# TIBCO ActiveMatrix® BPM Organization Browser User's Guide

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Two-Second Advantage®

TIBCO®

## Important Information

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# TIBCO Documentation and Support Services

Documentation for this and other TIBCO products is available on the TIBCO Documentation site. This site is updated more frequently than any documentation that might be included with the product. To ensure that you are accessing the latest available help topics, visit:

https://docs.tibco.com

### Product-Specific Documentation

Documentation for TIBCO products is not bundled with the software. Instead, it is available on the TIBCO Documentation site. To directly access documentation for this product, double-click the following file:

*TIBCO_HOME*/release_notes/TIB_amx-bpm_*version*_docinfo.html

where *TIBCO_HOME* is the top-level directory in which TIBCO products are installed. On Windows, the default *TIBCO_HOME* is `C:\tibco`. On UNIX systems, the default *TIBCO_HOME* is `/opt/tibco`.

The following documents for this product can be found on the TIBCO Documentation site:

- TIBCO ActiveMatrix BPM SOA Concepts
- TIBCO ActiveMatrix BPM Concepts
- TIBCO ActiveMatrix BPM Developer's Guide
- TIBCO ActiveMatrix BPM Web Client Developer's Guide
- TIBCO ActiveMatrix BPM Tutorials
- TIBCO ActiveMatrix BPM Business Data Services Developer Guide
- TIBCO ActiveMatrix BPM Case Data User Guide
- TIBCO ActiveMatrix BPM Event Collector Schema Reference
- TIBCO ActiveMatrix BPM - Integration with Content Management Systems
- TIBCO ActiveMatrix BPM SOA Composite Development
- TIBCO ActiveMatrix BPM Java Component Development
- TIBCO ActiveMatrix BPM Mediation Component Development
- TIBCO ActiveMatrix BPM Mediation API Reference
- TIBCO ActiveMatrix BPM WebApp Component Development
- TIBCO ActiveMatrix BPM Administration
- TIBCO ActiveMatrix BPM Performance Tuning Guide
- TIBCO ActiveMatrix BPM SOA Administration
- TIBCO ActiveMatrix BPM SOA Administration Tutorials
- TIBCO ActiveMatrix BPM SOA Development Tutorials
- TIBCO ActiveMatrix BPM Client Application Management Guide
- TIBCO ActiveMatrix BPM Client Application Developer's Guide
- TIBCO Openspace User's Guide
- TIBCO Openspace Customization Guide
- TIBCO ActiveMatrix BPM Organization Browser User's Guide (Openspace)
- TIBCO ActiveMatrix BPM Organization Browser User's Guide (Workspace)

- TIBCO ActiveMatrix BPM Spotfire Visualizations
- TIBCO Workspace User's Guide
- TIBCO Workspace Configuration and Customization
- TIBCO Workspace Components Developer Guide
- TIBCO ActiveMatrix BPM Troubleshooting Guide
- TIBCO ActiveMatrix BPM Deployment
- TIBCO ActiveMatrix BPM Hawk Plug-in User's Guide
- TIBCO ActiveMatrix BPM Installation: Developer Server
- TIBCO ActiveMatrix BPM Installation and Configuration
- TIBCO ActiveMatrix BPM Log Viewer
- TIBCO ActiveMatrix BPM Single Sign-On
- Using TIBCO JasperReports for ActiveMatrix BPM

### How to Contact TIBCO Support

For comments or problems with this manual or the software it addresses, contact TIBCO Support:

- For an overview of TIBCO Support, and information about getting started with TIBCO Support, visit this site:

  http://www.tibco.com/services/support

- If you already have a valid maintenance or support contract, visit this site:

  https://support.tibco.com

  Entry to this site requires a user name and password. If you do not have a user name, you can request one.

### How to Join TIBCO Community

TIBCO Community is an online destination for TIBCO customers, partners, and resident experts. It is a place to share and access the collective experience of the TIBCO community. TIBCO Community offers forums, blogs, and access to a variety of resources. To register, go to the following web address:

https://community.tibco.com

# Introduction

The Organization Browser can be used to browse organization models, create LDAP containers that hold potential resources, map resources to groups and positions in the organization model, and edit various organizational entity information.

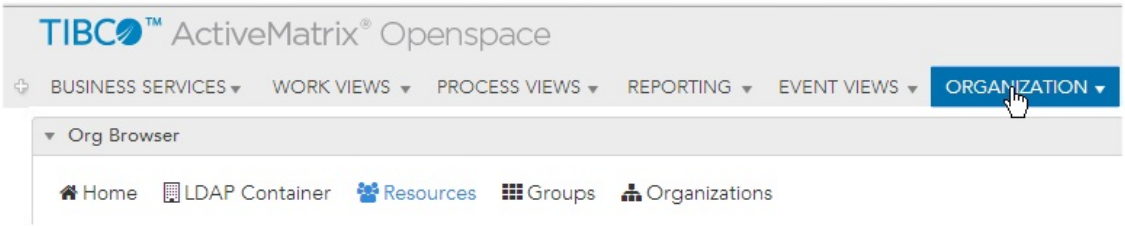
There are two Organization Browsers available in TIBCO ActiveMatrix BPM. One is accessible through the Openspace client -- it is described in this document. The other one is accessible through the Workspace client -- the documentation for that Organization Browser is available with the Workspace documentation.

## Access to the Organization Browser

The Organization Browser is accessible from the Openspace application.

To use the Organization Browser in Openspace, the *Organization Browser* gadget must be added. You may have logged into Openspace using a persona that automatically adds the gadget (for example, the "Default" persona automatically adds the Organization Browser gadget), otherwise you must manually add the gadget. See the documentation provided with TIBCO Openspace for more information.

Accessing the Organization Browser causes a number of tabs and icons to appear that can be used to view or manage LDAP containers, map resources to groups or positions, view the available groups and organizations, and so on.

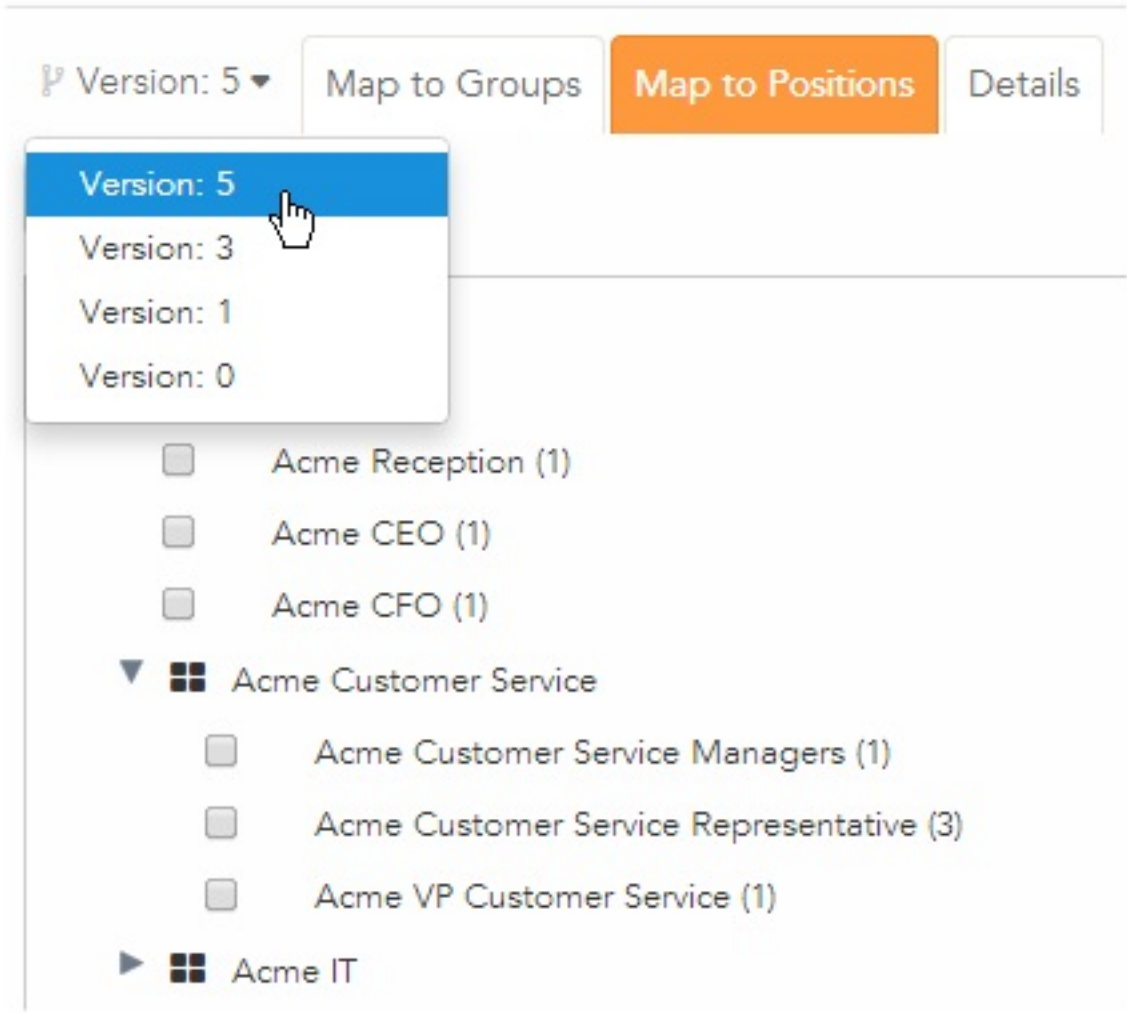



## Organization Model Versions

As your organization changes over time, your organization model may need to be modified to add or remove groups, positions, organization units, and so on. Additions to the organization model can be merged into the existing version, but when parts of the model are deleted or other types of significant changes are made, it is given a new version number.

When you are browsing the organization model, mapping resources, or performing any function available in the Organization Browser, you must select the version of the organization model that you want to be working with.

Various locations in the Organization Browser provide a **Version** field in which you can select the version of the organization model. For example:




As you select different versions, the contents of that version of the organization model is displayed.

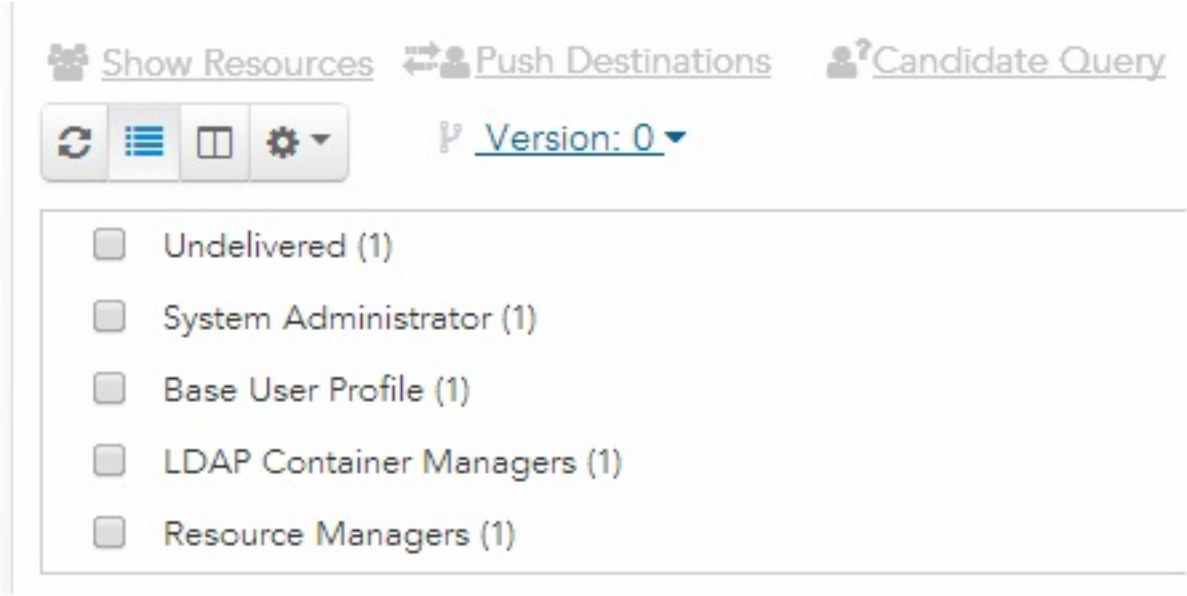
You may need to select an earlier version of the organization model to map resources to groups and/or positions in that version because processes being run may still use that earlier version.

Note that the version number shown here is the *major* version number.

## Organization Model Version 0

Version 0 of the organization model is built into the system by default.

The following illustrates the default groups in Organization Model Version 0 (it does not contain any organization units or positions):




Note that the Base User Profile, LDAP Container Managers, and Resource Managers groups are not used at this time**.**

The System Administrator and Undelivered groups in Version 0 of the organization model are described below:

- **System Administrator** - Users that are mapped to this group have access to all functions in the BPM application. By default, there is a " System Administrator user" who(1) is a member of this group and cannot be deleted from it. You can map additional users to this group, which also gives them access to all functions in the BPM application.
- **Undelivered** - This is a special group to which work items are sent that for some reason could not be delivered to the intended user. The tibco-admin user is a member of this group, and cannot be removed from it. You can add additional users to this group, if desired. Note, however, that you cannot distinguish undeliverable work items from work items that would be received because of membership in other groups or positions, so only a user who would deal with those types of work items should be mapped to this group.

Note that if the System Administrator user (tibco-admin) is selected from a resource list, then Organization Model Version 0 is selected, the **Map to Groups** and **Map to Positions** tabs are not displayed. This prevents the System Administrator from being removed from the groups in Version 0.

## Authentication

Once a resource has been “created”, that user can log into an ActiveMatrix BPM application.

A resource is created using the Organization Browser by doing one of the following:

- Mapping the resource to a group or position in the organization model. See Mapping Resources.
- Selecting the **Create** function from the Organization Browser. See Creating Resources Using the Create BPM Resource Function.

These actions cause an entry to be added to the database for the resource.

Resources can log into the BPM application using the “Resource Name” assigned when the resource is created, and a password specified in the LDAP source.

[1] Out-of-the-box, the System Administrator user's user name and password are “tibco-admin” and “secret”, respectively, but may have been changed.

Resources can also be deleted from the database using the Organization Browser, preventing that resource from being able to log into the BPM application. See Deleting Resources.

By default, BPM applications recognize the user name “tibco-admin” with a password of “secret” as the System Administrator (although these names may be changed). This is the only user authorized to log in until another user is configured using the Organization Browser. By default, the tibco-admin resource is located in the System Resources container. (Note that if an external LDAP server is used, rather than the one built into AMX-BPM, the initial password for the tibco-admin user may be different; ask your system administrator.)

## Export and Import of Organizational Information

The Organization Browser allows you to export all of the container and resource mapping information in your current system. You can then import that information into another system so that it will contain the same containers and resource mappings that you exported.

When you export organizational information, it is exported as XML data that can be copied and pasted into a text document for storage. To import into another system, you must copy the stored XML data, then paste it into an import dialog.

The system to which you import organizational information must have compatible organization models deployed. It doesn’t necessarily have to have the exact same organization model version(s) deployed on the destination system, but any groups, positions, resource attributes, etc., that are referenced by the LDAP containers and resources must exist on the destination system.

### Exporting Organizational Information

When you export organizational information, it is exported as XML data that can be copied and pasted into a text document for storage.

#### Procedure

1. In the Organization Browser, click the **LDAP Containers** button.
2. On the LDAP Containers dialog, click the **Export** button.
3. From the Export Resources And Container Definitions dialog, select and copy all of the XML text in the dialog.
4. Open a new text document with a text editor and paste the text copied in the previous step to the document, then save the document.
5. Click **OK** to close the export dialog.

### Importing Organizational Information

To import organizational information into another system, you must copy the stored XML data (which was previously exported, then paste it into an import dialog.

#### Procedure

1. In the Organization Browser, click the **LDAP Containers** button.
2. Click the **Have a LDAP you wish to import?** link.
   The Import Resource And Container Definitions dialog is displayed.
3. Open the text document in which the exported data was saved when the organizational information was exported.
4. Copy the XML data in the text document, then paste it into the Import Resource And Container Definitions dialog.

5. Click **Import**.

   The Organization Model into which you imported should now contain the LDAP containers, resource mappings, etc.

# Browsing the Organization Model

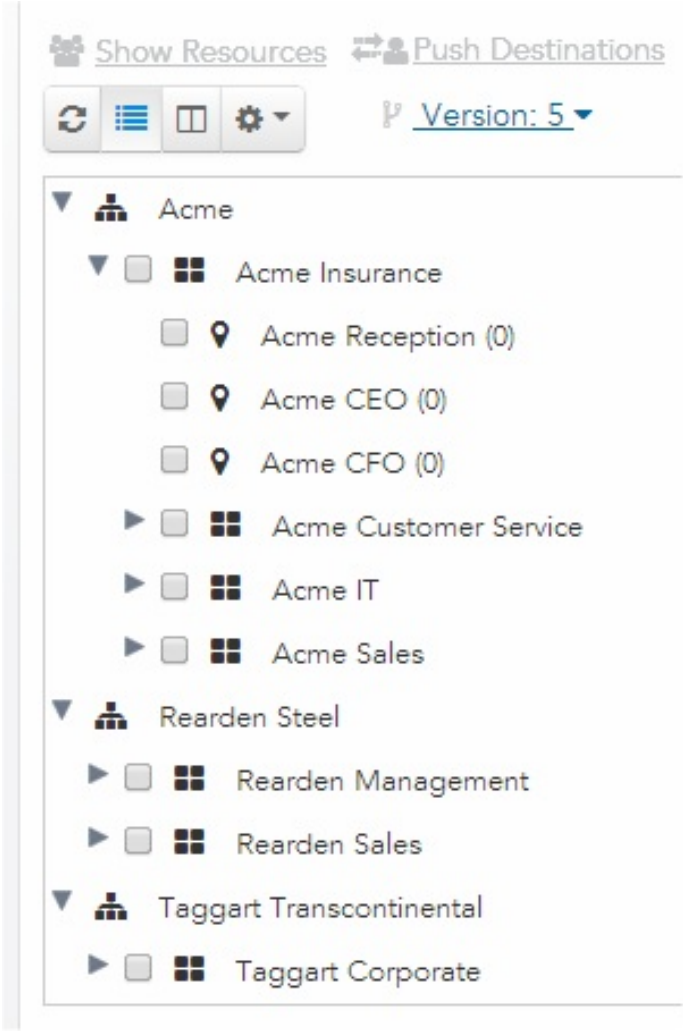
The Organization Browser can be used to browse the organization model, which can consist of groups, organizations, organization units, and positions.

## Browsing Organization Units and Positions

An organization model can consist of multiple organization units, which can each contain multiple positions.

### Procedure

1. Access the Organization Browser and click the **Organizations** button.
2. Click either the **Tree View** ( ) button or the **Columns View** ( ) button to display the organization hierarchy in a tree- or column-view format, respectively (the example below shows the tree-view format).
3. Click the **Settings** ( ) button and select **Toggle Label or Name** to toggle between displaying the "label" or "name" for organization units and positions; these can be different, depending on how they were defined in TIBCO Business Studio (for example, the name might be "AcmeCEO" and the label "CEO").
4. Ensure that the appropriate version of the organization model is selected in the **Version** field.
   A graphical representation of the organization units, and their respective positions, that have been defined in the organization model is displayed. For example:




The icon to the left of each organizational entity indicates the type of entity, as follows:

| Icon | Entity Type |
|---|---|
| | Organization |
| | Organization Unit |
| | Organization unit that has been configured with an extension point; for more information, see Dynamic Organization Model Extension Points. |
| | Position |
| | Position that has a candidate query configured; for more information, see Candidate Queries. |

The number in parentheses to the right of each position indicates the number of resources that are currently mapped to that position.

If LDAP containers have been created on your system that have an organization relationship set up, you may or may not be able to see all organizations in the organization model when you display the Organization Browser. For more information, see Container Organization Relationships.

5. Select one of the desired organization units or positions by checking the box to the left of the name, then clicking the appropriate button on the top of the dialog, as described below.

   Organization units and positions can be selected by clicking anywhere on a line, or you can move up and down in the list using the arrows keys on the keyboard, then use either the spacebar or the Enter key to select/unselect an item.

   - **Show Resources** - (Only applicable when a position is selected.) Displays the resources currently mapped to the position, and allows you to mapped the listed resources to additional positions. For more information, see Mapping Resources.

     Another option is to double-click on any position that already has resources mapped to it (a number other than 0 is shown in parentheses to the right of the position name). This causes a dialog to display that lists only the resources that have been mapped to that position. This dialog contains a **Map Resources** button that, when clicked, displays the "Resource" view, that is, the resource list for the position that was double clicked.
   - **Push Destinations** - Displays the push destinations defined for the selected organization unit or position, and allows you to add additional push destinations. For more information, see Editing Organizational Entity Push Destinations.
   - **Candidate Query** - (Only enabled when a position is selected.) Displays a candidate query defined for the position, if any, and allows you to specify a candidate query. Also note that if a candidate query is configured for a position, a question mark icon is displayed next to the position name. For example:

     For more information, see Candidate Queries.
   - **Configure Extension Point** - (Only enabled when an organization unit that has been

     designated with an extension point is selected, which you can also determine by a  icon next to the organization unit name.) Displays an extension point defined for the position, if any, and allows you to specify an extension point. For more information, see Dynamic Organization Model Extension Points.
   - **View Template** - (Only enabled when an organization unit that has been designated with an

     extension point is selected, which you can also determine by a  icon next to the organization unit name.) Allows you to view the structure of a dynamic organization model template. For more information, see Viewing a Dynamic Organization Model Template.
   - **View Details** - Provides the following details about the selected organization unit or position.

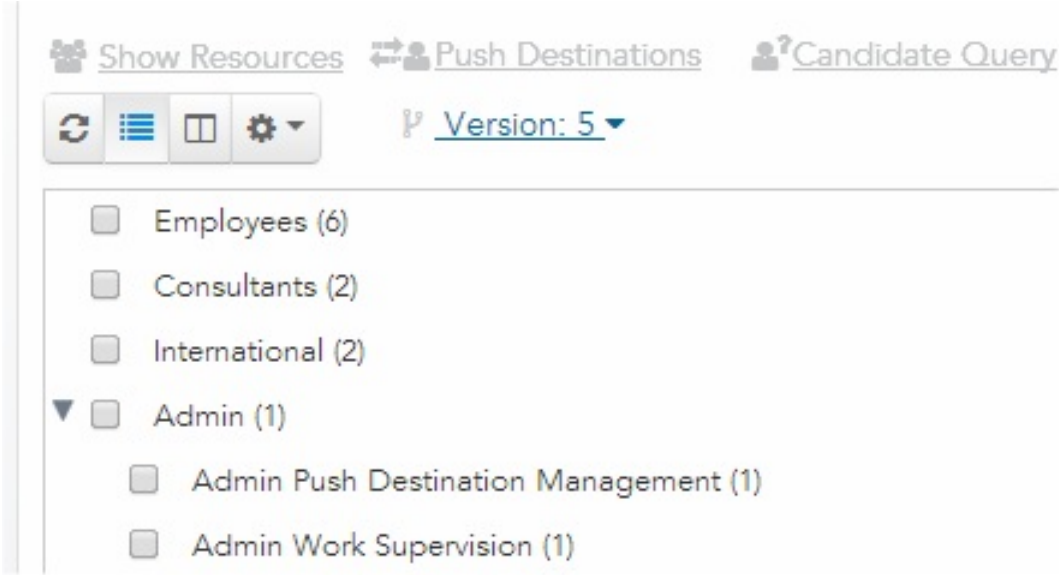
| Property | Description |
|---|---|
| Allocation Method | Identifies the method by which resources are selected from the collection of resources mapped to the position, as follows:<br>• ANY - Uses random selection.<br>• NEXT - Uses an iterative selection.<br>• THIS - Uses the specifically identified resource.<br>• PLUGIN - Uses the named plug-in to perform the selection. |
| Ideal Count (only applicable to positions) | The ideal number of resources to have mapped to the position. This is only a suggestion; it is not a requirement, nor is it enforced. |
| Organizational Entity Push Destinations | The destination(s) to which work items sent to the organizational entity are to be pushed. For more information, see Editing Organizational Entity Push Destinations. |
| Privileges | The privileges assigned to the organization unit or position, which are inherited by resources mapped to the position. For more information, see Privileges. |
| Required Capabilities (only applicable to positions) | The capabilities resources should have to be mapped to the position. For more information, see Capabilities. |

## Browsing Groups

An organization model can consist of multiple groups, including subordinate groups.

### Procedure

1. Access the Organization Browser and click the **Groups** button.
2. Click either the **Tree View** (  ) button or the **Columns View** (  ) button to display the organization hierarchy in a tree- or column-view format, respectively (the example below shows the tree-view format).
3. Click the **Settings** (  ) button and select **Toggle Label or Name** to toggle between displaying the "label" or "name" for groups; these can be different, depending on how they were defined in TIBCO Business Studio.
4. Ensure that the appropriate version of the organization model is selected in the **Display Version** field.
   A graphical representation of the groups that have been defined in the organization model is displayed. For example:




The number in parentheses to the right of each group indicates the number of resources that are currently mapped to that group.

If LDAP containers have been created on your system that have an organization relationship set up, you may or may not be able to see all organizations in the organization model when you display the Organization Browser. For more information, see Container Organization Relationships.

5. Select one of the desired groups by checking the box to the left of the name, then clicking the appropriate button on the top of the dialog, as follows:

   Groups can be selected by clicking anywhere on a line, or you can move up and down in the list using the arrows keys on the keyboard, then use either the spacebar or the Enter key to select/unselect an item.

   - **Show Resources** - Displays the resources currently mapped to the group, and allows you to mapped the listed resources to additional groups. For more information, see Mapping Resources.

     Another option is to double-click on any group that already has resources mapped to it (a number other than 0 is shown in parentheses to the right of the group name). This causes a dialog to display that lists only the resources that have been mapped to that group. This dialog contains a **Map Resources** button that, when clicked, displays the "Resource" view, that is, the resource list for the group that was double clicked.
   - **Push Destinations** - Displays the push destinations defined for the selected group, and allows you to add additional push destinations. For more information, see Editing Organizational Entity Push Destinations.
   - **Candidate Query** - Displays a candidate query defined for the group, if any, and allows you to specify a candidate query. Also note that if a candidate query is configured for a group, a question mark icon is displayed next to the group name. For example:

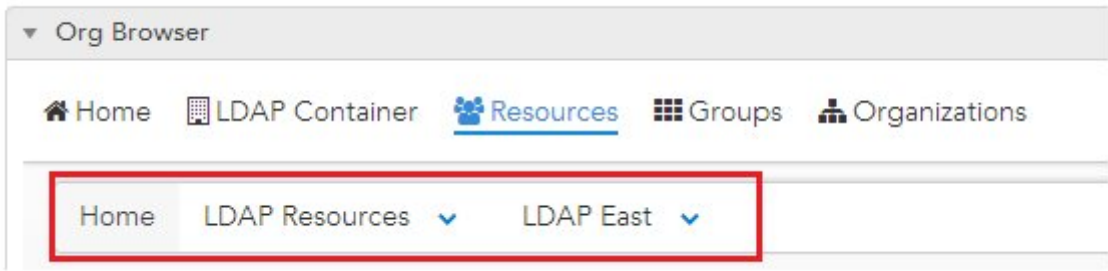
     For more information, see Candidate Queries.
   - **View Details** - Provides the following details about the selected group.

| Property | Description |
|---|---|
| Allocation Method | Identifies the method by which resources are selected from the collection of resources mapped to the group, as follows:<br>• ANY - Uses random selection.<br>• NEXT - Uses an iterative selection.<br>• THIS - Uses the specifically identified resource.<br>• PLUGIN - Uses the named plug-in to perform the selection. |
| Organizational Entity Push Destinations | The destination(s) to which work items sent to the group are to be pushed. For more information, see Editing Organizational Entity Push Destinations. |
| Privileges | The privileges assigned to the group, which are inherited by resources mapped to the group. For more information, see Privileges. |
| Required Capabilities | The capabilities resources should have to be mapped to the group. For more information, see Capabilities. |

## The Action Path

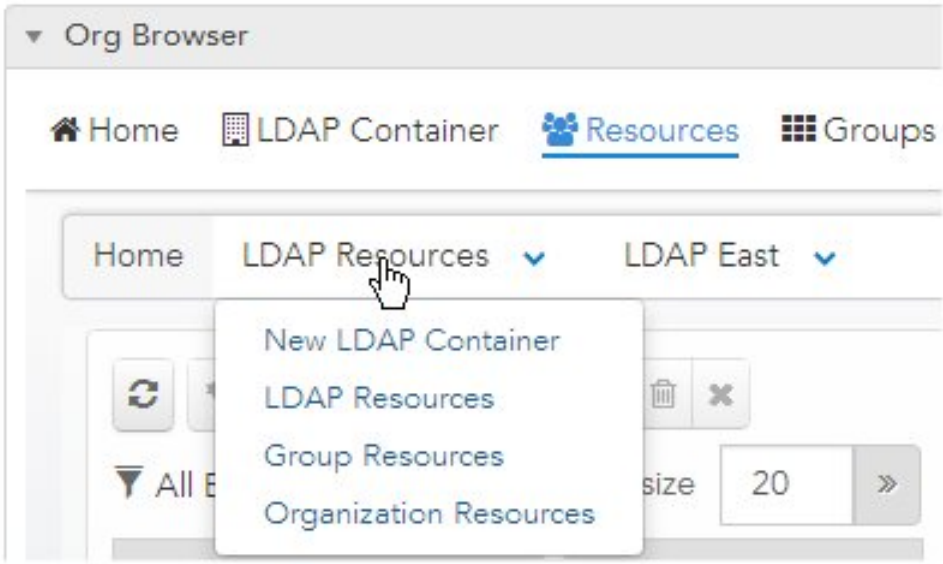
The Action Path is somewhat like a breadcrumb-trail; it shows you the path of the actions you took to get to the current location in the Organization Browser. But it also allows you to browse to other areas.

The Action Path is shown below the top Organization Browser menu bar:

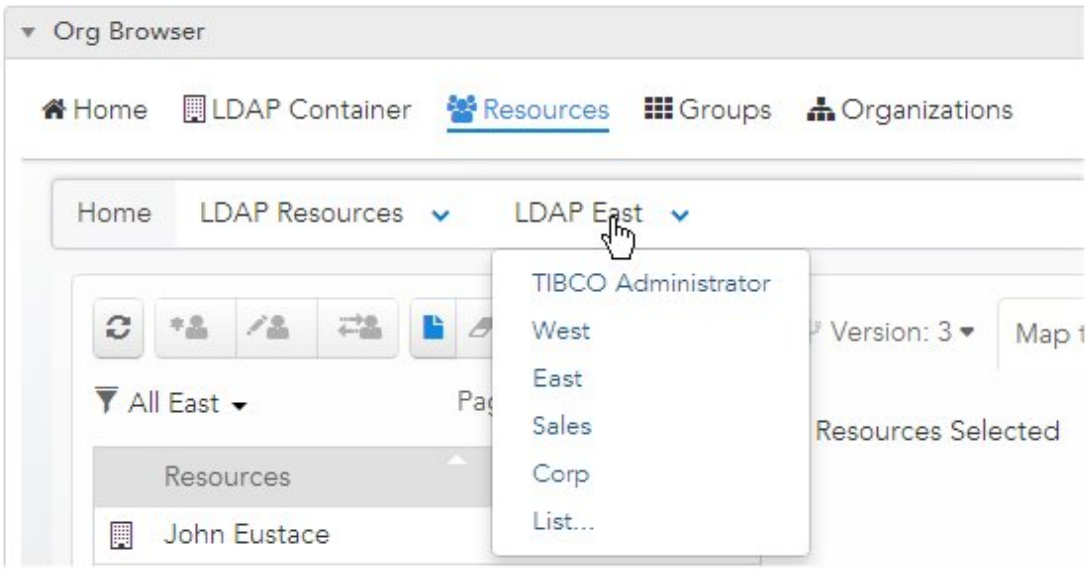



In this example, "LDAP Resources" was selected, following by the LDAP container by the name of "East" being chosen.

Each of the items in the Action Path allows you to initiate other actions related to that action. For example, from the **LDAP Resources** action, you can initiate the following actions:




And from the **LDAP East** action, you can choose to display one of the other defined LDAP containers:



# LDAP Containers

LDAP (Lightweight Directory Access Protocol) is an application protocol for querying and modifying directory services. LDAP containers are a collection of one or more LDAP sources. An LDAP source represents an LDAP server, which holds information about candidate resources — users — who may need to use or participate in TIBCO applications.

You must create at least one LDAP container from which resources can be selected and mapped to groups or positions in the organization model. You can create additional LDAP containers, if desired — additional containers may contain different LDAP sources, or they may query the same LDAP sources in a different way, resulting in a different set of resources to choose from.

The recommended best practice is to create LDAP containers that show only a constrained view on the corporate LDAP. That view would ideally include only those resources that have a business role in common, that belong to a particular department, work on a particular project, etc.

Every LDAP container must include one *primary* LDAP source. It can also include one or more *secondary* LDAP sources, as follows:

- Primary LDAP Source - The primary LDAP source identifies the candidate resources that are available to map to groups and positions in the organization models.
- Secondary LDAP Source(s) - If there are secondary LDAP sources defined, they are used to find additional information about each candidate resource.

For more information, see Primary and Secondary Sources.

When you are specifying primary and secondary sources for an LDAP container, you can use either an *LDAP query source* or an *LDAP group source* to identify the candidate resources in the LDAP directory, as follows:

- Using an LDAP Query Source - An LDAP query is used to identify the directory entries that will be candidate resources. For more information, see LDAP Query Sources.
- Using an LDAP Group Source - A group DN (distinguished name) is used to identify the LDAP directory that is the group. When a group DN is specified, a member attribute is also specified, which holds the collection of member identifiers, that is, their DNs. This provides the list of candidate resources. For more information, see LDAP Group Sources.

## Primary and Secondary Sources

Every LDAP container must include one *primary* LDAP source. It can also include one or more *secondary* LDAP sources.

The primary LDAP source identifies the candidate resources that are available to map to groups and positions in the organization models.

If there are secondary LDAP sources defined, they are used to find additional information about each candidate resource.

Lookups are performed into each secondary LDAP source. If an exact match of a candidate resource can be found in every secondary LDAP source, the data from all sources is merged together. This is accomplished using attribute relationships you specify when adding a secondary LDAP source to a container.

The following are reasons you might want to define a secondary LDAP source:

- The business process needs to access attribute data that is in both the primary and secondary LDAP sources.
- The business process needs to access attribute data from an LDAP source that is not used for login authentication (the primary LDAP source is always used for authentication).

The Organization Browser constructs the list of candidate resources as follows:

- It starts with a list of candidate resources from the primary LDAP source.
- An attempt is made to match those candidate resources with entries in each secondary resource. If an exact match is found in every secondary LDAP source, the data from the secondary sources is merged in with the data from the primary source.

  If a candidate resource is not found inside one or more of the secondary LDAP sources, the candidate resource is eliminated from the list.

  If matches are found in every secondary LDAP source, they must uniquely identify only one LDAP entry in each source. If one or more match multiple items, the item remains in the candidate resources list but is marked as invalid.

As an example, suppose you have two LDAP sources: Acme-Employees and Acme-Developers. The Acme-Employees LDAP source includes sales and support resources, as well as developers. The Acme-Developers LDAP source includes Acme employees who are developers, as well as developer contractors who are not Acme employees. If you want the list of candidate resources to include all Acme employees that are developers, and the business process needs attribute data from both LDAP sources, you would add both sources to one container, using filter criteria to filter out all resources other than Acme developers.

Conversely, if the attribute data needed by the business process is available in one of the LDAP sources, it is much more efficient to include only the one LDAP source in the container.

Also note that when you specify primary and secondary LDAP sources, you can use either an LDAP query or an LDAP group DN to identify the candidate resources to include in the LDAP container. For more information, see LDAP Query Sources and LDAP Group Sources, respectively.

### Multiple Entries

When you are defining a secondary LDAP source, you must choose attributes from both the primary and secondary source whose values are compared to determine the final set of resources to include in the LDAP container. The goal is to choose the appropriate attributes so that you know the resources used from the secondary source are exactly the same resources that are in the primary source. If you choose attributes where it cannot make a one-to-one match, you may see a  icon in the resource list, and a "Multiple Entries" message next to a resource name:


This could occur, for instance, if you were comparing attributes between the primary and secondary sources that contained only the resource's last name (for example, the sn attribute):

| sn | userpassword | pager | roomnumber | displayname | objectClass | uid |
|---|---|---|---|---|---|---|
| Parkin | c3RhZmYxMjM= | 801 123 403 | 520 | jparkin | organizationalPe... | Jon Parkin |
| Court | c3RhZmYxMjM= | 801 127 100 | 522 | lcourt | organizationalPe... | Leon Court |
| Broomes | c3RhZmYxMjM= | 801 127 400 | 550 | mbroomes | organizationalPe... | Marlon Broomes |
| Cresswell | c3RhZmYxMjM= | 801 127 401 | 560 | rcresswell | organizationalPe... | Richard Cresswell |
| Simonsen | c3RhZmYxMjM= | 801 127 444 | 561 | ssimonsen | organizationalPe... | Steve Simonsen |
| Pulis | c3RhZmYxMjM= | 801 231 401 | 610 | tpulis | organizationalPe... | Tony Pulis |
| Pulis | c3RhZmYxMjM= | 801 231 550 | 720 | tpulis | organizationalPe... | Tracy Pulis |

In this particular example, the uid attribute would be a better choice to uniquely identify each resource.

For the procedure to chose the attributes to match resources in the primary and secondary sources, see Defining a Secondary Source Using an LDAP Query (if using LDAP queries) or Defining a Secondary Source Using an LDAP Group (if using LDAP groups).

## LDAP Query Sources

If you are using an LDAP query source to identify the candidate resources to include in an LDAP container, a filter string is used to determine which of the resources to return from the LDAP source.

When using an LDAP query source, the following two attributes are required to determine the candidate resources for the LDAP container:

- ldap-alias - The name (or alias) of the LDAP source from which candidate resources will be obtained.
- ldap-query - A filter string that will be used to determine which of the resources to return from the LDAP source. This allows you to limit the resources returned. For example, you may only be interested in considering resources from a specific department or region.

For more details about these parameters, plus information about additional optional parameters that can be specified when creating an LDAP container using an LDAP query, see:

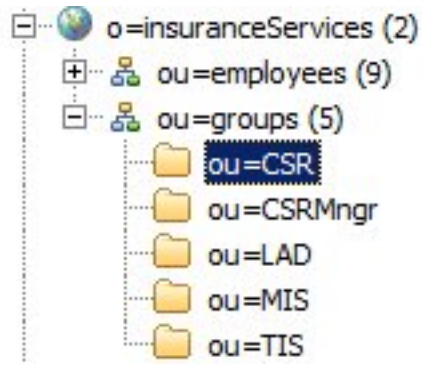
- Defining the Primary Source Using an LDAP Query
- Defining a Secondary Source Using an LDAP Query

## LDAP Group Sources

If you are using an LDAP group source to identify the candidate resources to include in the LDAP container, you will specify a group DN to identify the directory entry that is the group. When a group DN is specified, a member attribute is also specified, which holds the collection of member identifiers, that is, their DNs. This provides the list of candidate resources.

When using an LDAP group source, the following three attributes are required to determine the candidate resources for the LDAP container:

- ldap-alias - The name (or alias) of the LDAP source from which candidate resources will be obtained.
- group-dn - The LDAP directory entry that is the group. If the following LDAP directory identifies the group, the group-DN is "OU=CSR,OU=groups,O=insuranceServices":




- member-attribute - Identifies the attribute within the group entry that holds the collection of DNs that identifies the candidate resources. The following example shows the attributes for the DN shown above:

DN: ou=CSR,ou=groups,o=insuranceServices

| Attribute Description | Value |
|---|---|
| ***objectClass*** | ***organizationalRole (structural)*** |
| ***objectClass*** | ***top (abstract)*** |
| **cn** | **Customer Services Representative** |
| ou | CSR |
| roleoccupant | uid=jparkin,ou=Employees,o=insuranceServices |
| roleoccupant | uid=rcresswell,ou=Employees,o=insuranceServices |

In this example, "roleoccupant" would be the member-attribute, as it provides the DN for each member of the group.

For more details about these parameters, plus information about additional optional parameters that can be specified when creating an LDAP container using an LDAP group, see:

- Defining the Primary Source Using an LDAP Group
- Defining a Secondary Source Using an LDAP Group

### Object Classes

All entries in an LDAP directory are of a particular object class, that is, their "objectClass". The objectClass defines what attributes the directory entry "must" have (required attributes), as well as the attributes it "may" have (optional attributes).

LDAP directories that contain group entries, often have one of the following objectClasses:

- groupOfNames
- groupOfUniqueNames
- groupOfURLs
- organizationalRole

These common group-related object classes contain an attribute whose values identify members of the group. The member attributes for the common group-related object classes are "member", "uniqueMember", "memberURL", and "roleoccupant", respectively.

As you can see in the example above, the directory identified by the DN "OU=CSR,OU=groups,O=insuranceServices" is an objectClass of organizationalRole, and has two "roleoccupant" attributes that contain the DNs of the members of the group (CSRs in this example).

The object classes listed above are supported by default. If an objectClass other than these are going to be used, you must specify the objectClass in the LdapGroupClass property in the `DE.Properties` file. The LdapGroupClass property is not included in the `DE.Properties` file by default. (The `DE.Properties` file contains properties for the Directory Engine. For more information see the *TIBCO ActiveMatrix BPM Administration Guide.* )

### Static LDAP Groups

Static LDAP groups specify the DN of each member of the group in the member attribute. The example shown above is a static group.

Another example of a static LDAP group directory is the following:

```
DN: cn=Dev.Staff,ou=Austin,c=US
 objectclass: groupOfNames
 cn: Dev.Staff
 member: cn=John Doe,o=IBM,c=US
 member: cn=Jane Smith,o=IBM,c=US
 member: cn=James Smith,o=IBM,c=US
```

In this example, the group members are identified in the "member" attribute -- each attribute contains the DN of a member of the group.

Static LDAP groups can also be nested by specifying the DN of another group as a value of a member attribute. If any value within a member attribute identifies another group, the same named attribute of that group is used to augment the collection of group members. The resulting candidate resources consists of all nested group members.

The identification of nested groups is done using their objectClass; comparing the objectClasses named in the `DE.Properties` file. The known group objectClasses, groupOfNames and groupOfUniqueNames, are applied by default. Those member entries that are of any of the named objectClasses are considered to be nested groups.

### Dynamic LDAP Groups

Dynamic groups specify one or more URL search filters (queries). All entries that match the URL search filters are members of the group. Membership of a dynamic group is defined each time the filters are evaluated.

Dynamic groups use one of the following object classes and attribute pairs:

- The groupOfURLs object class, with the memberURL attribute.
- The groupOfUniqueNames object class, with the uniqueMember attribute.

The memberURL attribute and the uniqueMember attributes specify one or more URL search filters. An example is:

```
dn: cn=GROUP1,ou=Austin
 objectclass: groupOfURLs
 cn: GROUP1
 memberURL: ldap:///cn=users,ou=Austin??one?(group=GROUP1)
```

## Creating LDAP Containers

You must create at least one LDAP container from which resources can be selected and mapped to groups or positions in the organization model.

For each LDAP container that you create, you must specify an *LDAP source* (which equates to an LDAP server) from which resources are obtained. You must specify one *primary* LDAP source, and you can additionally specify one or more *secondary* LDAP sources, for each LDAP container you create. For more information, see Primary and Secondary Sources.

Plus, the procedure you use to create an LDAP container differs, depending on whether the LDAP source is an *LDAP query source* or an *LDAP group source*. For information about the differences, see LDAP Query Sources and LDAP Group Sources.

See the following procedures for creating a primary/secondary LDAP container using an LDAP query/group source:

- Using an LDAP query source:
  - Defining the Primary Source Using an LDAP Query
  - Defining a Secondary Source Using an LDAP Query
- Using an LDAP group source:
  - Defining the Primary Source Using an LDAP Group
  - Defining a Secondary Source Using an LDAP Group

## Defining the Primary Source Using an LDAP Query

Each LDAP container must contain a primary LDAP source. If you are using an LDAP query source in the LDAP container definition, all resources in the primary LDAP source that satisfy the LDAP query are included in the list of candidate resources in the container.

### Procedure

1. Open the Organization Browser (see Access to the Organization Browser), then select **LDAP Containers**.

   If any LDAP containers had previously been defined, they are shown in the left pane of the dialog, and the details of the selected container are shown in the right pane:


   The first time you display the Organization Browser, there will not be any containers listed.

   After you've defined a container, you can edit it by selecting the container in the list, then clicking the **Edit** link in the lower-right part of the dialog. You can generally follow the same steps in this procedure to edit an existing LDAP container.

   However, if the existing LDAP container contains resources, the LDAP sources for that container are fixed; you cannot delete or change the primary or secondary LDAP sources, nor add additional secondary LDAP sources.

   Also note that if an LDAP source defined in an LDAP container is currently offline, you cannot edit the container until the LDAP source is back online.

2. Click the **Add a new LDAP container** button.
3. On the Add a new LDAP Container dialog, enter a name and description for the new container.
4. If desired, you can now specify organization relationships for the new container (note that this is applicable only if there are multiple organizations in your organization model).

   If the container has a relationship with an organization, resources in the container will be able to see that organization in the Organization Browser, as well as organizations that do not have an explicit relationship with a container. Resources can be mapped to positions in organizations that the user can see in the Organization Browser.

   For more information about organization relationships, see Container Organization Relationships.

   If you are not specifying organization relationships for this container, proceed to Step 5. (You can specify organization relationships for this container at a later time.)

   To specify organization relationships:

   a) Click the **Edit** button to the right of the **Organization** field.
   b) On the Define relationships to containers dialog, select the appropriate boxes for the organizations to which you want the new container to have a relationship.

Selecting a box causes the **Relate this container to the following organizations** option to automatically be selected.

Selecting the **Do not relate this container to specific organizations** option causes all check boxes to become unchecked.

c) Click **Save**.

The organization(s) you specified is now shown in the **Organization** field.

5. Click the **Add Query Source** button, which displays the Add new LDAP Source dialog.

   The Add new LDAP Source dialog is used to select the primary LDAP source from which resources will be obtained, as well as to provide query information so that you can limit the number of resources returned from the LDAP Server.

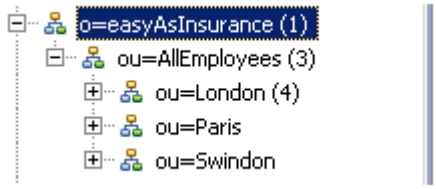
   If you create multiple LDAP containers that use the same primary LDAP source, then create a resource in one container, that resource will *not* appear in any other container. Once created, a resource only appears in the container in which it is created.

6. In the **Alias** field, select the LDAP source from which you want to obtain resources.

   The names in the **Alias** list are user-readable names that an administrator has assigned to each of the LDAP Servers available in the enterprise.

7. Optional: In the **Base DN** field, enter the branch (e.g., an organization unit) in which you would like to limit the search in the LDAP directory structure. This increases the efficiency of the search if the LDAP contains a large number of branches.

   The search base must provide the complete path to the desired branch in the LDAP directory structure. For example (this illustration is from an external application that shows the LDAP source), if you want to limit the search to the "London" organization unit in the following LDAP source ...

   ... you would enter the following in the **Base DN** field:

   ```
   ou=London, ou=AllEmployees
   ```

   You can also leave the **Base DN** field blank.

8. In the **Query** field, enter a filter string.

   The filter string is used to determine which of the resources to return from the LDAP source. This allows you to limit the resources returned. For example, you may only be interested in considering resources from a specific department or region.

   Query strings must be enclosed in parentheses. This allows you to specify multiple strings, each one enclosed in its own parentheses.

   For information about special characters that can be used in LDAP query strings, plus some examples of query strings, see LDAP Query String Characters and Examples.

9. Using the **Search Scope** options, specify the depth to perform the search in the LDAP directory structure, as follows:

   - **ONE LEVEL** - Only the elements directly within the Base-DN level are searched.
   - **SUBTREE** - Elements directly within, and below, the Base-DN level are searched.

10. Click one of the **Show sample of LDAP Entities** buttons.

You can choose to display 10, 50, or 100 sample entities by clicking the appropriate button. This allows you to see the attributes that are in your chosen LDAP source. The number of sample entities returned has no bearing on the number of resources that will be in the LDAP container; it only determines how many are shown in the sample data.

11. In the **Resource Name Attribute(s)** field, enter one or more LDAP attributes by which you want the resources to be displayed in the list of candidate resources.

    You can use the list of attributes returned by the **Show sample of LDAP Entities** button to determine the attributes to use from the resource name attribute(s). The resource name attribute is significant from the following reasons:

    - These are the names by which the user must log into the BPM application.
    - These are the names by which the resources will be listed when mapping resources to groups and/or positions in the organization model. That is, they must be names that the user doing the mapping can use to uniquely identify the resources. For example, you probably wouldn't want to use only "sn" (surname), as that may not be unique among all of the resources.

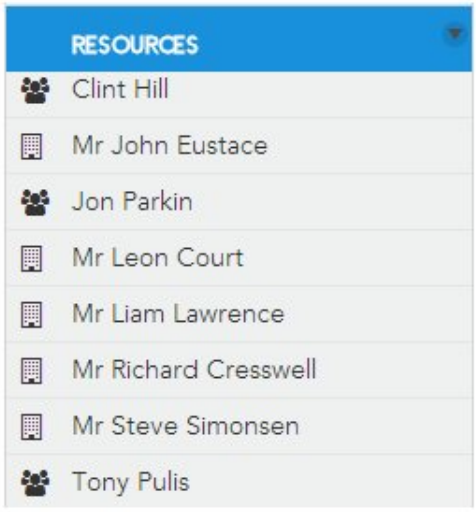

    The default resource attribute is "cn", which typically contains a full name. But depending on the data in the LDAP source, there may be more suitable attributes for this use.

    You can specify multiple attributes in the **Resource Name Attribute(s)** field. For instance, you could enter "givenname  sn" to display the resource's first name and last name (again, depending on what is stored in those attributes on the chosen LDAP source).

    Once you save the LDAP Container you will be able to view the list of resources for the container. For the LDAP entities you see in that list that have not yet been "created", the resource name will be constructed based on the Resource Name Attribute(s).

    When a resource is created (either using the **Create** function or by mapping the user to a group or position), you are given the opportunity to edit the constructed resource name.

    It is possible to change the Resource Name Attribute(s) setting for the container, but that will not affect the resource name of resources that have already been created. It will, however, change the name that is constructed for the remaining LDAP entries that have not yet been created. For instance, using the example shown above, if you change the value in **Resource Name Attribute(s)** field to "cn" (which contains "Mr" or "Mrs" with the resource's full name), the Resource Names now appear as shown below in the list of candidate resources.




Notice that the resources that had been previously created (those that have the ), are shown with the resource names they had when they were created; the resources that have not been created yet (those that have the icon), are shown with the new resource names.

12. Click **Save** to save the primary LDAP source you have defined, then click **Save** again to save the LDAP container definition.
    The newly created LDAP container now appears in the **Container Name** list.
13. Select the new container to see its definition details in the right pane.
    For example:


14. You can now do one of the following:

- add one or more secondary LDAP sources to your container - see Defining a Secondary Source Using an LDAP Query.
- map resources to groups/positions - see Mapping Resources.
- map resource attributes - see Mapping Resource Attributes.
- create BPM resources - see Creating BPM Resources.

## Defining a Secondary Source Using an LDAP Query

This procedure describes defining a secondary source for an LDAP container whose primary source locates resources using an LDAP query.

### Prerequisites

Create an LDAP container whose primary source locates resources using an LDAP query -- see Defining the Primary Source Using an LDAP Query.

You can optionally define one or more secondary sources for an LDAP container. For more information, see Primary and Secondary Sources.

### Procedure

1. Open the Organization Browser (Access to the Organization Browser) and select **LDAP Containers**.
2. From the **Container Name** list, select the LDAP container to which you want to add a secondary LDAP source, then click the **Edit** link in the lower right part of the dialog.
3. On the Edit LDAP Container dialog, click the **New Query Source** button.

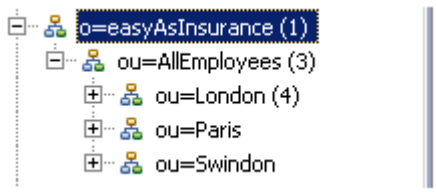
   After an LDAP container is created, and resources have been created in that container, you cannot delete or change the secondary LDAP sources defined for that container, nor add additional secondary LDAP sources to the container. (The only exception is that you can change the value of the Resource Name Attribute for an existing LDAP source.)
4. From the **Alias** field drop down list, select the secondary LDAP source you would like to add to the LDAP container.

   The names in the **Alias** drop-down list are user-readable names that an administrator has assigned to each of the LDAP Servers available in the enterprise.

   Note that when choosing a secondary source, the alias that was chosen for the primary source is omitted from the **Alias** field drop-down list.
5. Optional: In the **Base DN** field, enter the branch (e.g., an organization unit) in which you would like to limit the search in the LDAP directory structure.

   This increases the efficiency of the search if the LDAP contains a large number of branches.

   The search base must provide the complete path to the desired branch in the LDAP directory structure. For example, if you want to limit the search to the “London” organization unit in the following LDAP...

   ... you would enter the following in the **Base DN** field:

   ```
   ou=London, ou=AllEmployees
   ```
6. In the **Query** field, enter a filter string that will be used to determine which of the resources to return from the LDAP source.

   The filter string is used to determine which of the resources to return from the LDAP source. This allows you to limit the resources returned. For example, you may only be interested in considering resources from a specific department or region.

Query strings must be enclosed in parentheses. This allows you to specify multiple strings, each one enclosed in its own parentheses.

For information about special characters that can be used in LDAP query strings, plus some examples of query strings, see LDAP Query String Characters and Examples.

The **Resource Name Attribute(s)** field has no meaning when you are defining a secondary LDAP source.

7. Using the **Search Scope** options, specify the depth to perform the search in the LDAP directory structure, as follows:
   - **ONE LEVEL** - Only the elements directly within the Base-DN level are searched.
   - **SUBTREE** - Elements directly within, and below, the Base-DN level are searched.
8. Click one of the **Show sample of LDAP Entities** buttons.

   You can choose to display 10, 50, or 100 sample entities by clicking the appropriate button. This allows you to see the attributes that are in your chosen LDAP source. (The number of sample entities returned has no bearing on the number of resources that will be in the LDAP container; it only determines how many are shown in the sample data.

   Notice that when you clicked one of the **Show sample of LDAP Entities** buttons, two **Mapping** fields (**Primary Attribute** and **(Secondary) Ldap Attribute**) appear under the **Show sample of LDAP Entities** buttons. These are used to choose related LDAP attributes, as described in the following steps.
9. At this point, you need to make a determination which attributes in the secondary LDAP source will be compared to attributes in the primary LDAP source.

   The goal of comparing primary / secondary attributes is to ensure that data from the secondary LDAP source is only merged together with the appropriate candidate resource from the primary LDAP source.

   Where a match cannot be found, or where it is not one-to-one, the candidate resource will not have a complete, accurate set of information, and it will be either omitted (where no match is found) or marked as "multiple entries" (where the match isn't one-to-one).

   For example, if there are several resources with the same last name, you need to check more than just the last name; maybe checking first name too will be enough, or maybe you need to check more attributes (because there may be multiple resources in the secondary LDAP source with the same first and last name — it would not know which to include). Maybe there are other types of data, such as an employee ID that would work better and would avoid inconsistencies in data entry (typos, nicknames, abbreviations, etc.).

   You may need to also go back and view the data in the attributes in the primary LDAP source.

   For this example, if you know that the “ou” attribute in the primary LDAP source contains the complete name of the resources (Clint Hill, John Eustace, etc.), and the “displayname” attribute in the secondary LDAP source contains the same information, those attributes would be prime candidates to link.

   If you choose attributes that contain names, always be aware that there may be differences in the way those names were entered in the different LDAP sources, for example, Bob vs. Robert, Mike vs. Michael, or simple misspellings. Things like employee numbers tend to make good attributes to link.

   For additional information, see Primary and Secondary Sources.
10. Using the **Mapping** fields that appeared when you clicked one of the **Show sample of LDAP Entities** buttons, choose the related LDAP attributes, as follows:
    a) In the **Primary Attribute** field, choose the primary LDAP source attribute (for example, "ou") that contains data you want to compare to the data in the attribute you will choose in the next sub-step.

b) In the **(Secondary) Ldap Attribute** field, choose the secondary LDAP source attribute (for example, "displayname") that contains data you want to compare to the data in the attribute you chose in the previous sub-step.

After an LDAP container is created, and resources have been created in that container, you cannot modify the "related primary/secondary attributes" that had been defined for the container.

11. Optional: Click the  icon above the **Primary Attribute** field to add additional related primary/secondary attributes.

    This would be done if there are additional attributes you want to match to ensure it's the same resource whose attribute data is being obtained from the secondary source.

12. When you are finished linking attributes, click **Save**.
    The secondary LDAP source is now shown in the list of sources for the container. For example:

| TYPE | SOURCE NAME | LDAP QUERY | BASE DN | GROUP DN | RESOURCE NAME | MEMBER ATTRIB... | RELATIONAL KEY(S) |
|---|---|---|---|---|---|---|---|
| ? | easyAs | (ObjectClass=pe... | | | ou | | |
| ? | deLdap2 | (ObjectClass=pe... | | | displayname | | (ou=displayname) |

    The **Relational Key(s)** column shows that the linked attributes are "ou" and "displayname". The **Relational Key(s)** column is blank for the primary source.

13. If you are finished defining LDAP sources for the container, click the **Save** button.

### LDAP Query String Characters and Examples

Special characters can be used in LDAP queries when defining LDAP containers.

| Special Character | Meaning |
|---|---|
| * | Wild card character. Matches zero or more of any character. |
| & | Logical AND. Returns resources that satisfy the first string AND the second string.<br>Place this special character to the left of the first query string, then enclose the entire expression in parentheses, as follows:<br>`(&(string1)(string2))` |
| \| | Logical OR. Returns resources that satisfy the first string OR the second string.<br>Place this special character to the left of the first query string, then enclose the entire expression in parentheses, as follows:<br>`(\|(string1)(string2))` |
| ! | NOT. This means that you want all resources that do NOT match the specified value.<br>Place this special character to the left of the query string to which it applies, inside of the parentheses:<br>`(!(string))` |

### Examples

The following are examples of LDAP query strings:

- The following query returns all resources that have sn attribute values beginning with "s":
  ```
  (sn=s*)
  ```
- The following query returns all resources that have sn attribute values beginning with "s" *or* "p":
  ```
  (|(sn=s*)(sn=p*))
  ```
- The following query returns all resources with carlicense attribute values equal to "Full" *and* employeetype attribute values equal to "Permanent":
  ```
  (&(carlicense=Full)(employeetype=Permanent))
  ```
- The following query returns all resources where sn attribute values *don't* start with "s" and *don't* start with "p":
  ```
  (&(!(sn=s*))(!(sn=p*)))
  ```

Depending on the specific LDAP Server being used, the query syntax can vary. If the syntax described above does not return the expected results, consult the documentation for your LDAP Server.

Note that the values in a particular LDAP attribute may not be consistent across different LDAP Servers.

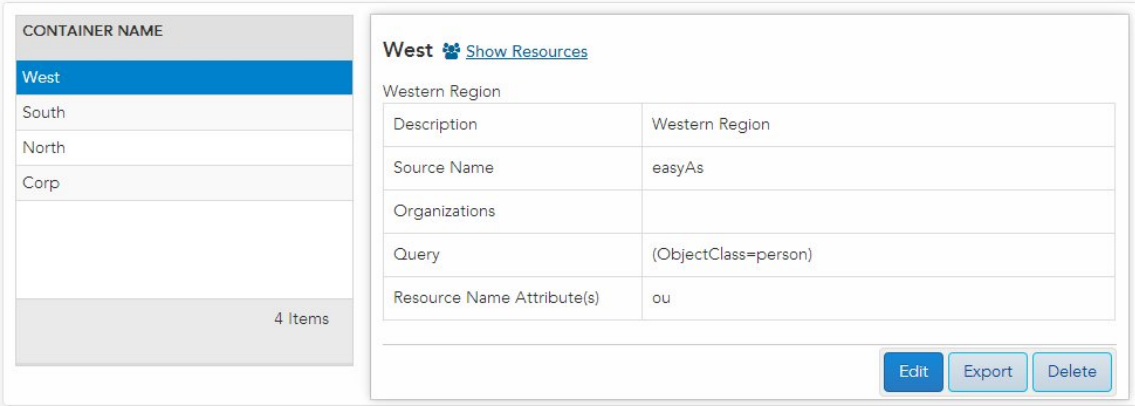
## Defining the Primary Source Using an LDAP Group

Each LDAP container must contain a primary LDAP source. If you are using an LDAP group source in the LDAP container definition, a group DN is used to identify the directory entry that is the group. When a group DN is specified, a *member attribute* is also specified, which holds the collection of member identifiers (DNs). This provides the list of candidate resources.

### Procedure

1. Open the Organization Browser (see Access to the Organization Browser), then select **LDAP Containers**.

   If any LDAP containers had previously been defined, they are shown in the left pane of the dialog, and the details of the selected container are shown in the right pane:




   The first time you display the Organization Browser, there will not be any containers listed.

After you've defined a container, you can edit it by selecting the container in the list, then clicking the **Edit** link in the lower-right part of the dialog. You can generally follow the same steps in this procedure to edit an existing LDAP container.

However, if the existing LDAP container contains resources, the LDAP sources for that container are fixed; you cannot delete or change the primary or secondary LDAP sources, nor add additional secondary LDAP sources.

Also note that if an LDAP source defined in an LDAP container is currently offline, you cannot edit the container until the LDAP source is back online.

2. Click the **Add a new LDAP container** button.
3. On the Add a new LDAP Container dialog, enter a name and description for the new container.
4. If desired, you can now specify organization relationships for the new container (note that this is applicable only if there are multiple organizations in your organization model).

   If the container has a relationship with an organization, resources in the container will be able to see that organization in the Organization Browser, as well as organizations that do not have an explicit relationship with a container. Resources can be mapped to positions in organizations that the user can see in the Organization Browser.

   For more information about organization relationships, see Container Organization Relationships.

   If you are not specifying organization relationships for this container, proceed to Step 5. (You can specify organization relationships for this container at a later time.)

   To specify organization relationships:

   a) Click the **Edit** button to the right of the **Organization** field.
   b) On the Define relationships to containers dialog, select the appropriate boxes for the organizations to which you want the new container to have a relationship.

      Selecting a box causes the **Relate this container to the following organizations** option to automatically be selected.

      Selecting the **Do not relate this container to specific organizations** option causes all check boxes to become unchecked.
   c) Click **Save**.

      The organization(s) you specified is now shown in the **Organization** field.
5. Click the **Add Group LDAP Source** link, which displays the Add new LDAP Group Source dialog.

   The Add new LDAP Group Source dialog is used to select the primary LDAP source from which resources will be obtained, as well as to provide the DN that identifies the LDAP directory containing the group.

   If you create multiple LDAP containers that use the same primary LDAP source, then create a resource in one container, that resource will *not* appear in any other container. Once created, a resource only appears in the container in which it is created.
6. In the **Alias** field, select the LDAP source from which you want to obtain resources.

   The names in the **Alias** list are user-readable names that an administrator has assigned to each of the LDAP Servers available in the enterprise.
7. Optional: In the **Base DN** field, enter the branch (e.g., an organization unit) in which you would like to limit the search in the LDAP directory structure.

   This increases the efficiency of the search if the LDAP contains a large number of branches.

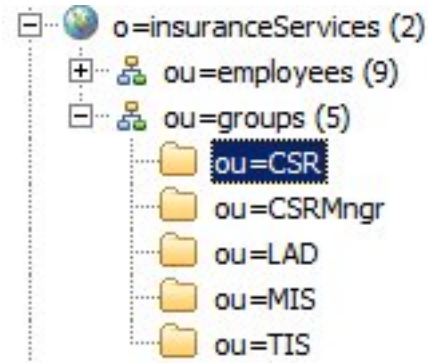
   You can also leave the **Base DN** field blank.
8. In the **Group DN Query** field, identify the objectClass of the LDAP directory whose entries are group entries.

This field defaults to "(objectClass=group)". To change the value, select the box to the left of the field. Note that the value must be enclosed in parentheses.

For information about objectClasses, see LDAP Group Sources.

9. Using the **Search Scope** options, specify the depth to perform the search in the LDAP directory structure, as follows:
   - **ONE LEVEL** - Only the elements directly within the Base-DN level are searched.
   - **SUBTREE** - Elements directly within, and below, the Base-DN level are searched.
10. In the **Group DN** field, enter the LDAP directory that contains the group entries.

    For example, if the LDAP directory shown in the following illustration identifies the group, the group-DN is "ou=CSR,ou=groups,o=insuranceServices":




    You can either manually type in the group DN if you know it, or you can click the **Fetch Group DN** button, then click the arrow button to the right of the field and select one of the DNs listed. The **Fetch Group DN** button causes the Organization Browser to retrieve all of the group DNs whose objectClass matches the one specified in the **Group DN Query** field.
11. In the **Member Attribute** field, enter the attribute within the LDAP group entry that holds the collection of DNs that identifies the candidate resources.

    For example, if the DN specified in the **Group DN** field contains the following attributes, where the roleoccupant attribute contains the DNs of the group members, you would specify "roleoccupant" as the member attribute:

DN: ou=CSR,ou=groups,o=insuranceServices

| Attribute Description | Value |
|---|---|
| ***objectClass*** | ***organizationalRole (structural)*** |
| ***objectClass*** | ***top (abstract)*** |
| **cn** | **Customer Services Representative** |
| ou | CSR |
| roleoccupant | uid=jparkin,ou=Employees,o=insuranceServices |
| roleoccupant | uid=rcresswell,ou=Employees,o=insuranceServices |

    You can either manually type in the member attribute name if you know it, or you can click the **Fetch** button to the left of the field, then click the **select** field to the right of the field and select one of the attributes listed. The **Fetch** button causes the Organization Browser to retrieve all of the attributes from the DN specified in the **Group DN** field.
12. In the **Resource Attribute(s)** field, enter one or more LDAP attributes by which you want the resources to be displayed in the list of candidate resources.

You may need to click the **Get Sample Values** button (which is covered in Step 13) to see the names of the available attributes.

The resource attribute name is significant for a couple of reasons:

- These are the names by which the user must log into the BPM application.
- These are the names by which the resources will be listed when mapping resources to groups and/or positions in the organization model. That is, they must be names that the user doing the mapping can use to uniquely identify the resources. For example, you probably wouldn't want to use only "sn" (surname), as that may not be unique among all of the resources.

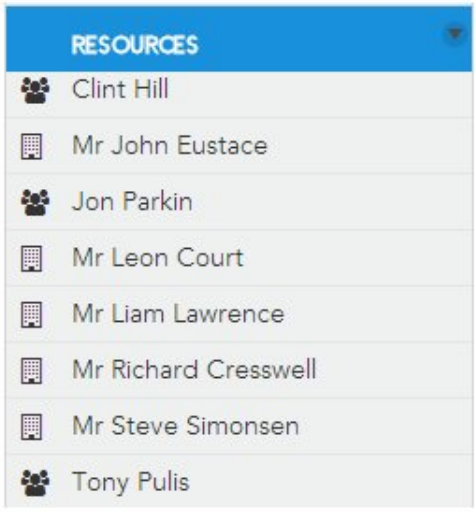

The default resource attribute is "cn", which typically contains a full name. But depending on the data in the LDAP source, there may be more suitable attributes for this use.

You can specify multiple attributes in the **Resource Attribute(s)** field. For instance, you could enter "givenname  sn" to display the resource's first name and last name (again, depending on what is stored in those attributes on the chosen LDAP source).

Once you save the LDAP Container you will be able to view the list of resources for the container. For the LDAP entities you see in that list that have not yet been "created", the resource name will be constructed based on the Resource Attribute(s).

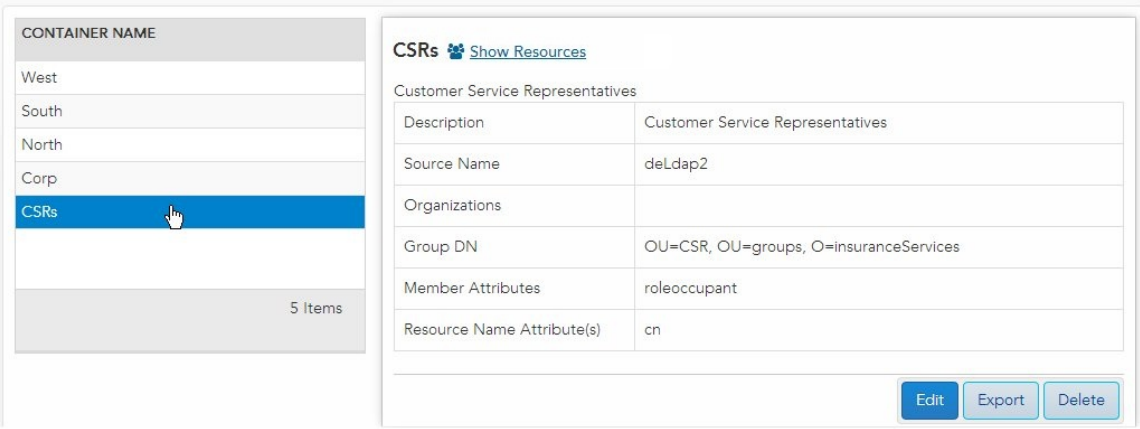
When a resource is created (either using the **Create** function or by mapping the user to a group or position), you are given the opportunity to edit the constructed resource name.

It is possible to change the Resource Attribute(s) setting for the container, but that will not affect the resource name of resources that have already been created. It will, however, change the name that is constructed for the remaining LDAP entries that have not yet been created. For instance, using the example shown above, if you change the value in **Resource Attribute(s)** field to "cn" (which contains "Mr" or "Mrs" with the resource's full name), the Resource Names now appear as shown below in the list of candidate resources.




Notice that the resources that had been previously created (those that have the  ), are shown with the resource names they had when they were created; the resources that have not been created yet (those that have the  icon), are shown with the new resource names.

13. Click the **Get Sample Values** button.
    A list of the group members DNs are returned and displayed.
14. Click **Save** to save the primary LDAP source you have defined, then click **Save** again to save the LDAP container definition.
    The newly created LDAP container now appears in the **Container Name** list.
15. Select the new container to see its definition details in the right pane.
    For example:




16. You can now do one of the following:

- add one or more secondary LDAP sources to your container - see Defining a Secondary Source Using an LDAP Group.
- map resources to groups/positions - see Mapping Resources.
- map resource attributes - see Mapping Resource Attributes.
- create BPM resources - see Creating BPM Resources.

## Defining a Secondary Source Using an LDAP Group

This procedure describes defining a secondary source for an LDAP container whose primary source locates resources using an LDAP group.

### Prerequisites

Create an LDAP container whose primary source locates resources using an LDAP group -- see Defining the Primary Source Using an LDAP Group.

You can optionally define one or more secondary sources for an LDAP container. For more information, see Primary and Secondary Sources.

### Procedure

1. Open the Organization Browser (Access to the Organization Browser) and select **LDAP Containers**.
2. From the **Container Name** list, select the LDAP container to which you want to add a secondary LDAP source, then click the **Edit** link in the lower right part of the dialog.
3. On the Edit LDAP Container dialog, click the **New Group Source** button.

   After an LDAP container is created, and resources have been created in that container, you cannot delete or change the secondary LDAP sources defined for that container, nor add additional secondary LDAP sources to the container. (The only exception is that you can change the value of the Resource Name Attribute for an existing LDAP source.)
4. From the **Alias** field drop down list, select the secondary LDAP source you would like to add to the LDAP container. (Note that when choosing a secondary source, the alias that was chosen for the primary source is omitted from the **Alias** field drop-down list.)

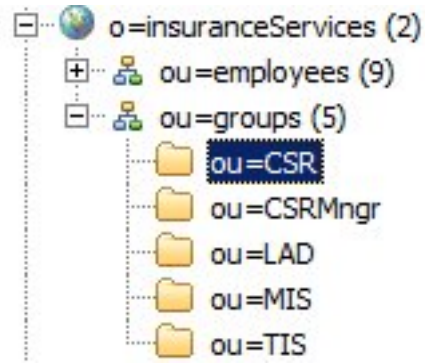
   The names in the **Alias** drop-down list are user-readable names that an administrator has assigned to each of the LDAP Servers available in the enterprise.
5. Optional: In the **Base DN** field, enter the branch (e.g., an organization unit) in which you would like to limit the search in the LDAP directory structure. This increases the efficiency of the search if the LDAP contains a large number of branches.
6. In the **Group DN Query** field, identify the objectClass of the LDAP directory whose entries are group entries.

   This field defaults to "(objectClass=group)". To change the value, select the box to the left of the field. Note that the value must be enclosed in parentheses.

   For information about objectClasses, see LDAP Group Sources.
7. Using the **Search Scope** options, specify the depth to perform the search in the LDAP directory structure, as follows:

   - **ONE LEVEL** - Only the elements directly within the Base-DN level are searched.
   - **SUBTREE** - Elements directly within, and below, the Base-DN level are searched.
8. In the **Group DN** field, enter the LDAP directory that contains the group entries.

   For example, if the LDAP directory shown in the following illustration identifies the group, the group-DN is "ou=CSR,ou=groups,o=insuranceServices":




You can either manually type in the group DN if you know it, or you can click the **Fetch Group DN** button, then click the arrow button to the right of the field and select one of the DNs listed. The **Fetch Group DN** button causes the Organization Browser to retrieve all of the group DNs whose objectClass matches the one specified in the **Group DN Query** field.

The **Resource Attribute(s)** field has no meaning when you are defining a secondary LDAP source.

9. In the **Member Attribute** field, enter the attribute within the LDAP group entry that holds the collection of DNs that identifies the candidate resources.

   The illustration below shows an example DN from an external LDAP browser. If the DN specified in the **Group DN** field contains the following attributes, where the roleoccupant attribute contains the DNs of the group members, you would specify "roleoccupant" as the member attribute:

DN: ou=CSR,ou=groups,o=insuranceServices

| Attribute Description | Value |
|---|---|
| ***objectClass*** | ***organizationalRole (structural)*** |
| ***objectClass*** | ***top (abstract)*** |
| **cn** | **Customer Services Representative** |
| ou | CSR |
| roleoccupant | uid=jparkin,ou=Employees,o=insuranceServices |
| roleoccupant | uid=rcresswell,ou=Employees,o=insuranceServices |

   You can either manually type in the member attribute name if you know it, or you can click the **Fetch** button to the left of the field, then click the arrow button to the right of the field and select one of the attributes listed. The **Fetch** button causes the Organization Browser to retrieve all of the attributes from the DN specified in the **Group DN** field.

10. Click the **Get Sample Values** button.
    A list of the group members DNs are returned and displayed.

    Also notice that when you clicked the **Get Sample Values** button,two **Mapping** fields (**Primary Attribute** and **(Secondary) Ldap Attribute**) appear under the **Get Sample Values** button. These are used to choose related LDAP attributes.

11. At this point, you need to make a determination which attributes in the secondary LDAP source will be compared to attributes in the primary LDAP source.

    The goal of comparing primary / secondary attributes is to ensure that data from the secondary LDAP source is only merged together with the appropriate candidate resource from the primary LDAP source.

    Where a match cannot be found, or where it is not one-to-one, the candidate resource will not have a complete, accurate set of information, and it will be either omitted (where no match is found) or marked as "multiple entries" (where the match isn't one-to-one).

For example, if there are several resources with the same last name, you need to check more than just the last name; maybe checking first name too will be enough, or maybe you need to check more attributes (because there may be multiple resources in the secondary LDAP source with the same first and last name — it would not know which to include). Maybe there are other types of data, such as an employee ID that would work better and would avoid inconsistencies in data entry (typos, nicknames, abbreviations, etc.).

You may need to also go back and view the data in the attributes in the primary LDAP source.

For this example, if you know that the “ou” attribute in the primary LDAP source contains the complete name of the resources (Clint Hill, John Eustace, etc.), and the “displayname” attribute in the secondary LDAP source contains the same information, those attributes would be prime candidates to link.

If you choose attributes that contain names, always be aware that there may be differences in the way those names were entered in the different LDAP sources, for example, Bob vs. Robert, Mike vs. Michael, or simple misspellings. Things like employee numbers tend to make good attributes to link.

For additional information, see Primary and Secondary Sources.

12. Using the **Mapping** fields that appeared when you clicked the **Get Sample Values** button, choose the related LDAP attributes, as follows:
    a) In the **Primary Attribute** field, choose the primary LDAP source attribute (for example, "ou") that contains data you want to compare to the data in the attribute you will choose in the next sub-step.
    b) In the **(Secondary) Ldap Attribute** field, choose the secondary LDAP source attribute (for example, "displayname") that contains data you want to compare to the data in the attribute you chose in the previous sub-step.

After an LDAP container is created, and resources have been created in that container, you cannot modify the "related primary/secondary attributes" that had been defined for the container.

13. Optional: Click the  icon above the **Primary Attribute** field to add additional related primary/secondary attributes.

    This would be done if there are additional attributes you want to match to ensure it's the same resource whose attribute data is being obtained from the secondary source.

14. When you are finished linking attributes, click **Save**.
15. If you are finished defining LDAP sources for the container, click the **Save** button.

## Container Organization Relationships

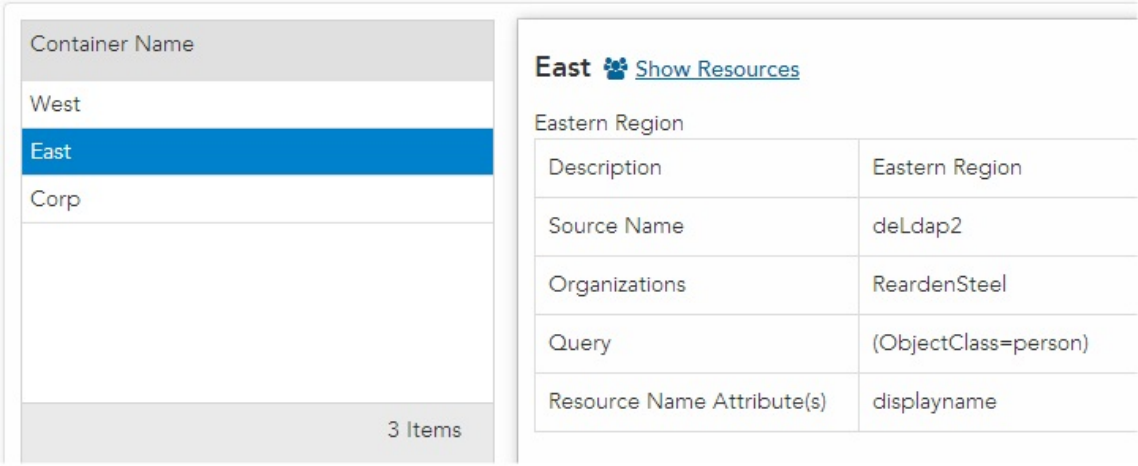
When you are creating or editing an LDAP container, you can specify that the LDAP container have a relationship with one or more organizations. These *organization relationships* allow you to prevent users from seeing LDAP containers and organizations they are not intended to see, as well as prevent resources from being mapped to positions in organizations they should not be in.

The ability to see containers and organizations (that is, the resources in those containers and organizations) has an impact when you are using the Organization Browser. It also affects the resources that you see when creating and editing supervised work views, as well as when using the Allocate Work Items to World function in a client application.

For organization relationships to work, the **OrgModelRestrictionsEnabled** property in the `DE.Properties` file must be set to true. (The `DE.Properties` file is located on the server; it contains properties for the Directory Engine. For more information see the *TIBCO ActiveMatrix BPM Administration Guide*.)

Organization relationships do not apply to groups. That is, you cannot prevent a resource from seeing the resources in a particular group when using the Organization Browser or allocating work items to world. (Seeing resources in groups does not apply when creating supervised work views.)

If an organization relationship exists for the selected container, it is shown in the **Organizations** field on the Organization Browser's LDAP Containers dialog:




In this example, the LDAP container named "East" has a relationship with the ReardenSteel organization.

For more information about assigning organization relationships, see Defining the Primary Source Using an LDAP Query and Defining the Primary Source Using an LDAP Group.

There is a system action called "Organization Admin" (DE.organizationAdmin) that allows a user who possesses this system action to see *all* containers, organizations, and resources, regardless of the organization relationships that are defined (you also need the DE.browseModel and DE.LDAPAdmin system actions to view LDAP containers). Note, however, this system action does *not* allow a resource to be mapped to a position in an organization from which the resource has been barred because of organization relationships.

## Organization Relationship Examples

An organization relationship allows you to prevent users from seeing LDAP containers and organizations they are not intended to see, as well as prevent resources from being mapped to positions in organizations they should not be in.

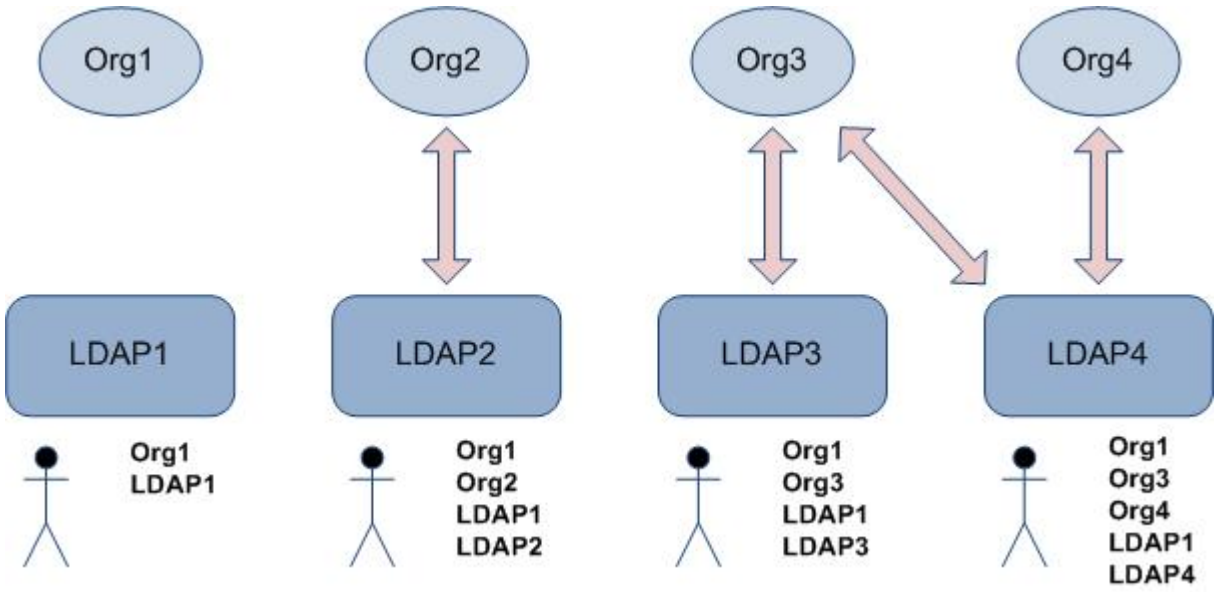
The descriptions that follow assume the resource does not have the DE.organizationAdmin system action.

The following summarizes the result of organization relationships:

- Resources that are in a container that does not have a relationship with any organization can:
  - see containers that do not have a relationship with any organization.
  - see organizations that do not have a relationship with any container.
  - be mapped only to organizations that do not have a relationship with any container.
- Resources that are in a container that has one or more organization relationships can:
  - see containers that do not have a relationship with any organization, as well as the container they are in.
  - see organizations that do not have a relationship with any container, as well as organizations to which their container has a relationship.

– be mapped to organizations that do not have a relationship with any container, as well as to the organizations that have a relationship with the container the resource is in.

The following graphic illustrates these points by showing four organizations and four LDAP containers. The arrows represent a relationship between the container and the organization. Under each container is a resource that is in that container, and to the right of each resource is shown the organizations and LDAP containers the resource can see.




- All resources can see Org1 and LDAP1 because neither has an explicit relationship set up.
- The resources in containers that have an organization relationship can also see the LDAP container they are in, as well as the organizations for which their container has a relationship.
- Any of the resources can be mapped to Org1, as well as to the organization(s) to which their container has a relationship.

An important point to understand here is that if multiple containers have a relationship with a single organization, the resources in one container will *not* be able to see the resources from the other container when viewing the organization to which they both have a relationship.

For example, using the illustration above, if a resource from both LDAP3 and LDAP4 are mapped to the same position in Org3, when a resource from LDAP3 looks at that position (using the Organization Browser, when creating supervised work views, or when allocating work items to world), that resource will *not* see the LDAP4 resource that is mapped to that position. Likewise, a resource from LDAP4 will not see the LDAP3 resource when looking at that position.

## Invalid Mappings Because of Organization Relationships

If you are logged on as a user who has the "Organization Admin" system action, you are able to see all organizations regardless the organization relationships that are defined. However, the system does not allow you to map resources to positions in organizations to which the resource is barred because of organization relationsips.

If you attempt to map a resource to a position that is invalid because of organization relationships, the following message is displayed when you click the **Save** button:


The message is telling you that the mapping is not allowed.

If a resource is mapped to a position, then an organization relationship is defined that bars the resource from the organization, the resource remains mapped to the position; the resource is not automatically un-mapped from the position. You can manually remove the mapping using the Remove function, if desired.

## Viewing the Resources in a Container

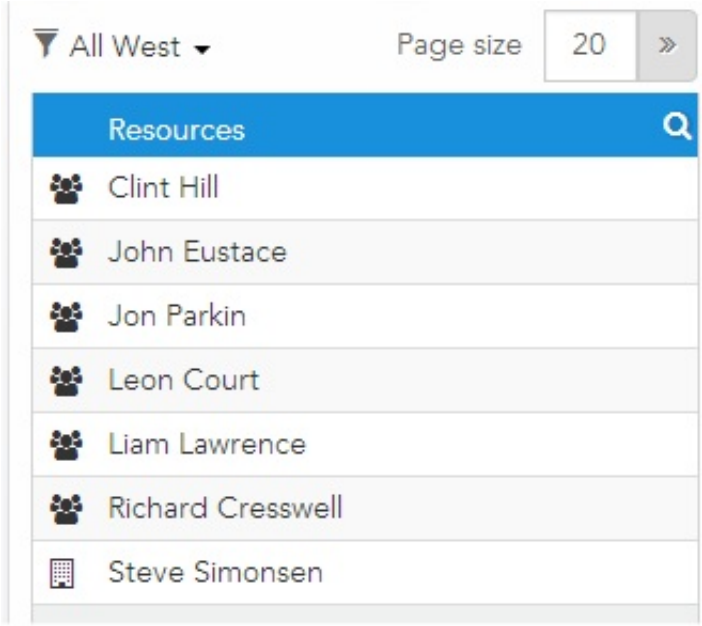
An LDAP container contains a list of resources from a specific LDAP server.

For information about creating an LDAP container, see LDAP Containers.

### Procedure

1. From the top menu bar in the Organization Browser, click **LDAP Container**.
   If any LDAP containers have been created, they are shown in the **Container Name** list.
2. Select the desired container from the **Container Name** list.
3. Click the **View Resources** link.

   The list of resources in the selected container is shown in the left pane:




The icon to the left of the resource name indicates the following:

| Icon | Meaning |
|---|---|
| | This is a BPM resource that has been "created", either directly (with the Create function) or as a result of being mapped to a group or position.<br>See Creating BPM Resources and Mapping Resources. |
| | The resource is a "candidate resource". The resource is available to be made a BPM resource; see above. |
| | (Only displayed if "Error Marked Only" is selected above the resource list.) There is an error condition associated with this resource (see below). |
| | The Organization Browser could not make a one-to-one match using the attributes chosen for comparison between the primary and secondary LDAP sources. This indicates that there are "multiple entries" that satisfy the attribute value comparison. For more information, see Primary and Secondary Sources. |

If there are multiple LDAP containers that use the same LDAP source, the same resource may appear in multiple LDAP containers as a candidate resource. However, once a resource is made a BPM resource, the same resource cannot be created from another LDAP container using the same "Resource Name".

If you select an LDAP container that uses an LDAP server that is currently offline, a message is displayed informing you that the resource list cannot currently be viewed.

4. Optional: Choose which resources you want to display in the list by clicking the above the resource list.

   The selections are:

- All - Displays both candidate resources and BPM resources.
- BPM Only - Displays only BPM resources.
- Non-BPM Only - Displays only candidate resources.
- Error Marked Only - Displays resources that have some sort of error condition. One error condition is for a "missing resource" -- see Missing Resource.

5. Optionally use the **Page Size** field to specify the number of resources to display in the list, or click the  button to page through the pages of resources.

The LDAP server may impose its own page-size limit. If the LDAP server has a page-size specified (which is commonly 1000), it takes precedence over the value specified in the **Page Size** field.

### Returning to the Resource List

Note that once you display a resource list, you can navigate to other areas of the Organization Browser (for example, to view groups or organizations), then easily return to the previously displayed resource list by clicking the **Resources** button in the top-level header bar of the Organization Browser.

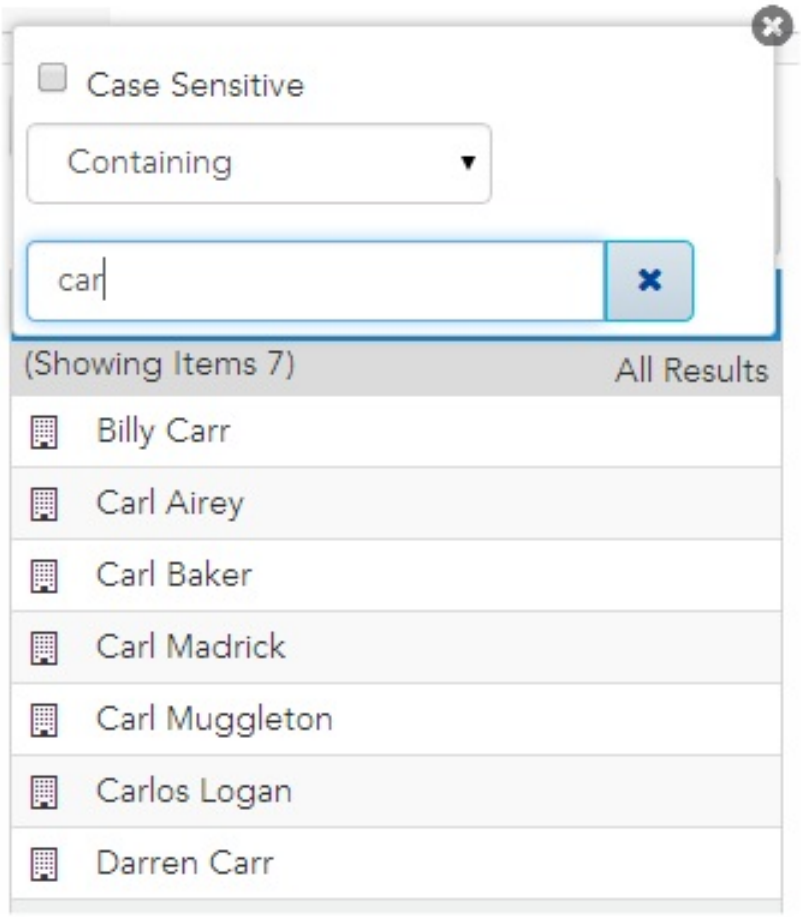
## Searching the Resource List

The Organization Browser contains a Search function that allows you to find the desired resource(s) in a list of resources.

### Procedure

1. Display a list of resources -- see Viewing the Resources in a Container or Viewing Resources Mapped to a Position or Group.
2. Click the  icon on the resource list header.
3. Specify whether or not the search is to be case sensitive using the **Case Sensitive** check box.
4. In the field below the **Case Sensitive** check box, specify whether you want the search results to include resources whose name starts with, or contains, the search text.
5. In the second field of the search dialog, enter the search text.

   The list of resources changes as you enter each character. In this example, the results show all resources containing "car", regardless of case:




Note, however, the search is restricted to only those resources that are currently in the paged list. Therefore, if only the first 20 resources are in the list, the search only looks through those resources.

If you have clicked the » button to page through the list, or changed the page size to include a large number of resources, the search will include all of those resources.

6. Close the search dialog by clicking the icon.

   Note that when you close the dialog, the search results remain displayed, and a **Showing Items: *nn*** message is displayed at the top of the resource list, indicating the list is filtered and *nn* resources are displayed as a result of the filter.

7. To clear the search and re-display all resources in the container, click the **All Results** link in the resource list.

## Mapping Resource Attributes

You may need to *map* one or more resource attributes to attributes in the LDAP sources you have defined in your LDAP container. You may need to do this because the business process does not have direct access to the attributes in the LDAP sources, but it does have access to the resource attributes in the organization model.

### Prerequisites

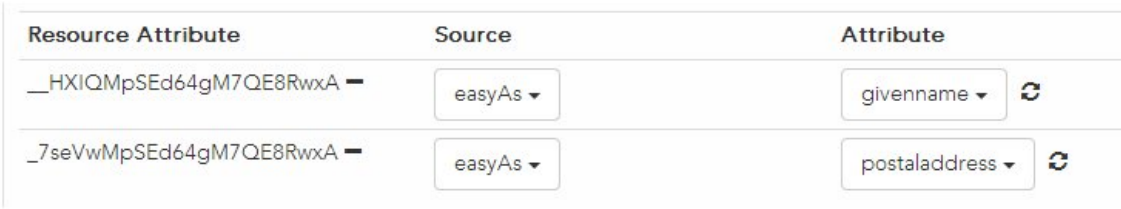
For the example shown in these steps, assume that the **`mail`** attribute in the deLAP2 LDAP source contains data that the business process needs. The business process has been designed in such a way to

expect this data in the **`EmailAddress`** resource attribute. Therefore, if the **`mail`** LDAP attribute is mapped to the **`EmailAddress`** resource attribute, the business process will be able to access the user's email address at runtime.

### Procedure

1. From the list of LDAP containers, choose the container that contains the LDAP source to which you want to map one or more resource attributes, then click **Edit**.
2. In the **Resource Attribute Mapping** section on the Edit LDAP Container dialog, choose the appropriate version of the organization model from the **Select Version** list.

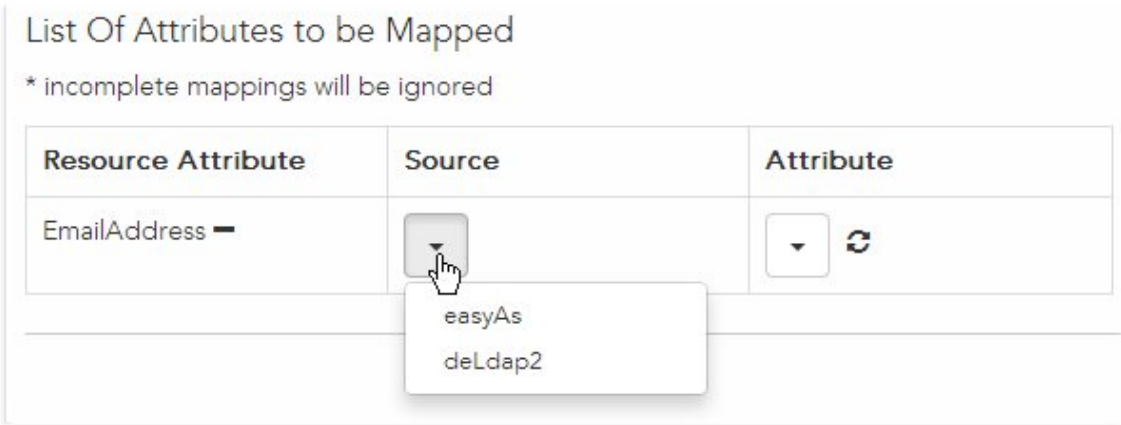
   Note that prior to choosing the organization model version, any previously assigned resource attributes are listed, but they are shown with GUIDs rather than resource attribute names. For example:




   Once the version is selected, the resource attribute names are shown.
3. From the **Available Resource Attributes** that are displayed, select the resource attribute to which you want to map LDAP attribute data by clicking the plus sign to the right of the resource attribute name.

   If there are LDAP attributes that contain binary data, those attributes may or may not be included in the list of available LDAP attributes, depending on the setting of a configuration set by the system administrator. For information about this parameter, see the TIBCO Workspace Configuration and Customization guide. LDAP attributes that contain binary data are base-64 encoded, therefore they can be mapped to resource attributes of type String.)

   The chosen attribute is added to the **List of Attributes to be Mapped** section.
4. Click the arrow button in the **Source** column and choose the LDAP source that contains the LDAP attribute that is being mapped to the resource attribute.
   The list contains all LDAP sources that are used in the container. For example:




5. Click the  button to the right the arrow icon in the **Attribute** column.

This causes the Organization Browser to read the attributes from the LDAP source you selected.

6. Click the arrow icon in the **Attribute** column, then choose the LDAP attribute whose value you want mapped to the resource attribute.

   For example:


7. Map additional attributes by clicking the plus sign to the right of the desired attributes in the **List of Attributes to be Mapped** section.

   If you choose an LDAP source that is different than one you've already chosen, you also need to click the  button to read the attributes from the newly selected source.

   You can also remove attributes from the **List of Attributes to be Mapped** section by clicking the minus sign to the right of the attribute name in the **Resource Attribute** column.

8. When you've added all of the desired attributes to the **List of Attributes to be Mapped** section, click **Save**.

## Moving a Resource to a Different LDAP Container

Resources listed in an LDAP container can be moved to a different LDAP container. This may be desired, for instance, if an employee has moved to a different department or location within the company.

Note that the same function used to move a resource to a different LDAP container can be used to also move the resource to a different "location". Locations are defined in the organization model and can be associated with organization units or positions. Resources are initially assigned locations by being mapped to those positions; the Rename/Move Resource function can be used to change the location for a resource.

### Procedure

1. Select the LDAP container that contains the resource you want to move, then click **Show Resources**.
2. From the resource list, select the desired resource, then click the **Rename/Move Resource** (  ) icon.
3. From the **Ldap Container** field on the Edit Selected Resources dialog, select the LDAP container to which you want to move the resource.

   A resource's "BPM resource" name can also be changed from this dialog; for information, see Renaming a Resource.
4. In the **Ldap Reference DN** field for each LDAP source, enter the DN that uniquely identifies the resource in that specific LDAP source.

There is no way to browse to and select the DN for each LDAP source, nor is there any validation on the value that is entered in the **Ldap Reference DN** field. Therefore, when the DN is manually entered, it is your responsibility to ensure that it entered is correct.

Note, however, when the Edit Selected Resources dialog is initially displayed, the resource's DN is shown in the **Ldap Reference DN** field. But once you select a different LDAP container, the field clears.

If an entered DN does not match the structure in the LDAP source, an "alert" icon (  ) is shown for the resource in the resource list if **Error Marked Only** is selected on the resource list.

5. If desired, also select a location for the resource from the available locations in the **Select Location** section.
6. Click **Save** to save the changes and close the dialog.

## Deleting LDAP Containers

LDAP containers can be deleted using the Organization Browser.

If the container currently contains BPM resources, you must have the DE.deleteResourceAdmin system action, otherwise you will not be allowed to delete the container. If the container does contain BPM resources, you can move them to another container prior to deleting the container, otherwise they will be deleted with the container. If BPM resources are deleted with the container, those deleted resources are automatically removed from any groups or positions to which they were mapped.

Also note that you cannot delete the LDAP container in which you were created.

### Procedure

1. In the Organization Browser, select **LDAP Containers** to display the list of containers, then select the container you want to delete.
2. Click the **Delete** button.
3. On the Delete LDAP Container dialog, you must select the **confirm ...** check box to proceed with the deletion.
4. Either:
   a) check the **confirm ...** check box, then click **OK** to delete the container, or
   b) click **cancel** to cancel the deletion.

# Resources

Resources represent users who log into BPM applications and receive work items that they need to work on.

Resources are obtained from *LDAP sources*, which are separate servers to which the Organization Browser connects to get a list of *candidate resources*. Before a resource can log into a BPM application, the candidate resource must be made a *BPM resource* by using the Create BPM Resource function in the Organization Browser.

Resources can be mapped to groups or positions in the organization model; resources receive work items in their work list because of being mapped to certain groups or positions. If you map a candidate resource to a group or position, the Create BPM Resource function is executed prior to the mapping, making the resource a BPM resource before it is mapped.

If you just "create" a BPM resource, without mapping the resource to a group or position, it allows the resource to log in to the BPM application, but the resource will not receive work items until after being mapped to a group or position in the organization. Resources can also be deleted, preventing them logging in.

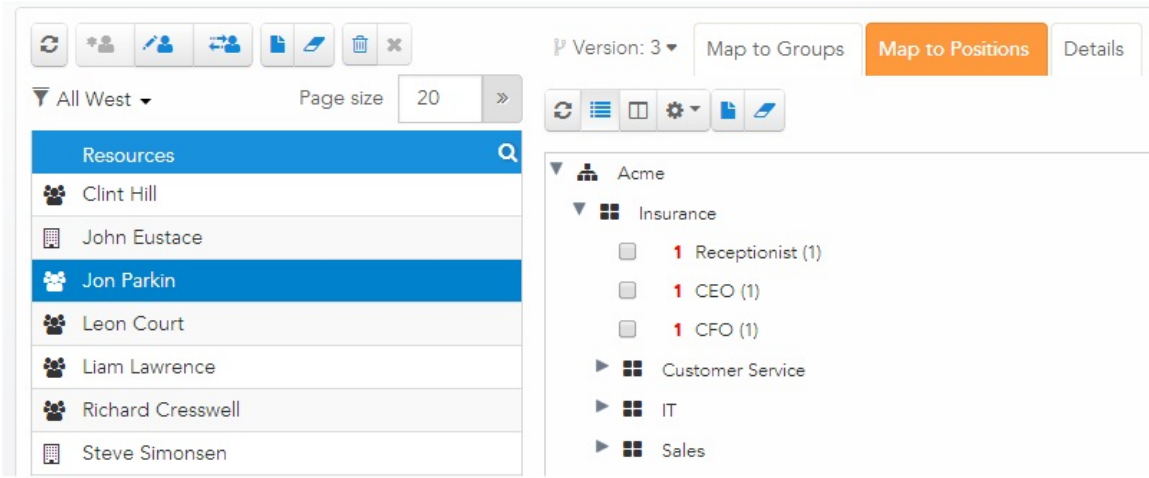
## Resource Lists

The *Resource List* either lists all of the resources in an LDAP container, or all of the resources that have been mapped to a particular group or position.

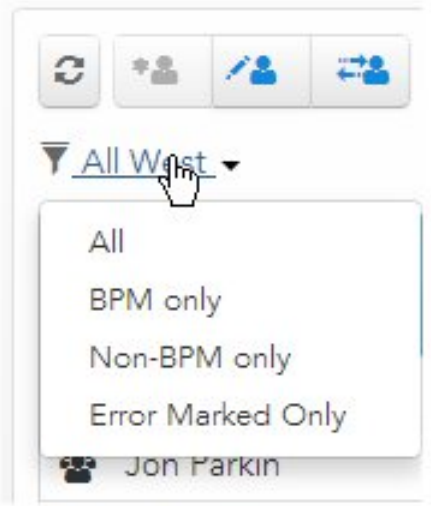
To display a resource list, see one of the following topics:

- Viewing the Resources in a Container
- Viewing Resources Mapped to a Position or Group

When viewing a resource list, the right pane is used to map resources to groups or positions, view details about a resource, and so on.




Use the filter menu above the resource list to choose the types of resources you want displayed in the list:




These selections have the following meanings:

- All - Displays both candidate resources and BPM resources.
- BPM Only - Displays only BPM resources.
- Non-BPM Only - Displays only candidate resources.
- Error Marked Only - Displays resources that have some sort of error condition. One error condition is for a "missing resource" -- see Missing Resource.

If you've displayed a resource list, then clicked another button, such as **LDAP Containers**, **Organizations**, and so on, that navigates you away from the resource list, you can always return to the previously displayed resource list by clicking the **Resources** button in the top menu bar of the Organization Browser. If you have not yet displayed a resource list (for example, you just accessed the Organization Browser), the **Resources** button displays a resource list that lists only the system administrator user.

There are a number of buttons above the resource list that do the following:

| Button | Description |
|---|---|
| - **Refresh** | Refreshes the resource list. |
| - **Create BPM Resource** | Creates a resource in BPM. See Creating Resources Using the Create BPM Resource Function. |
| - **Rename/Move Resource** | Used to perform one of the following functions:<br>• Change the *resource name* for the selected resource. See Renaming a Resource.<br>• Move the selected resource to a different LDAP container. See Moving a Resource to a Different LDAP Container. |

| Button | Description |
|---|---|
|  - **Manage Push Destinations** | Edit push destinations for the selected resource. See Editing Resource Push Destinations |
|  - **Select All** | Selects all resources in the resource list. |
|  - **Clear Selected** | Unselects the currently selected resources. |
|  - **Delete Resource** | Deletes the selected resource. See Deleting Resources. |
|  - **Remove Resource from Group/Position Membership** | Removes the resource's membership from a group or position.<br>Note, however, that this button is enabled only when viewing the list of resources that are mapped to a particular group or position, not when viewing the list of resources in an LDAP container. For more information, see Removing Resources Using the Resource List Remove Function. |

Also notice that when you are viewing a resource list, the right pane contains a series of buttons that allow you to specify how the right pane is to appear as you are viewing a resource list. These buttons are described below:

| Button / Selection | Description |
|---|---|
|  - **Refresh** | Refreshes the information in the right pane. |
|  **Tree View** | Displays groups and positions in a tree format. |
|  - **Columns View** | Displays groups and positions in a column format. |

| Button / Selection | Description |
|---|---|
|  - **Settings** | Additional settings, as described below.<br>• **Toggle All Indicators** - Causes the green- and red-colored numbers to be displayed or not when mapping resources. For more information, see Mapping Resources.<br>• **Toggle Label or Name** - Toggles between displaying the "label" or "name" for groups and positions; these can be different, depending on how they were defined in TIBCO Business Studio (for example, the name might be "AcmeCEO" and the label "CEO").<br>• **Settings** - This selection displays a **Settings** dialog that is used to set the default setting for column / tree view, as well as whether the available counts should be displayed. For information about the available counts, see Mapping Resources. |
|  - **Select All** | Selects all groups or positions. |
|  - **Clear Selected** | Unselects all currently selected groups or positions. |

## Creating BPM Resources

A candidate resource must be "created" to become a BPM resource. This results in an entry for that resource being added to the BPM database. Once a resource is a BPM resource, that resource can be mapped to groups and positions and log into the BPM application.

BPM resources can be created in the following ways:

- Use the Create BPM Resource function. This function allows you to add the resource to the database without having to map the resource to a group or position, allowing the user to log into the BPM application.

  Once you've created a BPM resource with the Create BPM Resource function, you can also edit resource attributes, capabilities, and so on, for the resource — you may have a need to do this prior to mapping the resource to groups or positions.

  See Creating Resources Using the Create BPM Resource Function.
- Map the resource to a group or position. If you attempt to map a candidate resource to a group or position, the Create BPM Resource dialog is displayed before the mapping takes place. The resource must become a BPM resource before it can be mapped.

  See Mapping Resources.

BPM resources can also be deleted. When a BPM resource is deleted, it once again becomes a candidate resource; that resource can no longer log into the BPM application. For information about how to delete a BPM resource, see Deleting Resources.

### Creating Resources Using the Create BPM Resource Function

Creating a resource using the Create BPM Resource function allows you to add the resource to the database without having to map the resource to a group or position.

### Procedure

1. From the Organization Browser, select the LDAP container containing the candidate resource you want to create, then select one or more candidate resources.
2. Click the **Create BPM Resource** button ( ).
3. On the Create Selected Resources dialog, optionally specify a different name in the **Resource Name** field.

   The resource name is the name the user must use to log into BPM applications. If the resource is a "BPM resource" in another LDAP container, you must provide a different resource name, otherwise a message is displayed when you click **Create**, stating that the name already exists; the resource is not created.

   Only one case variation of a resource name is allowed, across all LDAP containers. For example, if there is already a resource with the name "Clint Hill", you cannot create a resource with the name of "clint hill".
4. Click **Create**.

### Result

The icon to the left of the resource name changes to a , indicating that the resource is now a BPM resource, and is now able to log into the BPM application.

## Mapping Resources

Mapping resources is an administrative task that will typically be performed before users start using the BPM application.

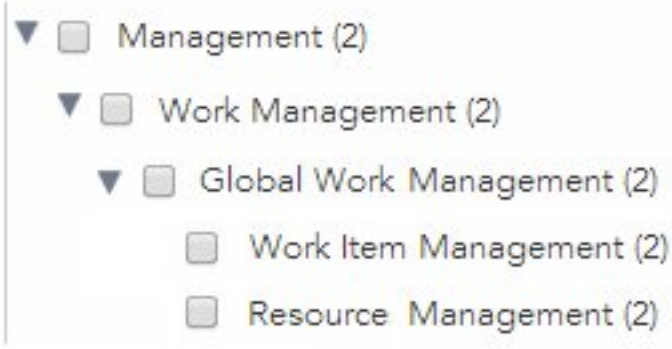
Mapping resources can then be performed on an ongoing basis as resources are added or removed from the system, or if the organization model is revised (new positions, groups, etc.).

Mapping resources involves assigning resources to specific groups and/or positions in an organization model, which results in the resources receiving work items that are sent to the groups/positions to which the resources have been mapped.

Resources can be mapped to groups and/or positions:

- A *group* represents a job type within the organization. It allows resources to be grouped by their job characteristics.

  Groups are hierarchical, that is, you can have parent groups with sub groups. Typically, sub-groups are specializations of the parent group. For example:

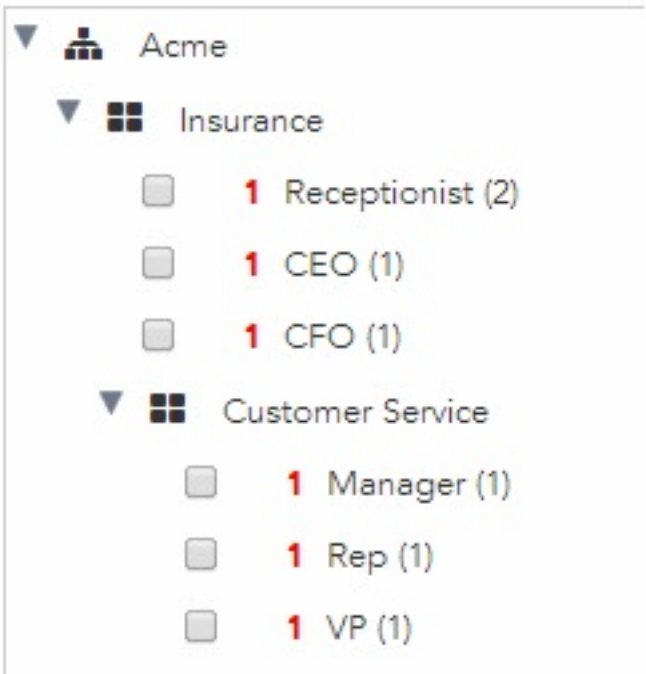


If a group has sub-groups, you can assign resources to either the parent group or the sub-group. Resources that belong to sub-groups receive work items that are offered to their parent groups, as well as to the sub-group to which they belong. Using the example above, resources in the Work Item Management and Resource Management groups will also receive work items offered to the Global Work Management group.

For information about the inheritance of privileges and capabilities assigned to groups, see Privileges and Capabilities.

- A *position* represents a set of responsibilities for a job within an organization unit. It allows resources to be grouped by job responsibility.

  Positions are subordinate to an organization unit in the organization model. An organization unit can have many positions. Positions cannot be nested, although organization units can. In the following example, Acme Insurance and Acme Customer Service are organization units under the Acme organization. Each of the organization units have three positions.




  Resources can be mapped to positions, but not organizations or organization units.

  Resources that belong to a position receive work items offered to the position, as well as work items offered to the organization unit that is the immediate parent of the position.

  For information about the inheritance of privileges and capabilities assigned to positions, see Privileges and Capabilities.

Resources must not be mapped to groups or positions in more than eight organization models. If you exceed this limit, a "TOO_MANY_ORG_IDS" error will occur when those resources perform functions in the BPM client application.

**Procedure**

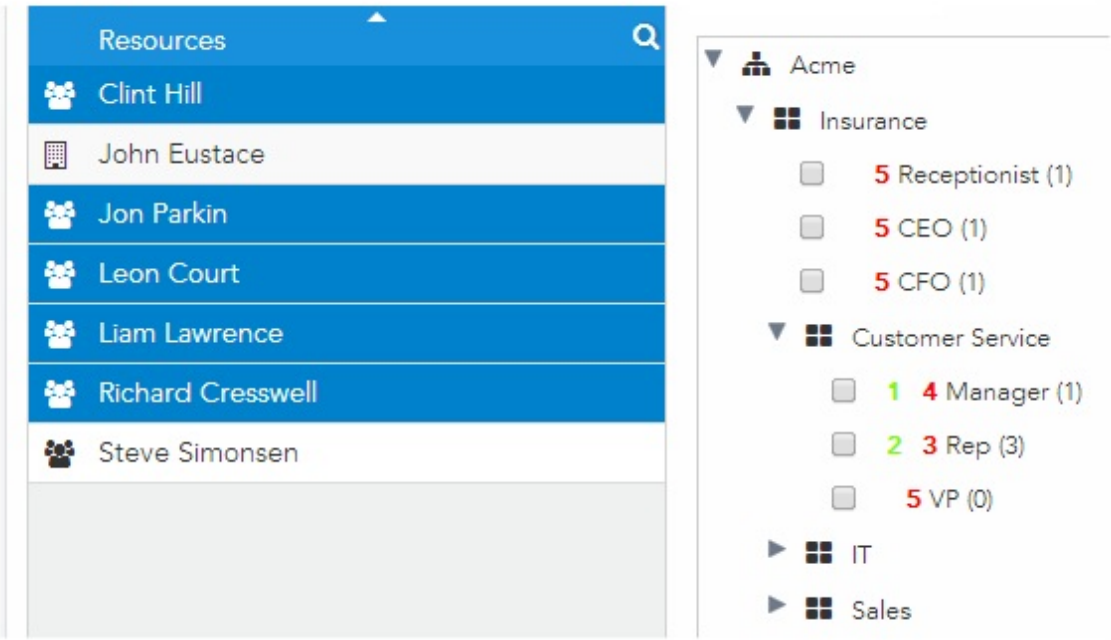
1. Display the list of resources that contains the resource(s) you want to map.

   You can do this by either displaying the resources in an LDAP container (see Viewing the Resources in a Container), or the resources already mapped to a position or group (see Viewing Resources Mapped to a Position or Group).
2. Select one or more resources in the list.

- As you select resources in the list, previously selected resources remain selected. Clicking on a selected resource unselects it.
- Use the **Shift** key to select a group of resources.
- Use the **Select All** button ( ) to select all of the resources in the list.
- Use the **Clear Selected** button ( ) to unselect all resources.

3. Ensure that the correct version of the organization model is displayed using the **Version** selection.
4. Click **Map to Groups** or **Map to Positions** to choose whether you want to map to groups or positions.
5. Use the buttons available in the right pane to specify how information is to appear in the right pane. For information, see Groups and Positions Display.
6. If required, drill down into the group or position hierarchy to expose the groups or positions to which you want to map the selected resources.

   "Counts" are displayed next to each group or position:




The counts have the following meanings:

- The number to the right of the group or position name in parentheses is the number of resources that are currently mapped to the group/position.
- The green-colored number tells you how many of the currently selected resources are already mapped to that group/position.
- The red-colored number tells you how many of the currently selected resource are not yet mapped to the group/position.

If only a green-colored number is displayed, it means all of the selected resources are already mapped to that group/position.

If only a red-colored number is displayed, it means none of the selected resources are mapped to that group/position.

7. Select the groups/positions to which you want to map the selected resources.
   There are a number of ways in which you can select groups and/or positions, as follows:

   - Click in the check box to the left of the group or position name to select it.
   - Click anywhere on the line for the desired group/position, then press Enter or the space bar to select it.
   - Press and hold the Ctrl key, then click a organization unit or position to select it and all subordinate positions or groups.
   - Click the button to select all groups or positions, depending which is currently displayed.
   - Click the button to unselect all currently selected groups or positions, depending which is currently displayed.

   And note that you can use the up/down/left/right arrow keys on the keyboard to navigate the tree/column view.

   You can also click the **Actions** link and select **Grant all Groups memberships**, **Grant all Positions memberships**, or **Grant all Groups and Positions** to assign the selected resources to all groups or positions. If you choose to use one of those options, you do not need to click the **Grant** link as described in the next step.

8. Select the **Grant** link in the upper-right part of the dialog.

   If one or more of the selected resources was not yet a BPM resource, the Create Selected Resources dialog is displayed. If this dialog is displayed, optionally specify a different name in the **Resource Name** field for each resource listed, then click **Create**. The resource name is the name the user must use to log into BPM applications. If the resource is already a BPM resource in another LDAP container, you must provide a different resource name, otherwise a message is displayed when you click **Create**, stating that the name already exists. (Note that only one case variation of a resource name is allowed across all LDAP containers. For example, if there is already a resource with the name "Clint Hill", you cannot create a resource with the name of "clint hill".

   Numbers appear to the left of the selected groups or positions to reflect the number of resources that will be added to the group/position if you save the changes. For example:

   The "+3" that was added indicates that three of the currently selected resources will be added to the Customer Service > Rep position when you select **Save**. The green "2" means that two of the selected resources are already mapped to that position; the red "3" means that three of the selected resources are not currently mapped to that position.

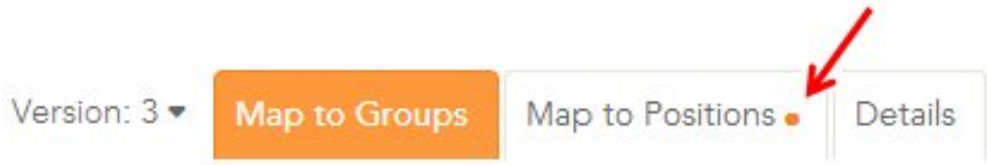
9. Optionally choose different resources in the resource list and select groups or positions to which you want to map those resources.

   You can map various resources to various groups and positions within a single "mapping session" without saving changes between selections. The Organization Browser remembers the resource and group/position selections as you select various resources and group/positions.

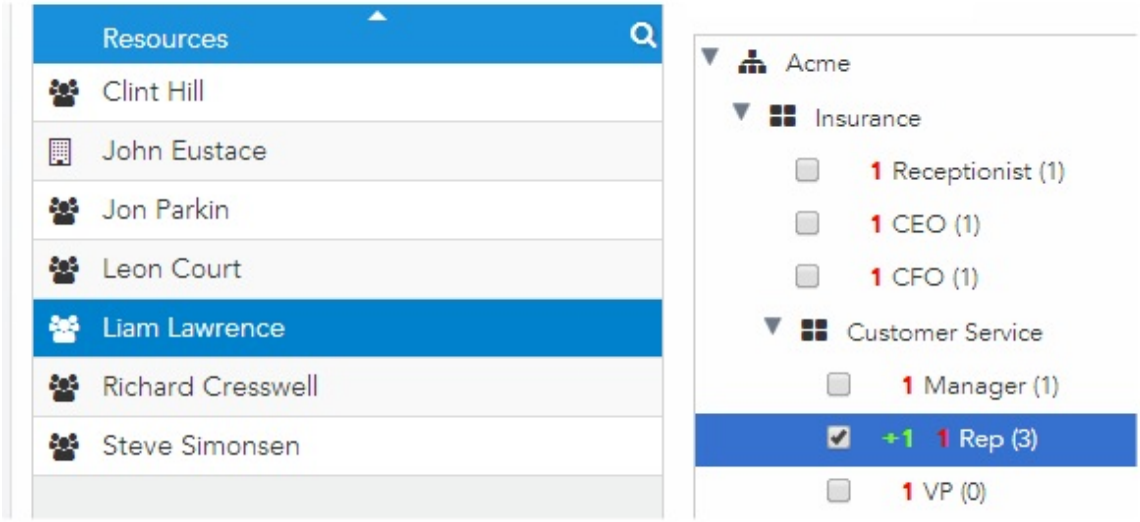
   Be aware, however, that the green and red numbers showing the pending changes (granted or removed memberships) only reflect changes that apply to the currently selected resources. It may be

advisable to always click **Save** (which is the last step in this procedure) after each grant when close tracking of pending changes is required.

Also note that if there are pending changes to memberships, a "dot" appears on the right of the applicable tab, indicating that the changes have not been saved yet. For example:

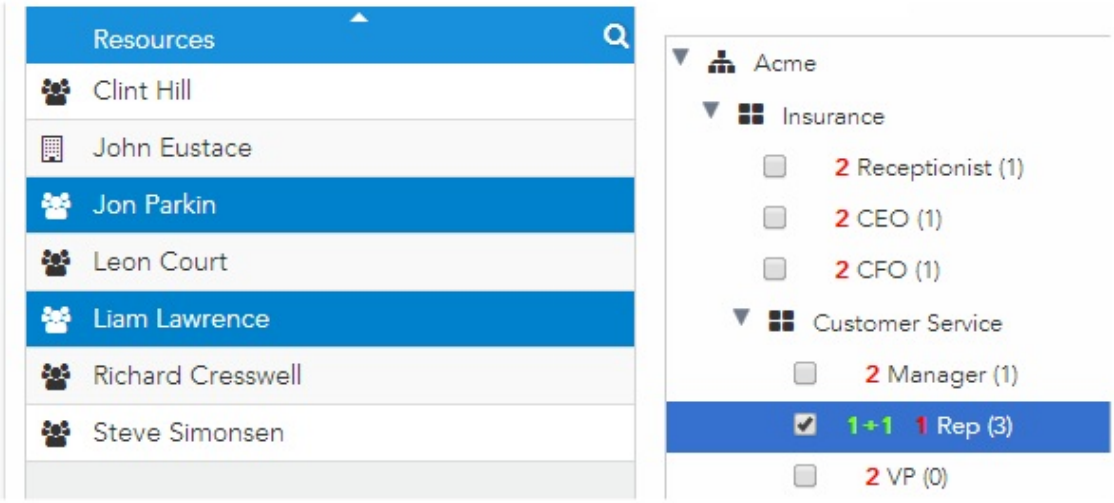



If you choose different resources, the green- and red-colored numbers to the left of the groups/positions change to reflect the currently selected resources. For example, assume the selections were made in the preceding steps, and **Grant** was selected (but **Save** was not clicked yet), but now only Liam Lawrence is selected. The Customer Service > Rep position will now appear as follows:




The "+1" indicates that the mapping of Liam Lawrence to the Customer Service > Rep position is pending.

And if you now selected Jon Parkin in addition to Liam Lawrence, the following is displayed:




The addition of the green-colored "1" indicates that Jon Parkin is already mapped to the Customer Service > Rep position. Also notice that the red number to the left of all of the other positions increased to "2" to indicate that neither of the selected two resources are a member of those positions.

10. Prior to saving the mapping selections you've made, the following options are also available from the **Actions** link:

    - **Reset selected Groups/Positions memberships** - This reverses mapping selections you've made to the currently selected resources, and currently selected groups or positions.
    - **Reset all Groups/Positions memberships** - This reverses mapping selections you've made to all resources and groups or positions, not just those that are currently selected.

    Note that you can also specify the removal of resources from groups or positions at the same time that you are mapping resources. This is done by choosing the resources to remove, selecting the groups/position, then clicking the **Remove** link. A negative red-colored number is displayed to the left of the group or position name to indicate the resource removal. For more information about removing resources, see Removing Resources from Groups or Positions.

11. Once all desired resources are mapped to the desired groups and positions, click **Save**.

    This action saves the mapping that is currently pending for both groups and positions.

## Groups and Positions Display

The way in which lists of groups and positions appear can be controlled using the buttons available above the lists.

| Button / Selection | Description |
|---|---|
| - **Refresh** | Refreshes the information in the lists of groups and positions. |
| **Tree View** | Displays groups and positions in a tree format. |
| - **Columns View** | Displays groups and positions in a column format. |

| Button / Selection | Description |
|---|---|
|  - **Settings** | Additional settings, as described below.<br>• **Toggle All Indicators** - Causes the green- and red-colored numbers to be displayed or not displayed when mapping resources. For more information, see Mapping Resources.<br>• **Toggle Label or Name** - Toggles between displaying the "label" or "name" for groups and positions; these can be different, depending on how they were defined in TIBCO Business Studio (for example, the name might be "AcmeCEO" and the label "CEO").<br>• **Settings** - This selection displays a dialog that is used to set the default setting for column / tree view, as well as whether the available counts should be displayed. For information about the available counts, see Mapping Resources. |
|  - **Select All** | Selects all groups or positions. |
|  - **Clear Selected** | Unselects all currently selected groups or positions. |

## Removing Resources from Groups or Positions

Removing resources from groups or positions prevents the resources from receiving work items destined to the groups or positions.

There are two ways in which resources can be removed from groups or positions.

### Removing Resources Using the Mapping Remove Function

To remove resources from groups and positions using this method, you navigate to the group or position from which you want to remove resources by using the **Map to Groups** or **Map to Positions** tabs.
This method of removing resources is similar to mapping resources, except you click the **Remove** link instead of the **Grant** link.

#### Procedure

1. Display the list of resources that contains the resource(s) you want to remove from groups or positions.

   You can do this by either displaying the resources in an LDAP container (see Viewing the Resources in a Container), or the resources already mapped to a position or group (see Viewing Resources Mapped to a Position or Group).
2. Select the resources you want to remove.

   - As you select resources in the list, previously selected resources remain selected. Clicking on a selected resource unselects it.
   - Use the **Shift** key to select a group of resources.
   - Use the **Select All** button (  ) to select all of the resources in the list.

- Use the **Clear Selected** button ( ) to unselect all resources.

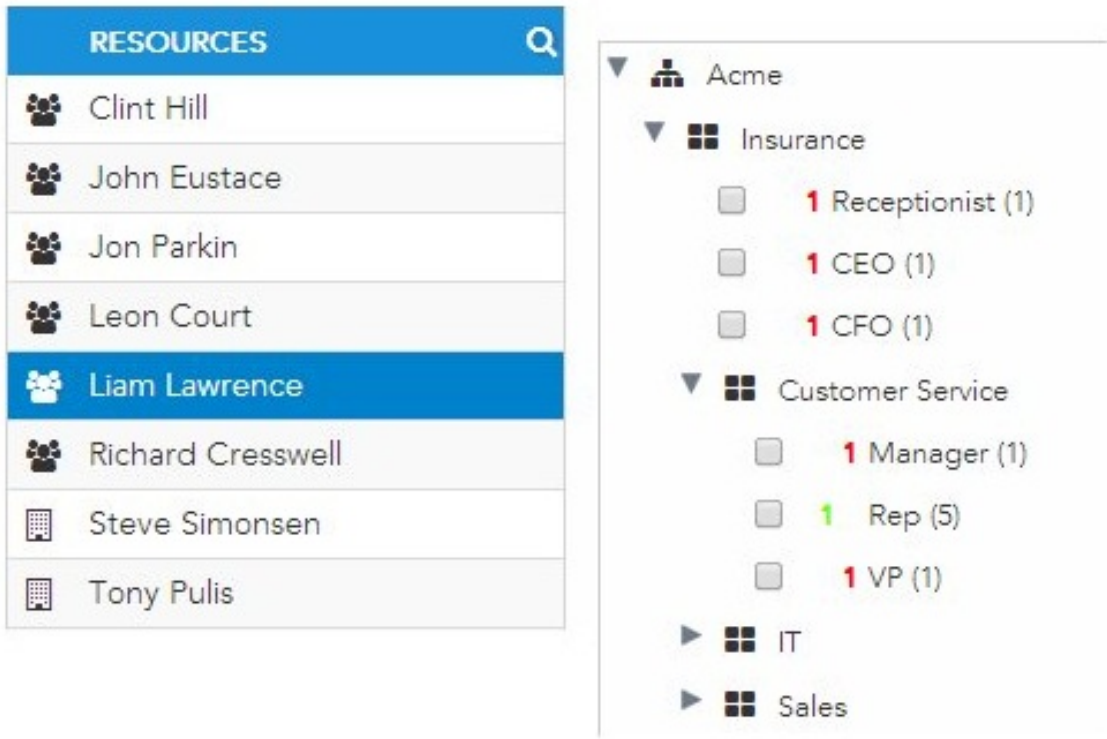
3. Ensure that the correct version of the organization model is displayed using the **Version** selection.
4. Click either the **Map to Groups** or **Map to Positions** tab to choose whether you want to remove the resource(s) from groups or positions.

   You can go back and forth between groups and positions when you are removing resources. The **Save** button is enabled for each tab which has mapping changes pending. Selecting either **Save** button will save any changes pending for both groups and positions.
5. Use the buttons available in the right pane to specify how information is to appear in the right pane.

   For information, see Groups and Positions Display.
6. If required, drill down into the group or position hierarchy to expose the groups or positions to which you want to remove the selected resources.

   The descriptions below assume that all of the available indicators and counts are being displayed. You can optionally turn off indicators (the colored numbers)and some or all of the available counts by using selections on the menu. For information, see Resource Lists.

   In the following example, in which Liam Lawrence is selected, you can see that that resource is mapped to the Customer Service > Rep position based on the green-colored "1" to the left of the position name:




7. Select the group or position to which the selected resources are mapped, then click the **Remove** link.

   You can also click the **Actions** link and select **Remove all Groups memberships**, **Remove all Positions memberships**, or **Remove all Groups and Positions** to remove the selected resources from all groups or positions. If you choose to use one of those options, you do not need to select any individual groups or positions.

A negative red-colored number is displayed to the left of the group or position name to indicate the number of resources that are being removed from the group/position. For example:


8. Prior to saving the mapping removals, the following options are also available from the **Actions** link:
   - **Reset selected Groups/Positions memberships** - This reverses mapping selections you've made to the currently selected resources, and currently selected groups or positions.
   - **Reset all Groups/Positions memberships** - This reverses mapping selections you've made to all resources and groups or positions, not just those that are currently selected.
9. Once all desired resources are removed from the desired groups and positions, click **Save**.

### Removing Resources Using the Resource List Remove Function

To remove resources from groups and positions using this method, you select one or more resources in the resource list, then click the **Remove Resource** button ( ✖ ) that is above the resource list. Note, however, the resource list *must be* a list of resources that are mapped to a particular group or position. It cannot be the list of resources that are in an LDAP container.

#### Procedure

1. From the Organization Browser, click either the **Groups** or **Organizations** button.
2. In the group or organization structure, expand the hierarchy if necessary, then select the group or position from which you want to remove resources.
3. Click **Show Resources**.
4. In the resource list, select one or more resources that you want to remove from the group or position, then click the **Remove Resource** button ( ✖ ) that is above the resource list
5. On the Remove Selected Resources confirmation dialog, click **Continue**.

## Viewing Resources Mapped to a Group or Position

You can select a group or position and see which resources are mapped to that group or position.

#### Procedure

1. In the Organization Browser, click the **Groups** button to view the resources in a group, or the **Organizations** button to view the resources in a position.
2. Ensure that the correct version of the organization model is displayed using the **Version** selection.

3. Using the **Tree View** button (  ) or **Columns View** button (  ), choose how you want the groups or positions displayed, in a column format or tree format.
4. If required, drill down into the group or position hierarchy to expose the group or position to which you want to view resources.

   The number in the parentheses to the right of each group and position name is the number of resources that are currently mapped to that group/position.
5. Select the group or position for which you want to view the mapped resources by clicking the check box to the left of the group or position name, then click **Show Resources**.
   The list of resources that are mapped to the selected group/position is displayed in the left pane.

If you select a group or position that contains one or more resources from an LDAP server that is currently offline, a message is displayed informing you that the resource list cannot currently be viewed.

Also note that an alternative approach is to double-click on a group or position that has resources mapped to it. This causes a dialog to display that lists the resources mapped to that group or position. This dialog also contains a **Map Resources** button that, when clicked, displays the "Resource" view, that is, the resource list for the group or position that was double clicked.

#### Result

This list of resources works in the same way as the list of resources in a container, that is, you can select a resource in this list to display details about that resource, or map them to other groups or positions.

You might not be able to see all resources mapped to a particular position because there are resources mapped to that position that were created in an LDAP container for which you don't have visibility (because of an organization relationship). (This applies only to positions, not to groups.) Note, however, that the counts shown to the right of the position name is the *total count* for the resources in the position. From this count, you can determine if there are resources mapped to the position that you cannot see. For more information, see Container Organization Relationships.

#### Returning to the Resource List

Note that once you display a resource list, you can navigate to other areas of the Organization Browser (for example, to view LDAP containers), then easily return to the previously displayed resource list by clicking the **Resources** button in the top-level header bar of the Organization Browser.

## Searching the Resource List

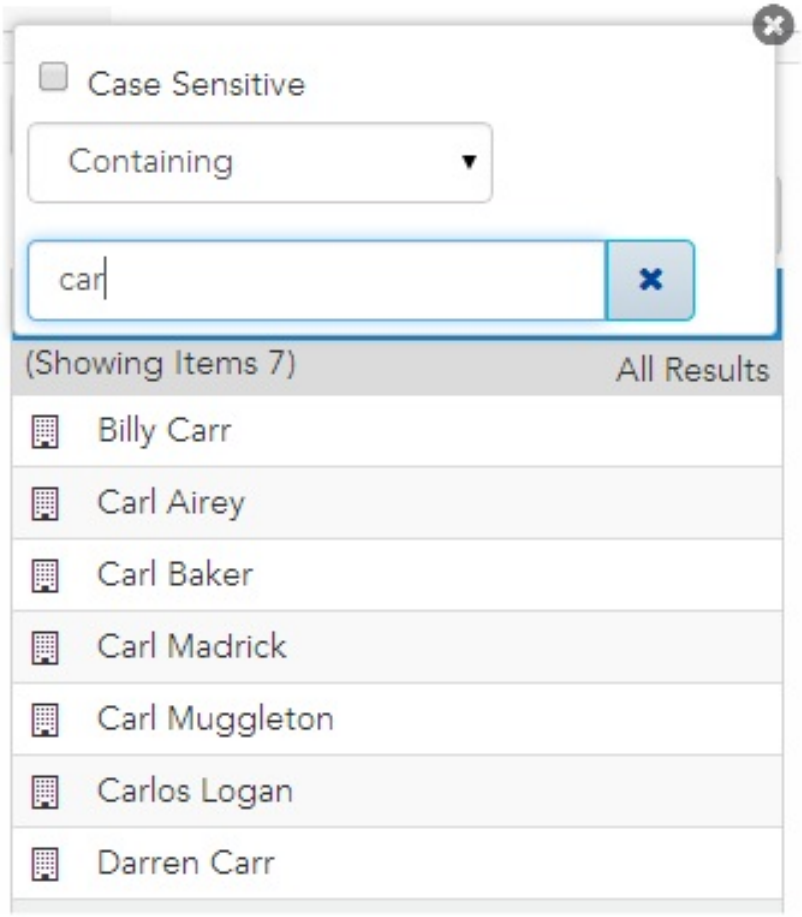
The Organization Browser contains a Search function that allows you to find the desired resource(s) in a list of resources.

#### Procedure

1. Display a list of resources -- see Viewing the Resources in a Container or Viewing Resources Mapped to a Position or Group.
2. Click the  icon on the resource list header.
3. Specify whether or not the search is to be case sensitive using the **Case Sensitive** check box.
4. In the field below the **Case Sensitive** check box, specify whether you want the search results to include resources whose name starts with, or contains, the search text.

5. In the second field of the search dialog, enter the search text.

   The list of resources changes as you enter each character. In this example, the results show all resources containing "car", regardless of case:




   Note, however, the search is restricted to only those resources that are currently in the paged list. Therefore, if only the first 20 resources are in the list, the search only looks through those resources.

   If you have clicked the » button to page through the list, or changed the page size to include a large number of resources, the search will include all of those resources.

6. Close the search dialog by clicking the icon.

   Note that when you close the dialog, the search results remain displayed, and a **Showing Items: *nn*** message is displayed at the top of the resource list, indicating the list is filtered and *nn* resources are displayed as a result of the filter.

7. To clear the search and re-display all resources in the container, click the **All Results** link in the resource list.

# Viewing Resource Details

Resource details includes things like groups and positions to which the resources are mapped, privileges held by the resources, etc.

### Procedure

1. Display the list of resources that contains the resources whose details you want to view.

   You can do this by either displaying the resources in an LDAP container (see Viewing the Resources in a Container), or the resources already mapped to a position or group (see Viewing Resources Mapped to a Position or Group).

2. Select the desired resource(s).

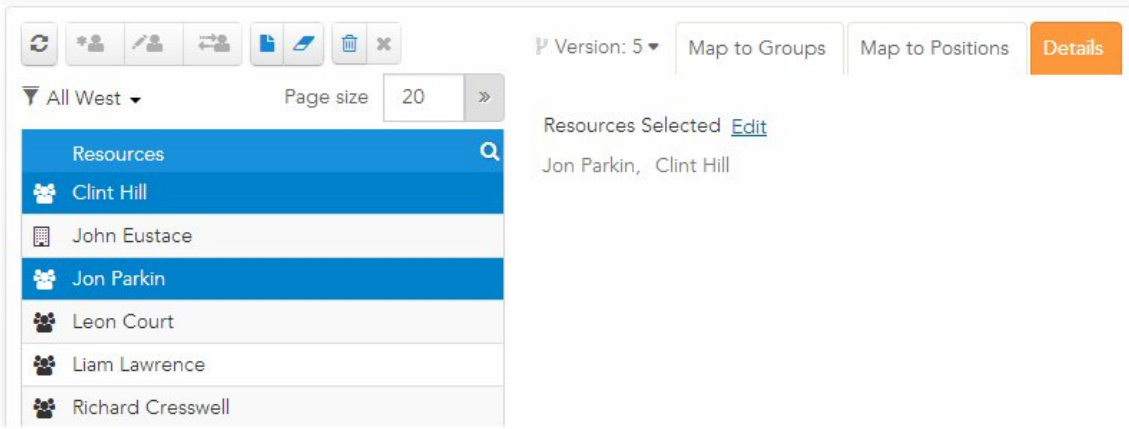
   Select only BPM resources (resources that have a  icon next to their name). No details are available for candidate resources.

3. Click the **Details** tab.

   If you have a single resource selected, the right pane displays the categories of information available for the resource. The red number shown on the right side of each category heading indicates the number of items in that category. Note that much of this information (all categories except for capabilities and resource attributes) is *only* available when you select a single resource in the resource list. You can click the category headings to show details for the single resource that is selected. The categories of information are:

   - **Capabilities** - These are the capabilities possessed by the selected resource. For more information, see Capabilities.
   - **Groups** - These are the groups to which the resource has been mapped. For more information, see Mapping Resources.
   - **Positions Held** - These are the positions to which the resource has been mapped. For more information, see Mapping Resources.
   - **Privileges** - These are the privileges that the resource has inherited. The name in parentheses is the name of the group or position the user was mapped to that caused the resource to inherit the privilege. For more information, see Privileges.
   - **Resource Attributes** - This is the list of available resource attributes, as well as the value of each one for the selected resource. For more information, see Viewing and Editing Resource Attributes.
   - **Push Destinations** - These are the push destinations that have been assigned to the selected resource. Push destinations specify the destination(s) to which work items sent to a resource are to be pushed. For more information, see Editing Resource Push Destinations.
   - **Location** - The location to which the resource is assigned. Locations are defined in the organization model. You can change the location to which a resource is assigned using the Rename/Move Resource function. For information, see Moving a Resource to a Different LDAP Container.

   If you have multiple resources selected, an **Edit** link appears, as follows:




Clicking the **Edit** link causes only two category headings to appear in the right pane -- **Capabilities** and **Resource Attributes**. These are the only categories that can be edited from the Organization Browser. For information about editing capabilities and resource attributes for the selected resources, see Viewing and Editing Resource Capabilities and Viewing and Editing Resource Attributes, respectively.

## Renaming a Resource

When users log into a BPM application, they must enter their *resource name*. Initially, each user's resource name is established as the value that is stored in an attribute in an LDAP source. The LDAP attribute is specified when you create an LDAP container.

After a resource is added to an LDAP container, you can specify a name different than the one stored in the LDAP source attribute. This can be done in the following ways:

- On the Create Selected Resources dialog. This dialog is displayed when you do one of the following:
  - create a resource using the **Create Resource in BPM** function; for information, see Creating Resources Using the Create BPM Resource Function.
  - map a *candidate* resource (that is, a resource who is not yet a BPM resource) to a group or position; for information, see Mapping Resources.
- Using the **Rename/Move Resource** function. Note, however, that this function can be used only with a BPM resource, that is, it cannot be a *candidate* resource. This function is described below.

Only one case variation of a resource name is allowed, across all LDAP containers. For example, if there is already a resource with the name "Clint Hill", you cannot create a resource with the name of "clint hill".

Use the following procedure to assign a new resource name to a resource using the **Rename/Move Resource** function.

### Procedure

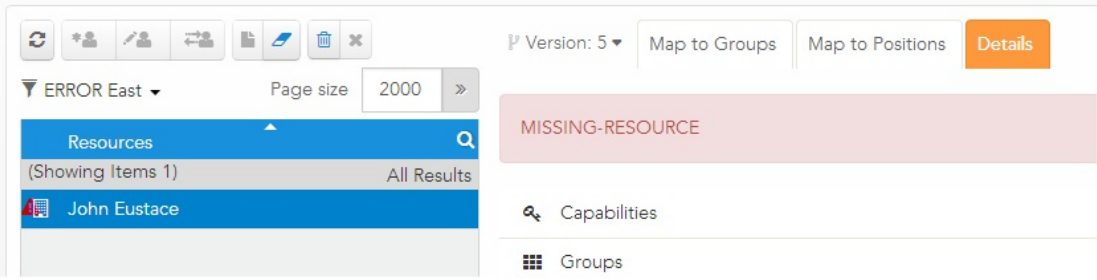
1. Select the LDAP container that contains the resource you want to rename, then click **Show Resources**.
2. From the resource list, select the desired resource, then click the **Rename/Move Resource** ( ) icon.
3. In the **Name** field on the Edit Selected Resources dialog, enter the new name for the resource.
4. Click **Save** to save the changes and close the dialog.

## Missing Resource

If an LDAP entry that was used to create a resource is deleted from, or changed in, the LDAP source, that resource is flagged as a "missing resource" in the Organization Browser.

Under these circumstances, the resource still exists as a BPM resource, but the resource can no longer log in and cannot be edited in the Organizational Browser (although it can be deleted).

Missing resources are shown in the resource list as shown below. Also note that if you select the resource, then click **Details**, "MISSING - RESOURCE" is shown in the details pane:




## Deleting Resources

BPM Resources can also be deleted. After deleting a resource, it becomes a candidate resource again; that resource can no longer log into the BPM application.

Note that deleting a resource using the Organization Browser does not remove the resource from the LDAP source, nor from the container; it becomes a candidate resource and deletes any mapping that may have been done for that resource, preventing that user from being able to log into the BPM application.

More than one resource can be deleted at one time.

If the resource you are going to delete is the *security subject* for one or more active process instances (that is, the resource started the active process instances), the security subject should be replaced using the replaceUser API before deleting the resource. For information about replaceUser, see the *TIBCO ActiveMatrix® BPM Developer's Guide*.

### Procedure

1. From the Organization Browser, select the LDAP container containing the resource(s) you would like to delete, then click **View Resources**.
2. Select the desired resource(s), then click the **Delete Resource from BPM** button ( ).
3. From the Delete Selected Resources dialog, click **OK** to confirm the deletion.

   The icon to the left of the resource name changes to a icon, indicating that the resource is no longer a BPM resource.

### Result

The resource is removed from the database and the resource can no longer log in.

If you delete an LDAP container that contains BPM resources, the resources will be deleted at the same time. For information, see Deleting LDAP Containers.

## Managing Deleted Users

If a user is deleted from ActiveMatrix BPM, and the deleted user is the principle of an outstanding process instance, that process instance will eventually fail. This will occur because a process instance performs actions on behalf of the principle of the process instance. After a user is deleted, that user cannot perform any actions in ActiveMatrix BPM.

Therefore, if a user has been deleted, and that user has outstanding process instances, you must reassign those process instances to another user.

Using the Organization Browser, you can:

- View a list of deleted users - see Viewing Deleted Users.
- View details about a deleted user - see Viewing Details of Deleted Users.
- Reassign process instances that are assigned to a deleted user - see Reassigning Process Instances that are Assigned to a Deleted Resource.
- Purge deleted users - see Purging Deleted Users

To perform any of the functions listed above (with the exception of purge deleted users), you must have system action, **`resourceAdmin`**.

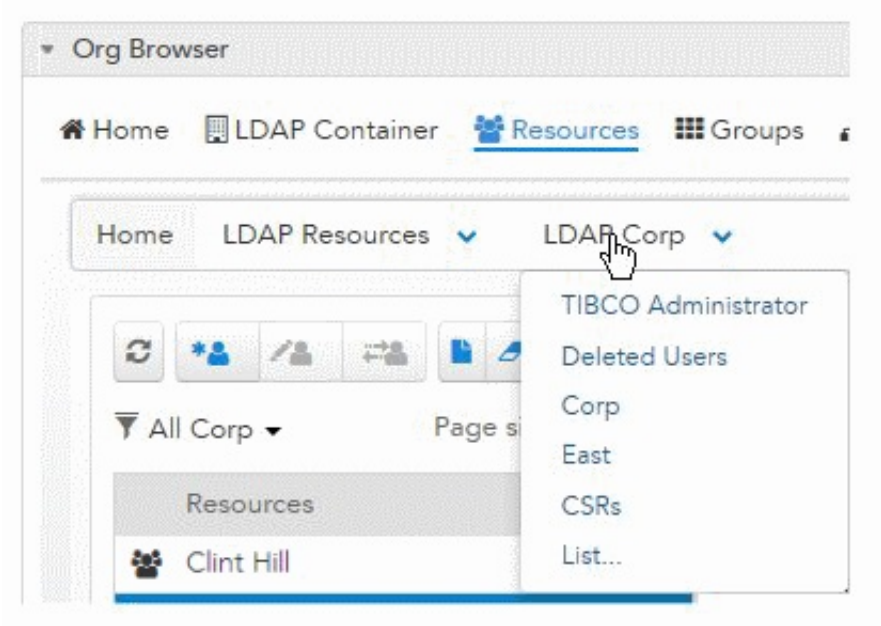
To purge deleted users, you must have system action, **`deleteResourceAdmin`**.

### Viewing Deleted Users

Using the Organization Browser, you can view a list of resources that have been deleted from ActiveMatrix BPM.

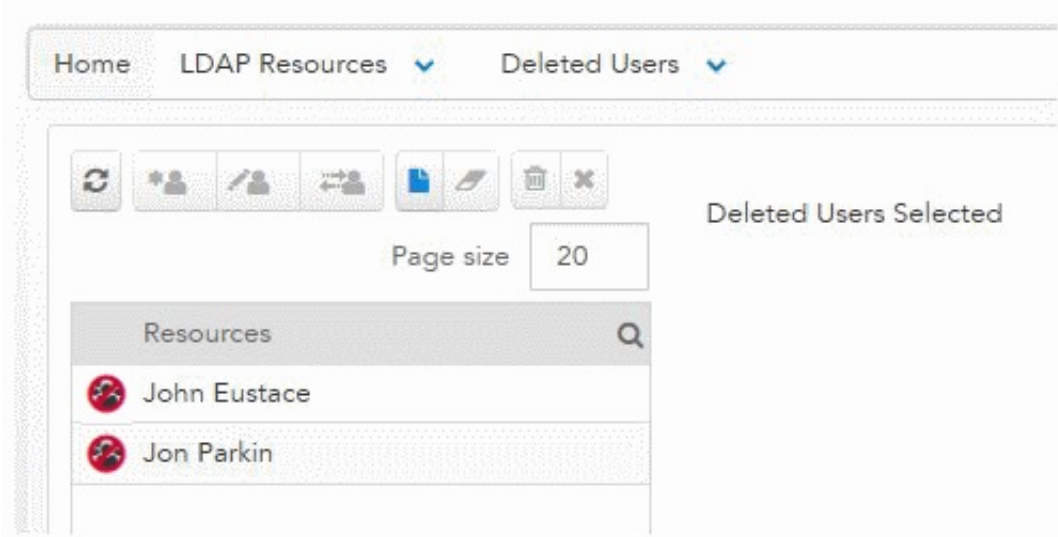
#### Procedure

1. From the Organization Browser, select **Resources**.
2. Select the button to the right of **Home** and **LDAP Resources** buttons:

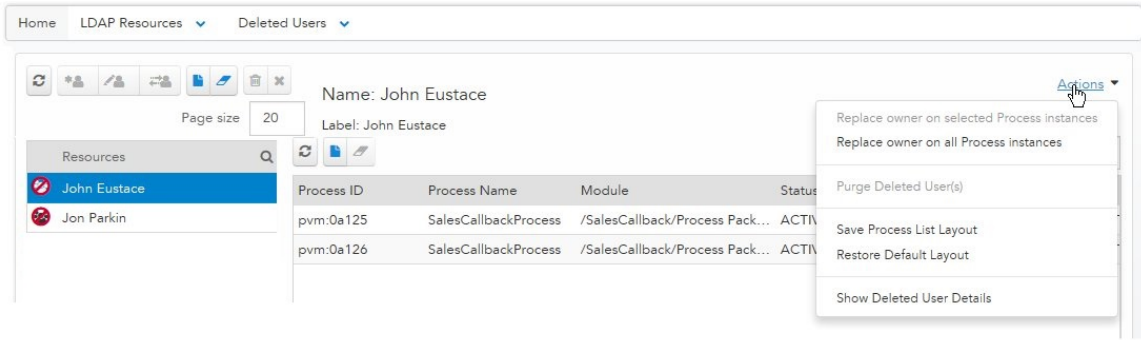



Note that the button to the right of the **Home** and **LDAP Resources** buttons depends on what, if anything, you have previously viewed in the Organization Browser. In this example, the "Corp" LDAP container had been viewed previously. If you have not viewed anything yet, the button is **TIBCO Administrator**.

3. From the drop-down list, select **Deleted Users**.
   A list of deleted users displays. For example:




Notice that the only icon above the list of deleted users that is enabled is the **Select All** icon (and the **Clear All** icon if one or more users are selected). All actions on deleted users are performed using the **Actions** link on the right side of the pane. For example, if John Eustace is selected from the list of deleted users, various actions are available from the **Actions** menu:




The functions on the **Actions** menu are described in subsequent topics.

### What to do next

From the list of deleted users, you can:

- View details about a single deleted resource - see Viewing Details of Deleted Users.
- Reassign outstanding process instances for which a deleted user is the principle - see Reassigning Process Instances that are Assigned to Deleted Users.
- Purge deleted users from the list - see Purging Deleted Users.

## Viewing Details of Deleted Users

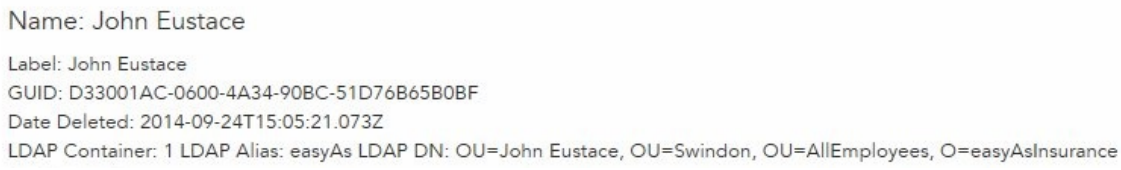
You can view information about deleted users, such as their GUID, the date they were deleted, and so on.

Deleted users can be *purged* from the system as well; once purged, their details are no longer available using this procedure -- see Purging Deleted Users.

### Procedure

1. Display the list of deleted users as described in Viewing Deleted Users.
2. From the list of deleted users, select a single user.
3. Click the **Actions** link, then select **Show Deleted User Details**.

   Details of the deleted user is shown in the right pane. For example:




   This contains the following information:

| Name | Description |
|---|---|
| GUID | The unique identifier of the user. |
| DateDeleted | The date and time the user was deleted, in the format: YYYY-MM-DD hh:mm:ss.nnn. |
| LDAPContainer | The LDAP container ID of the LDAP container that the user was associated with (if the user was associated with an LDAP container). |
| LDAP Alias | The LDAP Alias of the LDAP Container that the user was associated with (if the user was associated with an LDAP container). |
| LDAP DN | The DN (Distinguished Name) for the user, which uniquely identifies the user in the LDAP source. |

## Reassigning Process Instances that are Assigned to Deleted Users

You can reassign process instances that are currently assigned to a user that has been deleted from ActiveMatrix BPM.

When you reassign a process instance in this way, it is assigned to you, making you the principle of the outstanding process instance.

### Procedure

1. Display the list of deleted users as described in Viewing Deleted Users.
2. From the list of deleted users, select one or more users.

   If you select a single user, the right pane shows a list of the outstanding process instances for which the deleted user is the principle. If you select multiple deleted users, the right pane does *not* list any process instances.

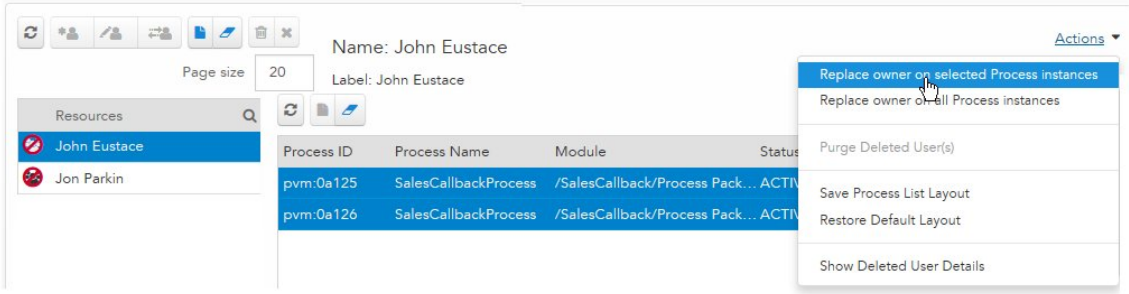
   To reassign specific process instances:

   a) Select a single deleted user.
   b) In the list of process instances in the right pane, choose the process instances you want to assign to yourself.

You can use the **Select All** and **Clear Selections** buttons above the list of process instances. You can also manually move the columns in the list to different locations, if desired. If you customize the list in this way, you can use the **Save Process List Layout** and **Restore Default Layout** selections on the **Actions** menu to save / restore the list layout. (Note that a saved process list layout is not written to the database. Therefore, if you save the layout, it is only persisted on the local machine from which you saved it. If you move to another machine, that layout is not saved there.)

There is also a search icon --  -- on the upper-right part of the list that displays search fields to locate process instances in long lists.

c) Click the **Actions** link, then select **Replace owner on selected process instances**.
For example:




To reassign all outstanding process instances for one or more deleted users:

a) Select one or more deleted users.

b) Click the **Actions** link, then select **Replace owner on all process instances**.

## Purging Deleted Users

After users are deleted from ActiveMatrix BPM, you can also *purge* them from the deleted users list. This provides a method of managing the size of the Deleted Users list so that it doesn't become too large over time.
Once the owner has been replaced on all process instances associated with a given deleted user, there is no need to retain that user in this list as there are no further actions that can be performed here on that deleted user. After being purged, the user is still a *candidate resource*, and can be created again (assuming the user is still in the LDAP source).

Therefore, this function is only for the purpose of managing the size of the deleted users list.

To purge deleted users, you must have system action, **`deleteResourceAdmin`**.

### Prerequisites

If you are purging a single deleted user, all outstanding process instances for which the deleted user is a principle must be reassigned (see Reassigning Process Instances that are Assigned to Deleted Users) before you can purge the deleted user.

If you select multiple deleted users, and one or more of those users have outstanding process instances, you *can* continue with the purge operation. This can result in failed process instances, so purge multiple deleted users with caution.

### Procedure

1. Display the list of deleted users as described in Viewing Deleted Users.
2. Select one or more deleted users.

3. Click the **Actions** link, then select **Purge Deleted User(s)**.
   If multiple deleted users are selected, a warning about possibly purging users with outstanding process instances, as described above, is displayed.

### Result

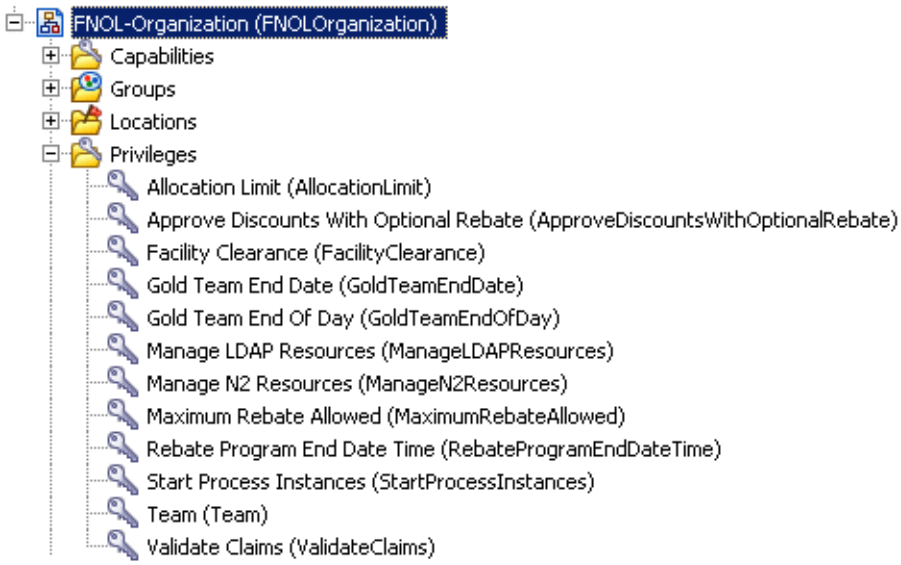
After being purged, the user is immediately removed from the list of deleted users.

# Privileges

Privileges represent authorities. They are used by the BPM application to determine which functions the user can access in the application. Users obtain privileges by being mapped to groups and/or positions to which privileges have been assigned.

The BPM application uses privileges in conjunction with *system actions* to determine access to functions in the application. For more information, see the *TIBCO ActiveMatrix® BPM Concepts* guide.

Privileges are defined in the organization model using the TIBCO Business Studio Organization Modeler. The following is an example from TIBCO Business Studio of some privileges that have been created in an organization model:




Privileges that have been defined in the organization model can be assigned to the following:

- **Groups, organization units, and positions** - Privileges can be assigned to these entities when they are created in the TIBCO Business Studio Organization Modeler.

  Resources that are mapped to these entities inherit the privileges of those entities, as follows:

  - **Groups** - Members of groups inherit the privileges of the group, as well as the privileges of *all* parent groups.
  - **Positions / organization units** - Members of a position inherit the privileges of the position, as well as the organization unit that is the immediate parent of the position. If organization units are nested, members of the position do *not* inherit privileges from organization units further up the tree — only the immediate parent.

    For information about viewing the privileges assigned to groups, organization units, and positions, see Browsing Groups and Browsing Organization Units and Positions.

- **Resources** - Resources cannot be given privileges directly. They obtain them only by virtue of being a member of a group or position.

  For information about viewing the privileges a resource has inherited by being mapped to groups or positions, see Viewing a Resource's Privileges.

# Viewing a Resource's Privileges

A resource is granted privileges by being mapped to groups or positions that have been assigned the privileges in TIBCO Business Studio.

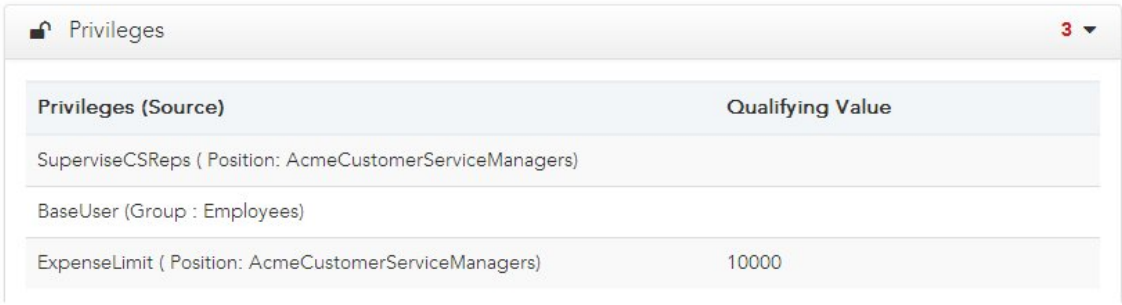
### Procedure

1. Display the Details page for a single resource.

   For information about displaying the Details page, see Viewing Resource Details.
2. In the right pane, click the **Privileges** header.

   Note that the red number shown to the right of the header indicates the number of privileges currently held by the resource.

   The privileges held by the resource are displayed. For example:



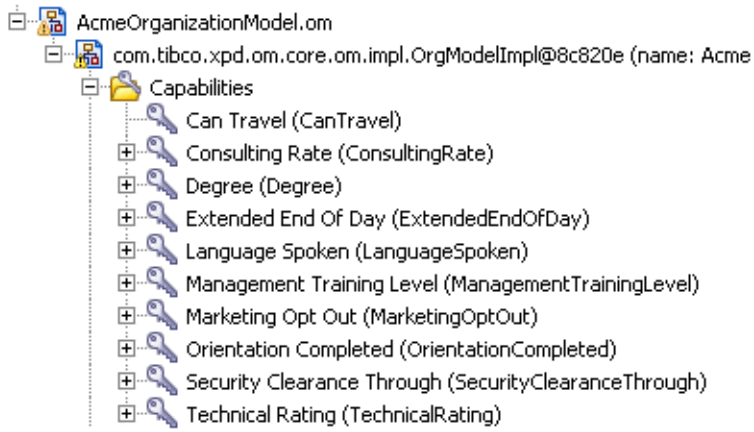

   The source of the privilege (this is, the group or position to which the resource was mapped to gain the privilege) is shown in parentheses after each privilege name.

   If a qualifier was defined for the privilege, it is shown in the **Qualifying Value** column. This value can be used by a process to make a business decision.
3. Click the **Privileges** header again to collapse the list of privileges.

# Capabilities

Capabilities represent skills needed to perform a task, for instance, being bilingual. They can also be further qualified, for instance, by specifying a specific language needed.

Capabilities are defined in the organization model using the TIBCO Business Studio Organization Modeler. The following is an example of some capabilities that have been created in an organization model:




After capabilities are defined in the organization model, they can be assigned to the following:

- **Groups and positions** - Capabilities are assigned to groups and positions using the TIBCO Business Studio Organization Modeler. The purpose of this is to state that resources assigned to that group or position *should* have that capability.

  For example, assume you have a position to which the "LanguageSpoken" capability with a qualifier of "German" has been assigned. When someone is mapping resources using the Organization Browser, they should map only resources that also have the "LanguageSpoken/German" capability, to that position.

  Note, however, that this is *not* an enforced requirement — the Organization Browser will allow you to assign a resource that does not have the required capability to a group or position that has been assigned that capability.

  For information about the capabilities assigned to groups and position (this is, the capabilities that resource should have to be mapped to those groups and positions), see Browsing Groups and Browsing Organization Units and Positions.

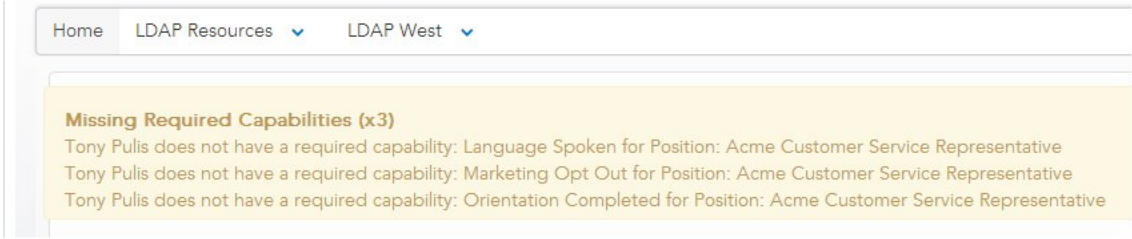
- **Resources** - Capabilities are assigned to individual resources using the Organization Browser. The purpose of this is to state that the resource has that capability, for example, to speak a specific language.

  As stated above, when resources are assigned to groups and positions that require capabilities, the assigner should ensure that only resources that have the required capabilities be assigned to those groups and positions.

  Note that resources do *not* inherit capabilities based on their membership in groups and positions; capabilities must be assigned directly to resources using the Organization Browser.

  For more information, see Viewing and Editing Resource Capabilities.

If you attempt to map a resource to a group or position that has capabilities assigned to it, and the resource does not have the capabilities, a warning message is displayed in the Organization Browser. For example:




# Viewing and Editing Resource Capabilities

The way in which you view and edit capabilities differs depending on whether you are viewing/editing for a single resource or multiple resources.

## Viewing and Editing Resource Capabilities for a Single Resource

This procedure shows how to view or edit capabilities for a single resource.

### Procedure

1. Display the list of resources that contains the resource whose capabilities you want to view or edit.

   You can do this by either displaying the resources in an LDAP container (see Viewing the Resources in a Container), or the resources already mapped to a position or group (see Viewing Resources Mapped to a Position or Group).

2. Select the desired resource.

   Select only a BPM resource (a resource that has a  icon next to the resource name); candidate resources cannot have capabilities assigned to them.

3. Click the **Details** tab in the right pane.
4. Click the **Capabilities** header.
   The capabilities held by the resource are displayed. Note that the number shown to the right of the header indicates the number of capabilities currently assigned to the resource.

   If a qualifier was defined for the capability, it is shown in the **Qualifying Value** column. This value can be used by a process to make a business decision.

5. To assign a capability to the resource, or to edit a capability already assigned to the resource, click the **Edit** link in the **Qualifying Value** column.
   All of the capabilities that are defined in the organization model are listed.
6. Assign the desired capabilities.

   The **Qualifying Value** column provides various methods of specifying a capability and possible qualifying value: check boxes, date and time pickers, lists from which you can select one or more values, and fields in which you enter a value.

   You can also un-assign a capability by clicking the X to the right of the desired capability. Note that this actually deletes the capability item from the display, but it reappears if you edit the resource's capabilities at a later time.

Both capabilities and resource attributes can be edited in a single session, that is, without saving in-between editing those two items. While you are editing capabilities and resource attributes, you can revert to the previous settings for each of those using the **Reset Capabilities** or **Reset Attributes** selections on the **Actions** menu. These allow you to reset one, but not the other. You can also use the **Actions > Reset All** selection to reset both capabilities and resource attributes to their previous settings.

7. After you have made the desired changes to the resource's capabilities, click **Save** (or also edit the resource's attributes, if desired, as described in the note above, then click **Save**).
8. Click the **Capabilities** header again to collapse the list of capabilities.

## Viewing and Editing Resource Capabilities for Multiple Resources

This procedure shows how to view or edit capabilities for multiple resources.

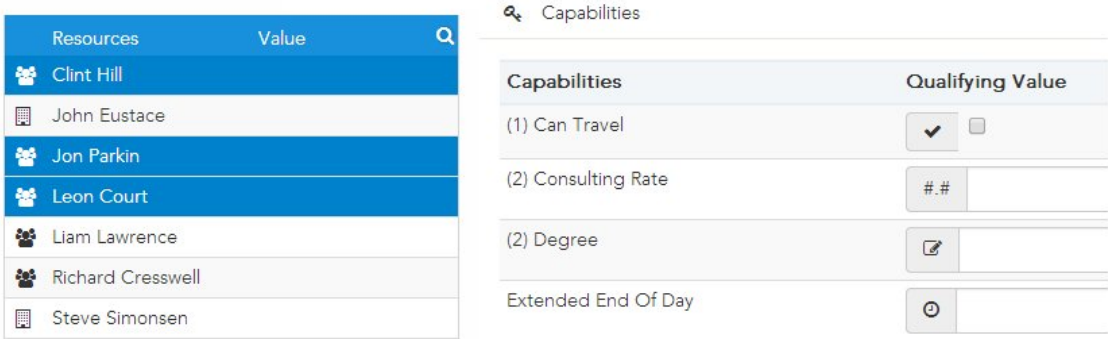
### Procedure

1. Display the list of resources that contains the resources whose details you want to view.

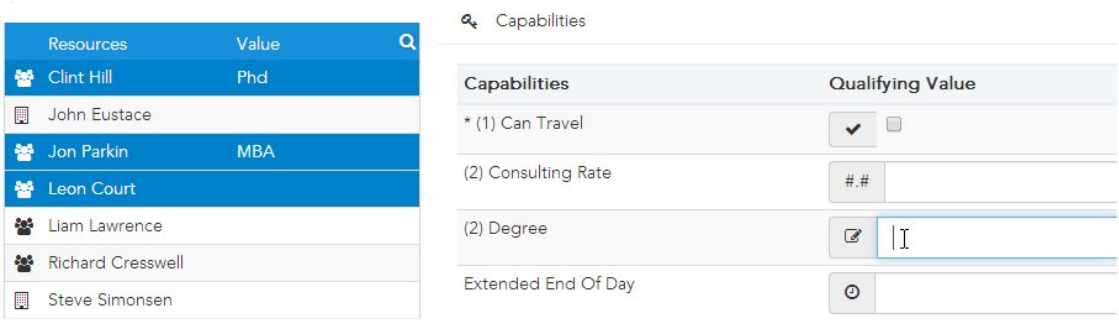
   You can do this by either displaying the resources in an LDAP container (see Viewing the Resources in a Container), or the resources already mapped to a position or group (see Viewing Resources Mapped to a Position or Group).
2. Select the desired resources.

   Select only BPM resources (resources that has a  icon next to their resource name); candidate resources cannot have capabilities assigned to them.
3. Click the **Details** tab in the right pane.
4. In the right pane, click the **Edit** link next to the "Resources Selected" message.
5. Click the **Capabilities** header.
   All of the capabilities that are defined in the organization model are listed.

   If a number in parentheses appears to the left of a capability name, it means that that number of the selected resources have that capability. In the following example, one of the selected resources has the "Can Travel" capability, two of the selected resources have a "Consulting Rate" capability defined, and so:




6. To determine which of the selected resources have a capability defined, click in the **Qualifying Value** field for the capability.
   The capability value for each resource is shown in the **Value** column in the resource list. For example, clicking in the **Degree** field shows that Clint Hill has that capability with a value of "Phd" and Jon Parkin has that capability with a value of "MBA":




7. To assign a capability to the selected resources, or to edit a capability already assigned to the resources, use the check boxes or fields in the **Qualifying Value** column.

   The **Qualifying Value** column provides various methods of specifying a capability and possible qualifying value: check boxes, date and time pickers, lists from which you can select one or more values, and fields in which you enter a value.

   You can also un-assign a capability by clicking the X to the right of the desired capability. Note that this actually removes the capability from the display, but it reappears if you edit the resource's capabilities at a later time.

   Be aware that assigning or editing capabilities when multiple resources are selected assigns or edits the capability for *all* selected resources.

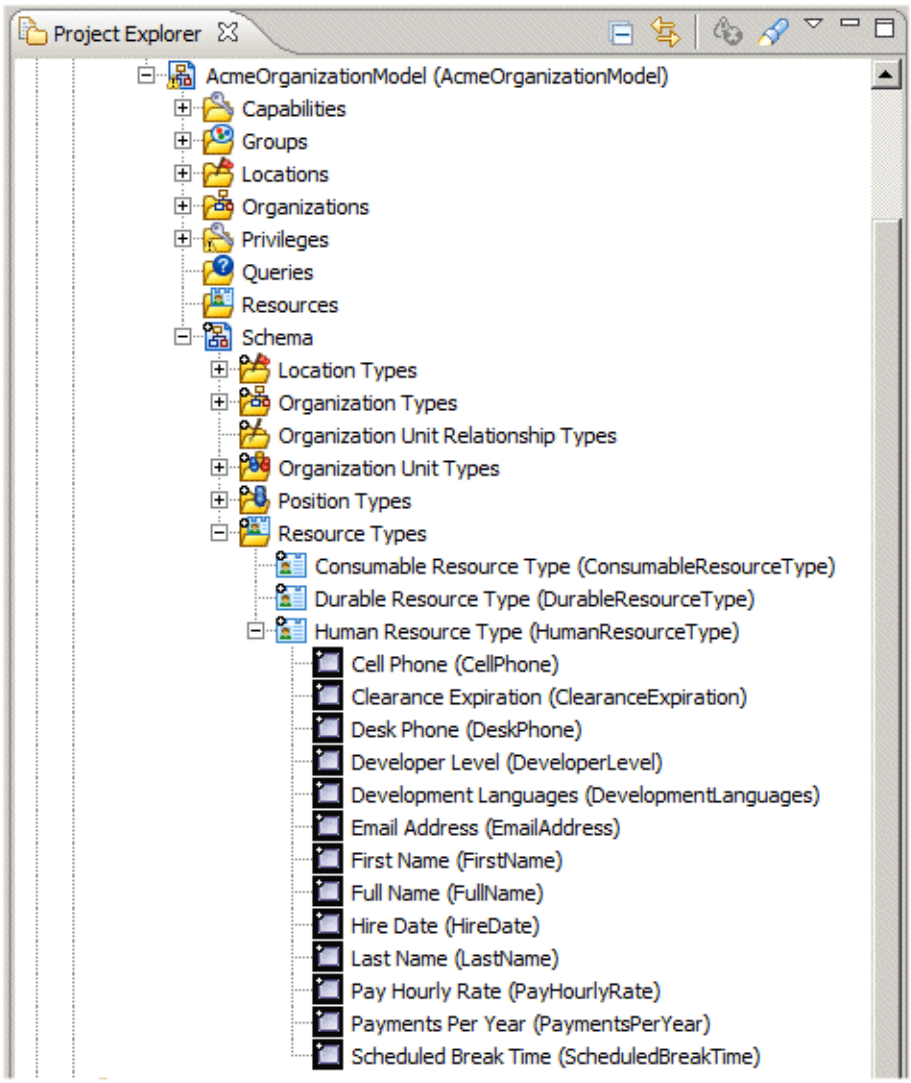
   Both capabilities and resource attributes can be edited in a single session, that is, without saving in-between editing those two items. While you are editing capabilities and resource attributes, you can revert to the previous settings for each of those using the **Reset Capabilities** or **Reset Attributes** selections on the **Actions** menu. These allow you to reset one, but not the other. You can also use the **Actions > Reset All** selection to reset both capabilities and resource attributes to their previous settings.

8. After you have made the desired changes to the resource's capabilities, click **Save** (or also edit the resource's attributes, if desired, as described in the note above, then click **Save**).
9. Click the **Capabilities** header again to collapse the list of capabilities.

# Resource Attributes

When an organization model is created using the TIBCO Business Studio Organization Modeler, *resource attributes* can also be created. Resource attributes are used to store information about resources. For example, there may be an "EmailAddress" attribute defined, in which each resource's email address is stored. These attributes can contain data that the business process may access during runtime.

The following shows an example of some resource attributes that were created in TIBCO Business Studio:




These attributes are available for each BPM resource. For example, each resource's cell phone number can be stored in the CellPhone attribute. You can use the Organization Browser to assign values to a resource's resource attributes -- see Viewing and Editing Resource Attributes.

You may also need to *map* one or more of these resource attributes to attributes in the LDAP sources you have defined in your LDAP container. You may need to do this because the business process does not have direct access to the attributes in the LDAP sources, but it does have access to the resource attributes in the organization model. When you map a resource attribute to an LDAP attribute, it gives the business process access to the data in the LDAP attribute at runtime. For information about mapping resource attributes to LDAP attributes, see Mapping Resource Attributes.

For information about creating attributes for the “Human Resource Type”, see the *TIBCO Business Studio Organization Modeler User's Guide*.

# Viewing and Editing Resource Attributes

The way in which you view and edit resource attributes differs depending on whether you are viewing/editing for a single resource or multiple resources.

## Viewing and Editing Resource Attributes for a Single Resource

This procedure shows how to view or edit resource attributes for a single resource.

### Procedure

1. Display the list of resources that contains the resource whose resource attributes you want to view or edit.

   You can do this by either displaying the resources in an LDAP container (see Viewing the Resources in a Container), or the resources already mapped to a position or group (see Viewing Resources Mapped to a Position or Group).

2. Select the desired resource.

   Select only a BPM resource (a resource that has a  icon next to the resource name).

3. In the right pane, click the **Resource Attributes** header.

   Note that the number shown to the right of the header indicates the number of resource attributes available for the resource.

   The header expands to show you all of the resource attributes that are defined in the organization model, as well as any values that have been assigned to the attributes for the selected resource.

4. To assign values to resource attributes, or to edit existing attribute values, click the **Edit** link in the **Attribute Value** column.

5. Assign values to the desired resource attributes.

   The **Attribute Value** column provides various methods of specifying values: check boxes, date and time pickers, lists from which you can select one or more values, and fields in which you enter a value.

   Note that if the resource attribute has been mapped to an LDAP attribute (see Mapping Resource Attributes), the value of the resource attribute cannot be changed or deleted using this procedure. The value is obtained from an attribute in the LDAP source. You can tell if a resource attribute is mapped to an LDAP attribute by "LDAP Attr" shown in parentheses to the right of the resource attribute name. The value obtained from the LDAP source is shown in the **Attribute Value** column. For example:

| Resource Attributes | Attribute Value |
|---|---|
| Phone (Cell) (LDAP Attr: telephonenumber) | 776-209-4489 |

   You can also delete an attribute value by clicking the X to the right of the desired attribute. Note that this actually removes the attribute item from the display, but it reappears if you edit the resource's attributes at a later time.

Both capabilities and resource attributes can be edited in a single session, that is, without saving in-between editing those two items. While you are editing capabilities and resource attributes, you can revert to the previous settings for each of those using the **Reset Capabilities** or **Reset Attributes** selections on the **Actions** menu. These allow you to reset one, but not the other. You can also use the **Actions > Reset All** selection to reset both capabilities and resource attributes to their previous settings.

6. After you have made the desired changes to the resource's attributes, click **Save** (or also edit the resource's capabilities, if desired, as described in the note above, then click **Save**).
7. Click the **Resource Attributes** header again to collapse the list of resource attributes.

## Viewing and Editing Resource Attributes for Multiple Resources

This procedure shows how to view or edit resource attributes for multiple resources.

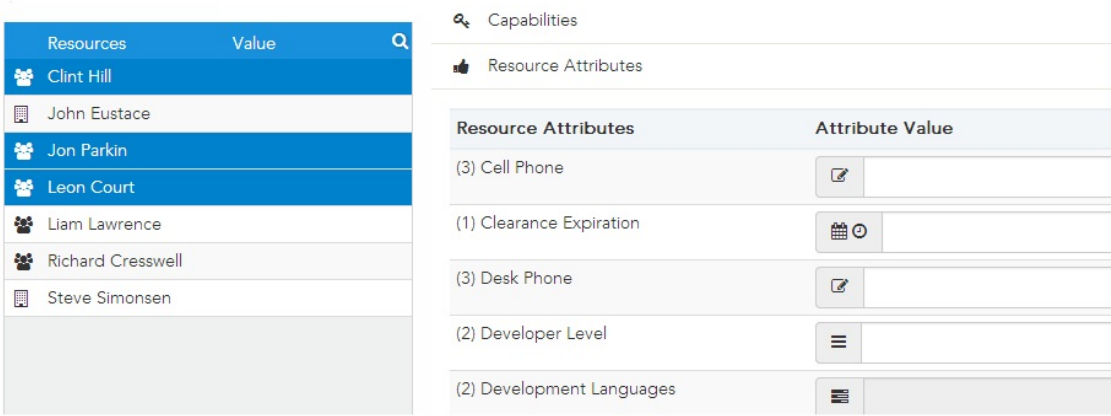
### Procedure

1. Display the list of resources that contains the resources whose resource attributes you want to view or edit.

   You can do this by either displaying the resources in an LDAP container (see Viewing the Resources in a Container), or the resources already mapped to a position or group (see Viewing Resources Mapped to a Position or Group).
2. Select the desired resources.

   Select only BPM resources (resources that have a  icon next to their resource name).
3. Click the **Details** tab in the right pane.
4. In the right pane, click the **Edit** link next to the "Resources Selected" message.
5. Click the **Resource Attributes** header.
   All of the resource attributes that are defined in the organization model are listed.

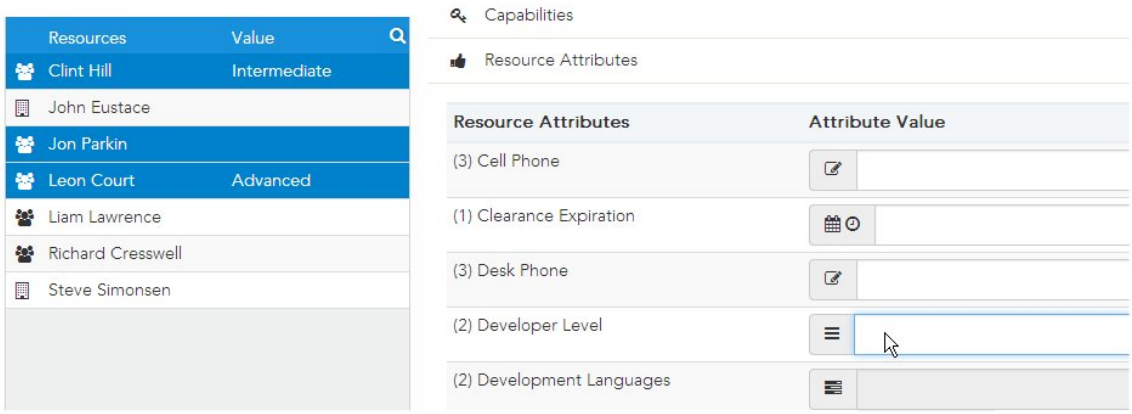
   If a number in parentheses appears to the left of a resource attribute name, it means that that number of the selected resources have a value assigned to that resource attribute. In the following example, all three of the selected resources have a value assigned to the "Cell Phone" resource attribute, one of the selected resources has a value assigned to the "Clearance Expiration" resource attribute, and so:




   Also note that if the resource attribute has been mapped to an LDAP attribute (see Mapping Resource Attributes), the value of the resource attribute cannot be changed or deleted using this procedure. The value is obtained from an attribute in the LDAP source. You can tell if a resource attribute is mapped to an LDAP attribute by "LDAP Attr" shown in parentheses to the right of the resource attribute name. For example:


The values mapped from the LDAP attribute to the resource attribute are not shown when multiple resources are selected.

6. To determine which of the selected resources have a value assigned to a particular resource attribute, click in the **Attribute Value** field for the resource attribute.
The resource attribute value for each resource is shown in the **Value** column in the resource list. For example, clicking in the **Developer Level** field shows that Clint Hill has "Intermediate" assigned to that resource attribute, and Leon Court has "Advanced" assigned to that resource attribute:




7. To assign a value to a resource attribute for the selected resources, or to edit a value already assigned to the resources, use the check boxes or fields in the **Attribute Value** column.

   The **Attribute Value** column provides various methods of specifying resource attribute values: check boxes, date and time pickers, lists from which you can select one or more values, and fields in which you enter a value.

   You can also un-assign a resource attribute value by clicking the X to the right of the desired resource attribute. Note that this actually removes the resource attribute from the display, but it reappears if you edit the resource's resource attributes at a later time.

   Be aware that assigning or editing resource attribute values when multiple resources are selected assigns the value to *all* selected resources.

   Both capabilities and resource attributes can be edited in a single session, that is, without saving in-between editing those two items. While you are editing capabilities and resource attributes, you can revert to the previous settings for each of those using the **Reset Capabilities** or **Reset Attributes** selections on the **Actions** menu. These allow you to reset one, but not the other. You can also use the **Actions > Reset All** selection to reset both capabilities and resource attributes to their previous settings.

8. After you have made the desired changes to the resource's resource attributes, click **Save** (or also edit the resource's capabilities, if desired, as described in the note above, then click **Save**).
9. Click the **Resource Attributes** header again to collapse the list of resource attributes.

# Push Destinations

"Pushed" distribution of work items is supported. In a pushed distribution model, when a work item is generated, it is sent to a user as an email. The email contains the URL of the work item, which the user can click to open and process the work item.

Generally, work items are "pulled" when a user logs into the BPM application and accesses their work list — this "pulls", from the TIBCO server, the work items that were sent to that user.

Users do not need to login to the BPM application to access a pushed work item, though they are required to authenticate themselves before they can open the work item.

A pushed distribution is useful for occasional users — for example, managers who only need to become involved in a process when some form of higher level approval is required. These users will typically not be logged into the BPM application all the time and so could otherwise miss the arrival of high-priority work items.

If you use the presentation channel settings (push destinations) to deliver notification of work items via email, on the Work Resource tab for the user task, you must set the Distribution Strategy to **Allocate to One** rather than **Offer to All**. For example, if you have a performer field set to: `resource(name='tibco-admin')`, `tibco-admin` will receive an email notification of a work item **only** if the Distribution Strategy is **Allocate to One**.

Push destinations can be specified for:

- **Organizational entities** - These specify the destination(s) to which work items sent to the organizational entity are to be pushed. You can specify one or more push destinations for each organizational entity. For information, see Editing Organizational Entity Push Destinations.
- **Resources** - These specify the destination(s) to which work items that are sent *directly* to the resource are to be pushed. You can specify one or more push destinations for each resource. For information, see Editing Resource Push Destinations.

## Editing Organizational Entity Push Destinations

Work items can be *pushed* to an organizational entity, rather than be *pulled* from a work item list. The organizational entity push destination defines how, and to where, the work items are pushed.

### Procedure

1. From the Organization Browser, click one of the following:
   - **Groups** button to edit a push destination for a group.
   - **Organizations** button to edit a push destination for an organization unit or position.
2. From either the groups or organizations list, select the desired group, organization unit, or position, then click **Push Destinations**.
   A dialog is displayed that lists any existing push destinations that are defined for the selected organizational entity.
3. To define a new push destination for the organizational entity, click **Add a Push Destination**.

   Note that you can also remove an existing push destination by clicking the  button to the right of the push destination you want to remove.
4. On the Push Destinations for Org Entity dialog, enter the following information:

| Field | Description |
|---|---|
| **Active** | Check the box to make the push destination active. This provides a means of disabling the push destination without removing it. |
| **Name** | A descriptive name for the push destination. |
| **Channel Type** | The type of channel that will be used to push work items to the organizational entity. Currently, the only available channel type is "Email Channel", which causes the work items to be pushed to an email address. |
| **Channel ID** | Uniquely identifies the presentation channel to use when pushing work items to the organizational entity. The channel ID is defined when a presentation channel is defined in TIBCO Business Studio. For more information, see the TIBCO Business Studio documentation. |
| **Targets** | The email address to which the work items are to be pushed. |

5. Click **Save** to save the push destination definition.

## Editing Resource Push Destinations

Work items can be *pushed* to a resource, rather than be *pulled* from a work item list. The resource push destination defines how, and to where, the work items are pushed.

### Procedure

1. From the Organization Browser, display a list of resources.
   For information about how to display a resource list, see Resource Lists.
2. Select a resource whose push destinations you want to edit.
   You can edit the push destination for only a single resource at a time.
3. From the toolbar above the resource list, click the **Manage Push Destinations** (  ) button.
   A dialog is displayed that lists any existing push destinations that are defined for the selected resource.
4. To define a new push destination for the resource, click **Add a Push Destination**.

   Note that you can also remove an existing push destination by clicking the  button to the right of the push destination you want to remove.
5. On the Push Destinations for <*Org Entity*> dialog, enter the following information:

| Field | Description |
|---|---|
| **Active** | Check the box to make the push destination active. This provides a means of disabling the push destination without removing it. |
| **Name** | A descriptive name for the push destination. |
| **Channel Type** | The type of channel that will be used to push work items to the resource. Currently, the only available channel type is "Email Channel", which causes the work items to be pushed to an email address. |
| **Channel ID** | Uniquely identifies the presentation channel to use when pushing work items to the organizational entity. The channel ID is defined when a presentation channel is defined in TIBCO Business Studio. For more information, see the TIBCO Business Studio documentation. |

| Field | Description |
|---|---|
| **Target Source** | Using the drop-down list in this field, you can select a resource attribute that contains the email address. You can either use this field, or the **Targets** field (see below) to specify the email address. If you specify a source for the email address in the **Target Source** field, the **Targets** field is disabled.<br><br>Note that if the email address is ultimately coming from an LDAP attribute, you must map the LDAP attribute to a resource attribute — for information, see Mapping Resource Attributes. |
| **Targets** | The email address to which the work items are to be pushed. You can either use this field, or the **Target Source** field (see above) to specify the email address. To specify an email address in the **Targets** field, you must choose ("enter a target value)" from the **Target Source** field drop-down list. |

6. Click **Save** to save the push destination definition.

# Dynamic Organization Model Extension Points

An organization model extension point is an organization unit that references an organization model template.

The extension point configuration is used to dynamically generate instances of the organization model template directly below it.

The designation of the extension point is a design-time function; it consists only of the assignment of the organization model template. The remaining extension point configuration — that is, the LDAP connection information — is not known, nor can it be interrogated, at design-time, and is therefore performed after deployment using the Organization Browser (it can also be done using the API).

Note that any extension point that is not fully configured is ignored, and does not result in the creation of organization model template instances.

After an extension point is configured, instances of the organization model template are generated using the following properties in the `DE.Properties` file:

- `ExtensionPointProcessEnable` - Enables (true) or disables (false) the generation of instances of dynamic organization models each day at the time specified in the `ExtensionPointProcessStart` property.
- `ExtensionPointProcessStart` - Specifies the time each day to generate instances of dynamic organization models as long as `ExtensionPointProcessEnable` is set to true.
- `ExtensionPointProcessInterval` - The delay between the start of one extension point processing event and the next. This value should be great enough to ensure that two events do not overlap. The value is expressed as an XML Schema Duration string.
- `ExtensionPointDeleteEnabled` - Enables (true) or disables (false) the removal of previously generated instances of dynamic organization models if the LDAP entry/attribute from which they were derived has been removed from the LDAP source.

For more information about properties in `DE.Properties`, see the *TIBCO ActiveMatrix BPM Administration* guide.

For more information about dynamic organizations, see the *TIBCO Business Studio Modeling* guide.

## Configuring Dynamic Organization Model Extension Points

An extension point configuration is used to dynamically generate instances of the organization model template directly below it.

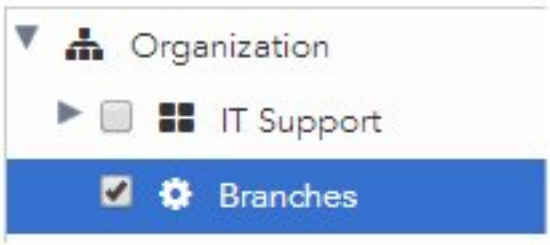
### Prerequisites

There must be an organization unit designated with an extension point, as well as an organization model template defined, in the deployed organization model.

### Procedure

1. From the Organization Browser, click the **Organizations** button, then expand the hierarchy and select the organization unit for which you want to configure an extension point.

   The organization unit must have been designated for an extension point when it was defined in TIBCO Business Studio. You can determine organization units that have been designated for an extension point by the  icon next to the organization unit name. For example:




2. Click the **Configure Extension Point** link.

   - If an extension point has been configured for the organization unit, its configuration is displayed on the Dynamic Organization Configuration dialog. You can edit the configuration using the information in Step 3.
   - If an extension point does not exist for the organization unit, click **Configure Extension Point** button on the Dynamic Organization Configuration dialog, then use the information in Step 3 to configure the extension point.

3. Configure the extension point using the fields on the Dynamic Organization Configuration dialog, as follows:

| Field | Description |
|---|---|
| **Ldap Connection** | The alias for the LDAP connection that contains the instance name attribute (see below) whose values is used to instantiate the organization model template. |
| **Base DN** | The LDAP branch to which the LDAP query (see below) will be restricted. This is optional and is relative to any Base-DN already specified on the LDAP connection. |
| **LDAP Query** | This expression will locate entries that identify the new dynamic organization model instances. |
| **Search Scope** | Determines the depth to which the search will be performed, as follows:<br>• One Level - Only the elements directly within the Base-DN level are searched.<br>• Sub Tree - Elements directly within, and below, the Base-DN level are searched. |
| **Instance Name Attribute** | For every LDAP entry that is found in the query result set, the query looks up this attribute. For every value in this attribute, an instance of the dynamic organization model is created. And each value in this attribute is used as the name of the root organization unit of the newly created dynamic organization model instance. |
| **Dynamic Organization Identifier(s)** | These are attributes that are defined in the dynamic organization model. They are used to uniquely identify a generated instance of a dynamic organization at runtime. When a participant is assigned to a user task, the runtime needs to be able to identify the correct instance of the dynamic organization. These identifiers are used for that purpose.<br>These attributes must be mapped to LDAP attributes that contain values used to identify a particular instance of the dynamic organization at runtime. This allows the process to access the identifying value (as processes cannot directly access LDAP attributes). |

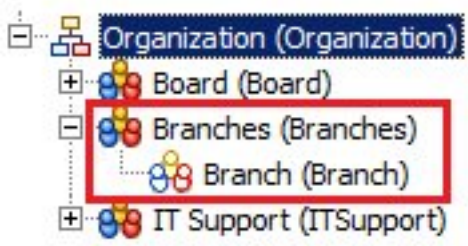
| Field | Description |
| --- | --- |
| | For each identifier listed, select an LDAP attribute that contains the values needed by the process to identify the dynamic organization model instance.<br>For more information and to see examples of dynamic organization identifiers, see the "Dynamic Organization Identifier Mapping" topic in the *TIBCO Business Studio Modeling User's Guide.* |

4. Click **Save** to save the edited or new extension point configuration.

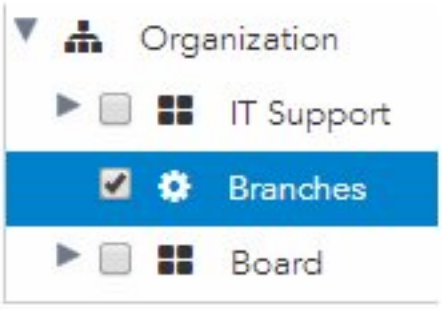
### Extension Point Configuration and Model Template Instance Generation Example

Assumptions:

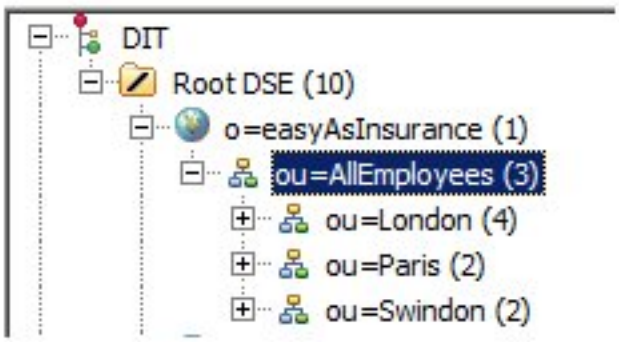
- There is a dynamic organization model that was previously defined in TIBCO Business Studio, with an extension point entitled "Branches":




- The organization model has been deployed, so it appears in the Organization Browser as follows:

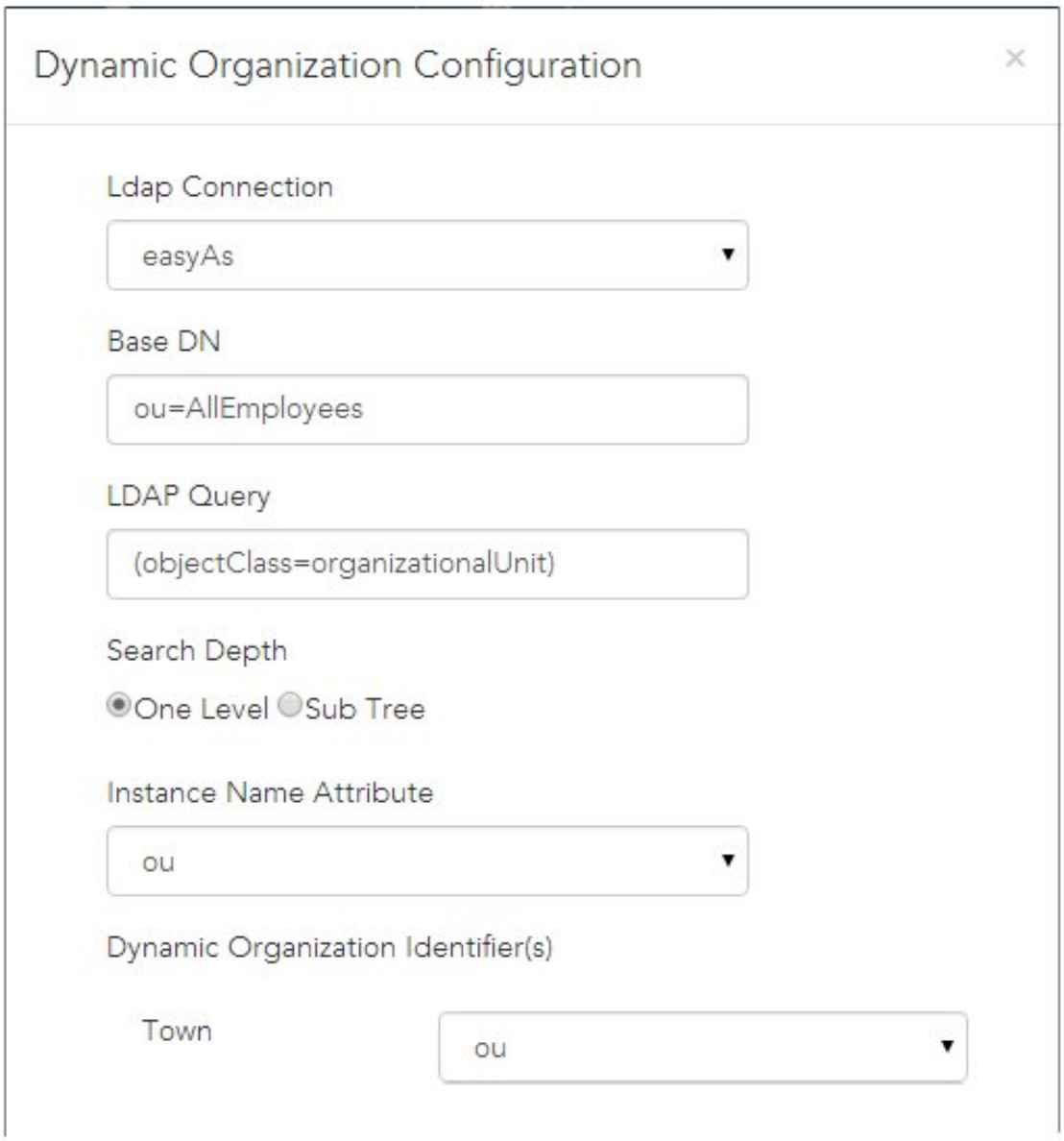



- Your LDAP source looks like this:

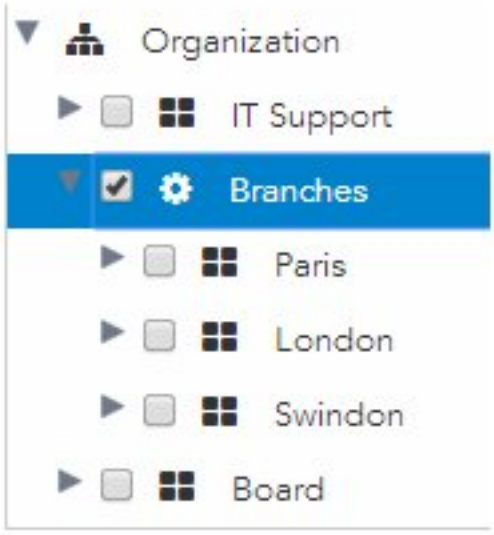



- You want a branch dynamically generated for each of the organization units under ou=AllEmployees in the LDAP source.
- Your business process contains a dynamic organization identifier called "Town" that is mapped to the "ou" attribute, which allows work items to be routed to users in the appropriate dynamically generated branch.

To configure an extension point for Branches, follow the procedure above and fill in the fields of the Dynamic Organization Configuration dialog as follows:




After instances of the dynamic organization model are generated by the properties in the `DE.Properties` file, the organization model appears as follows in the Organization Browser:

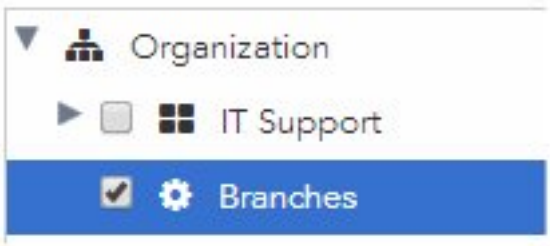



## Viewing a Dynamic Organization Model Template

You can see the structure of dynamic organization model templates from the Organization Browser.

### Procedure

1. From the Organization Browser, click the **Organizations** button, then expand the hierarchy and select the organization unit for which you want to view the dynamic organization model template. The organization unit must have been designated for an extension point when it was defined in TIBCO Business Studio. You can determine organization units that have been designated for an extension point by the icon next to the organization unit name. For example:




2. Click the **View Template** link.
3. On the Dynamic Org Template dialog, expand the hierarchy to view the organization structure.

   You can also define a candidate query from this dialog, using the **Edit Candidate Query** button, to populate positions of the dynamically generated organization model. For information, see Populating Dynamic Organization Models.
4. Click **Close** to close the Dynamic Org Template dialog.

## Populating Dynamic Organization Models

Organization models that are generated dynamically, can also be populated dynamically. This allows you to generate organization units and their positions, and at the same time populate the positions in each instance of the organization unit with only the resources that are appropriate for each instance.

For information about defining candidate queries using substitution variables, see Configuring Candidate Queries for Dynamic Organizations.

# Candidate Queries

A candidate query is an LDAP Query assignment to a position or group. The position or group is populated based on the results of the candidate query.

An LDAP container must be specified in the candidate query configuration. The primary LDAP source of the LDAP container identifies the LDAP connection on which the query is performed. This also determines the LDAP container to which any newly created resources are assigned.

Any resource identified by the candidate query of a position or group must also be visible via the associated LDAP container. That is, no resource can be created dynamically that could not also be created manually using an LDAP container. This ensures that any resource attributes are able to retrieve their values from the mapped LDAP attributes of an LDAP container.

Each candidate query will only identify potential entries from the primary LDAP source of the associated LDAP container. If that LDAP container has any secondary LDAP sources, the rules that bind entries within the secondary LDAP sources to those of the primary LDAP source must be followed. It is only when those rules have been completed that the true set of candidate resources can be resolved.

The deletion of the LDAP container will, depending on the request parameters, cause the deletion of all resources belonging to that LDAP container; whether they were created manually or dynamically. If the request to delete the LDAP container does not specify that associated resources should also be deleted, and associated resources exist, the request will fail. The deletion of the LDAP container will always result in the deletion of candidate queries that reference that LDAP container.

Candidate queries can be used to populate either *static* or *dynamic* organization models:

- **Static Organization Models** - These are organization models that are statically defined in TIBCO Business Studio, that is, they are not dynamically generated from model templates. For these types of organization models, you can populate both groups and positions using candidate queries.
- **Dynamic Organization Models** - These are organization models that are dynamically generated from model templates. They consist of organization units with subordinate positions that can be populated using candidate queries. For dynamic organization models, the candidate query can also use *substitution variables* to identify the appropriate resources to assign to positions in each instance of the dynamically generated organization unit. This allows each instance to contain resources that are different than the other instances. (If you did *not* use substitution variables when assigning resources to a dynamically generated organization model, each of the instances would be populated with the same resources.)

### LDAP Source Classes

The class of the primary LDAP source of the LDAP container determines how much candidate query configuration is allowed. There are two classes of LDAP sources:

- **LDAP Group Source** - For this LDAP source class, the candidate query will take *all* of the resources identified by the LDAP container as its candidate list. No configuration other than identifying the LDAP container is allowed for this class of LDAP source. Therefore, it is not applicable to populating dynamic organization models, that is, since neither a Base-DN nor a query is specified for this class of LDAP source, substitution variables cannot be specified.
- **LDAP Query Source** - For this LDAP source class, the candidate query can include a Base-DN and query to identify the resources to populate positions and groups.

### Invoking Candidate Queries

Candidate queries are invoked using the following properties in the `DE.properties` file on the server:

- `AutoResourceGenEnable` - Enables (true) or disables (false) the population of positions and groups that have candidate queries defined each day at the time specified in the `AutoResourceGenStart` property.
- `AutoResourceGenStart` - Specifies the time each day to populate positions and groups that have candidate queries defined, as long as `AutoResourceGenEnable` is set to true.
- `AutoResourceGenInterval` - The delay between the start of one candidate query processing event and the next. This value should be great enough to ensure that two events do not overlap. The value is expressed as an XML Schema Duration string.
- `AutoResourceDeleteEnabled` - Enables (true) or disables (false) the removal of resources from positions/group if the LDAP entry/attribute from which they were derived has been removed from the LDAP source.

For more information about the properties in the `DE.properties` file, see the *TIBCO ActiveMatrix BPM Administration* guide.

## Configuring Candidate Queries for Static Organizations

This procedure describes how to configure candidate queries for *static* organizations, that is, organizations that are not *dynamically* generated.

### Prerequisites

You must have an LDAP container defined from which the resource candidates can be obtained.

### Procedure

1. From the Organization Browser, click one of the following:
   - **Groups** button to configure a candidate query for a group.
   - **Organizations** button to configure a candidate query for a position.
2. From either the groups or organizations list, select the desired group or position, then click **Candidate Query**.
   - If a candidate query exists for the group or position, its configuration is displayed on the Candidate Query dialog. You can edit the configuration using the information in Step 3, or you can delete the existing candidate query by clicking the **Delete Query** (  ) button.
   - If a candidate query does not exist for the group or position, click **Add Candidate Query**, then use the information in Step 3 to configure the candidate query.
3. Configure the candidate query using the fields on the Candidate Query dialog, as follows:

| Field | Description |
|---|---|
| **Ldap Container** | Select the LDAP container from which the resource candidates are to be obtained to populate the group or position.<br>• If you select an LDAP container that was created using a query source, you can use the remainder of the fields on the Candidate Query dialog to configure the candidate query.<br>• If you select an LDAP container that was created using a group source, the remainder of the fields on the Candidate Query dialog are disabled. In this case, the candidate query will take all the entries identified by the LDAP container (that is, the LDAP group) as its candidate list. |

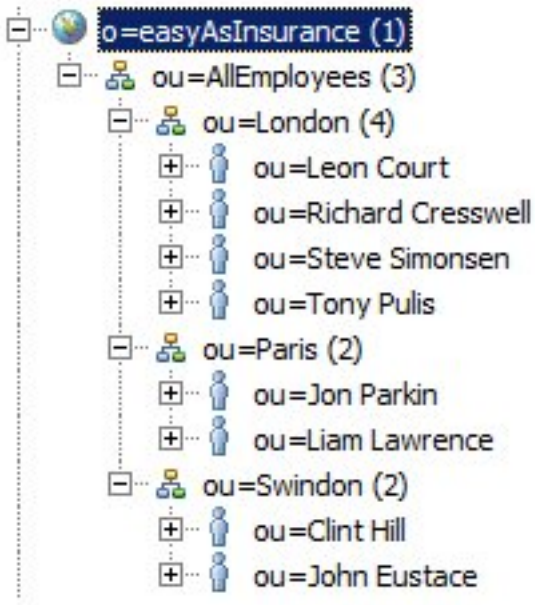
| Field | Description |
|---|---|
| **Base DN** | The LDAP branch to which the query (see below) will be restricted. This is optional and is relative to any Base-DN already configured on the primary LDAP source of the identified LDAP container. For example:<br>`ou=London`<br>If a Base-DN was configured on the primary LDAP source, it is shown below the **Base DN** field. |
| **Query** | This expression will locate entries that identify candidate resources. The expression is combined with that of the primary LDAP source of the identified LDAP container. The query expression must be enclosed in parentheses. For example:<br>`(employeetype=Permanent)`<br>The LDAP query that was specified on the primary LDAP source of the container is shown below the **Query** field. |
| **Search Scope** | Determines the depth to which the search will be performed, as follows:<br>• One Level - Only the elements directly within the Base-DN level are searched.<br>• SubTree - Elements directly within, and below, the Base-DN level are searched.<br>The candidate query cannot be more inclusive in its Search Scope than the LDAP container's primary LDAP source. Therefore, if the primary LDAP source has a search scope of One Level, then the candidate query must also use One Level. However, if the primary source is SubTree, then the candidate query may be either. |

4. Click **Save** to save the edited or new candidate query.

### Candidate Query Configuration for a Static Organization Example

Assumptions:

- Your LDAP source looks like this:



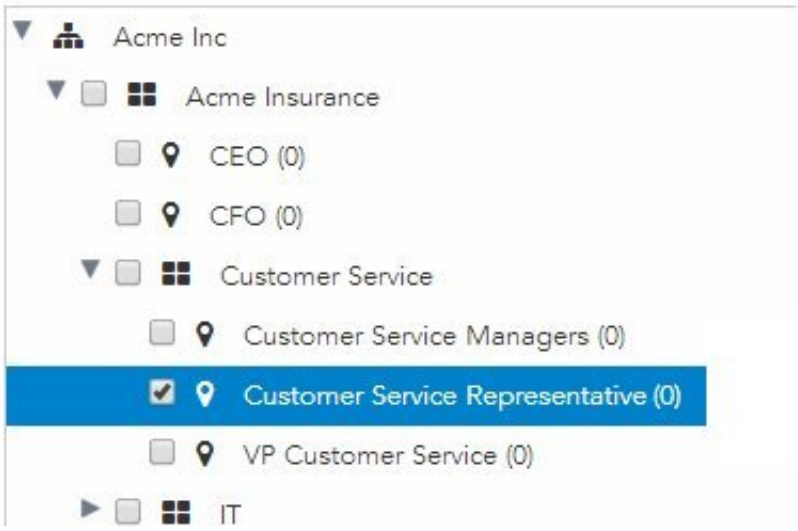

- The LDAP source contains the following attributes for each of the resources:

DN: ou=Richard Cresswell,ou=London,ou=AllEmployees,o=easyAsInsurance

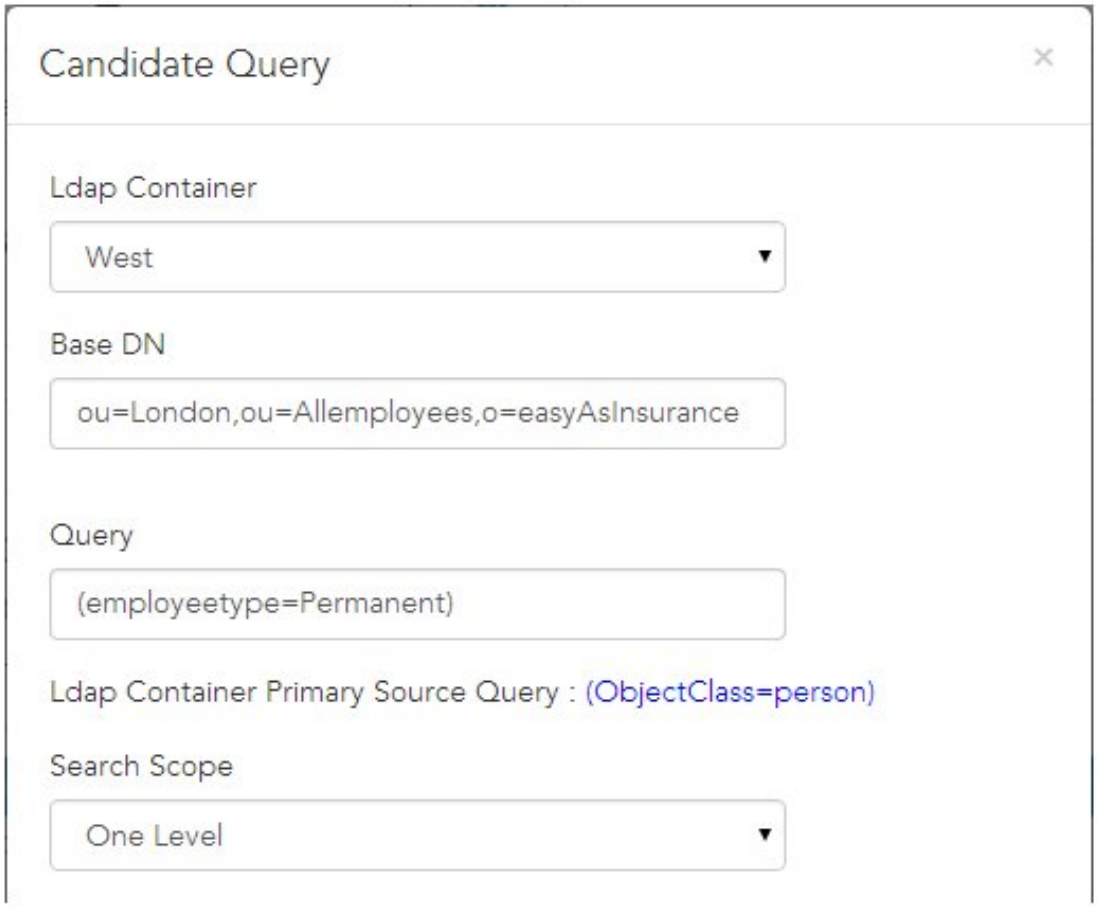
| Attribute Description | Value |
|---|---|
| ***objectClass*** | ***inetOrgPerson (structural)*** |
| ***objectClass*** | ***organizationalPerson (structural)*** |
| ***objectClass*** | ***person (structural)*** |
| ***objectClass*** | ***top (abstract)*** |
| **cn** | **Mr Richard Cresswell** |
| **sn** | **Cresswell** |
| carlicense | Suspended |
| departmentnumber | FNB1 |
| employeenumber | 1320 |
| employeetype | Permanent |
| givenname | Richard |
| mail | RCresswell@easyasinsurance.com |
| manager | ou=Tony Pulis,ou=London,ou=AllEmployees,o=easyAsInsurance |
| ou | Richard Cresswell |
| postaladdress | 4 Cherry Walk, Mayfair, LONDON, EC1V |
| preferredlanguage | English, Welsh |

The query in this example assigns candidate resources whose `employeetype` attribute = "Permanent".

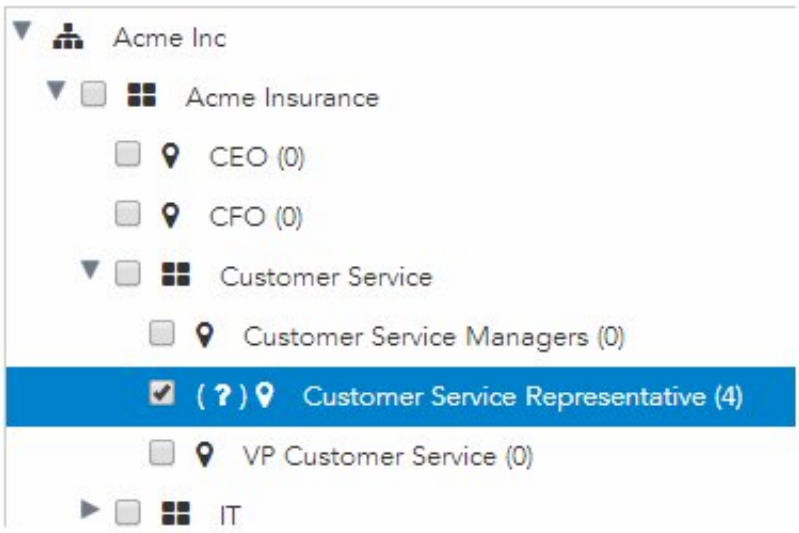
- Your organization model contains a "Customer Service Representative" position to which you want the candidate query to assign candidate resources:




To configure a candidate query to populate the Customer Service Representative position with resources from the London office (`ou=London`), who are permanent employees (`employeetype=Permanent`), follow the procedure above and fill in the fields of the Candidate Query dialog as follows:




After the candidate query is invoked by the properties in the `DE.Properties` file (for more information, see Candidate Queries), the organization model looks like this:




Notice that the **(?)** to the right of the check box indicates that the position has a candidate query defined.

And if you view the resources in the Customer Service Representative position, they appear as follows:

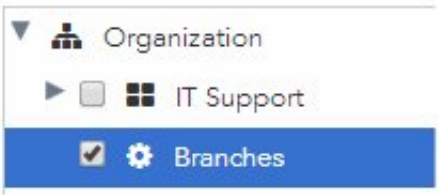

## Configuring Candidate Queries for Dynamic Organizations

It is possible to construct the Base-DN and LDAP query of a candidate query in such a way that it identifies different resources for each instance of the dynamic organization model.

### Prerequisites

- You must have an LDAP container defined from which the resource candidates can be obtained.
- There must be an organization unit that has been designated for an extension point when it was defined in TIBCO Business Studio, that is, a model template has been defined for the organization unit. You can determine organization units that have been designated for an extension point by the

  icon next to the organization unit name. For example:



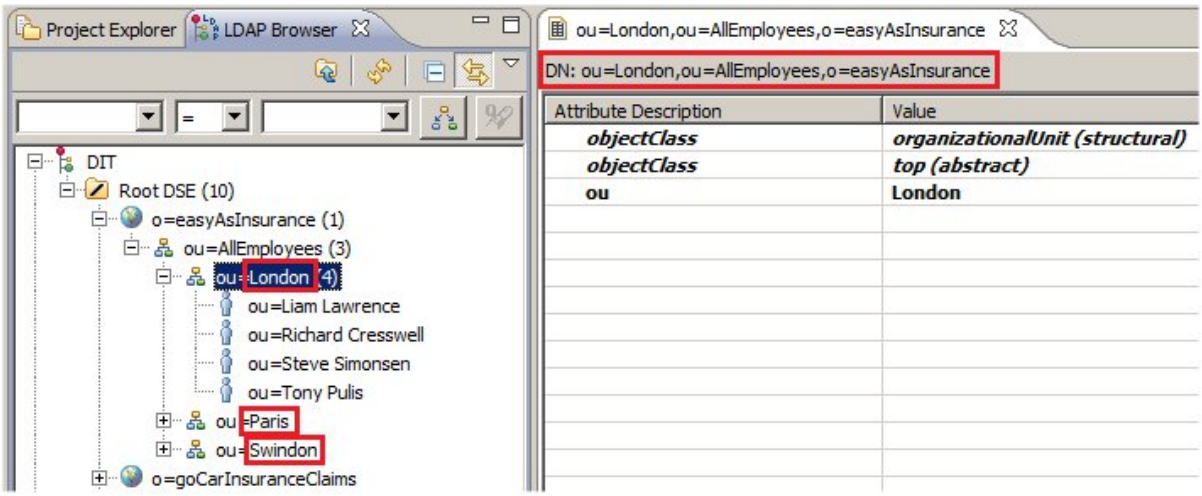

### Substitution Variables

To allow you to specify that each instance of the dynamically generated organization unit be populated with different resources, two *substitution variables* are available for use in a candidate query:

- **{root-dn}** - The DN of the LDAP entry that initiated the organization model template instance. Generally, this substitution variable is used in the **Base DN** of the candidate query configuration. This is used in the example that is shown below.
- **{root-name}** - The name assigned to the root organization unit of the organization model instance; that is, the value of the LDAP attribute named in the extension point. Generally, this substitution variable is used in the **Query** of the candidate query configuration. Note that this variable is *not* used in the example that is shown below, but it is available for use if your LDAP source is set up in such a way that it needs to be queried.

Note that substitution variables must be enclosed in braces { }, and they are case insensitive.

These substitution variables will take their values according to each instance from the LDAP entry that the instance comes from. Using the following example, the `{root-dn}` for the currently selected LDAP entry is "ou=London,ou=AllEmployees,o-easyAsInsurance". The Paris and Swindon entries would have similar DNs. The `{root-name}` for the three organization units in this example are London, Paris, and Swindon.




### Procedure

1. From the Organization Browser, click the **Organizations** button, then expand the hierarchy and select the organization unit that contains an extension point (that is, one that has a icon next to the organization unit name).
2. Click the **View Template** link.
3. On the Dynamic Organization Template dialog, expand the hierarchy to view the organization structure, select the position you want to populate in each dynamically generated instance of the template, then click **Edit Candidate Query**.

- If there is already a candidate query defined for the selected position, it is displayed. You can use the information in Step 4 to edit the candidate query, or you can delete the existing candidate query by clicking the **Delete Query** (  ) button.
- If there has not been a candidate query defined for the selected position, click **Add Candidate Query** then use the information in Step 4 to define the candidate query.

4. Configure the candidate query using the fields on the Candidate Query dialog, as follows:

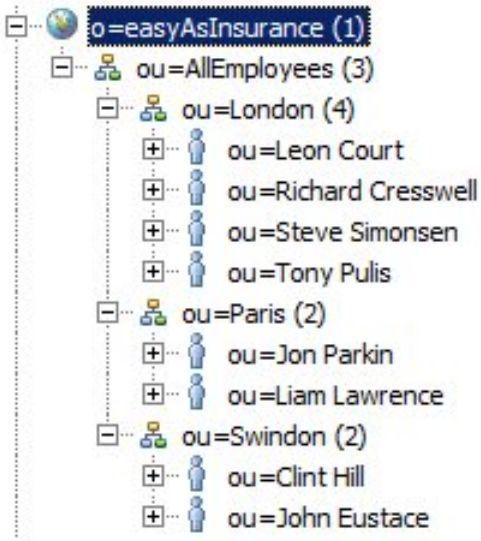
| Field | Description |
|---|---|
| **Ldap Container** | Select the LDAP container from which the resource candidates are to be obtained to populate the dynamic organization model.<br><br>Note that if you choose an LDAP container that was created using a group source, all of the other fields on this dialog are disabled. If you choose that type of container, you cannot use variable substitution in the Base-DN nor the Query, as those are disabled. In this case, every instance of the dynamically generated organization model will be the same (as defined in the LDAP container), and are populated with the same resources. |
| **Base DN** | The LDAP branch to which the query will be restricted. This is optional and is relative to any Base-DN already configured on the primary LDAP source of the identified LDAP container. |
| **Query** | This expression will locate entries that identify candidate resources. The expression is combined with that of the primary LDAP source of the identified LDAP container. The query expression must be enclosed in parentheses.<br><br>If you want to include multiple attributes in the query, they must be ANDed together using the following notation:<br><br>(&(*attribute1=value*)(*attribute2=value*))<br><br>For example:<br><br>`(&(employeetype=Contract)(departmentnumber=3100))`<br><br>You could include the `root-name` substitution variable in the query as well if it works with the data in the LDAP source. For example:<br><br>`(&(ou={root-name})(employeetype=Contract)(departmentnumber=3100))` |
| **Search Scope** | Determines the depth to which the search will be performed, as follows:<br><br>• One Level - Only the elements directly within the Base-DN level are searched.<br>• SubTree - Elements directly within, and below, the Base-DN level are searched.<br><br>The candidate query cannot be more inclusive in its Search Scope than the LDAP container's primary LDAP source. Therefore, if the primary LDAP source has a search scope of One Level, then the candidate query must also use One Level. However, if the primary source is SubTree, then the candidate query may be either. |

5. Click **Save Changes** to save the edited/new candidate query and close the Candidate Query dialog.
6. Click **Close** to close the Dynamic Org Template dialog.

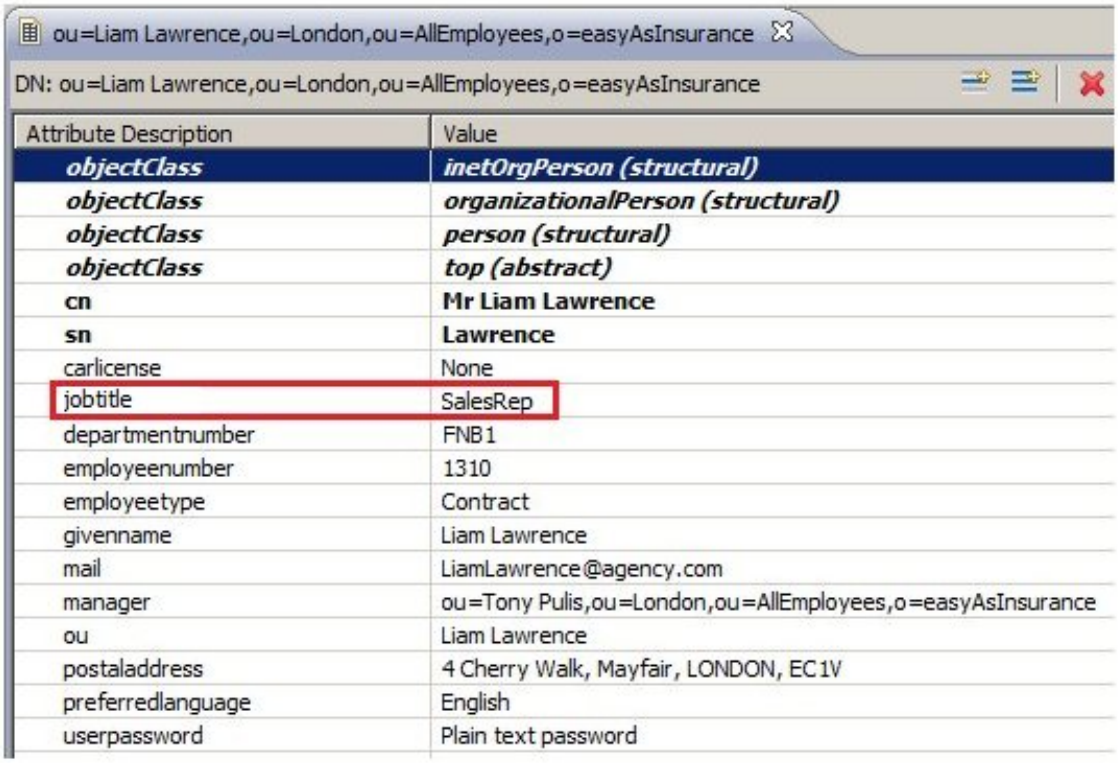
### Candidate Query Configuration for a Dynamic Organization Example

Assumptions:

- Your LDAP source looks like this:

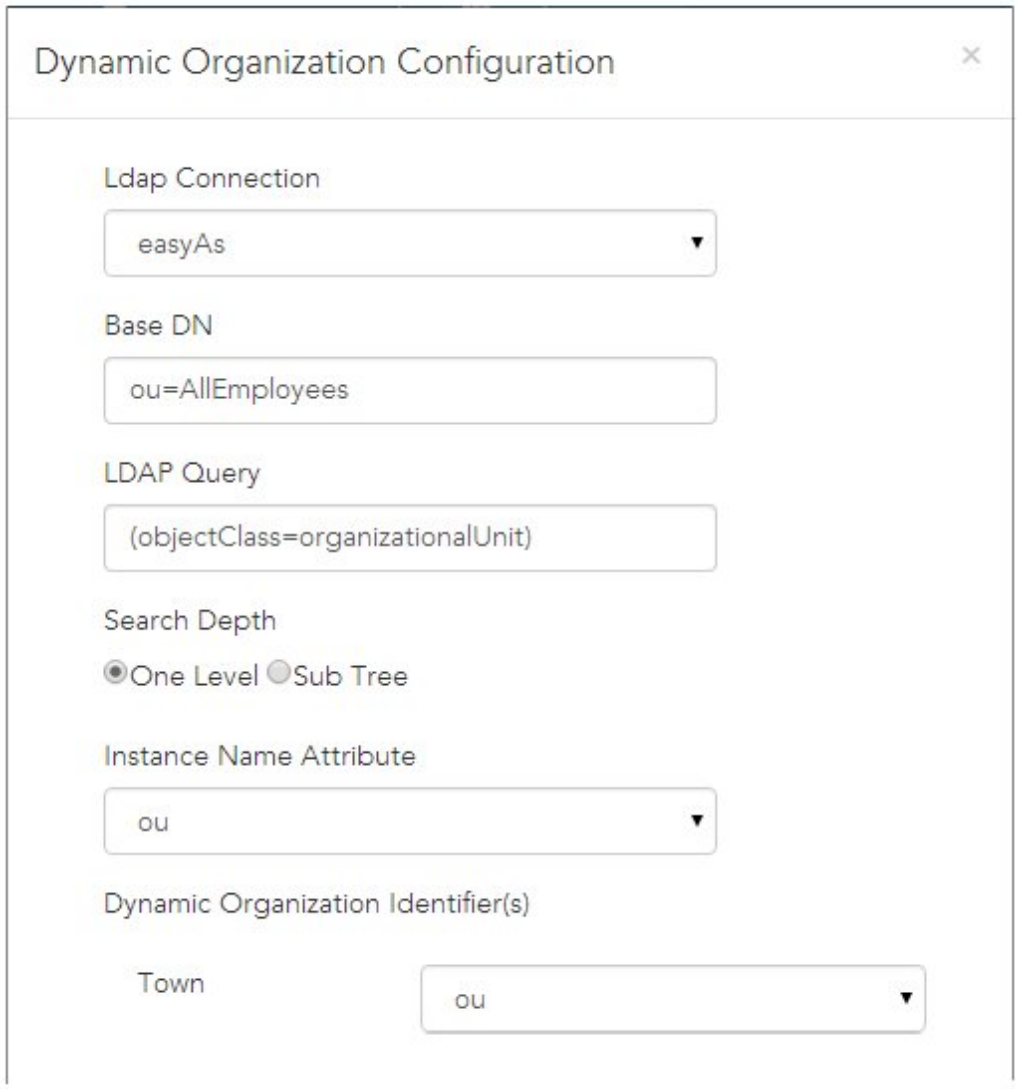



- The LDAP source contains the following attributes for each of the LDAP entries (resources):



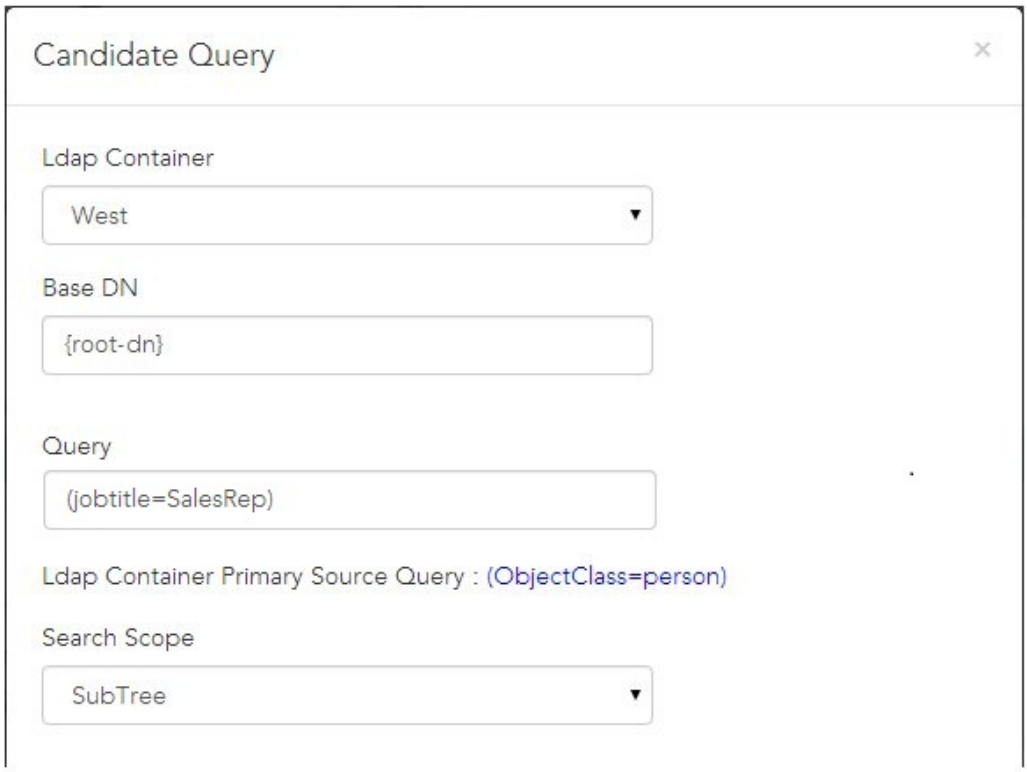

  Each LDAP entry contains a `jobtitle` attribute. The query looks for the entries in which the value of this attribute is "SalesRep".

- You have configured the extension point for the dynamic organization as follows:

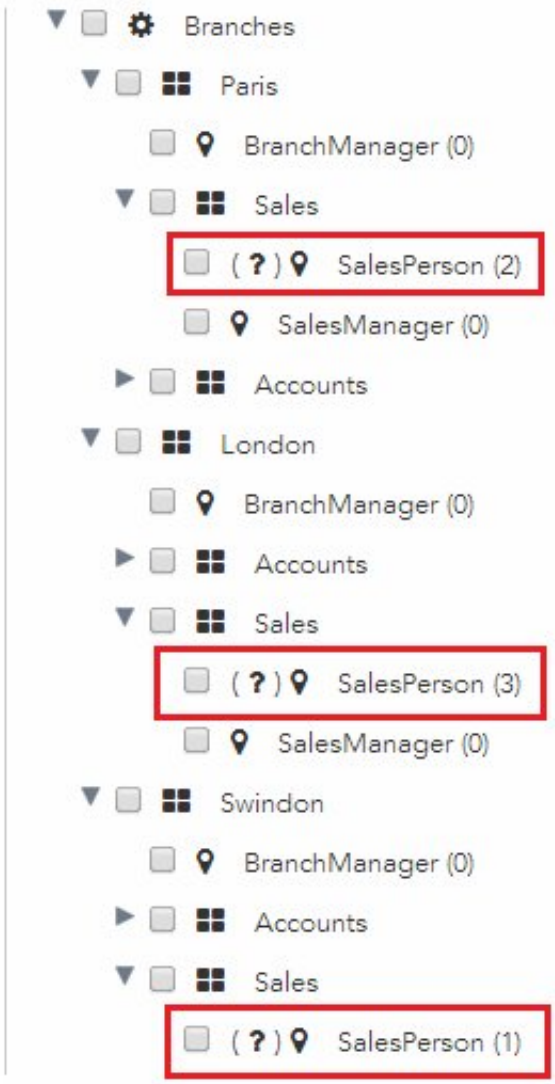



Note that this is the same extension point configuration described in Configuring Dynamic Organization Model Extension Points.

- The candidate query for the "SalesPerson" position in the model template is configured as follows:




After the candidate query is invoked by the properties in the `DE.Properties` file (for more information, see Candidate Queries), the organization model looks like this:




Three instances of the model template were generated, one for each instance of `{root-dn}`: `ou=Paris,ou=AllEmployees,o=easyAsInsurance`, `ou=London,ou=AllEmployees,o=easyAsInsurance`, and `ou=Swindon,ou=AllEmployees,o=easyAsInsurance`

And each of the instances are populated with the resources whose `jobtitle` attribute equals "SalesRep" for each of the branches.

Notice that the **(?)** to the right of the check box indicates that the position has a candidate query defined.

## Modifying Existing Candidate Queries for Dynamic Organizations

After an organization unit is dynamically generated, and positions are dynamically populated based on the candidate query, you can modify the candidate query.

When you modify an existing candidate query, you can modify it in one of the following ways:

- **Modify the candidate query in the organization model template** - When you modify a candidate query at this level, the next time positions are generated (based on the property settings in the `DE.properties` file), those positions will be populated based on the modified candidate query,

except for those positions whose individual candidate queries have been modified (as described below).

- **Modify the candidate query for a generated position** - When a generated position's candidate query is modified, that specific candidate query is used to populate that position; the candidate query in the template is no longer used to populate the position. Therefore, if the candidate query in the template is modified, it has no affect on positions whose individual candidate queries have been modified.

To modify the candidate query for either the template or a generated position, perform the procedure provided in Configuring Candidate Queries for Dynamic Organizations on page 96, except perform Step 2 and Step 3 as described below, depending on which candidate query you want to modify.

**To modify the candidate query in the organization model template, do the following:**

Step 2 - Click the **View Template** link.

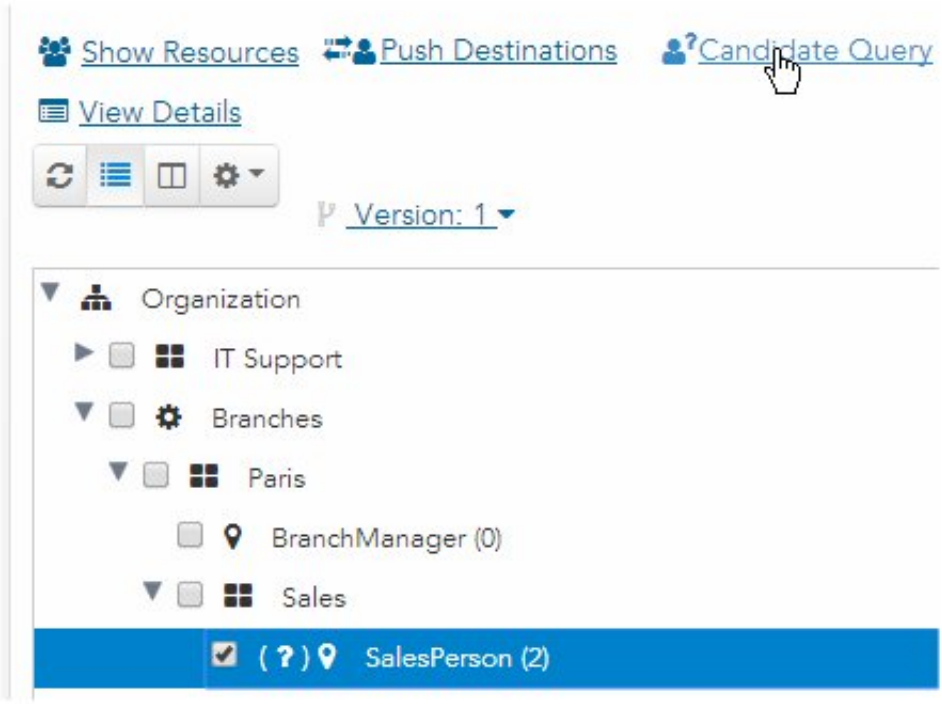
Step 3 - On the Dynamic Org Template dialog, expand the hierarchy to view the organization structure, select the position whose candidate query you want to modify, then click **Edit Candidate Query**.

Continue with Step 4 in Configuring Candidate Queries for Dynamic Organizations on page 96 to modify the query as desired.

**To modify the candidate query for a generated position, do the following:**

Step 2 - Expand the organization unit hierarchy to the generated position whose candidate query you want to modify, and select the position.

Step 3 - Click **Candidate Query**. For example:




Continue with Step 4 in Configuring Candidate Queries for Dynamic Organizations on page 96 to modify the query.