



Grandstream Networks, Inc.

LDAP Configuration Guide



Table of Contents

SUPPORTED DEVICES	4
INTRODUCTION.....	5
INSTALLING AND CONFIGURING LDAP SERVER.....	6
Installing ApacheDS LDAP Server	6
<i>Prerequisites</i>	6
<i>Download and Install ApacheDS</i>	6
Configuring ApacheDS	7
<i>Create New LDAP Connection</i>	7
<i>Add New Entry</i>	10
LDAP CLIENT CONFIGURATION.....	14
GXP21xx/17xx/16xx Series	14
DP75x Series.....	15
GVC32xx/GAC2500 Series	16
GXV3350/GXV3370/GXV3380 Series	18
GRP261x Series	19
GRP260x Series	20
LDAP Client Parameters	21
LDAP OPERATIONS	24
LDAP Search	24
Match Incoming Call	24
Making Calls using LDAP Contacts.....	25



Table of Figures

Figure 1: LDAP Tree	5
Figure 2: ApacheDS First Start	6
Figure 3: LDAP Servers Tab	7
Figure 4: Create LDAP Server	7
Figure 5: Start the LDAP Server	8
Figure 6: Create New LDAP Connection	8
Figure 7: New LDAP Connection - Network Parameters	9
Figure 8: New LDAP Connection - Authentication	10
Figure 9: Create New Entry.....	11
Figure 10: New Entry - Object Classes	11
Figure 11: New Entry - Distinguished Name	12
Figure 12: New Entry Attributes	13
Figure 13: New Attribute - Attribute Type	14
Figure 14: Contact List	14
Figure 15: LDAP Settings on GXP21xx/17xx/16xx Series	15
Figure 16: LDAP Settings on DP750.....	16
Figure 17: LDAP Settings on GVC3200/GAC2500 Series	17
Figure 18: LDAP Settings on GXV33xx Series	18
Figure 19 : LDAP Settings on GRP261x/GRP2634/GRP2624	19
Figure 20: LDAP configuration example on GRP260x.....	20
Figure 21: LDAP Search	24
Figure 22: LDAP Matching Contacts.....	25
Figure 23: LDAP Calls.....	26



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			1.0.1.28 or higher
GXV3380			1.0.1.14 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



INTRODUCTION

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.

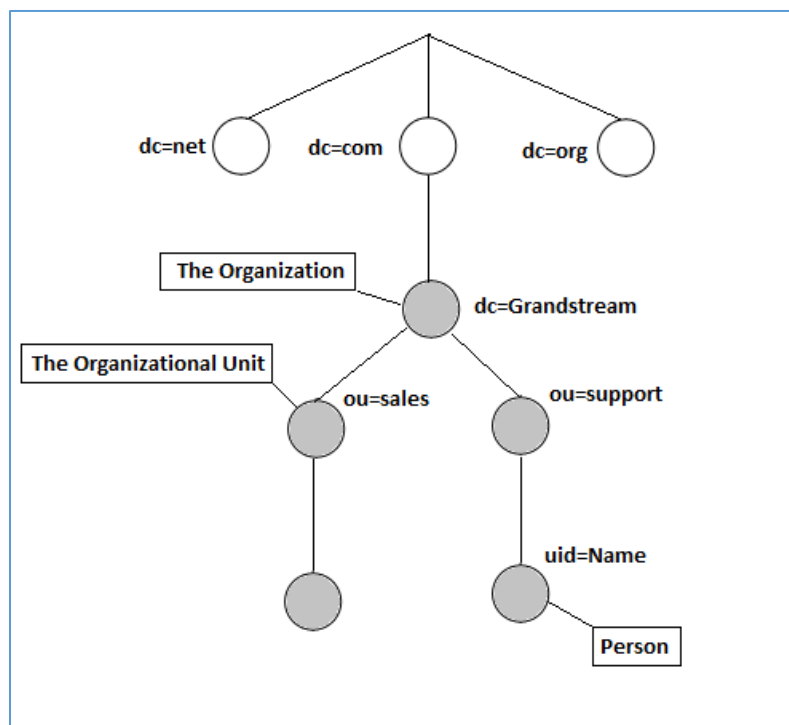


Figure 1: LDAP Tree



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.

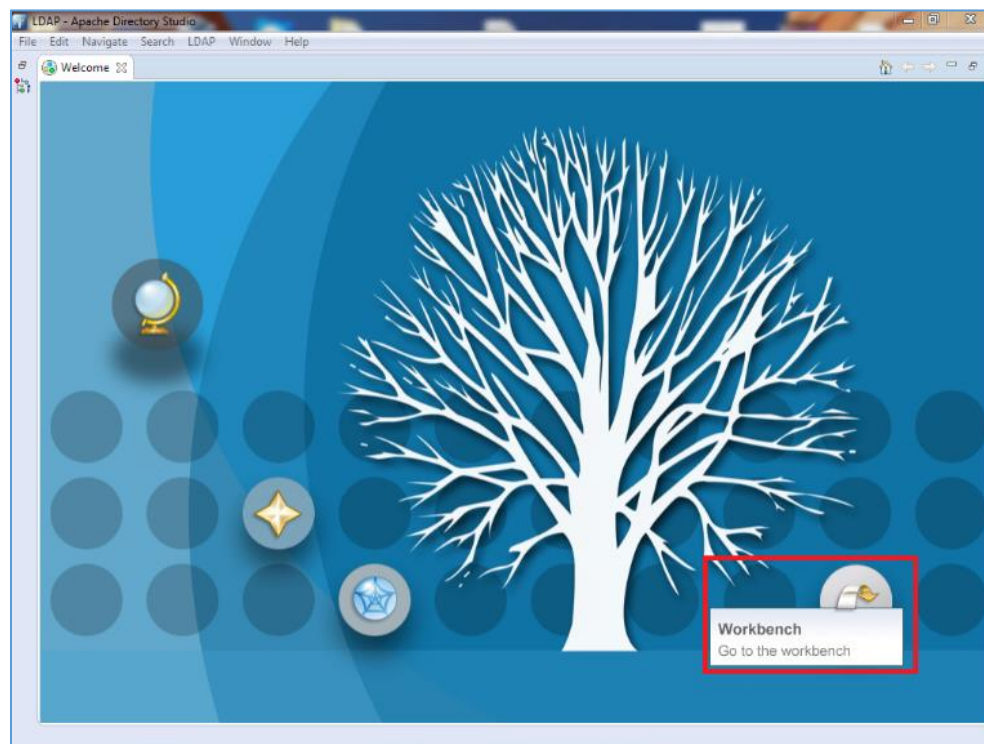


Figure 2: ApacheDS First Start

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**.

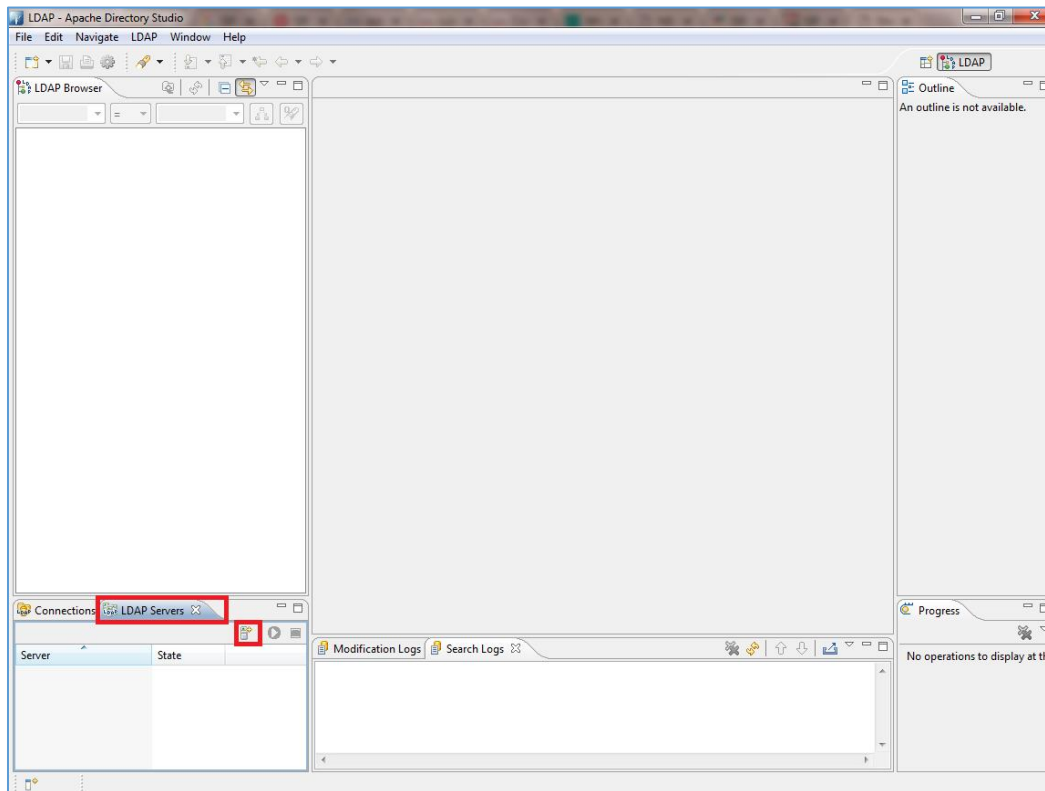


Figure 3: LDAP Servers Tab

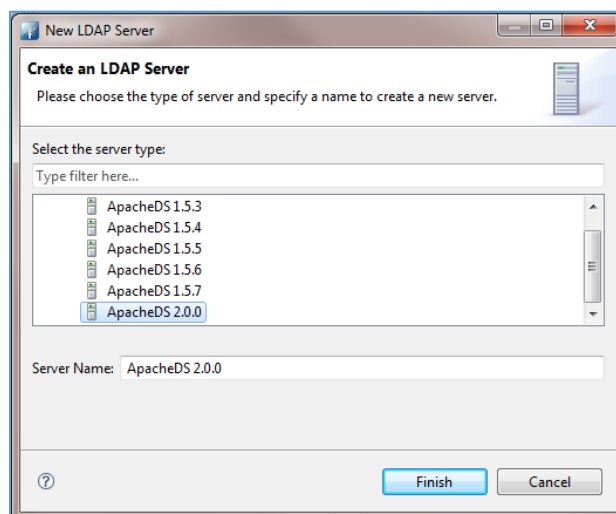


Figure 4: Create LDAP Server

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

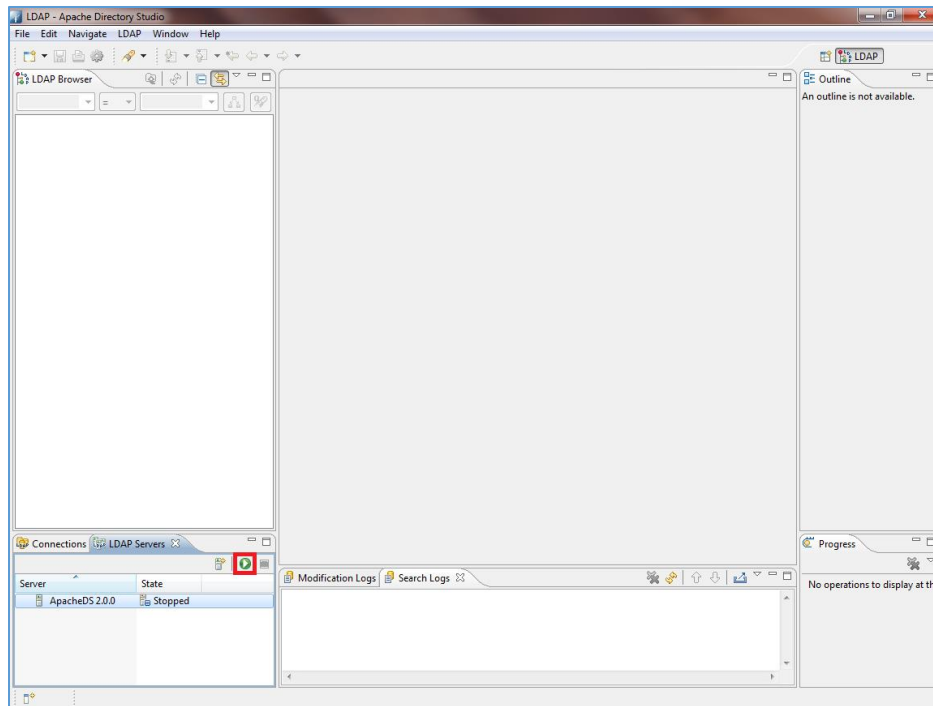


Figure 5: Start the LDAP Server

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

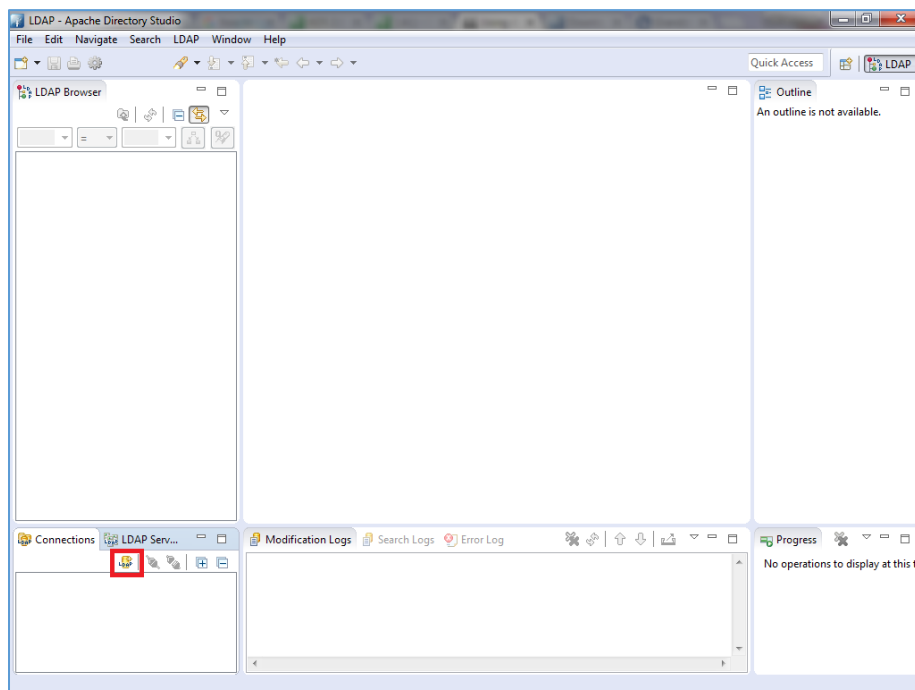


Figure 6: Create New LDAP Connection



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

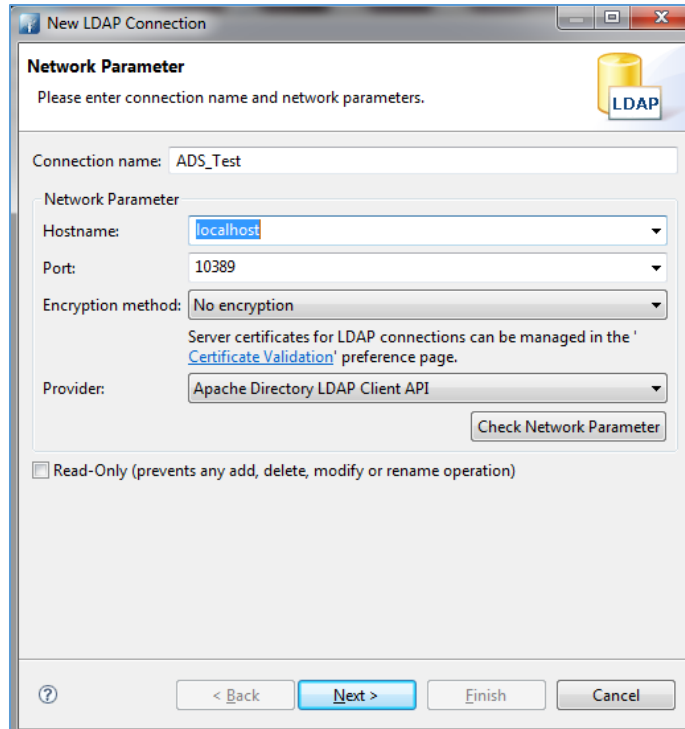


Figure 7: New LDAP Connection - Network Parameters

- 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”.

Note: 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.



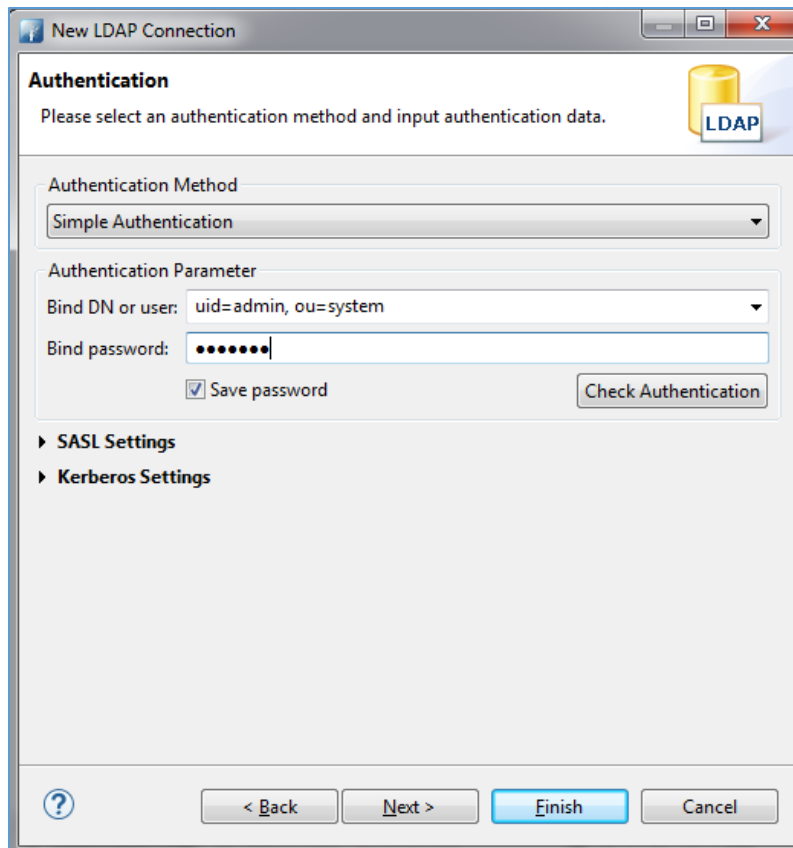


Figure 8: New LDAP Connection - Authentication

- a) Choose the **Authentication Method** desired. In this example, “*Simple Authentication*”.
 - b) Enter the **Bind DN or user**. By default, “*uid=admin, ou=system*”.
 - c) Set **Bind password**. Default password is “*secret*”
6. 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**



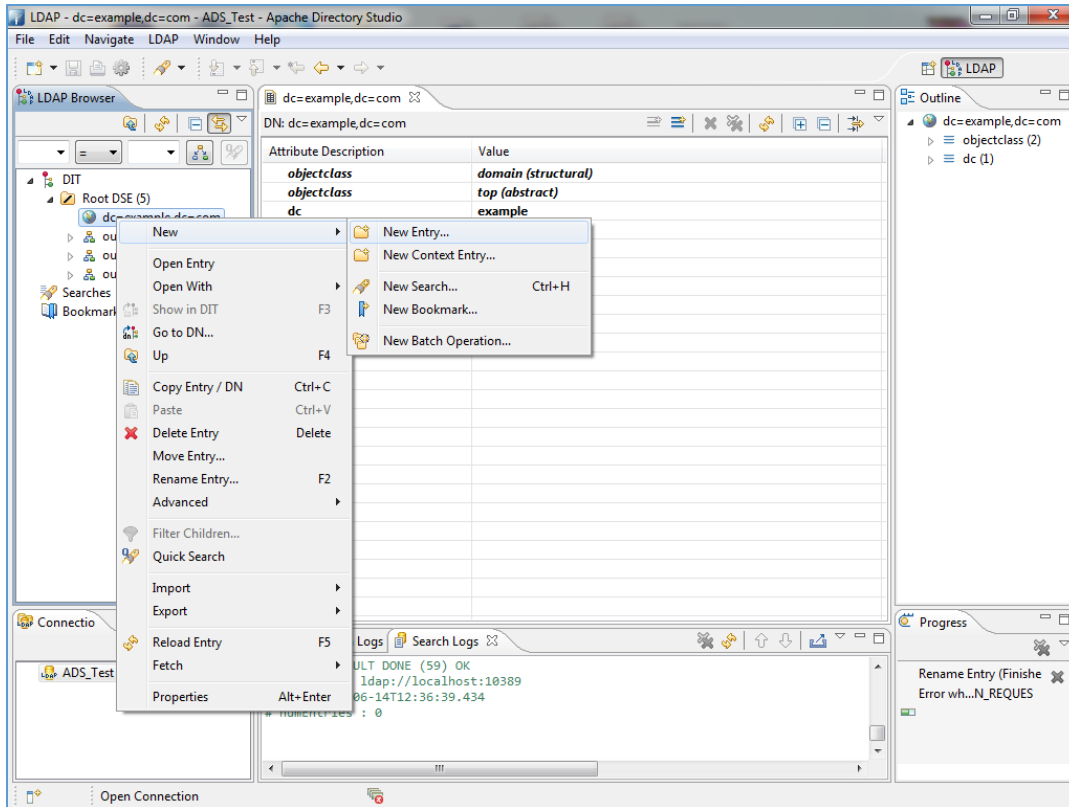


Figure 9: Create New Entry

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

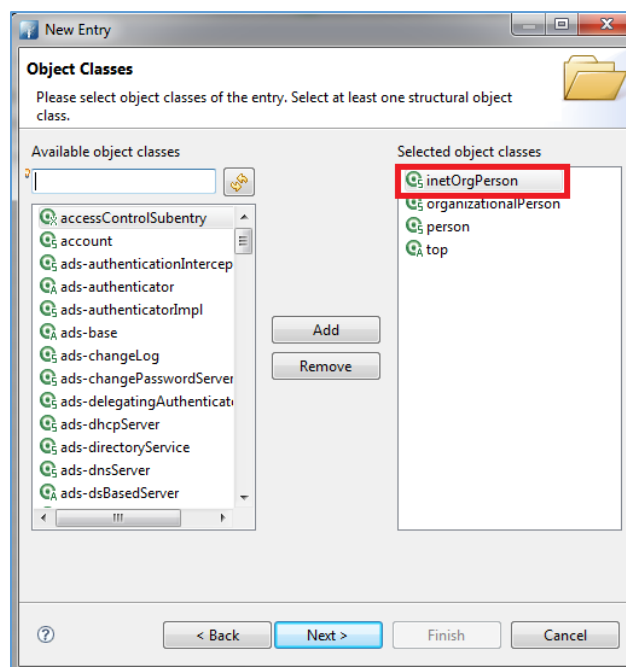


Figure 10: New Entry - Object Classes

- 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).

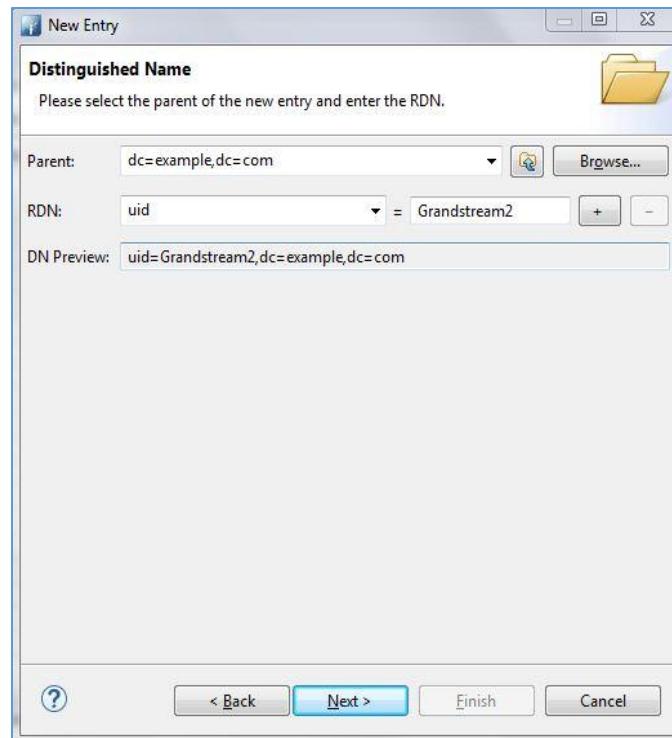


Figure 11: New Entry - Distinguished Name

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



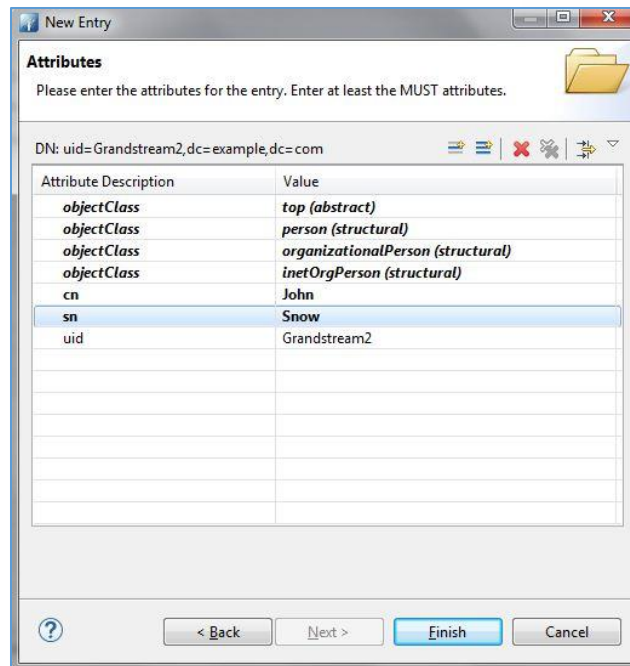


Figure 12: New Entry Attributes

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.



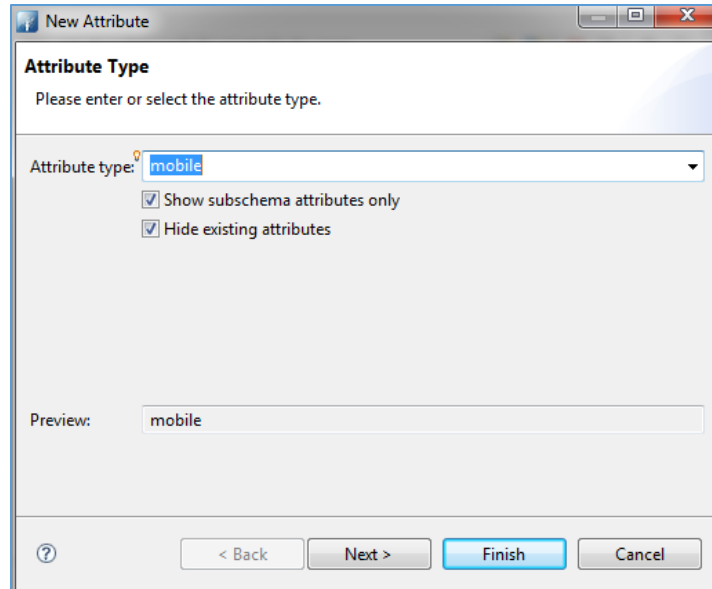


Figure 13: New Attribute - Attribute Type

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

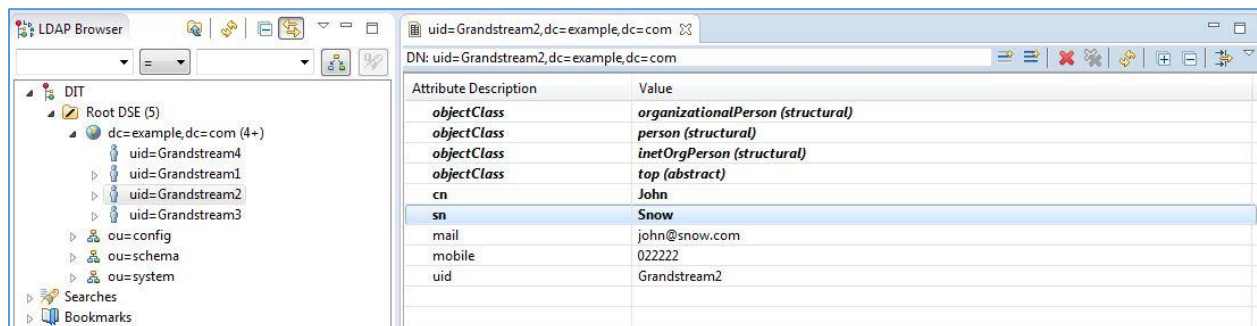


Figure 14: Contact List

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	<input type="text" value="LDAP"/>
Server Address	<input type="text" value="192.168.5.131"/>
Port	<input type="text" value="10389"/>
Base	<input type="text" value="dc=example, dc=com"/>
User Name	<input type="text"/>
Password	<input type="password"/>
LDAP Number Filter	<input type="text" value="(mobile=%)"/>
LDAP Name Filter	<input type="text" value="((cn=*)(sn=*))"/>
LDAP Version	<input type="radio"/> Version 2 <input checked="" type="radio"/> Version 3
LDAP Name Attributes	<input type="text" value="sn cn"/>
LDAP Number Attributes	<input type="text" value="mobile"/>
LDAP Display Name	<input type="text" value="cn sn mobile"/>
Max. Hits	<input type="text" value="50"/>
Search Timeout	<input type="text" value="30"/>
Sort Results	<input checked="" type="radio"/> No <input type="radio"/> Yes
LDAP Lookup	<input checked="" type="checkbox"/> Incoming Calls <input checked="" type="checkbox"/> Outgoing Calls
Lookup Display Name	<input type="text" value="cn sn mobile"/>

Figure 15: LDAP Settings on GXP21xx/17xx/16xx 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

Port

Base

User Name

Password

LDAP Filter

LDAP Version Version 2 Version 3

First Name Attribute

Last Name Attribute

Work Number Attribute

Home Number Attribute

Mobile Number Attribute

Max. Hits

Search Timeout

Save
Save and Apply
Reset

Figure 16: LDAP Settings on DP750

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:



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 lookup when dialing :	<input checked="" type="checkbox"/> Enable
Search LDAP for incoming call :	<input checked="" type="checkbox"/> Enable
<input type="button" value="Save"/> <input type="button" value="Cancel"/>	

Figure 17: LDAP Settings on GVC3200/GAC2500 Series

Note: LDAP is not supported in the GVC3212.



GXV3350/GXV3370/GXV3380 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	<input type="checkbox"/>
LDAP Lookup For Incoming Call	<input type="checkbox"/>
LDAP Dialing Default Account	Default

Figure 18: LDAP Settings on GXV33xx 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	<input type="text" value="LDAP"/>
Server Address	<input type="text" value="192.168.5.131"/>
Port	<input type="text" value="10389"/>
Base	<input type="text" value="dc=example, dc=com"/>
Username	<input type="text"/>
Password	<input type="password"/>
LDAP Number Filter	<input type="text" value="(mobile=%)"/>
LDAP Name Filter	<input type="text" value="((cn=%)(sn=%))"/>
LDAP Version	<input type="radio"/> Version 2 <input checked="" type="radio"/> Version 3
LDAP Name Attributes	<input type="text" value="cn sn"/>
LDAP Number Attributes	<input type="text" value="mobile"/>
LDAP Display Name	<input type="text" value="%cn %sn %mobile"/>
Max Hits	<input type="text" value="50"/>
Search Timeout	<input type="text" value="30"/>
Sort Results	<input checked="" type="radio"/> No <input type="radio"/> Yes
LDAP Lookup	<input checked="" type="checkbox"/> Incoming Calls <input checked="" type="checkbox"/> Outgoing Calls
Lookup Display Name	<input type="text" value="cn sn mobile"/>
Exact Match Search	<input checked="" type="radio"/> No <input type="radio"/> Yes

Figure 19 : LDAP Settings on GRP261x/GRP2634/GRP2624



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 ?	<input type="text" value="LDAP"/>
Server Address ?	<input type="text" value="192.168.5.131"/>
Port ?	<input type="text" value="10389"/>
Base DN ?	<input type="text" value="dc=example, dc=com"/>
Username ?	<input type="text"/>
Password ?	<input type="password"/>
LDAP Number Filter ?	<input type="text" value="(mobile=%)"/>
LDAP Name Filter ?	<input type="text" value="((cn=%)(sn=%))"/>
LDAP Version ?	<input type="text" value="Version 3"/>
LDAP Name Attributes ?	<input type="text" value="cn sn"/>
LDAP Number Attributes ?	<input type="text" value="mobile"/>
LDAP Display Name ?	<input type="text" value="%cn %sn %mobile"/>
Max Hits ?	<input type="text" value="50"/>
Search Timeout ?	<input type="text" value="30"/>
Sort Results ?	<input type="checkbox"/>
LDAP Lookup ?	<input checked="" type="checkbox"/> Incoming Calls <input checked="" type="checkbox"/> Outgoing Calls
Lookup Display Name ?	<input type="text" value="cn sn mobile"/>
LDAP Dialing Default Account ?	<input type="text" value="Auto"/>
Exact Match Search ?	<input type="checkbox"/>

Figure 20: LDAP configuration example on GRP260x



LDAP Client Parameters

Following table shows LDAP Client parameters on Grandstream products:

Fields	Description
Connection Mode <i>(GXV33xx/GXV32xx/GVC32xx/GAC2500)</i> LDAP Protocol <i>(GXP21xx/DP75x/GRP26xx/GRP26xx)</i>	Option to choose secured or non-secured LDAP connection. LDAPS (LDAP Secured) uses SSL/TLS to encrypt LDAP traffic. <i>In this guide:</i> <ul style="list-style-type: none"> LDAP
Server Address	IP address or FQDN of the LDAP server. <i>In this guide:</i> <ul style="list-style-type: none"> 192.168.5.131
Port	Listening port for LDAP connections on the server side. Default is 389 . <i>In this guide:</i> <ul style="list-style-type: none"> 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> <ul style="list-style-type: none"> 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> <ul style="list-style-type: none"> 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> <ul style="list-style-type: none"> 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> <ul style="list-style-type: none"> 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> <ul style="list-style-type: none"> • 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> <ul style="list-style-type: none"> • 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> <ul style="list-style-type: none"> • 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.
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/GAC2500 only)</i>	Mail attributes of each record to be returned in the LDAP search result. <i>In this guide:</i> <ul style="list-style-type: none"> • 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> <ul style="list-style-type: none"> • ((cn=%)(sn=%))
LDAP Number Filter	Search filter for number lookup. Its format is compliant with RFC4514. <i>In this guide:</i>



	<ul style="list-style-type: none"> • (mobile=%)
LDAP Mail Filter <i>(GXV33xx/GXV32xx/GVC32xx/GAC2500 only)</i>	Search filter for mail lookup. Its format is compliant with RFC4514. <i>In this guide:</i> <ul style="list-style-type: none"> • (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> <ul style="list-style-type: none"> • %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.
Lookup Display Name <i>(GXP21xx/17xx/16xx/GRP26xx only)</i>	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> <ul style="list-style-type: none"> • cn sn mobile
LDAP Dialing Default Account <i>(GXV33xx/GXV32xx/GAC2500/GRP26xx only)</i>	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 <i>(GRP26xx only)</i>	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:

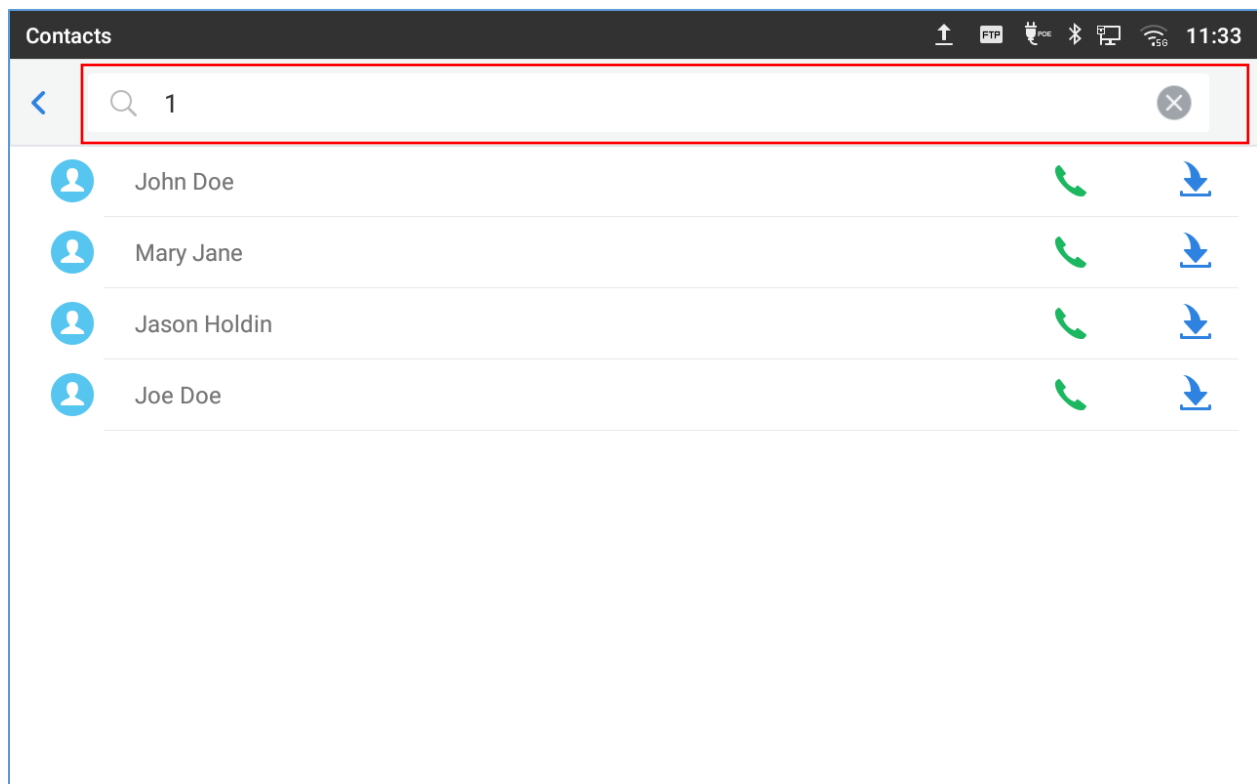


Figure 21: LDAP Search

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.

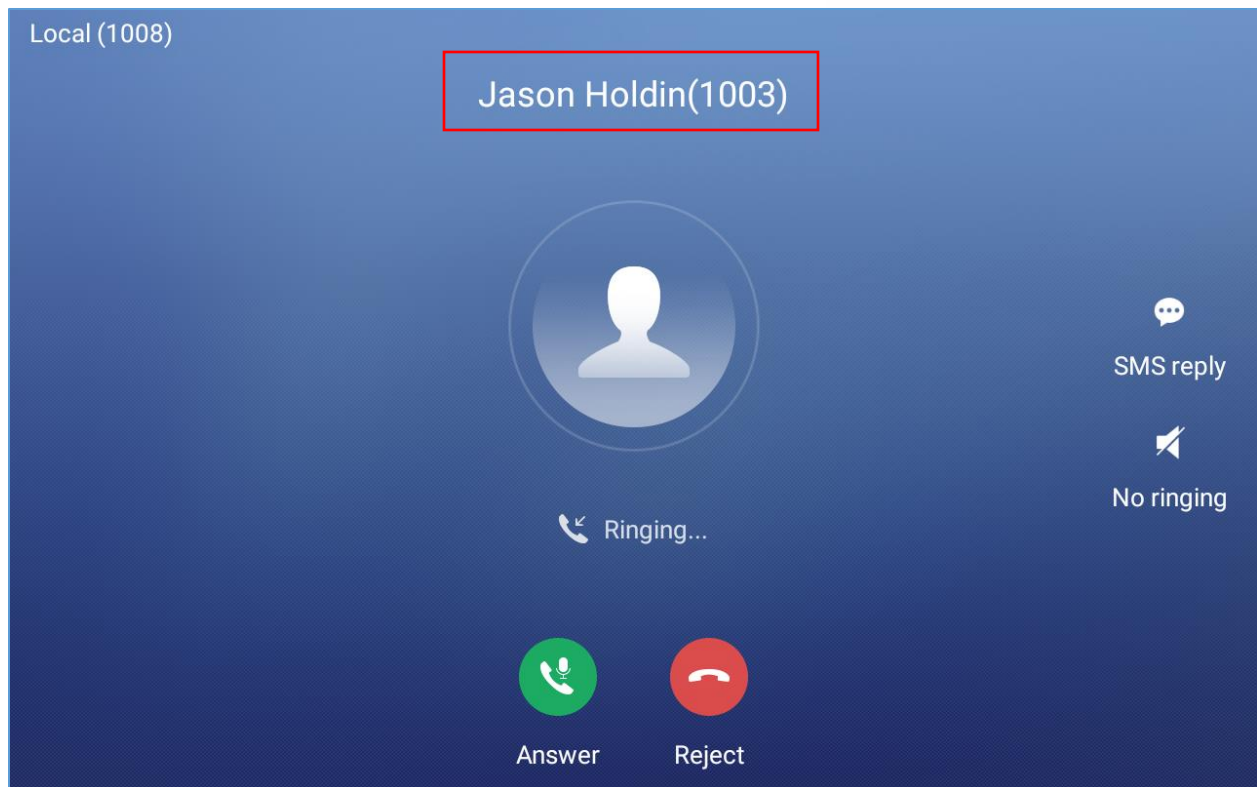


Figure 22: LDAP Matching Contacts

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.



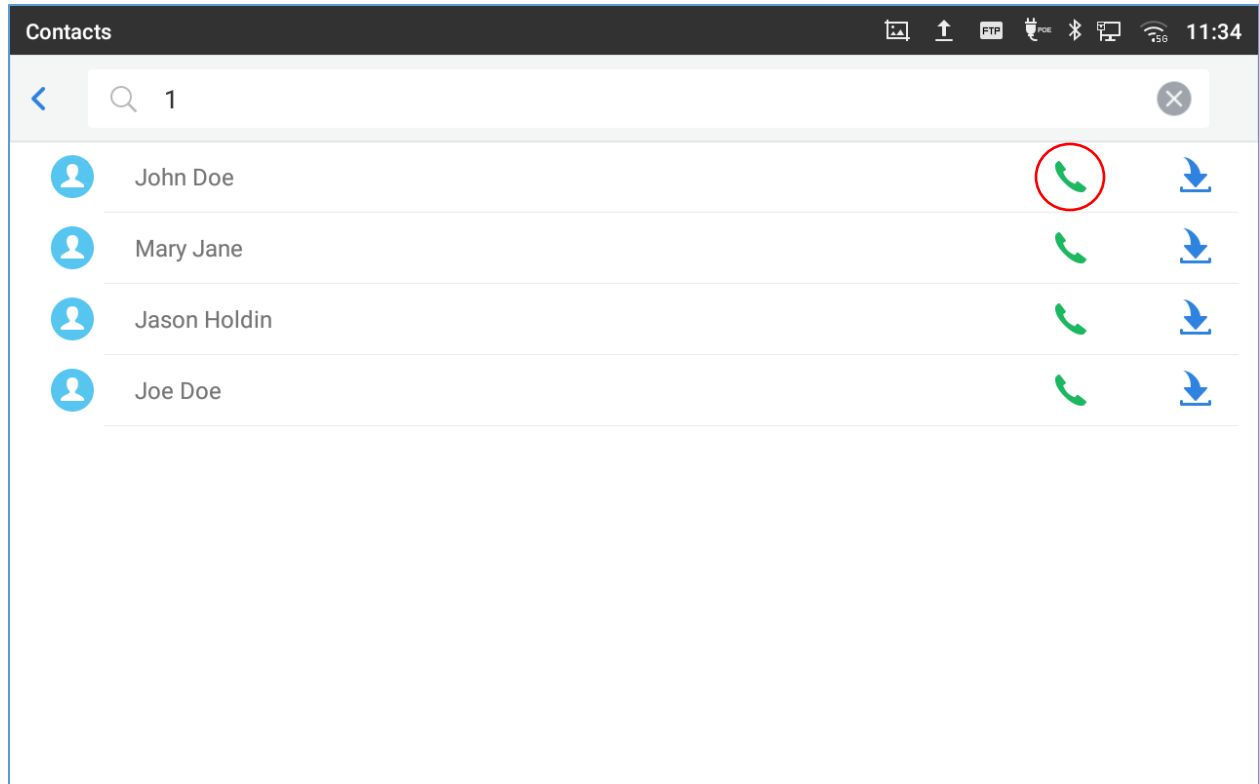


Figure 23: LDAP Calls

