Jobs Guide

Identity Manager 3.6.1

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Novell.

Contents

About This Guide

This guide contains information about managing Identity Manager jobs. The guide is organized as follows:

Audience

This guide is intended for administrators, consultants, and network engineers who require a high-level introduction to Identity Manager business solutions, technologies, and tools.

Documentation Updates

For the most recent version of this document, see the Identity Manager Documentation Web site (http://www.novell.com/documentation/idm36/index.html).

Additional Documentation

For documentation on other Identity Manager drivers, see the Identity Manager Drivers Web site (http://www.novell.com/documentation/idm36drivers/index.html).

Documentation Conventions

In Novell documentation, a greater-than symbol (>) is used to separate actions within a step and items in a cross-reference path.

A trademark symbol (®, ™, etc.) denotes a Novell trademark. An asterisk (*) denotes a third-party trademark.

When a single pathname can be written with a backslash for some platforms or a forward slash for other platforms, the pathname is presented with a backslash. Users of platforms that require a forward slash, such as Linux* or UNIX*, should use forward slashes as required by your software.

1 Overview

Identity Manager provides the ability to launch jobs that perform specific tasks. The jobs can be run one or more times either manually or at scheduled times.

Identity Manager provides five predefined jobs:

* **Random Password Generator:** Generates a random password for each object defined in the job's scope. The password is generated by NMAS™ to match a Password Policy object that the job references. The job submits the generated passwords one at a time to a driver's Subscriber channel. The Subscriber channel policies must take action on the passwords.
* **Schedule Driver:** Starts or stops a driver.
* **Subscriber Channel Trigger:** Sends event documents to be processed by a driver's Subscriber channel. For example, a job could generate an event document to trigger policies associated with a user. Submitted event documents can be queued to the driver cache, or they can bypass the cache and be processed immediately.
* **Driver Health:** Evaluates the health conditions for a driver, assigns the health state, and carries out any actions associated with the health state. This job is used in conjunction with driver health monitoring. For complete instructions about setting up driver health monitoring, including using the Driver Health job, see "Monitoring Driver Health" in the *Identity Manager 3.6.1 Common Driver Administration Guide*.
* **Password Expiration Notification:** Searches an LDAP directory for objects whose passwords expire in a specified number of days. When an object that meets the criteria is discovered, the job sends an e-mail to the address contained in the object's mail LDAP attribute.

Information about using the predefined jobs is provided in Chapter 2, "Adding a Predefined Job," on page 9 and Chapter 3, "Configuring a Predefined Job's Properties," on page 13.

You can also develop custom jobs to perform tasks. A custom job requires you to create a Job Definition and a Job Implementation. The Job Definition is XML code that defines the parameters for the job. The Job Implementation is a JAR file that contains the Java* classes that perform the task. The job can perform any task that you can implement through Java classes. Because the job is initiated through the Metadirectory engine, the job also has access to the Identity Vault data. For more information, see Chapter 4, "Creating a Custom Job," on page 23.

2 Adding a Predefined Job

Identity Manager includes the following predefined jobs:

- **Random Password Generator:** Generates a random password for identified objects.
- **Schedule Driver:** Starts or stops the driver.
- **Subscriber Channel Trigger:** Submits XML documents to the Subscriber channel to trigger events.
- **Driver Health:** Evaluates the health conditions for the driver, assigns the health state, and carries out any actions associated with the health state.
- **Password Expiration Notification:** Sends e-mail notifications to users whose passwords are about to expire.

The first three jobs (Random Password Generator, Schedule Driver, and Subscriber Channel Trigger) operate at the driver level, which means that you add them to individual drivers. The other two jobs (Driver Health and Password Expiration Notification) operate at the driver set level; they automatically apply to all drivers in the driver set unless you change the job's scope to exclude some drivers.

The following steps provide instructions for using iManager to add predefined jobs. For information about using Designer to add jobs, see "Scheduling Jobs" in the *Designer 3.5 for Identity Manager 3.6 Administration GuideDesigner 3.5 for Identity Manager 3.6 Administration Guide*.

1 In iManager, click to display the Identity Manager Administration page.

2 Open the Overview page for the driver or driver set where you want to add the job:

    2a In the *Administration* list, click *Identity Manager Overview* to display the Identity Manager Overview page.

    2b In the *Search in* field, specify the fully distinguished name of the container where you want to start searching for driver sets and then click , or leave [root] in the field and click to search from the root of the tree.

        You can also click to browse for and select the container in the tree structure, or click to select the container from a list of previously selected objects.

    2c After the available driver sets are displayed on the Driver Sets page, click the desired driver set to display the Driver Set Overview page.

    2d (Conditional) If you are adding the job to a driver, click the driver to display the Driver Overview page.

3 Click the *Jobs* tab.

4 Click *New* to display the Create Job page.

Driver: Active Directory.IDM Driver Set.Novell

Overview | Advanced | **Jobs**

New

☐ J

Create Job ⊠

Job Name:

Job1

Job type

⦿ Installed

Subscriber channel trigger ▾

This job submits zero or more trigger documents to the subscriber channel. The submission may either be a document per object if a scope is defined or may be a single document for each job run.

○ Custom

Enter the XML that defines the custom job.

Servers

Select the server(s) this job should run on:

☑ IDMTEST.Novell

OK | Cancel

5 In the *Job Name* field, specify a descriptive name for the job.

6 Under *Job Type*, make sure that *Installed* is selected, then choose one of the following job types:

- ◆ **Random Password Generator (Driver Only):** Generates a random password for each object in the job's scope. The password is generated by NMAS™ to match the Password Policy object that the job references. These Password Policy objects are not usually the same as those used for eDirectory™ user password policies.

  The job submits the generated passwords one at a time to the driver's Subscriber channel. The Subscriber channel policies must take action on the passwords.

- ◆ **Schedule Driver (Driver Only):** Starts or stops the associated driver. You can also toggle a driver to start the driver if it is stopped or to stop the driver if it is running.

- ◆ **Subscriber Channel Trigger (Driver Only):** Submits zero or more trigger documents to the Subscriber channel. The submission can either be a document per object if a scope is defined, or it can be a single trigger event if no scope is defined.

  Trigger event documents identify the job and the scope object. A trigger event can bypass the cache and be processed immediately if desired. Trigger jobs allow you to use driver policies that you can customize for your personal requirements.

- **Driver Health (Driver Set):** Evaluates the health conditions for a driver, assigns the health state, and carries out any actions associated with the health state.
- **Password Expiration Notification (Driver Set):** Sends e-mail notifications to users whose passwords are about to expire.

7 In the *Server* field, select the servers where you want to run the job.

8 Click *OK* to create the job and display its configuration properties.

Job : Check driver health.driverset1.idm.services.system

Identity Manager

Job | Misc

| **General** | **Schedule** | **Scope** | **Parameters** | **Results** |

Java class name: com.novell.nds.dirxml.job.ckdrvhealth.CheckDriverHealthJob

☑ Enable job

☐ Delete the job after it runs once

Servers

Select the server(s) this job should run on:

☑ metaserver1.metaserver1.servers.system

Email server:

Default Notification Collection.Security

Display name:

Driver Health

Description:

This job checks the health of drivers by evaluating the criteria defined in the driver's health configuration.

OK   Cancel   Apply

9 To configure the job's properties, continue with the instructions in the appropriate section:

- Section 3.1, "Configuring the Random Password Generator Job," on page 13
- Section 3.2, "Configuring the Schedule Driver Job," on page 15
- Section 3.3, "Configuring the Subscriber Channel Trigger Job," on page 16

3 Configuring a Predefined Job's Properties

The following sections provide instructions for using iManager to configure the properties for the five predefined jobs: Random Password Generator, Schedule Driver, Subscriber Channel Trigger, Driver Health, and Password Expiration Notification. For each job, you can schedule the runtimes, define the scope of objects that the job applies to, set the job-specific parameters, and determine the methods used for results notification. For information about using Designer to configure a job, see "Scheduling Jobs" in the *Designer 3.5 for Identity Manager 3.6 Administration Guide*.

The steps assume that you've already added the job to a driver or driver set. If you have not, see Chapter 2, "Adding a Predefined Job," on page 9.

3.1 Configuring the Random Password Generator Job

The Random Password Generator job creates a random password for each object defined in the job's scope. The password is generated by NMAS™ to match a Password Policy object that the job references. Generally, each driver requires a password policy designed specifically for the connected system. If you don't have a password policy to use, you need to create one before continuing with the job configuration.

The job submits the generated passwords one at a time to the driver's Subscriber channel. The Subscriber channel policies must take action on the passwords.

1 Make sure you've already added the job to the driver. If you haven't, see Chapter 2, "Adding a Predefined Job," on page 9.

2 On the General page, configure the following options:

Enable Job: Leave this option selected unless you don't want the job to run.

Delete the Job After it Runs Once: Select this option if you want the job to run one time only and then be deleted.

Servers: Select the servers where you want the job to run. Multiple servers are available only if the driver is running on multiple servers.

Email Server: To monitor the job, you (or others) can receive e-mail notifications whenever certain results occur for the job. You configure e-mail notification on the Results page. However, to enable this e-mail notification to work, you must first specify the e-mail server that will be used to send the notifications. Click the 🔍 button to locate and select the Default Notification Collection object or any other notfTemplateCollection object that defines an SMTP mail server.

Display Name: Displays the name assigned to the job.

Description: Displays the description assigned to the job.

3 On the Schedule page, select one of the following options:

Run on a Schedule: Runs the job on a daily, weekly, monthly, or yearly schedule. You can also specify a custom schedule; use the crontab standard when specifying a custom schedule.

Run Manually: Runs the job only when you initiate it through the *Run Now* option (see Chapter 5, "Starting a Job," on page 27).

4 On the Scope page, click *Add* to add the objects for which you want to generate passwords.

5 On the Parameters page, fill in the following fields:

Password Policy Object Used for Password Generation: Select the Password Policy object you want to use to generate the passwords. NMAS uses the password policy to generate the passwords. Generally, each driver requires a password policy designed specifically for the connected system. If you don't have a password policy to use, click *OK* to save the job's current configuration, then create a password policy.

Generate a Password for Objects without a Driver Association: This is set to *False* by default. If you added objects to the Scope page that are not associated with objects in the driver's connected system, and you want to generate passwords for these objects, select *True*.

6 On the Results page, define the actions you want performed based on the results for the job.

Each time the job runs, it generates Intermediate results and a Final result. The possible results are Success, Warning, Error, and Aborted. Intermediate results are generated at various points throughout the job. The Final result is generated when the job is finished. For each result, you can specify the action you want performed when it occurs: 1) generate an event for Novell® Audit or Novell Sentinel™ and 2) generate an e-mail notification. For example, you might want no action to occur for an Intermediate Success result and an e-mail notification to be sent for an Intermediate Error result.

To define an action for a result:

  6a Click the *No action* link next to the result to display the Result Notification dialog box.

  6b Select *Audit result* if you want to generate an event for Novell Audit or Novell Sentinel.

     or

     Select *Send email*, then fill in the recipient and e-mail template information.

  6c Click *OK* to save your changes.

7 When you have finished configuring the job, click *OK* to save your changes.

The job is added to the job list.

8 Select the job in the list (by selecting the check box next to the job name), then click *Get Status*.

The Job Status dialog box displays any configuration errors. Because the job requires rights to the driver object and those rights have not yet been granted, you see an `Insufficient rights to driver object` error.

9 Click *Grant rights*, then click *OK* to confirm the action.

10 If other errors are displayed, resolve the errors. Otherwise, click *Close* to close the Job Status dialog box.

3.2 Configuring the Schedule Driver Job

The Schedule Driver job starts or stops the driver based on an established schedule.

1 Make sure you've already added the job to the driver. If you haven't, see Chapter 2, "Adding a Predefined Job," on page 9.

2 On the General page, configure the following options:

Enable Job: Leave this option selected unless you don't want the job to run.

Delete the Job After it Runs Once: Select this option if you want the job to run one time only and then be deleted.

Servers: Select the servers where you want the job to run. Multiple servers are available only if the driver is running on multiple servers.

Email Server: To monitor the job, you (or others) can receive e-mail notifications whenever certain results occur for the job. You configure e-mail notification on the Results page. However, to enable this e-mail notification to work, you must first specify the e-mail server that will be used to send the notifications. Click the 🔍 button to locate and select the Default Notification Collection object or any other notfTemplateCollection object that defines an SMTP mail server.

Display Name: Displays the name assigned to the job.

Description: Displays the description assigned to the job.

3 On the Schedule page, select one of the following options:

Run on a Schedule: Runs the job on a daily, weekly, monthly, or yearly schedule. You can also specify a custom schedule; use the crontab standard when specifying a custom schedule.

Run Manually: Runs the job only when you initiate it through the *Run Now* option (see Chapter 5, "Starting a Job," on page 27).

4 Ignore the Scope page; it does not apply to the Schedule Driver job.

5 On the Parameters page, select the type of action you want the job to perform:

Start the Driver: Starts or restarts the driver.

Stop the Driver: Stops the driver.

Toggle the Driver: Starts the driver if it is stopped. Stops the driver if it is running.

6 On the Results page, define the actions you want performed based on the results for the job.

Each time the job runs, it generates Intermediate results and a Final result. The possible results are Success, Warning, Error, and Aborted. Intermediate results are generated at various points throughout the job. The Final result is generated when the job is finished. For each result, you can specify the action you want performed when it occurs: 1) generate an event for Novell Audit or Novell Sentinel and 2) generate an e-mail notification. For example, you might want no action to occur for an Intermediate Success result and an e-mail notification to be sent for an Intermediate Error result.

To define an action for a result:

6a Click the *No action* link next to the result to display the Result Notification dialog box.

6b Select *Audit result* if you want to generate an event for Novell Audit or Novell Sentinel.

or

Select *Send email*, then fill in the recipient and e-mail template information.

6c Click *OK* to save your changes.

7 When you have finished configuring the job, click *OK* to save your changes.

The job is added to the job list.

8 Select the job in the list (by selecting the check box next to the job name), then click *Get Status*.

The Job Status dialog box displays any configuration errors. Because the job requires rights to the driver object and those rights have not yet been granted, you see an `Insufficient rights to driver object` error.

9 Click *Grant rights*, then click *OK* to confirm the action.

10 If other errors are displayed, resolve the errors. Otherwise, click *Close* to close the Job Status dialog box.

3.3 Configuring the Subscriber Channel Trigger Job

The Subscriber Channel Trigger job sends event documents to be processed by the driver's Subscriber channel. For example, a job could generate an event document to trigger policies associated with a user.

You configure the job to generate zero, one, or more event documents by defining a scope for the job. The scope identifies objects for which you want the job to trigger events. If you do not include a scope (no objects), the job creates one event document. If you identify one or more objects, the job creates event documents for each object.

Submitted event documents can be queued to the driver cache, or they can bypass the cache and be processed immediately.

1 Make sure you've already added the job to the driver. If you haven't, see Chapter 2, "Adding a Predefined Job," on page 9.

2 On the General page, configure the following options:

Enable Job: Leave this option selected unless you don't want the job to run.

Delete the Job After it Runs Once: Select this option if you want the job to run one time only and then be deleted.

Servers: Select the servers where you want the job to run. Multiple servers are available only if the driver is running on multiple servers.

Email Server: To monitor the job, you (or others) can receive e-mail notifications whenever certain results occur for the job. You configure e-mail notification on the Results page. However, to enable this e-mail notification to work, you must first specify the e-mail server that will be used to send the notifications. Click the 🔍 button to locate and select the Default Notification Collection object or any other notfTemplateCollection object that defines an SMTP mail server.

Display Name: Displays the name assigned to the job.

Description: Displays the description assigned to the job.

3 On the Schedule page, select one of the following options:

Run on a Schedule: Runs the job on a daily, weekly, monthly, or yearly schedule. You can also specify a custom schedule; use the crontab standard when specifying a custom schedule.

Run Manually: Runs the job only when you initiate it through the *Run Now* option (see Chapter 5, "Starting a Job," on page 27).

4 On the Scope page, add the objects for which you want the job to trigger events. For each identified object, the job creates an event document. If no object is scoped, the job trigger creates one event document.

5 On the Parameters page, set the parameters for which you want the job to submit trigger documents.

1. If you want to submit a trigger document for scoped objects that do not have a driver association, select *True*. Otherwise, keep the default of *False*.

2. If you want to use the job's Common Name (CN) as a document identifier trigger, keep the default of *True*. Otherwise, select *False*.

3. (Optional) If you select *False*, enter the string that the job can use as the value for the trigger element's Source attribute.

4. Select a method for submitting the trigger documents. If you want to queue the job the trigger is from, keep the default of *Queue (use cache)*. Otherwise, select *Direct (bypass cache)*.

5. (Optional) If you select *Direct (bypass cache)*, you are presented with the *Start driver if not running* option. If you want to start the driver if it is not running, keep the default of *True*. Otherwise, select *False*.

6. (Optional) If you select *True* on the *Start driver if not running* option, you are presented with the *Stop driver when finished processing triggers* option with the default of *True*. Use the default to stop the driver once it finishes processing the trigger job, or select *False* to keep the driver running.

A customized job definition has its own parameter set.

6 On the Results tab, define the actions you want performed based on the results for the job.

Each time the job runs, it generates Intermediate results and a Final result. The possible results are Success, Warning, Error, and Aborted. Intermediate results are generated at various points throughout the job. The Final result is generated when the job is finished. For each result, you can specify the action you want performed when it occurs: 1) generate an event for Novell Audit or Novell Sentinel and 2) generate an e-mail notification. For example, you might want no action to occur for an Intermediate Success result and an e-mail notification to be sent for an Intermediate Error result.

To define an action for a result:

6a Click the *No action* link next to the result to display the Result Notification dialog box.

6b Select *Audit result* if you want to generate an event for Novell Audit or Novell Sentinel.

or

Select *Send email*, then fill in the recipient and e-mail template information.

6c Click *OK* to save your changes.

7 When you have finished configuring the job, click *OK* to save your changes.

The job is added to the job list.

8 Select the job in the list (by selecting the check box next to the job name), then click Get Status.

The Job Status dialog box displays any configuration errors. Because the job requires rights to the driver object and those rights have not yet been granted, you see an `Insufficient rights to driver object` error.

9 Click *Grant rights*, then click *OK* to confirm the action.

10 If other errors are displayed, resolve the errors. Otherwise, click *Close* to close the Job Status dialog box.

3.4 Configuring the Driver Health Job

The Driver Health job evaluates the conditions for a driver's health states and assigns the driver the appropriate state. It evaluates the conditions for the health states, assigns the driver with the appropriate state, executes any actions associated with the assigned state, and stores the driver's transaction data. The default polling interval is one minute. The job also executes any actions associated with the assigned state. For more information about setting up health monitoring for a driver, see "Monitoring Driver Health" in the *Identity Manager 3.6.1 Common Driver Administration Guide*.

1 Make sure you've already added the job to the driver set. If you haven't, see Chapter 2, "Adding a Predefined Job," on page 9.

2 On the General page, configure the following options:

Enable Job: Leave this option selected unless you don't want the job to run.

Delete the Job After it Runs Once: Select this option if you want the job to run one time only and then be deleted.

Servers: Select the servers where you want the job to run. Multiple servers are available only if the driver is running on multiple servers.

Email Server: To monitor the job, you (or others) can receive e-mail notifications whenever certain results occur for the job. You configure e-mail notification on the Results page. However, to enable this e-mail notification to work, you must first specify the e-mail server that will be used to send the notifications. Click the 🔍 button to locate and select the Default Notification Collection object or any other notfTemplateCollection object that defines an SMTP mail server.

Display Name: Displays the name assigned to the job.

Description: Displays the description assigned to the job.

3 On the Schedule page, specify when you want the job to run:

The Driver Health job is a continuously running job, meaning that it does not stop unless a health state action shuts it down or it is shut down manually. The job must run continuously to be able to support transaction data collection for use in Transactions History conditions.

If the job does stop, it is restarted based on the schedule.

Run on a Schedule: Runs the job on a daily, weekly, monthly, or yearly schedule. You can also specify a custom schedule; use the crontab standard when specifying a custom schedule. The default schedule checks every minute to see if the job is running. If the job is not running, it is started.

Run Manually: Runs the job only when you initiate it through the *Run Now* option (see Chapter 5, "Starting a Job," on page 27).

4 On the Scope page, add the driver sets or individual drivers you want the job applied to.

By default, the job applies to all drivers in the driver set. You can, however, modify the list so that the job applies only to specific drivers in the driver set. You can also add other driver sets or drivers from other driver sets.

5 On the Parameters page, select the type of action you want the job to perform:

Login ID: This defaults to the login ID that was used when creating the driver job. You should change this only if you want the driver to authenticate by using different credentials.

Login password: This is the password required for the login ID that you supplied in the *Login ID* field.

Subscriber Heartbeat: Controls whether the Driver Health job does a heartbeat query on a driver's Subscriber channel before performing a healthcheck on the driver.

Polling interval: Determines how often the job evaluates the conditions for the health states, assigns the driver the appropriate state, executes any actions associated with the assigned state, and stores the driver's transaction data. The default polling interval is one minute.

Polling interval units: Specifies the time unit (minutes, hours, days, weeks) for the number specified in the *Polling interval* setting.

Duration sampling data is kept: Specifies how long a driver's transaction data is kept. The default, two weeks, causes a transaction to be retained for two weeks before being deleted. A longer duration provides a greater time period that can be used in Transactions History conditions, but requires more memory. For example, to use a Transactions History condition that evaluates of the number of publisher reported events for the last 10 days, you need to keep transaction data for at least 10 days.

To store transaction data for one driver every minute (*Polling interval*) for two weeks (*Duration sampling data is kept*) requires approximately 15 MB of memory.

For more information about setting up health monitoring for a driver, see "Monitoring Driver Health" in the *Identity Manager 3.6.1 Common Driver Administration Guide*.

Duration units: Specifies the time unit (minutes, hours, days, weeks) for the number specified in the *Duration sampling data is kept* setting.

6 On the Results page, define the actions you want performed based on the results for the job.

Each time the job runs, it generates Intermediate results and a Final result. The possible results are Success, Warning, Error, and Aborted. Intermediate results are generated at various points throughout the job. The Final result is generated when the job is finished. For each result, you can specify the action you want performed when it occurs: 1) generate an event for Novell Audit or Novell Sentinel and 2) generate an e-mail notification. For example, you might want no action to occur for an Intermediate Success result and an e-mail notification to be sent for an Intermediate Error result.

To define an action for a result:

6a Click the *No action* link next to the result to display the Result Notification dialog box.

6b Select *Audit result* if you want to generate an event for Novell Audit or Novell Sentinel.

or

Select *Send email*, then fill in the recipient and e-mail template information.

6c Click *OK* to save your changes.

7 When finished configuring the job, click *OK* to save your changes.

The job is added to the job list.

8 Select the job in the list (by selecting the check box next to the job name), then click *Get Status*.

The Job Status dialog box displays any configuration errors. Because the job requires rights to the driver object and those rights have not yet been granted, you see an `Insufficient rights to driver object` error.

9 Click *Grant rights*, then click *OK* to confirm the action.

10 If other errors are displayed, resolve the errors. Otherwise, click *Close* to close the Job Status dialog box.

# 3.5 Configuring the Password Expiration Notification Job

The Password Expiration Notification job searches an LDAP directory for objects whose passwords expire in a specified number of days. When an object that meets the criteria is discovered, the job sends an e-mail to the address contained in the object's mail LDAP attribute.

1 Make sure you've already added the job to the driver set. If you haven't, see Chapter 2, "Adding a Predefined Job," on page 9.

2 On the General page, configure the following options:

Enable Job: Leave this option selected unless you don't want the job to run.

Delete the Job After it Runs Once: Select this option if you want the job to run one time only and then be deleted.

Servers: Select the servers where you want the job to run. Multiple servers are available only if the driver is running on multiple servers.

Email Server: To monitor the job, you (or others) can receive e-mail notifications whenever certain results occur for the job. You configure e-mail notification on the Results page. However, to enable this e-mail notification to work, you must first specify the e-mail server that will be used to send the notifications. Click the 🔍 button to locate and select the Default Notification Collection object or any other notfTemplateCollection object that defines an SMTP mail server.

Display Name: Displays the name assigned to the job.

Description: Displays the description assigned to the job.

3 On the Schedule page, specify when you want the job to run:

Run on a Schedule: Runs the job on a daily, weekly, monthly, or yearly schedule. You can also specify a custom schedule; use the crontab standard when specifying a custom schedule. The default schedule checks every minute to see if the job is running. If the job is not running, it is started.

Run Manually: Runs the job only when you initiate it through the *Run Now* option (see Chapter 5, "Starting a Job," on page 27).

4 Ignore the Scope page, it does not apply to this job.

5 On the Parameters page, fill in the following fields:

LDAP Connection: Use the following fields to specify the information required to connect to the LDAP directory.

- **LDAP Host:** Specify the IP address or DNS name of the LDAP server.

- **Use SSL/TLS:** Select *True* if the LDAP connection is secured with SSL/TLS, then set the following options:

  - LDAP Port: Specify the port number that LDAP uses to make a connection. If *Use SSL/ TLS* is set to False, the default value is 389. If *Use SSL/TLS* is set to True, the default value is 636.

  - SSL/TLS Provider: Specify whether the SSL/TLS provider is Novell Secure Transport Layer (NTLS) or Java Secure Socket Extension (JSSE). If you select NTLS, you must provide the name of a KMO object to create the secure connection. If you select JSSE, you must provide a keystore pair of certificates to create the secure connection.

- **LDAP Authentication Type:** Select whether the LDAP connection is an anonymous connection or an authenticated connection. If you select *Authenticated*, you must provide the username and password of the object that authenticates to the Identity Vault.

LDAP Search: Use the following fields to specify the information used when sending the expiration notification e-mail to users:

- **Days Until Password expires:** Specify the days, prior to when the password expires, when the job sends an e-mail to users informing them that their password is expiring. By default, the job sends an e-mail to the users 30 days, 15 days, 5 days, and 1 day before their passwords expire.

- **Search Base:** Specify the DN of the container where the job search occurs. The default value for the Resource Kit is ou=users,o=company,dc=data.

- **Object Class:** Specify the LDAP object class to search. The default is inetOrgPerson.

Notification Email: Use the following fields to specify the information used to create the expiration notification e-mail, receivers of the e-mail, and other e-mail settings.

- **Notification Email Template:** Specify the name of the template used to create the expiration notification e-mail. The default is the Password Expiration Notification template in the Default Notification Collection object.

- **User Name Attribute:** Specify the LDAP attribute used to add the username into the notification template.

- **From:** Specify the e-mail address used to populate the e-mail's From field.

- **Show Advanced Options:** Select True to display the advanced options, or select False to hide the advanced options. The advanced options are:

   - Reply to: Specify the e-mail address that appears in the Reply to field.

   - Admin BCC: Specify an administrator to blind copy on the notification e-mail.

   - Character encoding: Specify the desired character encoding.

   - Custom SMTP headers: Specify a custom SMTP header if desired.

6 On the Results page, define the actions you want performed based on the results for the job.

Each time the job runs, it generates Intermediate results and a Final result. The possible results are Success, Warning, Error, and Aborted. Intermediate results are generated at various points throughout the job. The Final result is generated when the job is finished. For each result, you can specify the action you want performed when it occurs: 1) generate an event for Novell Audit or Novell Sentinel and 2) generate an e-mail notification. For example, you might want no action to occur for an Intermediate Success result and an e-mail notification to be sent for an Intermediate Error result.

To define an action for a result:

6a Click the *No action* link next to the result to display the Result Notification dialog box.

6b Select *Audit result* if you want to generate an event for Novell Audit or Novell Sentinel.

or

Select *Send email*, then fill in the recipient and e-mail template information.

6c Click *OK* to save your changes.

7 When you have finished configuring the job, click *OK* to save your changes.

The job is added to the job list.

8 Select the job in the list (by selecting the check box next to the job name), then click *Get Status*.

The Job Status dialog box displays any configuration errors. Because the job requires rights to the driver object and those rights have not yet been granted, you see an `Insufficient rights to driver object` error.

9 Click *Grant rights,* then click *OK* to confirm the action.

10 If other errors are displayed, resolve the errors. Otherwise, click *Close* to close the Job Status dialog box.

4 Creating a Custom Job

You can create a custom job to perform a task one or more times. The following sections provide the concepts and instructions required to create a custom job:

4.1 Job Components

The following diagram identifies the principle components required to process a job:

Figure 4-1 *High-level view of Job Scheduler process*
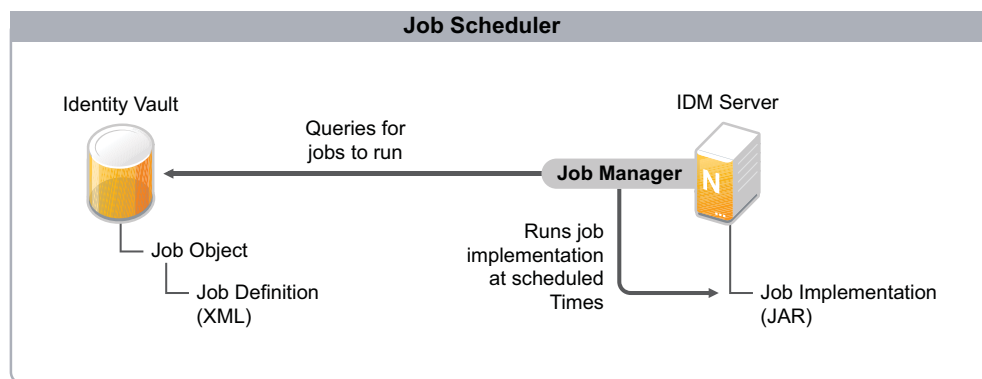
Job Manager: The Job Manager is responsible for launching scheduled jobs. It runs in the background on each Identity Manager server and checks every minute to see if a job is scheduled to run. When it encounters a scheduled job, it runs the appropriate Job Implementation.

Job Object: The Job object contains all the information necessary to invoke the job. It includes the name, description, schedule, server list, and XML job definition. The Job object is created in the Identity Vault when you use Identity Manager or Designer to add the job to a driver set or driver.

Job Definition: The Job Definition is an XML description of all the parameters necessary to perform a specific job, including the Job Implementation used to actually run the job. The Job Definition is an XML attribute associated with the Job object.

Job Implementation: The Job Implementation file is typically a JAR file that contains the Java classes that perform the job. Each Identity Manager server where you want a job to run must have a copy of the Job Implementation file. The Job Manager runs the Job Implementation at the times scheduled in the Job Definition.

4.2 Creating the Job Definition and Job Implementation

The Job Definition is XML that defines the parameters required to perform the job. This includes the schedule, scope, and notification parameters as well as the path to the Job Implementation file. To create the XML, see "Jobs DTD" in the *Identity Manager 3.6 DTD Reference*.

The Job Implementation is a JAR file that contains the Java classes required to perform the job. Novell does not provide instructions for creating the Job Implementation. The only requirement is that the Java classes run in the Identity Manager server's Java Runtime Environment. For more information, see Javadocs for the job interface.

4.3 Adding the Job

The following steps provide instructions for using iManager to add a custom job. For information about using Designer to add jobs, see "Scheduling Jobs" in the *Designer 3.5 for Identity Manager 3.6 Administration Guide*.

1 In iManager, click to display the Identity Manager Administration page.

2 Open the Overview page for the driver or driver set where you want to add the job:

    2a In the *Administration* list, click *Identity Manager Overview* to display the Identity Manager Overview page.

    2b In the *Search in* field, specify the fully distinguished name of the container where you want to start searching for driver sets and then click , or leave [root] in the field and click to search from the root of the tree.

    You can also click to browse for and select the container in the tree structure, or click to select the container from a list of previously selected objects.

    2c After the available driver sets are displayed on the Driver Sets page, click the desired driver set to display the Driver Set Overview page.

    2d (Conditional) If you are adding the job to a driver, click the driver to display the Driver Overview page.

3 Click the *Jobs* tab.

4 Click *New* to display the Create Job page.

5 In the *Job Name* field, specify a descriptive name for the job.

6 Under *Job Type*, select *Custom*, then paste the Job Definition's XML into the text box.

7 In the *Server* field, select the servers where you want to run the job.

8 Click *OK* to create the job and display its configuration properties.

9 Provide the General, Schedule, Scope, Parameters, and Results information required by the Job Definition.

10 When you have finished, click *OK* to save the configuration.

The job is added to the Jobs list.

11 Select the job in the list (by selecting the check box in front of the job name), then click *Get Status*.

The Job Status dialog box displays any configuration errors.

12 If errors are displayed, resolve the errors. Otherwise, click *Close* to close the Job Status dialog box.

5 Starting a Job

You can start a job by establishing a run schedule for the job, or you can manually start the job. The following steps explain how to use iManager to manually start a job. For information about creating a schedule to run a job, see Chapter 2, "Adding a Predefined Job," on page 9. For information about using Designer to start a job, see "Scheduling Jobs" in the *Designer 3.5 for Identity Manager 3.6 Administration Guide*.

1 In iManager, click ⬤ to display the Identity Manager Administration page.

2 Open the Overview page for the driver or driver set where the job is defined:

   2a In the *Administration* list, click *Identity Manager Overview* to display the Identity Manager Overview page.

   2b In the *Search in* field, specify the fully distinguished name of the container where you want to start searching for driver sets and then click ▶, or leave [root] in the field and click ▶ to search from the root of the tree.

      You can also click 🔍 to browse for and select the container in the tree structure, or click 🗐 to select the container from a list of previously selected objects.

   2c After the available driver sets are displayed on the Driver Sets page, click the desired driver set to display the Driver Set Overview page.

   2d (Conditional) If you are starting the job for a driver (rather than a driver set), click the driver to display the Driver Overview page.

3 Click the *Jobs* tab.

4 Select the check box in front of the job you want to start, then click *Run Now*.

5 Click *OK* to dismiss the startup confirmation dialog box.

6 Stopping a Job

You can abort a running job by stopping it. The job stops immediately without completing its task.

The following steps provide instructions for using iManager to stop a job. For information about using Designer to stop a job, see "Scheduling Jobs" in the *Designer 3.5 for Identity Manager 3.6 Administration Guide*.

1 In iManager, click ⬤ to display the Identity Manager Administration page.

2 Open the Overview page for the driver or driver set where the job is defined:

    2a In the *Administration* list, click *Identity Manager Overview* to display the Identity Manager Overview page.

    2b In the *Search in* field, specify the fully distinguished name of the container where you want to start searching for driver sets and then click ▶, or leave [root] in the field and click ▶ to search from the root of the tree.

        You can also click 🔍 to browse for and select the container in the tree structure, or click 🔚 to select the container from a list of previously selected objects.

    2c After the available driver sets are displayed on the Driver Sets page, click the desired driver set to display the Driver Set Overview page.

    2d (Conditional) If you are stopping the job for a driver (rather than a driver set), click the driver to display the Driver Overview page.

3 Click the *Jobs* tab.

4 Select the check box in front of the job you want to stop, then click *Stop*.

5 Click *OK* to dismiss the confirmation dialog box.

7 Disabling a Job

You can disable a job so that it does not run until it is enabled again.

The following steps provide instructions for using iManager to disable a job. For information about using Designer to disable a job, see "Scheduling Jobs" in the *Designer 3.5 for Identity Manager 3.6 Administration Guide*.

1 In iManager, click ⬤ to display the Identity Manager Administration page.

2 Open the Overview page for the driver or driver set where the job is defined:

  2a In the *Administration* list, click *Identity Manager Overview* to display the Identity Manager Overview page.

  2b In the *Search in* field, specify the fully distinguished name of the container where you want to start searching for driver sets and then click ▶, or leave [root] in the field and click ▶ to search from the root of the tree.

  You can also click 🔍 to browse for and select the container in the tree structure, or click 📋 to select the container from a list of previously selected objects.

  2c After the available driver sets are displayed on the Driver Sets page, click the desired driver set to display the Driver Set Overview page.

  2d (Conditional) If you are disabling the job for a driver (rather than a driver set), click the driver to display the Driver Overview page.

3 Click the *Jobs* tab.

4 Select the check box in front of the job you want to disable, then click *Disable*.

5 Click *OK* to dismiss the confirmation dialog box.
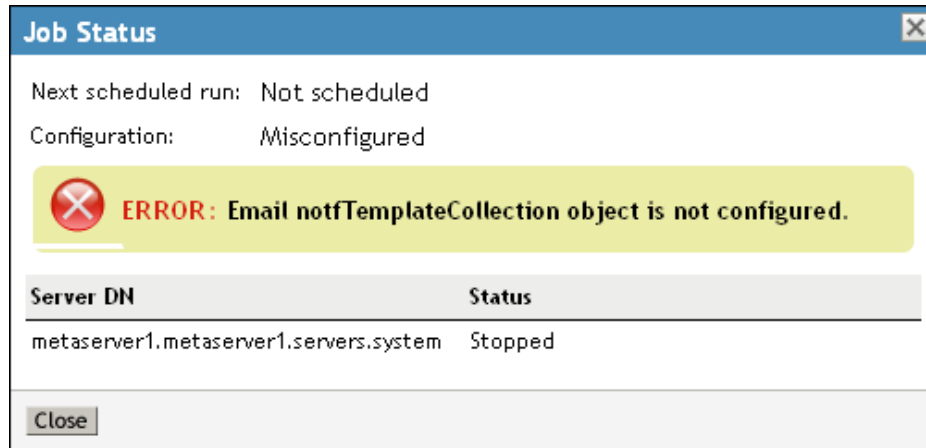
8 Checking a Job's Status

You can ensure that a job is configured correctly by checking its status. If it is not configured correctly, the status provides error messages instructing you what needs to be done for the job to run properly.

The following steps provide instructions for using iManager to check a job's status. For information about using Designer to check the status of a job, see "Scheduling Jobs" in the *Designer 3.5 for Identity Manager 3.6 Administration Guide*.

1 In iManager, click to display the Identity Manager Administration page.

2 Open the Overview page for the driver or driver set where the job is defined:

    2a In the *Administration* list, click *Identity Manager Overview* to display the Identity Manager Overview page.

    2b In the *Search in* field, specify the fully distinguished name of the container where you want to start searching for driver sets and then click , or leave [root] in the field and click to search from the root of the tree.

        You can also click to browse for and select the container in the tree structure, or click to select the container from a list of previously selected objects.

    2c After the available driver sets are displayed on the Driver Sets page, click the desired driver set to display the Driver Set Overview page.

    2d (Conditional) If you are checking the job for a driver (rather than a driver set), click the driver to display the Driver Overview page.

3 Click the *Jobs* tab.

4 Select the check box in front of the job you want to check, then click *Get Status*.

5 Click *Close* when you've finished reviewing any errors.

9 Deleting a Job

You can configure a job to run once and then be deleted, or you can delete a job manually. The following steps provide instructions for manually deleting a job in iManager. For information about configuring a job to run once and then be deleted, see Chapter 3, "Configuring a Predefined Job's Properties," on page 13.

For information about deleting a job in Designer, see "Scheduling Jobs" in the *Designer 3.5 for Identity Manager 3.6 Administration Guide*.

1 In iManager, click 🔵 to display the Identity Manager Administration page.

2 Open the Overview page for the driver or driver set where the job is defined:

  2a In the *Administration* list, click *Identity Manager Overview* to display the Identity Manager Overview page.

  2b In the *Search in* field, specify the fully distinguished name of the container where you want to start searching for driver sets and then click ▶, or leave [root] in the field and click ▶ to search from the root of the tree.

  You can also click 🔍 to browse for and select the container in the tree structure, or click 📇 to select the container from a list of previously selected objects.

  2c After the available driver sets are displayed on the Driver Sets page, click the desired driver set to display the Driver Set Overview page.

  2d (Conditional) If you are deleting the job for a driver (rather than a driver set), click the driver to display the Driver Overview page.

3 Click the *Jobs* tab.

4 Select the check box in front of the job you want to delete, then click *Delete*.

5 Click *OK* to confirm the deletion.