Apache Directory Studio LDAP Browser

User's Guide

Apache Directory Studio LDAP Browser: User's Guide

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Chapter I. Getting started

This getting started guide provides a brief introduction to the Apache Directory Studio Browser.

1. Download and installation

The latest version of Apache Directory Studio can be downloaded from the Apache Directory Studio Downloads page, at this address : https://directory.apache.org/studio/downloads.html [https://directory.apache.org/studio/downloads.html] .

The download page also includes the installation instructions.

2. Open LDAP perspective

To use the Apache Directory Studio Browser plug-in open the LDAP perspective. Therefore go to **Window** → **Open Perspective** → **Other...** and select the **LDAP** perspective.
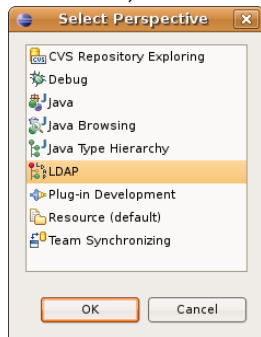
For more information about the LDAP perspective see LDAP perspective

3. Create connection

The bottom left corner shows all of the LDAP connections. As can be seen, the view is empty, meaning a connection still needs to be specified.

To create a new connection click the **New Connection** button.
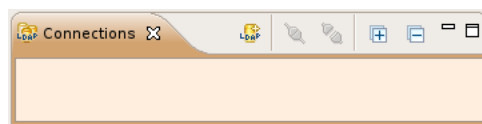
In the wizard's first page enter a connection name as well as the hostname and the port of the LDAP server. To check the connection parameter you entered you may click to **Check Network Parameter**. Click **Next** when done.

Here is a list of common directory servers and the ports they use by default:

Directory Server	Default Port
Apache Directory Server	10389
OpenDS	1389
OpenLDAP, Fedora, Sun, Active Directory	389

In the wizard's second page select the authentication method. If you choose the simple bind method also enter your bind DN or user and bind password. To check the authentication parameter you entered you may click to **Check Authentication**. Click **Finish** when done.

Here is a list of common directory servers and the administrator's bind DN and password they use by default:

Directory Server	Default Bind DN	Default Bind Password
Apache Directory Server	uid=admin,ou=system	secret

Directory Server	Default Bind DN	Default Bind Password
OpenDS, Sun, Fedora	cn=Directory Manager	specified at setup
OpenLDAP	specified at setup, see slapd.conf	specified at setup, see slapd.conf

Observe that the **Connections view** now shows the created connection.

For more information see Connections view

4. Browse the directory

The **LDAP Browser view** is on the top left. The category **DIT** shows the hierarchical content of the directory. You may expand and collapse the tree.
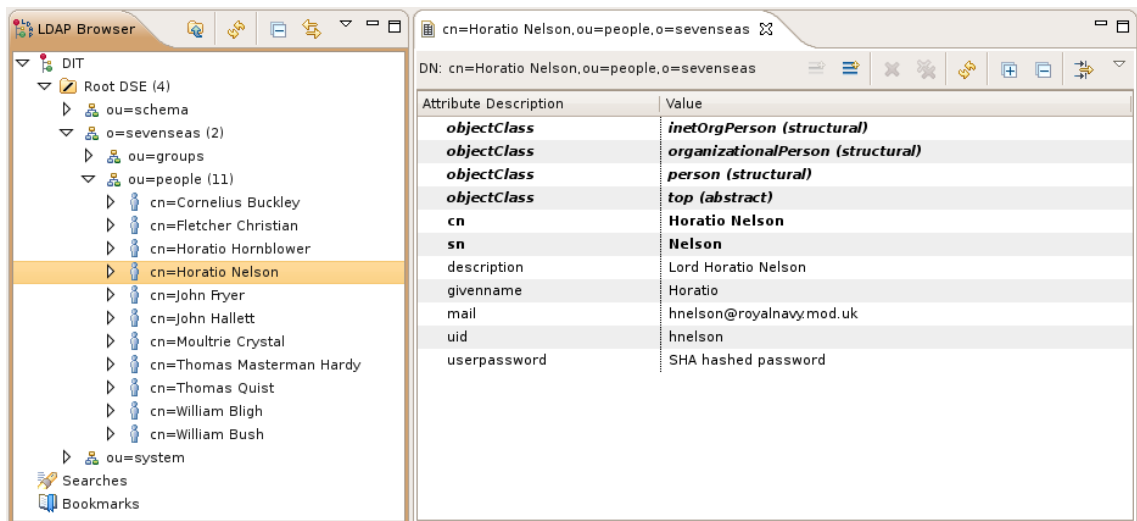
When selecting an entry its attributes and values will be displayed in an **Entry editor**.

For more information see LDAP Browser view and Entry editors.

5. Search the directory

For a basic search you could use the Quick Search.

For a more advanced serach you may use the search function.

1. In the toolbar click the **Search** button.

2. If it is not already selected, select the **LDAP Search** tab.
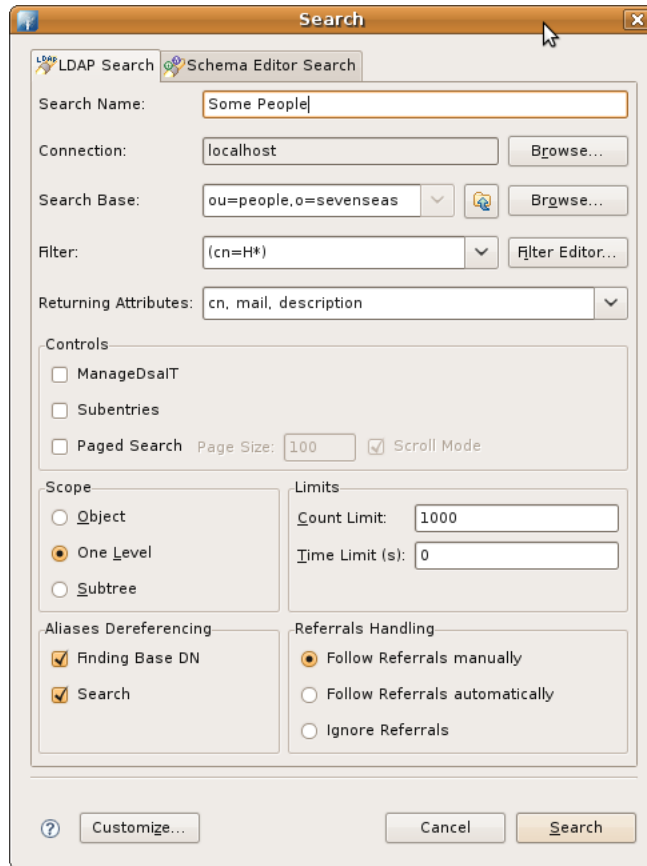
In the search dialog type in a search name. Select a connection to search on and the search base DN. Specify a valid LDAP filter and the returning attributes as comma separated list, hit Ctrl-Space to get content assistance. Additionally you may choose scope, limits, alias and referral options.

3. Press the **Search** button.

4. The category 🔎 **Searches** in the LDAP Browser shows the searches. You may expand the search to see all search result enties.
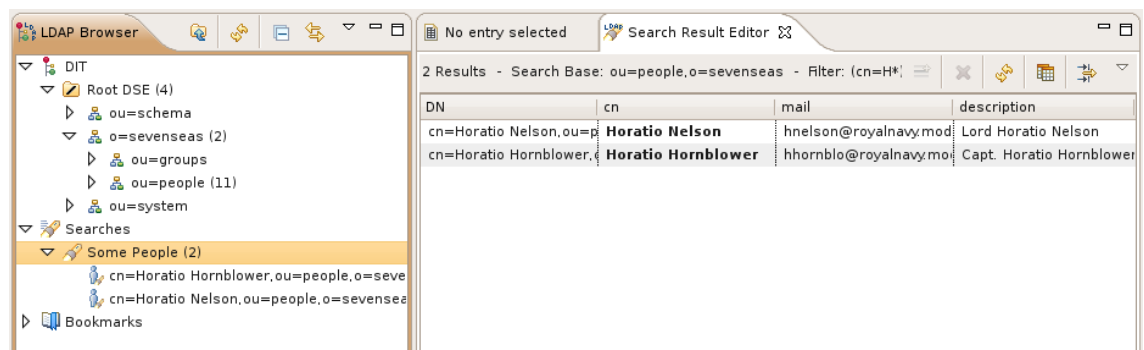
When selecting a search the search results and returning attributes will be displayed in the **Search Result editor**.

When selecting a search result entry its attributes and values will be displayed in the **Entry editor**.

For more information see LDAP Browser view and Search Result editor.

Chapter II. Tools

1. LDAP perspective

The Apache Directory Studio Browser plug-in provides a LDAP perspective. It is designed for working with an LDAP directory (browse, edit, search) as well as for editing LDIF files. The views and edtiors are arranged as follows:
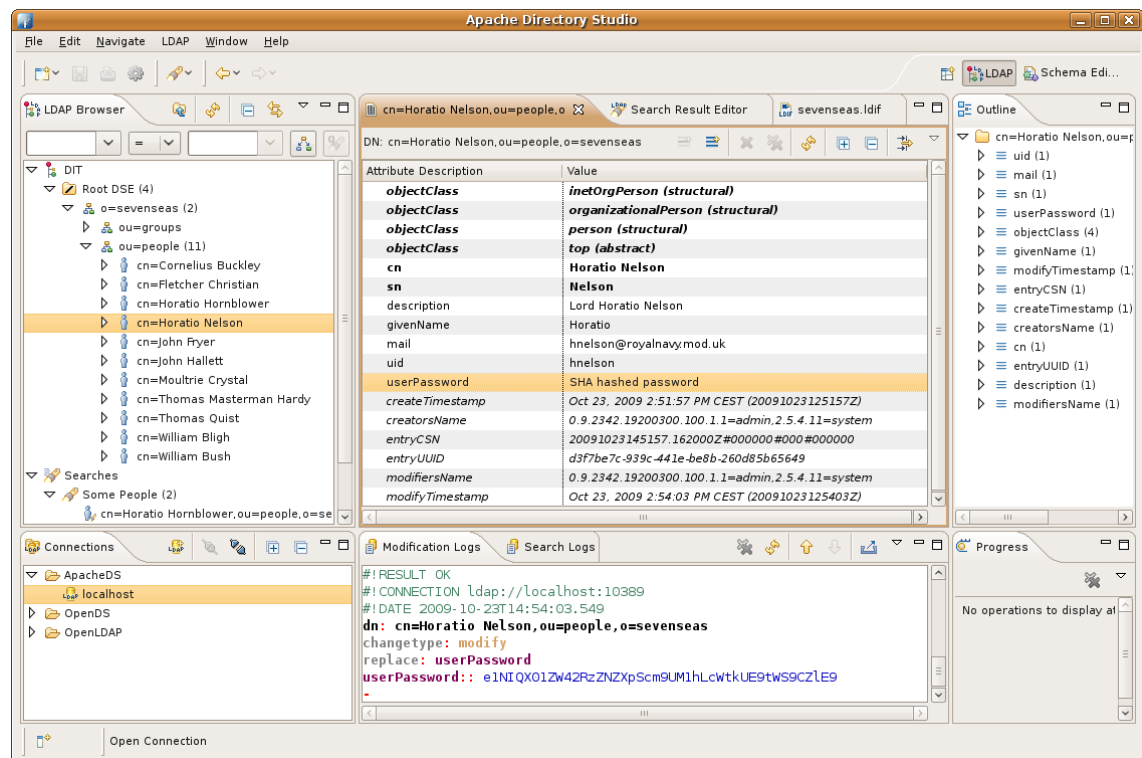
The bottom left view shows all the **Connections**. It is used to create, edit, delete, open and close connections. When selecting a single connection the LDAP Browser shows the content of the selected connection.

The **LDAP Browser view** is on the top left. It shows the directory information tree (DIT), the persistent searches and bookmarks of the selected connection. With the LDAP Browser you are able to navigate and modify the DIT, perform searches and manage bookmarks. When selecting a single entry the Entry editor shows its attributes and values. When selecting a single search the Search Result editor shows the search results.

The editor area in the top middle. The following LDAP specific editors are available:

- The **Entry editor** displays the attributes and values of the currently selected entry. Further it is possilbe to add, edit and delete attributes

- The **Search Result editor** shows the result of the currently selected search in a table. Further it is possible to edit the search result in a spreadsheet-like manner.

- With the **Schema Browser** you could browse the schema with its object class and attribute definitions.

- The **LDIF editor** is a rich editor to create LDIF files. It provides well-known Eclipse features like syntax highlighting and content assistance

The **Outline view** on the top right displays the structure of the entry currently opended in the entry editor or the structured outline of the currently opened LDIF file.

The bottom centered view displays all **Modifications** made on the currently selected connection as LDIF change records and all **Searches** performed on the on the currently selected connection as LDIF records.

The bottom right **Progress view** displays long-running operations like connecting to the directory or import/export operations.

2. Views and editors

2.1. Connections view

The Connections view shows all the LDAP connections that you have added. Here is an example screenshot of the Connection view:
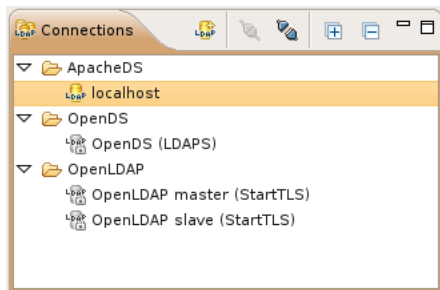
Organize Connections

It is possible to organize connections in folders and sub-folders. Use drag-and-drop to re-organize connections and folders.

You could copy and paste the connection parameters as LDAP URL to/from the clipboard. This makes it very easy to share connection parameters with other users.

Icons

The following icons can appear in the Connections view:

Icon	Description
	Connection is opened.
	Connection is closed.
	Secure Connection is opened.
	Secure Connection is closed.
	Connection folder

Toolbar

Icon	Action	Description
	New Connection...	Starts the New Connection wizard

Icon	Action	Description
🔌	Open Connection	Opens the selected connection(s)
🔌	Close Connection	Closes the selected connection(s)
⊞	Expand All	Expands all connection folders
⊟	Collapse All	Collapses all connection folders

Context Menu

Icon	Action	Description	Shortcut
	New Connection...	Starts the New Connection wizard	
	New Connection Folder...	Opens a dialog to create a new connection folder.	
	Open Connection	Opens the selected connection(s)	
	Close Connection	Closes the selected connection(s)	
	Open Schema Browser	Opens the Schema Browser and shows the schema of the selected connection	
	Copy Connection	Copies the selected connection(s) as LDAP URL(s) to the clipboard. To duplicate an existing connection please combine copy and paste.	**Ctrl-C** or **Ctrl-Insert**
	Paste Connection	Pastes the copied connection(s) or LDAP URL(s) from clipboard. Only enabled if there are connections or LDAP URLs in clipboard.	**Ctrl-V** or **Shift-Insert**
✖	Delete Connection	Deletes the selected connections(s). Only enabled if the selected connections are closed.	**Delete**
	Select All	Selects all connections.	**Ctrl-A**
	Rename Connection...	Opens a dialog to rename the selected connection.	**F2**
	Rename Connection Folder...	Opens a dialog to rename the selected connection folder.	**F2**
	Import → LDIF Import...	Starts the LDIF Import wizard.	
	Import → DSML Import...	Starts the DSML Import wizard.	
	Import → Import Connections...	Starts the Import Connection wizard.	
	Export → LDIF Export...	Starts the LDIF Export wizard.	
	Export → DSML Export...	Starts the DSML Export wizard.	
	Export → CSV Export...	Starts the CSV Export wizard.	
	Export → Excel Export...	Starts the Excel Export wizard.	

Icon	Action	Description	Shortcut
	Export → ODF Export...	Starts the ODF Export wizard.	
	Export → Export Connections...	Starts the Export Connections wizard.	
	Properties	Opens the connection properties dialog.	**Alt-Enter**

2.2. LDAP Browser view

The LDAP Browser shows the directory information tree (DIT), the persistent searches and bookmarks of the selected connection in three separate categories. It allows you to explore the directory content.

2.2.1. Overview

This section describes general aspects of the LDAP Browser view.

Example screenshot
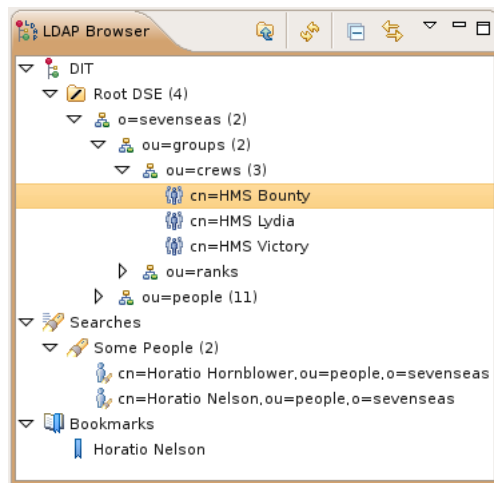
Icons

The following icons can appear in the LDAP Browser view:

Icon	Description
	The top-level category containing the directory information tree.
	Entry, the icon depends on its object classes.
	Alias or referral entry.
	The schema entry.
	The root DSE entry.
	A container for folded entries.
	The top-level category containing persistent searches.
	A search.

Icon	Description
📖	The top-level category containing bookmarks.
📑	A Bookmark.

Toolbar

The toolbar contains the following items:

Icon	Action	Description
🔼	Up	Selects the parent node of the currently selected node.
🔄	Refresh	Refreshes the selected objects
➖	Collapse All	Collapses the whole tree, only the three top-level categories remain visible.
🔗	Link With Editor	Links the editor with the current selection and the selection with the current editor.

Drop Down Menu

The drop down menu contains the following items:

- Sorting...: Opens the Sort Dialog .

- Show Quick Search: Shows/Hides the . Quick Search .

- Show DIT: Shows the DIT category.

- Show Searches: Shows the Searches category.

- Show Bookmarks: Shows the Bookmarks category.

- Show Directory Metadata: Shows the directory metadata entries (e.g. the root DSE or the schema entry) inside the DIT category.

- Preferences...: Opens the LDAP Browser preferences dialog.

Quick Search

The Quick Search allows searching the DIT with specifying only a single search attribute and value.
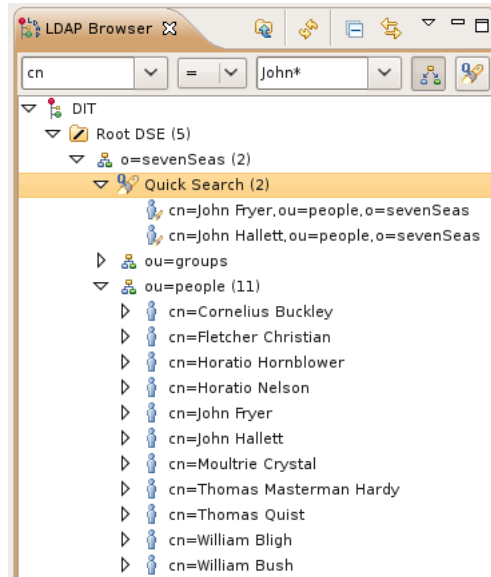
To use the quick search select an entry in the DIT first. It is used as search base.

In the left input field you could type in the search attribute. There is an auto-completion of known attributes. You could also select a recently used attribute from the drop-down box.

In the next drop-down box you could select the search operations.

In the right input field you could type in the search value. You could use '*' as wildcard. You could also select a recently used value from the drop-down box.

The ⬡ icon toggles the search scope: To search only the direct descendants of the selected entry uncheck the button. Check the button to search the whole subtree.

When pressing the ⚲ button the search is executed. You could also press **Enter** in one of the input fields to execute the search.

The search result is presented directly under the selected entry using a ⚲ **Quick Search** icon.

Sort dialog

With the sort dialog you can set the sorting behaviour of the LDAP Browser view.
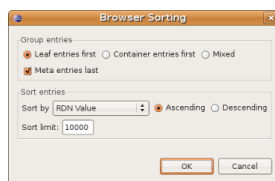
Field	Description	Default
Leaf entries first	If enabled, entries without children are grouped before the entries with children.	on
Container entries first	If enabled, entries with children are grouped before the entries without children.	on

Field	Description	Default
Mixed	If enabled, entries with and without children are not group before each other.	on
Meta entries last	If enabled, meta entries (e.g. root DSE or schema entry) are grouped after all other entries.	on
Sort by	Sort criteria and order of entries in DIT and search results. Select either 'RDN' or 'RDN Value' from the drop-down list as sort critera and select the sort order. Or select 'No sorting' to disable sorting.	RDN Value and Ascending
Sort limit	If there are more than the specified number of children or search results they won't be sorted. Hint: For performance reasons the maximum value should be 10000!	10000

2.2.2. DIT category

This section describes the DIT category in the LDAP Browser view.

Navigation

In the DIT category the directory information tree of the LDAP directory is displayed in its natural hierarchical structure. The first hierachy level contains the base entries, the Root DSE and the schema entry. When expanding an entry its direct children are fetched from directory. To expand and collapse an entry you could also double-click.

Children detection

While browsing the directory the LDAP Browser tries to find out if a fetched entry has children. Entries without children couldn't be expanded. This behaviour could be changed in the LDAP Browser preferences .

Labels

By default the RDN of the entries is used as label and the length of the label is limited to 50 characters. This behaviour could be changed in the LDAP Browser preferences . For the Base entries always the whole DN is used as label.

If an entry has child entries the number of children is appended in parentheses to the label. If the directory server returned a partial result (e.g. because of count or time limits) a plus (+) character is appended to the number of children to indicate that there are more child entries. Note: The limit parameters are inherited from connection properties.

▷ 🏠 ou=Testdata10000 (1000+)

Icons

The following icons are used to distinguish entry types:

Icon	Description
👤	Entry with object class person, inetOrgPerson, posixAccount, user
👥	Entry with object class groupOfNames, groupOfUniqueNames, posixGroup, group

Icon	Description
	Entry with object class organization, organizationalUnit, container
	Entry with object class domain, domainComponent, country, locality
	Entry with object class alias
	Entry with object class referral
	The schema entry.
	The root DSE entry.
	All other entries

Alias and referral entries

To manage alias entries you have the following options:

- Disable the options "Finding Base DN" and "Search" in the "Aliases Dereferencing" group of the Connection properties . This setting will display alias entries in the tree.

- If you know that an entry contains alias child entriy you could select **Fetch > Fetch Aliases** from the browser's context menu.

To manage referral entries you have the following options

- Enable the option "Use ManageDsaIT control" in the "Controls" group of the Connection properties . This setting will display referral entries in the tree.

- If you know that an entry contains referrals child entriy you could select **Fetch > Fetch Referrals** from the browser's context menu.

Folding

By default the entries of large branches are folded into virtual folders each with 100 entries. This may help to keep the displayed tree smaller. This behaviour could be changed in the LDAP Browser preferences .
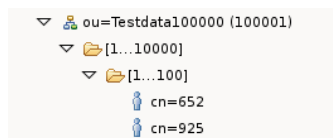
Filter Children

With the **Filter Children** action you can define a filter to select entries returned by the server for your needs. You could recognise a filtered entry by its modified icon and label.
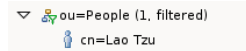
2.2.3. Searches category

This section describes the Searches category in the LDAP Browser view.

New Search

To perform a new search please choose one of the following methods:

- Select a search or entry and choose 🚀 **New Search...** from the context menu. The selected search or entry is used to preset search parameters.

- Use the Workbench 🚀 **Search** action.

Please see Search dialog how to define the search parameters.

Navigation

In the Searches category the searches and belonging search results are displayed. The first hierachy level contains the Searches, the second hierarchie level shows the search result entries. To expand and collapse a search the double-click could be used.
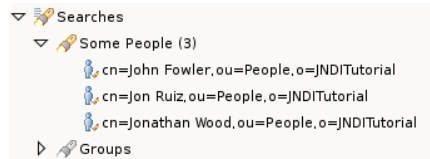
With the 🧩 **Open Search Result in DIT** action the search result entry could be located in the DIT.

Unperfomed Searches

An unperfomed search could be identified by the gray search icon 🚀 and the absent number in parentheses at the end of the search name label. To perfom the search expand it or press the refresh button.

Perfomed Searches

A perfomed search could be identified by the yellow search icon 🚀 If a search is performed the number of search results is appended in parentheses to the search name label. If the directory server returned a partial result (e.g. because of count or time limits) a plus (+) character is appended to the number of search results to indicate that there are more results. To perfom the search again press the refresh button.

Search Results

By default the DN of the search results is used as label and the length of the label is limited to 50 characters. This behaviour could be changed in the LDAP Browser preferences .

The icons of the search results depends on the RDN type, see DIT category . Additional the search results have a small overlay image 🚀

Folding

By default large search results folded into virtual folders 📂 each with 100 entries. This may help to keep the displayed tree smaller. This behaviour could be changed in the LDAP Browser preferences .
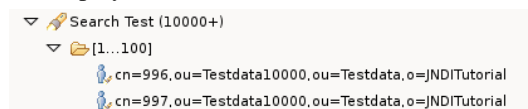
Batch Operation

With the 🍄 **New Batch Operation...** action you can execute a modify operation to all search results.

2.2.4. Bookmarks category

This section describes the Bookmark category in the LDAP Browser view.

Bookmarks could be used to quickly access frequently used entries.

New Bookmark

To create a new bookmark select an entry or search result and choose **New Bookmark...** from the context menu.

Navigation

With the **Open Bookmark in DIT** action the bookmark entry could be located in the DIT.

2.2.5. Context Menu

This section describes the context menu of the LDAP Browser view.

New > New Entry...

- Icon:

- Description: Opens the New Entry wizard . The selected entry is used as template or to preset the parent entry.

- Enabled: If one entry, search result or bookmark is selected.

New > New Context Entry...

- Icon:

- Description: Opens the New Context Entry wizard .

- Enabled: If one entry, search result or bookmark is selected.

New > New Search...

- Icon:

- Description: Opens the Search dialog . The selected search or entry is used to preset the search parameters.

- Enabled: If one search, entry, search result or bookmark is selected.

- Shortcut: **Ctrl-H**

New > New Bookmark...

- Icon:

- Description: Opens the bookmark dialog. The selected entry is used to preset the new bookmarks name and DN.

- Enabled: If one entry, search result or bookmark is selected.

New > New Batch Operation...

- Icon:

- Description: Opens the Batch Operation wizard . If one or multiple entries are selected they are used as operation objects. If a search is selected its search results are used as operation objects.

- Enabled: If one search is selected or if one or multiple entries, search results or bookmarks are selected.

Open Entry

- Description: Opens the selected entry in the default entry editor.

- Enabled: If one entry, search result or bookmark is selected.

Open With >

Opens the selected entry in a custom Entry editor. The follwing editor types are available:

- Table Entry Editor (single-tab)

  - Icon: ▤

  - Description: Displays attributes and values in a table grid. Single-tab means that only one instance of the editor is used, all entries are opened in the same editor tab. This is the traditional Entry editor.

- Table Entry Editor (multi-tab)

  - Icon: ▦

  - Description: Displays attributes and values in a table grid. Multi-tab means that each entry is opened in its own editor tab.

- LDIF Entry Editor (multi-tab)

  - Icon: ▤

  - Description: Displays attributes and values in LDIF format. Multi-tab means that each entry is opened in its own editor tab.

- LDIF Entry Editor (single-tab)

  - Icon: ▤

  - Description: Displays attributes and values in LDIF format. Single-tab means that only one instance of the editor is used, all entries are opened in the same editor tab.

Open Search Result in DIT / Open Bookmark in DIT

- Icon: ⚘ / ⚘

- Description: Opens the selected search result or bookmark in DIT.

- Enabled: If one search result or bookmark is selected.

- Shortcut: **F3**

Up

- Icon: ⚘

- Description: Opens the parent node of the selected node.

- Enabled: If a node with a parent is selected.

- Shortcut: **F4**

Copy Entries / DNs

- Icon:

- Description: Copies the selected entries and DNs to the system clipboard. The entries are copied in an internal format and could be pasted inside the LDAP Browser view. The DNs are copied as text and could be pasted even outside of Studio.

- Enabled: If one or multiple entries, search results or bookmarks are selected.

- Shortcut: **Ctrl-C** or **Ctrl-Insert**

Paste Entries

- Icon:

- Description: Pastes the previously copied entries as children into the selected entry. If the copied entries have children you are asked for the copy depth.
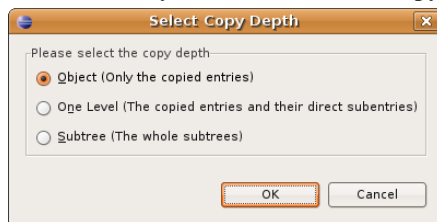
The new entries will receive the same RDNs and attributes as the copied entries. If there is already an entry with the same RDN you are asked how to proceed.
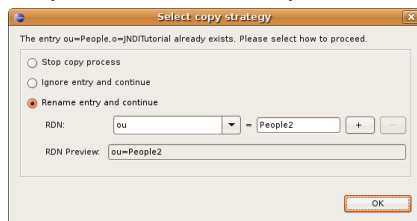
- Enabled: If one entry is selected and the system clipboard contains entries.

- Shortcut: **Ctrl-V** or **Shift-Insert**

Delete

- Icon:

- Description: Deletes the selected elements, the real action depends on the selected elements type:

  - Entries or Search Results: The entries and its children are deleted physically from directory. It is not possible to delete base entries or the root DSE.

  - Searches: The selected searches are removed from the view. No entries from directory are deleted.

- Bookmarks: The selected bookmarks are removed from the view. No entries from directory are deleted.

- Enabled: If one or multiple searches, entries, search results or bookmarks are selected.

- Shortcut: **Delete**

Move Entries...

- Description: Moves the selected entries to another parent. The Move Entries dialog is opened to select the new parent DN.

- Enabled: If one or multiple entries or search results are selected.

Rename...

- Description: Renames the selected element, the real action depends on the selected element type:

  - Entry or Search Result: Renames the selected entry in directory. The Rename Entry dialog is opened to specify a new RDN.

  - Search: Renames the selected search.

  - Bookmark: Renames the selected bookmark.

- Enabled: If one search, entry, search results or bookmark is selected.

- Shortcut: **F2**

Advanced > Copy DN

- Icon:

- Description: Copies the distinguished name of the selected entry (e.g. cn=John Fowler,ou=People,o=JNDITutorial)

- Enabled: If one entry, search result or bookmark is selected.

Advanced > Copy URL

- Icon:

- Description: Copies the URL of the selected entry (e.g. ldap://localhost:389/cn=John Fowler,ou=People,o=JNDITutorial)

- Enabled: If one entry, search result or bookmark is selected.

Advanced > Copy Entry as LDIF

Copies the selected entries in LDIF content format. There are four options:

- DN only

  - Icon:

  - Description: Copies the distinguished names of the selected entries in LDIF format. If a search is selected the distinguished names of all search results are copied.

- Enabled: If one search is selected or if one or multiple entries, search results or bookmarks are selected.

- returning attributes only

  - Icon:

  - Description: Copies all returning attributes of the selected search result entries in LDIF format. If a search is selected the returning attributes of all search results are copied.

  - Enabled: If one search is selected or if one or multiple search results are selected.

- all user attributes

  - Icon:

  - Description: Copies all user attributes of the selected entries in LDIF format. If a search is selected the user attributes of all search results are copied.

  - Enabled: If one search is selected or if one or multiple entries, search results or bookmarks are selected.

- include operational attributes

  - Icon:

  - Description: Copies all user attributes and operational attributes of the selected entries in LDIF format. If a search is selected the attributes of all search results are copied.

  - Enabled: If one search is selected or if one or multiple entries, search results or bookmarks are selected.

Advanced > Copy Entry as CSV

Copies the selected entries in CSV format. By default the tabulator is used as attribute delimiter, a pipe is used as value delimiter and each attribute is wrapped by double-quotes, these settings could be changed in Text Formats preferences . There are four options:

- DN only

  - Icon:

  - Description: Copies the distinguished names of the selected entries in CSV format. If a search is selected the distinguished names of all search results are copied.

  - Enabled: If one search is selected or if one or multiple entries, search results or bookmarks are selected.

- returning attributes only

  - Icon:

  - Description: Copies all returning attributes of the selected search result entries in CSV format. If a search is selected the returning attributes of all search results are copied.

  - Enabled: If one search is selected or if one or multiple search results are selected.

- all user attributes

  - Icon: 📄

  - Description: Copies all user attributes of the selected entries in CSV format. If a search is selected the user attributes of all search results are copied.

  - Enabled: If one search is selected or if one or multiple entries, search results or bookmarks are selected.

- include operational attributes

  - Icon: 📄

  - Description: Copies all user attributes and operational attributes of the selected entries in CSV format. If a search is selected the attributes of all search results are copied.

  - Enabled: If one search is selected or if one or multiple entries, search results or bookmarks are selected.

Advanced > Delete All

- Icon: ✖

- Description: The action depends on the selected element type:

  - Entry: The children entries of the selected entry are deleted physically from directory. It is not possible to delete base entries or the root DSE.

  - Search or 'Searches' category: All the searches are removed from the view. No entries from directory are deleted.

  - Bookmark or 'Bookmarks' category: All the bookmarks are removed from the view. No entries from directory are deleted.

- Enabled: If an entry, search, bookmark, the 'Searches' or 'Bookmarks' category is selected.

Filter Children...

- Icon: 🔻

- Description: Opens the Filter Children dialog to specify a children filter for the selected entry.

- Enabled: If one entry in DIT category is selected.

Remove Children Filter

- Icon: 🔻

- Description: Removes the children filter.

- Enabled: If one entry in DIT category is selected and a children filter is set.

Import > LDIF Import...

- Icon: 📄

- Description: Starts the LDIF Import wizard .

Import > DSML Import...

- Icon:

- Description: Starts the DSML Import wizard .

Export > LDIF Export...

- Icon:

- Description: Starts the LDIF Export wizard .

Export > DSML Export...

- Icon:

- Description: Starts the DSML Export wizard .

Export > CSV Export...

- Icon:

- Description: Starts the CSV Export wizard .

Export > Excel Export...

- Icon:

- Description: Starts the Excel Export wizard .

Export > ODF Export...

- Icon:

- Description: Starts the ODF Export wizard .

Refresh

- Icon:

- Description: Refreshes the selected elements. If entries, search results or bookmarks are selected their attributes and children are refreshed. If searches are selected this searches are performed

- Enabled: If one or multiple searches, entries, search results or bookmarks are selected.

- Shortcut: **F5**

Fetch -> Fetch Operational Attributes

- Description: Enables/disables fetching of operational attributes. If the server supports the 'All Operational Attributes' feature the operation attributes are requested using a '+', otherwise all available operational attributes available in the schema are requested.

- Enabled: If one or multiple entries, search results or bookmarks are selected.

- Note: This menu item is not available if "Fetch operational attributes while browsing" in the connection properties is enabled because in that case operational attributes are always loaded.

Fetch -> Fetch Aliases

- Description: Enables/disables fetching of alias entries. If enabled an additional search request with alias deferncing mode 'never' is necessary when loading the children of an entry.

- Enabled: If one or multiple entries are selected.

- Note: This menu item is not available if no alias dereferencing is enabled in the connection properties because in that case alias entries are always visible.

Fetch -> Fetch Referrals

- Description: Enables/disables fetching of referral entries. If enabled an additional search request with ManageDsaIT controls is necessary when loading the children of an entry.

- Enabled: If one or multiple entries are selected.

- Note: This menu item is not available if "Use ManageDsaIT control while browsing" is enabled in the connection properties because in that case referral entries are always visible.

Fetch -> Fetch Subentries

- Description: Enables/disables fetching of subentries. If enabled an additional search request with Subentries controls is necessary when loading the children of an entry.

- Enabled: If one or multiple entries are selected.

- Note: This menu item is not available if "Fetch subentries while browsing" is enabled in the connection properties because in that case subentries are always fetched.

Properties

- Description: Opens the entry properties , search properties or bookmark properties dialog.

- Enabled: If one search, entry, search result or bookmark is selected.

- Shortcut: **Alt**-**Enter**

2.3. Entry editors

Entry editors are used to view and edit the attributes and values of an entry.

Editor Types

There are two editor types available.

- Table Entry editor: Displays the entry's attributes and values in a table grid.

- LDIF Entry editor: Displays the entry's attributes and values in LDIF format.

By default the single-tab Table Entry editor is used, you could change that setting in the Entry Editor preferences.

Single-Tab vs. Multi-Tab

Each editor type can be used in single-tab or multi-tab mode.

- Single-tab means that only one instance of the editor is used, all entries are opened in the same editor tab.

- Multi-tab means that each entry is opened in its own editor tab.

Open Mode

With the open mode you could define how an entry should be opened while navigating through the DIT in the LDAP Browser view.

- Traditional: Editors open on single-click, using arrow keys triggers the opening of a new editor.

- Application-wide open mode + double-click: Editors open on double-click, using arrow keys requires an explicit enter to open the entry in an editor.

- Application-wide open mode + single-click: Editors open on single-click, arrow key and hover behaviour could be configured.

By default the traditional open mode is used, you could change that setting in the Entry Editor preferences.

2.3.1. Table Entry Editor Overview

This section describes general aspects of the Table Entry editor.

Example screenshot

Layout

The Entry editor has a two-column layout. The left column contains the attribute descriptions (names), the right column contains the attribute values. Each line represents a name-value pair.

The Entry editor has its own toolbar. The left part displays the distinguished name of the current entry. The right part contains the toolbar icons and menu.

Colors and Fonts

To distinguish the different attribute classes the Entry editor uses different fonts. By default the following colors and fonts are used:

Attribute class	Default font	Default color	Example
objectClass attribute	bold and italic	black	objectClass person (Structural)
Must attributes	bold	black	cn Ted Geisel
May attributes	normal	black	telephoneNumber +1 408 555 5252
Operational attributes	italic	black	creatorsName cn=Admin,o=JNDITutorial

These colors and fonts could be changed in the Colors and Fonts preferences .

Toolbar

The toolbar contains the following items:

Icon	Action	Description	Shortcut
⇉	New Value	Adds a new value to the selected attribute and starts the edit mode.	**Ctrl-+**
⇉	New Attribute...	Opens the New Attribute wizard . When finishing the wizard a new attribute is created and the edit mode is started to enter a value.	**Shift-Ctrl-+**
✖	Delete	Deletes the selected values.	**Delete**
✖	Delete Attributes	Deletes all values of the selected attributes. Applicable to multi-valued attributes, if you want to delete the complete attribute just select one value use this action.	
⟳	Reload Attributes	Reloads the attributes of the current entry.	**F5**
⊞	Expand All	Expands all folded attributes.	
⊟	Collapse All	Collapses all folded attributes.	
⇶	Show Quick Filter	Shows/Hides the Quick Filter .	**Ctrl-F**

Drop Down Menu

The drop down menu contains the following items:

- Sorting...: Opens the Sort Dialog to set default sorting.

- Show Decorated Values: If checked decorated values are displayed, this means some additional information is displayed:

  - Images: Image format, width, height, and size.

  - Binary data: Data size.

  - Passwords: Used hash method.

  - Timestamps: Locale dependent date and time format.
  If unchecked the raw values (as stored in directory) are displayed.

- Save Automatically: If checked, each modifcation (add attribute, edit value, delete attribute) is saved automatically and a modify request is sent to the server. If unchecked the editor becomes dirty (an asterisk '*' appears in the editor tab) if the entry is modified. Multiple modifications could be applied to the entry. The editor must be saved explicitly using **Ctrl+S**.

- Preferences...: Opens the Entry editor preferences dialog.

2.3.2. Table Entry Editor Features

This section describes the features of the Table Entry editor.

Sorting

You could sort the displayed attributes by attribute description or value by clicking to the column header. The current sort criteria and direction is indicated by an arrow. The default sorting behaviour could be changed in the Sort Dialog (**Toolbar menu ->** 🔽ᵃz **Sorting**):

Sort dialog

The default sorting behaviour of the entry editor could be changed in this dialog.
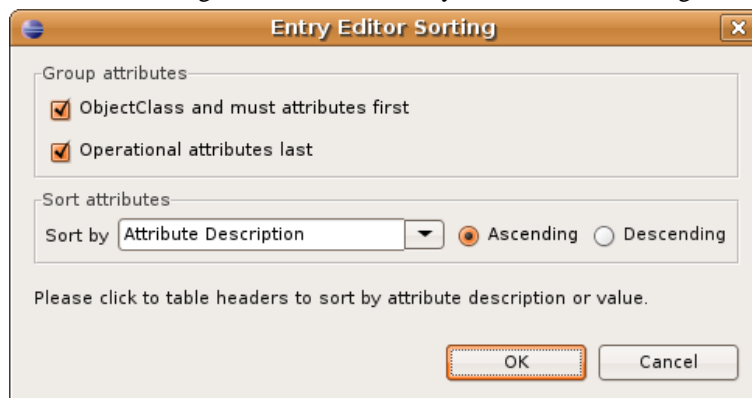
Field	Description	Default
ObjectClass and must attributes first	If enabled, objectClass and must attributes are grouped at the top.	on
Operational attributes last	If enabled, operational attributes (e.g. createTimestamp and modifyTimestamp) are grouped at the bottom.	on
Sort by	Default sort criteria and order of attribute and values. Select either 'Attribute Description' or	Attribute Description and Ascending

Field	Description	Default
	'Value' from the drop-down list as sort critera and select the sort order. Or select 'No sorting' to disable default sorting.	

Quick Filter

If an entry has many attributes and values it is difficult to find a specific attribute. The Quick Filter provides a client-side filter. To show/hide the Quick Filter toggle the ⇥ button or press **Ctrl-F** . Enter (even parts of) attribute descriptions or values into the input fields, only matching attributes keep displayed. When hiding the filter is removed.
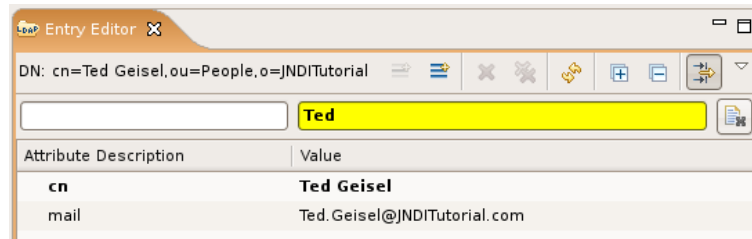
Visible attributes

By default all user attributes of an entry are fetched and displayed in the Entry editor. You could define to request operational attributes for each entry for the whole connection, see Connection properties for details. Another way is to request operational attributes for the selected entry only, choose **Fetch Operational Attributes** from the context menu.

Folding

By default attributes with more than 10 values are folded. The attribute is displayed as single line containing the number of values

Expand the attribute to make the values visible (double-click works also). To expand/collapse all folded attributes use the ⊟ Collapse All and ⊞ Expand All and buttons from toolbar.

You could change this setting in Entry editor preferences .

Locate DN in DIT

If a value contains a distinguished name the ⚄ **Locate DN in DIT** action can be used to locate and open the entry in the DIT.

Query by example

When selecting attributes these attribute-value-pairs are used to build a search filter, this feature could be used for "query by example".

- Select example attributes and choose **New Search...** from context menu. Watch the search filter in the search dialog.

- Select example attributes and choose **Advanced -> Copy [NOT|AND|OR] Search Filter** from context menu. This copies the search filter to system clipboard.

When building a filter necessary value encoding is supported (*->\2a, (->\28,)->29, \->\5c, NUL->\00).

Edit Attributes and Values

It is possible to add, edit or delete attributes and values of an entry in the Entry editor.

To enter the edit mode using the default value editor select a value and press **Enter** or **F7** or double-click the value. If the attribute is a simple string (like givenName or telephoneNumber) the value could be edited in-place, otherwise a specific value editor dialog is opened. To use a specific value editor choose one from **Context Menu -> Edit Value With** .

To finish editing press **Enter** or click to another value or click the OK button in a value editor dialog. To cancel editing press **ESC** or click the Cancel button in a value editor dialog.

Edit Entry Offline and Save Automatically

Sometimes you may want to make multiple modifications on an entry and to send these modifications as one request to the server. This is necessary e.g. when adding an additional object class which requires addional attributes. There are two ways to accomplish this.

One way is to toggle the "save modifications automatically" setting. This could be done from the editor's drop-down menu or in the Table Entry Editor preferences. This mode could be set independently for the single-tab and the multi-tab editor. For the single-tab editor it is enabled by default, for the multi-tab editor it is disabled by default. If disabled the editor becomes dirty (an asterisk '*' appears in the editor tab) if the entry is modified. The editor must be saved explicitly using **Ctrl+S**.

Another way is to use the Editor Entry Wizard. To start the wizard press **F8** or choose **Edit Entry...** from the context menu.

2.3.3. Table Entry Editor Context Menu

This section describes the context menu of the Table Entry editor.

New Attribute...

- Opens the New Attribute wizard . When finishing the wizard a new attribute is created and the edit mode is started to enter a value.

- Icon:

- Shortcut: **Shift-Ctrl-+**

New Value

- Adds a new value to the selected attribute and starts the edit mode.

- Icon:

- Enabled: If one attribute or value is selected.

- Shortcut: **Ctrl-+**

New Search...

- Opens the Search dialog . The selected attributes and values are used to build the search filter (Query by example).

- Icon: 🚀

- Enabled: If attributes or values are selected.

- Shortcut: **Ctrl-H**

New Batch Operation...

- Opens the Batch Operation wizard . If one or multiple DN values are selected these DNs are used as operation objects. Otherwise the selected attributes and values are used to build the search filter (Query by example).

- Icon: 🎛️

- Enabled: If attributes or values are selected.

Locate DN in DIT

- Locates the entry of the selected DN in DIT.

- Icon: 🔍

- Enabled: If one value is selected and this value is a distinguished name.

- Shortcut: **F3**

Open Schema Browser -> Object Class Definition

- Opens the Object Class page in Schema Browser and selects the object class definition of the currently selected objectClass value.

- Icon: ◎

- Enabled: If one objectClass value is selected and the schema contains this object class.

Open Schema Browser -> Attribute Type Definition

- Opens the Attribute Type page in Schema Browser and selects the attribute type definiton of the currently selected attribute.

- Icon: Ⓐ

- Enabled: If one attribute or value is selected and the schema contains this attribute type.

Open Schema Browser -> Equality Matching Rule Definition

- Opens the Matching Rule page in Schema Browser and selects the equality matching rule definiton of the currently selected attribute.

- Icon: Ⓜ

- Enabled: If one attribute or value is selected, the attribute provides an equality matching rule and the schema contains this matching rule.

Open Schema Browser -> Substring Matching Rule Definition

- Opens the Matching Rule page in Schema Browser and selects the substring matching rule definiton of the currently selected attribute.

- Icon:

- Enabled: If one attribute or value is selected, the attribute provides a substring matching rule and the schema contains this matching rule.

Open Schema Browser -> Ordering Matching Rule Definition

- Opens the Matching Rule page in Schema Browser and selects the ordering matching rule definiton of the currently selected attribute.

- Icon:

- Enabled: If one attribute or value is selected, the attribute provides an ordering matching rule and the schema contains this matching rule.

Open Schema Browser -> Syntax Definition

- Opens the Syntax page in Schema Browser and selects the syntax definiton of the currently selected attribute.

- Icon:

- Enabled: If one attribute or value is selected, the attribute provides an syntax and the schema contains this syntax.

Copy Values

- Copies the selected values. The values are copied to clipboard in an internal format so they could be pasted to another entry even in the search result editor. Additional the displayed values are copied to the system clipboard as string so they could be pasted in other applications. New-line is used as value separator.

- Icon:

- Shortcut: **Ctrl-C** or **Ctrl-Insert**

Paste Values

- Pasted the previously copied values to the current entry. Each value is copied separately, when an error occurs while adding the value the paste operation will continue with the next value.

- Icon:

- Enabled: If the system clipboard contains values.

- Shortcut: **Ctrl-V** or **Shift-Insert**

Delete

- Deletes the selected attributes and values.

- Icon: ✖

- Enabled: If attributes and values are selected.

- Shortcut: **Delete**

Select All

- Selects all attributes and values.

- Shortcut: **Ctrl-A**

Advanced > Copy DN

- Copies the distinguished name of the current entry (e.g. cn=John Fowler,ou=People,o=JNDITutorial)

- Icon:

Advanced > Copy URL

- Copies the URL of the current entry (e.g. ldap://localhost:389/cn=John Fowler,ou=People,o=JNDITutorial)

- Icon:

Advanced > Copy Attribute Descriptions

- Copies the attribute descriptions of the selected attributes and values as string to the system clipboard.

- Icon:

Advanced > Copy Display Values

- Copies the values as displayed in the entry editor, either decorated or not.

- Icon:

Advanced > Copy Values (UTF-8)

- Copies the selected values UTF-8 encoded to the system clipboard.

- Icon:

Advanced > Copy Values (BASE-64)

- Copies the selected values BASE-64 encoded to the system clipboard.

- Icon:

Advanced > Copy Values (HEX)

- Copies the selected values HEX encoded to the system clipboard.

- Icon:

Advanced > Copy Name-Value-Pairs as LDIF

- Copies the selected attribute and values in LDIF format to the system clipboard.

- Icon:

Advanced > Copy Search Filter

Builds search filters from the selected attributes and values. There are four options:

- Default

    - Copies the selected attribute and value as LDAP search filter (attribute=value).

    - Icon: (=)

    - Enabled: If one value is selected.

- NOT

    - Copies the selected attribute and value as LDAP NOT search filter (!(attribute=value)).

    - Icon: (!)

    - Enabled: If one value is selected.

- AND

    - Copies the selected attributes and values as LDAP AND search filter (&(attribute1=value1)... (attributeN=valueN)).

    - Icon: (&)

- OR

    - Copies the selected attributes and values as LDAP OR search filter (|(attribute1=value1)... (attributeN=valueN)).

    - Icon: (|)

Advanced > Delete Attributes

- Deletes all values of the selected attributes. Applicable to multi-valued attributes, if you want to delete the complete attribute just select one value use this action.

- Icon:

- Enabled: If values of multi-valued attributes are selected.

Edit Attribute Description

- Opens the Edit Attribute wizard . When changing the attribute description a add operation and a delete operation is performed.

- Enabled: If one attribut or value is selected.

- Shortcut: **F6**

Edit Value

- Edits the selected value using the default value editor. To change the default value editor see Value Editors preferences .

- Enabled: If one value is selected.

- Shortcut: **F7** or **Enter**

Edit Value With

- Depending on the selected value there could be alternate value editors. To edit the selected value with another value editor choose one of the listed editors.

- Enabled: If one value is selected.

Edit Entry...

- Opens the Editor Entry Wizard, used to edit the entry offline.

- Shortcut: **F8**

Reload Attributes

- Reloads the attributes of the current entry.

- Icon: 🔄

- Shortcut: **F5**

Fetch Operational Attributes

- Loads the operational attributes of the current entry.

Properties

- Opens the Properties dialog with the Attribute properties page or Value properties page .

- Shortcut: **Alt**-**Enter**

2.3.4. LDIF Entry Editor Overview

The LDIF Entry editor allows you to view and edit an entry using its LDIF representation. An LDIF content record is used to display all attributes and values.

You could add, modify and delete attributes. To save the modifications to the directory server you must explicitly save the editor.

It is not possible to modify the distinguished name. It is also not possible to add change the record type or to add additional records.

Example screenshot
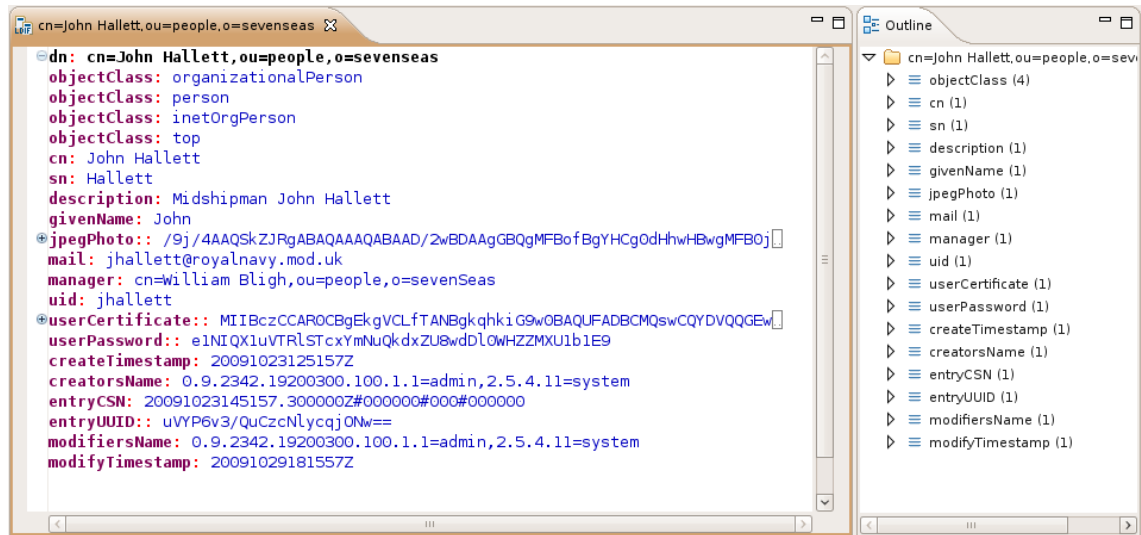
2.3.5. LDIF Entry Editor Context Menu

This section describes the context menu of the LDIF Entry editor.

Undo Typing

- Undo the last typing.

- Shortcut: **Ctrl-Z**

Revert File

- Reverts all unsaved modifications.

Save

- Saves the modified entry to the directory server.

- Shortcut: **Ctrl-S**

Cuts

- Cuts the selected text to the clipboard.

- Shortcut: **Ctrl-X**

Copy

- Copies the selected text to the clipboard.

- Icon:

- Shortcut: **Ctrl-C** or **Ctrl-Insert**

Paste

- Pastes the content of the clipboard.

- Icon: 📋

- Shortcut: **Ctrl-V** or **Shift-Insert**

Edit Attribute Description

- Opens the Edit Attribute wizard.

- Enabled: If one attribute is selected.

- Shortcut: **F6**

Edit Value

- Edits the selected value using the default value editor. To change the default value editor see Value Editors preferences .

- Enabled: If one value is selected.

- Shortcut: **F7**

Edit Value With

- Depending on the selected value there could be alternate value editors. To edit the selected value with another value editor choose one of the listed editors.

- Enabled: If one value is selected.

Edit Record

- Opens the LDIF Record Editor dialog.

- Shortcut: **F8**

Reload Attributes

- Reloads the attributes of the current entry.

- Icon: 🔗

- Shortcut: **F5**

Fetch Operational Attributes

- Loads the operational attributes of the current entry.

Preferences

- Opens the LDIF Editor preferences.

2.4. Search Result editor

The Search Result editor is used to view and edit search results. Although it is placed in the editor area there is only a single instance of the Search Result editor.

2.4.1. Overview

This section describes general aspects of the Search Result editor.

Example screenshot
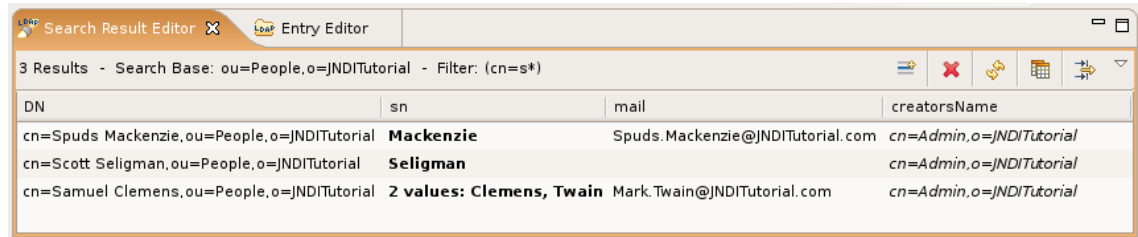
Layout

The Search Result editor has a multi-column layout, one column for each returning attribute defined in search parameters. Each line represents a search result with its values.

The cells have the following meaning:

- A value indicates that the entry has such an attribute with exactly one value.

- An empty cell indicates that the entry hasn't such an attribute.

- X values: ... indicates that the entry has multiple values for that attribute.

You can choose whether the DN of each search result is displayed as first column. Toggle **Toolbar menu -> Show DN** .

Fonts and Colors

To distinguish the different attribute classes the Search Result editor uses the same fonts and colors as the Entry editor .

Toolbar

The toolbar contains the following items:

Icon	Action	Description	Shortcut
⇒	New Value	Adds a new value to the selected attribute and starts the edit mode.	**Ctrl-+**
✖	Delete	Deletes the selected attribute.	**Delete**
↻	Refresh	Performs the current search.	**F5**
▦	Copy Table	Copies values as displayed in the table as CSV. By default the tabulator is used as attribute delimiter, a pipe is used as value delimiter and each attribute is wrapped by double-quotes. These settings are suitable to paste the copied data into Excel or OpenOffice, the settings could be changed in Text Formats preferences .	

Icon	Action	Description	Shortcut
⇥	Show Quick Filter	Shows/Hides the Quick Filter .	**Ctrl-F**

Drop Down Menu

The drop down menu contains the following items:

- Show DN: If checked the distinguished name of each search result is displayed as first column.

- DN as link: If checked the distinguished name of each search result is a link. Clicking to this link will open the search result entry.

- Show Decorated Values: If checked decorated values are displayed, this means some additional information is displayed:

  - Images: Image format, width, height, and size.

  - Binary data: Data size.

  - Passwords: Used hash method.

  - Timestamps: Locale dependent date and time format.
  If unchecked the raw values (as stored in directory) are displayed.

- Preferences...: Opens the Search Result editor preferences dialog.

2.4.2. Features

This section describes the features of the Search Result editor.

Sorting

To sort the search results by attributes click the column header. The current sort attribute and direction is indicated by an arrow.

Quick Filter

If there are many search results it is difficult to find a specific one. The Quick Filter provides a client-side filter. To show/hide the Quick Filter toggle the ⇥ button or press **Ctrl-F** . Enter (even parts of) a value into the input field, only matching search results keep displayed. When hiding the filter is removed.
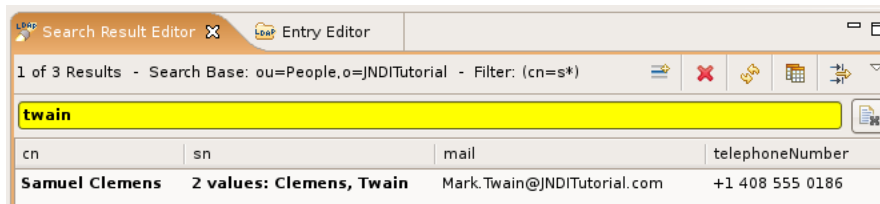
Navigation

The 🔲 **Locate DN in DIT** action locates and opens the entry of a selected DN in the DIT.

The 🔖 **Open Search Result** action locates and opens the selected search result.

Copy Table

The ▦ **Copy Table** action copies attributes as displayed in the table to the system clipboard.

By default the tabulator is used as attribute delimiter, a pipe is used as value delimiter and each attribute is wrapped by double-quotes. These settings are suitable to paste the copied data into Excel or OpenOffice, the settings could be changed in Text Formats preferences .

Editing

It is possible to add, edit or delete the displayed attributes of the search results in the Search Result editor.

To enter the edit mode using the default value editor select a cell and press **Enter** or **F7** or double-click the cell. If the attribute is a simple string (like givenName or telephoneNumber) the value could be edited in-place, otherwise a specific value editor dialog is opened. To use a specific value editor choose one from **Context Menu -> Edit Value With** .

To finish editing press Enter or click to another cell or click the OK button in a value editor dialog. To cancel editing press ESC or click the Cancel button in a value editor dialog.

Multivalued Editor

In LDAP it is possible (and even normal) that an entry has multivalued attributes. To handle this in a spreadsheet-like editor a special editor is necessary:

- In the cell a multivalued attribute is displayed as "X values: ..." to show the number of values and a preview

- When entering edit mode the Multivalued Editor dialog is opened.

The Mulivalued Editor is similar to the Entry editor: you could add, edit and delete values. Of course it is limited to edit only the current attribute, not the whole entry.

When editing a multivalued attribute the Multivalued Editor is used as default value editor. When editing a singlevalued attribute you could select **Context Menu -> Edit Value With ->** 🗎 **Multivalued Editor** .

2.4.3. Context Menu

This section describes the context menu of the Search Result editor.

New Value

- Icon: ⇗

- Description: Adds a new value to the selected attribute and starts the edit mode. If the attribute already contains one or multiple values the Multivalued Editor is opened.

- Enabled: If an attribute is selected.

- Shortcut: **Ctrl-+**

New Search...

- Icon: 🚀

- Description: Opens the Search dialog . The selected attribute is used to build the search filter (Query by example).

- Enabled: If an attribute is selected.

- Shortcut: **Ctrl-H**

New Batch Operation...

- Icon: 🏷️

- Description: Opens the Batch Operation wizard . If an attribute with one or multiple DNs values are selected these DNs are used as operation objects. Otherwise the selected attribute is used to build the search filter (Query by example).

- Enabled: If an attribute is selected.

Locate DN in DIT

- Icon: 🔗

- Description: Locates the entry of the selected DN in DIT.

- Shortcut: **F3**

Open Search Result

- Icon: 🔍

- Description: Locates and opens the search result.

- Shortcut: **F4**

Open Schema Browser -> Object Class Definition

- Icon: ⊙

- Description: Opens the Object Class page in Schema Browser and selects the object class definition of the currently selected objectClass attribute.

- Enabled: If the objectClass attribute is selected and the schema contains this object class.

Open Schema Browser -> Attribute Type Definition

- Icon: Ⓐ

- Description: Opens the Attribute Type page in Schema Browser and selects the attribute type definiton of the currently selected attribute.

- Enabled: If an attribute is selected and the schema contains this attribute type.

Open Schema Browser -> Equality Matching Rule Definition

- Icon: 🏷️

- Description: Opens the Matching Rule page in Schema Browser and selects the equality matching rule definiton of the currently selected attribute.

- Enabled: If an attribute is selected, the attribute provides an equality matching rule and the schema contains this matching rule.

Open Schema Browser -> Substring Matching Rule Definition

- Icon:

- Description: Opens the Matching Rule page in Schema Browser and selects the substring matching rule definiton of the currently selected attribute.

- Enabled:If an attribute is selected, the attribute provides a substring matching rule and the schema contains this matching rule.

Open Schema Browser -> Ordering Matching Rule Definition

- Icon:

- Description: Opens the Matching Rule page in Schema Browser and selects the ordering matching rule definiton of the currently selected attribute.

- Enabled: If an attribute is selected, the attribute provides an ordering matching rule and the schema contains this matching rule.

Open Schema Browser -> Syntax Definition

- Icon:

- Description: Opens the Syntax page in Schema Browser and selects the syntax definiton of the currently selected attribute.

- Enabled: If an attribute is selected, the attribute provides an syntax and the schema contains this syntax.

Copy Values

- Icon:

- Description: Copies the values of the selected attribute. The values are copied to clipboard in an internal format so they could be pasted to another entry even in the entry editor. Additional they are copied to the system clipboard as string so they could be pasted in other applications. New-line is used as value separator. Binary values are copied BASE-64 encoded.

- Shortcut: **Ctrl-C** or **Ctrl-Insert**

Paste Values

- Icon:

- Description: Pastes the previously copied values to the selected attribute.

- Enabled: If the system clipboard contains values.

- Shortcut: **Ctrl-V** or **Shift-Insert**

Delete

- Icon: ✖

- Description: Deletes the selected attribute.

- Enabled: If an attributes is selected.

- Shortcut: **Delete**

Advanced -> Copy DN

- Icon:

- Description: Copies the distinguished name of the current search result (e.g. cn=John Fowler,ou=People,o=JNDITutorial)

Advanced -> Copy URL

- Icon:

- Description: Copies the URL of the current search result (e.g. ldap://localhost:389/cn=John Fowler,ou=People,o=JNDITutorial)

Advanced -> Copy Attribute Description

- Icon:

- Copies the attribute description of the selected attribute as string to the system clipboard.

Advanced -> Copy Values (UTF-8)

- Icon:

- Copies the selected values UTF-8 encoded to the system clipboard.

Advanced -> Copy Values (BASE-64)

- Icon:

- Copies the selected values BASE-64 encoded to the system clipboard.

Advanced -> Copy Values (HEX)

- Icon:

- Copies the selected values HEX encoded to the system clipboard.

Advanced -> Copy Name-Value-Pairs as LDIF

- Icon:

- Copies the selected attribute in LDIF format to the system clipboard.

Advanced -> Copy Search Filter

Builds search filters from the selected attribute. There are four options:

- Default

    - Icon: (=)

    - Description: Copies the selected attribute as LDAP search filter (attribute=value).

    - Enabled: If a singlevalued attribute is selected.

- NOT

    - Icon: (!)

    - Description: Copies the selected attribute as LDAP NOT search filter (!(attribute=value)).

    - Enabled: If a singlevalued value is selected.

- AND

    - Icon: (&)

    - Description: Copies the selected attribute as LDAP AND search filter (&(attribute1=value1)...
    (attributeN=valueN)).

- OR

    - Icon: (|)

    - Description: Copies the selected attribute as LDAP OR search filter (|(attribute1=value1)...
    (attributeN=valueN)).

Edit Value

- Edits the selected attribute using the default value editor. To change the default value editor see Value
  Editor preferences .

- Enabled: If an attribute is selected.

- Shortcut: **F7** or **Enter**

Edit Value With

- Depending on the selected attribute there could be alternate value editors. To edit the selected attribute
  with another value editor choose one of the listed editors.

- Enabled: If an attribute is selected.

Search Again

- Icon:

- Performs the search again.

- Shortcut: **F5**

Properties

- Description: Opens the Properties dialog with the attribute properties page or entry properties page .

- Shortcut: **Alt-Enter**

2.5. Schema Browser

With the Schema Browser you can browse the schema with its schema elements like object classes, attribute types, matching rules and syntaxes. It is placed in the editor area.

2.5.1. Overview

This section describes general aspects of the Schema Browser.

Example screenshot
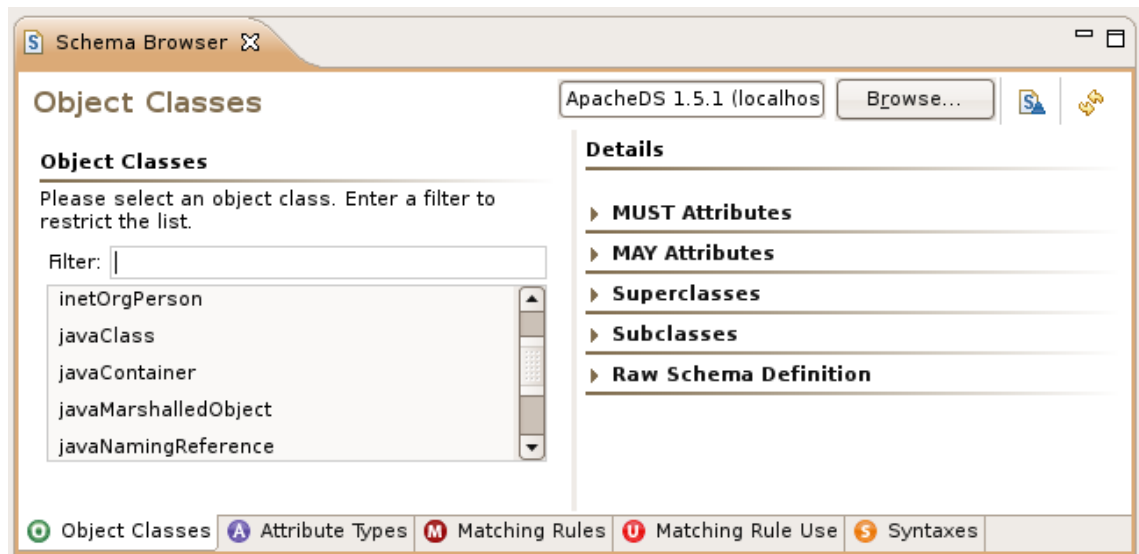
Layout

The header of the Schema Browser contains the title and the toolbar. The toolbar shows the connection of the currently displayed schema and a Browse... button to select another connection.

The Schema Browser consists of five pages:

- Object Classes page

- Attribute Type page

- LDAP Syntaxes page

- Matching Rules page

- Matching Rule Use page

Each page has a master-detail layout. The left part of a page shows a list of all schema elements (like object class names or attribute types). To search a schema element you can filter the list by typing the

name of the schema element into the filter input field. When selecting one schema element the right part of the page shows the details.

Navigation

In the detail section references to other schema elements are displayed as hyperlinks. Click to the hyperlink to jump to the target schema element.
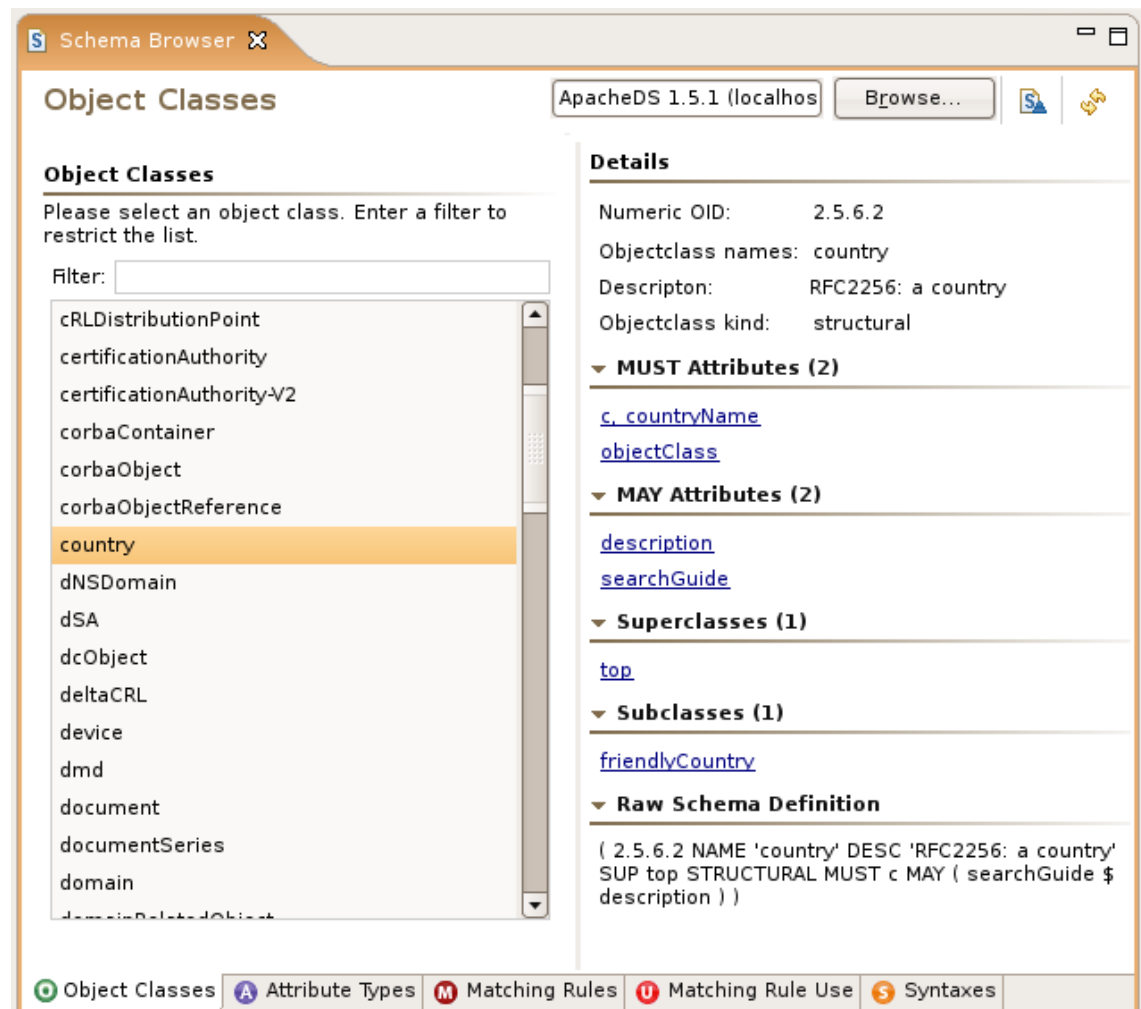
Toolbar

The toolbar contains the following items:

Icon	Action	Description
⑤	Show Default Schema	Shows the default schema instead of the schema of the currently selected connection.
↻	Reload Schema	Reloads the schema of the currently selected connection.

2.5.2. Object Classes

The Object Classes page shows the object classes defined in schema.

The left part of the page lists the available object classes.

The right part of the page shows the details of the selected object class:

• Details: Shows the OID, names, description and kind of the object class.

• MUST Attributes: Shows all MUST attributes, even those inherited from superclasses.

• MAY Attributes: Shows all MAY attributes, even those inherited from superclasses.

• Superclasses: Shows the object classes this object class is directly derived from (in other words the parents).

• Subclasses: Shows the object classes derived from this object class (in other words the children).

• Raw Schema Definition: Shows the raw value of the object class definition as returned from server.

2.5.3. Attribute Types

The Attribute Types page shows the attribute types defined in schema.

The left part of the page lists the available attribute types.

The right part of the page shows the details of the selected attribute type:

- Details: Shows the OID, names, description and usage of the attribute type.

- Flags: Shows if the attribute type is single-valued, read-only and/or collective. Non-matching flags are greyed-out.

- Syntax: Shows the syntax OID and description and optional a length of the attribute type.

- Matching Rules: Shows the equality, substring and ordering matching rules of the attribute type.

- Other Matching Rules: Shows additional matching rules applicable to the attribute type.

- Used as MUST: Shows object classed where this attribute type is used as MUST.

- Used as MAY: Shows object classed where this attribute type is used as MAY.

- Supertype: Shows the attribute type where this attribute is derived from (in other words the parent).

- Subtypes: Shows attribute types derived from this attribute types (in other words the children).

- Raw Schema Definition: Shows the raw value of the attribute type definition as returned from server.

2.5.4. Syntaxes

The Syntaxes page shows the syntaxes defined in schema.
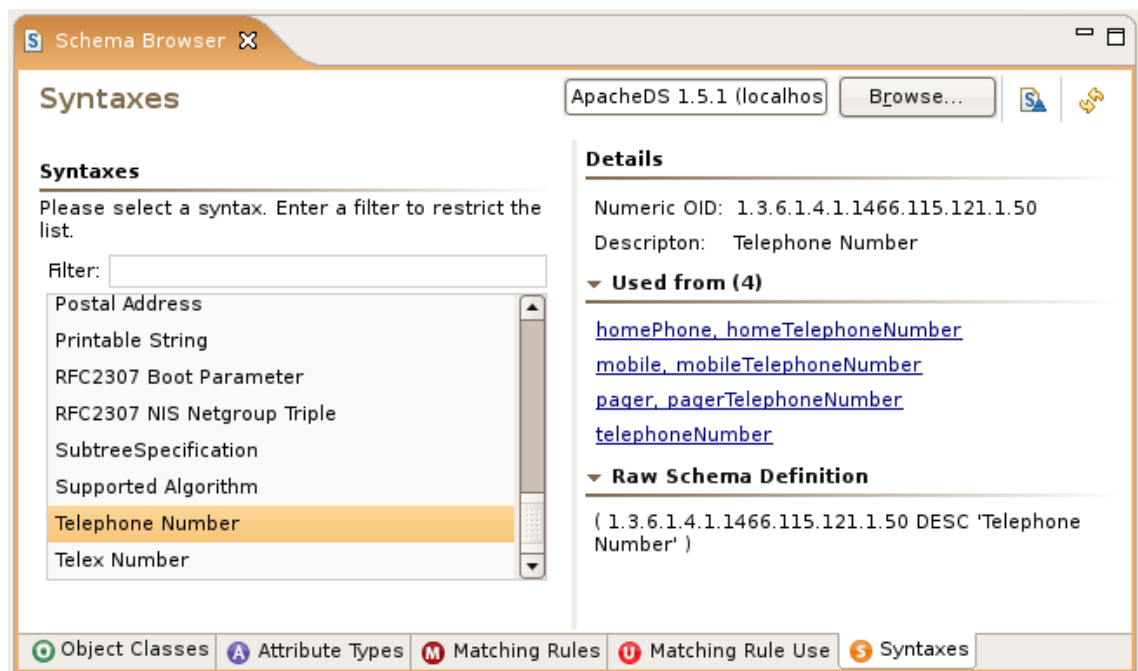
The left part of the page lists the available syntaxes.

The right part of the page shows the details of the selected syntax:

- Details: Shows the OID description of the syntax.

- Used from: Shows attribute types using this syntax.

- Raw Schema Definition: Shows the raw value of the syntax definition as returned from server.

2.5.5. Matching Rules

The Matching Rules page shows the matching rules defined in schema.
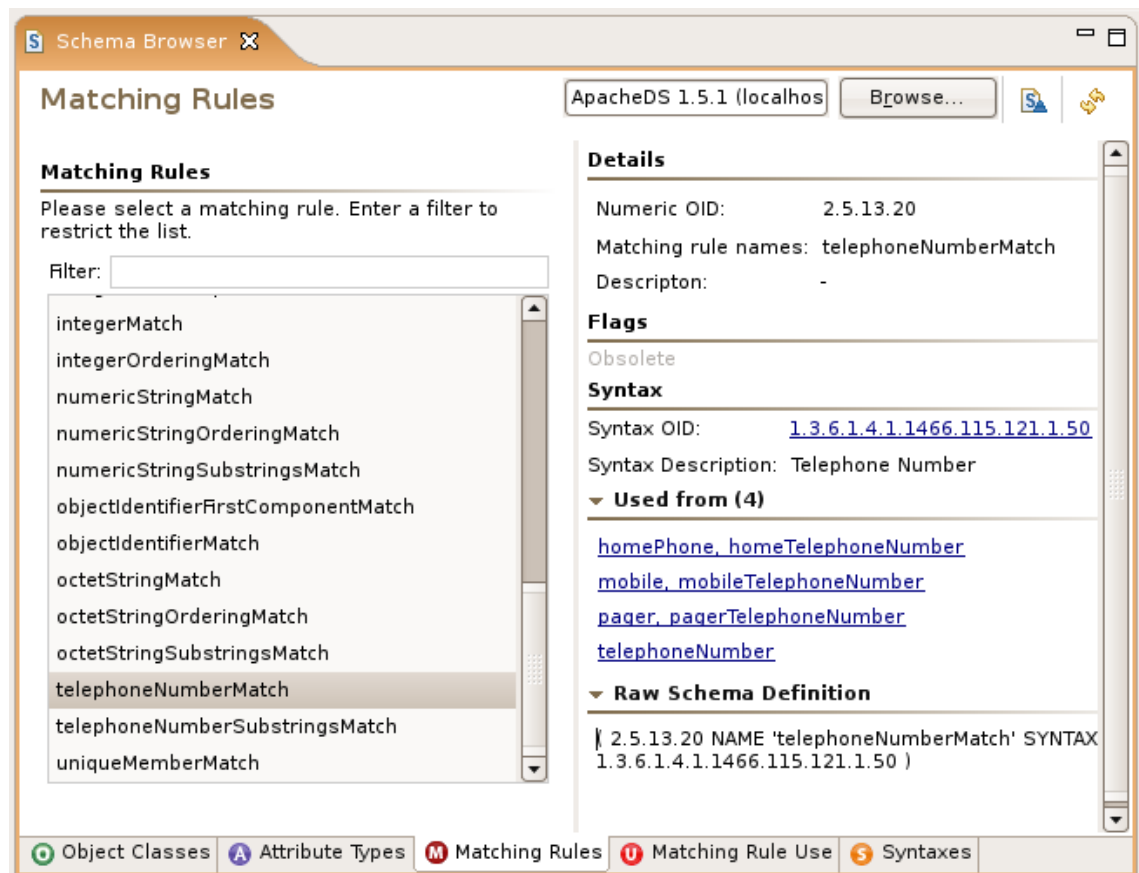
The left part of the page lists the available matching rules.

The right part of the page shows the details of the selected matching rule:

- Details: Shows the OID, name and description of the matching rule.

- Syntax: Shows the syntax OID and description of the matching rule.

- Used from: Shows attribute types using this matching rule.

- Raw Schema Definition: Shows the raw value of the matching rule definition as returned from server.

2.5.6. Matching Rule Use

The Matching Rule Use page shows the matching rule uses defined in schema.
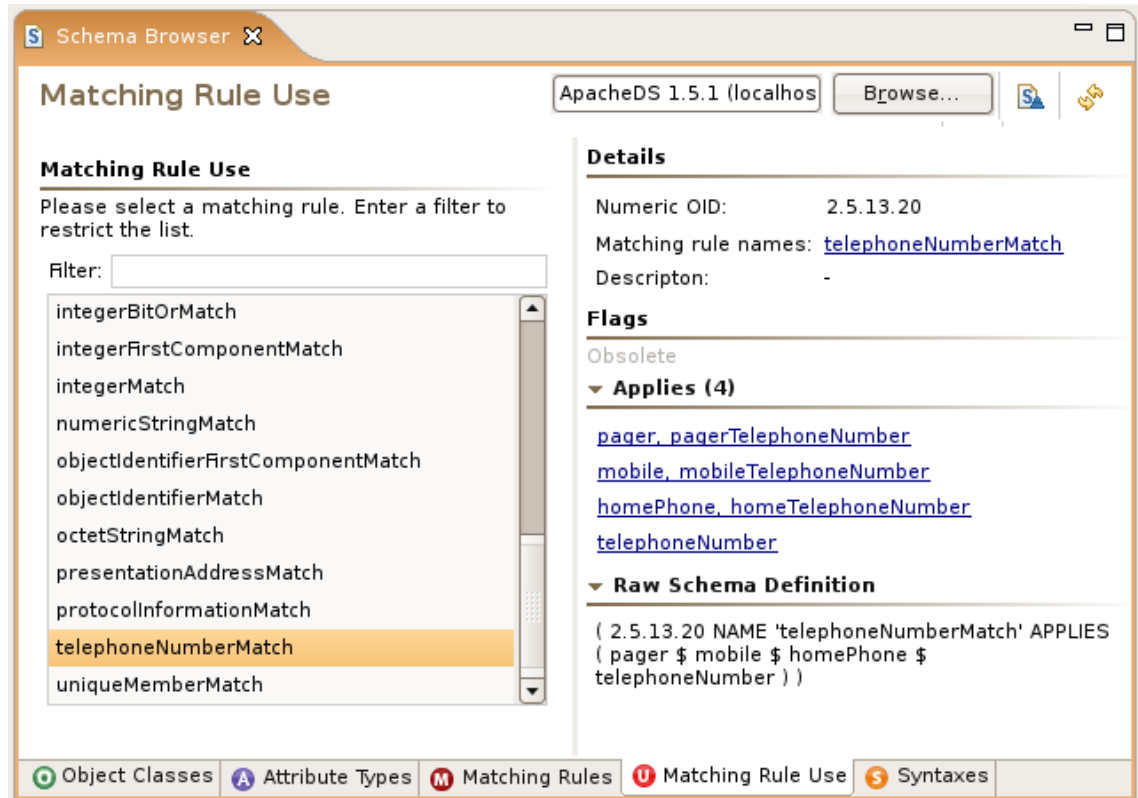
The left part of the page lists the available matching rule use descriptions.

The right part of the page shows the details of the selected matching rule use:

- Details: Shows the OID, namees and description of the matching rules.

- Applies: Shows attribute types this matching rule applies to.

- Raw Schema Definition: Shows the raw value of the matching rule use definition as returned from server.

2.6. Modification Logs view

The Modification Logs view shows all sucessful and failed modifications.

Concept

All modify operations are logged to a logfile in LDIF format. Additionally the result (OK or ERROR) is prepended as LDIF comment to every log record.

Example log of a sucessfully performed modification:
```
#!RESULT OK
#!CONNECTION ldap://localhost:389
#!DATE 2006-11-04T21:32:40.134
dn: cn=Ted Geisel,ou=People,o=JNDITutorial
changetype: modify
add: mail
mail: Ted.Geisel@JNDITutorial.com
-
```

Example log of a failed modification:
```
#!RESULT ERROR
#!CONNECTION ldap://localhost:389
#!DATE 2006-11-04T21:33:05.739
#!ERROR [LDAP: error code 20 - modify/add: mail: value #0 already exists]
dn: cn=Ted Geisel,ou=People,o=JNDITutorial
changetype: modify
add: mail
mail: Ted.Geisel@JNDITutorial.com
-
```

The modification logging mechanism works with logfile rotation. By default 10 logfiles each with 100KB per connection are used, you may change these settings in the Modification Logs preferences .

Example screenshot
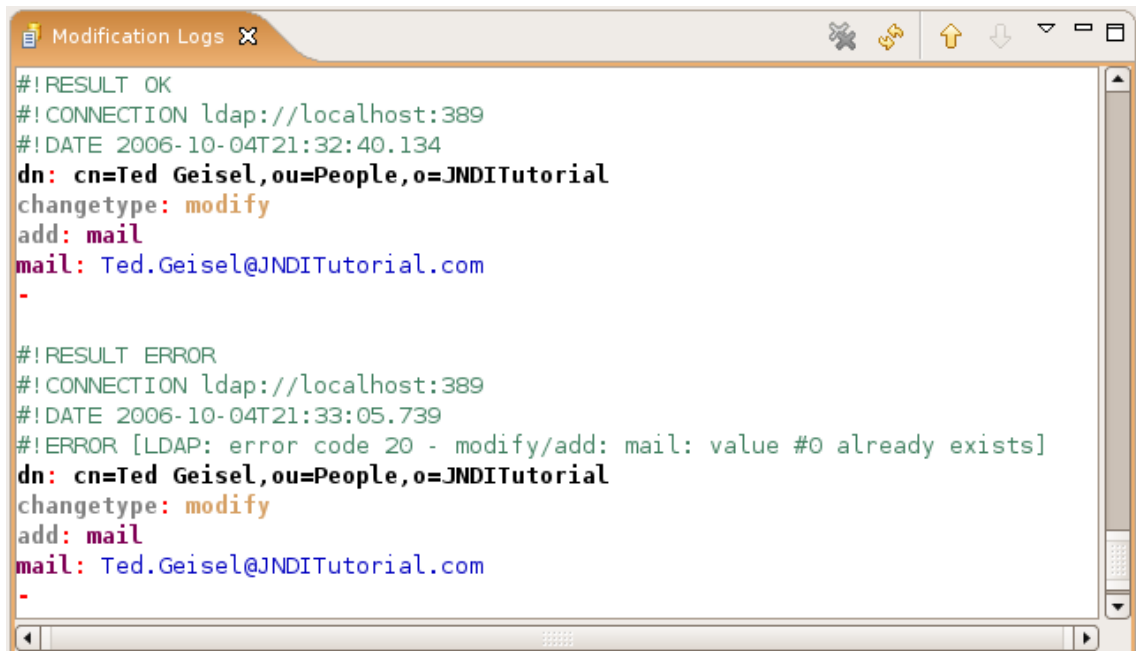
Toolbar

Icon	Action	Description
✖	Clear	Clears the current modification logfile.
↻	Refresh	Reloads the current modification logfile.
⬆	Older	Loads an older modification logfile.
⬇	Newer	Loads a newer modification logfile.
↗	Export Modification Logs...	Exports the modification logs to a file.

Drop Down Menu

The drop down menu contains the following items:

- Enable Modification Logs: Enables/Disables the modification logs.

- Preferences...: Opens the Modification Logs preferences dialog.

2.7. Search Logs view

The Search Logs view shows all search requests and optionally all received search result entries.

Concept

All search requests are logged in LDIF to a logfile, it consists of three parts:

- The initial SEARCH REQUEST record. It contains all search request parameters like search filter, scope and requested attributes. It also contains the command line argument that could be used to send the same request using the ldapsearch command line tool.

- Optional multiple SEARCH RESULT ENTRY records, one for each received entry.

- The final SEARCH RESULT DONE record. It contains the number of received entries.

Each part contains a unique number that helps to put together all parts for a specific request in case that there are multiple requests in parallel.

Example log of a SEARCH REQUEST record:
```
#!SEARCH REQUEST (112) OK
#!CONNECTION ldap://localhost:10389
#!DATE 2008-08-26T16:31:59.271
#     LDAP     URL    :     ldap://localhost:10389/dc=example,dc=com?
objectClass,cn,description?one?(objectClass=*)
#  command  line  :  ldapsearch  -H  ldap://localhost:10389  -x  -D
"uid=admin,ou=system" -W -b "dc=example,dc=com" -s one -a always -z 1000
"(objectClass=*)" "objectClass" "cn" "description"
# baseObject : dc=example,dc=com
# scope : singleLevel (1)
# derefAliases : derefAlways (3)
# sizeLimit : 1000
# timeLimit : 0
# typesOnly : False
# filter : (objectClass=*)
# attributes : objectClass cn description
```

Example log of a SEARCH RESULT ENTRY record:
```
#!SEARCH RESULT ENTRY (112) OK
#!CONNECTION ldap://localhost:10389
#!DATE 2008-08-26T16:31:59.272
dn: cn=test,dc=example,dc=com
objectClass: person
objectClass: top
cn: test
```

Example log of a SEARCH RESULT DONE record:
```
#!SEARCH RESULT DONE (112) OK
#!CONNECTION ldap://localhost:10389
#!DATE 2008-08-26T16:31:59.273
# numEntries : 1
```

The search logging mechanism works with logfile rotation. By default 10 logfiles each with 100KB per connection are used, you may change these settings in the Search Logs preferences

Example screenshot
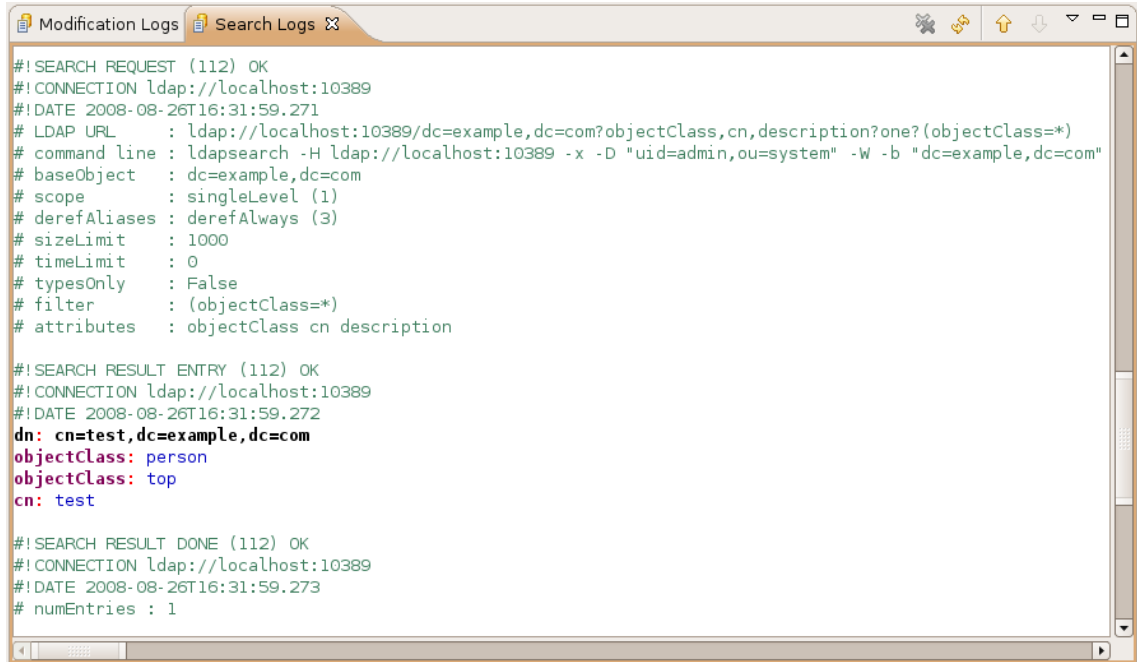
Toolbar

Icon	Action	Description
✸	Clear	Clears the current search logfile.
⟳	Refresh	Reloads the current search logfile.
⬆	Older	Loads an older search logfile.
⬇	Newer	Loads a newer search logfile.
↗	Export Search Logs...	Exports the search logs to a file.

Drop Down Menu

The drop down menu contains the following items:

• Enable Search Request Logs: Enables/Disables the search request and search result done logs.

• Enable Search Result Entry Logs: Enables/Disables the search result entry logs. Note: You should only activate this options for debug reasons, otherwise your logfile will overfill very fast.

• Preferences...: Opens the Search Logs preferences dialog.

2.8. Progress view

Long-running operations, especially every access to directories, are executed in background. The Progress view shows such pending operations.
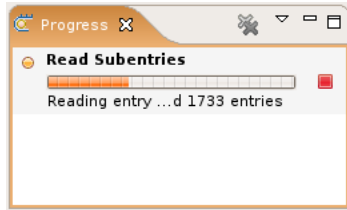
To cancel a long-running operation press the stop button.

3. Wizards and dialogs

3.1. New Connection wizard

This wizard helps you to create a new connection to a LDAP directory.

To start the wizard choose one of the following options:

* In the Connections view select the ⊞ **New Connection...** button or select **New Connection...** from the context menu.

* In the Workbench window's toolbar, activate the drop-down menu on the New Wizard button and select **LDAP Connection**

* In the Workbench menu bar select **File > New > LDAP Connection** .

The creation of a new LDAP connection is a four-step process:

1. Define network parameters.

2. Define authentication parameters.

3. Define additional browser options (optional).

4. Define additional edit options (optional).

Page 1

The first page allows you to enter a connnection name and the network parameters.
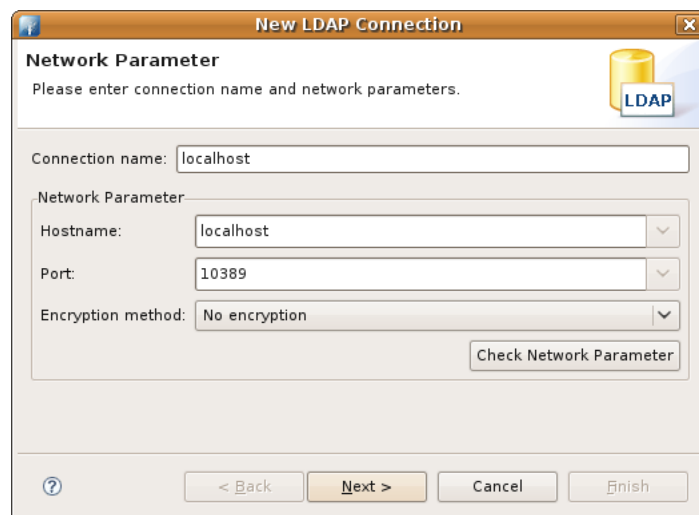
Option	Description	Default
Connection name	The name of the connection. In the Connections view the connection is listed with this name. The name must be unique.	empty
Hostname	The hostname or IP address of the LDAP server. A history of recently used hostnames is available through the drop-down list.	empty
Port	The port of the LDAP server. The default port for non-encyrpted connections is 389. The default port for ldaps:// connections is 636. A history of recently used ports is available through the drop-down list.	389
Encryption method	The encryption to use. Possible values are 'No encrypton', 'ldaps://' and 'StartTLS extension'.	No encryption
Check network parameter	Use this function if you want validate that the entered information is correct and the server is reachable.	-

Page 2

On the second page you could specify the authentication parameters.

Option	Description	Default
Authentication Method	Select your authentication method between: • Anonymous Authentication: connects to the directory without authentication. • Simple Authentication: uses simple authentication using a bind DN and password, the credentials are transmitted in clear-text over the network.	Simple Authentication

Option	Description	Default
	• CRAM-MD5 (SASL): authenticates to the directory using a challenge-response authentication mechanism, the credentials are not transmitted in clear-text over the network. • DIGEST-MD5 (SASL): another challenge-response authentication mechanism, additionally you could define your realm and QoP parameters. • GSSAPI (Kerberos): users Kerberos based authentication, additional parameters could be defined.	
Bind DN or user	The distinguished name or user ID used to bind. Previously entered DNs could be selected from drop-down list.	empty
Bind Password	The password used to bind.	empty
Save password	If checked the password will be saved in configuration. If not checked you have to enter the password whenever you connect to the server. Warning: The password is saved as plain text!	checked
Check Authentication	Use this function if you want to attempt a connection plus a bind to the host upon completion of the wizard to validate that the entered information is correct.	-

Additional authentication parameters for SASL and Kerberos:

Option	Description	Default
SASL Realm	The SASL Relam used to bind, only applicaple if DIGEST-MD5 is choosen.	empty
Quality of Protection	The QoP to use: authentication only, with integrity protection, and with privacy protection	Authentication only
Protection Strength	The protection strength to use	High

Option	Description	Default
Mutual Authentication	If checked mutual authentication is used, that means the server has to authenticate itself to the client. If unchecked only the client authenticates itself to the server.	unchecked
Use native TGT	If checked the native credential cache is used, thus no additional authentication is necessary. Note that on Windows systems that requires a modification of the registry.	checked
Object TGT from KDC	If checked a new TGT is obtained from the KDC. Username and password must be provided.	unchecked
Use native system configuration	If checked the native Kerberos configuration is used (e.g. /etc/krb5.conf).	checked
Use configuration file	If checked a custom configuration file could be used.	unchecked
Use following configuration	If checked the Kerberos configuration parameters (realm, host, port) could be set in the dialog.	unchecked

Page 3

On the third page you could enter additional browser options .

Option	Description	Default
Get base DNs from Root DSE	If checked the base DNs are fetched from namingContexts attribute of the Root DSE.	checked

Option	Description	Default
Fetch Base DNs	Use this function to get the namingContext values from the Root DSE. The returned values will appear in the 'Base DN' drop-down list.	-
Base DN	The base DN to use. You may enter a DN manually or you may select one from the drop-down list. This field is only enabled if the option 'Get base DNs from root DSE' is off.	empty
Count Limit	Maximum number of entries returned from server when browsing the directory, it is also used as default value when searching the directory. A value of 0 means no count limit. Note that this value is a client-side value, its possible that also a server-side limit is used.	1000
Time Limit	The maximum time in seconds the server searches for results. This is used as default value when browsing or searching the directory. A value of 0 means no limit. Note that this value is a client-side value, its possible that also a server-side limit is used.	0
Alias Dereferencing	Specifies whether aliases should be dereferenced while finding the search base entry or when performing the search or both. To manage (create, modify, delete) alias objects you have to uncheck both options.	Both finding and searching
Referrals Handling	Specifies the referral handling. • Follow Referrals manually: Received referrals and search continuations are just displayed in the Browser. As soon as you open or expand such an search continuation the search is continued. You are asked which connection you want to use to follow a specific referral URL, this way you have full control regarding encryption and authentication options when following referrals. • Follow Referrals automatically: Follows referrals and search continuations immediately if they are received from the directory server. You are asked which connection you want to use to follow a specific referral URL, this way you have full control regarding encryption and authentication options when following referrals. • Ignore Referrals: Any referral or search continuation received from the directory server is silently ignored. No error is logged, no dialog appears, no special entry is displayed in the DIT, no ManageDsaIT control is sent to the server.	Follow Referrals manually
Use ManageDsaIT control while browsing	If enabled the ManageDsaIT control is sent to the server in each request. This signals the	unchecked

Option	Description	Default
	directory server to not send referrals and search continuations, but return the special referral objects. This only works if the directory server supports the ManageDsaIT control.	
Fetch subentries while browsing	If enabled enabled both, normal and subentries according to RFC 3672 are fetched. This causes additional search requests while browsing the directory.	unchecked
Paged Search	If enabled the simple paged result control is used while browsing the directory. With the page size you could define how many entries should be retrieved in one request. If Scroll Mode is enabled only one page is fetched from the server at once while browsing, you could 'scroll' through the pages by using the 'next page' and 'top page' items. If disabled **all** entries are fetched from the server, the paged result control is only used in background to avoid server-side limits.	unchecked
Fetch operational attributes while browsing	If enabled enabled both, user attributes and operational attributes are retrieved while browsing. If the server supports the feature 'All Operational Attributes' then a '+' is used to retrieve operational attributes, otherwise all operational attributes defined in the schema are requested.	unchecked

Page 4

On the fourth page you could enter additional edit options.
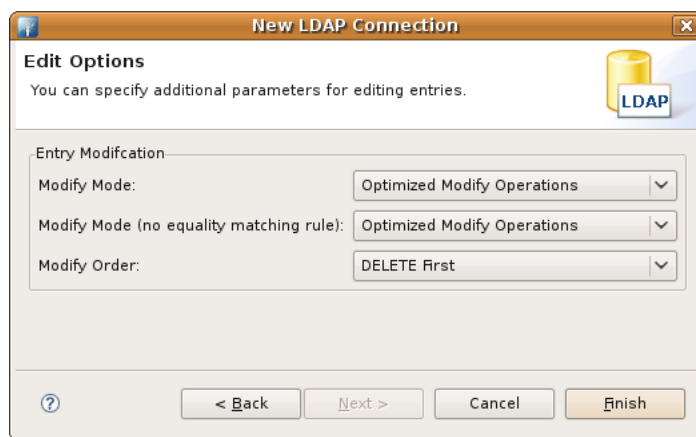
Option	Description	Default
Modify Mode	Specify the modify mode for attributes with an equality matching rule. Description of options: • Default: uses add/delete by default, uses replace for X-ORDERED attributes	Default

Option	Description	Default
	• Always REPLACE: always uses replace operations to perform entry modifications • Always ADD/DELETE: always uses add and/or delete operations to perform entry modifications	
Modify Mode (no equality matching rule)	Specify the modify mode for attributes with *no* equality matching rule. Description of options: • Default: uses add/delete by default, uses replace for X-ORDERED attributes • Always REPLACE: always uses replace operations to perform entry modifications • Always ADD/DELETE: always uses add and/or delete operations to perform entry modifications Recommended values for various LDAP servers: • ApacheDS: Default or REPLACE • OpenLDAP: REPLACE • OpenDS / SunDSEE: Default or REPLACE • FedoraDS / 389DS: Default (missing equality matching rules for many standard attribute types) • Active Directory: Default (exposes no equality matching rules at all) • eDirectory: Default (exposes no equality matching rules at all)	Default
Modify Order	Specify the modify order when using add and delete operations.	Delete first

3.2. New Entry wizard

This wizard helps you to create a new entry.

To start the wizard choose one of the following options:

• In the LDAP Browser view select an entry or search result or bookmark. Then choose 🗀 **New > New Entry...** from context menu.

• In the Workbench window's toolbar, activate the drop-down menu on the New Wizard button and select **LDAP Entry**

• In the Workbench menu bar select **File > New > LDAP Entry** .

The creation of a new LDAP entry is a four-step process:

1. Select entry creation method.

2. Specify object classes of the new entry.

3. Specifiy the distinguished name of the new entry.

4. Enter attributes and values of the new entry.

Page 1

First you have to select the entry creation method.
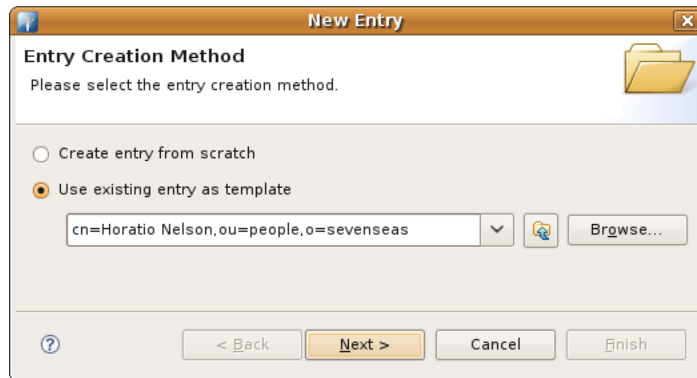
With the option **Create entry from scratch** you could create a the new entry from scratch. All object classes and attributes have to be specified in the wizard.

The option **Use existing entry as template** allows you to use an existing entry with its object classes and attributes as template. The entry used as template could be specified in the input field:

- By default the DN of entry that was selected when the wizard has been started is used as template entry.

- You could manually edit the DN of the templayte entry.

- You could choose a previously used DN from drop-down list.

- By clicking **Browse....** you could open a dialog to select the DN of the template entry.

Page 2

On the second page you have to choose the object classes of the new entry.
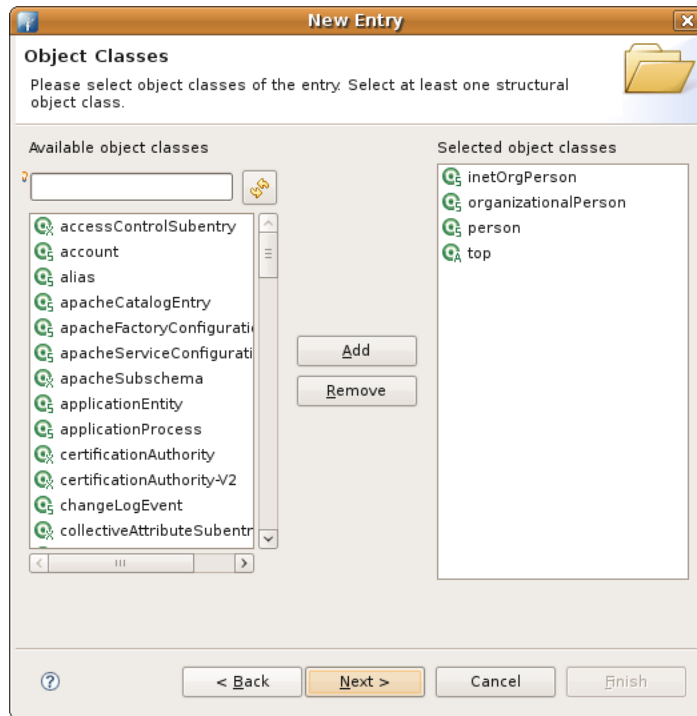
The list **Available object classes** on the left side lists the object classes provided from schema of the current connection. The list **Selected object classes** lists the object classes of the new entry. To add object classed to the "selected" list select some in the "available" list and click the **Add** button. You could also double-click an object class in the "available" list. To remove object classed from the "selected" list select some in the "selected" list and click the **Remove** button. You could also double-click an object class in the "selected" list.

Page 3

On the third page you have to define the distinguished name of the new entry.
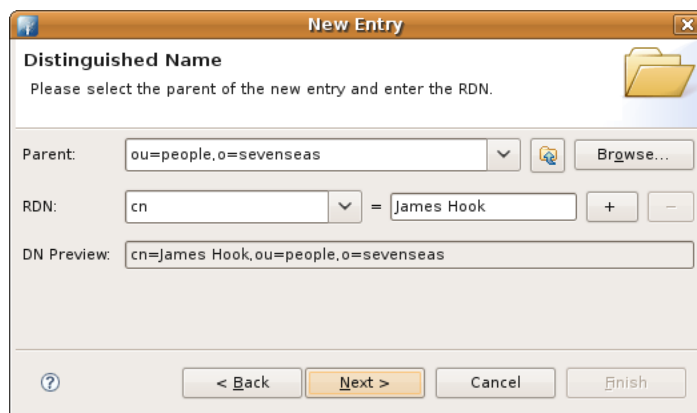
The parent of the new entry could be specified in the input field:

- If you choosed the "from scratch" method the DN of entry that was selected when the wizard has been started is used by default. If you choosed the "template" method the parent of the template entry is used by default.

- You could manually edit the parent DN.

- You could choose a previously used DN from drop-down list.

- By clicking **Browse....** you could open a dialog to select the parent DN.

To specify the RDN select an attribute from the drop-down list and enter the value. If you chose the "template" method the RDN is preset with the RDN of the template entry. The wizard also support multivalued RDNs. With the + and - buttons you can add and remove name-value pairs.

The DN preview field shows a preview of the DN.

When clicking to **Next** the wizard checks if an entry with the specified DN already exists. In that case you have to change the DN of the new entry.

Page 4

On the fourth page you have to define the attributes of the new entry.

The layout and features are similar to the Entry editor. You could add, edit or delete attributes and values.

If you have chosen the "template" method all attributes of the template entry are already filled in the new entry. Otherwise only the selected object classes and the RDN attribute are filled.

As soon as all MUST attributes are filled the **Finish** button is activated. When clicking the button the new entry will be created in directory.

3.3. New Context Entry wizard

This wizard helps you to create a new context entry.

To start the wizard choose one of the following options:

- In the LDAP Browser view select an entry or search result or bookmark. Then choose 📁 **New -> New Context Entry...** from context menu.

- In the Workbench window's toolbar, activate the drop-down menu on the New Wizard button and select **LDAP Context Entry**

- In the Workbench menu bar select **File > New > LDAP Context Entry** .

The creation of a new LDAP entry is a four-step process:

1. Select entry creation method.

2. Specify object classes of the new context entry.

3. Specifiy the distinguished name of the new context entry.

4. Enter attributes and values of the new context entry.

Page 1

This page is identical to the New Entry wizard.

Page 2

This page is identical to the New Entry wizard.

Page 3

On the third page you have to define the distinguished name of the new entry.
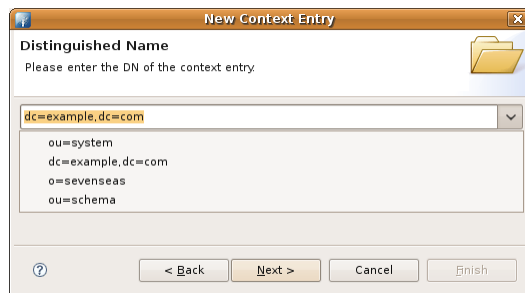
The distinguished name the new context entry could be specified in the input field. The drop-down list provides all available values from the Root DSE namingContexts attribute.

Page 4

This page is identical to the New Entry wizard.

3.4. Edit Entry wizard

This wizard helps you to edit an entry offline. You could make multiple modifications, when finishing the wizard all your modifications are sent to the directory in one request. This wizard is especially helpful when adding additional object classes which require additional attributes.

To start the wizard choose **Edit Entry...** from the Entry editor's context menu or use the **F8** shortcut.

The wizard is also the default value editor for the objectClass attribute, so you could also start the wizard by editing the objectClass attribute.

Editing the LDAP entry is a two-step process:

1. Specify object classes of the entry.

2. Edit attributes and values of the entry.

Page 1

On the first page you could change the object classes of the entry.
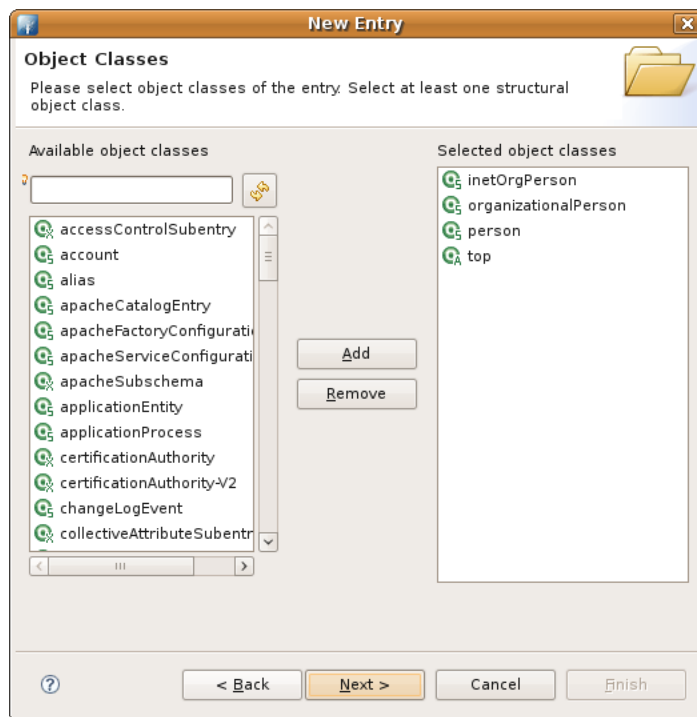
The list **Available object classes** on the left side lists the object classes provided from schema of the current connection. The list **Selected object classes** lists the object classes of the entry. To add object classed to the "selected" list select some in the "available" list and click the **Add** button. You could also double-click an object class in the "available" list. To remove object classed from the "selected" list select some in the "selected" list and click the **Remove** button. You could also double-click an object class in the "selected" list.

Page 2

On the second page you could change the attributes of the entry.

The layout and features are similar to the Entry editor. You could add, edit or delete attributes and values.

As soon as all MUST attributes are filled the **Finish** button is activated. When clicking the button all modifications will be sent to to the direcrory.

3.5. Attribute wizard

The Attribute wizard is used to create an attribute or to edit the attribute description of an existing attribute.

To create a new attribute select the ⇉ **New Attribute...** button in the Entry editor's tool bar or select **New Attribute...** from the Entry editor's context menu or hit **Shift-Strg-+**.

To edit the attribute description select an attribute in the Entry editor and select **Edit Attribute Description** from context menu or use the **F6** shortcut.

Page 1

On the first page you have to enter the attribute type.

Option	Description	Default
Attribute type	The attribute type. Enter the attribute type into the input field or select one from drop-down-list.	Empty in New Attribute wizard, filled in Edit Attribute Description wizard.
Show subschema attributes only	If checked the drop-down list contains only attributes suitable to the entry's subschema.	Checked
Hide existing attributes	If checked the drop-down list contains only attributes not yet assigned to the entry.	Checked in New Attribute wizard, unchecked in Edit Attribute Description wizard.
Preview	Shows a preview of the attribute description.	-

Page 2

On the second page you could specify options.

Option	Description
Language tags	To provide language-specifc attributes you could use language tags if supported by the directory. Enter a language code and optionally a country code into the input fields or select values from drop-down lists. With the **+** and **-** buttons you could add and remove tags.
Other options	If needed you may enter specific options. With the **+** and **-** buttons you could add and remove options.
Binary option	If checked the binary option is added to attribute description.
Preview	Shows a preview of the attribute description.
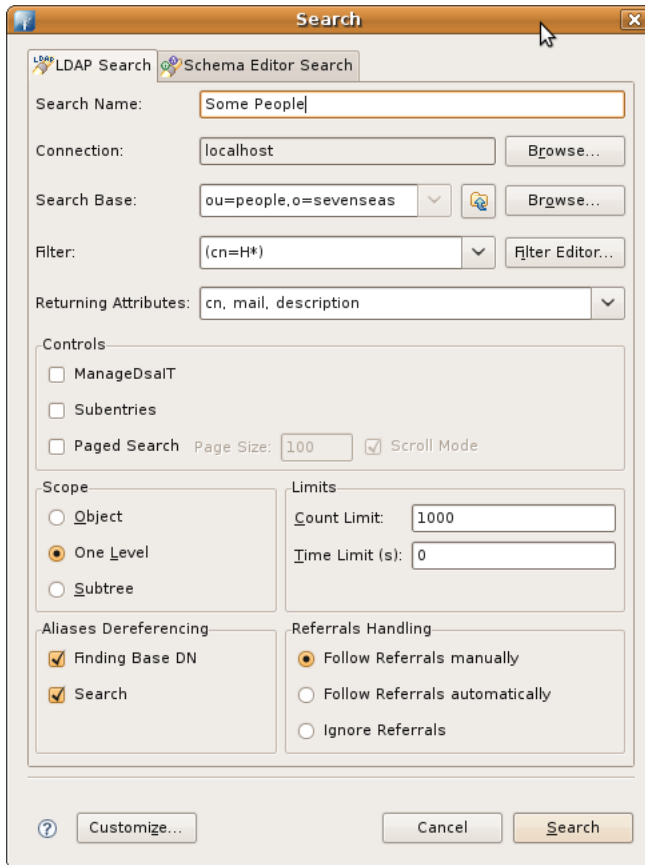
3.6. Search dialog

In the LDAP Search page you can specify search parameters to query a directory. It is integrated within the Eclipse search dialog.

To start the LDAP Search page the following procedure is recommended:

1. Select a entry, search, attribute or value in the LDAP Browser view, in the Entry editor or in the Search Result editor.

2. Then choose 🚀 **New Search...** from context menu or use the shortcut **Ctrl-H** or press the 🚀 **Search** button in the Workbench toolbar.

Option	Description	Default
Search Name	A meaningful name of the search. With this name the search is listed in the Searches category.	Current timestamp
Connection	The connection to search on. Use the **Browse...** button to select a connection.	*)
Search Base	The base DN of the search. You could edit the DN or select a recently used DN from drop-down list or click to **Browse....** to open the DN Selector dialog.	*)
Filter	Enter a valid LDAP search filter. The drop-down list provides a history of recently used filters. A click to the **Filter Editor** button opens the Filter Editor dialog , it also explains how the content assistance works.	*)
Returning Attributes	A comma-separated list of attributes that should be returned and displayed in the Search Result editor. Hit **Strg-Space** to get content assistance. The drop-down list provides a history of recently used attributes.	*)
ManageDsaIT	If checked the ManageDsaIT control is sent to the server.	unchecked
Subentries	If checked the Subentries control (RFC 3672) is sent to the server.	unchecked

Option	Description	Default
Paged Search	If checked the simple paged result control is sent to the server. With the page size you could define how many entries should be retrieved in one request. If Scroll Mode is enabled only one page is fetched from the server at once, you could 'scroll' through the pages by using the 'next page' and 'top page' items. If disabled **all** entries are fetched from the server, the paged result control is only used in background to avoid server-side limits.	unchecked
Scope	The search scope. **Object** searches on the base DN only (compare); **One Level** searches the direct children of the base DN; **Subtree** searches the base DN an all its descendants.	[*])
Count Limit	The maximum number of entries the server should return, value 0 means no limit. Note that this value is a client-side limit, its possible that also a server-side limit is used.	[*])
Time Limit	The maximum time in seconds the server should search. Value 0 means no limit. Note that this value is a client-side value, its possible that also a server-side limit is used.	[*])
Alias Dereferencing	Specifies whether aliases should be dereferenced while finding the search base entry or when performing the search or both. To manage (create, modify, delete) aliases you have to uncheck both options.	[*])
Referrals Handling	Specifies the referral handling. • Follow Referrals manually: Received referrals and search continuations are just displayed As soon as you open or expand such an search continuation the search is continued. You are asked which connection you want to use to follow a specific referral URL, this way you have full control regarding encryption and authentication options when following referrals. • Follow Referrals automatically: Follows referrals and search continuations immediately if they are received from the directory server. You are asked which connection you want to use to follow a specific referral URL, this way you have full control regarding encryption and authentication options when following referrals. • Ignore Referrals: Any referral or search continuation received from the directory server is silently ignored. No error is logged, no dialog appears, no special entry is displayed, no ManageDsaIT control is sent to the server.	[*])

[*]) The default values depends on the element that was selected when the wizard has been started:

- Search: All search parameters are taken from the selected search

- Entry, search result or bookmark:

  - Connection: the connection behind the entry

  - Search Base: the entry's DN

- Filter: (objectClass=*)

- Returning Attributes: -

- Scope: One Level

- Limits, aliases and referral handling are taken from the entry's connection

- Attribte and/or values:

  - Connection: the connection behind attribute's entry

  - Search Base: the DN of the attribute's entry

  - Filter: The filter is build from the selected attributes and values (Query by example)

  - Returning Attributes: -

  - Scope: One Level

  - Limits, aliases and referral handling are taken from connection behind attribute's entry

3.7. Batch Operation wizard

This wizard helps you to execute a batch operation to several entries.

To start the wizard choose one of the following options:

- In the LDAP Browser view select an entry or search. Then choose **New Batch Operation...** from context menu.

- In the Workbench window's toolbar, activate the drop-down menu on the New Wizard button and select **LDAP Batch Operation**

- In the Workbench menu bar select **File > New > LDAP Batch Operation** .

The execution of a batch operation is a four-step process:

1. Select entries where the batch operation should be applied to.

2. Select the operation type.

3. Specifiy the modifications.

4. Choose execution method.

Page 1

TODO..

Page 2

TODO..

Page 3

TODO..

Page 4

TODO..

3.8. LDIF Import wizard

This wizard imports LDIF files into the directory. It supports LDIF content files as well as LDIF modification files.

To start the wizard choose one of the following options:

- In the Connections view select a connection and choose **Import > LDIF Import...** from context menu.

- In the LDAP Browser view select an entry and choose **Import > LDIF Import...** from context menu.

- In the Workbench menu bar select **File > Import...** and choose **LDIF into LDAP** .

Logging

When importing LDIF files the import operations could be logged. Every imported record is completely written into logfile and the result (OK or ERROR) is prepended to every log record as LDIF comment.

Example log of a sucessfully imported record:
```
#!RESULT OK
#!CONNECTION ldap://localhost:389
#!DATE 2006-11-03T14:12:21.050
dn: cn=John Fowler,ou=Testdata,o=JNDITutorial
...
```

Example errol log:
```
#!RESULT ERROR
#!CONNECTION ldap://localhost:389
#!DATE 2006-11-03T14:12:21.050
#!ERROR [LDAP: error code 21 - telephoneNumber: value #0 invalid per
syntax]
dn: cn=John Fowler,ou=Testdata,o=JNDITutorial
...
```

The wizard

Option	Description	Default
LDIF file	The LDIF file to import. Type in the full path or **Browse...** to select the path on the file system. The drop-down list provides a history of recently used files.	empty
Import into	The connection into which the LDIF should be imported. Use the **Browse...** button to select a connection.	The connection that was selected when the wizard has been started.
Enable logging	When checked every imported LDIF record is logged into a logfile.	on
Use default logfile	By default the extension ".log" is appended the import filename.	on
Use custom logfile	When checked you could specify a custom logfile.	off
Overwrite existing logfile	If the default or custom logfile already exist, you must permit to overwrite the logfile.	off
Update existing entries	This options applies for LDIF content records and LDIF add records. If enabled and the entry to add already exists it will be updated with the attributes defined in the LDIF record. In detail a replace operation for each attribute is performed. Attributes of the existing entry that are not defined in the LDIF record remain without modification.	off
Continue on error	If checked the import process continues if an error occurs while importing a record. If not checked the import process interrupts.	off

3.9. DSML Import wizard

This wizard imports DSMLv2 files into the directory.

To start the wizard choose one of the following options:

- In the Connections view select a connection and choose **Import > DSML Import...** from context menu.

- In the LDAP Browser view select an entry and choose **Import > DSML Import...** from context menu.

- In the Workbench menu bar select **File > Import...** and choose **DSML into LDAP** .

The wizard
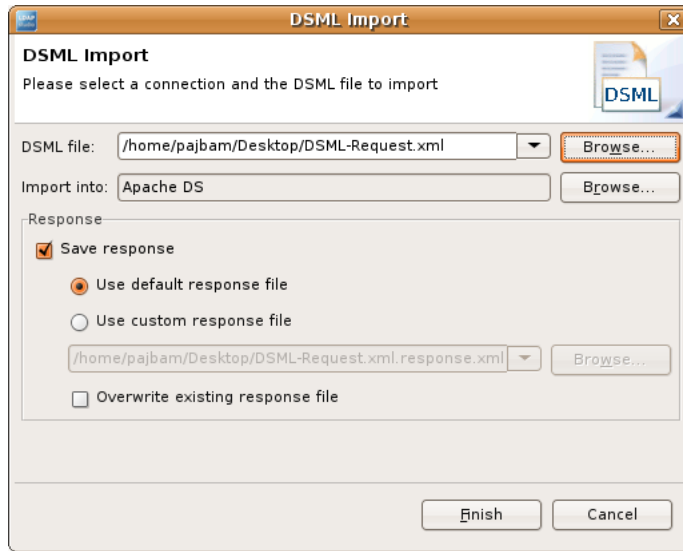
Option	Description	Default
DSML file	The DSML file to import. Type in the full path or **Browse...** to select the path on the file system. The drop-down list provides a history of recently used files.	empty
Import into	The connection into which the DSML should be imported. Use the **Browse...** button to select a connection.	The connection that was selected when the wizard has been started.
Save response	When checked the response of the DSML request execution is saved into a response file.	on
Use default response file	By default the extension ".response.xml" is appended the import filename.	on
Use custom response file	When checked you could specify a custom response file.	off
Overwrite existing response file	If the default or custom response file already exist, you must permit to overwrite the response file.	off

3.10. Import Connections wizard

This wizard imports previously exported connections to the Connections view.

To start the wizard select **Import > Import Connections...** from the context menu of the Connections view.

On the wizard page you have to select the source file.
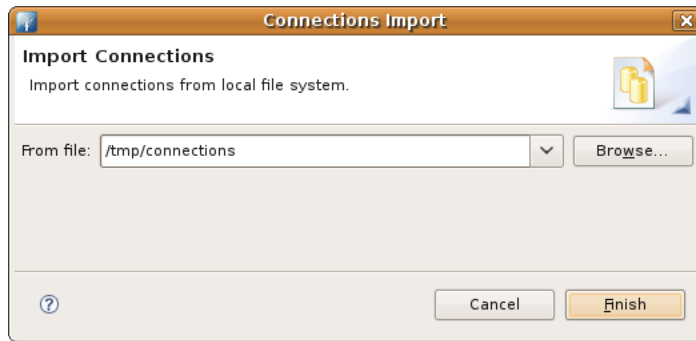
Option	Description	Default
From file	The file containing all the connections. Type in the full path or **Browse...** to select the path on the file system. The drop-down list provides a history of recently used files.	empty

3.11. LDIF Export wizard

This wizard is used to export entries to LDIF content files.

To start the wizard choose one of the following options:

- In the LDAP Browser view select an entry or a search and choose **Export > LDIF Export...** from context menu.

- In the Connections view select a connection and choose **Export > LDIF Export...** from context menu.

- In the Workbench menu bar select **File > Export...** and choose **LDAP to LDIF** .

Data to Export

On the Data to Export page you have to specify which entries and attributes to export.

The layout of the page is similar to the LDAP Search page . In the **Returning Attributes** section you can also choose the following options:

Option	Description	Default
All user attributes	Exports all user attributes.	on if the Returning Attributes field is empty
Operational attributes	Exports all operational attributes.	off

LDIF File

On the LDIF File page you have to select the target LDIF file.
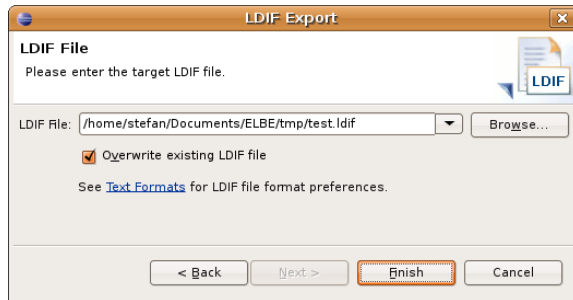
Option	Description	Default
LDIF File	The LDIF file to export to. Type in the full path or **Browse...** to select the path on the file system. The drop-down list provides a history of recently used files.	empty
Overwrite existing LDIF file	If the export file already exist, you must permit to overwrite the file.	off
Text Formats	Opens the Text Formats preferences where you could modify the LDIF format.	-

3.12. DSML Export wizard

This wizard is used to export entries to DSMLv2 files.

To start the wizard choose one of the following options:

- In the LDAP Browser view select an entry or a search and choose **Export > DSML Export...** from context menu.

- In the Connections view select a connection and choose **Export > DSML Export...** from context menu.

- In the Workbench menu bar select **File > Export...** and choose **LDAP to DSML** .

Data to Export

On the Data to Export page you have to specify which entries and attributes to export.

The layout of the page is similar to the LDAP Search page . In the **Returning Attributes** section you can also choose the following options:

Option	Description	Default
All user attributes	Exports all user attributes.	on if the Returning Attributes field is empty
Operational attributes	Exports all operational attributes.	off

DSML File

On the DSML File page you have to select the target DSML file.
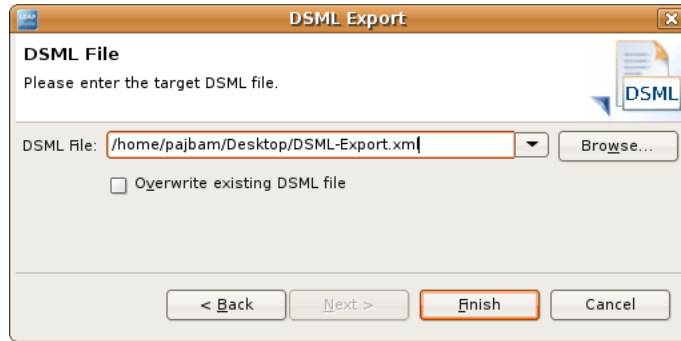
Option	Description	Default
DSML File	The DSML file to export to. Type in the full path or **Browse...** to select the path on the file system. The drop-down list provides a history of recently used files.	empty
Overwrite existing DSML file	If the export file already exist, you must permit to overwrite the file.	off

3.13. CSV Export wizard

This wizard is used to export entries to CSV files.

To start the wizard choose one of the following options:

- In the LDAP Browser view select an entry or a search and choose **Export > CSV Export...** from context menu.

- In the Connections view select a connection and choose **Export > CSV Export...** from context menu.

- In the Workbench menu bar select **File > Export...** and choose **LDAP to CSV** .

Data to Export

On the Data to Export page you have to specify which entries and attributes to export.

The layout of the page is similar to the LDAP Search page . In the **Returning Attributes** section you can also choose the following option:

Option	Description	Default
Export DN	Exports the distinguished name as first column in the CSV file.	on

CSV File

On the CSV File page you have to select the target CSV file.
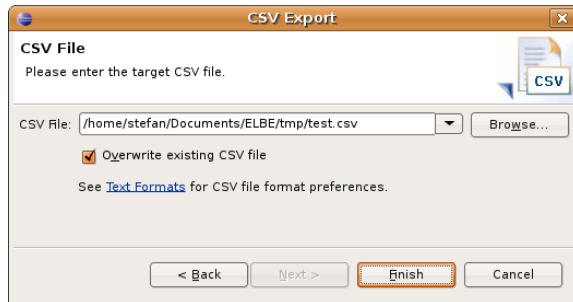
Option	Description	Default
CSV File	The CSV file to export to. Type in the full path or **Browse...** to select the path on the file system. The drop-down list provides a history of recently used files.	empty
Overwrite existing CSV file	If the export file already exist, you must permit to overwrite the file.	off
Text Formats	Opens the Text Formats preferences where you could modify the CSV format.	-

3.14. Excel Export wizard

This wizard is used to export entries to Excel files.

To start the wizard choose one of the following options:

* In the LDAP Browser view select an entry or a search and choose **Export > Excel Export...** from context menu.

* In the Connections view select a connection and choose **Export > Excel Export...** from context menu.

* In the Workbench menu bar select **File > Export...** and choose **LDAP to Excel** .

Data to Export

On the Data to Export page you have to specify which entries and attributes to export.

The layout of the page is similar to the LDAP Search page . In the **Returning Attributes** section you can also choose the following option:

Option	Description	Default
Export DN	Exports the distinguished name as first column in the Excel file.	on
All user attributes	Exports all user attributes.	on if the Returning Attributes field is empty
Operational attributes	Exports all operational attributes.	off

Excel File

On the Excel File page you have to select the target Excel file.
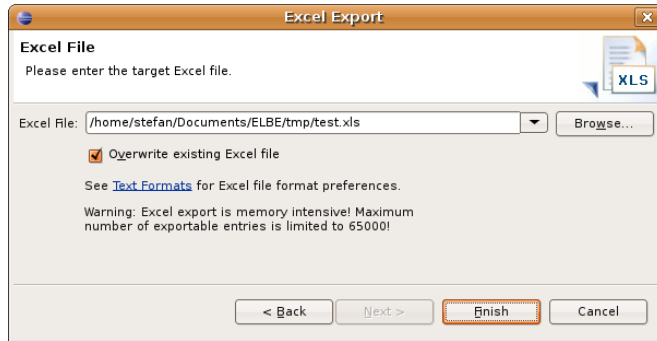
Option	Description	Default
Excel File	The Excel file to export to. Type in the full path or **Browse...** to select the path on the file system. The drop-down list provides a history of recently used files.	empty
Overwrite existing Excel file	If the export file already exist, you must permit to overwrite the file.	off
Text Formats	Opens the Text Formats preferences where you could modify the Excel format.	-

3.15. ODF Export wizard

This wizard is used to export entries to OpenDocument Spreadsheet files.

To start the wizard choose one of the following options:

- In the LDAP Browser view select an entry or a search and choose **Export > ODF Export...** from context menu.

- In the Connections view select a connection and choose **Export > ODF Export...** from context menu.

- In the Workbench menu bar select **File > Export...** and choose **LDAP to ODF** .

Data to Export

On the Data to Export page you have to specify which entries and attributes to export.

The layout of the page is similar to the LDAP Search page . In the **Returning Attributes** section you can also choose the following option:

Option	Description	Default
Export DN	Exports the distinguished name as first column in the ODF file.	on
All user attributes	Exports all user attributes.	on if the Returning Attributes field is empty
Operational attributes	Exports all operational attributes.	off

ODF File

On the ODF File page you have to select the target ODF file.

Option	Description	Default
ODF File	The ODF file to export to. Type in the full path or **Browse...** to select the path on the file system. The drop-down list provides a history of recently used files.	empty
Overwrite existing ODF file	If the export file already exist, you must permit to overwrite the file.	off
Text Formats	Opens the Text Formats preferences where you could modify the ODF format.	-

3.16. Connections Export wizard

This wizard is used to export all defined connections in the Connections view to a file.

To start the wizard select **Export >** 🗋 **Export Connections...** from the context menu of the Connections view.

On the wizard page you have to select the target file.
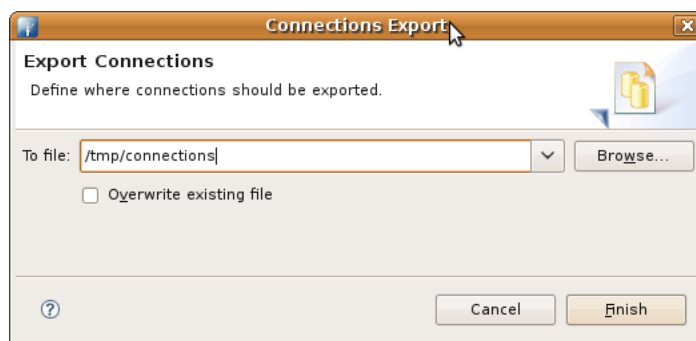
Option	Description	Default
To file	The file to export all the connections to. Type in the full path or **Browse...** to select the path on the file system. The drop-down list provides a history of recently used files.	empty
Overwrite existing file	If the export file already exist, you must permit to overwrite the file.	off

3.17. Select Referral Connection dialog

The Select Referral Connection dialog is used to select the target connection of an referral. If the host and port one of the available connection matches the host and port of the referral URL this connection is preselected. It is also possible to create a new connection for the referral.
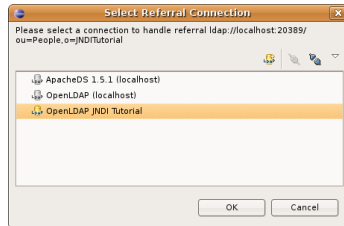
3.18. Filter Editor dialog

To edit complex and nested filters you could use the filter editor dialog. It provides syntax highlighting, content assistance and a formatter for nested filters.
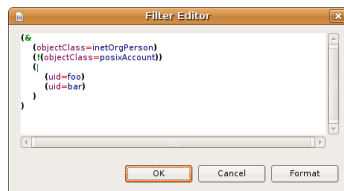
Syntax coloring

Syntax coloring helps you to distinguish the different elements of an LDAP filter. The following colors and fonts are used:

Element	Color
opening and closing parenthesis	black and bold
filter operator (& | !)	green and bold
attribute	violett
filter type	red and bold
assertion value	blue

Content assistance and code completion

The filter editor provides the following helpful features when editing an LDAP filter:

- Automatically adds and removes opening and closing parenthesis: just start typing the attribute or filter operator.

- Hit **Strg-Space** to open a list of available code completions, press Esc to close the list.

- Attribute completion: when typing an attribute, e.g. "tel" a list with attributes that start with the "tel" is opened.
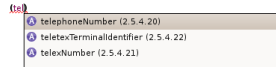
- Object class completion: if the attribute is objectClass a list with available object classes is opened.
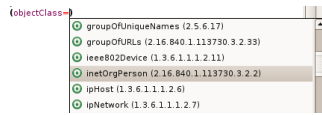
- Matching rule completion: for filters with extensible matching a list with available matching rules is provided.
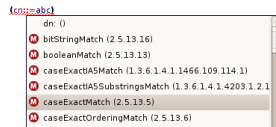
Formatting

In the filter editor it is possible to format complex and nested filters. The formatter is invoked by pressing the **Format** button and formats the filter the following way:

- Each filter item gets its own line.

- Each level of a nested filter is intended according to the level.

When opening the editor the filter is formatted automatically. When pressing OK the line breaks and white-spaces are removed.

3.19. Rename Entry dialog

The Rename Entry dialog is used to rename an entry. In detail the relative distinguished name (RDN) is modified by sending a modrdn operation to the directory.

To start the Rename Entry dialog select the entry you want to rename, then choose **Rename...** from context menu or press **F2**.

Note 1: Some directories don't support renaming whole trees but only renaming of leaf entries. In that case you are ask if you want to simulate the rename operation, this is done by copying the whole tree and deleting the old tree afterwards.

Note 2: It is not possible to rename the Root DSE.
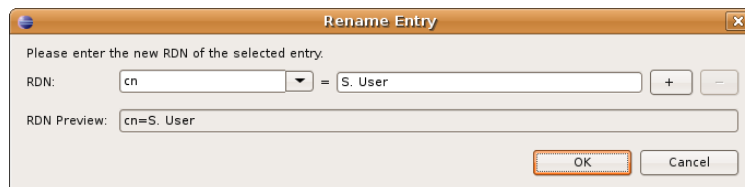
Option	Description	Default
RDN	The new RDN of the entry. The drop-down list on the left side contains possible attribute types. The input field on the right side contains the attribute value.	Current attribute type and value

Option	Description	Default
+	Adds a new name-value pair to RDN	-
-	Removes a name-value pair from RDN	-
RDN Preview	Shows a preview of the new RDN	Current RDN

3.20. Move Entries dialog

The Move Entries dialog is used to move entries to another parent.

To start the Move Entries dialog select the entries you want to move, then choose **Move...** from context menu.

Note 1: Some directories don't support moving whole trees but only moving of leaf entries. In that case you are ask if you want to simulate the move operation, this is done by copying the whole tree and deleting the old tree afterwards.

Note 2: It is not possible to move the root DSE.
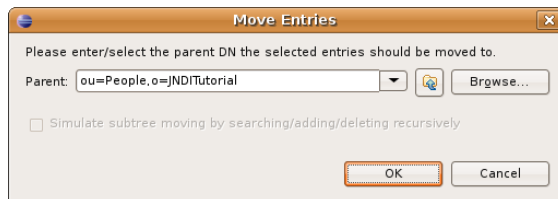
Option	Description	Default
Parent	The new parent of the entries. You could edit the DN or select a recently used DN from drop-down list or click to **Browse....** to open the DN Selector dialog.	The current parent

3.21. Go to DN dialog

The Goto DN dialog is used find an entry in the DIT by its distinguished name.

To start the Go to DN dialog choose **Go to DN...** from context menu.
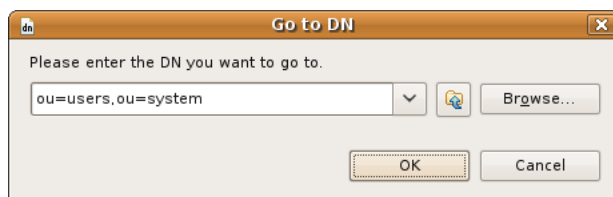
Enter the DN of the entry into the input field and press OK.

3.22. Certificate Trust dialog

The Certificate Trust dialog pops up if a secure connection (ldaps or StartTLS) is established and the validation of the server's certificate failed.

Option	Description
Dont't trust this certificate.	If you don't trust the certificate choose this option, the connection won't be established
Trust this certificate for this session.	The certificate is only valid within this session and added to the temporary certificate store. After a restart of Studio you are asked again You could see all temporary trusted certificates in the Certificate Validation preferences.
Always trust this certificate.	The certificate is permanently valid and added to the permanent certificate store. You could see all permanent trusted certificates in the Certificate Validation preferences
View Certificate...	Opens the Certificate Viewer dialog, where you could examine the certificate.
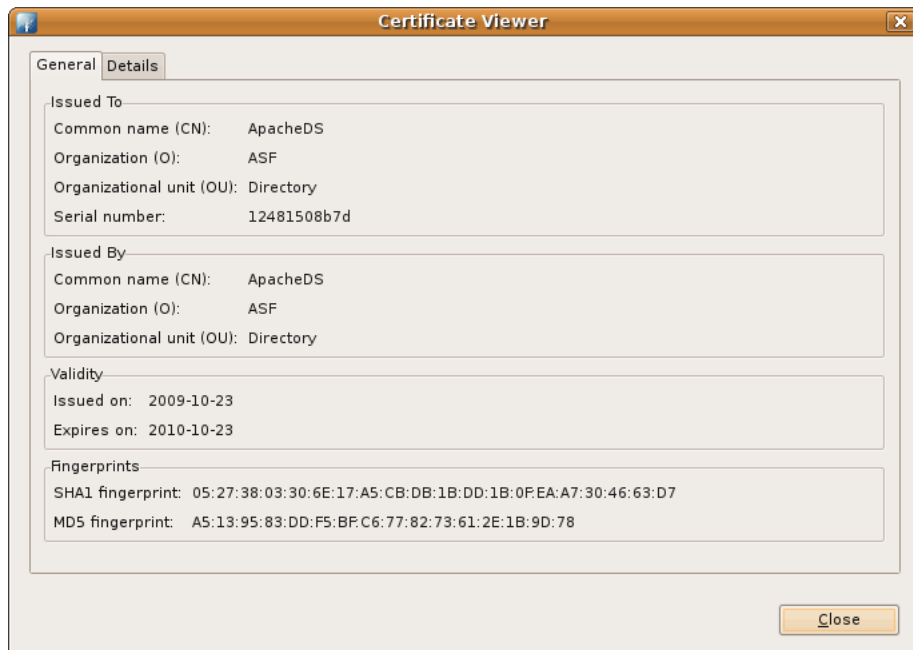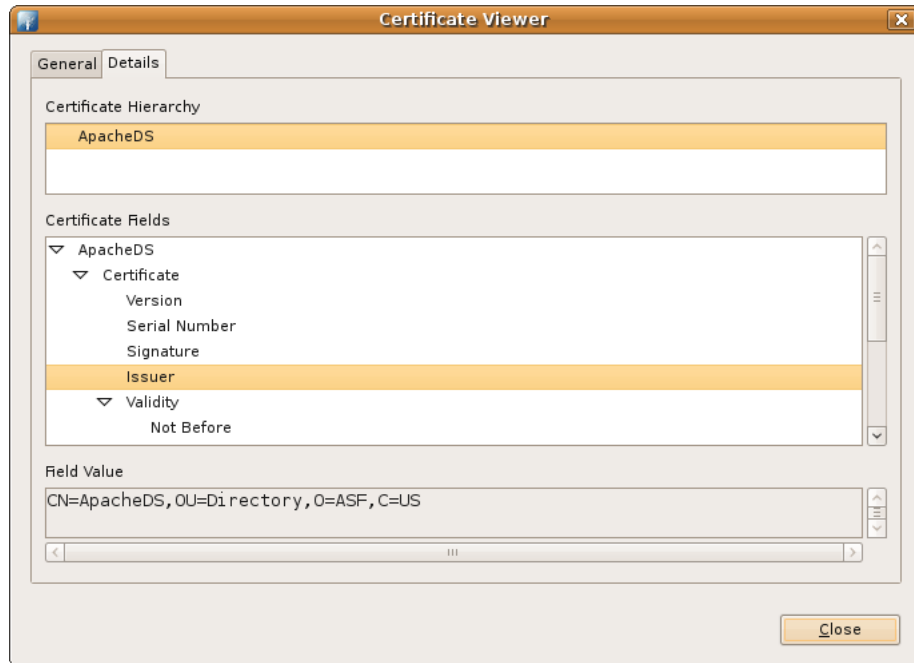
4. Value Editors

4.1. Concept

An LDAP entry contains different attribute types with different syntaxes: objectClasses, names, passwords, images, etc. To handle the different data types Value Editors are used. Value Editors know how to edit a value .

The default Value Editor for an attibute is determined using the following procedure:

1. If a Value Editor for the attribute type is specified, this one is used.

2. If a Value Editor for the attribute's syntax is specified, this one is used.

3. If the attribute is binary according to its syntax, the Binary Editor is used.

4. If the attribute is string according to its syntax, the Text Editor is used.

The default Value Editor could be specified by attribute type or syntax in the Value Editors preferences

Another task of a Value Editor is to provide the displayed value for the Entry editor and Search Result editor. Especially binary data can't be displayed "as-is".

4.2. In-Place Text Editor

The In-Place Text Editor is the default editor for string values without line breaks.

Display value

Values are displayed as stored in directory:

facsimileTelephoneNumber   +1 408 555 6277

Edit value

Values are edited directly within the entry editor or search result editor. To save the new value press **Enter** or click somewhere outside the edit field. To cancel the modification press **Esc**.

facsimileTelephoneNumber   +1 408 555 6277|

4.3. Text Editor

The Text Editor is the default editor for string values with line breaks.

Display value

Values are displayed as stored in directory:

description   Line 1
                             Line 2
                             Line 3

Edit value

Values are edited in a dialog which provides a simple text area. To finish editing press **OK** to save the new value or **Cancel** to discard your modification.
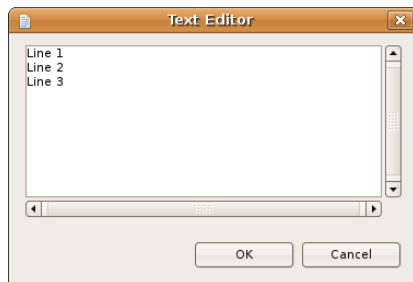
4.4. Hex Editor

The Hex Editor is the default editor for binary values.

Display value

The displayed value "Binary Data" indicates that the value contains binary data, additional the size in bytes is shown.

userCertificate;binary   Binary Data (1287 Bytes)

Edit value

The Hex Editor dialog displays the binary data as hex. To create or modify a value load the binary data from a file using the **Load data...** button.
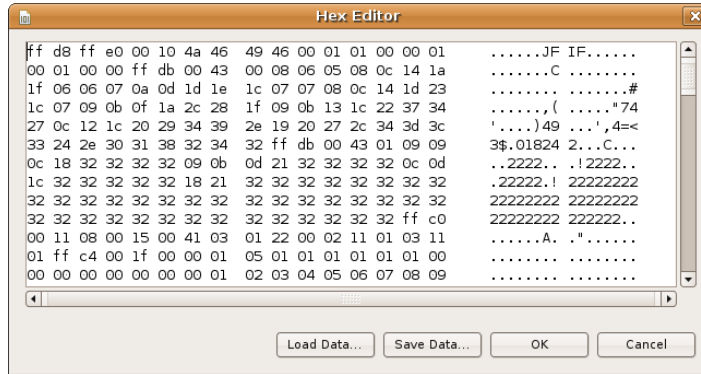
Save value

You could also save the current binary data to a file with the **Save data...** button.

4.5. Password Editor

The Password Editor is the default editor for passwords.

Display value

The real password isn't displayed but only the encryption method.

Details

In the **Current Passord** tab you see some details about the password.

The current password could also be verified. Enter the compare password into the **Verify Password** field. The **Verify** function compares the current password with the hashed value of the entered password. The **Bind** function binds to the directory using the DN of the current entry and the entered password.

Edit value

In the **New Passord** tab you can enter a new passord. Type in the password in the input field and select a hash (encryption) method. The preview field shows the resulting password.

4.6. Image Editor

The Image Editor is the default editor for images.

Display value

The image type, width, height and size in bytes is used as display value.

Details

In the **Current Image** tab you see the image and some details about it.

You could also save the current image to a file with the **Save...** button.
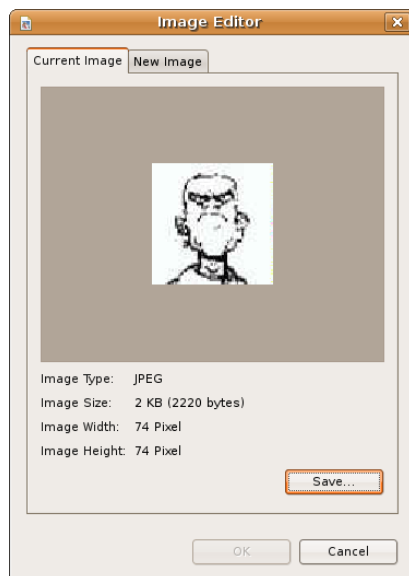
Edit value

In the **New Image** tab you can load a new image from a file using the **Browse...** button.
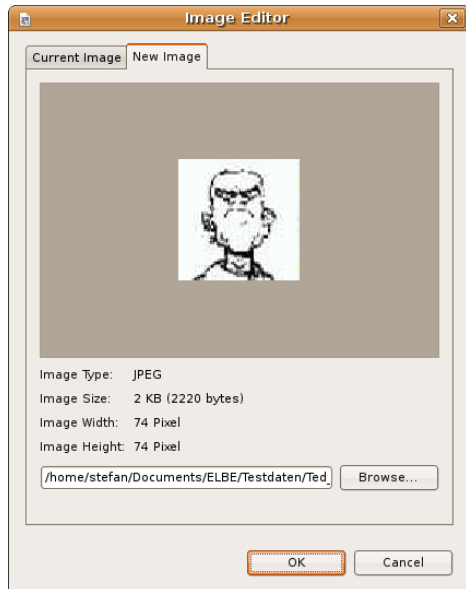
4.7. Object Class Editor

The Object Class Editor is the default editor for the objectClass attribute.

Display value

The objectClass name and the type of object class (structural, auxiliary, abstract) is used as display value.

objectClass	*extensibleObject (auxiliary)*
objectClass	*inetOrgPerson (structural)*
objectClass	*top (abstract)*

Edit value

In the Object Class Editor dialog you can select the available object classes from a drop-down list.
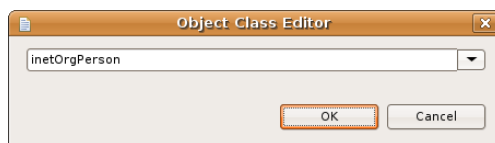
4.8. Address Editor

The Address Editor is the default editor for attributes with postal address syntax. In the postal address syntax the dollar character '$' is used as line separator.

Display value

Values are displayed as stored in directory, dollar characters are replaced by commas.

postalAddress	10 Downing Street, London, SW1A 2AA

Edit value

Values are edited in a dialog which provides a simple text area. Dollar characters are replaced by line breaks.
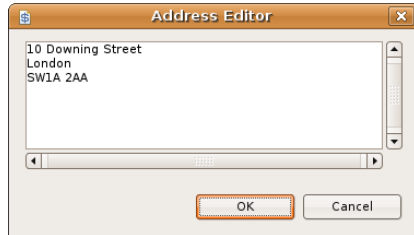
4.9. DN Editor

The DN Editor is the default editor for attributes with distinguished name syntax.

Display value

Values are displayed as stored in directory.
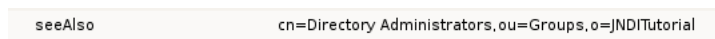
Edit value

The edit dialog looks as follows:
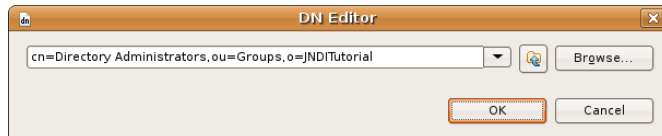
To edit the DN you can use the following options:

- You could manually edit the DN in the input field.

- You could choose a previously used DN from drop-down list.

- By clicking **Parent** the parent DN of the current DN appears in the input field.

- **Browse..** opens a DN Selector, similar to the LDAP Browser. You can browse and filter to find an entry. When selecting an entry its DN appears int the input field.
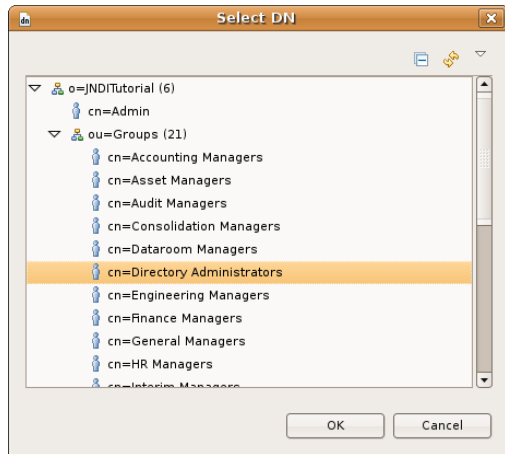
4.10. Date & Time Editor

The Date & Time Editor is the default editor for attributes with generalized time syntax.

Display value

The values are converted to local time.

Edit value

The edit dialog looks as follows:

To edit date and time you have the following options:

- You could set the time, pick a date from the calendar and choose a time zone.

- You could manually edit the raw value in the input field.

4.11. OID Editor

The OID Editor is the default editor for attributes with OID syntax.

Display value

The values are suffixed with the textual description of the OID.

```
createTimestamp          02.10.2006 22:47:30 CEST (20061002204730Z)
```

Edit value

The In-Place Text Editor is used to edit values.

4.12. Certificate Editor

The Certificate Editor is the default editor for certificates.

Display value

The certificate type, version and owner are displayed.

```
userCertificate          X.509v1: CN=ApacheDS,OU=Directory,O=ASF,C=US
```

Certificate Editor Dialog

The full certificate data could be exampined in the Certificate Editor dialog. **Load data...** button.
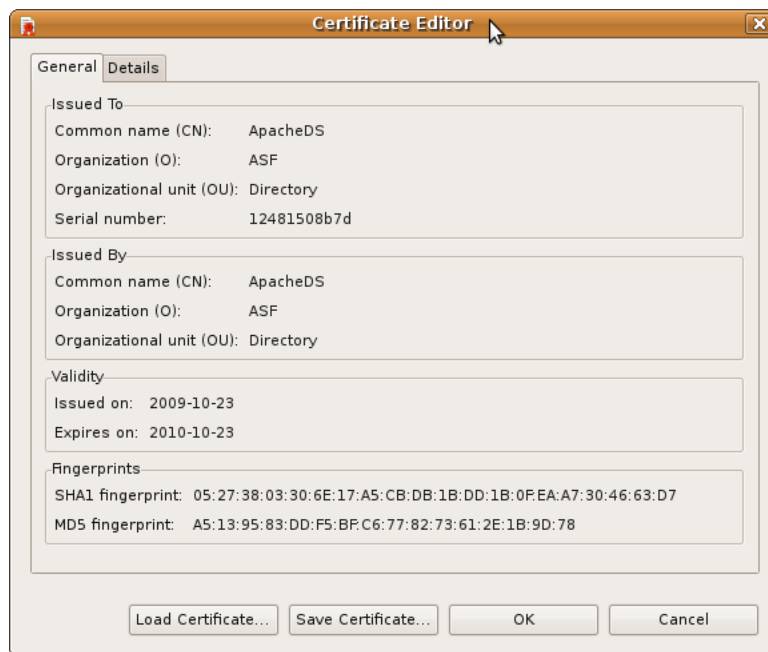
You could also save the current certificate to a file with the **Save Certificate...** button.

To modify the certificate in the directory server load the new certificate from a file using the **Load Certificate...** button and press the **OK.** button.

5. Properties

5.1. Connection properties

The following properties can be modified on the Connection properties pages:

Network Parameter

Field	Description
Connection name	The name of the connection. In the Connections view the connection is listed with this name. The name must be unique.
Hostname	The hostname or IP address of the LDAP server. A history of recently used hostnames is available through the drop-down list.
Port	The port of the LDAP server. The default port for non-encyrpted connections is 389. The default port for ldaps:// connections is 636. A history of recently used ports is available through the drop-down list.
Encryption method	The encryption to use. Possible values are 'No encrypton', 'ldaps://' and 'StartTLS extension'.
Check Network Parameter	Use this function if you want validate that the entered information is correct and the server is reachable.

Authentication

Field	Description
Authentication Method	Select your authentication method between: • Anonymous Authentication: connects to the directory without authentication. • Simple Authentication: uses simple authentication using a bind DN and password, the credentials are transmitted in clear-text over the network. • CRAM-MD5 (SASL): authenticates to the directory using a challenge-response authentication mechanism, the credentials are not transmitted in clear-text over the network. • DIGEST-MD5 (SASL): another challenge-response authentication mechanism, additionally you could define your realm and QoP parameters. • GSSAPI (Kerberos): users Kerberos based authentication, additional parameters could be defined.
Bind DN or user	The distinguished name or user ID used to bind. Previously entered DNs could be selected from drop-down list.
Bind Password	The password used to bind.
Save password	If checked the password will be saved in configuration. If not checked you have to enter the password whenever you connect to the server. Warning: The password is saved as plain text!

Field	Description
Check Authentication	Use this function if you want to attempt a connection plus a bind to the host upon completion of the wizard to validate that the entered information is correct.

Additional authentication parameters for SASL and Kerberos:

Option	Description
SASL Realm	The SASL Relam used to bind, only applicaple if DIGEST-MD5 is choosen.
Quality of Protection	The QoP to use: authentication only, with integrity protection, and with privacy protection
Protection Strength	The protection strength to use
Mutual Authentication	If checked mutual authentication is used, that means the server has to authenticate itself to the client. If unchecked only the client authenticates itself to the server.
Use native TGT	If checked the native credential cache is used, thus no additional authentication is necessary. Note that on Windows systems that requires a modification of the registry.
Object TGT from KDC	If checked a new TGT is obtained from the KDC. Username and password must be provided.
Use native system configuration	If checked the native Kerberos configuration is used (e.g. /etc/krb5.conf).
Use configuration file	If checked a custom configuration file could be used.
Use following configuration	If checked the Kerberos configuration parameters (realm, host, port) could be set in the dialog.

Browser Options

Field	Description
Get base DNs from Root DSE	If checked the base DNs are fetched from namingContexts attribute of the Root DSE.
Fetch Base DNs	Use this function to get the namingContext values from the Root DSE. The returned values will appear in the 'Base DN' drop-down list.
Base DN	The base DN to use. You may enter a DN manually or you may select one from the drop-down list. This field is only enabled if the option 'Get base DNs from root DSE' is off.
Count Limit	Maximum number of entries returned from server when browsing the directory, it is also used as default value when searching the directory. A value of 0 means no count limit. Note that this value is a client-side value, its possible that also a server-side limit is used.
Time Limit	The maximum time in seconds the server searches for results. This is used as default value when browsing or searching the directory. A value of 0 means no limit. Note that this value is a client-side value, its possible that also a server-side limit is used.
Alias Dereferencing	Specifies whether aliases should be dereferenced while finding the search base entry or when performing the search or both. To manage (create, modify, delete) alias objects you have to uncheck both options.
Referrals Handling	Specifies the referral handling. • Follow Referrals manually: Received referrals and search continuations are just displayed in the Browser. As soon as you open or expand such an search continuation the search is continued. You are asked which connection you want to use to follow a

Field	Description
	specific referral URL, this way you have full control regarding encryption and authentication options when following referrals. • Follow Referrals automatically: Follows referrals and search continuations immediately if they are received from the directory server. You are asked which connection you want to use to follow a specific referral URL, this way you have full control regarding encryption and authentication options when following referrals. • Ignore Referrals: Any referral or search continuation received from the directory server is silently ignored. No error is logged, no dialog appears, no special entry is displayed in the DIT, no ManageDsaIT control is sent to the server.
Use ManageDsaIT control while browsing	If enabled the ManageDsaIT control is sent to the server in each request. This signals the directory server to not send referrals and search continuations, but return the special referral objects. This only works if the directory server supports the ManageDsaIT control.
Fetch subentries while browsing	If enabled enabled both, normal and subentries according to RFC 3672 are fetched. This causes additional search requests while browsing the directory.
Paged Search	If enabled the simple paged result control is used while browsing the directory. With the page size you could define how many entries should be retrieved in one request. If Scroll Mode is enabled only one page is fetched from the server at once while browsing, you could 'scroll' through the pages by using the 'next page' and 'top page' items. If disabled **all** entries are fetched from the server, the paged result control is only used in background to avoid server-side limits.
Fetch operational attributes while browsing	If enabled enabled both, user attributes and operational attributes are retrieved while browsing. If the server supports the feature 'All Operational Attributes' then a '+' is used to retrieve operational attributes, otherwise all operational attributes defined in the schema are requested.

Edit Options

Field	Description
Modify Mode	Specify the modify mode for attributes with an equality matching rule. Description of options: • Default: uses add/delete by default, uses replace for X-ORDERED attributes • Always REPLACE: always uses replace operations to perform entry modifications • Always ADD/DELETE: always uses add and/or delete operations to perform entry modifications
Modify Mode (no equality matching rule)	Specify the modify mode for attributes with *no* equality matching rule. Description of options: • Default: uses add/delete by default, uses replace for X-ORDERED attributes • Always REPLACE: always uses replace operations to perform entry modifications • Always ADD/DELETE: always uses add and/or delete operations to perform entry modifications Recommended values for various LDAP servers: • ApacheDS: Default or REPLACE • OpenLDAP: REPLACE

Field	Description
	• OpenDS / SunDSEE: Default or REPLACE
	• FedoraDS / 389DS: Default (missing equality matching rules for many standard attribute types)
	• Active Directory: Default (exposes no equality matching rules at all)
	• eDirectory: Default (exposes no equality matching rules at all)
Modify Order	Specify the modify order when using add and delete operations.

Root DSE
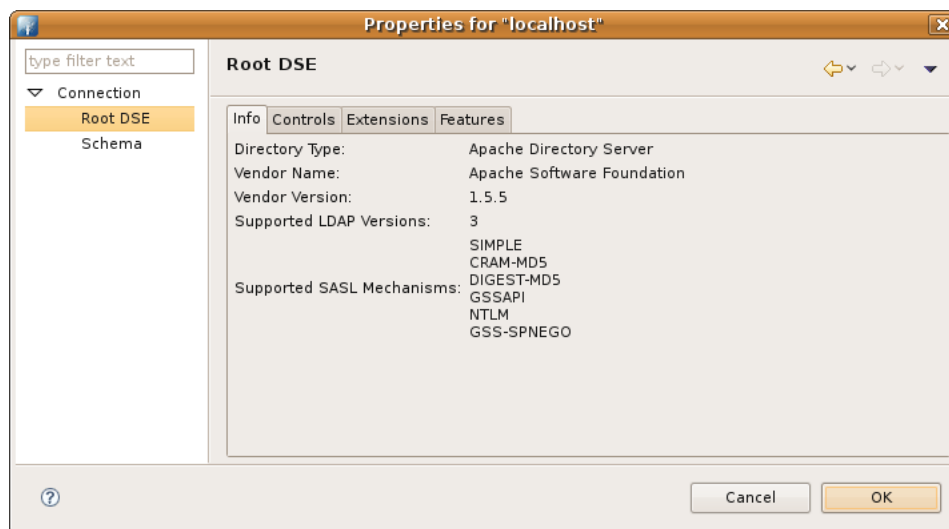
The Root DSE properties page provides information about the connected directory server like directory type and version, controls, extensions and features.

Schema
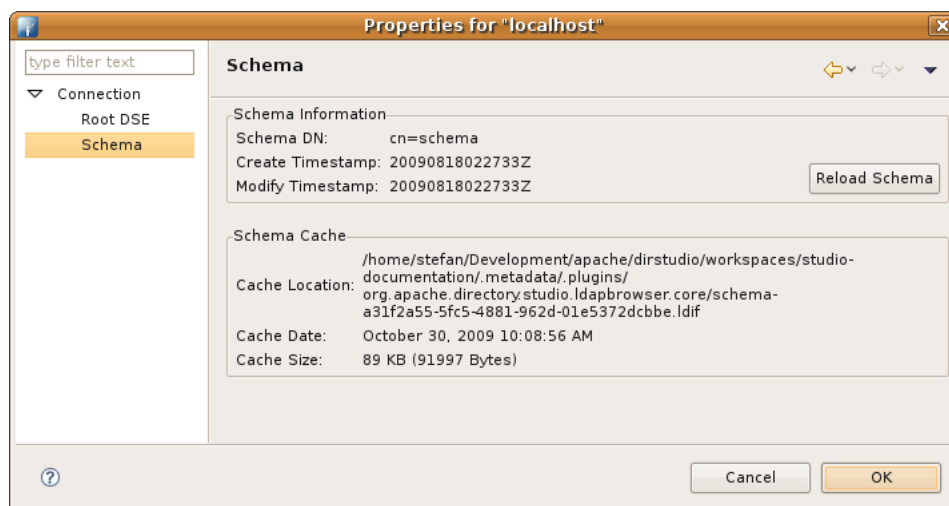
The Schema properties page provides some information about the schema. The 'Schema Information' group shows the schema DN an modification timestamp. With the 'Reload Schema' button a schema reload could be forced, the schema is reloaded automatically if the directory's schema is newer than the cached one. The 'Schema Cache' group shows information about the cached schema.

5.2. Entry properties

The Entry properties page shows some information about the entry.
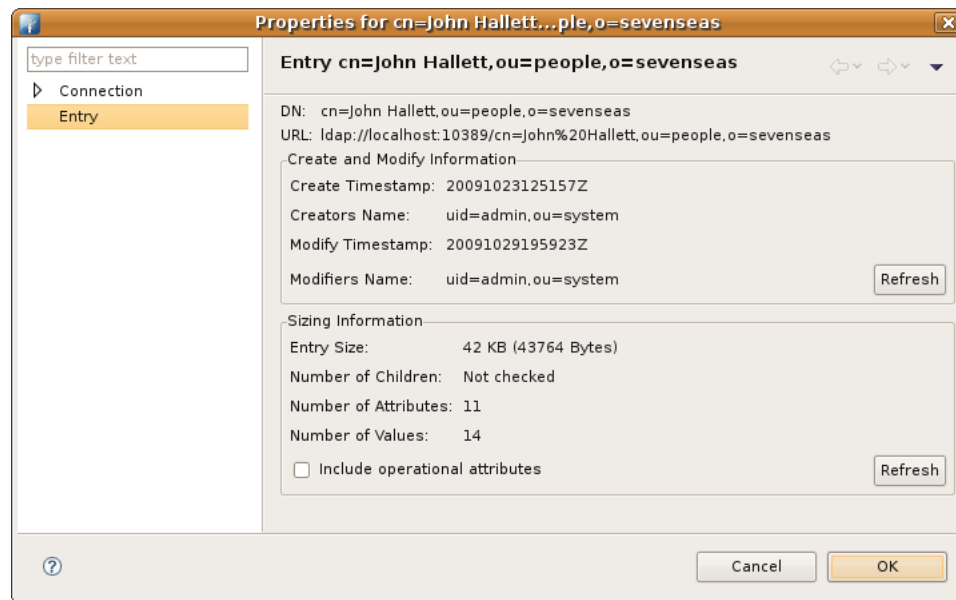
The first two lines shows the DN and LDAP-URL of the entry.

The 'Create and Modify Information' group shows the create and modify timestamp and DN. If no values are shown use the 'Refresh' button to load the attributes.

The 'Sizing Information' group shows information about the entry size in bytes, the number of children, attributes and values. To take operational attributes into account check 'Include operational attributes'. The 'Refresh' button reloads the attributes and counts children.

You could select and copy all displayed information.

5.3. Attribute properties

The Attribute properties page shows some information about the attribute.
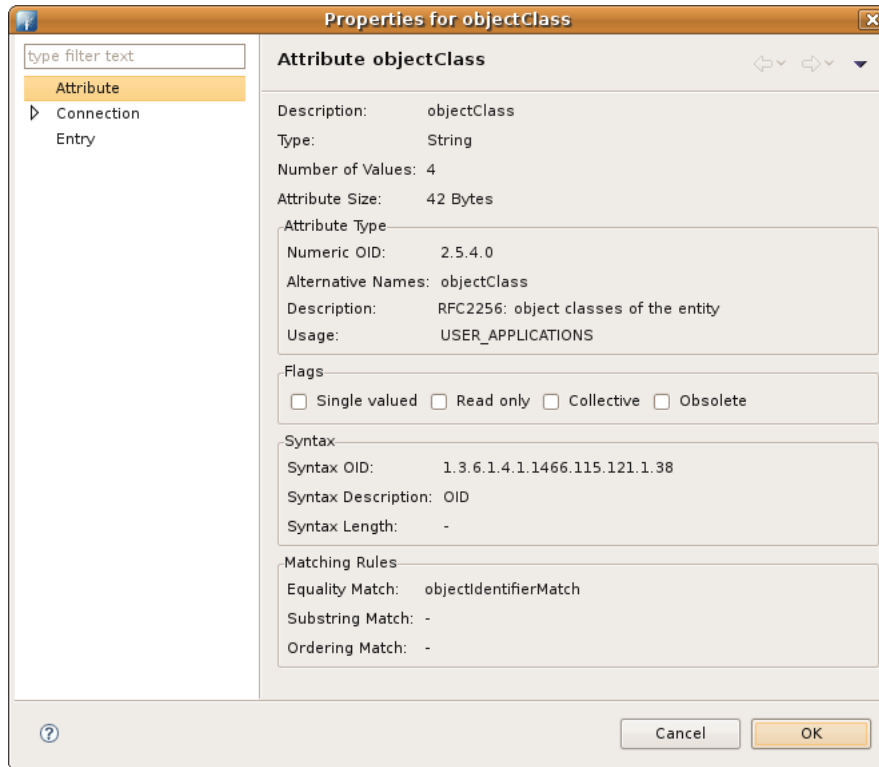
The first four lines shows the attribute description, the type (String or Binary), the values count and the size in bytes.

The next four groups shows the attribute's schema definition, similar to the Attribute Type schema page.

You could select and copy all displayed information.

5.4. Value properties

The Values properties page shows some information about the value.
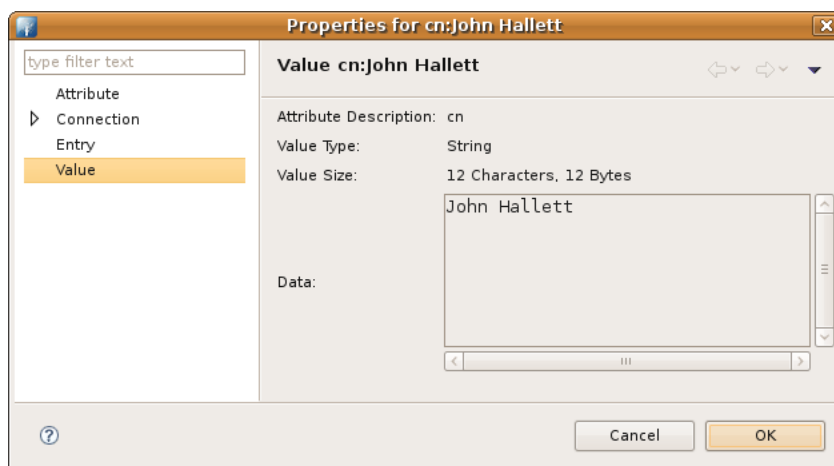
Field	Description
Attribute Description	The attribute description of the attribute

Field	Description
Value Type	String or Binary
Value Size	If Binary the size in bytes. If String the number of characters and the size in bytes. These two number could differ if the value contains multibyte characters.
Data	Nothing if Binary. If String the raw value as returned form server.

You could select and copy all displayed information.

5.5. Search properties

The layout of the Search properties page is similar to the Search dialog. All fields except the connection could be modified.
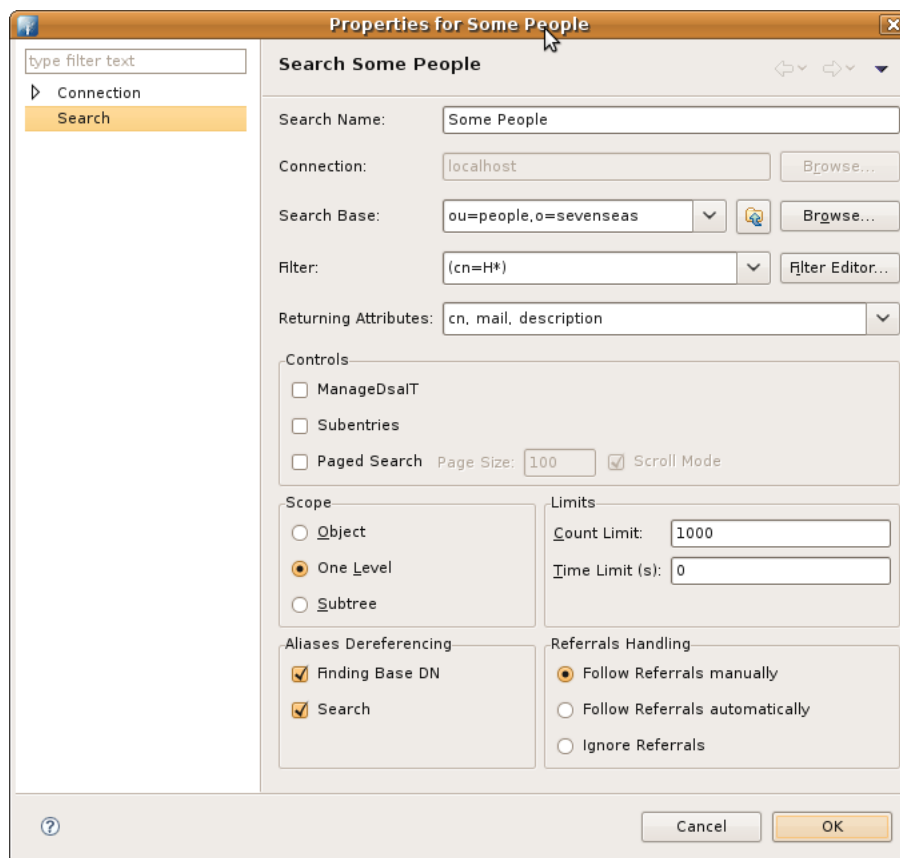
5.6. Bookmark properties

In the Bookmark properties page you can modify the bookmark name and target entry.
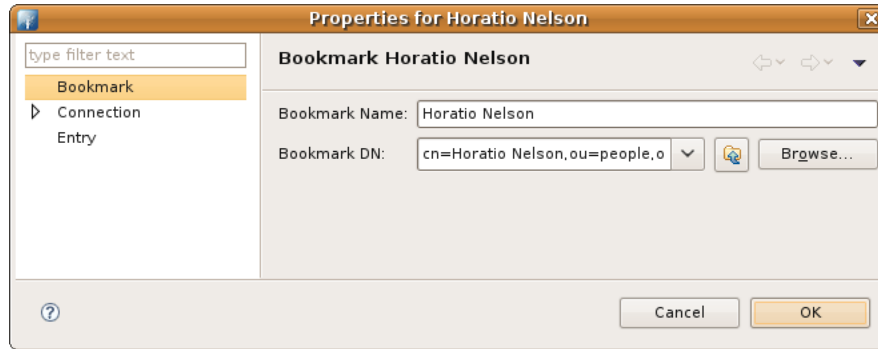
6. Preferences
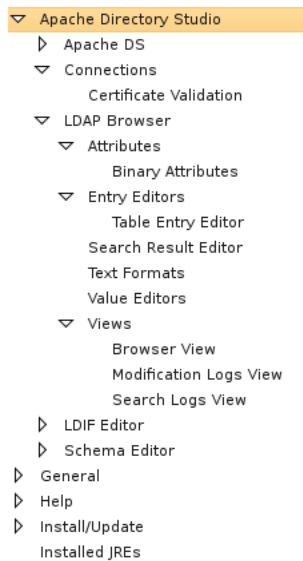
6.1. Connections

In the Connections preferences page you can configure general settings for LDAP Connections.
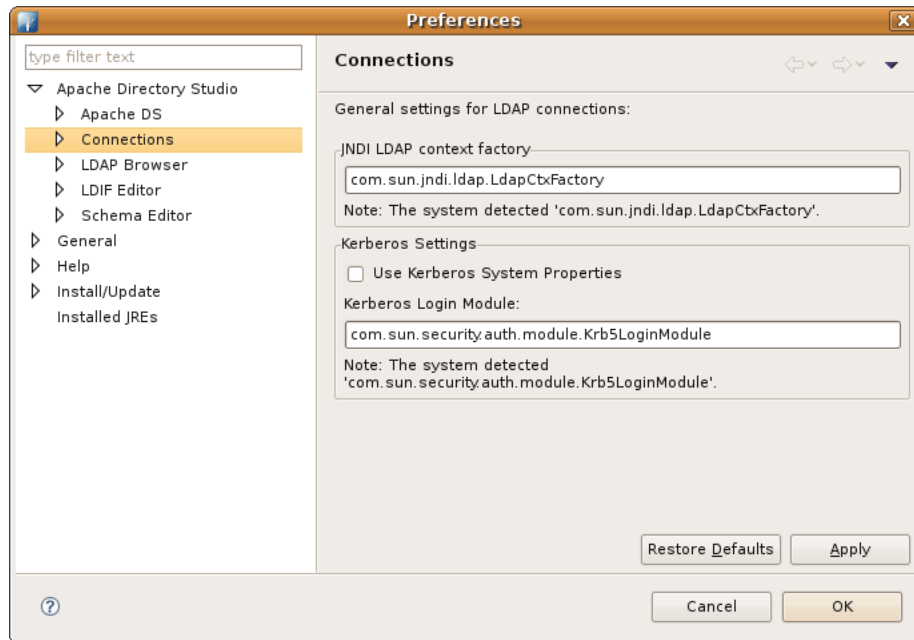
Option	Description	Default
JNDI LDAP Context Factory	Apache Directory Studio uses JNDI for LDAP access. This parameter configures the the factory class. Normally this value is automatically detected and there is no need to change it.	auto-detected
User Kerberos System Properties	If checked you need to configure Kerberos (GSSAPI) authentication using system properties, see http://java.sun.com/products/jndi/tutorial/ldap/security/gssapi.html for details.	unchecked
Kerberos Login Module	Apache Directory Studio uses JAAS for Kerberos authentication. This parameter configures the JAAS login modul. Normally this value is automatically detected and there is no need to change it.	auto-detected

6.2. Certificate Validation

In the Certificate Validation preferences page you can configure certificate validation settings.
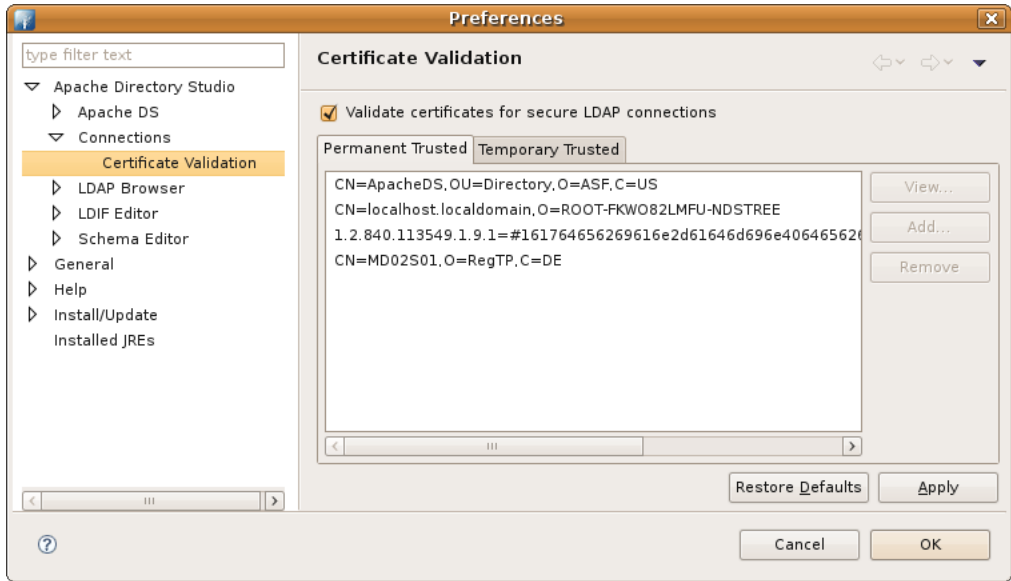
If **Validate certificates for secure LDAP connections** is checked, Apache Directory Studio checks certificates when a secure LDAP connection (ldaps or StartTLS) is established. The following checks are performed: a valid certification path with a trusted root CA must exist, the certificate must not be expired, the hostname must match the certificate subject common name, the certificate must not be self-signed.

If validation fails the Certificate Trust dialog pops up and the you could manually trust a certificate. Those certificates are listed in the "Permanent Trusted" and "Temporary Trusted" lists. You could examine those certificates using the **View** button. You can remove certificates if you don't trust them any more using the **Remove** button.

6.3. Attributes preferences

In the Attributes preferences page you can configure general settings for attributes.
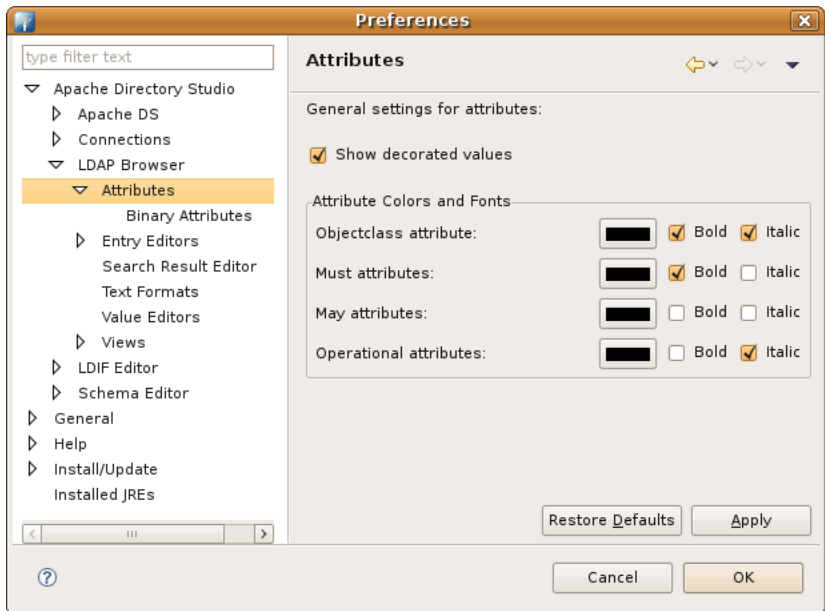
By default non-text attributes are displayed in a user-friendly way within the Entry editor and the Search Result editor. For example if an attribute contains a timestamp it is displayed in your local date format. When unchecking the option **Show decorated values** the values are displayed as returned from directory.

In the **Attribute Colors and Fonts** group you can define the style how attributes and values are displayed within the Entry editor and the Search Result editor.

6.4. Binary Attributes preferences

In the Binary Attributes preferences page you can configure which attributes are binary.
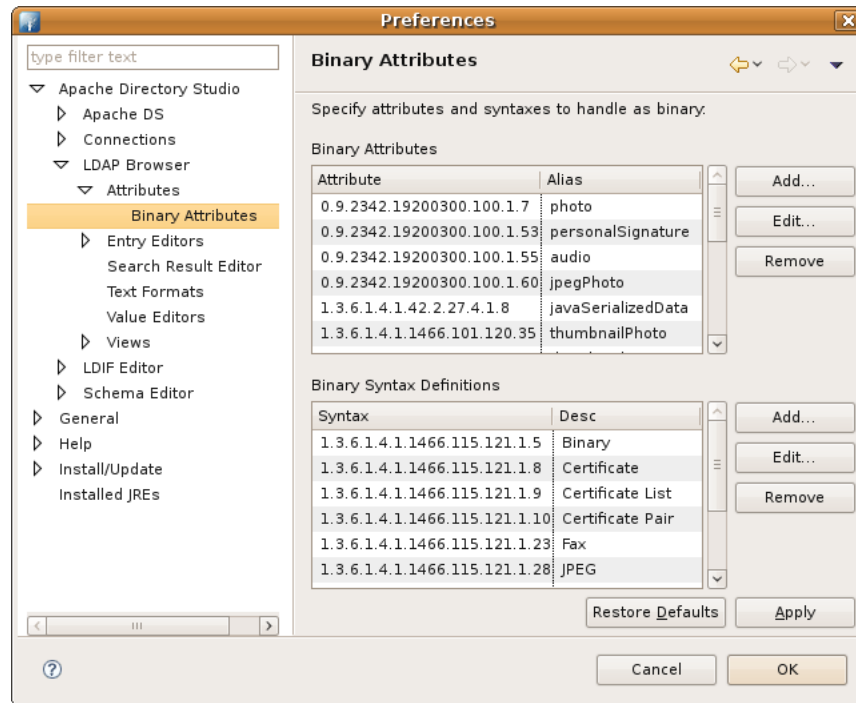
You can specify binary attributes by attribute type or by syntax.

6.5. Entry Editors preferences

In the Entry editor preferences page you can configure the behavior of the Entry editors.
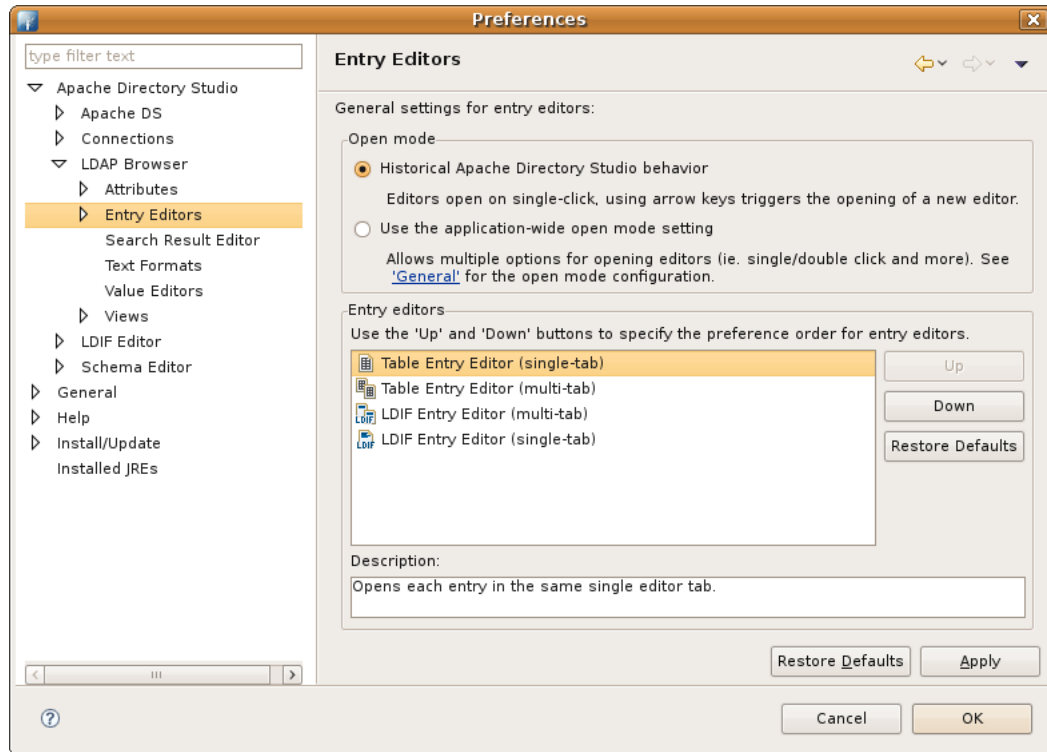
With the open mode you could define how the entry editor should be opened while browsing through the DIT.

In the entry editors section you could define your preferred order of available entry editors using the Up/Down buttons. The topmost entry editor in the list is the default entry editor.

6.6. Table Entry Editor preferences

In the Table Entry Editor preferences page you can configure the behavior of the Table Entry Editor.
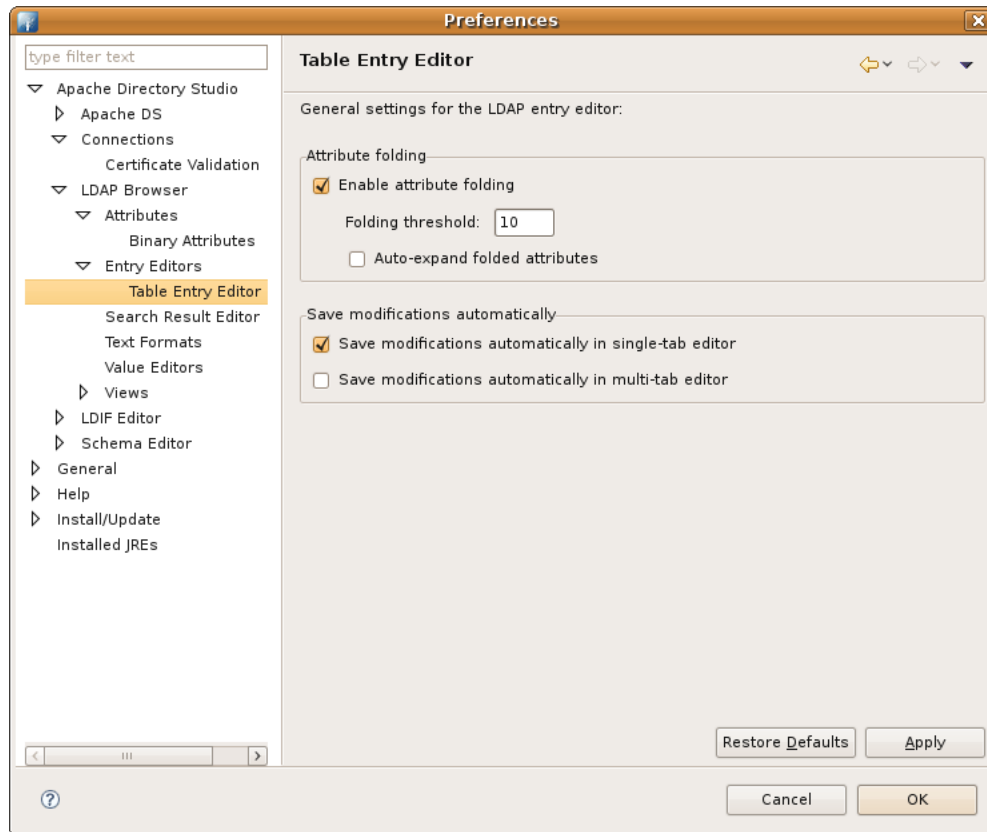
Option	Description	Default
Enable folding	If checked attributes with many values are folded.	on
Folding threshold	The threshold when folding should be activated.	10
Auto-expand folded attributes	If checked folded attribute are automatically expanded.	off
Save modifications automatically in single-tab editor	If checked the single-tab editor automatically saves any modification immediately and sends a modify request to the LDAP server. If unchecked you need to save the editor manually in order to save modifications.	on
Save modifications automatically in multi-tab editor	If checked the multi-tab editor automatically saves any modification immediately and sends a modify request to the LDAP server. If unchecked you need to save the editor manually in order to save modifications.	off

6.7. Search Result editor preferences

In the Search Result editor preferences page you configure the behavior of the Search Result editor.
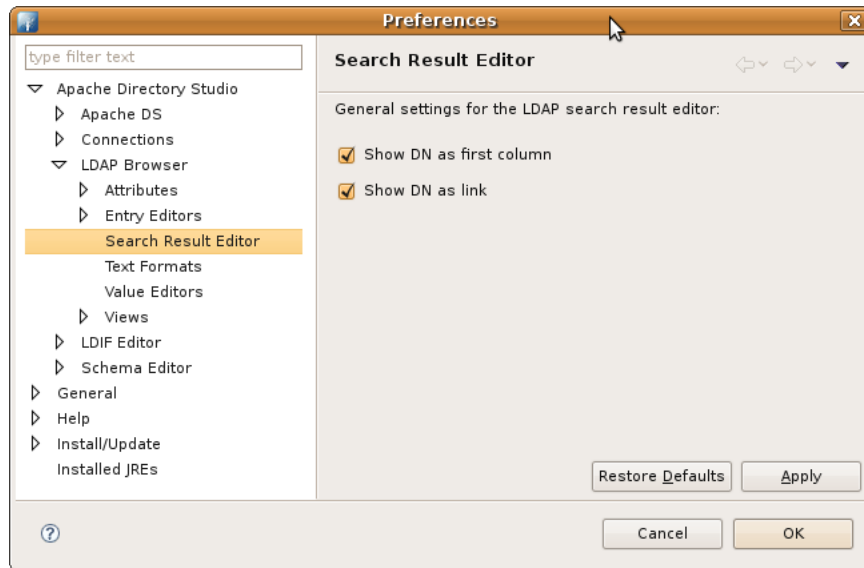
Option	Description	Default
Show DN as first column	If checked the distinguished name of each search result entry is displayed as first line.	on
Show DN as link	If checked the distinguished name of each search result entry is displayed as a link.	on

6.8. Text Formats preferences

In the Text Formats preferences page you configure the text formats of LDIF, CSV and Excel files.

LDIF

In the LDIF tab you can configure the LDIF format.
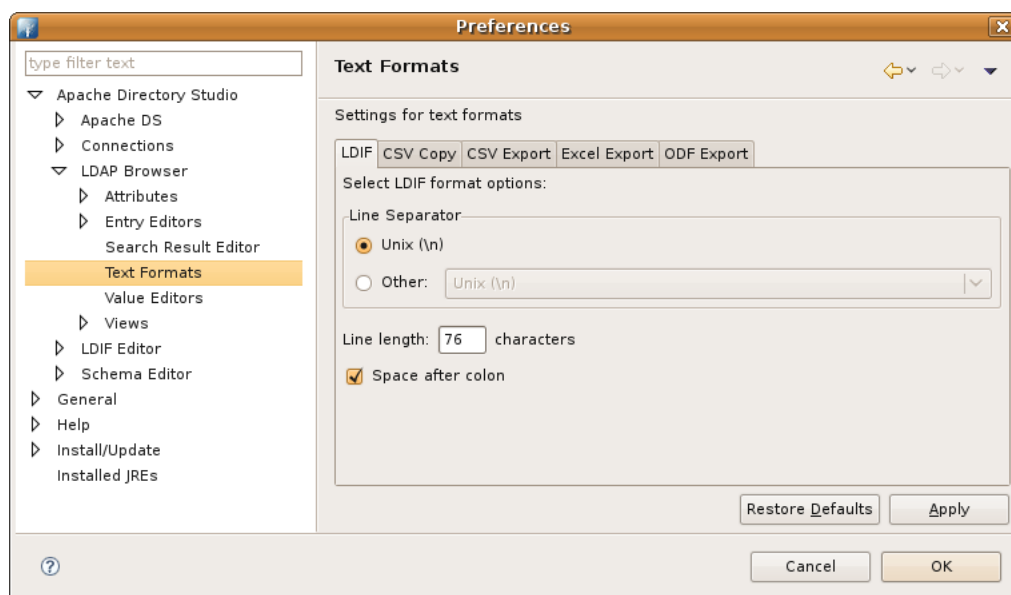
Option	Description	Default
Line Separator	Select the line spearator to use for LDIF files. Possible values are **Windows**, **Unix**	The platform specific line separator
Line length	The line length in LDIF files.	76
Space after colon	If checked a space in inserted between the colon and the value.	on

CSV Copy

In the CSV Copy tab you can configure the format used when copying CSV to clipboard (Copy Entry as CSV, Copy Table).

Option	Description	Default
Attribute Delimiter	The character used to separate attributes. Select default or one from the drop-down box or enter a custom character.	Tabulator (ASCII 9)
Value Delimiter	The character used to separate values of multi-valued attributes. Select default or one from the drop-down box or enter a custom character.	Pipe (|)
Quote Character	Each attribute is enclosed by this quote character. Select default or one from the drop-down box or enter a custom character.	Double Quote (")
Line Separator	Select the line spearator to use. Possible values are **Windows**, **Unix**	The platform specific line separator
Binary Encoding	When copying binary values they must be encoded. Choose • Ignore: if binary values should not be copied. • BASE-64: to copy the binary values BASE-64 encoded.	Ignore

Option	Description	Default
	• HEX: to copy the HEX representation of each byte.	

CSV Export

In the CSV Export tab you can configure the format used when exporting to CSV.

Option	Description	Default
Attribute Delimiter	The character used to separate attributes. Select default or one from the drop-down box or enter a custom character.	Comma (,)
Value Delimiter	The character used to separate values of multi-valued attributes. Select default or one from the drop-down box or enter a custom character.	Pipe (|)
Quote Character	Each attribute is enclosed by this quote character. Select default or one from the drop-down box or enter a custom character.	Double Quote (")
Line Separator	Select the line spearator to use. Possible values are **Windows**, **Unix**	The platform specific line separator
Binary Encoding	When exporting binary values they must be encoded. Choose • Ignore: if binary values should not be exported. • BASE-64: to export the binary values BASE-64 encoded. • HEX: to export the HEX representation of each byte.	Ignore
File Encoding	The file encoding used to when exporting to CSV. Select default or one from the drop-down box.	The platform specific file encoding

Excel Export

In the Excel Export tab you can configure the format used when exporting to Excel.

Option	Description	Default
Value Delimiter	The character used to separate values of multi-valued attributes. Select default or one from the drop-down box or enter a custom character.	Pipe (|)
Binary Encoding	When exporting binary values they must be encoded. Choose • Ignore: if binary values should not be exported. • BASE-64: to export the binary values BASE-64 encoded. • HEX: to export the HEX representation of each byte.	Ignore

ODF Export

In the ODF Export tab you can configure the format used when exporting to Open Document Spreadsheet format.

Option	Description	Default
Value Delimiter	The character used to separate values of multi-valued attributes. Select default or one from the drop-down box or enter a custom character.	Pipe (|)
Binary Encoding	When exporting binary values they must be encoded. Choose • Ignore: if binary values should not be exported. • BASE-64: to export the binary values BASE-64 encoded. • HEX: to export the HEX representation of each byte.	Ignore

6.9. Value Editors preferences

In the Value Editors preferences page you can configure which value editor to use for an attribute.
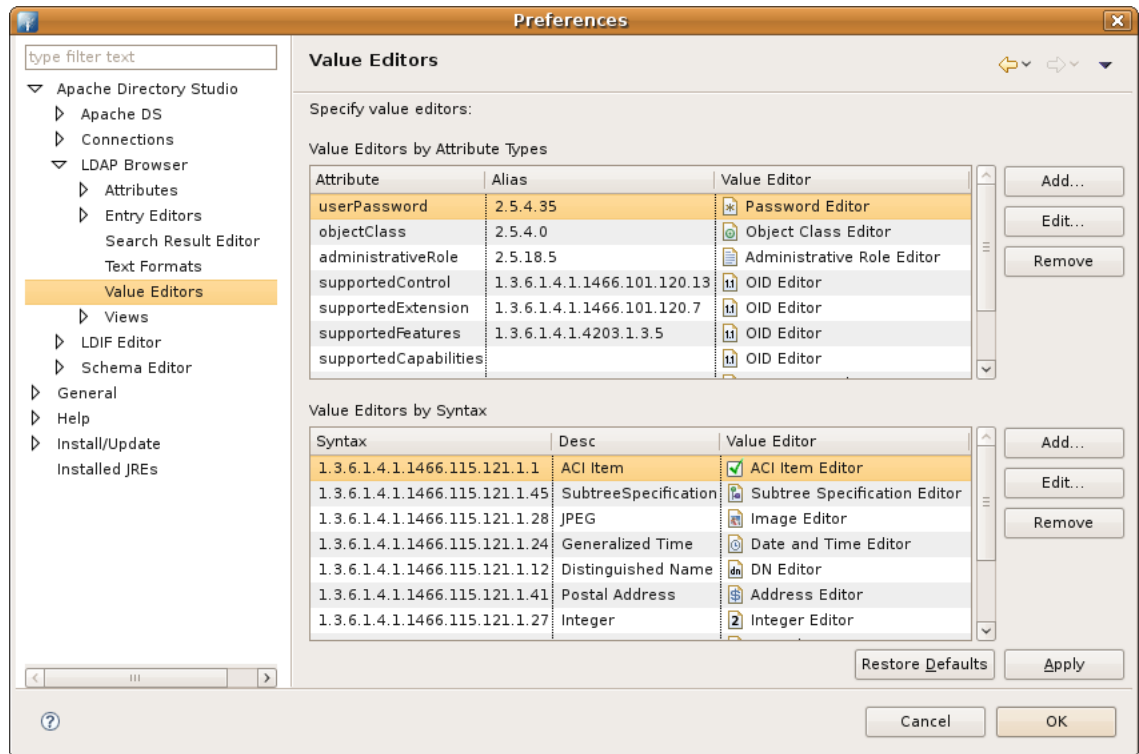
You can specify value editors by attribute type or by syntax. If a value editor is specified by syntax the value editor is used for all attributes with this syntax. A value editor specified for an attribute overwrites the syntax-setting.

6.10. Browser View preferences

In the Browser View preferences page you can configure the layout and behavior of the LDAP Browser view and the Select DN dialog.
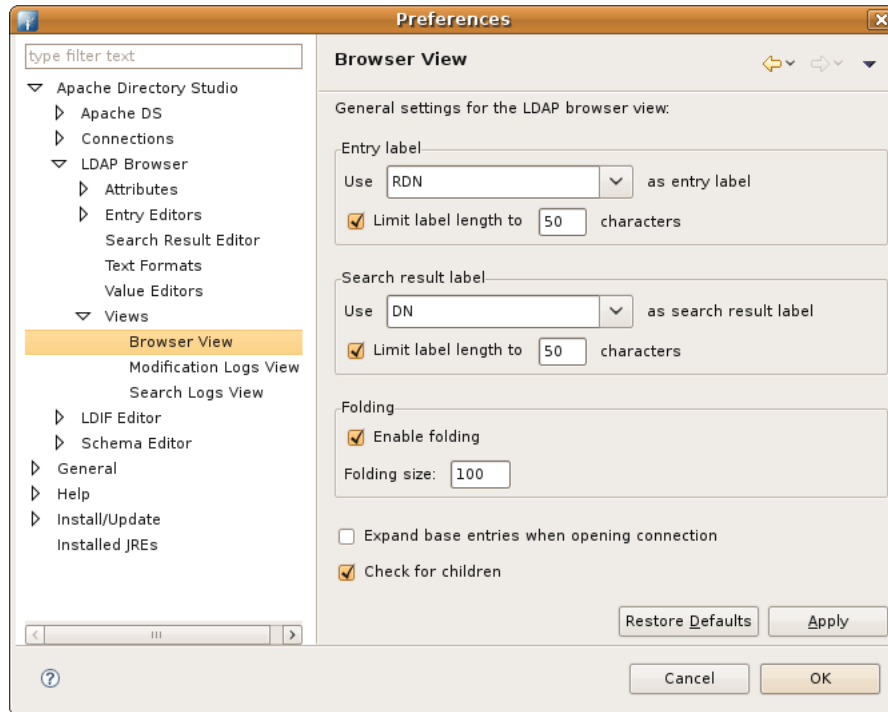
Option	Description	Default
Entry label	Choose one of **DN**, **RDN** or **RDN value** to be used as label for entries in the DIT category. If the checkbox is checked long labels with more than the specified number of characters are abbreviated.	RDN with limit of 50 characters
Search Result label	Choose one of **DN**, **RDN** or **RDN value** to be used as label for search results in the DIT category. If the checkbox is checked long labels with more than the specified number of characters are abbreviated.	DN with limit of 50 characters
Folding	If checked large subtrees and search results are folded into virtual folders each with the given number of entries.	enabled with folding size 100
Expand base entries when opening connection	If checked the base entries are expanded when opening the connection.	off
Check for children	If checked the LDAP Browser tries to find out if the fetched entries have children. Therefore the operational attributes hasSubordinates, numSubordinates and subordinateCount are requested from server.	on

6.11. Modification Logs View preferences

In the Modification Logs preferences page you can configure the behavior of the Modification Logs view
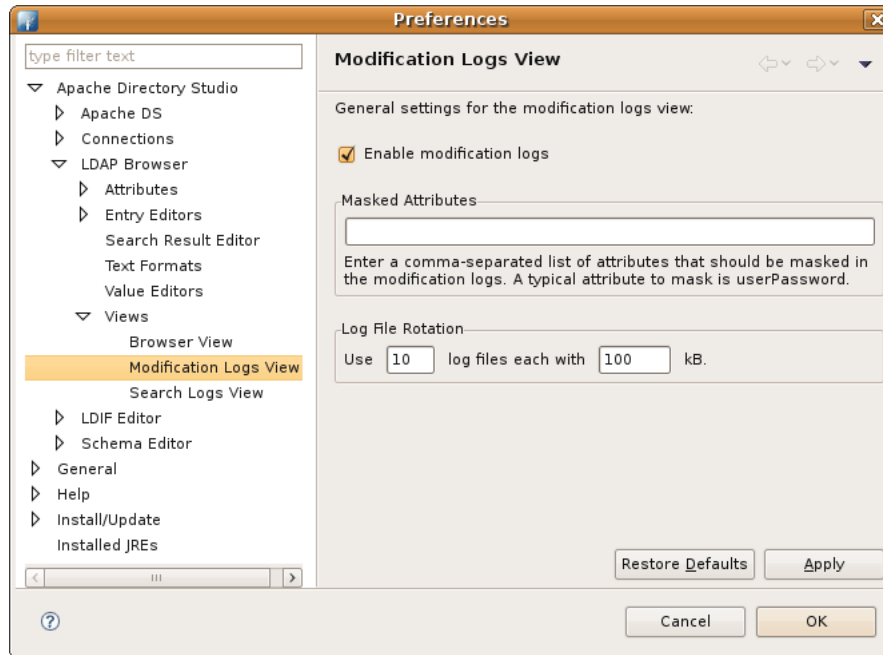
Option	Description	Default
Enable modificaton logs	Enables/Disables the modificaton logs.	on
Masked Attributes	Enter a comma-separated list of attributes that should be masked by an asterisk '*'. A typical attribute to mask is userPassword.	
Log File Rotation	Log file rotation is used. You could specifiy the number of log files an the maximum size for each log file.	10 log files each with 100 kB

6.12. Search Logs View preferences

In the Search Logs preferences page you can configure the behavior of the Search Logs view
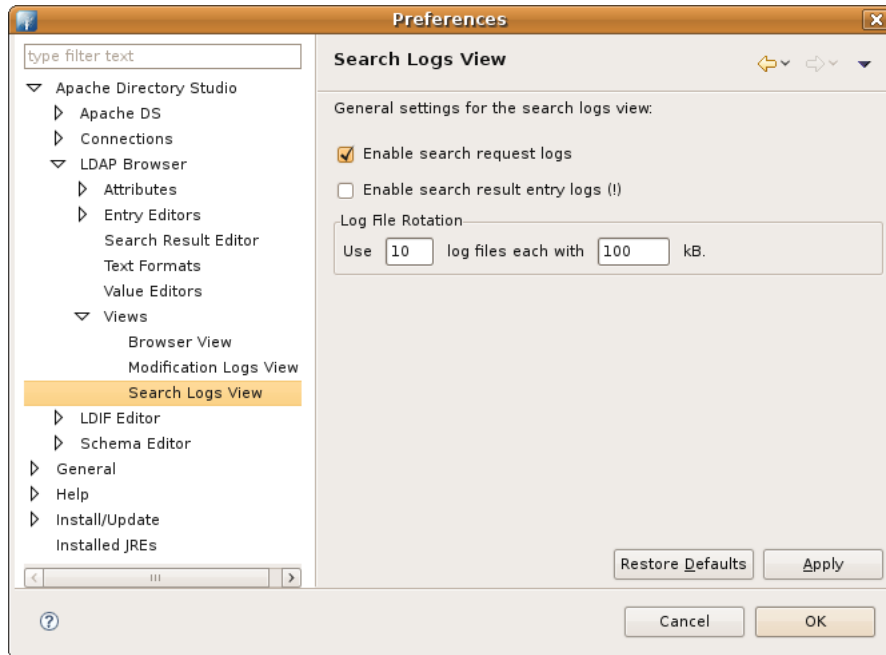
Option	Description	Default
Enable search request logs	Enables/Disables the search request and search result done logs.	on
Enable search result entry logs	Enables/Disables the search result entry logs. Note: You should only activate this options for debug reasons, otherwise your logfile will overfill very fast.	off
Log File Rotation	Log file rotation is used. You could specifiy the number of log files an the maximum size for each log file.	10 log files each with 100 kB

Chapter III. Tasks

1. Managing connections

1.1. Creating a connection

Using the New Connection wizard

To create a new connection please use the New Connection wizard.

Duplicating an existing connection

It is also possible to duplicate an existing connection. This is helpful if the new connection has similar connection parameters:

1. Select the connection you want to duplicate and select 🖹 **Copy Connection** from context menu or use the **Strg-C** shortcut.

2. Afterward select 🖺 **Paste Connection** from context menu or use the **Strg-V** shortcut. Observe the new connection, prefixed with "Copy of ".

3. Rename the connection to your needs.

4. Modify the connection parameters to your needs.

1.2. Modifying connection parameters

The connection parameters could be modified in the Connection properties. Select a connection and choose **Properties...** from context menu or press **Alt-Enter** to open the properties dialog.

Note: A connection must be closed in order to modify its connection parameters.

1.3. Renaming a connection

To rename a connection select a connection and choose **Rename Connection...** from context menu or press **F2**.

In the opened dialog enter the new name and press **OK**.

1.4. Deleting a connection

To delete a connection select a connection and choose ✖ **Delete Connection** from context menu or press **Delete**.

Note: A connection must be closed in order to delete it.

1.5. Opening a connection

A connection is automatically opened when expanding the DIT or when performing a search.

To open a connection explicitly choose one of the following options:

- In the Connections view select a connection and choose 🔍 **Open Connection** from context menu or from toolbar.

- Double-click a connection.

1.6. Closing a connection

To close a connection select a connection and choose 🔍 **Close Connection** from context menu or from toolbar.

1.7. Enabling secure connections

Apache Directory Studio supports secure connections using SSL (ldaps) or StartTLS extended operation. Select a proper encryption method in the Connection properties.

1.8. Sharing connections

There are two ways to export and import connections. This may be useful if you want to copy your connections from one computer to another or if you want to share connection parameters with other users. You could also use this features to backup your defined connections.

Import/Export connections

You could use the Export Connection wizard and Import Connection wizard to export and import connections.

Copy/Paste connections as LDAP URL

A more simple way is to copy/paste connections as LDAP URL.

RFC 2255 specifies the LDAP URL format. Apache Directory Studio uses the host and port field and uses X- extensions for all other connection paramter.

Parameter	Description	Possible values	Default
X-CONNECTION-NAME	The connection name.	Any name, must be URL encoded	Current date
X-ENCRYPTION	The encryption to use.	none, ldaps, StartTLS	none
X-AUTH-METHOD	The authentication to use.	Anonymous, Simple, DIGEST-MD5, CRAM-MD5	Simple imf X-BIND-USER is present, else Anonymous
X-BIND-USER	The bind DN or user.	Any DN, must be URL encoded	none
X-BIND-PASSWORD	The bind password.		none
X-SASL-REALM	The SASL realm.		none
X-BASE-DN	The base DN.	A valid base DN, none to get base DNs from the Root DSE	none

Parameter	Description	Possible values	Default
X-COUNT-LIMIT	The count limit.	A positive integer, 0 for no count limit	0
X-TIME-LIMIT	The time limit in seconds.	A positive integer, 0 for no time limit	0
X-ALIAS-HANDLING	The alias handling method.	NEVER, SEARCHING, FINDING, ALWAYS	ALWAYS
X-REFERRAL-HANDLING	The referral handling method.	FOLLOW, IGNORE, MANAGE	FOLLOW
X-FETCH-SUBENTRIES	If present the subentries control is activated.	no value	-
X-PAGED-SEARCH	If present the paged control is activated.	no value	-
X-PAGED-SEARCH-SIZE	The paged search size.	Any positive integer	100
X-PAGED-SEARCH-SCROLL-MODE	If present the scroll mode is activated.	No value	-

Here's an example how such an URL looks like: ldap://localhost:10389/????X-CONNECTION-NAME=ApacheDS,X-BIND-USER=uid=admin%2cou=system,X-BIND-PASSWORD=secret,X-COUNT-LIMIT=1000

When you copy a connection within the Connections view it is copied in the described format to your clipboard. You could then paste this LDAP URL into a text editor or to an email.

The same way you could copy an LDAP URL from somewhere and paste it into the Connections view.

2. Browsing directory

2.1. Handling large number of entries

A directory may have entries with thousands of child entries. It is not recommended to fetch all these children when browsing because this increases directory and network load and is very time consuming.

Limiting number of fetched entries

It is recommended to limit the number of returned entries. The limit is defined in Connection properties.

Filtering children

Another option is to use a filter to limit the fetched children. Choose 🔽 **Filter Children...** from context menu. In the opened dialog you could define a LDAP filter. Hit **Strg-Space** to get content assistance. The drop-down list provides a history of recently used filters. A click to the **Filter Editor** button opens the Filter Editor dialog.

2.2. Showing RootDSE and Schema entry

To make RootDSE and Schema entry visible in the Browser view enable **Show Directory Metadata** in the Browser's drop down menu.

2.3. Showing subentries

Subentries are a special kind of entries used for managing the administration of different aspects of the directory. By default they are not visible. To make them visible in the Browser view enable **Fetch subentries** in the Connection properties.

2.4. Displaying entry's attribute

Select an entry in the Browser view. The Entry editor will be opened and shows the entry's attributes.

2.5. Filtering entry's attribute

Please see Quick Filter in Entry editor features.

3. Managing entries

3.1. Creating an entry

To create a new entry please use the New Entry wizard.

3.2. Renaming an entry

To rename an entry please use the Rename Entry dialog.

3.3. Moving entries

To move entries to another parent please use the Move Entry dialog.

3.4. Deleting entries

To delete entries select the entries you would like to delete and choose ✖ **Delete** from context menu or press **Delete** key.

3.5. Adding an attribute

1. Use the Attribute wizard to specify the attribute.

2. After finishing the wizard a proper Value editor is invoked. Enter the value and press **Enter**.

3.6. Adding a value

1. Select the attribute where you would like to add a value.

2. Choose ⇟ **New Value** from tool bar or context menu or hit **Strg-+**. This invokes a proper Value editor

3. Enter the value and press **Enter**.

3.7. Modifying a value

1. Select the value you would like to edit.

2. Invoke the default Value editor by pressing **Enter** or **F7** or double-click the value.

or

Invoke a custom Value editor by choosing one from **Edit Value With** in the context menu.

3. Modify the value and press **Enter**.

3.8. Deleting attributes and values

To delete attributes and values select the attributes and values you would like to delete and choose ✖ **Delete** from tool bar or context menu or press **Delete** key.

3.9. Modifying the object class

To modify the object class please use the Edit Entry wizard.

Chapter IV. Reference

RFCs

RFC 4510: LDAP: Technical Specification Road Map [rfc/rfc4510.txt]
RFC 4511: LDAP: The Protocol [rfc/rfc4511.txt]
RFC 4512: LDAP: Directory Information Models [rfc/rfc4512.txt]
RFC 4513: LDAP: Authentication Methods and Security Mechanisms [rfc/rfc4513.txt]
RFC 4514: LDAP: String Representation of Distinguished Names [rfc/rfc4514.txt]
RFC 4515: LDAP: String Representation of Search Filters [rfc/rfc4515.txt]
RFC 4516: LDAP: Uniform Resource Locator [rfc/rfc4516.txt]
RFC 4517: LDAP: Syntaxes and Matching Rules [rfc/rfc4517.txt]
RFC 4518: LDAP: Internationalized String Preparation [rfc/rfc4518.txt]
RFC 4519: LDAP: Schema for User Applications [rfc/rfc4519.txt]
RFC 2849: The LDAP Data Interchange Format (LDIF) - Technical Specification [rfc/rfc2849.txt]
RFC 3866: Language Tags and Ranges in the LDAP [rfc/rfc3866.txt]

Obsolete RFCs

RFC 2251: Lightweight Directory Access Protocol (v3) [rfc/rfc2251.txt]
RFC 2252: Attribute Syntax Definitions [rfc/rfc2252.txt]
RFC 2253: UTF-8 String Representation of Distinguished Names [rfc/rfc2253.txt]
RFC 2254: The String Representation of LDAP Search Filters [rfc/rfc2254.txt]
RFC 2255: The LDAP URL Format [rfc/rfc2255.txt]
RFC 2256: A Summary of the X.500(96) User Schema for use with LDAPv3 [rfc/rfc2256.txt]
RFC 2829: Authentication Methods for LDAP [rfc/rfc2829.txt]
RFC 2830: Extension for Transport Layer Security [rfc/rfc2830.txt]

Tutorials

JNDI Tutorial [http://java.sun.com/products/jndi/tutorial/]

Chapter V. Tips and tricks

TODO...