

Introduction to Oracle® Solaris 11.4 Network Services

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Using This Documentation

- **Overview** – Provides an overview of the network services supported by the Oracle Solaris operating system.
- **Audience** – System administrators.
- **Required knowledge** – Basic and some advanced network administration skills.

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Introduction to Network Services

This chapter provides lists of key tasks for managing the network services in Oracle Solaris 11.4.

Network Services in Oracle Solaris 11.4

Select the appropriate link for a list of pointers to the key configuration tasks for that network service:

- [“LDAP Key Tasks” on page 12](#) – The Lightweight Directory Access Protocol (LDAP) service enables you to access directory servers for distributed naming service.
- [“DNS and NIS Key Tasks” on page 13](#) – The Domain Name System (DNS) service enables the system to look up IP addresses for host names and host names for IP addresses. The Network Information System (NIS) service enables you to manage network information such as machine names and addresses, users, and network services.
- [“DHCP and IPQoS Key Tasks” on page 15](#) – The Dynamic Host Configuration Protocol (DHCP) service enables systems to automatically configure the network. The IP Quality of Service (IPQoS) service enables you to prioritize, control, and gather network accounting statistics.
- [“NFS Key Tasks” on page 16](#) – The network file system (NFS) service enables you to access file systems over a network.
- [“SMB and Windows Interoperability Key Tasks” on page 17](#) – The Server Message Block (SMB) service enables you to share files between an Oracle Solaris system and a Windows system.
- [“Time-Related Services Key Tasks” on page 17](#) – The Network Time Protocol (NTP) and Precision Time Protocol (PTP) services enable you to synchronize system clocks within a network.
- [“sendmail Key Tasks” on page 18](#) – The sendmail service enables you to set up and maintain an email service.
- [“Key Tasks for Managing Remote Systems” on page 18](#) – The File Transfer Protocol (FTP) service enables you to transfer files between two systems over a network.

- [“Key Tasks for Managing Serial Networks Using UUCP and PPP” on page 19](#) – The Point-to-Point Protocol (PPP) service enables two systems in different physical locations to communicate with each other. The UNIX-to-UNIX CoPy (UUCP) service enables two systems in different physical locations to transfer files and exchange mail with each other.

Note - UUCP was removed from the Oracle Solaris 11.4 SRU 12 release. PPP was removed from the Oracle Solaris 11.4 SRU 24 release.

LDAP Key Tasks

You can use the following tasks to manage the LDAP service:

- Configure Oracle Unified Directory Server or OpenLDAP Server for the LDAP naming service. For more information, see [Chapter 4, “Setting Up an Oracle Unified Directory Server or OpenLDAP Server” in *Working With Oracle Solaris 11.4 Directory and Naming Services: LDAP*](#).
- Populate the LDAP server with data. For more information, see [Chapter 4, “Setting Up an Oracle Unified Directory Server or OpenLDAP Server” in *Working With Oracle Solaris 11.4 Directory and Naming Services: LDAP*](#).
- Populate the directory server with additional profiles. For more information, see [Chapter 4, “Setting Up an Oracle Unified Directory Server or OpenLDAP Server” in *Working With Oracle Solaris 11.4 Directory and Naming Services: LDAP*](#).
- You can use the following tasks to administer the LDAP client:
 - Initialize an LDAP client. For more information, see [“Initializing an LDAP Client” in *Working With Oracle Solaris 11.4 Directory and Naming Services: LDAP*](#).
 - Modify an LDAP client configuration. For more information, see [“Modifying an LDAP Client Configuration” in *Working With Oracle Solaris 11.4 Directory and Naming Services: LDAP*](#).
 - Uninitialize an LDAP client. For more information, see [“Uninitializing an LDAP Client” in *Working With Oracle Solaris 11.4 Directory and Naming Services: LDAP*](#).
- You can use the following tasks to monitor LDAP client status:
 - Verify that the `ldap_cachemgr` daemon is running. For more information, see [“Verifying the ldap_cachemgr Daemon Status” in *Working With Oracle Solaris 11.4 Directory and Naming Services: LDAP*](#).
 - Check the current profile information. For more information, see [“Checking the Client Profile Information” in *Working With Oracle Solaris 11.4 Directory and Naming Services: LDAP*](#).

- Verify basic client-server communication. For more information, see [“Verifying Basic Client-Server Communication”](#) in *Working With Oracle Solaris 11.4 Directory and Naming Services: LDAP*.
- Check server data from a non-client machine. For more information, see [“Checking LDAP Server Data From a Non-Client Machine”](#) in *Working With Oracle Solaris 11.4 Directory and Naming Services: LDAP*.
- Transition from NIS to LDAP. For more information, see [“Transitioning From NIS to LDAP Task Map”](#) in *Working With Oracle Solaris 11.4 Directory and Naming Services: LDAP*.

DNS and NIS Key Tasks

You can use the following tasks to manage the name service switch, DNS services, and NIS services.

- You can use the following tasks to configure the name service switch:
 - Change the source for a database. For more information, see [“How to Change the Source for a Database”](#) in *Working With Oracle Solaris 11.4 Directory and Naming Services: DNS and NIS*.
 - Configure a search criterion for a database. For more information, see [“How to Configure a Search Criterion for a Database”](#) in *Working With Oracle Solaris 11.4 Directory and Naming Services: DNS and NIS*.
 - Change the source for all naming databases. For more information, see [“How to Change the Source for All Naming Databases”](#) in *Working With Oracle Solaris 11.4 Directory and Naming Services: DNS and NIS*.
 - Use a legacy `nsswitch.conf` file. For more information, see [“How to Use a Legacy `nsswitch.conf` File”](#) in *Working With Oracle Solaris 11.4 Directory and Naming Services: DNS and NIS*.
- You can use the following tasks to administer the DNS server and client services:
 - Install the DNS package. For more information, see [“How to Install the DNS Package”](#) in *Working With Oracle Solaris 11.4 Directory and Naming Services: DNS and NIS*.
 - Configure a DNS server. For more information, see [“How to Configure a DNS Server”](#) in *Working With Oracle Solaris 11.4 Directory and Naming Services: DNS and NIS*.
 - Create configuration file for remote control access of DNS server daemon. For more information, see [“How to Create an `rmdc.conf` File”](#) in *Working With Oracle Solaris 11.4 Directory and Naming Services: DNS and NIS*.
 - Run the DNS service as an alternative user. For more information, see [“How to Run the DNS Service as an Alternative User”](#) in *Working With Oracle Solaris 11.4 Directory and Naming Services: DNS and NIS*.

- Enable a DNS client. For more information, see [“How to Enable a DNS Client” in Working With Oracle Solaris 11.4 Directory and Naming Services: DNS and NIS.](#)
- Verify DNS configuration. For more information, see [“How to Verify DNS Configuration Changes” in Working With Oracle Solaris 11.4 Directory and Naming Services: DNS and NIS.](#)
- Enable Multicast DNS and DNS service discovery. For more information, see [“How to Enable mDNS and DNS Service Discovery” in Working With Oracle Solaris 11.4 Directory and Naming Services: DNS and NIS.](#)
- Configure the `nss_ad` module to set up Oracle Solaris active directory clients. For more information, see [“How to Configure the `nss_ad` Module” in Working With Oracle Solaris 11.4 Directory and Naming Services: DNS and NIS.](#)
- You can use the following tasks to set up and configure the NIS service:
 - Prepare the master server. For more information, see [“Preparing the NIS Master Server” in Working With Oracle Solaris 11.4 Directory and Naming Services: DNS and NIS.](#)
 - Start and stop NIS services on an NIS server. For more information, see [“Starting and Stopping NIS Services on an NIS Server” in Working With Oracle Solaris 11.4 Directory and Naming Services: DNS and NIS.](#)
 - Set up NIS slave servers. For more information, see [“Setting Up NIS Slave Servers” in Working With Oracle Solaris 11.4 Directory and Naming Services: DNS and NIS.](#)
 - Administer NIS clients. For more information, see [“Administering NIS Clients” in Working With Oracle Solaris 11.4 Directory and Naming Services: DNS and NIS.](#)
- You can use the following tasks to administer NIS service:
 - Add a new NIS user to an NIS domain. For more information, see [“How to Add a New NIS User to an NIS Domain” in Working With Oracle Solaris 11.4 Directory and Naming Services: DNS and NIS.](#)
 - Change a NIS map's master server. For more information, see [“How to Change an NIS Map's Master Server” in Working With Oracle Solaris 11.4 Directory and Naming Services: DNS and NIS.](#)
 - Modify configuration file to update the security and supported map information. For more information, see [“How to Modify NIS Configuration Files” in Working With Oracle Solaris 11.4 Directory and Naming Services: DNS and NIS.](#)
 - Modify `Makefile` entries. For more information, see [“How to Modify `/var/yp/Makefile` to Use Specific Databases” in Working With Oracle Solaris 11.4 Directory and Naming Services: DNS and NIS.](#)
 - Update and modify existing maps. For more information, see [“How to Update NIS Maps Supplied With the Default Set” in Working With Oracle Solaris 11.4 Directory and Naming Services: DNS and NIS.](#)
 - Work with the NIS server to modify the NIS configuration. For more information, see [“How to Configure System Host Name and Address Lookup Through NIS and DNS” in Working With Oracle Solaris 11.4 Directory and Naming Services: DNS and NIS.](#)

- You can use the following information to troubleshoot NIS:
 - NIS problems affecting one client. For more information, see [“NIS Problems Affecting One Client”](#) in *Working With Oracle Solaris 11.4 Directory and Naming Services: DNS and NIS*.
 - NIS problems affecting many clients. For more information, see [“NIS Problems Affecting Many Clients”](#) in *Working With Oracle Solaris 11.4 Directory and Naming Services: DNS and NIS*.

DHCP and IPQoS Key Tasks

- You can use the following tasks to manage the DHCP service:
 - Grant user access to DHCP commands. For more information, see [“How to Grant User Access to DHCP Commands”](#) in *Working With DHCP in Oracle Solaris 11.4*.
 - Configure an ISC DHCP Server. For more information, see [“How to Configure an ISC DHCP Server”](#) in *Working With DHCP in Oracle Solaris 11.4*.
 - Modify the Configuration of the DHCP Service. For more information, see [“How to Modify the Configuration of the DHCP Service”](#) in *Working With DHCP in Oracle Solaris 11.4*.
 - Enable a DHCP Client. For more information, see [“How to Enable a DHCP Client”](#) in *Working With DHCP in Oracle Solaris 11.4*.
 - Disable a DHCP Client. For more information, see [“How to Disable a DHCP Client”](#) in *Working With DHCP in Oracle Solaris 11.4*.
 - Enable a DHCPv4 Client to Request a Specific Host Name. For more information, see [“How to Enable a DHCPv4 Client to Request a Specific Host Name”](#) in *Working With DHCP in Oracle Solaris 11.4*.
- You can use the following tasks to manage the IPQoS service:
 - Plan the QoS policy. For more information, see [“QoS Policy Planning Task Map”](#) in *Managing IP Quality of Service in Oracle Solaris 11.4*.
 - Define a QoS policy in the IPQoS configuration file. For more information, see [“Defining a QoS Policy Task Map”](#) in *Managing IP Quality of Service in Oracle Solaris 11.4*.
 - Administer IPQoS. For more information, see [“Administering IPQoS”](#) in *Managing IP Quality of Service in Oracle Solaris 11.4*.
 - Set up flow accounting. For more information, see [“How to Create a File for Flow-Accounting Data”](#) in *Managing IP Quality of Service in Oracle Solaris 11.4*.

NFS Key Tasks

You can use the following tasks to manage network file systems:

- Set up the NFS service. For more information, see [“Setting Up the NFS Service” in *Managing Network File Systems in Oracle Solaris 11.4*](#).
- Mount NFS file system. For more information, see [“Mounting File Systems Task Map” in *Managing Network File Systems in Oracle Solaris 11.4*](#).
- You can use the following tasks to manage automatic file system sharing:
 - Set up automatic file system sharing. For more information, see [“How to Set Up Automatic File System Sharing” in *Managing Network File Systems in Oracle Solaris 11.4*](#).
 - Administer automatic file system sharing. For more information, see [“Autofs Administration” in *Managing Network File Systems in Oracle Solaris 11.4*](#).
- You can use the following tasks to administer NFS referrals:
 - Create and access an NFS referral to connect to multiple NFS Version 4 server. For more information, see [“How to Create and Access an NFS Referral” in *Managing Network File Systems in Oracle Solaris 11.4*](#).
 - Remove an NFS referral. For more information, see [“How to Remove an NFS Referral” in *Managing Network File Systems in Oracle Solaris 11.4*](#).
- You can use the following information to troubleshoot NFS and autofs:
 - Check connectivity issues on an NFS client. For more information, see [“How to Check Connectivity on an NFS Client” in *Managing Network File Systems in Oracle Solaris 11.4*](#).
 - Check the NFS server remotely. For more information, see [“How to Check the NFS Server Remotely” in *Managing Network File Systems in Oracle Solaris 11.4*](#).
 - Verify the NFS service on the server. For more information, see [“How to Verify the NFS Service on the Server” in *Managing Network File Systems in Oracle Solaris 11.4*](#).
 - Verify options used with the mount command. For more information, see [“How to Verify Options Used With the mount Command” in *Managing Network File Systems in Oracle Solaris 11.4*](#).
 - NFS error message description and solution. For more information, see [“NFS Error Messages” in *Managing Network File Systems in Oracle Solaris 11.4*](#).
 - Autofs error message description and solution. For more information, see [“Troubleshooting Autofs” in *Managing Network File Systems in Oracle Solaris 11.4*](#).

SMB and Windows Interoperability Key Tasks

You can use the following tasks to manage the SMB service:

- You can use the following tasks to create identity mapping strategy:
 - Manage directory-based name mapping for users and groups. For more information, see [“Managing Directory-Based Name Mapping for Users and Groups”](#) in *Managing SMB File Sharing and Windows Interoperability in Oracle Solaris 11.4*.
 - Manage directory-based identity mapping by using identity management for UNIX. For more information, see [“Managing Directory-Based Identity Mapping by Using Identity Management for UNIX”](#) in *Managing SMB File Sharing and Windows Interoperability in Oracle Solaris 11.4*.
 - Managing rule-based identity mapping for users and groups. For more information, see [“Managing Rule-Based Identity Mapping for Users and Groups”](#) in *Managing SMB File Sharing and Windows Interoperability in Oracle Solaris 11.4*.
- Disable the samba service. For more information, see [“Disabling the Samba Service”](#) in *Managing SMB File Sharing and Windows Interoperability in Oracle Solaris 11.4*.
- Configure the SMB server operation mode. For more information, see [“Configuring the SMB Server Operation Mode”](#) in *Managing SMB File Sharing and Windows Interoperability in Oracle Solaris 11.4*.
- Manage SMB shares. For more information, see [“Managing SMB Shares \(Task Map\)”](#) in *Managing SMB File Sharing and Windows Interoperability in Oracle Solaris 11.4*.
- Manage SMB groups. For more information, see [“Managing SMB Groups”](#) in *Managing SMB File Sharing and Windows Interoperability in Oracle Solaris 11.4*.
- Configure the WINS service. For more information, see [“How to Configure WINS”](#) in *Managing SMB File Sharing and Windows Interoperability in Oracle Solaris 11.4*.
- You can use the following tasks to manage SMB mounts:
 - Manage SMB mounts in your local environment. For more information, see [“Managing SMB Mounts in Your Local Environment”](#) in *Managing SMB File Sharing and Windows Interoperability in Oracle Solaris 11.4*.
 - Manage SMB mounts in the global environment. For more information, see [“Managing SMB Mounts in the Global Environment”](#) in *Managing SMB File Sharing and Windows Interoperability in Oracle Solaris 11.4*.

Time-Related Services Key Tasks

You can use the following tasks for managing the PTP and NTP services.

- You can use the following tasks to manage PTP:

- Install the PTP package. For more information, see [“How to Install PTP”](#) in *Managing Clock Synchronization in Oracle Solaris 11.4*.
- Set up an interface as a PTP master. For more information, see [“How to Set Up an Interface as a PTP Master”](#) in *Managing Clock Synchronization in Oracle Solaris 11.4*.
- Set up an interface as a PTP slave. For more information, see [“How to Set Up an Interface as a PTP Slave”](#) in *Managing Clock Synchronization in Oracle Solaris 11.4*.
- Enable the PTP service to use the PTP hardware in the NIC. For more information, see [“How to Enable the PTP Service to Use the PTP Hardware in a NIC”](#) in *Managing Clock Synchronization in Oracle Solaris 11.4*.
- Enable PTP logging. For more information, see [“How to Enable PTP Logging”](#) in *Managing Clock Synchronization in Oracle Solaris 11.4*.
- You can use the following tasks to manage NTP:
 - Set up NTP on an Oracle Solaris system. For more information, see [“How to Set Up NTP on a Oracle Solaris System”](#) in *Managing Clock Synchronization in Oracle Solaris 11.4*.
 - Enable NTP logging. For more information, see [“How to Enable NTP Logging”](#) in *Managing Clock Synchronization in Oracle Solaris 11.4*.
 - Display the SMF properties associated with the NTP service. For more information, see [“How to Display the SMF Properties Associated With the NTP Service”](#) in *Managing Clock Synchronization in Oracle Solaris 11.4*.

sendmail Key Tasks

You can use the following tasks to manage sendmail service:

- Set up the mail services. For more information, see [“Setting Up Mail Services”](#) in *Managing sendmail Services in Oracle Solaris 11.4*.

Key Tasks for Managing Remote Systems

You can use the following tasks to manage file transfer between two systems:

- Start a FTP Server using SMF. For more information, see [“How to Start an FTP Server Using SMF”](#) in *Managing Remote Systems in Oracle Solaris 11.4*.
- Stop a FTP server using SMF. For more information, see [“How to Shut Down the FTP Server Using SMF”](#) in *Managing Remote Systems in Oracle Solaris 11.4*.
- Shut down the FTP connection. For more information, see [“How to Shut Down the FTP Connection”](#) in *Managing Remote Systems in Oracle Solaris 11.4*.

- Change the FTP service configuration. For more information, see [“How to Change the ProFTPD Configuration” in *Managing Remote Systems in Oracle Solaris 11.4*](#).
- Access a remote system by using Secure Shell (ssh). For more information, see [“Accessing a Remote System by Using Secure Shell” in *Managing Remote Systems in Oracle Solaris 11.4*](#).
- You can use the following tasks to transfer files between a local system and a remote system by using sftp:
 - Open and close an sftp connection to a remote system. For more information, see [“How to Open and Close an sftp Connection to a Remote System” in *Managing Remote Systems in Oracle Solaris 11.4*](#).
 - Copy files from a remote system. For more information, see [“How to Copy Files From a Remote System \(sftp\)” in *Managing Remote Systems in Oracle Solaris 11.4*](#).
 - Copy files to a remote system. For more information, see [“How to Copy Files to a Remote System \(sftp\)” in *Managing Remote Systems in Oracle Solaris 11.4*](#).
- Transfer files between remote systems by using the scp command. For more information, see [“Remote Copying With the scp Command” in *Managing Remote Systems in Oracle Solaris 11.4*](#).

Key Tasks for Managing Serial Networks Using UUCP and PPP

Note - UUCP was removed from the Oracle Solaris 11.4 SRU 12 release. PPP was removed from the Oracle Solaris 11.4 SRU 24 release.

You can use the following tasks to manage UUCP and PPP services:

- Set up a dial-up PPP link. For more information, see [“Major Tasks for Setting Up the Dial-Up PPP Link” in *Managing Serial Networks Using UUCP and PPP in Oracle Solaris 11.4*](#).
- Set up a leased-line PPP link. For more information, see [“Setting Up a Leased Line Tasks” in *Managing Serial Networks Using UUCP and PPP in Oracle Solaris 11.4*](#).
- Set up PPP authentication. For more information, see [Chapter 5, “Setting Up Point-to-Point Protocol Authentication” in *Managing Serial Networks Using UUCP and PPP in Oracle Solaris 11.4*](#).
- Set up PPP over Ethernet (PPPoE) tunnel. For more information, see [Chapter 6, “Setting Up a PPP Over Ethernet Tunnel” in *Managing Serial Networks Using UUCP and PPP in Oracle Solaris 11.4*](#).
- Troubleshoot PPP-related and PPPoE-related problems. For more information, see [“Solving PPP Problems” in *Managing Serial Networks Using UUCP and PPP in Oracle Solaris 11.4*](#).

- Administer UUCP. For more information, see [“UUCP Administration Tasks”](#) in *Managing Serial Networks Using UUCP and PPP in Oracle Solaris 11.4*.
- You can use the following tasks to troubleshoot UUCP:
 - Check for faulty modems. For more information, see [“How to Check for Faulty Modems or ACUs”](#) in *Managing Serial Networks Using UUCP and PPP in Oracle Solaris 11.4*.
 - Debug transmissions. For more information, see [“How to Debug Transmissions”](#) in *Managing Serial Networks Using UUCP and PPP in Oracle Solaris 11.4*.