



Nortel Communication Server 1000

# Common Network Directory 2.2 Administration

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# Contents

---

<b>How to get help</b>	<b>11</b>
Contents	11
Introduction	11
Getting help from the Nortel web site	11
Getting help over the telephone from a Nortel Solutions Center	12
Getting help from a specialist by using an Express Routing Code	12
Getting help through a Nortel distributor or reseller	12
<hr/>	
<b>New in this Release</b>	<b>13</b>
Contents	13
Introduction	13
Features	13
Other	14
Revision History	14
<hr/>	
<b>Introduction</b>	<b>17</b>
Contents	17
Introduction	17
CND Manager	17
CND Manager distribution media	18
Tools	18
<hr/>	
<b>System requirements</b>	<b>21</b>
Contents	21
Introduction	21
Stand-alone PC requirements	21
Java Runtime Environment (JRE)	22
Co-residency supported	22
Unicode support	22
<hr/>	
<b>Installation and Maintenance</b>	<b>25</b>
Contents	25
Introduction	25
Fresh installation	25
Administrator choices during installation	26
Installing Java Runtime Environment (JRE) 5.0	28
Upgrades	29

---

Administrator choices during upgrade	30
Data migration	32
Maintenance mode	32
Repair	33
Remove	34
Removing JRE 5.0	35

---

### **CND Manager** **37**

Contents	37
Introduction	37
User interface	38
Menu items	38
Management functions	38
CND Manager password rules	40
Password rules	40
Definition of letter, punctuation, and digit	40
When password rules are enforced	41
When password rules are violated	41
Launching CND Manager	41
Management functions	43
Service configuration tab	43
Privacy Settings tab	48
Accounts Management tab	51

---

### **Backup, Scheduled Backup, and Restore** **61**

Contents	61
Introduction	61
Backup	62
Manual backup using CND Manager	63
Manual backup using Command Line Interface	64
Output folder	64
Backup file names	65
Batch file usage	65
Performing a backup from Command Line Interface (CLI)	66
Scheduling automated backups	66
Output folder	67
Backup file names	67
Overwriting backup files	67
Scheduling workflow	67
Scheduling a backup of CND data	68
Error handling	71
Minor errors	71
Major errors	71
Restore	71
Restoring the CND server data	71

---

---

**LDAP Subscriber Synchronization** 75

- Contents 75
  - Introduction 75
  - Basic LDAP Subscriber Synchronization 76
    - LDAP servers 76
    - Terms related to entries 77
    - Terms related to attributes 78
    - Synchronization jobs 78
  - Advanced LDAP Subscriber Synchronization options 79
  - LDAP Subscriber Synchronization Job window 80
    - External Directory Server Connection Details parameters 81
    - External Directory Server Connection Details Search Parameters 81
    - Attribute Map 82
  - Advanced Options window 84
  - Progress monitor window 85
  - Logging 86
  - Procedures for LDAP Subscriber Synchronization 88
  - Scheduling LDAP Subscriber Synchronization jobs 98
- 

**CSV Subscriber Synchronization** 103

- Contents 103
  - Introduction 103
  - File Format 103
    - Supported attributes 104
    - Multi-valued attributes 104
    - Deleting attributes 104
    - File encoding 105
  - Determining the operation to perform 106
  - Details for imported subscribers 107
    - Common names for imported subscribers 107
    - Required attributes 108
  - Operational conditions 108
  - Synchronizing subscribers in CND 108
  - CSV subscriber synchronization limitations 110
  - Error handling 111
  - Logging 112
    - The summary log 112
    - The transaction log 114
    - The failure log 115
- 

**CallPilot Global Address Book Synchronization** 117

- Contents 117
  - Introduction 117
  - Functional description 118
-

- Synchronization phase 118
- Log files 119
  - Summary log file 119
- Passwords 121
- CallPilot GAB Synchronization dialog 121
  - Menu bar 122
  - Configuration tabs 124
- CallPilot GAB progress dialog 128
  - Statistics 129
  - Cancel button 129
  - Close button 129
- CallPilot GAB Synchronization Procedures 129
  - Launching the CallPilot GAB synchronization job 130
  - Defining the CallPilot GAB synchronization job 130
  - Saving the CallPilot GAB synchronization job 131
  - Running the CallPilot GAB synchronization job 132
  - Scheduling the CallPilot GAB synchronization job 134

---

**CSV Subscriber Export 139**

- Contents 139
- Introduction 139
- Exported attributes 139
  - File Format 141
- Exporting CSV subscriber data 141
- Error Handling 143

---

**Nortel Schema Upgrade 145**

- Contents 145
- Introduction 145
- Backward-compatibility 145
- Schema Downgrading 145
  - Implications to backup and restore 145
- Schema validation 146
- Error conditions 147
  - Invalid schema file 148

---

**Version Information 149**

- Contents 149
- Introduction 149
- Current version information 149

---

**Clearing Configuration of TLS Certificates 151**

- Contents 151
- Introduction 151
- Clearing TLS/SSL certificates 151

---

---

<b>Appendix A CND Troubleshooting</b>	<b>155</b>
Logging 155	
OpenLDAP log files 155	
CND Manager log files 156	
The CND service does not start 157	
Recovering a corrupted database 157	
Starting service from command line 158	
Reinstalling application files 159	
Verifying the Host Server IP configuration 159	
Verifying base network connectivity to LDAP or CallPilot Host Servers 159	
Displaying service statistics 159	
Configuring the CND Manager service interaction 161	
Logging service failures 161	
Configuration 163	
Synchronization problems 164	
Idle connection timeout configuration 164	
Manual CND removal 165	
<b>Appendix B LDAP background information</b>	<b>167</b>
LDAP terms 167	
Organizational Unit (ou) 167	
Domain Component (dc) 167	
The LDAP models 168	
The information model 168	
The naming model 168	
The functional model 169	
The security model 170	
Further reading 170	
<b>Appendix C Attribute syntax</b>	<b>171</b>
Audio 171	
DirectoryString 171	
Facsimile Telephone Number 172	
Generalized time 173	
IA5 String 174	
Numeric String 174	
PostalAddress 175	
Printable String 175	
TelephoneNumber 176	
Telex Number 176	
<b>Appendix D LDAP References</b>	<b>179</b>
Data 179	
API 180	
References 180	

---

---

<b>Appendix E Destination folder and files</b>	<b>183</b>
Installed files	183
<b>Appendix F Subscriber attributes</b>	<b>185</b>
Subscriber attributes	185
Nortel subscriber schema attributes	188
<b>Appendix G CSV File Format</b>	<b>191</b>
CSV file format	191
Rules that apply to both formats	191
Records and field values	191
Field values with commas, semi-colons, and newlines	191
Quoted field values	192
Empty field values	192
Empty lines	192
Differences between standard CSV format and Microsoft CSV format	192
Embedded quotes in quoted field values	193
Backslashes in quoted field values	193
Leading and trailing white space between field values	193
CND-specific rules	193
Records with different numbers of fields	193
Summary of CSV rules	194
<b>Appendix H Unicode byte-order mark</b>	<b>197</b>
<b>Appendix I SSL Configuration</b>	<b>199</b>
Server configuration	199
CND	199
Active Directory	200
<b>Appendix J Third-party License Agreements</b>	<b>201</b>
OpenLDAP end user licence agreement	201
Berkeley DB by Sleepycat Software end user license agreement	203
OpenSSL end user license agreement	205
LICENSE ISSUES	205
OpenSSL License	205
Original SSLeay License	206
JWizard by Tony Freixas end user license agreement	207
Apache Jakarta Commons end user license agreement	209
Args4J by Kohsuke Kawaguchi end user license agreement	213
Windows Registry API by Ice Engineering end user license agreement	214
CSVReader end user license agreement	214
Dom4j by MetaStuff Ltd. end user license agreement	214
JNDI/LDAP booster pack by Sun end user license agreement	215
Jaxen by The Werken Company user license agreement	215
Netbeans end user license agreement	216

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<b>Glossary</b>	<b>217</b>
<b>Index</b>	<b>219</b>



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# How to get help

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## Contents

This section contains the following topics:

- "Introduction" (page 11)
- "Getting help from the Nortel web site" (page 11)
- "Getting help over the telephone from a Nortel Solutions Center" (page 12)
- "Getting help from a specialist by using an Express Routing Code" (page 12)
- "Getting help through a Nortel distributor or reseller" (page 12)

## Introduction

This chapter explains how to get help for Nortel products and services.

## Getting help from the Nortel web site

The best way to get technical support for Nortel products is from the Nortel Technical Support web site:

<http://www.nortel.com/support>

This site provides quick access to software, documentation, bulletins, and tools to address issues with Nortel products. From this site, you can:

- download software, documentation, and product bulletins
- search the Technical Support Web site and the Nortel Knowledge Base for answers to technical issues
- sign up for automatic notification of new software and documentation for Nortel equipment
- open and manage technical support cases

### **Getting help over the telephone from a Nortel Solutions Center**

If you do not find the information you require on the Nortel Technical Support web site, and you have a Nortel support contract, you can also get help over the telephone from a Nortel Solutions Center.

In North America, call 1-800-4NORTEL (1-800-466-7835).

Outside North America, go to the following web site to obtain the telephone number for your region:

[www.nortel.com/callus](http://www.nortel.com/callus)

### **Getting help from a specialist by using an Express Routing Code**

To access some Nortel Technical Solutions Centers, you can use an Express Routing Code (ERC) to quickly route your call to a specialist in your Nortel product or service. To locate the ERC for your product or service, go to:

[www.nortel.com/erc](http://www.nortel.com/erc)

### **Getting help through a Nortel distributor or reseller**

If you purchased a service contract for your Nortel product from a distributor or authorized reseller, contact the technical support staff for that distributor or reseller.

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# New in this Release

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## Contents

This section contains the following topics:

- ["Introduction" \(page 13\)](#)
- ["Features" \(page 13\)](#)
- ["Other" \(page 14\)](#)

## Introduction

The following sections describe what is new in Common Network Directory (CND) 2.2.

## Features

Refer to the following sections for information about feature changes:

The Comma Separated Values (CSV) subscriber export feature exports subscribers from CND into a CSV file. See ["CSV Subscriber Export" \(page 139\)](#).

The CSV subscriber synchronization feature imports new subscribers and updates existing subscribers in CND using a CSV file. See ["CSV Subscriber Synchronization" \(page 103\)](#).

Use the scheduled backup feature to schedule a backup of CND that occurs automatically at some point in the future. See ["Scheduling automated backups" \(page 66\)](#).

CND Manager ensures that passwords conform to a set of rules. See ["CND Manager password rules" \(page 40\)](#).

The CND Schema is extended in the CND 2.2 release. See .

## Other

### Revision History

#### February 2008

Standard 02.05. This document is up-issued to reflect changes in technical content in the following sections/procedures:

- Procedures
  - Performing a fresh installation
  - Using the repair option
  - Using the remove option
  - Changing an existing application account password
  - Changing the Administrator account password
  - Deleting an existing application account
  - Scheduling a backup of CND data
  - Exporting subscribers from CND
  - Upgrading the Nortel schema
  - Starting the CND Service manually
  - Changing the CND service startup type to manual
  - Configuring the CND idle connection timeout
  - Synchronizing subscribers in CND
- Sections:
  - Nortel subscriber schema attributes
  - Effects of upgrade
  - Multi-valued attributes
  - CSV subscriber export limitations
  - CSV subscriber synchronization limitations
  - Features
  - Co-residency supported
  - Scheduling automated backups
  - Logging
- Table:
  - Handled error conditions

#### December 2007

Standard 02.04. This document is up-issued to support Nortel Communication Server 1000 Release 5.5.

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- June 2007** Standard 01.03. This document is up-issued to reflect changes in technical content in the following sections/procedures:
- Procedures:
    - Upgrading from CND 1.0 or 2.0 to CND 2.1
    - Using the Repair option
    - Using the Remove option
  - Sections:
    - Administrator choices during upgrade
    - Effects of upgrade
  - Table:
    - Target machine condition related to operation performed by installation software
- June 2007** Standard 01.02. This document is up-issued to reflect changes in technical content in the following section:  
Section: Remove
- May 2007** Standard 01.01. This document is issued to support Communication Server 1000 Release 5.0. This document contains information previously contained in the following legacy document now retired: Common Network Directory (NN-10300-028). No new content has been added for Communication Server 1000 Release 5.0. All references to Communication Server 1000 Release 4.5 are applicable to Communication Server 1000 Release 5.0.
- March 2006** Standard 2.00. This document is up-issued to support Telephony Manager 3.0.
- February 2005** Standard 1.00. This document was first released for the ESM CND 1.0 product as version 1.01.0 for controlled release.



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# Introduction

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## Contents

This section contains the following topics:

- ["Introduction" \(page 17\)](#)
- ["CND Manager" \(page 17\)](#)
- ["CND Manager distribution media" \(page 18\)](#)
- ["Tools" \(page 18\)](#)

## Introduction

Common Network Directory (CND) is a Lightweight Directory Access Protocol (LDAP) Version 3 compliant directory server with extended schema and functionality to support Nortel applications. Applications, such as Nortel Communication Server 1000 Telephony Manager (TM) currently use CND as a shared repository of subscriber data.

CND consists of two main components:

- the LDAP Version 3 compliant directory server with standard and Nortel proprietary schema
- a graphical management utility called CND Manager, to manage selected aspects of the directory server

## CND Manager

Administrators can use CND Manager to configure CND. The following aspects of the CND service are configurable:

- query processing limits: the maximum size and time limits for queries
  - For more information about Query processing limits see ["Query processing limits" \(page 44\)](#).
- debug log settings: options for debug logging
  - For more information about Debug log settings see ["Logging" \(page 46\)](#).

- Transaction Layer Security/Secure Socket Layer (TLS/SSL) certificate configuration
  - For more information about TLS/SSL certificates see "[Clearing Configuration of TLS Certificates](#)" (page 151).
- port configuration: set the server to listen on the unencrypted port, or both the unencrypted and encrypted ports
  - For more information about Port configuration see "[Enabled ports](#)" (page 50).
- Account Management: add, delete and manage CND application accounts
  - For more information about account management see "[Application accounts](#)" (page 52).
- access control configuration: configure the account access to CND data
- CND passwords: CND Manager ensures that passwords conform to a set of rules.
  - For more information about CND password rules, see "[CND Manager password rules](#)" (page 40).

## CND Manager distribution media

CND is distributed as a sub-component of the Nortel applications that depend on it, such as Telephony Manager and Subscriber Manager. The CND software is found in a top-level folder on the media used to install these applications. Usually the folder is named "Common Network Directory" or "CND". All references to the CND installation media in procedures in this guide assume this folder as a starting point.

## Tools

CND Manager provides a number of useful tools:

- Backup, Scheduled Backup, and Restore: Used to backup and restore CND data and certain configurations. It is also useful for migrating data from one CND to another. The Scheduled Backup allows you to schedule a backup of CND that occurs automatically at some point in the future.
  - For more information about Backup, Scheduled Backup, and Restore see "[Backup, Scheduled Backup, and Restore](#)" (page 61).
- LDAP subscriber synchronization: Supports importing and regular updates between CND and a corporate directory server

- For more information about LDAP subscriber synchronization see "[LDAP Subscriber Synchronization](#)" (page 75).
- CSV subscriber export: Exports subscribers from CND into a CSV file
  - For more information about CSV subscriber export, see "[CSV Subscriber Export](#)" (page 139).
- Comma Separated Values (CSV) subscriber synchronization: Imports new subscribers and updates existing subscribers in CND using a CSV file
  - For more information about CSV subscriber synchronization, see "[CSV Subscriber Synchronization](#)" (page 103)
- CallPilot global address book synchronization: provides a central address book for CallPilot mailboxes by synchronizing CND with the CallPilot network
  - For more information about CallPilot global address book synchronization see "[CallPilot Global Address Book Synchronization](#)" (page 117).
- Schema Upgrade: allows upgrading of the Nortel schema as new versions become available
  - For more information about Schema upgrade see "[Nortel Schema Upgrade](#)" (page 145)



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# System requirements

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## Contents

This section contains the following topics:

- "Introduction" (page 21)
- "Stand-alone PC requirements" (page 21)
- "Java Runtime Environment (JRE)" (page 22)
- "Co-residency supported" (page 22)

## Introduction

Common Network Directory (CND) can co-reside with other Nortel applications such as the Nortel Communication Server 1000 Telephony Manager (TM), or it can be installed stand-alone on a PC that does not have any other Nortel applications installed. When co-residing with other Nortel applications, the PC requirements are the greater of the application requirements and CND stand-alone requirements as listed below.

## Stand-alone PC requirements

You can install CND on a stand-alone PC, if the PC meets the following minimum requirements:

- Operating system must be one of the following:
  - Microsoft Windows XP (English) with SP2 installed and a locale of English, French or German
  - Windows 2000 Server (English) with SP4 installed and a locale of English, French or German
  - Windows 2000 Server (Japanese) with SP4 installed and a locale of English
  - Windows 2000 Server (simplified Chinese) with SP4 installed and a locale of English
  - Windows Server 2003 with SP1 installed and a locale of English, French or German

- Windows Server 2003 (Japanese) with SP1 installed and a locale of English
- Windows Server 2003 (Simplified Chinese) with SP1 installed and a locale of English
- CPU speed: 1 Ghz for Intel-based computers (2 Ghz recommended)
- RAM: 512 MB (1024 MB recommended)
- Disk space: 100 MB for installation (also see Attention note below)
- CD-ROM drive
- Network connectivity

### **ATTENTION**

Extra disk space is required for CND directory data. The amount of disk space required depends on the amount of directory data.

## **Java Runtime Environment (JRE)**

CND Manager is dependent on Java Runtime Environment (JRE) Version 5.0. CND 2.2 is only supported on a machine that has JRE 5.0 installed.

If JRE 5.0 is not detected you can:

- Install JRE 5.0 during the installation of CND 2.2.
- Run the Sun JRE 5.0 stand-alone installer at a later time. The standalone installer is available with the CND distribution (see "[CND Manager distribution media](#)" (page 18)). The CND manager does not run unless the JRE is installed.

## **Co-residency supported**

The only application that CND explicitly supports co-residency with is Telephony Manager.

CND cannot co-reside on a PC running Microsoft Active Directory, or any other LDAP directory that uses the standard LDAP ports (389 and 636). A fresh installation of CND 2.2 cannot be performed if either of these ports is in use.

## **Unicode support**

CND 2.2 supports characters in the following Unicode code charts:

- Basic Latin
- Latin-1
- Unified CJK Ideographs

- CJK Ideographs extensions A and B
- Korean
- Hiragana
- Katakana
- Arabic
- Hebrew



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# Installation and Maintenance

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## Contents

This section contains the following topics:

- ["Introduction" \(page 25\)](#)
- ["Fresh installation" \(page 25\)](#)
- ["Upgrades" \(page 29\)](#)
- ["Data migration" \(page 32\)](#)
- ["Maintenance mode" \(page 32\)](#)

## Introduction

Use Common Network Directory (CND) 2.2 installation software to perform the following operations:

- Installing CND 2.2 on a PC or server with no previous version of CND software. See ["Fresh installation" \(page 25\)](#).
- Upgrading from CND 2.1 to CND 2.2. See ["Upgrades" \(page 29\)](#).
- Data migration from one PC or server to another. See ["Data migration" \(page 32\)](#).
- Repairing and removing CND 2.2 software after the initial installation. See ["Maintenance mode" \(page 32\)](#).

## Fresh installation

The installation software determines whether CND is already installed and the version that is installed. [Table 1 "Target machine condition related to operation performed by installation software" \(page 25\)](#) summarizes the operation, based on the condition of the target machine.

**Table 1**  
**Target machine condition related to operation performed by installation software**

Target machine condition	Operation performed
No version of CND is installed	Fresh installation

Target machine condition	Operation performed
CND 1.0 is installed	No direct upgrade
CND 2.0 is installed	No direct upgrade
CND 2.1 is installed	Upgrade (see "Upgrades" (page 29))
CND 2.2 is installed	Maintenance

CND is shipped as a folder that contains the setup.exe executable file, in addition to other relevant files and subfolders. You can execute any of the operations in [Table 1 "Target machine condition related to operation performed by installation software" \(page 25\)](#) by launching the executable installation file.

### Administrator choices during installation

The administrator must choose the following during the installation of CND 2.2:

- the destination folder for the software files
- administrator account password. See [Procedure 1 "Performing a fresh installation" \(page 26\)](#), step 6 for more information.
- whether to install Java Runtime Environment (JRE) 5.0

#### Procedure 1

##### Performing a fresh installation

Step	Action
------	--------

- |   |   |
|---|---|
| 1 | Double-click Setup.exe in the CND distribution media (see <a href="#">"CND Manager distribution media" (page 18)</a> ). |
| 2 | When the installation Wizard appears, click <b>Next</b> .   |
| 3 | Choose the default destination folder for CND.<br>or<br>Click <b>Browse</b> to find the destination folder.             |
| 4 | Click <b>Next</b> .   |
| 5 | Enter a password for the Administrator account on the <b>CND Administrator Password</b> screen.                         |

The administrator password is the password used to authenticate the administrator against the CND server. To prohibit unauthorized access to the system, any attempt to log on to CND Manager requires this password.

The password must comply with the following requirements:

- It cannot be blank.
- It cannot contain spaces.

#### **ATTENTION**

For security reasons, Nortel recommends that you do not use the operating system Administrator password for the CND Administrator password.

#### **ATTENTION**

**CND installation software does not encrypt the password.** Change the Administrator password immediately after the first time you log on to CND Manager to ensure that the password is encrypted. You can change the Administrator password using the CND Manager Accounts tab. For details about changing the Administrator password see [Procedure 18 "Changing the Administrator account password" \(page 57\)](#). The Administrator password is encrypted when changed using CND Manager. Any CND service configuration changes saved through CND Manager also cause the administrator password to be encrypted again.

- 6 Type in the same password in the **Confirm Password** text box.  
The password characters entered are displayed as "\*".
- 7 Click **Next** to continue with the installation.  
CND is installed in the chosen folder.  
See [Appendix "Destination folder and files" \(page 183\)](#).
- 8 Click **Next** to start the installation.  
When the installation status is 100% complete, the JRE installation window appears (if JRE is not already installed).
- 9 Click **Yes** to install JRE 5.0.  
or  
Click **No** if you want to install JRE 5.0 later. (Use [Procedure 2 "Installing JRE 5.0" \(page 29\)](#) when you want to install JRE 5.0.)  
The JRE 5.0 Installation Wizard launches.  
If JRE 5.0 is already installed, the Installation Completed window appears, displaying the **Finish** button.  
When the JRE 5.0 setup has finished preparing the installation wizard, the License Agreement window appears.

- 10 Click **Accept** to accept the terms set out in the license agreement.  
The Setup Type window appears.
- 11 Select **Typical** on the **Setup Type** window.
- 12 Click **Accept**.  
The JRE 5.0 Installing progress status window appears.  
When the installation of JRE 5.0 is complete, the Installation Completed window appears.
- 13 Click **Finish**.  
The InstallShield Wizard window will still be open.
- 14 Click **Finish** to close the Install Wizard window.

---

—End—

---

### Effects of fresh installation

A fresh installation affects the target machine in the following ways:

- files and directories are installed in the chosen destination folder. See [Appendix "Destination folder and files" \(page 183\)](#).
- items are added to the Start menu.

A Nortel folder is added to the Start menu, if it does not already exist. Within the Nortel folder, a "Common Network Directory" sub-folder is created that contains the following items:

- CND Manager
- Clear configuration of CND Manager Transaction Layer Security (TLS) certificates
- Show CND version

- the CND service is created and started.

The CND service is installed with the name Nortel Common Network Directory with a startup type of automatic. After installation is successfully completed, this setup allows the Windows operating system to start the CND service automatically when the system is rebooted.

### Installing Java Runtime Environment (JRE) 5.0

CND 2.2 requires Java Runtime Environment (JRE) 5.0. CND requires that JRE 5.0 is the system's default JRE.

CND is shipped as a folder that contains the setup.exe executable file, in addition to other relevant files and subfolders.

As the last step in the installation of CND, administrators are asked to install JRE 5.0, if it is not already installed on the system.

There are two ways to install JRE 5.0 software:

- as part of the installation of CND. See [Procedure 1 "Performing a fresh installation" \(page 26\)](#).
- separately, after CND 2.2 is installed. See [Procedure 2 "Installing JRE 5.0" \(page 29\)](#).

#### Procedure 2 Installing JRE 5.0

Step	Action
1	Double-click the Sun Java Runtime JRE installer included with the CND media (see <a href="#">"CND Manager distribution media" (page 18)</a> ).  When the JRE 5.0 setup has finished preparing the installation wizard, the license agreement window appears.
2	Select <b>Typical</b> radio button.
3	Click <b>Accept</b> .  The JRE 5.0 Installing progress status window appears.  When the installation is complete, the Installation Completed window appears.
4	Click <b>Finish</b> .
5	If directed, reboot the computer after installing JRE 5.0 the first time.

—End—

## Upgrades

You can only automatically upgrade to CND 2.2 from CND 2.1. Directly upgrading from CND releases prior to CND 2.1 is not supported. If you attempt to upgrade to CND 2.2 from a release prior to CND 2.1 (for example, CND 2.0), the system prohibits the upgrade and displays an error dialog that states, "You cannot directly upgrade from Nortel CND 2.0 to CND 2.2. Consult the Administration Guide for upgrade and data migration instructions."

To upgrade from releases prior to CND 2.1 perform one of the following upgrade procedures:

- [Procedure 3 "Upgrading from a release prior to CND 2.1 without data migration" \(page 30\)](#)

- Procedure 4 "Upgrading from a release prior to CND 2.1 with data migration" (page 31)

CND 2.2 installation software is packaged as one executable file. You can run the upgrade operation as indicated in [Table 1 "Target machine condition related to operation performed by installation software"](#) (page 25) by launching the executable installation file.

### Administrator choices during upgrade

CND is shipped as a folder that contains the setup.exe executable file, in addition to other relevant files and subfolders. If CND 2.2 is installed on a PC that does not have any version of JRE 5.0 installed, you have the option of installing JRE 5.0 during the upgrade or waiting until another time.

If you decide not to install JRE 5.0 during the upgrade to CND 2.2, you can run the JRE 5.0 installer included on the CND 2.2 deployment CD. See [Procedure 2 "Installing JRE 5.0"](#) (page 29) for instructions.

#### ATTENTION

Back up CND data before you start the upgrade.

Backup files are not removed if they are stored in the default location.

#### ATTENTION

To install files during an upgrade, the CND service is stopped. However, stopping the service impacts potential clients of CND. Therefore, you can choose to cancel and run the upgrade later, rather than stopping the service at that time. The CND service is automatically restarted after an upgrade.

If you choose to cancel an upgrade, the system prompts you to confirm your decision to cancel. If you confirm, the system returns to its state prior to the start of the upgrade.

### Procedure 3

#### Upgrading from a release prior to CND 2.1 without data migration

Step	Action
1	Remove the current version of CND (see <a href="#">"Remove"</a> (page 34)).
2	Perform a fresh installation of CND 2.2 (see <a href="#">Procedure 1 "Performing a fresh installation"</a> (page 26)).

—End—

---

**Procedure 4****Upgrading from a release prior to CND 2.1 with data migration**

---

**Step Action**

---

- 1 Logon to CND Manager application (see [Procedure 9 "Launching CND Manager" \(page 42\)](#)).
  - 2 Back up data to a file.
  - 3 Remove the current version of CND (see ["Remove" \(page 34\)](#)).
  - 4 Perform a fresh installation of CND 2.2 (see [Procedure 1 "Performing a fresh installation" \(page 26\)](#)).
  - 5 Logon to CND Manager (see step 1 in this procedure).
  - 6 Restore from the backup file created in step 2 (see ["Restore" \(page 71\)](#)).
- 

—End—

---

**Effects of upgrade**

An upgrade affects the target machine in the following ways:

- Files and directories are installed or overwritten into the destination folder chosen during the installation of an earlier version of CND. See [Appendix "Destination folder and files" \(page 183\)](#).
- Start menu items are modified—An upgrade deletes the Start menu folder and items that were created during the installation of an earlier version of CND and recreates the Start menu items as if a fresh installation had occurred. See ["Effects of fresh installation" \(page 28\)](#).
- The CND service is restarted and has some of its properties changed.

You are not asked to choose a destination folder during an upgrade. Files are installed into the destination folder that was chosen during the installation of CND. The files and subdirectories within the chosen destination directory are the same after an upgrade as after a fresh installation. See [Appendix "Destination folder and files" \(page 183\)](#).

An upgrade to CND 2.2 changes the CND service as follows:

- the service is configured to automatically start every time the machine restarts
- the service name is changed to "Nortel Common Network Directory"
- the service is given a description in the Description column of the Services window

## Data migration

You can restore backup files to CND 2.2 created in:

- CND 1.0
- CND 2.0
- CND 2.1
- CND 2.2

You can not restore backup files created in CND 2.2 to any previous release of CND.

To migrate CND 2.2 data installed on system A to system B, perform the steps in [Procedure 5 "Migrating CND data from one system to another"](#) (page 32).

### Procedure 5

#### Migrating CND data from one system to another

Step	Action
1	On system A, launch CND Manager. See <a href="#">Procedure 9 "Launching CND Manager"</a> (page 42).
2	Back up data to a file (for example, systemAData.bak). See <a href="#">"Manual backup using CND Manager"</a> (page 63).
3	Copy the systemAData.bak file to system B.
4	If CND 2.2 is installed on system B, go to <a href="#">step 5</a> . or Install CND 2.2 if it is not installed on system B (see <a href="#">Procedure 1 "Performing a fresh installation"</a> (page 26)).
5	On system B, launch CND Manager: From the Start menu select <b>Nortel &gt; Common Network Directory &gt; CND Manager</b> (see <a href="#">"Launching CND Manager"</a> (page 41)).
6	Restore data from systemAData.bak. See <a href="#">Procedure 24 "Performing a restore"</a> (page 72).

—End—

## Maintenance mode

The CND 2.2 installation application runs in maintenance mode if CND 2.2 is already installed.

CND 2.2 installation software is packaged as one executable file. You can run the maintenance operation in [Table 1 "Target machine condition related to operation performed by installation software" \(page 25\)](#) by launching the executable installation file or by launching the *Add/Remove Programs* application from the system Control Panel.

In maintenance mode, CND 2.2 installation offers the following options:

- Repair – Reinstalls all program components installed by the original installation.
- Remove – Completely uninstalls CND from the system.

These options are shown in [Figure 1 "Installation: Maintenance mode" \(page 33\)](#).

**Figure 1**  
**Installation: Maintenance mode**



### ATTENTION

The Modify option is reserved for future use.

### Repair

Repair reinstalls CND 2.2 folders and files. You can repair a corrupted file or a file deleted by mistake.

Note that the following are not overwritten during a repair:

- CND data

- CND Manager and LDAP Subscriber Synchronization log files
- the files that store CND service configuration parameters

#### Procedure 6 Using the Repair option

Step	Action
1	Go to <b>Start &gt; Control Panel &gt; Add/Remove Programs</b> .
2	Select <b>Nortel Common Network Directory</b> in the list of programs.
3	Click <b>Change/Remove</b> . The window shown in <a href="#">Figure 1 "Installation: Maintenance mode" (page 33)</a> appears.
4	Select the <b>Repair</b> radio button.
5	Click <b>Next</b> . A Question window appears, asking if you still want to proceed.
6	Click <b>Yes</b> to proceed. The Maintenance Complete screen appears.

#### ATTENTION

A window may appear asking for the location of the Setup.ini file. If this should happen, follow these steps:

- Click **Browse** to find the location of the CND install software.
- Click **OK**.

7 Click **Finish**.

—End—

See [Appendix "Destination folder and files" \(page 183\)](#) for more information about the files that are overwritten.

#### Remove

The Remove option deletes the current version of CND from a system.

Note that the following are not removed when CND is removed:

- TLS certificates
- backup files stored in CND's default location

- JRE 5.0

You must ensure that CND Manager is not running before starting the following procedure.

**Procedure 7**  
**Using the Remove option**

---

**Step Action**

---

**ATTENTION**

The following steps may vary slightly, depending on which version of Windows OS you are running.

- 1 Go to **Start > Control Panel > Add/Remove programs** .  
The Welcome dialog appears as shown in [Figure 1 "Installation: Maintenance mode" \(page 33\)](#)
- 2 Click **Change/Remove** to remove CND 2.2.
- 3 Click **Next**.  
The confirmation request dialog appears, stating "Uninstall will remove the directory service, CND Manager, and all directory data. Do you want to continue?".
- 4 Click **Yes**.  
The cursor changes to an hourglass during the removal process. The Maintenance Complete screen appears.
- 5 Click **Finish**.

---

—End—

---

### Removing JRE 5.0

Once installed, JRE 5.0 can be used by other applications. Therefore, if JRE 5.0 was installed during the installation of CND 2.2, it is not removed if CND 2.2 is removed.

JRE 5.0 can be removed through *Add/Remove Programs* in the Windows Control Panel if you are certain that it is not required by other applications.



---

# CND Manager

---

## Contents

This section contains the following topics:

- "Introduction" (page 37)
- "Launching CND Manager" (page 41)
- "User interface" (page 38)
- "Management functions" (page 43)

## Introduction

Common Network Directory (CND) Manager is the configuration and management utility for the CND. CND Manager is a user-friendly, Windows-based application that allows administrators to manage the server and run tools.

CND Manager manages the following aspects of CND:

- CND service configuration
- Server security
- CND accounts

CND Manager tools provide the following capabilities:

- Backup, Scheduled Backup, and Restore
- Lightweight Directory Access Protocol (LDAP) Subscriber Synchronization
- Comma Separated Values (CSV) Subscriber Export
- CSV Subscriber Synchronization
- CallPilot Global Address Book Synchronization
- Nortel Schema Upgrade

## User interface

The CND Manager is comprised of two main sections:

- CND Menu items (see ["Menu items"](#) (page 38))
- CND Management functions (see ["Management functions"](#) (page 38))

The CND Manager window is shown in [Figure 3 "CND Manager window"](#) (page 43).

### Menu items

The CND Menu items are used to help you complete or navigate to specific tasks. There are three menu items on the CND manager. They are:

- **File** – The file menu has a single submenu item, *Exit*, which is used to save and close the CND manager.
- **Tools** – The tools menu allows you to access various tools to manage the directory, such as backing up and restoring the directory, subscriber synchronization, exporting of subscriber data, and upgrading the schema. The submenu items are:
  - *Backup*
  - *Restore*
  - *Subscriber synchronization*, which includes:
    - *LDAP subscriber synchronization*
    - *CSV subscriber synchronization*
    - *CallPilot Global Address Book synchronization*
  - *CSV subscriber export*
  - *Nortel schema upgrade*
- **Help** – You can access the CND Administration Guide or get information about the release of the CND from the help menu. The submenu items are *CND Administration Guide*, which launches the Administration Guide and *About CND Manager*, which displays an information window about CND and its version. For more information, see ["Version Information"](#) (page 149).

### Management functions

The management functions are used to configure the CND Parameters. There are three Management functions:

- **Service Configuration**—The Service Configuration tab is used to configure the CND service query processing limits and logging settings. It is also used to view, save and clear logs. See ["Management functions"](#) (page 43).

- **Privacy Settings**—The Privacy Settings tab is used to configure transport encryption for traffic between a client and CND using Transport Level Security/Secure Sockets Layer (TLS/SSL) technology. See "[Privacy Settings tab](#)" (page 48).
- **Accounts Management**—The Accounts Management tab is used by administrators to manage CND accounts and to configure their access to CND data. Clients who want to access the data in CND are required to first inform the service of their identity. CND then compares this information with a list of internally-configured accounts. Once CND has established an account to use for a given client session, access permissions are applied to that session according to the current configuration. See "[Accounts Management tab](#)" (page 51)

### ATTENTION

Whenever changes are made to the CND Manager configuration, a service restart is required for those configuration changes to take effect.

Close the CND Manager to save any changes you have made. You are prompted to perform a service restart.

Use [Procedure 8 "Closing CND Manager with a service restart"](#) (page 39) to apply your changes in CND Manager. The service restart is required in order to apply the changes.

#### Procedure 8

#### Closing CND Manager with a service restart

Step	Action
1	Click <b>OK</b> from the CND manager window. or Select <b>File &gt; Exit</b> in the CND Manager window. The <b>Restart CND Service</b> dialog appears.
2	Click <b>Yes</b> to restart the CND service immediately. or Click <b>No</b> to restart the CND service at a later time.  If you select "Yes", a restart dialog box appears indicating the status of the CND service restart. If you select "No" a warning message appears notifying you that changes are not applied to the CND service until it is restarted.
3	Click <b>OK</b> to close the dialog box.  The CND Manager window closes.

---

—End—

---

If you choose to restart the CND service later you are required to manually restart the CND service. For details on manually starting the CND services see [Procedure 47 "Starting the CND Service manually" \(page 153\)](#).

## CND Manager password rules

In Common Network Directory (CND) 2.2, CND Manager ensures that passwords conform to certain rules. For details on the password rules, see ["Password rules" \(page 40\)](#). For details on when the password rules are enforced, see ["When password rules are enforced" \(page 41\)](#).

### Password rules

CND Manager ensures that passwords conform to all of the following rules:

- They must have at least 8 characters.
- They must not have a space.
- They must have at least one uppercase letter.
- They must have at least one lowercase letter.
- They must have at least one punctuation character.
- They must have at least one digit.

### Definition of letter, punctuation, and digit

CND Manager uses Unicode general categories to identify an uppercase letter, lowercase letter, punctuation character, and digit. For example, É is considered an uppercase letter and ô is considered a lowercase letter. In particular, letters are not restricted to the English letters from A to Z.

### Examples:

CND Manager does not allow any of the following passwords:

**Table 2**  
**Examples of disallowed passwords**

Password	Explanation of why password is not allowed
He2You!	Password is too short – it is only 7 characters.
Hello 2You!	Password has a space.
hello2you!	Password does not have an uppercase letter.
HELLO2YOU!	Password does not have a lowercase letter.

Hello2You	Password does not have a punctuation character.
HelloYou!	Password does not have a digit.

CND Manager allows both of the following passwords:

- Hello2You!
- ÉÉÉ&8ôôô

The second password is allowed because É is considered an uppercase letter and ô is considered a lowercase letter.

### When password rules are enforced

The password rules are only enforced in the following cases:

- When an application account is added using CND Manager.
- When an application account's password is changed using CND Manager.
- When the CND Administrator's password is changed using CND Manager.

### When password rules are violated

When you attempt to use CND Manager to add or change a password that violates one or more of the password rules, the Password Error dialog screen appears.

## Launching CND Manager

To prohibit unauthorized access to the system, administrators are required to log on to CND Manager. Only the Administrator of CND is permitted access to CND Manager.

When CND Manager is started, the administrator is asked to log on.

**ATTENTION**

Running multiple instances of CND Manager is not supported.

Multiple instances of CND Manager can be detected if the following situations occur:

- there is another instance of CND Manager running
- the operating system was not shut down properly (for example, due to a power failure)
- CND Manager was not shut down properly

If you try to launch CND Manager while another instance of CND Manager is detected as running on the same computer, you receive the warning message that another instance of CND Manager has been detected on your computer.

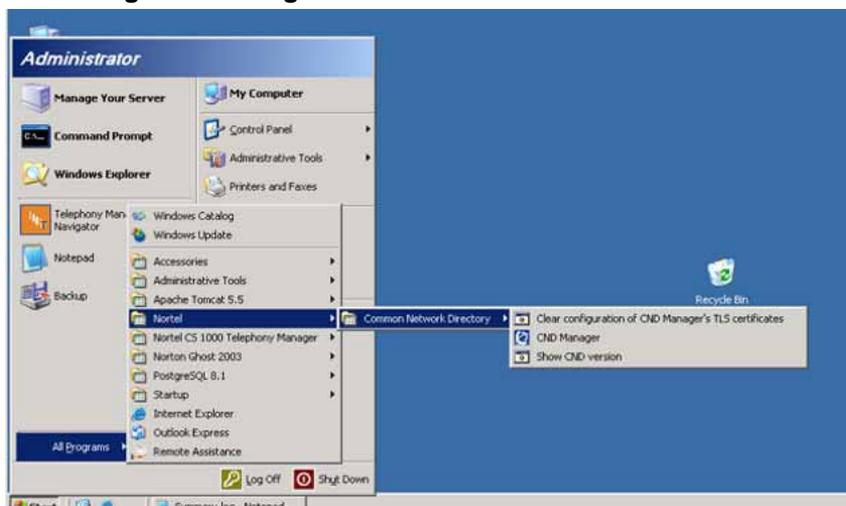
If you are sure that no other instances of CND Manager are running on this computer, click **OK** to continue. If any other instance of CND Manager is running on this computer, click **Cancel** to exit.

### Procedure 9 Launching CND Manager

#### Step Action

- 1 From the Start menu select **All Programs > Nortel > Common Network Directory > CND Manager**, or click the CND Manager desktop shortcut.

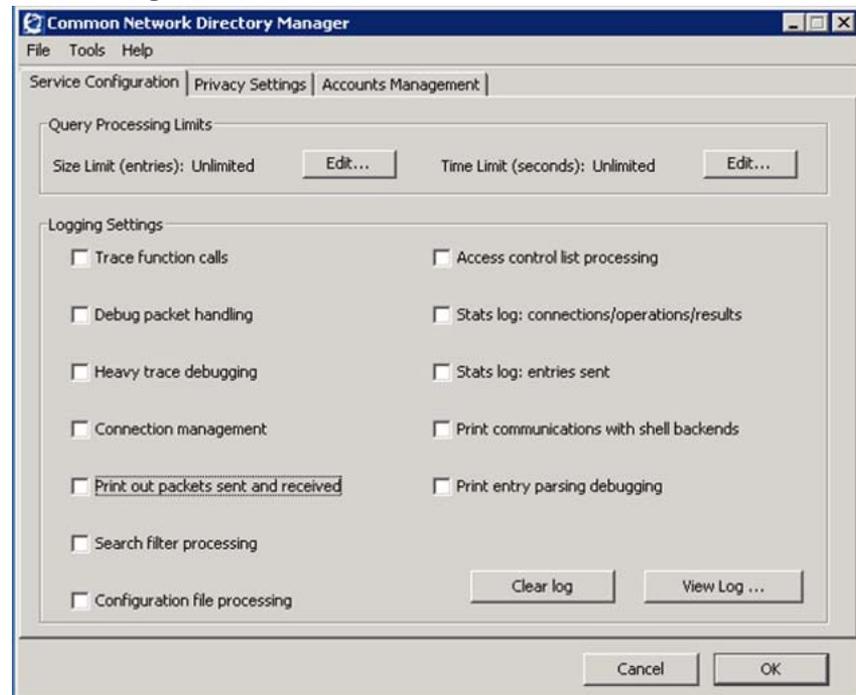
**Figure 2**  
Launching CND Manager



The CND Manager Login window appears.

- 2 Enter the CND Administrator password.  
The password entered here is the same one used during installation (see [Procedure 1 "Performing a fresh installation"](#) (page 26).
- 3 Click **OK** to log on.  
If your logon succeeds, CND Manager launches. See [Figure 3 "CND Manager window"](#) (page 43).

**Figure 3**  
**CND Manager window**



If your logon fails, Login Failed warning dialog appears.

Check your password. If you are using the correct password, you may need to clear the TLS certificate configuration. See ["Clearing Configuration of TLS Certificates"](#) (page 151).

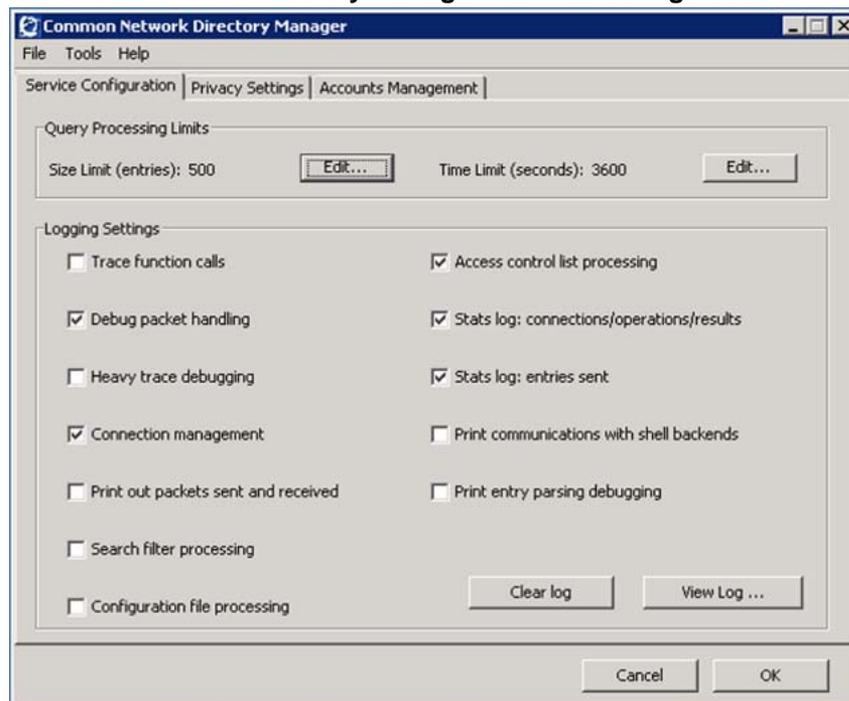
—End—

## Management functions

### Service configuration tab

Use the Service Configuration tab to configure the CND service query processing limits and logging settings. See [Figure 4 "Common Network Directory Manager: Service configuration tab"](#) (page 44).

**Figure 4**  
**Common Network Directory Manager: Service configuration tab**



### Query processing limits

The query processing limits include size and time limits:

**Size limit** – The size limit defines the maximum number of records that can be returned as the result of a single query to the directory. By default the size limit is unlimited.

#### Procedure 10

##### Setting a size limit on the number of records to return

Step	Action
1	Launch CND Manager. See <a href="#">Procedure 9 "Launching CND Manager" (page 42)</a> .
2	Select <b>Service Configuration</b> tab.
3	Click <b>Edit</b> located to the right of <b>Size Limit (entries)</b> . The <b>Query size limit configuration</b> dialog appears.
4	Select <b>Unlimited</b> (default) to assign an unlimited size limit for query processing. or

Select **Limited** to assign a limited size limit for query processing, and enter the size limit for query processing in the text field.

- 5 Click **OK**.
- 6 Close CND Manager to save and activate the changes immediately. See [Procedure 8 "Closing CND Manager with a service restart" \(page 39\)](#).

---

—End—

---

**Time limit** – The time limit defines the maximum time the CND service waits for query results before issuing a query processing timeout. The unit of time that is being configured is seconds. By default the time limit is unlimited.

#### Procedure 11

##### Setting a time limit on the query

Step	Action
1	Launch CND Manager. See <a href="#">Procedure 9 "Launching CND Manager" (page 42)</a> .
2	Select <b>Service Configuration</b> tab.
3	Click <b>Edit</b> located to the right of <b>Time Limit (seconds):</b> . The <b>Query time limit configuration</b> dialog appears.
4	Select <b>Unlimited</b> (default) to assign an unlimited time limit for query response.  or Select <b>Limited</b> to assign a specific time limit for query response, and enter the time limit for query response in the text field.
5	Click <b>OK</b> .
6	Close CND Manager to save and activate the changes immediately. See <a href="#">Procedure 8 "Closing CND Manager with a service restart" (page 39)</a> .

#### ATTENTION

The Administrator account is not subject to the query processing limits. The Administrator account always has unlimited query processing privileges. The query processing limits, as assigned by the administrator, are applicable to all other accounts, including all application accounts.

---

—End—

---

### Logging

CND Manager allows you to configure OpenLDAP logging options. See the *Open LDAP 2.2 Administrators Guide* (<http://www.openldap.org/>) for more information about these OpenLDAP logging options.

Logging is used to log messages generated by the CND service. By default, logging of the CND service is not enabled.

Logging options are configured using the "Logging Settings" that appear in the Service Configuration tab.

You can select none, or one or more of the following OpenLDAP service logging options:

- trace function calls
- debug packet handling
- heavy trace debugging
- connection management
- print out packets sent and received
- search filter processing
- configuration file processing
- access control list processing
- stats log: connections/operations/results
- stats log: entries sent
- print communications with shell backends
- print entry parsing debugging

All the information is stored in one log file.

Logging records information, based on the categories listed above is a good tool for troubleshooting.

### Procedure 12

#### Configuring OpenLDAP service logging options

---

Step	Action
------	--------

---

- |   |   |
|---|---|
| 1 | Launch CND Manager. See <a href="#">Procedure 9 "Launching CND Manager" (page 42)</a> . |
| 2 | Select <b>Service Configuration</b> tab.  |
-

- 3 Enable the log messages you wish to have generated under the **Logging Settings** section by placing a check mark next to the log type.
- 4 Click **OK**.
- 5 Close CND Manager to save and activate the changes immediately. See [Procedure 8 "Closing CND Manager with a service restart" \(page 39\)](#).

---

—End—

---

**ATTENTION**

Stopping and restarting the CND service regenerates the service log file. The old log file is overwritten.

**ATTENTION**

Logging options slow down the performance of the CND service. With each additional enabled logging option, CND service performance is further degraded.

### ***Viewing log***

#### **Procedure 13**

#### **Viewing the CND service log**

<b>Step</b>	<b>Action</b>
1	Launch CND Manager. See <a href="#">Procedure 9 "Launching CND Manager" (page 42)</a> .
2	Select <b>Service Configuration</b> tab.
3	Click the <b>View Log</b> button.  The information in the log depends on the logging options that are configured.



---

—End—

---

***Saving and clearing log*** If the CND service is running for long periods and many logging options are selected, it is recommended that you clear the log file occasionally. You can back up the log file using the "Clear Log" option and save the old log file to a desired location.

**Procedure 14**  
**Saving and clearing log**

---

<b>Step</b>	<b>Action</b>
1	Launch CND Manager. See <a href="#">Procedure 9 "Launching CND Manager" (page 42)</a> .
2	Select <b>Service Configuration</b> tab.
3	Click <b>Clear Log</b> . The <b>Select an Option</b> dialog appears.
4	Select one of the following three options: <ul style="list-style-type: none"><li>• Click <b>Cancel</b> to cancel the clear log operation and go to Step 8.</li><li>• Click <b>No</b> if you don't want to save the current logs to a backup file and go to Step 8.</li><li>• Click <b>Yes</b> if you would like to backup the log files before clearing the log. The <b>Save</b> file window appears.</li></ul>
5	Browse to the location where you wish to save the file.
6	Type the log file name in the <b>File name</b> field.
7	Click <b>Save</b> .
8	Close CND Manager to save and activate the changes immediately. See <a href="#">Procedure 8 "Closing CND Manager with a service restart" (page 39)</a> .

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—End—

---

**Privacy Settings tab**

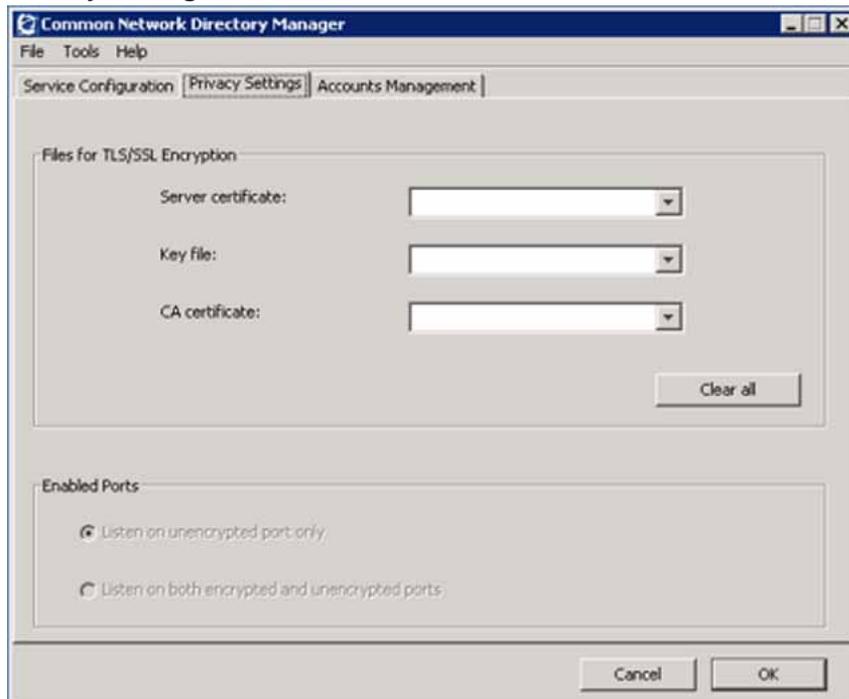
Network traffic between CND and a client can be encrypted using Transport Level Security/Secure Sockets Layer (TLS/SSL) technology.

Use the Privacy Settings tab to:

- set up the server encryption certificates
- assign the enabled CND ports

See [Figure 5 "Privacy settings tab" \(page 49\)](#).

**Figure 5**  
**Privacy settings tab**



### **Installing certificate files on the server**

For the Secure Socket Layer (SSL) transport to be fully operational the appropriate files must be installed in CND. You can obtain a service certificate from a trusted authority (for example, Verisign) or generate a certificate using a certificate server.

This document assumes you have already obtained a server certificate and key file, and only describes the steps required to install them. Using the Privacy Settings tab, install the required certificates and key file on the CND server.

### **Server certificates and key files**

The server certificates must be issued by the same Certificate Authority (CA) that issued the CA certificate. In addition, the key file must be the one that was used to generate the server certificate.

If you select an invalid certificate, the CND service fails to start. If this happens, see "[Clearing Configuration of TLS Certificates](#)" (page 151).

### Enabled ports

Privacy settings allow you to configure communications between SSL clients and non-SSL clients and the CND server. These settings allow you to choose whether the CND service listens on the unencrypted port only or listens on both the encrypted and the unencrypted port. By default, the service listens only on the unencrypted port. To configure CND to listen on both ports, follow [Procedure 15 "Enabling the encrypted port" \(page 50\)](#).

#### Procedure 15

#### Enabling the encrypted port

Step	Action
1	Copy the server certificates that you obtained prior to beginning this section to the "certs" subfolder under the CND installation folder.
2	Launch CND Manager. See <a href="#">Procedure 9 "Launching CND Manager" (page 42)</a> . <i>Depending on how you obtained the certificate information, there may only be one file that contains the certificates and the key. Select that file name for each of the lists described in step 4.</i>
3	Select <b>Privacy settings</b> tab.
4	Select the <b>Server Certificate</b> from the list.
5	Select the <b>Key file</b> from the list.
6	Select the <b>CA certificate</b> from the list.
7	Select the <b>Listen on both encrypted and unencrypted port</b> option in the <b>Enabled Ports</b> section of the screen.  The options in the <b>Enabled Ports</b> section remain disabled until you have completed Steps 5 to 7.
8	Close CND Manager to save and activate the changes immediately. See <a href="#">Procedure 8 "Closing CND Manager with a service restart" (page 39)</a> .  If the CND service does not start you can clear the TLS configurations. For more information on clearing Configuration of TLS certificates see <a href="#">"Clearing Configuration of TLS Certificates" (page 151)</a> .



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—End—

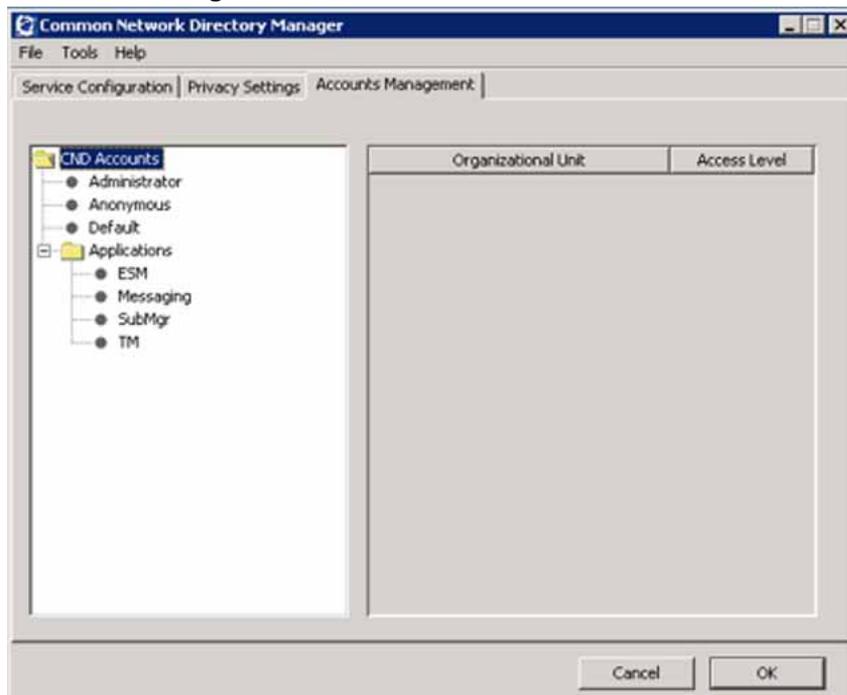
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## Accounts Management tab

Clients who want to access the data in CND are required to first inform the service of their identity. CND then compares this information with a list of internally-configured accounts. Once CND has established an account to use for a given client session, access permissions are applied to that session according to the current configuration.

The Accounts Management tab is used by administrators to manage CND accounts and to configure their access to CND data.

**Figure 6**  
**Accounts management tab**



There are two types of accounts in CND:

- System accounts
- Application accounts

The following sections describe these account types and the rules for working with them.

### System accounts

There are three CND system accounts:

- **Administrator account** – This is the most powerful account in CND. There is only one Administrator account. The account cannot be deleted and additional Administrator accounts cannot be created. The only

operation permitted on the Administrator account is a password change. Access control permissions for the Administrator are to always allow full write access to all data in CND. These access permissions cannot be changed.

- **Anonymous account** – This is the account used by all non-authenticated sessions with CND. The Anonymous account cannot be deleted and additional Anonymous accounts cannot be created. Since the account is used unauthenticated, there is no password to change. Default access permissions (as shown in [Table 4 "Default access levels" \(page 53\)](#)) are applied to the Anonymous account, but they can be changed. See ["Modifying access level" \(page 59\)](#).
- **Default account** – Like the Anonymous account, there is only one Default account with no password attribute. Additional Default accounts cannot be created. The Default account is used to hold the access rights for any authenticated user who does not have explicit access permission settings for a given object in CND. Default access permissions (as shown in [Table 4 "Default access levels" \(page 53\)](#)) are applied to the Default account, but they can be changed. See ["Modifying access level" \(page 59\)](#).

### Application accounts

Application accounts are used by applications to access data in CND. They can be installed manually using the Accounts Management tab. CND 2.2 has four predefined application accounts (see [Table 3 "Predefined application accounts" \(page 52\)](#)):

**Table 3**  
**Predefined application accounts**

Account Name	Description	Default Password
TM	This account is used by the Nortel Communication Server 1000 Telephony Manager (TM).	tmpass
ESM	This account is used by the Enterprise Subscriber Manager (ESM).	odyssey
Messaging	This account is used by CallPilot applications.	cppass
SubMgr	This account is used by the Subscriber Manager application.	submgrpass

[Table 4 "Default access levels" \(page 53\)](#) shows you the default access levels for these accounts.

### Organizational units

For information about domain components, see ["Organizational Unit \(ou\)" \(page 167\)](#).

## Domain components

For information about domain components, see "[Domain Component \(dc\)](#)" (page 167).

## Access Levels

For each account in CND, access permissions can be defined for each organizational unit. If a given account does not have explicit permissions defined for one of the organizational units, any client logged in as that account receives the permissions of the Default account.

There are three possible levels of permissions, referred to as access levels, which can be applied:

- **Read** – accounts with this access level for a given organizational unit are permitted to read its data but not to add new objects or modify existing objects
- **Write** – accounts with this access level are permitted to read, add and modify the data in the given organizational unit
- **None** – accounts with this access level for a given organizational unit are restricted from accessing any of its data

**Table 4**  
**Default access levels**

Account	Access to ou=Subscribers,dc=Nortel,dc=com	Access to ou=Applications,dc=Nortel,dc=com
Administrator	Write	Write
Anonymous	Read	Read
Default	Read	Read
Application Accounts	Write	Read

## Managing accounts

### ATTENTION

CND supports up to 100 application accounts.

The operations you can perform on application accounts are listed below:

- **Add new account**
- **Change Password**
- **Delete account**
- **Modify access level**

The following sections detail the procedures you use to perform these operations.

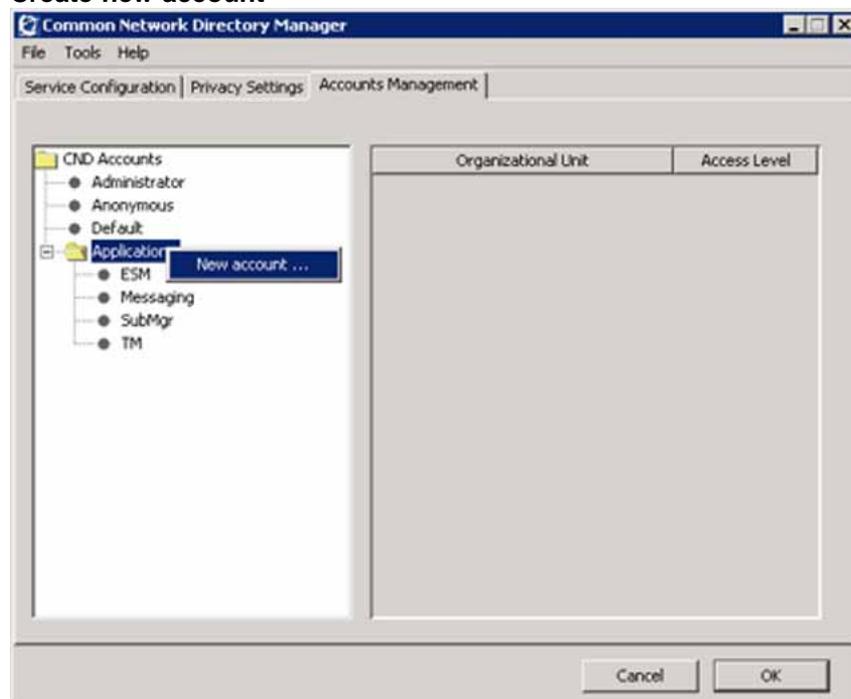
### Procedure 16

#### Adding an application account

Step	Action
------	--------

- |   |   |
|---|---|
| 1 | Launch CND Manager. See <a href="#">Procedure 9 "Launching CND Manager" (page 42)</a> . |
| 2 | Select the <b>Accounts Management</b> tab.  |
| 3 | Right-click the <b>Applications</b> folder in the CND Accounts tree.                    |

**Figure 7**  
Create new account



- |   |   |
|---|---|
| 4 | Select the <b>New account</b> option from the context menu. |
|---|---|

The **Add Account** window appears.

In the **Add Account** window enter the **Account Name** in the text field.

The following rule applies to all Account Names:

- They cannot be blank.

- 5 Enter the password for the new account in the **Password** field. See ["Password rules" \(page 40\)](#).
- 6 Enter the password again in the **Confirm** field.
- 7 Click **OK** to create the new account and close the **Add Account** window.  
or  
Click **Cancel** to cancel the addition and close the **Add Account** window.
- 8 Close CND Manager to save and activate the changes immediately. See [Procedure 8 "Closing CND Manager with a service restart" \(page 39\)](#).

---

—End—

---

### Application account password change

#### ATTENTION

Changing application accounts can cause service interruptions for the applications affected. Coordinate an account configuration change in the application when modifying the CND account. Notifications are not sent to applications in the event of a CND application account change.

To change an existing application account password, see [Procedure 17 "Changing an existing application account password" \(page 55\)](#).

#### Procedure 17

#### Changing an existing application account password

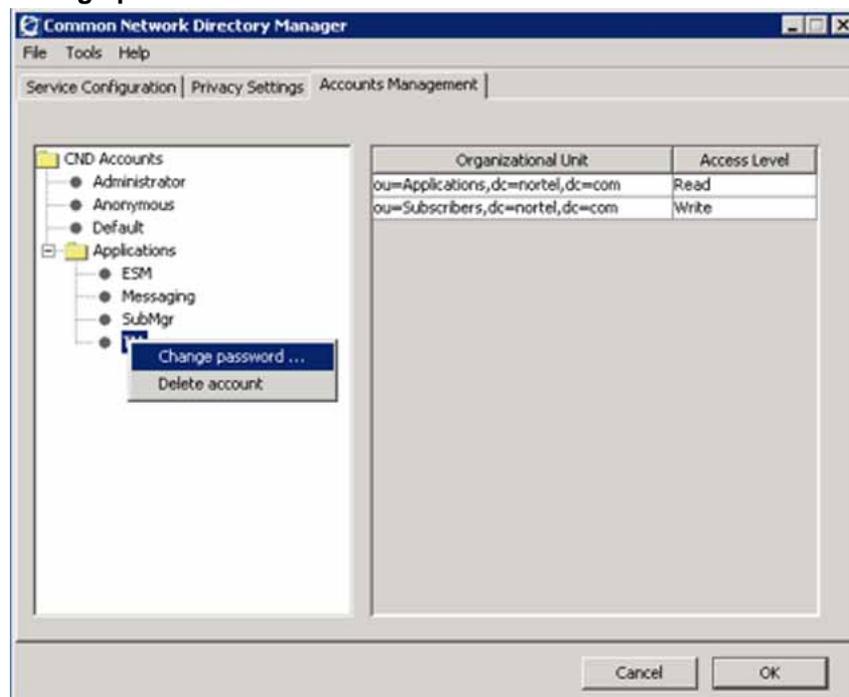
Step	Action
1	Launch CND Manager. See <a href="#">Procedure 9 "Launching CND Manager" (page 42)</a> .
2	Select <b>Accounts Management</b> tab on CND Manager.
3	Expand the <b>Applications</b> folder.
4	Select the existing application account for which you wish to change the password. (The account is highlighted.)
5	Right-click the highlighted application account. A menu appears with two options: <ul style="list-style-type: none"> <li>• <b>Change password...</b></li> </ul>

- **Delete account**

- 6 Select the **Change password...** option from the context menu as shown in [Figure 8 "Change password"](#) (page 56).

The **Change Password** dialog appears.

**Figure 8**  
**Change password**



- 7 Enter the old password in the **Old Password** field.
- 8 Enter the new password for the Application account in the **New Password** field.  
The new password must conform to the password rules and restrictions. See "[CND Manager password rules](#)" (page 40).
- 9 Enter the new password in the **Confirm** field.
- 10 Click **OK** to save the changed application account password and close the **Change Password** dialog.  
or  
Click **Cancel** to cancel the task and close the **Change Password** dialog.
- 11 Close CND Manager to save and activate the changes immediately.

---

—End—

---

**Administrator account password change** To change the Administrator account password, see [Procedure 18 "Changing the Administrator account password" \(page 57\)](#).

**Procedure 18**

**Changing the Administrator account password**

Step	Action
1	Launch CND Manager. See <a href="#">Procedure 9 "Launching CND Manager" (page 42)</a> .
2	Select <b>Accounts Management</b> tab on CND Manager.
3	Expand the <b>CND Accounts</b> folder.
4	Select <b>Administrator</b> .
5	Right-click the <b>Administrator</b> account. (The account is highlighted.)
6	Select the <b>Change password</b> option from the context menu, as shown in <a href="#">Figure 8 "Change password" (page 56)</a> . The <b>Change Password</b> dialog appears. See .
7	Enter the old password in the <b>Old Password</b> field.
8	Enter the new password for the <b>Administrator</b> account in the <b>New Password</b> field. The new password must conform to the password rules and restrictions. See <a href="#">"CND Manager password rules" (page 40)</a> .
9	Enter the new password in the <b>Confirm</b> field.
10	Click <b>OK</b> to save the <b>Administrator</b> account password and close the <b>Change Password</b> dialog. or Click <b>Cancel</b> to cancel the task and close the <b>Change Password</b> dialog.
11	Close CND Manager to save and activate the changes immediately.

---

—End—

---

## Deleting an existing application account

### ATTENTION

If an application account is deleted from CND Manager, that application can no longer communicate with the directory and can no longer store data in the directory.

#### Procedure 19

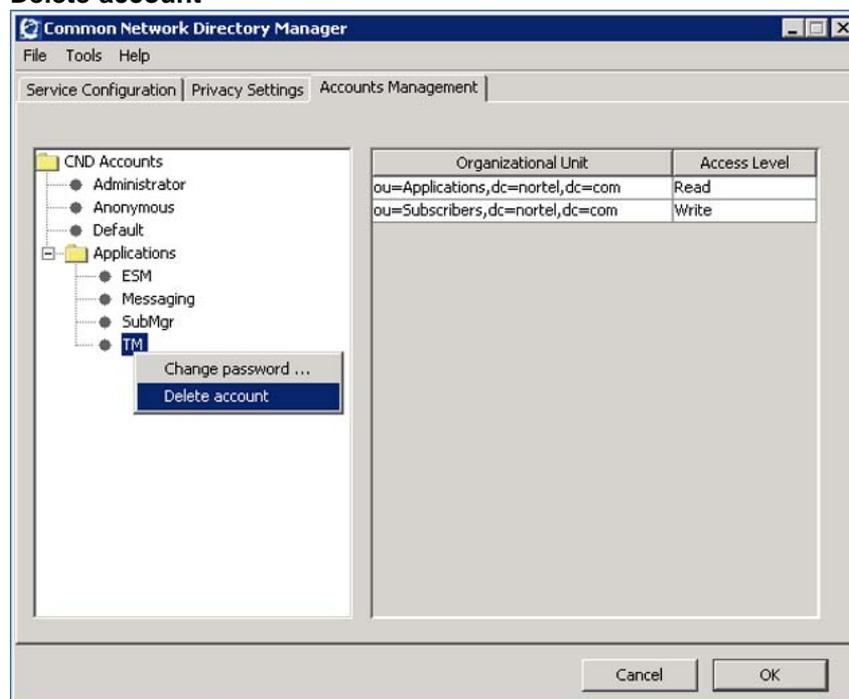
#### Deleting an existing application account

Step	Action
------	--------

- |   |   |
|---|---|
| 1 | Launch CND Manager. See <a href="#">Procedure 9 "Launching CND Manager" (page 42)</a> .   |
| 2 | Select <b>Accounts Management</b> tab on CND Manager.   |
| 3 | Expand the <b>Applications</b> folder.  |
| 4 | Select the <b>Application account</b> you wish to delete.   |
| 5 | Right-click the existing application account.   |
| 6 | Select the <b>Delete account</b> option from the context menu as shown in <a href="#">Figure 9 "Delete account" (page 58)</a> . |

**Figure 9**

**Delete account**



- The **Confirm Delete** dialog appears.
- 7 Click **Yes** to confirm the delete task.  
or  
Click **No** to cancel the delete task.
  - 8 Close CND Manager to save and activate the changes immediately.

---

—End—

---

### Modifying access level

Access level modifications are permitted for Anonymous, Default, and application accounts, not for the Administrator account.

#### ATTENTION

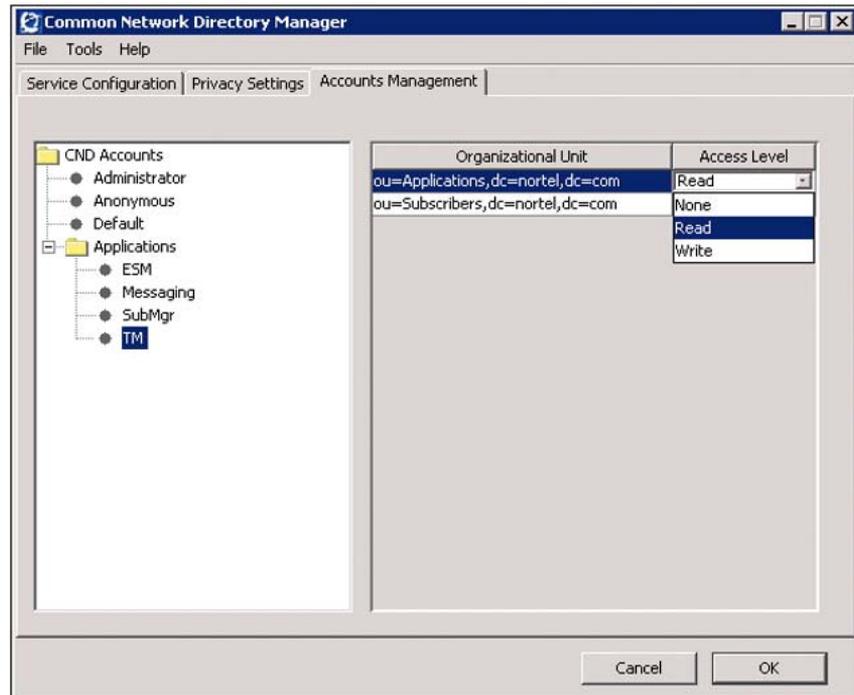
The access level of the Administrator account cannot be modified. Modifying access permissions for the application, Anonymous, and Default accounts can result in reduced security. Consider such modifications carefully prior to implementation.

### Procedure 20

#### Modifying access level

Step	Action
1	Launch CND Manager. See <a href="#">Procedure 9 "Launching CND Manager" (page 42)</a> .
2	Select <b>Accounts Management</b> tab on CND Manager.
3	Expand the <b>Applications</b> folder.
4	Select the <b>Application Account</b> for which you wish modify access levels.  The Organizational Unit and Access Level for the selected application are displayed in the right-hand side of the screen (see <a href="#">Figure 10 "Select access level" (page 60)</a> ).

**Figure 10**  
**Select access level**



- 5 Select the **Access Level** field next to the organizational unit you want to change.
- 6 Change the **Access Level**.
- 7 Close CND Manager to save and activate the changes immediately. See [Procedure 8 "Closing CND Manager with a service restart" \(page 39\)](#).

---

—End—

---

---

# Backup, Scheduled Backup, and Restore

---

## Contents

This section contains the following topics:

- "Introduction" (page 61)
- "Manual backup using CND Manager" (page 63)
- "Manual backup using CND Manager" (page 63)
- "Manual backup using Command Line Interface" (page 64)
- "Scheduling automated backups" (page 66)
- "Error handling" (page 71)
- "Restore" (page 71)

## Introduction

The data contained in Common Network Directory (CND) is critical to the day-to-day operation of the business. This data can be damaged for various reasons, such as disk failure, operator error, theft or disasters.

CND data can be backed up and restored using the Backup and Restore options in the Tools menu in CND Manager.

Administrators can schedule a backup of CND data by using the Windows scheduler to schedule the execution of a DOS batch file that is deployed with CND. The DOS batch file can also be run manually from the DOS command prompt.

The Restore tool helps recover the system from a previous backup.

The Backup, Scheduled Backup, and Restore tools require a service restart. Therefore, it is recommended that you use these tools during off-peak hours.

The data backup requires sufficient physical drive space to carry out the operation. The amount of disk space required depends on the amount of data stored in CND.

## Backup

The Backup tool is used to create a backup of the CND server content. The destination directory can be on the local drive or on the network drive where the administrator has write permission.

There are three ways to back up the data on the CND, two of the methods are manual and the third is an automated backup. The difference between the two manual methods is the level of detail you can specify when running the backup operation.

1. **manual backup method one**—Use the tools menu in the CND Manager (see [Procedure 21 "Performing a backup from CND Manager" \(page 63\)](#)). If you perform a backup using this procedure, you must manually name the file and select the location of the backup file.
2. **manual backup method two**—Run a backup script from the **Command Line Interface** (see [Procedure 22 "Performing a backup from Command Line Interface \(CLI\)" \(page 66\)](#)). The script allows you to specify three different options:
  - **folder**—The folder option permits you to specify the location where the backup files are saved.
  - **prefix**—The prefix option allows you to specify what prefix you would like included in the file name. When the backup file is created, the beginning of the file name created will include the prefix you choose.
  - **IP**—When the IP option is selected, the IP address of the server that is being backed up is appended to the file name. When any file is created using the script method, the file name will automatically include the date and time of creation. This is very helpful, as it enables you to identify when the backup file was created.

Understanding these manual options is required in order to make good use of the third backup method, which is to automate the backup.

3. **automated backup method**—The automated backup will execute the script used in the second manual procedure at a predefined time that you establish (see [Procedure 23 "Scheduling a backup of CND data" \(page 68\)](#)) .

The automated scheduling of CND backup is achieved using the Windows scheduler to schedule the execution of a DOS batch file that is deployed with CND.

## Manual backup using CND Manager

The default backup file name is in the format: current year, current month, current day (for example, 20061127CND.bak). The default location is the "backup" sub-folder in the CND installation directory.

To perform a backup from CND Manager, see [Procedure 21 "Performing a backup from CND Manager" \(page 63\)](#).

### Procedure 21

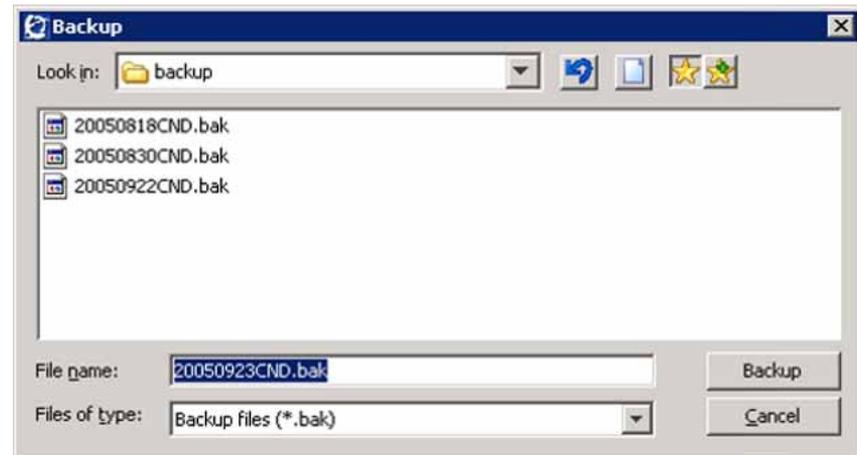
#### Performing a backup from CND Manager

Step	Action
------	--------

- |   |   |
|---|---|
| 1 | Launch CND Manager. See <a href="#">Procedure 9 "Launching CND Manager" (page 42)</a> . |
| 2 | Select <b>Tools &gt; Backup</b> on the Common Network Directory Manager window.         |

The **Backup** window appears (see [Figure 11 "Backup window" \(page 63\)](#)).

**Figure 11**  
**Backup window**



- |   |  |
|---|--|
| 3 | Navigate to the folder where you want the server to store the backup file.               |
| 4 | Enter the backup <b>file name</b> in the File name text box or accept the default value. |

If the backup file already exists a warning message appears, asking if you want to overwrite the file. Click **Yes** or **No** depending on what you would like to do.

**ATTENTION**

The .bak extension is automatically added if files of type **Backup files** (\*.bak) are selected from the **Files of type** list.

**ATTENTION**

Nortel recommends that you use the .bak file extension for backup files. However, CND supports restoring from files regardless of their file extension, provided that the file is a valid backup file.

- 5 Click **Backup** to start the process.  
A warning dialog appears stating, "The CND service must be temporarily stopped to perform the backup".
- 6 Click **Yes** to continue. The backup operation begins and a progress dialog is displayed.  
or  
Click **No** to cancel the backup.  
Canceling the backup may result in the necessity to manually restart the CND service.

**ATTENTION**

Do not manually start or stop the CND service while a backup is in progress. During a backup, if any applications that use CND are running, they fail to operate, and must be restarted.

The dialog box displays a message clearly indicating whether the backup was a success or a failure.

- 7 Click **OK** when the **Backup Progress** dialog indicates it has completed the backup.

---

—End—

---

## Manual backup using Command Line Interface

### Output folder

By default, backup files are created in CND's default backup folder (the backup folder of CND's installation folder). However, you can override the output folder using a command-line option.

## Backup file names

The filename prefix and whether to include the IP address in the filename are both configurable using command-line options (see "[Filename prefix command-line option](#)" (page 65) and "[IP address in filename command-line option](#)" (page 65)).

The date and time stamp will always be included in the file name, so if you change the prefix you are simply adding a prefix to the date and time stamp of the file name. If you add the `-ip` option, then you are simply appending the IP address to the date and timestamp of the backup file name.

## Batch file usage

The batch file is named `backup.bat` and is used as follows:

```
backup.bat [-folder <outputFolder>] [-prefix  
<filenamePrefix>] [-ip]
```

The batch file provides command-line options that configure the following:

- the output folder in which backup files are placed
- the prefix to put before the backup filename
- whether to include the IP address in the backup filename

### Output folder command-line option

To change the output folder, use the `-folder` command-line option. For example, to have backup files created on a network drive on 192.168.100.125, schedule the execution of the following command:

```
backup.bat -folder \\192.168.100.125\CND_Backups
```

### Filename prefix command-line option

By default, the tool uses a filename prefix of `CND_`. To change the filename prefix, use the `-prefix` command-line option. For example, to prefix backup files with "CND\_EastRegion", schedule the execution of the following command:

```
backup.bat -prefix CND_EastRegion
```

### IP address in filename command-line option

By default, the IP address of the machine that performs the backup is not included in backup filenames. To include this information, use the `-ip` command-line option. For example, suppose the following command is scheduled to execute on 192.168.100.125 at 10:42 AM on February 19, 2007:

```
backup.bat -ip
```

This command creates a backup file in CND's default backup folder named `CND_20070219104200_192.168.100.125.bak`.

### Performing a backup from Command Line Interface (CLI)

To perform a backup from Command Line Interface (CLI), see [Procedure 22 "Performing a backup from Command Line Interface \(CLI\)"](#) (page 66).

#### Procedure 22

#### Performing a backup from Command Line Interface (CLI)

Step	Action
1	From Windows select <b>Start &gt; Run</b> . The <b>Run</b> dialog box appears.
2	Enter <code>cmd</code> in the <b>Run</b> dialog box.
3	Click <b>OK</b> . A DOS window appears.
4	Change the directory to <code>C:\Program Files\Nortel\Common Network Directory</code> using the <code>CD</code> command.
5	Run the backup script. The default name is <code>CND_&lt;datetime&gt;.bak</code> . The <code>&lt;datetime&gt;</code> parameter is filled in with correct date and time by the system.  For example, if the backup script is executed, a file similar to the following is created: <code>CND_20071126144547.bak</code> , where the date and time parameter is November 26, 2007, 14:45:47.  If the backup script is executed using the <code>-ip</code> option, a file similar to the following is created: <code>CND_20071126145418_192.167.101.84.bak</code> , where the ip address is 192.167.101.84.  The default backup folder is <code>C:\Program Files\Nortel\Common Network Directory\backup\</code> .

---

—End—

---

### Scheduling automated backups

Administrators can schedule a backup of CND data by using the Windows scheduler to schedule the execution of a DOS batch file that is deployed with CND.

You can schedule a backup of CND data to run per available options (daily, weekly, monthly, etc.).

You can remove a scheduled backup from the scheduler, thus preventing its execution.

When a scheduled backup starts, it temporarily stops the CND service, and any applications using CND must be restarted. Therefore it is best to schedule the backup during off-peak hours.

If you cancel the automated backup, you will have to manually restart the CND service.

### Output folder

By default, backup files are created in CND's default backup folder (the backup folder of CND's installation folder). However, users can override the output folder using a command-line option (see "[Output folder command-line option](#)" (page 65)).

### Backup file names

Backup files are named using the following information:

- a prefix (by default, CND\_)
- a timestamp in the format of YYYYMMDDHHMMSS, where YYYY is the year, MM is the month, DD is the day, HH is the hour, MM is the minute, and SS is the second when the backup starts
- optionally, the IP address of the machine on which the backup was performed (by default, the IP address is not in the filename)
- a suffix of .bak

The filename prefix and whether to include the IP address in the filename are both configurable using command-line options (see "[Filename prefix command-line option](#)" (page 65) and "[IP address in filename command-line option](#)" (page 65)).

### Overwriting backup files

Backup files are never overwritten. If for some reason a backup file with the chosen name already exists, it is a minor error (see "[Minor errors](#)" (page 71)).

### Scheduling workflow

Use the Windows scheduler to schedule the execution of the `backup.bat` batch file.

### Scheduling a backup of CND data

To schedule a backup of CND data, see [Procedure 23 "Scheduling a backup of CND data"](#) (page 68).

#### Procedure 23

#### Scheduling a backup of CND data

Step	Action
1	<p>Open the Windows Control Panel from the CND server.</p> <ul style="list-style-type: none"> <li>• On Windows XP, select <b>Start &gt; Control Panel</b>.</li> <li>• On Windows Server 2003, select <b>Start</b>, right-click <b>Control Panel</b> and select the <b>Open</b> command.</li> <li>• On Windows 2000 and Windows 2000 Server systems, select <b>Start &gt; Settings &gt; Control Panel</b>.</li> </ul>
2	<p>Double-click <b>Scheduled Tasks</b> shortcut.</p> <p>The <b>Scheduled Tasks</b> page appears.</p>
3	<p>Double-click <b>Add Scheduled Task</b>.</p> <p>The <b>Add Scheduled Task</b> wizard appears.</p>
4	<p>Click <b>Next</b> on the wizard introductory screen</p>
5	<p>Select <b>Browse</b> on the program selection screen.</p> <p>The <b>Select Program to Schedule</b> window appears.</p>
6	<p>Navigate to the folder where the backup.bat file is located.</p> <p>The default directory is <code>C:\Program Files\Nortel\Common Network Directory</code> .</p>
7	<p>Select the <code>backup.bat</code> file.</p>
8	<p>Click <b>Open</b>.</p>
9	<p>Provide a name for this task in the text box.</p>
10	<p>Select the frequency to run the <code>backup.bat</code> file by selecting the radio button next to the frequency.</p> <p><b>When my computer starts</b> or <b>When I log on</b> options are not supported.</p>
11	<p>Click <b>Next</b>.</p>
12	<p>Enter the parameters required for your backup. This step can vary, depending on the frequency selected in step 10.</p>

- 13 Click **Next**.
- 14 Enter the user name that has permission to run the `batch.bat` file.
- 15 Enter the user password.
- 16 Confirm the user password.  
If the information in steps 14 to 16 is incorrect or not completed, the `backup.bat` file does not execute.
- 17 Click **Next**.
- 18 Select the **Open advanced properties for this task when I click Finish** option.
- 19 Click **Finish**.
- 20 In the **Run** text box, enter the directory path of the backup .bat file in quotation marks and the options you wish to include outside the quotation marks.

or

Browse to the location of the backup.bat file and select the backup.bat file and append the option outside the quotation marks.

**Example:**

Run "`C:\Program Files\Nortel\Common Network Directory\backup.bat`" If no options are selected.

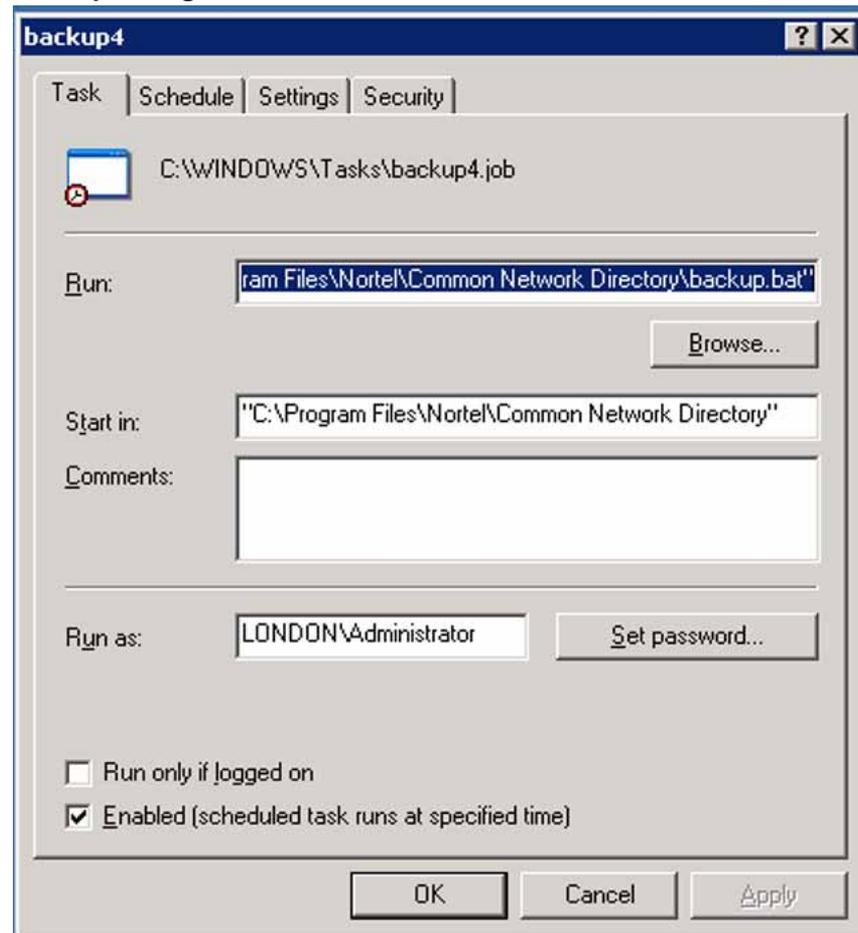
or

Run "`C:\Program Files\Nortel\Common Network Directory\backup.bat`" <options> if you want to specify the options.

**ATTENTION**

The options are case sensitive, so "`C:\Program Files\Nortel\Common Network Directory\backup.bat`"-IP would fail to run, but "`C:\Program Files\Nortel\Common Network Directory\backup.bat`"-ip would run as expected.

**Figure 12**  
**Backup dialog box**



- 21 Select the **Enabled (Scheduled task runs at specified time)** option.
- 22 Click **Apply**.  
The **Set Account Information** dialog box appears.
- 23 Enter the user password in the **Password** field.
- 24 Confirm the user password in the **Confirm Password** field.
- 25 Click **OK** to close the password window.
- 26 Click **OK**.

—End—

## Error handling

Errors fall into two categories:

- minor errors that you can probably fix (see "[Minor errors](#)" (page 71))
- major errors that you probably can't fix (see "[Major errors](#)" (page 71))

### Minor errors

`backup.bat` detects the following minor errors:

- invalid command-line arguments
- backup file already exists
- output folder does not exist
- failure to create backup file

Minor errors are handled in two ways:

- printed to the console
- logged to CND Manager's log file (in the log subfolder of CND's installation folder)

When a scheduled backup is performed, the console is of little use because there is probably not a person monitoring it.

### Major errors

`backup.bat` detects the following major errors:

- failed to read CND configuration
- failed to open CND configuration
- internal error

Major errors are printed to standard error and may be logged in CND Manager's log file. However, they are not necessarily logged because they sometimes occur before the batch file can write to the log file.

## Restore

Prior to instituting a restoration of CND server data, you must perform a backup of the data.

### Restoring the CND server data

The Restore tool is used to restore the CND server data from a previously created backup file.

#### **ATTENTION**

The CND server is unavailable while restoring data from a backup file.

**ATTENTION**

Restoring your directory overwrites any existing data.

The Restore utility performs a CND backup before the Restore process begins to support roll back if the Restore operation fails. As a result, this procedure requires additional hard drive space.

The Restore tool does the following steps in the sequence shown:

- stops the CND service
- performs a backup of the directory
- restores directory data and configuration
- restarts the CND service

If the CND service fails to start for any reason, the process restores CND data to the original state it was in when the Restore process began.

**Procedure 24**

**Performing a restore**

---

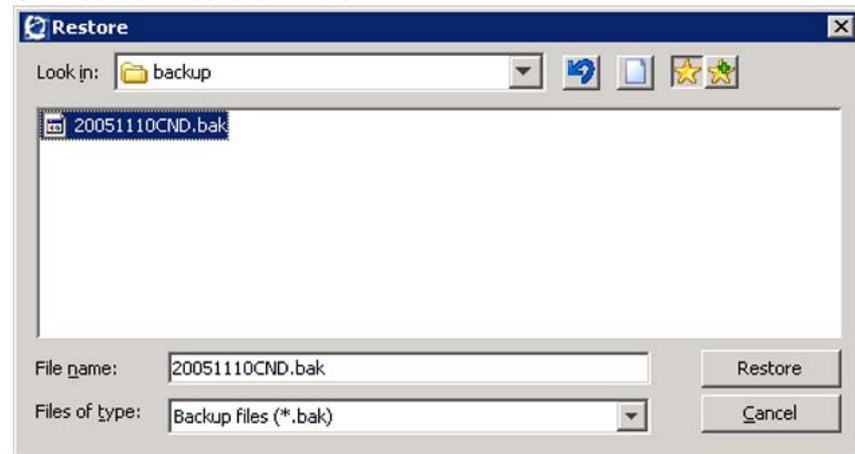
**Step Action**

---

*Pre-requisite - Ensure you have previously performed a backup before beginning this procedure.*

- 1** Launch CND Manager. See [Procedure 9 "Launching CND Manager" \(page 42\)](#).
- 2** Select **Tools > Restore**.  
The **Restore** window appears.
- 3** Browse to your backup directory and select a valid backup file as shown in [Figure 13 "CND server Restore window" \(page 73\)](#).

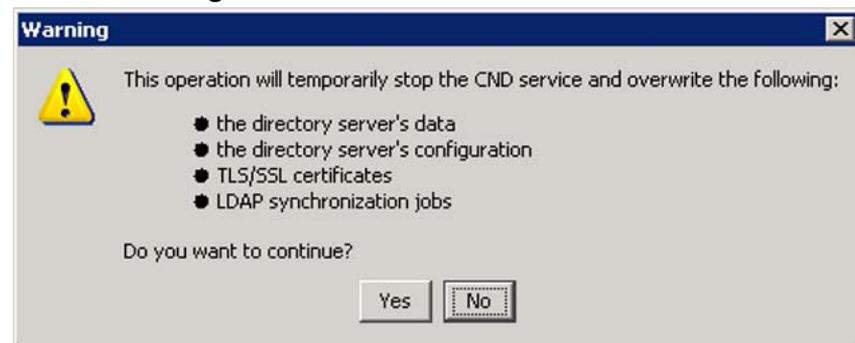
**Figure 13**  
**CND server Restore window**



- 4 Click **Restore**.

A warning appears as shown in [Figure 14 "Restore warning"](#) (page 73).

**Figure 14**  
**Restore warning**



- 5 Click **Yes** to stop the CND service so that the Restore process can begin.

or

Click **No** to cancel the Restore process.

**ATTENTION**

Do not manually start or stop the CND service while a restore is in progress.

**ATTENTION**

On successful completion of the Restore operation, the CND service restarts and a completion message appears.

If the Restore operation fails, the Restore Progress dialog appears, providing restore failure information, such as the following (for example), "Failed to restore from 20061207CND.bak".

- 6 Click **OK** to close the Restore dialog.

---

—End—

---

**ATTENTION**

The restore feature does not permit a restore to occur that would result in a Nortel schema downgrade. The Nortel schema version that is part of the backup file must be equal to or greater than the version that the server is currently using.

---

# LDAP Subscriber Synchronization

---

## Contents

This section contains the following topics:

- "Introduction" (page 75)
- "Basic LDAP Subscriber Synchronization" (page 76)
- "Advanced LDAP Subscriber Synchronization options" (page 79)
- "LDAP Subscriber Synchronization Job window" (page 80)
- "Advanced Options window" (page 84)
- "Progress monitor window" (page 85)
- "Procedures for LDAP Subscriber Synchronization" (page 88)
- "Scheduling LDAP Subscriber Synchronization jobs" (page 98)
- "Logging" (page 86)
- "Procedures for LDAP Subscriber Synchronization" (page 88)

## Introduction

Common Network Directory (CND) provides central storage of common and shared data for various Enterprise products, such as Nortel Communication Server 1000 Telephony Manager (TM). Administrators of these products can synchronize subscriber data between their Lightweight Directory Access Protocol (LDAP)-enabled corporate directory servers and CND using the LDAP Subscriber Synchronization feature.

The term synchronization is defined as follows:

The act of coordinating data between a pair of directory servers.

This feature eliminates the need for duplicate data entry, which reduces administrative and support costs.

The following LDAP-enabled directory servers are supported:

- Active Directory Server 2000/2003
- Microsoft Exchange Server 2000/2003

- Sun Java System Directory Server 5.2

The Subscriber Synchronization feature supports the following operations:

- Define a new synchronization job
- Save a new synchronization job
- Run a previously defined synchronization job
- Modify an existing synchronization job
- Delete an existing synchronization job
- View the LDAP Subscriber Synchronization summary log
- Schedule a synchronization job to run at some time in the future, either repetitively or one time only
- Remove a synchronization job from the scheduler

For more information about synchronization jobs, see "[Synchronization jobs](#)" (page 78).

The information in this chapter is presented in the following order:

- Concepts related to Basic and Advanced synchronization are presented first.
- Procedures related to synchronization are presented second.

## Basic LDAP Subscriber Synchronization

Basic LDAP Subscriber Synchronization defines a limited form of synchronization. The information in this section defines and describes general terms related to the LDAP Subscriber Synchronization domain.

Basic synchronization refers to the process of synchronizing data between an external directory server and CND without any advanced options configured. This means that a basic synchronization only acts upon data when there is a pre-established link between an entry in the external directory server and CND.

### LDAP servers

The following sections describe the two types of servers that are involved in a LDAP Subscriber Synchronization job. They are:

- An external directory server
- CND

### External directory server

The external directory server is a directory server, usually a repository of the customer's corporate directory, that is used to acquire the master set of entries from which a synchronization job is based. The server is considered the *source* of a synchronization operation even though the synchronization may be bidirectional in nature. For more information, see "[Synchronization jobs](#)" (page 78).

### CND

CND is considered the destination directory server by the LDAP Subscriber Synchronization feature in all cases.

### Terms related to entries

This section defines terms that are related to entries.

#### Entries and objectclasses

In LDAP, the units of synchronization are called *entries*. Each entry represents an object in the directory server. Entries are defined by their class of information as defined by the schema of the server. In LDAP, these classes of information are referred to as *objectclasses*. Objectclasses define the rules for what constitutes a particular class of information in the directory server.

Included in these rules is the list of *attributes* that an entry of a particular objectclass can contain. Attributes are defined in the schema. The schema identifies the names of the attributes and the syntax rules to which a value of the attribute must adhere.

#### Entry mapping

Entry mapping is the process of establishing a link between an entry in the external directory server and one in CND. To establish the map, LDAP Subscriber Synchronization copies the value of a known attribute in the external directory server entry to a special operational attribute in the CND entry. The external directory server attribute that is used for this depends on the type of the external directory server.

The process of entry mapping can occur in a number of different scenarios:

1. During the import of an entry from the external directory server to CND
2. During an entry resolution operation

#### Master set of entries

The master set of entries, or master set, is the collection of entries that is acquired as the result of searching the external directory server. The search is defined by the search parameters configured for the particular synchronization job.

### Terms related to attributes

This section defines the LDAP Subscriber Synchronization terms related to attributes. They are:

- Attribute map
- Attribute relations
- Bidirectional synchronization

#### Attribute map

An attribute map is a set of attribute relations that determines the behavior of a synchronization job with regards to the copying of data between the external directory server and CND.

The attribute map is used by LDAP Subscriber Synchronization to determine the following:

- Which attributes in the external server to ask for in the search
- The correspondence between external server attributes and CND attributes
- The direction of the synchronization for each attribute

#### Attribute relations

An attribute relation is a single entry in an attribute map. The attribute relation consists of an external directory server attribute, a CND attribute and the direction with which to synchronize the attributes.

#### Bidirectional synchronization

A bidirectional synchronization refers to the ability to choose, for each attribute, the direction for which the copying of data occurs in a synchronization job. The default direction for all attribute mappings is from the external directory server to CND.

### Synchronization jobs

Synchronization job is the name given to the complete set of configuration parameters required to run a synchronization between an external directory server and CND. The degree of synchronicity between directory servers is always in relation to a particular set of rules for determining what it means for two directory servers to be 'in sync'. In the LDAP Subscriber Synchronization feature, these rules are packaged as *synchronization jobs* which are configured by the administrator of the system. It is possible for two directory servers to be 'in sync' according to one synchronization job, but 'out of sync' with respect to another.

A synchronization job consists of:

- The connection details of the external directory server

- The search parameters used to query the external directory server and acquire a master set of entries
- An attribute map
- Advanced options. For more information, see "[Advanced LDAP Subscriber Synchronization options](#)" (page 79).

## Advanced LDAP Subscriber Synchronization options

The following advanced options of LDAP Subscriber Synchronization are necessary to define the behavior of the system when it encounters an unmatched entry. An unmatched entry is an entry in the master set that is not linked, by entry relations, to an entry in CND. The two options for dealing with the unmatched entries are:

**Importing**—Using importing, LDAP Subscriber Synchronization adds unmatched entries to CND. When importing an entry, the values of its attributes are determined using the following rules:

- All attributes that are explicitly contained in the attribute map are synchronized to the new CND entry. This occurs regardless of the direction defined by the individual attribute relations.
- Any attributes that are not defined in the attribute map, but are required attributes as determined by the CND schema, are synchronized according to the default attribute map for the external directory server type.

**Entry resolution**—Attempts to establish a match, using criteria outside entry mapping. The process involves first determining a match and then establishing the entry map between the two entries. The process of determining a match is based on comparing the values of a user-defined attribute in the external directory server with a user-defined attribute in CND. If the values of the two attributes are equal, the entries are considered a match.

### ATTENTION

It is also an option to ignore unmatched entries; this is the defining factor of a basic synchronization. It is also possible to turn on both entry importing and entry resolution. In this event, the system attempts to perform a resolution, and if that fails, it does an import.

There are other advanced options that do not affect synchronization job behavior. They are:

**Security options**—The use of Transport Layer Security/Secure Sockets Layer (TLS/SSL) encryption is optional but is recommended. The LDAP Subscriber Synchronization feature supports the use of TLS/SSL for the

encryption of traffic with both the external directory server and CND. For more information, see [Figure 15 "LDAP Subscriber Synchronization job window" \(page 80\)](#).

**Logging options**—LDAP Subscriber Synchronization generates up to three types of logs every time it runs a synchronization job. These logs are called:

- "Summary log" (page 87)
- "Transaction log" (page 87)
- "Failure log" (page 88)

The logs are in ASCII text format.

For more information, see ["Logging" \(page 86\)](#).

## LDAP Subscriber Synchronization Job window

[Figure 15 "LDAP Subscriber Synchronization job window" \(page 80\)](#) shows you the LDAP Subscriber Synchronization job window. Use this window to define all the parameters required by the system to perform a synchronization between an external directory server and CND.

These parameters are divided into the following categories:

- External Directory Server Connection Details
- External Directory Server Connection Details Search Parameters
- Attribute Map

**Figure 15**  
**LDAP Subscriber Synchronization job window**

Source Attribute	Direction	CND Attribute
givenName	-->	givenName
initials	-->	initials
sn	-->	sn
street	-->	street
l	-->	l
st	-->	st
postalCode	-->	postalCode
co	-->	country
mail	-->	mail
employeeNumber	-->	employeeNumber
title	-->	title
description	-->	description
departmentNumber	-->	departmentNumber
uid	-->	uid

### External Directory Server Connection Details parameters

The following parameters describe the external directory server in a synchronization job:

- **Host:** the host name, fully qualified domain name (FQDN), or IP address of the external directory server host PC.
- **Bind DN:** the distinguished name (DN) of the account used to authenticate to the external server.
- **Password:** the password associated with the Bind DN used to authenticate to the external server.
- **Base DN:** The DN of the entry in the external directory server to which to establish the connection. The base DN determines the connection's view of the directory tree by defining the subset of entries in the tree upon which a connection can act. The base DN is also used to identify the entry for basing searches.
- **Server type:** The type of external directory server to which CND is connected. This is used to determine how entry mapping is established as well as the defaults for attribute relations. The available selections are:
  - Microsoft Active Directory 2000
  - Microsoft Active Directory 2003
  - Exchange Server 2000
  - Exchange Server 2003
  - Sun Java System Directory Server 5.2

The default selection for this parameter is Microsoft Active Directory 2003.

- **Port:** The port number that the external directory server is listening on. The standard LDAP ports are 389 for non-encrypted traffic and 636 for encrypted traffic. The default for this field is 389.

### External Directory Server Connection Details Search Parameters

The following parameters configure the query that the LDAP Subscriber Synchronization utility uses to extract a set of entries from the external server.

- **Search Scope:** selected to determine the depth of the search. The available options are:
  - **Subtree**—Start searching from the base entry (as identified by the base DN) and search everything below it, including the base entry. Subtree is the default search scope.

- **One level**—Searches only entries that are exactly one level below the base entry.
- **Search filter:** a legal LDAP filter used to refine the search of the external server. Objectclass=person is the default.  
Search filter examples:
  - (&(l=Toronto)(objectclass=person)) : To select entries that have a locality of "Toronto" and an objectclass of "person".
  - (&(objectclass=person)(|(sn=Smith)(cn=Joe M\*))) : To select entries that have an objectclass of "person" and a surname of "Smith" or common name that starts with "Joe M".

### Attribute Map

For every synchronization job you must define an attribute map using the Attribute Map section of the LDAP Subscriber Synchronization Job window.

The attribute map is a table where each row represents one relation. To define a relation you must provide three pieces of information:

- The name of an attribute in the external directory server
- The name of the corresponding attribute in CND. For more information, see [Appendix "Subscriber attributes" \(page 185\)](#).
- The direction of the synchronization

Use the **Load Default** button to load a default attribute map based on the external directory server type. As part of this operation, the LDAP Subscriber Synchronization tool queries the external server and CND for a list of available attributes. This list is then used to populate selection controls in the appropriate cells of the attribute relation table. All this requires proper configuration of the connection parameters to the external server.

A default attribute mapping of the supported LDAP servers populates the attribute mapping table in the LDAP Subscriber Synchronization job window.

[Table 5 "Default attribute maps" \(page 82\)](#) shows you the default attribute maps.

**Table 5**  
**Default attribute maps**

Description	Active Directory 2000 and Exchange Server 2000	Active Directory 2003 and Exchange Server 2003	Sun Java System Directory Server 5.2	CND
First name	givenName	givenName	givenName	givenName

Description	Active Directory 2000 and Exchange Server 2000	Active Directory 2003 and Exchange Server 2003	Sun Java System Directory Server 5.2	CND
Middle name	initials	initials	initials	initials
Last Name	sn	sn	sn	sn
Street	streetAddress	street	street	street
City	l	l	l	l
Province/ State	st	st	st	st
Postal Code	postalCode	postalCode	postalCode	postalCode
Country	co	co		country
Email	mail	mail	mail	mail
Employee ID	employeeID	employeeNumber	employeeNumber	employeeNumber
Title	title	title	title	title
Description	description	description	description	description
Department	department	departmentNumber	departmentNumber	departmentNumber
Unique Identifier	uid	uid	uid	uid

### ATTENTION

A default attribute map must be successfully loaded to create attribute relations.

If you click the **Load Default** button against a map that is already configured with attribute relations, the default mappings for the server type are substituted. A warning appears, indicating that this is happening, and you must confirm the operation before continuing.

### Remove selected

The **Remove Selected** button removes the selected attribute relation from the map.

### Add attribute relation

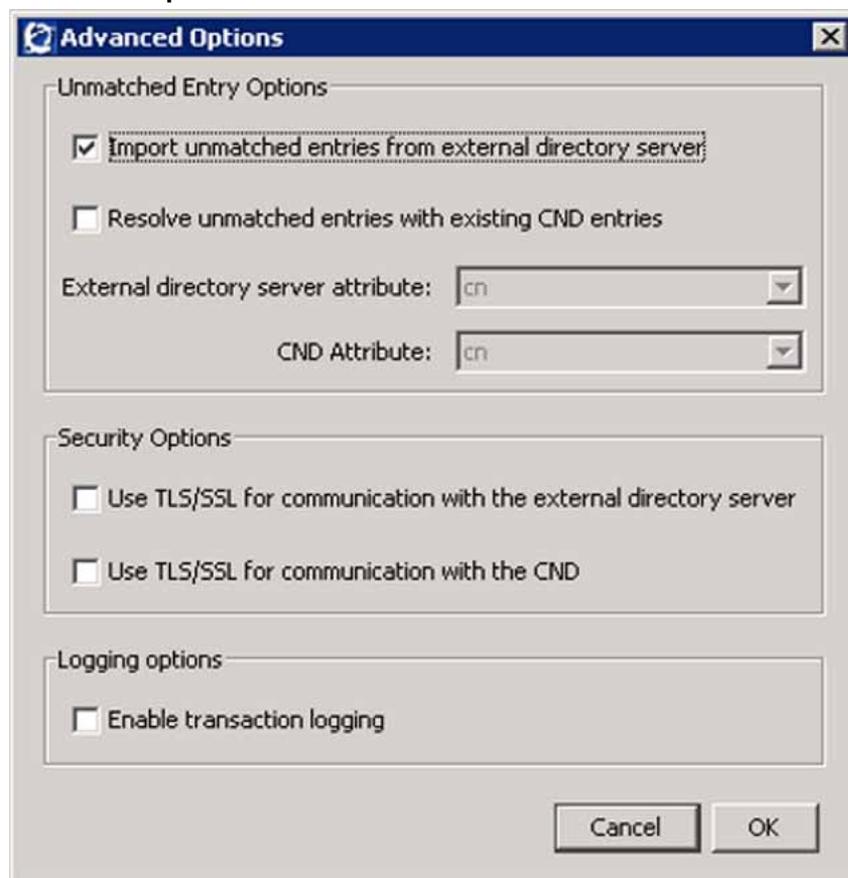
The **Add Attribute Relation** button generates a new empty row in the table for the administrator to edit.

## Advanced Options window

The Advanced Options window (Figure 16 "Advanced Options window" (page 84)) accessible from the **Advanced** button of the LDAP Subscriber Synchronization Job window, allows you to configure the following LDAP Subscriber Synchronization Job options:

- Whether to add new entries to CND, if unmatched entries are found in the external directory
- Whether to attempt to resolve new entries in the external server with existing CND entries, and which attributes in both servers to use to resolve them
- Whether to use TLS/SSL encrypted communications with the external directory server
- Whether to use TLS/SSL encrypted communications with CND
- Whether to generate a transaction log for the synchronization job

**Figure 16**  
**Advanced Options window**



## Progress monitor window

When you select a synchronization job and click **Run** on either the LDAP Subscriber Synchronization main window or the LDAP Subscriber Synchronization Job window, the progress monitor windows appear.

See [Figure 17 "Run LDAP synchronization job window" \(page 86\)](#).

The first window is the Run LDAP synchronization job window.

The LDAP synchronization job window has the following sections:

- **Job details**—Outlines Job name, external directory server host, and external directory server search filter from the saved synchronization job.
- **Job status**—Lists total number of entries, number of entries synchronized and number of entries that failed to synchronize. By default, when the Run LDAP synchronization job window first appears, there are no values for any of these entries until you click **Start**.
- **Job Progress**—When you click **Start**, the blue progress monitor goes back and forth near the bottom of the Run LDAP synchronization job window with the message "Preparing to execute synchronization job...". At this time, the number of entries to be synchronized is being determined.

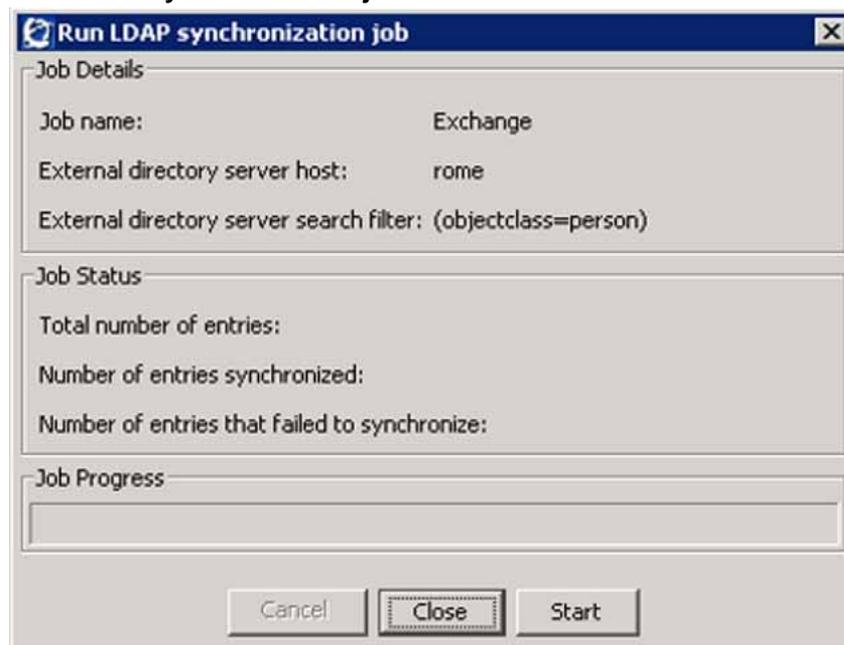
When the number of entries to be synchronized between an external directory server and CND is determined, this tool starts to synchronize data. The progress bar starts to display the progress of the operation. The total number of entries, number of entries synchronized and the number of entries that failed to synchronize are also displayed at this time. These numbers, as well as the progress bar, are updated as the job progresses.

- **Start** and **Close** in this window are the only available choices when the job is not started.

Click **Close** to close the Run LDAP synchronization job window after a synchronization job is completed or cancelled.

When synchronization is in progress, only **Cancel** is available. Click **Cancel** to stop the synchronization job.

**Figure 17**  
**Run LDAP synchronization job window**



If you click **Start**, the job progress bar displays across the bottom of the window.

## Logging

The types of LDAP Subscriber Synchronization logs are:

- Summary logs
- Transaction logs
- Failure logs

### Log file locations

There is only one summary log. Each job may also generate a transaction or a failure log. The location of the transaction log and the failure log for each job is indicated in that job's summary log entry.

For each synchronization job executed new directories are created to hold the transaction log (optional) and the failure log (if generated).

The name of the directory is generated and comprised of the name of the synchronization job and an appended system timestamp. For example:  
NightlySync\_20050419120000

In the above example, the year is 2005, the month is April, the date is the 19th and the time is 12 noon.

### Summary log

There is one summary log that contains an entry for each synchronization job executed by the system. The log contains the following details about each job:

- Synchronization job name
- External directory server host name
- CND server host name
- Start and completion timestamp
- Number of entries successfully synchronized
- Number of entries that failed to be synchronized
- Location of the failure log, if one exists
- Location of the transaction log, if one exists
- Status of the job (completed, interrupted during synchronization, interrupted during cleaning, aborted during synchronization, aborted during cleaning)

You access the summary log from the LDAP Subscriber Synchronization main window using the **View** menu. For more information, see [Figure 20 "View summary log" \(page 97\)](#).

### Transaction log

One transaction log is optionally created for every synchronization job. This optional log provides the following details for each entry synchronized by the system:

- Destination DN of the entry
- source host
- source entry DN
- source attribute modifications
- destination host
- For each synchronized attribute in the entry, the following is recorded:
  - attribute name
  - original value
  - new value

**Failure log**

For each synchronization job a failure log is generated, if a failure occurs during the synchronization.

**ATTENTION**

If a failure occurs, any entries that have been updated to that point remain updated.

The following details are captured for each failure:

- the location of the failure (SRC or DEST)
- the host (or IP address) where the failure occurred
- the operation that failed
- the details of the failure
- the timestamp when the error occurred

**Procedures for LDAP Subscriber Synchronization**

The procedures in this section are:

- [Procedure 25 "Launching LDAP Subscriber Synchronization" \(page 88\)](#)
- [Procedure 26 "Creating a new basic synchronization job" \(page 90\)](#)
- [Procedure 27 "Creating a new advanced Import LDAP Subscriber synchronization job " \(page 91\)](#)
- [Procedure 28 "Running a synchronization job using the LDAP Subscriber Synchronization main window" \(page 93\)](#)
- [Procedure 29 "Running a synchronization job using the LDAP Subscriber Synchronization Job window" \(page 93\)](#)
- [Procedure 30 "Modifying an existing synchronization job" \(page 94\)](#)
- [Procedure 31 "Deleting an existing synchronization job" \(page 95\)](#)
- [Procedure 32 "Viewing Summary log" \(page 97\)](#)

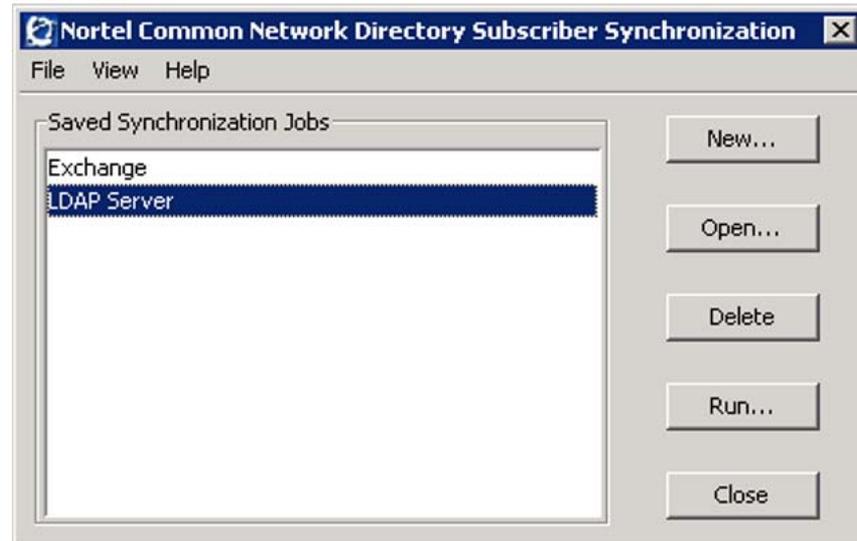
**Procedure 25****Launching LDAP Subscriber Synchronization****Step Action**

- |          |  |
|----------|--|
| <b>1</b> | Select <b>All Programs &gt; Nortel &gt; Common Network Directory &gt; CND Manager</b> from the Start menu.<br><br>or<br><br>Click the CND Manager desktop shortcut.<br><br>The CND Manager login window appears. |
|----------|--|

- 2 Enter the CND Administrator password.  
The password entered here is the same one used during installation.
- 3 Click **OK** to log in.  
The CND Manager launches.
- 4 Select **Tools > Subscriber synchronization > LDAP Subscriber Synchronization** on the Common Network Directory Manager window.

The Nortel Common Network Directory LDAP Subscriber Synchronization main window opens as shown in [Figure 18 "Nortel Common Network Directory LDAP Subscriber Synchronization main window"](#) (page 89).

**Figure 18**  
**Nortel Common Network Directory LDAP Subscriber Synchronization main window**



**ATTENTION**

The first time you see this window, there are no jobs listed under Saved Synchronization Jobs.

—End—

**Procedure 26**  
**Creating a new basic synchronization job**

---

**Step Action**

---

- 1 Launch the **LDAP subscriber Synchronization** page. See [Procedure 25 "Launching LDAP Subscriber Synchronization" \(page 88\)](#).
- 2 From the **LDAP Subscriber Synchronization** main window, either:
  - a. Click **New**.
  - or
  - b. Select **File > New**.The **Subscriber Synchronization Job** page appears.
- 3 In the **Subscriber Synchronization Job** window, provide values for the external directory server connection details:
  - **Host**
  - **Bind DN**
  - **Password**
  - **Base DN**
  - **Server type**
  - **Port**For more information, see ["External Directory Server Connection Details Search Parameters" \(page 81\)](#) for explanations of these fields.
- 4 In the **Subscriber Synchronization Job** window provide values for the search parameters:
  - a. **Search scope** (or accept the default).
  - b. **Search filter**, if any (or accept the default).
- 5 In the **Subscriber Synchronization Job** window define the attribute map for the synchronization job:

Click **Load Default** to retrieve the available attributes for the external server and CND, and to load a default attribute map.
- 6 Modify the existing **Attribute Map** as necessary:
  - To delete an attribute relation, select the attribute relation and click **Remove selected**.

- To add a new attribute relation click **Add attribute relation** and modify the values in each of the columns to select an external directory server attribute, a CND attribute, and a direction.
  - To modify an existing attribute relation, click on the attribute and modify the values by selecting from the list.
- 7 Click **Save** to save the new job.  
The **Save as** dialog screen appears.
  - 8 Enter the name of the newly created job in the text field of the **Save as** dialog screen.
  - 9 Click **OK**.
  - 10 Click **Close**.  
The newly created subscriber synchronization job appears in the list of the **Saved Synchronization Jobs**.

---

—End—

---

#### Procedure 27

#### Creating a new advanced Import LDAP Subscriber synchronization job

Step	Action
1	Create a new basic synchronization job, see steps 1 to 6 of <a href="#">Procedure 26 "Creating a new basic synchronization job" (page 90)</a> .
2	Click <b>Advanced</b> in the <b>LDAP Subscriber Synchronization Job</b> window. The <b>Advanced Options</b> window appears.
3	Select the advanced options which meet your job requirements. For detailed information on the different options see <a href="#">Table 6 "LDAP Subscriber Synchronization advanced options" (page 92)</a> .
4	Click <b>OK</b> to close the <b>Advanced Options</b> window.
5	Click <b>Save</b> to save the new job. The <b>Save as</b> dialog screen appears.
6	Enter the name of the newly created job in the text field of the <b>Save as</b> dialog screen.
7	Click <b>OK</b> .
8	Click <b>Close</b> .

The newly created subscriber synchronization job appears in the list of the **Saved Synchronization Jobs**.

—End—

**Table 6**  
**LDAP Subscriber Synchronization advanced options**

Option	Description
Import unmatched	Using importing, LDAP Subscriber Synchronization adds unmatched entries to CND. This option is selected by default.
Resolve unmatched	Select this option to resolve unmatched LDAP Subscriber entries with existing CND entries. The values of the External Directory server attribute and the CND attribute must match to identify an entry pair to be mapped.
Use TLS/SSL for Directory Server	Select this option to enable Transport Layer Security/Secure Sockets Layer (TLS/SSL) communication with Directory Server. Ensure that the external directory server is configured to accept connections on the secure port. The use of TLS/SSL encryption is optional but is recommended.
Use TLS/SSL for CND	Select this option to enable Transport Layer Security/Secure Sockets Layer (TLS/SSL) communication with CND. Ensure that CND is configured to accept connections on the secure port. The use of TLS/SSL encryption is optional but is recommended. For LDAP synchronization to run over SSL, the JRE's keystore must be configured with certificates for each server it wants to talk to as a client.
Enable transaction logging	Select this option to have transaction logging enabled. One transaction log is optionally created for every synchronization job. This optional log provides details for each entry synchronized by the system.

**Procedure 28****Running a synchronization job using the LDAP Subscriber Synchronization main window**

<b>Step</b>	<b>Action</b>
1	Launch the LDAP Subscriber Synchronization page. See <a href="#">Procedure 25 "Launching LDAP Subscriber Synchronization"</a> (page 88).
2	Select the LDAP synchronization job you want to run.
3	Click <b>Run</b> . or Select <b>File &gt; Run</b> . The <b>Run LDAP synchronization job</b> window appears.
4	Click <b>Start</b> to start the job synchronization. The status of the synchronization can be monitored in the Job Status section or Job Progress section.
5	Click <b>Close</b> when the job is completed to return to the <b>LDAP Subscriber Synchronization</b> main window.
6	Click <b>Close</b> to return to the <b>CND Manager</b> main window.

---

—End—

---

**Procedure 29****Running a synchronization job using the LDAP Subscriber Synchronization Job window**

<b>Step</b>	<b>Action</b>
1	Launch the LDAP Subscriber Synchronization page. See <a href="#">Procedure 25 "Launching LDAP Subscriber Synchronization"</a> (page 88).
2	Select one of the following two options to get to the <b>LDAP Subscriber Synchronization job</b> window: <ul style="list-style-type: none"> <li>• Select the job you wish to run from the LDAP Synchronization Main Window. <ul style="list-style-type: none"> <li>— Click <b>Open</b>.</li> <li>or</li> <li>Double-click the job.</li> <li>or</li> </ul> </li> </ul>

Select **File > Open**.

- Create a new basic subscriber synchronization job. See [Procedure 26 "Creating a new basic synchronization job"](#) (page 90).
- 3 Click **Run**.
- or
- Select **File > Run**.
- The **Run LDAP synchronization job** window appears.
- 4 Click **Start** to start the job synchronization.
- The status of the synchronization can be monitored in the Job Status section or Job Progress section.
- 5 Click **Close** when the job is completed to return to the **LDAP Subscriber Synchronization** main window.
- 6 Click **Close** to return to the **CND Manager** main window.

---

—End—

---

### Procedure 30

#### Modifying an existing synchronization job

---

Step	Action
------	--------

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- |   |   |
|---|---|
| 1 | Launch the <b>LDAP subscriber Synchronization</b> page. See <a href="#">Procedure 25 "Launching LDAP Subscriber Synchronization"</a> (page 88).   |
| 2 | Select the synchronization job you wish to modify from the list of <b>Saved Sync Jobs</b> .   |
| 3 | Click <b>Open</b> .   |
|   | or  |
|   | Select <b>File &gt; Open</b> .  |
|   | or  |
|   | Double-click the job to modify.   |
|   | The <b>Subscriber Synchronization Job</b> dialog page appears.  |
| 4 | Modify the basic parameters for the selected <b>Subscriber Synchronization</b> job. For detailed information about the parameters see <a href="#">"LDAP Subscriber Synchronization Job window"</a> (page 80). |

- 5 Click **Advanced** to modify the advanced synchronization job parameters.  
The advanced parameters page appears.
- 6 Modify the advanced parameters. For details about advanced parameters see [Table 6 "LDAP Subscriber Synchronization advanced options"](#) (page 92).
- 7 Click **OK** to save changes to the advanced parameters.  
or  
Click **Cancel** to exit the advanced parameter page.
- 8 Select one of the following two options:
  - Select **File > Save As** to save a new copy of the job.  
The **Save as** dialog box appears.  
or
  - Select **File > Save** to save the changes to the existing job, and proceed to step 11.
- 9 Enter the new Synchronization job name in the text box.
- 10 Click **OK** to save the file.  
or  
Click **Cancel** to cancel the save of the new copy.
- 11 Click **Close**.  
If you have not saved a copy of the job, a warning **Save** dialog box appears, asking if you want to save the change. Select **Yes** or **No**, depending on what you want to do.

---

—End—

---

### Procedure 31

#### Deleting an existing synchronization job

---

Step	Action
------	--------

---

- |   |   |
|---|---|
| 1 | Launch the <b>LDAP subscriber Synchronization</b> page. See <a href="#">Procedure 25 "Launching LDAP Subscriber Synchronization"</a> (page 88). |
| 2 | Select the synchronization job you wish to delete from the list of <b>Saved Synchronization Jobs</b> .  |

- 3 Click **Delete**.

or

select **File > Delete**.

A **Delete** warning dialog box appears, asking if you are sure you want to delete the synchronization job.

- 4 Click **Yes** to confirm deletion.

or

Click **No** to cancel the request.

If CND manager has scheduled jobs a reminder appears, reminding you to delete any tasks that use the scheduler (see [Figure 19 "Synchronization job deleted reminder"](#) (page 96)).

**Figure 19**  
**Synchronization job deleted reminder**



**ATTENTION**

If you delete a synchronization job it does not remove any references to it in the Windows scheduler. You must remove the job from the scheduler separately. For more information about Removing a synchronization job from the scheduler, see [Procedure 35 "Removing a synchronization job from the scheduler"](#) (page 101).

- 5 Click **Close**.

A message dialog appears if you have scheduled tasks, reminding you to delete any scheduled tasks using this Synchronization job procedure.

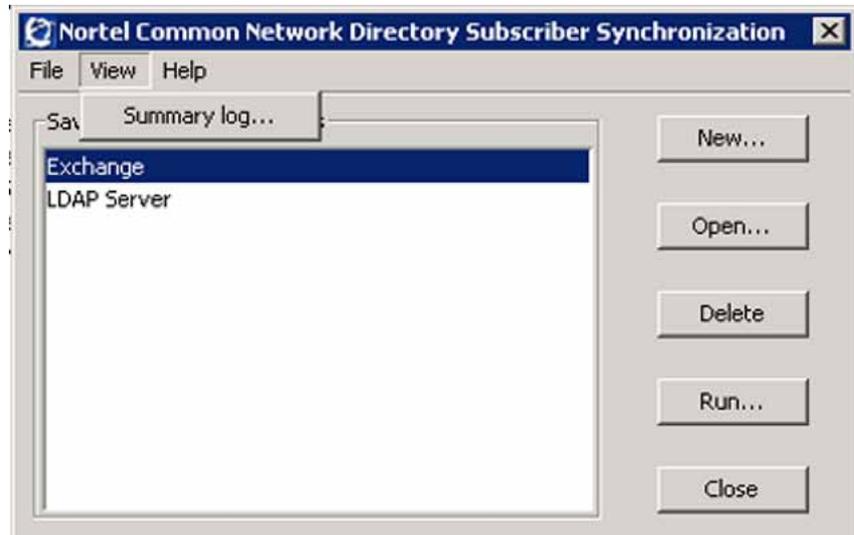
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—End—

---

**Procedure 32**  
**Viewing Summary log**

- | Step | Action  |
|------|---|
| 1    | Launch the <b>LDAP subscriber Synchronization</b> page. See <a href="#">Procedure 25 "Launching LDAP Subscriber Synchronization"</a> (page 88). |
| 2    | Select the synchronization job which you wish to view from the list of <b>Saved Synchronization Jobs</b> .                                      |
| 3    | Select <b>View &gt; Summary log</b> , see <a href="#">Figure 20 "View summary log"</a> (page 97).   |

**Figure 20**  
**View summary log**

A window similar to that in [Figure 21 "Sample Summary Log"](#) (page 98) appears. The data you see depends on your configuration and the jobs you have run.

**Figure 21**  
**Sample Summary Log**

```

Summary - Notepad
File Edit Format View Help
Sync Job Name: CSV_Import
External directory server host: D:\Profiles\worganc\My Documents\Common
Network directory\500.csv
Destination (CND) host: 47.11.181.136
Job Status: COMPLETED
Sync started at: Tue Nov 28 21:15:39 EST 2006
Sync ended at: Tue Nov 28 21:15:47 EST 2006
User account name: worganc
Sync stats:
  Source host: Host status, # Entries Synced, # Entries Failed To Sync
  CSV_IMPORT: SYNC_COMPLETE_NORMAL, 418, 81
  TOTAL: 418, 81
Cleaning stats:
  Source host ID: # Entries Cleaned, # Entries Failed To Clean
  TOTAL: 0, 0
Failure log path: d:\Program Files\Nortel\Common Network
Directory\log\LDAP_Sync\CSV_Import_20061128_211539\Failure.log
Transaction log path: N/A
*****
Sync Job Name: R25
External directory server host: 47.11.221.170
Destination (CND) host: 47.11.181.136
Job Status: COMPLETED
Sync started at: Wed Dec 06 17:06:19 EST 2006
Sync ended at: Wed Dec 06 17:06:20 EST 2006
User account name: worganc
Sync stats:
  Source host: Host status, # Entries Synced, # Entries Failed To Sync
  47.11.221.170: SYNC_COMPLETE_NORMAL, 6, 4
  TOTAL: 6, 4
Cleaning stats:
  Source host ID: # Entries Cleaned, # Entries Failed To Clean
  TOTAL: 0, 0
Failure log path: d:\Program Files\Nortel\Common Network
Directory\log\LDAP_Sync\R25_20061206_170619\Failure.log
Transaction log path: N/A
*****
Sync Job Name: R25
External directory server host: 47.11.221.170
Destination (CND) host: 47.11.181.136
Job Status: COMPLETED
Sync started at: Wed Dec 06 17:09:11 EST 2006

```

### ATTENTION

The transaction and failure logs are available at the paths specified in the summary log.

- 4 Click the **X** on the **Summary Notepad** window to close the summary log (see [Figure 21 "Sample Summary Log" \(page 98\)](#)).
- 5 Click **Close** on the **Saved Synchronization Jobs** window to exit.

—End—

## Scheduling LDAP Subscriber Synchronization jobs

Use the Windows scheduler to perform job scheduling and scheduled task monitoring.

The procedures in this section are :

[Procedure 33 "Scheduling a synchronization job" \(page 99\)](#)

Procedure 34 "Modifying a scheduled synchronization job" (page 101)

Procedure 35 "Removing a synchronization job from the scheduler" (page 101)

### Procedure 33

#### Scheduling a synchronization job

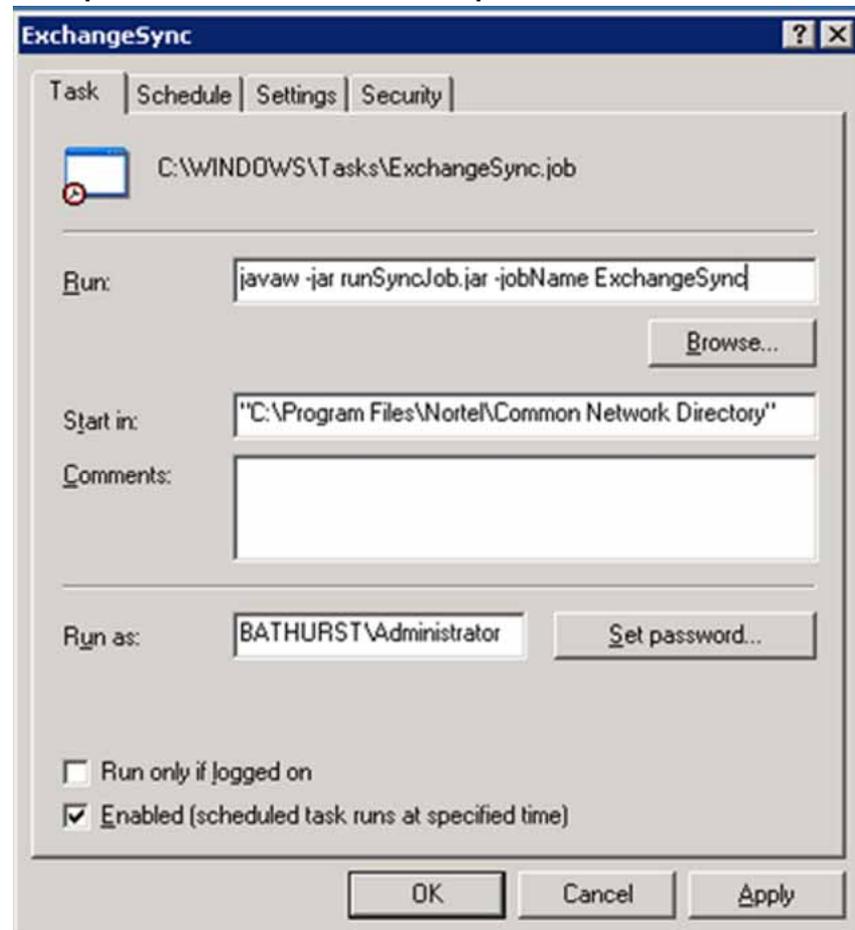
Step	Action
1	<p>Open the Windows Control Panel.</p> <ul style="list-style-type: none"> <li>• On Windows XP, select <b>Start &gt; Control Panel</b>.</li> <li>• On Windows Server 2003, select <b>Start</b>, right-click <b>Control Panel</b> and select the <b>Open</b> command.</li> <li>• On Windows 2000 and Windows 2000 Server systems, select <b>Start &gt; Settings &gt; Control Panel</b>.</li> </ul>
2	Double-click the <b>Scheduled Tasks</b> shortcut.
3	In the Scheduled Tasks explorer, double-click <b>Add Scheduled Task</b> .
4	In the introductory screen of the Scheduled Task Wizard click <b>Next</b> .
5	Select <b>Browse</b> on the next screen and use the Select Program to Schedule window and navigate to the CND install folder (C:\Program Files\Nortel\Common Network Directory).
6	Select the runSyncJob.jar file.
7	Provide a name for the scheduled task and select the frequency. Click <b>Next</b> .
8	Provide a schedule for the synchronization job to run (this step can vary, depending on the frequency selected in the previous step). Click <b>Next</b> .
9	Provide the account name and password with which to run the synchronization job. (Use an account on the PC that has the privileges to run this program). Click <b>Next</b> .
10	Click the check box beside <b>Open advanced properties for this task when I click Finish</b> .
11	Click <b>Finish</b> to open the Advanced Options window.
12	<p>In the <b>Run</b> box enter:</p> <pre>javaw -jar runSyncJob.jar -jobName savedJobName</pre>

For **savedJobName**, substitute the name of the saved job you want to run. See Figure 22 "Example of Run box on Advanced Options window" (page 100).

**ATTENTION**

In the example, the job is called ExchangeSync.

**Figure 22**  
Example of Run box on Advanced Options window



- 13 Click **Apply** to accept the change.
- 14 When prompted, provide the password for the account identified in [step 9](#).
- 15 Click **OK** to close the password window.
- 16 Click **OK** to close the Advanced Options window.

---

—End—

---

**Procedure 34****Modifying a scheduled synchronization job**


---

Step	Action
------	--------

---

- |   |   |
|---|---|
| 1 | Open the Windows Control Panel. <ul style="list-style-type: none"> <li>• On Windows XP, select <b>Start &gt; Control Panel</b>.</li> <li>• On Windows Server 2003, select <b>Start</b>, right-click <b>Control Panel</b> and select the <b>Open</b> command.</li> <li>• On Windows 2000 and Windows 2000 Server systems, select <b>Start &gt; Settings &gt; Control Panel</b>.</li> </ul> |
| 2 | Double-click the <b>Scheduled Tasks</b> shortcut.   |
| 3 | In the Scheduled Tasks explorer, double-click the task you want to modify.  |
| 4 | In the <b>Scheduled Tasks</b> properties window make the required changes using the tabs.   |
| 5 | Click <b>Apply</b> to accept the change.  |
| 6 | Provide the password for the account identified in <a href="#">step 9 of Procedure 33 "Scheduling a synchronization job" (page 99)</a> .  |
| 7 | Click <b>OK</b> to close the password dialog.   |

---

—End—

---

**Procedure 35****Removing a synchronization job from the scheduler**


---

Step	Action
------	--------

---

- |   |   |
|---|---|
| 1 | Open the Windows Control Panel. <ul style="list-style-type: none"> <li>• On Windows XP, select <b>Start &gt; Control Panel</b>.</li> <li>• On Windows Server 2003, select <b>Start</b>, right-click <b>Control Panel</b> and select the <b>Open</b> command.</li> <li>• On Windows 2000 and Windows 2000 Server systems, select <b>Start &gt; Settings &gt; Control Panel</b>.</li> </ul> |
|---|---|

- 2 Double-click the **Scheduled Tasks** shortcut.
- 3 In the Scheduled tasks explorer select the scheduled task you want to remove.
- 4 Select **File > Delete**.  
or  
Right-click for a context menu and select **Delete**.
- 5 Click **Yes** in the Confirm File Delete window to delete.  
or  
Click **No** to cancel the deletion.

---

—End—

---

---

# CSV Subscriber Synchronization

---

## Contents

This section contains the following topics:

- "Introduction" (page 103)
- "File Format" (page 103)
- "Determining the operation to perform" (page 106)
- "Details for imported subscribers" (page 107)
- "Operational conditions" (page 108)
- "Synchronizing subscribers in CND" (page 108)
- "CSV subscriber synchronization limitations" (page 110)
- "Error handling" (page 111)
- "Logging" (page 112)

## Introduction

This section describes the Comma Separated Values (CSV) subscriber synchronization feature that allows you to import new subscribers and update existing subscribers using data in a CSV file.

## File Format

Each row in the CSV file, other than the first row, is treated as an individual subscriber record. The first row is used to identify the fields in all the remaining records in the file. These field names correspond to Lightweight Directory Access Protocol (LDAP) attribute names in the Common Network Directory (CND).

### Supported attributes

While the CSV export feature "[CSV Subscriber Export](#)" (page 139) only supports a fixed set of the legal nortelSubscriber attributes, the synchronization feature is slightly less restrictive. CSV subscriber synchronization imports or updates nortelSubscriber attributes, with the following restrictions:

- The attribute must not be a binary type attribute, such as jpegPhoto or audioClip.
- The attribute must not be operational, such as modifyTimestamp.
- The cn (common name) attribute cannot be modified.
- The userPassword attribute cannot be modified.

### Multi-valued attributes

Within the CSV file, field values are separated by commas. To facilitate the import and update of those LDAP attributes that support multiple values, each field value can be further delimited by semi-colon (;). To include a semicolon as a character in a single value for an attribute, the semicolon must be preceded by a backslash. [Table 7 "Semicolon interpretation"](#) (page 104) shows examples of how semicolons are interpreted.

**Table 7**  
**Semicolon interpretation**

CSV field data	Interpretation
A;B	Value 1: A Value 2: B
A\;B	Value 1: A;B
A\;B;C	Value 1: A;B Value 2: C

Any attempt to import or update multiple values against an LDAP attribute that does not support multiple values is an error and causes the synchronization for that entry to fail. Any such failures are logged (see "[Logging](#)" (page 112)).

See [Table 14 "Subscriber attributes in CND"](#) (page 185) for LDAP attributes supporting multiple values.

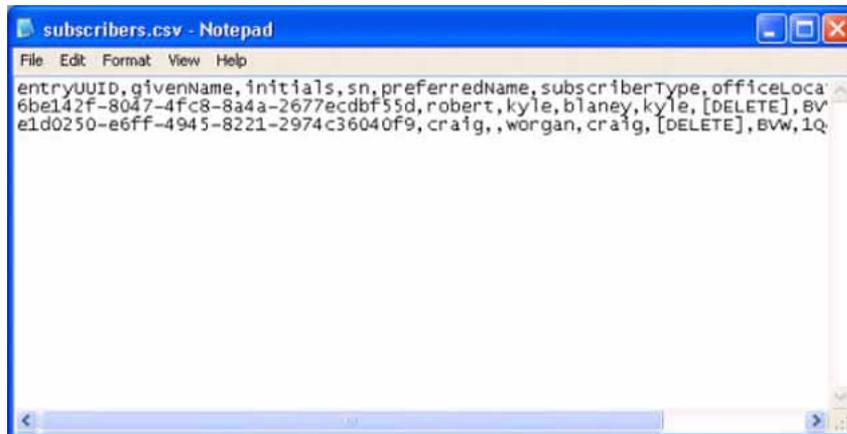
### Deleting attributes

CSV subscriber synchronization supports the deletion of individual subscriber attributes in CND. A special value is used to indicate that all current values in the current subscriber entry for the specified attribute should be deleted in CND. The special value is

[DELETE]

Figure 23 "CSV file with attribute deletion" (page 105) shows a CSV file that uses attribute deletion to delete all values for the subscriberType attribute for two subscribers.

**Figure 23**  
**CSV file with attribute deletion**



### File encoding

The CSV synchronization feature supports reading files encoded using any of the following:

- 8-bit Unicode Transformation Format (UTF-8)
- 16-bit Unicode Transformation Format with big-endian byte order (UTF-16BE)
- 16-bit Unicode Transformation Format with little-endian byte order (UTF-16LE)
- the default encoding of the machine running CND Manager

Rather than ask its users to identify the encoding of a selected CSV file, CSV synchronization relies on the presence of the Unicode byte order mark (BOM) to identify the file's encoding. For details on the use of the byte-order mark, see [Appendix "Unicode byte-order mark" \(page 197\)](#).

If a selected CSV file starts with the BOM as encoded by UTF-8, UTF-16BE, or UTF-16LE, CND Manager reads the remainder of the file using that encoding. If no BOM is detected at the start of the CSV file, CND Manager reads the file using the default encoding of the machine on which its running. Note that CSV files created using the CSV export feature are always encoded using UTF-8 and always start with the BOM encoded using UTF-8 (see ["File encoding" \(page 141\)](#)).

## Determining the operation to perform

The CSV subscriber synchronization feature examines each record in the CSV file and determines which of the following operations to perform:

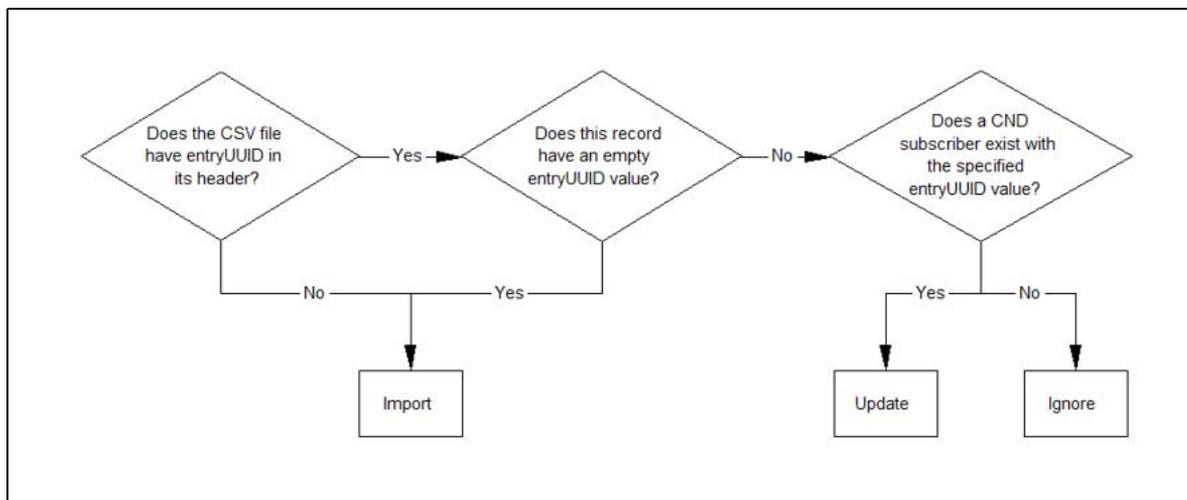
- update an existing CND subscriber
- import a new CND subscriber
- ignore the record

These operations are named update, import, and ignore, respectively. Figure 24 "CSV subscriber synchronization operation decision-making algorithm" (page 106) shows the algorithm used on each CSV record to determine the operation to perform.

### ATTENTION

The same CND subscriber can be updated by more than one record in the CSV file.

**Figure 24**  
CSV subscriber synchronization operation decision-making algorithm



The presence of a non-empty entryUUID value determines the operation to perform:

- If a CSV record has a non-empty entryUUID value and an existing CND subscriber has the specified entryUUID, the operation is **update**; that subscriber is updated according to the details in the CSV record.
- If a CSV record has a non-empty entryUUID value but there is no subscriber in CND that has the specified entryUUID, the operation is **ignore**. This is noted in the failure log.

- If entryUUID does not appear in the CSV file's header or a CSV record has an empty value for that field, the operation is **import**; that record is imported to CND as a new subscriber.

## Details for imported subscribers

The following details apply only to imported subscribers:

- ["Common names for imported subscribers" \(page 107\)](#)
- ["Required attributes" \(page 108\)](#)

### Common names for imported subscribers

New subscribers imported to CND must have a unique common name. This section discusses the different common name options available when CSV subscriber synchronization imports new subscribers. The options are:

- **Use common names specified in the CSV file.** Using this option, common names are taken directly from the CSV file; no common names are generated. If a common name is not specified in the CSV file for a record that requires one, it is an error condition that is logged in the failure log (see ["The failure log" \(page 115\)](#)).
- **Generate common names by combining given name and surname.** Using this option, common names are generated using a combination of the givenName and sn attributes for any record in the CSV file that doesn't have a common name specified. The possible combinations are:
  - Given Name and surname (for example "John Doe")
  - Surname, Given Name (for example "Doe, John")
  - First initial and surname (for example "JDoe")
  - Surname and first initial (for example "DoeJ")

In the event that the givenName attribute is empty for a record when this option is chosen, the sn attribute is used alone, and the format of the resulting common name does not include an additional space or a comma. For example, the generated common name is "Doe" for a subscriber with a surname of "Doe" and an empty givenName, regardless of the chosen combination.

- **Generate common names using values of another attribute.** Using this option, common names are generated using another specified attribute in the CSV file for any record in the CSV file that doesn't have a common name specified.

It is an error if a subscriber being imported has a common name that is the same as the value of the common name of an existing CND subscriber. In this situation the error is logged in the failure log (see ["The failure log" \(page 115\)](#)).

### Required attributes

In CND, subscribers must have a surname. Therefore, a CSV record for an imported subscriber must have a non-empty value for the sn attribute specified in the CSV file. It is an error if a subscriber being imported does not have a surname. In this situation the error is logged in the failure log (see "[The failure log](#)" (page 115)).

### Operational conditions

Following is a list of operational conditions that apply to CSV subscriber synchronization:

- Attempting to delete required attributes results in a failure to update the subscriber in question, and is logged in the failure log (see "[The failure log](#)" (page 115)).
- Attribute deletion only works when the operation being performed is an update (see "[Determining the operation to perform](#)" (page 106)). If the operation is an import, any [DELETE] directives are ignored.
- Attempting to delete an attribute that has no values does nothing and is not considered an error.
- Deleting an attribute deletes all of its values.
- Modifying an attribute replaces all of its existing values.

### Synchronizing subscribers in CND

To synchronize subscribers in CND see [Procedure 36 "Synchronizing subscribers in CND"](#) (page 108).

#### Procedure 36

#### Synchronizing subscribers in CND

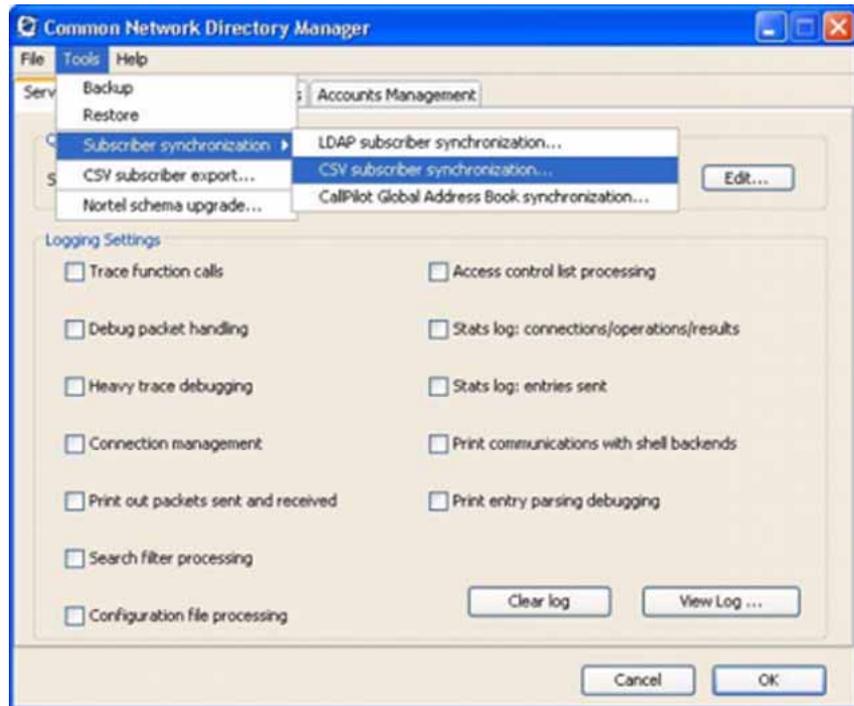
---

Step	Action
------	--------

---

- |   |  |
|---|--|
| 1 | Launch CND Manager. See <a href="#">Procedure 9 "Launching CND Manager"</a> (page 42).   |
| 2 | Select <b>Tools &gt; Subscriber synchronization &gt; CSV subscriber synchronization</b> (see <a href="#">Figure 25 "CSV subscriber synchronization tools menu item"</a> (page 109)). |

**Figure 25**  
**CSV subscriber synchronization tools menu item**



The CSV subscriber synchronization dialog screen appears.

- 3 Click **Browse** on the CSV subscriber synchronization dialog screen to select the CSV file with which to synchronize.
- 4 Select the appropriate CSV file on the **Windows Explorer** screen.
- 5 Click **Open**.
- 6 Select the appropriate **CSV file format**. Note that CSV files generated with the CSV subscriber export feature use the Microsoft CSV format.
- 7 Click **Next**.

The **Common names for imported subscribers** dialog screen appears.

- 8 Select a **common name option for imported subscriber** entries. The choices are:
  - **Generate common names by combining given name and surname**

- **Generate common names by using the value of another attribute**

The option **Use common names specified in the CSV file** is disabled.

9 Click **Next**.

10 Verify the items listed in the **Current selections** window.

11 Click **Finish** to start synchronizing subscribers.

The CSV subscriber synchronization progress dialog indicates the progress of the synchronization job.

or

Click **Back** to return to previous menus to make modifications.

or

Click **Cancel** to abort the synchronization.

When the job is completed, the CSV subscriber synchronization dialog indicates the location of the transaction log and, if applicable, the location of the failure log. If you receive a failure error, see [Table 8 "Error handling in CSV subscriber synchronization" \(page 111\)](#).

12 Click **Close** to close the synchronization progress page.

---

—End—

---

## CSV subscriber synchronization limitations

Following is a list of CSV subscriber synchronization limitations:

- Synchronization of accounts is not supported.
- Synchronization of binary attributes (for example, jpegPhoto and audioClip) is not supported.
- Deletion of subscribers is not supported.
- Statistics that differentiate between imported entries and updated entries are not collected or displayed.
- Subscribers that are not direct children of the ou=Subscribers, dc=Nortel, dc=com container of the CND are not synchronized.
- Transaction logging is non-configurable.

## Error handling

Table 8 "Error handling in CSV subscriber synchronization" (page 111) shows how error conditions are handled:

**Table 8**  
**Error handling in CSV subscriber synchronization**

Error condition	System response	Troubleshooting
No file is specified.	A standard error dialog is displayed. The text on the dialog is:  "Enter a CSV file and then press Next."	Use the Browse... button to select a CSV file.
The file does not exist.	A standard error dialog is displayed. The text on the dialog is:  "File does not exist. Check file path."	Use the Browse... button to select a CSV file.
The file is empty.	A standard error dialog is displayed. The text on the dialog is:  "The file is empty."	Use the Browse... button to select a CSV file that is not empty.
The file has a header, but has no records.	A standard error dialog is displayed. The text on the dialog is:  "The file has no records."	Use the Browse... button to select a CSV file that has records.
The system is unable to read the file.	A standard error dialog is displayed. The text on the dialog is:  "Unable to read CSV file."	Ensure that the CSV file: <ul style="list-style-type: none"> <li>• exists</li> <li>• is readable</li> <li>• isn't locked by another process, for example Microsoft Excel</li> </ul>
The CSV file has neither sn nor entryUUID in its header.	A standard error dialog is displayed. The text on the dialog is:  "The file's header must include at least one of the following attributes: <ul style="list-style-type: none"> <li>• sn</li> <li>• entryUUID"</li> </ul>	Add either an sn column or entryUUID column to the CSV file.

There is an unsupported attribute in the CSV file's header.	A standard error dialog is displayed. The text on the dialog is:  "Field <field number> (<attribute name>) in the header of <file name> is unsupported" (If the unsupported attribute's name is too long, it is abbreviated with ellipsis ("...") to ensure that the error dialog is readable.)	Remove the column with the unsupported attribute.
An attribute is duplicated in the CSV file's header.	A standard error dialog is displayed. The text on the dialog is:  "<attribute name> is duplicated in the file's header."	Remove the duplicate column or rename the header.
The connection to the CND service is unavailable.	A standard error dialog is displayed. The text on the dialog is:  "The CND service is unavailable."	Try to start the CND service using the Windows Services applet. If this fails, see <a href="#">Appendix "CND Troubleshooting" (page 155)</a>
The connection to the CND service is lost after the synchronization has started.	A standard error dialog is displayed and the export job is terminated. The text on the dialog is:  "Lost connection to the CND service. The synchronization job has been terminated."	Try to start the CND service using the Windows Services applet. If this fails, see <a href="#">Appendix "CND Troubleshooting" (page 155)</a>

## Logging

For each synchronization job the following logs are generated:

- "The summary log" (page 112)
- "The transaction log" (page 114)
- "The failure log" (page 115) (potentially)

### ATTENTION

Log files are not automatically cleaned by the system. It is recommended that you periodically remove unwanted log files.

## The summary log

Each time a CSV subscriber synchronization job is run, the summary details for the job are recorded in the LDAP Synchronization summary log.

The summary log holds summaries of all synchronization-related CND tasks, including:

- LDAP subscriber synchronization jobs
- CallPilot Global Address Book synchronization jobs
- CSV subscriber synchronization

The file is located at the following path:

```
<CND installation folder>\log\ LDAP_Sync\Summary.log
```

Where <CND installation folder> is the folder where CND is installed, which defaults to:

```
C:\Program Files\Nortel\Common Network Directory
```

The details in the summary log are:

- **Sync Job Name:** For CSV subscriber synchronization jobs, the name is always "CSV\_Sync".
- **External directory server host:** For CSV subscriber synchronization jobs, the host is the path and filename of the CSV file used in the job.
- **Destination (CND) host:** For CSV subscriber synchronization jobs, the destination shows the IP address of the CND that the job was run against.
- **Job Status:** Is one of:
  - **COMPLETED** – the job completed normally
  - **ABORTED\_DURING\_SYNCING** – the job failed to complete due to an exceptional circumstance
  - **INTERRUPTED\_DURING\_SYNCING** – the job failed to complete because you cancelled it
- **Sync started at:** The time the job started.
- **Sync ended at:** The time the job finished.
- **User account name:** This is the Windows user ID of the currently logged in user on the PC where the synchronization was run.
- **Sync stats:** The statistics of the job, which includes:
  - **Source host:** For CSV subscriber synchronization job, this is always "CSV\_SYNC".
  - **CSV\_SYNC:** Is one of:
    - **SYNC\_COMPLETE\_NORMAL** – the synchronization was completed normally

- **SYNC\_COMPLETE\_ABORT** – the synchronization was terminated before it finished due to an exceptional circumstance
  - **SYNC\_COMPLETE\_NO\_ENTRIES** – the synchronization was completed, but there are no records in the CSV file
  - **SYNC\_INTERRUPTED** – the synchronization was cancelled by the user
- **TOTAL:** The number of entries synchronized. The number of entries that failed to synchronize.
- **Cleaning stats:** Not applicable to CSV subscriber synchronization.
  - **Failure log path:** If a failure log is generated, this field displays the path in the file system to that log file. Otherwise, "N/A" is displayed.
  - **Transaction log path:** The path in the file system to the transaction log.

See [Figure 26 "CSV subscriber synchronization summary log"](#) (page 114) for an example of a summary log.

**Figure 26**  
**CSV subscriber synchronization summary log**

```

Summary.log - Notepad
File Edit Format Help
Sync Job Name: CSV_Sync
External directory server host: D:\subscribers.csv
Destination (CND) host: 47.11.181.136
Job Status: COMPLETED
Sync started at: Tue Nov 28 21:15:39 EST 2006
Sync ended at: Tue Nov 28 21:15:47 EST 2006
User account name: worganc
Sync stats:
  Source host: Host status, # Entries Synced, # Entries Failed To Sync
  CSV_SYNC: SYNC_COMPLETE_NORMAL, 418, 81
  TOTAL: 418, 81
Cleaning stats:
  Source host ID: # Entries Cleaned, # Entries Failed To Clean
  TOTAL: 0, 0
Failure log path: d:\Program Files\Nortel\Common Network
Directory\log\LDAP_Sync\CSV_Sync_20061128_211539\Failure.log
Transaction log path: d:\Program Files\Nortel\Common Network\
Directory\log\LDAP_Sync\CSV_Sync_20061128_211539\Transaction.log

```

### The transaction log

For every CSV subscriber synchronization job run, a transaction log (Transaction.log) file is created and stored in the following directory:

```

<CND installation
folder>\log\LDAP_Sync\CSV_Sync_[date]_[time]\

```

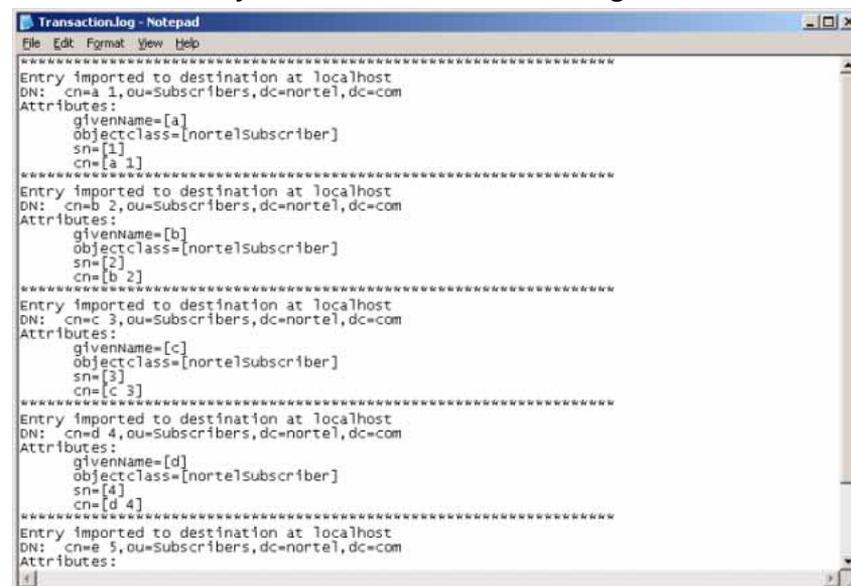
Where [date] and [time] are generated based on the date and time that the synchronization job started. For example, for a synchronization job started on January 7, 2007 at 10:05:47 am, the generated folder is named CSV\_Sync\_20070107\_100547.

The CSV subscriber transaction log contains the following details:

- **DN:**
- **Attributes:**

See [Figure 27 "CSV subscriber synchronization transaction log"](#) (page 115) for an example of a transaction log.

**Figure 27**  
**CSV subscriber synchronization transaction log**



```

Transaction.log - Notepad
File Edit Format View Help
=====
Entry imported to destination at localhost
DN: cn=a 1,ou=Subscribers,dc=nortel,dc=com
Attributes:
    givenName=[a]
    objectclass=[nortelsubscriber]
    sn=[1]
    cn=[a 1]
=====
Entry imported to destination at localhost
DN: cn=b 2,ou=Subscribers,dc=nortel,dc=com
Attributes:
    givenName=[b]
    objectclass=[nortelsubscriber]
    sn=[2]
    cn=[b 2]
=====
Entry imported to destination at localhost
DN: cn=c 3,ou=Subscribers,dc=nortel,dc=com
Attributes:
    givenName=[c]
    objectclass=[nortelsubscriber]
    sn=[3]
    cn=[c 3]
=====
Entry imported to destination at localhost
DN: cn=d 4,ou=Subscribers,dc=nortel,dc=com
Attributes:
    givenName=[d]
    objectclass=[nortelsubscriber]
    sn=[4]
    cn=[d 4]
=====
Entry imported to destination at localhost
DN: cn=e 5,ou=Subscribers,dc=nortel,dc=com
Attributes:

```

### The failure log

For every CSV subscriber synchronization job run that has failures, a failure log (Failure.log) file is created and stored in the following directory:

```
<CND installation
folder>\log\LDAP_Sync\CSV_Sync_[date]_[time]\
```

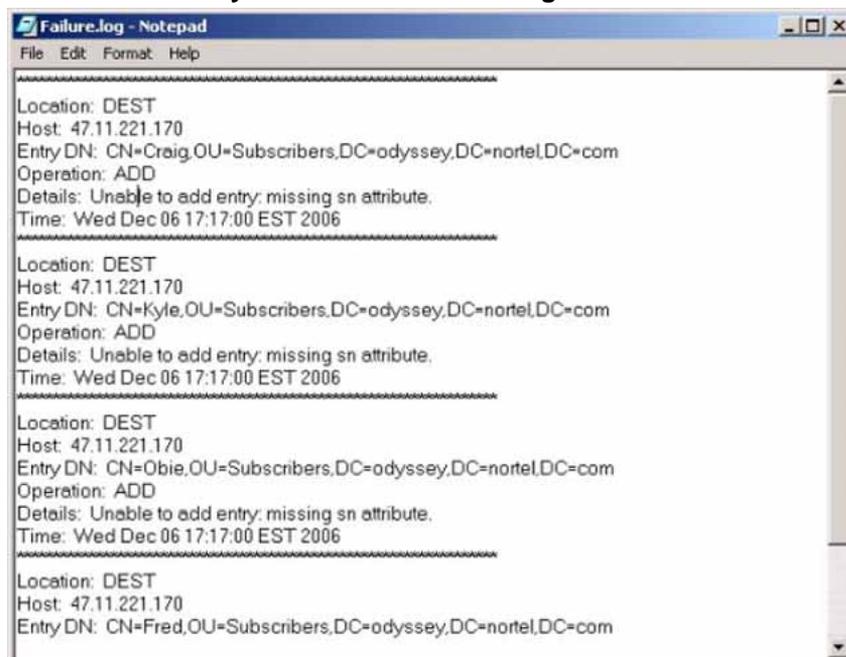
Where [date] and [time] are generated based on the date and time that the synchronization job started. For example, for a synchronization job started on January 7, 2007 at 10:05:47 am, the generated folder is named CSV\_Sync\_20070107\_100547

The failure log contains the following details:

- **The location of the failure.** In a CSV subscriber synchronization job, the location is either the destination (DEST) if the error occurred in the CND, or source (SRC) if the error is caused by the CSV file.
- **Location:** In a CSV subscriber synchronization job, the host is always the IP address of the CND.
- **Host:** The IP address.
- **Entry DN:** The cn, ou, and dc of the job.
- **Operation:** The operation that failed.
- **Details:** The details of the failure.
- **Time:** The date and time that the failure occurred.

See [Figure 28 " CSV subscriber synchronization failure log" \(page 116\)](#) for an example of a failure log.

**Figure 28**  
**CSV subscriber synchronization failure log**



```
Failure.log - Notepad
File Edit Format Help
.....
Location: DEST
Host: 47.11.221.170
Entry DN: CN=Craig,OU=Subscribers,DC=odyssey,DC=nortel,DC=com
Operation: ADD
Details: Unable to add entry: missing sn attribute.
Time: Wed Dec 06 17:17:00 EST 2006
.....
Location: DEST
Host: 47.11.221.170
Entry DN: CN=Kyle,OU=Subscribers,DC=odyssey,DC=nortel,DC=com
Operation: ADD
Details: Unable to add entry: missing sn attribute.
Time: Wed Dec 06 17:17:00 EST 2006
.....
Location: DEST
Host: 47.11.221.170
Entry DN: CN=Obie,OU=Subscribers,DC=odyssey,DC=nortel,DC=com
Operation: ADD
Details: Unable to add entry: missing sn attribute.
Time: Wed Dec 06 17:17:00 EST 2006
.....
Location: DEST
Host: 47.11.221.170
Entry DN: CN=Fred,OU=Subscribers,DC=odyssey,DC=nortel,DC=com
```

---

# CallPilot Global Address Book Synchronization

---

## Contents

This section contains information on the following topics.

- "Introduction" (page 117)
- "Functional description" (page 118)
- "Log files" (page 119)
- "Passwords" (page 121)
- "CallPilot GAB Synchronization dialog" (page 121)
- "CallPilot GAB progress dialog" (page 128)
- "CallPilot GAB Synchronization Procedures" (page 129)

## Introduction

This chapter describes CallPilot Global Address Book Synchronization, a Common Network Directory (CND) Manager tool. The tool allows a CallPilot network administrator to consolidate the local address books of all CallPilot 5.0 hosts in a network into a global address book (GAB) having entries stored as subscribers in CND. Additionally, the tool ensures that each CND subscriber entry is kept up-to-date with respect to the CallPilot 5.0 local address book entry with which it is associated.

When local address books are consolidated into a global address book, each subscriber can address a message to a colleague regardless of where that colleague works. Without consolidation, a subscriber can only address a message to a colleague if the information of the subscriber and colleague is stored in the same local address book. CND subscriber entries associated with a CallPilot local address book entry store information such as given name, initials, surname, email address, title, and description in the same way as subscribers created by other applications (such as CS1000 Telephony Manager). This approach allows other applications to share subscriber data with CallPilot.

## Functional description

CallPilot Global Address Book Synchronization consists of two phases:

- Synchronization
- Cleaning

### Synchronization phase

The first step of synchronization is to query a user-defined CallPilot (named the CallPilot network authority) for a list of all CallPilot hosts that have been configured in its networking tree using CallPilot Manager. The next step of synchronization is to query each host. If the host is at release 5.0, it is queried for a list of all of its local address book entries. If the host is at any other release, its entries are not synchronized.

Each local address book entry results in potential changes to one CND subscriber entry:

- If a CND subscriber entry is already associated with the local address book entry, the CND subscriber entry is updated to reflect the information in the local address book entry.
- If CND subscriber entry is not associated with the local address book entry, one of the following occurs:
  - If exactly one CND subscriber entry has the same surname, given name, and telephone number as those details in the local address book entry, the CND subscriber entry is associated with the local address book entry. In addition, the CND subscriber entry is updated to reflect the information in the local address book entry.
  - If zero or more than one CND subscriber entry has the same surname, given name, and telephone number as those details in the local address book entry, a new CND subscriber entry is created to reflect the information in the local address book entry. In addition, the new entry is associated with the local address book entry.

### Cleaning phase

Cleaning takes care of CND subscriber entries that have had all of the associated CallPilot local address book entries deleted. Users have two options for such entries:

- Only delete the CallPilot-specific attributes of the entry: Keep the entry (with its other attributes) in CND. This option allows other applications to use the remaining subscriber data stored in the entry.
- Delete the entire entry: Choose this option when CallPilot is the only application using subscriber data in CND.

**ATTENTION**

There is no fallback to the first option if entry deletion fails. For example, if a CND subscriber entry cannot be deleted, its CallPilot-specific attributes are not touched. Rather, the inability to delete the entry is logged as a **failure to clean**.

## Log files

There are potentially three log files relevant to CallPilot Global Address Book Synchronization:

- summary log file. See "[Summary log file](#)" (page 119)
- transaction log file. See "[Transaction log file](#)" (page 120)
- failure log file. See "[Failure log file](#)" (page 121)

All log files are stored within the **LDAP\_Sync\log** folder that exists within the CND installation folder (by default, **C:\Program Files\Nortel\Common Network Directory**).

There is a single summary log file; it contains one record for each subscriber synchronization job that is performed, whether it be Comma Separated Values (CSV) subscriber import, CallPilot GAB synchronization, or Lightweight Directory Access Protocol (LDAP) subscriber synchronization. Note that a record is created whether the job is performed manually or scheduled.

For each CallPilot GAB synchronization job that is performed, a unique sub-folder within **LDAP\_Sync\log** is created in which to store the job transaction and failure log files. The sub-folder name starts with **CallPilot\_GAB** and ends with a string representation of the date and time the job was started (for example, **CallPilot\_GAB\_20051230\_160704** for a job that started at 4:07:04 PM on December 30, 2005).

### Summary log file

The summary log file is named **Summary.log** and is located in the **log\LDAP\_Sync** sub-folder of the CND installation folder. It is plain text, with records separated from one another by a line of asterisks. A record for CallPilot GAB synchronization contains the following information:

- the fixed name of the CallPilot GAB synchronization job (CallPilot\_GAB)
- the network authority host
- the CND host
- the status of the job – one of the following:
  - completed

- interrupted during synchronization – indicates that the job was interrupted by you while synchronization was occurring
- interrupted during cleaning – indicates that the job was interrupted by you while cleaning was occurring
- aborted during synchronization – indicates that the job was aborted due to error while synchronization was occurring
- aborted during cleaning – indicates that the job was aborted due to error while cleaning was occurring
- the account name of the user that ran the synchronization job
- the date and time the job started and ended
- for each source CallPilot host:
  - the status of synchronization with the host: one of:
    - unreachable: indicates that the host was not reachable
    - synchronization not started: indicates that synchronization with the host was not started
    - synchronization completed
    - synchronization aborted: indicates that synchronization with the host was aborted due to error
    - synchronization interrupted: indicates that synchronization with the host was interrupted by the user
  - the number of entries that synchronized and failed to synchronize
  - the number of entries that were cleaned and failed to be cleaned
- the total number of entries that synchronized and failed to synchronize
- the total number of entries that were cleaned and failed to be cleaned
- the failure log path, if applicable
- the transaction log path, if applicable

### Transaction log file

The transaction log file is optional; it is enabled or disabled in the CallPilot GAB Synchronization Job dialog. See "[Logging tab](#)" (page 127). If enabled, the file is named Transaction log and is located in the unique sub-folder of the particular CallPilot GAB synchronization job. It is plain text, with records separated from one another by a line of asterisks. The transaction log file contains a record when any of the following events occur to a CND subscriber entry:

- It is created.

- It is associated with a CallPilot local address book entry.
- It is updated to reflect the information in its associated CallPilot local address book entry.
- The CallPilot-specific attributes are deleted.
- It is deleted.

### **Failure log file**

The failure log file contains a record for each entry that fails to be synchronized or cleaned. Note that the failure log file is not the place that failures of a magnitude larger than a single entry are logged. For example, suppose that one of 100 CallPilot hosts is temporarily unavailable and the synchronization tool can not get the list of local address book entries from that host. That information is not logged in the failure log file, rather, it is noted in the summary log file.

The failure log file is named **Failure.log** and is located in the unique sub-folder of the particular CallPilot GAB synchronization job. It is in simple text format, with records separated from one another by a line of asterisks.

Each record contains the following information:

- The distinguished name (DN) and host of the entry that caused the failure.
- Whether the failure occurred on the source or destination of the synchronization job.
- The operation being attempted.
- The time the failure occurred.

## **Passwords**

There are potentially three passwords necessary to perform CallPilot Global Address Book Synchronization:

- The CND Administrator password – assigned during CND installation and configured using CND Manager.
- The password used when communicating with the CallPilot network authority – configured in the CallPilot GAB Synchronization dialog box.
- The Windows account password under which scheduled CallPilot GAB synchronization occurs.

## **CallPilot GAB Synchronization dialog**

The CallPilot Global Address Book Synchronization dialog contains:

- A menu bar that allows a user to run the synchronization job, save the details of the job, close the dialog, view the summary log, or view the administration guide. See "[Menu bar](#)" (page 122).

- A tab for configuration of network authority details. See "Network authority tab" (page 124).
- A tab for configuration of attribute modification. See "Attribute modification tab" (page 125).
- A tab for configuration of entry cleaning. See "Entry cleaning tab" (page 126).
- A tab for configuration of logging. See "Logging tab" (page 127).
- Three buttons:
  - **Run** - to run the synchronization job
  - **Save** - to save the details of the synchronization job
  - **Close** - to close the dialog

### Menu bar

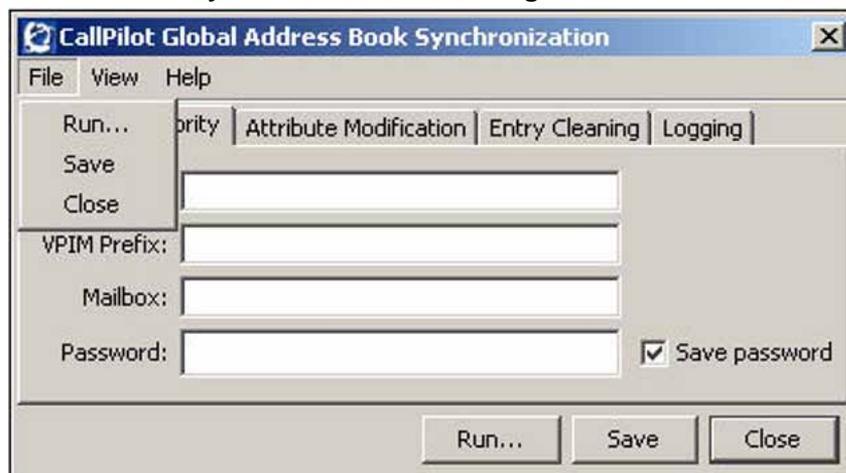
The menu bar contains the following menus:

- File. See "File menu" (page 122)
- View. See "View menu" (page 123)
- Help. See "Help menu" (page 123)

### File menu

The file menu contains menu items that allows you to run the synchronization job, save the details of the job, or close the dialog. See Figure 29 "CallPilot GAB Synchronization Job dialog File menu" (page 122)

**Figure 29**  
CallPilot GAB Synchronization Job dialog File menu



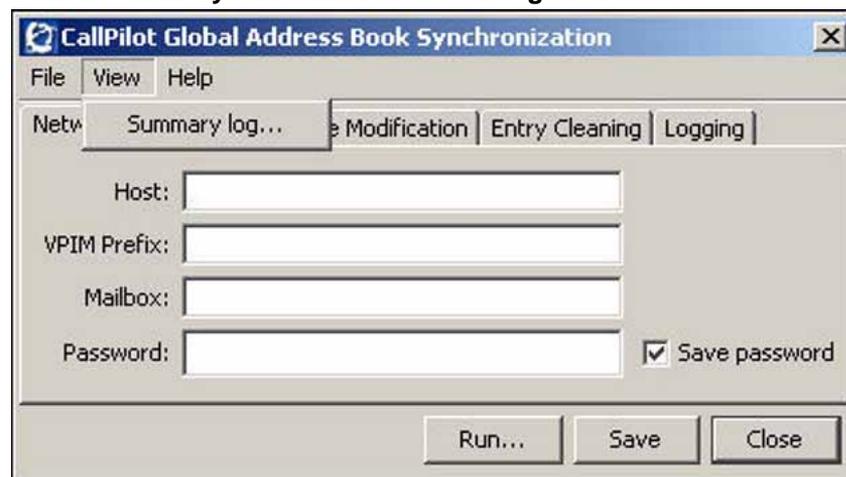
For the procedure to save the CallPilot GAB synchronization job, see ["Saving the CallPilot GAB synchronization job"](#) (page 131)

For the procedure to run the CallPilot GAB synchronization job, see ["Running the CallPilot GAB synchronization job"](#) (page 132)

### View menu

The view menu has a single menu item that allows you to view the summary log. [Figure 30 "CallPilot GAB Synchronization Job dialog View menu"](#) (page 123).

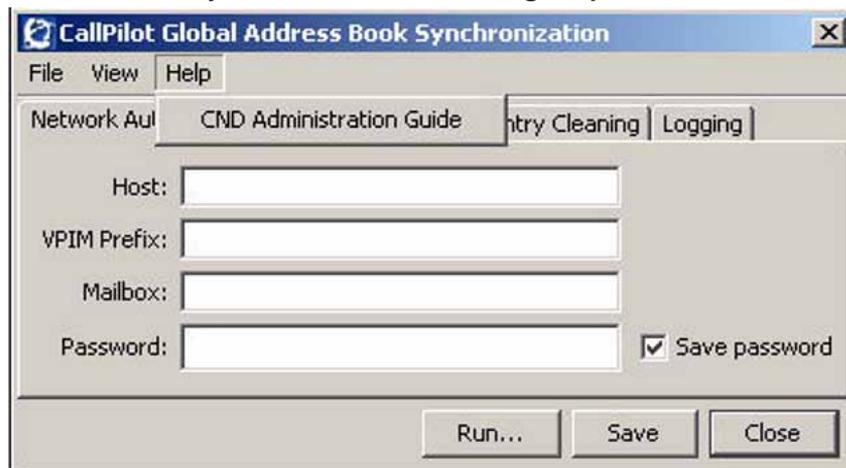
**Figure 30**  
**CallPilot GAB Synchronization Job dialog View menu**



### Help menu

The help menu contains a single menu item that allows you to view the CND Administration Guide. See [Figure 31 "CallPilot GAB Synchronization Job dialog Help menu"](#) (page 124)

**Figure 31**  
CallPilot GAB Synchronization Job dialog Help menu

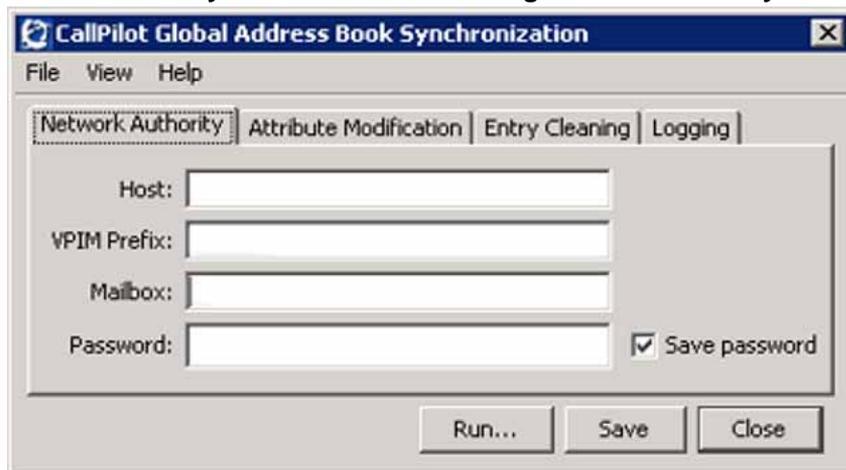


## Configuration tabs

### Network authority tab

The Network authority tab is used to configure network authority details and contains text fields for the host, VPIM prefix, mailbox, and password. See [Figure 32 "CallPilot GAB Synchronization Job dialog Network Authority tab"](#) (page 124)

**Figure 32**  
CallPilot GAB Synchronization Job dialog Network Authority tab



The CallPilot details that are entered into the dialog is the network authority that is queried for the list of all CallPilot hosts in the network. The VPIM prefix, mailbox and password must be those of an administrator on the CallPilot network authority with at least **Directory Synchronization Administration** rights.

If a previous CallPilot GAB synchronization job has been saved, the saved values are pre-populated as the dialog defaults. Otherwise, all text fields are blank and the **Save password** check box is not selected.

**Host validity** The host field ignores leading and trailing white space. For example, a host of " **CallPilotA** " is equivalent to a host of "**CallPilotA**". The host must be a non-empty string (after leading and trailing white space is removed). If you try to run CallPilot GAB synchronization when the host is invalid, the following error message is displayed that states, "The host is invalid. It must be :".

After you acknowledge the error message, input focus is moved to the host text field.

**VPIM prefix validity** The VPIM prefix must be a sequence of one or more digits. If you try to run CallPilot GAB synchronization when the VPIM prefix is invalid, the following error message is displayed, "The VPIM prefix is invalid. It must be a sequence of one or more digits."

After you acknowledge the error message, input focus is moved to the VPIM prefix text field.

**Mailbox validity** The mailbox must be a sequence of between one and 18 digits. If you try to run CallPilot GAB synchronization when the mailbox is invalid, the following error message is displayed, "The mailbox is invalid. It must be a sequence of between one and 18 digits."

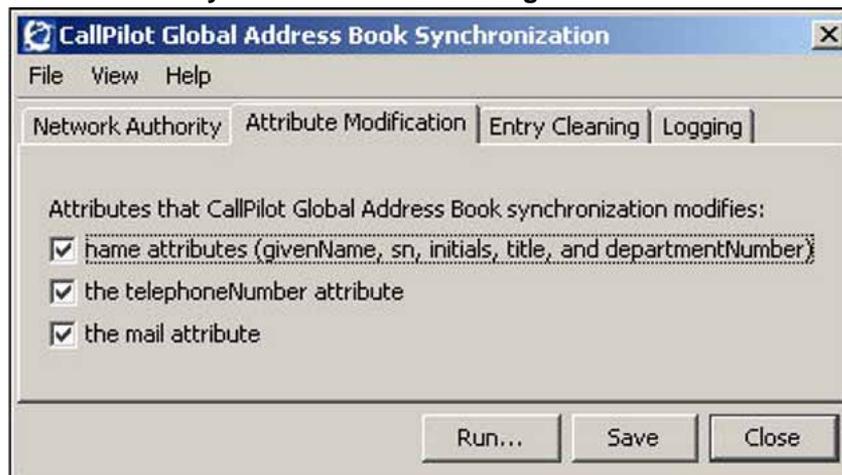
After you acknowledge the error message, input focus is moved to the mailbox text field.

**Password validity** The password must be that of an administrator on the CallPilot network authority with at least Directory Synchronization Administration rights. The password cannot be blank, and it cannot contain spaces. The password characters entered are displayed as "\*".

### **Attribute modification tab**

The tab that configures attribute modification contains check boxes that specify which CND attributes are modified during CallPilot GAB synchronization. See [Figure 33 "CallPilot GAB Synchronization Job dialog Attribute modification tab"](#) (page 126)

**Figure 33**  
**CallPilot GAB Synchronization Job dialog Attribute modification tab**



The check boxes determine the CND attributes that are modified during CallPilot GAB synchronization. For example, suppose that Telephony Manager has added many subscribers to CND and the network administrator does not want those subscriber name attributes overwritten by their values in CallPilot during GAB synchronization. Therefore, the network administrator deselects the check box on the name attributes.

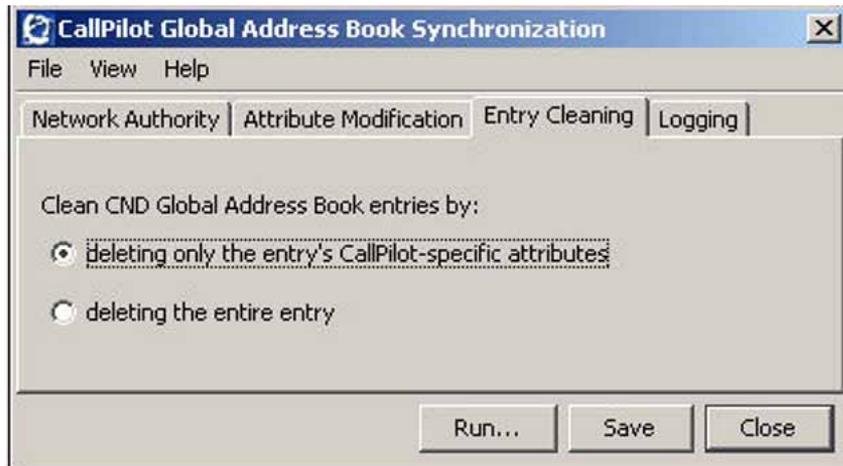
#### **ATTENTION**

If the CND mail attribute is not modified, IMAP-compatible clients can not use the CallPilot Global Address Book. They must continue to use their existing local address books.

#### **Entry cleaning tab**

The entry cleaning tab contains radio buttons that you select to determine how CND subscriber entries are cleaned during CallPilot GAB synchronization. See "[Cleaning phase](#)" (page 118).

**Figure 34**  
**CallPilot GAB Synchronization Job dialog Entry Cleaning tab**



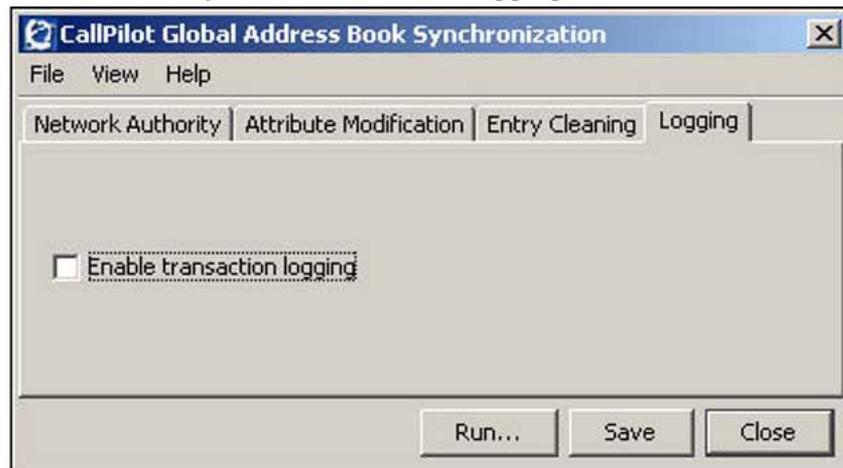
Exactly one of the two entry cleaning radio buttons can be selected at any given time.

If a previous CallPilot GAB synchronization job has been saved, the saved value is pre-populated as the entry cleaning default. Otherwise, the first radio button is selected.

### Logging tab

The tab that configures logging contains a check box that specifies whether transaction logging occurs during CallPilot GAB synchronization. See [Figure 35 "CallPilot GAB Synchronization Job Logging tab" \(page 127\)](#)

**Figure 35**  
**CallPilot GAB Synchronization Job Logging tab**



The check box determines whether transaction logging is enabled.

If a previous CallPilot GAB synchronization job has been saved, the saved value is pre-populated as the transaction logging default. Otherwise, transaction logging is disabled.

## CallPilot GAB progress dialog

The CallPilot GAB Progress dialog monitors the progress of a running synchronization job. The following statistics are monitored:

- the number of entries synchronized and cleaned
- the number of entries that have failed to synchronize and be cleaned
- a message
- a progress bar

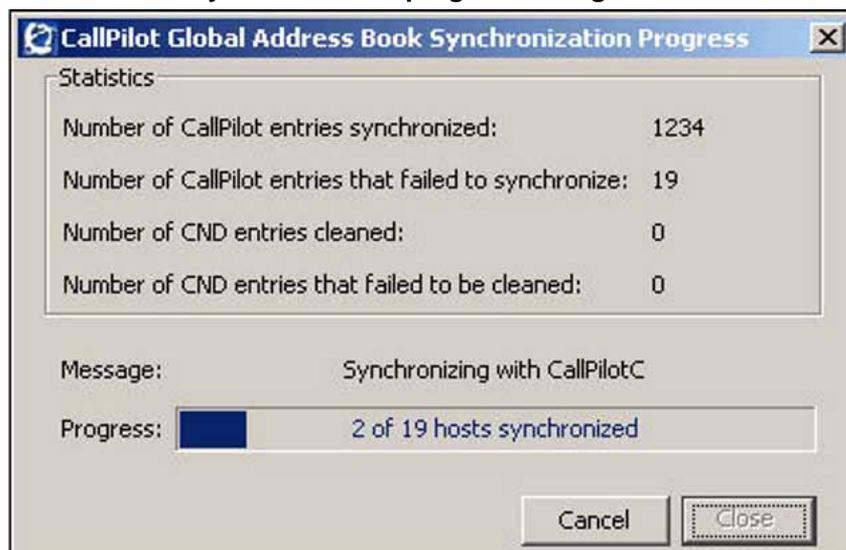
The dialog also contains buttons that:

- cancel the synchronization
- close the dialog

### ATTENTION

CallPilot synchronization is underway as soon as the progress dialog opens. There is no Start button.

**Figure 36**  
CallPilot GAB Synchronization progress dialog



### Statistics

The statistics fields display the total number of entries for all CallPilot hosts. Users can view these statistics for each CallPilot host in the summary log when the job is complete. See "[Summary log file](#)" (page 119).

### Cancel button

The cancel button is initially the only button that is enabled. When clicked, the following events occur:

- the synchronization job is cancelled
- the cancel button is disabled
- the close button is enabled

#### ATTENTION

No changes are rolled back after cancellation. For example, entries that have already been synchronized maintain the changes made to them that took place prior to cancellation. Also, if cancellation occurs during the synchronization phase, no entry cleaning occurs

#### ATTENTION

There is no way to restart or continue the synchronization from within the progress dialog once the job is cancelled. After cancellation, the only option is to close the progress dialog.

### Close button

The close button is initially disabled. It is only enabled when you manually cancel the synchronization or the synchronization completes normally. When clicked, the progress dialog is closed.

## CallPilot GAB Synchronization Procedures

Procedures in this section are:

- Launching the CallPilot GAB synchronization job. See [Procedure 37 "Launching the CallPilot GAB synchronization job"](#) (page 130).
- Defining the CallPilot GAB synchronization job. See "[Defining the CallPilot GAB synchronization job](#)" (page 130)
- Saving the CallPilot GAB synchronization job. See "[Saving the CallPilot GAB synchronization job](#)" (page 131)
- Running the CallPilot GAB synchronization job. See [Procedure 40 "Running the CallPilot GAB synchronization job manually"](#) (page 132)
- Scheduling the CallPilot GAB synchronization job . See "[Scheduling the CallPilot GAB synchronization job](#)" (page 134)

## Launching the CallPilot GAB synchronization job

To launch the CallPilot GAB synchronization job, see [Procedure 37 "Launching the CallPilot GAB synchronization job"](#) (page 130).

### Procedure 37

#### Launching the CallPilot GAB synchronization job

Step	Action
------	--------

- |   |   |
|---|---|
| 1 | Launch CND Manager. See <a href="#">Procedure 9 "Launching CND Manager"</a> (page 42).                    |
| 2 | Select <b>Tools &gt; Subscriber synchronization &gt; CallPilot Global Address Book synchronization...</b> |

The **CallPilot Global Address Book Synchronization** screen appears (see [Figure 37 "CallPilot Global Address Book Synchronization"](#) (page 130)).

**Figure 37**  
CallPilot Global Address Book Synchronization

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—End—

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## Defining the CallPilot GAB synchronization job

To define the CallPilot GAB synchronization job, see [Procedure 38 "Defining the CallPilot GAB synchronization job"](#) (page 131).

**Procedure 38****Defining the CallPilot GAB synchronization job**

<b>Step</b>	<b>Action</b>
1	Launch CND Manager. See <a href="#">Procedure 9 "Launching CND Manager" (page 42)</a> .
2	Select <b>Tools &gt; Subscriber Synchronization &gt; CallPilot Global Address Book Synchronization</b> .
3	Click the <b>Network Authority</b> tab of the CallPilot GAB Synchronization dialog box, provide values for the network authority fields. See <a href="#">"Network authority tab" (page 124)</a> .
4	Select the <b>Save Password</b> check box if you want the password to be remembered.
5	Click the <b>Attribute Modification</b> tab of the CallPilot GAB Synchronization dialog box, select the CND attributes that are to be modified by the synchronization job. See <a href="#">"Attribute modification tab" (page 125)</a> .
6	Click the <b>Entry Cleaning</b> tab of the CallPilot GAB Synchronization dialog box, select how CND subscriber entries are to be cleaned. See <a href="#">"Entry cleaning tab" (page 126)</a> .
7	Click the <b>Logging</b> tab of the CallPilot GAB Synchronization dialog box, select whether transaction logging is to occur. See <a href="#">"Logging tab" (page 127)</a> .
8	Click <b>Save</b> .

---

—End—

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**Saving the CallPilot GAB synchronization job**

To save the CallPilot GAB synchronization job, see [Procedure 39 "Saving the CallPilot GAB synchronization job" \(page 131\)](#).

**Procedure 39****Saving the CallPilot GAB synchronization job**

<b>Step</b>	<b>Action</b>
1	If it is not already open, open the CallPilot GAB Synchronization dialog box. See <a href="#">"Passwords" (page 121)</a>

- 2 On the Network Authority tab of the CallPilot GAB Synchronization dialog box, select whether the network authority password is to be saved.

**ATTENTION**

Note that scheduled GAB synchronization cannot be performed until the GAB synchronization job has been defined and saved (including the network authority password).

- 3 In the **CallPilot Global Address Book Synchronization** dialog box, either:
  - Click **Save** to save the job.or
  - Select **File > Save** to save the job.
- 4 If prompted, click **Yes** to save the changes.
- 5 Click **Close** to close the **CallPilot Global Address Book Synchronization** dialog box.

---

—End—

---

### Running the CallPilot GAB synchronization job

To manually run the CallPilot GAB synchronization job, see [Procedure 40 "Running the CallPilot GAB synchronization job manually" \(page 132\)](#)

#### Procedure 40

#### Running the CallPilot GAB synchronization job manually

---

Step	Action
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- |   |   |
|---|---|
| 1 | Launch CND Manager. See <a href="#">Procedure 9 "Launching CND Manager" (page 42)</a> .   |
| 2 | Select <b>Tools &gt; Subscriber Synchronization &gt; CallPilot Global address Book Synchronization</b> .  |
| 3 | In the CallPilot GAB Synchronization dialog box, either <ul style="list-style-type: none"><li>• Click <b>Run</b></li></ul> or <ul style="list-style-type: none"><li>• Select <b>File &gt; Run</b></li></ul> |

The CallPilot GAB Synchronization Progress dialog appears.

Regardless of how the job is run, the following events occur:

- The values in the host, VPIM prefix, and mailbox fields are checked for validity in that order. If any of the fields contain invalid values, an error dialog is displayed and input focus is moved to the field in error. Note that even if more than one of the fields contains an invalid value, only one error dialog is displayed: for the first field in error.
- If all field values are valid, the tool displays the progress dialog and starts synchronization. If synchronization can not start (for example, because the network authority details are incorrect), the "Failed to start synchronization job." error message dialog appears.

#### ATTENTION

Running the synchronization job does not automatically save the information entered into the dialog.

The password is only saved if the **Save password** check box is selected. When selected, the password is encrypted before it is saved. If the password is not saved, it has a blank default value the next time the tool runs.

#### ATTENTION

If the correct password is not saved, scheduled CallPilot GAB synchronization cannot be performed.

- 4 Click **Save** on the **CallPilot Global address Book Synchronization** screen.

or

Click **File > Save** on the menu bar.

When either action is taken, the information in the dialog is saved so that the fields are pre-populated the next time the CallPilot GAB synchronization tool is run.

- 5 Click **Close** when the progress bar shows the job is completed and you have reviewed the information on the screen.

If there are any unsaved changes, the Save dialog screen appears, asking "Do you want to save the changes to this synchronization job?".

---

—End—

---

## Scheduling the CallPilot GAB synchronization job

### ATTENTION

Scheduled GAB synchronization cannot be performed until the GAB synchronization job has been defined and saved (including the password). See the procedures in sections "Defining the CallPilot GAB synchronization job" (page 130) and "Saving the CallPilot GAB synchronization job" (page 131).

To schedule CallPilot GAB synchronization to occur at same time in the future, see [Procedure 41 "Scheduling the CallPilot GAB synchronization job" \(page 134\)](#).

### Procedure 41

#### Scheduling the CallPilot GAB synchronization job

---

Step	Action
------	--------

---

- |   |   |
|---|---|
| 1 | Open the Windows Control Panel. <ul style="list-style-type: none"><li>• On Windows XP, select <b>Start &gt; Control Panel</b>.</li><li>• On Windows Server 2003, select <b>Start</b>, right-click <b>Control Panel</b> and select <b>Open</b>.</li><li>• On Windows 2000 and Windows 2000 Server, select <b>Start &gt; Settings &gt; Control Panel</b>.</li></ul> |
| 2 | Double-click the Scheduled Tasks shortcut.  |
| 3 | In the Scheduled Tasks explorer, double-click <b>Add Scheduled Task</b> to display a welcome dialog.  |
| 4 | In the welcome dialog, click <b>Next</b> to display a dialog in which to select the program to schedule.  |

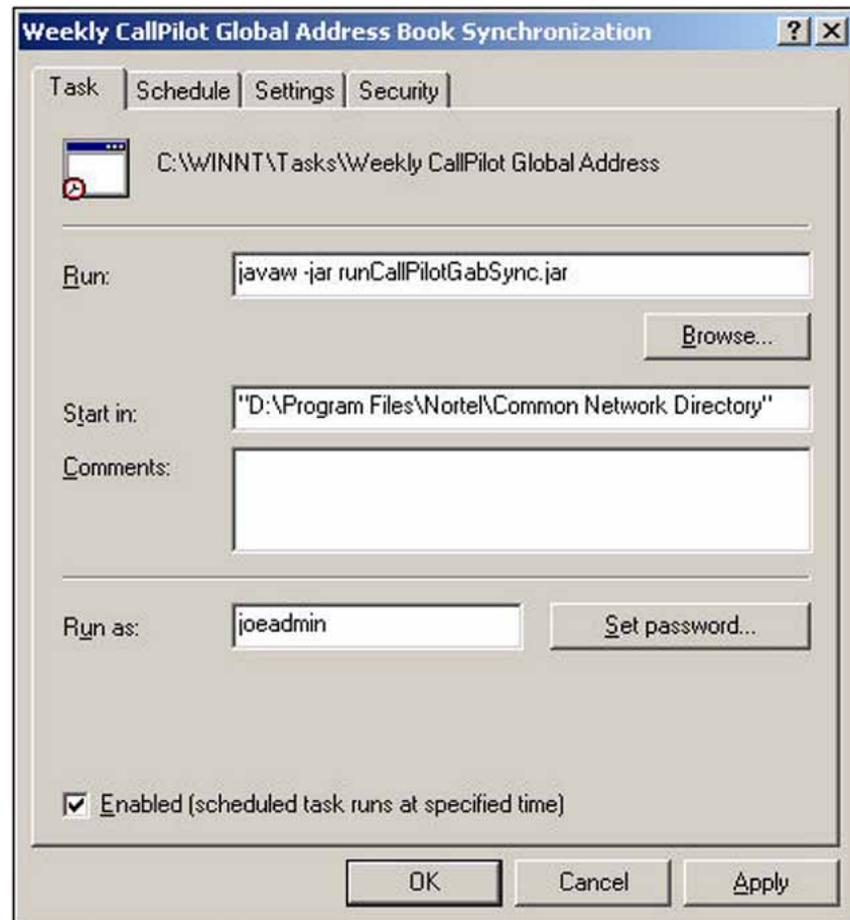
**Figure 38**  
**Add Scheduled Task: Program dialog**



- 5 In the program dialog, click **Browse** to open a file chooser.
- 6 Browse to the CND installation folder and select the **runCallPilotGABSync.jar** file.
- 7 Click **Open** to open a task name and frequency dialog.
- 8 Enter the task name and select when CallPilot GAB synchronization is to occur (either daily, weekly, monthly, or one time only). Note that CallPilot GAB synchronization can not be scheduled to occur for the choices **when my computer starts** or **when I log on**. Do not select either of those choices
- 9 Click **Next** to open a start time and date dialog.
- 10 Enter information to indicate when CallPilot GAB synchronization is to occur.
- 11 Click **Next** to open a user dialog.
- 12 Enter the user name and password of the Windows account under which CallPilot GAB synchronization is going to run. See ["Passwords"](#) (page 121) for an explanation of CallPilot GAB passwords.
- 13 Click **Next** to open a summary dialog.

- 14 In the summary dialog, select the check box to open advanced properties.
- 15 Click **Finish** to open an advanced properties dialog.

**Figure 39**  
**Add scheduled task: Advanced options dialog**



- 16 Edit the **Run** field to be exactly as follows (noting that case is significant).  
**javaw -jar runCallPilotGabSync.jar**
- 17 Click **Apply** to apply the changes and open a dialog prompting for account information.
- 18 Enter the account information as in step 12.
- 19 Click **OK** to close the account dialog.
- 20 Click **OK** to close the Add Scheduled Task dialog.

At the date and time the task is scheduled to run, the **CallPilot GAB Synchronization Progress** dialog box appears and synchronization begins.

---

—End—

---



# CSV Subscriber Export

## Contents

This section contains information on the following topics.

- ["Introduction" \(page 139\)](#)
- ["Exported attributes" \(page 139\)](#)
- ["Exporting CSV subscriber data" \(page 141\)](#)
- ["Error Handling" \(page 143\)](#)

## Introduction

The Comma Separated Values (CSV) Subscriber Export feature allows administrators to export subscriber records from Common Network Directory (CND) to a CSV file. This feature is limited to exporting subscribers (in other words, any entry in the ou=Subscribers container in CND that has an objectclass value of 'nortelSubscriber'). All subscribers in CND are exported during an export.

## Exported attributes

A fixed set of attributes for each subscriber is exported (see [Table 9 "Supported subscriber attributes in CND export tool" \(page 139\)](#)).

**Table 9**  
**Supported subscriber attributes in CND export tool**

Column	CND Attribute	Description	Syntax
1	entryUUID	Entry's unique identifier	UUID
2	givenName	Official First Name	DirectoryString
3	initials	Official Middle Name	DirectoryString
4	sn	Official Last Name	DirectoryString
5	preferredName	Preferred Name	DirectoryString
6	subscriberType	Type	DirectoryString
7	officeLocation	Location	DirectoryString

8	roomNumber	Room Number	DirectoryString
9	serviceStartDate	Service Start Date	DirectoryString
10	serviceEndDate	Service End Date	DirectoryString
11	preferredLanguage	Language	DirectoryString
12	postOfficeBox	Post Office Box	DirectoryString
13	street	Street No	DirectoryString
14	l	City	DirectoryString
15	st	Province/State	DirectoryString
16	country	Country	DirectoryString
17	postalCode	Postal Code/Zip	DirectoryString
18	mail	Email	IA5 String
19	preferredDirectoryNumber	Preferred DN	DirectoryString
20	preferredEsnTelephoneNumber	Preferred ESN	DirectoryString
21	preferredExternalTelephoneNumber	Preferred External DN	DirectoryString
22	facsimileTelephoneNumber	Fax	Facsimile Telephone Number
23	homePostalAddress	Home Address	TelephoneNumber
24	homePhone	Home Phone	TelephoneNumber
25	mobile	Mobile Phone	TelephoneNumber
26	pager	Pager	TelephoneNumber
27	o	Company	DirectoryString
28	employeeNumber	Employee Number	DirectoryString
29	description	Description	DirectoryString
30	title	Job Title	DirectoryString
31	departmentNumber	Department number	DirectoryString
32	preferredExtension	Preferred Extension	DirectoryString
33	subMgrTaskStatus	Subscriber Manager task status	DirectoryString
34	billingAccountCode	Billing account code	DirectoryString
35	billingAuthorizationCode	Billing authorization code	DirectoryString
36	cpndName	Call Party Name Display name	DirectoryString

## File Format

The first row in the exported CSV file is the file header, and contains the CND attribute names for the exported attributes. A complete list of the attribute names is shown in [Table 9 "Supported subscriber attributes in CND export tool" \(page 139\)](#). Each row in the file is a complete record, with attribute values corresponding to the attribute names in the header row. If a value does not exist for an attribute, none is given in the file, and this is represented with no characters. A simple example is shown in [Figure 40 "Example of CSV export file" \(page 141\)](#). Note that all attributes are not visible in the figure.

**Figure 40**  
Example of CSV export file



The file created by CSV subscriber export conforms to the Microsoft CSV format when exporting subscribers. For a detailed discussion of Standard and Microsoft CSV formats see [Appendix "CSV File Format" \(page 191\)](#).

### File encoding

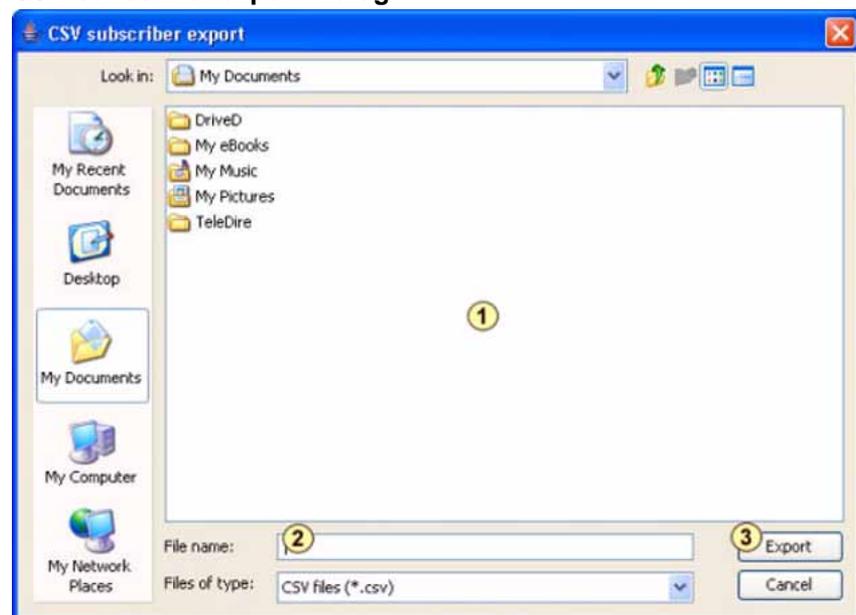
Files written by the CSV export feature are encoded using 8-bit Unicode Transformation Format (UTF-8) and include the Unicode byte-order mark (see [Appendix "Unicode byte-order mark" \(page 197\)](#)) to indicate the file's encoding. This allows exported CSV files to be modified and then properly read by the CSV synchronization feature.

## Exporting CSV subscriber data

To export subscriber data from CND see [Procedure 42 "Exporting subscribers from CND" \(page 142\)](#).

**Procedure 42**  
**Exporting subscribers from CND****Step Action**

- 1 Launch CND Manager. See Procedure 9 "Launching CND Manager" (page 42).
- 2 Select **Tools > CSV subscriber export...** .  
The CSV subscriber export screen appears (see Figure 41 "CSV subscriber export dialog " (page 142)).

**Figure 41**  
**CSV subscriber export dialog**

- 3 Choose a directory that you would like the export file to be located in (#1 in Figure 41 "CSV subscriber export dialog " (page 142)).
- 4 Enter a filename to export the subscribers to (#2 in Figure 41 "CSV subscriber export dialog " (page 142)).
- 5 Click **Export** to start the export (#3 in Figure 41 "CSV subscriber export dialog " (page 142)).  
The CSV subscriber export progress dialog indicates that the export is in progress.
- 6 Click **OK** to close the progress dialog when the CSV subscriber export dialog indicates that the export is completed .

---

—End—

---

## Error Handling

Table 10 "Handled error conditions" (page 143) shows how error conditions are handled:

**Table 10**  
**Handled error conditions**

Error condition	System response
You select an existing file as the target.	A confirmation dialog is displayed, asking if you want to replace the file.
You select a file without an extension, and when the .csv extension is appended to the file, the resulting file exists.	A confirmation dialog is displayed, asking you if you want to replace the file.
The connection to the CND service is lost after the export has started.	A standard error dialog is displayed. The text on the dialog is: <i>Unable to export to &lt;filename&gt;.</i>
The connection to the CND service is unavailable.	A standard error dialog is displayed. The text on the dialog is: <i>The export to &lt;filename&gt; could not start.</i>
The system is unable to complete the export operation. For example, the system is out of disk space or the CND service is lost after the export has started.	A standard error dialog is displayed. The text on the dialog is: <i>Unable to export to &lt;filename&gt;.</i>

### ATTENTION

If the system is unable to complete the export operation for any reason, a CSV file is not created, even if one with partial results could be created.

For detailed CND troubleshooting information see [Appendix "CND Troubleshooting"](#) (page 155).



---

# Nortel Schema Upgrade

---

## Contents

This section contains the following topics:

- "Introduction" (page 145)
- "Backward-compatibility" (page 145)
- "Schema Downgrading" (page 145)
- "Schema validation" (page 146)
- "Error conditions" (page 147)

## Introduction

Nortel schema upgrade provides the ability to upgrade the Common Network Directory (CND) Nortel schema. It is necessary to upgrade the CND schema when Nortel applications require new schema elements.

## Backward-compatibility

All Nortel schema releases are completely backward-compatible. Applications that require a CND Nortel schema to be at a specific version are completely operational if the CND Nortel schema is at that version or any subsequent version.

## Schema Downgrading

Schema downgrading refers to the upgrading of the Nortel schema to a lesser version than the one currently installed on the system. For example, upgrading to Version 3 when you are currently running Version 5. Schema downgrading is not supported since it may invalidate objects stored in CND.

### Implications to backup and restore

To protect against inadvertent schema downgrading, you cannot restore a backup file containing data tied to a newer version of CND schema than the one that is currently installed on the system. Nortel recommends that a backup operation be performed immediately after a schema upgrade, and all previous backup files be archived.

## Schema validation

The Nortel schema upgrade tool validates the user-supplied schema file prior to attempting to perform a schema upgrade. A schema file is considered invalid for either of the following reasons:

- It is not a genuine Nortel schema file.
- It is a genuine Nortel schema file, but the file has been modified.

To upgrade theCND Nortel schema, perform the following steps:

### Procedure 43

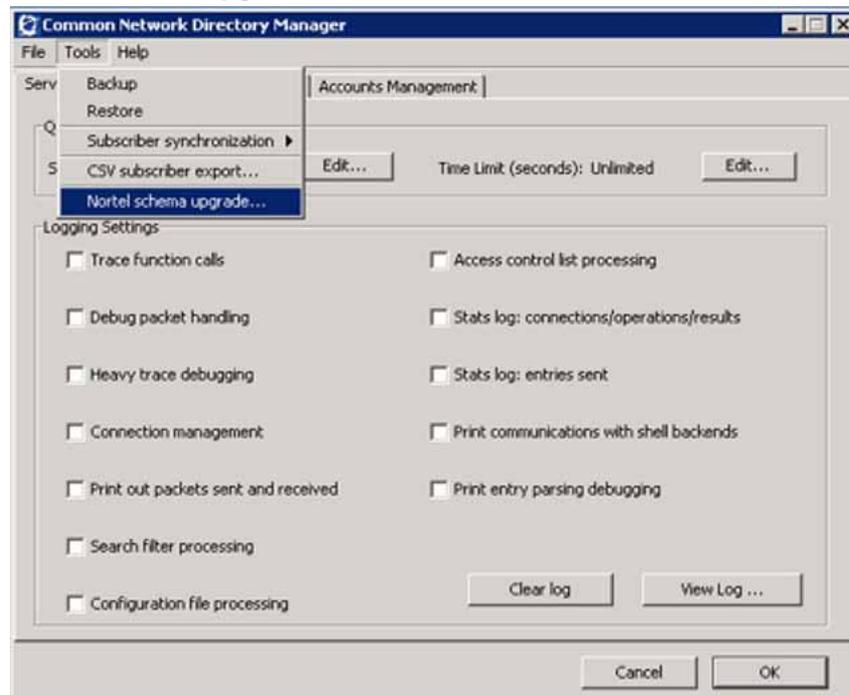
#### Upgrading the Nortel schema

Step	Action
------	--------

- |   |   |
|---|---|
| 1 | Launch CND Manager. See <a href="#">Procedure 9 "Launching CND Manager" (page 42)</a> . |
| 2 | Select <b>Tools &gt; Nortel schema upgrade</b> .  |

The Upgrade dialog box appears (see [Figure 42 "Nortel schema upgrade" \(page 146\)](#)).

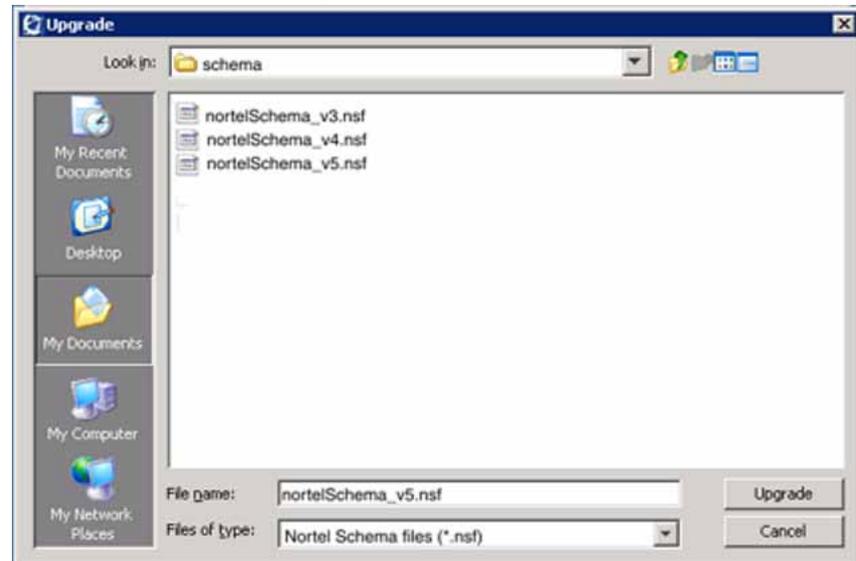
**Figure 42**  
Nortel schema upgrade



- |   |   |
|---|---|
| 3 | Navigate to the directory with the Nortel Schema files. |
|---|---|

- 4 Select the Nortel Schema file that you want to use for the upgrade (see Figure 43 "Nortel schema file dialog box" (page 147)).

**Figure 43**  
Nortel schema file dialog box



- 5 Click **Upgrade**.
- 6 Click **Yes** to confirm the schema upgrade.  
OR  
Click **No** to cancel the schema upgrade.
- 7 The Schema upgrade process dialog displays during the schema upgrade.  
At the end of the upgrade process, the Schema Upgrade Progress dialog indicates that the job is complete.
- 8 Click **OK** to close the dialog.

---

—End—

---

## Error conditions

The following section discusses how the Nortel schema upgrade feature handles the following error conditions:

- Invalid schema file
- Invalid upgrade schema version

- Other error conditions

### **Invalid schema file**

If a Nortel schema file is corrupted for any reason, it cannot be selected for upgrade by the system. An error message indicates that the schema file is invalid.

### **Invalid upgrade schema version**

The system does not allow a Nortel schema file to be selected that would cause a downgrade (see "[Schema Downgrading](#)" (page 145)).

An error message indicates that the schema version is invalid.

### **Other errors**

If a schema upgrade operation fails for any reason not mentioned in the previous sections, such as a problem stopping or starting the CND service, a general error message is displayed.

---

# Version Information

---

## Contents

This section contains the following topics:

- ["Introduction" \(page 149\)](#)
- ["Current version information" \(page 149\)](#)

## Introduction

This section shows you how to locate the current Common Network Directory (CND) version.

## Current version information

The version of CND currently in use is displayed under Show CND Version, located in the CND Manager Start menu folder. When it is launched, a DOS command window appears that displays the CND version currently being used. There are two ways to determine the version of CND Manager that is installed:

- [Procedure 44 "Verifying version information using CND Manager" \(page 149\)](#)
- [Procedure 45 "Verifying version information from Microsoft OS" \(page 150\)](#)

### Procedure 44

#### Verifying version information using CND Manager

Step	Action
1	Launch CND Manager. See <a href="#">Procedure 9 "Launching CND Manager" (page 42)</a> .
2	Select <b>Help &gt; About CND Manager</b> . The <b>About CND Manager</b> page appears. Information on this page includes: <ul style="list-style-type: none"> <li>• Release</li> </ul>

- Build Number
- Schema Version

3 Click **OK** to close the window.

---

—End—

---

#### Procedure 45

#### Verifying version information from Microsoft OS

---

Step	Action
------	--------

---

1	Select <b>Start &gt; All Programs &gt; Common Network Directory &gt; Show CND Version</b> in the Windows OS.
---	--

The **Show CND version** window appears.

The CND version information on the screen includes CND release number, build number, and schema version

2	Hit any key to close the window.
---	----------------------------------

---

—End—

---

---

# Clearing Configuration of TLS Certificates

---

## Contents

This section contains the following topics:

- ["Introduction" \(page 151\)](#)
- ["Clearing TLS/SSL certificates" \(page 151\)](#)

## Introduction

Configuring invalid Transaction Layer Security/Secure Socket Layer (TLS/SSL) encryption certificates in Common Network Directory (CND) Manager renders the CND service unreachable. During the configuration of the TLS/SSL encryption certificates in CND Manager, the certificates are not validated until the configuration settings are applied and the CND service is restarted. If certificates are invalid, the CND service does not restart.

Suppose the administrator were to do the following:

The administrator selects an invalid server certificate, key file or Certificate Authority (CA) certificate, using the Privacy Settings tab in CND Manager, under the Files for TLS/SSL Encryption group box and then clicks **OK**. The system asks if the administrator wants the service to automatically be restarted. However, the CND service restart fails and CND Manager closes. The administrator cannot log on to CND Manager again to fix the selected invalid certificate files because the CND service is not running.

In this case, an error dialog appears, stating "Unable to login. Ensure the CND service is running and try again." If you encounter this warning when you log on, use [Procedure 46 "Clearing TLS/SSL encryption certificate configuration" \(page 152\)](#) to fix the problem.

## Clearing TLS/SSL certificates

With CND 2.2, you can remove the configuration of all TLS/SSL encryption certificates using the *Clear configuration of CND Manager's TLS certificates* tool.

If the configuration of all encryption certificates is cleared:

- Certificates are not deleted. Only CND configuration is updated not to use encryption certificates.
- CND does not start on the secure TLS/SSL port

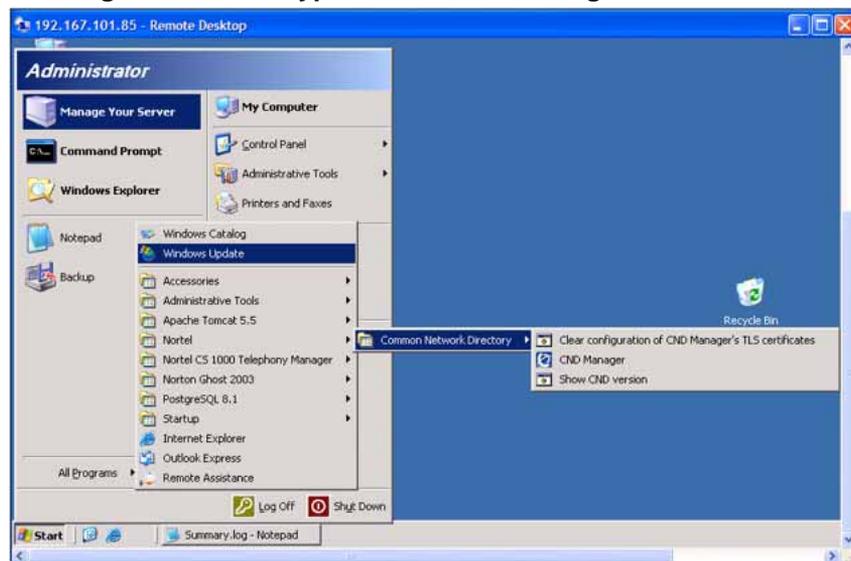
#### Procedure 46

#### Clearing TLS/SSL encryption certificate configuration

Step	Action
------	--------

- |   |  |
|---|--|
| 1 | From the Windows Start menu, select <b>All Programs &gt; Nortel &gt; Common Network Directory &gt; Clear configuration of CND Manager's TLS certificates</b> . |
|---|--|

**Figure 44**  
Clearing TLS/SSL encryption certificate configuration



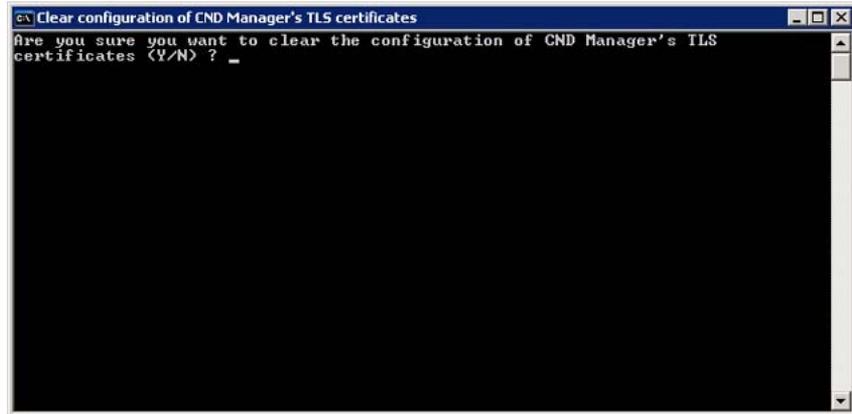
- |   |  |
|---|--|
| 2 | At the prompt (shown in Figure 45 "Clear all TLS/SSL encryption certificates confirmation" (page 153)), type <b>Y</b> or <b>y</b> and press <b>Enter</b> to clear TLS/SSL certificate configuration. Once certificate configuration is cleared, CND does not start on the secure TLS/SSL port. |
|---|--|

Selecting this option automatically enables the "Listen on unencrypted port only" option and disables other port encryption options.

or

Type **N** or **n** and press **Enter** to close the utility without clearing the TLS/SSL certificate configuration.

**Figure 45**  
**Clear all TLS/SSL encryption certificates confirmation**



- 3 Start the CND service. See [Procedure 47 "Starting the CND Service manually"](#) (page 153).

---

—End—

---

**Procedure 47**  
**Starting the CND Service manually**

---

**Step Action**

---

- 1 Select **Start > All Programs > Administrative Tools > Services** in the Windows OS.
- 2 Right-click **Nortel Common Network Directory Service** .
- 3 Select **Start** or **Restart** on the context menu.

The Windows Service Control Manager displays a progress bar while the CND service starts.

After the CND service starts successfully, the Service Control window closes, and the service status is updated to "Started" in the Services window.

If the CND Service has been started, the **Start** option will be disabled on the context menu and the service status will show as "Started".

---

—End—

---



---

# Appendix A

## CND Troubleshooting

---

This chapter provides detailed information for troubleshooting CND. The following topics are covered:

- "Logging" (page 155)
- "The CND service does not start" (page 157)
- "Configuring the CND Manager service interaction" (page 161)
- "Synchronization problems" (page 164)
- "Idle connection timeout configuration" (page 164)
- "Manual CND removal" (page 165)

### Logging

Much information is logged to files on a server with a running Common Network Directory (CND). Those log files are divided into the following categories:

- log files created by the OpenLDAP directory service
- log files created by CND Manager

#### OpenLDAP log files

The OpenLDAP directory service's log file is `openldap.log`, which is stored in CND's installation folder (C:\Program Files\Nortel\Common Network Directory by default). You can control the information that is placed into `openldap.log` using CND Manager. Using CND Manager, you can select none, or one or more of the following OpenLDAP logging options:

- trace function calls
- debug packet handling
- heavy trace debugging
- connection management
- print out packets sent and received

- search filter processing
- configuration file processing
- access control list processing
- stats log connections/operations/results
- stats log entries sent
- print communication with shell backends
- entry parsing

### **CND Manager log files**

Log files created by CND Manager are divided into the following categories:

- main log file
- Lightweight Directory Access Protocol (LDAP) synchronization log files

#### **Main log file**

The main CND manager log file is a rotating set of files stored in the log folder within CND's installation folder. When viewing CND Manager log files, it is important to note the timestamp on each file to ensure you view the most recently logged information.

Using a rotating set of files provides the benefit of ensuring that the most recent information is logged while also capping the disk space that log files can occupy.

#### **File names**

Each log file is named `cndManagerX.Y.log`, where X is a digit starting at zero used to distinguish the rotating set of files and Y is used to resolve conflicts that occur if the log file is in use by other applications when CND Manager attempts to write to it. For example, if `cndManager0.0.log` is locked because it is open in a text editor, CND Manager automatically creates `cndManager0.1.log` and logs its information there.

#### **Log file contents**

CND Manager log files are in text format and each logged event writes a new record. Records contain the following information:

- the date and time the event occurred
- the Java class and method that caused the event to be logged
- event details

The event details vary depending on the type of event. The details can be as simple as a message (for example, the Java Runtime Engine (JRE) version used to launch the CND Manager JAR file) or as complicated as a complete stack trace with source code line numbers (when a Java exception is logged).

CND Manager log files are best read in a simple text editor, such as Microsoft WordPad.

## The CND service does not start

To recover a CND system whose service does not start see [Procedure 48 "Recovering a CND system whose service does not start" \(page 157\)](#):

### Procedure 48

#### Recovering a CND system whose service does not start

Step	Action
1	Try to recover a corrupted database (see <a href="#">"Recovering a corrupted database" (page 157)</a> ).
2	Try to start the service from the command line and turn on all debugging (see <a href="#">"Starting service from command line" (page 158)</a> ).
3	Try to display database statistics (see <a href="#">"Displaying service statistics" (page 159)</a> ).

—End—

## Recovering a corrupted database

`db_recover` is a tool that is used to recover a corrupted database. CND installs the tool directly into its installation folder. The tool has no effect on a database that is not corrupted.

The tool is only useful when the CND service is stopped. To make absolutely certain that the CND service is stopped see [Procedure 49 "Ensuring the CND service is stopped" \(page 157\)](#):

### Procedure 49

#### Ensuring the CND service is stopped

Step	Action
1	Change the CND service startup type to "manual" (see <a href="#">Procedure 50 "Changing the CND service startup type to manual" (page 158)</a> ).
2	Reboot the machine on which CND is installed.

---

—End—

---

**Procedure 50****Changing the CND service startup type to manual**

---

**Step Action**

---

- 1 Go to **Start > All Programs > Administrative Tools > Services** in the Windows OS.
  - 2 Right-click on **Nortel Common Network Directory**.
  - 3 Select **Properties**.
  - 4 On the **General** tab, under **Startup type**, choose **Manual**.
- 

—End—

---

To run the `db_recover` tool see [Procedure 51 "Running the db\\_recover tool" \(page 158\)](#).

**Procedure 51****Running the db\_recover tool**

---

**Step Action**

---

- 1 Open a command window.
  - 2 Change directory to CND's installation folder (by default, "C:\Program Files\Nortel\Common Network Directory").
  - 3 Run the following command: `db_recover -h data`.
- 

—End—

---

If the tool runs without error, it has no output. Even if the tool runs without error, the CND service does not necessarily start. After running the tool, try to manually start the CND service. If you are able to manually start the CND service, ensure you change the service's startup type to "automatic".

**Starting service from command line**

To start the service from the command line see [Procedure 52 "Starting the service from command line" \(page 159\)](#):

**Procedure 52****Starting the service from command line**

Step	Action
1	Open a command window.
2	Change directory to CND's installation folder (by default, "C:\Program Files\Nortel\Common Network Directory").
3	Run the following command: <code>slapd -d 1</code> .

---

—End—

---

The `-d 1` switch enables debugging and causes a lot of information to be output to the console. To help the CND design team debug the problem, you can direct the command's output to a file as follows: `slapd -d 1 > outputFile.txt`.

**Reinstalling application files**

If CND continues to fail, you can repair a corrupted file or a file deleted by mistake. See ["Repair" \(page 33\)](#).

**Verifying the Host Server IP configuration**

Verify the Host Server IP configuration by entering `ipconfig /all` in the command line window.

**Verifying base network connectivity to LDAP or CallPilot Host Servers**

Verify base network connectivity to LDAP or CallPilot Host Servers by entering `ping <address or Hostname>` in the command line window.

**Displaying service statistics**

`db_stat` is a tool that is used to print out database statistics. CND installs the tool directly into its installation folder.

To run the `db_stat` tool see [Procedure 53 "Running the db\\_stat tool" \(page 159\)](#):

**Procedure 53****Running the db\_stat tool**

Step	Action
1	Open a command window.
2	Change directory to CND's installation folder (by default, "C:\Program Files\Nortel\Common Network Directory").

**3** Run the following command: `db_stat -c -h data`.

---

—End—

---

The tool's output is as follows:

```
D:\Program Files\Nortel\Common Network Directory>db_stat
-c -h data

101      Last allocated locker ID.
2147M     Current maximum unused locker ID.
9         Number of lock modes.
1000     Maximum number of locks possible.
1000     Maximum number of lockers possible.
1000     Maximum number of lock objects possible.
10       Number of current locks.
62       Maximum number of locks at any one time.
30       Number of current lockers.
33       Maximum number of lockers at any one time.
10       Number of current lock objects.
62       Maximum number of lock objects at any one time.
1095970  Total number of locks requested.
1095960  Total number of locks released.
0        Total number of lock requests failing because
DB_LOCK_NOWAIT was set.
0        Total number of locks not immediately available
due to conflicts.
0        Number of deadlocks.
0        Lock timeout value.
0        Number of locks that have timed out.
0        Transaction timeout value.
0        Number of transactions that have timed out.
360KB    The size of the lock region.
0        The number of region locks granted after waiting.
1201311  The number of region locks granted without
waiting.
```

After running the tool, try to manually start the CND service.

## Configuring the CND Manager service interaction

The Windows service handling API (described in detail on the Microsoft Software Developer Network, or MSDN) is asynchronous in nature. This impacts CND because there are several instances where CND Manager requires the CND service be in a particular state. For example, a backup operation cannot proceed until the CND service is actually stopped (not only when CND Manager asks Windows to stop the service).

To deal with the Windows API behavior, CND Manager uses polling to ascertain the actual status of the CND service. On most systems, CND Manager's default polling configuration is sufficient, and no service interaction problems occur. On some systems, however, the default configuration is not enough.

CND Manager has two ways to help with service handling:

- logging service failures
- configuration

### Logging service failures

Service failures are logged in a file named "serviceFailures.txt" in the CND installation folder (C:\Program Files\Nortel\Common Network Directory by default). This file contains one multi-line entry for each service failure. Each entry contains:

- a description of what failed (for example, "Spawn start attempt" or "Spawn stop attempt")
- the attempt number of the failure
- the date and time of the failure
- an error code
- the traceback of the code that caused the failure

For example, an entry in the log file might be:

```
Spawn stop attempt 2 failed at Tue Oct 17 12:39:23 EDT 2006: 51061
    java.lang.Thread.dumpThreads(Native Method)
    java.lang.Thread.getStackTrace(Unknown Source)
com.nortel.openldap.servermgr.ServiceMgrImpl.logFailure(ServiceMgrImpl.java:357)
com.nortel.openldap.servermgr.ServiceMgrImpl.logSpawnServiceStopFailure(ServiceMgrImpl.java:319)
com.nortel.openldap.servermgr.ServiceMgrImpl.spawnServiceStopProcess(ServiceMgrImpl.java:178)
```



```
java.awt.EventQueueDispatchThread.pumpEvents(Unknown Source)
java.awt.EventQueueDispatchThread.run(Unknown Source)
```

In this case, attempt #2 to spawn a stop attempt failed with an error code of 51061. This occurred during a backup attempt, which is apparent from the traceback.

## Configuration

As of CND 2.1.87 (build 02.10.00.87), users can configure four values related to how CND Manager interacts with the CND service:

- how many attempts are made to start the CND service before giving up
- the delay between each start attempt
- how many attempts are made to stop the CND service before giving up
- the delay between each stop attempt

### ATTENTION

The configuration of these values should be used for troubleshooting only.

The configuration options are specified using Java Virtual Machine (JVM) system properties, which can be assigned when launching the CND Manager JAR file (cndManager.jar). "[System properties](#)" (page 163) provides a list of the system properties, descriptions, and default values.

### System properties

Property name	Description	Default value
NUM_START_ATTEMPTS	configures how many start attempts are made before CND Manager gives up	100
START_DELAY	configures the number of milliseconds between each start attempt	750
NUM_STOP_ATTEMPTS	configures how many stop attempts are made before CND Manager gives up	100
STOP_DELAY	configures the number of milliseconds between each stop attempt	500

Use [Procedure 54 "Configuring CND Manager for number and interval of attempts"](#) (page 164) to configure that CND Manager should try 200 start attempts before giving up and delay 625 milliseconds between each attempt:

**Procedure 54****Configuring CND Manager for number and interval of attempts**

Step	Action
1	Open a DOS command window.
2	Change directory to the CND installation folder (C:\Program Files\Nortel\Common Network Directory by default).
3	Issue the following command: <code>java -DNUM_START_ATTEMPTS=200 -DSTART_DELAY=625 -jar cndManager.jar</code>

---

—End—

---

If the properties are given non-integral values, they revert to their default values. Other than that check, there is no other checking on the values. For example, if a user were to specify lower values for any of the properties, CND Manager may not work as expected. This could manifest itself in a number of ways not limited to failed backups, failed restores, and failed schema upgrades.

**Synchronization problems**

To correct LDAP synchronization problems, see ["LDAP Subscriber Synchronization" \(page 75\)](#).

To correct CallPilot synchronization problems, see ["CallPilot Global Address Book Synchronization" \(page 117\)](#).

**Idle connection timeout configuration**

As with all servers, CND only supports a certain number of active connections. When client applications create a connection to CND but do not properly close that connection, it becomes idle. Normally, this is not a problem. However, when many connections aren't properly closed, the CND's OpenLDAP server eventually gets bogged down and does not run properly. When that happens, CND's database must be manually recovered using the procedures in ["Recovering a corrupted database" \(page 157\)](#).

In CND 2.1, the default number of seconds to wait before forcibly closing an idle client connection is 10 seconds.

In CND 2.0, the feature is disabled by default. In other words, idle client connections are never forcibly closed.

Idle connection timeout is configured in the `idletimeout.conf` file, which is in CND's installation folder (by default, C:\Program Files\Nortel\Common Network Directory). Note that this file only exists in CND releases that support idle connection timeout configuration.

To configure CND's idle connection timeout see [Procedure 55 "Configuring the CND idle connection timeout" \(page 165\)](#).

**Procedure 55**  
**Configuring the CND idle connection timeout**

---

**Step Action**

---

- 1 Stop the CND service.
  - 2 Open the `idletimeout.conf` file in a text editor (located in ...Nortel\Common Network Directory file).
  - 3 Edit the line that contains the `idletimeout` directive.  

The numerical value after the directive is the number of seconds CND waits before forcibly closing an idle client connection. A numerical value of zero (0) indicates that the feature is disabled. In other words, when the value is 0, idle client connections are never forcibly closed.
  - 4 Restart the CND service.
- 

—End—

---

Note that idle connections are forcibly closed only when new connection attempts are made. For example, suppose the idle timeout is set to 10 seconds. If there is a connection that remains idle forever, it is not forcibly closed until a second connection attempt is made.

## Manual CND removal

If you are unable to remove CND using Add/Remove Programs in the Windows control panel, manually remove the following registry key:

```
HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall\{1FC12B1E-E8EC-43A2-9698-D0FC0FFE105C}
```

This procedure is taken from Microsoft's knowledge base article 314481.

Once the registry key is removed, close any open instances of CND Manager and manually delete all of the files and subfolders in CND's installation folder (C:\Program Files\Nortel\Common Network Directory by default). Be careful not to delete any needed backup files (in the backup subfolder) or TLS/SSL certificates (in the certs subfolder).

Once CND has been removed, you can manually reinstall it if desired.



---

## Appendix B

# LDAP background information

---

Lightweight Directory Access Protocol (LDAP) defines a standard, message-oriented, extensible protocol for communicating with directory servers. Initially developed as a gateway to Open Systems interconnect (OSI) directory services running the X.500 protocol, LDAP has evolved into a standalone directory service protocol for directories operating on the lightweight Transport Control Protocol (TCP) stack.

LDAP has the following characteristics:

- Defines a communication protocol.
- Defines the transport and format of messages used by a client to access data in a directory.
- Operates over the lightweight Transport Control Protocol/Internet Protocol (TCP/IP) protocol stack.

Common Network Directory (CND) is based on OpenLDAP, an open source LDAP directory server.

### LDAP terms

#### Organizational Unit (ou)

A container object that is a directory administrative partition. OUs can contain directory entries of user data or other OUs. Organizational units enable the delegation of administration to distinct subtrees of the directory.

An example of an OU in a directory is:

```
"ou=HumanResources,dc=companyAbc,dc=com"
```

#### Domain Component (dc)

A directory's base Distinguished Name (DN) is generally derived from a company's Domain Name Server (DNS) domain components. One of the formats to define a base DN is to split a company's DNS domain name, for example "companyAbc.com" into domain components as dc=companyAbc, dc=com.

For more information, see ["The naming model" \(page 168\)](#).

for more information about LDAP and LDAP-related terms see [Appendix "LDAP References" \(page 179\)](#).

## The LDAP models

LDAP is most often described in terms of the following models:

- Information Model
- Naming Model
- Functional Model
- Security Model

The models are discussed briefly in the following sections.

### The information model

The LDAP information model defines the format of data in a directory server.

The primary unit of data in a directory is an *entry*. Each entry describes an object in the server. The type of information that a given entry can contain is controlled by its schema.

The schema defines the following items:

- **Attributes**—All entries are comprised of a set of name/value pairs that are called attributes. For example, an entry representing a person may have a surname attribute with a value of "Smith".
- **Objectclasses**—Each entry implements one or more class definitions, referred to as objectclasses. An objectclass defines the rules for a particular class of information. For example, an objectclass dictates attributes that are required in a particular type of entry and attributes that are optional.
- **Syntaxes**—Syntaxes define the rules for what is an acceptable value for a given attribute. Some attributes require their values to be specially formatted strings, for example, while others require binary values.
- **Matching Rules**—Matching rules determine what makes a successful match when searching for an entry in the directory server. Each attribute has associated matching rules that define its behavior in a search.

### The naming model

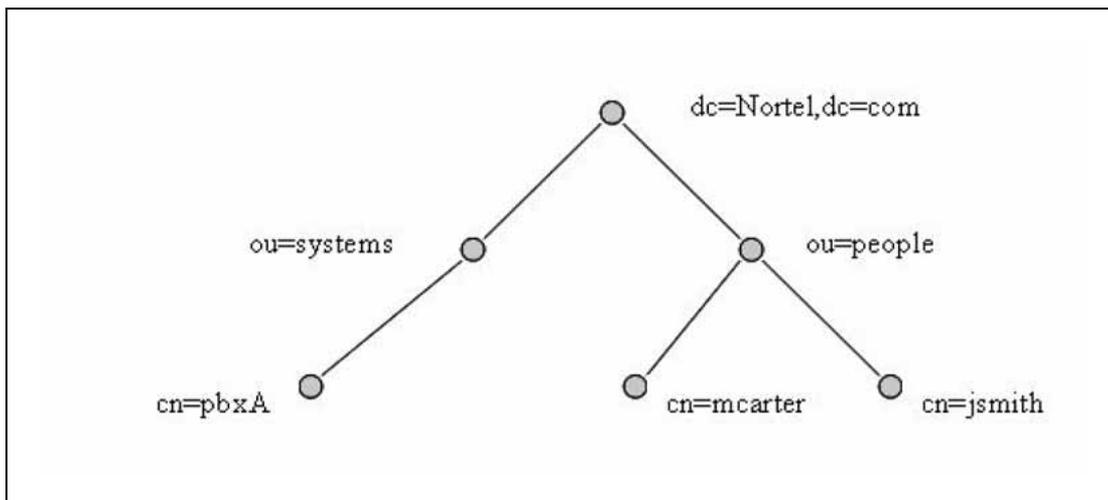
The LDAP naming model defines the organization of data in a directory server.

Data in most directory servers is organized in a tree structure known as the Directory Information Tree (DIT). Entries are named according to their location in the DIT by a distinguished name (DN). A DN is composed of the relative distinguished name (RDN) of each entry in the DIT from the entry in question to the root. An RDN is an attribute value pair chosen when the entry is added to the directory, which uniquely identifies the entry at its level in the DIT. The components of the DN are separated by commas or semicolons. (Commas are most commonly used.)

Figure 46 "Example of directory information tree" (page 169) illustrates a simplified DIT.

In the example DIT, labels indicate the RDNs for each entry in the directory.

**Figure 46**  
Example of directory information tree



The DN for the entry "cn=jsmith" is expressed as cn=jsmith, ou=people, dc=Nortel, dc=com.

### The functional model

The LDAP functional model defines the ways in which a directory server can be utilized by its clients. There are nine supported operations, divided into three categories, listed below:

1. The interrogation operations:
  - Search
  - Compare
2. The update operations:
  - Add

- Delete
  - Modify
  - Modify RDN—this operation is used to modify the special RDN attribute, as well as to support moving an entry from one location in the DIT to another
3. The authentication operations:
- Bind
  - Unbind
  - Abandon—permits the canceling of an operation that is already in progress

### **The security model**

The LDAP security model defines how clients authenticate themselves to the directory service and how they are treated after authentication. Privacy of communication between a client and the server is also supported using Transport Layer Security / Secure Sockets Layer (TLS/SSL).

Once authenticated, a user's access to the data in the directory is controlled by the access control policies configured in the server. LDAP can support control of access based on the attribute, not just the entry.

### **Further reading**

For more information about LDAP see the following references:

- Understanding and Deploying LDAP Directory Services, Second Edition, Timothy A. Howes, Mark C. Smith, Gordon S. Good, Addison-Wesley, 2003.
- Understanding LDAP – Design and Implementation, IBM Redbooks, available at the web at <http://publib-b.boulder.ibm.com/red-books.nsf/RedbookAbstracts/sg244986.html?Open>
- LDAP Directories, Marcel Rizcallah, Wiley, 2000.

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## Appendix C

# Attribute syntax

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Though Lightweight Directory Access Protocol (LDAP) supports many different attribute syntaxes, there are a few common ones used in Common Network Directory (CND) that need to be understood in order to effectively interpret the output from Comma Separated Values (CSV) subscriber export. An understanding of the attribute syntax is also important to any user wishing to use the CSV subscriber synchronization feature (see "[CSV Subscriber Synchronization](#)" (page 103)).

The following sections describe the most common attribute syntaxes in CND.

NOTE: The latest information on CND attribute syntax is available on CND's Twiki site at <http://nbvws300.ca.nortel.com/twiki/bin/view.pl/EMS/CndAttributeSyntax>.

### Audio

RFC 1274 describes the audio syntax as:

```
( 1.3.6.1.4.1.1466.115.121.1.4 DESC 'Audio String' )
```

The Audio attribute type allows the storing of sounds in the Directory. The attribute uses a u-law encoded sound file as used by the "play" utility on a Sun 4. This is an interim format.

Attributes with this syntax store binary data.

### DirectoryString

RFC 2252 describes the Directory String syntax as:

```
( 1.3.6.1.4.1.1466.115.121.1.15 DESC 'Directory String' )
```

A string in this syntax is encoded in the UTF-8 form of ISO 10646 (a superset of Unicode). Servers and clients MUST be prepared to receive encodings of arbitrary Unicode characters, including characters not presently assigned to any character set.

For characters in the PrintableString form, the value is encoded as the string value itself.

If it is of the TeletexString form, then the characters are transliterated to their equivalents in UniversalString, and encoded in UTF-8 [9].

Loosely translated, this means an International Organization for Standards (ISO) 10646 text string in UCS Transformation 8 (UTF-8) format.

Since Unicode is a vast topic and not widely understood, it is expected that this definition will be expanded in the future as we learn more about Unicode in general. Also, restrictions will be added in the future to this definition as they become apparent.

## Facsimile Telephone Number

RFC 2252 describes the Facsimile Telephone Number syntax as:

```
( 1.3.6.1.4.1.1466.115.121.1.22 DESC 'Facsimile Telephone Number' )
```

Values in this syntax are encoded according to the following BNF:

```
fax-number = printablestring [ "$" faxparameters ]
faxparameters = faxparm / ( faxparm "$" faxparameters )
faxparm = "twoDimensional" / "fineResolution" /
"unlimitedLength" /
"b4Length" / "a3Width" / "b4Width" / "uncompressed"
In the above, the first printablestring is the telephone number, based on E.123 [15], and the faxparm tokens represent fax parameters.
```

Through trial and error, it was discovered that OpenLDAP (and therefore CND) does not exactly conform to the restrictions outlined in the RFC. For example, CND allows the following attribute values that are invalid according to the RFC:

- 6139675027\$Hello
- 6139675027\$B4Length\$Kyle

In CND, attributes with this syntax can store any non-empty string of characters, with the following restrictions:

- Each character must either be a dollar sign (\$) or a character that can appear in a printable string.
- The string can not begin or end with a dollar sign (\$).

## Generalized time

RFC 2252 describes the Generalized time syntax as:

```
( 1.3.6.1.4.1.1466.115.121.1.24 DESC 'Generalized Time'
)
```

Values in this syntax are encoded as printable strings, represented as specified in X.208. Note that the time zone must be specified. It is strongly recommended that GMT time be used. For example,

```
199412161032Z
```

Through investigation, and trial and error, we have been able to determine the following additional information on this syntax.

The format can be represented as **YYYYMMDDHHMMSS[.n](Z | (+|-)HHMM)**

The format can be divided into the following components:

- the required date component: **YYYYMMDD**
  - YYYY is the year: **required**
  - MM is the month: **required**
  - DD is the day: **required**
- the required time format, which is in military time: **HHMMSS[.n]**
  - HH is the hour (24 hour military time): **required**
  - MM is the minute: **required**
  - SS is the second: **required**

- .n is the fraction of a second: **optional**
- the required time zone information
  - where Z indicates Coordinated Universal Time (UTC); formerly Greenwich Mean Time (GMT). Note that the Z character is required only if there is no deviation from UTC. Note that if there is a deviation from UTC the Z character must be omitted.
  - "+" or "-" indicates the direction of the deviation from UTC
  - HHMM is the deviation from UTC in hours (HH) and minutes (MM)

**Table 11**  
**Generalized time examples**

Coordinated Universal Time	Generalized time syntax
January 9, 2007 10:24am UTC	20070109102400Z
January 9, 2007 1:12:34pm UTC	20070109131234Z
January 9, 2007 1:12:34pm and 345 milliseconds UTC	20070109131234.345Z
January 9, 2007 1:12:34pm and one-tenth of a second UTC	20070109131234.1Z
January 9, 2007 at midnight UTC	20070109000000Z
January 9, 2007 10:24am UTC - 5.5 hours	20070109102400-0530
January 9, 2007 10:24am UTC + 10 hours	20070109102400+1000

## IA5 String

RFC 2252 describes the IA5 String syntax as:

```
( 1.3.6.1.4.1.1466.115.121.1.26 DESC 'IA5 String' )
```

The encoding of a value in this syntax is the string value itself.

Attributes with this syntax can store any non-empty string of ASCII characters.

## Numeric String

RFC 2252 describes the Numeric String syntax as:

```
( 1.3.6.1.4.1.1466.115.121.1.36 DESC 'Numeric String' )
```

Example: 1997

Attributes with this syntax can store any non-empty string, where each character in the string is either a digit (0-9) or a space (' ').

## PostalAddress

RFC 2252 describes the Postal Address syntax as:

```
( 1.3.6.1.4.1.1466.115.121.1.41 DESC 'Postal Address' )
```

Values in this syntax are encoded according to the following BNF:

```
postal-address = dstring *( "$" dstring )
```

In the above, each dstring component of a postal address value is encoded as a value of type Directory String syntax. Backslashes and dollar characters, if they occur in the component, are quoted as described in section 4.3. Many servers limit the postal address to six lines of up to thirty characters.

Example:

```
1234 Main St.$Anytown, CA 12345$USA
\241,000,000 Sweepstakes$PO Box 1000000$Anytown, CA
12345$USA
```

OpenLDAP does not enforce the suggestions of RFC 2252. Therefore, attributes with the Postal Address syntax can store exactly the same values as attributes with the Directory String syntax.

## Printable String

RFC 2252 describes the Printable String syntax as:

```
( 1.3.6.1.4.1.1466.115.121.1.44 DESC 'Printable String' )
```

The Printable String syntax is any sequence of the following English characters:

- a-z (lowercase letters)
- A-Z (uppercase letters)
- 0-9 (digits)
- ' (single quotation mark)
- ( (open parenthesis)
- ) (close parenthesis)
- + (plus sign)
- , (comma)

- - (minus sign)
- . (period)
- / (forward slash)
- : (colon)
- ? (question mark)
- (space)

Attributes with this syntax can store any non-empty string of characters, provided that each character appears in the above list.

## TelephoneNumber

RFC 2252 describes the Telephone Number syntax as:

```
( 1.3.6.1.4.1.1466.115.121.1.50 DESC 'Telephone Number' )
```

Values in this syntax are encoded as if they were Printable String types. Telephone numbers are recommended in X.520 to be in international form, as described in E.123 [15].

Example:  
+1 512 305 0280

The TelephoneNumber syntax is a string representation of a telephone number. It is recommended to be in E.123 format. For example,

```
+1 123 123 1234
```

OpenLDAP does not enforce the recommendations in RFC 2252. Therefore, attributes with the Telephone Number syntax can store exactly the same values as attributes with Printable String syntax.

## Telex Number

RFC 2256 describes the Telex Number syntax as:

```
( 1.3.6.1.4.1.1466.115.121.1.52  
1.3.6.1.4.1.1466.115.121.1.50 DESC 'Telex Number' )
```

Values in this syntax are encoded according to the following BNF:

- telex-number = actual-number "\$" country "\$" answerback
- actual-number = printablestring
- country = printablestring
- answerback = printablestring

In the above, actual-number is the syntactic representation of the number portion of the TELEX number being encoded, country is the TELEX country code, and answerback is the answerback code of a TELEX terminal.

OpenLDAP does not enforce the recommendations in RFC 2256. Therefore, attributes with the Telex Number syntax can store exactly the same values as attributes with Facsimile Telephone Number syntax.



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## Appendix D

# LDAP References

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The Common Network Directory (CND) server provides standard Lightweight Directory Access Protocol (LDAP) Version 3 directory services. The LDAP protocol (Version 3) is described by the following internet standards and drafts:

- [RFC 2251](#): Lightweight Directory Access Protocol (v3).
- [RFC 2252](#): Lightweight Directory Access Protocol (v3): Attribute Syntax.
- [RFC 2253](#): Lightweight Directory Access Protocol (v3): UCS Transformation 8 (UTF-8) String Representation of Distinguished Names.
- [RFC 2254](#): The String Representation of LDAP Search Filters.
- [RFC 2255](#): The LDAP URL Format.
- [RFC 2256](#): A Summary of the X.500(96) User Schema for use with LDAPv3.
- [RFC 2829](#): Authentication Methods for LDAP.

### Data

CND uses the following standard schema:

- [RFC-2256](#) – Core Schema.
- [RFC-1274](#) – Cosine Schema for support of the inetOrgPerson object class.
- [RFC-2798](#) – inetOrgPerson (depends on Core schema and Cosine schema).

Where it is not possible to use standard objects and attributes, CND defines its own. These take two forms:

- Extensions to existing standard object classes.
- New proprietary objects.

## API

The CND server supports the standard LDAPv3 interface, as described in [RFC-1823](#), *The LDAP Application Programming Interface*. Any client that intends to use CND must utilize the LDAP API to communicate and store data in CND.

## References

**Table 12**  
LDAP references

Ref #	Document name	Issue #; mm/dd/yyyy
1.	RFC 2251: Lightweight Directory Access Protocol (v3)	M. Wahl <i>et al.</i>  <a href="ftp://ftp.rfc-editor.org/in-notes/rfc2251.txt">ftp://ftp.rfc-editor.org/in-notes/rfc2251.txt</a>  December 1997
2.	RFC 2252: Lightweight Directory Access Protocol (v3): Attribute Syntax Definitions	M. Wahl <i>et al.</i>  <a href="ftp://ftp.rfc-editor.org/in-notes/rfc2252.txt">ftp://ftp.rfc-editor.org/in-notes/rfc2252.txt</a>  December 1997
3.	RFC 2253: Lightweight Directory Access Protocol (v3): UTF-8 String Representation of Distinguished Names	M. Wahl <i>et al.</i>  <a href="ftp://ftp.rfc-editor.org/in-notes/rfc2253.txt">ftp://ftp.rfc-editor.org/in-notes/rfc2253.txt</a>  December 1997
4.	RFC 2254: The String Representation of LDAP Search Filters	T. Howes  <a href="ftp://ftp.rfc-editor.org/in-notes/rfc2254.txt">ftp://ftp.rfc-editor.org/in-notes/rfc2254.txt</a>  December 1997
5.	RFC 2255: The LDAP URL Format	T. Howes and M. Smith  <a href="ftp://ftp.rfc-editor.org/in-notes/rfc2255.txt">ftp://ftp.rfc-editor.org/in-notes/rfc2255.txt</a>  December 1997

Ref #	Document name	Issue #; mm/dd/yyyy
6.	RFC 2256: A Summary of the X.500 User Schema for use with LDAPv3	M. Wahl <a href="ftp://ftp.rfc-editor.org/in-notes/rfc2256.txt">ftp://ftp.rfc-editor.org/in-notes/rfc2256.txt</a>  December 1997
7.	RFC 2829, Authentication Methods for LDAP	M. Wahl <i>et al.</i> <a href="ftp://ftp.rfc-editor.org/in-notes/rfc2829.txt">ftp://ftp.rfc-editor.org/in-notes/rfc2829.txt</a>  May 2000
8.	OpenLDAP 2.3.27 Administrators Guide	The OpenLDAP Project <a href="http://www.openldap.org/doc/admin21/">http://www.openldap.org/doc/admin21/</a>  January 2003
9.	RFC 1274: The COSINE and Internet X.500 Schema	P Barker and S. Kille <a href="ftp://ftp.rfc-editor.org/in-notes/rfc1274.txt">ftp://ftp.rfc-editor.org/in-notes/rfc1274.txt</a>  November 1991
10.	RFC 2798: Definition of the inetOrgPerson LDAP Object Class	M. Smith <a href="ftp://ftp.rfc-editor.org/in-notes/rfc2798.txt">ftp://ftp.rfc-editor.org/in-notes/rfc2798.txt</a>  April 2000
11.	RFC 1823: The LDAP Application Programming Interface	T. Howes and M. Smith <a href="ftp://ftp.rfc-editor.org/in-notes/rfc1823.txt">ftp://ftp.rfc-editor.org/in-notes/rfc1823.txt</a>  August 1995



## Appendix E

# Destination folder and files

### Installed files

Folders and files are created within the destination folder chosen at installation. Installed folders and files have the following properties:

- whether they are initially empty
- whether they are overwritten during an upgrade or repair
- whether they are deleted when Common Network Directory (CND) 2.2 is removed

The information in [Table 13 "Destination folder subdirectories"](#) (page 183) provides the details of the folders created within the chosen destination folder.

**Table 13**  
**Destination folder subdirectories**

Folders within the Destination folder	Description of contents	Is folder initially empty?	Are contents overwritten during upgrade or repair?	Are contents deleted when CND is removed?
3rdPartyLicenses	third-party licenses	No	Yes	Yes
backup	the default folder for CND backup files	Yes	No	No
certs	Transaction Layer Security (TLS) certificate files	Yes	No	No
data	OpenLDAP's server's user data	No	No	Yes
help	CND administration guide files	No	Yes	Yes
lib	third-party libraries	No	Yes	Yes
log	CND Manager log files	Yes	No	Yes

<b>Folders within the Destination folder</b>	<b>Description of contents</b>	<b>Is folder initially empty?</b>	<b>Are contents overwritten during upgrade or repair?</b>	<b>Are contents deleted when CND is removed?</b>
log\LDAP_Sync	Lightweight Directory Access Protocol (LDAP) Subscriber Synchronization log files	Yes	No	Yes
schema	schema files	No	Yes	Yes

## Appendix F

# Subscriber attributes

### Subscriber attributes

Common Network Directory (CND) extends the "*inetOrgPerson*" schema with additional attributes for subscribers. Table 14 "Subscriber attributes in CND" (page 185) provides a complete list.

**Table 14**  
Subscriber attributes in CND

Attribute Name	Required?	Syntax Object Identifier (OID)	Can be imported using CSV Subscriber Synchronization?	Can store multiple values?
audio	No	1.3.6.1.4.1.1466.115.121.1.4	No	Yes
billingAccountCode	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	No
billingAuthorizationCode	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	No
billingWebReportingAccessRights	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	No
businessCategory	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	Yes
carLicense	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	Yes
cn	Yes	1.3.6.1.4.1.1466.115.121.1.15	Yes	Yes
combinedName	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	No
country	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	No
cpndName	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	No
departmentNumber	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	Yes
description	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	Yes
destinationIndicator	No	1.3.6.1.4.1.1466.115.121.1.44	Yes	Yes
displayName	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	No
employeeNumber	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	No

Attribute Name	Required?	Syntax Object Identifier (OID)	Can be imported using CSV Subscriber Synchronization?	Can store multiple values?
employeeType	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	Yes
esmGUID	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	No
facsimileTelephoneNumber	No	1.3.6.1.4.1.1466.115.121.1.22	Yes	Yes
givenName	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	Yes
homePhone	No	1.3.6.1.4.1.1466.115.121.1.50	Yes	Yes
homePostalAddress	No	1.3.6.1.4.1.1466.115.121.1.41	Yes	Yes
initials	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	Yes
internationaliSDNNumber	No	1.3.6.1.4.1.1466.115.121.1.36	Yes	Yes
jpegPhoto	No	1.3.6.1.4.1.1466.115.121.1.28	No	Yes
l	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	Yes
labeledURI	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	Yes
mail	No	1.3.6.1.4.1.1466.115.121.1.26	Yes	Yes
manager	No	1.3.6.1.4.1.1466.115.121.1.12	No	Yes
messagingHostSerialNum	No	1.3.6.1.4.1.1466.115.121.1.15	No	No
messagingScrEntryUuid	No	1.3.6.1.4.1.1466.115.121.1.15	No	No
messagingTelephoneNumber	No	1.3.6.1.4.1.1466.115.121.1.15	No	No
messagingUseEsnAccess Code	No	1.3.6.1.4.1.1466.115.121.1.7	No	No
messagingVpimAddress	No	1.3.6.1.4.1.1466.115.121.1.15	No	No
mobile	No	1.3.6.1.4.1.1466.115.121.1.50	Yes	Yes
nortelUserDefinedField	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	Yes
o	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	Yes
officeLocation	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	No
officialName	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	No
ou	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	Yes
pager	No	1.3.6.1.4.1.1466.115.121.1.50	Yes	Yes
photo	No	1.3.6.1.4.1.1466.115.121.1.23	No	Yes
physicalDeliveryOfficeName	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	Yes
postalAddress	No	1.3.6.1.4.1.1466.115.121.1.41	Yes	Yes

Attribute Name	Required?	Syntax Object Identifier (OID)	Can be imported using CSV Subscriber Synchronization?	Can store multiple values?
postalCode	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	Yes
postOfficeBox	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	Yes
preferredDeliveryMethod	No	1.3.6.1.4.1.1466.115.121.1.14	No	No
preferredDirectoryNumber	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	No
preferredEsnTelephoneNumber	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	No
preferredExtension	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	No
preferredExternalTelephoneNumber	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	No
preferredLanguage	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	No
preferredName	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	No
registeredAddress	No	1.3.6.1.4.1.1466.115.121.1.41	Yes	Yes
roomNumber	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	Yes
secretary	No	1.3.6.1.4.1.1466.115.121.1.12	No	Yes
refer to Also	No	1.3.6.1.4.1.1466.115.121.1.12	No	Yes
serviceEndDate	No	1.3.6.1.4.1.1466.115.121.1.24	Yes	No
serviceStartDate	No	1.3.6.1.4.1.1466.115.121.1.24	Yes	No
sn	Yes	1.3.6.1.4.1.1466.115.121.1.15	Yes	Yes
st	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	Yes
street	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	Yes
subMgrTaskStatus	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	No
subscriberType	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	No
telephoneNumber	No	1.3.6.1.4.1.1466.115.121.1.50	Yes	Yes
teletexTerminalIdentifier	No	1.3.6.1.4.1.1466.115.121.1.51	No	Yes
telexNumber	No	1.3.6.1.4.1.1466.115.121.1.52	Yes	Yes
title	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	Yes
tmUserGroup	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	No
uid	No	1.3.6.1.4.1.1466.115.121.1.15	Yes	Yes
userCertificate	No	1.3.6.1.4.1.1466.115.121.1.8	No	Yes
userPassword	No	1.3.6.1.4.1.1466.115.121.1.40	No	Yes
userPKCS12	No	1.3.6.1.4.1.1466.115.121.1.5	No	Yes

Attribute Name	Required?	Syntax Object Identifier (OID)	Can be imported using CSV Subscriber Synchronization?	Can store multiple values?
userSMIMECertificate	No	1.3.6.1.4.1.1466.115.121.1.5	No	Yes
x121Address	No	1.3.6.1.4.1.1466.115.121.1.36	Yes	Yes
x500uniqueIdentifier	No	1.3.6.1.4.1.1466.115.121.1.6	No	Yes

## Nortel subscriber schema attributes

Table 15 "Nortel subscriber schema attributes" (page 188) provides the Nortel subscriber schema attribute name, origin, and whether or not it is required.

**Table 15**  
Nortel subscriber schema attributes

Attribute Name	Origin	Required?
sn	person	Yes
cn	person	Yes
userPassword	person	No
telephoneNumber	person	No
seeAlso	person	No
description	person	No
title	organizationalPerson	No
x121Address	organizationalPerson	No
registeredAddress	organizationalPerson	No
destinationIndicator	organizationalPerson	No
preferredDeliveryMethod	organizationalPerson	No
telexNumber	organizationalPerson	No
teletexTerminalIdentifier	organizationalPerson	No
internationaliSDNNumber	organizationalPerson	No
facsimileTelephoneNumber	organizationalPerson	No
street	organizationalPerson	No
postOfficeBox	organizationalPerson	No
postalCode	organizationalPerson	No
postalAddress	organizationalPerson	No
physicalDeliveryOfficeName	organizationalPerson	No

ou	organizationalPerson	No
st	organizationalPerson	No
l	organizationalPerson	No
audio	inetOrgPerson	No
businessCategory	inetOrgPerson	No
carLicense	inetOrgPerson	No
departmentNumber	inetOrgPerson	No
displayName	inetOrgPerson	No
employeeNumber	inetOrgPerson	No
employeeType	inetOrgPerson	No
givenName	inetOrgPerson	No
homePhone	inetOrgPerson	No
homePostalAddress	inetOrgPerson	No
initials	inetOrgPerson	No
jpegPhoto	inetOrgPerson	No
labelledURI	inetOrgPerson	No
mail	inetOrgPerson	No
manager	inetOrgPerson	No
mobile	inetOrgPerson	No
o	inetOrgPerson	No
pager	inetOrgPerson	No
photo	inetOrgPerson	No
roomNumber	inetOrgPerson	No
secretary	inetOrgPerson	No
uid	inetOrgPerson	No
userCertificate	inetOrgPerson	No
x500uniqueIdentifier	inetOrgPerson	No
preferredLanguage	inetOrgPerson	No
userSMIMECertificate	inetOrgPerson	No
userPKCS12	inetOrgPerson	No
officeLocation	CND 1.0	No
country	CND 1.0	No
esmGUID	CND 1.0	No
serviceStartDate	CND 1.0	No
serviceEndDate	CND 1.0	No

subscriberType	CND 1.0	No
officialName	CND 1.0	No
preferredName	CND 1.0	No
combinedName	CND 1.0	No
cpndName	CND 1.0	No
nortelUserDefinedField	CND 1.0	No
tmUserGroup	CND 2.0	No
billingWebReportingAccessRights	CND 2.0	No
preferredDirectoryNumber	CND 2.0	No
preferredExternalTelephoneNumber	CND 2.0	No
preferredESNTelephoneNumber	CND 2.0	No
billingAccountCode	CND 2.0	No
billingAuthorizationCode	CND 2.0	No
messagingTelephoneNumber	CND 2.1	No
messagingVpimAddress	CND 2.1	No
messagingHostSerialNumber	CND 2.1	No
messagingSrcEntryUUID	CND 2.1	No
messagingUseEsnAccessCode	CND 2.1	No
preferredExtension	CND 2.1	No

---

## Appendix G

# CSV File Format

---

### CSV file format

When users synchronize a Comma Separated Values (CSV) file into Common Network Directory (CND), they are asked to specify the format of the file, either standard CSV or Microsoft CSV. This appendix explains the rules of each format and the CND-specific rules that imported and exported files must follow.

### Rules that apply to both formats

#### Records and field values

CSV files are text files that contain a list of records separated by new-line characters.

Each record contains field values separated by commas. For example, consider a CSV file with the following contents:

```
a,b,c,d,e  
f,g,h,i,j
```

This file has two records, each with five field values.

#### Field values with commas, semi-colons, and newlines

If a field value contains a comma or new-line, the entire field value must be surrounded by double quotes. For example, consider a CSV file with the following contents:

```
a,b,"c,d",e  
"f,g",h,i,j
```

This file has three records, each with four field values. The first record's third field value has an embedded comma as does the second record's first field value.

### Quoted field values

Any field value can be surrounded by double quotes; they are only required when the field value contains an embedded comma or new-line.

Text after a field value's closing double quote but before the next comma is ignored. For example, consider a CSV file with the following contents:

```
a,b,"c"XXX,d
"a"XXX,b,c,d
```

This file has two records, each with the same four field values (a, b, c, d). XXX is ignored in both cases.

### Empty field values

Empty field values are indicated by consecutive commas. For example, consider a CSV file with the following contents:

```
a,,b,,c
a,b,,,,c
```

This file has two records. The first record has five field values where the second and fourth are empty. The second record has six field values where the third, fourth, and fifth are empty.

### Empty lines

Empty lines and lines that only contain spaces and tabs are ignored. For example, consider a CSV file with the following contents:

```
a,b,c,d,e

f,g,h,i,j

k,l,m,n,o
```

This file only has three records, even though it has five lines.

## Differences between standard CSV format and Microsoft CSV format

Standard CSV format and Microsoft CSV format differ in their handling of:

- "Embedded quotes in quoted field values" (page 193)
- "Backslashes in quoted field values " (page 193)
- "Leading and trailing white space between field values " (page 193)

### Embedded quotes in quoted field values

Standard CSV and Microsoft CSV use a different character to escape quotes embedded in quoted field values; standard CSV uses a backslash while Microsoft CSV uses a second quote. For example, consider a CSV file with the following contents:

```
"He said ""Hello""",b,c
```

If this file is parsed with a standard CSV parser, it reads the first field value as "He said ", ignoring the quoted Hello. If this file is parsed with a Microsoft™ CSV parser, it reads the first field value as "He said "Hello"".

### Backslashes in quoted field values

In standard CSV, backslashes are special characters used to escape quotes. Therefore, embedded backslashes must be escaped with a second backslash. Backslashes that are not followed by a quote or backslash are ignored. In Microsoft CSV, backslashes have no special significance. For example, consider a CSV file with the following contents:

```
"C:\data\file.txt",a,b,c
```

A standard CSV parser reads the first field value as C:datafile.txt. A Microsoft CSV parser reads the first field value as C:\data\file.txt.

### Leading and trailing white space between field values

In standard CSV, leading and trailing white space between field values is ignored. In Microsoft CSV, it is significant. For example, consider a CSV file with the following contents:

```
, a, b
, c, , d
```

A standard CSV parser reads each field value as a single character, ignoring the spaces. A Microsoft CSV parser includes the spaces in the field values.

## CND-specific rules

### Records with different numbers of fields

Prior to CND 2.1.90, each record that did not have exactly the same number of field values as the first record was a failure and caused the entire import operation to abort.

As of CND 2.1.90, records are allowed to have any number of fields. If a record has fewer fields than the header, the remaining fields are taken as null. If a record has more fields than the header, the extra fields are ignored. For example, consider a CSV file with the following contents:

```

cn,sn,givenName
johndoe, doe, john
lyndasmythe, smythe, lynda
fredflintstone,flintstone
barneyrubble,rubble,barney,fatherofbambam

```

Using CND's CSV subscriber import feature (in CND 2.1.90 or later) on this file results in four entries being added to CND:

- cn=johndoe, sn=doe, givenName=john
- cn=lyndasmythe, sn=smythe, givenName=lynda
- cn=fredflintstone, sn=flintstone
- cn=barneyrubble, sn=rubble, givenName=barney

Note that Fred Flintstone's givenName attribute does not exist because his given name was not specified in the CSV file. Also note that Barney Rubble's additional information (fatherofbambam) is ignored.

## Summary of CSV rules

Table 16 "CSV rules" (page 194) summarizes the CSV rules.

Table 16  
CSV rules

CSV file content	CND interpretation (Microsoft format)	CND interpretation (standard format)
<b>Record</b>		
<b>Field values in a record are separated by commas</b> a,b,c,d,e	field1: a field2: b field3: c field4: d field5: e	field1: a field2: b field3: c field4: d field5: e
<b>Field values with embedded comma</b> <b>A value in quotes is one field value, even if the value contains a comma</b> a,b,"c,d",e	field1: a field2: b field3: c,d field4: e	field1: a field2: b field3: c,d field4: e
<b>Field values with embedded newline</b> <b>A value in quotes is one field value, even if the value contains a newline</b> a,b,"c d",e	field1: a field2: b field3: c d field4: e	field1: a field2: b field3: c d field4: e

CSV file content	CND interpretation (Microsoft format)	CND interpretation (standard format)
<b>Field values with quotes</b>		
<p><b>In field values that start with a quote, text after the end quote is ignored. In field values that contain quotes but do not start with a quote, quotes are part of the field value</b></p> <p>a,b,"c"XXX,d "e"XXX,f,g,h i,j"k"l,m</p>	Record1	Record1
	field1: a	field1: a
	field2: b	field2: b
	field3: c	field3: c
	field4: d	field4: d
	Record2	Record2
	field1: e	field1: e
	field2: f	field2: f
	field3: g	field3: g
	field4: h	field4: h
	Record3	Record3
	field1: i	field1: i
field2: j"k"l	field2: j"k"l	
field3: m	field3: m	
<b>Empty field values</b>		
<p><b>Consecutive commas denote empty field values</b></p> <p>a,b,,,c</p>	field1: a	field1: a
	field2: b	field2: b
	field3:	field3:
	field4:	field4:
	field5:	field5:
	field6: c	field6: c
<b>Empty lines</b>		
<p><b>Empty lines and lines that only contain spaces and tabs are ignored:</b></p> <p>a,b,c,d e,f,g,h</p>	Record1	Record1
	field1: a	field1: a
	field2: b	field2: b
	field3: c	field3: c
	field4: d	field4: d
	Record2	Record2
	field1: e	field1: e
	field2: f	field2: f
	field3: g	field3: g
	field4: h	field4: h
<b>Embedded quotes in quoted fields</b>		
<p><b>Microsoft CSV uses a second quote to escape embedded quotes; generic CSV uses a backslash</b></p> <p>"Say" "Hello""",b "Say\"Hello\""",b</p>	Record1	Record1
	field1: Say"Hello"	field1: Say
	field2: b	field2: b
	Record2	Record2
	field1: Say\	field1: Say"Hello"
	field2: b	field2: b

CSV file content	CND interpretation (Microsoft format)	CND interpretation (standard format)
<b>Backslashes in quoted fields</b> <b>In Microsoft CSV, backslashes have no special significance; in standard CSV, backslashes are special characters used to escape quotes</b> "C:\ab\cd.tx",a	field1: C:\ab\cd.tx field2: a	field1: C:abcd.tx field2: a
<b>Leading and trailing white space</b> <b>In Microsoft CSV, leading and trailing white space between field values is significant; in standard CSV, it is ignored</b> a, b , c	field1: a field2: b field3: c	field1: a field2: b field3: c

---

## Appendix H

# Unicode byte-order mark

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The Unicode byte-order mark (BOM) is the Unicode character at code point U+FEFF ("zero-width no-break space"), when that character is used to denote the endianness of a string of UCS/Unicode characters encoded in 16-bit Unicode Transformation Format (UTF-16) or 32-bit Unicode Transformation Format (UTF-32) and/or as a marker to indicate that text is encoded in 8-bit Unicode Transformation Format (UTF-8), UTF-16 or UTF-32.

Table 17 "Encodings of the BOM by encoding scheme" (page 197) displays the encodings of the byte-order marks by encoding scheme.

**Table 17**  
**Encodings of the BOM by encoding scheme**

Encoding scheme	Encoding of BOM
UTF-8	EF BB BF
UTF-16 Big Endian	FE FF
UTF-16 Little Endian	FF FE



---

## Appendix I

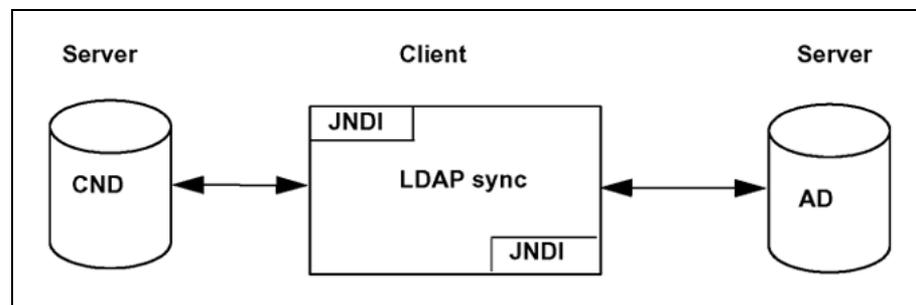
# SSL Configuration

---

The Lightweight Directory Access Protocol (LDAP) sync agent can talk to Common Network Directory (CND) and customer LDAP servers over a Transaction Layer Security/Secure Socket Layer (TLS/SSL) encrypted channel. Proper configuration of the server and client needs to be done before secure communication can be carried out.

The relationship between LDAP sync client and directory servers is shown in [Figure 47 "LDAP sync client and directory servers"](#) (page 199).

**Figure 47**  
**LDAP sync client and directory servers**



### Server configuration

#### CND

Refer to CND 2.2 User Guide for detailed instructions:

1. Acquire certificates.
2. Enable Secure Socket Layer (SSL) through the CND Manager Privacy tab.

## Active Directory

### Procedure 56

#### Setting up Active Directory for SSL

---

Step	Action
------	--------

---

- 1 Install the Enterprise Certificate Authority on the server where Active Directory resides.  
  
Refer to the following link for instructions: <http://www.microsoft.com/windows2000/techinfo/planning/security/casetup-steps.asp>.
  - 2 Start the Certificates snap-in in Microsoft Management Console (MMC). Make sure a certificate with the domain controller template is present in the personal certificate folder of the local computer (see ) If YES, continue with step 4.
  - 3 In the Certificates snap-in, under folder **Certificates (Local Computer) > Personal > Certificates**, request a new certificate with domain controller template.
  - 4 Restart the server.
- 

—End—

---

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## Appendix J

# Third-party License Agreements

---

The following list identifies the third party software distributed as components of the Common Network Directory (CND):

- OpenLDAP
- Sleepycat Software's Berkeley DB
- OpenSSL

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CND 2.2 introduces the following third-party library:

- Tony Freixas' Jwizard
- Apache Jakarta Commons
- Kohsuke Kawaguchi's Args4J
- Ice Engineering's Windows Registry API
- CSVReader
- MetaStuff Ltd.'s Dom4J
- Sun's JNDI/LDAP booster pack
- The Werken Company's Jaxen
- Netbeans

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Version 2.8, 17 August 2003

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# Glossary

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**Attribute**

A single named piece of data within an object class

**BOM**

Unicode byte order mark

**CN**

Common Name

**CallPilot network authority**

User-defined CallPilot queried by CND for the list of all CallPilot hosts in its networking tree

**CND**

Common Network Directory

**CND GAB entry**

CND subscriber entry containing CallPilot-specific attributes

**CND GAB entry cleaning**

CND GAB entry whose corresponding CallPilot local address book entry has been deleted

**CND subscriber entry**

An entry on CND that stores information about subscribers

**CND Service**

LDAP Directory Service

**CSV**

Comma Separated Values

**DN**

Distinguished Name

**GAB**

Global Address Book

**GUI**

Graphical User Interface

**IP**

Internet Protocol

**JNDI**

Java Naming and Directory Interface

**JRE**

Java Runtime Environment

**LDAP**

Lightweight Directory Access Protocol

**Object Class**

A named collection of attributes used to describe an object in the directory

**OSI**

Open Systems Interconnect

**Schema**

The complete collection of objects, their attributes, and rules that dictate the type of data that can be stored in a directory service.

**SHA**

Secure Hash Algorithm

**SSL**

Secure Socket Layer

**TLS**

Transaction Layer Security

**TM**

Nortel Communication Server 1000 Telephony Manager

**UI**

User Interface

**VPIM**

Voice Profile for Internet Mail

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# Index

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## A

- access levels 53
  - Administrator account 59
  - default values
- accounts
  - adding 54
  - administrator 51
  - Anonymous 52
  - default 52
- Accounts Management tab 51
- adding 83
  - accounts 54
- Administrator account 51
  - changing passwords 57
  - query processing option 45
- Anonymous account 52
- Application account
  - deleting 58
- Application accounts
  - ESM 52
  - Messaging 52
  - SubMgr 52
  - TM 52
- attribute map
  - default values
  - Load Default button 82
  - synchronization 82
- attribute relation 83
  - adding 83
  - removing 83
- attribute relations 78
- attributes 78
  - attributes map 78
  - relations 78

- synchronizing 79

## B

- back up CND data 30
- backing up data 63
- Backup
  - manual 64
  - scheduled 66
- backup
  - batch file 65
  - error handling 71
  - filename prefix 65
  - ip address 65
  - major errors 71
  - minor errors 71
  - output folder 65
- backup file names 67
- backup files
  - file names 64
  - overwriting 67
- Base DN
  - external directory server 81
- basic
  - LDAP Subscriber Synchronization 76
- bi-directional
  - synchronizations 78
- Bind DN
  - external directory server 81

## C

- certificates
  - clearing 152
- changing

- account password 55
- changing passwords
  - Administrator account 57
- clearing certificates 152
- CND
  - new install 25
  - upgrading 30
- CND data
  - migrating 32
- CND Manager
  - functions 38
  - launching 42
  - menu items 38
  - password 27
- CND service 28
  - restarting 30
- configuration changes
  - restarting service 39
- csv subscriber synchronization
  - common names 107
  - deleting attributes 104
  - error handling 111
  - file encoding 105
  - file format 103
  - operational conditions 108
  - required attributes 108
  - supported attributes 104
- csv subscriber synchronization
  - csv subscriber 103

## D

- data
  - migrating 32
- default account 52
- default values
  - attribute maps
- deleting
  - application account 58
  - synchronization job 95
- directory server 77

## E

- encrypted ports
  - setting up 50
- entries 79
  - entry mapping 77

- importing 79
  - master set 77
  - objectclasses 77
  - unmatched 84
- entry mapping 77
- entry resolution 79, 79
- export
  - attributes 139
  - error handling 143
  - file format 141
- extensions
  - schema 185
- external 77
- external directory server 77
  - Base DN setting 81
  - bind DN setting 81
  - host settings 81
  - password setting 81
  - port numbers 81
  - server type 81

## F

- failure log
  - synchronization job 88
- file names
  - backup files 64

## H

- host settings
  - external directory server 81

## I

- importing
  - entries into CND 79
  - unmatched entries 91
- install
  - JRE 29
- installing
  - certificates 49
  - new 25
- invalid certificates 151

## J

- job progress
  - LDAP Subscriber Synchronization 85

jobs  
import unmatched entries 91  
logging options 80  
security options 79  
synchronization 78

JRE  
install 29  
uninstalling 35

## L

launching  
CND Manager 42

LDAP  
entries 77  
port numbers 81

LDAP Subscriber Synchronization  
attribute map 82  
basic 76  
basic job 90  
changing job details 94  
deleting a job 95  
features 76  
import unmatched entries 91  
job progress 85  
job window 80  
main window 89  
rescheduling a job 101  
running a job 93  
scheduling a job 99  
TLS/SSL 84  
TLS/SSL communication 92  
transaction logs 84  
unmatched entries 84

Load Default button  
attribute map 82

log files  
clearing 47  
failure 88  
location of 86  
overwriting 47  
saving 47  
summary 87  
transaction 87

logging options  
service configuration 46  
synchronization jobs 80

## M

maintenance mode  
remove 33, 34  
repair 33, 33  
manual backup 64  
map 78  
master set  
entries 77  
migrating data 32

## N

Nortel Schema Upgrade  
backup and restore 146  
Backward compatibility 145

## O

organizational units 52  
overwriting  
log files 47

## P

password  
changing 55  
CND Manager 27  
external directory server 81  
permissions  
access to organizational units 53  
port numbers  
external directory server 81  
ports  
encrypted 50  
Privacy Settings tab 48  
installing certificates 49

## Q

query processing  
and the Administrator account 45  
limits 44

## R

removing  
attribute relation 83  
jobs from schedule 101  
removing CND 34

- repair
  - maintenance mode 33
- rescheduling jobs 101
- restarting service 30
  - after upgrading 30
  - save settings 39
- restoring
  - CND data 72

## S

- saving
  - service logs 47
- scheduled backup 66
- scheduling jobs 99
  - removing jobs 101
- schema extensions 185
- security options
  - synchronization jobs 79
- Server type
  - external directory server 81
- service
  - starting 153
- service configuration
  - logging 46
  - query processing 44
  - time limits 45
- service logs
  - saving 47
  - viewing 47
- setting
  - encrypted ports 50
  - query processing limits 44
  - time limits 45
- Show CND Version 149
- source server 77
- starting
  - CND service 153
- Subscriber attributes 185
- summary log
  - synchronization job 87
  - viewing 97
- synchronization
  - bi-directional 78

- defined 75
- jobs 78
- synchronization job
  - failure log 88
  - new basic 90
- synchronization units
  - entries 77
- synchronizing
  - attributes 79
- system accounts
  - Administrator 51
  - Anonymous 51
  - default 51

## T

- time limits
  - service configuration 45
- TLS/SSL
  - LDAP Subscriber Synchronization 84
- TLS/SSL certificates 152
- TLS/SSL communication
  - setting up 92
- transaction log
  - synchronization job 87
- transaction logs
  - LDAP Subscriber Synchronization 84

## U

- unicode
  - general categories 40
- uninstalling
  - JRE 35
- uninstalling CND 34
- upgrading CND 30, 30, 30

## V

- validating
  - TLS/SSL certificates 151
- viewing
  - service logs 47
  - summary logs 97



Nortel Communication Server 1000

## Common Network Directory 2.2 Administration

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