



# Grandstream Networks, Inc.

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## LDAP Configuration Guide



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## SUPPORTED DEVICES

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

Model	LDAP Supported	LDAPS Supported	Firmware
Small Business IP Phones GXP16xx Series			
GXP16xx	Yes	No	1.0.4.6 or higher
Mid-Range IP Phones GXP17XX Series			
GXP17xx	Yes	No	1.0.0.37 or higher
Enterprise IP Phones GXP21xx Series			
GXP21xx	Yes	Yes	1.0.7.25 or higher
IP Video Phones for Android 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
DECT Cordless IP Phones DP75x Series			
DP750/DP752	Yes	Yes	1.0.2.16 or higher
Wi-Fi IP Phones WP820			
WP820	Yes	Yes	1.0.7.7 or higher
Full HD Video Conferencing System 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
Audio Conferencing System GAC2500 Series			
GAC2500	Yes	Yes	1.0.1.44 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.

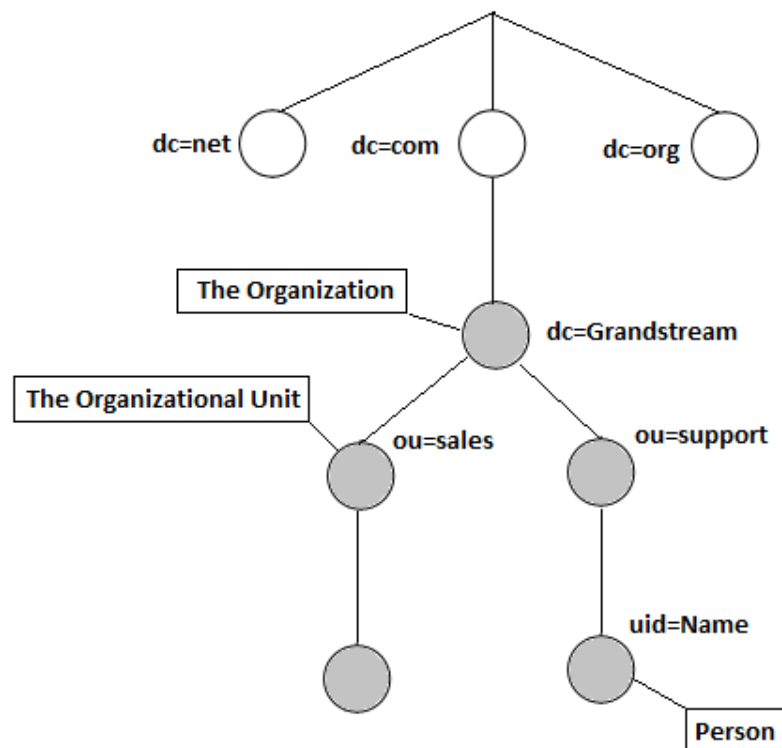


Figure 1: LDAP Tree

## 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.

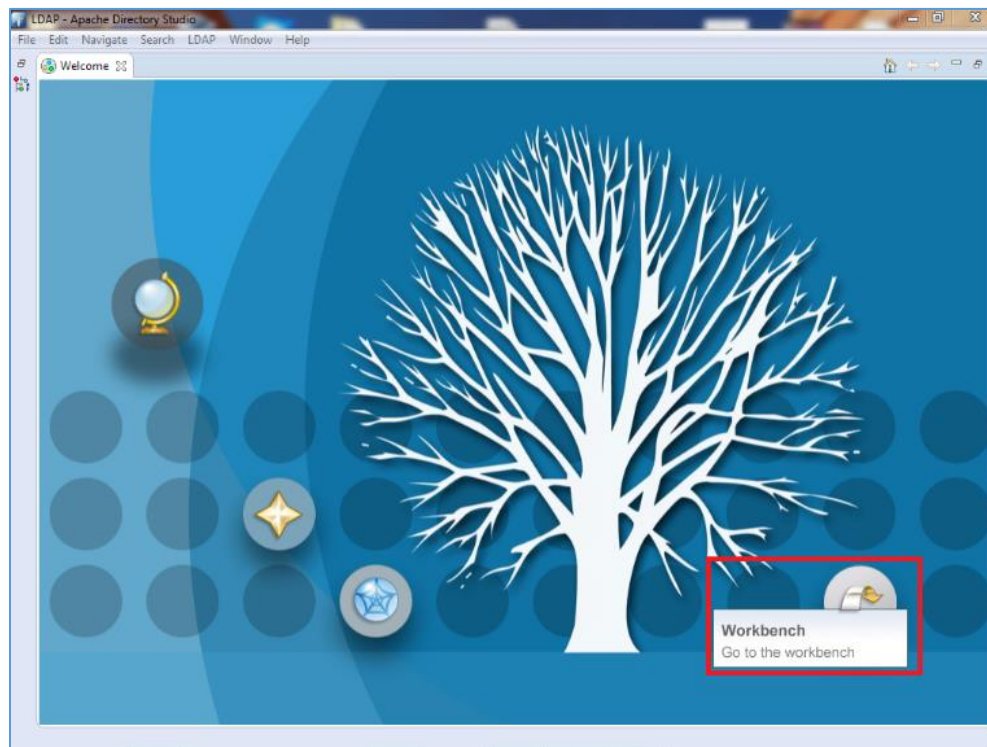
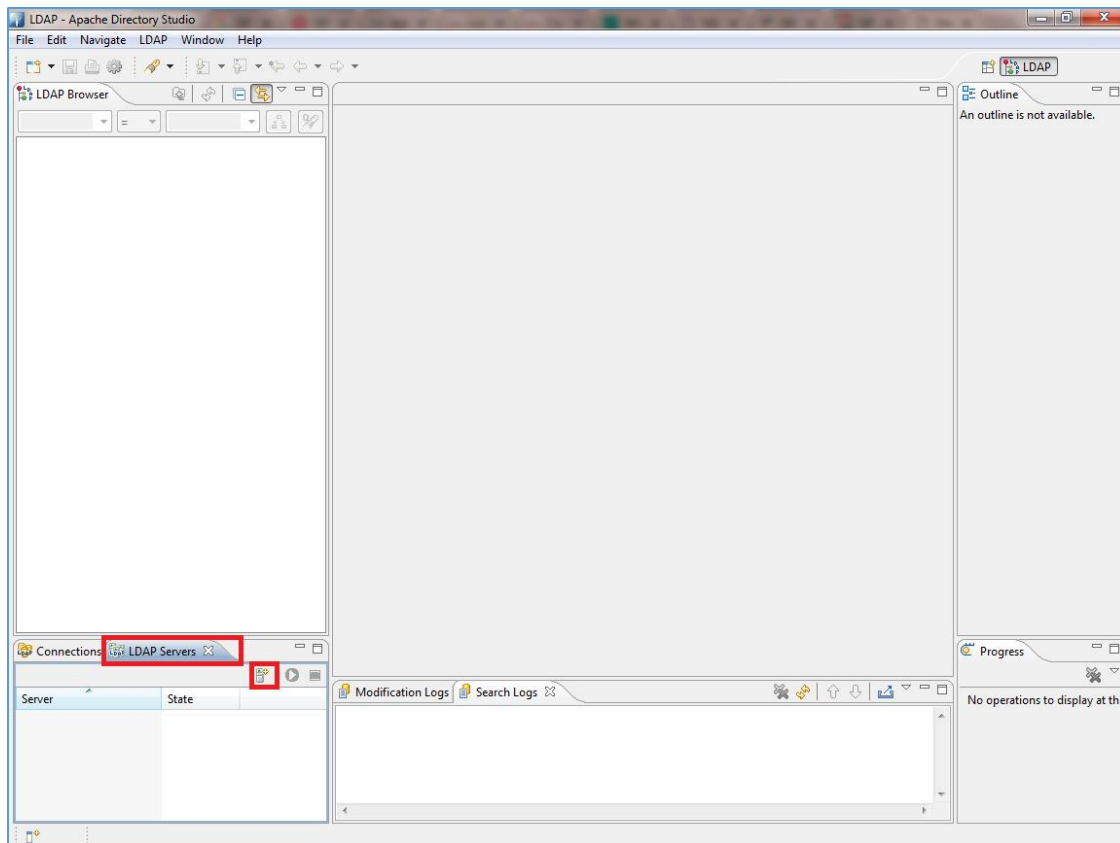


Figure 2: ApacheDS First Start

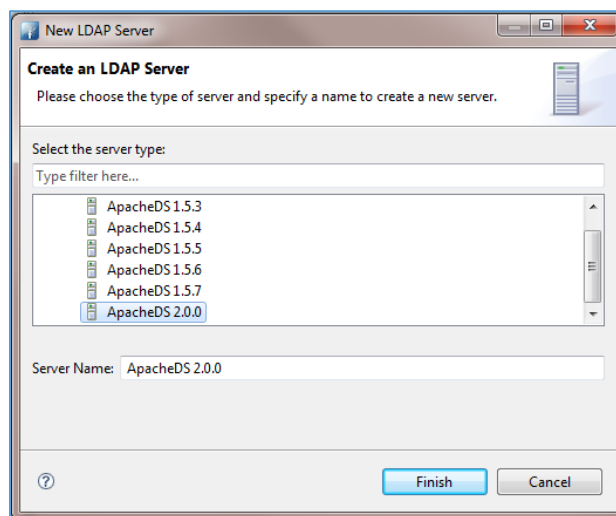
## Configuring ApacheDS

### 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**.

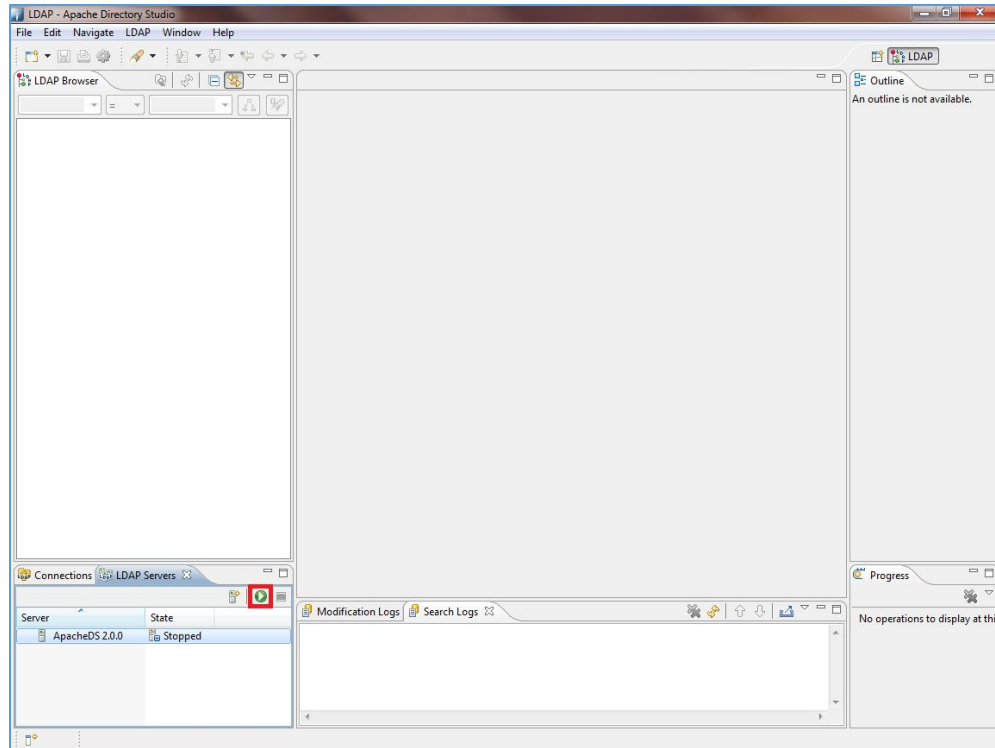


**Figure 3: LDAP Servers Tab**



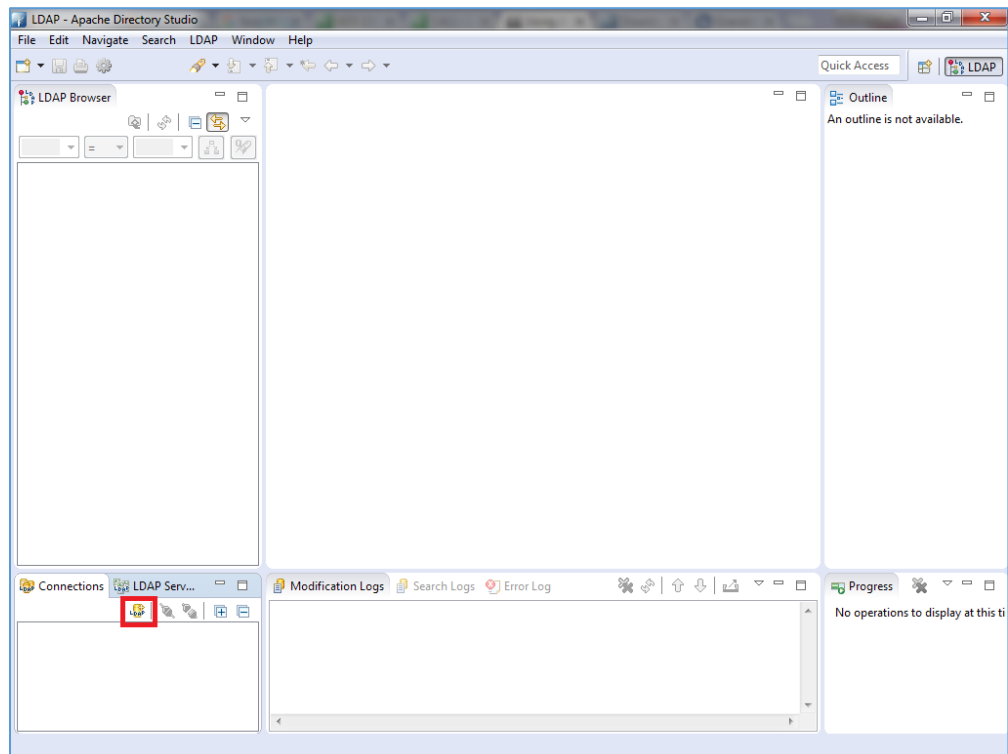
**Figure 4: Create LDAP Server**

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



**Figure 5: Start The LDAP Server**

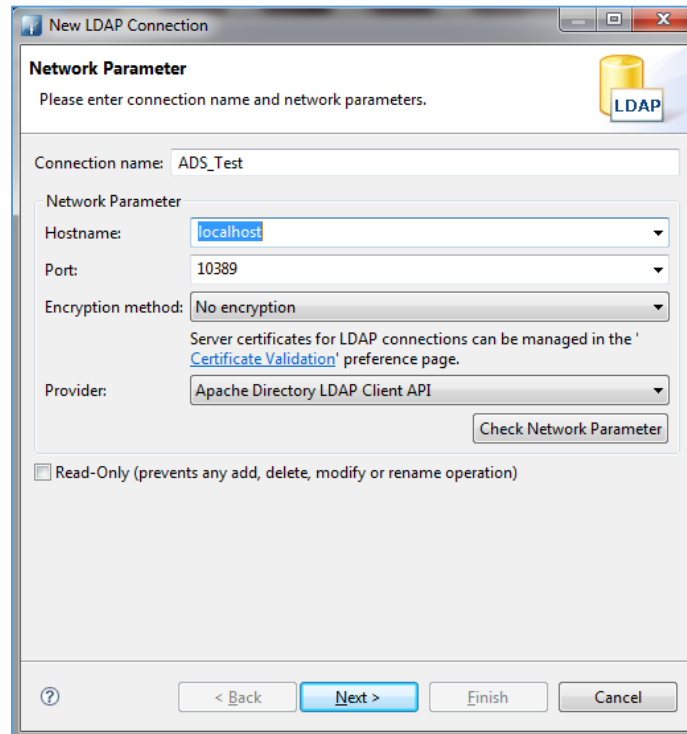
3. In **Workbench**, go to **Connections** tab and press create new connection button as shown below:



**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**

- a) Enter **Hostname** value with IP address or FQDN of the machine where ApacheDS is installed.
- b) The default connection **port** for LDAP on ApacheDS is 10389.
- c) Set **Encryption method** to “No encryption”.
- d) 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.

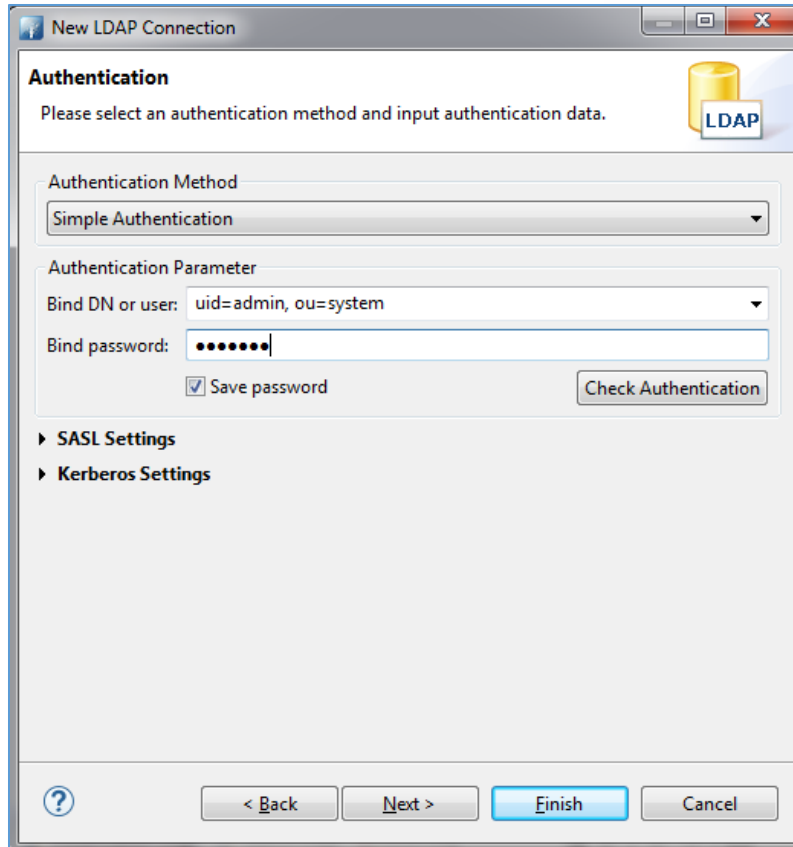


Figure 8: New LDAP Connection - Authentication

- 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**

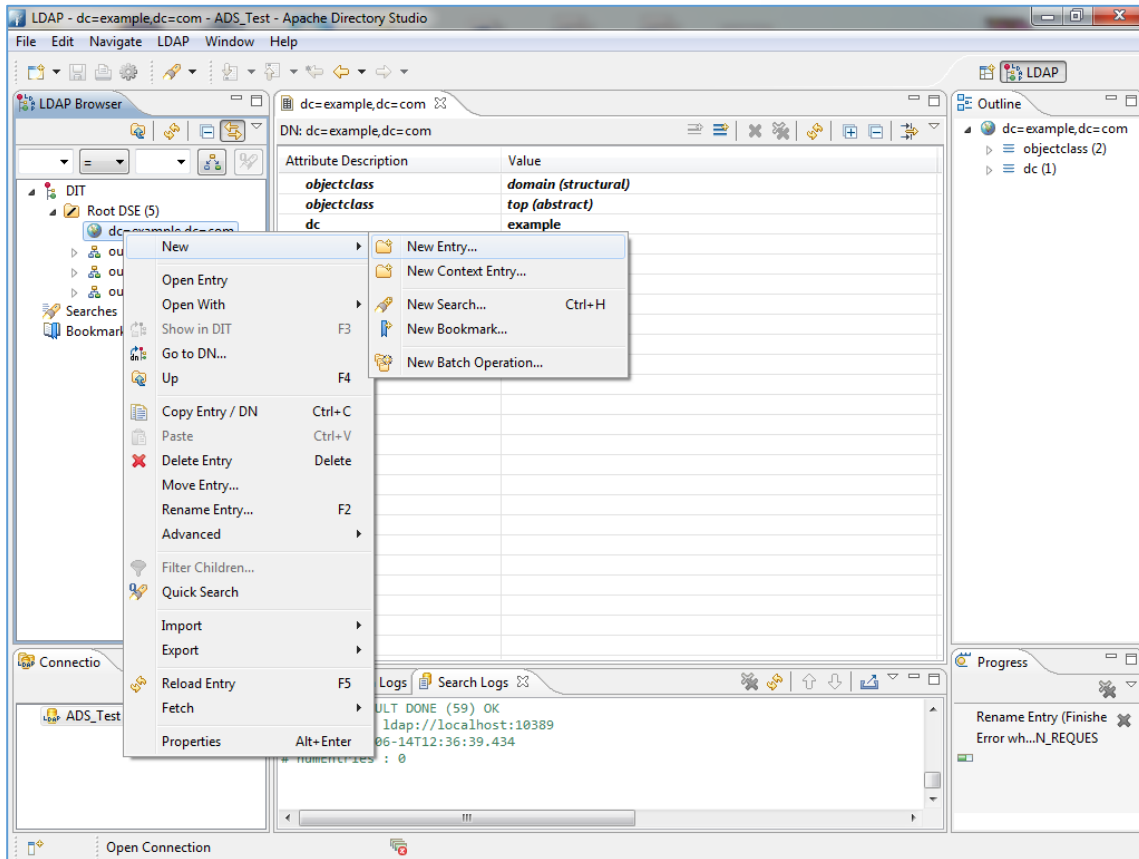


Figure 9: Create New Entry

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

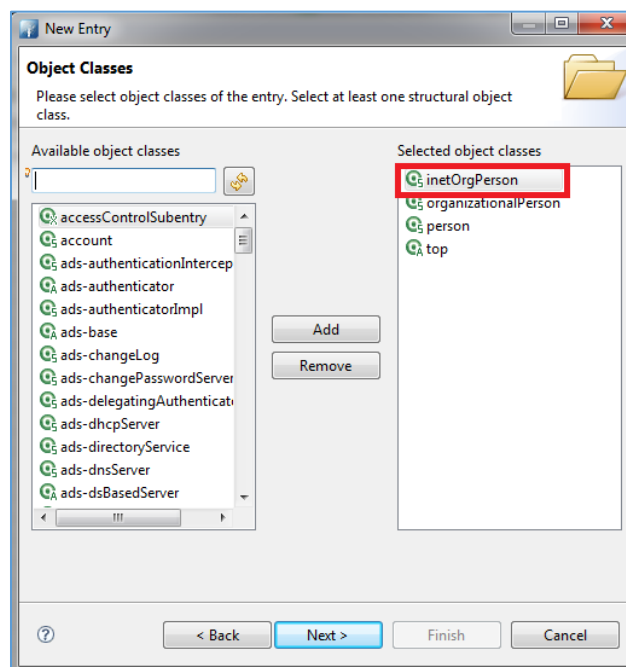
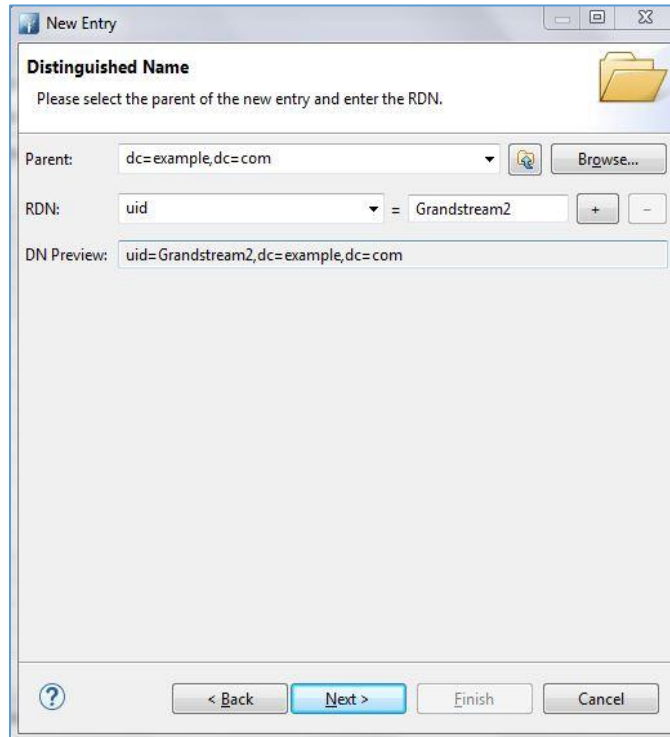



Figure 10: New Entry - Object Classes

4. 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**  
Please select the parent of the new entry and enter the RDN.

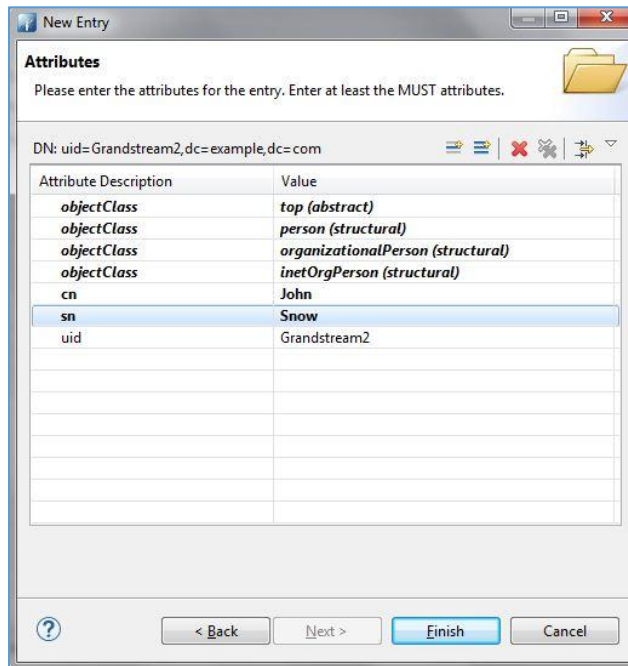
Parent:  

RDN:  =

DN Preview:

**Figure 11: New Entry - Distinguished Name**

5. 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

**Figure 12: New Entry Attributes**

The table below shows common attributes:

Attribute	Description
<b>cn</b>	Full name of the entry
<b>sn</b>	First Name
<b>gn</b>	Last Name or family name
<b>telephoneNumber</b>	Office phone number
<b>homePhone</b>	Home phone number
<b>mobile</b>	Mobile phone number
<b>Company</b>	Company name
<b>o</b>	Organization name
<b>ou</b>	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.

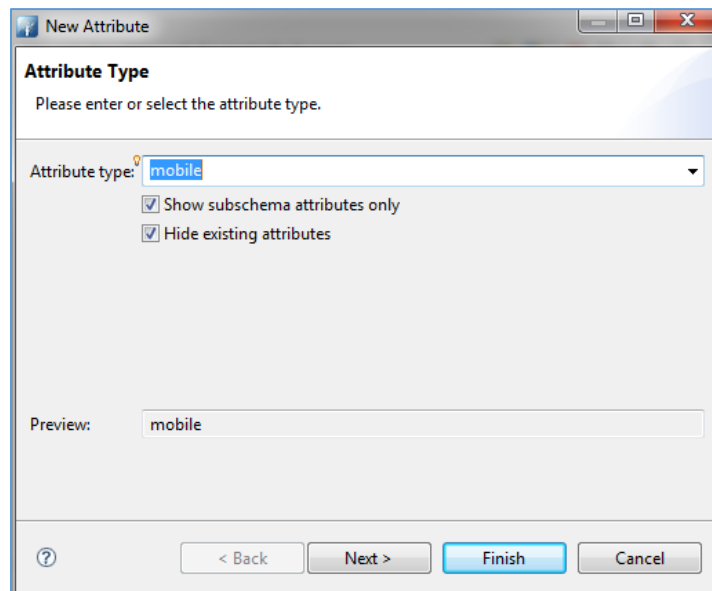
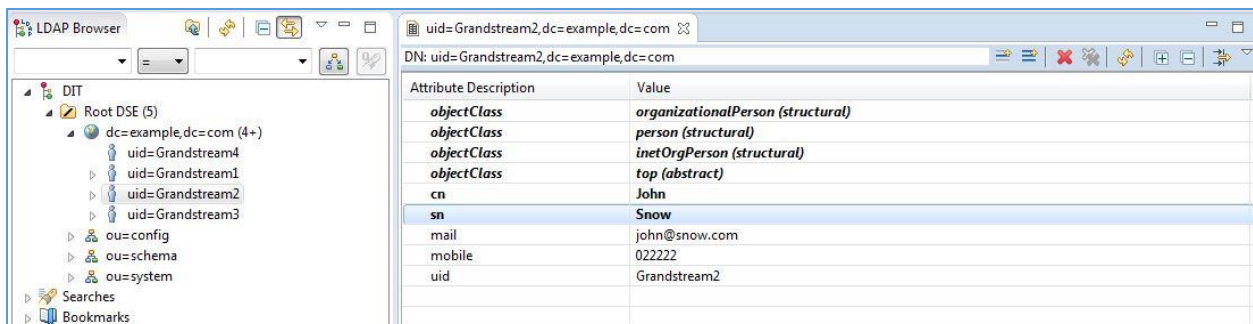


Figure 13: New Attribute - Attribute Type

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



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

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	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	<input type="radio"/> Version 2 <input checked="" type="radio"/> 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	<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	cn sn mobile

Save
Save and Apply
Reset

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	<span>LDAP ▾</span>
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 Filter	<input type="text" value="(mobile=%)(sn=%)"/>
LDAP Version	<input type="radio"/> Version 2 <input checked="" type="radio"/> Version 3
First Name Attribute	<input type="text" value="sn"/>
Last Name Attribute	<input type="text" value="cn"/>
Work Number Attribute	<input type="text"/>
Home Number Attribute	<input type="text"/>
Mobile Number Attribute	<input type="text" value="mobile"/>
Max. Hits	<input type="text" value="500"/>
Search Timeout	<input type="text" value="30"/>

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
<div>Save Cancel</div>	

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**

## LDAP Client Parameters

Following table shows LDAP Client parameters on Grandstream products:

Fields	Description
<b>Connection Mode</b> <i>(GXV33xx/GXV32xx/GVC32xx/GAC2500)</i> <b>LDAP Protocol</b> <i>(GXP21xx/DP75x)</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"> <li><b>LDAP</b></li> </ul>
<b>Server Address</b>	IP address or FQDN of the LDAP server. <i>In this guide:</i> <ul style="list-style-type: none"> <li><b>192.168.5.131</b></li> </ul>
<b>Port</b>	Listening port for LDAP connections on the server side. <i>In this guide:</i> <ul style="list-style-type: none"> <li><b>10389</b></li> </ul>
<b>Base DN</b>	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"> <li><b>dc=example, dc=com</b></li> </ul>
<b>User Name</b>	"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"> <li><b>Blank</b> (no value to enter)</li> </ul>
<b>Password</b>	"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"> <li><b>Blank</b> (no value to enter)</li> </ul>
<b>First Name Attribute</b> <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"> <li><b>sn</b></li> </ul>
<b>Last Name Attribute</b> <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"> <li><b>cn</b></li> </ul>
<b>LDAP Name Attributes</b>	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"> <li><b>cn sn</b></li> </ul>



<b>Work Number Attribute</b> <i>(DP750/DP752 only)</i>	Specifies which LDAP attribute represent the contact's work number. Must be in number attributes on LDAP server.
<b>Home Number Attribute</b> <i>(DP750/DP752 only)</i>	Specifies which LDAP attribute represent the contact's home number. Must be in number attributes on LDAP server.
<b>Mobile Number Attribute</b> <i>(DP750/DP752 only)</i>	Specifies which LDAP attribute represent the contact's mobile number. Must be in number attributes on LDAP server.
<b>LDAP Mail Attributes</b> <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"> <li>• <b>mail</b></li> </ul>
<b>LDAP Filter</b> <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.
<b>LDAP Version</b>	Selects LDAP protocol version to send bind requests. Default is Version <b>3</b> .
<b>LDAP Name Filter</b>	Search filter for name lookup. Its format is compliant with RFC4514. <i>In this guide:</i> <ul style="list-style-type: none"> <li>• <b>((cn=*)(sn=*))</b></li> </ul>
<b>LDAP Number Filter</b>	Search filter for number lookup. Its format is compliant with RFC4514. <i>In this guide:</i> <ul style="list-style-type: none"> <li>• <b>(mobile=*)</b></li> </ul>
<b>LDAP Mail Filter</b> <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"> <li>• <b>(mail=*)</b></li> </ul>
<b>LDAP Display Name</b>	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"> <li>• <b>sn cn mobile</b></li> </ul>
<b>Max. Hits</b>	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 <b>50</b> .
<b>Search Timeout</b>	Interval (in seconds) for the server to process the request and return search results to the client. The default setting is <b>30</b> seconds.
<b>Sort Results</b> <i>(GXP21xx/17xx/16xx only)</i>	Sort returned results. The default setting is <b>No</b> .
<b>LDAP Lookup For Dial</b>	Contact LDAP server to look up number when dialing. The default setting is <b>No</b> .



<b>LDAP Lookup For Incoming Call</b>	Contact LDAP server to look up incoming caller number. The default setting is <b>No</b> .
<b>Lookup Display Name</b> <i>(GXP21xx/17xx/16xx 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"><li>• <b>cn sn</b></li></ul>
<b>LDAP Dialing Default Account</b> <i>(GXV33xx/GXV32xx/GAC2500 only)</i>	Default account to use when dialing contact from LDAP directory. Users may choose from Account 1 to 6. The default setting is <b>Default</b> .



## 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 GXV32xx 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:

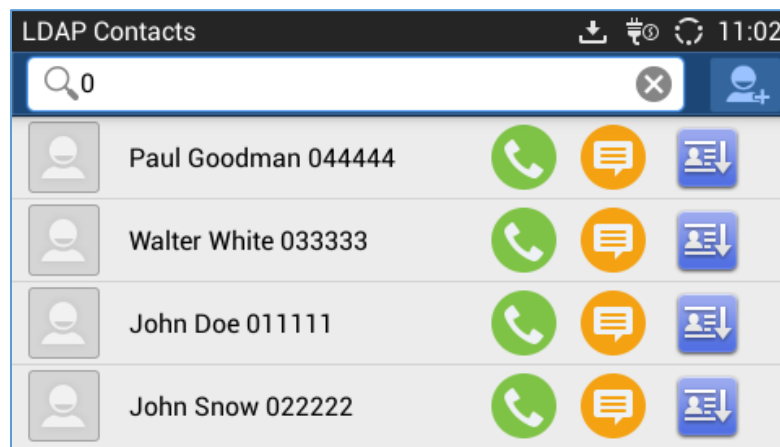


Figure 19: LDAP Search

### 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.

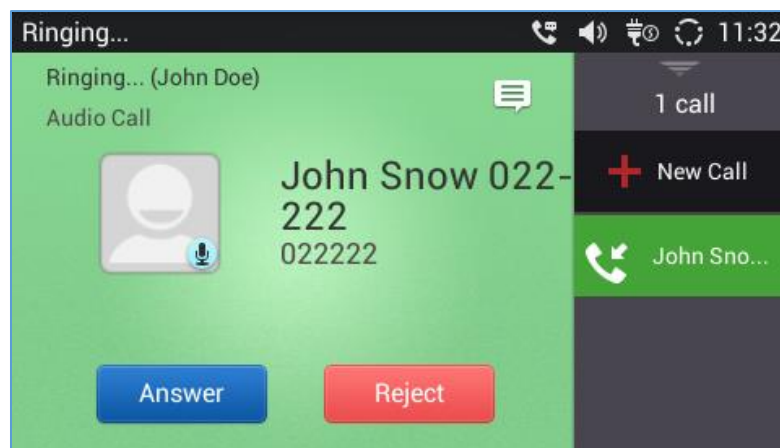


Figure 20: LDAP Matching Contacts

## 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.

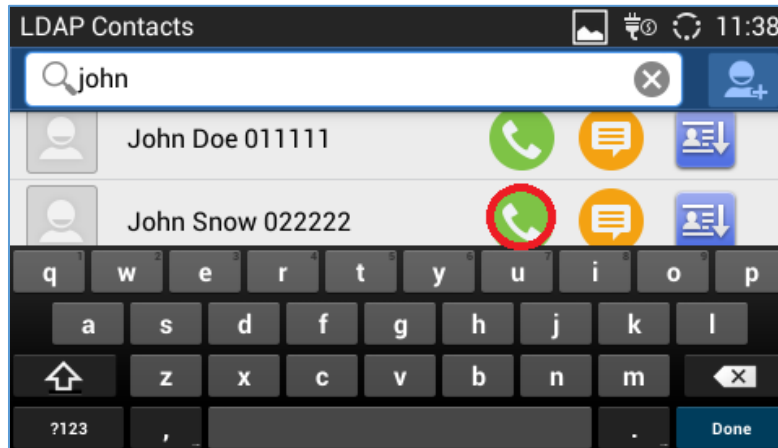


Figure 21: LDAP Calls