make
<input type="checkbox"/>	LOWER_SUPPORT	GC000019		GOLF_CART	A	In Work	02/25/2005	Make
<input type="checkbox"/>	LOWER_SUPP_BAR	GC000020		GOLF_CART	A	In Work	02/25/2005	Make
<input type="checkbox"/>	LOWER_BAG HOLDER	GC000022		GOLF_CART	A	In Work	02/25/2005	Make

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[Refine Search](#)

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PTC Home | Product | Project | Change | Library | Organization | Site

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Note that Source did not appear where we expected – it appeared after all the other columns. This is because DCA tracks table layout definitions with some user preferences. Any columns not listed in those preferences are displayed at the end of the table. In order for us to be able to use the updated DCA element order to define the table, an administrator must remove the old user preferences. The preferences which must be removed can be found by searching for *DCAType.Preference/compositeTable.searchResults.WCTYPE|wt.part.WTPart in the Preference Manager tool. Delete all of these preference items, and restart the servlet engine. Your table will now use the new column order as defined in the updated DCA configurations. NOTE: Future releases will likely give the end user direct control over the column order without going through these steps.

Changing the Results Table Header Toolbar

To change the toolbar at the top of the table (the portion highlighted in green on the original search results screen shot), we need to change the DCA ID called *actionList.tableSelectionOperations.search*. As with the column settings, there is no specific ID defined for wt.part.WTPart. So, just like before, copy the fragment from revisionControlled/action.xml to part/action.xml:

```
<ActionList id="actionList.tableSelectionOperations.search" actionListType="toolbar" context.rendererType="jsp">
```

```
<Insert ref="action.copy"/>
<Insert ref="action.copyToProject" if="%[context#showCopyToProjectAction]==true"/>
</ActionList>
```

Now we can add or delete actions to / from the wt.part.WTPart behaviors. The important thing to remember here is that the actions you perform should not require unique user input for each object that was selected. You would not launch an object edit page unless it was specifically designed to produce a single page that would affect all the selected objects. You would also not want to launch multiple individual edit pages, either. So, the kinds of operations you would put into this toolbar should be limited to such actions as delete, move, checkin, checkout, undo checkout where you would be performing the same operation on each item in the selection set. So, identify or create a new Action or Hyperlink element (not covered in this article) and add it into the ActionList element like this:

```
<ActionList id="actionList.tableSelectionOperations.search" actionListType="toolbar" context.rendererType="jsp">
  <Insert ref="action.copy"/>
  <Insert ref="action.copyToProject" if="%[context#showCopyToProjectAction]==true"/>
  <Insert ref="action.checkout"/>
  <Insert ref="action.checkin"/>
  <Insert ref="action.undocheckout"/>
</ActionList>
```

The next time you bring up the WTPart search page, you will have the new actions in the search results table header.

Changing the Results Table Row Toolbar

To change the toolbar in each row of the table (the portion highlighted in black on the original search results screen shot), we need to change the DCA ID called *actionList.tableRowOperations*. This time, there is one already defined in part/action.xml:

```
<ActionList id="actionList.tableRowOperations" actionListType="horizontal">
  <Extend ref="revisionControlled:actionList.tableRowOperations"/>
</ActionList>
```

All this fragment does is reuse the set of actions defined for revisionControlled objects. To add more to the end of the original list of actions, just add more <Action> elements. With <Extend>, additional elements will add to the end of the list. To add to the beginning or the end of the original list of elements, change <Extend> to <Insert>. Items added before <Insert> will appear before those defined within the <Insert>. If you want to completely re-arrange the actions, then copy the actions from revisionControlled/action.xml and arrange them however you like.

Summary

We've seen how to modify the search page for wt.part.WTPart. The same principles will apply to the search page of any other object. This allows you, the customer, to make the final decision on which fields appear or don't appear, the order they appear in and what actions can be performed on the objects returned in the search results. And, the best part is that there was no Java coding involved.

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Tips of the Week

Pro/ENGINEER Wildfire Cross-Release Interoperability

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Tips of the Week

Reducing the Number of “Your Session Has Expired” Messages from Windchill 7.0 Search

The Windchill R7.0 Search pages are Dynamic Client Architecture (DCA) based. As a result, there are servlet engine sessions established to hold information about the current client. The default session timeout setting for most servlet engines is only about 30 minutes long. For many users, this may be shorter than the average time between search requests. This session timeout can be altered to a longer value at the expense of some incremental memory usage in the servlet engine.

To increase the session timeout value, make a copy of the file

```
<windchill home>/codebase/wtcore/com/ptc/core/ca/web/gw/gw.jsp
```

Edit the original file and find the line

```
(new WebGateway()).handleRequest(envData);
```

Insert this line immediately before the one with handleRequest

```
session.setMaxInactiveInterval(3600);
```

It is recommended that you set it to one hour (3600) and evaluate any changes in the number of occurrences of timeout messages as well as any excessive memory usage on the part of the servlet engine. Adjust the number up or down to balance the number of timeouts against the amount of memory being used in the servlet engine.

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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.

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<http://www.ptc.com/go/engineering/index.htm>

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