

Arc LDAP Server User Guide

Version 4.1



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Section 1: Introduction

Welcome to the Arc LDAP (Lightweight Directory Access Protocol) Server user guide. The LDAP Server application is a part of the Arc Connect suite. This Server application acts as a medium for transferring the contact directories from different website sources to the Arc CT Server. This product is developed for a client, requiring the transfer for its contact directories to the Arc Console Connect application.

The Product

The LDAP Server is developed for the clients to look up for entries and/or their contact directories from different sources to the Arc CT Server. This transfer takes place successfully with no data erased. It is an efficient medium for synchronizing the contacts' information into the CT Server. It is also capable of importing the domain and security information from the sources.

The LDAP Server indexes all the data, and selects contacts and returns the required information. It is a middle manager, which is present between the Arc Console application and the sources, allowing the users to view and update contacts' information. The contacts information can be Internal, External or both.

It allows the users to set preferences according to their requirements. It displays status for the primary CT Server, the configured database and the log database.

About the User Guide

The purpose of this user guide is to provide information on the set up of the application, how to initialise it and working on it.

It gives information on how the LDAP Server application works with the Arc CT Server and synchronises the contacts' information into it. It describes the architecture of the LDAP Server application so that the users get clear idea about it. Also the user guide contains information on setting the preferences for the LDAP Server.

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The Audience

The document is intended for the audience who are:

- Involved in the implementation of training for the application users.
- Themselves application users.

It is assumed that the users have a working knowledge of Microsoft Windows NT.

Inside The User Guide

The user guide contains the following sections,

Getting Started

This section explains the architecture of the Arc LDAP Server application. It gives introduction to the functions of the application and also the instructions on how to use them. The users are given description of the support it provides to the LDAP and the Arc databases. It explains its support to the Arc Console Connect application and the valued client. The users get to know about the Contacts Synchronization and Keep Alive processes. It explains the interface describing its functions and Menu bar.

Initialising Arc LDAP Server

In this section, the user is given instruction on setting the preferences fro the LDAP Server application. It defines the functions to be set in the preferences, so that the application works according to the user's requirement.

Working With Arc LDAP Server

This section tells how to start the LDAP Server and work.

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Section 2: Getting Started

The LDAP Server acts as a mediator Server, which synchronises the Internal and External contacts to the local database configured by the Arc CT Server. The Console users can view and update the contacts information within the Console application as required. The data will also update in the LDAP source.

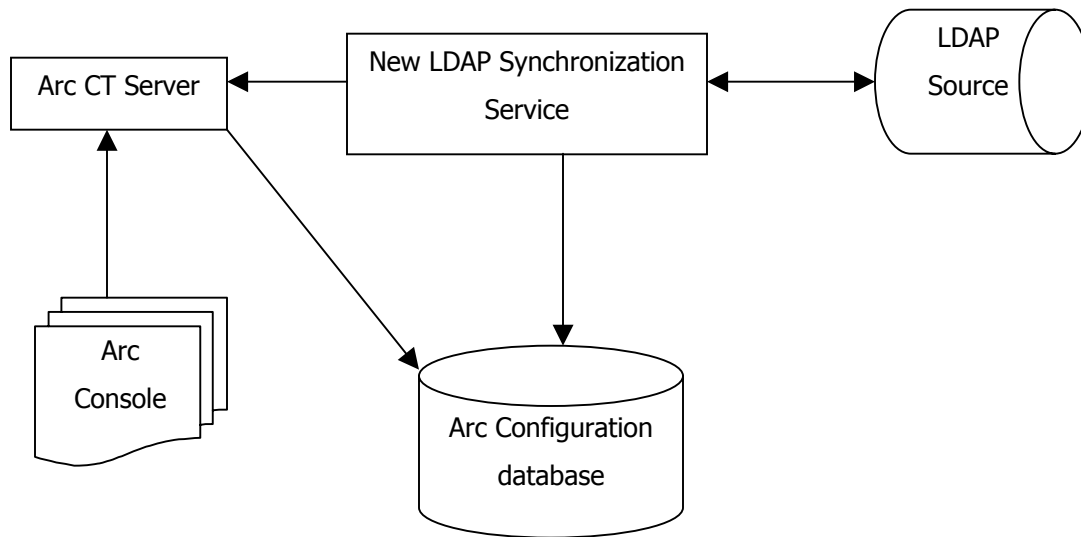


Figure 2-1 Architecture overview of the LDAP Server

The main configuration for the LDAP Server is done in the *Arc Configuration utility* > *LDAP Synchronization*¹. Arc LDAP Server uses NT Service Architecture and performs the following key features,

2.1 LDAP Database Support

The Server will connect to an LDAP database Server and will use one or many filters to identify contact records that require synchronisation.

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¹ The descriptions for the LDAP in the Configuration utility can be read in the Arc Connect Walkthrough.

Arc LDAP Server supports the following LDAP databases,

- Sun Microsystems IPlanet\Netscape, IPlanet versions (5.1, 5.2)
- Microsoft Active Directory

2.2 Arc Database Support

The Server will connect to an Arc Connect Configuration database to identify contact records that require synchronisation.

2.3 Arc Console Connect Support

The Server will connect to the Arc Connect CT Server to manage contact changes made through the Console Operator. The connection to the Arc Connect CT Server will be via TCP/IP using the Multi Session Interface (MSI). An MSI is an Arc proprietary protocol used to communicate with the CT Server.

2.4 Client Support

The Server will communicate with a TCP/IP socket allowing the Client application to connect and request status information and change settings online.

2.5 Contact Synchronization

The Server is linked with the Arc Connect Configuration database, LDAP Server database and the MSI to support the following requirements,

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- **Filter:** Arc has provided a support for the collection of filters so user can create a customized rule that will select records from LDAP source and synchronize them to the Arc database.



EXAMPLE

A filter for the contacts is applied as to only synchronise contacts from “**London**”. It will search all individuals or groups within the criteria.

- **Field Mapping:** It is able to specify a logical data map between the supported Arc fields and the LDAP database.
- **Read:** It can read data from the LDAP database and compare it to the Arc database. Changes will be written back to the Arc database and the information propagated to the Arc applications on real-time basis.
- **Write:** It can read data from the Arc database and push the changes to the LDAP database.
- **Both:** It can read and write the data from the Arc database and drive the changes to the LDAP Server.

Client applications like Console Connect and others will only be able to modify the contact fields that have NOT been mapped for LDAP Synchronization.

2.6 Keep Alive Processing

The LDAP Server uses **Keep Alive Processing** to test the validity of the network connection with Primary CT Server. If **Keep Alive Processing** fails, then the LDAP Server tries to reconnect with the CT Server.

The application will wait for a response from the other side after sending a small packet of data over a network connection. The data-receiving application will pick up the request and simply respond back. If any leg of the packet sending the process fails, the connection is identified as broken. The LDAP Server tries to reconnect the connection with CT Server on failure of a Keep Alive request.

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2.7 Interface

The interface provides an overview of the total activity in the Arc Console. It is divided into the following sections,

1. Activity
2. Server Status
3. Status Bar

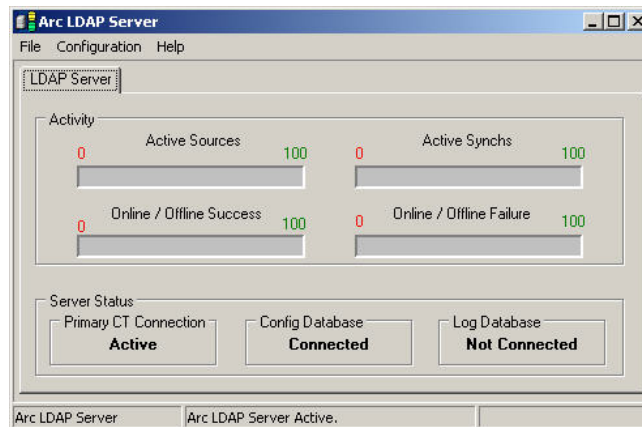


Figure 2-2 Arc LDAP Server

2.7.1 Activity Section

This section is divided into four parts as described in the following table, *Table 2.1*. It allows the users to know the statistics for the sources and synchronizations.

Control Name	Explanation
Active Sources	It displays the number of all the sources that are active and fed in the Configuration Database.
Active Synchs	This shows the number of active sources that are synchronising data with the Server.
Online/Offline Success	It displays the collective number of the sources successively synchronising through MSI and/or Arc Source. The online success synchronisation is through MSI. The offline synchronisation is through Arc Source.

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Online/Offline Failure	<p>It displays the collective number of the sources failed in synchronising through MSI and/or Arc Source.</p> <p>The online failure synchronisation is through MSI. The offline failure synchronisation is through Arc Source.</p>
------------------------	---

Table 2-1

2.7.2 Server Status

This section shows the connection status for the **Primary** Arc CT Server. There can be four states for the connection between the CT Server and the LDAP Server.

States	Explanation
Active	Arc CT Server is connected with Arc LDAP Server and currently being used for Requests and Processes.
Connected	Specified Arc CT Server is available on the Network.
Not Connected	Specified Arc CT Server is not available on Network.
Not Configured	Details for the specified Arc CT Server are incomplete.

Table 2-2

When the CT Server is not available on the Network, the Log Database is connected to run the synchronisation of the contacts offline. When the CT Server is available the status becomes **Active**, and the Log database disconnects. When the CT Server is active, the contacts are synchronized online to the Configuration database directly.

2.7.3 Status Bar

It has two parts; the first part is the name of the application, **Arc LDAP Server**. The second part is the connection status for the LDAP Server, e.g. **Active**.

2.8 Using Menu Bar Options

Arc LDAP Server menu bar provides the user a quick way for work around. Following menu options are available in Arc LDAP Server,

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Menu

File menu has following sub menu options available to the user.

Control Name	Explanation
File	
Connect	After the LDAP Sever application starts, it will automatically connect to Arc LDAP Sever Services using the information given during the installation. If LDAP Sever could not find the services or it has been stopped, then the Status bar will show a Status Not Connected . Use this option to Connect the LDAP Sever again.
Service Manager	Services for the LDAP Server can be started / stopped from this sub menu option.
Exit	Use this option to quit the LDAP Server application.
Configuration	
Preferences	Click to set preferences for the LDAP Server to work accordingly.
Help	
Contents	This will open the Help File for Arc LDAP Server application.
Keyword Search	This will let you find a Keyword in Help File.
About	This option opens the About Box for Arc LDAP Server.

Table 2-3

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Section 3: Initialising Arc LDAP Server

The users are allowed to set preferences in the Arc LDAP Server. They can select options in the given tabs according to their requirements. Select the *Configuration* → *Preferences* on the Menu bar. This will open the window, **Preferences** that consists of three tabs for discrete modifications.

3.1 Preferences

It provides the facility of viewing/updating **Defaults** for Arc LDAP Server. It is recommended that before making any changes in this section, consult your Network/System Administrator.

3.1.1 General

This tab allows users to enter the information for the **LDAP Server**.

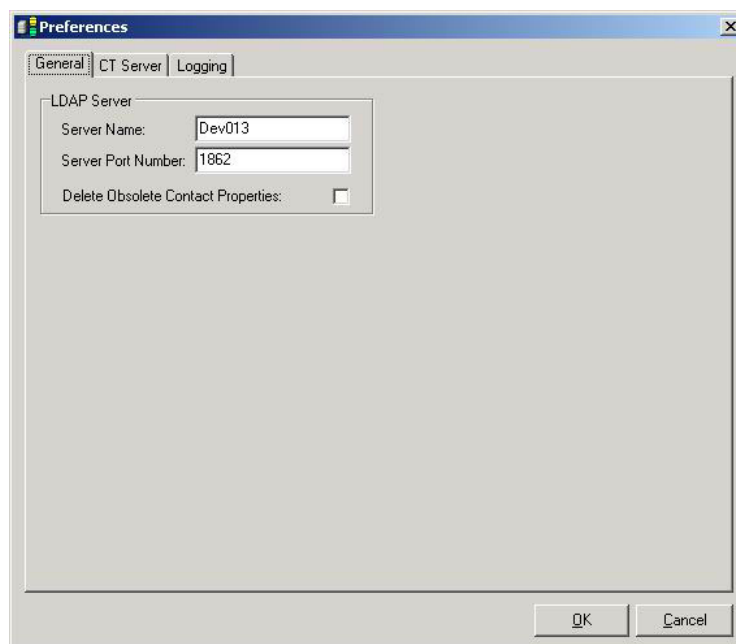


Figure 3-1 General tab selected in the LDAP Server preferences

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Server Name: It is the **Name** or **IP Address** of the machine where the LDAP Service is installed.

Server Port Number: It is the **Service Port Number** used by the LDAP Server.

Delete Obsolete Contact Properties: If this option is selected LDAP Server will remove those contact properties that are not included in source filed mappings of LDAP contacts otherwise all such contact properties will be ignored.

3.1.2 CT Server

This tab is for configuring the settings for the Primary Server and Request Timeout Delay. There is a CT Server installed on the Primary machine. The Primary Server is used as default. If the Primary Server goes down or stops due to a reason, the Console Operator application will connect to the Log Database until it becomes active again.

The CT Server is divided into two sections, **General**, and **Primary CT Server**.

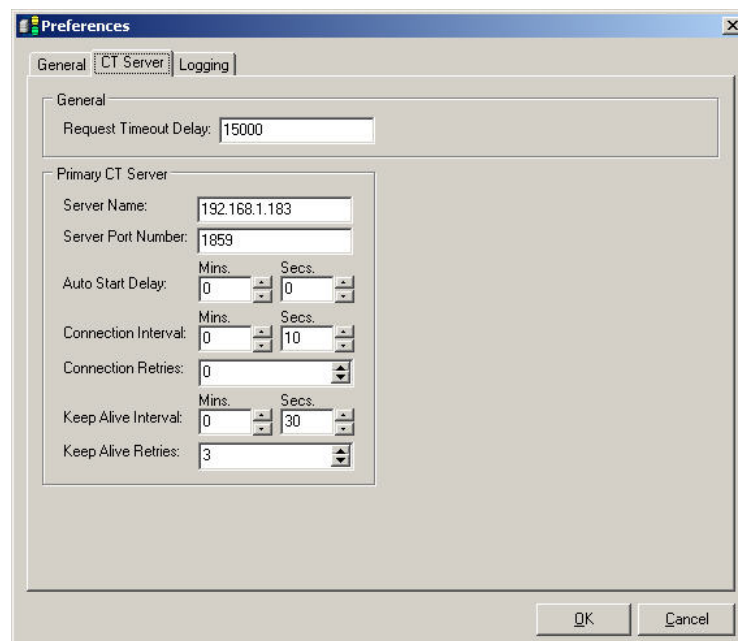


Figure 3-2 CT Server tab in the Preferences window

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General:

This section has a text box, **Request Timeout Delay**. It allows the user to enter the time interval in milliseconds. This time interval is the delay of response for a synchronous request to the Arc CT Server, which is to be declared as timed out by the LDAP Server.

Primary Server:

The options in this section of the CT Server tab are defined in the *Table 3.1*,

Control Name	Explanation
Server name	Name or IP Address of the machine where the Primary Server is installed.
Server Port Number	Service Port number used by the Primary Server.
Auto Start Delay	Once started, after the time given in this selection box, LDAP Server will try to connect to the CT Server. This option has two selection boxes to select time, Minutes and Seconds .
Connection Interval	This option contains two selection boxes, Minutes and Seconds . The interval is selected in minutes or milliseconds for the LDAP Server to retry a connection request to the CT Server.
Connection Retries	This selection box contains the number of connection attempts; the application will make to connect the CT Server.
Keep Alive Interval	This option has two selection boxes, Minutes and Seconds . It contains the time interval between the two Keep Alive requests sent by the LDAP Server to the CT Server.
Keep Alive Retries	This selection box contains the number of consecutively failed keep alive requests, after this LDAP Server will reconnect with the CT Server.

Table 3-1

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3.1.3 Logging

The LDAP Server has the ability to keep records of all the events and processes through the process of logging. It is structured to enable the users and support engineers to check the LDAP Server's performance and activity, determine functionality loss and the configuration issues. The names and description of the logging levels are given in the *Section 3.1.3.1*.

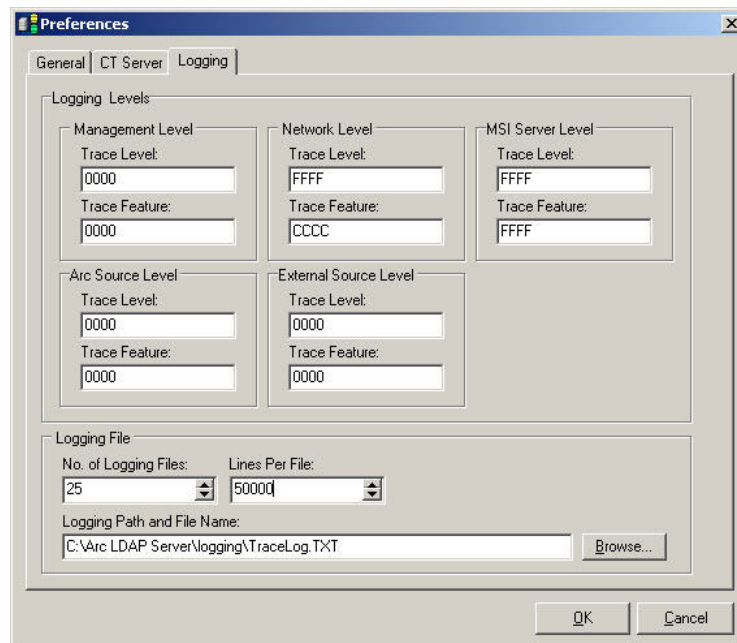


Figure 3-3 Logging Levels and Logging File sections

3.1.3.1 Logging Levels

The LDAP Server application allows the users to keep record of the activities in five different levels. These levels are,

1. Management Level
2. Network Level
3. MSI Server Level
4. Arc Source Level
5. External Source Level

These five levels have two Trace values, **Trace Level** and **Trace Feature**. These levels have same options for entering values. *See figure 3.3.*

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Trace Levels

The LDAP Server allows a Trace level to be set for each **Logging Level**. The higher the **Logging Level**, the more detailed the logging becomes. This allows the Support Engineers to select full detailed log-files or lower detailed log-files. Currently Arc LDAP Server offers four logging levels. These are **Low, Medium, High** and **Full**. Users enter a hexadecimal value in the text box, **Trace Levels**. This value is then converted into the binary form. The Binary value states the level selected by the users. Use the following hexadecimal values to set the desired level.

- i. Trace Off = 0
- ii. Trace Level Low = 1
- iii. Trace Level Medium = 2
- iv. Trace Level High = 4
- v. Trace Level Full = FFFF

Trace Features

There are different logging features available for altered levels. Remember that the logging for the features is dependable upon the value given in the text box, **Trace Level**. If the value is **0** in the **Trace Level**, then there will be no logging for that level, no matter how many features are enabled for this logging level.

For more details about the hexadecimal values used by the Arc LDAP Server, see the *Appendix 1*, at the end of this guide.

3.1.3.2 Logging Files

The LDAP Server application uses an advanced technique to keep record of the activities to a series of log-files. Each log file contains a predefined number of lines. The log-files are generated in a sequence. There is control over the number of log-files generated. Once the maximum log-files have been exceeded, the Server will overwrite the first log-file and so on. This enables support engineers to ensure the disk space is not exceeded.

- Select a value from the selection box, **No. Of Logging File** to define a maximum number of the log files that should be created by LDAP Server.
- Select a value from the selection box, **Lines Per File** to define the maximum number of lines each log file will contain. After the log file reaches this number of lines, a new file will be created to log the events.

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- To change the file name or the path for the log file, click on the **Browse** button and reach for the folder where log file is to be stored, give the **File** name and click the **Open** button.

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Section 4: Working with Arc LDAP Server

This chapter provides the steps to start the services of the Arc LDAP Server.

4.1 Connect to Services

To Connect the Arc LDAP Server to its Services,

1. Select: *File* → *Connect*
2. Enter the **Server Name** or the **IP Address** of the machine where the Arc LDAP Server has been installed.
3. Enter the Service **Port Number, 1861**.
4. Click the **Connect** button.
5. The LDAP Server status will change to **Stopped**.



Figure 4-1 Service Manager - Arc LDAP Server

4.2 Start /Stop Services for Arc LDAP Server

Services for the Arc LDAP Server can be started/stopped from *File* → *Service Manager*.

1. A green colour signal shows that the service is running, whereas a red colour shows that the service is stopped.
2. **Start Service** will be highlighted when the service is stopped. Click the button to start the service.
3. **Stop Service** will be highlighted when the service is running. Click the button to stop the service.
4. Click the **Close** button to close the **Service Manager**.

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4.3 Closing the Arc LDAP Server

To close the Arc LDAP Sever Application,

1. Select *File* → *Exit*.
2. If the services are running and you select to close the application, it will still log the events and processes as configured in **Preferences**.

4.4 Getting Help

In case user requires help on any of the area in Arc LDAP Server, place the cursor or focus on the respective area and press F1 key. Attached help file will open the topic related to that area.

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Section 5: Glossary

LDAP	Lightweight Directory Access Protocol
Comms Debug Feed	It is the information about the Events and Processes in TCP/IP Communication Layer during communication between the Arc LDAP Server and LDAP client applications.
Comms Error Feed	Information about the Errors occurred in TCP/IP Communication Layer during communication between the Arc LDAP Server and LDAP client applications.
Connection Retries	The number of times Arc LDAP Service will try to connect with Primary Arc CT Server.
CT Server	Arc Connect Computer Telephony Server application in the Call Centre.
Keep Alive retries	The number of times Arc LDAP Service will try to check the sanity of connection with the Arc CT Server.
MSI	Multi Session Interface.
MSI Debug Feed	It is the information about the Events and Processes in TCP/IP Communication Layer during communication between the Arc LDAP Server and Arc CT Server.
MSI Error Feed	Information about the Errors occurred in TCP/IP Communication Layer during communication between the Arc LDAP Server and Arc CT Server.
Processes	A Series of action in Arc LDAP Server that lead to a desired result.
Request	LDAP Clients' call for specific service to be performed by Arc LDAP Server.
TCP/IP Events	Information about the responses being sent to the LDAP Clients Application through TCP/IP Communication Layer at Network Level.
TCP/IP Request	Information about the requests being sent from the LDAP Clients to the Arc LDAP Server, through TCP/IP Communication Layer at Network Level.
Trigger	Signal in Arc LDAP Server that causes the launching of a certain process.

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Section 8: Appendix 1: Converting Numbers

From Binary to Hexadecimal

To convert a binary number into its hexadecimal form, start by grouping the digits into 4-bit groups. Beginning with the least significant bit (all the way to the right of the number), write the hexadecimal equivalent of each group. For example,

$$111111_{(\text{base } 2)} = 3F_{(\text{base } 16)}$$

0011	1111	(base 2)
3	F	(base 16)

From Hexadecimal to Binary

To convert a hexadecimal number into a binary value, just reverse the above process, starting all the way to the right, convert each digit into a 4-bit binary number.

Hexadecimal Numbers in Arc LDAP Server

Although user can enter binary values but the Arc LDAP Server accepts the hexadecimal values as well. It then converts these values in Binary number system. That number states the option that which level or feature is set as enabled or disabled for logging by the user. Therefore before entering a number in the text box, user must do the following calculations

1. First decide that which options are required to be enabled for logging in this section.
2. Set the digit for the enabled options as 1, and for disabled options as 0.
3. User will get a binary number in result.
4. Convert that binary number into a hexadecimal value.
5. Now give this number into the input box in logging section.

User must give this Hexadecimal value in logging section in order to set the Trace features options. An error while calculating the value can cause mis-configuration. While calculating the value keep in mind the followings,

1. Choices available for each text box are given in this guide in a list format. The choice appearing above in the list would be on the right side while calculating a Binary number.
2. Text boxes in logging section accept a value in hexadecimal up to FFFF. But Arc LDAP Server application will convert any value entered in the input box into binary

and will consider only the numbers from the right, equal to the number of options available for concerned feature. Method for converting a binary number in to Hexadecimal number was given in the previous section.

3. There are four Trace levels available in Arc LDAP Server. While setting the Trace level, Arc LDAP Server will check the highest ON bit. That means giving a hexadecimal value 8 or 9 will have no difference, as these values will be producing binary numbers 1000 and 1001, and Arc LDAP Server will check for the left most ON bit in four digits starting from left side. Once the fourth would be found ON then it does not matter whether third one is ON or not. Higher level has a priority over the lower level.

Section 9: Appendix 2: Using Hexadecimal Values

Management Level

The LDAP Server can log in four areas in management level; these are:

1. Requests
2. Processes
3. MSI Response
4. DB Response

Use the following hexadecimal values to set the desired features for this level.

- | | | |
|------|--------------|-----|
| i. | No Feature | = 0 |
| ii. | Requests | = 1 |
| iii. | Processes | = 2 |
| iv. | MSI Response | = 4 |
| v. | DB Response | = 8 |
| vi. | All | = F |

Network Level

The LDAP Server can log in four areas in Network level. These are:

1. Comms Debug Feed
2. Comms Error Feed
3. TCP/IP Request
4. TCP/IP Events

Use the following hexadecimal values to set the desired features for this level.

- | | | |
|------|------------------|-----|
| ii. | No feature | = 0 |
| iii. | Comms Debug Feed | = 1 |
| iv. | Comms Error Feed | = 2 |
| v. | TCP/IP Request | = 4 |
| vi. | TCP/IP Events | = 8 |
| vii. | All | = F |

MSI Server Level

The LDAP Server can log in six areas in MSI Server Level.

1. MSI Debug Feed
2. MSI Error Feed
3. Triggers
4. Keep Alive retries
5. Connection Retries
6. MSI Activity

Use the following hexadecimal values to set the desired features for this level.

- | | | |
|-------|--------------------|------|
| i. | No feature | = 0 |
| ii. | MSI Debug Feed | = 1 |
| iii. | MSI Error Feed | = 2 |
| iv. | Triggers | = 4 |
| v. | Keep Alive retries | = 8 |
| vi. | Connection Retries | = 10 |
| vii. | MSI Activity | = 20 |
| viii. | All | = 7F |

Arc Source Level

The LDAP Server can log in six areas in CTI Link level.

1. DB Error Feed
2. DB Debug Feed
3. Triggers
4. Connection Retries
5. DB Activity
6. DB Driver

Use the following hexadecimal values to set the desired features for this level.

- | | | |
|-------|--------------------|------|
| i. | No feature | = 0 |
| ii. | DB Error Feed | = 1 |
| iii. | DB Debug Feed | = 2 |
| iv. | Triggers | = 4 |
| v. | Connection Retries | = 8 |
| vi. | DB Activity | = 10 |
| vii. | DB Driver | = 20 |
| viii. | All | = 7F |

External Source Level

The LDAP Server can log in six areas in CTI Link level.

1. External Source Error Feed
2. External Source Debug Feed
3. Triggers
4. Keep Alive Retries
5. Connection Retries
6. External Source Activity

Use the following hexadecimal values to set the desired features for this level.

- | | | |
|-------|----------------------------|------|
| i. | No feature | = 0 |
| ii. | External Source Error Feed | = 1 |
| iii. | External Source Debug Feed | = 2 |
| iv. | Triggers | = 4 |
| v. | External Source Activity | = 8 |
| vi. | Connection Retries | = 10 |
| vii. | External Server Activity | = 20 |
| viii. | All | = 7F |