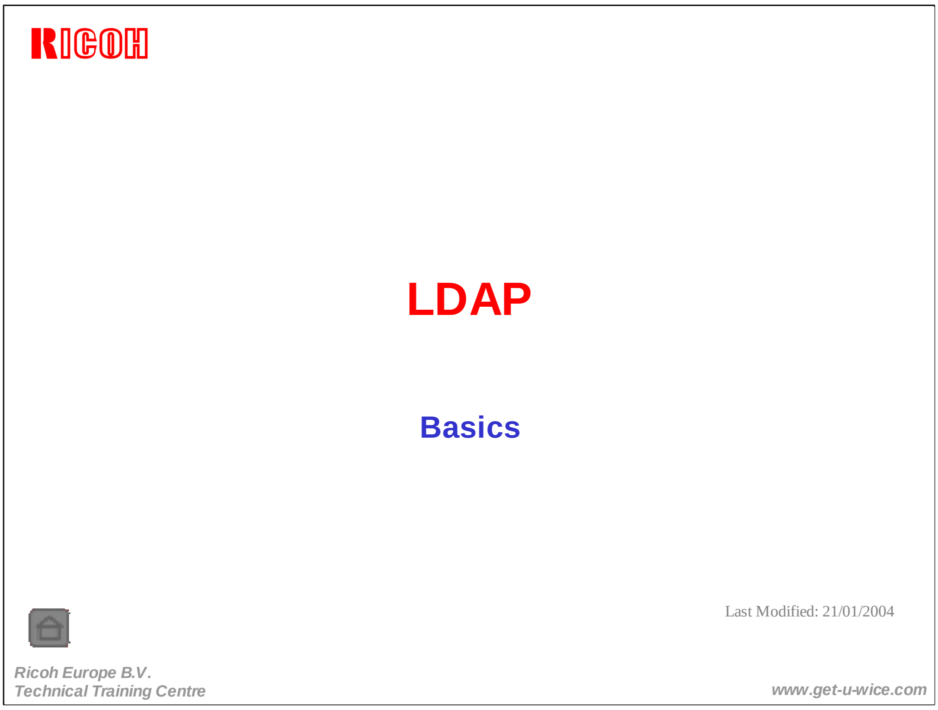


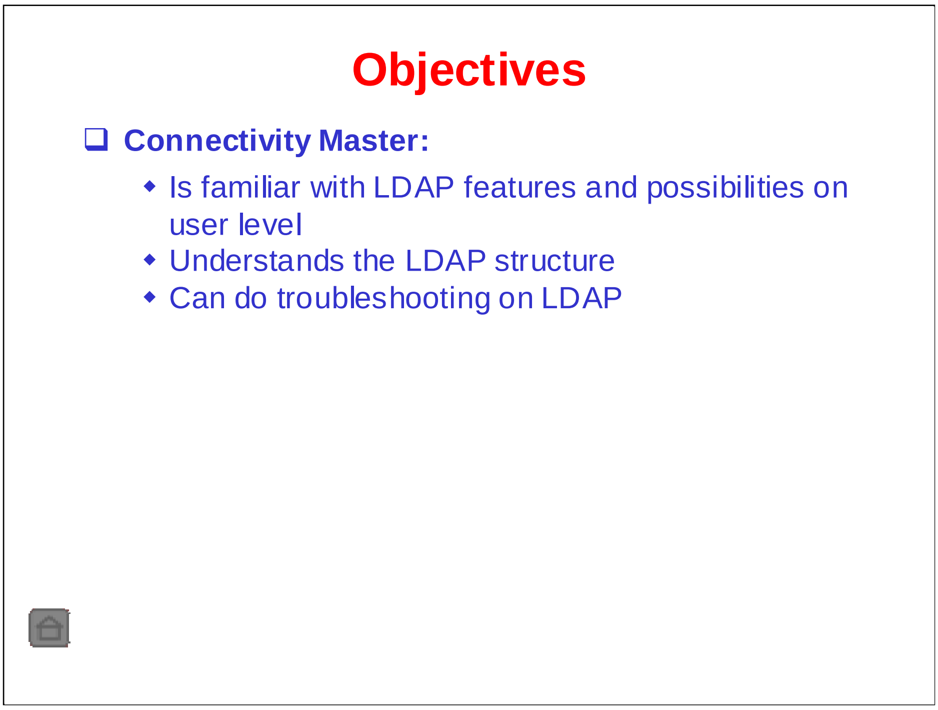
LDAP

Basics

Last Modified: 21/01/2004

Ricoh Europe B.V.
Technical Training Centre

www.get-u-wice.com

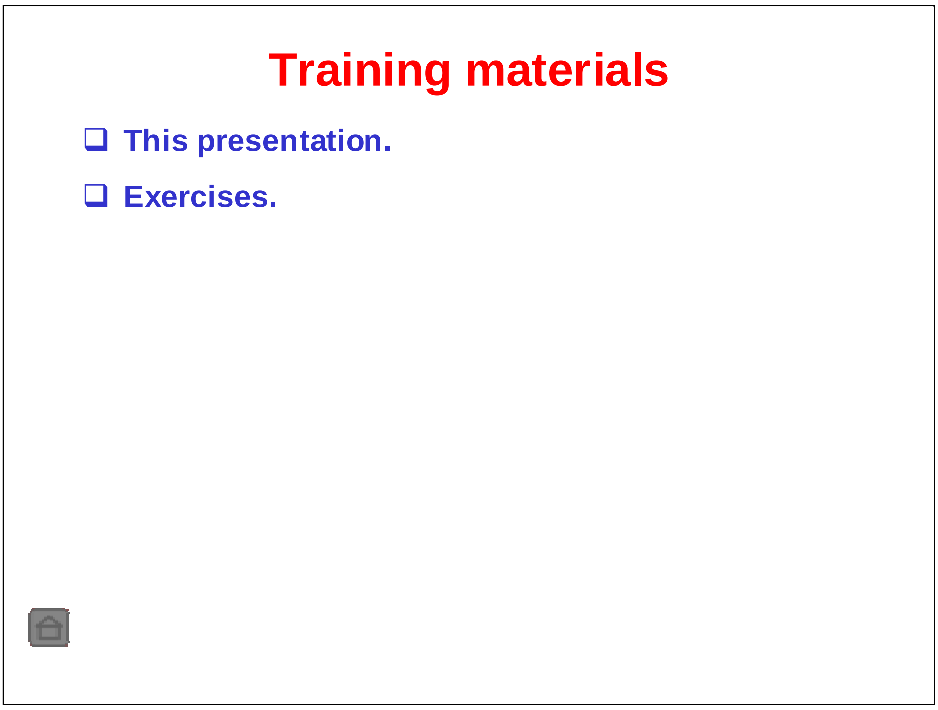


Objectives

- ❑ **Connectivity Master:**
  - Is familiar with LDAP features and possibilities on user level
  - Understands the LDAP structure
  - Can do troubleshooting on LDAP

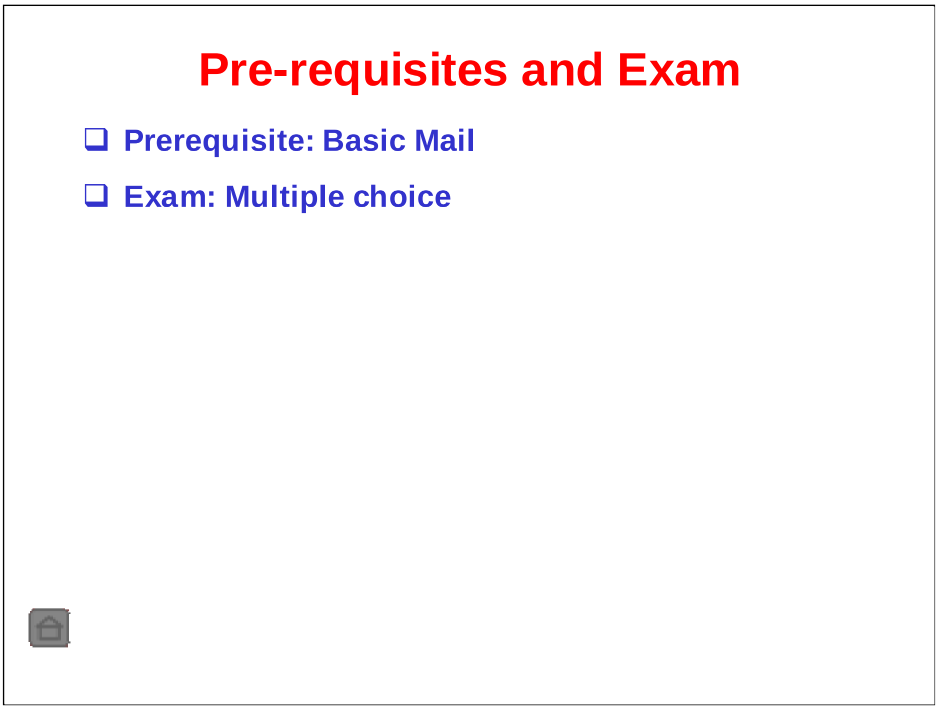
Requirements

- ❑ Training material
- ❑ PC with outlook (express).
- ❑ Mail server.
- ❑ LDAP server.
- ❑ Software tools (LDP, Softerra LDAP browser)



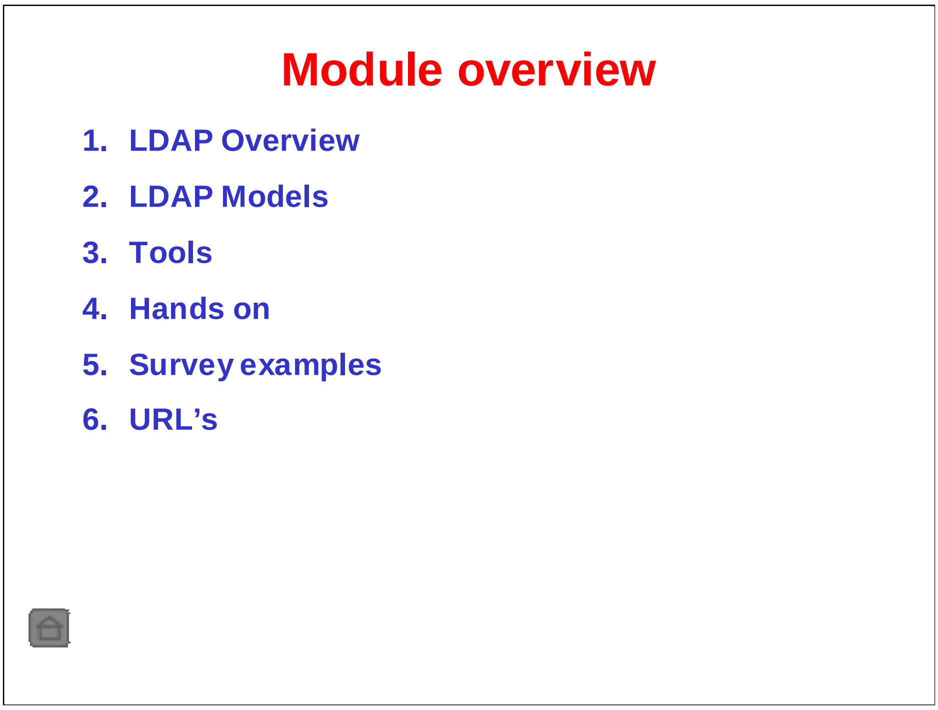
Training materials

- ❑ This presentation.
- ❑ Exercises.



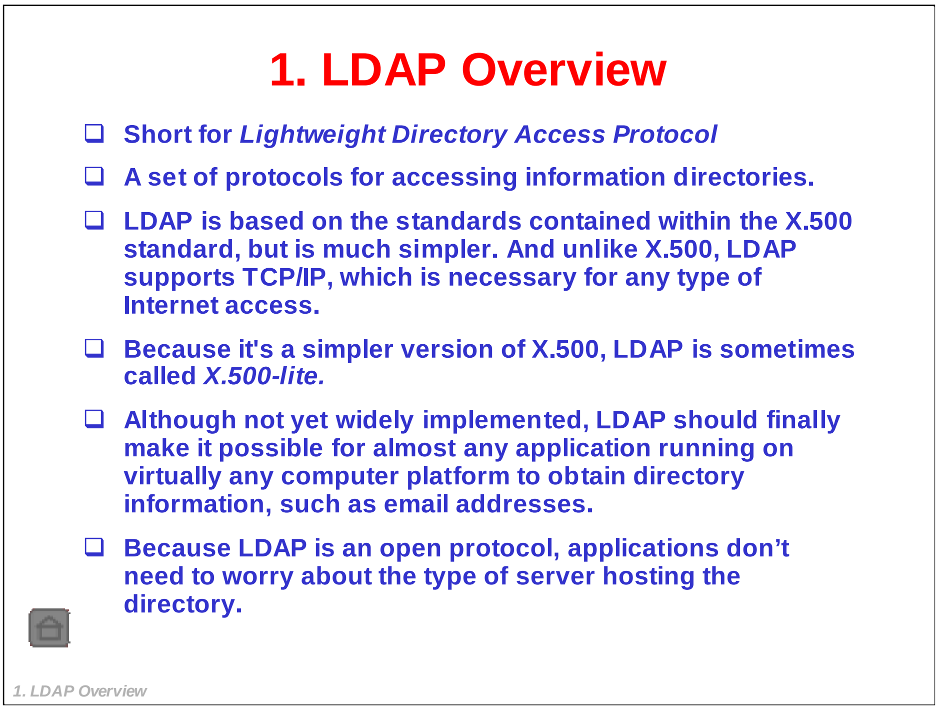
Pre-requisites and Exam

- ❑ Prerequisite: Basic Mail
- ❑ Exam: Multiple choice



Module overview

1. LDAP Overview
2. LDAP Models
3. Tools
4. Hands on
5. Survey examples
6. URL’s



1. LDAP Overview

- ❑ **Short for *Lightweight Directory Access Protocol***
- ❑ **A set of protocols for accessing information directories.**
- ❑ **LDAP is based on the standards contained within the X.500 standard, but is much simpler. And unlike X.500, LDAP supports TCP/IP, which is necessary for any type of Internet access.**
- ❑ **Because it's a simpler version of X.500, LDAP is sometimes called *X.500-lite.***
- ❑ **Although not yet widely implemented, LDAP should finally make it possible for almost any application running on virtually any computer platform to obtain directory information, such as email addresses.**
- ❑ **Because LDAP is an open protocol, applications don’t need to worry about the type of server hosting the directory.**

1. LDAP Overview

LDAP

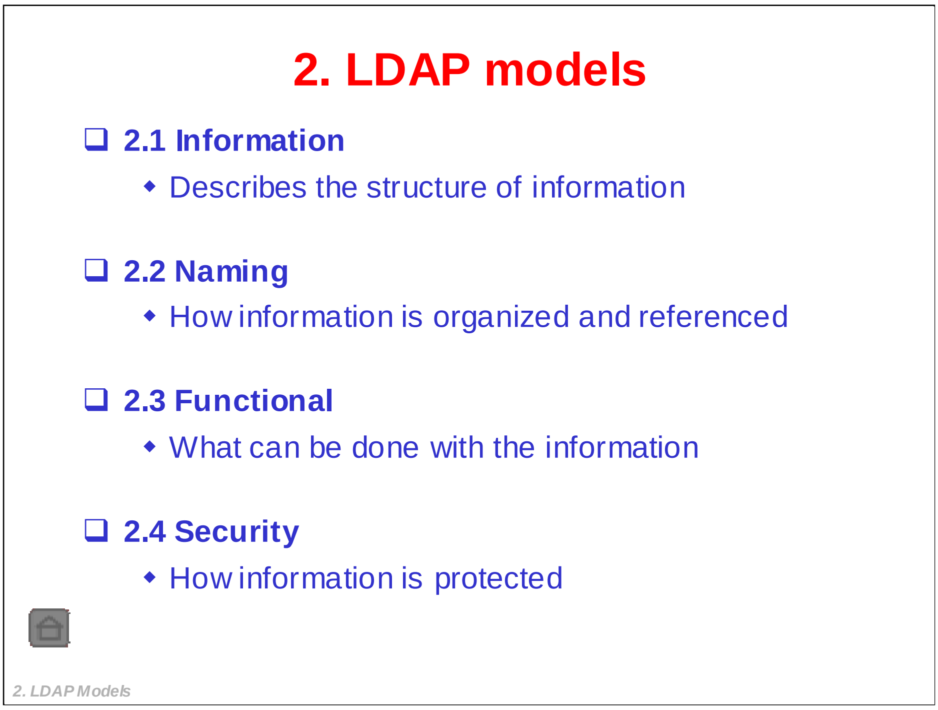
- ❑ Lightweight Directory Access Protocol, is a directory service protocol that runs over the popular TCP/IP.

Directory service

- ❑ A network service that identifies all resources on a network and makes them accessible to users and applications. Resources include e-mail addresses, computers, and peripheral devices such as printers. Ideally, the directory service should make the physical network topology and protocols transparent so that a user on a network can access any resource without knowing where or how it is physically connected. There are a number of directory services that are used widely. Two of the most important ones are LDAP, which is used primarily for e-mail addresses, and Netware Directory Service (NDS), which is used on Novell Netware networks. Virtually all directory services are based on the X.500 ITU standard

X500

- ❑ An ISO and ITU standard that defines how global directories should be structured. X.500 directories are hierarchical with different levels for each category of information, such as country, state, and city.
  - ➢ http://www.nlc-bnc.ca/9/1/p1-244-e.html



2. LDAP models

❑ **2.1 Information**

- Describes the structure of information

❑ **2.2 Naming**

- How information is organized and referenced

❑ **2.3 Functional**

- What can be done with the information

❑ **2.4 Security**

- How information is protected

2. LDAP Models

LDAP Models

❑ LDAP can be better understood by considering the four models upon which it is based:

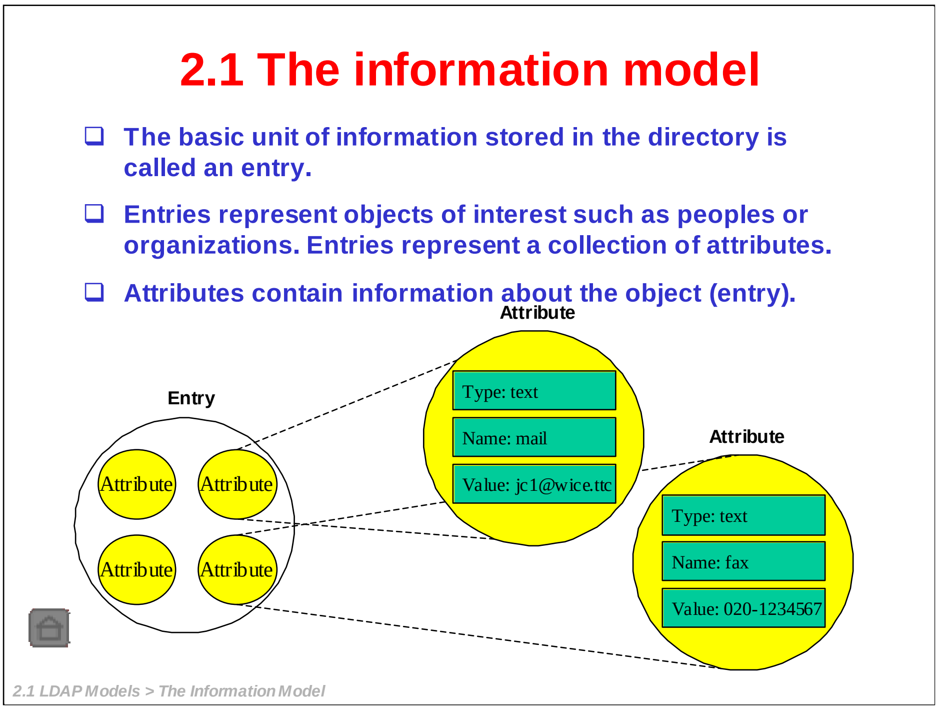
➢ Information - Describes the structure of information store in an LDAP directory

➢ Naming - Describes how information in an LDAP directory is organized and identified

➢ Functional – Describes what operation can be performed on the information stored in an LDAP directory

➢ Security – Describes how the information in an LDAP directory can be protected from unauthorized access

❑ The following section describes the four LDAP models.



2.1 The information model

❑ The basic unit of information stored in the directory is called an entry.

❑ Entries represent objects of interest such as peoples or organizations. Entries represent a collection of attributes.

❑ Attributes contain information about the object (entry).

2.1 LDAP Models > The Information Model

The Information Model

❑ The basic unit of information stored in the directory is called an entry. Entries represent objects of interest in the real world such as people, servers, organizations, and so on. Entries are composed of a collection of attributes that contain information about the object. Every attribute has a type and one or more values.

❑ The type of the attribute is associated with a syntax. The syntax specifies what kind of values can be stored.

❑ For example, an entry might have a facsimilieTelephoneNumber attribute. The syntax associated with this type of attribute would specify that the values are telephone numbers represented as printable strings optionally followed by keywords describing paper size and resolution characteristics. It is possible that the directory entry for an organization would contain multiple values in this attribute—that is that an organization or person represented by the entity would have multiple fax numbers. The relationship between a directory entry and its attributes and their values is shown in Figure on the slide.

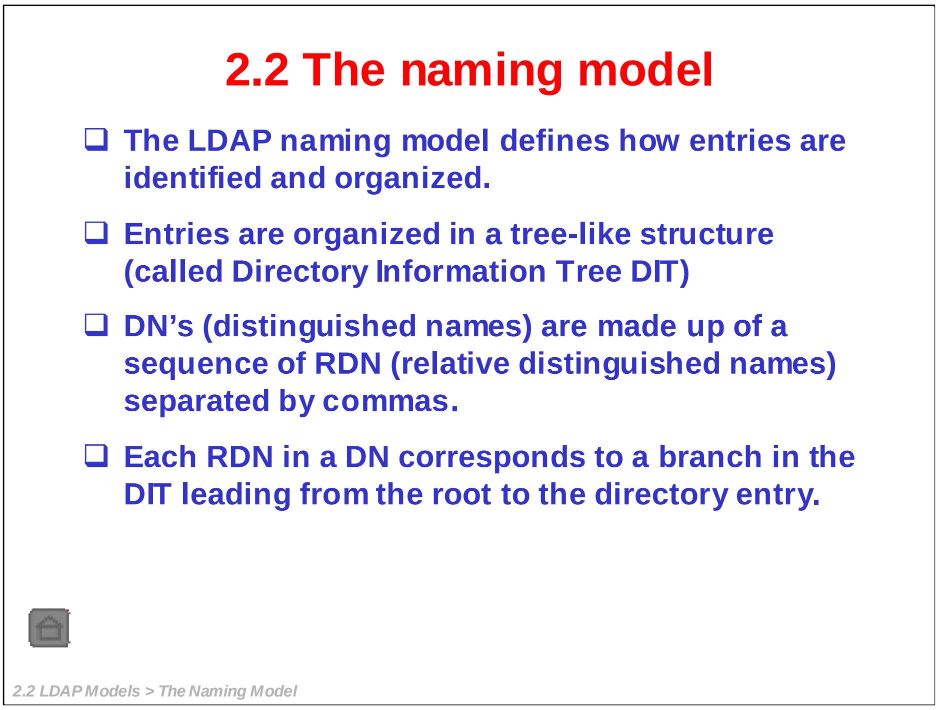
Entry (container or leaf)

❑ Coming from a structural class

❑ Microsoft refers to Entries as Objects

Attributes (Often called properties by Microsoft)

❑ Containers and Leaves have attributes



2.2 The naming model

- ❑ The LDAP naming model defines how entries are identified and organized.
- ❑ Entries are organized in a tree-like structure (called Directory Information Tree DIT)
- ❑ DN’s (distinguished names) are made up of a sequence of RDN (relative distinguished names) separated by commas.
- ❑ Each RDN in a DN corresponds to a branch in the DIT leading from the root to the directory entry.

2.2 LDAP Models > The Naming Model

distinguished name

- ❑ A name that uniquely identifies an object by using the relative distinguished name for the object, plus the names of container objects and domains that contain the object. The distinguished name identifies the object as well as its location in a tree. Every object in Active Directory has a distinguished name. A typical distinguished name might be CN=MyName,CN=Users,DC=Microsoft,DC=Com
- ❑ This identifies the MyName user object in the microsoft.com domain.

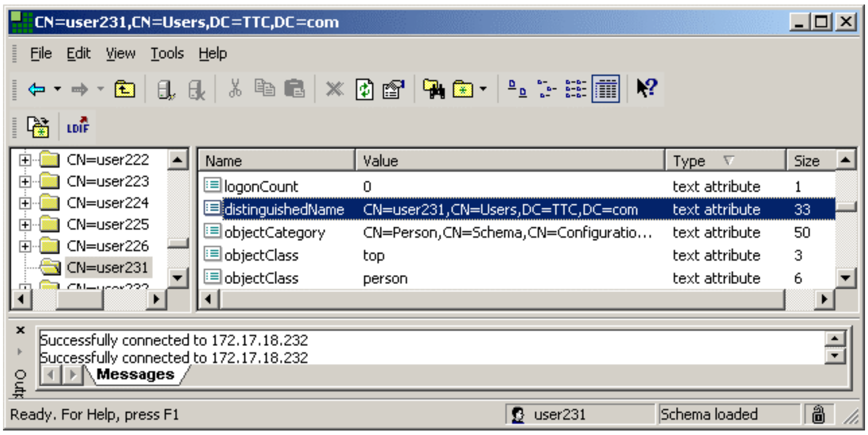
relative distinguished name

- ❑ The part of an object's distinguished name that is an attribute of the object itself. For most objects this is the Common Name attribute. For security principals, the default common name is the security principal name, also referred to as the SAM account name.For the distinguished nameCN=MyName,CN=Users,DC=Microsoft,DC=Com the relative distinguished name of the MyName user object is CN= MyName.
- ❑ The relative distinguished name of the parent object is CN=Users.

- ❑ See next page for more detail.

2.2 The naming model

❑ Example Exchange2000 DN



CN=user231,CN=Users,DC=TTC,DC=com

CN=user222
CN=user223
CN=user224
CN=user225
CN=user226
CN=user231
CN=user232

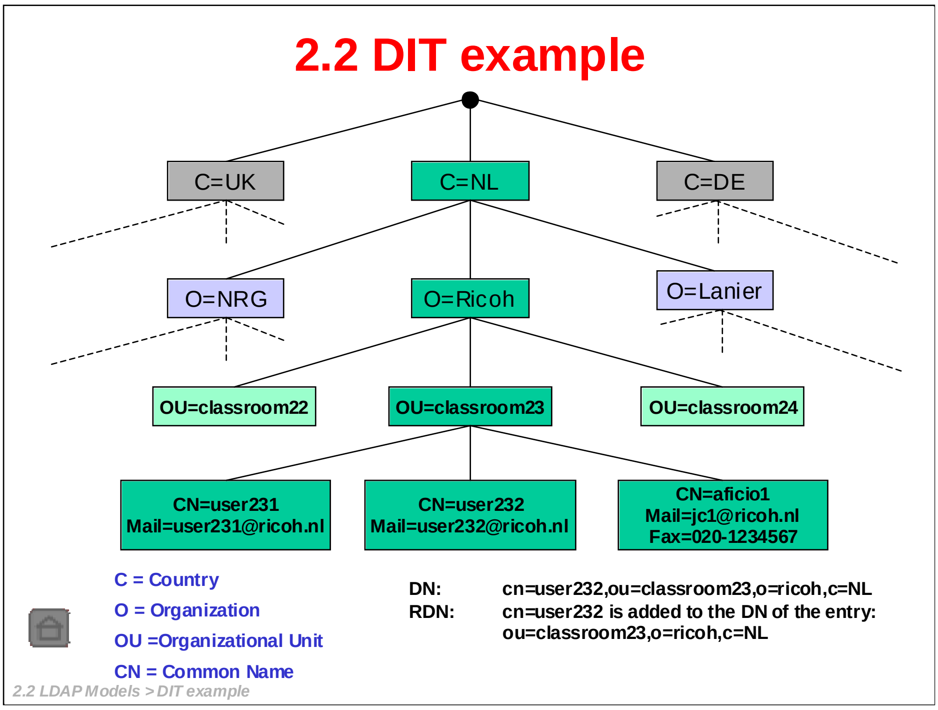
Name	Value	Type	Size
logonCount	0	text attribute	1
distinguishedName	CN=user231,CN=Users,DC=TTC,DC=com	text attribute	33
objectCategory	CN=Person,CN=Schema,CN=Configuratio...	text attribute	50
objectClass	top	text attribute	3
objectClass	person	text attribute	6

```
Successfully connected to 172.17.18.232
Successfully connected to 172.17.18.232
```

Messages

Ready. For Help, press F1 | user231 | Schema loaded

2.2 LDAP Models > The Naming Model



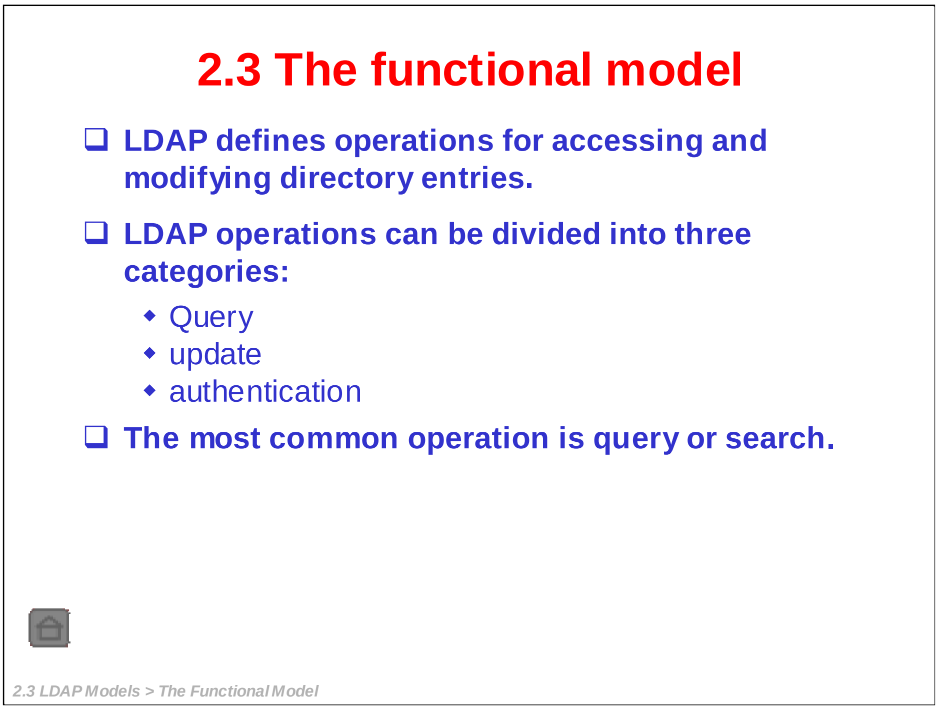
2.2 DIT example

C = Country
O = Organization
OU =Organizational Unit
CN = Common Name

DN: cn=user232,ou=classroom23,o=ricoh,c=NL
RDN: cn=user232 is added to the DN of the entry: ou=classroom23,o=ricoh,c=NL

2.2 LDAP Models > DIT example

- An example of a DIT is shown in the slide. The example is very simple, but can be used to illustrate some basic concepts. Each box represents a directory entry. The root directory entry is conceptual, but does not actually exist. attributes are listed inside each entry. The list of attributes shown is not complete. For example, the entry for the country NL (c=NL) could have an attribute called description with the value Netherlands.
- The organization of the entries in the DIT are restricted by their corresponding object class definitions. It is usual to follow either a geographical or an organizational scheme. For example, entries that represent countries would be at the top of the DIT. Below the countries would be national organizations, states, and provinces, and so on. Below this level, entries might represent people within those organizations or further subdivisions of the organization. The lowest layers of the DIT entries could represent any object, such as people, printers, application servers, and so on. The depth or breadth of the DIT is not restricted and can be designed to suit application requirements.
- Entries are named according to their position in the DIT. The directory entry in the lower-right corner of the Figure has the DN: cn=Aficio1,ou=classroom23,o=ricoh,c=NL.
- Note that DNs read from leaf to root as opposed to file system names which usually read from root to leaf. The DN is made up of a sequence of RDNs. Each RDN is constructed from an attribute (or attributes) of the entry its names. For example, the DN cn=user231,ou=classroom23,o=ricoh,c=NL is constructed by adding the RDN cn=user231 to the DN of the ancestor entry ou=classroom23,o=ricoh,c=NL.
- Note that cn=user231 is an attribute in the entry cn=user231,ou=classroom23,o=ricoh,c=NL



2.3 The functional model

- ❑ **LDAP defines operations for accessing and modifying directory entries.**
- ❑ **LDAP operations can be divided into three categories:**
  - Query
  - update
  - authentication
- ❑ **The most common operation is query or search.**

2.3 LDAP Models > The Functional Model

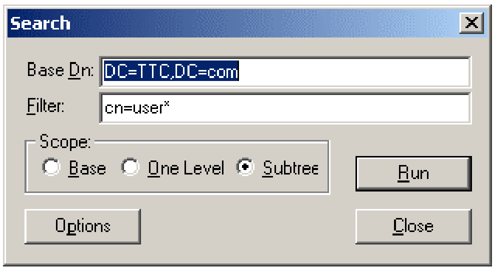
LDAP operations

- ❑ can be divided into the following three categories:
- ❑ Query
  - ➢ Includes the search and compare operations used to retrieve information from a directory
- ❑ Update
  - ➢ Includes the add, delete, modify, and modify RDN operations used to update stored information in a directory
- ❑ Authentication
  - ➢ Includes the bind, unbind, and abandon operations used to connect and disconnect to and from an LDAP server, establish access rights and protect information

The most common operation is search. The search operation is very flexible and has some of the most complex options.

2.4 Search

- ❑ **The following parameters must be specified:**
  - Base
    - » A DN that defines the starting point of the search.
  - Scope
    - » Specifies how deep within the tree to search from base object
  - Search Filter
    - » Specifies the criteria an entry must match to be returned from a search.



Base Dn: DC=TTC,DC=com

Filter: cn=user*

Scope: ○ Base ○ One Level ● Subtree

2.4 LDAP Models > Search

❑ To perform a search, the following parameters must be specified

- ➢ Base

  A DN that defines the starting point, called the base object, of the search. The base object is a node within the DIT.

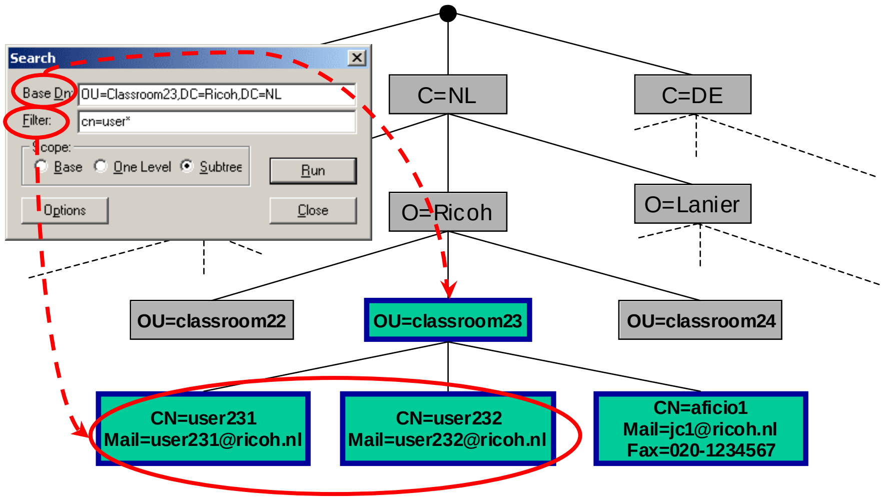
- ➢ Scope

  Specifies how deep within the DIT to search from the base object. There are three choices: baseObject, singleLevel, and wholeSubtree.If baseObject is specified, only the base object is examined. If singleLevel is specified, only the immediate children of the base object are examined; the base object itself is not examined. If wholeSubtree is specified, the base object and all of its descendants are examined.

- ➢ Search Filter

  Specifies the criteria an entry must match to be returned from a search. The search filter is a Boolean combination of attribute value assertions. An attribute value assertion tests the value of an attribute for equality, less than or equal, and so on. For example, a search filter might specify entries with a common name containing "user" or belonging to the organization WICE.

2.4 Search Parameters



Search

Base Dn: OU=Classroom23,DC=Ricoh,DC=NL

Filter: cn=user*

Scope: ○ Base ○ One Level ● Subtree

Result:
User231 and User232

2.4 LDAP Models > Search Parameters

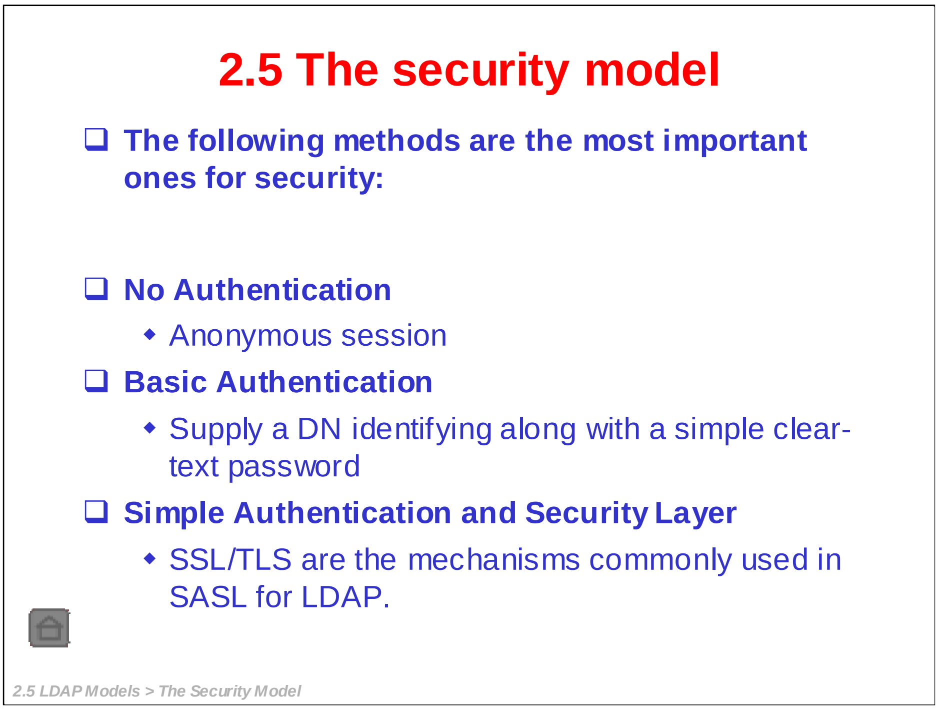
Search Filter Syntax

- The search filter defines criteria that an entry must match to be returned from a search. The basic component of a search filter is an attribute value assertion of the form: *[attribute] [operator] [value]*
- For example, to search for a person named John Smith the search filter would be *cn=user**. In this case, *cn* is the attribute; = is the operator, and *user** is the value. This search filter matches entries with the common name beginning with user.

The table lists the operators for search filters.

Operator	Description	Example
=	Returns entries whose attribute is equal to the value.	cn=John Smith finds the entry with common name John Smith
>=	Returns entries whose attribute is greater than or equal to the value.	sn>=smith finds all entries from smith to z*
<=	Returns entries whose attribute is less than or equal to the value.	sn<=smith finds all entries from a* to smith
=*	Returns entries that have a value set for that attribute.	sn=* finds all entries that have the sn attribute
~=	Returns entries whose attribute value approximately matches the specified value. Typically, this is an algorithm that matches words that sound alike.	sn~= smit might find the entry “sn=smith”

- The * character matches any substring and can be used with the = operator. For example, *cn=user*3** would match user231 and user232.
- Search filters can be combined with Boolean operators to form more complex search filters. The syntax for combining search filters is out of the scope of this training module.



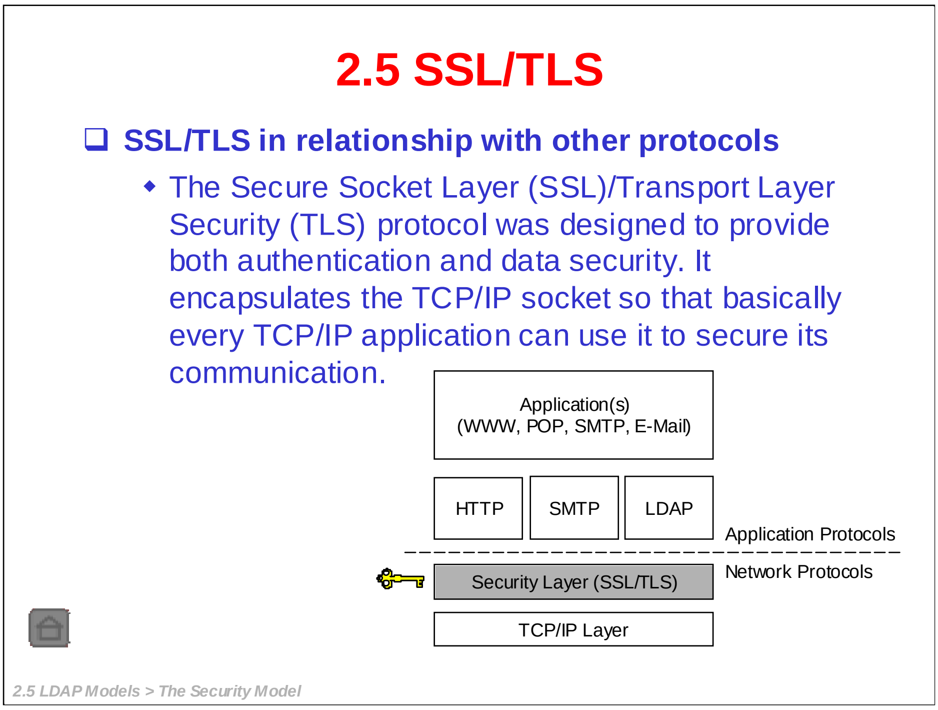
2.5 The security model

- ❑ **The following methods are the most important ones for security:**
- ❑ **No Authentication**
  - Anonymous session
- ❑ **Basic Authentication**
  - Supply a DN identifying along with a simple clear-text password
- ❑ **Simple Authentication and Security Layer**
  - SSL/TLS are the mechanisms commonly used in SASL for LDAP.

2.5 LDAP Models > The Security Model

Security

- ❑ Security is of great importance in the networked world of computers, and this is true for LDAP as well. When sending data over insecure networks, internally or externally, sensitive information may need to be protected during transportation. There is also a need to know who is requesting the information and who is sending it. This is especially important when it comes to the update operations on a directory. The term security, as used in the context of this training module, generally covers the following four aspects:
- ❑ Authentication
  - ➢ Assurance that the opposite party (machine or person) really is who he/she/it claims to be.
- ❑ Integrity
  - ➢ Assurance that the information that arrives is really the same as what was sent.
- ❑ Confidentiality
  - ➢ Protection of information disclosure by means of data encryption to those who are not intended to receive it.
- ❑ Authorization
  - ➢ Assurance that a party is really allowed to do what he/she/it is requesting to do. This is usually checked after user authentication. In LDAP Version 3, this is currently not part of the protocol specification and is therefore implementation- (or vendor-) specific. This is basically achieved by assigning access controls, like read, write, or delete, to user IDs or common names. There is an Internet Draft that proposes access control for LDAP.
- ❑ See next page for more detail



2.5 SSL/TLS

❑ **SSL/TLS in relationship with other protocols**

- The Secure Socket Layer (SSL)/Transport Layer Security (TLS) protocol was designed to provide both authentication and data security. It encapsulates the TCP/IP socket so that basically every TCP/IP application can use it to secure its communication.

Application(s)
(WWW, POP, SMTP, E-Mail)

HTTP | SMTP | LDAP

Application Protocols

Network Protocols

Security Layer (SSL/TLS)

TCP/IP Layer

2.5 LDAP Models > The Security Model

❑ We focus on the first three aspects (since authorization is not contained in the LDAP Version 3 standard): authentication, integrity and confidentiality. There are several methods that can be used for this purpose; the most important ones are discussed here. These are:

- ➢ No authentication
- ➢ Basic authentication
- ➢ Simple Authentication and Security Layer (SASL)

No Authentication

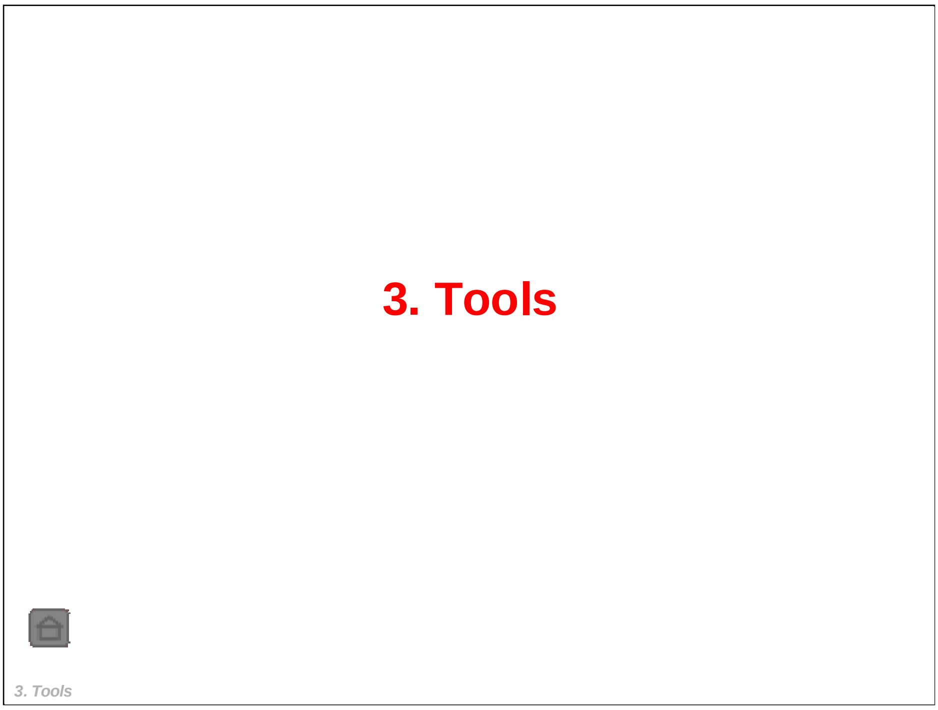
❑ This is the simplest way, one that obviously does not need to be explained in much detail. This method should only be used when data security is not an issue and when no special access control permissions are involved. This could be the case, for example, when your directory is an address book browsable by anybody. No authentication is assumed when you leave the password and DN field empty in the bind API call. The LDAP server then automatically assumes an anonymous user session and grants access with the appropriate access controls defined for this kind of access

Basic Authentication

- ❑ The security mechanism in LDAP is negotiated when the connection between the client and the server is established. This is the approach specified in the LDAP application program interface (API). Beside the option of using no authentication at all, the most simple security mechanism in LDAP is called basic authentication, which is also used in several other Web-related protocols, such as in HTTP. When using basic authentication with LDAP, the client identifies itself to the server by means of a DN and a password which are sent in clear text over the network (some implementation may use Base64 encoding instead). The server considers the client authenticated if the DN and password sent by the client matches the password for that DN stored in the directory. Base64 encoding is defined in the Multipurpose Internet Mail Extensions (MIME) standard (RFC 1521). It is a relatively simple encryption, and therefore it is not hard to break once one has captured the data on the network.

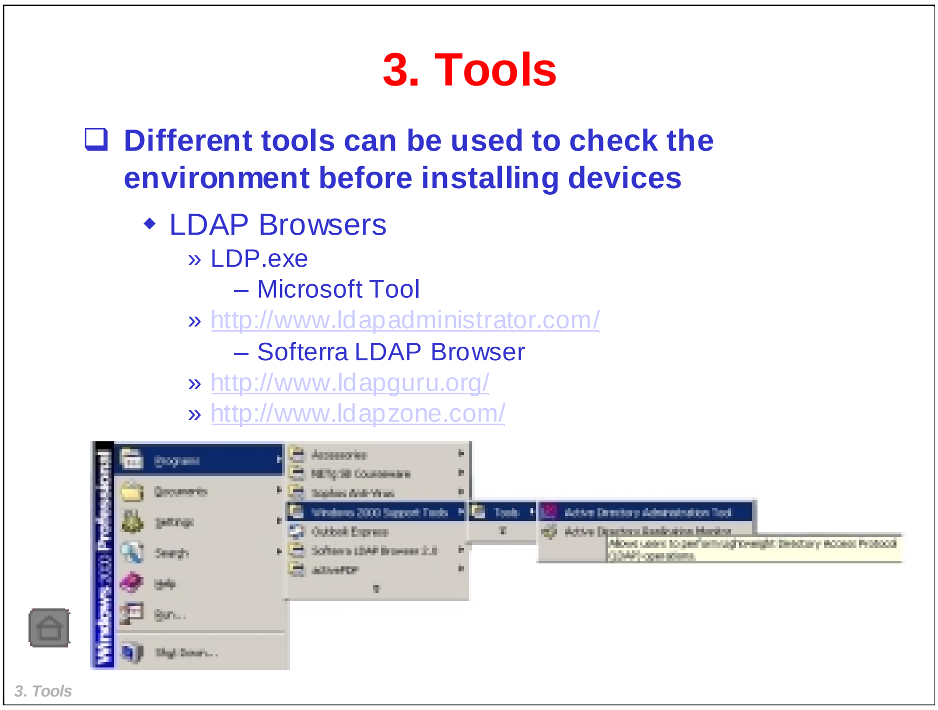
Simple Authentication and Security Layer (SASL)

- ❑ SASL is a framework for adding additional authentication mechanisms to connection-oriented protocols. It has been added to LDAP Version 3 to overcome the authentication shortcomings of Version 2. SASL was originally devised to add stronger authentication to the IMAP protocol. SASL has since evolved into a more general system for mediating between protocols and authentication systems. It is a proposed Internet standard defined in RFC 2222.
- ❑ In SASL, connection protocols, like LDAP, IMAP, and so on, are represented by profiles; each profile is considered a protocol extension that allows the protocol and SASL to work together. A complete list of SASL profiles can be obtained from the Information Sciences Institute (ISI). Each protocol that intends to use SASL needs to be extended with a command to identify an authentication mechanism and to carry out an authentication exchange. Optionally, a security layer can be negotiated to encrypt the data after authentication and so ensure confidentiality. LDAP Version 3 includes such a command (ldap_sasl_bind()).



3. Tools

3. Tools



3. Tools

- ❑ **Different tools can be used to check the environment before installing devices**
  - ◆ LDAP Browsers
    - » LDP.exe
      - – Microsoft Tool
    - » http://www.ldapadministrator.com/
      - – Softerra LDAP Browser
    - » http://www.ldapguru.org/
    - » http://www.ldapzone.com/

Windows 2000 Professional
Programs
Documents
Settings
Search
Help
Run...
Shut Down...
Accessories
NETg 5B Courseware
Sophos Anti-Virus
Windows 2000 Support Tools
Outlook Express
Softerra LDAP Browser 2.0
activePDF
Tools
Active Directory Administration Tool
Active Directory Replication Monitor

Allows users to perform Lightweight Directory Access Protocol (LDAP) operations.

3. Tools

- ❑ Several additional tools that can be used to configure, manage and debug Active Directory are available as command line tools. These tools are known as the Support Tools and are available on the Windows 2000 Server compact disc in the \SUPPORT\TOOLS folder.

LDAP querying component

- ❑ Ldp.exe is a graphical tool that allows users to perform Lightweight Directory Access Protocol (LDAP) operations, such as connect, bind, search, modify, add, and delete, against any LDAP-compatible directory, such as Active Directory™ directory service. LDAP is an Internet-standard wire protocol used by Active Directory.
- ❑ Many objects stored in Active Directory are not displayed using the graphical tools that are shipped with the retail version of Microsoft Windows 2000. Ldp.exe can be used by administrators to view these objects and their metadata such as security descriptors and replication metadata to aid in problem determination.

Site links

- ❑ http://www.ldapadministrator.com/
- ❑ http://www.ldapguru.org/
  - ➢ This site is owned and operated by LDAPguru.com L.L.C.
- ❑ http://www.ldapzone.com/
  - ➢ Here's the latest information and resources to leverage LDAP (Lightweight Directory Access Protocol) directories on your target platforms

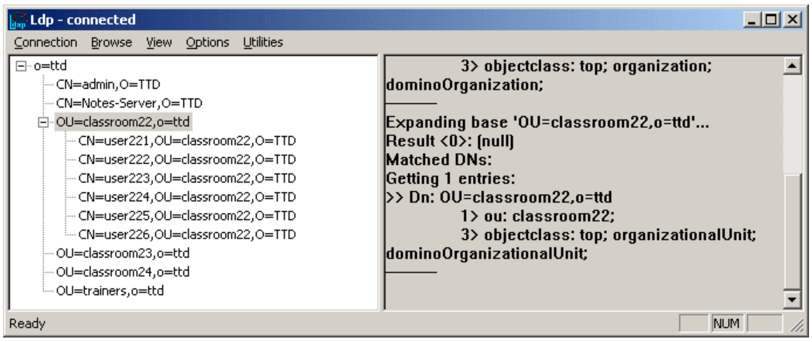
3. Tools

To install the Windows 2000 Support Tools

1. Start Windows 2000. You must log on as a member of the Administrator group to install these tools.
2. Insert the Windows 2000 CD into your CD-ROM drive.
3. When the Autorun screen appears, click Browse this CD.
4. Browse to the Support\Tools directory.
5. Double-click Setup.exe.
6. Follow the instructions that appear on your screen.

- ❑ **Important** If you are installing on Windows 2000, restart your computer to complete the installation.
- ❑ The Setup program installs the Support Tools files onto your hard disk and requires 18.2 megabytes (MB) of free space for a typical installation.
- ❑ Setup creates a Windows 2000 Support Tools folder within the Programs folder on the Start menu. For information about individual tools, click the Tools Help menu item. GUI tools can be selected from the Tools menu.
- ❑ Setup also adds the Program Files\Support Tools directory (or the directory name you choose for installing the tools) to your computer's Path environment variable.

LDAP services



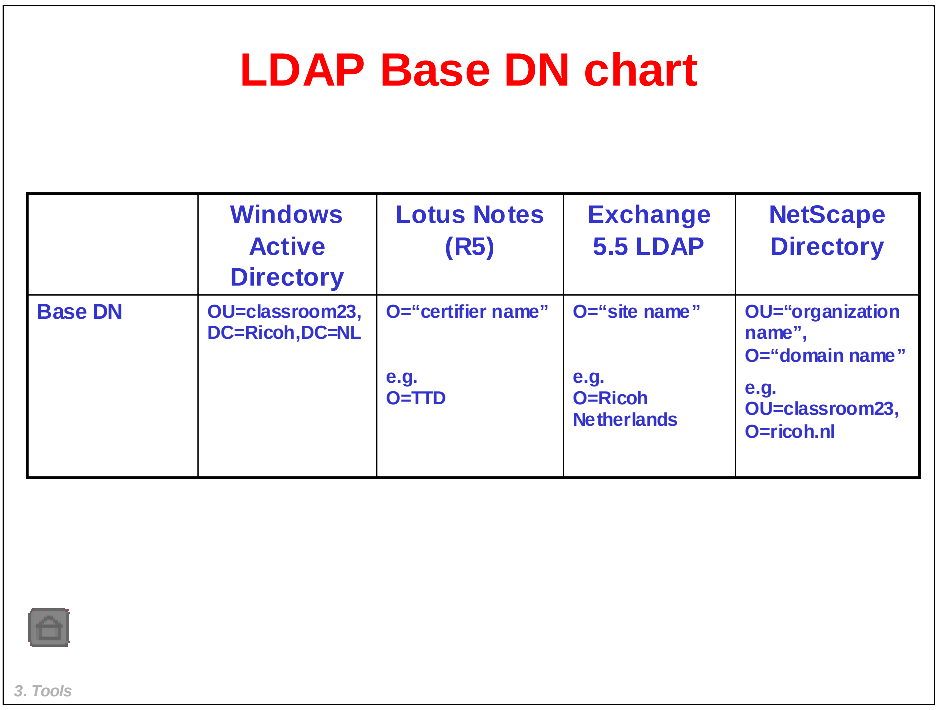
```
⊟ o=ttd
   CN=admin,O=TTD
   CN=Notes-Server,O=TTD
   ⊟ OU=classroom22,o=ttd
      CN=user221,OU=classroom22,O=TTD
      CN=user222,OU=classroom22,O=TTD
      CN=user223,OU=classroom22,O=TTD
      CN=user224,OU=classroom22,O=TTD
      CN=user225,OU=classroom22,O=TTD
      CN=user226,OU=classroom22,O=TTD
   OU=classroom23,o=ttd
   OU=classroom24,o=ttd
   OU=trainers,o=ttd
```

```
        3> objectclass: top; organization;
dominoOrganization;
-----------
Expanding base 'OU=classroom22,o=ttd'...
Result <0>: (null)
Matched DNs:
Getting 1 entries:
>> Dn: OU=classroom22,o=ttd
        1> ou: classroom22;
        3> objectclass: top; organizationalUnit;
dominoOrganizationalUnit;
-----------
```

Lotus Notes providing LDAP

3. Tools

- ❑ This is an example of the Lotus Notes server that also runs LDAP services.



LDAP Base DN chart

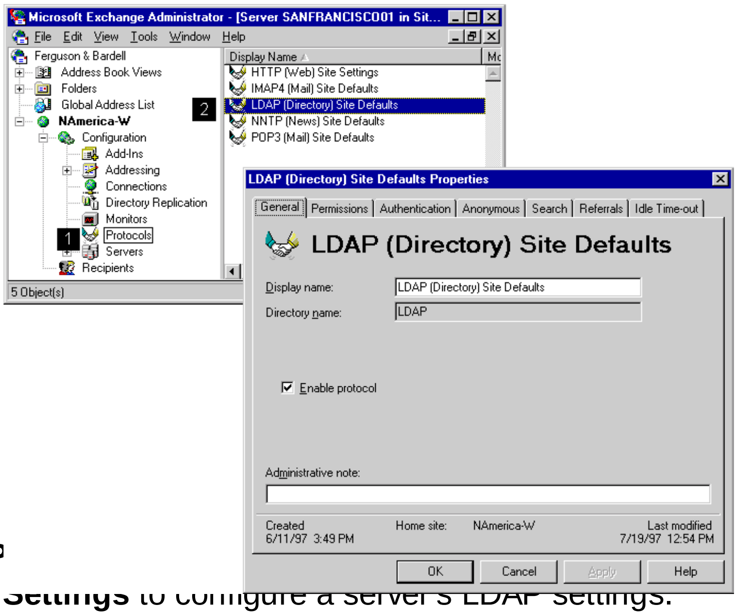
	Windows Active Directory	Lotus Notes (R5)	Exchange 5.5 LDAP	NetScape Directory

Base DN	OU=classroom23, DC=Ricoh,DC=NL	O="certifier name"
		e.g.
		O=TTD
			O="site name"
			e.g.
			O=Ricoh Netherlands
				OU="organization name", O="domain name"
				e.g.
				OU=classroom23, O=ricoh.nl

3. Tools

Exchange 5.5

- ❑ Exchange 5.5 is for Windows NT and not for Windows 2000 (W2K)
- ❑ Microsoft Windows NT Server version 4.0 and Service Pack 3 (SP3) or later.
- ❑ NT has NO LDAP support but exchange 5.5 has. When Microsoft Exchange Server is installed, LDAP is enabled within the site by default. LDAP clients can access the directory as soon as the server is set up.
- ❑ You can set properties for LDAP at either the site or server level using the Microsoft Exchange Server Administrator program.
- ❑ **Getting to the Site and Server property pages**
  - ➢ In the Administrator window, choose a site or server, and then choose **Protocols**.



Microsoft Exchange Administrator - [Server SANFRANCISCO01 in Sit...

LDAP (Directory) Site Defaults Properties

Display name: LDAP (Directory) Site Defaults

Directory name: LDAP

☑ Enable protocol

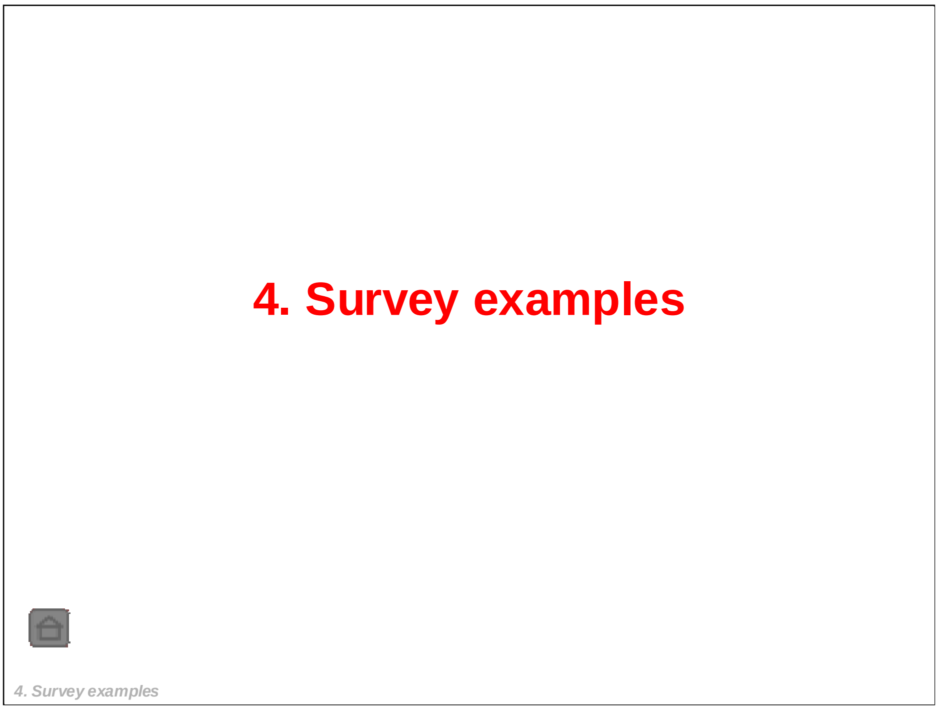
Administrative note:

Created 6/11/97 3:49 PM Home site: NAmerica-W Last modified 7/19/97 12:54 PM

  - ➢ Double-click **LDAP** efaults, or **LDAP (Directory) Settings** to configure a server's LDAP settings.

Exchange 2000

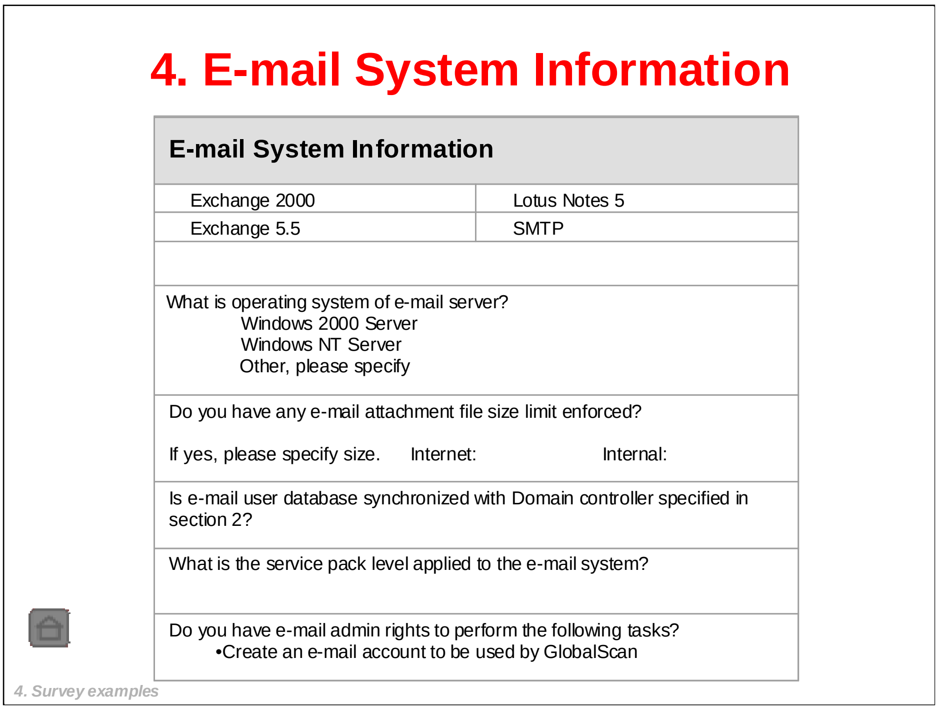
- ❑ Unlike earlier versions of Exchange, Exchange 2000 Server does not include its own directory service. It is integrated with the directory in Windows 2000 called Active Directory.
- ❑ Centralized administration: A separate directory for Exchange is no longer necessary, and administrators can administer Exchange and Windows 2000 Server at the same time



4. Survey examples

4. Survey examples

❑ The examples you see give you an impression on some topics which are maybe important to think about before you start implementing machines with LDAP support.



4. E-mail System Information

E-mail System Information

Exchange 2000	Lotus Notes 5
Exchange 5.5	SMTP

What is operating system of e-mail server?
Windows 2000 Server
Windows NT Server
Other, please specify

Do you have any e-mail attachment file size limit enforced?

If yes, please specify size. Internet: Internal:

Is e-mail user database synchronized with Domain controller specified in section 2?

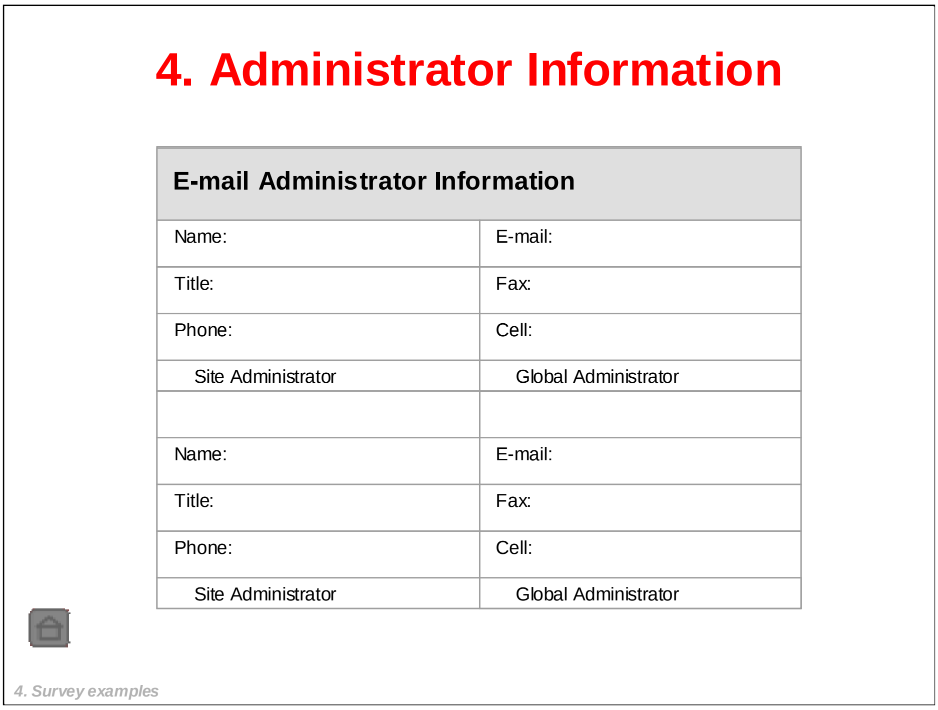
What is the service pack level applied to the e-mail system?

Do you have e-mail admin rights to perform the following tasks?

- Create an e-mail account to be used by GlobalScan

4. Survey examples

See slide for details

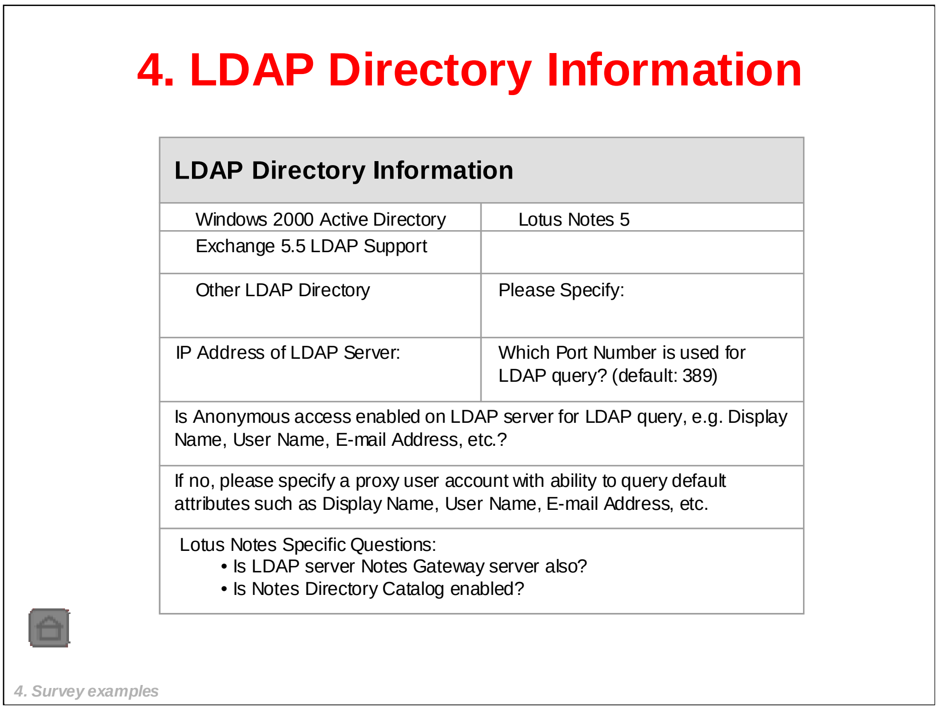


4. Administrator Information

E-mail Administrator Information	
Name:	E-mail:
Title:	Fax:
Phone:	Cell:
Site Administrator	Global Administrator
Name:	E-mail:
Title:	Fax:
Phone:	Cell:
Site Administrator	Global Administrator

4. Survey examples

See slide for details

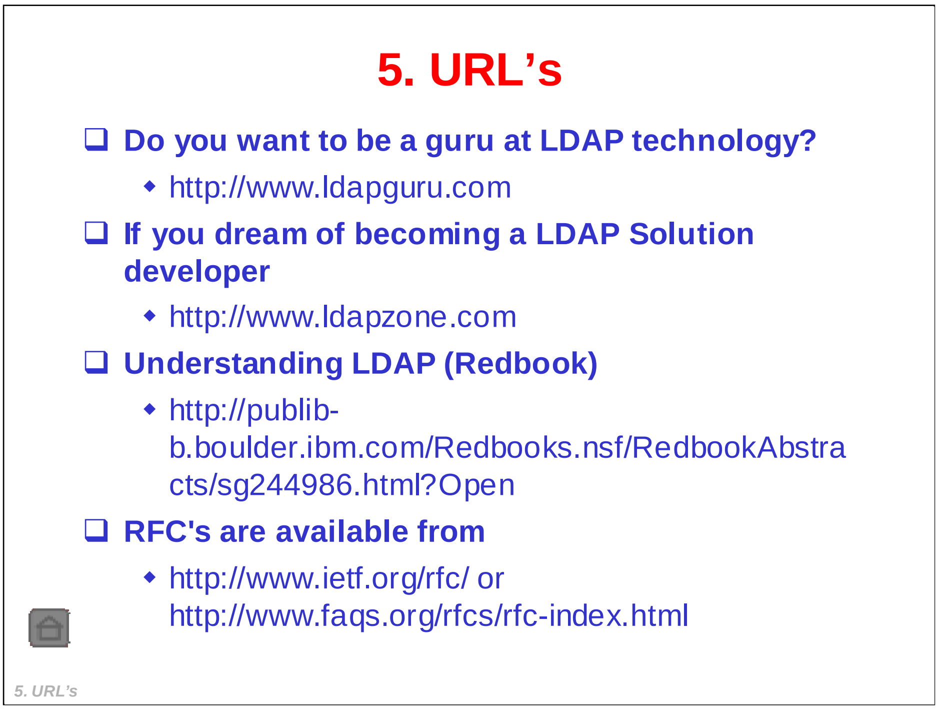


4. LDAP Directory Information

LDAP Directory Information	
Windows 2000 Active Directory	Lotus Notes 5
Exchange 5.5 LDAP Support	
Other LDAP Directory	Please Specify:
IP Address of LDAP Server:	Which Port Number is used for LDAP query? (default: 389)
Is Anonymous access enabled on LDAP server for LDAP query, e.g. Display Name, User Name, E-mail Address, etc.?	
If no, please specify a proxy user account with ability to query default attributes such as Display Name, User Name, E-mail Address, etc.	
Lotus Notes Specific Questions: • Is LDAP server Notes Gateway server also? • Is Notes Directory Catalog enabled?	

4. Survey examples

See slide for details



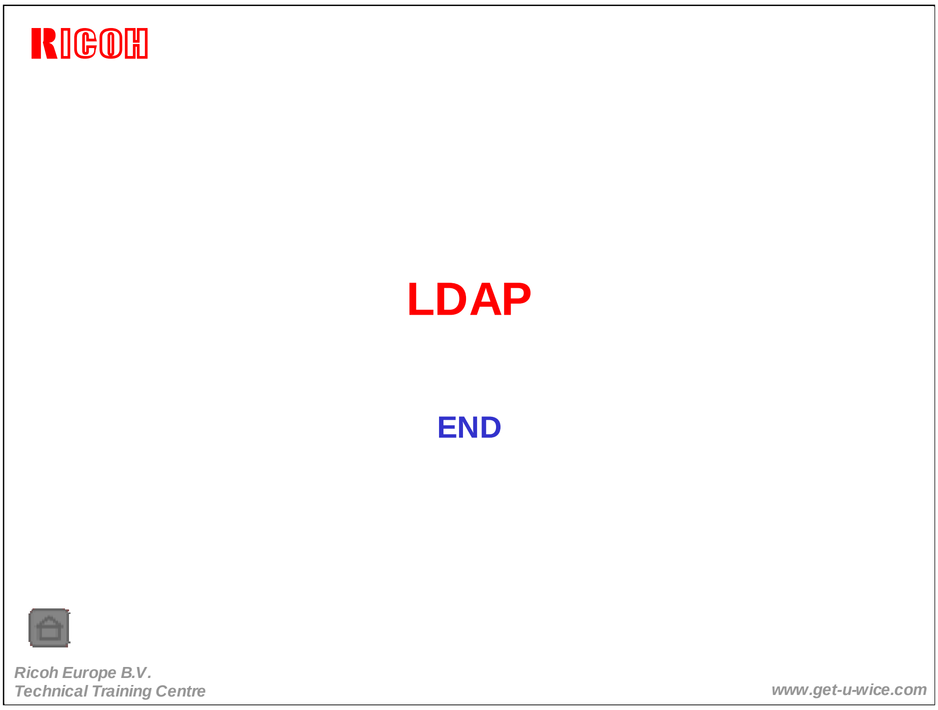
5. URL's

- ❑ **Do you want to be a guru at LDAP technology?**
  - http://www.ldapguru.com
- ❑ **If you dream of becoming a LDAP Solution developer**
  - http://www.ldapzone.com
- ❑ **Understanding LDAP (Redbook)**
  - http://publib-b.boulder.ibm.com/Redbooks.nsf/RedbookAbstracts/sg244986.html?Open
- ❑ **RFC's are available from**
  - http://www.ietf.org/rfc/ or http://www.faqs.org/rfcs/rfc-index.html

5. URL's

The following requests for comments provide interesting background information:

- RFC3383: Internet Assigned Numbers Authority (IANA) Considerations for the Lightweight Directory Access Protocol (LDAP)
- RFC3377: Lightweight Directory Access Protocol (v3): Technical Specification
- RFC3296: Named Subordinate References in Lightweight Directory Access Protocol (LDAP) Directories
- RFC3112: LDAP Authentication Password Schema
- RFC3062: LDAP Password Modify Extended Operation
- RFC3045: Storing Vendor Information in the LDAP root DSE
- RFC2927: MIME Directory Profile for LDAP Schema
- RFC2891: LDAP Control Extension for Server Side Sorting of Search Results
- RFC2849: The LDAP Data Interchange Format (LDIF) - Technical Specification
- RFC2820: Access Control Requirements for LDAP
- RFC2798: Definition of the inetOrgPerson LDAP Object Class
- RFC2739: Calendar Attributes for vCard and LDAP
- RFC2714: Schema for Representing CORBA Object References in an LDAP Directory
- RFC2713: Schema for Representing Java(tm) Objects in an LDAP Directory
- RFC2696: LDAP Control Extension for Simple Paged Results Manipulation
- RFC2596: Use of Language Codes in LDAP
- RFC2587: Internet X.509 Public Key Infrastructure LDAPv2 Schema
- RFC2307: An Approach for Using LDAP as a Network Information Service



LDAP

END

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Objective

- ✓ To use LDAP from a standard platform and to become familiar with all the terminology of this technology. This knowledge is required to connect to several user environments in the field.

Required materials

- ✓ Windows 2000 Domain Controller
- ✓ Exchange 2000 mail server.
- ✓ E-mail client

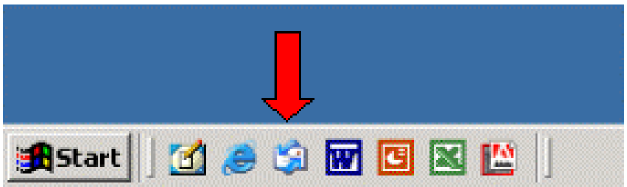
Introduction

This exercise will help for a better understanding about mail configuration.
We connect a mail client to a mail server and test it.
After that we connect to the LDAP server to find users.

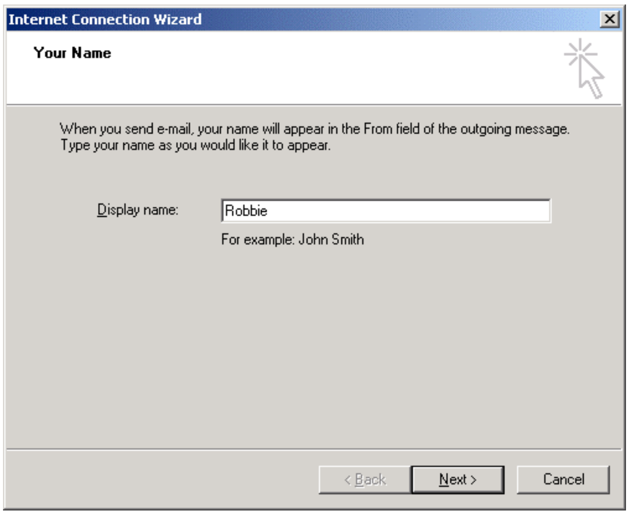
Content

1 Set-up outlook for classroom practice (with exchange 2000 mail server)

1) To start setting up Outlook Express click on the icon in the “Quick Launch” toolbar



2) In the first screen of the “Internet Connection Wizzard” type your name


Internet Connection Wizard

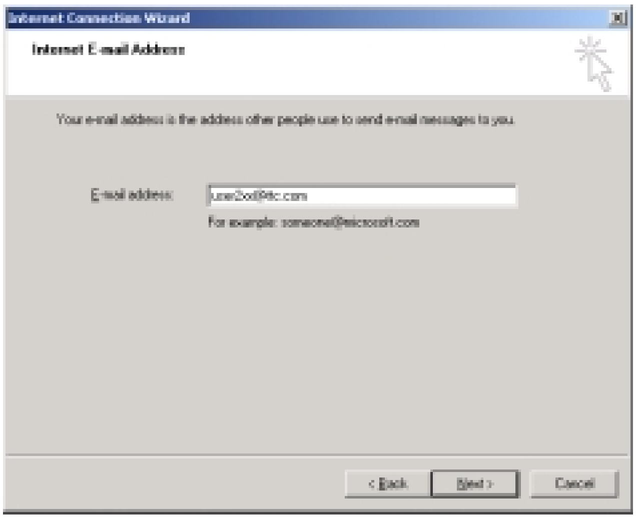
Your Name

When you send e-mail, your name will appear in the From field of the outgoing message. Type your name as you would like it to appear.

Display name: Robbie

For example: John Smith

3) Enter the mail adress (user2xx@tc.com)


Internet Connection Wizard

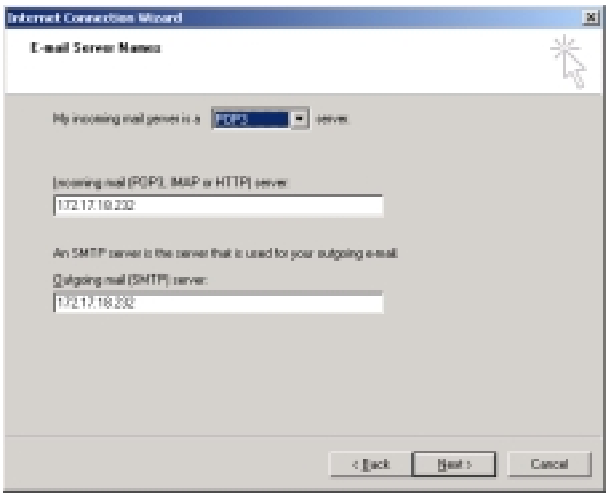
Internet E-mail Address

Your e-mail address is the address other people use to send e-mail messages to you.

E-mail address: user2xx@tc.com

For example: someone@microsoft.com

4) Enter the IP address or server name (172.17.18.232) for both Incoming- and outgoing mailserver


Internet Connection Wizard

E-mail Server Names

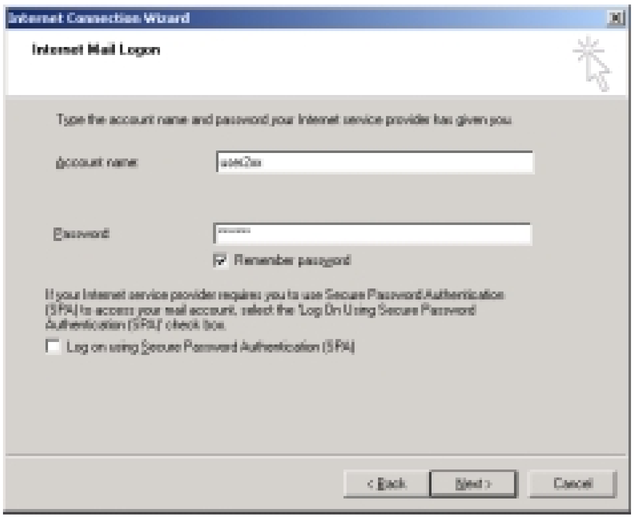
My incoming mail server is a POP3 server.

Incoming mail (POP3, IMAP or HTTP) server: 172.17.18.232

An SMTP server is the server that is used for your outgoing e-mail.

Outgoing mail (SMTP) server: 172.17.18.232

5) Enter account name (user2xx) and password (password)


Internet Connection Wizard

Internet Mail Logon

Type the account name and password your Internet service provider has given you.

Account name: user2xx

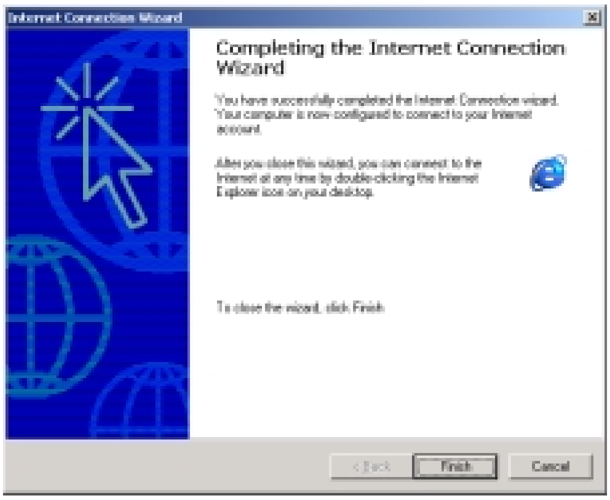
Password: ********

☑ Remember password

If your Internet service provider requires you to use Secure Password Authentication (SPA) to access your mail account, select the 'Log On Using Secure Password Authentication (SPA)' check box.

□ Log on using Secure Password Authentication (SPA)

6) Click Finish to complete the setup of your new mail account


Internet Connection Wizard

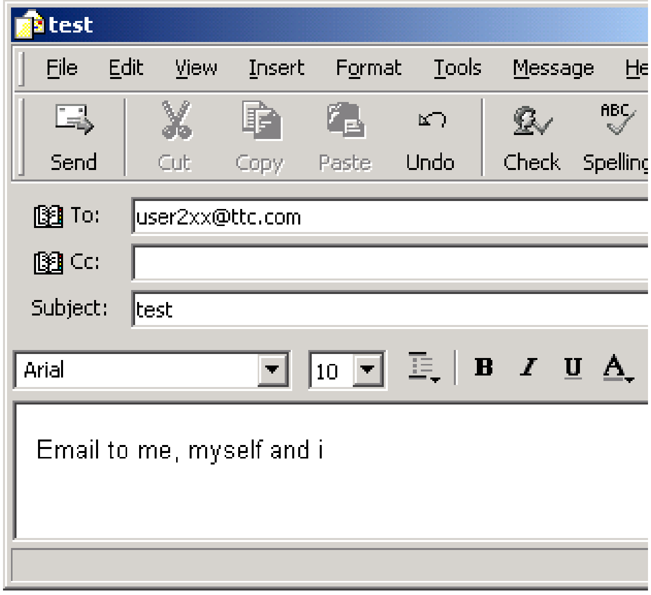
Completing the Internet Connection Wizard

You have successfully completed the Internet Connection wizard. Your computer is now configured to connect to your Internet account.

After you close this wizard, you can connect to the Internet at any time by double-clicking the Internet Explorer icon on your desktop.

To close the wizard, click Finish.

7) Send yourself a email to test the connection


test

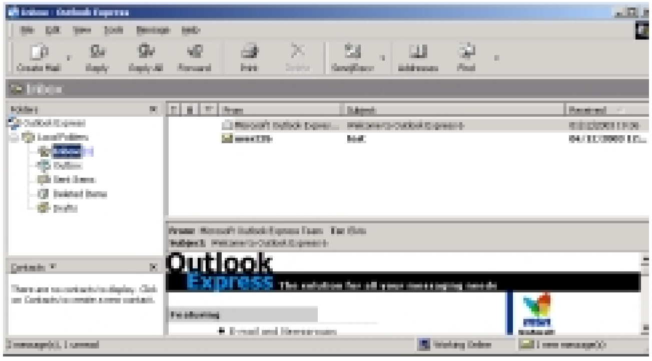
To: user2xx@ttc.com

Cc:

Subject: test

Email to me, myself and i

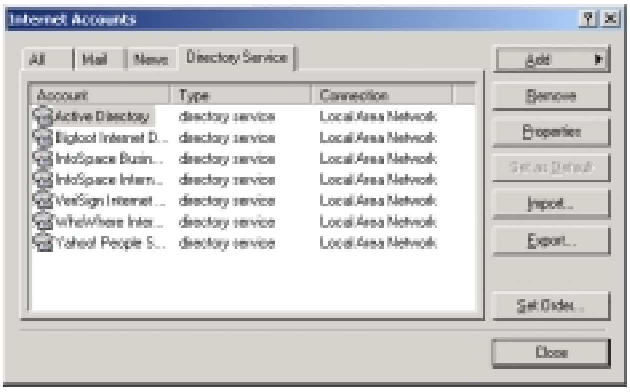
8) You now shouldt have received the email



2 Connecting outlook to an LDAP server.

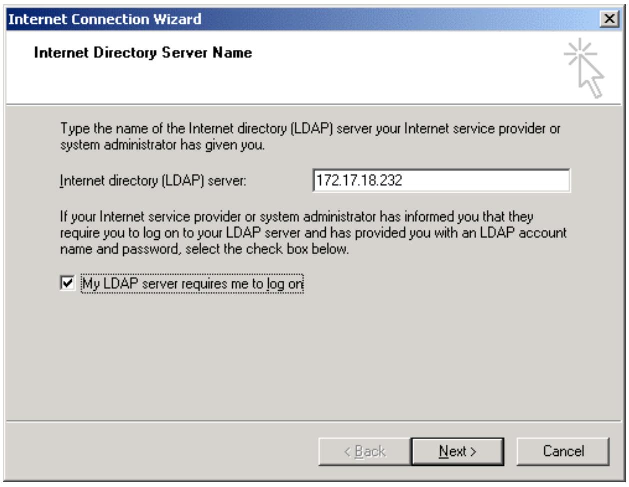
9) Click on the Tools menu and select Accounts

10) Now click on the Add button and select “Directory service...”



Account	Type	Connection
Active Directory	directory service	Local Area Network
Bigfoot Internet D...	directory service	Local Area Network
InfoSpace Busin...	directory service	Local Area Network
InfoSpace Intern...	directory service	Local Area Network
VeriSign Internet ...	directory service	Local Area Network
WhoWhere Inter...	directory service	Local Area Network
Yahoo! People S...	directory service	Local Area Network

11) Enter the server name (TTC-DC) or IP address (172.17.18.232)



Internet Directory Server Name

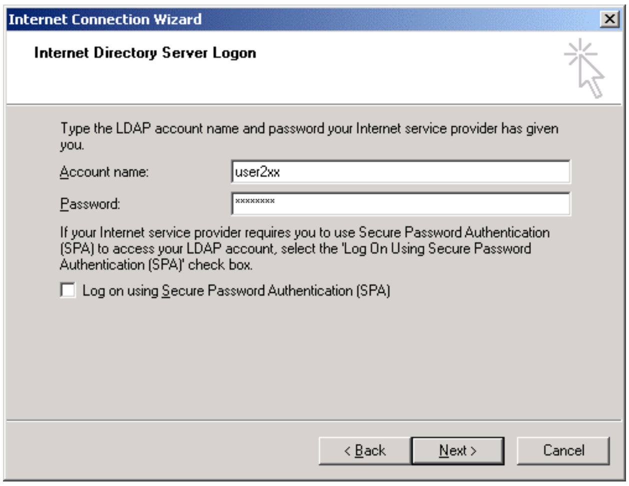
Type the name of the Internet directory (LDAP) server your Internet service provider or system administrator has given you.

Internet directory (LDAP) server: 172.17.18.232

If your Internet service provider or system administrator has informed you that they require you to log on to your LDAP server and has provided you with an LDAP account name and password, select the check box below.

☑ My LDAP server requires me to log on

12) Enter your username (user2xx) and your password (password)



Internet Directory Server Logon

Type the LDAP account name and password your Internet service provider has given you.

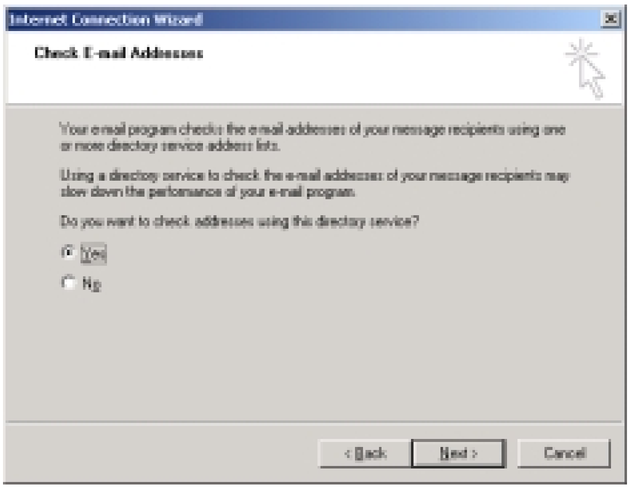
Account name: user2xx

Password: ********

If your Internet service provider requires you to use Secure Password Authentication (SPA) to access your LDAP account, select the 'Log On Using Secure Password Authentication (SPA)' check box.

□ Log on using Secure Password Authentication (SPA)

13) Select "Yes"



Check E-mail Addresses

Your e-mail program checks the e-mail addresses of your message recipients using one or more directory service address lists.

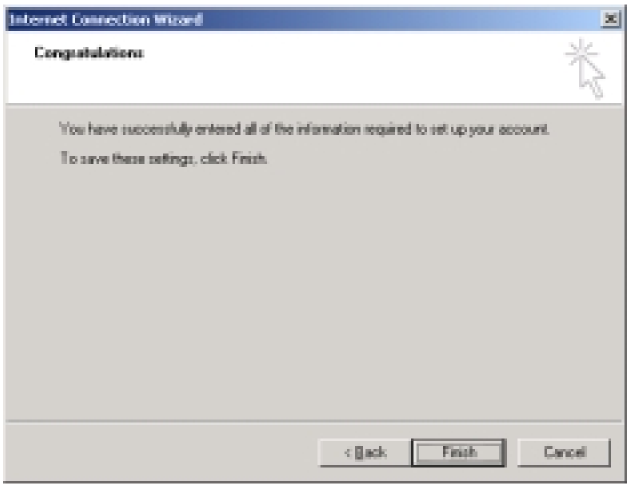
Using a directory service to check the e-mail addresses of your message recipients may slow down the performance of your e-mail program.

Do you want to check addresses using this directory service?

● Yes

○ No

14) Select "Finish".



Congratulations

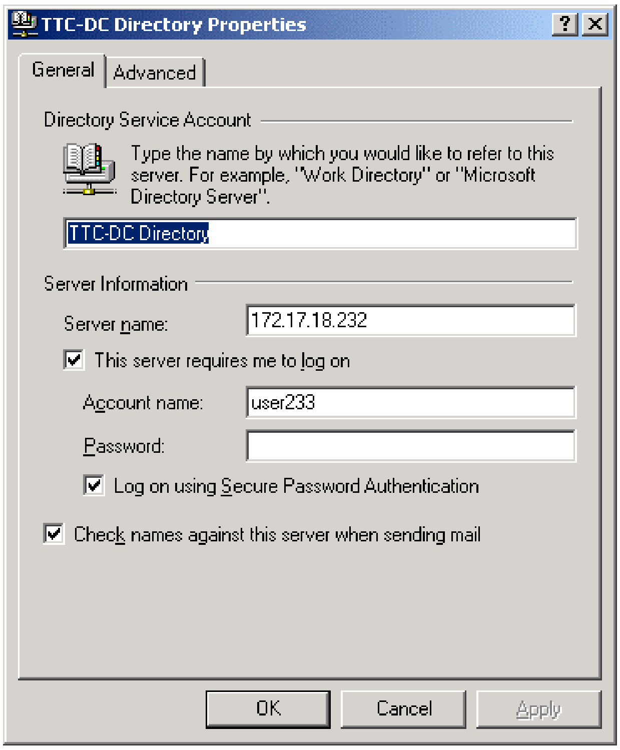
You have successfully entered all of the information required to set up your account.

To save these settings, click Finish.

15) Select the properties of the newly created directory service

16) Check all your entries.

NOTE: altough you have filled in the password field it will show an empty box!



TTC-DC Directory Properties

General | Advanced

Directory Service Account

Type the name by which you would like to refer to this server. For example, "Work Directory" or "Microsoft Directory Server".

TTC-DC Directory

Server Information

Server name: 172.17.18.232

☑ This server requires me to log on

Account name: user233

Password:

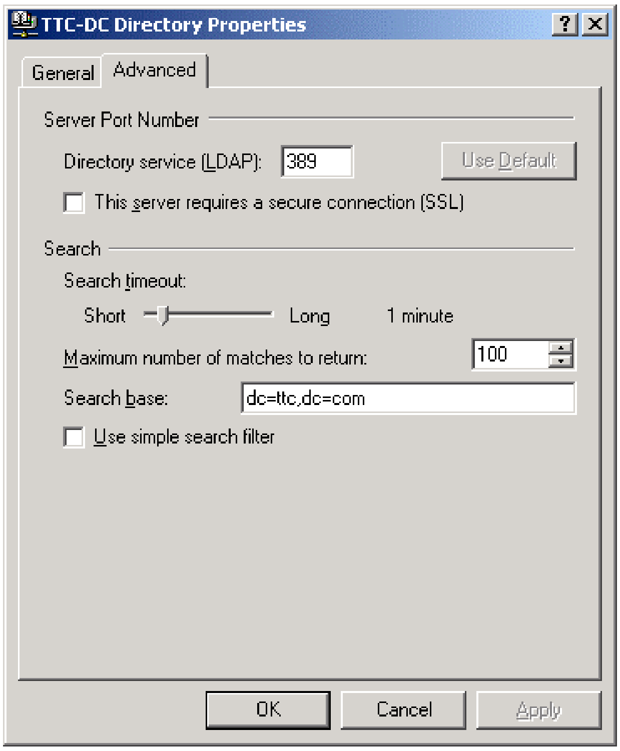
☑ Log on using Secure Password Authentication

☑ Check names against this server when sending mail

17) In the "Search base" field enter the Base DN and the port number and click "OK" and click "Close" to close the Internet accounts box

The default port number is 389

NOTE: remember that the used Search base (Base DN) depends on the type of LDAP Server used (in our case Windows Active Directory)



TTC-DC Directory Properties

General | Advanced

Server Port Number

Directory service (LDAP): 389

☐ This server requires a secure connection (SSL)

Search

Search timeout:

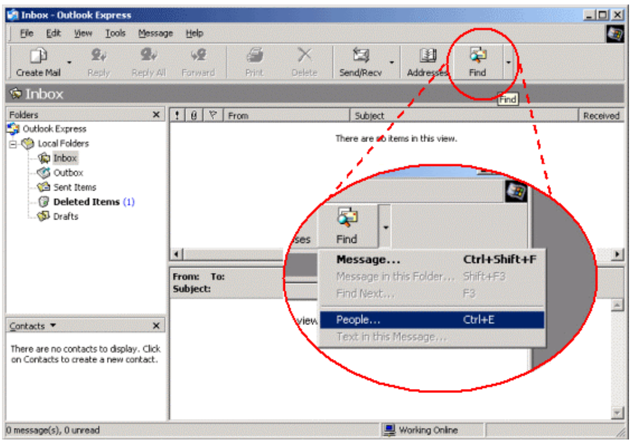
Short — Long 1 minute

Maximum number of matches to return: 100

Search base: dc=ttc,dc=com

☐ Use simple search filter

18) Select "Find->people"



Inbox - Outlook Express

There are no items in this view.

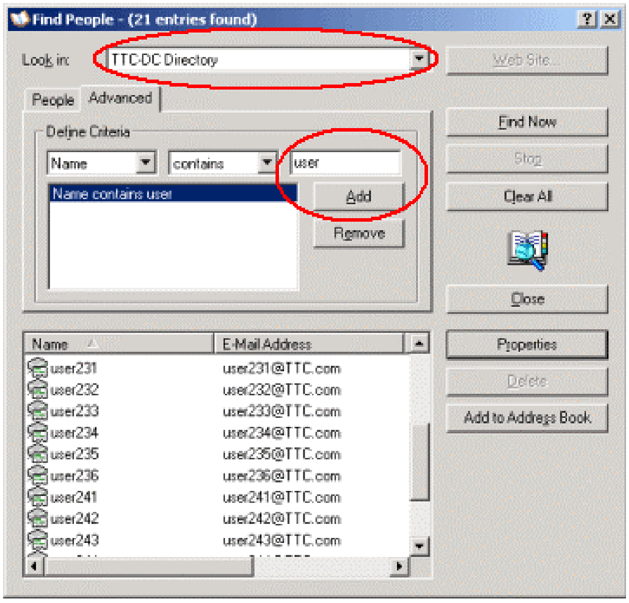
There are no contacts to display. Click on Contacts to create a new contact.

0 message(s), 0 unread

19) Select the newly created directory service

20) Define search criteria in the Advanced tab

You should find some users..


Find People - (21 entries found)

Look in: TTC-DC Directory

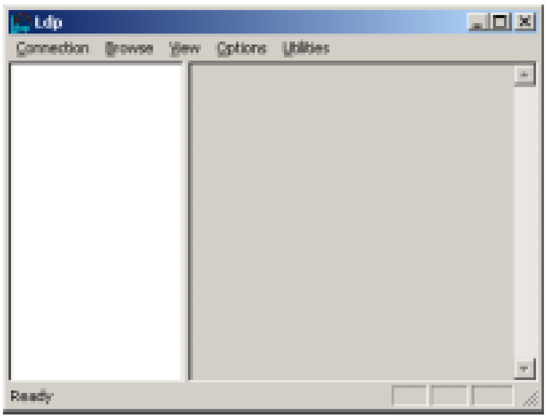
Define Criteria: Name | contains | user

Name contains user

Name	E-Mail Address
user231	user231@TTC.com
user232	user232@TTC.com
user233	user233@TTC.com
user234	user234@TTC.com
user235	user235@TTC.com
user236	user236@TTC.com
user241	user241@TTC.com
user242	user242@TTC.com
user243	user243@TTC.com

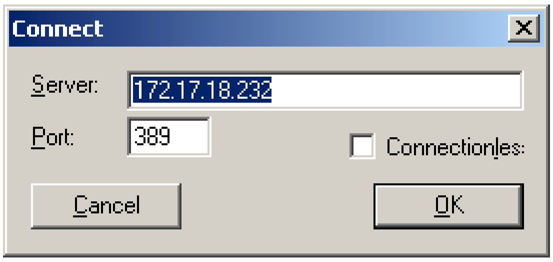
3 Tools: using MS LDAP Browser

Start the Ldp.exe
This program is on drive D in the subdirectory \LDAP Tools



Click on the “Connection” menu and select “Connect”

Enter the LDAP Servers IP-address and port number.

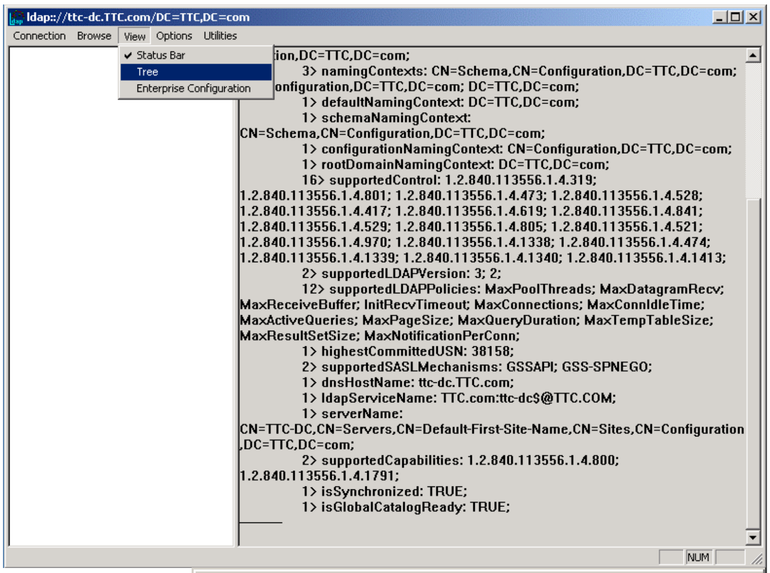


Server: 172.17.18.232

Port: 389

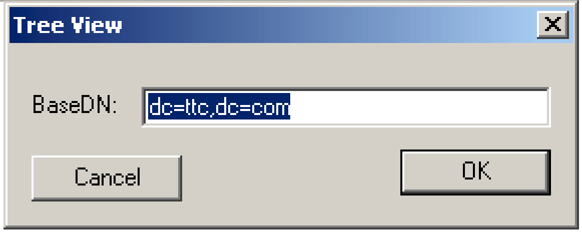
□ Connectionles:

Click on the “View” menu and select the “Tree” option



```
ion,DC=TTC,DC=com;
            3> namingContexts: CN=Schema,CN=Configuration,DC=TTC,DC=com;
onfiguration,DC=TTC,DC=com; DC=TTC,DC=com;
            1> defaultNamingContext: DC=TTC,DC=com;
            1> schemaNamingContext:
CN=Schema,CN=Configuration,DC=TTC,DC=com;
            1> configurationNamingContext: CN=Configuration,DC=TTC,DC=com;
            1> rootDomainNamingContext: DC=TTC,DC=com;
            16> supportedControl: 1.2.840.113556.1.4.319;
1.2.840.113556.1.4.801; 1.2.840.113556.1.4.473; 1.2.840.113556.1.4.528;
1.2.840.113556.1.4.417; 1.2.840.113556.1.4.619; 1.2.840.113556.1.4.841;
1.2.840.113556.1.4.529; 1.2.840.113556.1.4.805; 1.2.840.113556.1.4.521;
1.2.840.113556.1.4.970; 1.2.840.113556.1.4.1338; 1.2.840.113556.1.4.474;
1.2.840.113556.1.4.1339; 1.2.840.113556.1.4.1340; 1.2.840.113556.1.4.1413;
            2> supportedLDAPVersion: 3; 2;
            12> supportedLDAPPolicies: MaxPoolThreads; MaxDatagramRecv;
MaxReceiveBuffer; InitRecvTimeout; MaxConnections; MaxConnIdleTime;
MaxActiveQueries; MaxPageSize; MaxQueryDuration; MaxTempTableSize;
MaxResultSetSize; MaxNotificationPerConn;
            1> highestCommittedUSN: 38158;
            2> supportedSASLMechanisms: GSSAPI; GSS-SPNEGO;
            1> dnsHostName: ttc-dc.TTC.com;
            1> ldapServiceName: TTC.com:ttc-dc$@TTC.COM;
            1> serverName:
CN=TTC-DC,CN=Servers,CN=Default-First-Site-Name,CN=Sites,CN=Configuration
,DC=TTC,DC=com;
            2> supportedCapabilities: 1.2.840.113556.1.4.800;
1.2.840.113556.1.4.1791;
            1> isSynchronized: TRUE;
            1> isGlobalCatalogReady: TRUE;
```

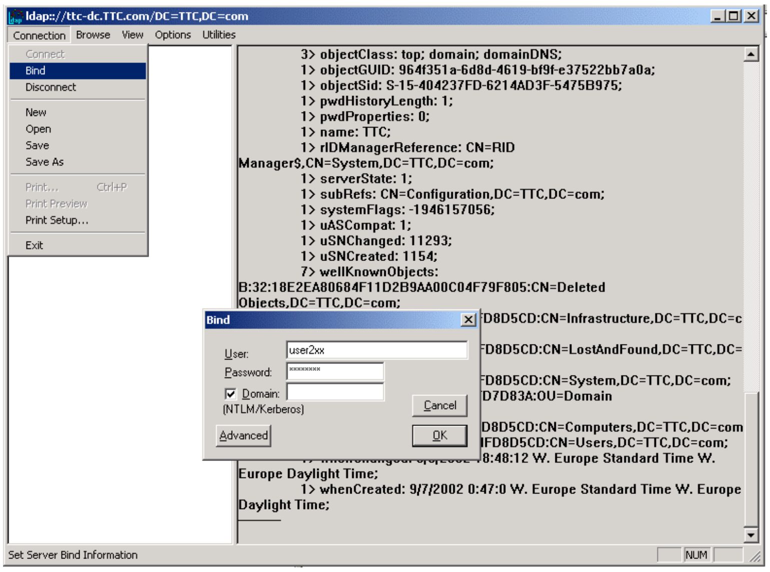
Enter the base DN and click “OK”



BaseDN: dc=ttc,dc=com

Click on the “Connection” menu and select “Bind” to bring up the authentication screen.

Authenticate with the server by typing your username (user2xx) and your password (password)



User: user2xx

Password: ********

☑ Domain:

(NTLM/Kerberos)

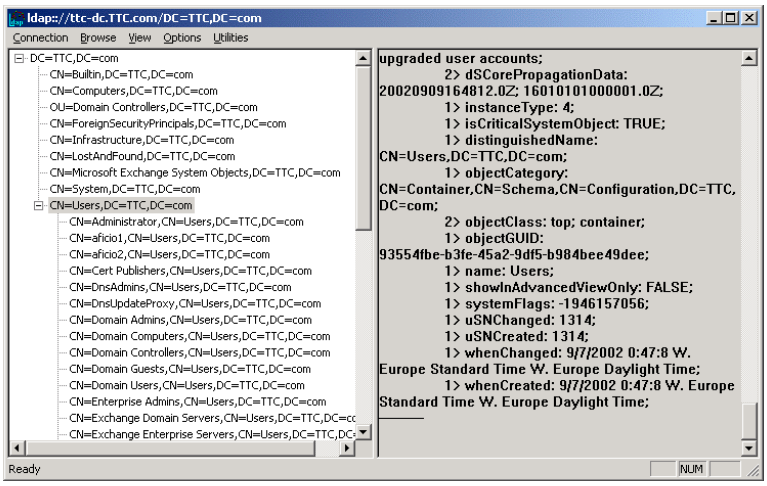
```
          3> objectClass: top; domain; domainDNS;
          1> objectGUID: 964f351a-6d8d-4619-bf9f-e37522bb7a0a;
          1> objectSid: S-15-404237FD-6214AD3F-5475B975;
          1> pwdHistoryLength: 1;
          1> pwdProperties: 0;
          1> name: TTC;
          1> rIDManagerReference: CN=RID
Manager$,CN=System,DC=TTC,DC=com;
          1> serverState: 1;
          1> subRefs: CN=Configuration,DC=TTC,DC=com;
          1> systemFlags: -1946157056;
          1> uASCompat: 1;
          1> uSNChanged: 11293;
          1> uSNCreated: 1154;
          7> wellKnownObjects:
B:32:18E2EA80684F11D2B9AA00C04F79F805:CN=Deleted
Objects,DC=TTC,DC=com;
                         FD8D5CD:CN=Infrastructure,DC=TTC,DC=c

                         FD8D5CD:CN=LostAndFound,DC=TTC,DC=

                         FD8D5CD:CN=System,DC=TTC,DC=com;
                         D7D83A:OU=Domain

                         D8D5CD:CN=Computers,DC=TTC,DC=com
                         IFD8D5CD:CN=Users,DC=TTC,DC=com;
                         8:48:12 W. Europe Standard Time W.
Europe Daylight Time;
          1> whenCreated: 9/7/2002 0:47:0 W. Europe Standard Time W. Europe
Daylight Time;
```

You should be able to see the directory tree now



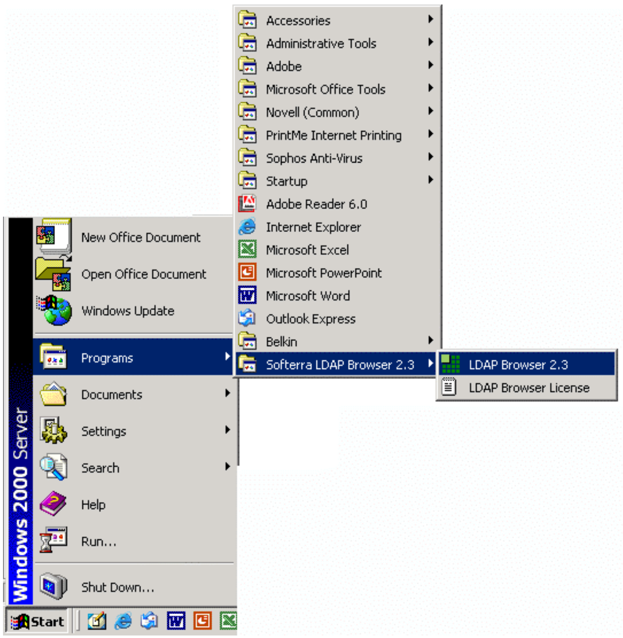
```
⊟ DC=TTC,DC=com
    CN=Builtin,DC=TTC,DC=com
    CN=Computers,DC=TTC,DC=com
    OU=Domain Controllers,DC=TTC,DC=com
    CN=ForeignSecurityPrincipals,DC=TTC,DC=com
    CN=Infrastructure,DC=TTC,DC=com
    CN=LostAndFound,DC=TTC,DC=com
    CN=Microsoft Exchange System Objects,DC=TTC,DC=com
    CN=System,DC=TTC,DC=com
  ⊟ CN=Users,DC=TTC,DC=com
      CN=Administrator,CN=Users,DC=TTC,DC=com
      CN=aficio1,CN=Users,DC=TTC,DC=com
      CN=aficio2,CN=Users,DC=TTC,DC=com
      CN=Cert Publishers,CN=Users,DC=TTC,DC=com
      CN=DnsAdmins,CN=Users,DC=TTC,DC=com
      CN=DnsUpdateProxy,CN=Users,DC=TTC,DC=com
      CN=Domain Admins,CN=Users,DC=TTC,DC=com
      CN=Domain Computers,CN=Users,DC=TTC,DC=com
      CN=Domain Controllers,CN=Users,DC=TTC,DC=com
      CN=Domain Guests,CN=Users,DC=TTC,DC=com
      CN=Domain Users,CN=Users,DC=TTC,DC=com
      CN=Enterprise Admins,CN=Users,DC=TTC,DC=com
      CN=Exchange Domain Servers,CN=Users,DC=TTC,DC=cc
      CN=Exchange Enterprise Servers,CN=Users,DC=TTC,DC=
```

```
upgraded user accounts;
          2> dSCorePropagationData:
20020909164812.0Z; 16010101000001.0Z;
          1> instanceType: 4;
          1> isCriticalSystemObject: TRUE;
          1> distinguishedName:
CN=Users,DC=TTC,DC=com;
          1> objectCategory:
CN=Container,CN=Schema,CN=Configuration,DC=TTC,
DC=com;
          2> objectClass: top; container;
          1> objectGUID:
93554fbe-b3fe-45a2-9df5-b984bee49dee;
          1> name: Users;
          1> showInAdvancedViewOnly: FALSE;
          1> systemFlags: -1946157056;
          1> uSNChanged: 1314;
          1> uSNCreated: 1314;
          1> whenChanged: 9/7/2002 0:47:8 W.
Europe Standard Time W. Europe Daylight Time;
          1> whenCreated: 9/7/2002 0:47:8 W. Europe
Standard Time W. Europe Daylight Time;
```

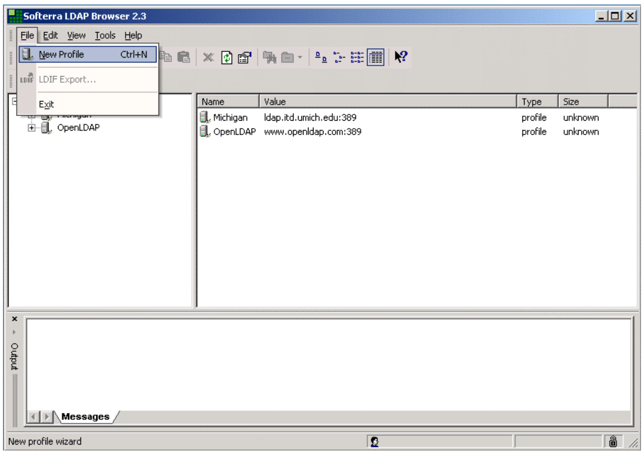
4 Browsing LDAP servers using Softerra LDAP Browser.

Doubleclick the ldapbrowser23 icon in the \LDAP Tools directory on drive D to start the installation

Accept the License Agreement and click Next 99 times (keep all the default choices)
Start the Softerra LDAP Browser by clicking Start > Programs > Softerra LDAP Browser 2.3

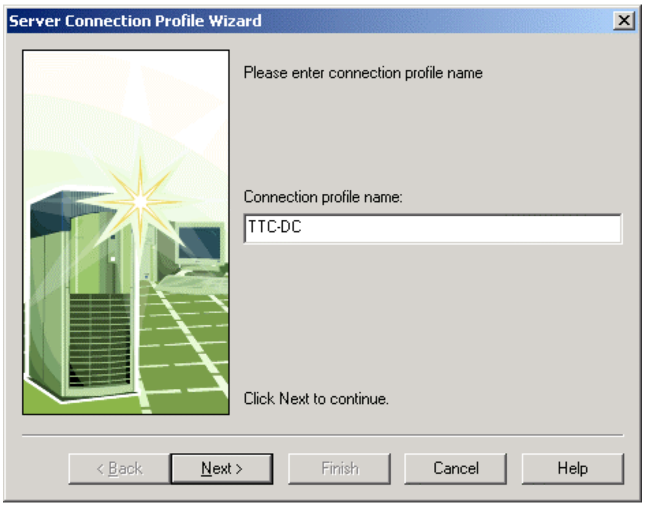


Click on the "File" menu and select "New Profile"



Name	Value	Type	Size
Michigan	ldap.itd.umich.edu:389	profile	unknown
OpenLDAP	www.openldap.com:389	profile	unknown

Type a descriptive name for your profile and click "Next"



Please enter connection profile name

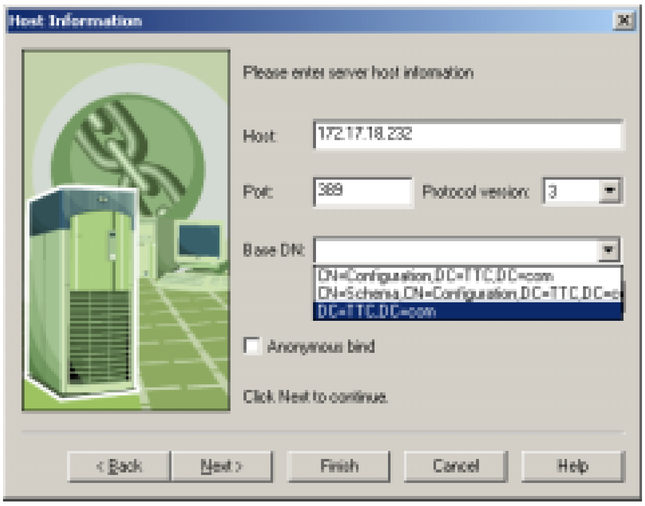
Connection profile name: TTC-DC

Click Next to continue.

Now we will have to fill in the host (directory server) information

You can see this tool finds the base DN by itself by click on the “Fetch…” button

Select the Base DN “DC=TTC,DC=COM” and click “Next”



Please enter server host information

Host: 172.17.18.232

Port: 389 Protocol version: 3

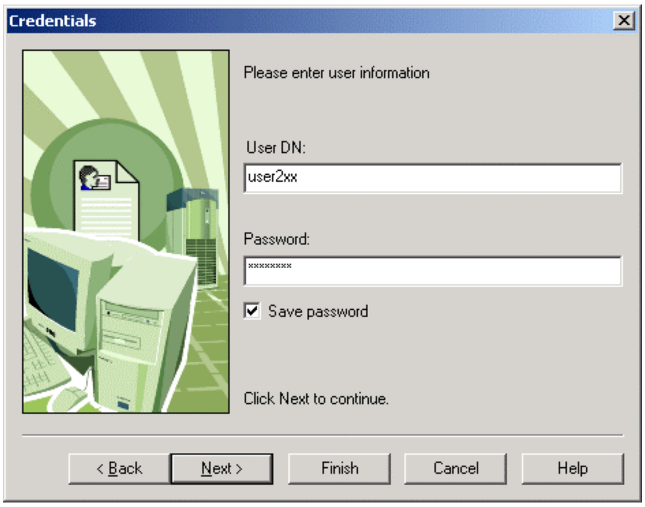
Base DN:

CN=Configuration,DC=TTC,DC=com
CN=Schema,CN=Configuration,DC=TTC,DC=c
DC=TTC,DC=com

☐ Anonymous bind

Click Next to continue.

Now to authenticate with the LDAP Server fill in your username (user2xx) and password (password) and click “Next”



Please enter user information

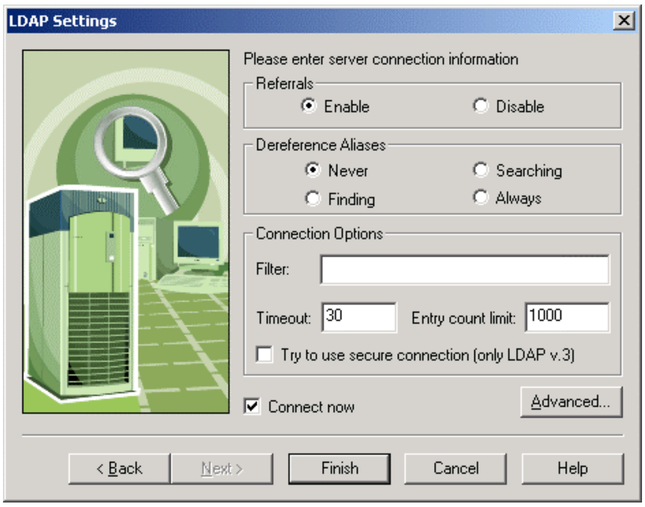
User DN: user2xx

Password: ********

☑ Save password

Click Next to continue.

We want to see the complete content from the Base DN of the selected LDAP server so clear the “Filter” box and click “Finish”



Please enter server connection information

Referrals
● Enable ○ Disable

Dereference Aliases
● Never ○ Searching
○ Finding ○ Always

Connection Options

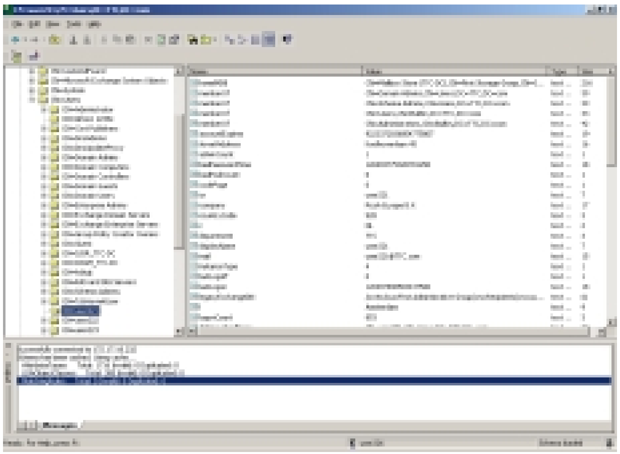
Filter:

Timeout: 30 Entry count limit: 1000

☐ Try to use secure connection (only LDAP v.3)

☑ Connect now

After that, your profile has been setup and you can now easaly browse the directory tree



Objective

- ✓ Installation
- ✓ Configuration

Required materials

- ✓ Notes Domino Server
- ✓ Client PC
- ✓ Notes CD ROM

Introduction

This exercise helps for better understanding about the Notes Client installation and configuration.

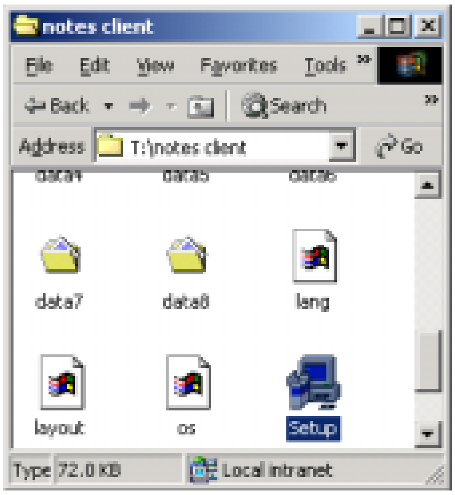
Content

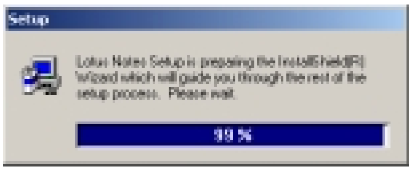
1.1 Client Installation

1) run setup from D:\notes

Or`

The next wizard screens will appear. Just follow the screens and fill in the relevant information.

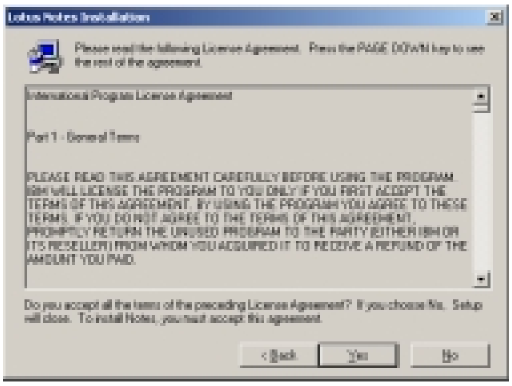



Setup

Lotus Notes Setup is preparing the InstallShield(R) Wizard which will guide you through the rest of the setup process. Please wait.

99 %

2) Click “Yes”



Lotus Notes Installation

Please read the following License Agreement. Press the PAGE DOWN key to see the rest of the agreement.

International Program License Agreement

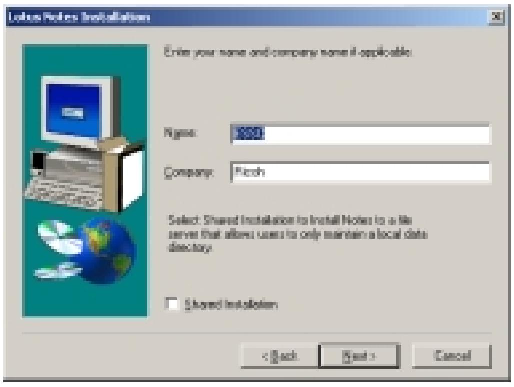
Part 1 - General Terms

PLEASE READ THIS AGREEMENT CAREFULLY BEFORE USING THE PROGRAM. IBM WILL LICENSE THE PROGRAM TO YOU ONLY IF YOU FIRST ACCEPT THE TERMS OF THIS AGREEMENT. BY USING THE PROGRAM YOU AGREE TO THESE TERMS. IF YOU DO NOT AGREE TO THE TERMS OF THIS AGREEMENT, PROMPTLY RETURN THE UNUSED PROGRAM TO THE PARTY (EITHER IBM OR ITS RESELLER) FROM WHOM YOU ACQUIRED IT TO RECEIVE A REFUND OF THE AMOUNT YOU PAID.

Do you accept all the terms of the preceding License Agreement? If you choose No, Setup will close. To install Notes, you must accept this agreement.

3) Enter your name and company

✓ Click “Next”



Lotus Notes Installation

Enter your name and company name if applicable.

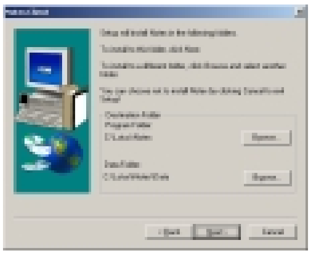
Name: [illegible]

Company: Ricoh

Select Shared Installation to Install Notes to a file server that allows users to only maintain a local data directory.

□ Shared Installation

4) Click “Next” 2 times



Setup will install Notes in the following folders.

To install to this folder, click Next.

To install to a different folder, click Browse and select another folder.

You can choose not to install Notes by clicking Cancel to exit Setup.

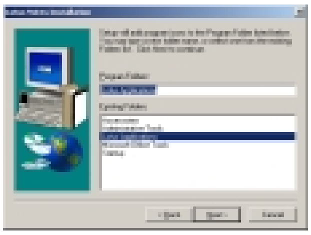
Destination Folder

Program Folder

C:\Lotus\Notes

Data Folder

C:\Lotus\Notes\Data



Lotus Notes Installation

Setup will add program icons to the Program Folder listed below. You may type a new folder name, or select one from the existing Folders list. Click Next to continue.

Program Folders:

Lotus Applications

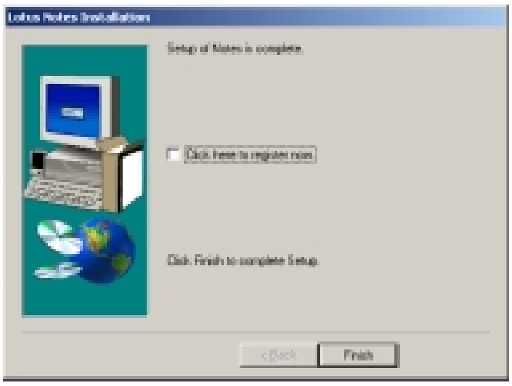
Existing Folders:

Accessories
Administrative Tools
Lotus Applications
Microsoft Office Tools
Startup

Copying files

[illegible]

5) Click “Finish”



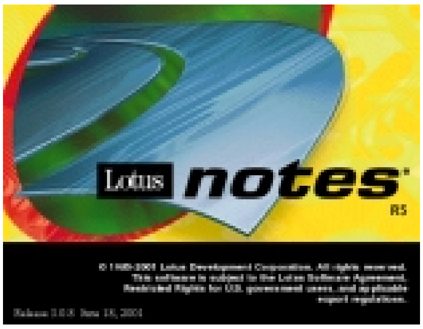
Lotus Notes Installation

Setup of Notes is complete.

□ Click here to register now.

Click Finish to complete Setup.

6) Launch Lotus Notes



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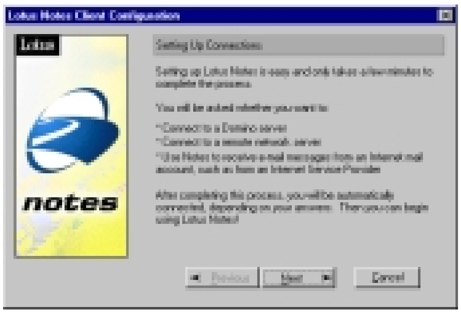
export regulations.

Release 5.0.8 June 18, 2001

7) Click "Next"



Setting Up Connections

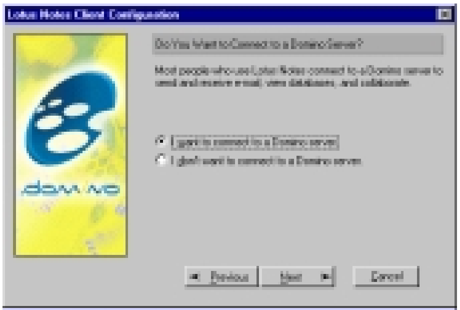
Setting up Lotus Notes is easy and only takes a few minutes to complete the process.

You will be asked whether you want to:

*Connect to a Domino server
*Connect to a remote network server
*Use Notes to receive e-mail messages from an Internet mail account, such as from an Internet Service Provider

After completing this process, you will be automatically connected, depending on your answers. Then you can begin using Lotus Notes!

8) Click "Next"

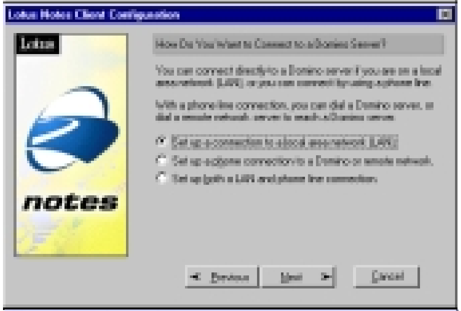


Do You Want to Connect to a Domino Server?

Most people who use Lotus Notes connect to a Domino server to send and receive e-mail, view databases, and collaborate.

● I want to connect to a Domino server
○ I don't want to connect to a Domino server

9) Click "Next"



How Do You Want to Connect to a Domino Server?

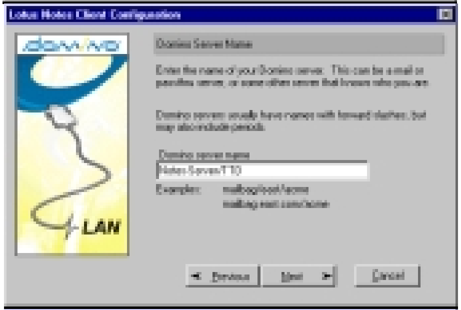
You can connect directly to a Domino server if you are on a local area network (LAN), or you can connect by using a phone line.

With a phone line connection, you can dial a Domino server, or dial a remote network server to reach a Domino server.

● Set up a connection to a local area network (LAN)
○ Set up a phone connection to a Domino or remote network.
○ Set up both a LAN and phone line connection.

10) Enter the IP address for Domino Server

(IP address 172.17.18.231)



Domino Server Name

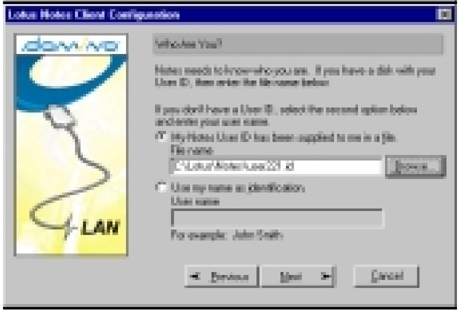
Enter the name of your Domino server. This can be a mail or passthru server, or some other server that knows who you are.

Domino servers usually have names with forward slashes, but may also include periods.

Domino server name
Notes Server/T10

Examples: mailbag/boston/acme
mailbag.east.com/acme

11) Tell the Domino Server who you are. If you have the User ID' s available you can browse for the ID.



Who Are You?

Notes needs to know who you are. If you have a disk with your User ID, then enter the file name below.

If you don't have a User ID, select the second option below and enter your user name.

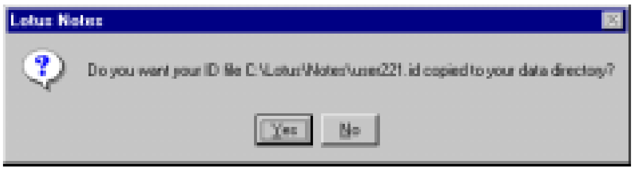
● My Notes User ID has been supplied to me in a file.
File name
C:\Lotus\Notes\user221.id

○ Use my name as identification.
User name

For example: John Smith

12) On the question, do you want your ID file copied to your data Directory?

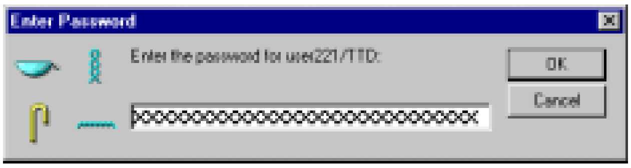
- ✓ Click “Yes”



Do you want your ID file C:\Lotus\Notes\user221.id copied to your data directory?

13) Enter the users password

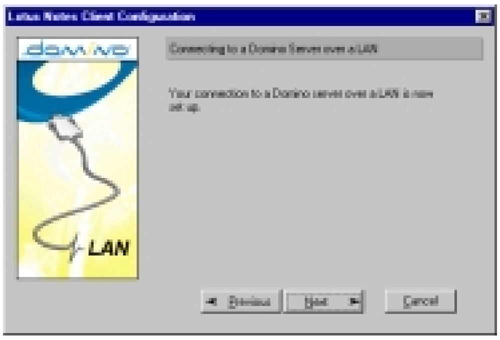
- ✓ Click “OK”



Enter the password for user221/TTD:

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

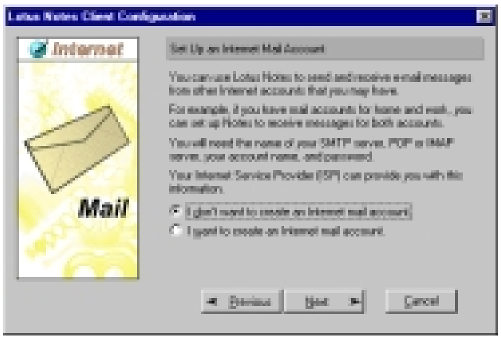
14) Click “Next”.



Connecting to a Domino Server over a LAN

Your connection to a Domino server over a LAN is now set up.

15) Click “Next”.



Set Up an Internet Mail Account

You can use Lotus Notes to send and receive e-mail messages from other Internet accounts that you may have.

For example, if you have mail accounts for home and work, you can set up Notes to receive messages for both accounts.

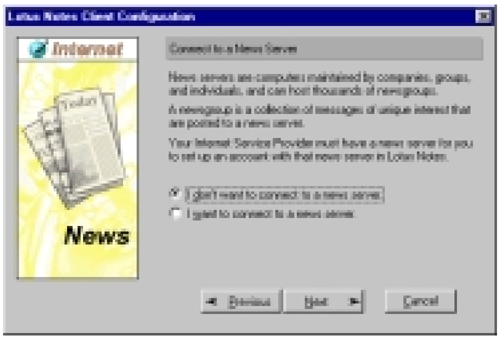
You will need the name of your SMTP server, POP or IMAP server, your account name, and password.

Your Internet Service Provider (ISP) can provide you with this information.

● I don't want to create an Internet mail account.

○ I want to create an Internet mail account.

16) The next wizard screens will appear. Just follow the screens and fill in the relevant information.



Connect to a News Server

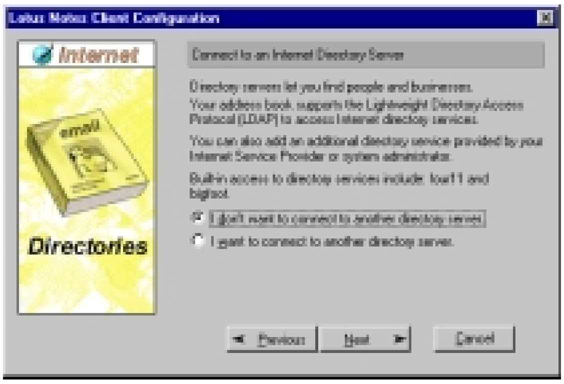
News servers are computers maintained by companies, groups, and individuals, and can host thousands of newsgroups.

A newsgroup is a collection of messages of unique interest that are posted to a news server.

Your Internet Service Provider must have a news server for you to set up an account with that news server in Lotus Notes.

● I don't want to connect to a news server.

○ I want to connect to a news server.



Connect to an Internet Directory Server

Directory servers let you find people and businesses.

Your address book supports the Lightweight Directory Access Protocol (LDAP) to access Internet directory services.

You can also add an additional directory service provided by your Internet Service Provider or system administrator.

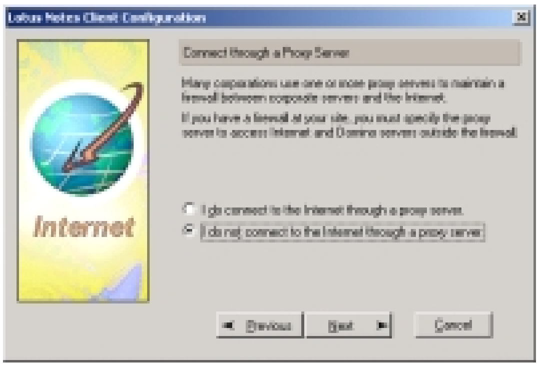
Built-in access to directory services include: four11 and bigfoot.

● I don't want to connect to another directory server.

○ I want to connect to another directory server.

17) Select “No directory server”

18) Select “No Proxy”, Click “next”



Lotus Notes Client Configuration

Connect through a Proxy Server

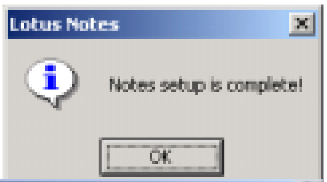
Many corporations use one or more proxy servers to maintain a firewall between corporate servers and the Internet.

If you have a firewall at your site, you must specify the proxy server to access Internet and Domino servers outside the firewall.

○ I do connect to the Internet through a proxy server.
● I do not connect to the Internet through a proxy server

19) Notes Setup is complete now.

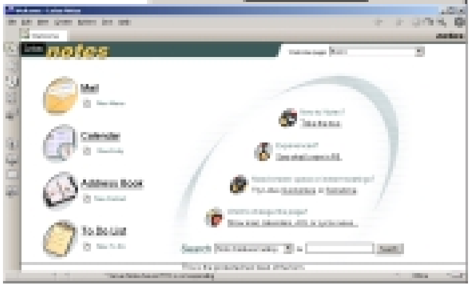
✓ Click “OK”



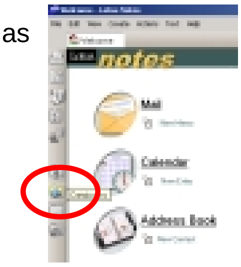
Lotus Notes

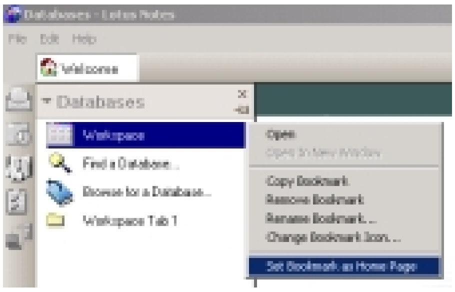
Notes setup is complete!

20) The welcome screen will appear

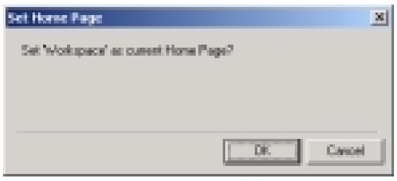


21) Click “Databases” and rightclick Workspace. Select “set bookmark as Home Page





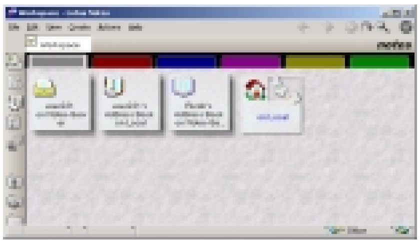
22) Confirm and click OK



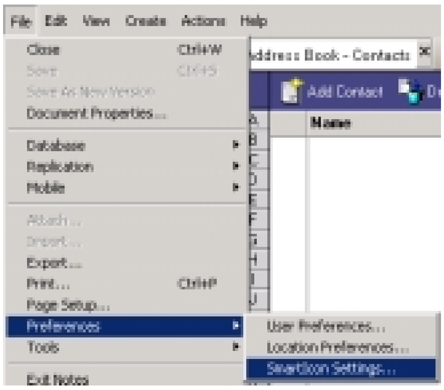
Set Home Page

Set 'Workspace' as current Home Page?

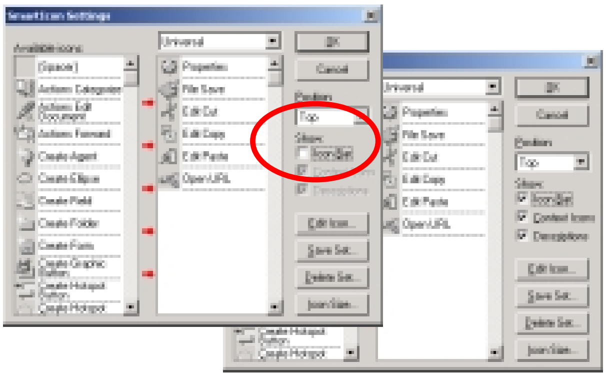
23) The next screens will appear.



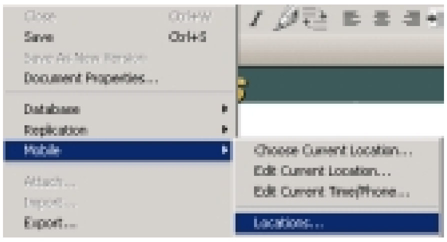
24) To make sure that the smarticons will be shown select File > Preferences > SmartIcon Settings



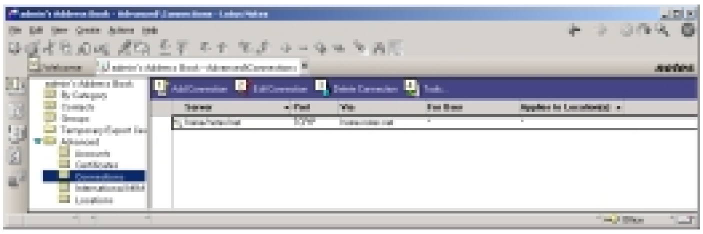
25) Enable the Icon Bar



26) To Add a connection with the domino server select File > Mobile > Locations

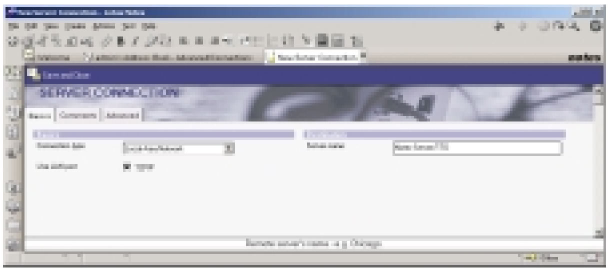


27) Select Add Connection



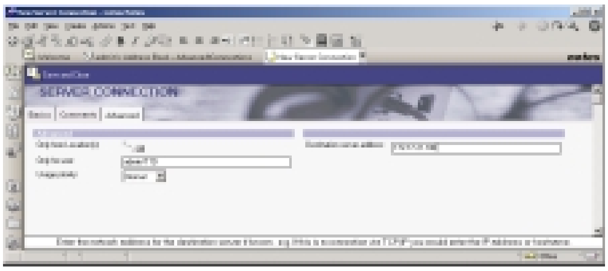
28) Select following settings:

- Connection Type: Local Area Network
- Use LAN Port: TCPIP
- Server Name: Notes-Server/TTD

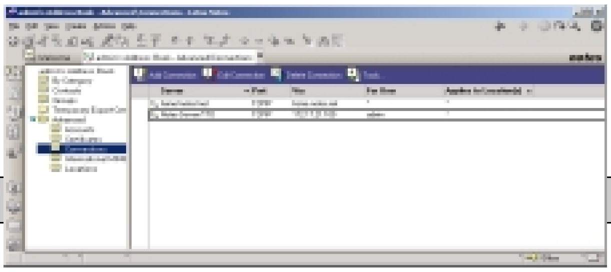


29) Select the Advanced TAB

- For the Destination Server Address enter the IP Address 172.17.18.231



30) Now that the connection is added it should be possible to send and receive notes mail.



Notes Client is running

Outlook Mail

Exercise

Objective

- ✓ Installation
- ✓ Configuration

Required materials

- ✓ 2000 Domain Controller
- ✓ Exchange

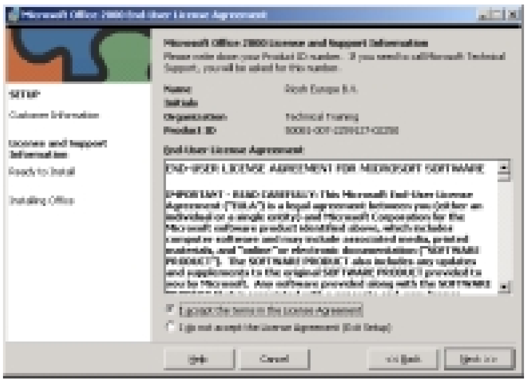
Introduction

This exercise will help for a better understanding about mail configuration.

Content

1 Set-up outlook for classroom practice (with exchange mail server).

1) Run through the installation wizard for Outlook (not outlook express).



Microsoft Office 2000 License and Support Information

Please write down your Product ID number. If you need to call Microsoft Technical Support, you will be asked for this number.

Name: Ricoh Europe B.V.

Initials

Organization: Technical Training

Product ID: 50001-007-2299127-02258

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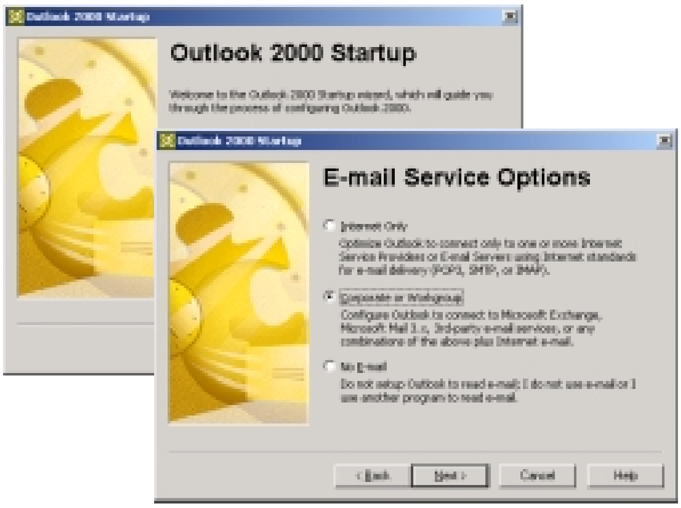
● I accept the terms in the License Agreement

○ I do not accept the License Agreement (Exit Setup)

2) Continue with the Outlook 2000 Startup wizard.

For E-mail Service Options select the Corporate or Workgroup option.



Outlook 2000 Startup

Welcome to the Outlook 2000 Startup wizard, which will guide you through the process of configuring Outlook 2000.

E-mail Service Options

○ Internet Only

Optimize Outlook to connect only to one or more Internet Service Providers or E-mail Servers using Internet standards for e-mail delivery (POP3, SMTP, or IMAP).

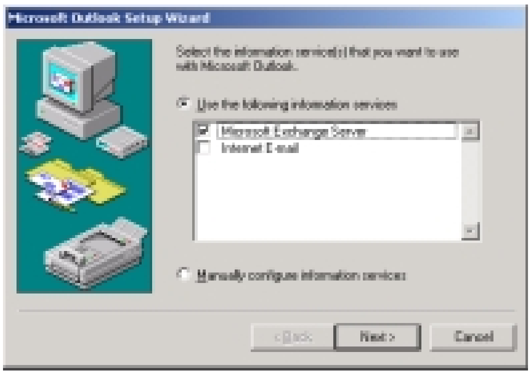
● Corporate or Workgroup

Configure Outlook to connect to Microsoft Exchange, Microsoft Mail 3.x, 3rd-party e-mail services, or any combinations of the above plus Internet e-mail.

○ No E-mail

Do not setup Outlook to read e-mail; I do not use e-mail or I use another program to read e-mail.

3) For Information service select Microsoft Exchange Server



Select the information service(s) that you want to use with Microsoft Outlook.

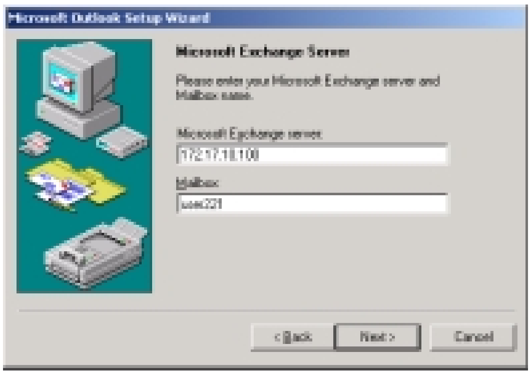
● Use the following information services

☑ Microsoft Exchange Server

☐ Internet E-mail

○ Manually configure information services

4) Enter the Microsoft Exchange server IP Address (172.17.10.100) and enter your Mailbox (User2xx).



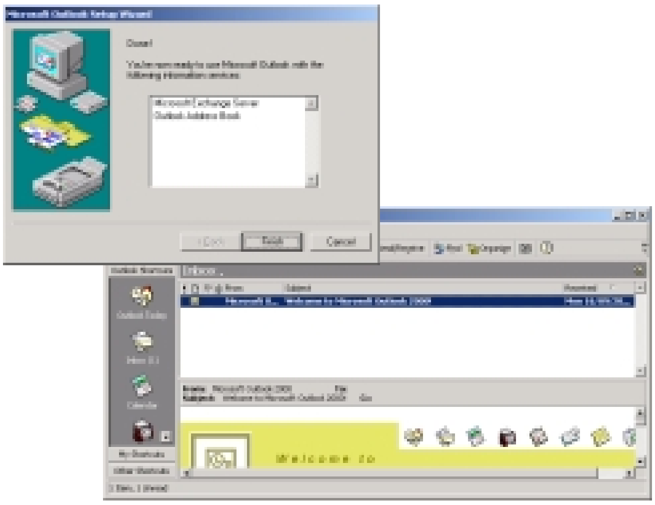
Microsoft Exchange Server

Please enter your Microsoft Exchange server and Mailbox name.

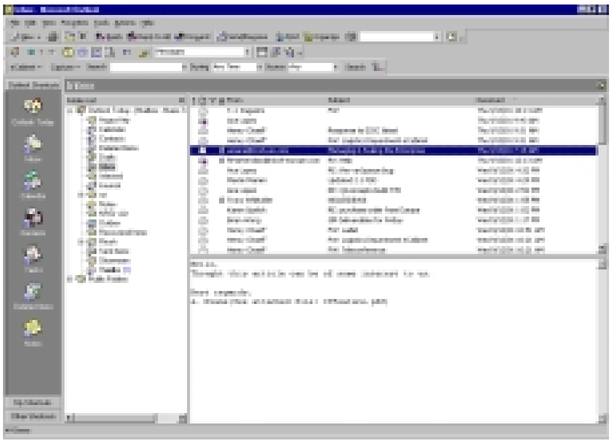
Microsoft Exchange server: 172.17.10.100

Mailbox: user221

5) Click Finish.

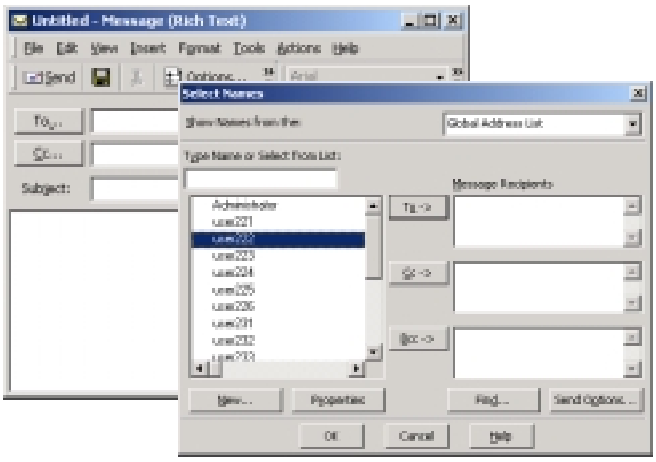


6) Open outlook.

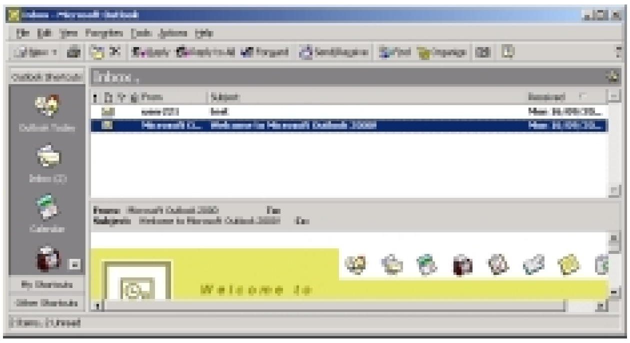


7) Select New Mail and click To. From the Global Address List you can select the correct user.

For example (user2xx@tc.com)



8) Click Send\Recv button to see if your email coming in.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test
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