
Rhythmyx

Rhythmyx Administration Manual

Version 6.5.2

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CHAPTER 1

About the Rhythmyx Administration Manual

The *Rhythmyx System Administration Manual* documents how to manage and maintain the Rhythmyx Content Management System. Both day-to-day and long-term administration tasks are addressed in this document.

Users of this manual should be familiar with the *Rhythmyx Concepts Guide*, but need not have read detailed implementation documentation nor attended Rhythmyx Developer's Training.

Users need not read the complete manual. In many cases, a single chapter or section may address the specific task you need to accomplish.

- If you manage Publishing, including monitoring publishing logs and troubleshooting and republishing failed Content Items, read Chapter 1, *Managing Publishing* (see page 5).
- If you need to start or stop the Rhythmyx server, or issue a command to the Rhythmyx server, read Chapter 2, *Operating the Rhythmyx Server* (see page 17).
- If you need to manage users and their access to Rhythmyx, read Chapter 3, *Maintaining Users* (see page 49); specifically:
 - if you need to manage or add a new security provider, read *Maintaining Security Providers* (see "Security Providers and Authentication" on page 50);
 - if you use LDAP or Microsoft Active Directory to maintain user access to your system, read *Using Directory Services* (see page 62);
 - If you need to maintain Roles or user membership in a Role, read *Roles* (see page 110).
- If you need to manage the Rhythmyx full-text search engine, read *Search Configuration* (see page 123).
- If you need to manage the Rhythmyx Repository database, read Repository Database Management and Maintenance.
- If you need to manage or maintain system hardware infrastructure, read *System Management and Recovery* (see page 141); specifically:
- If you need to plan the physical deployment of the system, read *Physical Architecture of Rhythmyx* (on page 142);
- If you need to implement source control or manage backups of the Rhythmyx Content Management System, read *Source Control and Backups* (on page 147);
- If you need to set up failover of the Rhythmyx Content Management System, read *Setting Up a Rhythmyx Failover Server* (on page 151).
- If you need to set up a disaster recovery server for you system, read *Setting Up a Rhythmyx Disaster Recovery Server* (see page 152).

CHAPTER 2

Managing Publishing

The publishing process converts the raw Content Items entered by content contributors into output consumable by visitors to your Web site. To help manage publishing, Rhythmyx provides both *logs* (see "Viewing Detailed Logs" on page 6) and *publication maps* (see "Publication Details: Publication Maps" on page 9).

This chapter also includes troubleshooting recommendations when publishing fails.

Viewing Detailed Logs

Rhythmyx keeps detailed logs of events during Publishing. You can access either a log filtered for errors or a complete log.

To view a log filtered for errors, click on the value in the error column of the Publication Logs whose results you want to view. Rhythmyx displays a detailed log consisting only of errors:

Log session start time Fri Feb 25 15:11:28 EST 2005		
Time	Level	Message
6003922	ERROR	HTTP error for the request URL: http://bobj9955/Rhythmyx/rxs_Home_cas/page.html?sys_revision=1&sys_siteid=301&sys_authtype=101&sys_contentid=466&sys_variantid=301 Error code: 404
6003938	ERROR	
6003938	ERROR	Failed to publish content item.
<pre> com.percussion.publisher.client.PSContentFetchException: HTTP error for the request URL: http://bobj9955/Rhythmyx/rxs_Home_cas/page.html?sys_revision=1&sys_siteid=301 at com.percussion.publisher.PSURLs.fetchContent(Unknown Source) at com.percussion.publisher.client.PSContentItem.publish(Unknown Source) at com.percussion.publisher.client.PSContentItem.process(Unknown Source) at com.percussion.publisher.client.PSContentPublisher.process(Unknown Source) at com.percussion.publisher.client.PSContentPublisher.execute(Unknown Source) at sun.reflect.NativeMethodAccessorImpl.invoke0(Native Method) at sun.reflect.NativeMethodAccessorImpl.invoke(Unknown Source) at sun.reflect.DelegatingMethodAccessorImpl.invoke(Unknown Source) at java.lang.reflect.Method.invoke(Unknown Source) at org.apache.soap.server.RPCRouter.invoke(RPCRouter.java:146) at org.apache.soap.providers.RPCJavaProvider.invoke(RPCJavaProvider.java:129) at org.apache.soap.server.http.RPCRouterServlet.doPost(RPCRouterServlet.java:354) at javax.servlet.http.HttpServlet.service(HttpServlet.java:760) at javax.servlet.http.HttpServlet.service(HttpServlet.java:853) at org.apache.catalina.core.ApplicationFilterChain.internalDoFilter(ApplicationFilterChain.java:247) at org.apache.catalina.core.ApplicationFilterChain.doFilter(ApplicationFilterChain.java:193) at org.apache.catalina.core.StandardWrapperValve.invoke(StandardWrapperValve.java:256) at org.apache.catalina.core.StandardPipeline\$StandardPipelineValveContext.invokeNext(StandardPipeline.java:643) at org.apache.catalina.core.StandardPipeline.invoke(StandardPipeline.java:480) at org.apache.catalina.core.ContainerBase.invoke(ContainerBase.java:995) at org.apache.catalina.core.StandardContext\$Valve.invoke(StandardContext\$Valve.java:191) at org.apache.catalina.core.StandardPipeline\$StandardPipelineValveContext.invokeNext(StandardPipeline.java:643) at org.apache.catalina.core.StandardPipeline.invoke(StandardPipeline.java:480) at org.apache.catalina.core.ContainerBase.invoke(ContainerBase.java:995) at org.apache.catalina.core.StandardContext.invoke(StandardContext.java:2416) at org.apache.catalina.core.StandardHost\$Valve.invoke(StandardHost\$Valve.java:180) at org.apache.catalina.core.StandardPipeline\$StandardPipelineValveContext.invokeNext(StandardPipeline.java:643) at org.apache.catalina.valves.ErrorDispatcherValve.invoke(ErrorDispatcherValve.java:171) at org.apache.catalina.core.StandardPipeline\$StandardPipelineValveContext.invokeNext(StandardPipeline.java:641) at org.apache.catalina.valves.ErrorReportValve.invoke(ErrorReportValve.java:172) at org.apache.catalina.core.StandardPipeline\$StandardPipelineValveContext.invokeNext(StandardPipeline.java:641) at org.apache.catalina.authenticator.SingleSignOn.invoke(SingleSignOn.java:376) at org.apache.catalina.core.StandardPipeline\$StandardPipelineValveContext.invokeNext(StandardPipeline.java:641) at org.apache.catalina.core.StandardPipeline.invoke(StandardPipeline.java:480) at org.apache.catalina.core.ContainerBase.invoke(ContainerBase.java:995) at org.apache.catalina.core.StandardEngine\$Valve.invoke(StandardEngine\$Valve.java:174) at org.apache.catalina.core.StandardPipeline\$StandardPipelineValveContext.invokeNext(StandardPipeline.java:643) at org.apache.catalina.core.StandardPipeline.invoke(StandardPipeline.java:480) at org.apache.catalina.core.ContainerBase.invoke(ContainerBase.java:995) at org.apache.coyote.tomcat4.CoyoteAdapter.service(CoyoteAdapter.java:223) at org.apache.coyote.http11.Http11Processor.process(Http11Processor.java:601) at org.apache.coyote.http11.Http11Protocol\$Http11ConnectionHandler.processConnection(Http11Protocol.java:392) at org.apache.tomcat.util.net.TopWorkerThread.runIt(PoolTcpEndpoint.java:565) at org.apache.tomcat.util.threads.ThreadPool\$ControlRunnable.run(ThreadPool.java:619) at java.lang.Thread.run(Unknown Source) </pre>		
6003953	ERROR	Items failed: 1

Figure 1: Detailed Publication Log showing only errors

To view a complete detailed log, click on the value in the Status Column. Rhythmyx displays the complete detailed log for the publication run.

Log session start time Fri Feb 25 15:11:26 EST 2005

Time	Level	Message
5997125	INFO	Starting publisher log. Version: Rhythmyx Publisher 5.6; Build:20050204. Date: Fri Feb 25 15:11:26 EST 2005
5997156	DEBUG	Begin Content List.
5997156	DEBUG	Begin content item.
5997156	DEBUG	Getting content item from URL : http://bobj:9955/Rhythmyx/bs_Category_cas/p_category.html?sys_revision=1&sys_siteid=301&sys_authtype=101&sys_contentid=485&sys_
5997172	DEBUG	PSFilePublisherHandler - Publishing item with contentid: 485
5997172	DEBUG	Creating file c:\inetpub\wwwroot\Mortgages and Home Finance\page485.html
5997234	DEBUG	Finished content item.

Figure 2: Section of a complete detailed Publication Log

Purging the Publication Log

Over time, you will build up a large backlog of publication logs. In order to keep the publication log manageable, you will want to purge it periodically. Purging the publications log deletes the log records permanently from the database, so you want to be sure that you have no need of a log record before you purge it.

To purge the publication log:

- 1 In the Rhythmyx Content Explorer, click the Publishing tab.
Rhythmyx displays the Publishing Administrator.
- 2 On the Publishing tab, click the Purge Pub Log option you want to use. (Note: The only option in the default version of the tab is By Site.)
- 3 Rhythmyx displays the Purge Publication Log page.

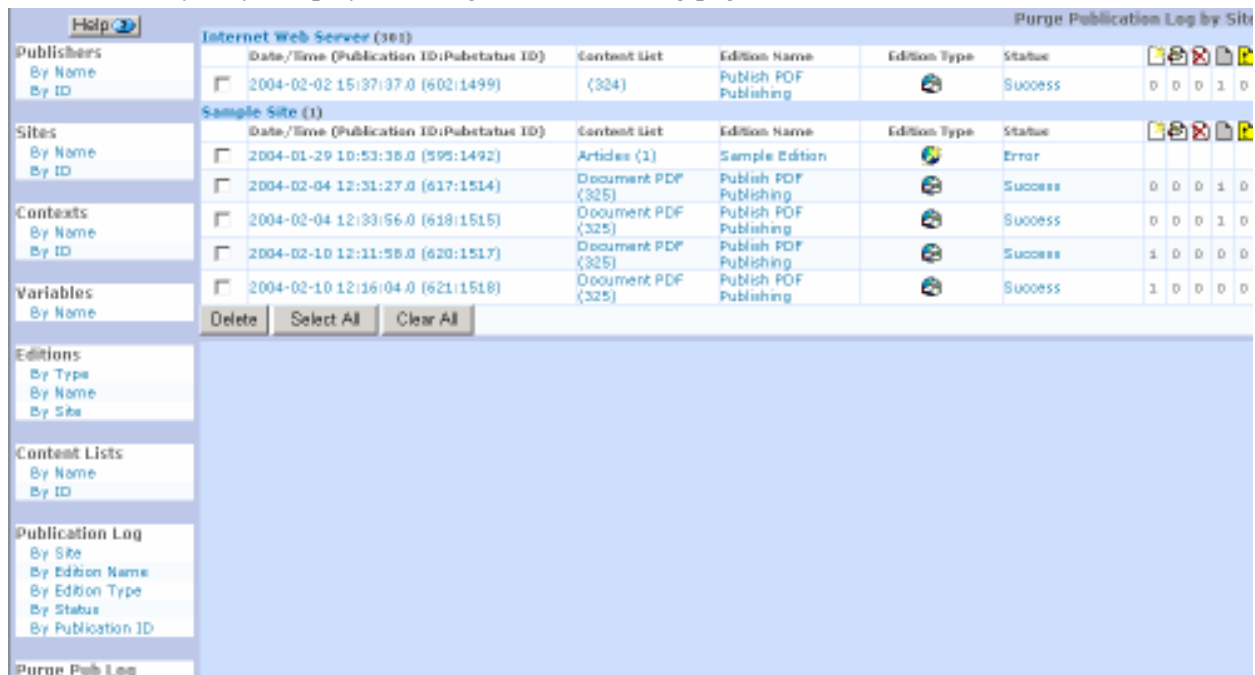


Figure 3: Purge Publication Log Page

- 4 Check the logs you want to purge. To purge all logs, click [**Select All**]. To clear your selections and start over, click [**Clear All**].
- 5 Click [**Delete**].
- 6 Rhythmyx will display a confirmation message. Click [**OK**] to confirm the delete action. Click [**Cancel**] to abort the delete action.

Publication Details: Publication Maps

When you click on the date/time stamp of a Publication in the Publication Log, Rhythmyx displays the publication details as a virtual map of the output of the run. Rhythmyx displays the same map of the current Publication when you click the File Tree icon in the Site Editor.

The virtual map is a tree diagram showing the location of each content item published in the Publication run, whether Rhythmyx succeeded or failed to publish the content item, and any links from the content item to another content item.

Use the Publication Map to see how a page appears on the Web Site by clicking on the Filename. To see if the Web site is properly displaying your Rhythmyx configuration, click on the CMS Link to view the page as assembled by the Rhythmyx content assembler.

To View the Publication Map:

- 1 Go to the Publication Log:

Corporate Investments (303)						Publications by Site				
Date/Time (Publication ID:Pubstatus ID)	Content List	Edition Name	Edition Type	Status						
2005-07-06 09:34:26.0 (407:407)	Site Root Full (310)	Full Corporate Investments		Error						
2005-07-06 09:35:28.0 (408:408)	Site Root Full (310)	Full Corporate Investments		Success	168	0	0	0	0	
Dynamic Preview Site (305)										
Date/Time (Publication ID:Pubstatus ID)	Content List	Edition Name	Edition Type	Status						
2005-06-27 10:45:47.0 (394:394)	Manual Content List (316)	Manual Edition for Dynamic Previewing		Success	1	0	0	0	0	
2005-06-27 14:56:20.0 (398:398)	Manual Content List (316)	Manual Edition for Dynamic Previewing		Success	0	1	0	0	0	
2005-06-27 15:00:43.0 (399:399)	Manual Content List (316)	Manual Edition for Dynamic Previewing		Success	1	0	0	0	0	
2005-06-28 10:31:41.0 (400:400)	Manual Content List (316)	Manual Edition for Dynamic Previewing		Error						
2005-06-28 10:33:59.0 (401:401)	Manual Content List (316)	Manual Edition for Dynamic Previewing		Error						

Figure 4: Publishing Administrator, Publications page

Click the time/date stamp of the Publication that you want to view.

2 Rhythmyx displays the Publication Details (Virtual Edition Map).






Filename	Operation	Status	CMS Link
C:/			
Rhythmyx/			
Publisher/			
webapps/			
Xroads40/			
images/			
	publish	success	System Menu
	publish	success	Image - Products
	publish	success	System Menu
	publish	success	Image - News
	publish	success	System Menu
			Image - Events
			System Menu
			Image -
			Downloads
			System Menu

Figure 5: Virtual Edition Map

- Click on a **Filename** to view the page from the published output location. (NOTE: If the output is published to a database, this function will not work. An error message will be displayed stating that the assembly resource cannot be found.) Click on a **CMS Link** to view the page as assembled by the Rhythmyx Content Assembler. Note that for output published to a database, the assembled output is XML, not HTML.

Monitoring Publication of Localized Content

Use the *Virtual Edition Map* (see "Publication Details: Publication Maps" on page 9) to monitor the publication of localized content.

If your Publishing Model is site-centric (publishes localized content to unique sites or destinations), you will have unique Sites and Editions for each Locale. Review the Virtual Edition Map for each Edition to determine whether the content of the Edition published correctly.

If your Publishing Model is content-centric (publishes all content to a single site or destination), you use a single Edition that includes the pages for all Localized versions of your content. After publishing this Edition, Rhythmyx creates a single Virtual Edition Map that shows the success or failure of each page. Click the different pages in the Virtual Edition Map to see if the different versions within the Edition published correctly.

See the document *Internationalizing and Localizing Rhythmyx* for more information about localization.

If Rhythmyx publishes your Editions or Edition, but does not publish some content items, **republish the failed content** (see "Republishing Failed Content" on page 12).

Republishing Failed Content

When you review the Publication Log and Virtual Edition Map for a publication, you may find that Rhythmyx published your Edition but did not publish some Content Items. After you resolve the problems causing the publication failure of these content items, you can republish just these items to your site by publishing an incremental Edition. You do not have to republish the entire Edition.

Troubleshooting Publishing

This section provides you with documentation for troubleshooting Rhythmyx Publishing problems.

Publication Log indicates that files have published correctly, but links to the files on the Web server are incorrect. (see "Incorrect links to published files on Web server" on page 13)

Error document displays "Access is denied" message. (see "Access is Denied Error" on page 14)

Publishing process resulted in an error, but the Publication Log and Error Document are empty. (see "Publication Error Log is Empty" on page 15)

Publication Log indicates that files were published correctly, but the files do not render correctly in the browser. (see "Files Do Not Render Properly in Browser" on page 16)

RXSITEITEMS table is not updating correctly. (see "RXSITEITEMS Is Updating Incorrectly" on page 16)

Content is publishing without related content. (see "Content is Publishing without Related Content" on page 15)

Files do not render property in the browser (see "Files Do Not Render Properly in Browser" on page 16).

Incorrect links to published files on the Web server (see "Incorrect links to published files on Web server" on page 13).

RXSITEITEMS is updating incorrectly (on page 16).

Incorrect links to published files on Web server

Error:

Publication Log in the Publishing Administrator indicates that files have published correctly, but links in the ***Publication Map*** (see "Publication Details: Publication Maps" on page 9) to the files on the Web server are incorrect.

Resolution:

Fix the Publishing Root Location or the Site Address (URL) on the Edit Site Page. The Publishing Root Location must be an existing directory that an HTTP server listed in Site Address (URL) serves. If you use FTP publishing, the Publishing Root Location must be relative to the FTP account specified under FTP information. If you publish to a file system, the Publishing Root Location must be an absolute path (for example, c:\inetpub\wwwroot or /usr/local/web).

Access is Denied Error

Error:

Status link in Publication Log displays error document with "Access is denied" message.

Example Error Documents:

```
[Debug] Creating file
c:/inetpub/wwwroot/ftppublish/articles/art303.html
Error: Could not create directory 'c:' on server
FTP server message: 550 c:: Access is denied.
```

```
[Debug] Creating file ftpublish/articles/art303.html
Error: Could not create directory 'ftppublish' on server
FTP server message: 550 ftpublish: Access is denied.
```

Resolution:

The error document displays this error message if the FTP account does not have access to the directory listed in the Publishing Root Location on the Edit Site Page. For Publishing to work, the FTP account must have access to the directory listed in Publishing Root Location or privileges to create it under the FTP root.

Check the following:

- Directory Permissions (Does account have read-only access to this directory?)
- Account Permissions (Is account permitted to create directories?)
- Publishing Root Location (Is Publishing Root Location relative to the FTP account's root directory?)

Publication Error Log is Empty

Error:

Publishing Log in the Publishing Administrator displays "Error" for status, and the columns for items inserted, updated, removed, skipped, and with errors are empty. The status link accesses an empty error document.

Example Error Document:

```
Rhythmyx Publisher 4.0; Build:20020226 Thu Apr 04 15:40:06 EST 2002 -  
begin log
```

Resolution:

This error occurs when the Publisher fails before it can establish a connection with the target server.

Common causes are:

- FTP IP Address is incorrectly defined on Edit Site Page.
- FTP Port Number is incorrectly defined on Edit Site Page.
- FTP User ID is incorrectly defined on Edit Site Page.
- FTP Password is incorrectly defined on Edit Site Page.
- FTP Service is not available.
- Firewall is blocking ports between Publisher and Web Server.
- The server running the publisher cannot resolve the host name used for the Site (if you used a host name instead of an IP address). To fix this problem, create or correct the entry for the host in the local host file, or create or correct the entry on the host file at the DNS server.

Content is Publishing without Related Content

Error:

Content is publishing without Related Content.

Response:

Check the ACLs of all your Content List and Assembly Applications in the Rhythmyx Workbench (the ACL is the Key icon on the left side column of the application workspace).

- Default should have full Run-Time access;
- The Admin Role (and any Rhythmyx Developer Roles) should have full Run-Time and Design access;
- Anonymous should not have any access.

Allowing Anonymous access will create an Anonymous session. When the application makes a request to another Rhythmyx application, the Anonymous session will be passed too. If that application does not allow Anonymous access, the request will fail. All Rhythmyx system applications do not allow Anonymous access, and few situations exist when Anonymous access is appropriate.

Files Do Not Render Properly in Browser

Error:

Publication Log in Publishing Administrator indicates that publishing was successful, but the files do not render correctly in the browser.

Resolution:

The assembly application is not generating the html file as you intended. Check the application.

RXSITEITEMS Is Updating Incorrectly

Error:

The RXSITEITEMS table is not updating correctly.

Resolution:

The RXSITEITEMS table has 4 key columns: SITEID, CONTENTID, CONTEXT, and VARIANTID.

The Content List must supply the Publisher with these values. Check your content list mappings to make sure the content list is being populated correctly. (See [Troubleshooting Content Lists](#) for more detailed troubleshooting help.)

CHAPTER 3

Operating the Rhythmyx Server

This chapter describes:

- how to start and stop the Rhythmyx server in the following environments:
- **Windows** (see "Operating the Rhythmyx Server in a Windows Environment" on page 18)
- **Solaris and Linux** (see "Operating the Rhythmyx Server in a Unix Environment" on page 20)
- **troubleshooting recommendations when the Rhythmyx server fails to start** (see "Troubleshooting Server Initialization" on page 22);
- **issuing commands to the Rhythmyx server** (see page 24);
- implementation and operational **tasks that require restart of the Rhythmyx server** (see page 48).

Operating the Rhythmyx Server in a Windows Environment

The Rhythmyx server can run as a Windows service or as an application. The installation sets up the Rhythmyx service to start automatically when you start Windows. Run the server as a service in production environments. Run it as an application in development and test environments.

Starting Rhythmyx Server as a Windows Service

To start the Rhythmyx server as a Windows service

- 1 Access the Windows Services dialog. (The procedure for accessing this dialog differs depending on the version of Windows you are running. Consult the Windows Help on your installation for the procedure to access this dialog.)
- 2 Select the Rhythmyx Server service.
- 3 Right-click and from the popup menu choose *Start*.
- 4 Alternately, you can double-click on the service to display the service properties dialog for the service. Click the [**Start**] button to start the service.

Starting Rhythmyx Server as an Application

Run Rhythmyx server as an application in development and test environments. Running Rhythmyx server as an application in production environments is not recommended.

To start Rhythmyx server as an application:

- 1 Browse to your Rhythmyx\bin folder.
- 2 Double-click the RhythmyxServer icon.

Windows will start Rhythmyx server as an application.

When starting Rhythmyx server as an application, you may get the message that authentication failed because the user does not have a required privilege. In this case, you need to modify the user's rights so they can act as part of the operating system. Consult the Help for your version of Windows for details about assigning user rights to act as part of the operating system.

Changing Rhythmyx Server Service Settings

When the Rhythmyx installation application creates the Rhythmyx service, it defines the following settings by default:

- Start automatically when Windows starts.
- Allow service to interact with the desktop. This setting displays the service as a DOS window on the desktop.

Use the service properties dialog to change these settings. The procedure to access this dialog differs for different versions of Windows; consult the Help for your version for the correct procedure.

- To change the Startup Type, click the radio button for the start up type you prefer. Options include Automatic (starts the service automatically when you start Windows), Manual (users must manually start the service), or Disabled (disables the service so it can no longer run).
- To stop displaying the service in a DOS window, uncheck Allow Service to Interact with Desktop. (NOTE: You will have to stop and restart the server for this option to take effect.)

Using a Command to Stop Rhythmyx Server

To stop the Rhythmyx server, *access the admin JSP page* (see page 24) and enter the command *quit*.

Stopping Rhythmyx Server from the Services Dialog

If you do not display Rhythmyx server in a DOS window, you will have to stop the Rhythmyx server from the Services dialog. You can also use this method if the server is displayed in a DOS window.

To stop the Rhythmyx server from the services dialog:

- 1 Access the Windows Services dialog. (The procedure for accessing this dialog differs depending on the version of Windows you are running. Consult the Windows Help on your installation for the procedure to access this dialog.)
- 2 Select the Rhythmyx Server service.
- 3 Right-click and from the popup menu choose *Stop*.
- 4 Alternately, you can double-click on the service to display the service properties dialog for the service. Click the [**Stop**] button to start the service.

Operating the Rhythmyx Server in a Unix Environment

Operating Rhythmyx in a Unix environment requires a user to install and run Rhythmyx. You must create a unique run user for each instance of the Rhythmyx server that you operate.

When you install Rhythmyx, the installer creates the file `rx_user.id`. This file has three entries,

```
SYSTEM_USER_ID=  
RHYTHMYX_USER_ID=admin1  
RHYTHMYX_USER_PWD=demo
```

The value of `SYSTEM_USER_ID` is set during installation. Do not change this value.

The values of `RHYTHMYX_USER_ID` and `RHYTHMYX_USER_PWD` define the user that can shut down the Rhythmyx server. Rhythmyx uses this user as part of the shut-down process. If you change the password of the `admin1` user, you will need to modify the value of the `RHYTHMYX_USER_PWD` to match the new password. If you delete the `admin1` user, you must enter a valid Rhythmyx username and password. Note that this is a user within the Rhythmyx system, not the Rhythmyx user for Unix, and this user must be in a Role that has Administrative access to the server ACL.

Other than these modifications, do not modify this file. In particular, do not change the permissions on the file.

The post-installation process determines whether Rhythmyx runs as a daemon or as a console. If you choose to install Rhythmyx as a daemon, the `InstallDaemon.sh` application creates `S15RhythmyxD` and `K15RhythmyxD` files in the `/etc/rc2.d` directory. The daemon thus starts automatically when you start your system. The daemon is controlled by a script located in `/etc/rc2.d`.

Starting Rhythmyx Server as a Daemon in a Unix Environment

The Rhythmyx server daemon starts automatically when you start your system. If you need to restart the daemon after shutting it down, change to the Rhythmyx `bin` directory and enter the following:

```
./RhythmyxDaemon start <Rhythmyx root directory>
```

When you press <Enter>, the Rhythmyx server will start as a daemon.

Starting the Rhythmyx Server as a Terminal Window in a Unix Environment

If you install Rhythmyx server as a console, you must start the server manually. Change to the Rhythmyx `bin` directory and enter `sh StartServer.sh`. When you press <Enter>, Rhythmyx will start as a console.

Stopping Rhythmyx Server in Unix Environment When Running as a Daemon

To stop Rhythmyx server when running as a daemon, change to the Rhythmyx bin directory and enter the following:

```
./RhythmyxDaemon stop <Rhythmyx root directory>
```

When you press <Enter>, the Rhythmyx server will shut down.

Stopping Rhythmyx Server in a Unix Environment When Running as a Terminal Window

To stop Rhythmyx server when running as a console, change to the Rhythmyx bin directory and enter the following:

```
./Sh StopServer.sh
```

When you press <Enter>, Rhythmyx server will shut down.

Uninstalling the Rhythmyx Daemon Control Scripts

To uninstall all instances of the Rhythmyx daemon control scripts (for all instances of Rhythmyx), execute the following commands as the root user:

```
# rm /etc/init.d/RhythmyxD  
# rm /etc/rc2.d/?15RhythmyxD
```

These commands remove the following files:

```
/etc/init.d/RhythmyxD  
/etc/rc2.d/S15RhythmyxD  
/etc/rc2.d/K15RhythmyxD
```

To remove a single instance from the daemon control scripts, remove the desired installation directories from the SERVER_DIR variable in the daemon control script /etc/init.d/RhythmyxD. The installation directories are colon (:) delimited. For example:

```
SERVER_DIR=/export/home/RxUser1/Rhythmyx:/export/home/RxUser2/Rhythmyx
```

Troubleshooting Server Initialization

When the Rhythmyx server encounters an error during the initialization process, it shuts down immediately. The server log (<Rhythmyxroot>/AppServer/server/rx/logs/server.log) will include details about the error that caused the shutdown.

The Rhythmyx server runs as a servlet within the JBoss Web application server. In some cases, problems in server initialization and operation may be issues in JBoss rather than in Rhythmyx. For JBoss operation and maintenance, see the JBoss documentation at www.jboss.org (<http://www.jboss.org>).

Common Server Initialization Errors

Common errors during server initialization include:

Expired License

The server fails on startup with the following error message in the log:

```
The evaluation period for this license has expired.
```

This error indicates that your license for Rhythmyx has expired and you will need a new license. Contact Percussion Technical Support for a new license and for instructions about updating your installation.

Database Connectivity Problems

The server fails on startup with a long stack trace in the log. The initial error may be one of the following:

```
2007-02-08 10:49:55,963 WARN
[org.jboss.resource.connectionmanager.JBossManagedConnectionPool]
Throwable while attempting to get a new connection: null
org.jboss.resource.JBossResourceException: Could not create connection;
- nested throwable: (java.sql.SQLException: Network error IOException:
Connection refused: connect)
```

This error indicates that you have a problem connecting to the database server. Either the server is down or you do not have network connectivity to the server. Confirm that the server is running and that the machine on which the Rhythmyx server resides can communicate with the machine on which the database server resides.

```
2007-02-08 11:16:43,597 WARN
[org.jboss.resource.connectionmanager.JBossManagedConnectionPool]
Throwable while attempting to get a new connection: null
org.jboss.resource.JBossResourceException: Could not create connection;
- nested throwable: (java.sql.SQLException: Unknown server host name
'RxAlt'.)
```

This error indicates that the datasource used to connect to the Rhythmyx server is misconfigured. In this specific case, the database server does not exist. This error commonly occurs when a Rhythmyx tree has been moved to a different machine

Other possible errors include incorrect login user names or passwords. The `java.sql.SQLException` should specify the error.

Port Conflicts

The server starts but with a stack trace at the end of startup. The stack trace starts with the following error:

```
13:24:05,415 ERROR [Http11Protocol] Error starting endpoint
java.net.BindException: Address already in use: JVM_Bind:9662
```

This error indicates that you have a port conflict. The port Rhythmyx is trying to use is already in use. This often happens when you are restarting the Rhythmyx server when the original Rhythmyx server session did not completely terminate and is holding on to the port. Check whether the Rhythmyx process is still running. If so, terminate the process. Also, confirm that you do not have two Rhythmyx server installations on the same machine using the same port.

Issuing Commands to the Rhythmyx Server

Two interfaces are available for issuing commands to the Rhythmyx server:

- administration JSP page

The administration JSP page is an HTML interface that provides the capability to issue commands to the Rhythmyx server. To access the administration JSP page, open a browser and in the Address field, enter the URL of the administration page:

`http://localhost:9992/Rhythmyx/admin/console.jsp`

where

`localhost` is the name or IP address of the machine where the Rhythmyx server resides; and

`9992` is the Rhythmyx port.

All server commands are valid using this interface.

- Rhythmyx Server Administrator

Use the Monitor tab of the Server Administrator to issue commands to the Rhythmyx server.

Enter the **Command** and click the [**Execute**] button. The results are displayed in the **Command Output** field. (NOTE: The quit command is not valid using this interface.)

In both cases, the results are displayed in HTML format.

NOTE: In Rhythmyx Version 5.7 and earlier, commands could be issued directly to the server in the server terminal window. This functionality is not available in Rhythmyx Version 6.0 and later.

Server Console Commands by Function

General Server Console Commands

To . . .	Enter the command . . .	Notes and Examples
Empty the log queue	<code>log flush</code>	Forces the server to write all pending log messages in the log queue to the log database immediately.
Display server log on the console.	<code>log dump</code>	This command may dump a very large amount of data onto the console.

To . . .	Enter the command . . .	Notes and Examples
Display the server version	show version	<p>Displays version and build of Rhythmyx.</p> <p>Example:</p> <pre>show version <?xml version='1.0' encoding='UTF-8'?> <PSXConsoleCommandResults> <command>show version </command> <resultCode>0</resultCode> <resultText>Release 4.5 Build 20020829 (1311)</resultText> </PSXConsoleCommandResults></pre>

To . . .	Enter the command . . .	Notes and Examples
Display statistics for server handling of all requests	show status server	<p>Displays how long the server has been running, the number of events processed, failed, and pending, the number of hits and misses to the cache, and average, minimum and maximum processing time for events.</p> <p>Example:</p> <pre>show status server <?xml version='1.0' encoding='UTF-8'?> <PSXConsoleCommandResults> <command>show status server</command> <resultCode>0</resultCode> <resultText></resultText> <PSXStatistics/> <ElapsedTime> <days>0</days> <hours>1</hours> <minutes>15</minutes> <seconds>4</seconds> <milliseconds>26</milliseconds> </ElapsedTime> <Counters> . . . </PSXConsoleCommandResults></pre>

To . . .	Enter the command . . .	Notes and Examples
Display statistics for server handling of requests by Workbench and Server Administrator	show status objectstore	<p>Displays how long the server has been running, the number of Workbench and Server Administrator events processed, failed, and pending, the number of hits and misses by such events to the cache, and average, minimum and maximum processing time for these events.</p> <p>Example:</p> <pre>show status objectstore <?xml version='1.0' encoding='UTF-8' ?> <PSXConsoleCommandResults> <command>show status objectstore</command> <resultCode>0</resultCode> <resultText></resultText> <PSXStatistics/> <ElapsedTime> <days>0</days> <hours>1</hours> <minutes>19</minutes> <seconds>49</seconds> <milliseconds>116</milliseconds> </ElapsedTime> <Counters> . . . </Counters> </PSXConsoleCommandResults></pre>
Free unreferenced allocated memory	garbagecollect OR gc	Forces a Java garbage collection.
Stop the server	stop server OR quit OR exit	

Server Console Commands for Applications

To ...	Enter the command ...	Notes
Display a list of active server applications	show applications active	<p>Example:</p> <pre>show applications active <?xml version='1.0' encoding='UTF-8'?> <PSXConsoleCommandResults> <command>show applications</command> <resultCode>0</resultCode> <resultText></resultText> <Applications> <Application id="18" active="yes" enabled="yes"> <name>casArticle</name> </Application> <Application id="531" active="yes" enabled="yes"> <name>casArticleWord</name> . . . </PSXConsoleCommandResults></pre>

To ...	Enter the command ...	Notes
Display a list of all server applications	show applications	<p>Examples:</p> <pre>show applications <?xml version='1.0' encoding='UTF-8'?> <PSXConsoleCommandResults> <command>show applications</command> <resultCode>0</resultCode> <resultText></resultText> <Applications> <Application id="18" active="yes" enabled="yes"> <name>casArticle</name> </Application> <Application id="531" active="yes" enabled="yes"> <name>casArticleWord</name> . . . </PSXConsoleCommandResults></pre>

To . . .	Enter the command . . .	Notes
Display statistics for server handling of requests to a specific application.	show status application applicationname	<p>Displays how long the application has been running, the number of application events processed, failed, and pending, the number of hits and misses by application events to the cache, and average, minimum and maximum processing time for application events.</p> <p>Example:</p> <pre>show status application sys_cmpCommunities <?xml version='1.0' encoding='UTF-8'?> <PSXConsoleCommandResults> <command>show status application sys_cmpCommunities</command> <resultCode>0</resultCode> <resultText></resultText> <PSXApplicationStatus> <name>sys_cmpCommunities</name> > <PSXStatistics/> <ElapsedTime> <days>0</days> <hours>0</hours> <minutes>50</minutes> . . . </PSXConsoleCommandResults></pre>
Start a server application	start application applicationname	
Stop and restart a server application	restart application applicationname	
Stop a server application	stop application applicationname	

To . . .	Enter the command . . .	Notes
Turn on default tracing to interactively debug an application running on Rhythmyx.	<pre>trace default applicationname</pre>	<p>When tracing occurs, Rhythmyx returns the output of <Rhythmyx root>/<application name>/~,application name>.trace to the console. [link to Tracing Results]</p> <p>Example:</p> <pre>trace default sys_caContentSearch <?xml version='1.0' encoding='UTF-8'?> <PSXConsoleCommandResults> <command>trace default sys_caContentSearch</command> <resultCode>0</resultCode> <resultText></resultText> </PSXConsoleCommandResults></pre>
Turn on specific tracing options to interactively debug an application running on Rhythmyx.	<pre>trace flag1 [flag2] [flag3] [flag4] applicationname</pre> <p>Tracer Types and Flags [link]</p>	<p>Enter up to four trace flags in hexadecimal format.</p> <p>Example:</p> <pre>trace 0x1 0x100 0x200 0x1000 sys_caContentSearch</pre> <p>When tracing occurs, Rhythmyx returns output of <Rhythmyx root>/<application name>/~,application name>.trace to the console. [link to Tracing Results]</p>
View tracing options	<pre>trace help</pre>	

Server Console Commands for Displaying Resources

To . . .	Enter the command . . .	Notes
Display information on various system resources	dump resources	<p>Displays database pool, user thread, request queue, user session, request dispatcher, and cache statistic information.</p> <p>Example:</p> <pre>dump resources <?xml version='1.0' encoding='UTF-8'?> <PSXConsoleCommandResults> <command>dump resources </command> <ReaperThread isAlive="yes" /> <DefaultCredentials> <Credential server="INETDAE7/JENNIFER"> <User name="sa" password="*****" /> </Credential> </DefaultCredentials> <InstalledDrivers> . . . </PSXConsoleCommandResults></pre>

To . . .	Enter the command . . .	Notes
Display summaries of datasource information	dump datasources	<p>Example:</p> <pre> dump datasource <datasources> <datasource name="rxdefault" isCmsRepository="yes"> <jndiDatsourceName>jdbc/rxdefault </jndiDatasourceName> <jdbcUrl>jdbc:jtds:sqlserver://be nder </jdbcUrl> <database>rxRhino</database> <schema>dbo</schema> </datasource> </datasources> </pre>
Display information about all handlers	dump handlers	<p>Example:</p> <pre> dump handlers <?xml version='1.0' encoding='UTF-8'?> <PSXConsoleCommandResults> <command>dump handlers </command> <RequestHandlers size="266"> <Handlers> <Handler name="data- xrd_cassyndarticles" class="com.percussion.server.PSAp plicationHandler"> <SupportedTypes>[POST, GET]</SupportedTypes> . . . </Handlers> </RequestHandlers> </PSXConsoleCommandResults> </pre>

To ...	Enter the command ...	Notes
Display request dispatchers	dump requestdispatchers	<p>Example:</p> <pre>dump requestdispatchers <?xml version='1.0' encoding='UTF-8'?> <PSXConsoleCommandResults> <command>dump requestdispatchers </command> <RequestDispatchers size="2"> <RequestDispatcher isAlive="yes"> <ListenerClass>com.percussion.con n.e</ListenerClass> </RequestDispatcher> <RequestDispatcher isAlive="yes"> <ListenerClass>com.percussion.ser ver.b</ListenerClass> </RequestDispatcher> </RequestDispatchers> </PSXConsoleCommandResults></pre>

Server Console Commands for Flushing the Server and MetaData Caches

MetaData Cache		
To ...	Enter the command ...	Notes
Flush the metadata cache	<pre>flush dbmd -i driver -s server [-d database] [-t table] [-o origin]</pre>	<p>The -d database, -t table, and -o origin parameters are optional, but you cannot include -o origin without -t table.</p> <p>Examples:</p> <p>To flush metadata for a backend table named dbo.RXARTICLE:</p> <pre>flush dbmd -i odbc -s rxmaster -d rxmaster -t RXARTICLE -o dbo</pre> <p>To flush metadata for all tables in the rxmaster database:</p> <pre>flush dbmd -i odbc -s rxmaster</pre>
Get Help with the flush dbmd command	<pre>flush dbmd OR flush dbmd -h</pre>	<p>Example:</p> <pre>flush dbmd -h</pre> <p>Format of this command is:</p> <pre>flush dbmd -i [driver] -s [server] -d [database] -t [table] -o [origin]</pre> <p>or</p> <pre>flush dbmd [-h]</pre> <p>The switches are not case sensitive, and the space between</p> <p>. . .</p>
Server Cache		
To ...	Enter the command ...	Notes
Delete all data from the server cache	<pre>flush cache</pre>	Flushes all assembler and resource pages.

To ...	Enter the command ...	Notes
Delete specific data from the server cache	For assembler pages: flush cache assembler [applicationname];[contentid]; [revisionid];[variantid] For resource pages: flush cache resource [applicationname];[datasetname]	The parameters must be supplied in the specified orders; they may be omitted, but the semi-colon placeholder must be included. Example: To flush all pages where contentid=135 and revisionid=1: flush cache ;135;1; <?xml version='1.0' encoding='UTF-8'?> <PSXConsoleCommandResults> <command>flush cache ;135;1;</command> <resultCode>1532</resultCode> > <resultText>The cache has been flushed.</resultText> </PSXConsoleCommandResults>

To . . .	Enter the command . . .	Notes
Display information from the server cache	dump cache	<p>Displays hit rate, total hits, total misses, number of items in cache, memory used, disk space used, average size of item, and disk hit rate. Amounts displayed are combined totals for cached assembler and resource pages</p> <p>Example:</p> <pre>dump cache <?xml version='1.0' encoding='UTF-8'?> <PSXConsoleCommandResults> <command>dump cache </command> <CacheStatistics> <totalHits>0</totalHits> <totalRequests>0</totalReque sts> <hitRate>0%</hitRate> <diskHitRate>0%</diskHitRate > <memoryUsage>0 bytes</memoryUsage> <diskUsage>0 bytes</diskUsage> <totalItems>0</totalItems> <AverageItemSize>0 bytes</AverageItemSize> </CacheStatistics> </PSXConsoleCommandResults></pre>
Start the server cache	start cache	Starts both assembler and resource caching.

To ...	Enter the command ...	Notes
Stop and restart the server cache	restart cache	<p>Stops cache, restarts cache, and displays cache statistics on the server console. Applies to both assembler and resource page caching. Statistics are combined totals for assembler and resource pages.</p> <p>Example:</p> <pre>restart cache Cache 9/6/02 11:00 AM: Restarting cache with new settings <?xml version='1.0' encoding='UTF-8'?> <PSXConsoleCommandResults> <command>restart cache </command> <CacheStatistics> <totalHits>0</totalHits> <totalRequests>0</totalReque sts> <hitRate>0%</hitRate> <diskHitRate>0%</diskHitRate > <memoryUsage>0 bytes</memoryUsage> <diskUsage>0 bytes</diskUsage> <totalItems>0</totalItems> <AverageItemSize>0 bytes</AverageItemSize> </CacheStatistics> <resultCode>1536</resultCode > <resultText>The server has restarted caching.</resultText> </PSXConsoleCommandResults></pre>

To . . .	Enter the command . . .	Notes
Stop the server cache	stop cache	<p>Flushes cache, stops it, and displays cache statistics on the console. Applies to both assembler and resource caching. Statistics are combined totals for assembler and resource pages.</p> <p>Example:</p> <pre>stop cache Cache 9/6/02 11:26 AM: Stopping cache <?xml version='1.0' encoding='UTF-8'?> <PSXConsoleCommandResults> <command>stop cache </command> <CacheStatistics> <totalHits>0</totalHits> <totalRequests>0</totalReque sts> <hitRate>0%</hitRate> <diskHitRate>0%</diskHitRate > <memoryUsage>0 bytes</memoryUsage> <diskUsage>0 bytes</diskUsage> <totalItems>0</totalItems> <AverageItemSize>0 bytes</AverageItemSize> </CacheStatistics> <resultCode>1534</resultCode > <resultText>The server has stopped caching.</resultText> </PSXConsoleCommandResults></pre>

Server Console Commands for Search

To...	Enter the command	Notes
View data about the current state of the search engine	show status search	<p>Console output:</p> <pre><?xml version="1.0" encoding="UTF-8" ?> <PSXConsoleCommandResults> <command>status search </command> <resultCode>0</resultCode> <resultText>0: </resultText> <SearchStatus runningStatus="Running"> <status program="engine" state="running"/> <status file-delete- count="0" program="indexer" uncommitted-libs-count="0"/> </SearchStatus> </PSXConsoleCommandResults></pre>
Shut down and restart the search engine	restart search	This command may be useful if the search engine is hung.
Index a specific Content Item	search index item <i>id</i>	<i>id</i> is the Content Item ID of the item you want to index. Indexing updates the appropriate search index with the text of the Content Item.
Index all Content Items of a specific Content Type	search index type <i>id</i>	<p><i>id</i> is the Content Type ID or Content Type name of the Content Type whose Content Items you want to index. The call returns after the items have been queued for indexing. The amount of time required for the actual indexing depends on the number of Content Items queued; a large number of Content Items may take some time to queue. Search results while indexing is taking place may not be fully up to date.</p> <p>If you do not include a value for <i>id</i>, then all Content Types will be indexed. This process can take a considerable amount of time.</p>
Delete the existing index for a Content Type and create a new, empty index	search index recreate <i>id</i>	<i>id</i> is the Content Type ID or Content Type name of the Content Type whose index you want to delete. The search engine shuts down while performing this operation.

Toggle debugging	debug search on debug search off	Toggles the debug output of the search engine on or off. Equivalent to checking or unchecking the Enable trace output box on the Server Administrator Search tab, but the setting does not persist past server shutdown.
------------------	-------------------------------------	---

Server Console Commands in Alphabetical Order

Command	Function	Notes
debug search on	Toggles the debug output of the search engine on.	Equivalent to checking the Enable trace output box on the Server Administrator Search tab, but the setting does not persist past server shutdown.
debug search off	Toggles the debug output of the search engine off.	Equivalent to unchecking the Enable trace output box on the Server Administrator Search tab, but the setting does not persist past server shutdown.
dump cache	Displays combined assembler and resource page information from the server cache.	Information displayed: <ul style="list-style-type: none"> ▪ hit rate ▪ total hits ▪ total misses ▪ number of items in cache ▪ memory used ▪ disk space used ▪ average size of item ▪ disk hit rate
dump datasources	Displays a summary of datasources.	
dump handlers	Display information about all handlers.	
dump requestdispatchers	Display request dispatchers.	

Command	Function	Notes
dump resources	Display information on various system resources.	Information displayed: <ul style="list-style-type: none"> ▪ database pool ▪ user thread ▪ request queue ▪ user session ▪ request dispatcher ▪ cache statistic information
exit	Stop the server.	
flush cache	Delete all data from the server cache.	Deletes all assembler and resource pages.
<pre>flush cache assembler [applicationname];[contentid]; [revisionid];[variantid] flush cache resource [applicationname];[datasetname]</pre>	Delete specific data from the server cache. Deletes an assembler page if you use flush cache assembler; deletes a resource page if you use flush cache resource.	The parameters must be supplied in the specified order; they may be omitted, but the semi-colon placeholder must be included. Example: To flush all pages where contentid=135 and revisionid=1: flush cache assembler ;135;1; Example: To flush the page where application name= sys_Compare and Dataset=145: flush cache resource sys_compare;145
flush dbmd	Get Help with the flush dbmd command.	
flush dbmd -h	Get Help with the flush dbmd command.	

Command	Function	Notes
flush dbmd -i <i>driver</i> -s <i>server</i> [-d <i>database</i>] [-t <i>table</i>] [-o <i>origin</i>]	Flush the metadata cache	The -d <i>database</i> , -t <i>table</i> , and -o <i>origin</i> parameters are optional, but you cannot include -o <i>origin</i> without -t <i>table</i> . Examples: To flush metadata for a backend table named dbo.RXARTICLE: flush dbmd -i odbc -s rxmaster -d rxmaster -t RXARTICLE -o dbo To flush metadata for all tables in the rxmaster database: flush dbmd -i odbc -s rxmaster
garbagecollect	Forces a Java garbage collect	This command is used to free unreferenced allocated memory.
gc	See garbagecollect	See garbagecollect.
log dump	Display server log on the console.	This command may dump a very large amount of data onto the console.
log flush	Forces the server to write all pending messages in the log queue to the log database immediately and returns an empty log queue.	
quit	Stop the server.	
restart application <i>applicationname</i>	Stop and restart a server application.	
restart cache	Stop and restart the server cache, and display cache statistics on the server console.	Applies to both assembler and resource caching.
restart search	This command may be useful if the search engine is hung.	

Command	Function	Notes
show status search	Displays data about the current state of the search engine.	<p>Example output:</p> <pre><?xml version="1.0" encoding="UTF-8"?> <PSXConsoleCommandRes ults> <command>status search </command> <resultCode>0</result Code> <resultText>0: </resultText> <SearchStatus runningStatus="Runnin g"> <status program="engine" state="running"/> <status file- delete-count="0" program="indexer" uncommitted-libs- count="0"/> </SearchStatus> </PSXConsoleCommandRe sults></pre>
search index item id	Indexes a specific Content Item	<i>id</i> is the Content Item ID of the item you want to index. Indexing updates the appropriate search index with the text of the Content Item.
search index recreate id	Deletes the existing index for a Content Type and creates a new, empty index	<i>id</i> is the Content Type ID or Content Type name of the Content Type whose index you want to delete. The search engine shuts down while performing this operation.

Command	Function	Notes
search index type id	Indexes all Content Items of a specific Content Type	<i>id</i> is the Content Type ID or Content Type name of the Content Type whose Content Items you want to index. The call returns after the items have been queued for indexing. The amount of time required for the actual indexing depends on the number of Content Items queued; a large number of Content Items may take some time to queue. Search results while indexing is taking place may not be fully up to date.
show applications	Display a list of all server applications.	
show applications active	Display a list of active server applications.	
show status application <i>applicationname</i>	Display statistics for server handling of requests to a specific application.	Information displayed: <ul style="list-style-type: none"> ▪ how long the application has been running ▪ the number of application events: <ul style="list-style-type: none"> ▪ processed ▪ failed ▪ pending ▪ the number of hits and misses by application events to the cache ▪ processing time for application events <ul style="list-style-type: none"> ▪ average ▪ minimum ▪ maximum

Command	Function	Notes
<code>show status objectstore</code>	Display statistics for server handling of requests by Workbench and Server Administrator.	Information displayed: <ul style="list-style-type: none"> ▪ how long the server has been running ▪ the number of Workbench and Server Administrator events: <ul style="list-style-type: none"> ▪ processed ▪ failed ▪ pending ▪ the number of hits and misses by these events to the cache ▪ processing time for these events <ul style="list-style-type: none"> ▪ average ▪ minimum ▪ maximum
<code>show status server</code>	Display statistics for server handling of all requests.	Information displayed: <ul style="list-style-type: none"> ▪ how long the server has been running ▪ the number of server events: <ul style="list-style-type: none"> ▪ processed ▪ failed ▪ pending ▪ the number of hits and misses by server events to the cache ▪ processing time for server events <ul style="list-style-type: none"> ▪ average ▪ minimum ▪ maximum
<code>show version</code>	Display the version of the server and Rhythmyx build.	
<code>start application <i>applicationname</i></code>	Start a server application.	

Command	Function	Notes
start cache	Start the server cache.	Starts both assembler and resource caching.
stop application <i>applicationname</i>	Stop a server application.	
stop server	Stop the server.	
stop cache	Stop the server cache.	Flushes cache, stops it, and displays cache statistics on the console. Applies to both assembler and resource caching.
trace flag1 [flag2] [flag3] [flag4] <i>applicationname</i>	Turn on up to four types of traces to interactively debug an application running on Rhythmyx. Link to Tracer Types and Flags (in Rhythmyx API)	Enter up to four trace flags in hexadecimal format. Example: trace 0x1 0x100 0x200 0x1000 sys_caContentSearch When tracing occurs, Rhythmyx returns output of <Rhythmyx root>/<application name>/~,application name>.trace to the console.
trace default <i>applicationname</i>	Turn on default tracing to interactively debug an application running on Rhythmyx.	When tracing occurs, Rhythmyx returns the output of <Rhythmyx root>/<application name>/~,application name>.trace to the console.
trace help	View tracing.	

Tasks Requiring Restart of the Rhythmyx Server

Certain implementation and configuration tasks require that you restart the Rhythmyx server before changes take effect. These tasks include:

- Creating a Shared Definition
- Adding a new datasource connection configuration
- Adding a new database driver configuration
- Adding a new JNDI datasource to the Rhythmyx datasource configuration.
- Adding a new datasource file to Rhythmyx.
- Adding a new custom value to the authtypes.properties file
- Compacting search engine index libraries
- Adding a new Role or Subject Catalogger
- Adding a new WebDAV configuration
- Enabling SSL

CHAPTER 4

Maintaining Users

Rhythmyx user definition and authentication data is generally maintained in an external repository.

Security providers (see "Security Providers and Authentication" on page 50) link to these repositories so Rhythmyx can authenticate and classify users correctly. If the security provider is an LDAP or Microsoft Active Directory server, you need to maintain a directory connection service to process this data correctly.

Each user must be included in a *Role* (see page 110) to define the Communities to which they belong and the Workflow States in which they have access to Content Items.

Security Providers and Authentication

Security providers link to external resources that list users that can use Rhythmyx. These external resources provide authentication support when a user attempts to log in to Rhythmyx, and in some cases also define the Rhythmyx Roles the user belongs to when logged in.

Four types of security providers are available for Rhythmyx:

- **Directory Connection**

A directory connection security provider uses a directory server, such as LDAP or Microsoft Active Directory, to list and authenticate users. This security provider can also define the Rhythmyx Roles for the users. The directory connection security provider is the recommended security provider.
- **Windows NT**

The Windows NT security provider can only be used in Windows environments. This security provider uses the operating system's security system to list and authenticate users. This security provider is the recommended alternative in Windows environments if a directory connection security provider is not an option. Percussion Software generally recommends converting your NT security to Active Directory and using a directory connection security provider instead.
- **Backend Table**

The backend table security provider uses a database table to list and authenticate users. No graphic front end is provided for this table, however, and both the user name and the password are stored as clear text. While this security provider is useful for development environments (the default Rhythmyx users shipped by Percussion Software are stored in the USERLOGIN table in the Repository database), it is not recommended for production environments.
- **Web Server**

The web server security provider derives users from a web server's security provider, and uses that security provider to authenticate the users. The exact security mechanism is controlled by the web server itself. This security provider is recommended for use only on portals or when Rhythmyx runs as a servlet on another servlet container that provides security.

Security Providers Tab

The Security Providers tab lists any existing security providers. When shipped, Rhythmyx includes three security providers, which are listed on this tab:

- Web server
- NT security
- rxmaster backend database table

Navigate to the Security Providers tab by logging into the Rhythmyx Server Administrator, clicking the Security tab, and then clicking the Security Providers tab at the bottom of the display.

Use this tab to access dialogs to add, edit, or delete security providers.

To open an existing Security Provider configuration:

- double-click on the name of the Security Provider configuration or
- select the desired Security Provider configuration and click the **[Edit]** button.

To create a new Security Provider configuration:

- Click the **[New]** button.
- On the "Select new security provider type dialog" that appears, choose Directory Connection Security Provider.

The *JNDI Security Provider Details* (see "JNDI Security Provider Details Dialog" on page 52) dialog appears.

Defining a Directory Connection Security Provider

Directory connection security providers, such as the Java Naming and Directory Interface (JNDI) security provider, allow Rhythmyx to query a directory server to authenticate users and, optionally, retrieve Role and other user information.

The procedures in this section describe how to configure Rhythmyx to use JNDI as a security provider.

JNDI Security Provider Details Dialog

Use the JNDI Security Provider Details dialog to define and manage JNDI security providers.

To access the JNDI Security Provider Details dialog:

- on the Security Providers subtab of the Security tab, click the [New] button; on the popup dialog, choose Directory Connection and click the [OK] button.
- on the Security Providers subtab of the Security tab, select the security provider you want to modify and click the [Edit] button. If the security provider is a Directory Connection security provider, the Server Administrator displays the JNDI Security Provider Details dialog.

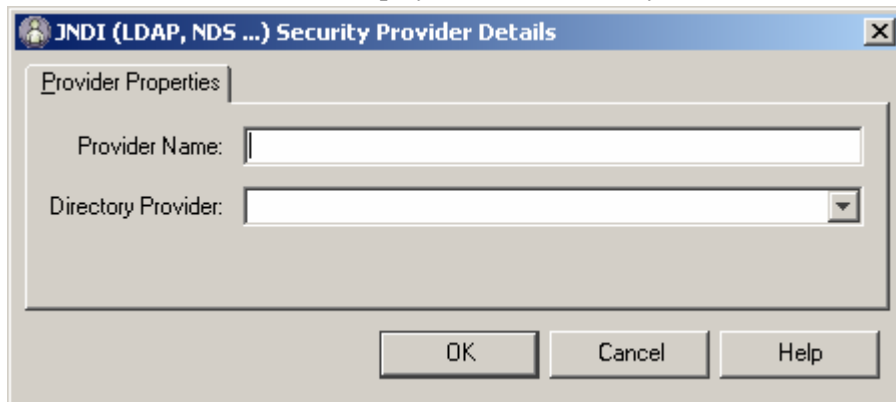


Figure 6: JNDI Security Provider Details dialog

Field Descriptions

Provider Name The name of the security provider, for example, *SunONE Provider*.

Directory Provider The name of the Directory Set used to authenticate users

Adding a JNDI Security Provider

To add a JNDI security provider:

- 1 On the Rhythmyx Server Administrator, choose the Security tab along the top of the dialog, then the Security Providers tab along the bottom of the dialog.
- 2 Click [New].
Rhythmyx displays the Select new security provider type dialog.
- 3 Choose Directory Connection Security Provider and click [OK].
Rhythmyx displays the *JNDI Security Provider Details dialog* (on page 52).
- 4 Enter a Provider Name.
- 5 Choose the *Directory Set* (see "Maintaining Directory Sets" on page 79) used to authenticate users.
- 6 Click [OK] to save the new security provider definition.
- 7 Click [Apply] to commit the changes to the Rhythmyx server.

Editing a JNDI Security Provider

To edit a JNDI security provider:

- 1 On the Rhythmyx Server Administrator, choose the Security tab along the top of the dialog, then the Security Providers tab along the bottom of the dialog.
- 2 Select the security provider you want to edit and click **[Edit]** or double-click on the security provider name.
Rhythmyx displays the *JNDI Security Provider Details dialog* (on page 52).
- 3 You can change the Provider Name or choose a different Directory Provider.
- 4 Click **[OK]** to save your changes and close the dialog.
- 5 Click **[Apply]** to commit the changes to the Rhythmyx server.

Deleting a JNDI Security Provider

NOTE: Rhythmyx does not warn you before deleting a security provider. Once you click **[Delete]** the changes are committed.

To delete a JNDI security provider:

- 1 On the Rhythmyx Server Administrator, choose the Security tab along the top of the dialog, then the Security Providers tab along the bottom of the dialog.
- 2 Select the security provider you want delete and click **[Delete]**.
- 3 Rhythmyx deletes the security provider. Rhythmyx DOES NOT ask you to confirm the delete action before deleting the security provider.

Web Server

The Web Server security provider relies on an existing Web server or Web application server authentication. It is only available if you interface to Rhythmyx as a servlet under the Web server or Web application server. If the user has been authenticated by the Web server or Web application server, Rhythmyx grants access. This type of authentication is useful when accessing Rhythmyx through a Web application server, such as BEA WebLogic or IBM Websphere.

You must use the Web Server security provider if you want to implement a Single Sign-on model. In this model, a user only has to log in once to access Rhythmyx through a Web server or Web application server.

Web Server Security Provider Details Dialog

Use the Web Server Security Provider Details dialog to create and manage Web server and Web application server security providers.

Figure 7: Web Server Security Provider Details Dialog

Field Descriptions

Security Provider Name Required. Name of the Security Provider. The name can include spaces.

Authentication user header name Required. The HTTP header variable Rhythmyx examines to find the authenticated user. This name must match the name specified in the `authUserHeaderName` parameter in the setup of the Rhythmyx servlet on the Web server. If Rhythmyx cannot locate this value, the user will not be authenticated by this security provider.

User role list header name Required. The http header variable Rhythmyx examines to determine the Roles to which the authenticated user belongs. These Roles are included in the session.. The name must match the name specified in the `userRolesHeaderName` parameter in the setup of the Rhythmyx servlet on the Web server. The value is case-insensitive and the default value is `RxUserRoles`. If Rhythmyx cannot locate this value, it queries for the Roles internally on the server.

Role list delimiter Required. Specifies the character or characters used to separate each Role in the list of Roles. The default value is a semicolon (;). For example, `Author;Editor`.

Adding a Web Server Security Provider

To add a Web server security provider:

- 1 On the Rhythmyx Server Administrator, choose the Security tab along the top of the dialog, then the Security Providers tab along the bottom of the dialog.
- 2 Click [New].
Rhythmyx displays the Select new security provider type dialog.
- 3 Choose *Web Server Security Provider*.
Rhythmyx displays the Web Server Security Provider Details dialog.
- 4 Enter a Security Provider Name.

- 5 To set up Single Sign-on:
 - a) In the **Authenticated user header name** field, enter the value of the `userRolesHeaderName` parameter from the Rhythmyx servlet setup.
 - b) In the **User role list header name** field, enter the value of the `roleListUrl` parameter from the Rhythmyx servlet setup.
- 6 The Role list delimiter field has a default value of “;” (semicolon). You can change this value.
- 7 Click **[OK]** to save the security provider.

Modifying a Web Server Security Provider

To modify a Web server security provider:

- 1 On the Rhythmyx Server Administrator, choose the Security tab along the top of the dialog, then the Security Providers tab along the bottom of the dialog.
- 2 Select the security provider you want to edit and click **[Edit]**.
Rhythmyx displays the Web Server Security Provider Details dialog.
- 3 You can change any field.
- 4 Click **[OK]** to save your edits.

Deleting a Web Server Security Provider

NOTE: Rhythmyx does not warn you before deleting a security provider.

To delete a Web server security provider:

- 1 On the Rhythmyx Server Administrator, choose the Security tab along the top of the dialog, then the Security Providers tab along the bottom of the dialog.
- 2 Select the security provider you want delete and click **[Delete]**.
- 3 Rhythmyx deletes the security provider. Rhythmyx DOES NOT ask you to confirm the delete action before deleting the security provider.

Windows NT

Users: Any user with a system login name and password.

Method of Operation: Credentials are passed through to any OS/NT directory. This includes directories foreign to the local machine where Rhythmyx is installed. NOTE: NT only.

Security provider name: A unique name for this security provider instance. For example: If you have two security providers for NT (one through Domain A and one through Domain B), you can name one security provider instance "NT Domain A" and the other instance "NT Domain B".

Domain/server name: The actual name of the Local NT Server or Trusted NT Domain being used for authentication.

- To use the Local NT Server: Enter . or \\ServerName where "ServerName" is the name of the Local NT Server where Rhythmyx is installed. (The local NT server account using "." as the server name is automatically set up during Rhythmyx installation.)
- To use a Trusted NT Domain: Enter DomainName where "DomainName" is the name of the Trusted NT Domain to be used for authentication.
Note: To use a Trusted NT Domain, Rhythmyx must be installed on an NT Domain Controller having trust relationships defined for the specified Domain.

User ID: A user name with read access to the NT directory. (User ID provides a list of user and group names a designer can use when creating ACLs and Roles.)

Password: The User ID password to access the NT directory.

Confirm password: Same as above.

DBMS Table Security Provider

A DBMS table security provider queries a backend table to authenticate user credentials during login. For example, the default Rhythmyx security provider, rxmaster, queries data stored in the USERLOGIN table.

At a minimum, the table must include columns to store the user name and password.

Note that Rhythmyx does not retrieve encrypted passwords, so the DBMS security provider is not recommended for production environments. This security provider is usually adequate for development environments, however.

Use the *DBMS Table Security Property Details dialog* (on page 57) to create and maintain DBMS Table security providers.

You can *add a new DBMS Table security provider* (see "Adding a DBMS Table Security Provider" on page 60) or modify an existing DBMS Table security provider.

DBMS Table Security Property Details Dialog

Use the DBMS Table Security Property Details dialog to create and maintain DBMS Table security providers.

To access the DBMS Table Security Property Details dialog:

- On the Security Providers subtab of the Security tab, click the [New] button and on the popup dialog, select Back-end Table Security Provider and click [OK].
- On the Security Providers subtab of the Security tab, select a DBMS Table security provider and click the [Edit] button.

The DBMS Table Security Property Details dialog consists of four tabs:

- **Provider Properties** (see "DBMS Table Security Property Details Provider Properties Tab" on page 57)
- **Backend Connection** (see "DBMS Table Security Property Details Backend Connection Tab" on page 58)
- **Authentication** (see "DBMS Table Security Property Details Authentication Tab" on page 59)
- **Attributes** (see "DBMS Table Security Property Details Attributes Tab" on page 59)

DBMS Table Security Property Details Provider Properties Tab

The Properties tab of the DBMS Table Security Property Details dialog includes general properties of the DBMS Table security provider.

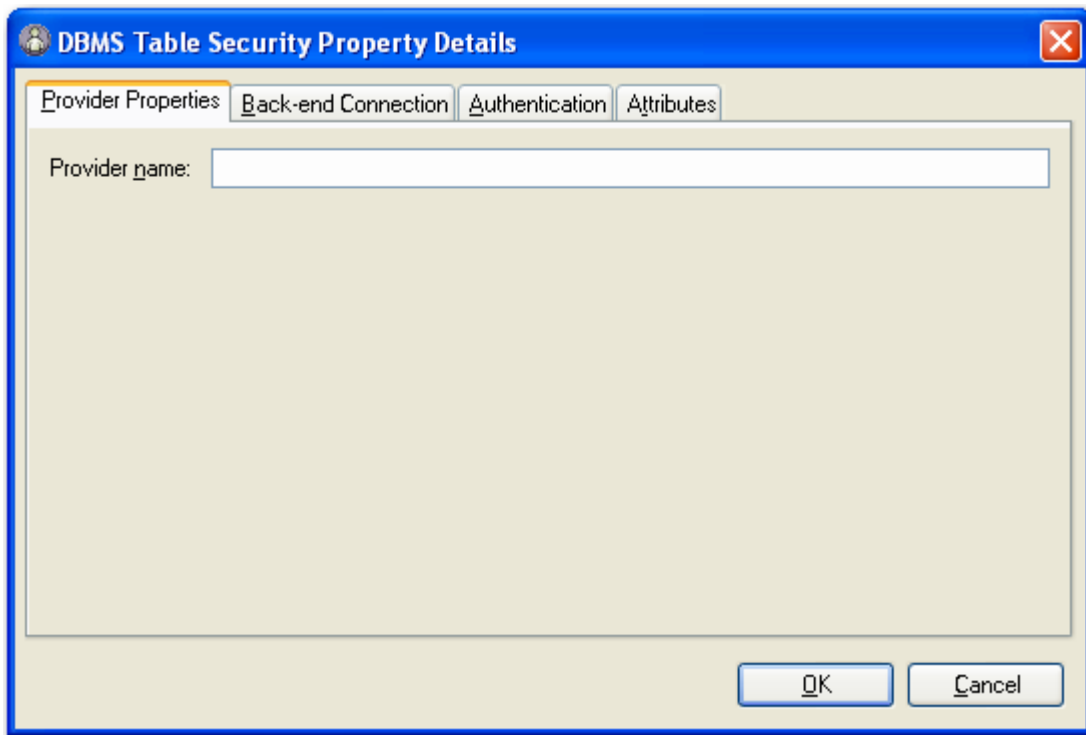


Figure 8: DBMS Table Security Property Details dialog Provider Properties tab

Field Descriptions

Provider name Name of the DBMS Table security provider.

DBMS Table Security Property Details Backend Connection Tab

Use the Back-end Connection tab of the DBMS Table Security Property Details dialog to specify the Datasource used to connect to the RDBMS server and the table that stores your authentication data.

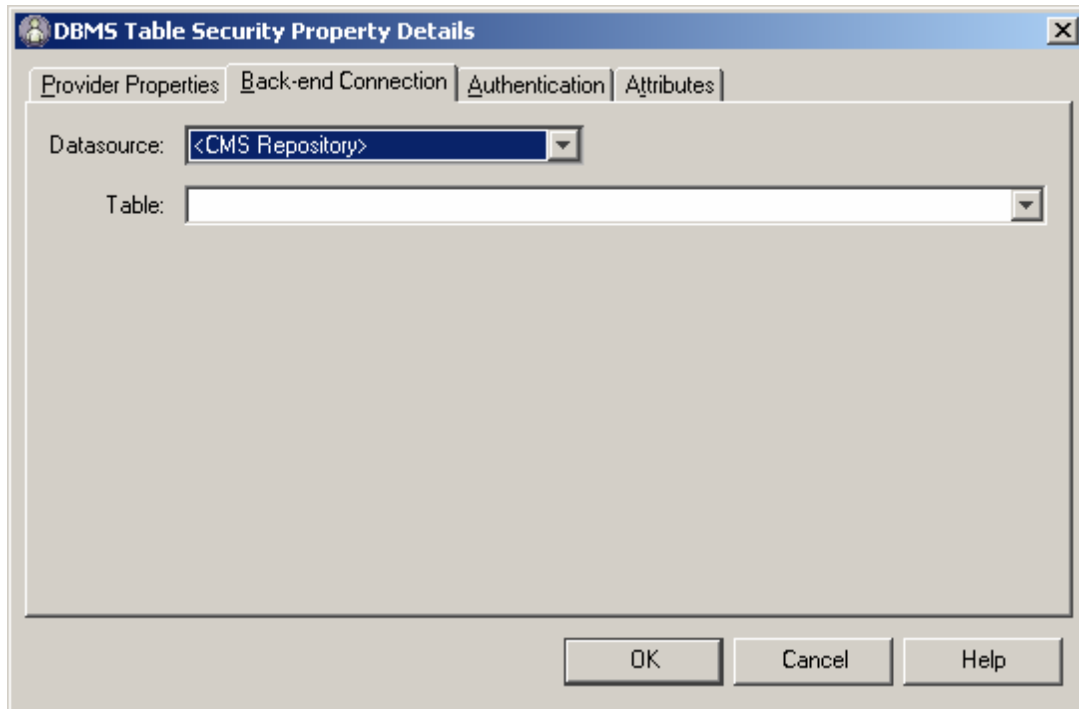


Figure 9: DBMS Table Security Property Provider Backend Connection Tab.

Field Descriptions

Datasource Datasource that provides the connection to the database repository where the authentication data is stored.

Table Table that stores the authentication data.

DBMS Table Security Property Details Authentication Tab

Use the Authentication tab of the DBMS Table Security Provider Details dialog to specify the columns where the authentication data is stored.

You can also specify a password filter, a Rhythmyx extension that encrypts and decrypts the password so it can be stored in the database in encrypted form.

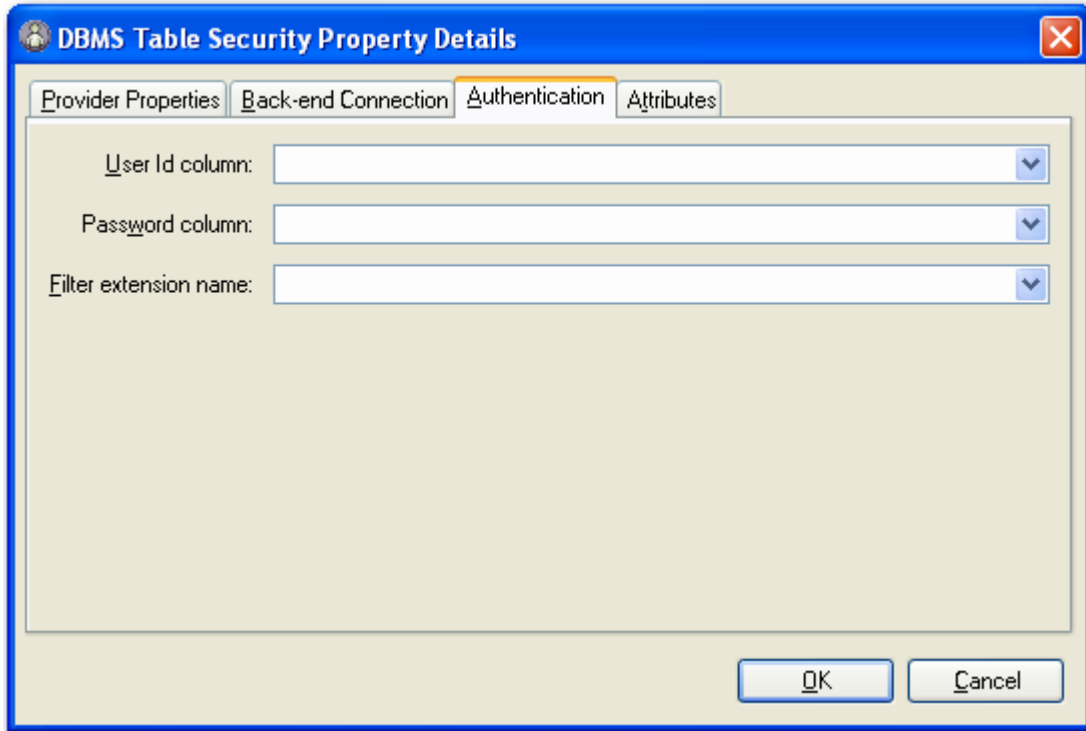


Figure 10: DBMS Table Security Property dialog Authentication tab

Field Descriptions

User Id column The name of the column containing the user's login id. This column must be defined as the primary key, or it must be defined as the only key in a unique index. If this column does not guarantee uniqueness, Rhythmyx will not allow the column to be mapped as the login id.

Password column The name of the column containing the user's password.

Filter extension name Name of the Rhythmyx extension used to encrypt or decrypt the password so it can be stored encrypted in the database. Rhythmyx is shipped with a default password filter, but you can create your own password filter extension. Options include all password filter extensions defined in the system. If no password filter extension is specified, the password is stored unencrypted.

DBMS Table Security Property Details Attributes Tab

Use the Attributes tab to specify columns whose data will be passed to the User Context as attributes. You can manually map column names to session attribute names to make the attributes easier to read.

User/Attribute/attributename=columnname

Click the **[Add All]** button to add all columns in the table as attributes.

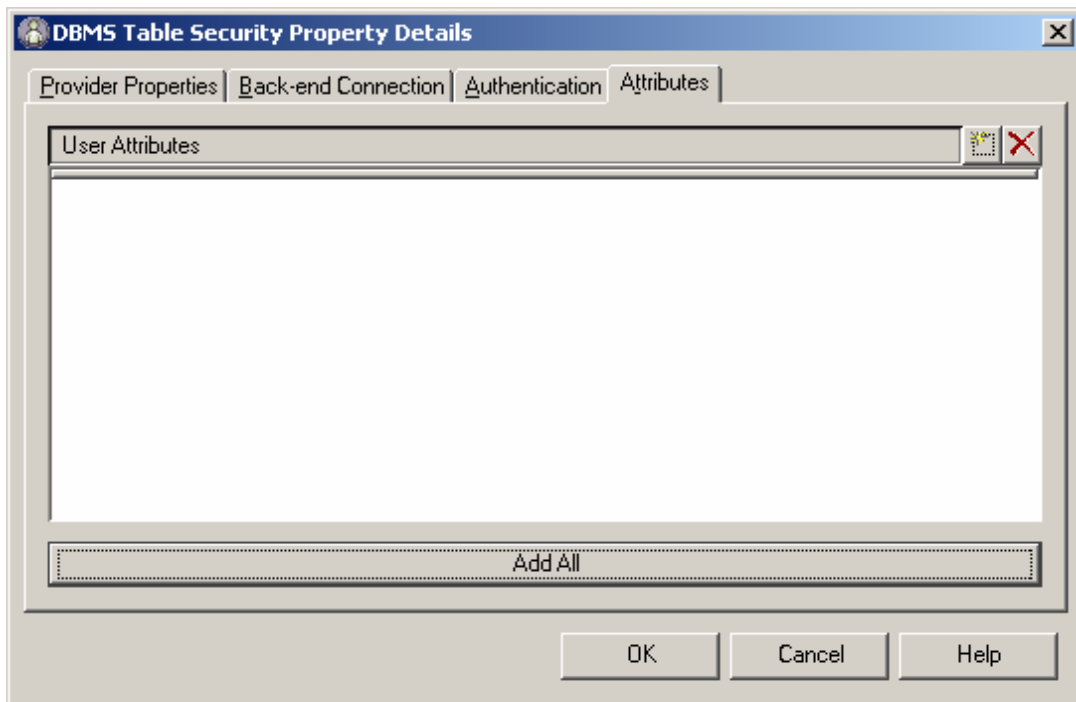



Figure 11: DBMS Table Security Property dialog Attributes tab

Adding a DBMS Table Security Provider



To add a DBMS Table security provider:

- 1 On the Security Provider subtab of the Security tab, click the **[New]** button.
- 2 The Server Administrator displays the Select new security provider type dialog. Choose the *Back-end table security provider* and click the **[OK]** button.
The Server Administrator displays the *DBMS Table Security Property dialog* (see "DBMS Table Security Property Details Dialog" on page 57) with the *Provider Properties tab* (see "DBMS Table Security Property Details Provider Properties Tab" on page 57) selected.
- 3 Enter a Provider Name.
- 4 Select the *Backend Connection tab* (see "DBMS Table Security Property Details Backend Connection Tab" on page 58).
 - c) Choose the **Datasource** you want to use to connect to the database where the authentication data is stored. Options include all Datasources defined in the system.
 - d) Choose the **Table** in which your authentication data is stored.
- 5 Select the *Authentication tab* (see "DBMS Table Security Property Details Authentication Tab" on page 59).
 - a) In the **User d** column drop list, choose column where user names are stored. Options include all columns in the specified table.

- b) In the **Password** column drop list, choose the column where passwords are stored. Options include all columns in the table.
 - c) If you want to store and query the password in encrypted form, in the **Filter Extension Name** drop list, choose the password filter to use to encrypt and decrypt the password.
- 6** If you want to retrieve data from other columns as user attributes:
- a) Select the **Attributes tab** (see "DBMS Table Security Property Details Attributes Tab" on page 59).
 - b) To add all columns as attributes, click the [**Add All**] button.
 - c) To add a single attribute, click the new button .
The Server Administrator opens a new line on the tab.
 - d) use the following code to associate a user attribute with a column name:
`User/Attribute/attributename=columnname`
- 7** Click the [**OK**] button.

Modifying a DBMS Table Security Provider

To modify a DBMS Table security provider:

- 1** Select the security provider you want to modify and click the [**Edit**] button.
- 2** If the security provider is a DBMS Table security provider, The Server Administrator displays the **DBMS Table Security Property Details dialog** (on page 57).
- 3** You can change any value on the **Provider Properties** (see "DBMS Table Security Property Details Provider Properties Tab" on page 57), **Backend Connections** (see "DBMS Table Security Property Details Backend Connection Tab" on page 58), and **Authentication tabs** (see "DBMS Table Security Property Details Authentication Tab" on page 59).
- 4** To add a new attribute mapping:
 - a) Select the **Attributes tab** (see "DBMS Table Security Property Details Attributes Tab" on page 59).
 - b) To add all columns as attributes, click the [**Add All**] button.
 - c) To add a single attribute, click the new button .
The Server Administrator opens a new line on the tab.
 - d) use the following code to associate a user attribute with a column name:
`User/Attribute/attributename=columnname`
- 5** To delete an attribute mapping, select the attribute mapping you want to delete and click the delete button .
- 6** Click the [**OK**] button

Using Directory Services

To use a directory services provider, configure a connection between Rhythmyx and the directory server. You can connect Rhythmyx to more than one directory server, if necessary. You can configure Rhythmyx to use a directory server alone or you can specify that these services be used in conjunction with a Rhythmyx backend database that can also supply user login information.

Use the Rhythmyx Server Administrator to configure connections to directory servers.

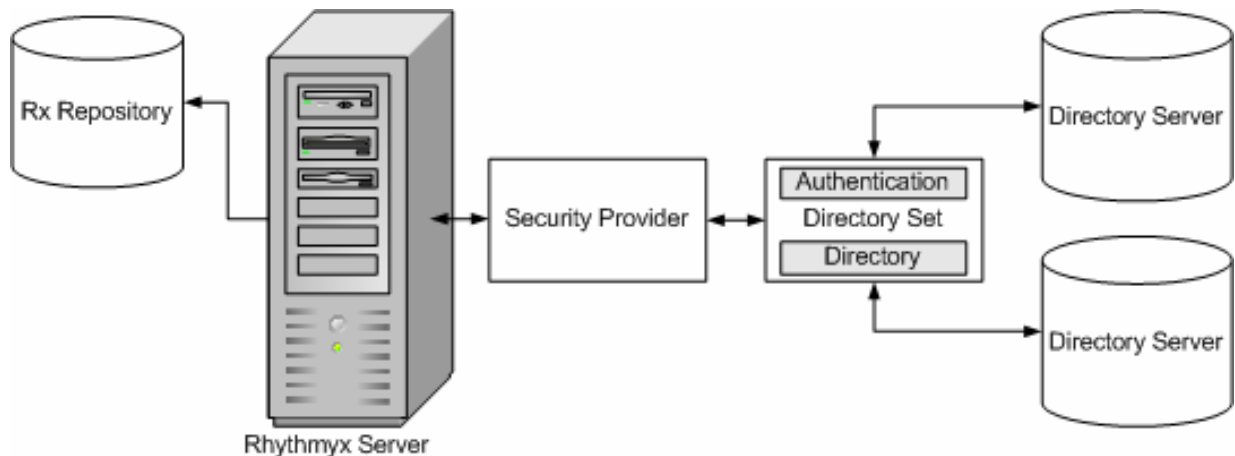


Figure 12: Sample LDAP Directory Server Configuration

Directory server connections can be used to provide user login authentication and other user details for use in Rhythmyx, such as Roles. LDAP directory servers (except for the Active Directory implementation) provide the option of defining custom attribute identifiers, which provides additional flexibility for defining attributes you can use in Rhythmyx. This feature is particularly useful for associating Roles with your users. You can maintain Roles as part of the user attributes in LDAP, rather than in Rhythmyx. Using this approach simplifies user maintenance in Rhythmyx.

By specifying user data in your directory server configuration, you can also use the directory server as a provider for other Rhythmyx processing, particularly Java extensions. For example, you can use directory services to supply user phone numbers and email addresses. Directory services are reusable, allow for searches at only one directory level or in all sub-trees, and allow users to log in using any available user attribute value.

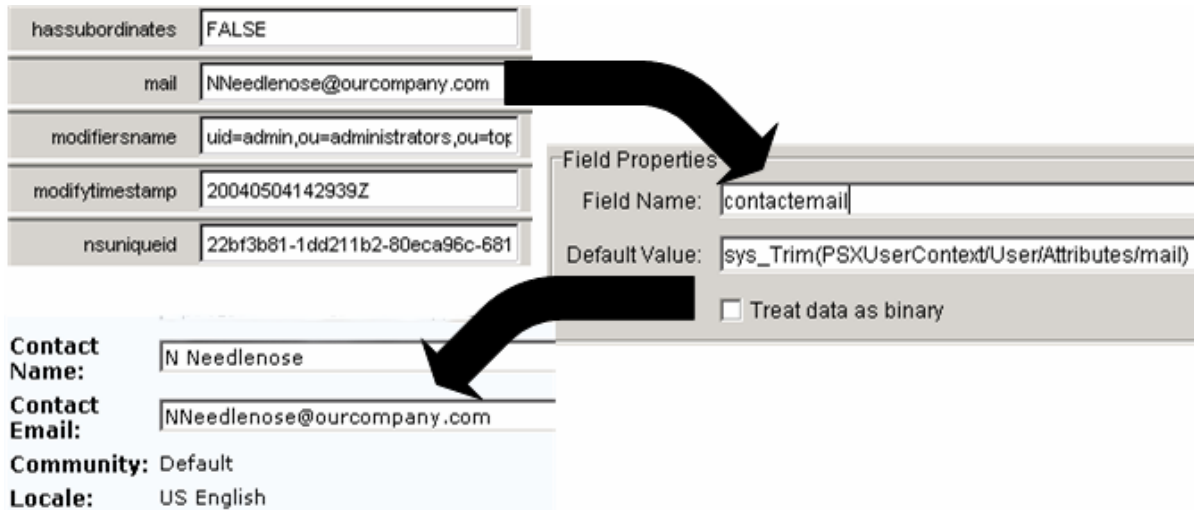


Figure 13: Using Directory Services Attributes in Rhythmyx Content Explorer

You can also aggregate multiple Directories into a common Directory Set and use this set to provide user information, which allows the use of data across Directories without redundancy. The goal of this functionality is to provide maximum reuse of Directory data while allowing access to a diverse range of directory services and configurations.

For more information on using directory servers, refer to documentation for the particular server application or third-party texts on the subject. Available resources include:

- *LDAP Directories Explained: An Introduction and Analysis* by Brian Arkills ISBN: 020178792X
- *The ABCs of LDAP: How to Install, Run, and Administer LDAP Services* by Reinhard Voglmaier ISBN: 0849313465
- *LDAP in the Solaris Operating Environment: Deploying Secure Directory Services* by Michael Haines (Author), Tom Bialaski (Author) ISBN: 0131456938
- *Active Directory*, Second Edition by Alistair G. Lowe-Norris, Robbie Allen ISBN: 0596004664
- *LDAP Directory Service - Details* <http://www.hawaii.edu/ldap/details.html>

LDAP Directory Services Framework

Rhythmyx is a Java-based application. Using the JNDI protocol, Rhythmyx can connect to and search various implementations of LDAP directory services, including Active Directory, SunONE, Netscape, and IPlanet. Rhythmyx uses JNDI without the need for additional programming by the Rhythmyx implementer.

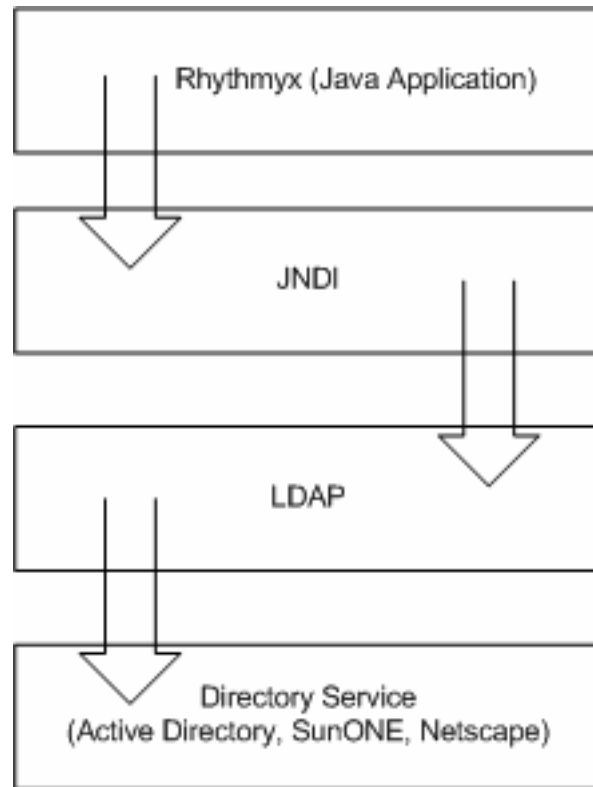


Figure 14: LDAP Directory Services Framework

LDAP directory services can be used to authenticate users as they log in to Rhythmyx in any interface – Content Explorer, Workbench, and the Server Administrator. Additionally, attributes and the values associated with each user can be used in several areas of Rhythmyx.

As such, Rhythmyx is defined as a directory-enabled application. As currently implemented, Rhythmyx can search directory services for particular objects and retrieve any and all necessary attributes. Rhythmyx is not designed to store or update objects in these repositories.

If you would like more information, consult available references on JNDI, including:

- <http://java.sun.com/products/jndi/tutorial/> - An online, downloadable tutorial providing both high- and low-level descriptions of connecting to LDAP through JNDI.
- *JNDI API Tutorial and Reference: Building Directory-Enabled Java(TM) Applications* by Rosanna Lee, Scott Seligman ISBN: 0201705028 - a Sun- recommended reference on the JNDI API.

NOTE: These references are only necessary if you would like a more detailed understanding of JNDI.

Implementing LDAP Directory Services

Implementing LDAP directory services involves two major tasks:

1 Defining an LDAP directory services configuration

An LDAP directory services configuration defines the data used to connect to the directory server, authenticate the user, and optionally provide additional user information. Use the Directory Services tab of the Rhythmyx Server Administrator to set up and maintain all the data for the directory services configuration.

An LDAP directory services configuration consists of the following kinds of data:

- **Authentication** (see "Maintaining Authentications" on page 66)
Authentication data defines the data used to log in to the directory server.
- **Directory Configuration** (see "Maintaining Directory Configurations" on page 71)
A Directory Configuration defines the data required to connect to a specific LDAP directory.
- **Directory Sets** (see "Maintaining Directory Sets" on page 79)
A Directory Set defines a group of Directory Configurations that can be accessed together, and the data required to connect to them. A Directory Set may consist of a single Directory Configuration, of multiple Directory Configurations for directories on the same directory server, or of multiple Directory Configurations for directories on different directory servers.

NOTE: You must define a Directory Set before you can define a Directory Connection Security Provider or a Role Provider.

- **Role Providers** (see "Maintaining Role Providers" on page 84) (optional)
A Role Provider defines the data that determines how Rhythmyx will use directory server information to determine the user's Roles once they have been authenticated.
- **Catalogers** (see "Maintaining Catalogers" on page 87) (optional)
A cataloger provides the ability to retrieve data from a security provider backend. Two types of catalogers are available: subject catalogers retrieve data on individual users; role catalogers determine membership in a Role.

You may find it useful to download and install an LDAP browser to facilitate your directory services configuration. The browser allows you to look up and confirm attribute, connection, and directory information. An LDAP browser makes it easier to complete the directory services configuration, but the browser is not required to complete the configuration successfully.

2 Defining the Directory Connection Security Provider (JNDI, in this case)

A Directory Connection Security Provider allows Rhythmyx to query the directory server to authenticate users and retrieve Role and other user information. Configure Rhythmyx to use JNDI as the Directory Connection Security Provider once you have completed the LDAP directory service configuration.

Maintaining Authentications

Authentications include the credentials necessary to log in to a particular directory server. The data you define for an Authentication includes:

- Authentication name
- Schema
- Credentials
- Credential Attributes

Authentication Dialogs

Use the following Rhythmyx Server Administrator dialogs to set up an Authentication.

- *Authentications tab* (on page 67)
- *Authentication Editor* (on page 68)

The topics for these two dialogs provide a description of what the dialogs contain and how to navigate to them. The procedures for adding, editing, or deleting authentications are in these topics:

- Adding an Authentication (*on page 69*)
- Editing an Authentication (*on page 70*)
- Deleting an Authentication (*on page 70*)

Authentications Tab

The Authentications tab lists any existing Authentications. When shipped, Rhythmyx does not contain any predefined Authentications (since the services to which you will be connecting and your credentials are unknown). The display shows the Authentication's name, the schema used, and the user name being used to log in to the directory server.

Navigate to the Authentications tab by logging into the Rhythmyx Server Administrator, clicking the Directory Services tab, and then clicking the Authentications tab at the bottom of the display.

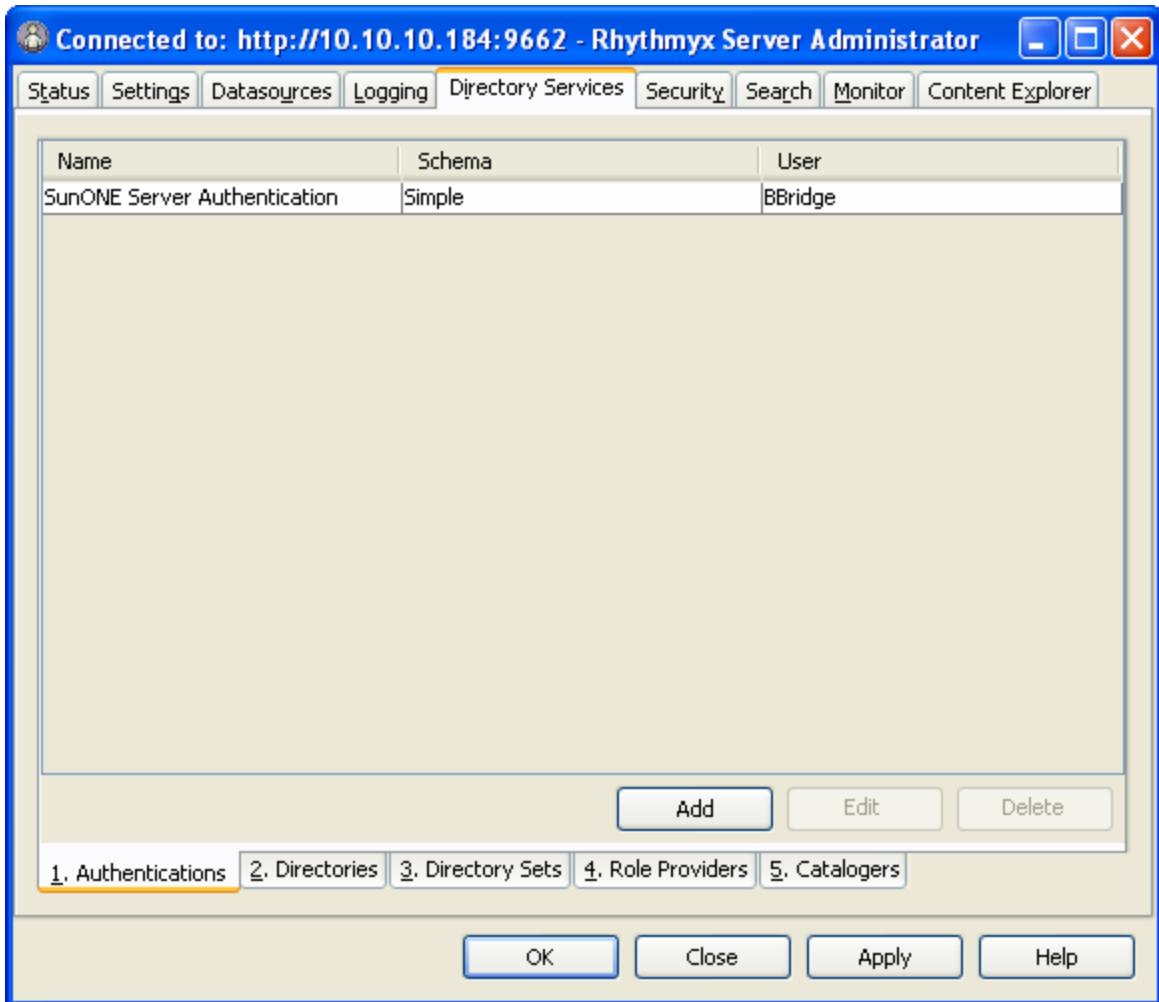


Figure 15: Authentications Tab

Use this tab to access dialogs to add, edit, or delete Authentications.

To open an existing Authentication:

- double-click on the name of the desired Authentication or
- select the desired Authentication and click the [**Edit**] button

To create a new Authentication:

- Click the [**Add**] button.

The *Authentication Editor* appears.

Authentication Editor

Use the Authentication Editor to enter or modify Authentication data.

To open an existing Authentication:

- double-click on the name of the desired Authentication on the Authentications tab or
- select the desired Authentication on the Authentications tab and click the [**Edit**] button

To create a new Authentication:

- Click the [**Add**] button on the Authentications tab

The Authentication Editor appears.

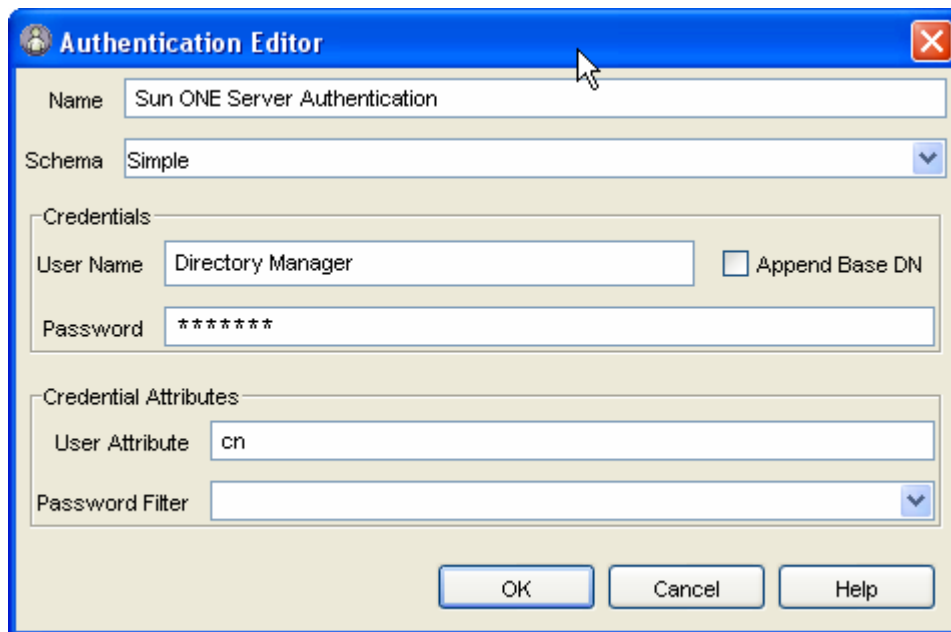


Figure 16: Example Authentication Definition

Authentication Editor Field Descriptions:

Name A description of the Authentication being registered. In this example, we used the name Sun ONE Server Authentication because this Authentication is for a Sun ONE directory server.

Schema The authentication mechanism being used. Rhythmyx supports three mechanisms. Choose the one appropriate for your configuration.

- None - This mechanism consists of a single message from the client to the server. This mechanism does not provide a security layer. This is similar to an anonymous bind.

- **Simple** - The most commonly used Authentication mechanism. This method uses a simple clear-text user password. Clear-text passwords are simple and interoperate with almost all existing operating system authentication databases. The mechanism consists of a single message from Rhythmyx to the directory server. Rhythmyx sends a null character, followed by the user name, followed by a null character, followed by the clear-text password. Upon receipt of the message, the directory server verifies the user name and password against the service's database and verifies the credentials, permitting the user to log in.
- **CRAM-MD5** - A challenge and response authentication mechanism for LDAP v3 servers. (It was superseded by Digest-MD5.) Some existing LDAP v3 servers still support CRAM-MD5. When using CRAM-MD5, the LDAP server sends some data to Rhythmyx. Rhythmyx responds by encrypting the data with its password using the MD5 algorithm. The LDAP server then uses Rhythmyx's stored password to determine whether it used the right password. If this password is correct, the user is permitted to login.

User Name The user name being used to establish a connection (log in) to the directory server. This user must have rights to catalog (list) all requested attribute values.

Password The password for the user name used to connect to the Directory Server.

Append Base DN In some instances, the user name used for connecting to the directory server is required by the directory server to be fully qualified. When you check this box, the Base DN for the Directory (defined in the Provider URL Selector Dialog) is appended to the User Name value. (The Base DN denotes the directory location where searches on the directory server should be initiated.) Connections to Active Directory require this box to be selected.

User Attribute The attribute associated with the User Name as viewed in the directory server. CN (common name) is the most commonly used attribute for user names.

Password Filter If the password is being processed by a custom encryption algorithm, the exit being used to do the encryption must be supplied here. Rhythmyx ships with one encryption filter (default encryption filter). Passwords must be decrypted by the directory server upon receipt.

Adding an Authentication

To add a new directory services Authentication:

- 1 Log into the Rhythmyx Server Administrator and click the Directory Services tab at the top of the display.

NOTE: An Authentication is valid for only one Rhythmyx server. When you have multiple Rhythmyx servers, you must create separate Authentications for each server.

- 2 Click the Authentications tab at the bottom of the display.
- 3 Click the **[Add]** button; Rhythmyx displays the Authentication Editor.

- 4 Complete the fields as described in the topic *Authentication Editor* (on page 68).

Figure 17: Example Authentication Definition

- 5 Click the [OK] button when you have completed the necessary fields.
- 6 Click the [Apply] button to commit the connection registration to the Rhythmyx server.

Editing an Authentication

You can make changes to any value in an existing Authentication registration.

NOTE: If you change the name of an existing Authentication, Rhythmyx prompts you to modify any Directories that reference the Authentication to reflect the new name.

- 1 Log into the Rhythmyx Server Administrator and click the Directory Services tab at the top of the display.
- 2 Click the Authentications tab at the bottom of the display.
- 3 Select the Authentication you want to modify and click the [Edit] button. (Alternatively, you can double-click the Authentication name.)
- 4 Make your changes using information in the topic *Authentication Editor* (on page 68).
- 5 Click the [OK] button to close the Editor dialog.
- 6 Click the [Apply] button to commit the changes to the Rhythmyx server.

Deleting an Authentication

When no Directories are using an Authentication, that Authentication is obsolete. You must delete obsolete Authentications manually.

- 1 Log into the Rhythmyx Server Administrator and click the Directory Services tab at the top of the display.
- 2 Click the Authentications tab at the bottom of the display.

- 3 Select the Authentication(s) you want to delete and click the [Delete] button.

CAUTION: Once you click the [Delete] button, the removal is committed even if you do not click the [Apply] button or save the changes when closing the Server Administrator.

- 4 Click the [OK] button to close the Editor dialog.
- 5 Click the [Apply] button to commit the changes to the Rhythmyx server.

Maintaining Directory Configurations

Directory configurations include the information necessary for Rhythmyx to connect to a particular directory server Directory. The data you define for the Directory configuration includes:

- Name
- Catalog
- Factory
- Authentication
- Provider URL

Optionally, you can include

- Returned Attributes
- Group Providers

Directory Configuration Dialogs

Use the following Rhythmyx Server Administrator dialogs to set up a Directory configuration.

- *Directories tab* (on page 71)
- *Directory Editor* (on page 73)
- *Provider URL Selector* (on page 74)

The topics for these three dialogs provide a description of what the dialogs contain and how to navigate to them. The procedures for adding, editing, or deleting Directory configurations are in these topics:

- Adding a Directory Configuration (*on page 76*)
- Editing a Directory Configuration (*on page 77*)
- Deleting a Directory Configuration (*on page 78*)

Directories Tab

The Directories tab lists any existing Directories. When shipped, Rhythmyx does not contain any predefined Directories (since the services to which you will be connecting and your credentials are unknown). The display shows the Directory's name, the catalog method used, and the URL of the directory server.

Navigate to the Directories tab by logging into the Rhythmyx Server Administrator, clicking the Directory Services tab, and then clicking the Directories tab at the bottom of the display.

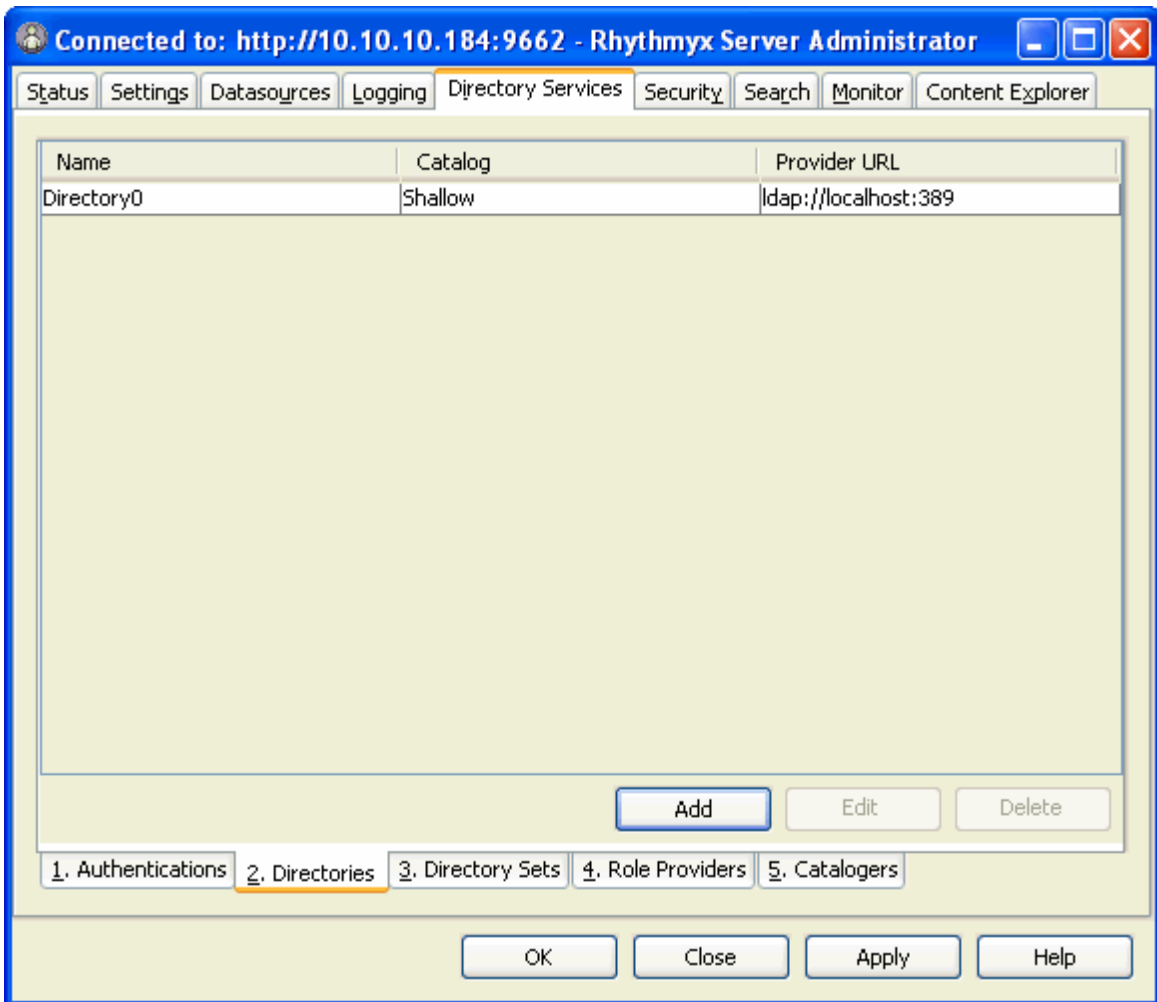


Figure 18: Directories Tab

Use this tab to access dialogs to add, edit, or delete Directory configurations.

To open an existing Directory configuration:

- double-click on the name of the desired Directory configuration or
- select the desired Directory configuration and click the **[Edit]** button

To create a new Directory configuration:

- Click the **[Add]** button.

The *Directory Editor* appears.

Directory Editor

Use the Directory Editor to enter or modify Directory configuration data.

To open an existing Directory configuration:

- double-click on the name of the desired Directory configuration on the Directories tab or
- select the desired Directory on the Directories tab and click the **[Edit]** button

Figure 19: Example Directory Definition

Directory Editor Field Descriptions:

Name A description of the Directory being registered. To be consistent with the naming scheme we used for the Authentication, we have named this Directory the Sun ONE Server Directory.

Catalog The type of cataloging being done. Rhythmix defines two types of directory server cataloging. Choose the one that is right for your configuration.

- **Shallow:** Rhythmix retrieves only those records immediately below the search base
- **Deep:** Rhythmix retrieves values from the search base and all sub-trees. Depending on the size of the tree being cataloged, this setting can cause increased response times.

Factory The class name for the factory used to create the contexts for connections to the directory server. The most common factories are provided in a drop list.

- **LdapCtxFactory** Used for connections to LDAP servers, including Active Directory. This is the most commonly used factory.
- **NISCtxFactory** Used for connections to NIS (Network Information Services) servers.

Authentication Select the Authentication for this Directory from the drop list. If you need to create a new Authentication, choose "New Authentication..." from the drop list to display the Authentication Editor.

Provider URL The provider URL defines the URL of the directory server and the location on the directory server where searches should begin. Click the ellipsis next to the field to display the **Provider URL Selector dialog** (see "Provider URL Selector" on page 74). Use this dialog to help define the correct URL.

Return Attributes Click the Insert New Entry icon to the right of the Return Attributes row to list any specific attribute names you want a directory search to return. If this table is filled in, only the specified attributes are returned with the search results. If the table in this field is empty, all attributes are returned with the search results.

Group Provider to make available Group providers define a source of group information to use when authenticating a user or when retrieving user attributes from a group. Add and remove Group Providers in this field.

Enable debug output Check this box to request debug output to the console.

Provider URL Selector

When defining a new Directory configuration, you must specify a Provider URL. This URL is a combination of the directory server host name, listening port, and a base DN for the directory server. The Provider URL Selector dialog helps you build the URL with a minimum of information.

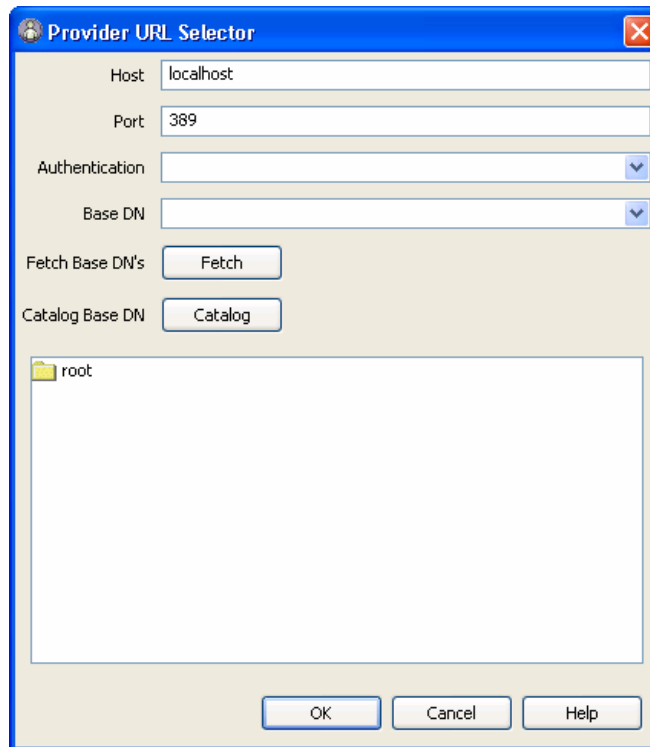


Figure 20: Provider URL Selector Dialog

Provider URL Selector Field Descriptions:

Host The resolvable name (or IP address) of the directory server to which Rhythmyx needs to connect.

Port The LDAP listening port of the named Host. The default port number for LDAP is 389.

Authentication The Authentication used to connect to the named Host. If an Authentication to this Host has not yet been created, select "New Authentication..." from the drop list to define an Authentication for the Host.

Base DN The place to begin searches in the directory server. If the Host, Port, and Authentication information is correct, clicking the [Fetch] button returns a list of available Base DN's.

Fetch Base DN's Clicking the [Fetch] button returns a list of available Base DN's from the named Host, assuming the Host, Port, and Authentication specified in the Provider URL Selector dialog are correct.

NOTE: Fetching Base DN's from an Active Directory server does not yield the proper DN for Users. Instead, on an Active Directory server, it is common to select the non-Configuration or Schema DN and prepend CN=Users.

Catalog Base DN Clicking the [Catalog] button catalogs the objects in the base DN tree. Selecting an object below the Base DN narrows the list of objects searched by adding the selected objects to the Base DN. A Base DN listed without any values below it usually indicates an error in the defined Authentication or Provider information.

JNDI Group Provider Details Dialog

Use the JNDI Group Provider Details dialog to create and maintain JNDI Group Provider records.

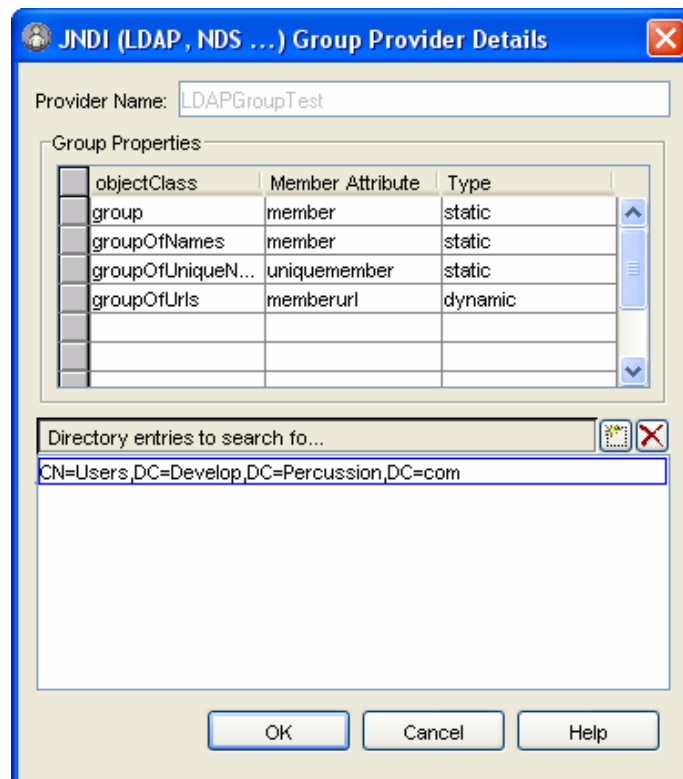


Figure 21: JNDI Group Provider Details Dialog

JNDI Group Provider Details Dialog Field Descriptions:


Provider Name Name of this group provider. Editable only when creating a new group provider. When editing an existing group provider, this field is unavailable.

Group Properties table: the Group Properties table is populated with standard values. If you do not use standard objectClasses or attributes, you can change the entries. For example, removing unused objectClasses (such as removing the groupOfUrls if you do not use dynamic groups) may improve performance slightly.

- **Group Properties: objectClass** Enter the name of a Java object class. Completing this field is required to enter a Member attribute or Type. Rhythmyx treats all LDAP entries with this object class as a group.
- **Group Properties: Member Attributes** The name of the attribute used to determine the group members for entries with the specified object class.
- **Group Properties: Type** The value in this field defines how Rhythmyx will treat the value of the Member Attribute. Options are:
 - Static - Rhythmyx treats the value of the attribute as if it specifies the name of another entry, either a person that is a member or another group. This is the default option.
 - Dynamic - Rhythmyx treats the value of the attribute as if it specifies an LDAP filter URL. This filter specifies the Directory entries that should be considered members of the group.

Directory Entries to search for groups Each entry in this list specifies a node in the Directory that Rhythmyx searches for possible group entries. Each entry should be the fully qualified distinguished name (DN) from the Directory root. Rhythmyx uses these entries to catalog groups for any directory connection security provider that lists this group provider in its definition.

To add a directory entry to search for groups:

- a) Click the Insert New Entry button  to the right of the "Directory Entries to Search For..." row.

Rhythmyx makes a new row available in the Directory entries to search for groups field.

- b) Enter the fully-qualified distinguished name (DN) of the directory entry.


Adding a Directory Configuration

To add a new Directory configuration:

- 1 Log into the Rhythmyx Server Administrator and click the Directory Services tab at the top of the display.

NOTE: A Directory configuration is valid for only one Rhythmyx server. When you have multiple Rhythmyx servers, you must create separate Directory configurations for each server.

- 2 Click the Directories tab at the bottom of the display.
- 3 Click the **[Add]** button.
- 4 The Server Administrator displays the *Directory Editor* (on page 73).
- 5 Enter a **Name** for the Directory configuration.
- 6 Choose a **Catalog** option. Options include:

- Shallow: Rhythmyx retrieves only those records immediately below the search base
 - Deep: Rhythmyx retrieves values from the search base and all sub-trees. Depending on the size of the tree being cataloged, this setting can cause increased response times.
- 7 Choose the **Factory** used to create connections to the directory server. Default options include:
 - **LdapCtxFactory** Used for connections to LDAP servers, including Active Directory. This is the most commonly used factory.
 - **NISCtxFactory** Used for connections to NIS (Network Information Services) servers.
 You can also add the name of any new factory class file you might use.
 - 8 Choose the **Authentication** (see "Maintaining Authentications" on page 66) you want to use to log in with this directory configuration. Options include all Authentications defined in your system.
 - 9 Enter the **Provider URL**. You can use the *Provider URL Selector* (on page 74) to help you determine the correct URL.
 - 10 To add a **Return Attribute**, click the **New** button  and enter the name of the attribute you want to return. (NOTE: If you specify any attributes in this table, only those attributes will be returned. If you do not specify any attributes, then all attributes will be returned.)
 - 11 To add a **Group Provider**, see *Adding a Group Provider* (on page 79).
 - 12 Click the **[OK]** button when you have completed the necessary fields.
 - 13 Click the **[Apply]** button to commit the registration to the Rhythmyx server.

Troubleshooting

If you are having trouble with your searches failing or returning incorrect data, check the following:

- Is the Authentication defined correctly?
- Is the search base too vague or too restrictive?
- Do the record and attributes actually exist?
- Is the record actually located under the search base?
- Are the directory, port, and bind id correct?
- Is there a firewall blocking access to complete the search?
- Is the directory operational at this time?
- Is there an access control list overriding the query search or response?

Editing a Directory Configuration



You can make changes to any value in an existing Directory configuration.

NOTE: If you change the name of an existing Directory, Rhythmyx prompts you to modify any Directory Sets that reference the Directory to reflect the new name.

- 1 Log into the Rhythmyx Server Administrator and click the **Directory Services** tab at the top of the display.
- 2 Click the **Directories** tab at the bottom of the display.

- 3 Select the Directory you want to modify and click the [Edit] button. (Alternatively, you can double-click the Directory name.)

The Server Administrator displays the *Directory Editor* (on page 73).

- 4 You can change the value in any field.
- 5 To add a Return Attribute, click the New button  and enter the name of the attribute you want to return. (NOTE: If you specify any attributes in this table, only those attributes will be returned. If you do not specify any attributes, then all attributes will be returned.)
- 6 To delete a Return Attribute, select the Return Attribute you want to delete and click the delete button .
- 7 You can *add* (see "Adding a Group Provider" on page 79), *modify* (see "Editing a Group Provider" on page 79), or *delete* (see "Deleting a Group Provider" on page 79) a Group Provider.
- 8 Click the [OK] button to close the Editor dialog.
- 9 Click the [Apply] button to commit the changes to the Rhythmyx server.

Troubleshooting a Directory Services Configuration

If you are having trouble with your searches failing or returning incorrect data, check the following:

- Is the Authentication defined correctly?
- Is the search base too vague or too restrictive?
- Do the record and attributes actually exist?
- Is the record actually located under the search base?
- Are the directory, port, and bind id correct?
- Is there a firewall blocking access to complete the search?
- Is the directory operational at this time?
- Is there an access control list overriding the query search or response?

Deleting a Directory Configuration

When no Directory Sets are using a Directory, that Directory is obsolete. You must delete obsolete Directories manually.


- 1 Log into the Rhythmyx Server Administrator and click the Directory Services tab at the top of the display.
- 2 Click the Directories tab at the bottom of the display.
- 3 Select the Directory(s) you want to delete and click the [Delete] button.

CAUTION: Once you click the [Delete] button, the removal is committed even if you do not click the [Apply] button or save the changes when closing the Server Administrator.

- 4 Click the [OK] button to close the Editor dialog.
- 5 Click the [Apply] button to commit the changes to the Rhythmyx server.

Adding a Group Provider

To add a group provider:

- 1 Access the Group Providers tab of the *JNDI Security Provider Details dialog* (on page 52).
- 2 Click the Insert New Entry button  to the right of the "Group Providers to Make Availa..." row.
Rhythmyx displays a drop list showing all existing group providers. You can select an existing provider by double-clicking on its name. If the drop list is empty, click the arrow and click on *Create new* to create a new group provider.
Rhythmyx displays the *JNDI Group Provider Details dialog* (on page 75).
- 3 Press the [Enter] or [Return] key and click [OK] to save the group provider.
- 4 Click [Apply] to commit the changes to the Rhythmyx server.

Editing a Group Provider


To edit a group provider:

- 1 Access the Group Providers tab of the *JNDI Security Provider Details dialog* (on page 52).
- 2 Double-click the name of the group provider you want to edit.
Rhythmyx displays the *JNDI Group Provider Details dialog* (on page 75). You can add new group properties or edit existing group properties.
- 3 To edit a directory entry, double-click the entry and enter your changes.
- 4 To delete a directory entry, select the entry and click the delete button.
- 5 Press the [Enter] or [Return] key and click [OK] to save your changes.
- 6 Click [Apply] to commit the changes to the Rhythmyx server.

Deleting a Group Provider

Removing a group provider from a security provider only removes the association between the security provider and the group provider. The group provider is not deleted.

To remove a group provider:

- 1 Access the Group Providers tab of the *JNDI Security Provider Details dialog* (on page 52).
- 2 Select the group provider you want to remove and click the remove button .

Maintaining Directory Sets

A Directory Set is an aggregation of existing Directories. The data you define for a Directory Set includes:

- Name
- Directories
- Required Attributes

Directory Set Dialogs

Use the following Rhythmyx Server Administrator dialogs to set up a Directory Set.

- *Directory Sets tab* (on page 80)
- *Directory Set Editor* (on page 81)

The topics for these two dialogs provide a description of what the dialogs contain and how to navigate to them. The procedures for adding, editing, or deleting Directory Set configurations are in these topics:

- Adding a Directory Set (*on page 82*)
- Editing a Directory Set (*on page 83*)
- Deleting a Directory Set (*on page 84*)

Directory Sets Tab

The Directory Sets tab lists any existing Directory Sets. When shipped, Rhythmyx does not contain any predefined Directory Sets (since the services to which you will be connecting and your credentials are unknown). The display shows the Directory Set's name and the Directory(s) aggregated in the Set.

Navigate to the Directory Sets tab by logging into the Rhythmyx Server Administrator, clicking the Directory Services tab, and then clicking the Directory Sets tab at the bottom of the display.

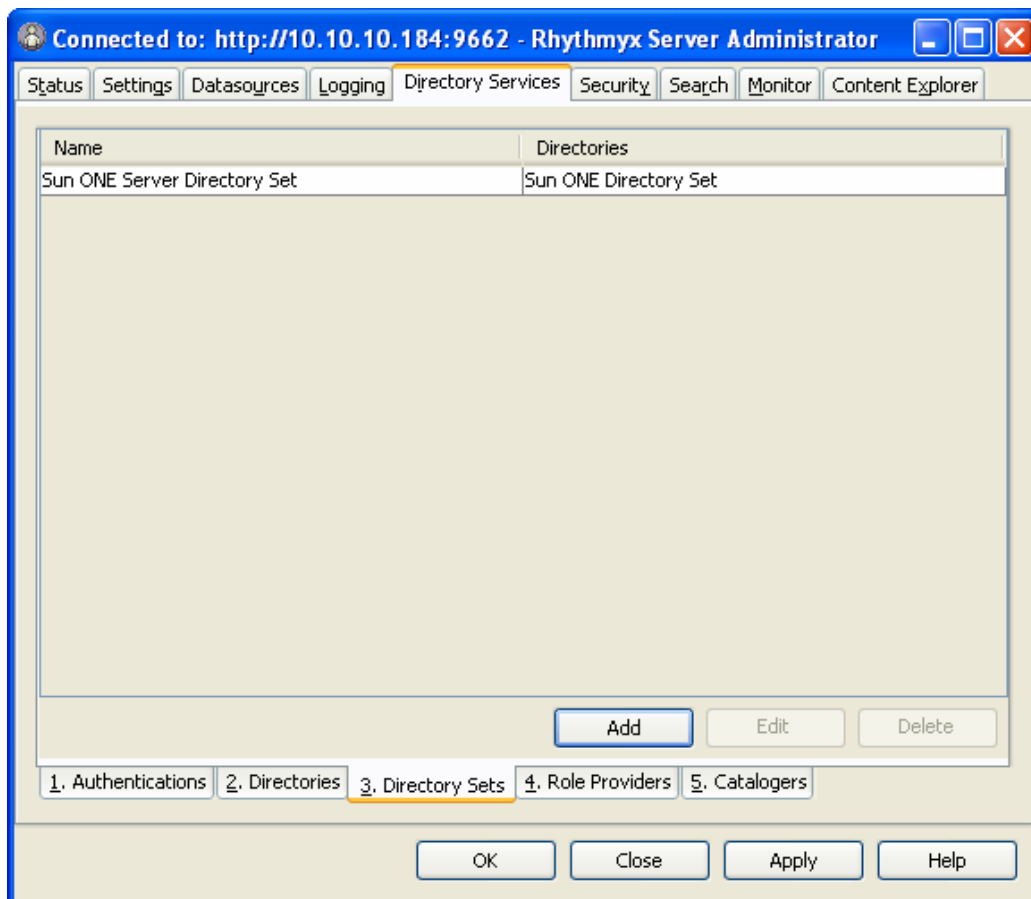


Figure 22: Directory Sets Tab

Use this tab to access dialogs to add, edit, or delete Directory Sets.

To open an existing Directory Set configuration:

- double-click on the name of the desired Directory Set configuration or
- select the desired Directory Set and click the **[Edit]** button

To create a new Directory Set configuration:

- Click the **[Add]** button

The *Directory Set Editor* appears.

Directory Set Editor

Use the Directory Set Editor to enter or modify Directory Set configuration data.

To open an existing Directory Set configuration:

- double-click on the name of the desired Directory Set configuration on the Directory Set tab or
- select the desired Directory Set on the Directory Set tab and click the **[Edit]** button

To create a new Directory Set configuration:

- Click the **[Add]** button on the Directory Set tab

The Directory Set Editor appears.

Directory Set Editor

Name: Active Directory Directory Set

Directories

Name	Catalog	Provider URL
Active Directory Directory	Shallow	ldap://localhost:389/CN=...

Required Attributes

Name	Value
objectAttributeName	cn
emailAttributeName	
roleAttributeName	memberOf

OK Cancel Help

Figure 23: Directory Set Editor

Directory Set Editor Field Descriptions:

Name A description of the Directory Set being registered. In this example, the screen shot shows an Active Directory Directory Set.

Directories A list of Directory configurations being aggregated. If a Directory configuration has not been defined for an existing Directory, (and thus does not appear in the list) double click in one of the table rows to display a drop list. Choose "New Directory..." from the drop list to open the Directory Editor and create the Directory configuration in Rhythmyx.

NOTE: Even if only one Directory is being queried, it is necessary to define it in its own Directory Set.

Required Attributes Several processes within Rhythmyx require a particular attribute. These attributes must be defined for the processes to succeed.

objectAttributeName Required. The attribute name being used during user authentication when logging into Rhythmyx. By changing the value of this attribute, it is possible to allow users to log in with any defined attribute, such as the cn or uid.

emailAttributeName Optional. Notifications sent during Workflow Transition are sent to individual users associated with the Transition Role. By providing the emailAttributeName value used in the directory server, Rhythmyx can send notifications to these users without having to individually define their email addresses in the Rhythmyx server.

roleAttributeName Optional. The attribute used to define a users's Rhythmyx Role. In some configurations, the directory server is used to define a user's Role in Rhythmyx. If each user has both a Functional and Community Role defined in the directory server, it is not necessary to add them to a Role in Rhythmyx. For example, the user Bobby Bluefin has the attribute rhythmyxrole defined with two values, Admin and Default, in the directory server.

rhythmyxrole	Default
	Admin

Figure 24: Rhythmyxrole Attribute

If the rhythmyxrole attribute is defined as the roleAttributeName in the directory set, Bobby Bluefin acquires the rights associated with those Roles when logged into Rhythmyx.

Required Attributes	
Name	Value
objectAttributeName	uid
emailAttributeName	mail
roleAttributeName	rhythmyxrole

Figure 25: Required Attributes Area in the Directory Set Editor

Adding a Directory Set

To add a new Directory Set:

- 1 Log into the Rhythmyx Server Administrator and click the Directory Services tab at the top of the display.

NOTE: A Directory Set is valid for only one Rhythmyx server. When you have multiple Rhythmyx servers, you must create separate Directory Sets for each server.

- 2 Click the Directory Sets tab at the bottom of the display.
- 3 Click the [Add] button; Rhythmyx displays the Directory Set Editor.
- 4 Complete the fields as described in the topic *Directory Set Editor* (on page 81).

Directory Set Editor

Name: Active Directory Directory Set

Directories

Name	Catalog	Provider URL
Active Directory Directory	Shallow	ldap://localhost:389/CN=...

Required Attributes

Name	Value
objectAttributeName	cn
emailAttributeName	
roleAttributeName	memberOf

OK Cancel Help

Figure 26: Example Directory Set Definition

- 5 Click the [OK] button when you have completed the necessary fields.
- 6 Click the [Apply] button to commit the registration to the Rhythmyx server.

Editing a Directory Set

You can make changes to any value in an existing Directory Set.

NOTE: If you change the name of an existing Directory Set, Rhythmyx prompts you to modify any Role Providers that reference the Directory Set to reflect the new name.

- 1 Log into the Rhythmyx Server Administrator and click the Directory Services tab at the top of the display.
- 2 Click the Directory Sets tab at the bottom of the display.

- 3 Select the Directory Set you want to modify and click the [Edit] button. (Alternatively, you can double-click the Directory Set name.)
- 4 Make your changes as described in the topic *Directory Set Editor* (on page 81)
- 5 Click the [OK] button to close the Editor dialog.
- 6 Click the [Apply] button to commit the changes to the Rhythmyx server.

Deleting a Directory Set

When no Role Providers are using a Directory Set, the Directory Set is obsolete. You must delete obsolete Directory Sets manually.

- 1 Log into the Rhythmyx Server Administrator and click the Directory Services tab at the top of the display.
- 2 Click the Directory Sets tab at the bottom of the display.
- 3 Select the Directory Set(s) you want to delete and click the [Delete] button.

CAUTION: Once you click the [Delete] button, the removal is committed even if you do not click the [Apply] button or save the changes when closing the Server Administrator.

- 4 Click the [OK] button to close the Editor dialog.
- 5 Click the [Apply] button to commit the changes to the Rhythmyx server.

Maintaining Role Providers

Role Providers include the information necessary to use a Directory Set to provide Rhythmyx with Role information for users. The data you define for a Role Provider includes:

- Name
- Directory Set

Creating Role Providers is optional. Use a Role Provider to maintain Roles in the directory server rather than in Rhythmyx.

NOTE: You must create a Directory Set before you can create a Role Provider or a Security Provider.

Role Provider Dialogs

Use the following Rhythmyx Server Administrator dialogs to set up a Role Provider.

- *Role Providers tab* (on page 84)
- *Role Provider Editor* (on page 85)

The topics for these two dialogs provide a description of what the dialogs contain and how to navigate to them. The procedures for adding, editing, or deleting Role Providers are in these topics:

- Adding a Role Provider (*on page 86*)
- Editing a Role Provider (*on page 86*)
- Deleting a Role Provider (*on page 86*)

Role Providers Tab

The Role Providers tab lists any existing Role Providers. When shipped, Rhythmyx does not contain any predefined Role Providers except for the internal rxmaster Role Provider. (This Provider is not displayed in the Role Providers dialog). The display shows the Role Provider's name and type.

Navigate to the Role Providers tab by logging into the Rhythmyx Server Administrator, clicking the Directory Services tab, and then clicking the Role Providers tab at the bottom of the display.

Use this tab to access dialogs to add, edit, or delete Role Providers.

To open an existing Role Provider configuration:

- double-click on the name of the desired Role Provider configuration or
- select the desired Role Provider configuration and click the **[Edit]** button

To create a new Role Provider configuration:

- Click the **[Add]** button

The *Role Provider Editor* appears.

Role Provider Editor

Use the Role Provider Editor to enter or modify Role Provider configuration data.

To open an existing Role Provider configuration:

- double-click on the name of the desired Role Provider configuration on the Role Providers tab or
- select the desired Role Provider on the Role Providers tab and click the **[Edit]** button

To create a new Role Provider configuration:

Click the **[Add]** button on the Role Providers tab. The *Role Provider Editor* (on page 85) appears.

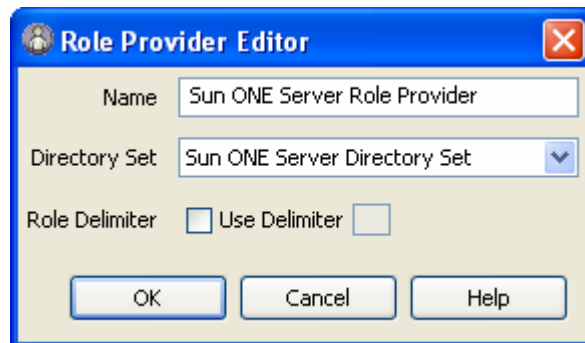


Figure 27: Example Role Provider Definition

Role Provider Editor Field Descriptions:

Name A description of the Role Provider being registered. To be consistent with the other components of the directory server configuration, we used the name Sun ONE Server Role Provider. (NOTE: The Role Provider must have the same name as the Security Provider that will use the Roles provided. If the Role Provider does not have the same name as the Security Provider, you will see the following error:

```
PSRoleCataloger 7/27/05 12:03 PM: Couldn't find a matching security
provider for role provider: RoleProvider0
```

To avoid this error, the Role Provider and the Security Provider should have the same name.)

Directory Set The Directory Set being used to establish the connection to the defined Role Provider. If an existing Directory Set does not appear in the drop list, select "New Directory Set..." from the drop list to bring up the Directory Set Editor and create a record for the Directory Set in Rhythmyx.

Adding a Role Provider

To add a Role Provider:

- 1 Log into the Rhythmyx Server Administrator and click the Directory Services tab at the top of the display.

NOTE: A Role Provider is valid for only one Rhythmyx server. When you have multiple Rhythmyx servers, you must create separate Role Providers for each server.

- 2 Click the Role Providers tab at the bottom of the display.
- 3 Click the **[Add]** button to display the Role Provider Editor.
The Server Administrator displays the *Role Provider Editor* (on page 85).
- 4 Enter a **Name** for the Role Provider.
- 5 Choose the **Directory Set** you want the Role Provider to use. Options include all *Directory Sets* (see "Maintaining Directory Sets" on page 79) defined in the system.
- 6 Click the **[OK]** button when you have completed the necessary fields.
- 7 Click the **[Apply]** button to commit the registration to the Rhythmyx server.

Editing a Role Provider

You can make changes to any value in an existing Role Provider.

NOTE: If you change the name of an existing Role Provider, Rhythmyx prompts you to modify any Security Providers that reference the Role Provider to reflect the new name.

- 1 Log into the Rhythmyx Server Administrator and click the Directory Services tab at the top of the display.
- 2 Click the Role Providers tab at the bottom of the display.
- 3 Select the Role Provider you want to modify and click the **[Edit]** button. (Alternatively, you can double-click the Role Provider name.)
The Server Administrator displays the *Role Provider Editor* (on page 85).
- 4 You can change the **Name** of the Role Provider or choose a different **Directory Set** (see "Maintaining Directory Sets" on page 79).
- 5 Click the **[OK]** button to close the Editor dialog.
- 6 Click the **[Apply]** button to commit the changes to the Rhythmyx server.

Deleting a Role Provider

When no Security Providers are using a Role Provider, the Role Provider is obsolete. You must delete obsolete Role Providers manually.

- 1 Log into the Rhythmyx Server Administrator and click the Directory Services tab at the top of the display.
- 2 Click the Role Providers tab at the bottom of the display.
- 3 Select the Role Provider you want to delete and click the **[Delete]** button.

CAUTION: Once you click the [**Delete**] button, the removal is committed even if you do not click the [**Apply**] button or save the changes when closing the Server Administrator.

- 4 Click the [**OK**] button to close the Editor dialog.
- 5 Click the [**Apply**] button to commit the changes to the Rhythmyx server.

Maintaining Catalogers

Catalogers are code modules used to retrieve user and Role information from a security provider backend. Catalogers must be registered with Rhythmyx before Rhythmyx can use them.

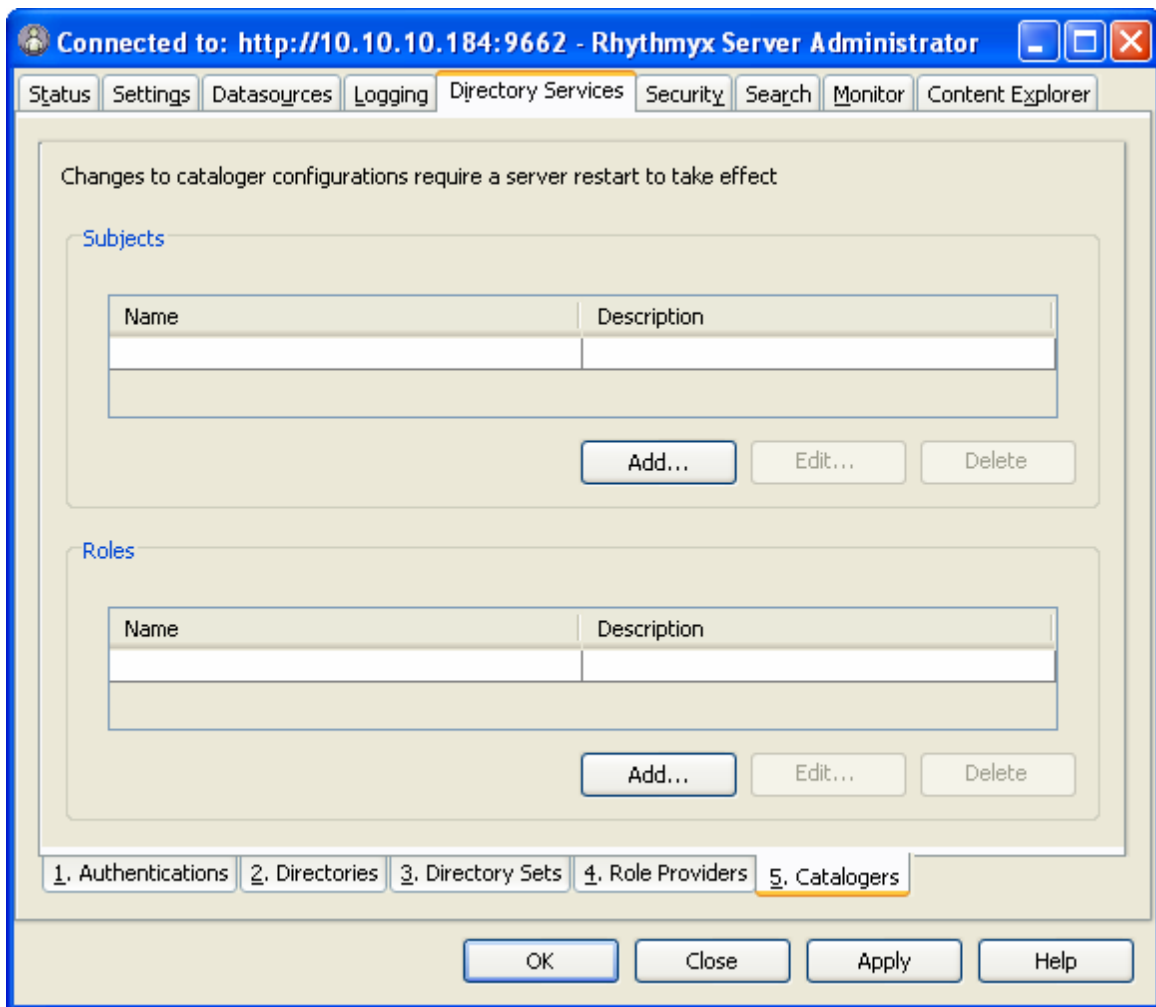


Figure 28: Catalogers Tab

You can implement two types of catalogers:

- subject catalogers retrieve data on individual users;
- role catalogers determine membership in a Role

The same dialogs and procedures are used to register both types of catalogers.

Use the *Cataloger Configuration dialog* (on page 88) to register new catalogers or to modify a cataloger registration.

You can *register a new cataloger* (see "Registering a Cataloger" on page 89), or *modify a cataloger registration* (see "Editing a Cataloger Registration" on page 89).

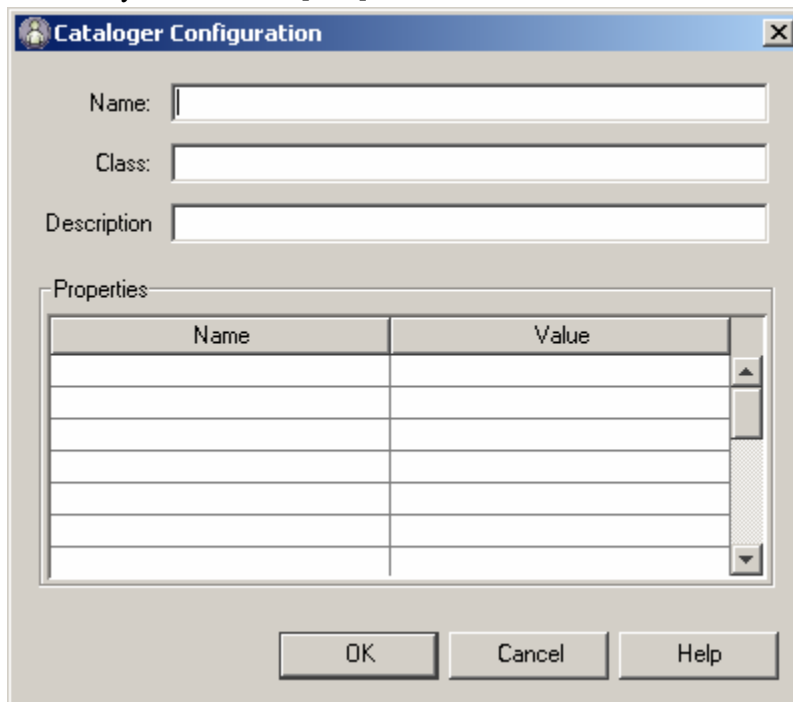
To delete a cataloger registration, select the registration you want to delete and click the **[Delete]** button.

Cataloger Configuration Dialog

Use the Cataloger Configuration dialog to *register new catalogers* (see "Registering a Cataloger" on page 89) or to *modify the registration of an existing cataloger* (see "Editing a Cataloger Registration" on page 89).

To access the Cataloger Configuration dialog:

- on the Catalogers subtab of the Directory Services tab, click the **[Add]** button.
- on the Catalogers subtab of the Directory Services tab, select the cataloger registration you want to modify and click the **[Edit]** button.



Name	Value

Figure 29: Cataloger Configuration dialog

Field Descriptions

Name Name of the cataloger registration

Class Fully-qualified name of the class of the cataloger.

Description Free-form description of the cataloger

Properties

Name Name of the cataloger property.

Value Value of the cataloger property

Registering a Cataloger

To register a cataloger:

- 1 On the Catalogers subtab of the Directory Services tab, click the **[Add]** button.
The Server Administrator displays the *Cataloger Configuration dialog* (on page 88).
- 2 Enter a **Name** for the cataloger registration.
- 3 Enter the fully-qualified name of the cataloger **Class**.
- 4 Optionally, enter a free-form **Description** of the cataloger.
- 5 For each property of the cataloger class, enter the **Name** of the property and the **Value** of the property in the same row.
- 6 Click the **[OK]** button to save the cataloger registration.

Editing a Cataloger Registration

To edit a cataloger registration:

- 1 On the Catalogers subtab of the Directory Services tab, select the cataloger registration you want to modify and click the **[Edit]** button.
The Server Administrator displays the *Cataloger Configuration dialog* (on page 88).
- 2 You can modify the value in any field.
- 3 Click the **[OK]** button to save your changes.

LDAP Configuration Examples

Now we will walk through examples of two ways of using LDAP directory services with Rhythmyx. The first example demonstrates using an Active Directory server to authenticate users. The second example demonstrates using a SunONE directory server to provide role information for Rhythmyx users.

Example 1: Using LDAP to Authenticate Users

In this example, we allow users maintained in the corporate Active Directory server to access our Rhythmyx server. There are three users: Nancy Needlenose, Bobby Bluefin, and Tiara Tuna. Nancy and Tiara are both members of the Content Contributors group only, while Bobby is a member of the TeamCaptains group.

We do not want all members of the TeamCaptains group to have access to Rhythmyx, only Bobby. Bobby is associated with the Rhythmyx Role Admin, while the Content Contributors are members of the Author Functional Role. All are members of the Default Community Role.

We have an Active Directory server named ADServer that stores all of our user names and attributes. The Directory Service is listening on port 389. The user Bobby Bluefin is used to bind to the Active Directory Service. This user need only have the appropriate rights to catalog the directory. Bobby's user attribute is CN (CN=Bobby Bluefin) and his password is DeepSea.

We have downloaded and installed an LDAP browser to facilitate configurations. The browser allows for quick and easy confirmation of attribute, connection, and credential information. Though this is not required, it is a handy tool to have available.

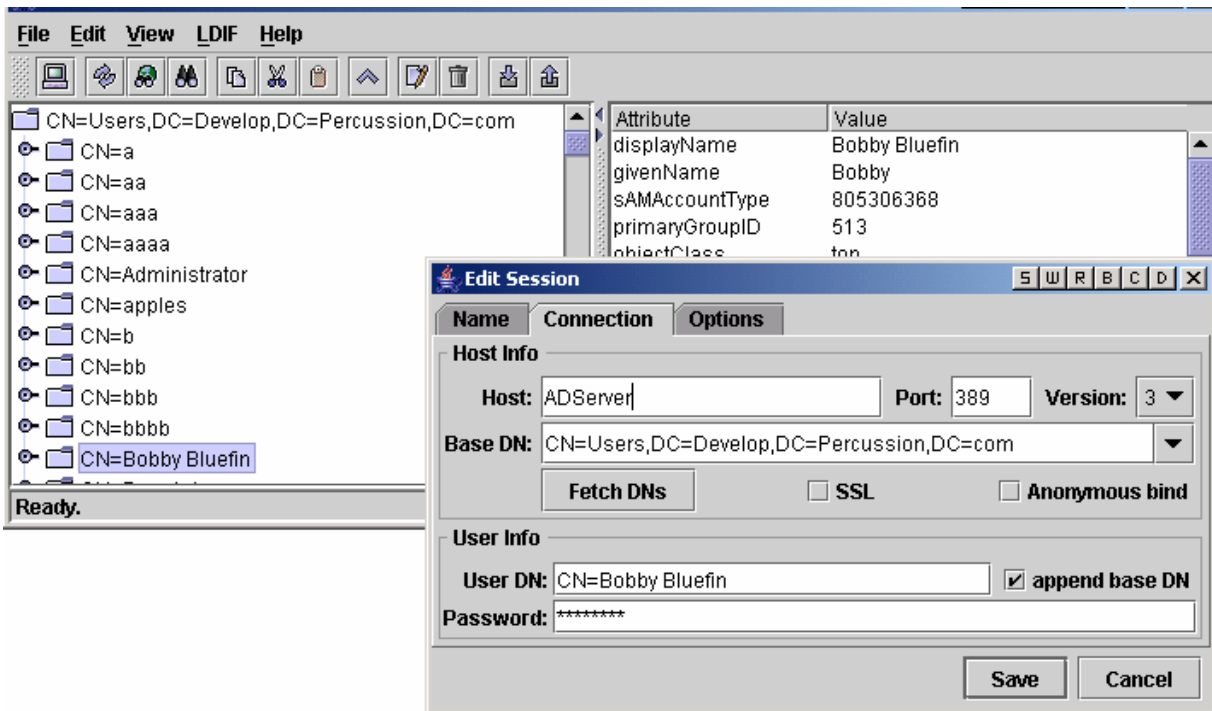


Figure 30: Using an LDAP Browser to Confirm the Configuration

Creating the Authentication

Our first step is to create an Authentication.

- 1 Start the Server Administrator client and connect to the Rhythmyx server.
- 2 Click the Directory Services tab.

3 Click the Authentications tab.

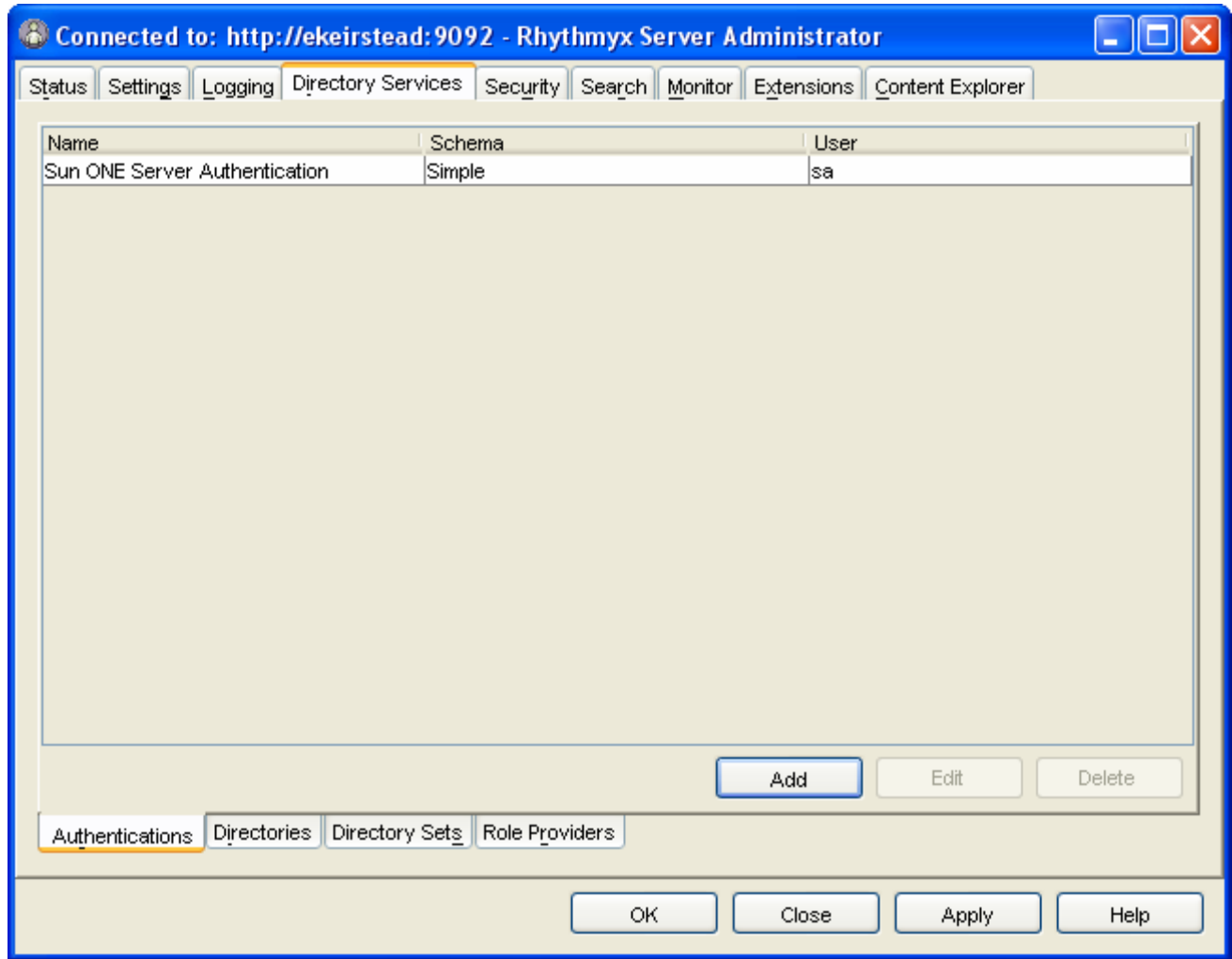


Figure 31: Authentications Tab

4 Click [Add].

- 5 If available, open an LDAP browser and create a new connection with the server information and credentials already provided.

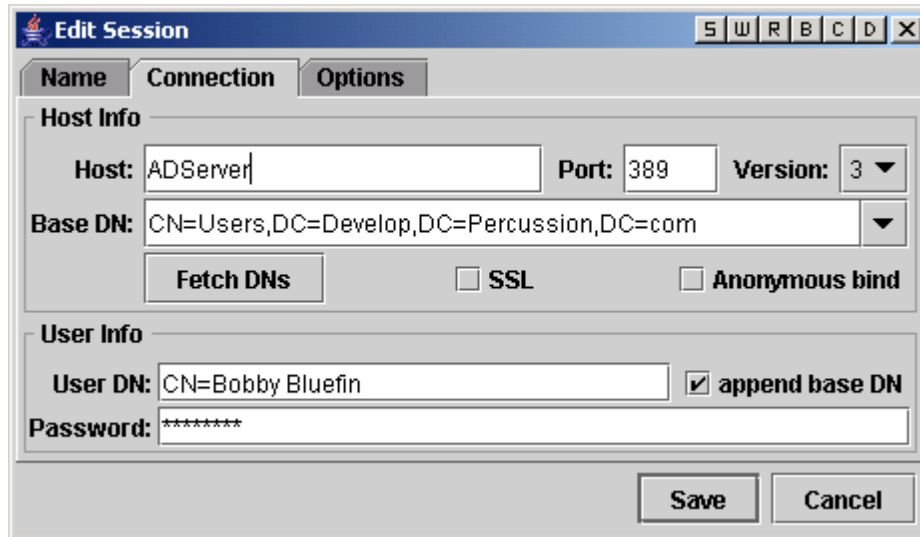


Figure 32: LDAP Browser Showing ADServer Connection

If the credentials are correct, it should be possible to bind to and catalog the Directory.

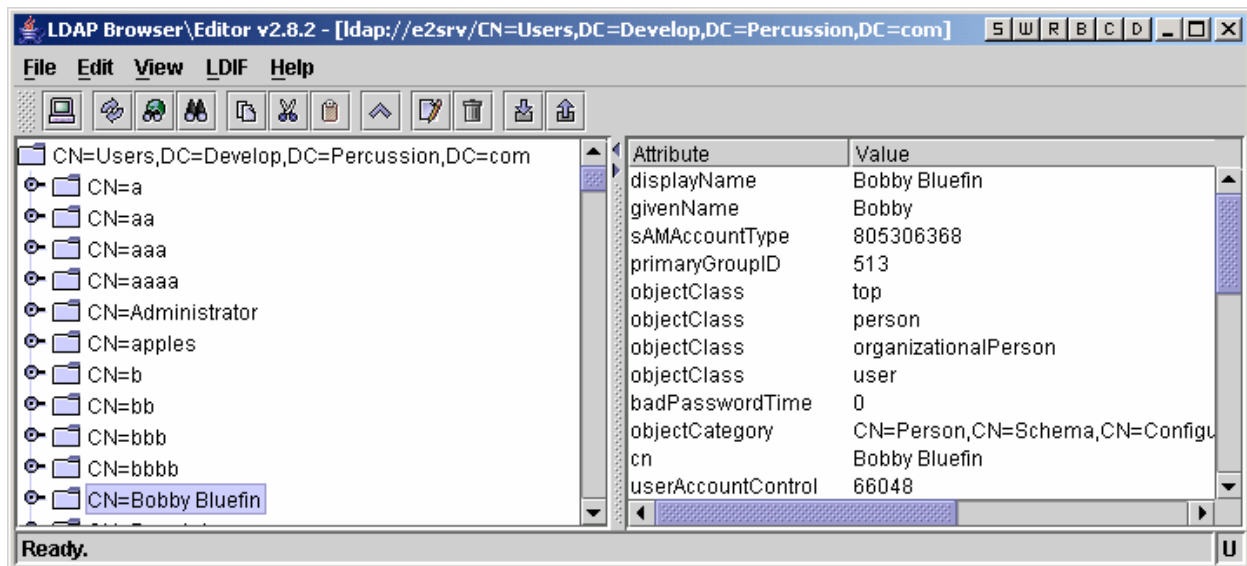
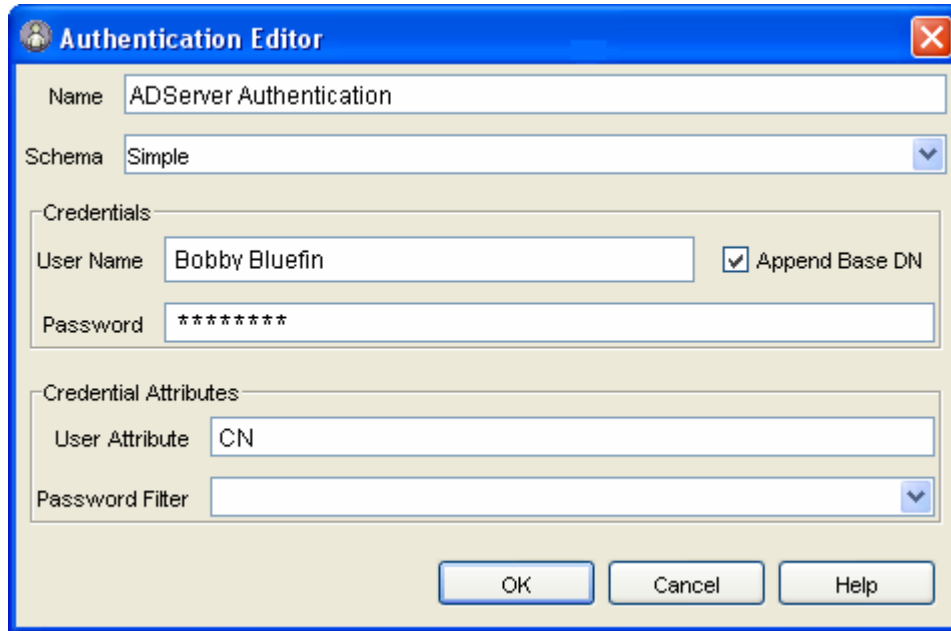


Figure 33: ADServer Directory Catalogued in LDAP Browser

NOTE: The LDAP Browser is a third-party utility, which is not a part of the Rhythmyx software and is not required.

- 6 In the Rhythmyx Server Administrator's Authentication Editor, complete the fields necessary to connect to ADServer.



The screenshot shows the 'Authentication Editor' dialog box. The 'Name' field is 'ADServer Authentication'. The 'Schema' dropdown is set to 'Simple'. Under the 'Credentials' section, the 'User Name' is 'Bobby Bluefin' and the 'Password' is masked with '*****'. The 'Append Base DN' checkbox is checked. Under the 'Credential Attributes' section, the 'User Attribute' is 'CN' and the 'Password Filter' dropdown is empty. The 'OK', 'Cancel', and 'Help' buttons are at the bottom.

Figure 34: Creating the ADServer Authentication

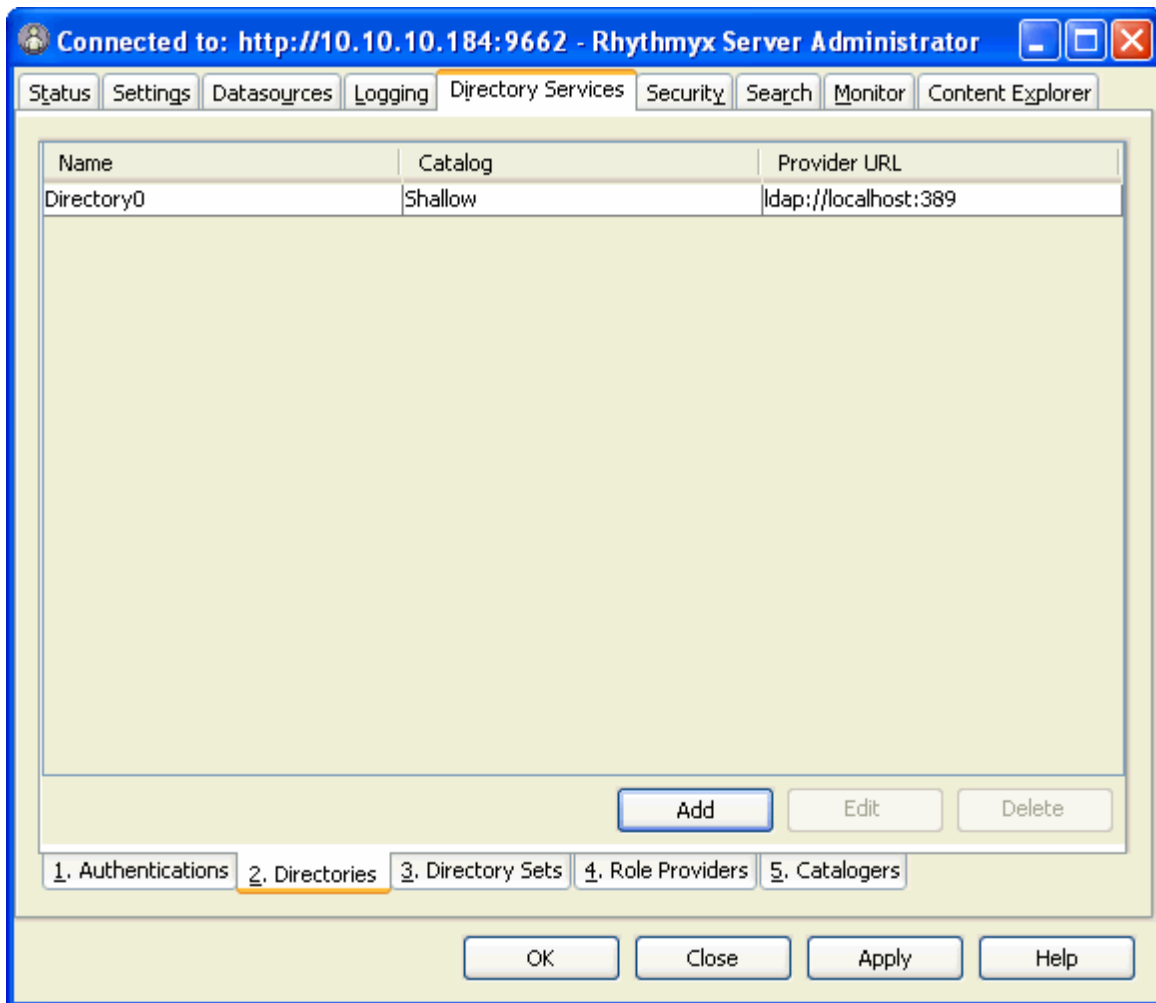
- 7 Click [OK] to save the new Authentication.
- 8 Click [Apply] to complete the new registration.

NOTE: The credentials being provided in these instructions are for demonstration purposes only.

Creating the Directory

Our second step is to define the Directory configuration.

- 1 Start the Server Administrator client and connect to the Rhythmyx server.
- 2 Select the Directory Services tab.

3 Select the Directories tab.*Figure 35: Directories Tab***4** Click [Add].

- 5 Using the information we confirmed in our LDAP Browser during the creation of a new Authentication, complete the Directory Editor dialog with the appropriate directory information for Name, Catalog, and Factory.

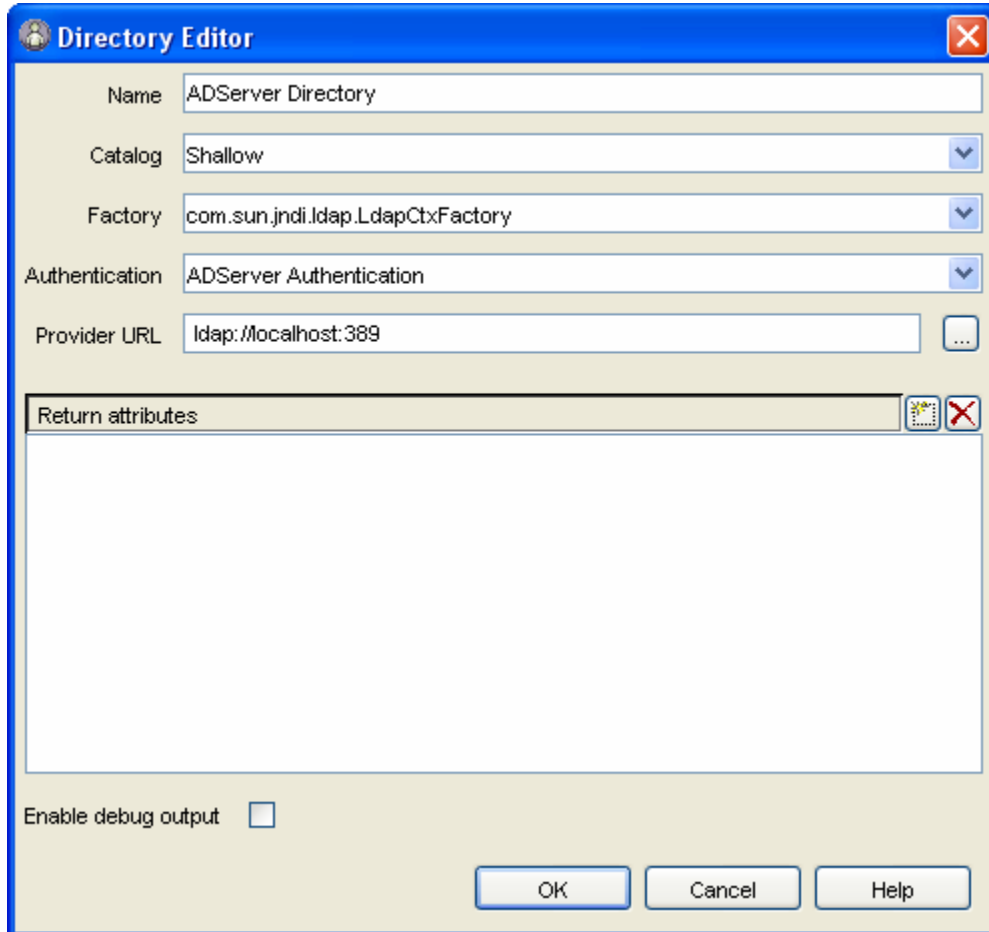


Figure 36: Directory Editor Dialog

- 6 Choose from the Authentication drop list the ADServer Authentication created in the section *Creating the Authentication* (on page 90).
- 7 Click the ellipsis after the Provider URL field to generate the URL if you don't already know what it is. If you know the URL, enter it manually into the field.

- 8 Continue entering the data we gathered with our LDAP browser and confirm this information by pressing the catalog button to search the Base DN.

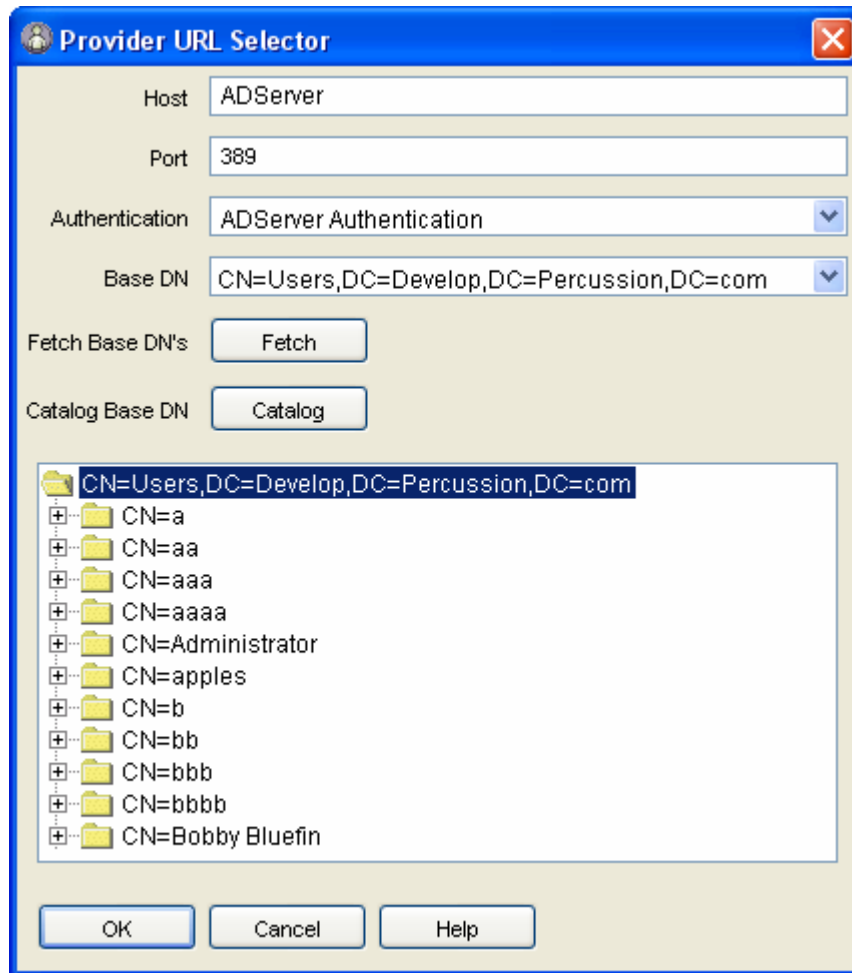


Figure 37: Provider URL Selector Dialog

NOTE: Rhythmyx will not be able to Fetch the appropriate Active Directory Base DN. This will need to be provided manually. The example above catalogs the Active Directory "Users" in the develop.percussion.com domain.

- 9 If the Base DN catalogs properly, click [OK] to complete the creation of the Provider URL. The result is a well-formed Directory.

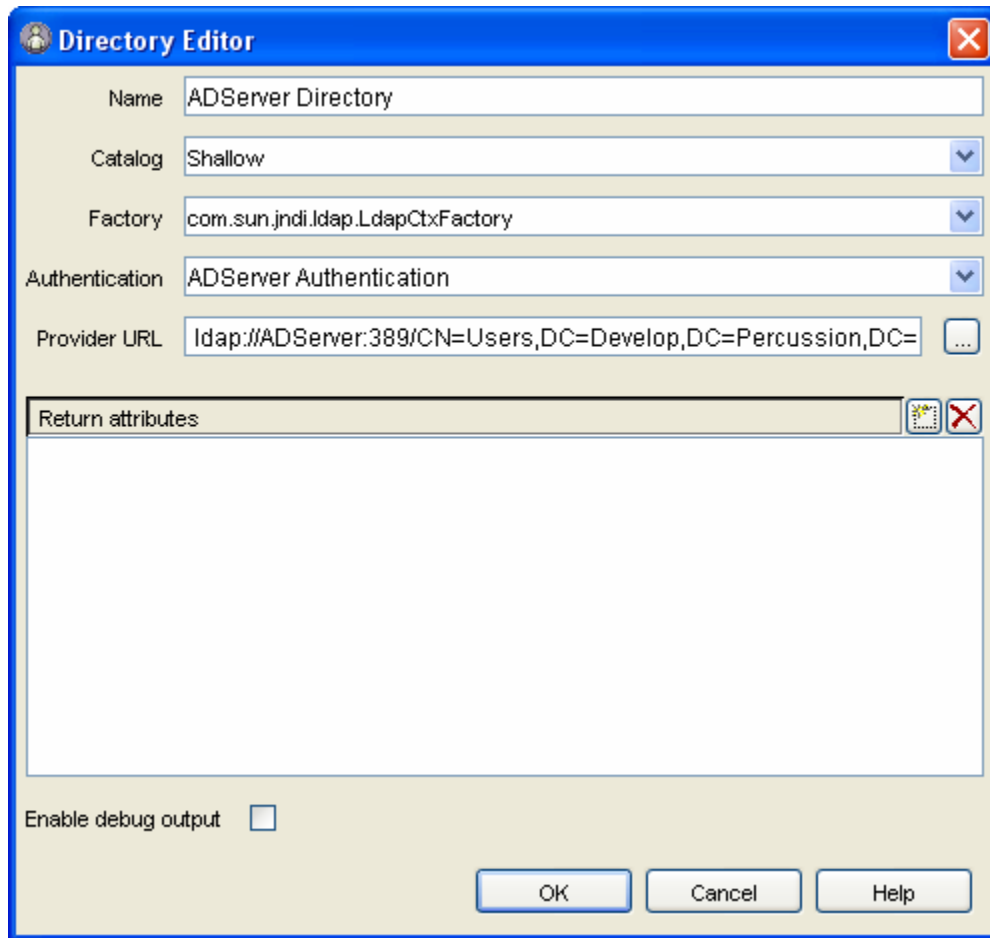



Figure 38: Directory Editor Dialog Showing Complete Provider URL

- 10 If we needed to return only a limited set of attributes for our users, we would define them explicitly in the Return Attributes table by clicking the Insert New Entry button  to the right of the Return attributes field name. Otherwise, all attributes are returned. The format for the table entries is `directoryAttribute=mappedAttribute`. For example, if we wanted to return only each user's cn and map it to the attribute `usersName`, we would add the value, `cn=usersName`.
- 11 Click [OK] to save the Directory configuration.
- 12 Click [Apply] to complete the registration.

Creating the Directory Set

The third step in creating a new LDAP connection is to define the Directory Set.

- 1 Start the Server Administrator client and connect to the Rhythmyx server.
- 2 Click the Directory Services tab.

3 Click the Directory Sets tab.

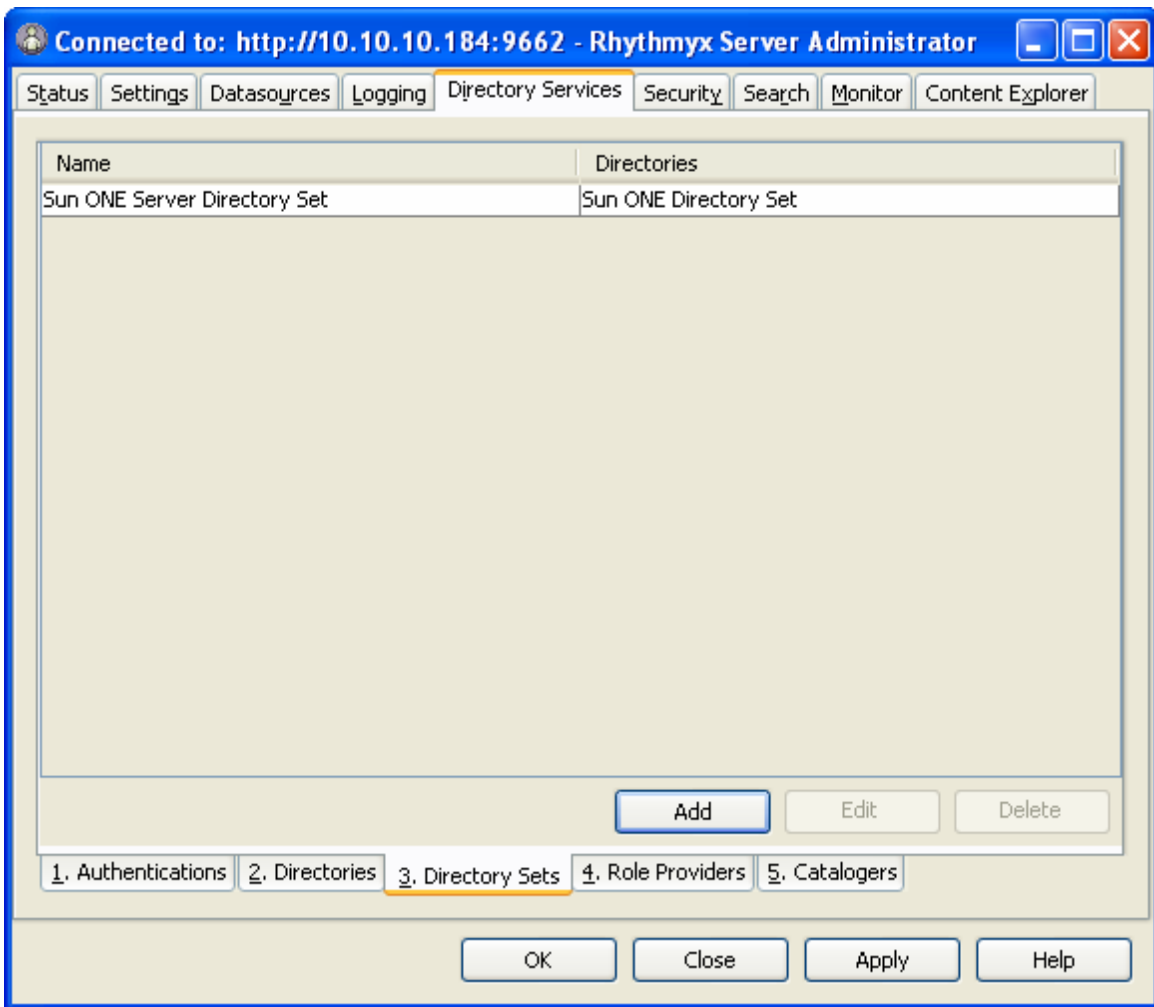


Figure 39: Directory Sets Tab

- 4 Click [Add].
- 5 Click the right-hand corner of the table below the Name column to display the existing Directories. Select our previously registered ADServer Directory entry.
- 6 We must next decide on the attribute users will use to log into Rhythmyx. Some of the available attributes in Active Directory are:

Attribute	Example Value
cn	Bobby Bluefin
userPrincipalName	BBluefin@develop.percussion.com
givenName	Bobby
sn	Bluefin

- 7 To assure a unique user id, we use `userPrincipalName` as the `objectAttributeName`. This will also be used to mine the user's email address and use it to send notifications during Workflow Transitions. We will not define a Role Attribute.

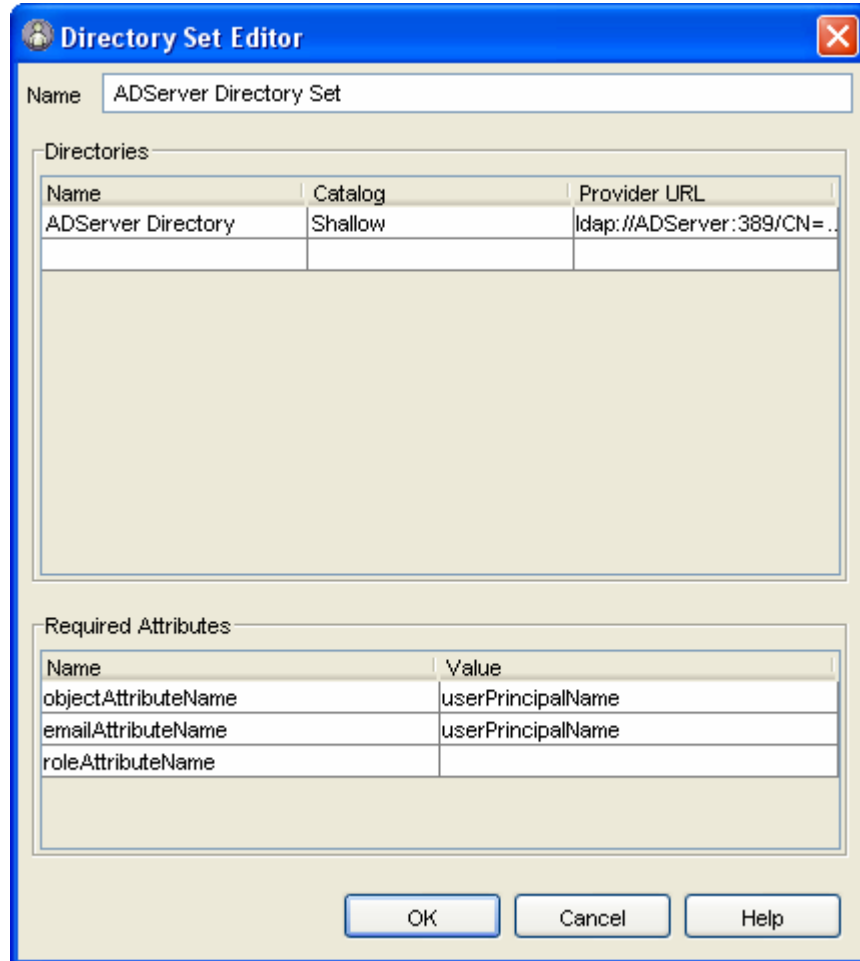


Figure 40: Directory Set Editor Dialog

- 8 When complete, click [OK] to save the new Directory Set configuration.
 9 Click [Apply] to complete the registration.

Creating the Security Provider

Once the Directory Set is created, it is used to define a Directory Connection Security Provider.

- 1 Start the Server Administrator client and connect to the Rhythmyx server.
- 2 Click the Security tab.
- 3 Click the Security Providers tab.
- 4 Click [New].
- 5 Choose Directory Connection Security Provider from the drop list.
- 6 Click [OK].

- 7 Fill in the Provider Properties tab with the Provider name. Choose our previously defined ADServer Directory Set from the drop list.



Figure 41: Security Provider Details Dialog

- 8 Click the Group Providers tab.
- 9 Click the Insert New Entry icon (box to the right of the "Group Providers to make availa..." row under the Group Providers tab) to display the drop list.
- 10 Choose, "Create New.." from the drop list. The Group Provider Details dialog appears.

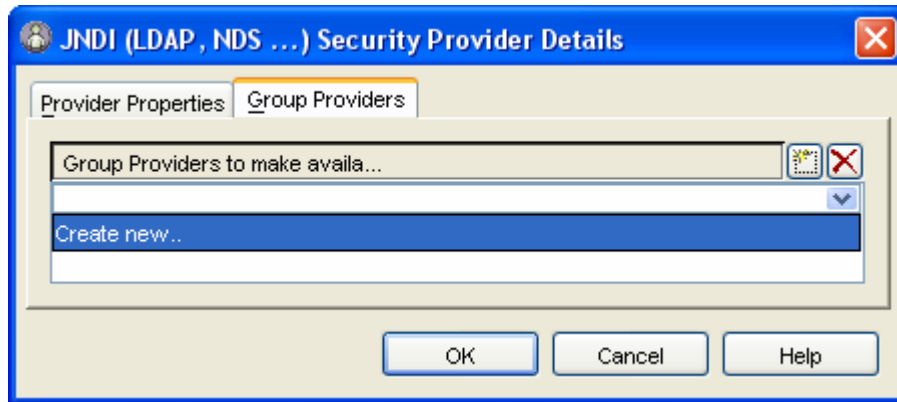



Figure 42: Group Providers Tab

- 11 Give the new Group Provider a name. Our Active Directory example uses the default values for the objectClass, Member Attribute, and Type properties, which are in the Group Properties table. Therefore, there is no need to modify the Group Properties table.

- 12 In the "Directory Entries to Search fo..." field, click the New Entry Icon  and enter a fully qualified LDAP URL to the ADServer Active Directory Server. This URL is the same as the URL we created in the Directory configuration field Provider URL.

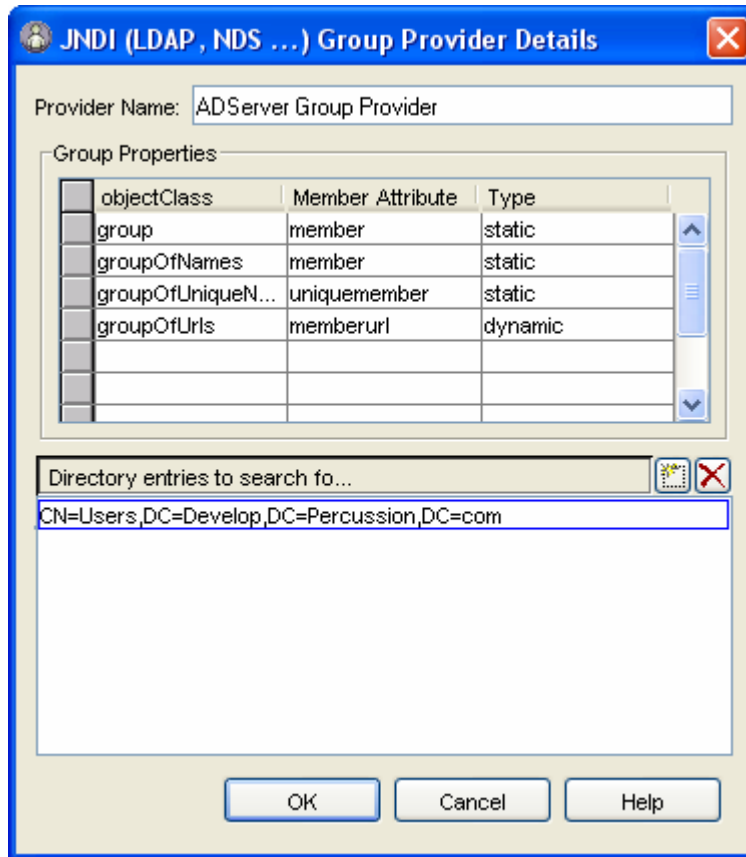


Figure 43: Group Provider Details Dialog

- 13 Click [OK] to save the Group Provider Registration.
 14 Click [OK] to save the Provider Properties Registration.
 15 Click [Apply] to register the new Security Provider.

Adding Users and Groups to Roles

Once you have registered the Security Provider, you can use it to catalog users and groups. This allows you to add individual users and entire groups to both Functional and Community Rhythmyx Roles.

- 1 Start the Server Administrator client and connect to the Rhythmyx server.
- 2 Select the Security tab.

3 Select the Roles tab.

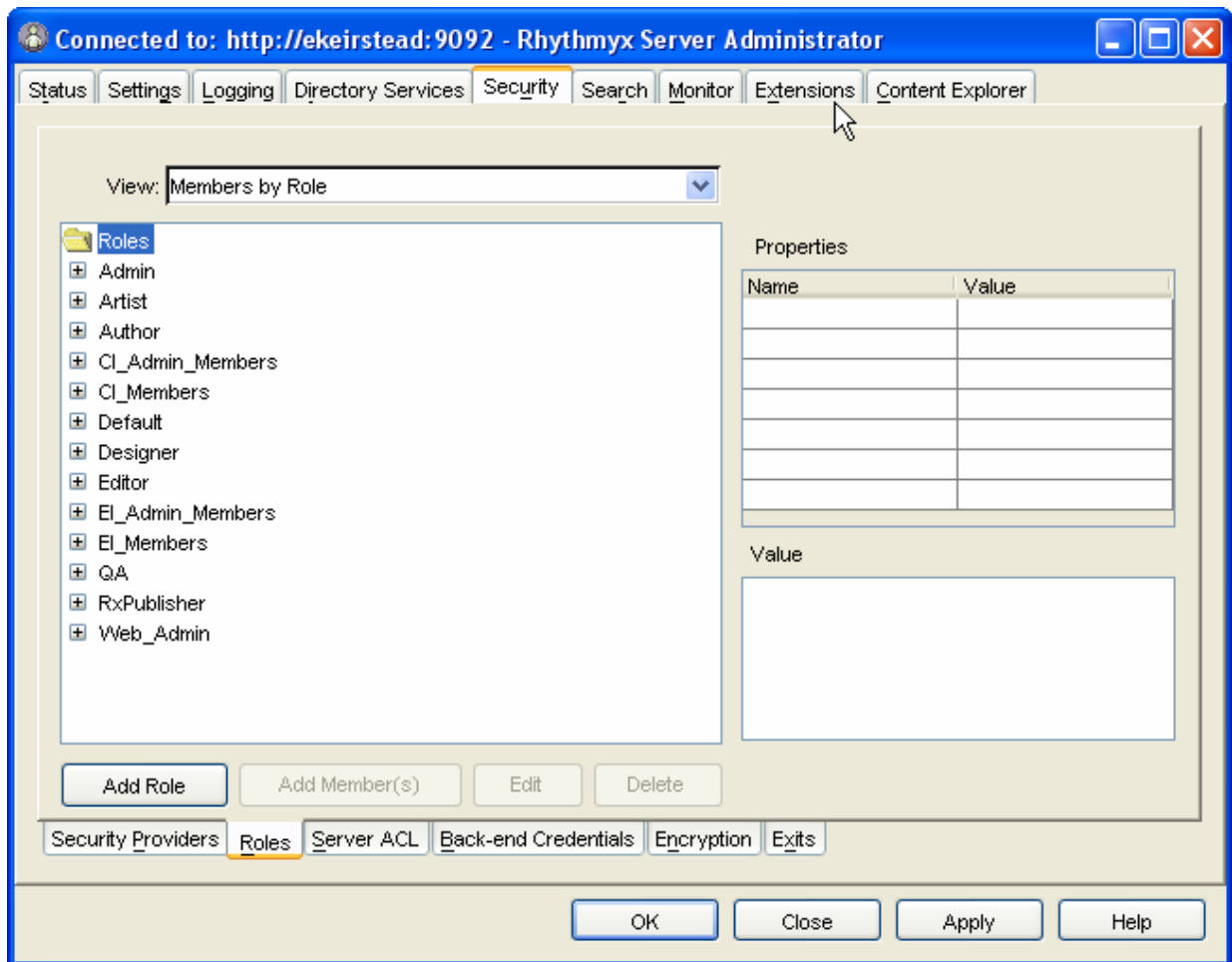


Figure 44: Roles Tab

NOTE: Our original goal was to make the Content Contributors Group a member of the Author Functional Role and Default Community Role. Additionally, the user Bobby Bluefin is to be made a member of the Admin Functional Role and Default Community Role.

- 4** Select the "Default" Community Role from the list under the Roles folder.
- 5** Click the [Add Member(s)] button. The "Modify member list for: Default" dialog appears.
- 6** Click the Provider field drop list arrow and choose our newly created ADServer Security Provider.
- 7** To limit our search to only Bobby Bluefin and the Content Contributors group, specify the following in the Filter field: %bbluefin%;CN=Content%.
- 8** Click Both in the Type field to return results for both users and groups.

- 9 Click the [Catalog] button. The result of the search should be our two required objects, the user Bobby Bluefin and the group Content Contributors.

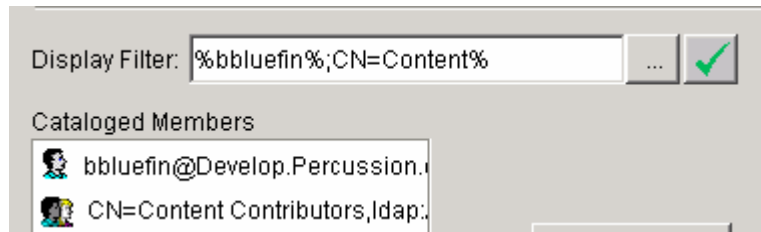


Figure 45: Result of Filtered Search on ADServer Directory Server

- 10 Select both cataloged members and click [Add] to add them to the Default Role.

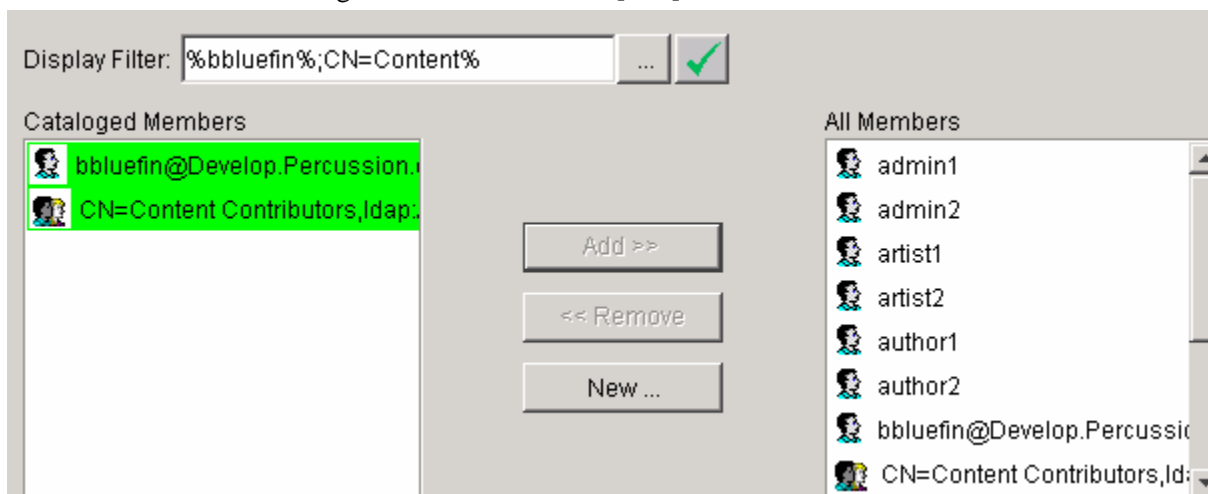


Figure 46: Cataloged Members Added to Default Role

- 11 Click [OK].
- 12 Back on the Roles tab, select the Admin Functional Role from the list under the Roles folder.
- 13 Click the [Add Member(s)] button. The "Modify member list for: Admin" dialog appears.
- 14 Click the Provider field drop list arrow and choose our newly created ADServer Security Provider.
- 15 Catalog the users.
- 16 Find and select the Bobby Bluefin user. Click the [Add] button to add Bobby Bluefin to the Admin Role.
- 17 Click [OK].
- 18 Back on the Roles tab, select the Author Functional Role from the list under the Roles folder.
- 19 Click the [Add Member(s)] button. The "Modify member list for: Author" dialog appears.
- 20 Click the Provider field drop list arrow and choose our newly created ADServer Security Provider.
- 21 Catalog the groups.

22 Find and select the Content Contributors group. Click the [Add] button to add Content Contributors to the Author Role.

23 Click [OK].

24 Click [Apply] to commit all registrations.

At this point, you should be able to log into the Rhythmyx Content Explorer as any of the members of the Content Contributors group (ttuna@develop.percussion.com, nneedlenose@develop.percussion.com) or as Bobby Bluefin (bbluefin@develop.percussion.com).

Example 2: Using LDAP as a Role Provider

In this example, our SunONE Directory server contains our users Bobby Bluefin, Nancy Needlenose, and Tiara Tuna. These users have a custom attribute identifier, `rhythmyxrole`, associated with their directory objects.

For Nancy and Tiara, the attribute values are Author and Default. Author describes their Functional Role in Rhythmyx while Default describes their Community Role. Bobby has the Admin Functional Role and the Default Community Role.

NOTE: Though we will not map these directory objects directly to Rhythmyx Roles, the attribute values used to define each user's Role must exist as defined Roles in Rhythmyx. Using LDAP as a Role Provider does not generate a list of Roles to be used in Rhythmyx; instead, defining LDAP as a Role Provider implies that user objects searched during a query contain attributes that correlate to existing Rhythmyx Roles. The attribute identifier used in this example, `rhythmyxrole`, is not unique and the name of this identifier is not important. What is key to this functionality is that "rhythmyxrole" is mapped to the Directory Set Required Attribute, `roleAttributeName`.

In the procedures in this example, we assume that the processes for configuring an Authentication, Directory, Directory Set, and Security Provider are understood. For details on these directory service configuration procedures, see *Implementing LDAP Directory Services*.

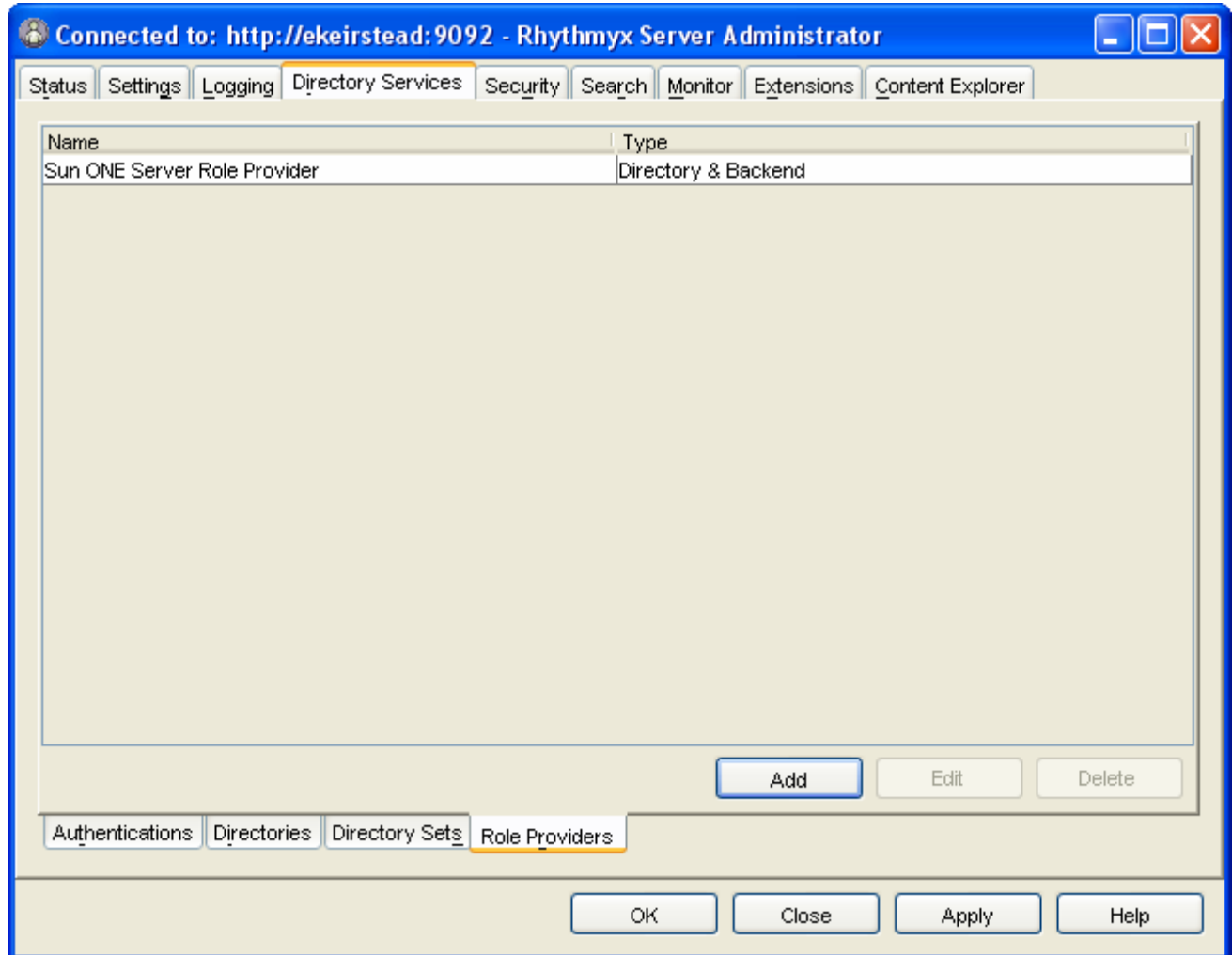


Figure 47: Role Providers Tab

NOTE: Since Active Directory does not give us an avenue for defining custom attribute identifiers, we will use our SunONE Directory server as our Role Provider in this example.

Defining Role Attributes in LDAP

The key to using LDAP as a Role Provider is that each user has a set of Roles (at least one Functional and one Community) associated with their user objects (or group objects). Our user objects in LDAP have the custom attribute identifier, `rhythmyxrole`, associated with them.

rhythmyxrole	Default
	Admin

Figure 48: *Rhythmyxrole Attribute*

Good practice tells us not to simply add the custom attribute to the existing object class, `person`. Instead, we created a new object class, `rhythmyxperson` with the allowed attribute, `rhythmyxrole`, and added this class to the list of attribute values for our user object.

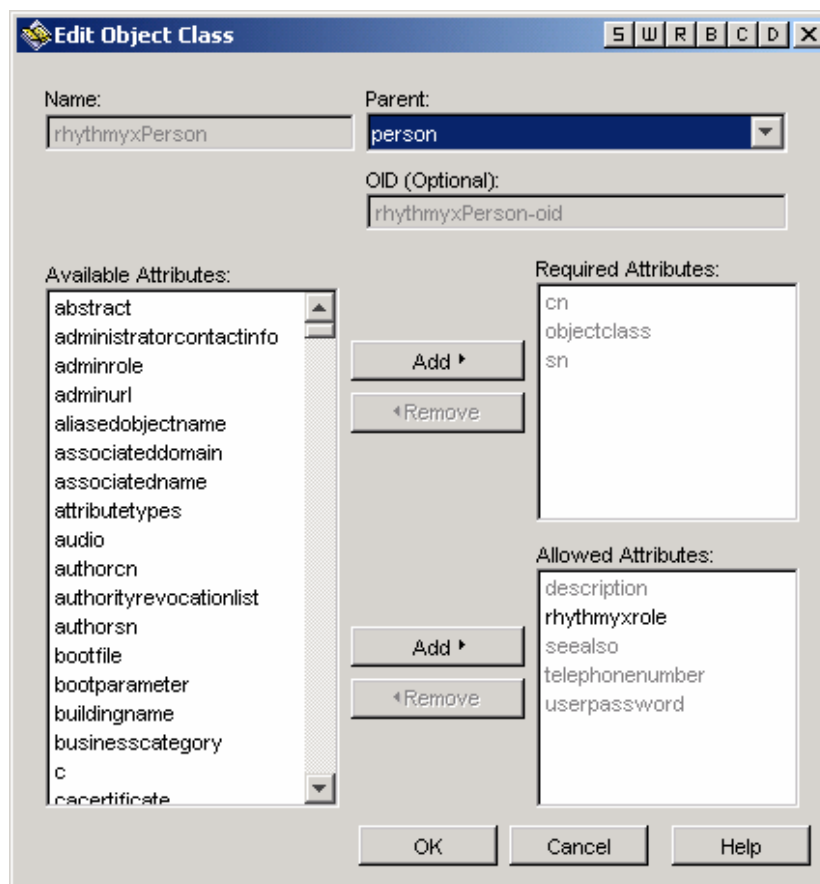


Figure 49: *rhythmyxPerson Object Class with rhythmyxrole Attribute*

Object class	top
	person
	organizationalPerson
	inetorgperson
	rhythmyxperson

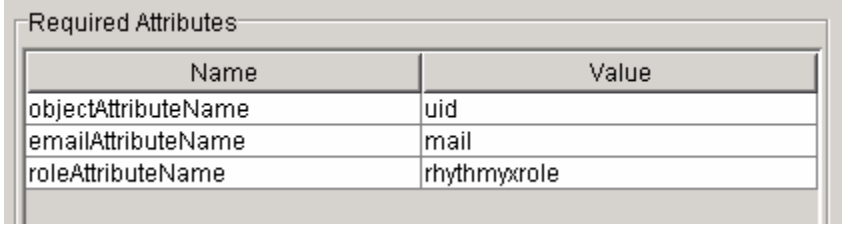
Figure 50: *rhythmyxperson Object Class Added to the User Object*

This, in turn, allowed our user object to inherit the attribute, `rhythmyxrole`. We then defined values for the `rhythmyxrole`. Each user was given a Functional and Community Role assignment.

Creating the Directory Server Connection

We begin by creating the Authentication, Directory, and Directory Set necessary for Rhythmyx to connect to the SunONE Directory Service.

- 1 Create the Authentication, SOServer Authentication.
 - Name - SOServer Authentication
 - Schema - Simple
 - User Name - Bobby Bluefin
 - Password - DeepSea
 - Append Base DN - Leave unchecked
 - User Attribute - CN
 - Password Filter - None
- 2 Create the Directory, SOServer Directory.
 - Name - SOServer Directory
 - Catalog - Deep
 - Factory - `com.sun.jndi.ldap.LdapCtxFactory`
 - Authentication - SOServer Authentication
 - Provider URL - `ldap://SOServer:389/ou=people,dc=percussion,dc=local`
- 3 Create the Directory Set, SOServer Directory Set.
 - Name - SOServer Directory Set
 - Directories - SOServer Directory
 - Required Attributes
 - `objectAttributeName` - `uid`
 - `emailAttributeName` - `mail`
 - `roleAttributeName` - `rhythmyxrole`



Required Attributes	
Name	Value
<code>objectAttributeName</code>	<code>uid</code>
<code>emailAttributeName</code>	<code>mail</code>
<code>roleAttributeName</code>	<code>rhythmyxrole</code>

Figure 51: Required Attributes Fields in the Directory Sets Dialog

The objectAttributeName value uid allows our users to log in with their uid as it is stored in the Directory. We have mapped the value mail to the emailAttributeName to allow Rhythmyx to send messages to users at their email address as it is stored in the Directory. The key to this activity, though, is the mapping of rhythmyxrole to roleName. rhythmyxrole matches the attribute identifier associated with each user object in the Directory. Once this is defined, an authenticated user has the rights associated with their rhythmyxrole Roles.

- 4 Once the Directory Set is created, you can create the Role Provider, SOServer Role Provider.
 - Name - SOServer Role Provider
 - Type - Directory
 - Directory Set - SOServer Directory Set

NOTE: By selecting Directory as the Role Provider Type, we are allowing only Roles in the Directory Set to be used for authorization.



Figure 52: Role Provider Editor

Creating the Directory Connection Security Provider

Once the Directory Set is created, you can create the Directory Connection Security Provider, where you can specify the Role Provider.

1. Create a new Directory Connection Security Provider, SOServer Directory Connection Security Provider.

- Name - SOServer Directory Connection Security Provider
- Directory Set - SOServer Directory Set
- Role Provider - SOServer Role Provider



Figure 53: JNDI Security Provider Details Dialog

NOTE: The Group Providers tab is left blank as we will not be doing any manual mapping of groups to Rhythmyx Roles.

Once the Role Provider configuration is complete, users should be able to log into Rhythmyx and be assigned their corresponding Roles.

Roles

A Role is a collection of users or groups of users. In Rhythmyx, Roles are used to manage access to specific applications and to manage access to content items in the Workflow.

Access to applications is granted based on the Roles to which a user belongs. Organizing users into Roles helps you manage users that have the same permissions. Instead of managing the permissions for each user, you define a Role and the permissions for it, then assign users to it. Users assigned to that Role have the permissions specified for that Role. When you assign a Role to the Access Control List of an application, the users in that Role have access to that application.

In Workflow, Roles determine which users have access to a content item and can act on it when it is in a particular State. Roles also determine which users are notified when a content item makes a Transition into or out of a State.

Each Role, and each Member in a Role, has a set of properties. Properties are defined by the administrator to provide additional options for customization. For example, a Role might have the property `sys_community`. The value of this property specifies the Community to which the members of the Role belong. Rhythmyx uses this property to implement the Communities feature, filtering the content to which the user has access, the tabs on the Content Explorer that the user can see, and the Content Types and Templates or Variants available to the user.

To maintain Roles, use the Roles tab of the Security tab in the System Administrator. Two views are available. You can view a list of Roles and the Members associated with each Role (Members by Role) or you can view a list of Members and the Roles associated with each Member (Roles by Member). Select the option you want from the **View** field.

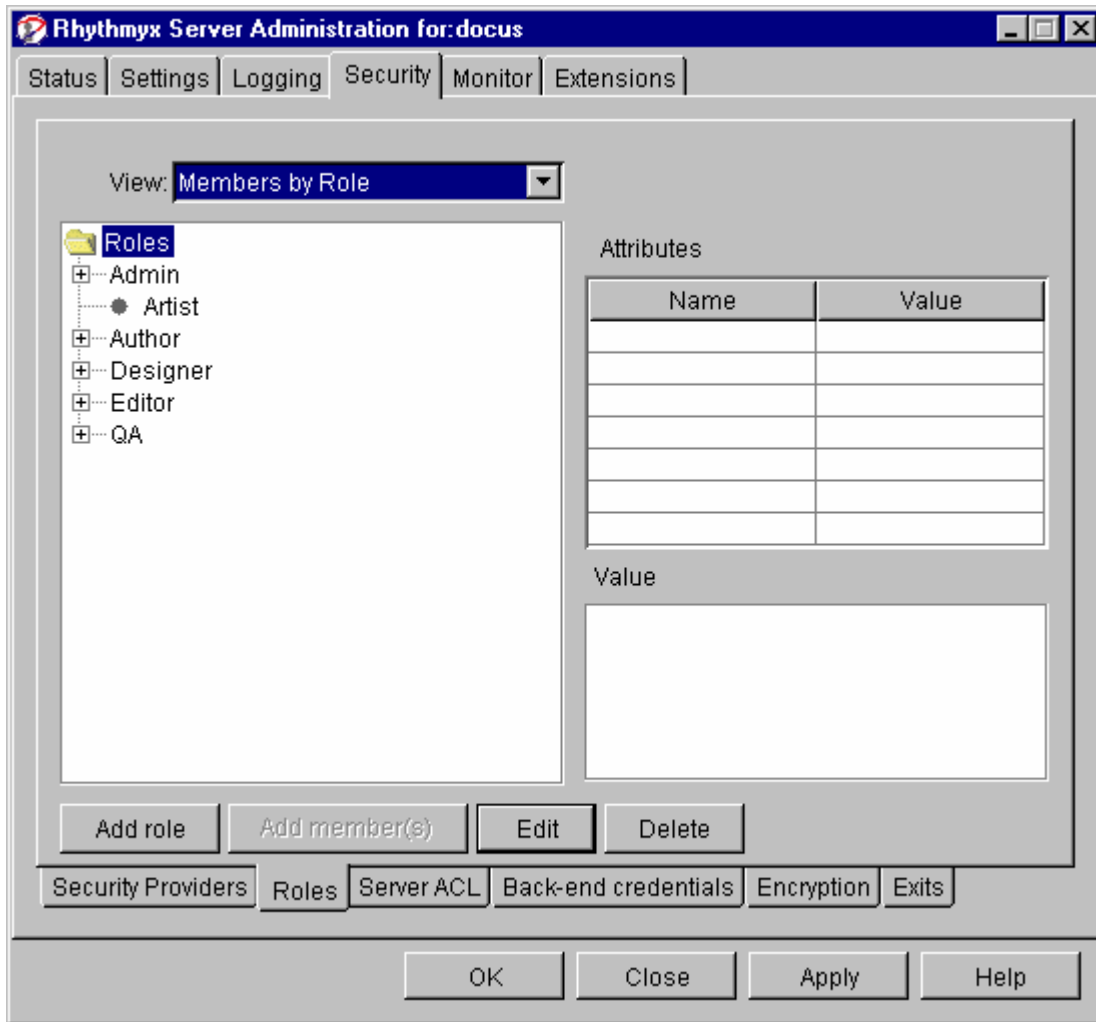


Figure 54: Edit Roles Tab in the Rhythmyx Server Administrator

Default Roles and Members

Rhythmyx is shipped with the following default Roles and Members:

- Admin
 - admin1
 - admin2

- rxserver (This is a special Member used in the Aging process. Rhythmyx uses this internal user to Transition a content item when the assigned user does not act on it within the time specified for the Transition. For more details, see "About Workflow Administrator" in the Help for the Workflow tab in Content Explorer.)
- Artist
 - artist1
 - artist2
- Author
 - author1
 - author2
- Designer
 - designer1
 - designer2
- Editor
 - editor1
 - editor2
- QA
 - qa1
 - qa2

Add/Edit Role Dialog

The New Role dialog and Edit Role dialog are identical, but the Name field is unavailable when the dialog is displayed as the Edit Role dialog. Users can edit the properties associated with the Role but not the name of the Role. To change the name of the Role, you must *delete the Role* (see "Deleting a Role" on page 115) and *add a new Role* with the new name.

To access the New Role dialog, click the Security tab of the Rhythmyx Server Administrator, then click Role tab. On the Role tab, click the [Add Role] button.

To access the Edit Role dialog, click the Security tab of the Rhythmyx Server Administrator, then click the Role tab. Select the Role whose properties you want to edit and click the [Edit] button.

The screenshot shows a Windows-style dialog box titled "New Role". At the top left is a small icon and the title "New Role", and at the top right is a red close button. Below the title bar is a text input field labeled "Name:". Underneath is a section titled "Properties" containing a table with two columns: "Name" and "Value". The table has five empty rows. Below the table is a text area labeled "Edit Value (enter multiple values one per line)" with a vertical scrollbar on the right. At the bottom of the dialog are three buttons: "OK", "Cancel", and "Help".

Figure 55: New Role Dialog

Field Descriptions

Name Mandatory on New Role dialog; read-only on Edit Role dialog. The name of the Role.

Properties Name Optional. *The name of the property* (see "Maintaining Role and Member Property Names and Values" on page 122).

Properties Value Read-only. The value of the property.

Edit Value - Free-form field to enter values for the selected property. Enter each separate value on a different line.

Adding a New Role

To add a New Role:

- 1 In the Rhythmyx Server Administrator, click the Security tab along the top, then the Roles tab along the bottom.
- 2 Click [**Add role**].
Rhythmyx displays the *Add Role dialog* (see "Add/Edit Role Dialog" on page 113).
- 3 Enter the Name of the new Role.
- 4 Add any Properties to the new Role. To add a property:
 - a) Click in an empty row under Name.
 - b) Rhythmyx displays a drop list of available properties.
 - c) Select the property you want to assign to the Role.
 - d) To add a value to the property, click in the same row under Value.
 - If values are pre-defined (see *Maintaining Role and Member Property Names and Values* (on page 122)), Rhythmyx will display the available properties in a drop list. Select the value you want to assign to the property.
 - If values are free-form, Rhythmyx will move your cursor to the Edit Value field, where you can enter the values. Enter each unique value on a separate line.
- 5 Click [**OK**] to save the new Role.

Editing a Role

You can edit a Role to change the properties associated with that Role.

To edit a Role:

- 1 In the Rhythmyx Server Administrator, click the Security tab along the top, then the Roles tab along the bottom.
- 2 Select the Role whose properties you want to edit.
- 3 Click the [**Edit**] button.
Rhythmyx displays the *Edit Role dialog* (see "Add/Edit Role Dialog" on page 113).
- 4 To add a property:
 - a) Click in an empty row under Name.
 - b) Rhythmyx displays a drop list of available properties.
 - c) Select the property you want to assign to the Role.
 - d) To add a value to the property, click in the same row under Value.

- If values are pre-defined (see *Maintaining Role and Member Property Names and Values* (on page 122)), Rhythmyx will display the available properties in a drop list. Select the value you want to assign to the property.
 - If values are free-form, Rhythmyx will move your cursor to the Edit Value field, where you can enter the values. Enter each unique value on a separate line.
- 5 To delete a property, right click on the property and select *Clear* from the popup menu.
 - 6 To change the value of an existing property, click in the same row under Value.
 - If values are pre-defined, Rhythmyx will display the available properties in a drop list. Select the value you want to assign to the property.
 - If properties are free-form, Rhythmyx will display the current value of the property in the **Edit Value** field, with the cursor at the end of the last value. You can add a new value on a new line or modify or delete an existing value.
 - 7 Click [OK] to save your changes.

Deleting a Role

When you delete a Role, you delete all Member associations with that Role.

To delete a Role:

- 1 In the Rhythmyx Server Administrator, click the Security tab along the top, then the Roles tab along the bottom.
- 2 In the **View** field, select Members by Role.
- 3 Select the Role you want to delete. You can select multiple Roles.
- 4 Click the [**Delete**] button.
- 5 Rhythmyx displays a confirmation message. Click [**Yes**] to confirm the delete action or [**No**] to abort the delete action.



Adding Existing Members to a Role

You can add members that already exist in a security provider to a Role. The Server Administrator includes a cataloging function that retrieves a list of users associated with a specified security provider.

To add Existing Members to a Role:

- 1 In the Rhythmyx Server Administrator, click the Security tab along the top, then the Roles tab along the bottom.
- 2 Select the Role to which you want to add Members.
- 3 Click [**Add Member(s)**].
Rhythmyx displays the Modify Member List for <Role> dialog.
- 4 Select the security **Provider** from which you want to select Members.

- 5 Choose the Type of Member you want to add. Options are *Users* (add individual Members), *Groups* (add groups of Members) or *Both* (add both individual Members and groups of Members). NOTE: Not all security providers support Groups. If the security provider you select does not support Groups, no Groups will be retrieved.
- 6 Enter an optional Filter. Use SQL syntax to define the values. Two wildcard characters are available: % matches 0 or more characters, while "_" matches any single character. (For example, to catalog the name admin1, you would enter *admin1*. This entry would return only admin1. If you wanted to catalog all names that begin admin, you would enter *admin%*. This entry would return *admin1*, *admin2*, etc. If you wanted to return all names that begin with "ad", you would enter *ad%*. This entry would return Adams, Adkins, admin1, admin2, etc. Similarly, if you entered *ols_n*, Rhythmyx would return Olsen, Olson, and Olsun.

Separate multiple search values with semicolons. You can also use the Catalog Filter Editor dialog to enter a filter:
 - a) Click the  button.
Rhythmyx displays the Catalog Filter Editor dialog.
 - b) Enter values. Each value should be entered on a separate line.
 - c) Click **[OK]** on the Catalog Filter Editor dialog.
- 7 Click the **[Catalog]** button.
- 8 Rhythmyx displays a list of Members that matches the parameters you defined. You can define a filter for this list in the Display Filter field. The same options are available for this field as for the catalog filter. Click the  button to activate the display filter.
- 9 Select the Members you want to add and click the **[Add>>]** button.
- 10 Click **[OK]** to save your edits.

Adding New Members to a Role

To add a new Member to a Role without Cataloging:

- 1 In the Rhythmyx Server Administrator, click the Security tab along the top, then the Roles tab along the bottom.
- 2 Select the Role to which you want to add Members.
- 3 Click **[Add member(s)]**.
Rhythmyx displays the Modify Member List for <Role> dialog.
- 4 On the Modify Member List for Role dialog, click the **[New]** button.
Rhythmyx displays the Member Properties dialog.
- 5 Enter the Name of the new Member.
- 6 Select a security Provider for the new Member.
- 7 Choose the Type of new Member. Options are **Users** (individual Member) or **Group** (group of Members).

- 8** Select the Properties you want to define. Options are *Global* (properties not associated with a specific Role) and *Role* (properties for a specific Role). If you select *Role*, you must select the Role for which you want to define properties. Options for the Role field are all Roles associated with the Member. Note that any Global property will override a property of the same name from the security provider.
- 9** To select a property, click in an empty row under Name and select a property from the drop list.
- 10** To add a value to a property, click in the same row under Value.
 - If values are pre-defined, Rhythmyx will display the available properties in a drop list. Select the value you want to assign to the property.
 - If values are free-form, Rhythmyx will move your cursor to the Edit Value field, where you can enter the values. Enter each unique value on a separate line.
- 11** Click [**OK**] to save the Member record.

Modify Member List for "Role" Dialog

Use the Modify Member List for <Role> dialog to *add new members to a Role*.

To access the Modify Member List for <Role> dialog, on the Roles tab of the Rhythmyx Server Administrator, select the Role whose Member list you want to modify and click [Add Members].

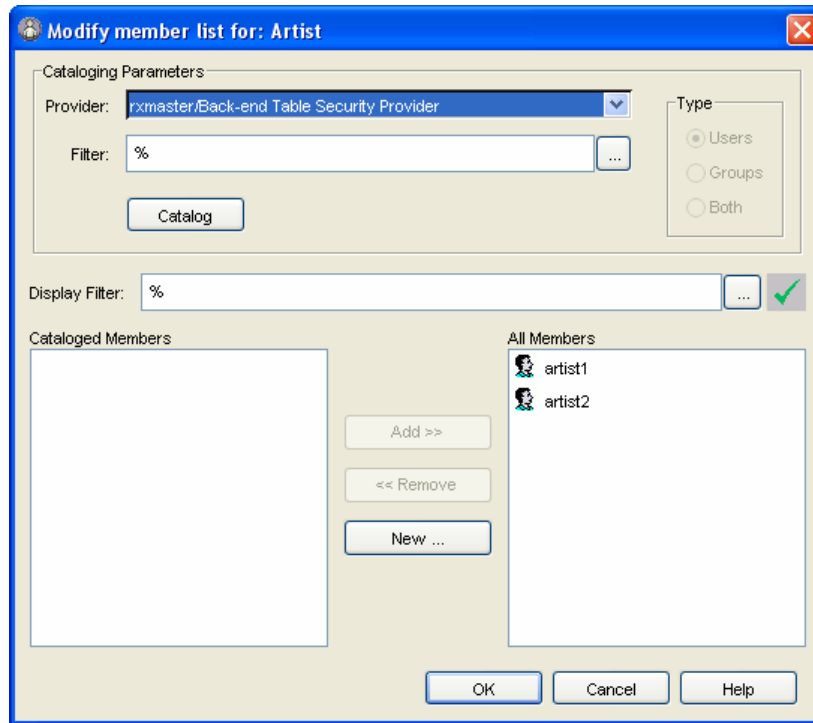

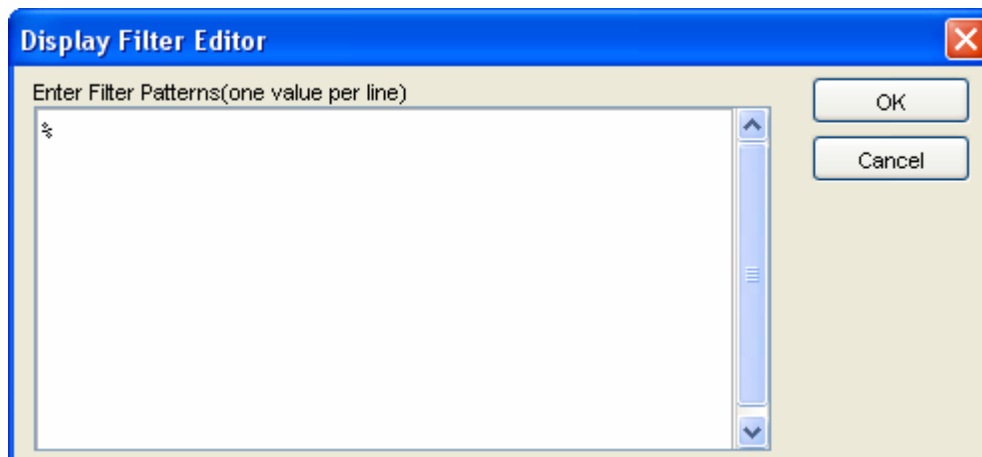


Figure 56: Modify Member List for <Role> Dialog

Field Descriptions

Provider - Drop list of registered security providers.

Filter - Optional. Use the  button to display the Catalog Filter Editor dialog:



where you can enter one or more characters to use to filter the return from the security provider.

Display Filter - Optional. This field functions in the same fashion as the Filter field, but filters only the cataloged Members displays.

Cataloged Members - List of Members returned from the security provider.

All Members - List of Members assigned to the Role.

New Member Dialog

Use the New Member dialog to *add a new Member to a Role without cataloging the Member from a security provider*. The Edit Member Properties dialog is a variation of this dialog.

To access the New Member dialog, click [New] on the *Modify Member List for <Role> dialog*.

Name	Value
sys_email	amyadmin@percussion.com

Figure 57: New Member Dialog

Field Descriptions

Member Name - Mandatory. The name of the Member you are adding to the Role.

Provider - Drop list. The security provider for the Member.

Type - Radio buttons. Indicates whether the new Member is a Group or an individual User.

View - Drop list. Specifies which properties you are viewing and editing. Options are Global (edit all Member properties) and Role (edit only properties associated with a specific Role).

Role - Drop list. Only available if the value of View is Role. The Role for which you are viewing and editing properties.

Name - The name of the property.

Value - The value of the property.

Edit Value - Free-form field to enter values for the selected property. Enter each separate value on a different line.

Role and Member Properties

Role and Member properties provide a generic mechanism for storing information about users that Rhythmyx can use for processing. Properties may be associated with a Role globally (Role Properties), with individual users (Member Properties), or with individual users only within a specific Role (Role Member Properties).

In general, Role and Member properties are used either to customize interfaces or to facilitate interactions between the end-user and the Rhythmyx server. An example of a Member Property used to facilitate interaction between the server and the end-user is the Notification feature of Workflow. The user's e-mail address is defined as a Member Property, and Rhythmyx sends Notifications to this address when a content item makes a Transition into a State to which the user's Role is assigned.

Editing a Member's Properties

To edit a Member's properties:

- 1 In the Rhythmyx Server Administrator, click the Security tab along the top, then the Roles tab along the bottom.
- 2 Select the Member whose record you want to edit.
- 3 Click the [Edit] button.
Rhythmyx displays the Edit Member Properties dialog (same as New Member dialog).
- 4 Select the **Properties** you want to View. Options are *Global* (view all properties) and *Role* (view properties associated with a specific Role). Note that any Global property will override a property of the same name from the security provider.
- 5 To delete a property, right click on the property and select *Clear* from the popup menu.
- 6 To change the value of an existing property, click in the same row under Value.
 - If values are pre-defined, Rhythmyx will display the available properties in a drop list. Select the value you want to assign to the property.
 - If values are free-form, Rhythmyx will display the current value of the property in the Edit Value field, with the cursor at the end of the last value. You can add a new value on a new line or modify or delete an existing value.
- 7 Click [OK].

Deleting a Member from a Role

To delete a Member from a Role:

- 1 In the Rhythmyx Server Administrator, click the Security tab along the top, then the Roles tab along the bottom.
- 2 You have two options to delete a Member from a single Role:
 - In the **View** field, select *Roles by Member*, expand the Role from which you want to delete the Member, and select the Member.
 - In the **View** field, select *Members by Role*, expand the Member you want to delete from a Role, and select the Role from which you want to delete the Member.
- 3 To delete a Member from all Roles, in the **View** field, select *Roles by Member*, then select the Member you want to delete.
- 4 Click the **[Delete]** button.
- 5 Rhythmyx displays a confirmation message. Click **[Yes]** to confirm the delete action or **[No]** to abort the delete action.

Maintaining Role and Member Property Names and Values

Names for Role and Member properties are stored in the PSX_ADMINLOOKUP table. Values may also be stored in this table if a specific set of values is defined for the property. Alternatively, administrators can specify a URL that generates valid values for the property. See PSX_ADMINLOOKUP table for details about how this information is stored.

Role and Member Properties Required by Rhythmyx Functions

Rhythmyx requires that you define role properties and member properties for some of its optional features. You can provide properties for the value in the PSX_ADMINLOOKUP table or the XML document referenced in the table.

Role or Subject Property	Property Name	Function
Role	sys_defaultCommunity	Stores the name of the role's default Community. Required when you are using the default Community feature.
Role	sys_defaulthomepageurl	Stores the fully qualified or relative URL of the first Rhythmyx page that appears after login for users who log in under this role. Required when you are using the default home page feature.
Subject	sys_email	Stores the email address of the login user. Required if you are using the email notifications feature.

CHAPTER 5

Search Configuration

Two search engines are available for Rhythmyx:

- The Rhythmyx full-text search engine is feature-rich search engine that can potentially search all content fields on your Content Items. This search engine is available by special license and requires additional installation steps.
- The database search engine is a light-weight search engine that uses query functionality embedded in the database system. This search engine cannot search fields that consist of large blocks of text, however.

Search Configuration is only available if you have installed the Rhythmyx full-text search engine. The properties on the Search tab of the Rhythmyx Server Administrator specify the search engine server used by the Rhythmyx server and details about search functionality.

Typically, the full-text search engine is installed on the same machine as the Rhythmyx master server. If you run multiple content hubs, you will need to enter a search configuration on each hub server to specify the location of the full-text search engine. You may also discover that you need to run the full-text search engine on a different machine than the Rhythmyx server either because running both servers on the same machine degrades the performance of one or both servers, or because the full-text search indices consume too much disk space. In that case, you will need to update the search configurations to specify the new location of the full-text search engine.

To maintain search configurations, on the Server Administrator, click the Search tab.

If you have not installed the full-text search engine, the Search configuration tab will only note that the search engine is not installed.

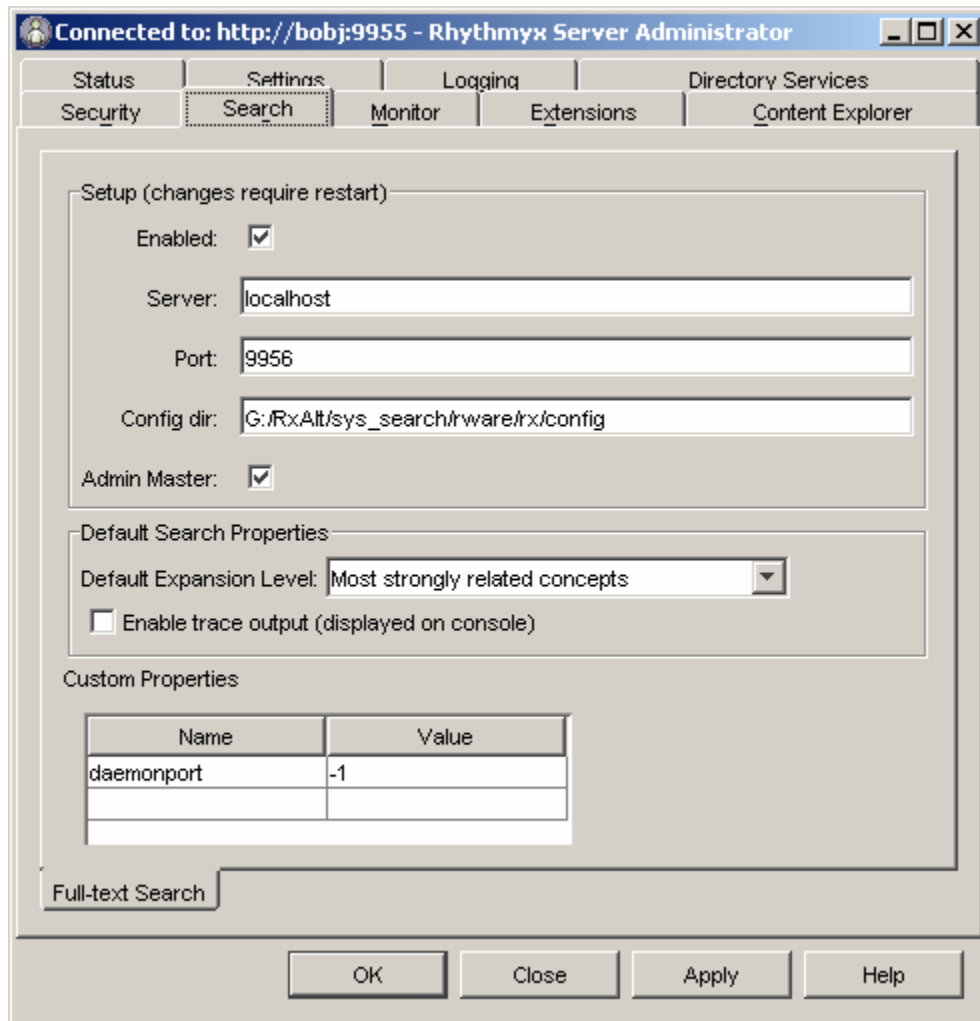


Figure 58: New Member Dialog

Search Tab Field Descriptions

Enabled Checkbox indicating whether the full-text search engine is enabled. The default is enabled. For details see *Disabling Full-text Search* (on page 136).

Server Specifies the machine on which the full-text search engine resides. Can use either the host name or IP address. Default value is *localhost*.

Port The port used by the full-text search engine.

Configuration Directory Specifies the directory where the full-text search indices and other configuration files reside on the host machine. The default value is `<Rhythmyxroot>/sys_search/rware70/rx`. If you specify a relative path, the path is relative to the Rhythmyx installation directory.

Admin Master Checkbox. Applicable only in environments with multiple content hubs. If checked, specifies the server as the master administrator server for the full-text search engine. Only one content hub should have this box checked. It should be unchecked for all other Rhythmyx servers. If multiple servers have this box checked, searches will return errors to business users.

Default Expansion Level Drop list. Specifies the default expansion level for concept searches. Business users can override this value when defining a new search request. Available values are (examples assume the user is searching on the word “catch”):

- Exact matches (Returns only Content Items that include the word “catch” or nearly identical variants, such as “catches”.)
- Simple variations (In addition to the previous option, also returns Content Items that include the word “caught”.)
- Most strongly related concepts (Default option; in addition to the previous option, also returns Content Items that include the word “catchable” and “catching”.)
- Strongly related concepts (In addition to the previous option, also returns Content Items that include words such as “bag” or “arrest”.)
- Weakly related concepts (In addition to the previous option, also returns Content Items that include words such as “capture”, “secure”, “seize”, or “nail”.)

Enable Trace Output Checkbox. When checked, the full-text search engine writes detailed debugging output to the Rhythmyx console.

Custom Properties Table of name/value pairs used when developing special customization of the search engine.

Deployment Options for the Full-text Search Engine and Indices

The Rhythmyx full-text search engine is typically installed on the same machine as the Rhythmyx server. However, you may want to install the search engine on a different machine if the demands of running both servers on the same machine degrades the performance of either (or both). You can choose to move both the search engine and search indices to a different machine, or move either independently.

Note that if you deploy the search engine server or indices (or both) to a separate machine, you must share or export the directory where the full-text search indices reside and map or mount this directory on the machine where the Rhythmyx server resides. The following topics discuss deployment options for the full-text search engine and indices.

Note that a prerequisite for all installations is copying the full-text search installer from the Rhythmyx CD-ROM to your local machine.

New Install (Both Servers on the Same Machine)

No special preparation is necessary for this installation. Install normally and accept the defaults.

New Install (Full-text Search Engine on a Different Machine)

Before installing, create the directories where you want to install the Rhythmyx server and the full-text search engine on their respective machines. Share (Windows)/export (Unix) the directory where the full-text search engine will reside, and map (Windows)/mount (Unix) it on the Rhythmyx server machine.

You should also determine which ports you will use for the search service or daemon on the remote machine. The search engine process uses three ports, which are generally numbered sequentially. The first port is the port on which the search engine will listen for search and index requests. The second port is used internally by the search engine. The third port is the port on which the search engine service or daemon listens for requests to initiate from the Rhythmyx server. The default value for the first port is the port of the Rhythmyx server plus 1 (9993 when using the default Rhythmyx port).

Installing the full-text search engine on a different machine from the Rhythmyx server is a two step process. In one step, you will install the Rhythmyx server to its target machine. In the other step, you will install the search engine to its machine. The order of installation does not necessarily matter, but you will not be able to start the Rhythmyx server until the remote search engine is installed and running.

When installing the Rhythmyx server:

- On the Select Products to Install dialog, check the Full Text Search checkbox. You must check this box to enable the server to recognize that full-text search is available, even if it is installed on a remote machine. The install wizard will also display the Full Text Search Settings dialog, allowing you to define the initial search configuration.
- When you reach the Rhythmyx Full Text Search Settings of the installation wizard:

- in the Full Text Search Engine host name field, enter the name of the machine where you want to install the full-text search engine. (NOTE: You must enter the name of the remote host. Convera's licensing will not allow you to use an IP address.)
- in the Full Text Search Engine Install Location field, enter the directory where you want to install the full-text search engine (for example: T:\RhythmyxFTS\sys_search. Note that this path must be a fully-qualified path, and must end with the sys_search directory. If you use a relative path, the installer will install the full-text search engine to the Rhythmyx installation directory. If the path does not end with the sys_search directory, the Rhythmyx server will not be correctly configured to find the remote search engine.
- enter the Search and Index Port Number. The default port number is your Rhythmyx port plus 1 (9993 if you use the default Rhythmyx port).
- DO NOT start the Rhythmyx server until you have completed the sthe installation of the remote search engine.

To install the full-text search engine, run the standard Rhythmyx installer (not the Publisher or Content Connector only installers):

- On the Installation Directory dialog, specify the directory you created and shared.
- On the Select a Product to Install dialog, deselect all options EXCEPT Full Text Search Engine.
- On the Rhythmyx Full Text Search Settings dialog:
 - Enter the Full Text Search Engine host name of the machine on which you are installing the full-text search engine. (NOTE: You must use the name of the host. Convera's licensing will not allow you to use the IP address or "localhost" as the host name.)
 - Enter the directory into which you want to install the search engine in the Full Text Search Target Install Location field. This directory should be mapped (Windows) or mounted (Unix) on the machine on which the Rhythmyx server will be installed.
 - The Search and index port number defaults to 9993; if you want to use a different value, enter it here.

When this installation is complete, start the full-text search engine service/daemon. Once the full-text search engine service/daemon is running, start the Rhythmyx server.

Troubleshooting New Installs of Rhythmyx with the Full Text Search Engine on a Different Machine

Problem: The Rhythmyx server fails with the following message:

```
Server          7/7/04 2:55 PM: A non-recoverable error has been
encountered. The server is shutting down.
Server          7/7/04 2:55 PM: An unexpected error was encountered.
com.percussion.search.PSSearchException: Connection to remote process
manager at 'SEARCHSERVER:9995' failed: Connection refused: connect
```

Solution: Confirm that the remote search engine process manager daemon has been started. When the remote search engine process manager daemon has been started, you should see a console or DOS window with the following message: `Rhythmyx Process Daemon is listening on port 9995`. When you initially install the remote search engine, you must start it manually. After that, it should start automatically whenever you reboot the machine.

Confirm that your port configurations are correct on the Rhythmyx server. In the Rhythmyx configuration XML file (`<Rhythmyxroot>\rxconfig\Server\config.xml`), check the `PSXSearchConfig` node. The value of the `serverPort` attribute of this node should match the value of the `procenv.PORT` property in `<searchengineroot>\rxconfig\server\procdaemon.properties`. The value of the `<Property>` child node with the `name=daemonport` attribute should match the value of the `port` property in `<searchengineroot>\rxconfig\server\procdaemon.properties` (this property is preceded by the comment “Port on which the daemon listens”).

Check the DNS cache for multiple entries of the machine on which the remote search engine process manager is running.

Problem: The Full-text search engine process will not start on the remote machine.

Solution: Confirm that you did not use an IP address or the value “localhost” (or any variation on that value) as the host name for the search engine on the remote machine. The licensing of the full-text search engine will not allow the use of these values. Only a valid host name will work. Check the following files for incorrect values:

```
<searchengineroot>\sys_search\rware\admin\exec.cfg (the value of
procenv.HOST should be a valid host name, not an IP address or “localhost”).
```

```
<searchengineroot>\rxconfig\Server\procdaemon.properties (the value of
procenv.HOST should be a valid host name, not an IP address or “localhost”).
```

Moving the Full-text Search Engine to a Different Machine

(NOTE: This implementation of the remote search engine does not currently work; a new implementation of the remote search engine is being developed.)

After running your production CMS for some time, you may decide that the performance of your system is not acceptable with both the Rhythmyx server and the full-text search engine on the same machine. To remedy this problem, move the full-text search engine to a different machine. To move the full-text search engine:

- 1 On the machine where you intend to run the full-text search engine, create the directory where you intend to install the search engine. Share (Windows)/export (Unix) this directory.
- 2 On the machine where the Rhythmyx server resides, map/mount the directory where the full-text search engine will be installed.
- 3 In the Rhythmyx Server Administrator, modify the search configuration. The **Server** field must specify the host name of the machine where the full-text search engine will be installed (NOTE: the full-text search engine license requires the use of a host name in this field; you cannot use an IP address). The **Port** field must specify the port the full-text search engine will use. In the **Configuration Directory** field, specify the mapped/mounted directory.

- 4 If you are going to use a different daemonport on the remote machine than you use on the Rhythmyx server, in the Custom Parameters table, change the value of the `daemonport` parameter to match the port you intend to use. The default value of this parameter is `Rhythmyxport + 3` (in other words, if your Rhythmyx port is the default, 9992, the value of this property would be 9995.)
- 5 Shut down the Rhythmyx server.
- 6 Install the full-text search engine on the remote machine into the directory you created in Step 1.
- 7 On the Rhythmyx Full Text Search Settings dialog of the installer, the value of the Search and index port number field defaults to 9993 (The default Rhythmyx port +1). If you want to use a different port, change this value.
- 8 Move the `sys_search/rware/rx` directory of your Rhythmyx server installation to the installation directory of the full-text search engine on the new machine.
- 9 On the new machine, open the file `<rxsearchroot>\sys_search\rware\rx\config\exec.cfg`. Change the value of the `HOST` parameter to match the name of the new machine. Change the value of the `-execd_host` parameter to specify the name of the new machine and search daemon port, in the format `machinename:portnumber`; for example: `Hera:9993`. Note that you must use a valid machine name for these parameters. The full-text search engine licensing does not permit the use of IP addresses or any variation on "localhost".
- 10 Start the service/daemon of the full-text search engine on the remote machine.
- 11 Restart the Rhythmyx server.

Troubleshooting Rhythmyx after Porting the Search Engine to a Different Machine

Problem: The Rhythmyx server fails with the following message:

```
Server          7/7/04 2:55 PM: A non-recoverable error has been
encountered. The server is shutting down.
Server          7/7/04 2:55 PM: An unexpected error was encountered.
: com.percussion.search.PSSearchException: Connection to remote process
manager at 'SEARCHSERVER:9995' failed: Connection refused: connect
```

Solution: Confirm that the remote search engine process manager daemon has been started. When the remote search engine process manager daemon has been started, you should see a console or DOS window with the following message: Rhythmyx Process Daemon is listening on port 9995. When you initially install the remote search engine, you must start it manually. After that, it should start automatically whenever you reboot the machine.

Confirm that your port configurations are correct on the Rhythmyx server. In the Rhythmyx configuration XML file (`<Rhythmyxroot>\rxconfig\Server\config.xml`), check the `PSXSearchConfig` node. The value of the `serverPort` attribute of this node should match the value of the `procenv.PORT` property in `<searchengineroot>\rxconfig\server\procdaemon.properties`. The value of the `<Property>` child node with the `name=daemonport` attribute should match the value of the `port` property in `<searchengineroot>\rxconfig\server\procdaemon.properties` (this property is preceded by the comment "Port on which the daemon listens").

Check the DNS cache for multiple entries of the machine on which the remote search engine process manager is running.

Problem: The Full-text search engine process will not start on the remote machine.

Solution: Confirm that you have updated the file `<rxsearchroot>\sys_search\rware\rx\config\exec.cfg`. The value of the `HOST` parameter must be the name of the machine on which the search engine resides. The value of the `-execd_host` parameter must specify the name of the machine on which the search engine resides and the search daemon port. Note that for both parameters, you must use a valid machine name. The full-text search engine license does not permit the use of IP addresses or any variation on "localhost".

Moving the Full-text Search Indices to a Different Machine

NOTE: The current implementation of remote search indices does not work correctly. A new implementation is being developed.

As you add more content to your system, you may find that the full-text search indices consume an unacceptable amount of space on the disks when the full-text search engine is installed locally with the Rhythmyx server. To alleviate this problem, you can move the indices to another machine. To move the full-text search indices:

- 1 Shut down the Rhythmyx server.
- 2 Move the `/sys_search/rware/rx/indexes` directory to the new location.
- 3 Share/export the new directory and map/mount it on the Rhythmyx server machine.
- 4 Edit the file `/sys_search/rware/rx/config/rware.cfg`. In each `INDEXES` block, change the value of the `DIRECTORY` entry to point to the new location. For example, the default entry of the `DIRECTORY` entry when you install the full-text search engine locally with the Rhythmyx server is:

```
DIRECTORY "${WORKING_DIR}\indexes\ce9";
```

To specify a new directory, you must specify the fully-qualified path to the new location. For example, if you have mapped the remote directory to the R: drive in a Windows environment, and the indices were in a directory called FTS on that drive, your new `DIRECTORY` entry would be:

```
DIRECTORY "${WORKING_DIR}R:\FTS\indexes\ce9";
```

- 5** Restart the Rhythmyx server.

Compacting Search Indices

As users add Content Items to the Repository and they are indexed, word references become scattered through the search indices. Scattered words slow down searches because the search engine must check through more of the search indices to find references to the words in the search query. To alleviate this problem, you need to compact your search indices.

NOTE: Compacting the search indices can be a time-consuming process, and requires that the Rhythmyx server be shut down. You should schedule it during a time when server usage is low.

Before beginning this procedure, you will want a list of the libraries where the indices you want to compact are stored. The libraries are stored in the <Rhythmyxroot>/sys_search/rware/rx/Indexes directory. Each subdirectory of this directory contains one library. You will want to make a list of the names of these subdirectories; you will need the name as part of the compact command.

To compact the search indices:

- 1 Create a temporary directory to store compacted indices.
- 2 Shut down the Rhythmyx server.
- 3 Open a console or command prompt, and change directories to the <Rhythmyxroot>/sys_search/rware/bin directory.
- 4 For each library, execute the following command:

```
indexdmp ..\rx\config\rware.cfg libname tmpdir -temp -reformat -time\
```

where `libname` is the name of the library you want to compact (All libraries have a name of the form `ceNNN[;MMM]`)

where `NNN` is the numeric ID of the Content type indexed by the library, and `MMM` occurs for each child Content Editor if that Content Type and is the unique mapper ID of the child;

and where `tmpdir` is the path to the temporary directory you created in Step 1.

For example, if you had a Content Editor with the ID 301, that included two child Editors, one with a mapper ID of 57, and the other with a mapper ID of 85, you would enter the command:

```
indexdmp ..\rx\config\rware.cfg ce301;57;85 c:\Rhythmyx\Temp -temp -reformat -time\
```

This command will create the following files in the temporary directory:

- perm.dat
- ref.dat
- word.dat

- 5** When all of the files have been created in the temporary directory, copy these files to the library directory for the Content Type whose search indices you compacted. Using the previous example, you would copy the files to the directory `<Rhythmyxroot>/sys_search/rware/rx/Indexes/ce301`. Do not modify any of the other files in the library directory. Once you have completed the copy, delete the files from the temporary directory.
- 6** Repeat Steps 4 and 5 for each library in your system you want to compact.
- 7** When you have finished compacting the libraries, restart the Rhythmyx server.

Configuring Server Restart After Search Engine Reconfiguration

A delay can be configured between the reconfiguration of the search engine and the start of the Rhythmyx server. This delay ensures modified configurations are available to all processes. Events that trigger this delay include:

- restarting the Rhythmyx server;
- saving modifications to a Content Editor in the Workbench;
- deploying a Multi-server Manager package.

The length of this delay is defined by the configuration parameter `propagation_delay`, which defines the length of the delay in milliseconds. The default value of this parameter is 5000. This value is tuned to the minimum recommended hardware infrastructure for Rhythmyx. If you are running your Rhythmyx server on hardware substantially more powerful than the recommended minimum, you may want to reduce the length of the delay (for example, to 3000 milliseconds. On stable systems, where you do not expect to modify existing Content Editors or to deploy new Content Editors (such as a production Rhythmyx server), you may want to reduce this parameter to 0. If you choose to run Rhythmyx on hardware less capable than the recommended minimums, you may want to increase the delay (for example to 10000 milliseconds).

To change the value of the `propagation_delay` parameter, click the Search tab of the Rhythmyx server administrator, in the Custom Parameters table, add the custom parameter `propagation_delay` to an empty row in the Name column. Enter the value you want to use for this parameter in the Value column.

You must restart the server for the new value of the property to take effect.

Maintaining Stop Words

Stop words are short words that generally serve mechanical purposes in language rather than conveying meaning. Hence, stop words are generally not included in indexes or searches.

The list of stop words is maintained in an ASCII file for each language you have installed. The standard stop word list for English is

`<Rhythmyxroot>\sys_search\rware\resource\rw_english\english.slx`. You can add new stop words to this file or delete stop words from it. If you modify this file, you should re-index all Content Types to ensure that the search indices use the latest changes.

Disabling Full-text Search

If you have installed the full-text search engine, you can disable it.

To disable the full-text search engine, uncheck the Enabled checkbox on the Full-text Search tab of the Search tab in the Server Administrator.

Disabling the full-text search engine is intended as a temporary measure on development servers only. It is not intended to be used on production servers. Nor is it intended to facilitate a permanent conversion from the full-text search engine to the light-weight database search engine.

When you disable the full-text search engine, any pre-defined searches you have configured in the View/Search Editor in the Rhythmyx Workbench will be unavailable for modification. In the Content Explorer, these searches will still function, but they will use the light-weight database search engine functionality rather than the full-text search functionality.

Any existing user-defined saved searches in Content Explorer that were created using the full-text search engine that are saved again while it is disabled will be converted to use the light-weight database search engine. They cannot be converted back to use the full-text search engine. If you convert a saved search accidentally while the full-text search engine is disabled, you will have to recreate it after enabling the full text search engine.

Configuring Maximum Search Results Returned

Some very general search queries can return large numbers of search results (on the order of thousands of Content Items). Such large numbers can cause Content Explorer to fail. To avoid this problem, configure the maximum search results for your system.

The maximum search results is controlled by the `maxSearchResults` attribute of the `PSXSearchConfig` node of the server configuration XML file (`<rhythmyxroot>/rxconfig.server.config.xml`). The default value for this parameter is `-1`, which returns all results. If you change this value to a positive integer, you restrict the maximum search results to that value. For example, if you change the value of the `maxSearchResults` parameter to `200`, Rhythmyx will return no more than 200 Content Items as the results for a search. If a user configures a maximum result higher than the value of the `maxSearchResults` attribute, Rhythmyx ignores the user-defined value and uses the value defined on the server. Using the previous example, if a user attempted to configure a Maximum Result of 300, Rhythmyx would ignore that value and return only the 200 result defined in the server.

If you configure a value for the `maxSearchResults` parameter, Rhythmyx notes the allowable range for any interface in which the user can configure maximum search results. Using the example above, the search dialog in Content Explorer would resemble the following screenshot:

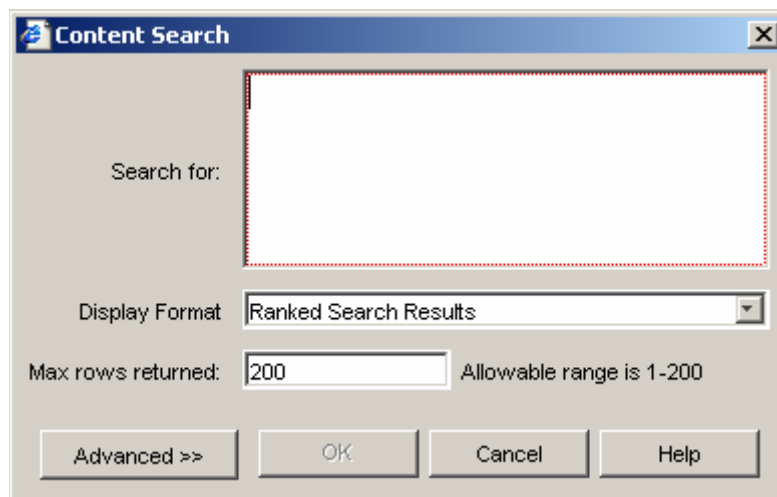


Figure 59: Content Explorer Search Dialog Showing Allowable Results Range

Note the text "Allowable range is 1-200" next to the **Max rows returned** field.

The same text is also added to the Search Query tab of the View and Search Editor in the Workbench:

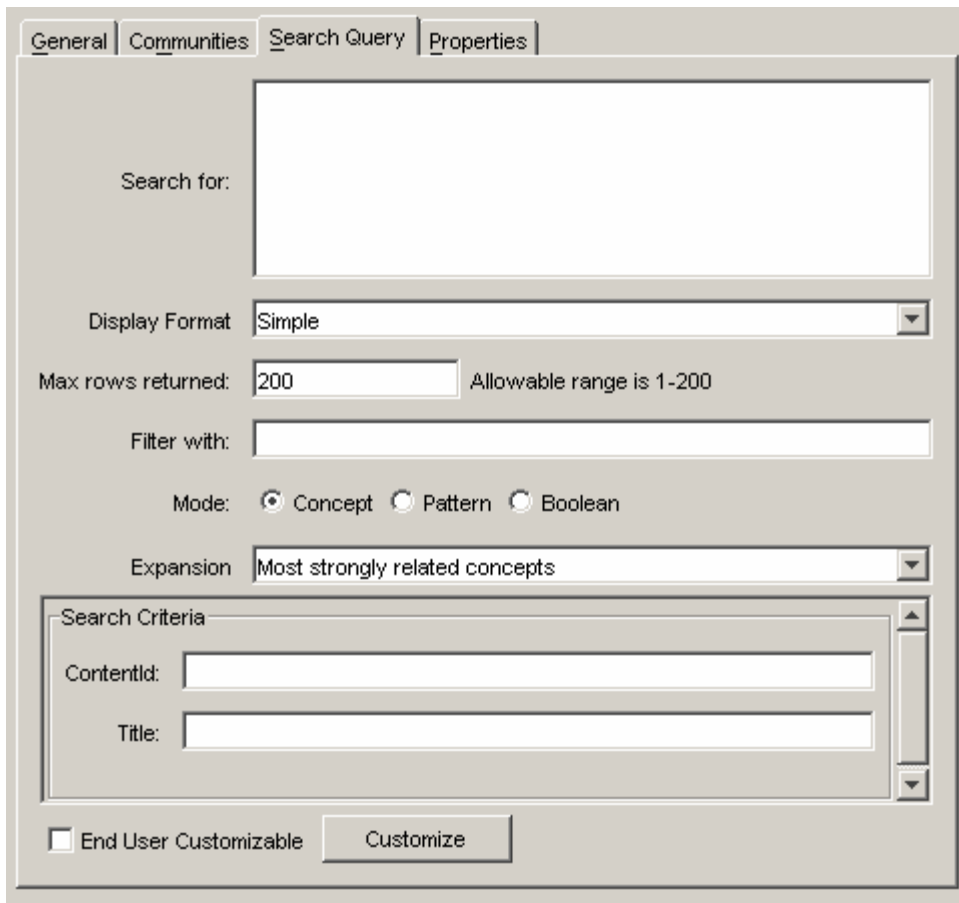


Figure 60: Search Query Tab in View and Search Editor Illustrating the Allowable Range Text

Full-text Search in Globalized Environments

The Convera Full-text Search Engine shipped with Rhythmyx includes only the search libraries for the default Locale, en-us. If your implementation includes other Locales, the Full-text Search engine requires additional search libraries for those Locales to index and return results for those Locales.

If your search engine does not include the search libraries required for a specific Locale, the first time you add a Content Item to that Locale, Rhythmyx will return an error similar to the following (which assumes the additional Locale fr-ca):

```
fr-ca not supported, using default of en-us
```

Rhythmyx returns this error in the server window, and in the server log.

Additional search libraries are available from Percussion Software. Contact your Percussion Software Sales Representative for details about obtaining these additional libraries.

If a user enters text in an unsupported Locale, the full-text search engine indexes it in the default Locale, en-us. Thus, if a user enters French text that include the word *chat* (cat), for example, this word would be expanded according to the English meaning of the string, resulting in matches such as "talk" or "converse".

CHAPTER 6

System Management and Recovery

This chapter describes the deployment and maintenance of the Rhythmyx CMS.

The first section describes the various deployment configurations of the physical components of the Rhythmyx Content Management System.

The second section describes how to set up source control and backups of the system.

The third section describes how to setup failover servers.

Physical Architecture of Rhythmyx

A Rhythmyx Content Management System is comprised of three major components:

- the Rhythmyx server
- the Repository database
- the Web server.

Note that the database and Web server are third-party products not provided by Percussion Software.

These physical components can be deployed in several different configurations, with various options for communicating between the Rhythmyx server and the other components.

All Physical Components Local

The simplest physical configuration of Rhythmyx is to install all components on the same machine:

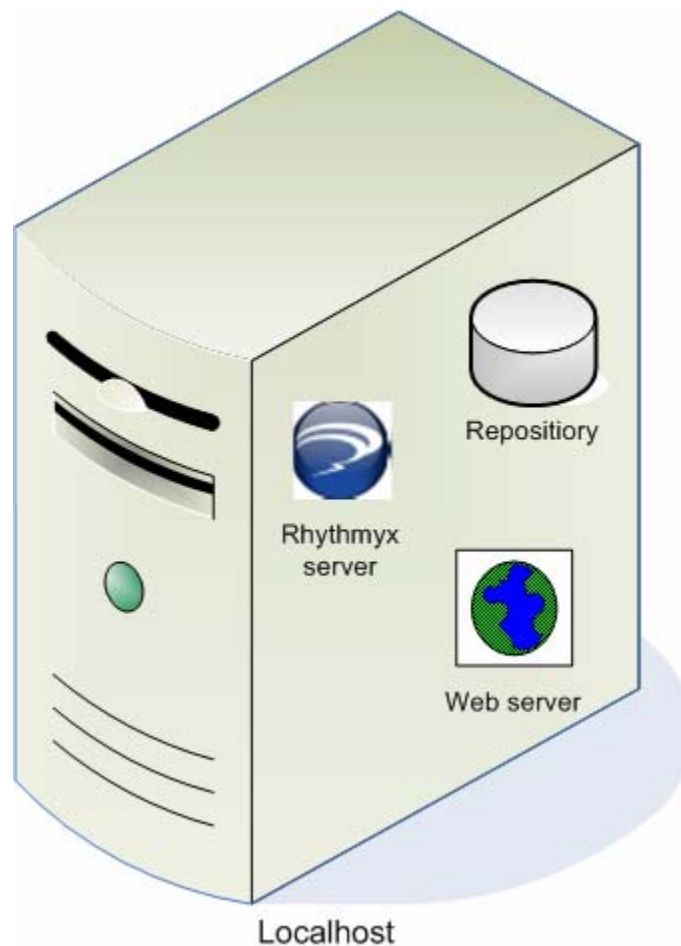


Figure 61: Rhythmyx Content Management System with all physical components installed locally

Rhythmyx Server with Local Repository, Remote Web Server Using FTP Publishing

In this configuration, the RDBMS for the Rhythmyx Repository is installed on the same machine as the Rhythmyx server. The Web server is hosted in a remote machine. Rhythmyx uses FTP to transfer the published content to the Web server.

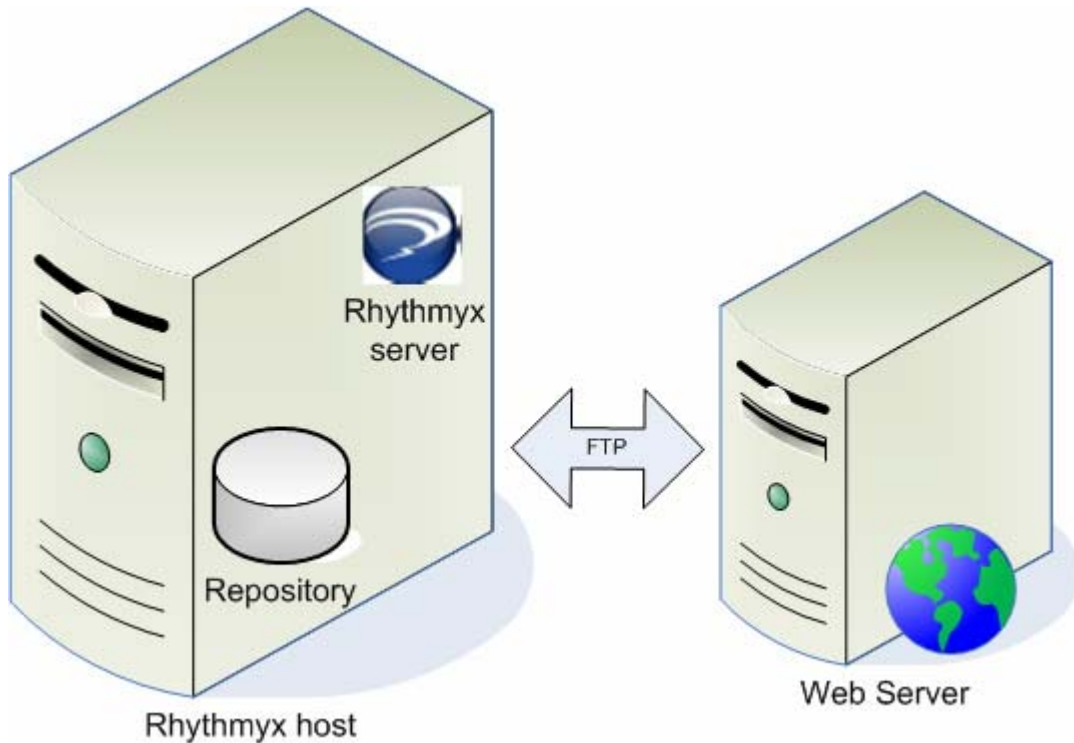


Figure 62: Rhythmyx server with local Repository and remote Web server using FTP publishing

Rhythmyx Server with Local Repository, Remote Web Server with Remote Publisher

In this configuration, the RDBMS for the Rhythmyx Repository is installed on the same machine as the Rhythmyx server. The Web server is hosted on a remote machine. A remote Publisher is installed on the same machine as the Web server and is used to publish the content to the Web server.

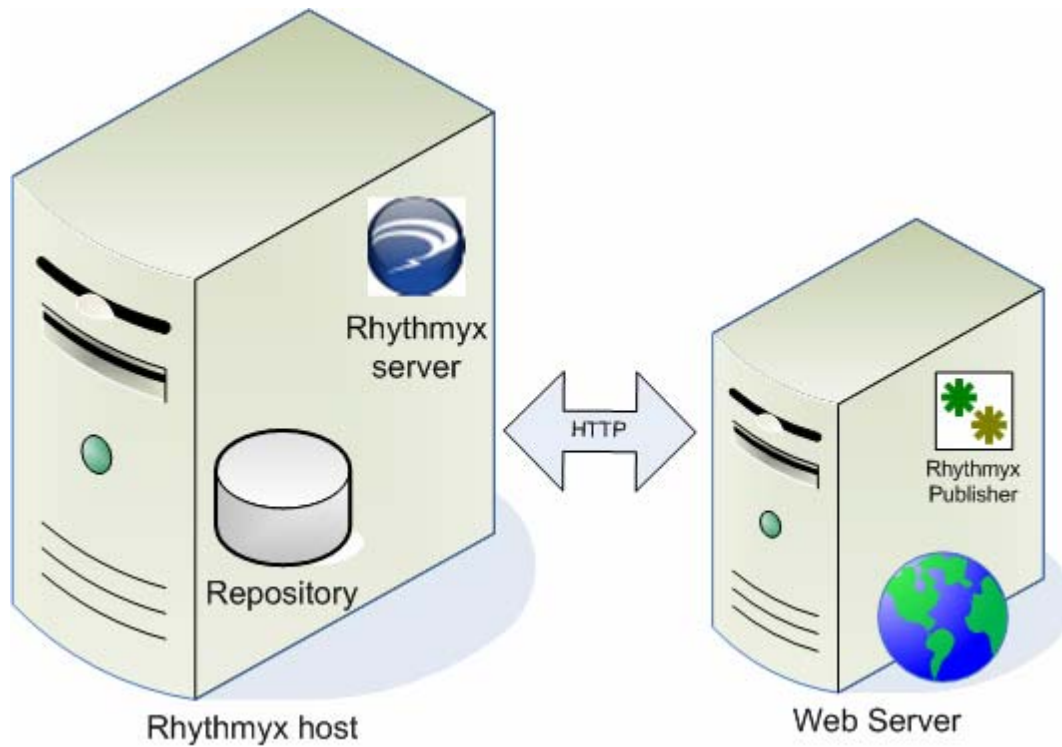


Figure 63: Rhythmyx server with local Repository and remote Web server with remote Publisher

Rhythmyx Server with Remote Repository and Remote Web Server Using FTP Publishing

In this configuration, the Rhythmyx server, RDBMS server, and Web server are each installed on different host machines. Rhythmyx uses the propriety protocol of the RDBMS to communicate with it. Content is published to the Web server using FTP publishing.

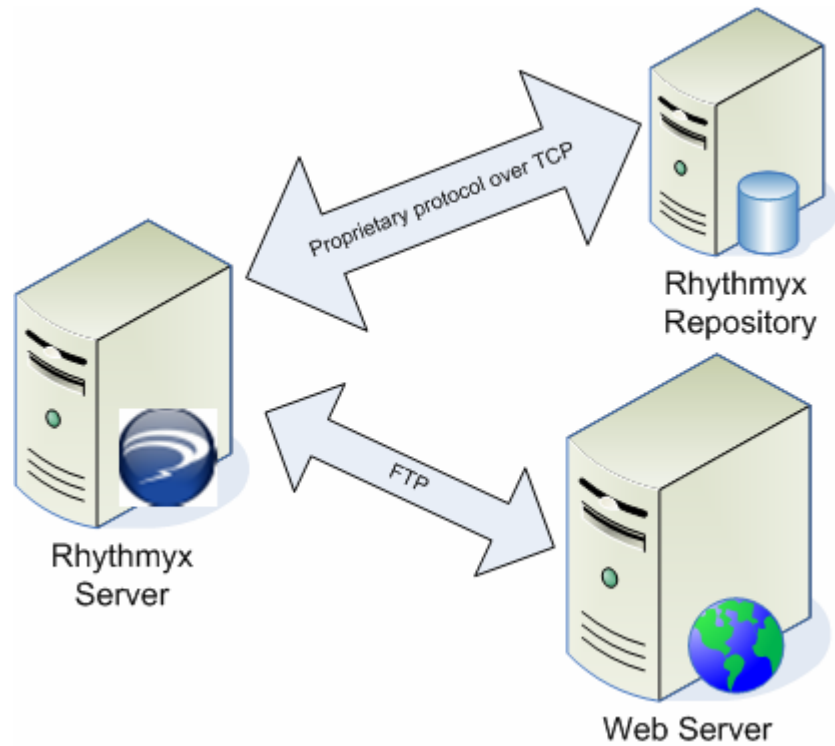
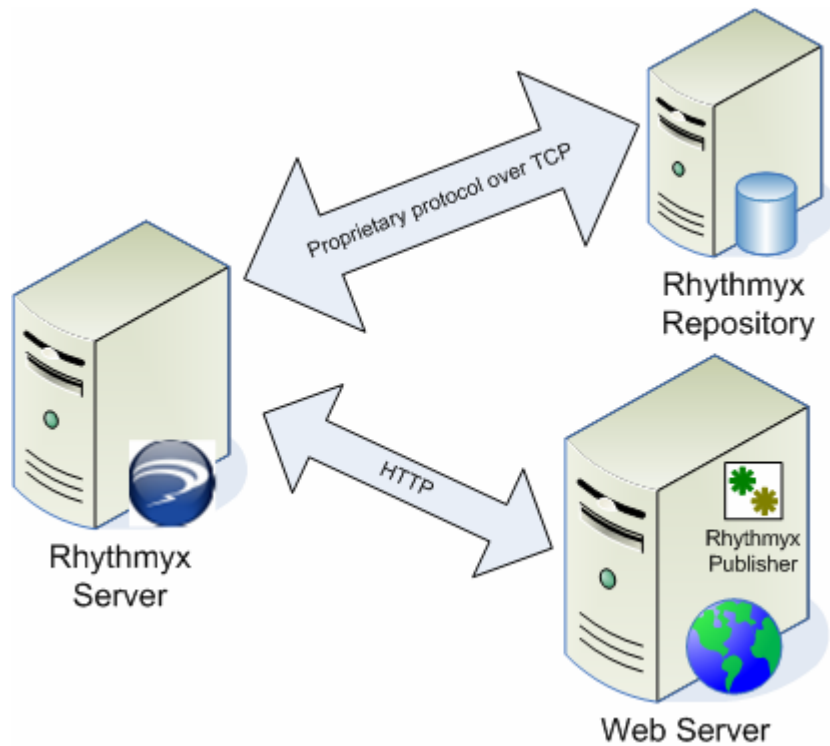


Figure 64: Rhythmyx server, RDBMS server, and Web server each on different hosts, with FTP publishing

Rhythmyx Server with Remote Repository and Remote Web Server with Remote Publisher

In this configuration, the Rhythmyx server, RDBMS server, and Web server are each installed on different host machines. Rhythmyx uses the propriety protocol of the RDBMS to communicate with it. A remote Publisher is installed on the same machine as the Web server and is used to publish the content to the Web server.



Source Control and Backups

Rhythmyx does not support version control for applications and other support files. You must use a third-party source/version control system to back up applications and other files in your Rhythmyx environment. Using a source control program is not only useful when you must perform recovery, but also helps you control production and deployment of applications.

At a minimum, you should implement a source control regime that includes Rhythmyx source files. If you use XSL Variants or other Rhythmyx applications, you should bring these under source control as well. A minimal program of source control includes:

- Source HTML for assembler applications
- Java and JavaScript extension files
- Shared Definition files
- Application directories
- Application XML files stored in ObjectStore directory
- Custom files stored in rx_resources directory
- SQL Statements used to create tables and views

Ideally, however, you should implement a source control program that includes your entire Rhythmyx tree. Such a regimen provides an additional layer of backup and recover protection. To implement a full-tree source control program, bring your entire Rhythmyx development environment under source control.

Integrating Rhythmyx with a Source Control System

Percussion Software, Inc., strongly recommends the use of a source control system to protect against accidental modification of your files. Percussion customers use a variety of source control systems, so you can use whatever specific system you prefer. Note, however, that some older source control systems may require workarounds. For example, Rhythmyx does not function correctly when its files are read-only, so when using Microsoft Visual SourceSafe you must copy the files to an external location where they can be writable.

This section documents the files that should be placed under source control.

Note that source control is not a substitute for backing up your systems. Development, staging, and production environments should all be backed up regularly.

Backing Up the CMS

You should back up all Rhythmyx environments (development, staging, and production). For each environment, you should backup the complete Rhythmyx tree. In addition, backup the Repository database associated with the tree. Use the techniques recommended in your RDBMS documentation to create backups of the Repository.

Backing Up Your Web Site

In Rhythmyx, you can roll back to previous versions of Content Items, but you cannot specify that the dependents of those Content Items return to the versions they had when the original Content Items were published. In general, using Rhythmyx as a recovery tool for your Web Server is unreliable; you should back up your Web Server each time that you publish to it. If you always publish your Web content to a staging server before publishing to your production server, your staging server may serve as your backup server. In this scenario, you can use Rhythmyx to publish to the staging server and, after testing, to publish to the production server. Alternatively, you can use Rhythmyx to publish to the staging server and then use a third-party delivery tool to synchronize the staging and production servers. If you want to publish to a production and backup server at the same time, you can use Rhythmyx to publish to the backup server and use a third party bulk copy tool (such as rsync or Open Deploy) to deploy the site to the production server.

Java Components

All Java Extensions (and other Java Components such as Servlets) should follow your standards for Java development. These components should be separated into Packages in the normal manner.

Java component developers should supply a deployment script (Percussion Software, Inc., recommends using an ANT build file named `deploy.xml`) that installs the appropriate JARs and registers any extensions with the Extension Install Tool program. This tool is documented in the JavaDoc (installed with the Rhythmyx Workbench) at:

```
com.percussion.util.PSExtensionInstallTool
```

Percussion Software recommends developing all Java components that relate to a single project in the same source project, with a single build script and a single output JAR.

All Java Components should have readily identifiable version / build numbers and the numbering scheme should be synchronized with the source control system.

Content Type Definitions and Templates

All Content Types and their associated Templates should be exported into an external directory and then placed in source control. Exporting these design objects produces XML files that describe the objects and can be re-imported at a later date.

Shared definitions are stored in

```
/Rhythmyx/rxconfig/Server/ContentEditors/shared
```

These files and the SQL definitions of their associated tables should be stored in source control.

Some installations will need to modify the System Definition file (`ContentEditorSystemDef.xml`). If you modify this file, manage it under source control.

Velocity Macros

Custom Rhythmyx macros are stored in the file

```
<Rhythmyxroot>/rx_resources/vm/rx_assembly.vm
```

If you add custom macros to this file, you should manage it under source control.

Servlet Dispatcher Files

Installations that include custom servlets should manage

```
<Rhythmyxroot>/AppServer/server/rx/deploy/rxapp.ear/rxapp.war/WEB-INF/config/user/spring/UserDispatcher-servlet.xml
```

under source control:

Any pages added to `<Rhythmyxroot>/AppServer/server/rx/deploy/rxapp.ear/rxapp.war/user/pages/` should also be managed under source control.

Ephox Editor Configuration

If you customize the Ephox EditLive! for Java DHTML rich text editor, you should manage the following files under source control:

```
<Rhythmyxroot>/rx_resources/ephox/rx_ephox_custom.xml
<Rhythmyxroot>/rx_resources/ephox/rx_ephox.js
<Rhythmyxroot>/rx_resources/ephox/elj_config.xml
```

Custom Content Editor Controls

Content editor custom controls are stored in the `rx_Templates.xsl` file

```
<Rhythmyxroot>/rx_resources/stylesheets/rx_Templates.xsl
```

If you implement any custom controls, this file should be managed under source control. In addition, some controls require additional XSL and JavaScript files. These files should be managed under source control as well.

Site Furniture

In most installations, the static site furniture is stored on the Rhythmyx server as well as the Web server, usually in the directory `<Rhythmyxroot>/web_resources`. These files should also be managed under source control.

Legacy XML Assembly Applications

Some installations require XML applications for Assembly, lookups and other purposes. These applications should be managed under source control. For each application there is an XML file in the

```
<Rhythmyxroot>/ObjectStore
```

directory and a directory under the Rhythmyx installation root directory. All of these files should be added to source control.

In addition, there are some stylesheets used by the XSL assembly process that should be managed under source control. These files are all stored in the directory

```
<Rhythmyxroot>/rx_resources/stylesheets/asmblers/
```

(These files are not used in assembly of Velocity templates.)

```
rx_Globals.xsl
rx_GlobalTemplates.xl
rx_Slots.xsl
```

WebDAV

If your implementation includes any WebDAV configurations, you should manage `<Rhythmyxroot>/AppServer/server/rx/deploy/rxapp.ear/rxapp.war/WEB-INF/config/user/webdav/rxwebdav-servlet.xml` under source control.

Other Design Objects

Some design objects cannot be added to source control easily. Most of these design objects are stored in a combination of tables in the Repository database and cannot be easily "exported". The best approach to managing these design objects is to document them thoroughly (including screenshots) at the time they are tested. (Relying on the Development Plan or similar document may not be adequate because the actual implementation may differ from the development plan.) Such documentation will allow you to create the design objects manually should need arise. The documentation should be managed by source control. Design objects that should be managed this way include:

- Action Menus and Action Menu Entries
- Item Filters
- Display Formats
- Keywords
- Workflows
- Relationship Configurations

In some cases, these design objects use one or more files that can and should be added to source control. For example, an Action Menu Entry usually points to either an XML application or a user JSP page; an Item Filter will have an associated Filter Rule Java extension.

Setting Up a Rhythmyx Failover Server

If you purchase a Rhythmyx Failover Server, you should configure and maintain it as an exact filesystem replica of your production Rhythmyx server. Both the production server and the failover server should use the same DBMS database repository and run on the same port.

Always deploy new and modified applications to the failover server when you deploy them to your production server. You may use any third-party filesystem replication utility to maintain synchronization between your failover and Rhythmyx servers or you can manually perform updates to the failover server each time you update the Rhythmyx Server.

Several strategies are available to seamlessly move users to a Rhythmyx Failover Server.

- IP Address Takeover (IPAT)

In this scenario, the failover and main server have administrative IP addresses and share a floating IP address. During regular operation, the main server receives requests from the floating IP address; during failover, the failover server receives requests from the floating IP address.

- MAC Address Takeover

Each hardware component accessed by your network has a MAC address. An IP address takeover may fail on your system if your system does not automatically refresh the cache holding the MAC addresses. In this scenario, you reassign the MAC address of hardware components.

- Domain Name System (DNS) Reconfiguration

In this scenario, if a server fails, a DNS lookup returns the IP address of another machine. Applications that reconfigure the IP addresses associated with domain names when a server fails may also perform load balancing for multiple servers.

To use any of these methods, have users regularly request the Rhythmyx server by a server name or fully qualified domain name, rather than an IP address. If your main Rhythmyx Server fails, as long as you have kept the data on your failover server current, the move to the failover server will appear seamless to your users.

You may implement your own network failover strategy at the switch and router level or purchase network failover software that may offer you any number of options for failover resolution and load balancing.

Setting Up a Rhythmyx Disaster Recovery Server

If you purchase a Rhythmyx Disaster Recovery Server, you should configure and maintain it as an exact filesystem replica of your production Rhythmyx server. Both the production server and the disaster recovery server should use the same DBMS database repository and run on the same port.

Always deploy new and modified applications to the disaster recovery server when you deploy them to your production server. You may use any third-party filesystem replication utility to maintain synchronization between your disaster recovery and Rhythmyx servers or you can manually perform updates to the disaster recovery server each time you update the Rhythmyx Server.

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