

LDAP Guide

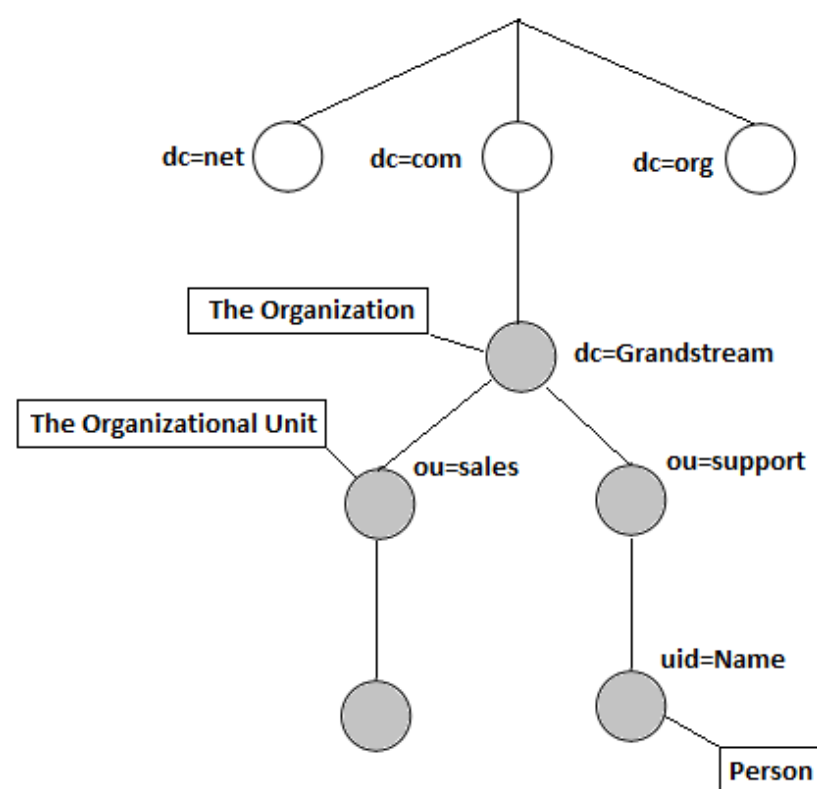
LDAP (Lightweight Directory Access Protocol) is a client/server protocol used to access and manage directory information over Internet Protocol, the core LDAP specifications are defined in RFC4511.

Just as a Database Management System is used to process queries and updates to a database, an LDAP server behave the same way. In other words, an LDAP information directory is a type of database, unlike databases that are designed for processing hundreds or thousands of changes per minute, LDAP directories are heavily optimized for read performance.

The LDAP information model is based on entries. An entry is a collection of attributes that has a globally-unique Distinguished Name (DN). The DN is used to refer to the entry. Each of the entry's attributes has a type and one or more values. The types are typically mnemonic strings, like "cn" for Common Name, or "mail" for Email Address. The syntax of values depends on the attribute type.

In LDAP directory, entries are arranged in a hierarchical tree-like structure. Traditionally, this structure reflects geographic and/or organizational boundaries. Entries representing countries appear at the top of the tree, followed by entries representing states and national organizations, then entries representing organizational units, people, printers, documents...

Figure below shows an example of LDAP directory tree.



LDAP Tree

INSTALLING AND CONFIGURING LDAP SERVER

In this tutorial, we will use "ApacheDirectoryStudio" which is a free LDAP server.

Installing ApacheDS LDAP Server

Prerequisites

JDK needs to be installed on PC to run ApacheDS, it can be downloaded from the link: [Download JDK](#)

Download and Install ApacheDS

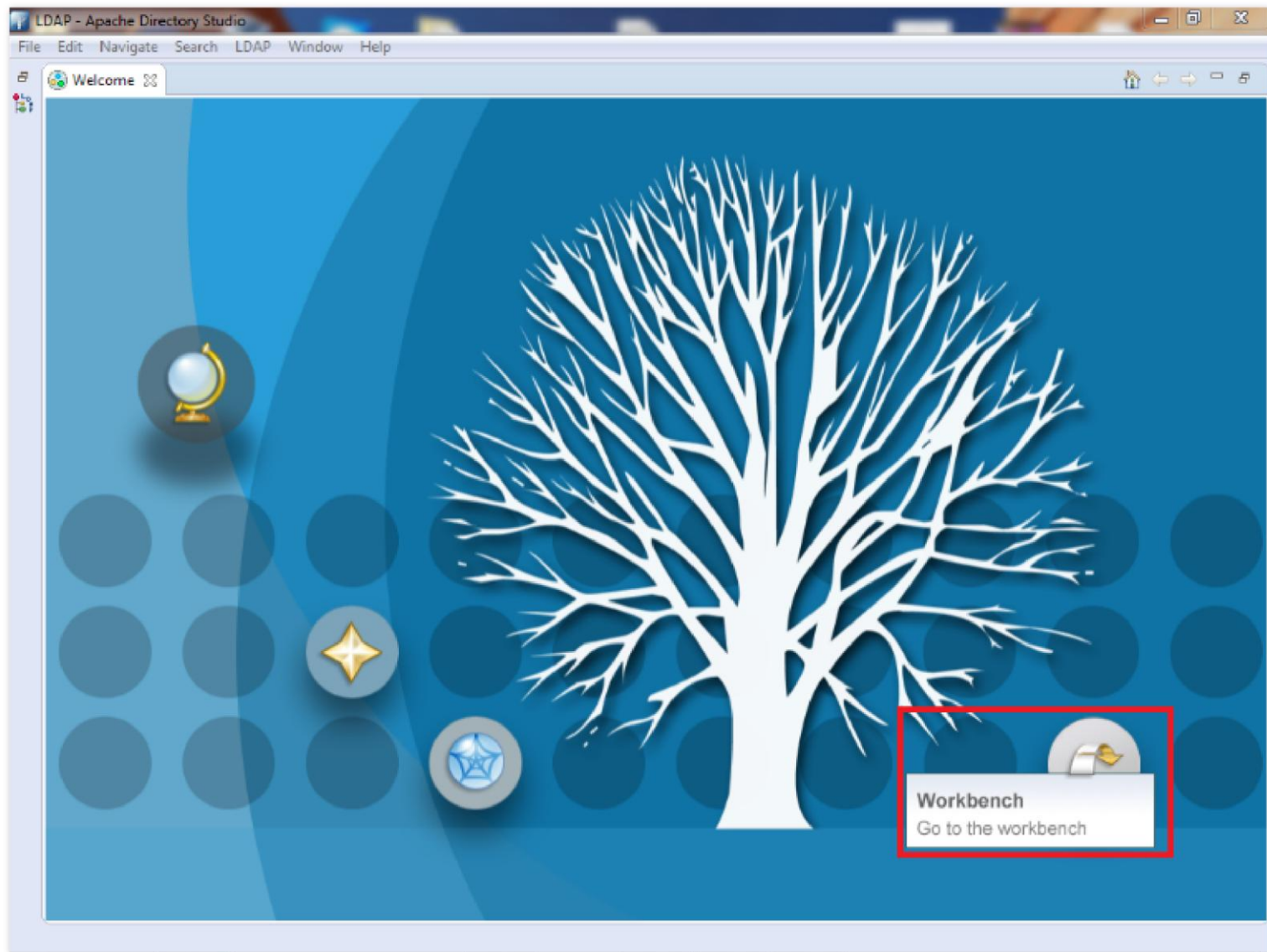
The ApacheDS server software can be downloaded for free from below link:

<http://directory.apache.org/studio/download/download-windows.html>

1. Download the Software from above link.
2. Follow the default steps for installation.

3. Launch the application.

Following first start page will be visible when launching the application.

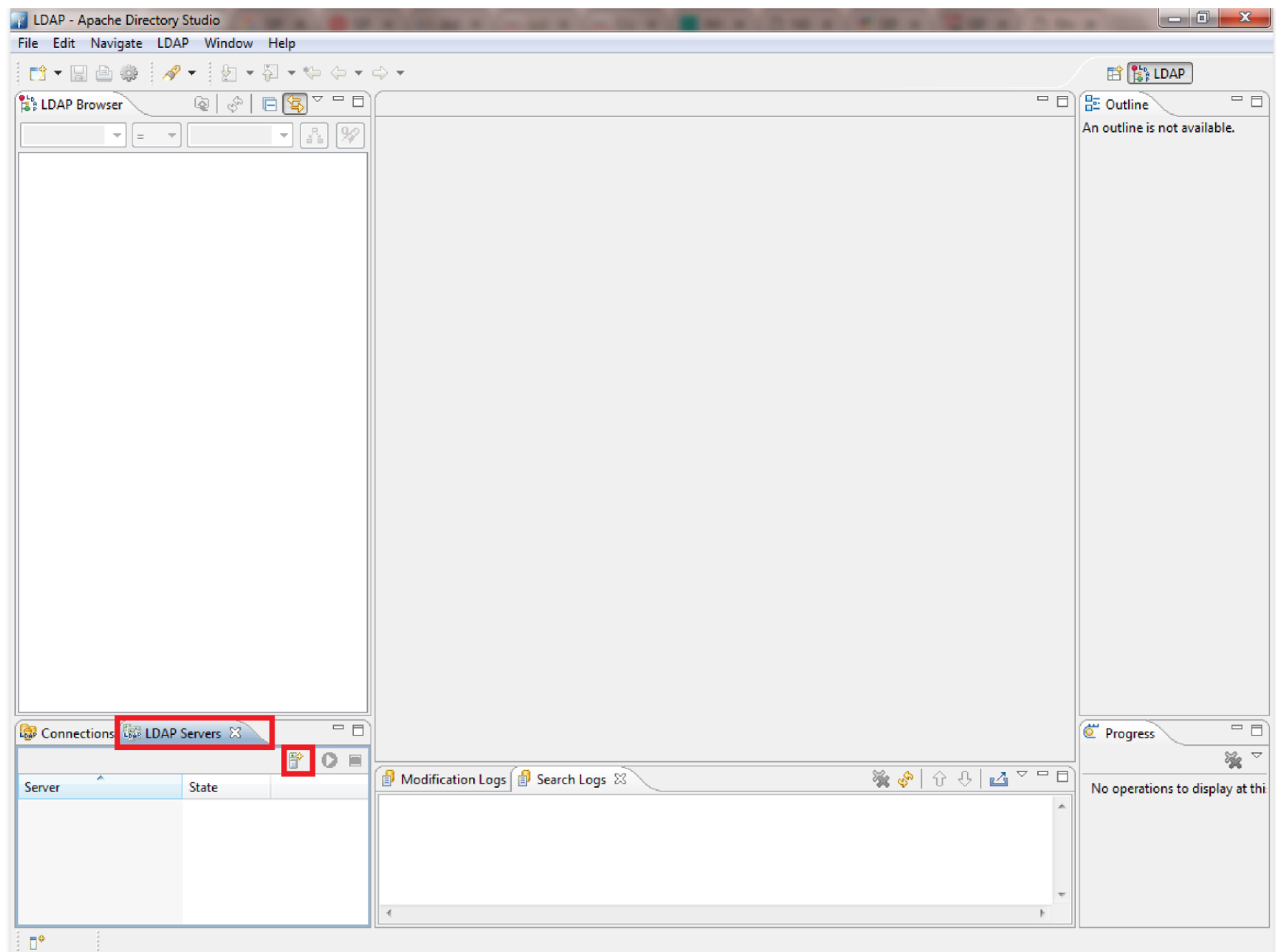


ApacheDS First Start

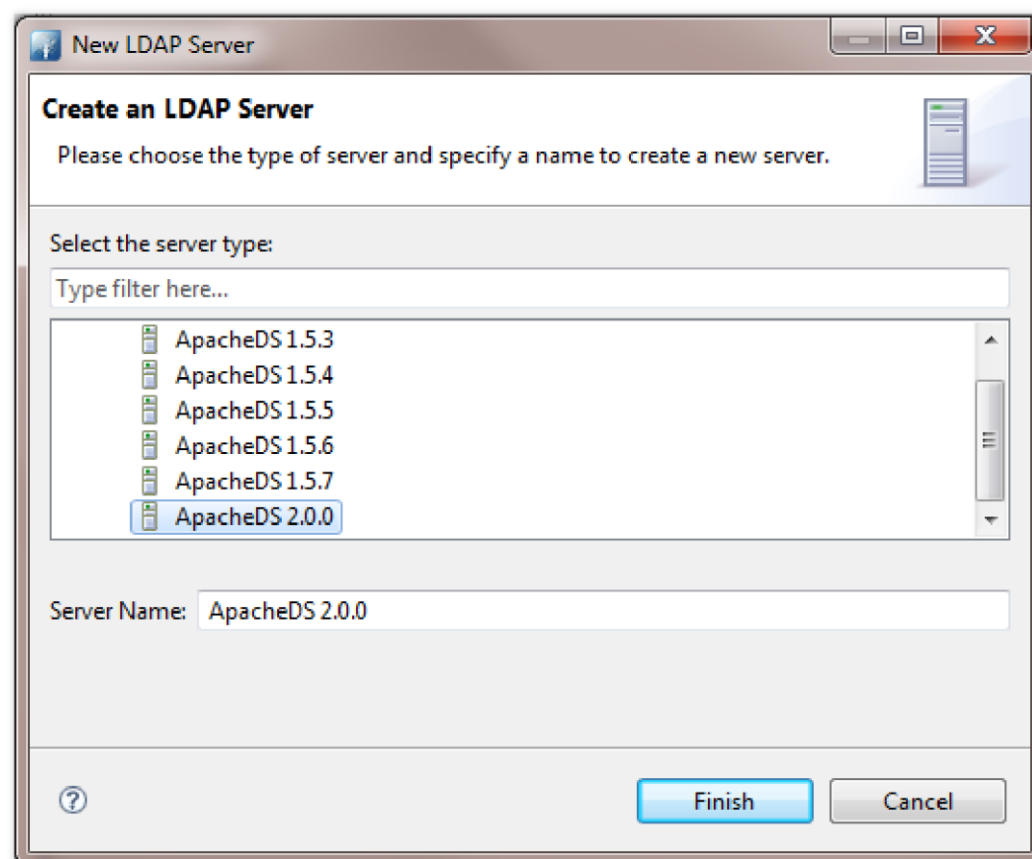
Configuring ApacheDS

Create New LDAP Connection

1. In **Workbench**, go to the **LDAP Servers** tab and click on **New Server** (If no server is created) then select a Server from the list and click **Finish**.

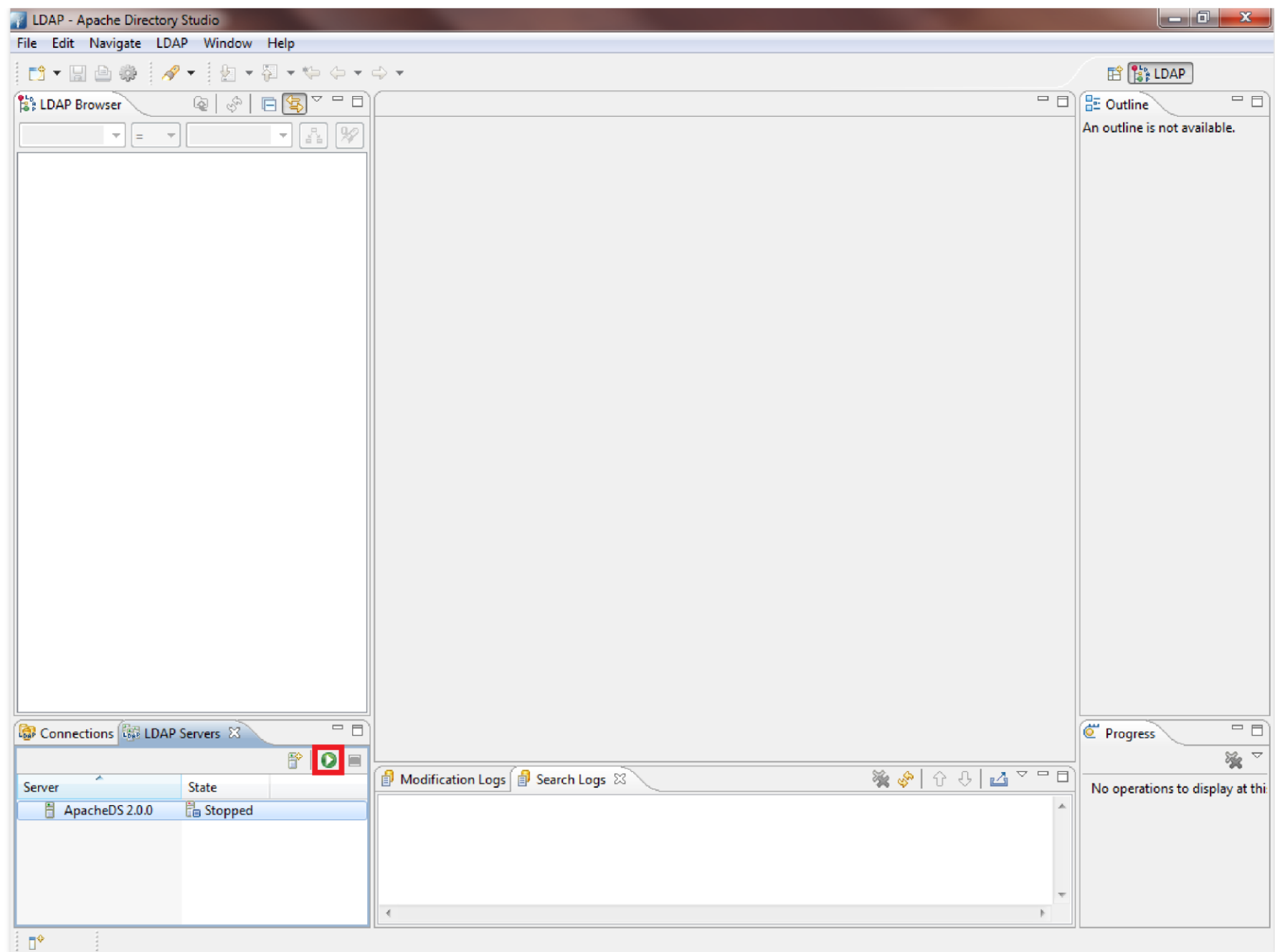


LDAP Servers Tab



Create LDAP Server

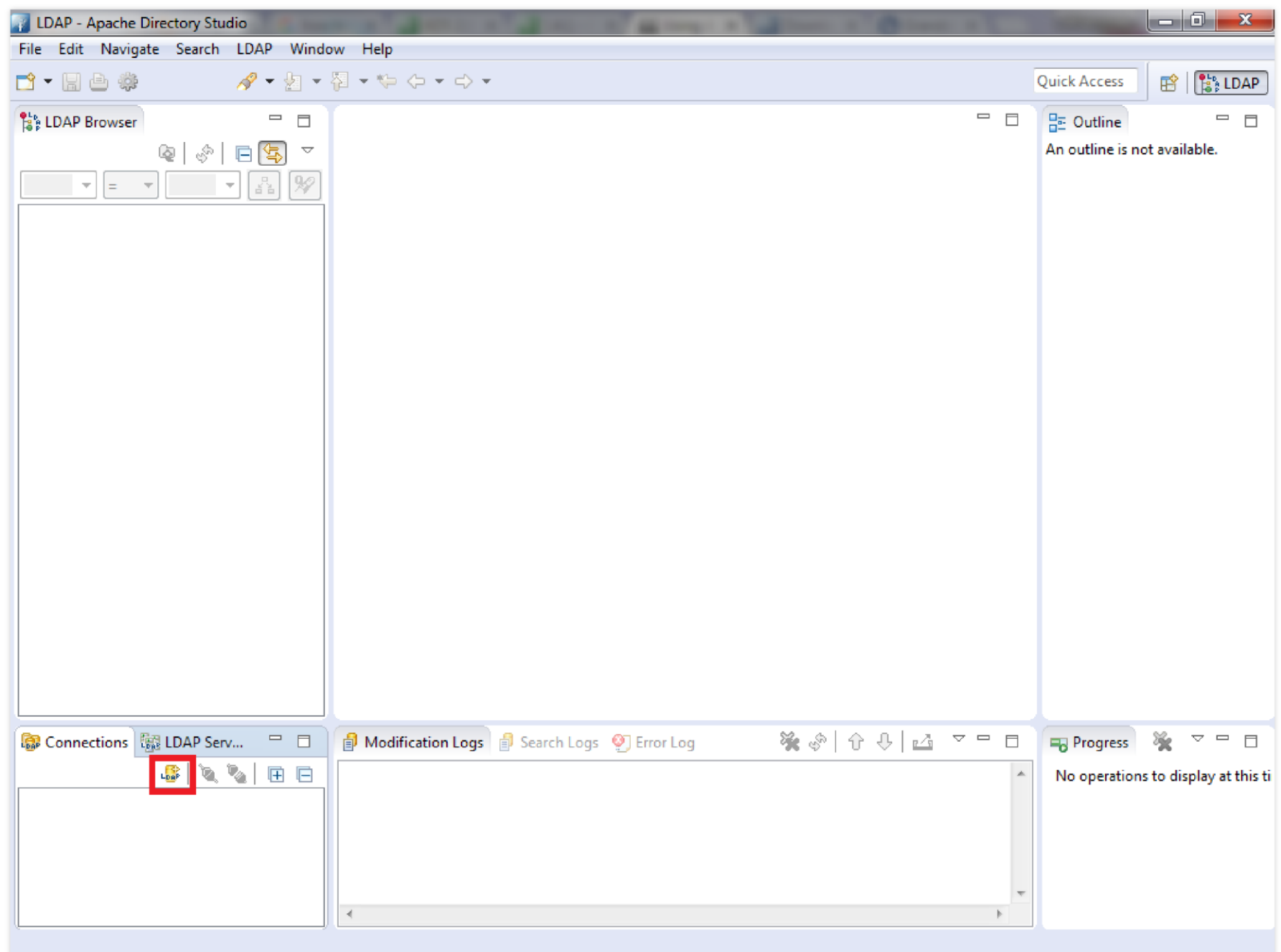
2. Once the Server is created, click on Start Button to launch it.



Start the LDAP Server

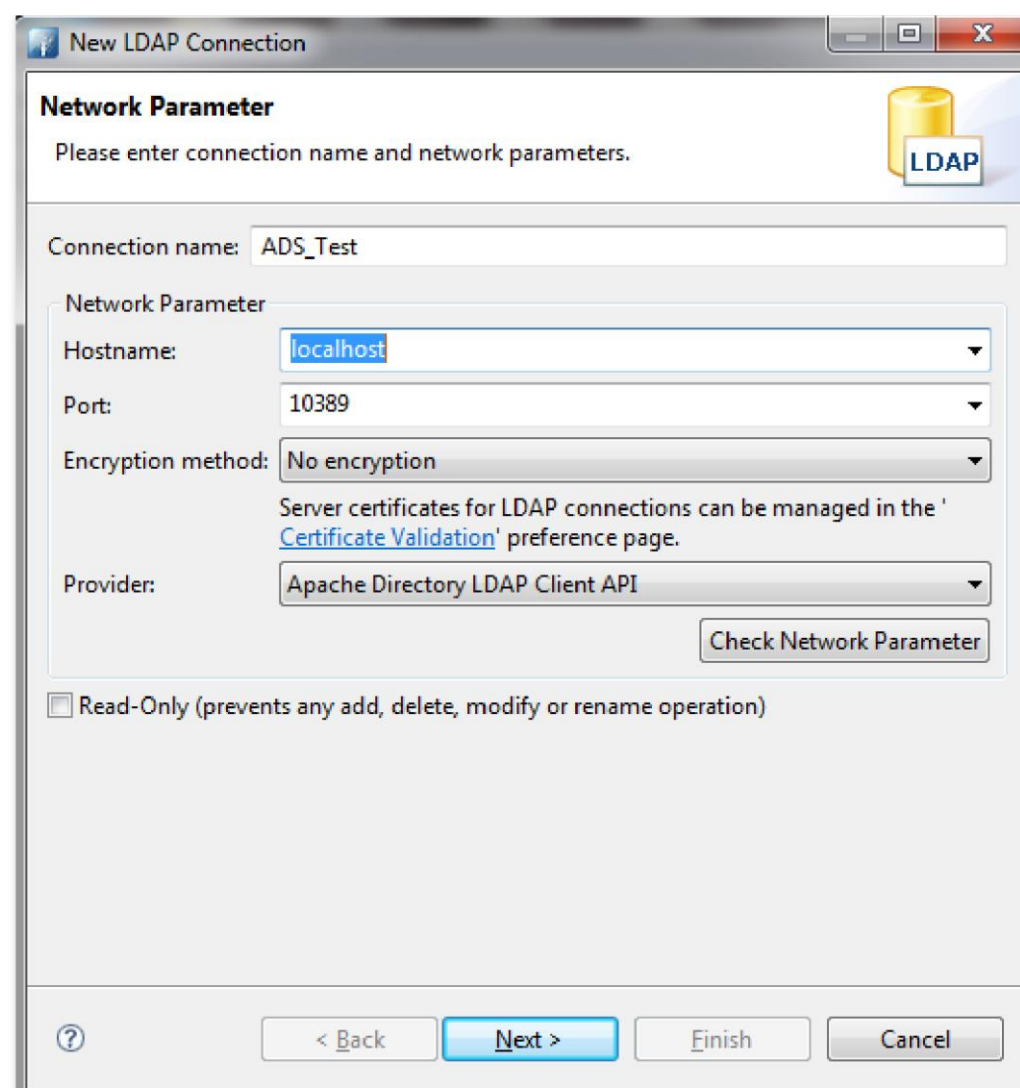
3.

In **Workbench**, go to **Connections** tab and press create new connection button as shown below:



Create New LDAP Connection

4. Once you click on the LDAP new connection button the "Network Parameter" window pops up.



New LDAP Connection

Network Parameter
Please enter connection name and network parameters.

Connection name: ADS_Test

Network Parameter

Hostname: localhost

Port: 10389

Encryption method: No encryption

Server certificates for LDAP connections can be managed in the '[Certificate Validation](#)' preference page.

Provider: Apache Directory LDAP Client API

Check Network Parameter

☐ Read-Only (prevents any add, delete, modify or rename operation)

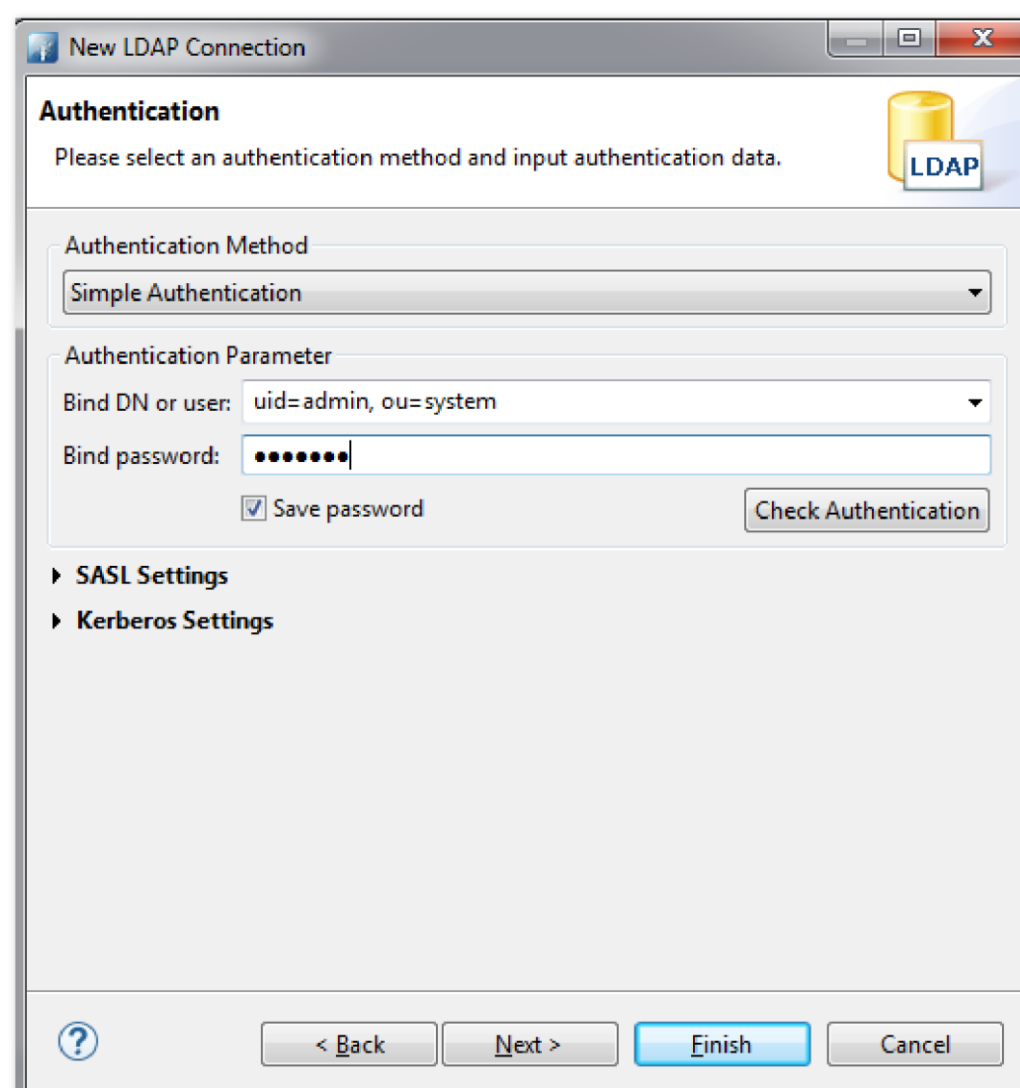
< Back Next > Finish Cancel

New LDAP Connection Network Parameters

- Enter **Hostname** value with IP address or FQDN of the machine where ApacheDS is installed.
- The default connection **port** for LDAP on ApacheDS is 10389.
- Set **Encryption method** to "No encryption".
- Keep **Provider** field with default value "Apache Directory LDAP Client API".

! If LDAPS is requested for secure connection, set **Port** to "10636" (default LDAPS port on ApacheDS) and **Encryption method** to "Use SSL encryption(ldaps://)".

5. After filling the fields, click Next, the following window will be shown.



New LDAP Connection

Authentication
Please select an authentication method and input authentication data.

Authentication Method

Simple Authentication

Authentication Parameter

Bind DN or user: uid=admin, ou=system

Bind password: ••••••

☒ Save password

Check Authentication

▶ SASL Settings

▶ Kerberos Settings

? < Back Next > Finish Cancel

New LDAP Connection Authentication

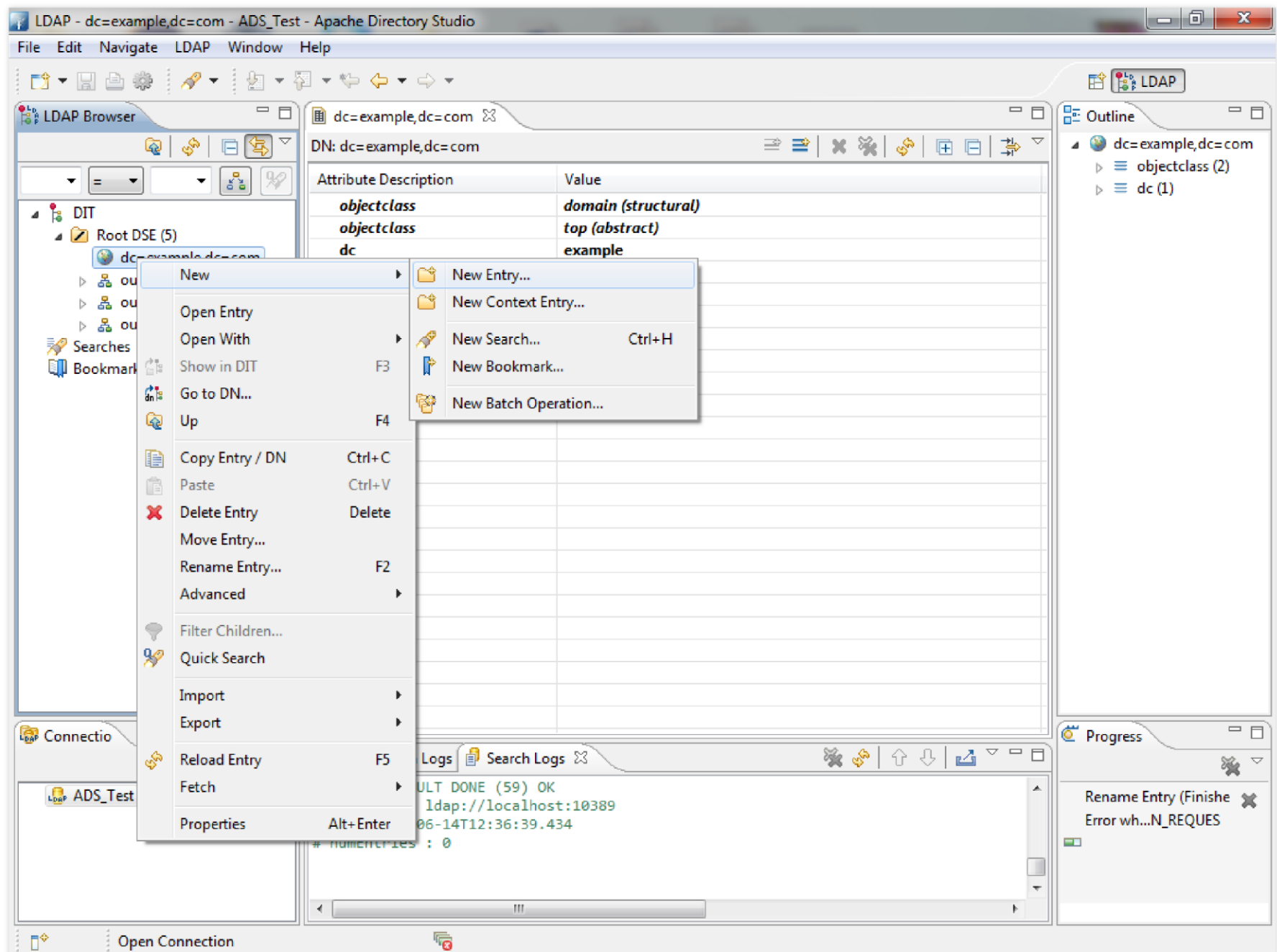
6. Choose the **Authentication Method** desired. In this example, "Simple Authentication".

7. Enter the **Bind DN or user**. By default, "*uid=admin, ou=system*".
8. Set **Bind password**. Default password is "*secret*"
9. Click **Finish** after completing connection information page.

Add New Entry

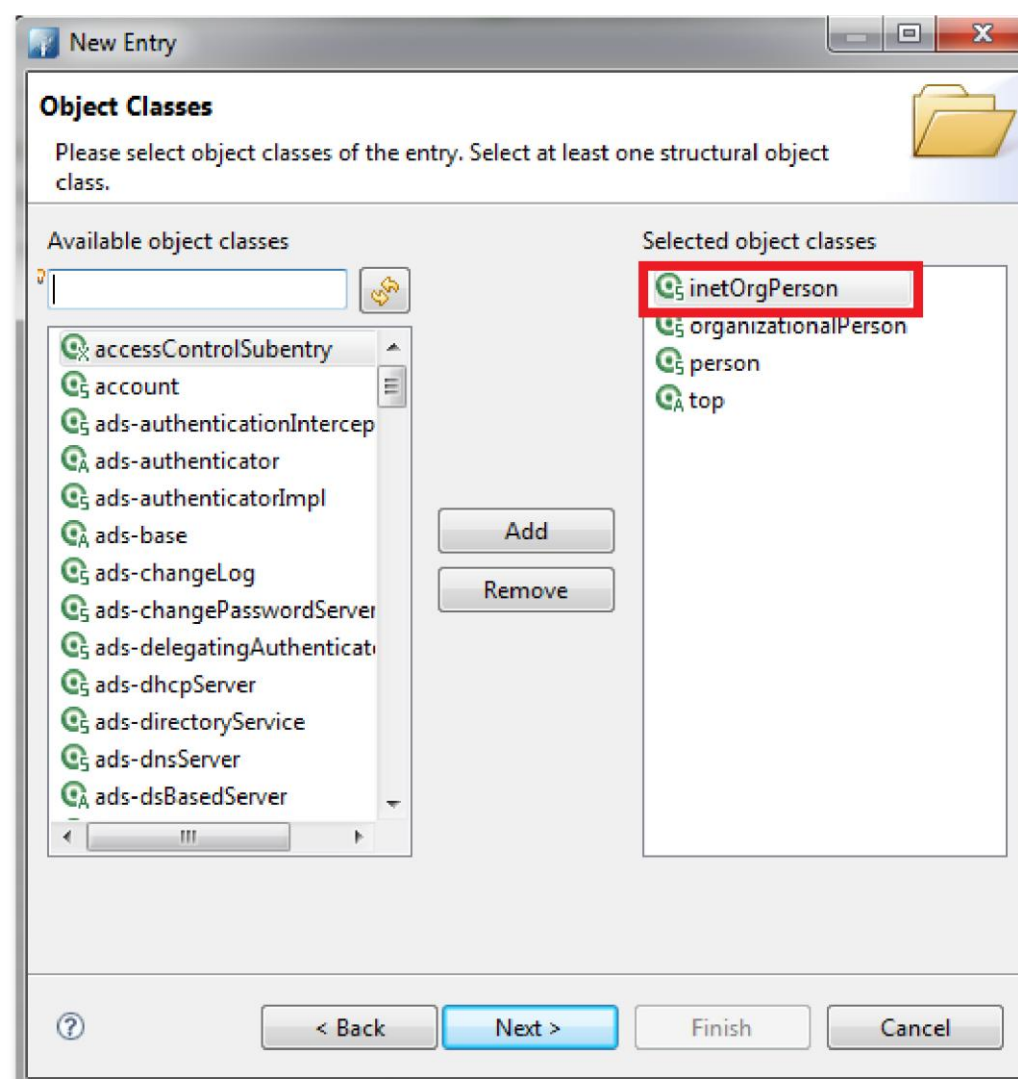
At this level our connection with the LDAP server is created successfully, we can add now users to "*dc=example,dc=com*" which by default has no entries. Administrator can create another domain instead of using *dc=example,dc=com*.

1. Under **dc=example,dc=com**, right click and select **New → New Entry**



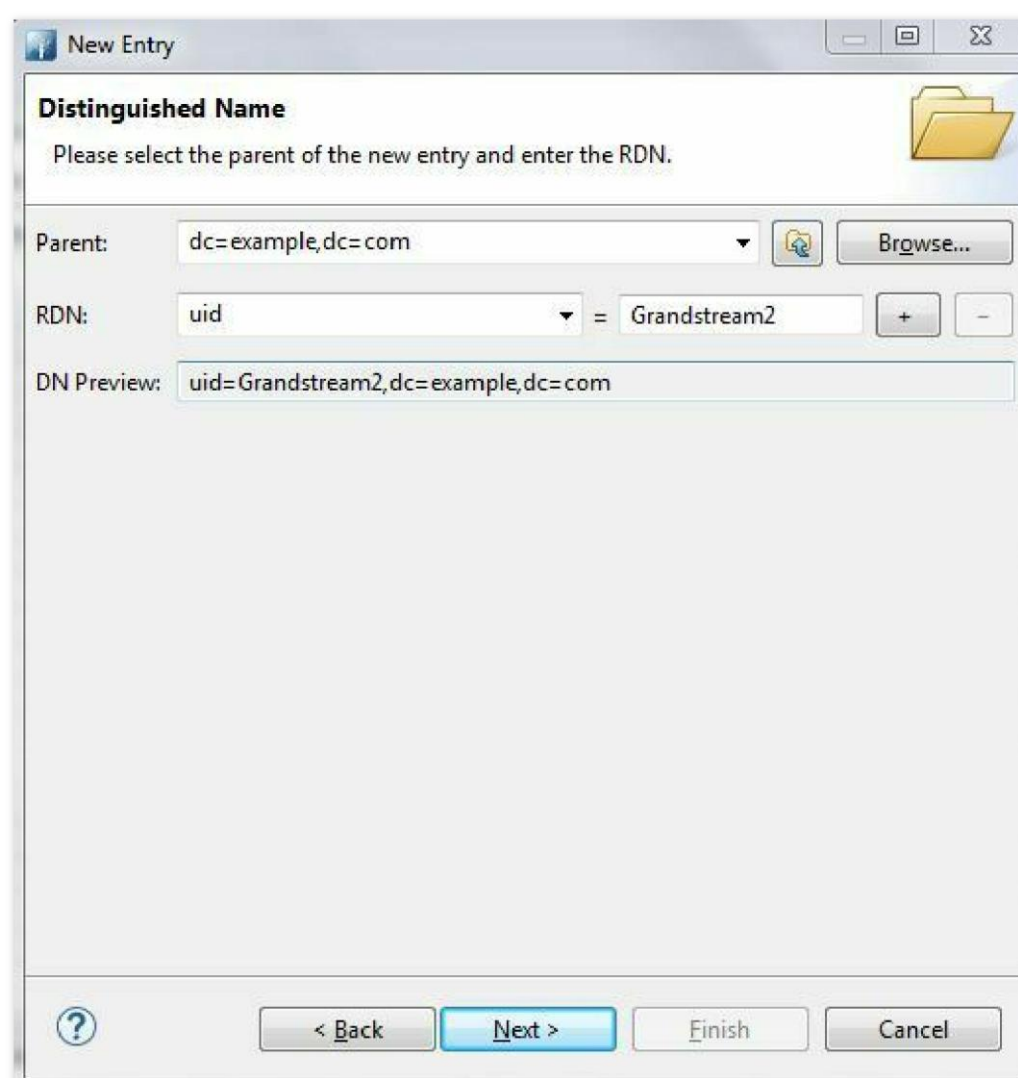
Create New Entry

2. Select **Create entry from scratch** and click Next.
3. Select **inetOrgPerson** from available object classes, then press **Add** followed by **Next** button.



New Entry Object Classes

- In the Distinguished Name window, enter a name for UserID. In this example, *Grandstream2* is used. Keep **Parent** and **RDN** (Relative DN) with default values; in this example, *dc=example,dc=com* and *uid* respectively, then click **Next** button. (Refer to next figure).



New Entry Distinguished Name

- In Attributes window, create contacts and enter their details: First Name (cn) and Last Name (sn).

New Entry

Attributes
Please enter the attributes for the entry. Enter at least the MUST attributes.

DN: uid=Grandstream2,dc=example,dc=com

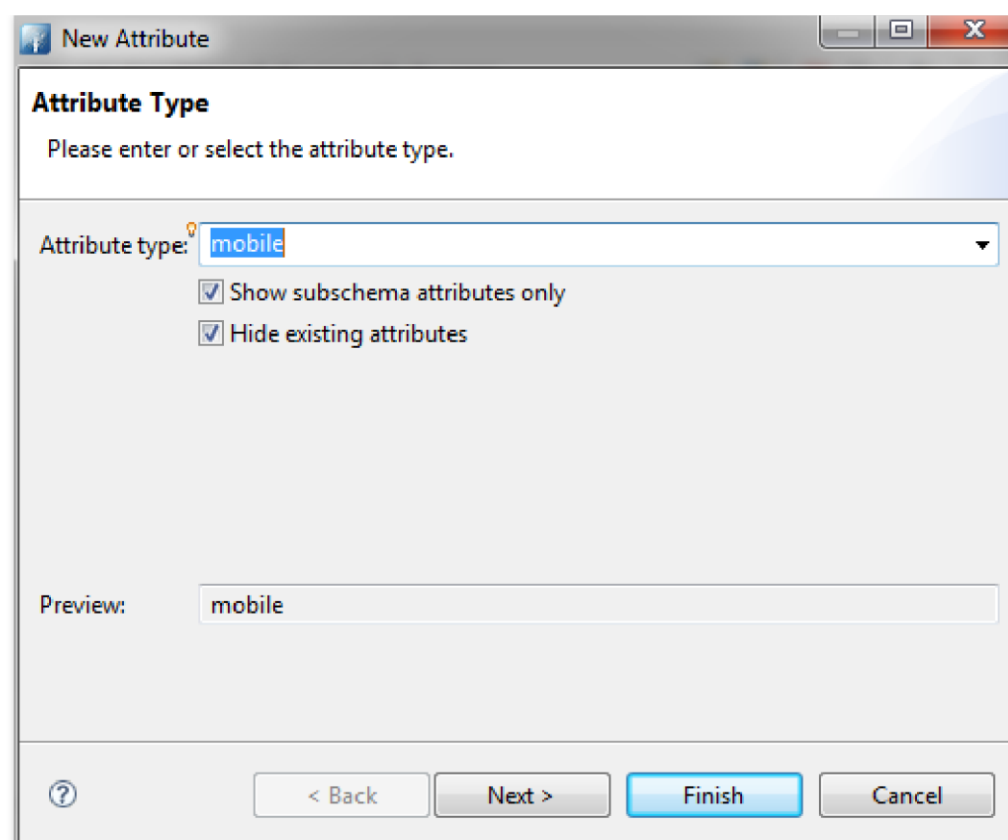
Attribute Description	Value
objectClass	top (abstract)
objectClass	person (structural)
objectClass	organizationalPerson (structural)
objectClass	inetOrgPerson (structural)
cn	John
sn	Snow
uid	Grandstream2

New Entry Attributes

The table below shows common attributes:

Attribute	Description
cn	Full name of the entry
sn	First Name
gn	Last Name or family name
telephoneNumber	Office phone number
homePhone	Home phone number
mobile	Mobile phone number
Company	Company name
o	Organization name
ou	Organization Unit. Usual department or any sub entity of larger entity

- To add new fields for contacts such as Mobile, Email... Press *Add New Field* button as shown in previous figure and specify the new **Attribute type**. Press **Next** to add another attribute or **Finish** if no more attribute will be added.



New Attribute

Attribute Type
Please enter or select the attribute type.

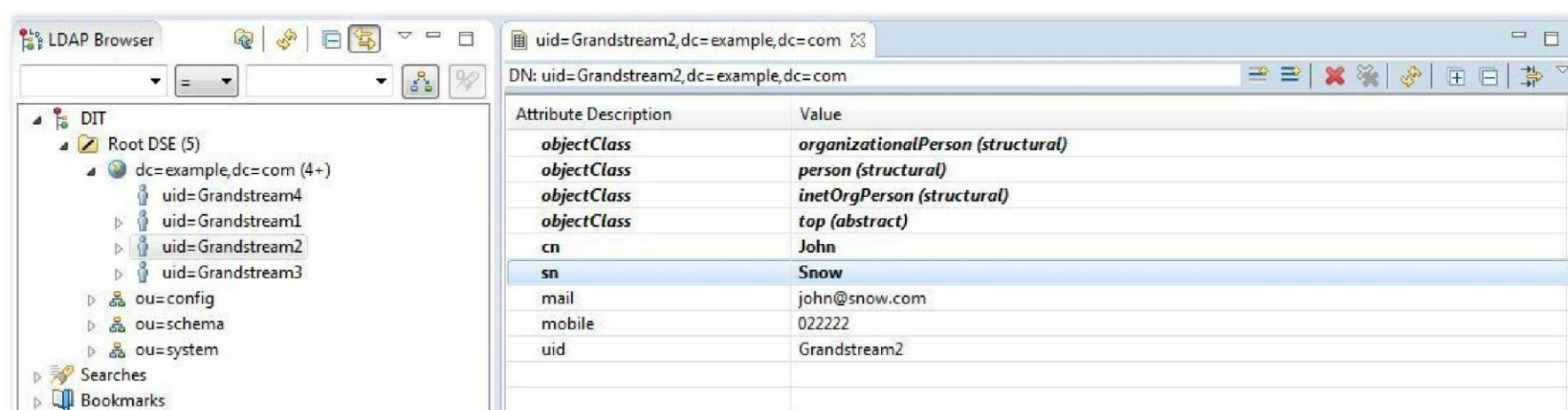
Attribute type:

☒ Show subschema attributes only
☒ Hide existing attributes

Preview:

New Attribute Attribute Type

A summary of contact details will be displayed showing all contact details as illustrated in below figure.



LDAP Browser

DN: uid=Grandstream2,dc=example,dc=com

Attribute Description	Value
objectClass	organizationalPerson (structural)
objectClass	person (structural)
objectClass	inetOrgPerson (structural)
objectClass	top (abstract)
cn	John
sn	Snow
mail	john@snow.com
mobile	022222
uid	Grandstream2

Contact List

LDAP CLIENT CONFIGURATION

This section shows client configuration associated with previously configured LDAP server.

GXP21xx/17xx/16xx Series

LDAP client configuration can be found on the web GUI under **Phonebook → LDAP**. Configure LDAP client settings as show in below figure:

LDAP

LDAP protocol	LDAP ▼
Server Address	192.168.5.131
Port	10389
Base	dc=example, dc=com
User Name	
Password	
LDAP Number Filter	(mobile=%)
LDAP Name Filter	((cn=%)(sn=%))
LDAP Version	☐ Version 2 ☒ Version 3
LDAP Name Attributes	sn cn
LDAP Number Attributes	mobile
LDAP Display Name	cn sn mobile
Max. Hits	50
Search Timeout	30
Sort Results	☒ No ☐ Yes
LDAP Lookup	☒ Incoming Calls ☒ Outgoing Calls
Lookup Display Name	cn sn mobile
Save Save and Apply Reset	

LDAP Settings on GXP21xx17xx16xx Series

DP75x Series

LDAP client configuration can be found on the web GUI under **Phonebook > Global Phonebook LDAP Settings**.

Configure LDAP client settings as show in below figure:

Global Phonebook LDAP Settings

Global Phonebook Type

LDAP ▼

LDAP Phonebook Settings

LDAP protocol

LDAP ▼

Server Address

192.168.5.131

Port

10389

Base

dc=example,dc=com

User Name

Password

LDAP Filter

(mobile=*)(sn=*)

LDAP Version

☐ Version 2 ☒ Version 3

First Name Attribute

sn

Last Name Attribute

cn

Work Number Attribute

Home Number Attribute

Mobile Number Attribute

mobile

Max. Hits

500

Search Timeout

30

Save

Save and Apply

Reset

LDAP Settings on DP750DP752

GVC32xx/GAC2500 Series

LDAP client configuration can be found on the web GUI under **Contacts > LDAP**.

Configure LDAP client settings as show in below figure:

LDAP lookup when dialing :	☒ Enable
Search LDAP for incoming call :	☒ Enable
Save Cancel	

Connection mode :	LDAP
Server address :	192.168.5.131
Port :	10389
Base DN :	dc=example, dc=com
Username :	
Password :	
LDAP name attributes :	sn cn
LDAP number attributes :	mobile
LDAP mail attributes :	mail
LDAP name filter :	((cn=%)(sn=%))
LDAP number filter :	(mobile=%)
LDAP mail filter :	(mail=%)
LDAP displaying name attributes :	cn sn mobile
Max hits :	50
Search timeout (ms) :	4000

LDAP Settings on GVC3200GAC2500 Series

 LDAP is not supported in the GVC3212.

GXV33XX/GXV34XX Series

LDAP client configuration can be found on the web GUI under **Applications > LDAP Phonebook**. Configure LDAP client settings as show in below figure:

Connection Mode 	LDAP 
Server Address 	192.168.5.131
Port 	389
Base DN 	dc=example, dc=com
User Name 	
Password 	
Connect Timeout (s) 	4
LDAP Name Attributes 	sn cn
LDAP Number Attributes 	mobile
LDAP Mail Attributes 	mail
LDAP Name Filter 	((cn=*)(sn=*))
LDAP Number Filter 	((cn=*)(sn=*))
LDAP Mail Filter 	(mail=*)
Search Field Filter 	All Filter 
LDAP Display Name Attributes 	sn cn mobile
Max Hits 	50
Search Timeout (s) 	4
LDAP Lookup For Dial 	☐
LDAP Lookup For Incoming Call 	☐
LDAP Dialing Default Account 	Default 

LDAP Settings on GXV33xx34xxGXV Series

GRP261x Series

LDAP client configuration can be found on the web GUI under **Directory → LDAP**. Configure LDAP client settings as show in below figure:

LDAP

LDAP Protocol	LDAP ▾
Server Address	192.168.5.131
Port	10389
Base	dc=example, dc=com
Username	
Password	
LDAP Number Filter	(mobile=%)
LDAP Name Filter	({(cn=%)(sn=%)})
LDAP Version	☐ Version 2 ☒ Version 3
LDAP Name Attributes	cn sn
LDAP Number Attributes	mobile
LDAP Display Name	%cn %sn %mobile
Max Hits	50
Search Timeout	30
Sort Results	☒ No ☐ Yes
LDAP Lookup	☒ Incoming Calls ☒ Outgoing Calls
Lookup Display Name	cn sn mobile
Exact Match Search	☒ No ☐ Yes
	Save Save and Apply Reset

LDAP Settings on GRP261xGRP2634GRP2624

GRP260x Series

LDAP client configuration can be found on the web GUI under **Application → LDAP**. Configure LDAP client settings as show in below figure:

LDAP

LDAP Protocol ⓘ

LDAP

Server Address ⓘ

192.168.5.131

Port ⓘ

10389

Base DN ⓘ

dc=example, dc=com

Username ⓘ

Password ⓘ

LDAP Number Filter ⓘ

(mobile=%)

LDAP Name Filter ⓘ

((cn=*)(sn=*))

LDAP Version ⓘ

Version 3

LDAP Name Attributes ⓘ

cn sn

LDAP Number Attributes ⓘ

mobile

LDAP Display Name ⓘ

%cn %sn %mobile

Max Hits ⓘ

50

Search Timeout ⓘ

30

Sort Results ⓘ

☐

LDAP Lookup ⓘ

☒ Incoming Calls ☒ Outgoing Calls

Lookup Display Name ⓘ

cn sn mobile

LDAP Dialing Default Account ⓘ

Auto

Exact Match Search ⓘ

☐

Save

Save and Apply

Reset

LDAP configuration example on GRP260x

LDAP Client Parameters

Following table shows LDAP Client parameters on Grandstream products:

Fields	Description
Connection Mode (GXV33xx/GXV32xx/GVC32xx/GAC 2500)	Option to choose secured or non-secured LDAP connection. LDAPS (LDAP Secured) uses SSL/TLS to encrypt LDAP traffic.
LDAP Protocol (GXP21xx/DP75x/GRP26xx/GRP26xx)	<i>In this guide:</i> LDAP
Server Address	IP address or FQDN of the LDAP server. <i>In this guide:</i> 192.168.5.131

Fields	Description
Port	Listening port for LDAP connections on the server side. Default is 389. <i>In this guide:</i> ◦ 10389
Base DN	Location in the directory where the search is requested to begin. It narrows the search scope and decreases directory lookup time. <i>In this guide:</i> ◦ dc=example, dc=com
User Name	“Username” to bind for querying LDAP servers. Most LDAP servers allow anonymous binds, in this case, this field can be left blank. <i>In this guide:</i> ◦ Blank (no value to enter)
Password	“Password” to bind for querying LDAP servers. Most LDAP servers allow anonymous binds, in this case, this field can be left blank. <i>In this guide:</i> ◦ Blank (no value to enter)
First Name Attribute <i>(DP750/DP52 only)</i>	Defines first name attributes of each record to be returned in the LDAP search result. This field allows users to configure multiple space separated name attributes. <i>In this guide</i> ◦ sn
Last Name Attribute <i>(DP750/DP752 only)</i>	Defines first name attributes of each record to be returned in the LDAP search result. This field allows users to configure multiple space separated name attributes. <i>In this guide</i> ◦ cn
LDAP Name Attributes	Name attributes of each record to be returned in the LDAP search result. This field allows users to configure multiple space separated name attributes. <i>In this guide:</i> ◦ cn sn
LDAP Name Attributes	Specifies the “number” attributes of each record which are returned in the LDAP search result. <i>In this guide:</i> ◦ mobile
Work Number Attribute <i>(DP750/DP752 only)</i>	Specifies which LDAP attribute represent the contact’s work number. Must be in number attributes on LDAP server.

Fields	Description
Home Number Attribute <i>(DP750/DP752 only)</i>	Specifies which LDAP attribute represent the contact's home number. Must be in number attributes on LDAP server.
Mobile Number Attribute <i>(DP750/DP752 only)</i>	Specifies which LDAP attribute represent the contact's mobile number. Must be in number attributes on LDAP server.
LDAP Mail Attributes <i>(GXV33xx/GXV32xx/GVC32xx/GAC 2500 only)</i>	Mail attributes of each record to be returned in the LDAP search result. <i>In this guide:</i> ○ mail
LDAP Filter <i>(DP750/DP752 only)</i>	Specifies the LDAP filter to limit which contacts are fetched from the server. LDAP statement to limit which contacts are fetched from the server. Statement must be in parenthesis.
LDAP Version	Selects LDAP protocol version to send bind requests. Default is Version 3 .
LDAP Name Filter	Search filter for name lookup. Its format is compliant with RFC4514. <i>In this guide:</i> ○ ((cn=%)(sn=%))
LDAP Number Filter	Search filter for number lookup. Its format is compliant with RFC4514. <i>In this guide:</i> ○ (mobile=%)
LDAP Mail Filter <i>(GXV33xx/GXV32xx/GVC32xx/GAC 2500 only)</i>	Search filter for mail lookup. Its format is compliant with RFC4514. <i>In this guide:</i> ○ (mail=%)
LDAP Display Name	Entry information to be shown on phone's LCD. Up to 3 fields can be displayed. <i>In this guide:</i> ○ %cn %sn %mobile
Max. Hits	Maximum number of results to be returned by the LDAP server. If set to 0, server will return all search results. The default setting is 50 .
Search Timeout	Interval (in seconds) for the server to process the request and return search results to the client. The default setting is 30 seconds.
Sort Results <i>(GXP21xx/17xx/16xx/GRP26xx only)</i>	Sort returned results. The default setting is No .
LDAP Lookup	Configures to enable LDAP number search when making and receiving calls.

Fields	Description
Lookup Display Name (GXP21xx/17xx/16xx/GRP26xx only)	Entry information when LDAP looks up the name for incoming call or outgoing call. This field must be a subset of the LDAP Name Attributes. <i>In this guide:</i> ○ cn sn mobile
LDAP Dialing Default Account (GXV33xx/GXV32xx/GAC2500/GRP26xx only)	Default account to use when dialing contact from LDAP directory. Users may choose from Account 1 to 6. The default setting is Auto .
Exact Match Search (GRP26xx only)	With LDAP Lookup Incoming call, Outgoing call selected, DUT will performs LDAP search during incoming and outgoing call. If exact match search enabled, during the LDAP search, DUT will only get the result that matches the search input exactly. i.e., if 100 is the incoming/outgoing number only 100 will get searched, *100* will not. Default is "disabled"

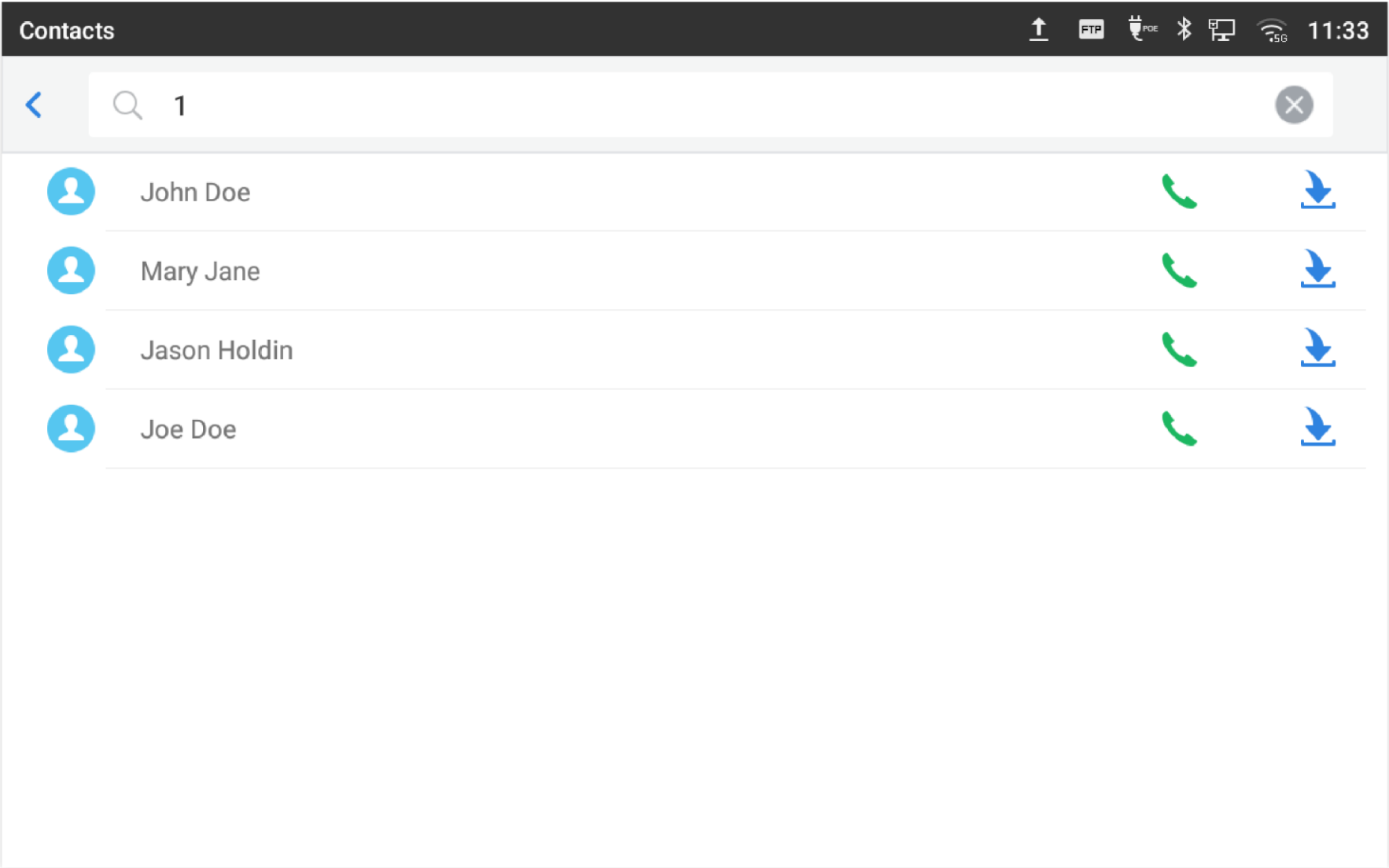
LDAP OPERATIONS

After configuring the LDAP server and the device(s), users can search LDAP contacts, dial using LDAP contacts and display matching name of caller/callee while receiving/making calls.

Following LDAP operations screenshots are using GXV33xx series, same operations are available in all models.

LDAP Search

Access LDAP contacts from **Phone LCD Menu → Contacts → LDAP Contacts**, and type the name or number you want to search. The result will be as follow:



LDAP Search

Match Incoming Call

When receiving a call from a number that exist on our LDAP server the phone will automatically display the number and name of the callee on the LCD screen like bellow.

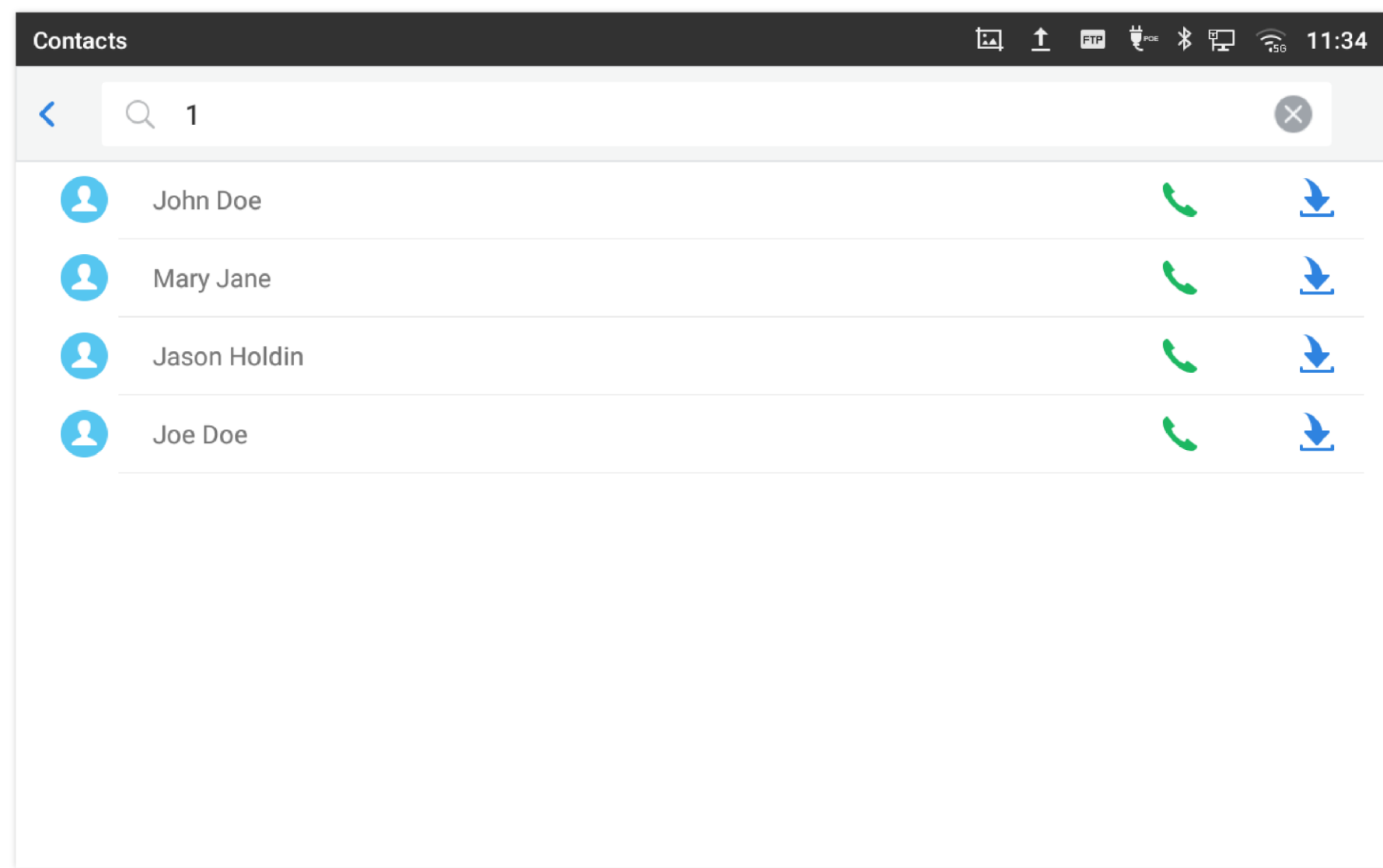
Note: The option “**LDAP Lookup For Incoming Call**” needs to be enabled from the webGUI under “Maintenance → LDAP Phonebook” so that the phone can match the incoming calls.



LDAP Matching Contacts

Making Calls using LDAP Contacts

Users can make search on the LDAP contacts and then dial the desired number by clicking on the Dial button next to the contact name.



LDAP Calls

SUPPORTED DEVICES

Following table shows Grandstream IP-Phones supporting LDAP/LDAPS client feature:

Model	LDAP Supported	LDAPS Supported	Firmware
GXP16xx Series			
GXP16xx	Yes	No	1.0.4.6 or higher
GXP17XX Series			
GXP17xx	Yes	No	1.0.0.37 or higher
GXP21xx Series			
GXP21xx	Yes	Yes	1.0.7.25 or higher
GXV33xx Series			
GXV3350	Yes	Yes	1.0.1.8 or higher
GXV3370	Yes	Yes	1.0.1.28 or higher
GXV3380	Yes	Yes	1.0.1.14 or higher

GXV34xx Series			
GXV3450	Yes	Yes	1.0.1.1 or higher
GXV3470	Yes	Yes	1.0.0.4 or higher
GXV3480	Yes	Yes	1.0.1.1 or higher
DP75x Series			
DP750/DP752	Yes	Yes	1.0.2.16 or higher
WP820			
WP820	Yes	Yes	1.0.7.7 or higher
GVC32xx Series			
GVC3200/GVC3202	Yes	Yes	1.0.1.74 or higher
GVC3210	Yes	Yes	1.0.1.20 or higher
GVC3220	Yes	Yes	1.0.1.24 or higher
GAC2500 Series			
GAC2500	Yes	Yes	1.0.1.44 or higher
GRP261x Series			
GRP261x	Yes	Yes	1.0.0.16 or higher
GRP2634	Yes	Yes	1.0.5.48 or higher
GRP2624	Yes	Yes	1.0.5.48 or higher
GRP260x Series			
GRP260x	Yes	Yes	1.0.1.18 or higher