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Introduction to naming services

Naming services provide a Data Mover with a mechanism for looking up user and system information, including usernames, passwords, home directories, groups, hostnames, IP addresses, and netgroup definitions. Configuring each Data Mover with access to one or more naming services is a basic task you must perform to ensure correct operation of the EMC® Celerra® Network Server. ["Naming services concepts" on page 5](#) provides more details.

Note: The Control Station is configured to use naming services, specifically DNS, during system initialization. *Configuring and Managing Celerra Networking* and the Celerra Manager Control Stations online help topic provide more information.

This technical module is part of the Celerra Network Server information set and is intended for the system administrators responsible for configuring and maintaining file storage and network retrieval infrastructure.

Terminology

This section defines terms important to understanding naming service capabilities on the Celerra Network Server. The *Celerra Glossary* provides a complete list of Celerra terminology.

CIFS (Common Internet File System): A file-sharing protocol based on the Microsoft Server Message Block (SMB). It allows users to share file systems over the Internet and intranets.

DNS (Domain Name System): A name resolution software that allows users to locate computers and services on a UNIX network or TCP/IP network by name. The DNS server maintains a database of domain names, hostnames and their corresponding IP addresses, and services provided by these hosts.

domain: A logical grouping of Microsoft Windows servers and other computers that share common security and user account information. All resources such as computers and users are members of the domain and have an account in the domain that uniquely identifies them. The domain administrator creates one user account for each user in the domain, and the users log in to the domain once. Users do not log in to each individual server.

FTP (File Transfer Protocol): A high-level protocol for transferring files from one machine to another. Implemented as an application-level program (based on the OSI model), FTP uses Telnet and TCP protocols.

LDAP (Lightweight Directory Access Protocol): An industry-standard access protocol that runs directly over TCP/IP. It is the primary access protocol for Active Directory and other directory servers such as the Sun Java System Directory Server (iPlanet). LDAP Version 3 is defined by a set of Proposed Standard documents in Internet Engineering Task Force (IETF) RFC 2251.

netgroup: A group of computers on a network administered using a single name. Netgroups can be defined using a local text file that provides the list of hosts in a netgroup or using NIS or a directory server such as Sun Java System Directory Server (iPlanet).

NFS (Network File System): A distributed file system that provides transparent access to remote file systems. NFS allows all systems on the network to share a single copy of a directory.

NIS (Network Information Service): A distributed data lookup service that shares user and system information across a network, including usernames, passwords, home directories, groups, hostnames, IP addresses, and netgroup definitions.

Sun Java System Directory Server: (Also known as Sun ONE Directory Server and iPlanet). A distributed directory service accessible using LDAP.

Windows 2000/Windows Server 2003 domain: A Microsoft Windows domain controlled and managed by a Microsoft Windows server/Windows 2003 server using the Active Directory to manage all system resources and using the DNS for name resolution.

Windows NT domain: A Microsoft Windows domain controlled and managed by a Microsoft Windows NT server using a SAM database to manage user and group accounts and a NetBIOS namespace. In a Windows NT domain, there is one primary domain controller (PDC) that has a read/write copy of the SAM, and possibly several backup domain controllers (BDCs) with read-only copies of the SAM.

WINS (Windows Internet Naming Service): A Microsoft name resolution system that determines the IP address associated with a particular network node. WINS provides the mapping between the machine name and the Internet address, allowing Microsoft networking to function over TCP/IP networks.

Restrictions

NIS+, which uses a different protocol than standard NIS, is not supported on the Celerra Network Server.

Naming services concepts

Each Data Mover on a Celerra Network Server needs a mechanism for looking up user and system information, including usernames, passwords, home directories, groups, hostnames, IP addresses, and netgroup definitions. The Data Mover obtains this information by making queries to naming services. Naming services are used in UNIX and Windows environments by the NFS, CIFS, and FTP protocols.

You can configure one or more of the following naming services for each Data Mover in your Celerra system:

- ◆ Local files (`passwd`, `group`, `hosts`, and `netgroup`)
- ◆ Network Information Service (NIS)
- ◆ Domain Name System (DNS)
- ◆ Sun Java System Directory Server (iPlanet)

Note: The Sun Java System Directory Server was formerly known as Sun ONE Directory Server and iPlanet. Because this product continues to be known as iPlanet by many users, the name iPlanet is used in this discussion.

- ◆ Windows Internet Name Service (WINS)
- ◆ Active Directory

Note: *Configuring Celerra User Mapping* describes the mapping of the security identifiers (SIDs) used by Windows users to the UNIX-style user identifiers (UIDs) and group identifiers (GIDs) used by the Celerra Network Server.

When naming services are required, the Data Mover first checks its local cache. It then queries all the configured naming services in a predetermined order until the requested entity is found or until all naming services are queried. The search order is determined by the name service switch (`nsswitch`), which is configured using the `nsswitch.conf` file.

Local files

Local files are text files that reside on a Data Mover. Depending on the type of information these files contain, they are identified as `passwd`, `group`, `hosts`, or `netgroup` files.

- ◆ The `passwd` file contains the users who can access the Data Mover.
- ◆ The `group` file defines the groups to which users belong.
- ◆ The `hosts` file contains a list of IP addresses with their corresponding hostnames.

Note: When deploying CIFS in a Windows 2000 or Windows Server 2003 environment, DNS is required.

- ◆ The `netgroup` file contains a list of network group names with the list of hostnames for hosts belonging to the group. In addition to mapping hosts to network groups, it also maps users to network groups.

Local files are the most efficient way of looking up entities because they do not require getting information from another server on the network. However, when you use local files, you must manually update entity information on each Data Mover as the entities on your network change.

Local files are not provided on a Data Mover by default. To use local files, you must create and copy these files to the Data Mover. To update the information in an existing file, you must retrieve the file from the Data Mover, modify it, and then copy it back to the Data Mover. These tasks can only be accomplished using the CLI.

NIS

NIS is a distributed data lookup service that shares user and system information across a network, including usernames, passwords, home directories, groups, hostnames, IP addresses, and netgroup definitions.

Unlike local files that must be maintained on each Data Mover individually, NIS allows you to organize information in a domain structure stored in a central repository and maintained on dedicated NIS servers. When configured, NIS domain information is available on the network.

To configure a Data Mover as a client of a NIS server, you must know the NIS domain name and the IP addresses for the NIS servers. If possible, configure multiple NIS servers; the Data Mover tries the alternate servers if the first one is unavailable. You can configure up to 10 NIS servers in a single NIS domain on a Data Mover.

Note: A Data Mover supports only one NIS domain. Each time you configure a NIS domain and specify the servers, it overwrites the previous configuration.

DNS

DNS is a name resolution system that allows users to locate computers and services on a UNIX or TCP/IP network by name. The DNS server maintains a database of domain names, hostnames and their corresponding IP addresses, and services provided by these hosts.

To configure a Data Mover as a client of a DNS server, you must know the DNS domain name and the IP addresses for the DNS servers. If possible, configure multiple DNS servers; the Data Mover tries the alternate servers if the first one is unavailable. You can configure up to three DNS servers in a single DNS domain on a Data Mover. Furthermore, you can configure multiple DNS domains for the same Data Mover, each with its own set of DNS servers.

Note: DNS is required for Windows 2000 and higher domains. The DNS server should support dynamic updates (DDNS). If DDNS is unsupported, you must manually update the DNS server. *Managing Celerra for the Windows Environment* provides more information on DNS and Windows domains.

iPlanet

iPlanet (also known as Sun Java System Directory Server and Sun ONE Directory Server) is a distributed LDAP-based directory server that provides a central repository for storing and managing identity profiles, access privileges, and application and network resource information. In a Celerra environment, iPlanet may be used to provide user account information, group information, hosts, and netgroups. The Celerra Network Server implementation of the iPlanet client is based on the following documents:

- ◆ RFC 2307, *An Approach for Using LDAP as a Network Information Service*
- ◆ RFC draft, *A Configuration Schema for LDAP Based Directory User Agents*

While iPlanet provides a repository for the same information as that stored by NIS, unlike NIS where you have to edit database tables and explicitly propagate updated information, iPlanet provides centralized management in real time.

To configure a Data Mover as a client of an iPlanet server, you must know the iPlanet domain name and the IP addresses for the iPlanet configuration or service servers. If possible, configure multiple iPlanet servers; the Data Mover tries the additional servers if the first one is unavailable. A Data Mover supports only one iPlanet domain.

Note: EMC recommends continuing to use DNS to get information about hostnames and their IP addresses.

WINS

WINS is a Microsoft NetBIOS-based name resolution system that determines the IP address associated with a particular network node. WINS is typically used only in Windows NT environments. Starting with Windows 2000, WINS is superseded by DNS.

Active Directory

Active Directory is a directory service used in Windows 2000 and Windows Server 2003 that provides management of user and group accounts, security, and distributed resources. A Data Mover uses the Lightweight Directory Access Protocol (LDAP) protocol to query the Active Directory for domain information.

If the Active Directory schema is extended to include UNIX attributes for Windows users and groups, you can configure a Data Mover to query the Active Directory to determine if a user and the group of which the user is a member has UNIX attributes assigned. If so, information stored in these attributes is used for file access authorization.

Note: *Configuring Celerra User Mapping* provides more information on the user mapping techniques supported by the Celerra Network Server.

nsswitch.conf file

The `nsswitch.conf` file determines which naming services are queried for each entity type and the order in which the naming services are checked. The `nsswitch.conf` file is a text file that can be edited to arrange the search order that best fits your environment. A template for the file, `nsswitch.conf.tpl`, is provided in the Control Station's `/nas/sys` directory.

If you do not provide a `nsswitch.conf` file, the Data Mover queries naming services for each entity in the following order:

- ◆ For `passwd`, `group`, and `netgroup` entities, the Data Mover queries its local files first, followed by NIS.
- ◆ For `hosts` entities, the Data Mover queries its local files first, followed by NIS, and then DNS.

If an entity is not defined in the `nsswitch.conf` file, the Data Mover uses the default search. The iPlanet server is only queried if added to the `nsswitch.conf` file as a naming service. If no `nsswitch.conf` file is provided, the Data Mover uses the default search order that does not include the iPlanet server.

System requirements for naming services

This section describes the Celerra Network Server software, hardware, network, and storage configurations required for using the naming services described in this technical module.

Table 1 Naming services system requirements

Software	Celerra Network Server version 5.5
Hardware	No specific hardware requirements
Network	To use NIS, DNS, iPlanet, or WINS with the Celerra Network Server, there must be at least one NIS, DNS, iPlanet, or WINS server, respectively, on the network accessible to the file server
Storage	No specific storage requirements

E-Lab Interoperability Navigator

The E-Lab Interoperability Navigator is a searchable, web-based application that provides access to EMC interoperability support matrices. It is available at <http://Powerlink.EMC.com>. After logging in to Powerlink®, go to **Support > Interoperability > E-Lab Interoperability Navigator**.

User interface choices for naming services

The Celerra Network Server offers flexibility in managing networked storage based on your support environment and interface preferences. This technical module describes how to configure naming services using the command line interface (CLI). You can also perform many of these tasks using one of the Celerra management applications:

- ◆ Celerra Manager - Basic Edition
- ◆ Celerra Manager - Advanced Edition
- ◆ Microsoft Management Console (MMC) snap-ins
- ◆ Active Directory Users and Computers (ADUC) extensions

For additional information about managing your Celerra, refer to:

- ◆ *Learning about Celerra*
- ◆ *Celerra Manager Online Help*
- ◆ *Monitoring Celerra*
- ◆ Application's online help system on the *Celerra Network Server Documentation CD*

Installing Celerra Management Applications includes instructions on launching Celerra Manager, and on installing the MMC snap-ins and the ADUC extensions.

Using Celerra Manager to configure naming services

Celerra Manager can be used to configure a Data Mover to use the naming services listed in [Table 2](#).

Table 2 Naming services configured using Celerra Manager

Naming service	Celerra Manager procedure
NIS	To configure the Data Mover as an NIS client, select Celerras > [Celerra_name] > Network and click the NIS Settings tab.
DNS	To configure the Data Mover as a DNS client, select Celerras > [Celerra_name] > Network and click the DNS Settings tab or select Celerras > [Celerra_name] > CIFS and click the DNS Settings tab. Note: You cannot use Celerra Manager to change the DNS server protocol or clear the DNS cache.
WINS	To configure the Data Mover as a WINS client, select Celerras > [Celerra_name] > CIFS and click the Configuration tab.

You cannot use Celerra Manager to manage local files, including the `nsswitch.conf` file, or configure a Data Mover as an iPlanet client.

For more information on using Celerra Manager to configure naming services, refer to the Celerra Manager online help.

Note: You can also use the configuration wizards to set up the use of NIS, DNS, and WINS.

Roadmap for naming services

This section lists the tasks for configuring and managing naming services.

Naming services configuration tasks:

- ◆ ["Configuring local files" on page 13](#)
- ◆ ["Configuring NIS" on page 16](#)
- ◆ ["Configuring DNS" on page 17](#)
- ◆ ["Configuring iPlanet" on page 18](#)
- ◆ ["Configuring additional iPlanet options" on page 19](#)
- ◆ ["Configuring WINS" on page 22](#)
- ◆ ["Configuring the use of the Active Directory" on page 23](#)
- ◆ ["Modifying the nsswitch.conf file" on page 24](#)

Naming services management tasks:

- ◆ ["Managing local files" on page 26](#)
- ◆ ["Managing NIS" on page 27](#)
- ◆ ["Managing DNS" on page 29](#)
- ◆ ["Managing iPlanet" on page 33](#)

Configuring local files

To configure the use of local files by a Data Mover, create the appropriate text file on the Control Station, and then copy it to the Data Mover using the `server_file` command. To update the information in an existing file, use the `server_file` command to retrieve the file from the Data Mover, modify it, and then copy it back to the Data Mover.

Before configuring local files

To create a new local file for a Data Mover, you can copy a `passwd`, `group`, `hosts`, or `netgroup` file from another UNIX system to use as a template.

When creating or editing local files, the following rules apply:

- ◆ All entries (Windows names, usernames, domain names, global group names) must be entered in lowercase ASCII only.
- ◆ Any spaces in Windows domain or group names should be replaced with `=20` to become legal in a UNIX-style file.
- ◆ If using UNIX user authentication, issue the `server_user` command to generate an encrypted password in the password field, but do not include the domain as part of the username.

Note: The `passwd`, `group`, `hosts`, and `netgroup` files are standard UNIX-based files. You can view the standard description of these files and their format by using the `man` command.

Creating or editing a `passwd` file

Each line of the `passwd` file defines a user and has the format:

```
username:password:uid:gid:gcoss:home-dir:login-shell
```

where:

- ◆ `username` is the user's login name.

Note: By default, the Celerra Network Server checks for the username in the form `username.domain` (domain being the Windows domain name). Setting the `cifs.resolver` parameter to 1 enables the Celerra Network Server to retrieve user and group entries without domain extensions. *Configuring Celerra User Mapping* provides more information.

- ◆ `password` is an empty field. The encrypted password for the user is in the corresponding entry in another file.
- ◆ `uid` is the user's unique numerical ID for the system.
- ◆ `gid` is the unique numerical ID of the group to which the user belongs.
- ◆ `gcoss` provides general information about the user, such as user's full name, location, and phone number.
- ◆ `home-dir` is the pathname to the directory in which the user is initially positioned upon logging in.

- ◆ `login-shell` is the user's initial shell program. If this field is empty, the default shell is `/usr/bin/sh`.

Note: You can use the `server_user <movename> -add` command to create a new user account on the Data Mover. This command must be executed from the `/nas/sbin` directory; `su` to `root` to execute it.

Creating or editing a group file

The `group` file defines the groups to which users belong. Each line of the `group` file defines a group and has the format:

```
groupname:passwd:gid:user_list
```

where:

- ◆ `groupname` is the name of the group.

Note: By default, the Celerra Network Server checks for the group name in the form `groupname.domain` (`domain` being the Windows domain name). Setting the `cifs.resolver` parameter to 1 enables the Celerra Network Server to retrieve user and group entries without domain extensions. *Configuring Celerra User Mapping* provides more information.

- ◆ `passwd` is the encrypted group password (if used).
- ◆ `gid` is the numerical group ID.
- ◆ `user_list` is all the group member usernames, separated by commas.

Creating or editing a hosts file

Each line of the `hosts` file defines a host and has the format:

```
IP_address hostname aliases
```

where:

- ◆ `IP_address` is the host's IP address.
- ◆ `hostname` is the official name of the host.
- ◆ `aliases` provides for name changes, alternate spellings, shorter hostnames, or generic hostnames (for example, `localhost`).

Fields are separated by any number of blanks and/or tab characters.

Creating or editing a netgroup file

Each line of the `netgroup` file defines a group and has the format:

```
groupname member1 member2 ...
```

Each member is either the name of another group or indicates specific hosts, users, and domains, referred to as a triple, as follows:

```
(hostname,username,domainname)
```

Any of the triple's three fields can be blank, meaning all the values in that field are included. A dash (-) in any of the fields means there are no valid values. For

example, the following line defines a group called `ouruniverse` that consists of all hosts and users in the NIS domain `ourdomain`.

```
ouruniverse (,,ourdomain)
```

The following lines define a group called `ourhosts` that includes all of the hosts but none of the users in the domain, and a group called `ourusers` that includes all users but no hosts.

```
ourhosts (,-,ourdomain)
```

```
ourusers (-,,ourdomain)
```

A netgroup file can include as many lines as required; however, each line must be less than 1 KB in length. If necessary, a line can be continued on another line by using the backslash (`\`) as a continuation character. A triple, however, cannot be split across two lines.

Note: If you use a backslash (`\`) as a continuation character, it must be the last character on the line. It cannot be followed by spaces.

Configuring local files on a Data Mover

"[Before configuring local files](#)" on page 13 provides more information about creating or editing entries in all types of local files.

Step	Action
1.	Copy the local file from the Data Mover to the Control Station using this command syntax: \$ server_file <movername> -get <src_file> <dst_file>
2.	Using a text editor, edit the file on the Control Station to add, delete, or modify entries.
3.	Copy the file from the Control Station back to the Data Mover using this command syntax: \$ server_file <movername> -put <src_file> <dst_file>

Configuring NIS

To configure a Data Mover as an NIS client, you must provide the NIS domain name and one or more NIS servers that host the domain. If possible, define multiple NIS servers; the Data Mover tries the alternate servers if the first one is unavailable. You can configure up to 10 NIS servers for a single NIS domain on a Data Mover.

Configuring a Data Mover as an NIS client

Action	
<p>To configure a Data Mover as an NIS client, use this command syntax:</p> <pre>\$ server_nis <movername> <domainname> {<ip_addr>,...}</pre> <p>Where:</p> <ul style="list-style-type: none"><movername> = name of the specified Data Mover<domainname> = name of the specified NIS domain<ip_addr> = address of an NIS server for the specified domain <p>Example:</p> <p>To configure the use of two NIS servers on <code>server_2</code> for the NIS domain <code>nsg</code> using NIS servers found at IP addresses 172.16.21.10 and 172.16.22.10, type:</p> <pre>\$ server_nis server_2 nsg 172.16.21.10,172.16.22.10</pre> <p>Note: A Data Mover can support only one NIS domain. Each time you run the <code>server_nis</code> command to configure a NIS domain and specify the servers, it overwrites the previous configuration.</p>	
Output	Note
<pre>server_2 : done</pre>	<p>This command also starts the NIS service on the Data Mover, if NIS is not running. Once the NIS service is configured, it is enabled by default; that is, it automatically restarts after a Data Mover reboot.</p>

Configuring DNS

To configure a Data Mover as a DNS client, you must provide a DNS domain name and one or more DNS servers that host the domain. If possible, define multiple DNS servers; the Data Mover tries the alternate servers if the first one is unavailable. You can configure up to three DNS servers for a single DNS domain on a Data Mover. Furthermore, you can configure multiple DNS domains for the same Data Mover, each with its own set of DNS servers.

Configuring a Data Mover as a DNS client

Action	
<p>To configure a Data Mover as a DNS client, use this command syntax:</p> <pre>\$ server_dns <movername> <domainname> {<ip_addr>,...}</pre> <p>Where:</p> <ul style="list-style-type: none"><movername> = name of the specified Data Mover<domainname> = name of the specified DNS domain<ip_addr> = address of a DNS server for the specified domain <p>Note: The DNS domain name cannot exceed 155 characters. Specify at least two IP addresses to guarantee the availability of a DNS server.</p> <p>Example:</p> <p>To configure <code>server_2</code> to use the DNS domain <code>nasdocs.emc.com</code> on the DNS server found at IP address <code>192.168.21.10</code>, type:</p> <pre>\$ server_dns server_2 nasdocs.emc.com 192.168.21.10</pre> <p>Note: To configure multiple DNS domains for the same Data Mover, reissue the <code>server_dns</code> command for the same Data Mover but indicate a different DNS domain name and IP address.</p>	
Output	Note
<pre>server_2 : done</pre>	<p>This command also starts the DNS service on the Data Mover, if DNS is not running. Once the DNS service is configured, it is enabled by default; that is, it automatically restarts after a Data Mover reboot.</p>

Configuring iPlanet

iPlanet supports several types of servers – configuration, service, preferred, and alternate – as defined by the RFC draft *A Configuration Schema for LDAP Based Directory User Agents*. If you plan to use a client configuration profile, specify the IP address of an iPlanet configuration server in the `server_ldap` command. If you are not using a profile, specify the IP address of a service server. It is possible for a configuration server and a service server to be the same.

Before configuring iPlanet

To configure a Data Mover as an iPlanet client, you must provide an iPlanet domain name and one or more iPlanet servers that host the domain. If possible, define multiple servers; the Data Mover tries the additional servers if the first one is unavailable. There is no limit on the number of iPlanet servers for a single iPlanet domain on a Data Mover.

Note: A Data Mover can support only one iPlanet domain. Before configuring a new iPlanet domain, the previous configuration must be deleted.

Configuring a Data Mover as an iPlanet client

Action	
<p>To configure a Data Mover as an iPlanet client, use this command syntax:</p> <pre>\$ server_ldap <movername> -set -domain <fqdn> -servers <ip_addr>[:<port>]</pre> <p>Where:</p> <ul style="list-style-type: none"><movername> = name of the specified Data Mover<fqdn> = fully-qualified domain name of the specified iPlanet domain<ip_addr> = address of a iPlanet server (configuration or service) for the specified domain<port> = number of the iPlanet server TCP port <p>Example:</p> <p>To configure <code>server_2</code> to use the iPlanet domain <code>nasdocs.emc.com</code> on the iPlanet server found at IP address <code>172.16.21.10</code> and the default port number <code>389</code>, type:</p> <pre>\$ server_ldap server_2 -set -domain nasdocs.emc.com -servers 172.16.21.10</pre>	
Output	Note
<pre>server_2 : done</pre>	<ul style="list-style-type: none">This command also starts the iPlanet service on the Data Mover. Once the iPlanet service is configured, it is enabled by default and automatically restarts after a Data Mover reboot.The iPlanet service can be managed using <code>server_ldap</code> command options. Refer to "Managing iPlanet" on page 33 for more information.

Configuring additional iPlanet options

There are several additional configuration options you can specify when you configure a Data Mover as an iPlanet client. You can specify these configuration options at any time, even after the iPlanet service is started, by issuing the `server_ldap -set` command. EMC recommends that first you stop and then restart the iPlanet service when making a configuration change. Configuration changes may take up to 1 minute to take effect.

The following configuration options are possible when configuring an iPlanet client:

- ◆ "Specifying the use of simple authentication" on page 19
- ◆ "Specifying a client configuration profile" on page 20
- ◆ "Specifying an NIS domain" on page 21

Specifying the use of simple authentication

The Celerra Network Server supports only anonymous and simple authentication. Anonymous authentication means no authentication occurs. Simple or proxy authentication means a bind distinguished name (DN) and password are required. A Data Mover uses simple authentication if you specify a bind distinguished name and password when configuring the Data Mover as an iPlanet client. Otherwise, the Data Mover uses an anonymous logon. The `-binddn` option of the `server_ldap` command enables you to specify the distinguished name of the identity used to bind to the service. By default, the identity used to bind to the service is the domain manager. The `-p` option ensures that you are prompted for the directory bind password.

Note: The password is defined using the iPlanet management interface.

Action

To specify that the iPlanet service for a Data Mover use simple authentication, use this command syntax:

```
$ server_ldap <movernam> -set [-p] -domain <fqdn> -servers  
<ip_addr>[:<port>] -binddn <bind_DN>
```

Where:

<movernam> = name of the specified Data Mover

<fqdn> = fully-qualified domain name of the specified iPlanet domain

<ip_addr> = address of a iPlanet server (configuration or service) for the specified domain

<port> = number of the iPlanet server TCP port

<bind_DN> = distinguished name of the identity used to bind to the service

Example:

To specify that the iPlanet service on `server_2` use simple authentication, type:

```
$ server_ldap server_2 -set -p -domain nasdocs.emc.com  
-servers 172.16.21.10 -binddn  
"uid=admin,ou=Administrators,ou=TopologyManagement,o=NetScapeRoot"
```

Output	Note
<pre>server_2 : done Enter password:</pre>	<ul style="list-style-type: none"> • The Celerra Network Server sends the password to the iPlanet server in clear text. • The <code>-binddn</code> and <code>-p</code> options must be specified if iPlanet is used to provide user password authentication for a Data Mover's FTP or PC-NFS services.

Specifying a client configuration profile

The client configuration profile is created and stored on the iPlanet server. The `-profile` option of the `server_ldap` command allows you to specify the use of an iPlanet client profile that includes additional configuration parameters (also referred to as attributes). Some attributes that can be defined include: preferred and alternate servers, search path, profile time-to-live (TTL), object class and attribute mapping, and authentication method. Refer to "[Appendix: iPlanet client profile attributes](#)" on page 57 for more information on attributes and the Sun Java System Directory Server (iPlanet) documentation at www.sun.com for more information on creating and using client profiles.

Action
<p>To specify the use of a special client profile, use this command syntax:</p> <pre>\$ server_ldap <movername> -set -domain <fqdn> -servers <ip_addr>[:<port>] -profile <profile_name></pre> <p>Where:</p> <ul style="list-style-type: none"> <movername> = name of the specified Data Mover <fqdn> = fully-qualified domain name of the specified iPlanet domain <ip_addr> = address of a iPlanet configuration server for the specified domain <port> = number of the iPlanet server TCP port <profile_name> = name of the specified client profile <p>Example:</p> <p>To specify that the iPlanet service on <code>server_2</code> use the special client profile <code>celerra_profile</code>, type:</p> <pre>\$ server_ldap server_2 -set -domain nasdocs.emc.com -servers 172.16.21.10 -profile celerra_profile</pre>
Output
<pre>server_2 : done</pre>

Specifying an NIS domain

An iPlanet domain can host more than one NIS domain. The `-nisdomain` option of the `server_ldap` command allows you to specify the NIS domain of which the Data Mover is a member. Do not specify the NIS domain if the iPlanet domain uses the same name.

Action

To specify the Data Mover's NIS domain, use this command syntax:

```
$ server_ldap <movername> -set -domain <fqdn> -servers  
<ip_addr>[:<port>] -nisdomain <nis_domain>
```

Where:

<movername> = name of the specified Data Mover

<fqdn> = fully-qualified domain name of the specified iPlanet domain

<ip_addr> = address of a iPlanet server (configuration or service) for the specified domain

<port> = number of the iPlanet server TCP port

<nis_domain> = name of the specified NIS domain

Example:

To specify that the iPlanet service on `server_2` recognize the Data Mover's NIS domain name, type:

```
$ server_ldap server_2 -set -domain nasdocs.emc.com -servers  
172.16.21.10 -nisdomain nsg
```

Output

```
server_2 : done
```

Configuring WINS

To configure a Data Mover as a WINS client, you must define one or more WINS servers that all CIFS servers on a Data Mover can access. *Managing Celerra for the Windows Environment* provides more information on configuring WINS for CIFS servers in Windows NT environments.

Configuring the use of the Active Directory

To configure a Data Mover to query the Active Directory for UNIX attributes, you must install the UNIX user management component of the Celerra CIFS management MMC snap-ins. You must also set the `cifs.useADMap` parameter. *Installing Celerra Management Applications* and the Celerra UNIX User Management and Celerra UNIX Attribute Migration online help systems provide more information.

Modifying the nsswitch.conf file

Edit the `nsswitch.conf` file to arrange the search order for querying naming services for each entity. ["nsswitch.conf file" on page 8](#) provides more information about the `nsswitch.conf` file.

Perform these tasks to modify the contents of the `nsswitch.conf` file:

- ◆ ["Editing the nsswitch.conf file" on page 25](#)
- ◆ ["Saving the edited nsswitch.conf file" on page 25](#)
- ◆ ["Copying the nsswitch.conf file to the Data Mover" on page 25](#)

Before editing the nsswitch.conf file

- ◆ Only use lowercase characters. Uppercase and mixed-case characters are invalid.
- ◆ Use spaces between the naming service entries.
- ◆ List at least one naming service database to search.

Note: EMC recommends avoiding the use of NIS and iPlanet simultaneously. If you need to use both NIS and iPlanet, the NIS domain must be the same in both NIS and iPlanet.

Task 1: Editing the nsswitch.conf file

Action

Using a text editor, edit the `nsswitch.conf.tpl` file in the `/nas/sys` directory on the Control Station to add, delete, or modify entries.

The file format includes one entry for each entity type followed by a list of naming services.

```
entity: <naming service> [name service] ...
```

where:

entity is `passwd`, `group`, `hosts`, or `netgroup`.

<naming service> is `files`, `nis`, `dns`, or `ldap`.

The following is an example of the `nsswitch.conf.tpl` file.

```
# /etc/nsswitch.conf:  
#
```

```
passwd: files nis  
group: files nis  
hosts: dns nis files  
netgroup: files nis
```

For example, to add an iPlanet server as a Data Mover naming service, modify the `nsswitch.conf.tpl` file as follows:

```
# /etc/nsswitch.conf:  
#  
passwd: files nis ldap  
group: files nis ldap  
hosts: files nis dns ldap  
netgroup: files nis ldap
```

Task 2: Saving the edited nsswitch.conf file

Action

Save the modified file as `nsswitch.conf.tpl`.

Task 3: Copying the nsswitch.conf file to the Data Mover

Action

Copy the `nsswitch.conf.tpl` file from the Control Station to the Data Mover using this command syntax:

```
$ server_file <movername> -put /nas/sys/nsswitch.conf.tpl nsswitch.conf
```

The modified `nsswitch.conf` file is used automatically once it is placed in the `/.etc` directory of the Data Mover's root file system.

Managing local files

You can verify the contents of the local files on a Data Mover by copying the files to the Control Station and using your favorite tool to view their contents (for example, using `view` or `more`).

Verifying the contents of local files

Step	Action
1.	Copy the file from the Data Mover to the Control Station using this command syntax: <code>\$ server_file <movername> -get <src_file> <dst_file></code>
2.	View the file on the Control Station: <code>\$ more <filename></code>

Managing NIS

This section describes the tasks you can use to manage a Data Mover's NIS configuration.

Perform these tasks to manage the NIS configuration:

- ◆ ["Displaying the NIS configuration" on page 27](#)
- ◆ ["Verifying the status of the NIS configuration" on page 28](#)
- ◆ ["Deleting the NIS configuration" on page 28](#)

Displaying the NIS configuration

Action	
<p>To display the NIS configuration, use this command syntax:</p> <pre>\$ server_nis <movername></pre> <p>Where: <movername> = name of the specified Data Mover</p> <p>Example: To display the NIS configuration on <code>server_2</code>, type:</p> <pre>\$ server_nis server_2</pre>	
Output	Note
<pre>server_2 : yp domain=nsg server=172.16.21.10 server=172.16.22.10</pre>	<p><code>server_2</code> is in the <code>nsg</code> NIS domain and uses the NIS servers <code>172.16.21.10</code> and <code>172.16.22.10</code></p> <hr/> <p>Note: NIS was formerly known as Yellow Pages or yp.</p> <hr/>

Verifying the status of the NIS configuration

Action	
<p>To verify the status of the NIS configuration, use this command syntax: <code>\$ server_nis <movername> -status</code></p> <p>Example: To verify the status of the NIS configuration for <code>server_2</code>, type: <code>\$ server_nis server_2 -status</code></p>	
Output	Note
<pre>server_2 : NIS default domain: nsg NIS server 172.16.21.10 NIS server 172.16.22.10</pre>	<p>If NIS was not started, the output of this command displays NIS not started.</p>

Deleting the NIS configuration

Action
<p>To delete the NIS configuration for a Data Mover, use this command syntax: <code>\$ server_nis <movername> -delete</code></p> <p>Where: <movername> = name of the specified Data Mover</p> <p>Example: To delete the NIS configuration for <code>server_2</code>, type: <code>\$ server_nis server_2 -delete</code></p>
Output
<pre>server_2 : done</pre>

Managing DNS

This section describes the tasks you can use to manage a Data Mover's DNS configuration.

Perform these tasks to manage the NIS configuration:

- ◆ ["Verifying the DNS configuration" on page 29](#)
- ◆ ["Deleting the DNS configuration" on page 30](#)
- ◆ ["Setting or changing the DNS server protocol" on page 30](#)
- ◆ ["Clearing the DNS cache" on page 31](#)
- ◆ ["Disabling access to the DNS server" on page 31](#)
- ◆ ["Enabling access to the DNS server" on page 32](#)

Verifying the DNS configuration

Action	
To display the DNS configuration, use this command syntax: \$ <code>server_dns <movername></code> Example: \$ <code>server_dns server_2</code>	
Output	Note
<code>server_2 : dns is running nasdocs.emc.com proto:udp server(s):172.16.21.10</code>	In this example, <code>server_2</code> is in the <code>nasdocs.emc.com</code> DNS domain and uses the DNS server <code>172.16.21.10</code> .

Deleting the DNS configuration

Action	
<p>To delete the DNS domain configuration for a Data Mover, use this command syntax:</p> <pre>\$ server_dns <movername> -delete <domainname></pre> <p>Where:</p> <ul style="list-style-type: none"><movername> = name of the specified Data Mover<domainname> = name of the specified DNS domain <p>Example:</p> <p>To delete the DNS domain configuration for <code>server_2</code>, type:</p> <pre>\$ server_dns server_2 -delete nasdocs.emc.com</pre>	
Output	Note
<pre>server_2 : done</pre>	<p>To avoid deleting all the DNS servers configured for the domain, as required by the <code>-delete</code> option, add a new DNS domain configuration that includes the servers you want to keep.</p>

Setting or changing the DNS server protocol

If a protocol is not specified when configuring DNS on the Data Mover, the Data Mover tries to query the DNS server using UDP. If UDP fails, the Data Mover switches to TCP.

Action
<p>To set or change the protocol used to communicate with the DNS servers, use this command syntax:</p> <pre>\$ server_dns <movername> -protocol {tcp udp} <domainname> {<ip_addr>,...}</pre> <p>Where:</p> <ul style="list-style-type: none"><movername> = name of the specified Data Mover<domainname> = name of the specified DNS domain<ip_addr> = address of a DNS server for the specified domain <p>Example:</p> <p>To set the protocol for communication with the DNS servers to UDP for <code>server_2</code>, type:</p> <pre>\$ server_dns server_2 -protocol tcp nasdocs.emc.com</pre>
Output
<pre>server_2 : done</pre>

Clearing the DNS cache

Occasionally, it may help to clear the cache of DNS information saved on a Data Mover. For example, clear the DNS cache when host-to-address mappings change, or are out of date, or to help determine if the Data Mover is communicating with the DNS server (refer to ["Checking communication with DNS" on page 41](#)).

Action
To clear the DNS cache on a Data Mover, use this command syntax: <code>\$ server_dns <movername> -option flush</code> Where: <movername> = name of the specified Data Mover Example: To clear the DNS cache for <code>server_2</code> , type: <code>\$ server_dns server_2 -option flush</code>
Output
<code>server_2 : done</code>

Disabling access to the DNS server

Action	
To disable access to the DNS server, use this command syntax: <code>\$ server_dns <movername> -option stop</code> Where: <movername> = name of the specified Data Mover Example: To disable access to the DNS server for <code>server_2</code> , type: <code>\$ server_dns server_2 -option stop</code>	
Output	Note
<code>server_2 : done</code>	Access to the DNS server can be restarted using the <code>server_dns -option start</code> command. It is also restarted on the next Celerra Network Server reboot.

Enabling access to the DNS server

You can restart a Data Mover's access to a DNS server after it has been stopped manually.

Action
To restart access to the DNS server, use this command syntax: <code>\$ server_dns <movername> -option start</code> Where: <movername> = name of the specified Data Mover Example: To restart access to the DNS server for <code>server_2</code> , type: <code>\$ server_dns server_2 -option start</code>
Output
<code>server_2 : done</code>

Managing iPlanet

This section describes the tasks you can use to manage a Data Mover's iPlanet configuration.

Perform these tasks to configure iPlanet:

- ◆ ["Verifying the status of the iPlanet service" on page 33](#)
- ◆ ["Deleting the iPlanet configuration" on page 34](#)
- ◆ ["Displaying information about the iPlanet configuration" on page 34](#)
- ◆ ["Temporarily disabling the iPlanet service" on page 35](#)
- ◆ ["Enabling the iPlanet service" on page 35](#)
- ◆ ["Looking up information in the iPlanet server" on page 36](#)

Verifying the status of the iPlanet service

Action	
<p>To verify the status of the iPlanet service, use this command syntax:</p> <pre>\$ server_ldap <movername> -service -status</pre> <p>Where: <movername> = name of the specified Data Mover</p> <p>Example:</p> <p>To verify the status of the iPlanet service for <code>server_2</code>, type:</p> <pre>\$ server_ldap server_2 -service -status</pre>	
Output	Note
<pre>server_2 : LDAP service active</pre>	<p>The iPlanet service can be active or inactive. If the Data Mover is not configured to access the iPlanet server, the output displays <code>No LDAP domain configured</code>.</p>

Deleting the iPlanet configuration

Action	
<p>To delete the iPlanet configuration for a Data Mover, use this command syntax: <code>\$ server_ldap <movername> -clear</code></p> <p>Where: <movername> = name of the specified Data Mover</p> <p>Example: To delete the iPlanet configuration for <code>server_2</code>, type: <code>\$ server_ldap server_2 -clear</code></p>	
Output	Note
<code>server_2 : done</code>	This command also permanently stops the iPlanet service.

Displaying information about the iPlanet configuration

Action	
<p>To display information about the iPlanet configuration, use this command syntax: <code>\$ server_ldap <movername> -info [-verbose]</code></p> <p>Where: <movername> = name of the specified Data Mover</p> <p>Example: To display basic information about the iPlanet Server for <code>server_2</code>, type: <code>\$ server_ldap server_2 -info</code></p> <p>Note: The <code>-verbose</code> option provides detailed information. Refer to "Troubleshooting naming services" on page 40 for more information.</p>	
Output	Note
<code>server_2 : LDAP domain: nasdocs.emc.com State: Configured - Connected NIS domain: nsg Profile Name: celerra_profile Profile TTL: 3600 seconds Next Profile update in 5 seconds Connected to LDAP server address: 172.16.21.10 - port 389</code>	<p>In this example, <code>server_2</code> is in the <code>nasdocs.emc.com</code> iPlanet domain and uses the iPlanet configuration server <code>172.16.21.10</code>.</p> <p>This example output assumes you previously configured <code>server_2</code> with iPlanet's additional configuration options. Otherwise, only the following output is displayed:</p> <pre>LDAP domain: nasdocs.emc.com State: Configured - Connected NIS domain: nsg Connected to LDAP server address: 172.16.21.10 - port 389</pre>

Temporarily disabling the iPlanet service

Action	
<p>To temporarily stop the iPlanet service, use this command syntax: <code>\$ server_ldap <movername> -service -stop</code></p> <p>Where: <movername> = name of the specified Data Mover</p> <p>Example: To disable the iPlanet service for <code>server_2</code>, type: <code>\$ server_ldap server_2 -service -stop</code></p>	
Output	Note
<code>server_2 : done</code>	The iPlanet service can be restarted using the <code>server_ldap -service -start</code> command. It is also restarted on the next Celerra Network Server reboot.

Enabling the iPlanet service

Use this command to restart the iPlanet service for a Data Mover after it has been manually stopped.

Action
<p>To restart the iPlanet service, use this command syntax: <code>\$ server_ldap <movername> -service -start</code></p> <p>Where: <movername> = name of the specified Data Mover</p> <p>Example: To restart the iPlanet service for <code>server_2</code>, type: <code>\$ server_ldap server_2 -service -start</code></p>
Output
<code>server_2 : done</code>

Looking up information in the iPlanet server

Use the `-lookup` option to look up information about resources in the iPlanet server. This command assists with troubleshooting because it allows you to verify the Data Mover can access the iPlanet server and perform a resource lookup. Perform the following types of lookup to look up information:

- ◆ ["Performing a user lookup by username" on page 36](#)
- ◆ ["Performing a user lookup by UID" on page 37](#)
- ◆ ["Performing a group lookup by group name" on page 37](#)
- ◆ ["Performing a group lookup by GID" on page 38](#)
- ◆ ["Performing a host lookup by hostname" on page 38](#)
- ◆ ["Performing a netgroup lookup" on page 39](#)

Performing a user lookup by username

Action
<p>To look up user information in the iPlanet server by username, use this command syntax:</p> <pre>\$ server_ldap <movername> -lookup -user <username></pre> <p>Where:</p> <p><movername> = name of the specified Data Mover <username> = name of the specified user</p> <p>Example:</p> <p>To look up information in the iPlanet server for <code>server_2</code>, type:</p> <pre>\$ server_ldap server_2 -lookup -user user1</pre>
Output
<pre>server_2 : LdapService::connect: @ = 0xa3994244, client = 0x7e422a04 : : LdapClient::~~LdapClient, @ = 0x7e422a04 user: user1, uid: 501, gid: 500, gecos: , home dir: , shell:</pre>

Performing a user lookup by UID

Action
<p>To look up user information in the iPlanet server by UID, use this command syntax: \$ server_ldap <movername> -lookup -uid <uid></p> <p>Where: <movername> = name of the specified Data Mover <uid> = UID of the specified user</p> <p>Example: To look up information in the iPlanet server for <code>server_2</code>, type: \$ server_ldap server_2 -lookup -uid 501</p>
Output
<pre>server_2 : LdapService::connect: @ = 0xa3994244, client = 0x7e422a04 . . . LdapClient::~~LdapClient, @ = 0x7e422a04 user: user1, uid: 501, gid: 500, description: gecos: , home dir: , shell:</pre>
Note
<p>In this example, the relevant information is in the final line of output.</p>

Performing a group lookup by group name

Action
<p>To look up group information in the iPlanet server by group name, use this command syntax: \$ server_ldap <movername> -lookup -group <groupname></p> <p>Where: <movername> = name of the specified Data Mover <groupname> = name of the specified group</p> <p>Example: To look up information in the iPlanet server for <code>server_2</code>, type: \$ server_ldap server_2 -lookup -group group1</p>
Output
<pre>server_2 : LdapService::connect: @ = 0xa3994244, client = 0x7e422a04 . . . LdapClient::~~LdapClient, @ = 0x7e422a04 group name: group1, gid: 2765 group members: 501 group members: 1023</pre>
Note
<p>In this example, the relevant information is in the final lines of output.</p>

Performing a group lookup by GID

Action
<p>To look up group information in the iPlanet server by GID, use this command syntax: \$ server_ldap <movername> -lookup -gid <gid></p> <p>Where: <movername> = name of the specified Data Mover <gid> = GID of the specified group</p> <p>Example: To look up information in the iPlanet server for <code>server_2</code>, type: \$ server_ldap server_2 -lookup -gid 1</p>
Output
<pre>server_2 : LdapService::connect: @ = 0xa3994244, client = 0x7e422a04 . . LdapClient::~LdapClient, @ = 0x7e422a04 group name: other, gid: 1 group member: servermanageradmin.servermanageradmin.dvt_a group member: servermanageradmin.dvt_b</pre>
Note
<p>In this example, the relevant information is in the final lines of output.</p>

Performing a host lookup by hostname

Action
<p>To look up host information in the iPlanet server by hostname, use this command syntax: \$ server_ldap <movername> -lookup -hostbyname <hostname></p> <p>Where: <movername> = name of the specified Data Mover <hostname> = name of the specified host</p> <p>Example: To look up information in the iPlanet server for <code>server_2</code>, type: \$ server_ldap server_2 -lookup -hostbyname win901230</p>
Output
<pre>server_2 : LdapService::connect: @ = 0xa3994244, client = 0x7e422a04 . . LdapDomainClient::parseIpHost: iphost cn: win901230 Host name: win901230 IP address: 172.16.21.10</pre>
Note
<p>In this example, the relevant information is in the final lines of output.</p>

Performing a netgroup lookup

Action

To look up network group (netgroup) information in the iPlanet server, use this command syntax:

```
$ server_ldap <movername> -lookup -netgroup <groupname>
```

Where:

<movername> = name of the specified Data Mover

<groupname> = name of the specified netgroup

Example:

To look up information in the iPlanet server for `server_2`, type:

```
$ server_ldap server_2 -lookup -netgroup netgroup1
```

Output

```
server_2 :  
LdapService::connect: @ = 0xa3994244, client = 0x7e422a04  
.  
.  
.  
LdapDomainClient::parseNetgroupTriples: totSize = 40 numTriples = 1  
usedSize = 3  
Netgroup: netgroup1 - triples:  
"win901230", "user1", "pagsun1"
```

Note

In this example, the relevant information is in the final lines of output.

Troubleshooting naming services

As part of an effort to continuously improve and enhance the performance and capabilities of its product lines, EMC periodically releases new versions of its hardware and software. Therefore, some functions described in this document may not be supported by all revisions of the software or hardware currently in use. For the most up-to-date information on product features, refer to your product release notes.

If a product does not function properly or does not function as described in this document, please contact your EMC representative.

Technical support

For technical support, go to EMC Customer Service on [Powerlink](#). To open a service request through Powerlink, you must have a valid support agreement. Please contact your EMC Sales Representative for details about obtaining a valid support agreement or to answer any questions about your account.

Telephone

U.S.: 800.782.4362 (SVC.4EMC)

Canada: 800.543.4782 (543.4SVC)

Worldwide: 508.497.7901

Note: Please do not request a specific support representative unless one has already been assigned to your particular system problem.

The *Problem Resolution Roadmap for Celerra* contains additional information about using [Powerlink](#) and resolving problems.

Checking network connectivity using server_ping

Name resolution problems can appear as a general degradation in network performance. To troubleshoot name services on a Data Mover, try the following:

- ◆ Issue the `server_ping` command with the IP address of a given name server.
- ◆ Issue the `server_ping` command with a name resolvable by a given name server.

Accessing naming services from the Control Station

If your Control Station is connected to the same name servers as a Data Mover, then you can use the tools in [Table 3](#) to test whether a name server is responding to requests. If the name server responds to manual request from the Control Station, then the problem is most likely with the Data Mover configuration.

Note: The Control Station does not support the use of iPlanet as a naming service.

Table 3 Tools for naming services problem resolution

Tool	Function
tracert	Prints the route that packets take to a server
nslookup	Queries name servers interactively
dig	Sends domain name query packets to name servers
host	Looks up a hostname or IP address in DNS
dnsdomainname	Shows the DNS domain name
ypdomainname	Shows the NIS domain name
ypwhich	Shows the NIS server
ypcat	Displays part of the NIS database

Note: These are standard UNIX-based commands. For more information, use the `man` command.

Checking communication with DNS

If a DNS server is responding correctly to DNS requests from the Control Station, you can test whether the Data Mover is communicating successfully with the DNS server by flushing the DNS cache on the Data Mover (refer to "[Clearing the DNS cache](#)" on page 31), and then performing a `server_ping` to the DNS server. If the `server_ping` succeeds, it is an indication the Data Mover is communicating with the DNS server.

Checking iPlanet operation

To display detailed information about a Data Mover's iPlanet configuration, use the `-verbose` option to the `server_ldap <movername> -info` command.

Note: To interpret the output displayed by the `-verbose` option, you must have a thorough understanding of the LDAP protocol. Consequently, this command option is typically used to provide EMC Customer Service with information for troubleshooting iPlanet configuration and operation problems.

Action

To display detailed information about the iPlanet configuration, use this command syntax:
`$ server_ldap <movername> -info [-verbose]`

Where:

`<movername>` = name of the specified Data Mover

Examples:

To display detailed information about the iPlanet configuration for `server_2`, type:

```
$ server_ldap server_2 -info -verbose
```

Output

```
server_2 :
LDAP domain: nasdocs.emc.com
      State: Configured - Connected
      State: 0x14
NIS domain: nsg
Proxy (Bind) DN:
uid=admin,ou=administrators,ou=topologymanagement,o=netscaperoot
  Profile Name: celerra_profile_shortttl
  Profile TTL: 6 seconds
  Next Profile update in 0 seconds
  Profile modification timestamp: 20050105161959Z
Connected to LDAP server address: 172.16.21.10 - port 389
LDAP configuration servers:
  Server address: 172.16.21.10 - port: 389
  Server state: connected
LDAP preferred servers:
  Server address: 172.16.21.10 - port: 389
  Server state: connected
LDAP default servers:
  Server address: 172.16.22.10 - port: 389
  Server state: disconnected
  Server address: 172.16.22.10 - port: 389
  Server state: disconnected
```

Output

```
Domain naming contexts:
  dc=nasdocs,dc=emc
  dc=testdom,dc=lab
  o=NetscapeRoot
Domain supported LDAP controls:
  2.16.840.1.113730.3.4.2
  2.16.840.1.113730.3.4.3
  2.16.840.1.113730.3.4.4
  2.16.840.1.113730.3.4.5
  1.2.840.113556.1.4.473
  2.16.840.1.113730.3.4.9
  2.16.840.1.113730.3.4.16
  2.16.840.1.113730.3.4.15
  2.16.840.1.113730.3.4.17
  2.16.840.1.113730.3.4.19
  2.16.840.1.113730.3.4.14
  1.3.6.1.4.1.1466.29539.12
  2.16.840.1.113730.3.4.13
  2.16.840.1.113730.3.4.12
  2.16.840.1.113730.3.4.18
Domain supported authentication mechanisms:
  EXTERNAL
  DIGEST-MD5
  Directory Base DN: dc=nasdocs,dc=emc
Domain default search Scope: single-level
'passwd' DN:
  ou=people,dc=nasdocs,dc=emc - search scope single-level
  ou=People2,dc=nasdocs,dc=emc - search scope single-level
'group' DN:
  ou=group,dc=nasdocs,dc=emc - search scope single-level
  ou=nregroup,dc=nasdocs,dc=emc - search scope single-level
'hosts' DN:
  ou=hosts,dc=nasdocs,dc=emc - search scope single-level
  ou=morehosts,dc=nasdocs,dc=emc - search scope single-level
'netgroup' DN:
  ou=netgroup,dc=nasdocs,dc=emc - search scope single-level
  ou=mynetgr,dc=nasdocs,dc=emc - search scope subtree
  ou=netgroup2,dc=nasdocs,dc=emc - search scope subtree
```

Output

```
LdapDomainSunOne::searchDomainRoot: Root domain subentry DN: ou=Groups, dc=nasdocs, dc=emc
LdapDomainSunOne::searchDomainRoot: Root domain subentry DN: ou=Special Users, dc=nasdocs, dc=emc
LdapDomainSunOne::searchDomainRoot: Root domain subentry DN: ou=group, dc=nasdocs, dc=emc
LdapDomainSunOne::searchDomainRoot: Root domain subentry DN: ou=rpc, dc=nasdocs, dc=emc
LdapDomainSunOne::searchDomainRoot: Root domain subentry DN: ou=protocols, dc=nasdocs, dc=emc
LdapDomainSunOne::searchDomainRoot: Root domain subentry DN: ou=networks, dc=nasdocs, dc=emc
LdapDomainSunOne::searchDomainRoot: Root domain subentry DN: ou=aliases, dc=nasdocs, dc=emc
LdapDomainSunOne::searchDomainRoot: Root domain subentry DN: ou=hosts, dc=nasdocs, dc=emc
LdapDomainSunOne::searchDomainRoot: Root domain subentry DN: ou=services, dc=nasdocs, dc=emc
LdapDomainSunOne::searchDomainRoot: Root domain subentry DN: ou=ethers, dc=nasdocs, dc=emc
LdapDomainSunOne::searchDomainRoot: Root domain subentry DN: ou=printers, dc=nasdocs, dc=emc
LdapDomainSunOne::searchDomainRoot: Root domain subentry DN: ou=morehosts, dc=nasdocs, dc=emc
LdapDomainSunOne::searchDomainRoot: Root domain subentry DN: ou=mynetgr, dc=nasdocs, dc=emc
LdapDomainSunOne::searchDomainRoot: Root domain subentry DN: ou=People, dc=nasdocs, dc=emc
LdapDomainSunOne::searchDomainRoot: Root domain subentry DN: ou=People2, dc=nasdocs, dc=emc
LdapDomainSunOne::searchDomainRoot: Root domain subentry DN: ou=ppprofile, dc=nasdocs, dc=emc
LdapDomainSunOne::searchDomainRoot: Root domain subentry DN: ou=netgroup2, dc=nasdocs, dc=emc
LdapDomainSunOne::searchDomainRoot: Root domain subentry DN: ou=profile, dc=nasdocs, dc=emc
LdapDomainSunOne::searchDomainRoot: Root domain subentry DN: ou=netgroup, dc=nasdocs, dc=emc
```

Verifying the download of the iPlanet client profile

The configuration of a Data Mover as an iPlanet client is an asynchronous process. This means the CLI can display the success of a command (based on the Control Station's successful parsing of the command options for syntax correctness) when the connection to the iPlanet server and the download of an iPlanet client profile have yet to be performed.

Consequently, to verify the connection to the iPlanet server and the download of a client profile is successful, check the configuration's status as follows:

- ◆ Issue the `server_ldap <movername> -info` command and verify the configuration's state is shown as configured and connected.
- ◆ Check the system log file and verify there are not errors, specifically the error `LDAP query for client profile failed`. To double-check, issue the `server_ldap <movername> -lookup` command to perform a resource lookup and determine if the Data Mover can access the iPlanet server.

Error messages for naming services

During runtime, the iPlanet service configured on the Data Mover returns error messages to the Data Mover's server log. The iPlanet service also returns error messages to the server log during its configuration process.

Table 4 and Table 5 list error messages, their definitions, and corrective actions. The *Celerra Network Server Error Messages Guide* contains additional information on error messages.

iPlanet error messages

Table 4 lists error messages, their definitions, and corrective actions for iPlanet.

Table 4 iPlanet/LDAP server log error messages

Message text	Description	Corrective action
Anonymous LDAP query of the domain rootDSE did not provide any answer	The Data Mover queried the domain root (rootDSE) and received an empty response. Occurs during configuration and reconfiguration	Check the directory and connectivity.
At least one LDAP server needs to be configured	No directory server IP address provided.	Provide the IP address of at least one iPlanet server.
Bad credential level: <credential_level>	Only anonymous and proxy credential levels are supported.	Functionality is not supported.
Bad option <option_name>	Unknown configuration option. Occurs during the configuration process.	Contact EMC Customer Service.
Called without initiating the enumeration with ...	A call to: getpwent, getgrent, gethostent, or getnetgrent made without initiating the enumeration.	Contact EMC Customer Service.
Check connectivity, profile name: %s, and for the profile container: %s, _profileName getChars , dn getChars	The configured client profile cannot be found. Review the LDAP error message and/or error code.	<ol style="list-style-type: none"> 1. Correct or remove the profile name from the configuration. 2. Check the directory.
Configuration for LDAP domain <domain_name> failed	The configuration failed.	<ol style="list-style-type: none"> 1. Check related log messages. 2. For additional help, send the system log file and network trace to EMC Customer Service.

Table 4 iPlanet/LDAP server log error messages (continued)

Message text	Description	Corrective action
Domain name <domain_name> provided for reconfiguration is not the same as the domain presently configured: <domain_name>. If the intention is to change domains, please delete the present configuration.	In order to change the iPlanet domain name, the configuration must be deleted using server_ldap <movername> -clear before a new domain is configured.	Delete the configuration using server_ldap <movername> -clear , and then configure a new iPlanet domain name.
Empty default server list	The client profile attribute defaultServerList contains no value.	Delete the configuration using server_ldap <movername> -clear , and then configure a new iPlanet domain name.
Empty preferred server list	The client profile attribute preferredServerList contains no value.	Delete the configuration using server_ldap <movername> -clear , and then configure a new iPlanet domain name.
Empty serviceSearchDescriptor	The serviceSearchDescriptor attribute is empty.	Check the iPlanet client profile and correct if necessary.
Error while processing VLV control response: <LDAP_error_message (LDAP_error_code)>	The VLV control response indicates a LDAP error.	Send the system log file and network trace to EMC Customer Service.
getClientProfile: client profile: <profile_name> not found in: ou=profile,<iPlanet_domain>	The iPlanet client profile is not found in the directory organizational unit.	
group name + password + gid too large for buffer. Group <group_name>	The space necessary to copy the 'group name' + 'group password (if any) + 'group GID' exceeds Access_GroupBufferSize.	Contact EMC Customer Service.

Table 4 iPlanet/LDAP server log error messages (continued)

Message text	Description	Corrective action
Invalid serviceSearchDescriptor	The serviceSearchDescriptor is malformed, according to the RFC draft <i>A Configuration Schema for LDAP Based Directory User Agents</i> .	Check the iPlanet client profile and correct if necessary.
LDAP Bind: LDAP server is down	If an error occurs during the LDAP bind, the connection aborts.	If the server is unavailable (due to network or environment conditions), there may be a number of these messages in the log. In this case, the user should correct the network or environment condition, to allow the connection to the server. If it is an intermittent error (e.g., a domain controller being rebooted), then no user action is required.
LDAP domain: <LDAP_domain> does not support NIS domain <NIS_domain_name>	The configured NIS domain is different from the configured LDAP domain, and the LDAP domain does not host the configured NIS domain.	Remove the profile option or change the profile name on the configuration command.
LDAP query for the specified client profile: <iPlanet client profile> - dn: ou=profile, <domain_name> failed.	The configured client profile cannot be found. The query for the specified client profile failed.	<ol style="list-style-type: none"> 1. Check the LDAP error code, and the directory. 2. Check connectivity, profile name, and the profile container.
LDAP search error when querying for container: %s error: %s %d matchedDn %s, fn, dn getChars, response getErrorMessage getChars, response getResultCode, response getMatchedDN getChars	The configured client profile cannot be found. Review the LDAP error message and/or error code.	Check the LDAP error code and the directory.
LDAP search failed dn: %s filter: %s filter getChars, response getErrorMessage getChars ,	A search request failed. Occurs when the Data Mover queries the directory.	Check the directory and network.

Table 4 iPlanet/LDAP server log error messages (continued)

Message text	Description	Corrective action
LDAP search failed dn: %s LDAP error: %s %d matchedDn %s, fn, response getErrorMessage getChars , response getResultCode, response getMatchedDN getChars	The configured client profile could not be found. Review the LDAP error message and/or error code. Occurs when the Data Mover queries the directory.	Check the directory and network.
LDAP search failed when querying for response getResultCode, response getMatchedDN getChars container: %s error: %s %d matchedDn %s, fn, dn getChars, response getErrorMessage getChars , response getResultCode, response getMatchedDN getChars	The configured client profile cannot be found. See the LDAP error message and/or error code. Occurs when the Data Mover queries the directory.	Check the directory and network.
LDAP search failed -dn: <LDAP_search_base_ D> -filter: <LDAP_search_crite ria> -error: <LDAP_error_messag e (LDAP_error_code)> -matchedDN <valid_DN>	The configured client profile cannot be found.	See the LDAP error message and/or error code.

Table 4 iPlanet/LDAP server log error messages (continued)

Message text	Description	Corrective action
LDAP search failed -dn: <search_base_DN> - filter: <search_criteria> -error: <LDAP_error_message (LDAP_error_code)> -matched DN: <valid_DN>	The LDAP search request failed.	See the LDAP error message and/or error code.
LDAP search failed -error: <LDAP_error_message (LDAP_error_code)> - matchedDn <valid DN>	The LDAP search operation failed.	See the LDAP error message and error code.
LdapClient::connect: error message: 00002028: LdapErr: DSID-0C090169, comment: The server requires binds to turn on integrity checking if SSL\TLS are not already active on the connection, data 0, vece, (error code 8)	The LDAP server (Windows Domain Controller) refused the connection, because LDAP signing (integrity checking) is required.	Check the param ldap SecurityLayer and set it to 2 (two).
LDAPDomainOpenLDAP not implemented	Open LDAP is unsupported. Currently only iPlanet is supported. User tried to use the Data Mover with an Open LDAP directory.	Functionality not supported.
LdapGssAuthenticator::unwrap:gss_unwrap failed <majStatus>, <minStatus>	An error occurred while unwrapping the LDAP message. Most likely cause is a corrupted message; e.g., "dropping a bit" at the network level.	No action required if this is an infrequent occurrence. If it appears frequently, check for network transmission and/or environment issues.

Table 4 iPlanet/LDAP server log error messages (continued)

Message text	Description	Corrective action
Malformed serviceSearchDescriptor: %s, descStr	The serviceSearchDescriptor is malformed, according to the RFC draft <i>A Configuration Schema for LDAP Based Directory User Agents</i> . Check the iPlanet client profile. Occurs when the Data Mover is parsing the client configuration profile it obtained from the Directory Server.	Check the iPlanet client profile and correct if necessary.
NIS domain: <NIS_domain_name> is not hosted by LDAP domain: <domain_name>. Please verify the configuration.	The configured NIS domain is different from the configured LDAP domain, and the LDAP domain does not host the configured NIS domain.	Set the nisDomain attribute with the same name as the LDAP domain.
No base DN configured	The client profile attribute 'defaultSearchBase' contains no value. Occurs during configuration or reconfiguration.	Fix the client configuration profile.
No configuration options provided	Configuration command has no arguments. Occurs during configuration process.	Contact EMC Customer Service.
No control response returned from directory server	The LDAP search reply does not have an LDAP Control section. Occurs when the Data Mover queries the directory.	Send server log and network trace to EMC Customer Service.
No domain name provided	No iPlanet domain name provided in the configuration process. This is either a Control Station or a command parsing error.	Contact EMC Customer Service.
No LDAP domain configured	The Data Mover iPlanet client is not configured.	Configure the Data Mover iPlanet client.
No NIS domain matches the LDAP domain: <LDAP_domain>	No domain nisDomain attribute matches the LDAP domain name, and a NIS domain is not configured on the Data Mover.	Use the -nisdomain option of the server_ldap command.

Table 4 iPlanet/LDAP server log error messages (continued)

Message text	Description	Corrective action
No profile configured	Celerra is trying to refresh the iPlanet client profile although there is no profile configured. Occurs during reconfiguration.	Contact EMC Customer Service.
No servers configured for LDAP domain <domain_name>	No directory server IP address provided.	Provide the IP address of at least one directory server.
posixAccount entry without UID name, fn	Occurs when the Data Mover queries for a user entry.	Check the user entry in the directory and correct if necessary.
posixGroup entry without name	The group entry is missing a name.	Check the group entry in the directory.
Reconfiguration for LDAP domain <domain_name> failed	The configuration failed.	1. Check related log messages. 2. For additional help, send the system log file and network trace to EMC Customer Service.
serviceSearchDescriptor with references: %s are not supported, base	Celerra does not support referrals in serviceSearchDescriptor attributes.	Change your domain configuration.
The specified client profile: <client_profile> does not exist in: ou=profile,<domain_base_DN>	The configured profile does not exist.	Configure an iPlanet client profile.
Unable to connect to any configuration server on LDAP domain: <domain_name>	The Data Mover is unable to connect to any iPlanet configuration servers on the domain specified.	Analyze and correct runtime error.
Unable to connect to any server in LDAP domain: <domain_name>	The Data Mover is unable to connect to any domain service servers.	Analyze and correct.
Unable to connect to the LDAP	The Data Mover is unable to connect to the directory server.	Check the directory server and connectivity.

Table 4 iPlanet/LDAP server log error messages (continued)

Message text	Description	Corrective action
Unable to connect to the LDAP server: <IP_address:port> -LDAP error: <LDAP_error_message (LDAP_error_code)>	Unable to connect to the domain server specified by the IP address and port.	Review the LDAP error message and error code.
Unable to decrypt client password	Only user passwords encrypted with {CRYPT} are supported.	Functionality not supported.
Unable to encrypt client password	Failure while encrypting the iPlanet bind password.	Contact EMC Customer Service.
user name + password + UID + gid too large for buffer. User <user_name>	The space necessary to copy the 'user name' + 'user password' + 'user UID' + 'user primary GID' exceeds Access_PasswordBufferSize.	Contact EMC Customer Service.
Warning. Reached maximum netgroup search depth (search_depth)	Reached the maximum depth when searching for netgroup membership.	None.
Warning: Authentication method <authentication_method> not supported	The authentication method specified in the client profile is unsupported.	None.
Warning: Bad search scope: <search_scope> - default search scope to single level.	Valid search scope is single-level (one) or sub-tree (sub).	None.
Warning: LDAP domain <domain_name> has no group container configured. Group information will not be retrieved.	The domain does not contain an organizational unit for group entries or it is not configured properly.	None.

Table 4 iPlanet/LDAP server log error messages (continued)

Message text	Description	Corrective action
Warning: LDAP domain <domain_name> has no hosts container configured. Host information will not be retrieved.	The domain does not contain an organizational unit for host entries or it is not configured properly.	None.
Warning: LDAP domain <domain_name> has no netgroup container configured. Netgroup information will not be retrieved.	The domain does not contain an organizational unit for netgroup entries or it is not configured properly.	None.
Warning: LDAP domain <domain_name> has no passwd container configured. User accounts will not be retrieved.	The domain does not contain an organizational unit for password records or it is not configured properly.	None.
Warning: Unknown authentication method: <authentication_method>	Unknown authentication method.	None.

LDAP error messages

[Table 5](#) lists the LDAP error messages defined by RFC 2251 *Lightweight Directory Access Protocol (v3)*. For more information on their exact meaning in the iPlanet implementation, refer to the Sun Java System Directory Server (iPlanet) documentation at www.sun.com.

Table 5 LDAP error messages and codes

LDAP error code	LDAP error message
1	operationsError
2	protocolError
3	timeLimitExceeded
4	sizeLimitExceeded

Table 5 LDAP error messages and codes (continued)

LDAP error code	LDAP error message
5	compareFalse
6	compareTrue
7	authMethodNotSupported
8	strongAuthRequired
9	reserved
10	referral
11	adminLimitExceeded
12	unavailableCriticalExtension
13	confidentialityRequired
14	saslBindInProgress
16	noSuchAttribute
17	undefinedAttributeType
18	inappropriateMatching
19	constraintViolation
20	attributeOrValueExists
21	invalidAttributeSyntax
22 - 31	unused
32	noSuchObject
33	aliasProblem
34	invalidDNsyntax
35	reserved for undefined
36	aliasDereferencingProblem
37 - 47	unused
48	inappropriateAuthentication
49	invalidCredentials

Table 5 LDAP error messages and codes (continued)

LDAP error code	LDAP error message
50	insufficientAccessRights
51	busy
52	unavailable
53	unwillingToPerform
54	loopDetect
55 - 63	unused
64	namingViolation
65	objectClassViolation
66	notAllowedOnNonLeaf
67	notAllowedOnRDN
68	entryAlreadyExists
69	objectClassModsProhibited
70	reserved for CLDAP
71	affectsMultipleDSAs
72 - 79	unused
80	other

Related information

For specific information related to the features and functionality described in this technical module, refer to:

- ◆ *Celerra Network Server Command Reference Manual*
- ◆ Online Celerra man pages
- ◆ *Celerra Network Server Parameters Guide*
- ◆ *Configuring and Managing Celerra Networking*
- ◆ *Configuring Celerra User Mapping*
- ◆ *Managing Celerra for the Windows Environment*
- ◆ *Managing Celerra for a Multiprotocol Environment*
- ◆ *Celerra Network Server Error Messages Guide*

The *Celerra Network Server Documentation CD*, supplied with your Celerra Network Server and also available on [Powerlink](#), provides general information on other EMC Celerra publications.

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Appendix: iPlanet client profile attributes

The configuration attributes defined in an iPlanet client profile are described in the RFC draft, *A Configuration Schema for LDAP Based Directory User Agents*. The Celerra Network Server supports these attributes as described in [Table 6](#) unless otherwise noted.

The following terms are used in the attribute descriptions:

- ◆ **DIT (Directory Information Tree)**: The entire information tree of the directory itself.
- ◆ **DSA (Directory Server Agent)**: The X.500 term for a directory server or any LDAP server, represented in the Celerra environment by the iPlanet directory server.
- ◆ **DUA (Directory User Agent)**: The directory client or any LDAP client, represented in the Celerra environment by the Data Mover.

Table 6 iPlanet client profile attributes

Attribute	Description	Celerra support
<code>preferredServerList</code>	<p>The <code>preferredServerList</code> attribute provides a list of server addresses and associated port numbers. List entries are separated by spaces. When the DUA needs to contact a DSA, the DUA must first attempt to contact one of the servers listed in the <code>preferredServerList</code> attribute.</p> <p>The DUA must contact the DSA specified by the first server address in the list. If that DSA is unavailable, the remaining DSAs must be queried in the order provided until a connection is established with a DSA. Once a connection with a DSA is established, the DUA should not attempt to establish a connection with the remaining DSAs.</p> <p>If the DUA is unable to contact any of the DSAs specified by the <code>preferredServerList</code>, the <code>defaultServerList</code> attribute must be examined.</p>	Yes, IP addresses only
<code>defaultServerList</code>	<p>The <code>defaultServerList</code> attribute must only be examined if the <code>preferredServerList</code> attribute is not provided, or the DUA is unable to establish a connection with one of the DSAs specified by the <code>preferredServerList</code>.</p> <p>If neither a <code>preferredServerList</code> nor a <code>defaultServerList</code> is provided, the DUA contacts the same server that provided the client configuration profile.</p>	Yes, IP addresses only
<code>defaultSearchBase</code>	<p>When a DUA needs to search the directory for information, the <code>defaultSearchBase</code> attribute defines the "base" for the search. This parameter can be overridden or appended by the <code>serviceSearchDescriptor</code> attribute.</p>	Yes

Table 6 iPlanet client profile attributes (continued)

Attribute	Description	Celerra support
defaultSearchScope	When the DUA needs to search the directory for information, this attribute provides the "scope" for the search. This parameter can be overridden by the <code>serviceSearchDescriptor</code> attribute. Values accepted: one and sub. Where one means one-level search, and sub means search the whole subtree. The default value is one.	Yes
authenticationMethod	The <code>authenticationMethod</code> attribute defines an ordered list of LDAP bind methods used when attempting to contact a DSA.	Yes, none and simple authentication
credentialLevel	The <code>credentialLevel</code> attribute defines what type(s) of credential(s) the DUA should use when contacting the DSA.	Yes, anonymous and proxy
serviceSearchDescriptor	The <code>serviceSearchDescriptor</code> attribute defines how and where an DUA should search for information for a particular service. The <code>serviceSearchDescriptor</code> contains a service ID, followed by one or more base-scope-filter triples. These base-scope-filter triples are used to define searches only for the specified service. Multiple base-scope-filters allow the DUA to search for data in multiple locations of the DIT.	Yes, with the exception of the redefinition of the search filter. Celerra supports a service ID followed only by base-scope.
serviceCredentialLevel	The <code>serviceCredentialLevel</code> attribute defines what type(s) of credential(s) the DUA should use when contacting the DSA for a particular service.	No
serviceAuthenticationMethod	The <code>serviceAuthenticationMethod</code> attribute defines an ordered list of LDAP bind methods to be used when attempting to contact a DSA for a particular service.	No
attributeMap	Maps attributes of similar syntaxes.	No
objectclassMap	<code>Objectclass</code> mapping should be used in conjunction with attribute mapping to map the required schema by the service to an equivalent schema available in the directory.	No
searchTimeLimit	The <code>searchTimeLimit</code> attribute defines the maximum time, in seconds, a DUA should allow to perform a search request.	No
bindTimeLimit	The <code>bindTimeLimit</code> attribute defines the maximum time, in seconds, a DUA should allow to perform an LDAP bind request against each DSA on the <code>preferredServerList</code> or <code>defaultServerList</code> .	No
followReferrals	If set to true, the DUA should follow any referrals if discovered.	No
dereferenceAliases	If set to true, the DUA should enable alias dereferencing. If set to false, the DUA must not enable alias dereferencing.	N/A

Table 6 iPlanet client profile attributes (continued)

Attribute	Description	Celerra support
profileTTL	The profileTTL attribute defines the time interval before the DUA should reload and reconfigure itself using the corresponding client configuration profile. If the profileTTL value is zero or not defined, the DUA does not reload the configuration profile.	Yes

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About this technical module

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