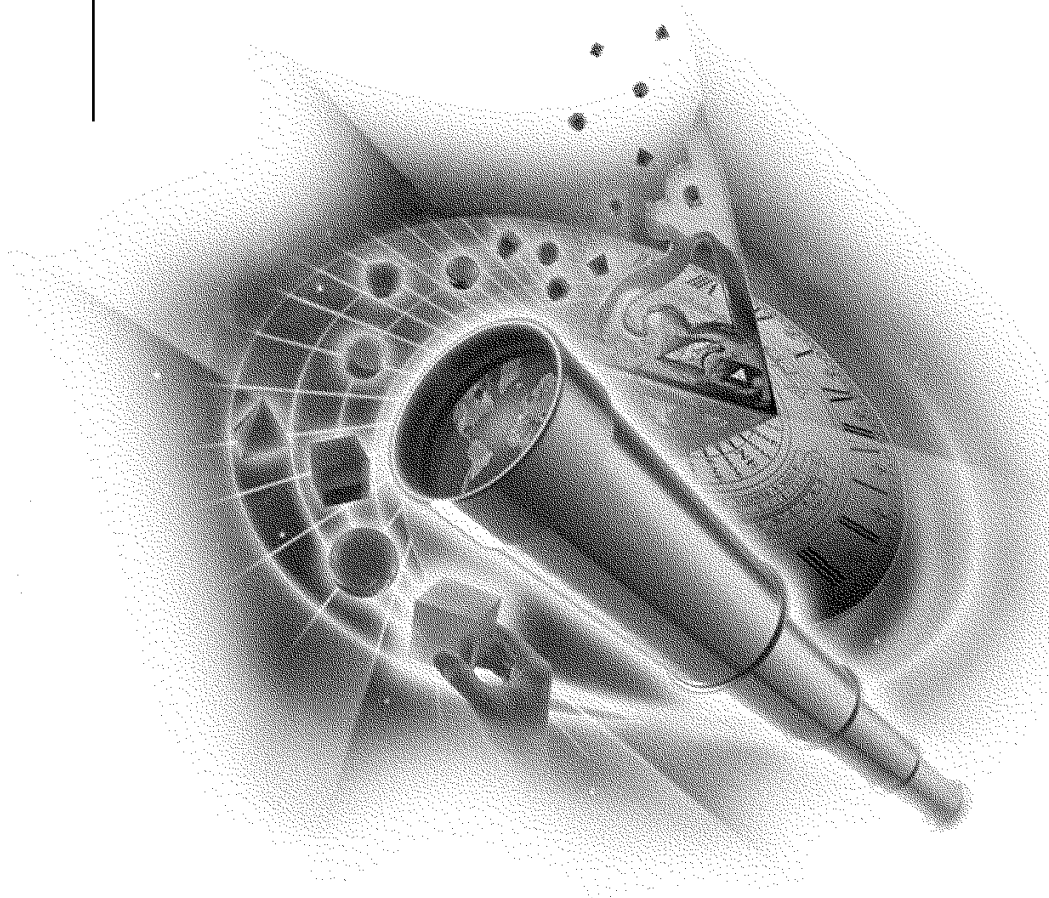


Catalog Services



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Catalog Services

Catalog Services allows administrators and applications to rapidly access NDS™ objects by combining them into user-defined catalogs. Catalogs allow you to access Directory information without "walking" the NDS tree.

1

Understanding

This section provides an overview of why you would use Catalog Services, what components the product consists of, and examples of how you would use it.

Overview of Catalog Services

Catalog Services lets administrators and applications create catalogs of frequently accessed NDS™ objects. A catalog is a flatfile database that contains a snapshot of information from the NDS database. A catalog can contain information from an entire NDS tree or a portion of the tree. For example, you can create a catalog of all users with their complete names and their telephone numbers. The catalog is stored as an NDS object and provides rapid access to selected Directory data. Catalog objects are created, used, and managed using NWAdmin. The user can update the catalogs as needed or schedule periodic, automatic updates.

The two main purposes of Catalog Services are to provide

- ♦ Faster access to information in the NDS database

Without Catalog Services, the user has to 'walk' the hierarchical NDS tree to find an object in the NDS database. Catalog Services speeds up access, especially for information located across WAN links, because it puts a representation of that object into the local catalog. You can specify the criteria used to include objects in the catalog.

- ♦ Enhanced search capabilities through a query language for the catalog

You can query (search) the catalog for specific information, such as a user's given name or access control list (ACL.)

Catalog Services consists of these components:

- ♦ `dscat.nlm`: This NetWare® Loadable Module™ (NLM™) is installed and loaded during the NetWare server installation. It contains the dredger that searches the NDS database for the objects and properties to include in the catalog.
- ♦ `dscqry16.dll` or `dscqry32.dll`: These DLLs are the query engines (16-bit or 32-bit) that the NetWare Administrator snap-in (or other applications) uses to query the directory.
- ♦ NetWare Administrator snap-in (`dscatmgr.dll`): Provides an interface to Catalog Services through NetWare Administrator. It lets you create, modify, query, index, and delete Catalog objects.

Understanding Catalogs

A catalog is an NDS object that stores information from the NDS database. The catalog stores only objects and properties that you specify and lets you find information about those objects without a time-consuming search of the entire Directory.

Catalogs are especially useful in networks where some NDS objects might only be accessible across WAN links, because searching the NDS Directory across those links consumes time and network bandwidth. You could, for example, build a catalog of your company's employees and their telephone numbers.

Some applications create their own catalogs. For example, Novell's Contextless Login creates a catalog of users' common names and their telephone numbers.

The catalog is stored as an NDS object, the Catalog object. To create a catalog, a User must have the following minimum rights:

- ♦ The Supervisor file right to the server that holds the dredger NLM
- ♦ The Write right to the Catalog List property of the NetWare Server object

You can refresh (update) the catalog manually or at scheduled intervals. Refreshing the catalog means that the dredger searches the NDS database for any information pertaining to a specific catalog, such as added users, changed telephone numbers, etc. and updates the catalog with this new information.

For each catalog, you create a master catalog. You can also create one or more slave catalogs. The relationship between master and slave catalogs is similar

to the one between NDS partitions and replicas. The slave catalog is a copy of the master catalog. The master catalog receives its information from the dredger and then replicates this information to the slave catalogs. The advantage of the master/slave model is that the catalog dredger, which takes up valuable network bandwidth, has to dredge (search) in only one place.

Querying and indexing a catalog lets you retrieve information from it.

Understanding the Catalog Dredger

The Catalog dredger (dscat.nlm) is a search engine that dredges (searches) an NDS database for user-specified NDS objects and their properties and puts these in a catalog. The dredger is installed and during the NetWare server installation, under Other Products. You must then load the dredger NLM by typing

```
load dscat
```

at the NetWare server console.

One dredger can serve multiple catalogs. You can initiate dredges manually, or you can schedule them to be performed automatically.

The NetWare server object has a list of the catalogs for which the dredger is responsible.

Understanding Catalog Queries and Indexes

Querying a catalog lets you extract information from the catalog. You can either look at the whole catalog, or you can index the catalog.

Indexing a catalog is similar to indexing a book: It speeds up the lookup of discrete terms.

When querying a catalog, you can refine the query by only looking for certain things in the catalog. This is called indexing the catalog. For example, if your catalog encompasses all the phone numbers of your company's employees, you could index the query (search) such that the dredger would only look for one phone number or a select group of phone numbers.

Understanding Labels

A label lets you further identify the catalog. You label a catalog when you create it. Applications and administrators can use the label to identify which catalog to use. Several applications can share the same catalog.

You have to use both the primary and the secondary label. How you label a catalog is up to you. For example, for a primary label, you can use your company name or your department (if it's a department-specific catalog). The secondary label can be anything that further distinguishes this catalog from another one.

WARNING: Some labels are created by the application with which they are associated. You should not modify these labels, as the application uses them to find out which catalog to use.

Catalogs and Applications

Several Novell applications, such as Contextless Login, LDAP Services for NDS, and Novell® Licensing Services use Catalog Services to speed up their Directory searches. They create their own catalogs.

Contextless Login, for example, includes in its catalog the User objects, their telephone numbers, and their Given Names. LDAP includes, among other things, users' common names (CN) and their Internet e-mail addresses.

WARNING: Do not modify catalogs that are created by applications. Doing so may negatively affect the application's operation.

If a catalog was created by an application, the application might have created a label that identifies it as belonging to the application.

The application can designate its catalog as being updated (refreshed) automatically.

An application has to be Novell Catalog Services-enabled to generate catalogs. (Catalog Services APIs are part of the Novell SDK.)

2

Setting Up

Read this section to find out about installing Catalog Services. It also contains procedures on how to create and modify a catalog.

Install and Load Catalog Services

Purpose

Catalog Services is installed as part of the NetWare[®] server installation. There is currently no separate client installation program.

NOTE: The NDS[™] schema is modified automatically when Catalog Services is installed.

Install and Load Catalog Services during the Initial NetWare Server Installation

You install Catalog Services when you install Other Products during the NetWare server installation. When you get to the Other Products screen, just check the box next to Catalog Services.

After the installation is complete, you need to load the Catalog Services NLM[™] (the dredger). Type **load dscat** at the NetWare server console.

Install and Load Catalog Services after the Initial NetWare Server Installation

If Catalog Services was *not* installed during the initial NetWare server installation, follow these steps to install it:

- 1** At the NetWare server console, type
Load nwconfig
- 2** Choose Product Options.
- 3** Choose Install a Product Not Listed.
- 4** Choose Specify a Different Path.
- 5** Enter the path to the CD image location of the install subdirectory. For example, if the NetWare 5 server CD was mounted as volume test on server gold, type gold/test:install.

After the files are copied, the NetWare 5 GUI installation screen appears.

- 6** In the Other Products and Services screen, check the box next to NDS Catalog Services. Click OK.
- 7** The following summary screen shows NDS Catalog Services under Products to Be Installed. Click Finish.
- 8** After the files have been copied, click No when asked whether you want to reboot the server.
- 9** If you want to install other products, proceed doing so. If not, exit nwconfig.
- 10** After the installation is complete, you need to load the Catalog Services NLM. Type **load dscat** at the NetWare server console.

Install the NetWare Administrator Snap-in

The Catalog Services NetWare Administrator snap-in is installed automatically. All you need to do is launch NetWare Administrator from sys:public/win32.

The next step is to create Catalog objects.

Create a Master Catalog

Purpose

When you create a master catalog, you create a place to store information extracted from the Directory database. The catalog stores only the objects and attributes you specify and lets you find information about those objects without a time-consuming search of the entire Directory. The master catalog receives updates from the catalog dredger (search engine) and distributes this information to any existing slave catalogs.

Create a Catalog

- 1** Launch NetWare Administrator and choose the container in which you want to create the Catalog object.
- 2** Right-click and choose Create.
- 3** Choose the NDSCat:Master Catalog object icon and click OK.
- 4** In the Create Catalog dialog, specify the Catalog name, check Define Additional Attributes, and then click Create.
- 5** Choose a host server. The host server hosts the catalog dredger that populates and updates this master catalog.

Type in the server's Complete Name (for example, bigserver.sales.novell). If you don't remember it, you can browse the tree to find the server by clicking the button next to the host server field.
- 6** Make the Catalog object security equivalent to another object so that the catalog has rights to browse the tree.
- 7** Click the button next to the Security Equals field to select the object.
- 8** (Optional) Enter a description, location, department, and organization for the master catalog.
- 9** Label the catalog. You need to enter both a primary and a secondary label.
- 10** Click Filter, and then enter a statement in the Filter box.
- 11** Define the scope of the catalog.
 - 11a** Choose or enter the context limits for the search.
 - 11b** Specify how deep the search is to go by choosing Search Subtree or Search Immediate Subordinates.
 - 11c** If you want the search to include aliases, check Search Aliases.

- 12** Click Schedule to specify when the catalog should be updated.
 - 12a** Choose whether to update the catalog manually or automatically.
 - 12b** If you chose Manual, click Update Now.
 - 12c** If you chose Automatic, fill in the Frequency, Start Time, and Start Date.
- 13** Click Attributes / Indexes and then choose All Attributes or Selected Attributes.
- 14** If you chose Selected Attributes, now click Select Attributes.
 - 14a** Choose attributes from the Available column.
 - 14b** Click Add.
 - 14c** Click OK.
- 15** Click Select Indexes to specify the attribute by which the catalog is to be indexed.
 - 15a** Choose attributes from the Available column.
 - 15b** Click Add.
 - 15c** Click OK; then Click OK again.

Create a Slave Catalog

Purpose

When you create a slave catalog, you create a copy of the master catalog. The master catalog receives updates from the dredger and sends these updates to the slaves. Slave catalogs are especially useful in Wide Area Networks. You could create a master catalog at a company's headquarters and replicate that information to remote sites.

Create a Slave Catalog

- 1** Launch NetWare Administrator and choose the container in which you want to create the slave Catalog object.
- 2** Right-click and choose Create.

- 3 Choose the NDSCat:Slave Catalog object icon and click OK.

If the NDSCat:Slave Catalog object class is missing from the list, make sure you have installed the Catalog Services snap-in and thereby modified the NDS schema.

- 4 In the Create Catalog dialog, specify the Catalog name, check Define additional attributes, and then click Create.

NOTE: You need to give the slave catalog a different name than the master catalog.

- 5 To further identify the catalog, fill out the identification page according to the help screen.

Add a Slave Catalog to a Master Catalog

Before you can add a slave catalog to a master catalog, you need to have created a slave catalog. 'Adding' it means that the master catalog will update this slave catalog as soon as the master catalog gets updated by the dredger.

Add a Slave Catalog to a Master Catalog

- 1 Launch NetWare Administrator and go to the context where the master catalog is located.
- 2 Double-click the master catalog's object icon.
- 3 Click the Slave Catalogs property page, and then click the Add button.
- 4 In the Select Object Dialog, go to the context where the slave catalog is located. If the catalog is not in the current context, click Change Context..., or traverse the tree by opening and closing containers in the Context box.
- 5 Double-click the slave object's icon.

This catalog now appears as a slave catalog to the master catalog.

Assign Rights to the Catalog Object

The dredger NLM logs in to NDS as the Catalog object for which it is responsible. In order for the dredger to be able to find the objects and attributes, the Catalog object needs Browse and Read rights to those objects and attributes. You can assign rights to the catalog object in two ways.

Make the Catalog Object Security Equivalent to another Object

By doing this during Catalog creation, the Catalog object inherits the rights of another object that it is made security equivalent to. You can make the Catalog object security equivalent to your own User object or to any other object that you have rights to.

Make the Catalog a Trustee of the Containers that You Want the Dredger to Search

NOTE: To use this method, you need Admin rights to all areas that the dredger is supposed to browse.

- 1** In NetWare Administrator, right-click the container where the catalog requires rights. For example, if the catalog is supposed to contain all User objects in the context sales.novell, click the Sales container.
- 2** Click Trustees of This Object.
- 3** Click Add Trustee.
- 4** Double-click the Catalog object that you want to make a trustee of the Sales container. If you need to change the context to find the catalog, click Change Context and fill in the context, or traverse the tree by opening or closing containers in the Context box.
- 5** If they are not already checked as the default, check the Browse object right and the Read property right.
- 6** Click OK.

Modify a Catalog

You can modify a catalog to add or remove categories of information. You can modify the scope of the catalog, the selection criteria, or both.

For example, if you have a catalog of a company division's users and their telephone numbers, you could modify the scope of the catalog to include the whole company, not just a division. You could also include users' fax numbers as a selection criterion. Depending on the urgency of a catalog refresh, you could then choose to manually update (refresh) the catalog.

WARNING: Modifying a catalog that was created by an application may negatively affect the application.

3

Managing

Read this section to find out more about when and how you should update a catalog, how you can search (query) a catalog for needed information, and when (and when not) to delete catalogs.

Update a Catalog

A catalog provides a snapshot of certain information in the NDS™ database at a certain time. For the master catalog to reflect changes in the database, it must be updated. You can update the master catalog manually at any time, or you can specify that the catalog be updated automatically at a specific interval.

The default setting for refreshes is 'daily.' The frequency of refreshes depends on the circumstances. For example, during a conference (such as Novell's BrainShare™) where users are added to the system frequently, you can schedule an hourly refresh. Or, if a group of engineers moves to a different building, you can do a manual update to refresh their location information (if this is part of the catalog).

Update the Catalog Manually

- 1** Launch the NetWare Administrator and choose NDS Browser from the Tools menu.
- 2** Specify the context of the master catalog you want to update.
- 3** Right-click the Catalog object icon.
- 4** Choose Details > Schedule.
- 5** In Update, choose Manual. (This is the default setting.)
- 6** Click Update Now.

Set the Catalog to Be Updated Automatically

- 1** Launch the NetWare Administrator and choose NDS Browser from the Tools menu.
- 2** Specify the context of the master catalog you want to update.
- 3** Right-click the Catalog object icon.
- 4** Choose Details > Schedule.
- 5** In Update, choose Automatic.
- 6** In Frequency, choose the number of minutes, hours, or days you want between updates.
- 7** In Start Time, enter the hour and minute you want automatic update to begin.
- 8** In Start Date, enter the month, day, and year you want automatic update to begin.

Query a Catalog

Querying a master catalog allows you to retrieve part or all of the information in the catalog.

Query a Catalog

- 1** From NetWare Administrator, choose Tools > Query Catalog.
- 2** Enter the name of the master catalog you want to query, or click the icon to the right of the Catalog box to browse for and choose a catalog.
- 3** In the Indexed By box, indicate whether you want your query results indexed by object name, canonical name, or base class.
- 4** In the Attribute Names box, indicate the name of the attributes from which data is to be retrieved.

To add attributes to or remove attributes from this list, click Select Attributes.
- 5** Enter additional information in the Where box if you want to further limit the data to be retrieved.
- 6** Click Query.

The Query Results window displays the retrieved data.

Delete a Catalog

You can delete a catalog you no longer use. When you delete a catalog, you remove the Catalog object from NDS™. Don't delete catalogs that were created by applications (unless you also remove the application).

You can delete a master catalog without deleting its associated slave catalogs, but the slave catalogs will no longer be updated.

Delete a Catalog

- 1** Launch NetWare Administrator and choose the catalog you want to delete.
- 2** Choose Object > Delete > Yes.

View Catalogs Assigned to a Dredger

The dredger NLM™ runs on the server on which it was installed. You can view the catalogs for which the dredger is responsible. When you create a master catalog, you specify a host server. The dredger residing on this host server is responsible for updating the master catalogs that have specified this NetWare server as their host server.

View Catalogs Assigned to a Dredger

- 1** Launch NetWare Administrator and click the NetWare Server object.
- 2** Click the Catalog Dredger Page.

You can see a list of assigned catalogs.

4 Troubleshooting

This section gives you troubleshooting information for NDS Catalog Services

Read the Log File

The log file details error log information.

Read the Log File

- 1** Launch NetWare Administrator and choose the container that holds the Catalog object.
- 2** Click the Catalog object.
- 3** Click Log View.

The log file tells you

- ♦ When the catalog was last updated
- ♦ About any error conditions that occurred

Error Conditions and Solutions

Here are some possible error conditions and suggested solutions for them.

You Get a 602 Error (No Such Value) when Querying the Catalog

You get a 602 error (No such value) when querying the catalog

This means that a scheduled catalog update has not occurred.

Solution: Perform a manual update.

You Query the Catalog and Find out that Only the Object in the Catalog Is the Catalog Itself

This indicates that the Catalog object has insufficient rights to the Directory. The Catalog object needs Browse and Read rights to the objects and properties that it's supposed to include.

Solution: You have to assign these rights. To find out how, go to “Assign Rights to the Catalog Object” on page 18.



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