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# NetIQ® Identity Manager

## WorkOrder Driver Implementation Guide

March 2018

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# About this Book and the Library

The *Identity Manager WorkOrder Driver Implementation Guide* explains how to install, configure, and manage the Identity Manager WorkOrder driver.

## Intended Audience

This book provides information for developers and administrators using Identity Manager and the WorkOrder driver.

## Other Information in the Library

For more information about the library for Identity Manager, see the following resources:

- ♦ [Identity Manager documentation website \(https://www.netiq.com/documentation/identity-manager-47/\)](https://www.netiq.com/documentation/identity-manager-47/)
- ♦ [Identity Manager drivers documentation website \(https://www.netiq.com/documentation/identity-manager-47-drivers/\)](https://www.netiq.com/documentation/identity-manager-47-drivers/)



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# 1 Understanding the WorkOrder Driver

Typically, changes to data in the Identity Vault or a connected application are immediately processed. Work orders enable you to schedule when tasks are to be performed.

For example, a new employee is hired but is not scheduled to start for a month. The employee needs to be added to the HR database but should not be granted access to any corporate resources (e-mail, servers, and so forth) until the start date. In a typical scenario, the user would be granted access as soon as he or she is added to the HR database. With work orders implemented, a work order is created that delays account provisioning to the user's start date.

The WorkOrder driver provides work order functionality. The following sections introduce the WorkOrder driver and the key concepts and terminology associated with the driver:

- ♦ [“Understanding the Work Order Process” on page 9](#)
- ♦ [“Key Features” on page 14](#)
- ♦ [“Support for Standard Driver Functions” on page 15](#)
- ♦ [“Terminology” on page 15](#)

## Understanding the Work Order Process

From a high-level perspective, work orders are processed as follows:

1. A work order is created, either through an automated process (another driver) or a manual process (iManager), and is added as a WorkOrder object in a the Identity Vault's work order container.
2. At the scheduled time (as defined in the WorkOrder object), the driver begins processing the work order.
3. The driver applies any policies to the work order (performing any actions associated with the policies) and creates a WorkToDo object in the Identity Vault's work order container.
4. Depending on how you configure the WorkOrder driver and the other drivers in your system, either the WorkOrder driver performs the desired work or other drivers use the information in the WorkToDo object to perform the work. Because the WorkOrder driver is designed to accommodate a variety of configuration scenarios, sample scenarios are provided in [Chapter 6, “Customizing the Driver,” on page 31](#).

The following sections provide detailed information about the work performed by the driver's Subscriber and Publisher channels. Because the WorkOrder driver channels function differently than with other drivers, you should carefully review the information.

- ♦ [“Subscriber Channel Functions” on page 10](#)
- ♦ [“Publisher Channel Functions” on page 11](#)

## Subscriber Channel Functions

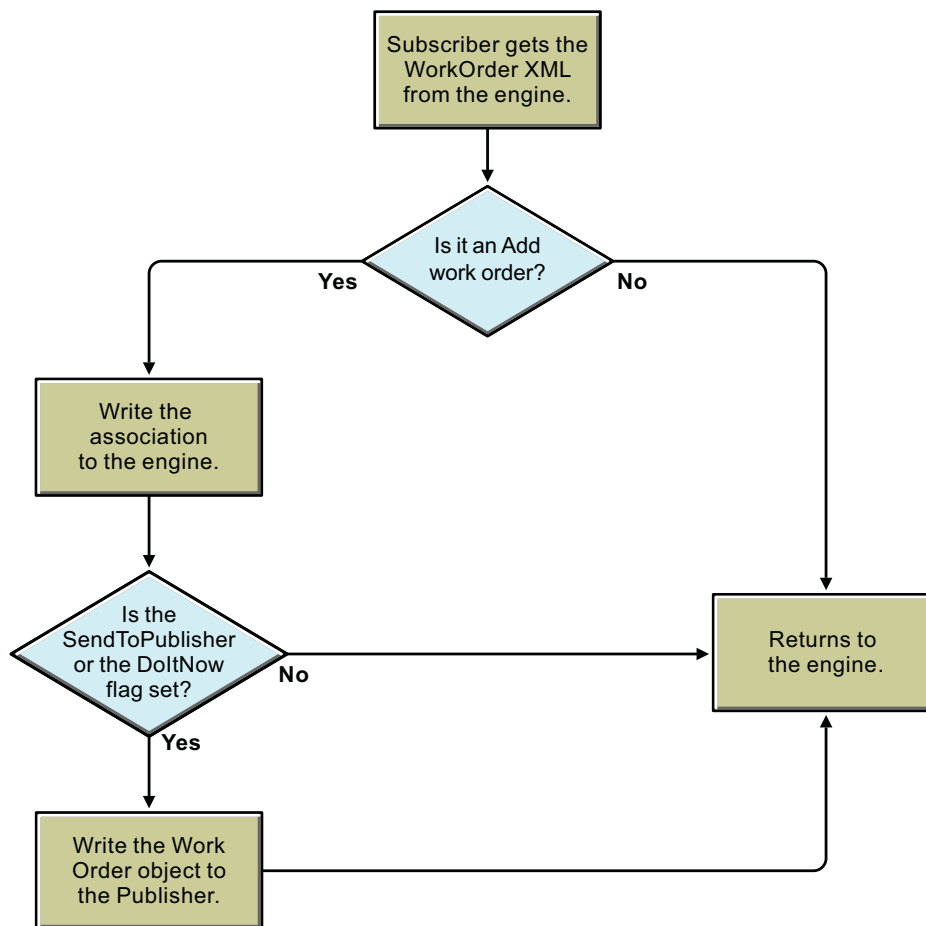
This section provides a basic understanding of the functions the Subscriber channel performs in the WorkOrder driver.

First, Placement and Create rules are configured so all new work orders that contain the required attributes are sent to the Subscriber channel. The following attributes must be present for a work order to pass the Create rule and go to the Subscriber channel:

- ♦ DirXML-nwoContent
- ♦ DirXML-nwoStatus
- ♦ DirXML-DoltNow Flag
- ♦ DirXML-SendToPublisher Flag

Figure 3-1 shows what happens when the Subscriber channel receives a work order.

*Figure 1-1 Subscriber Channel Configuration*



The Subscriber channel performs the following actions:

1. Creates an association for each WorkOrder object it receives.

2. Checks if the `DoItNow` and `SendToPublisher` flags are set to `True`. If these attributes are set to `True`, the Subscriber channel builds a work order and sends it immediately to the Publisher channel.
3. If the `DoItNow` and `SendToPublisher` flags are not set to `True`, the Subscriber channel waits until the next event.

## **Publisher Channel Functions**

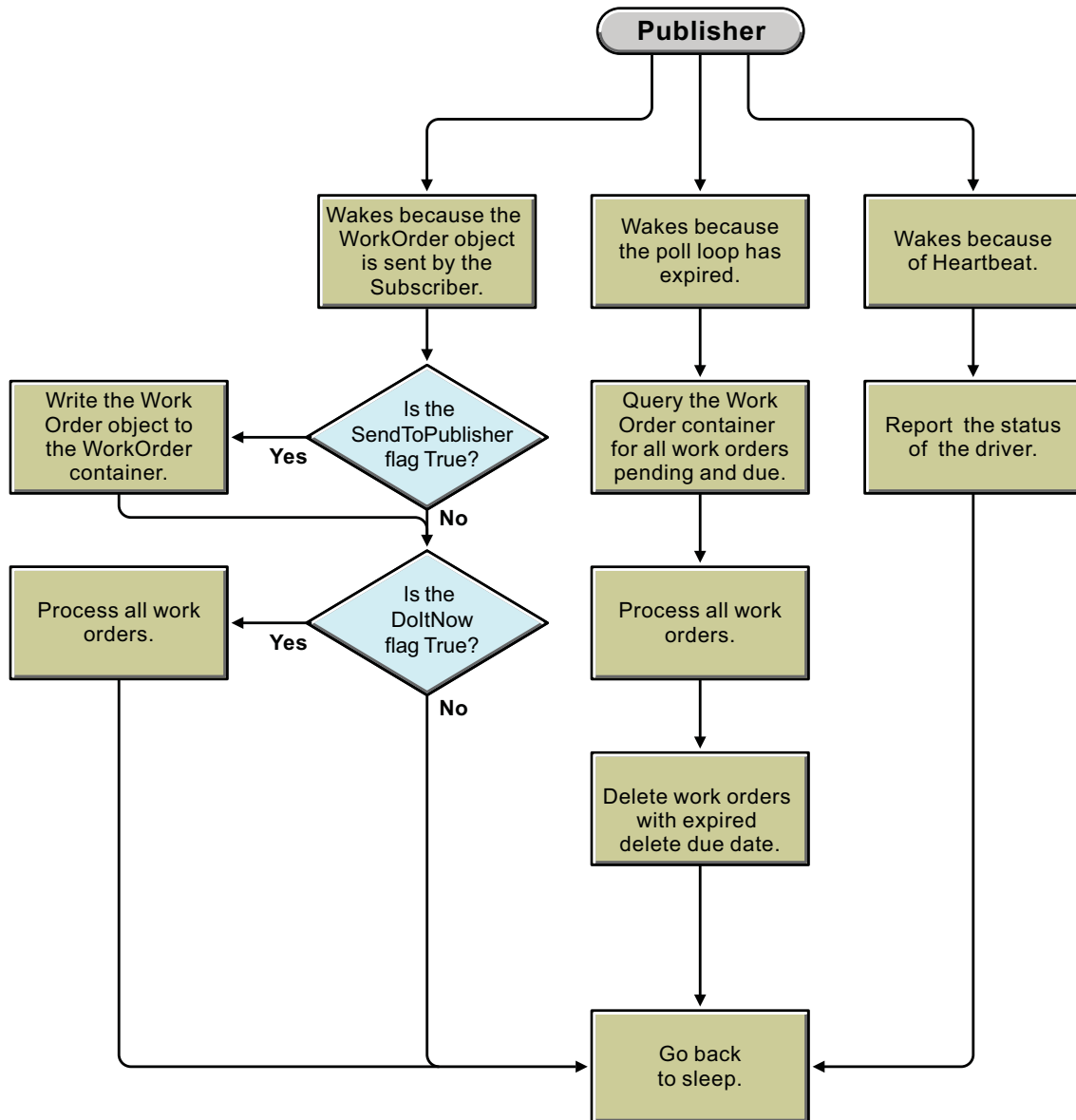
This section reviews the functions of the Publisher channel.

- ◆ [“The Publisher Channel Wakes Up” on page 11](#)
- ◆ [“How the Publisher Channel Processes Work Orders” on page 13](#)
- ◆ [“How the Publisher Channel Deletes Work Orders” on page 14](#)

### **The Publisher Channel Wakes Up**

The following flowchart illustrates the Publisher channel’s action when it wakes up.

Figure 1-2 Publisher Channel Configuration



- ♦ The Publisher channel wakes because the Subscriber channel sends a WorkOrder object. If the SendToPublisher flag is set to True, the work order is written out to the work order container. If the DoltNow flag is set to True, the work order is processed immediately.
- ♦ The Publisher channel wakes when the polling time has expired and queries the work order container for work orders that are pending and due. The driver processes these work orders. Work orders with delete due dates are deleted.
  1. The Publisher channel queries the work order container for work orders that are pending and due. See [“How the Publisher Channel Processes Work Orders”](#) on page 13.
  2. The Publisher channel queries all work orders for expired DeleteDueDates. See [“How the Publisher Channel Deletes Work Orders”](#) on page 14.
- ♦ If the driver heartbeat is configured, the driver wakes to report the driver status.

## How the Publisher Channel Processes Work Orders

After the Publisher channel queries the Identity Vault for work orders, it configures the work orders in the driver. The following flowchart illustrates how the Publisher channel processes work orders.

Figure 1-3 How the Publisher Processes Work Orders



1. Before a work order is processed, the driver checks the `DependentWorkOrder` attribute to see if the work order is dependent on another work order. If there is a dependent work order, the Publisher channel queries Identity Manager to see the status of the dependent work order. If the dependent work order status is configured, the Publisher channel processes the work order. If not, the work order waits until the next polling loop to see if the dependent work order has been configured.
2. The Publisher channel performs the work orders that are due, completing the appropriate action based on the attributes of the `DirXML-WorkOrder` objects.
3. To process the work order, the driver writes a `DirXML-WorkToDo` object to the `WorkToDo` container. The `DirXML-nwoContent` attribute of the `WorkToDo` object contains the value of the `DirXML-nwoContent` attribute of the `WorkOrder` object. The default configuration does not do

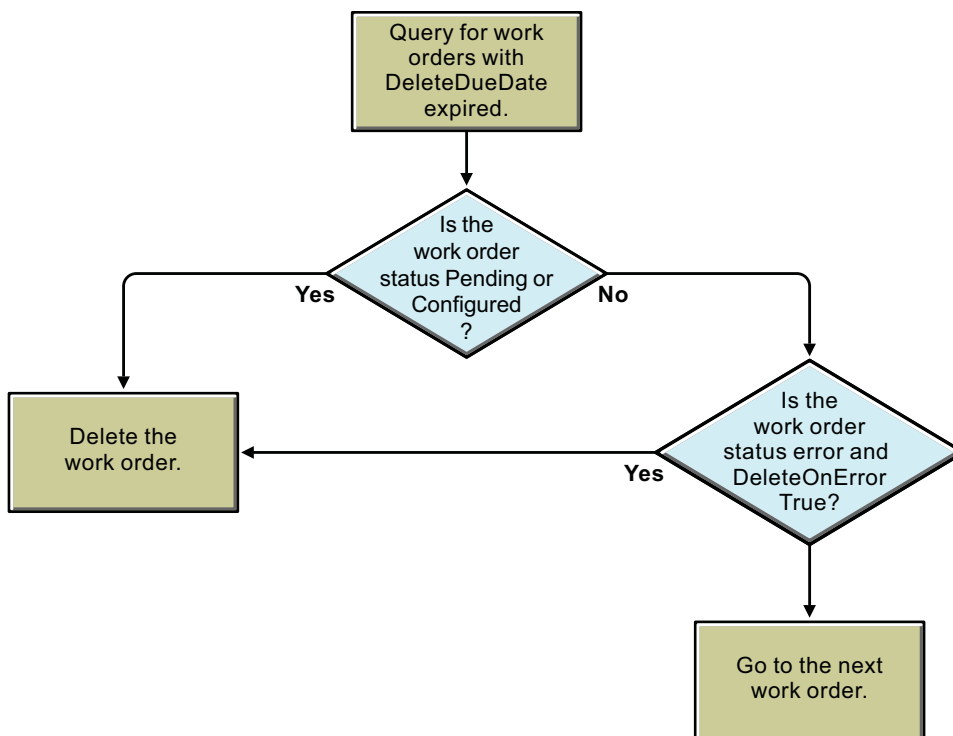
anything else with the WorkToDo object. A policy could use the WorkToDo object to process the work order. For example, the content attribute might contain the DN of a user object whose LogOnDisabled flag should be changed from True to False at the due date.

4. The Publisher channel updates the DirXML-WorkOrder with the results. If the WorkToDo object was processed without an error, the status of the work order is changed to Configured. If an error occurred, then the status is changed to Error. The work order process log is updated to contain the results.
5. If the WorkOrder object has a repeat interval value, the value is added to the Due Date and the work order status remains Pending. This allows for the work order to be repeated as many times as specified in the repeat interval count value, or indefinitely if no repeat interval count value is specified. The process log contains the results.

## How the Publisher Channel Deletes Work Orders

The Publisher channel now queries the work order container for work orders with an expired DeleteDueDate attribute. If the status of the work order is Pending or Configured, and the DeleteDueDate has expired, the work order is deleted. The work order is also deleted if it has an error status and the DeleteOnError attribute is set to True. The following flowchart illustrates this process.

Figure 1-4 The DeleteDueDate Process



## Key Features

The following list describes key features of the WorkOrder driver:

**Schedules work orders:** The WorkOrder driver allows work to be scheduled for a specific date and time.

**Supports dependent work orders:** If a work order is dependent on another work order, it is not processed until the dependent work order has been successfully processed.

**Repeats work orders:** The driver allows for work orders to be repeated at a set interval.

**Facilitates tracking and accountability for work orders:** Each work order carries with it the creator and main contact of the work order, a description of the action taken, and the errors it encountered.

## Support for Standard Driver Functions

There are several functions that most Identity Manager drivers support. The following list explains whether or not the WorkOrder driver supports these standard functions.

**Local Platforms:** The WorkOrder driver can run on the same platforms as the Identity Manager engine. See “[Implementation Checklist](#)” in the *NetIQ Identity Manager Setup Guide for Linux* or [Planning Your Installation](#) in the *NetIQ Identity Manager Setup Guide for Windows*.

**Remote Platforms:** The WorkOrder driver works on all the platforms supported by the Remote Loader. For System Requirements for Identity Manager Engine, Remote Loader, and iManager, see the [Technical Information for Identity Manager](#) page.

**Entitlements:** The WorkOrder driver does not support Entitlements.

**Password Synchronization Support:** The WorkOrder driver does not support password synchronization.

**Synchronized Objects:** The WorkOrder driver only processes events that pertain to work orders. It does not synchronize other objects and attributes within the Identity Vault.

## Terminology

The following terms are used by the WorkOrder driver:

**Due Date:** The date and time the work order is to be executed.

**Content:** The definition of the work that is to be processed.

**Interval:** The amount of time until the work order is to be repeated.

**Dependency:** The distinguished name of any other work orders that must be completed before the current work order.

**Status:** The value returned by the driver after the work order was processed (Configured, Error, etc.).

**Process Log:** The description of the events that occurred when the work order was processed.

**Delete Due Date:** The date the work order will be deleted from the Identity Vault.

**Pending:** A work order that is not yet due.





# 2 Implementation Checklist

Use the following checklist to ensure that you complete all of the tasks required to set up and use the WorkOrder driver.

*Table 2-1 WorkOrder Implementation Checklist*

Task	Details
<input type="checkbox"/> Install the WorkOrder driver files	By default, the WorkOrder driver files (driver shim and configuration file) are copied to the Identity Manager server when the Identity Manager engine is installed. If the driver is not on the Identity Manager server (because a custom installation was performed, or you want to run the driver on a server other than the Identity Manager server), see <a href="#">Chapter 3, “Installing Driver Files,” on page 19</a> .
<input type="checkbox"/> Create a new WorkOrder driver  or  <input type="checkbox"/> Upgrade an existing WorkOrder driver to the new version	You need to import the basic configuration file to create the driver. For instructions, see <a href="#">Chapter 4, “Creating a New Driver Object,” on page 21</a> .  If you have an existing driver, you can upgrade its configuration to this version. For instructions, see <a href="#">Chapter 5, “Upgrading an Existing Driver,” on page 27</a> .
<input type="checkbox"/> Customize the driver	The basic configuration for the WorkOrder driver enables it to create WorkOrder objects and WorkToDo objects. This is the extent of what the WorkOrder driver does when using the base configuration. For any additional work to be done, you must customize the WorkOrder driver or other Identity Manager drivers to perform the desired work.  For instructions, see <a href="#">Chapter 6, “Customizing the Driver,” on page 31</a> .
<input type="checkbox"/> Create work orders	Most work orders are likely created by other drivers as part of the work order process you establish while customizing the driver (see the previous task). However, you can also create work orders manually as well as modify existing work orders.  For instructions, see <a href="#">Chapter 7, “Creating and Managing Work Orders,” on page 37</a> .



# 3 Installing Driver Files

By default, the WorkOrder driver files are installed on the Identity Manager server at the same time as the Identity Manager engine. The installation program extends the Identity Vault's schema and installs both the driver shim and the driver packages. It does not create the driver in the Identity Vault (see [Chapter 4, "Creating a New Driver Object," on page 21](#)) or upgrade an existing driver's configuration (see [Chapter 5, "Upgrading an Existing Driver," on page 27](#)).

If you performed a custom installation and did not install the WorkOrder driver on the Identity Manager server, you have two options:

- ◆ Install the files on the Identity Manager server, using the instructions in [Considerations for Installing Identity Manager Components](#) in the *NetIQ Identity Manager Setup Guide for Linux* or [Planning to Install the Engine, Drivers, and Plug-ins](#) in the *NetIQ Identity Manager Setup Guide for Windows*
- ◆ Install the Remote Loader (required to run the driver on a non-Identity Manager server) and the driver files on a non-Identity Manager server where you want to run the driver. See [Installing Identity Manager](#) in the *NetIQ Identity Manager Setup Guide for Linux* or [Installing the Identity Vault](#) in the *NetIQ Identity Manager Setup Guide for Windows*.



# 4 Creating a New Driver Object

After the WorkOrder driver files are installed on the server where you want to run the driver (see [Chapter 3, “Installing Driver Files,” on page 19](#)), you can create the driver in the Identity Vault. You do so by installing the driver packages and then modifying the driver configuration to suit your environment. The following sections provide instructions:

- ♦ [“Creating the WorkOrder Container in the Identity Vault” on page 21](#)
- ♦ [“Creating the Driver Object in Designer” on page 21](#)
- ♦ [“Activating the Driver” on page 25](#)
- ♦ [“Adding Packages to an Existing Driver” on page 25](#)

## Creating the WorkOrder Container in the Identity Vault

The WorkOrder driver requires you to specify an Identity Vault container for WorkOrder objects and WorkToDo objects. You can use an existing container for these objects, but we strongly recommend that you create a new container. You can give the container any name you want (for example, WorkOrders). You should restrict rights to the container so that only authorized administrators can change the container or the objects it holds.

## Creating the Driver Object in Designer

You create the WorkOrder driver object by importing the driver’s basic configuration file and then modifying the configuration to suit your environment. After you’ve created and configured the driver, you need to deploy it to the Identity Vault and start it.

- ♦ [“Importing the Current Driver Packages” on page 22](#)
- ♦ [“Installing the Driver Packages” on page 22](#)
- ♦ [“Configuring the Driver Settings” on page 23](#)
- ♦ [“Deploying the Driver Object” on page 24](#)
- ♦ [“Starting the Driver” on page 24](#)

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**NOTE:** You should not create driver objects by using the new Identity Manager 4.0 and later configuration files through iManager. This method of creating driver objects is no longer supported. To create drivers, you now need to use the new package management features provided in Designer.

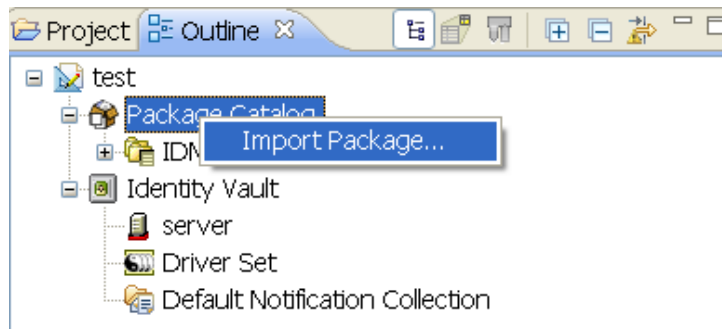
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## Importing the Current Driver Packages

The driver packages contain the items required to create a driver, such as policies, entitlements, filters, and Schema Mapping policies. These packages are only available in Designer and can be updated after they are initially installed. You must have the most current version of the packages in the Package Catalog before you can create a new driver object.

To verify that you have the most recent version of the driver packages in the Package Catalog:

- 1 Open Designer.
- 2 In the toolbar, click **Help > Check for Package Updates**.
- 3 Click **OK** to update the packages  
or  
Click **OK** if the packages are up-to-date.
- 4 In the Outline view, right-click the Package Catalog.
- 5 Click **Import Package**.



- 6 Select any WorkOrder driver packages  
or  
Click **Select All** to import all of the packages displayed.  
By default, only the base packages are displayed. Deselect **Show Base Packages Only** to display all packages.
- 7 Click **OK** to import the selected packages, then click **OK** in the successfully imported packages message.
- 8 After the current packages are imported, continue with [“Installing the Driver Packages” on page 22](#).

## Installing the Driver Packages

After you have imported the current driver packages into the Package Catalog, you can install the driver packages to create a new driver object.

- 1 In Designer, open your project.
- 2 In the Modeler, right-click the driver set where you want to create the driver, then click **New > Driver**.
- 3 Select **WorkOrder Base**, then click **Next**.
- 4 On the Driver Information page, specify a name for the driver, then click **Next**.

- 5 On the Install WorkOrder Base page, specify the name of the container that holds the WorkOrder objects, then click **Next**.
- 6 Fill in the following fields for Remote Loader information:
  - Connect To Remote Loader:** Select **Yes** or **No** to determine if the driver will use the Remote Loader. For more information, see [Installing Java Remote Loader](#) in the *NetIQ Identity Manager Setup Guide for Linux* or [Planning to Install the Remote Loader](#) in the *NetIQ Identity Manager Setup Guide for Windows*.
  - If you select **No**, skip to [Step 7](#). If you select **Yes**, use the following information to complete the configuration of the Remote Loader, then click **Next**:
    - Host Name:** Specify the IP address or DNS name of the server where the Remote Loader is installed and running.
    - Port:** Specify the port number for this driver. Each driver connects to the Remote Loader on a separate port. The default value is 8090.
    - Remote Loader Password:** Specify a password to control access to the Remote Loader. It must be the same password that is specified as the Remote Loader password on the Remote Loader.
    - Driver Password:** Specify a password for the driver to authenticate to the Identity Manager server. It must be the same password that is specified as the Driver Object Password on the Remote Loader.
- 7 Review the summary of tasks that will be completed to create the driver, then click **Finish**.
- 8 After you have installed the driver, you must change the configuration for your environment. Proceed to [“Configuring the Driver Settings” on page 23](#).


## Configuring the Driver Settings

After installing the driver packages, the WorkOrder driver will run. However, the basic configuration might not meet the requirements for your environment. For example, you might need to change whether the driver checks for new work orders in the WorkOrder container at a specific interval throughout the day or only at a specific time each day. The default setting is to poll the WorkOrder container every minute.

In addition to the polling setting, there are additional settings that can help you customize and optimize the driver. The settings are divided into categories such as Driver Configuration, Engine Control Values, and Global Configuration Values (GCVs).


The driver configuration settings are explained in [Appendix A, “Driver Properties,” on page 45](#).

If you do not have the Driver Properties page displayed in Designer:

- 1 Open your project.
- 2 In the Modeler, right-click the driver icon  or the driver line, then select **Properties**.
  - Although it is important for you to understand all of the settings, your first priority should be to review the [Driver Parameters](#) located on the Driver Configuration page. These settings let you control the method the driver uses to check for new work orders.
- 3 After you configure the driver, continue with [“Deploying the Driver Object” on page 24](#).

## Deploying the Driver Object

After the driver object is created in Designer, it must be deployed into the Identity Vault.

- 1 In Designer, open your project.
- 2 In the Modeler, right-click the driver icon  or the driver line, then select **Live > Deploy**.
- 3 If you are authenticated to the Identity Vault, skip to [Step 4](#); otherwise, specify the following information to authenticate, then click **OK**:
  - Host:** Specify the IP address or DNS name of the server hosting the Identity Vault.
  - Username:** Specify the DN of the user object used to authenticate to the Identity Vault.
  - Password:** Specify the user's password.
- 4 Read the deployment summary, then click **Deploy**.
- 5 Read the message, then click **OK**.
- 6 Click **Define Security Equivalence** to assign rights to the driver.

The driver requires rights to objects within the Identity Vault. The Admin user object is most often used to supply these rights. However, you might want to create a DriversUser (for example) and assign security equivalence to that user.

  - 6a Click **Add**, then browse to and select the object with the correct rights.
  - 6b Click **OK** twice.
- 7 Click **Exclude Administrative Roles** to exclude users that should not be synchronized.


You should exclude any administrative User objects (for example, Admin and DriversUser) from synchronization.

  - 7a Click **Add**, then browse to and select the user object you want to exclude, then click **OK**.
  - 7b Repeat [Step 7a](#) for each object you want to exclude.
  - 7c Click **OK**.
- 8 Click **OK**.

## Starting the Driver

When a driver is created, it is stopped by default. To make the driver work, you must start the driver and cause events to occur. Identity Manager is an event-driven system, so after the driver is started, it doesn't do anything until an event occurs.

To start the driver:

- 1 In Designer, open your project.
- 2 In the Modeler, right-click the driver icon  or the driver line, then select **Live > Start Driver**.

For information about management tasks with the driver, see [Chapter 8, "Managing the Driver,"](#) on [page 41](#).




# Activating the Driver

The Identity Manager driver for WorkOrder does not need a separate activation. If you create the driver in a driver set where you have already activated the Identity Manager server and service drivers, the driver inherits the activation from the driver set.

If you create the driver in a driver set that has not been previously activated, the driver will run in the evaluation mode for 90 days. You must activate the driver during the evaluation period; otherwise, the driver will be disabled. If you try to run the driver, the trace displays an error message indicating that you need to reactivate the driver to use it. For information about activation, refer to [Activating Identity Manager](#) in the [NetIQ Identity Manager Overview and Planning Guide](#).

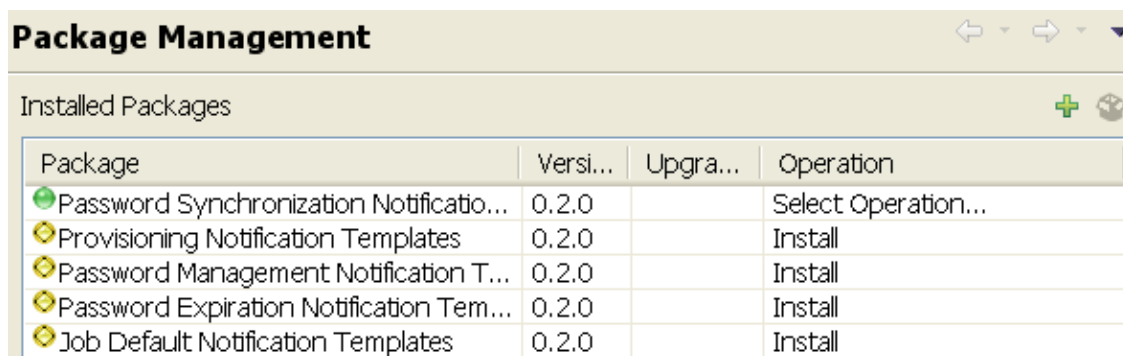
# Adding Packages to an Existing Driver

You can add new functionality to an existing driver by adding new packages to an existing driver.

- 1 Right-click the driver, then click **Properties**.
- 2 Click **Packages**, then click the **Add Packages** icon .
- 3 Select the packages to install. If the list is empty, there are no available packages to install.
- 4 (Optional) Deselect the **Show only applicable package versions** option, if you want to see all available packages for the driver, then click **OK**.

This option is only displayed on drivers. By default, only the packages that can be installed on the selected driver are displayed.

- 5 Click **Apply** to install all of the packages listed with the Install operation.



- 6 (Conditional) Fill in the fields with appropriate information to install the package you selected for the driver, then click **Next**.
- 7 Read the summary of the installation, then click **Finish**.
- 8 Click **OK** to close the Package Management page after you have reviewed the installed packages.

Package Management			
Installed Packages			
Package	Versi...	Upgra...	Operation
Job Default Notification Templates	0.2.0		Select Operation...
Password Expiration Notification Tem...	0.2.0		Select Operation...
Password Management Notification T...	0.2.0		Select Operation...
Password Synchronization Notificatio...	0.2.0		Select Operation...
Provisioning Notification Templates	0.2.0		Select Operation...

- 9 Repeat [Step 1](#) through [Step 8](#) for each driver where you want to add the new packages.

# 5 Upgrading an Existing Driver

If you are running the driver on the Identity Manager server, the driver shim files are updated when you update the server unless they were not selected during a custom installation. If you are running the driver on another server, the driver shim files are updated when you update the Remote Loader on the server.

The following sections provide information to help you upgrade an existing driver's configuration:

- ♦ [“Supported Upgrade Paths” on page 27](#)
- ♦ [“What’s New in Version 4.0” on page 27](#)
- ♦ [“Upgrading the Driver” on page 27](#)

## Supported Upgrade Paths

You can upgrade from any 3.x version of the WorkOrder driver. Upgrading a pre-3.x version of the driver directly to version 4.0 or later is not supported.

## What’s New in Version 4.0

Version 4.5 of the driver does not include any new features.

## Upgrading the Driver

The driver upgrade process involves upgrading the installed driver packages and updating the driver files.

This section provides general instructions for updating a driver. For information about updating the driver to a specific version, search for that driver patch in the [NetIQ Patch Finder Download Page](#) and follow the instructions from the Readme file accompanying the driver patch release.

- ♦ [“Upgrading the Installed Packages” on page 27](#)
- ♦ [“Applying the Driver Patch” on page 28](#)

## Upgrading the Installed Packages

- 1 Download the latest available packages.

To configure Designer to automatically read the package updates when a new version of a package is available, click **Windows > Preferences > NetIQ > Package Manager > Online Updates** in Designer. However, if you need to add a custom package to the Package Catalog, you can import the package .jar file. For detailed information, see the [Upgrading Installed Packages](#) in *NetIQ Designer for Identity Manager Administration Guide*.

- 2 Upgrade the installed packages.
  - 2a Open the project containing the driver.
  - 2b Right-click the driver for which you want to upgrade an installed package, then click **Driver > Properties**.
  - 2c Click **Packages**.

If there is a newer version of a package, there is check mark displayed in the Upgrades column.
  - 2d Click **Select Operation** for the package that indicates there is an upgrade available.
  - 2e From the drop-down list, click **Upgrade**.
  - 2f Select the version that you want to upgrade to, then click **OK**.

---

**NOTE:** Designer lists all versions available for upgrade.

---

- 2g Click **Apply**.
- 2h (Conditional) Fill in the fields with appropriate information to upgrade the package, then click **Next**.

Depending on which package you selected to upgrade, you must fill in the required information to upgrade the package.
- 2i Read the summary of the packages that will be installed, then click **Finish**.
- 2j Review the upgraded package, then click **OK** to close the Package Management page.

For detailed information, see the [Upgrading Installed Packages](#) in *NetIQ Designer for Identity Manager Administration Guide*.

## Applying the Driver Patch

The driver patch updates the driver files. You can install the patch as a `root` or `non-root` user.

### Prerequisites

Before installing the patch, complete the following steps:

- 1 Take a back-up of the current driver configuration.
- 2 (Conditional) If the driver is running with the Identity Manager engine, stop the Identity Vault and the driver instance.
- 3 (Conditional) If the driver is running with a Remote Loader instance, stop the Remote Loader instance and the driver instance.
- 4 In a browser, navigate to the [NetIQ Patch Finder Download Page](#).
- 5 Under **Patches**, click **Search Patches**.
- 6 Specify **Identity Manager *nn* Workorder Driver *nn*** in the search box.
- 7 Download and unzip the contents of the patch file to a temporary location on your server.

For example, `IDM45_Workorder_4000.zip`.

## Applying the Patch as a Root User

In a root installation, the driver patch installs the driver files RPMs in the default locations on Linux. On Windows, you need to manually copy the files to the default locations.

- 1 Update the driver files:
  - ♦ **Linux:** Log in to your server as `root` and run the following command in a command prompt:  

```
rpm -Uvh <Driver Patch File Temporary Location>/linux/novell-DXMLwkodr.rpm
```

  
For example, `rpm -Uvh <IDM45_Workorder_4000.zip>/linux/novell-DXMLwkodr.rpm`
  - ♦ **Windows:** Navigate to the `<Extracted Driver Patch File Temporary Location>\windows` folder and copy the `WorkOrder.jar` file to `<IdentityManager installation>\NDS\lib` or `<IdentityManager installation>\RemoteLoader\<architecture>\lib` folder.
- 2 (Conditional) If the driver is running locally, start the Identity Vault and the driver instance.
- 3 (Conditional) If the driver is running with a Remote Loader instance, start the Remote Loader instance and the driver instance.

## Applying the Patch as a Non-Root User

- 1 Verify that `<non-root eDirectory location>/rpm` directory exists and contains the file, `_db.000`.

The `_db.000` file is created during a non-root installation of the Identity Manager engine. Absence of this file might indicate that Identity Manager is not properly installed. Reinstall Identity Manager to correctly place the file in the directory.

- 2 To set the `root` directory to non-root eDirectory location, enter the following command in the command prompt:

```
ROOTDIR=<non-root eDirectory location>
```

This will set the environmental variables to the directory where eDirectory is installed as a non-root user.

- 3 Download the patch and untar or unzip the downloaded file.
- 4 To install the driver files, enter the following command:

```
rpm --dbpath $ROOTDIR/rpm -Uvh --relocate=/usr=$ROOTDIR/opt/novell/eDirectory --relocate=/etc=$ROOTDIR/etc --relocate=/opt/novell/eDirectory=$ROOTDIR/opt/novell/eDirectory --relocate=/opt/novell/dirxml=$ROOTDIR/opt/novell/dirxml --relocate=/var=$ROOTDIR/var --badreloc --nodeps --replacefiles <rpm-location>
```

For example, to install the WorkOrder driver RPM, use this command:

```
rpm --dbpath $ROOTDIR/rpm -Uvh --relocate=/usr=$ROOTDIR/opt/novell/eDirectory --relocate=/etc=$ROOTDIR/etc --relocate=/opt/novell/eDirectory=$ROOTDIR/opt/novell/eDirectory --relocate=/opt/novell/dirxml=$ROOTDIR/opt/novell/dirxml --relocate=/var=$ROOTDIR/var --badreloc --nodeps --replacefiles /home/user/novell-DXMLwkodr.rpm
```



# 6 Customizing the Driver

After you create a new WorkOrder driver by installing the driver packages, the driver processes WorkOrder objects from the Identity Vault to create WorkToDo objects. This is all the WorkOrder driver does when it uses the basic configuration. For any additional work to be done, you must customize the WorkOrder driver or other Identity Manager drivers to perform the desired work.

The following section describes how the policies and rules are set up in the basic configuration:

- ◆ [“Policies and Rules Used in the Basic Configuration” on page 31](#)

The WorkOrder driver is extremely flexible. The following sections illustrate two possible solutions for customizing your driver:

- ◆ [“Human Resource Example Using an HR Driver” on page 32](#)
- ◆ [“Human Resource Example without an HR Driver” on page 35](#)

## Policies and Rules Used in the Basic Configuration

This section describes policies and rules for the Subscriber and Publisher channels in the WorkOrder driver’s basic configuration. For an overview on how the Subscriber and Publisher channels work, see [“Subscriber Channel Functions” on page 10](#) and [“Publisher Channel Functions” on page 11](#).

- ◆ [“Subscriber Channel” on page 31](#)
- ◆ [“Publisher Channel” on page 32](#)

### Subscriber Channel

The Subscriber channel processes only events that pertain to the work orders. The following table lists the rules and policies used in configuring the Subscriber channel:

Rule or Policy	What it does
Subscriber Filter	Allows only events for WorkOrder objects to be processed.
Event Transformation	Not used in the packages.
Matching Rule	Not used in the packages.

Rule or Policy	What it does
Create Rule	<p>Contains rules only for WorkOrder objects.</p> <p>Requires values for the following attributes on a WorkOrder object:</p> <ul style="list-style-type: none"> <li>◆ nwoStatus</li> <li>◆ nwoSendToPublisher</li> <li>◆ nwoDoltNow</li> <li>◆ nwoContent</li> <li>◆ nwoType</li> </ul> <p>If the values are not present, the work order is not sent to the Publisher channel and the work order is not updated by the driver.</p> <p>For a description of these attributes, see <a href="#">Appendix C, “Schema and Policy Rules For Work Order Management,”</a> on page 51.</p>
Placement Rule	Maps work orders from the work order container you specified to the driver. This mapping is necessary so that the Subscriber channel can check the work orders to see if the DoltNow flag is set to True.
Command Transformation	Not used in the packages.
Schema Mapping	Maps the eDirectory namespace to the Work Order namespace.
Output Transformation	Not used in the packages.

## Publisher Channel

The following table lists the rules and policies used to configure the Publisher channel:

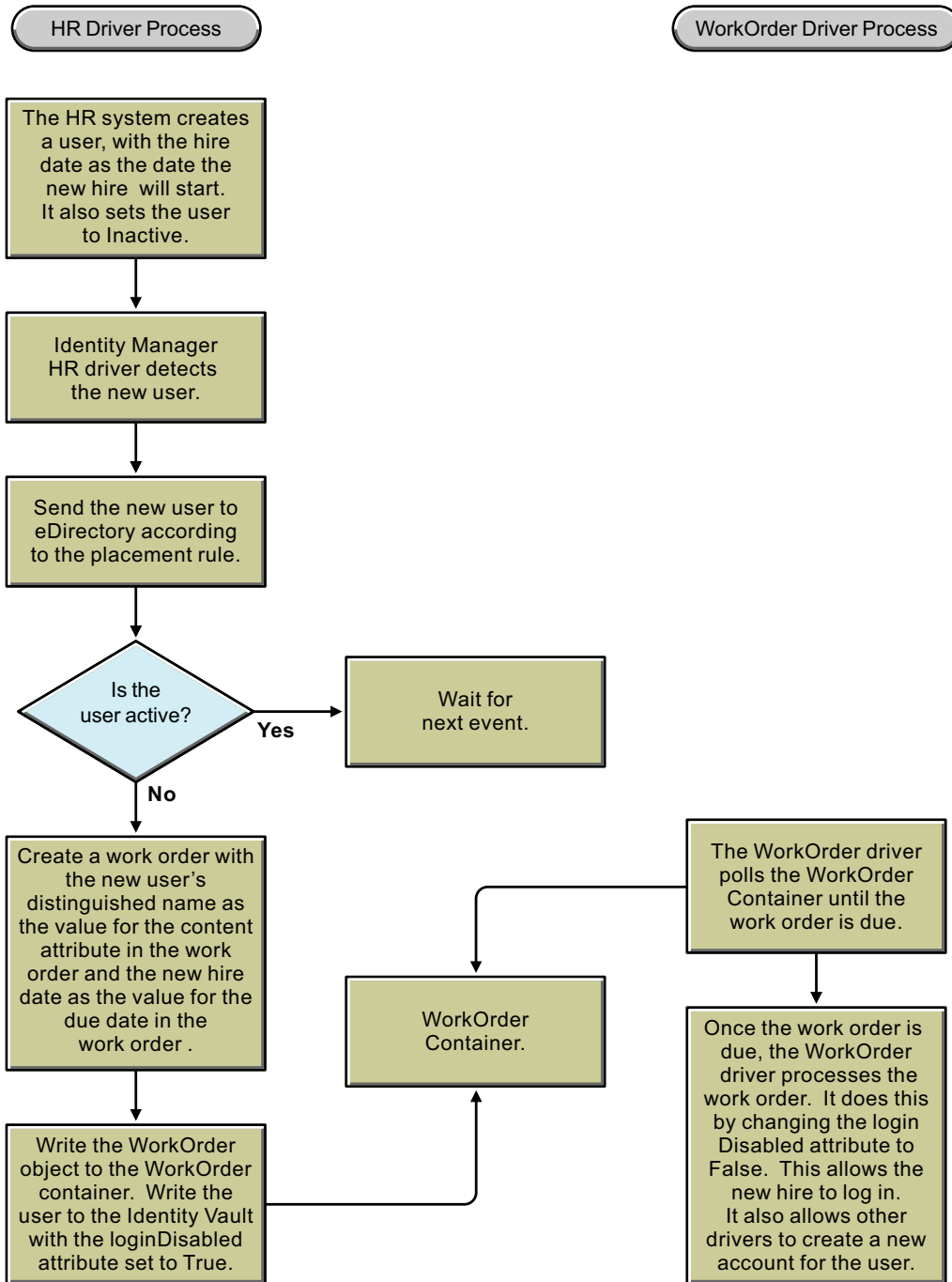
Rule or Policy	What it does
Schema Mapping	Maps the Work Order driver namespace to the eDirectory namespace.
Event Transformation	Not used in the packages.
Publisher Filter	Allows only events for WorkOrder objects to be processed.
Matching Rule	Not used in the packages.
Placement Rule	Places WorkOrder and WorkToDo objects in the correct container as defined in the driver’s configuration parameters.
Command Transformation	Not used in the packages.

## Human Resource Example Using an HR Driver

The following example illustrates how the WorkOrder driver can be used with an HR driver (SAP, PeopleSoft, and so forth) to create a new user and postpone activating the new employee’s access to the system until the hire date. [Figure 6-1](#) illustrates how these drivers work together in the example configuration.



Figure 6-1 Data Flow with an HR Driver



In this scenario, assume that the new employee's name is Albert Hauser. Albert is hired, but does not begin work until a future date and time. He is put into the HR system with the hire date set. Albert is marked as not active and does not have access to the system.

The HR Identity Manager driver writes Albert's user object to the Identity Vault. A policy in that driver checks to see if he is active. If he is active, the driver performs the work. If he is not active, the policy creates a work order to activate Albert's account on the hire date. The work order is marked as pending. A policy in the WorkOrder driver processes the work order on the hire date. The policy in the WorkOrder driver sets the user object's loginDisabled attribute to False, allowing Albert to log in.

The sample could be extended to allow other Identity Manager drivers to have a Create rule to disallow the creation of the user object in other connected systems until the user object's loginDisabled attribute is set to False. The result is that the user's system access is provisioned on his hire date and not before.

## Human Resource Driver Policies

The following policies or rules show how to implement this sample. In the sample, the WorkOrder driver is acting as the HR system interface. The WorkOrder driver is configured to provide the needed attributes: LastName, FirstName, HireDate, and Disabled.

- ◆ [“Mapping Rule” on page 34](#)
- ◆ [“Filter” on page 34](#)
- ◆ [“Command Transformation Policy” on page 34](#)

### Mapping Rule

The mapping rule maps the attributes used in the WorkOrder driver to attributes in the Identity Vault. You can view the sample at [hr-drv-schema-map.xml](http://www.novell.com/documentation/idm40drivers/work_order/samples/hr-drv-schema-map.xml) ([http://www.novell.com/documentation/idm40drivers/work\\_order/samples/hr-drv-schema-map.xml](http://www.novell.com/documentation/idm40drivers/work_order/samples/hr-drv-schema-map.xml)).

### Filter

The filter attribute allows only the attributes that are needed by this example to be passed through. The DirXML-DueDate is notify only. This attribute should not be applied to the user object. However, it should be available for the Command Transformation. You can view the sample at [hr-drv-filter.xml](http://www.novell.com/documentation/idm40drivers/work_order/samples/hr-drv-filter.xml) ([http://www.novell.com/documentation/idm40drivers/work\\_order/samples/hr-drv-filter.xml](http://www.novell.com/documentation/idm40drivers/work_order/samples/hr-drv-filter.xml)).

### Command Transformation Policy

The Command Transformation policy checks to see if a user object is being added to the Identity Vault. It also ensures that the loginDisabled attribute is set to True. If the conditions are satisfied, the policy then creates a work order and places it in the WorkOrder container. The WorkOrder driver looks in this container for work orders to process. The policy puts the DN of the user that was created into the DirXML-nwoContent attribute. You can view the sample at [hr-drv-cmd-transform.xml](http://www.novell.com/documentation/idm40drivers/work_order/samples/hr-drv-cmd-transform.xml) ([http://www.novell.com/documentation/idm40drivers/work\\_order/samples/hr-drv-cmd-transform.xml](http://www.novell.com/documentation/idm40drivers/work_order/samples/hr-drv-cmd-transform.xml)).

The policy also puts the DirXML-DueDate from the user into the WorkOrder object DirXML-DueDate and then sets the work order status to Pending.

There is a second policy that sets the status of the work order. You can view the sample at [hr-drv-cmd-transform2.xml](http://www.novell.com/documentation/idm40drivers/work_order/samples/hr-drv-cmd-transform2.xml) ([http://www.novell.com/documentation/idm40drivers/work\\_order/samples/hr-drv-cmd-transform2.xml](http://www.novell.com/documentation/idm40drivers/work_order/samples/hr-drv-cmd-transform2.xml)).

### WorkOrder Driver Policy

The WorkOrder driver policy uses only the Publisher Command Transformation policy. The Command Transformation policy checks to see that a DirXML-WorkToDo object is being added. If it is, the policy gets the DN of the user from the DirXML-nwoContent attribute. It then sets the user's Login Disable attribute to False. This allows the user to log in.

---

**NOTE:** `<do-add-dest-attr-value class-name="User" direct="true" name="Login Disabled">` should not be used.

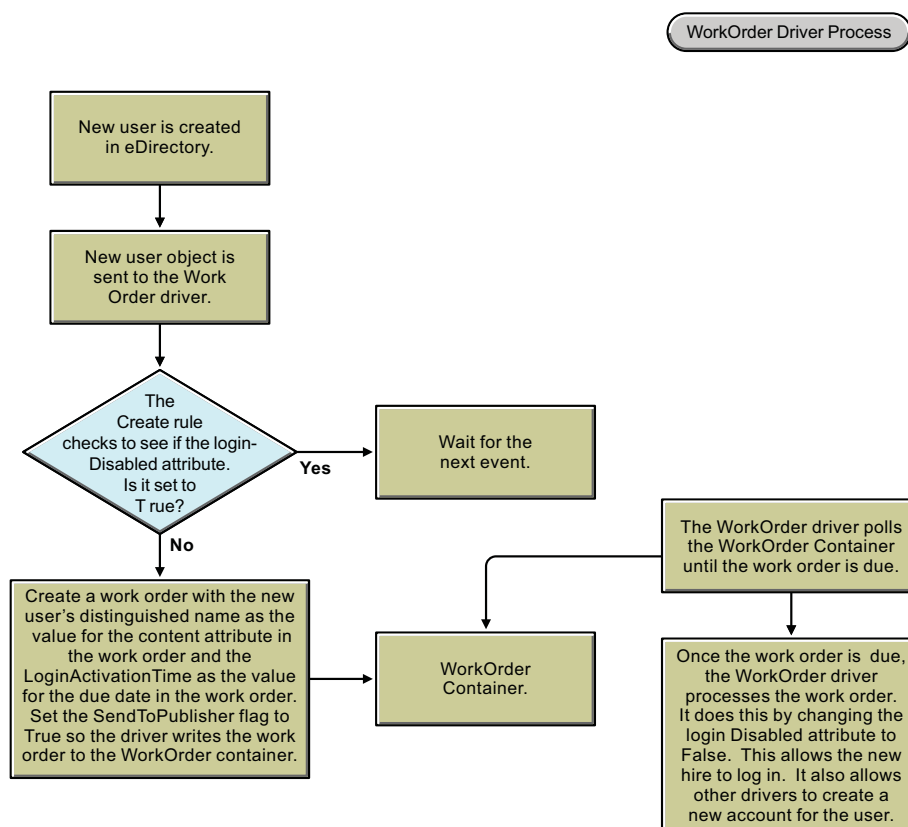
---

When `direct` is equal to `True`, the action is performed as desired, but the results are not returned to the driver. Therefore, the driver cannot correctly report the results of the write. You can view the sample at [hr-wo-drv-pub-cmd-transform.xml](http://www.novell.com/documentation/idm40drivers/work_order/samples/hr-wo-drv-pub-cmd-transform.xml) ([http://www.novell.com/documentation/idm40drivers/work\\_order/samples/hr-wo-drv-pub-cmd-transform.xml](http://www.novell.com/documentation/idm40drivers/work_order/samples/hr-wo-drv-pub-cmd-transform.xml)).

## Human Resource Example without an HR Driver

This example creates a new user and postpones activating the new employee's access to the system until the hire date by putting policies into the WorkOrder driver to create the work order. [Figure 6-2](#) illustrates this sample configuration.

*Figure 6-2 Data Flow without an HR Driver*



When a new user object is created in the Identity Vault, a policy in the WorkOrder driver checks to see if the `loginDisabled` attribute is set to `True`. If it is not set to `True`, the Create rule blocks the event. If it is set to `True`, the policy creates a work order to set the `loginDisabled` attribute on the user to `False` on the `loginActivationTime`.

The following policies or rules show how to implement the sample configuration:

- ◆ "Filter Additions" on page 36
- ◆ "Subscriber Create Rule" on page 36

- ♦ “Subscriber Command Transform” on page 36
- ♦ “Work Order E-Mail Notification of Work Order Completion” on page 36

## Filter Additions

These additions modify the filter to allow user objects with `loginActivationTime` and `loginDisabled` attributes to synchronize on the Subscriber channel. You can view the sample at [wo-filter.xml](http://www.novell.com/documentation/idm40drivers/work_order/samples/wo-filter.xml) ([http://www.novell.com/documentation/idm40drivers/work\\_order/samples/wo-filter.xml](http://www.novell.com/documentation/idm40drivers/work_order/samples/wo-filter.xml)).

## Subscriber Create Rule

The Create rule vetoes this event if the `loginActivationTime` or the `loginDisabled` attributes are not present. It also vetoes this event if the `loginDisabled` attribute is set to `False`. You can view the sample at [wo-create.xml](http://www.novell.com/documentation/idm40drivers/work_order/samples/wo-create.xml) ([http://www.novell.com/documentation/idm40drivers/work\\_order/samples/wo-create.xml](http://www.novell.com/documentation/idm40drivers/work_order/samples/wo-create.xml)).

## Subscriber Command Transform

This policy checks to see if the event is an Add of a user object. If that is true, the policy creates a `WorkOrder` object. The DN of the user object is added to the `DirXML-nwoContent` attribute. The `DirXML-DueDate` is set to the `loginActivationTime`. The `DirXML-nwoStatus` is set to `pending`. The `DirXML-nwoSendToPublisher` attribute is set to `True`.

This work order has not yet been created in the Identity Vault, so the sample configuration creates the work order in the Identity Vault by setting the `SendToPublisher` attribute to `True`. This tells the publisher in the `WorkOrder` driver to write the policy to the work order container that it looks in for work orders to be processed. You can view the sample at [wo-sub-cmd-transform.xml](http://www.novell.com/documentation/idm40drivers/work_order/samples/wo-sub-cmd-transform.xml) ([http://www.novell.com/documentation/idm40drivers/work\\_order/samples/wo-sub-cmd-transform.xml](http://www.novell.com/documentation/idm40drivers/work_order/samples/wo-sub-cmd-transform.xml)).

## Work Order E-Mail Notification of Work Order Completion

This policy can be used with the `WorkOrder` driver to send e-mail notification of a completed work order. This policy is in the `Publisher Command Transform`. The policy checks to see if a `DirXML-WorkOrder` modify event is happening. If it is, it builds an e-mail from the status, description, and process log of the work order and then sends it to an administrator. This notifies the administrator that a work order has been processed and gives them the results. You can view the sample at [wo-pub-cmd-transform.xml](http://www.novell.com/documentation/idm40drivers/work_order/samples/wo-pub-cmd-transform.xml) ([http://www.novell.com/documentation/idm40drivers/work\\_order/samples/wo-pub-cmd-transform.xml](http://www.novell.com/documentation/idm40drivers/work_order/samples/wo-pub-cmd-transform.xml)).

# 7 Creating and Managing Work Orders

There are two ways to create work orders.

- ♦ [“Using Drivers to Create Work Orders” on page 37](#)
- ♦ [“Using iManager to Create Work Orders” on page 37](#)

## Using Drivers to Create Work Orders


Identity Manager drivers can create work orders as a result of events processed by the drivers. For example, if you use a Human Resource driver (SAP, PeopleSoft, and so forth), you can have the driver generate a work order whenever a new user is added. [Chapter 6, “Customizing the Driver,” on page 31](#) provides examples of how to use a driver to create a work order.

## Using iManager to Create Work Orders

You can use iManager to manually create and maintain work orders:


- ♦ [“Creating a New Work Order” on page 37](#)
- ♦ [“Editing Work Order Properties” on page 37](#)
- ♦ [“Filtering the Work Order List” on page 39](#)

## Creating a New Work Order

- 1 In iManager, click  to display the Identity Manager Administration page.
- 2 In the **Features** list, click **Work Order Management** to display the Work Order Management page.
- 3 In the **WorkOrder Driver** field, browse for and select the WorkOrder driver for which you are creating the work order.
- 4 Click **New**, specify a name for the work order, then click **OK**.  
The name is used for the WorkOrder object’s name in the Identity Vault.
- 5 Fill in the fields on the WorkOrder page. For information about the fields, see the next section, [Editing Work Order Properties](#).

## Editing Work Order Properties

The Work Order page lets you configure a new work order or edit an existing work order.

- 1 If you are editing an existing work order and the WorkOrder page is not already open, open the Work Order page:
  - 1a In iManager, click  to display the Identity Manager Administration page.
  - 1b In the Features list, click **WorkOrder Management** to display the WorkOrder Management page.

**1c** In the **WorkOrder Driver** field, browse for and select the WorkOrder driver associated with the work order you want to edit.

After you select the appropriate WorkOrder driver, all work orders associated with the driver are listed.

**1d** Click the work order you want to edit.



**2** Fill in the following fields:

**Status:** The status of a new work order can be either **Pending** or **On Hold**. Normally, work order status is **Pending**. You can stop a work order by selecting **On Hold**. After a work order has been processed, the resulting work order status appears in this field.

**Due Date:** You can choose to have the driver do the work order immediately or schedule the work order. To schedule a due date, click the calendar icon. Use the calendar to choose the date. Use the arrows to select the month, year, and time.

**Repeat Work Order:** Select this option to have the work order processed multiple times. Specify the time interval by choosing the number of weeks, days, hours, or minutes before the work order is to be repeated. The work order stops repeating on the delete date unless it is manually deleted, edited, or the driver sends back an error message.

**Delete Date:** Use the calendar control to select a date to delete work orders that have been configured. Work orders with an error status are not deleted unless you select **Delete Work Order Even if the Work Order Has an Error**.

**Dependent Work Orders:** When you create a new work order, you can make it dependent on one or more work orders. Click  to browse for and select dependent work orders. To remove a work order from the list, select the work order, then click .

**Type:** Use this field to specify a work order type. The driver does not change this attribute. The attribute is passed through to the WorkToDo object when the work order is processed.

**Work Order Number:** A unique work order number. This value can be assigned by a corporate work order system other than NetIQ eDirectory, such as a work order database.

**Contact Information:** Contact information for the person responsible for the work order.

**Work Order Processing Log:** After a work order has been processed, the driver logs the results of the work order, including the status, in this field. This allows you to check the work order's current status and identify any problems the driver encountered while attempting to configure the work order.

The work order's status attribute remains pending until the work order is processed. The work order is processed when the due date has expired or the Do It Now flag is set. The driver reports the processing results by setting the status attribute to Configured, Warning, or Error. If the work order is On Hold, it ignores the work order.

- ◆ **Pending:** The driver is waiting for the due date to complete the work order.
- ◆ **Configured:** The work order has been successfully processed.
- ◆ **Error:** The driver was unable to perform the work order.
- ◆ **Warning:** There is a warning regarding the work order. For example, if the work order has a dependent work order with a later due date, the driver sends a warning.

**Description:** The work order description.

**Work Order Content:** The data in this field is used by the driver's rules to process the work order. For example, it might be the XML that the Command Transformation uses to process the work order.

**3** Select one of the following options when you are finished specifying or editing the work order properties:

- ◆ Click **Apply** to save the current information and continue working.

- ◆ Click **OK** to save and close the work order.
- ◆ Click **Cancel** to close the work order without saving the information.

## Filtering the Work Order List

1 Click **Show** under Work Order Management.

2 From the drop-down menu, select the filter type:

**Show all:** All work orders associated with the driver are listed.

**Configured:** Only configured work orders associated with the driver are listed.

**Error:** Only work orders with an error status are listed.

**On Hold:** Work orders that have been manually placed on hold are listed.

**Pending:** Work orders that are not yet due are listed.





# 8 Managing the Driver

As you work with the WorkOrder driver, there are a variety of management tasks you might need to perform, including the following:

- ◆ Starting and stopping the driver
- ◆ Viewing driver version information
- ◆ Using Named Passwords to securely store passwords associated with the driver
- ◆ Monitoring the driver's health status
- ◆ Backing up the driver
- ◆ Inspecting the driver's cache files
- ◆ Viewing the driver's statistics
- ◆ Using the DirXML Command Line utility to perform management tasks through scripts
- ◆ Securing the driver and its information

Because these tasks, as well as several others, are common to all Identity Manager drivers, they are included in one reference, the [NetIQ Identity Manager Driver Administration Guide](#).



# 9 Troubleshooting the Driver

Viewing driver processes is necessary to analyze unexpected behavior. To view the driver processing events, use DSTrace. You should only use it during testing and troubleshooting the driver. Running DSTrace while the drivers are in production increases the utilization on the Identity Manager server and can cause events to process very slowly. For more information, see [“Viewing Identity Manager Processes”](#) in the *NetIQ Identity Manager Driver Administration Guide*.



# A Driver Properties


This section provides information about the Driver Configuration and Global Configuration Values properties for the WorkOrder driver. These are the only unique properties for drivers. All other driver properties (Named Password, Engine Control Values, Log Level, and so forth) are common to all drivers. Refer to “[Driver Properties](#)” in the *NetIQ Identity Manager Driver Administration Guide* for information about the common properties.

The information is presented from the viewpoint of iManager. If a field is different in Designer, it is marked with a Designer icon.

- ♦ “[Driver Configuration](#)” on page 45
- ♦ “[Global Configuration Values](#)” on page 48

## Driver Configuration

In iManager:

- 1 Click  to display the Identity Manager Administration page.
- 2 Open the driver set that contains the driver whose properties you want to edit:
  - 2a In the **Administration** list, click **Identity Manager Overview**.
  - 2b If the driver set is not listed on the **Driver Sets** tab, use the **Search In** field to search for and display the driver set.
  - 2c Click the driver set to open the Driver Set Overview page.
- 3 Locate the WorkOrder driver icon, then click the upper right corner of the driver icon to display the **Actions** menu.
- 4 Click **Edit Properties** to display the driver’s properties page.

By default, the Driver Configuration page is displayed.

In Designer:

- 1 Open a project in the Modeler.
- 2 Right-click the driver icon or line, then select click **Properties > Driver Configuration**.

The Driver Configuration options are divided into the following sections:

- ♦ “[Driver Module](#)” on page 46
- ♦ “[Driver Object Password \(iManager Only\)](#)” on page 46
- ♦ “[Authentication](#)” on page 46
- ♦ “[Startup Options](#)” on page 47
- ♦ “[Driver Parameters](#)” on page 47
- ♦ “[ECMAScript](#)” on page 48
- ♦ “[Global Configuration](#)” on page 48

## Driver Module

The driver module changes the driver from running locally to running remotely or the reverse.

**Java:** Used to specify the name of the Java class that is instantiated for the shim component of the driver. This class can be located in the `classes` directory as a class file, or in the `lib` directory as a `.jar` file. If this option is selected, the driver is running locally.

The java class name is:

```
com.novell.nds.dirxml.driver.workorder.WorkOrderDriverShim
```

**Native:** This option is not used with the WorkOrder driver.

**Connect to Remote Loader:** Used when the driver is connecting remotely to the connected system. Designer includes two suboptions:

- ◆ **Remote Loader Client Configuration for Documentation:** Includes information on the Remote Loader client configuration when Designer generates documentation for the driver.
- ◆ **Driver Object Password:** Specifies a password for the Driver object. If you are using the Remote Loader, you must enter a password on this page. Otherwise, the remote driver does not run. The Remote Loader uses this password to authenticate itself to the remote driver shim.

## Driver Object Password (iManager Only)

**Driver Object Password:** Use this option to set a password for the driver object. If you are using the Remote Loader, you must enter a password on this page or the remote driver does not run. This password is used by the Remote Loader to authenticate itself to the remote driver shim.

## Authentication

The authentication section stores the information required to authenticate to the connected system.

**Authentication ID:** Specify a user application ID. This ID is used to pass Identity Vault subscription information to the application.

Example: `Administrator`

**Authentication Context:** Specify the IP address or name of the server the application shim should communicate with.

**Remote Loader Connection Parameters:** Used only if the driver is connecting to the application through the Remote Loader. The parameter to enter is `hostname=xxx.xxx.xxx.xxx port=xxxx kmo=certificatename`, when the host name is the IP address of the application server running the Remote Loader server and the port is the port the Remote Loader is listening on. The default port for the Remote Loader is 8090.

The `kmo` entry is optional. It is only used when there is an SSL connection between the Remote Loader and the Identity Manager engine.

Example: `hostname=10.0.0.1 port=8090 kmo=IDMCertificate`

**Application Password:** Specify the password for the user object listed in the **Authentication ID** field.

**Remote Loader Password:** Used only if the driver is connecting to the application through the Remote Loader. The password is used to control access to the Remote Loader instance. It must be the same password specified during the configuration of the Remote Loader on the connected system.

**Cache limit (KB):** Specify the maximum event cache file size (in KB). If it is set to zero, the file size is unlimited.

Click **Unlimited** to set the file size to unlimited in Designer.

## Startup Options

The Startup Option section allows you to set the driver state when the Identity Manager server is started.

**Auto start:** The driver starts every time the Identity Manager server is started.

**Manual:** The driver does not start when the Identity Manager server is started. The driver must be started through Designer or iManager.

**Disabled:** The driver has a cache file that stores all of the events. When the driver is set to Disabled, this file is deleted and no new events are stored in the file until the driver state is changed to Manual or Auto Start.

**Do not automatically synchronize the driver:** This option only applies if the driver is deployed and was previously disabled. If this is not selected, the driver re-synchronizes the next time it is started.

## Driver Parameters

The Driver Parameters section lets you configure the driver-specific parameters. When you change driver parameters, you tune driver behavior to align with your network environment. For example, you might find the polling interval to be shorter than you need. Making the interval longer could improve network performance while still maintaining your performance expectations for work order processing.

**Driver Name:** The actual name you want to use for the driver.

**WorkOrders Container:** The name of the container where WorkOrder objects and WorkToDo objects are to be stored.

**Poll Interval:** How often the Publisher channel polls the WorkOrder container for work orders to be configured. The default is one minute. You can use this setting, not use this setting, or use it with the Poll Time setting. If you don't want to use this setting, leave the field empty.

**Poll Time:** Time of day the Publisher channel checks the WorkOrder container for work orders to be configured. By default, this setting is disabled (**No poll time**) so that only the Poll Interval setting is used. However, you can use this setting instead of the Poll Interval setting, or you can use it with the Poll Interval setting.

The poll times are available in half-hour increments. If you need a more granular poll time (for example, 1:15 PM rather than 1:00 PM or 1:30 PM), click the **Edit XML** button, locate the `<definition display-name="Poll Time" id="112" name="polling-time" type="enum">` entry, and change the type from `enum` to `string`. Click **OK** to save the change, then enter the desired time in the Poll Time field. Use the `HH:MM AM/PM` format (for example, 1:15 PM).

**Publisher Heartbeat every Poll Interval:** Specifies if the Publisher should emit heartbeat documents. The driver emits heartbeat documents to indicate to the Identity Manager engine that the driver is still functioning.

If you don't use the Poll Interval setting, this setting is automatically disabled.

## ECMAScript

Enables you to add ECMAScript resource files. The resources extend the driver's functionality when Identity Manager starts the driver.

## Global Configuration

Displays an ordered list of Global Configuration objects. The objects contain extension GCV definitions for the driver that Identity Manager loads when the driver is started. You can add or remove the Global Configuration objects, and you can change the order in which the objects are executed.

## Global Configuration Values


Global configuration values (GCVs) are values that can be used by the driver to control functionality. GCVs are defined on the driver or on the driver set. Driver set GCVs can be used by all drivers in the driver set. Driver GCVs can be used only by the driver on which they are defined.

The WorkOrder driver includes one predefined GCV:

**WorkOrder Container:** This is the WorkOrder container that is specified by the **WorkOrder Container** setting on the Driver Configuration page. You can change the setting on the Driver Configuration page or on the GCV page.

The GCV is included as a driver set GCV (not a driver GCV) so that it can be used by other drivers as they create work orders to be placed in the WorkOrder container.


To modify the driver's GCVs in iManager:

- 1 Click  to display the Identity Manager Administration page.
- 2 Open the driver set that contains the driver whose properties you want to edit.
  - 2a In the **Administration** list, click **Identity Manager Overview**.
  - 2b If the driver set is not listed on the **Driver Sets** tab, use the **Search In** field to search for and display the driver set.
  - 2c Click the driver set to open the Driver Set Overview page.
- 3 To add a GCV to the WorkOrder driver, locate the WorkOrder driver icon, click the upper right corner of the driver icon to display the **Actions** menu, then click **Edit Properties**.

or

To add a GCV to the driver set, click **Driver Set**, then click **Edit Driver Set properties**.

To modify the driver's GCVs in Designer:

- 1 Open a project in the Modeler.
- 2 To add a GCV to the WorkOrder driver, right-click the driver icon  or line, then select **Properties > Global Configuration Values**.

or

To add a GCV to the driver set, right-click the driver set icon , then click **Properties > GCVs**.



# B Objects and Attributes

This section reviews the new objects and attributes used by the driver.

- ♦ [“New Objects Used by the Driver” on page 49](#)
- ♦ [“DoltNow and SendToPublisher Flags” on page 49](#)

## New Objects Used by the Driver

The Identity Manager WorkOrder driver uses two new object classes in the Identity Vault to configure work orders and record the results. For a description of a schema for these objects, see [Appendix C, “Schema and Policy Rules For Work Order Management,” on page 51](#).

- ♦ [“DirXML-WorkOrder Object” on page 49](#)
- ♦ [“DirXML-WorkToDo Object” on page 49](#)

### DirXML-WorkOrder Object

The DirXML-WorkOrder object delays the work order to be processed until the scheduled date and time or until a dependent work order is configured. The driver also repeats work orders if the work order has a repeating interval.

If the work order is marked DoltNow, the driver performs it immediately and does not wait for a polling time or time of day. To learn how to use the DoltNow and SendToPublisher flags, see [“DoltNow and SendToPublisher Flags” on page 49](#).

An iManager plug-in is provided to help you create and maintain work orders. To learn how to use the plug-in, see [Chapter 7, “Creating and Managing Work Orders,” on page 37](#).

### DirXML-WorkToDo Object

The driver creates this object and writes it to the Identity Vault to process the work order. The value of the WorkOrder Content attribute becomes the value of the DirXML-WorkToDo Content attribute. The driver sends this object to the Identity Vault, returns the status of the work order (Configured, Error, etc.), and writes it in the ProcessLog attribute. Any results or information available to the driver is recorded in the ProcessLog.

If the work order has a repeat attribute, the work order gets a new due date with the interval added and the status remains pending, allowing it to be processed again on the new due date.

## DoltNow and SendToPublisher Flags

The WorkOrder driver has two flags to initiate a work order event.

- ♦ [“DoltNow Flag” on page 50](#)
- ♦ [“SendToPublisherFlag” on page 50](#)

## **DoltNow Flag**

When this flag is set to True, the Subscriber channel wakes up the Publisher channel by sending the work order to the Publisher channel. This allows the Publisher channel to perform the work order immediately instead of waiting for the next polling time or polling interval.

Use this flag when you want the work order completed immediately. You can set this flag to True when you manually create a work order, or you can use policies in an automated solution to determine whether the flag should be set.

## **SendToPublisherFlag**

When this flag is set to True for a work order, the Subscriber channel sends the work order to the Publisher channel and the Publisher channel writes the WorkOrder object to the WorkOrder container specified in the configuration parameters.

This flag is usually set to False. However, if a work order is initiated by a policy in response to an event in the Identity Vault, setting the flag to True enables the WorkOrder driver to create the WorkOrder object and add it to the Identity Vault's work order container. The WorkOrder object can then be processed like any other WorkOrder object added to the container by another driver.



# Schema and Policy Rules For Work Order Management

As part of the installation of the WorkOrder driver, NetIQ eDirectory is extended to include two new object classes. These objects allow the driver to connect to the Identity Vault correctly, perform work orders, and create a process log with the work order status.

You can use iManager to create or view these objects in the Identity Vault. See [Chapter 6, “Customizing the Driver,”](#) on page 31.

- ◆ [“DirXML-WorkOrder Object”](#) on page 51
- ◆ [“DirXML-WorkToDo Object”](#) on page 53
- ◆ [“Publisher Placement Rule”](#) on page 54
- ◆ [“Subscriber Placement Rule”](#) on page 54
- ◆ [“Subscriber Create Rule”](#) on page 54

## DirXML-WorkOrder Object

The DirXML-WorkOrder object (sometimes referred to as the WorkOrder object in this documentation) is used to tell the driver what tasks to perform. It delays the work order until a date and time or until another work order is configured. It also repeats work orders at a given interval.

The following table shows the work order attributes you need to specify:

Work Order Attributes (eDirectory Namespace)	Description	Type
Description	Description of the work order. The driver does not change this attribute. It is passed through to the WorkToDo object when the work order is processed.	Case ignore string
Common Name	The naming attribute for eDirectory	Case ignore string
DirXML-nwoContact Name	Information about the work order. The driver does not change this attribute. It is passed through to the WorkToDo object when the work order is processed.	Case ignore string
DirXML-nwoContent	This attribute is passed through to the WorkToDo object. It is used by policies to process the work order.	Case ignore string
DirXML-DueDate	The date and time the work order is to be processed.	Time
DirXML-nwoDoltNowFlag	If this attribute is set to True, the Subscriber channel sends the work order to the Publisher channel to be processed immediately.	Boolean

<b>Work Order Attributes (eDirectory Namespace)</b>	<b>Description</b>	<b>Type</b>
DirXML-nwoSendToPublisher	If this attribute is set to True, the Subscriber channel sends the work order to the Publisher channel to be written to the WorkOrder container. For example, if the work order was created by a policy as a result of an event in the Identity Vault.	Boolean
DirXML-woType	Information about the work order. The driver does not change this attribute. It is passed through to the WorkToDo object when the work order is processed.	User defined
DirXML-nwoCreationDate	Information about the work order. The driver does not change this attribute.	Time
DirXML-nwoDependentWorkOrder	The DN of the dependent work order. The work order is not processed until the dependent work order has a status of Configured. If the attribute is nonexistent or empty, it is ignored.	Distinguished Name
DirXML-nwoRepeatInterval	The amount of time, in minutes, before the work order is repeated. This value is added to the due date after the work order is processed.	Case ignore string
DirXML-nwoRepeatCount	Repeats the work order as many times as the number specifies. Use this attribute in association with the DirXML-nwoRepeatInterval attribute.	Case ignore string
DirXML-nwoStatus	Status of the work order.  Pending: The work order will be processed on the due date.  Configured: The work order was processed.  Error: An error occurred when processing.  On Hold: The work order is not to be processed.	Case ignore string
DirXML-nwoWorkOrderNumber	Information about the work order. The driver does not change this attribute. It is passed through to the WorkToDo object when the work order is processed.	Case ignore string
DirXML-nwoDeleteOnError	If this attribute is set to True, the work order is deleted if the status is Error and the DeleteDueDate has expired.	Boolean
DirXML-nwoProcessLog	Contains information relating to the processing of the work order.	Case ignore string
DirXML-nwoDeleteDueDate	If the status is Pending or Configured, this attribute shows the date and time the work order will be deleted.	Time

<b>Work Order Attributes (eDirectory Namespace)</b>	<b>Description</b>	<b>Type</b>
DirXML-CreatorName	Information about the work order. The driver does not change this attribute. It is passed through to the WorkToDo object when the work order is processed.	Distinguished Name
DirXML-Other1	Information about the work order. The driver does not change this attribute. It is passed through to the WorkToDo object when the work order is processed.	Case ignore string
DirXML-Other2	Information about the work order. The driver does not change this attribute. It is passed through to the WorkToDo object when the work order is processed.	Case ignore string

## DirXML-WorkToDo Object

The DirXML-WorkToDo object is created by the driver to attempt processing. It is used by the policy to process the work to be done. All attributes in this object get their values from the WorkOrder object that initiated this object.

<b>WorkToDo Attributes</b>	<b>Description</b>	<b>Type</b>
DirXML-CreatorName	Information about the work order. The driver does not change this attribute.	Case ignore string
DirXML-nwoContent	The value of the content attribute in the work order.	Case ignore string
DirXML-nwoDN	DN of the work order.	Distinguished Name
Description	Information about the work order. The driver does not change this attribute.	Case ignore string
DirXML-nwoContactName	Information about the work order. The driver does not change this attribute.	Case ignore string
DirXML-nwoWorkOrderNumber	Information about the work order. The driver does not change this attribute.	Case ignore string
DirXML-woType	Information about the work order. The driver does not change this attribute.	Case ignore string
DirXML-Other1	Information about the work order. The driver does not change this attribute.	Case ignore string
DirXML-Other2	Information about the work order. The driver does not change this attribute.	Case ignore string

## Publisher Placement Rule

The Publisher Placement rule determines where the work orders are placed in the Identity Vault after they are processed. These containers might be the same or different, depending on how you choose to set up your customized driver. For example, you could have work orders stored in containers depending on the returned status, such as Configured, Error, Warning, or On Hold.

## Subscriber Placement Rule

The Subscriber Placement rule determines the container that work orders are created in and sent to the WorkOrder driver.

## Subscriber Create Rule

To create a work order, the Subscriber Create rule is set up so all new work orders with the necessary information can be sent to the Subscriber channel. The following attributes must be present to pass the Create rule, or the event cannot be processed further:

Required Attributes	Description	Values or Examples
DirXML-nwoSendToPublisher	Send the work order directly to the Publisher channel.	True or False
DirXML-nwoStatus	State of the work order so the driver knows what to do with the work order.	Pending, Configured, Error, On Hold, Warning
DirXML-nwoDoItNowFlag	When to perform the work order.	True or False
DirXML-nwoContent	Content to be processed by the driver.	XML code
DirXML-woType	Information about the work order. The driver does not change this attribute.	Case ignore string