

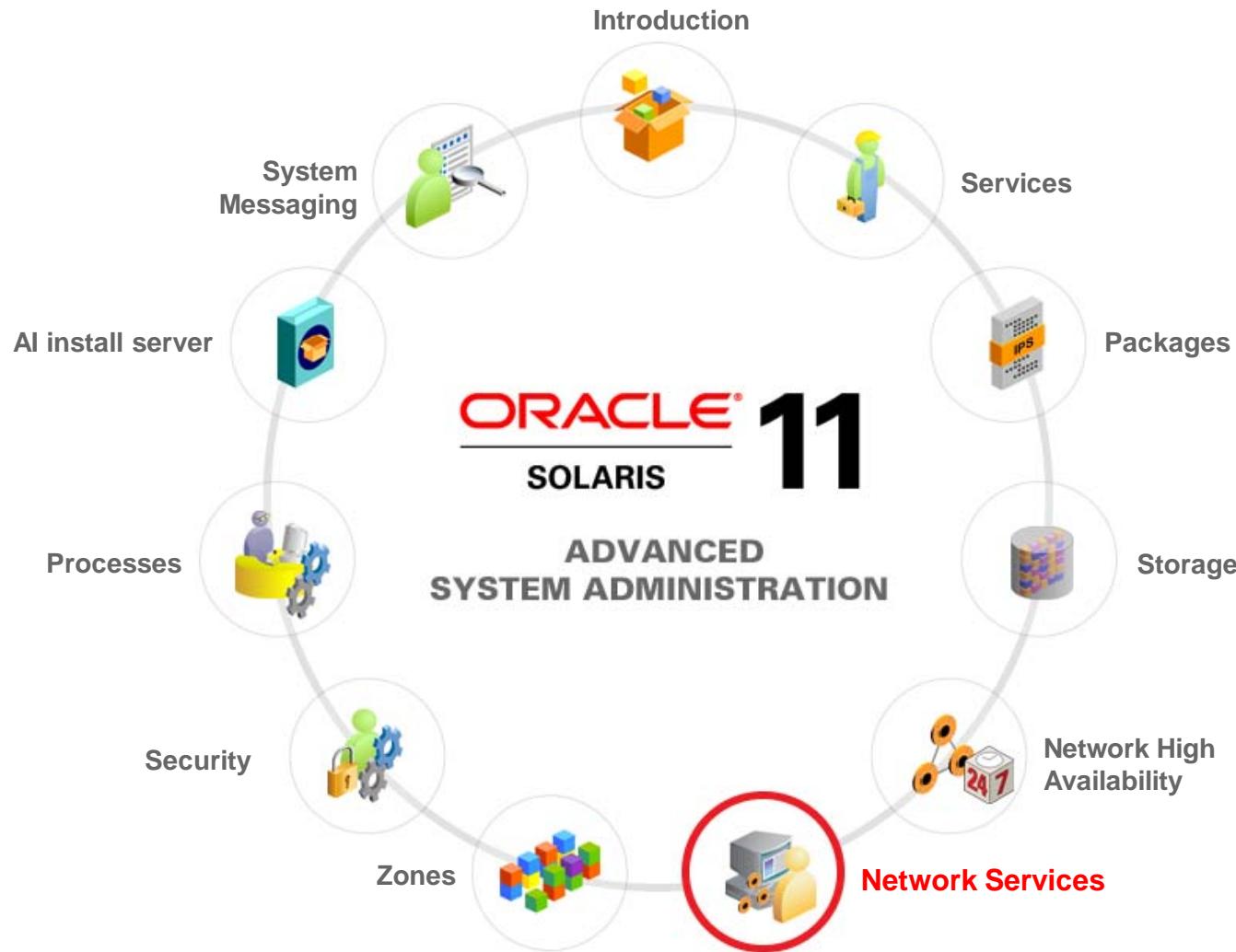
# Administering Network Services

# Objectives

After completing this lesson, you should be able to configure:

- Network File System (NFS)
- A Domain Name System (DNS) client
- A Lightweight Directory Access Protocol (LDAP) client

# Job Workflow



# Agenda

- Configuring the Network File System (NFS)
- Configuring a Domain Name System (DNS) client
- Configuring a Lightweight Directory Access Protocol (LDAP) client

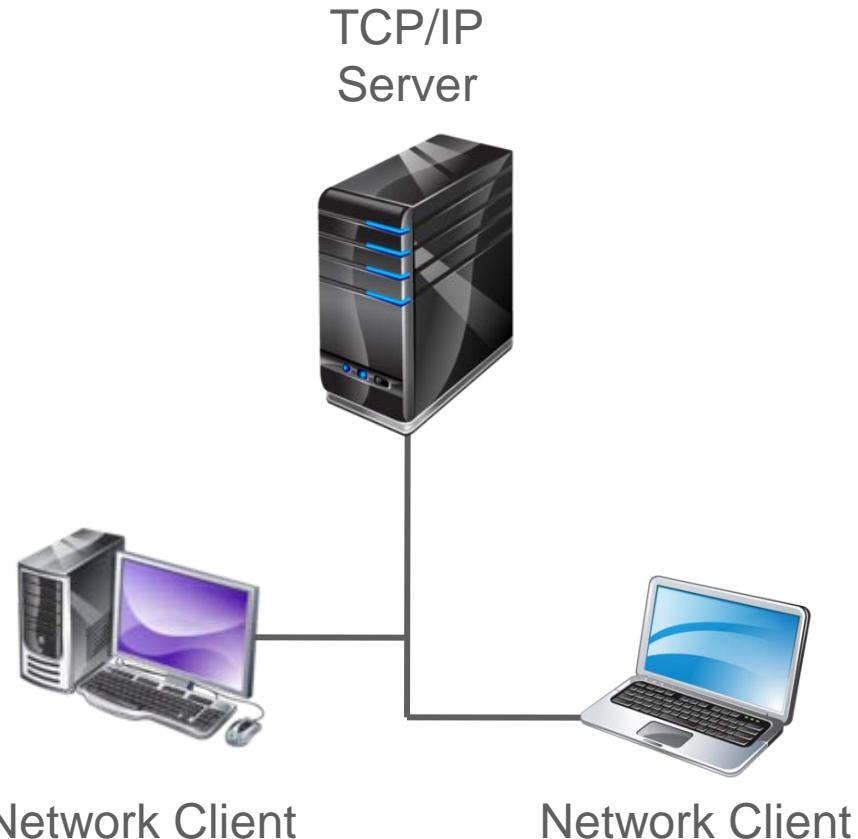
# Importance of Network Services

Network services are required to ensure the following:

- Computers of different architectures that run different operating systems are able to share file systems across a network.
- You can look up IP addresses for:
  - Internet host names
  - Host names for IP addresses that are distributed across the network
- You have a directory structure that:
  - Includes details of various resources and identities
  - Can be accessed across networks

# Configuring Network Services

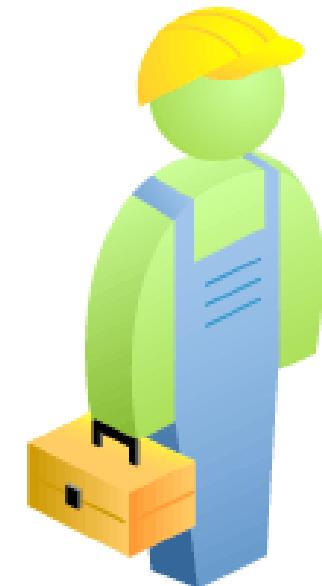
- RARP/ARP
- TFTP
- NFS
- Name service
  - NIS, LDAP, DNS



# Network File System: Overview

## The Network File System (NFS):

- Allows access to file systems over the network
- Enables any system to access any other system's file systems
- Has the following advantages:
  - Accesses the same data
  - Reduces storage costs
  - Provides data consistency and reliability
  - Provides transparency
  - Reduces administration overhead
  - Provides heterogeneous environments
  - Enables automatic file sharing



# Configuring NFS

This section covers the following topics:

- Configuring the NFS server
- Checking the NFS services status
- Configuring the NFS client
- Selecting a different version of NFS on a server
- Enabling the automount service
- Displaying NFS server and client statistics

# Configuring the NFS Server

1. Create a ZFS file system for the files you want to share.
2. To share the file system:
  - a. Set the ZFS share property.
  - b. Set the ZFS share.nfs property to on.
3. Use the share command to verify what is being shared.

```
# zfs create rpool/export/home/docs
# zfs set share=name=docs,path=/export/home/docs,prot=nfs \
rpool/export/home/docs
name=docs,path=/export/home/docs,prot=nfs
# zfs set share.nfs=on rpool/export/home/docs
# zfs set compression=on rpool/export/home/docs
# share
docs      /export/home/docs  nfs sec=sys,rw
```

# Checking the NFS Services Status

To check the status of the NFS services, use `svcs -a | grep nfs`.

```
# svcs -a | grep nfs
disabled          7:01:37 svc:/network/nfs/cbd:default
disabled          7:01:37 svc:/network/nfs/client:default
online            7:01:37 svc:/network/nfs/fedfs-client:default
online            7:01:37 svc:/network/nfs/mapid:default
online            16:31:11 svc:/network/nfs/status:default
online            16:31:12 svc:/network/nfs/nlockmgr:default
online            16:31:15 svc:/network/nfs/rquota:default
online            16:31:17 svc:/network/nfs/server:default
```

# Configuring the NFS Client

1. Run `dfshares server` to verify that you can view the shared resource.
2. Create a directory to use as the mount point.
3. Run `mount -F nfs -o ro server:resource /directory` to specify the resource to be mounted.
4. Verify that the files in the shared resource can be shared.

```
# dfshares server1
RESOURCE                                SERVER      ACCESS      TRANSPORT
server1:/export/home/docs                 server1     -          -
# mkdir /docs
# mount -F nfs -o ro server1:/export/home/docs /docs
# cd /docs
server1:/docs# ls
assetlist
```

# Selecting a Different Version of NFS on a Server

To select a different version of NFS on a server or client, use the `sharectl set` command.

## Example:

To set a server or client to provide only NFS version 3:

Server:

```
# sharectl set -p server_versmax=3 nfs  
# sharectl set -p server_versmin=3 nfs
```

Client:

```
# sharectl set -p client_versmax=3 nfs  
# sharectl set -p client_versmin=3 nfs
```

# Enabling the Automount

To enable or disable the automount service, use the `svcadm` command.

Enable service:

```
# svcadm enable autofs
```

Mount file system:

```
# cd /net/server1/export/share/local
```

Disable service:

```
# svcadm disable autofs
```

# Displaying NFS Server and Client Statistics

To display statistics about the NFS service on the client or server, use the nfsstat command.

```
# nfsstat -c
Client rpc:
Connection oriented:
calls      badcalls    badxids    timeouts   newcreds   badverfs   timers
1595799    1511        59         297        0          0          0
cantconn  nomem       interrupts
1198       0           7
Connectionless:
calls      badcalls    badxids    timeouts   newcreds   badverfs   timers
1595799    1511        59         297        0          0          0
. . . .
Client nfs:
calls      badcalls    clgets     cltoomany
1640097    3112        1640097   0
. . . .
Client nfs_acl:
Version 2: (3105 calls)
null      getacl      setacl     getattr    access    getxattrdir
0 0%      0 0 %      0 0%      3105    100%    0 0%      0 0%
```

# Practice 6-1 Overview: Configuring the NFS

This practice covers the configuration of the following:

- NFS server
- NFS client

# Agenda

- Configuring the Network File System (NFS)
- Configuring a Domain Name System (DNS) client
- Configuring a Lightweight Directory Access Protocol (LDAP) client

# Domain Name System: Overview

The Domain Name System (DNS) is:

- A hierarchical, distributed database that is implemented on a TCP/IP network
- Primarily used to look up IP addresses for Internet host names and host names for IP addresses
- Used to store other Internet-related host information, such as mail exchange routing information, location data, and available services

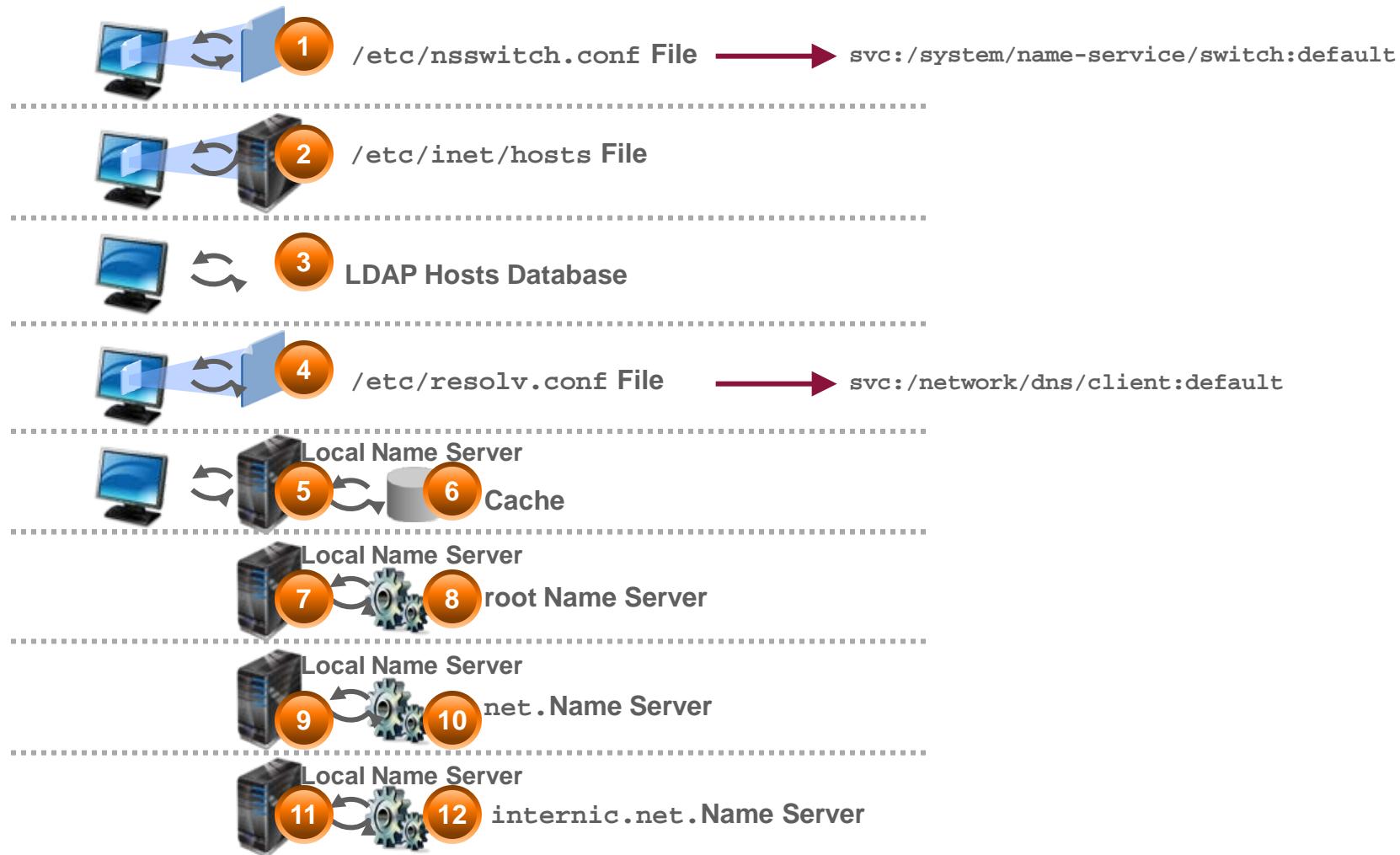
# How DNS Works

1. A DNS client requests information about a host name from one or more name servers and then waits for a response.
2. DNS servers respond to requests after looking up one of the following:
  - Information cache that was loaded from file or a third-party database on a DNS master
  - Network from a cooperating DNS slave server
3. If found, the host name is resolved.
4. If there is no response and the server is not responsible for the domain in question, the service recursively requests (if permitted) the host name from other servers and caches that response.

# DNS Name Resolution

- *Name resolution* is the process of translating a domain name to an IP address (and vice versa).
- The name resolution process in Oracle Solaris 11 is implemented through SMF services.
  - The `/etc/resolv.conf` file (which determines the name resolution search list and the address of the DNS servers) is now an SMF service:  
`svc:/network/dns/client:default`
  - The `/etc/resolv.conf` file is activated by a reference to the DNS entry in the `/etc/nsswitch.conf` file.
  - The `/etc/nsswitch.conf` file is also an SMF service:  
`svc:/system/name-service/switch:default`

# Name Resolution Process



# Checking the Connection to the DNS Server

To check the connectivity, use nslookup host\_IP\_address.

```
# nslookup 192.168.0.100
Server:  192.168.0.100
Address: 192.168.0.100#53

100.0.168.192.in-addr.arpaname = s11-server1.mydomain.com
```

# Practice 6-2 Overview: Configuring a DNS Client

In this practice, you configure a DNS client.

**Note:** The DNS server is already set up for you because setup is usually the job of a network administrator.

# Agenda

- Configuring the Network File System (NFS)
- Configuring a Domain Name System (DNS) client
- Configuring a Lightweight Directory Access Protocol (LDAP) client

# Lightweight Directory Access Protocol: Overview

## Lightweight Directory Access Protocol (LDAP):

- Allows access to directory servers for distributed naming and other directory services
- Supports a hierachal database structure
- Can be used to provide naming services in both UNIX and multiplatform environments

# Preparing for LDAP Client Setup

The requirements for an Oracle Solaris client to use LDAP as a naming service are:

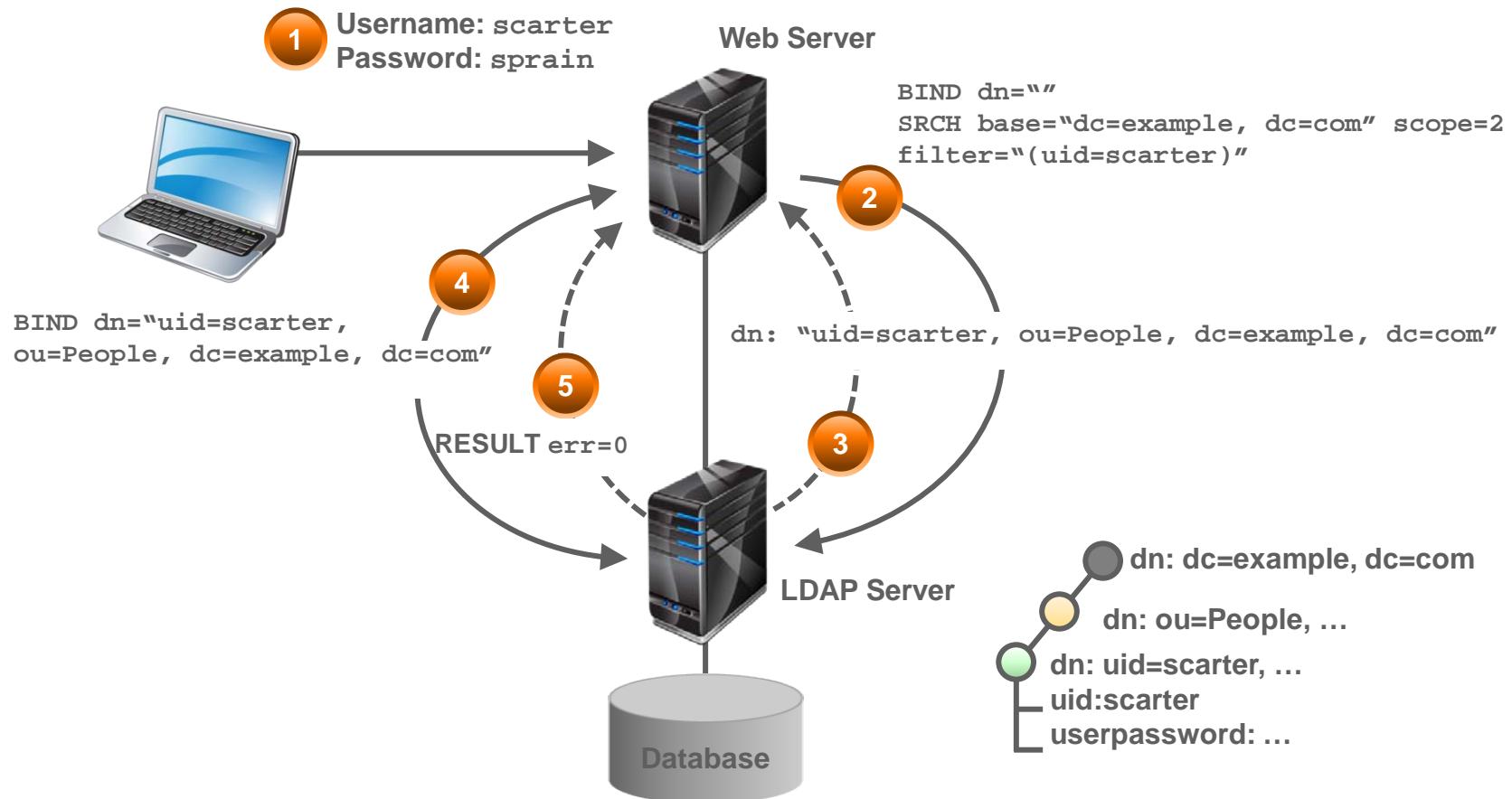
- The client's domain name must be served by the LDAP server.
- The name service switch must point to LDAP for the required services.
- The client must be configured with all the parameters that define its behavior.
- `ldap_cachemgr` must be running on the client.
- At least one server for which a client is configured must be running.

# LDAP and the SMF

SMF manages the LDAP client service.

SMF Feature	LDAP Client Service
svcadm	Used to enable, disable, or restart the LDAP client service
svc:/network/ldap/client	The fault management resource identifier (FMRI) for the LDAP client service
network/nis/domain	During the configuration process, this service is also enabled to supply the domain name to be used by the network/ldap/client service
svcs	Used to query the status of the LDAP client and the ldap_cachemgr daemon

# How LDAP Works



# Practice 6-3 Overview: Configuring an LDAP Client

In this practice, you configure an LDAP client.

**Note:** The LDAP server is already set up for you because setup is usually the job of a network administrator.

# Summary

In this lesson, you should have learned how to configure:

- Network File System (NFS)
- A Domain Name System (DNS) client
- A Lightweight Directory Access Protocol (LDAP) client