

Arc LDAP Synchronization User Guide

Version 4.1



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User Guide History

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Related Documents

Document	Author	Version	Format
A1617 - LDAP Integration - Functional Specification	J. A. Rumsey	1.6	MS Word
Arc LDAP Server User Guide	Shafiq-us-Salam	1.1	MS Word
Arc Connect Walkthrough			MS Word

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Purpose and Audience

This purpose of this document is to provide information on how to synchronise Arc Connect applications to an external enterprise directory.

The document is intended for the following audience: -

- Arc personnel involved with the support and installation of enterprise directory synchronisation.
- All personnel involved with the design, installation and management of enterprise directory synchronisation.

This document assumes an understanding of:

1. LDAP fundamentals
2. Arc Connect application suite

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Section 1: Overview

Arc Connect can synchronize with one or many Lightweight Directory Access Protocol (LDAP) databases. LDAP contact details are read and synchronized within the Arc contact database framework. Synchronized contact details are used by the Arc Console Operator application for directory lookups and call dialling.

Using Lightweight Directory Access Protocol (LDAP), synchronization will enable external LDAP contacts to be read as Arc contacts. Arc Operators will seamlessly integrate with a LDAP source, meaning all contact directory management will be online and synchronized.

Arc does not store any data in the external LDAP database. The LDAP data source is read and data is stored into the Arc contact database for use by the Arc Connect application suite.

Arc Connect v4.1 supports the synchronization of the following enterprise directories:

1. iPlanet (Netscape/Sun Microsystems)
2. Active Directory (Microsoft)

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Section 2: Architecture

A separate Arc component, Arc LDAP synchronization Server, will connect to the customers' LDAP contact database. This component will also read the Arc contact database and synchronise contact records between databases. See figure1-1 given below for an architecture overview.

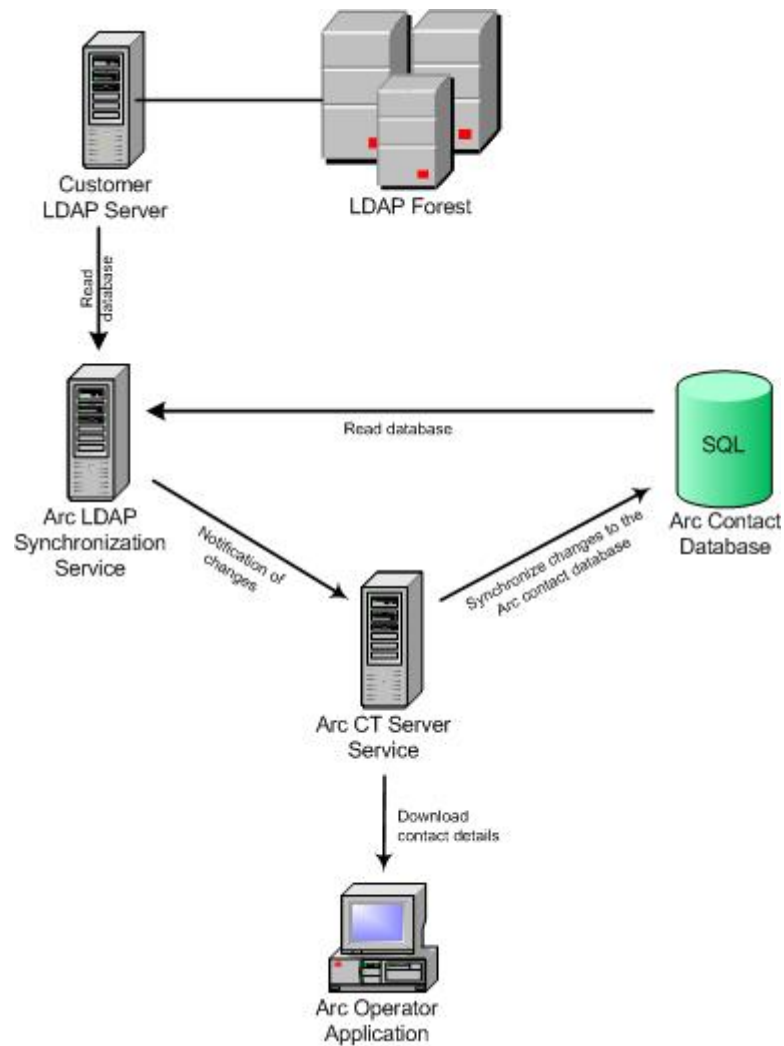


Figure 2-1: LDAP Service Architecture

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2.1. Enterprise Directory Requirements

Enterprise directories must support one of the following platforms,

1. iPlanet v4.2+ (Netscape/Sun Microsystems)
2. Active Directory (Microsoft)
3. LDAP protocol versions 1, 2 or 3
4. Contact records structured, as standard users or contacts, within an organisational unit (OU)

An LDAP Server node should be provided and configured to

1. Allow the Arc LDAP synchronization Server to connect over the network.
2. Allow the Arc LDAP synchronization Server to have suitable authentication to read LDAP contacts. Supplying a new directory account with rights to read provides this requirement.

Contact records must support a property that is considered unique. Arc Connect will use a unique property to synchronise contact records between the enterprise directory and the Arc contact database. A customer may use a proprietary unique property such as employee number or use the built-in native platform unique property.

Native platform unique properties are,

1. Active Directory – Object GUID (objectGUID)
2. iPlanet – Distinguished Name (DN).



NOTE

Distinguished name is based on general contact properties that can change, using a distinguished name as the unique index may cause synchronisation issues for Arc Connect.

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2.2. Arc Supported Features

Arc Connect supports the following features when synchronizing with an enterprise directory,

1. User DN and password authentication
2. Dynamic change notification

Arc Connect synchronisation functionality supports the following features,

1. Multiple enterprise directory connections
2. Configurable contact field mapping relationships between the Enterprise Directory and the Arc Connect Contact Database
3. Filtering rules to synchronise a sub-set of all contacts
4. Scheduled synchronisation
5. Synchronise internal or external Arc contacts
6. Synchronise to multiple Operator groups



NOTE

1. An Arc contact property is mapped to a single property within the enterprise directory contact schema. Therefore, this version cannot support an Arc contact property mapped to several enterprise directory contact properties.
2. Information stored in the Arc contact database will be truncated if the imported data exceeds the supported Arc field size.
3. Internal contact records with an invalid or BLANK "Primary Extension Number" will not be available to the Arc Operator application.

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Section 3: Configuring Arc Connect for LDAP

3.1. LDAP Synchronisation

This section will guide you through a typical configuration of Arc Connect software components for LDAP synchronisation.

To enable LDAP synchronisation within Arc Connect, the Arc LDAP synchronization Server plug-in is needed to install on the same machine as the Arc CT Server.

To start configuration, click on the *Configuration* menu and then select *LDAP Synchronisation*.

The Arc Administration utility allows the set-up of LDAP operation in following sections,

1. **Sources** – It is a connection with the enterprise LDAP directory.
2. **Container** – It is the location of the data and the object type required for LDAP directory synchronisation.
3. **Schedule** – It is the frequency and method that how the data will be synchronised.
4. **Field Mapping** –Contact field mapping, relationships between the enterprise LDAP directory and the Arc Connect contact database.
5. **Rules** – A rule is comprised of various Filters to synchronise a sub-set of all contacts.
6. **Rules Directory Groups** – Directory groups where data is synchronised and Operators can retrieve contacts.

3.1.1. Scheduled Sources

This is the main tab of the LDAP Synchronisation. Here users can create, edit and delete LDAP Directory sources. To create and configure a new Directory source the user must progress through a further six tabs within *Scheduled Sources*, which are; *Source Details*, *Container*, *Schedule*, *Fields Mapping*, *Rules*, and *Rules Directory Group*.

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On opening it for the first time it would look blank as shown in the figure below. The users can create new scheduled LDAP Directory sources. If Schedule sources have been created before, then the details can be viewed and edited. But to move forward, there has to be at least one schedule source configured.

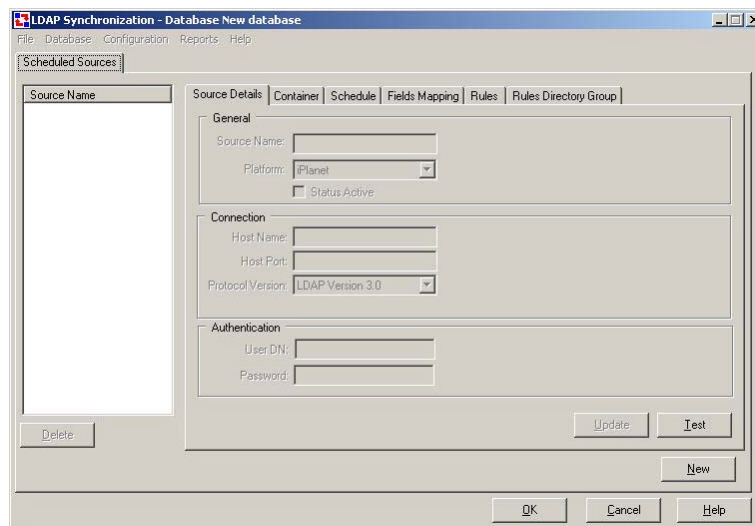


Figure 3-1: Starting Arc Connect Configuration for LDAP Synch

To create a new Scheduled Source

1. Click the **New** button.
2. The given options in the **Source Details** tab will become active.

To proceed further with the creating new **Scheduled Source**, the six sub-tabs are described in the following sections. The properties and options required to fill are used for connecting and authenticating. The LDAP Server uses these options' information to connect to the LDAP Directory Server.

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Source Details tab has three sections,

1. General
2. Connection
3. Authentication

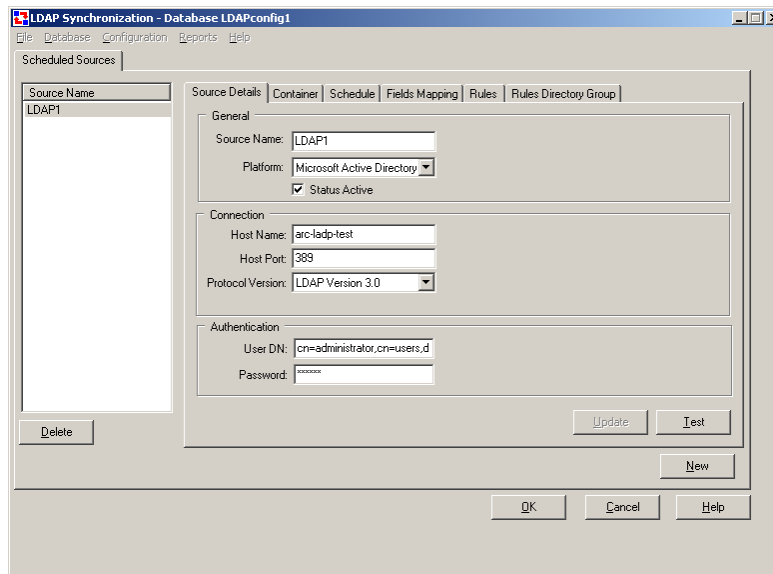


Figure 3-2: LDAP Source details tab page

Control Name	Explanation
<p>General: This section allows the users to enter the general information of the Source and its platform.</p>	
Source Name	In this field the user must create the name for the new Directory Source. The example used here is 'LDAP1', but the user can choose any name they feel appropriate.
Platform	In this field the user must select the type of directory that is running on their network, which is therefore the directory that the Arc Server will synchronise with. The LDAP platforms that the Arc LDAP Server is able to synchronise with are either iPlanet or Microsoft Active Directory .

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Status Active	For the Arc LDAP Server to synchronise with the LDAP Directory Server the status must be set to active (enter a tick in the box). If the user sets up the Arc LDAP Server to run multiple Scheduled Sources, but would like to disable one of them without deleting its configuration then they need simply to un-tick the Status Active box and click the Update button.
Connection: This section allows the users to give the host information and its protocol version.	
Host Name	In this field the user must enter the full computer name or IP address of the LDAP Directory Server.
Host Port	Port 389 is the default port number for LDAP set by the IANA (Internet Assigned Numbers Authority). However, port 45109 is the default port number for iPlanet Directory Server
Protocol Version	In this field the user must select which version of LDAP is running on their network. The user can select v3.0 (the latest version), v2.0 or v1.0 . LDAP protocol versions are backward compatible so if the user does not know which version they are running simply select v3.0 .
Authentication: This section is for entering secure information for the user name and password. Please note that if at any time the information in any of the fields in this tab are changed then the Object Class field in the Container tab will return to its default value of 'contact', and may therefore need to be changed accordingly.	

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User DN	In this field the user must enter the DN (Distinguished Name) of the network user whose account will be used to authenticate connection to the LDAP Directory Server. In our example the user is the Administrator, and their DN is shown as <i>cn=administrator,cn=users,dc=ldap-test</i> . Please note that as Arc does not write back to the LDAP Directory the user need not have administrative access rights.
Password	In this field the user must enter the network password for the above user.
Update	Click this button to save the entered or changed information.
Test	Click this button to validate the entered information. . If the test was successful then an information box with the message 'Success' will appear. If the details for the LDAP Source are incorrect, users get a message saying "Server Down", in case the users details are incorrect, they get a message saying "Invalid Credentials". On failure, users should correct the details and test again.



NOTE

1. Microsoft Active Directory does not support Sub Tree Level.

If records are synched for a particular source, and the source is later deleted then the behaviour will be such:

- After deletion, when another new source is created and LDAP Server is restarted, the contacts of the deleted source will then be deleted in the synch process and nothing will be available to the user.
- The system will basically delete the orphan records.

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Once the test has been carried out successfully the user must click the **Update** button to save the configuration for this tab, and then proceed to the *Container* tab.

3.1.2. Container

This tab requires information about the basic storage place of the objects and classes. This storage place is in the LDAP Directory Sever. The LDAP Server will use these objects and classes to synchronise contacts with the Arc Contact database.

It has two sections,

1. Container Settings
2. Notifications

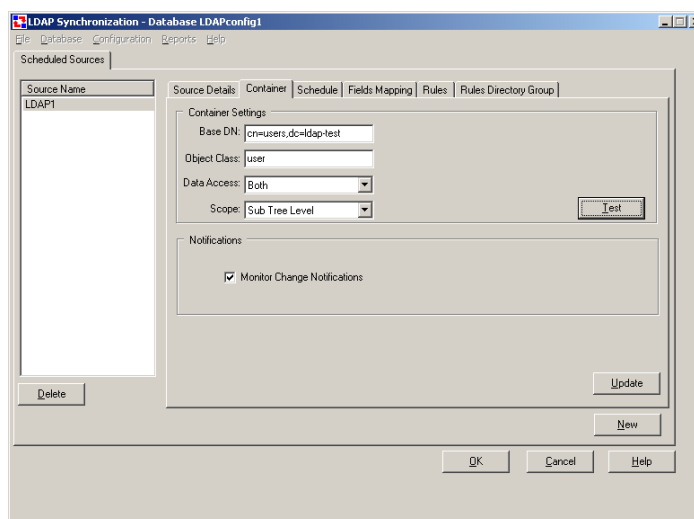


Figure 3-3: Container's details tab page

Control Name	Explanation
Container Settings:	In this section the users can define the objects and classes used for the synchronisation of contacts.

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Base DN	In this field the user must enter the Base Distinguished Name for the container that holds the desired records. In our example Base DN is <i>cn=users,dc=ldap-test</i> . This is so as the records that we want to retrieve are within the 'Users' container, and this container is on the domain 'ldap-test', hence the above Base DN.
Object Class	In this field the user must enter the type of record that they want to import from the LDAP Directory. The default setting for the Object Class is 'contact', however in our example we have chosen to import records of type 'User'. When used in conjunction with the Base DN (above) this tells the LDAP Server to look in the LDAP Directory for all records of type 'User' within the group 'Users' on the domain 'ldap-test'.
Data Access	Here the user has the choice of Read , Write or Both . If set to Read then the contacts that are imported into the Arc Directory can be read by the Operator, but may not have any more information added to that contact. If set to Write then new contacts will not be imported into the Arc Directory. If set to Both then the contacts that are imported into the Arc Directory can have information added to them, but not in any of the fields that have been selected in 'Fields Mapping'. These fields will appear greyed out in Console. Arc does not provide write back capability from the Arc Directory to the LDAP Directory.
Scope	Here the user has the choice of Base Level , One Level or Sub Tree Level .

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Test	Click the button to validate the information entered in this section. If the test was successful then an information box with the message 'Success' will appear. If the container entered in the Base DN does not exist in the LDAP Directory then an information box with the message 'Referral' will appear. If the syntax of the Base DN was entered incorrectly (i.e. other than cn=XXX, ou=XXX, dc=XXX) then an information box with the message 'Invalid DN Syntax' will appear. If the Object Class entered does not exist in the LDAP Directory then an information box with the message 'No Such Object' will appear.
Notifications	
Monitor Change Notification	<p>This feature is only available to those users running Active Directory. If the user ticks this box then the Arc LDAP Server will monitor online changes in the specified BaseDN container, and if a change is detected then the Arc LDAP Server will synchronise that change into Arc Directory.</p> <p>If new LDAP record is added in Directory Server, then LDAP Server will find the best LDAP rule matching the LDAP record. If any match exist then LDAP record will be synchronized into Arc Directory otherwise, it will be ignored. If an existing LDAP record is changed then LDAP Server will update Arc Directory accordingly. If an existing LDAP record is deleted then it will also be deleted from Arc Directory.</p> <p>Recommendations: This feature should be enabled if changes are not frequent otherwise, scheduling is the best approach to update Arc Directory</p>
Update	Click to save the information.

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While configuring Arc Connect for Synchronization, select the Scope level according to your requirements. The scope here has three levels,

1. **Base Level:** Arc LDAP Server will search and import information on the container specified in the Base DN (in our example 'Users'), but will not import the contacts within that container.
2. **One Level:** Arc LDAP Server will import records within the root of the selected container, but will not search any sub folders within that container.
3. **Sub Tree Level:** Arc LDAP Server will import information on the container and will search and import all contacts within that container and all subsidiary folders.

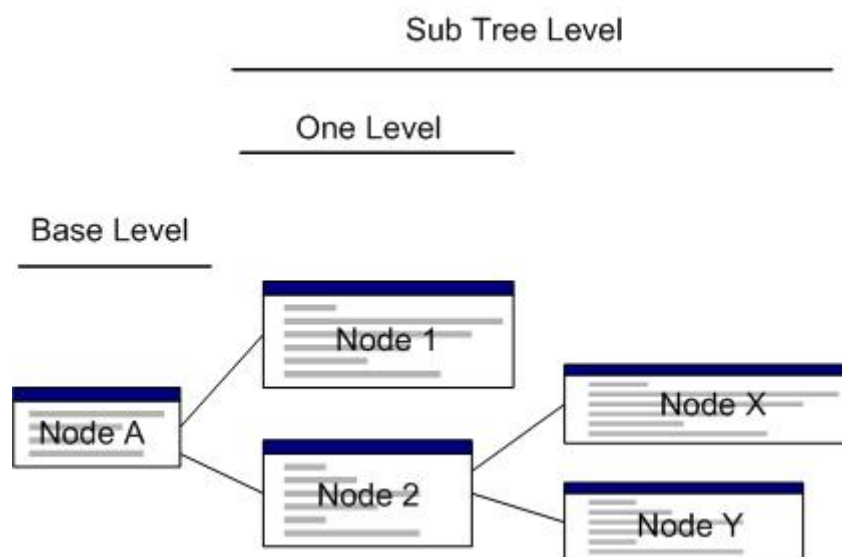


Figure 3-4: Scope Levels

If a Directory has three structures as shown in the Figure above and

1. If search request is sent to LDAP Server using BaseDN: **NODE A**, with SCOPE LEVEL: **BASE**. In the result LDAP Server will return **NODE A** entry.
2. If search request is sent to LDAP Server using BaseDN: **NODE A**, with SCOPE LEVEL: **ONELEVEL**. In the result, LDAP Server will return **NODE 1** and **NODE 2** entries.
3. If search request is sent to LDAP Server using BaseDN: **NODE A**, with SCOPE LEVEL: **SUBTREE**. In the result, LDAP Server will return **NODE 1**, **NODE 2**, **NODE X** and **NODE Y** entries.

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If a Directory has three structures as shown in the Figure above and

If search request is sent to LDAP Server using BaseDN: **NODE A**, with SCOPE LEVEL: **BASE**.

In the result LDAP Server will return **NODE A** entry.

If search request is sent to LDAP Server using BaseDN: **NODE A**, with SCOPE LEVEL:

ONELEVEL. In the result, LDAP Server will return **NODE 1** and **NODE 2** entries.

If search request is sent to LDAP Server using BaseDN: **NODE A**, with SCOPE LEVEL:

SUBTREE. In the result, LDAP Server will return **NODE 1**, **NODE 2**, **NODE X** and **NODE Y** entries.

Keep in mind the following regarding the Notifications, Arc System can get from the Arc LDAP Server.

It is not possible, in Notifications to get ONLY the updated attributes; actually Arc receives both updated and out-dated attributes against any change on the LDAP Server.

Some attributes have multiple values (**Multi Value Attributes**) like 'otherTelephone', 'otherWWWHomepage' etc, so if change occurs on any value then client receives only updated or remaining values.

For Example: 'otherTelephone' attribute has three value 13131313, 13131314, 13131315 and if on LDAP Server, the 2nd value 13131314 gets deleted then Arc will receive ONLY remaining values 13131313 and 13131315, no mark or Flag for deleted value.

Once the test has been carried out successfully the user must click the **Update** button to save the configuration for this tab, and then proceed to the *Schedule* tab.

3.1.3. Schedule

This tab requires information on the scheduling of the synchronisation. It has a section, **Schedule Settings**.

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This section is further divided into three sub-sections,

- 1. Start Date/Time
- 2. Execution
- 3. Auto Synchronisation

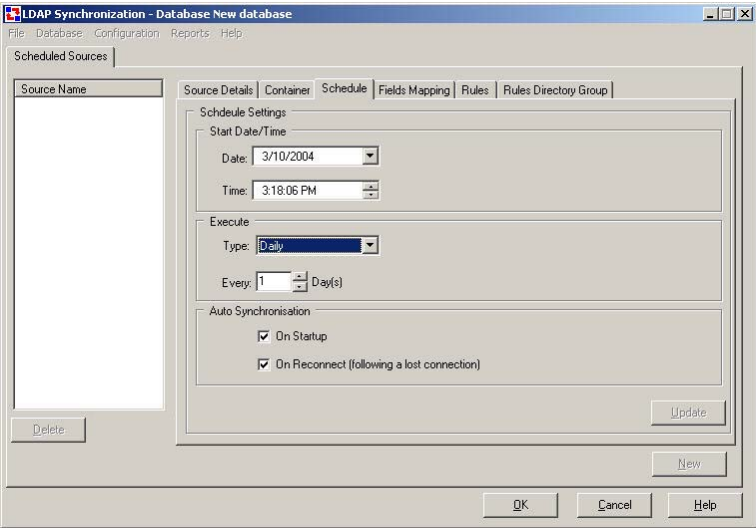


Figure 3-5: Scheduling the LDAP Synch

Control Name	Explanation
Schedule Settings: This is the main section of the tab that consists of three sub-sections allowing users to set the schedule at the basis of date and time.	
Start Date/Time: It allows the users to select the date and time to set the schedule.	
Date	In this field the user can set the date to start the synchronisation. This can be done by entering the date numerically, or if the user clicks on the arrow on the right of the box the date can be selected on a drop down calendar.
Time	In this field the user can set the time to start the synchronisation. This can be done by entering the time numerically, or by using the arrows on the right of the box.

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Execute: The users can set the execution periods in this section.	
Type	In this field the user can set how frequently they would like the Arc LDAP Server to synchronise with the LDAP Directory. This can be either None, Hourly, Daily, Weekly or Monthly .
Every [(Number)(Type)]	In this field the user can further customise the frequency of synchronisation. For example, if the user would like to set synchronisation less often than once a day, but more often than once a week then they could set it to synchronise, for example, once every <i>three</i> days. The number of hours/days/weeks/months can be entered numerically or by clicking on the arrows on the right of the box.
Auto Synchronisation: The users can set preferences for the automatic synchronisation.	
On Start up	If this box is ticked then the synchronisation will start when the Arc LDAP Server starts.
On Reconnect	If this box is ticked then the Arc LDAP server will synchronise with the LDAP Directory Server on reconnection (following a period of lost connection). This will ensure to update the Arc Directory in case of fail-over.
Update	Click to save the information in the tab.

To enable **Online Synchronisation** the user must set up a TCP/IP connection between the LDAP Server and the Primary CT Server. To do this the user must enter the '**Configuration**' menu within the Arc LDAP Server, and then click on '**Preferences**'. Next the user must enter in both the '**General**' and '**CT Server**' tabs the correct machine name or IP address of the machine on which the Arc CT Server is installed. Whilst in the '**CT Server**' tab the user must also then set the '**Auto Start Delay**' to **0 min** and **0 secs** to enable online synchronisation. If the user has any queries about any of the fields, then they can click on the appropriate box and press the **F1** key and the help page for that field will appear.

Once the test has been carried out successfully the user must click the **Update** button to save the configuration for this tab, and then proceed to the *Fields Mapping* tab.

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3.1.4. Fields Mapping

The information in this tab is used to map the contact information fields from the LDAP Directory into the Arc Directory. Here the user can choose which information they would like to be imported into the Arc Directory with the contact, such as mobile number, emails address, department etc. This tab has two sections,

1. Property Settings
2. Fields Mapping

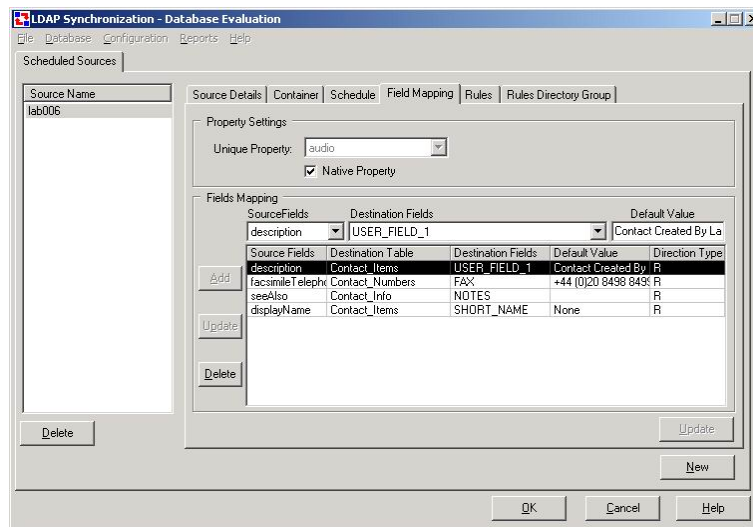


Figure 3-6: Field Mapping from LDAP Source to Arc System

Control Name	Explanation
Property Settings: This section allows the users to set properties for the source attributes.	
Unique Property	In this field the user can set the unique property so that the LDAP Server has a unique reference to identify contacts in the Arc Directory. The 'Unique Property' allows the user to specify which LDAP property will be used for this reference and is a critical part of the entire configuration. For example, if the user has specified a Unique Property, which does not contain wholly unique information, then it may cause the LDAP Server to behave abnormally and produce unforeseen results.

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Native Property	It is recommended that if the user is unsure of which property to designate as a 'Unique Property', then they should tick the 'Native Property' box, whereby the LDAP Server will automatically choose the appropriate property.
Fields Mapping: Before Arc LDAP Synchronisation starts, user must tell the service that where Source information will be copied in Arc Database.	
Source Fields	From a drop down list the user can select the field within the Object Class (which in our example is 'User', as configured in the 'Container' tab) that they would like to import into the Arc Directory. This field displays the tables supported in the Arc Directory.
Destination Fields	From a drop down list the user can select the destination in the Arc Directory for the 'Source Field' selected above. For example we have mapped 'givenName' in the LDAP Directory into 'FIRST_NAME' in the Arc Directory. Please note that there are character limits for fields in the Arc Directory (i.e. destination fields), and that if the information imported into a field exceeds the character limit, LDAP Server will truncate extra characters from the data for mapping into destination field before synchronization.
Default Value	In this field the user can set a default value for a given field. This default value will be entered in to the Arc Directory if the field in the LDAP Directory is blank. For example, if the user was to set the 'Company' field default value to 'Arc Solutions', then for every contact that is imported that has a blank 'Company' field the LDAP Server will automatically enter 'Arc Solutions' into that field in the Arc Directory.

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Add	Click to add the information in the Grid below.
Update	Click to update information in the table.
Delete	Click to delete information from the table.
Update	Click this button to save information in the Fields Mapping tab.

Field mapping duplication is restricted. The destination fields cannot be repeated during mapping except for the alternate fields, which may be duplicated. One source field may be copied in many destinations but one destination is restricted to copy on source field only. Arc Configuration Utility may take some time to load the fields mapping page since the records' details have to be fetched from the LDAP Server directly. As Arc Configuration Utility gets the schema, the hourglass is shown to the user and the page takes some time to load. As the number of iPlanet contacts increases the response gets slower.

On the Field Mapping tab page, the field size for the **Default Value** is the same irrespective of any field i.e. for Notes the field should be 255 char long whereas the default value box is 50 characters. Still it is advisable to have field size according to the table shown in the following as Arc Database saves the records according to the field size given below. For example, give a default value in case of **Job Title**, which is not more than 3 characters because only first three characters will be available to the user in Arc system.

Arc exports the following contact properties that can be mapped directly to an LDAP contact object:

Arc Contact Properties		
Source Field	Destination Field	Arc Field Size
Alternative First Name	ALTERNATE_FIRST_NAME	20
Alternative Last Name	ALTERNATE_LAST_NAME	30
Business Number 1	BUSN1	40
Business Number 2	BUSN2	40
Company Name	COMPANY_NAME	50
Company Section	COMPANY_SECTION	50

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Cost Center	COST_CENTER	50
Department Name	DEPARTMENT	50
Email Address	EMAIL	40
Extension Number 2	INTN2	40
Extension Number 3	INTN3	40
Extension Number 4	INTN4	40
Fax Number	FAX	40
First Name *	FIRST_NAME	20
Full Job Title	FULL_JOB_TITLE	50
Full Name	FULL_NAME	40
General Notes	NOTES	255
Home Address Line 1	HOME_ADDRESS_LINE_1	50
Home Address Line 2	HOME_ADDRESS_LINE_2	20
Home Address Line 3	HOME_ADDRESS_LINE_3	50
Home Address Line 4	HOME_ADDRESS_LINE_4	50
Home Number	HOME	40
Home Post Code\ZIP	HOME_POSTCODE	40
Initials	INITIALS	40
Job Title	JOB_TITLE	3
Last Name *	LAST_NAME	30
Location	LOCATION	50
Middle Name	MIDDLE_NAME	20
Mobile Number	MOBLE	40
Pager Number	PAGER	40
Pickup Extension	PICKUP_EXTENSION	6
Primary Extension Number **	INTNL	20
Room Name	ROOM_NAME	50
Short Name\Nickname	SHORT_NAME	20
Windows Login	USER_PROFILE	255
PIN	PIN	20
Absent Message	ABSENT_MESSAGE	4000

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Title	TITLE	4
User Definable Field 1	USER_FIELD_1	50
User Definable Field 2	USER_FIELD_2	50
User Definable Field 3	USER_FIELD_3	50

* Required fields to support all contact records in the Arc contact database

** Required fields to support internal contact records in the Arc contact database.



NOTE

An LDAP contact may be imported in the Arc system with a blank INTNL in any of the following cases,

- No mapping has been defined for the INTNL in case of an internal contact.
- Mapping has been defined but the LDAP source value does not contain a value and there is no default value either.

In the above cases, Arc Configuration Utility will show a blank entry in the Main Directory, which is only visible when the contact has INTNL and the contact is re-synched with the correct fields. Remember, contacts imported through LDAP Synch cannot be updated through Arc Configuration Utility.

Following is the procedure for Field Mapping in Arc Configuration Utility,

1. Select the Unique Property from the drop down box. This is the Object Class that was created in the Container tab.
2. If the check box, **Native Property** is selected, then users cannot select an option from the **Unique Property**; LDAP Server will select the appropriate Unique Property for the LDAP Source.

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3. Select the **Source Field** from the drop down list box.
4. Select the **Destination Field** for that source field according to the table given above.
5. Give a **Default Value** for that field.
6. Click **Add** when all settings are done.
7. Map all the required fields, click **Update** when done,

3.1.5. Rules

Rules is the set of Filters through which the contacts are synched from LDAP Directory source to Arc databases. The users can select and define the type of contacts i.e. Internal or External, as required to synchronise for the Arc Console Operator. The LDAP Server will synchronise the defined set of contacts from the LDAP Directory Server to the Arc Contact database according to the rules. It has a section, **Rules Mapping**. This further has a sub-section, **Rules** having another sub-section, **Filter**.

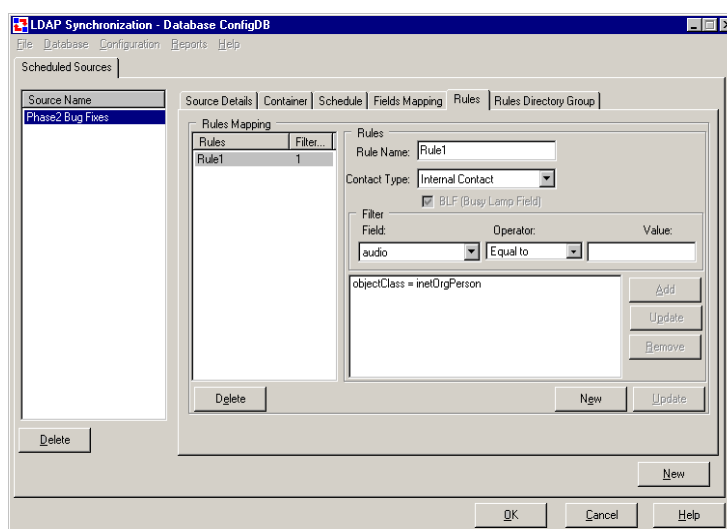


Figure 3-7: Defining Rules for LDAP Synch

Control Name	Explanation
Rules Mapping:	This section contains a list that shows the Rules and Filter.
Rules	

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Rule Name	In this field the user must enter a name for the rule that they are about to create. In our example we have named the rule 'Rule1', however, if the user requires many rules it would be prudent to name the rules after the field that they pertain to for easy reference. In our case, had we more rules, it might have been prudent to name the rule 'Company'.
Contact Type	In this field the user must choose whether the contacts that are to be imported into the Arc Directory are stored as Internal Contacts or External Contacts . Please note that for a contact to be imported into the Arc Directory as an Internal Contact that contact <i>must</i> have a valid device/directory number on Cisco Call Manager.
BLF (Busy Lamp Field)	If the user selects the Contact Type as Internal Contact (see above) then they also have the option to add those contacts to the BLF (Busy Lamp Field) in Console Connect. To enable this the user need simply tick the box. Please note that these contacts' device/directory numbers need to be associated to TAPI User Accounts for a true representation of the status of those devices in Arc Console.

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Filter: After the above information, users can enter information for the filters.	
Field	In this field the user must select the LDAP Directory field that they would like to use for a filter.
Operator	In this field the user can select the comparison operator that they would like to use for this filter. There are four possible comparison operators, which are: equal to (=), approx equal to (~=), less than equal to (<=), and greater than equal to (>=). Please note that whilst the approx equal to operator is useful when applied to names that could have slightly different spellings (e.g. Alan, Allan and Allen), it is the least effective/stable of the operators, and is not supported by the iPlanet platform.
Value	In this field the user must enter the value of the filter that is to be used for comparison. In our example we have used the field ' Company ', the operator ' equal to ' and the value is set as ' Arc Solutions '. This filter means that the LDAP Server will import all contacts that have ' Arc Solutions ' set as their Company in their user profile.
Add	Click to add the filter in the table.
Update	Click to update filter in the table.
Delete	Click to delete filter in the table.
New	Click to create a new Rule .
Update	Click to update a Rule .
Delete	Click to delete a selected Rule .

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While declaring Rules for synchronisation, keep the following points in mind,

- A contact synched through one rule would not be synched/updated through another rule as shown in the example below.
- If there exists two rules, Rule1 and Rule2 and a contact has been synched through Rule1 but it also satisfies the filters of Rule2 then it will not be synched/updated as per Rule2.
- All succeeding rules would be discarded if a contact has been synched through a Rule.
- If the contact type in a Rule is external, it will not appear in the Rule Groups mapping.
- A rule can have multiple filters on the same field no restriction has been set.
- All filters in a Rule are executed using the AND operator only.
- There are four types of Operators that can be used. The "**~= Operator**" does fetch records for numeric values under specific conditions. Therefore it is advisable not to use this Operator in configuration.
- Failure of synch through any rule will be reported in Log files i.e. if the destination field length is less than the field length of the source attribute value.



EXAMPLE

rule 1 = Location=London

rule 2 = Location=Paris

rule 3 = Location=*

- rule 1 gets London contacts
- rule 2 gets Paris contacts
- rule 3 gets ALL contacts including the London and Paris contacts. But the London and Paris contacts are ignored and are not duplicated.

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NOTE

1. Arc LDAP synchronization does not support statements such as (firstname= *) or (TelephoneNumber=*) to synchronize all contacts or telephone numbers to the database. A proper statement for this purpose must include the exact objectClass to fetch the desired values from the target database. The correct syntax in this case can be: **objectClass~=user**

Here objectClass is the LDAP property and is followed by an operator (~=, approx equal to) and value (user).

2. Following are the Operators that can be used while creating rules.

= (Equal to)

~= (Approximately equal to)

<= (Lexicographically less than or equal to)

>= (Lexicographically greater than or equal to)

By default all filters within a rule are joined with the logical "AND" operator.

There is no support to join them with either "OR" or "NOT" logical operators.

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3.1.6. Rules Directory Group

The users can assign the **Rules** to the **Directory Groups** in this tab. It has two sections. One shows a list of **Rules** and **Group Count**. The second is **Directory Group Rules**. Only the **Rules** with Internal Contacts are shown in this list, as **Directory Groups** are related to Internal contacts only.

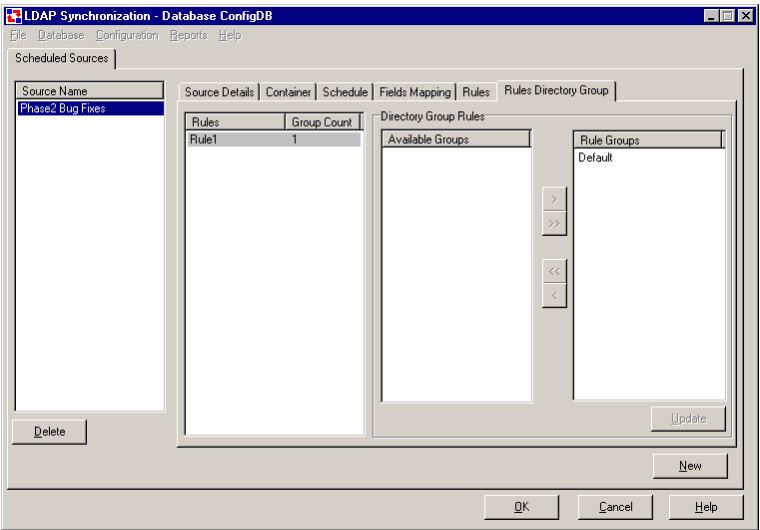


Figure 3-8: Assigning Directory Groups to Rules

Control Name	Explanation
Directory Group Rules	
Available Groups	This list contains the available Directory Group(s) . Directory Groups are created in CT Gateway section of Arc Administration Utility.
Rule Groups	This list contains the Groups assigned to the Rule from the Available Groups .
Update	Click to save the Rules Directory Groups.

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Keep the following points in mind before assigning Directory Groups to the Rules,

- Configuration Utility allows an empty Directory Groups to be created. This is to ensure that directory groups are available for Rule Directory Group mappings since the LDAP contacts synched do not create a **Default** Directory group.
- It would be advisable to create all "**Directory Groups**" to be used in mappings before the synch. The reason being that while loading a large number of records Arc Configuration Utility takes a very long time and it would not be feasible to associate records through it.
- The records should be synched through appropriate rules and the rules mapped to "**Directory Groups**" so that the records are automatically associated with the required "**Directory Groups**" as synch takes place.

For example, let us say that there is a Directory Group configured in Arc for internal contacts, that this Directory Group is called 'INT' and that it has been assigned to an Operator. Let us also say that in the pervious tab the user created the Rule 'company = Arc Solutions', and called this 'Rule 1'. In the *Rule Directory Group* tab the user can now select the desired Rule, and the list of available Directory Groups will be shown in the 'Available Groups' field. To enable a Rule to import contacts into a Directory Group the user simple selects the Directory Group from the list (here the Directory Group 'INT' has been selected in blue) and then click on the single right-facing arrow to move it into the 'Rule Groups' field.

Now all contacts in the LDAP Directory that have 'Arc Solutions' in their 'Company' field will automatically be synchronized into the 'INT' Directory Group'. Whenever an Operator who is assigned the 'INT' Directory Group signs into Arc Console, these contacts will automatically appear.

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Please note that if in the *Rules* tab the user has created rules to import contacts into the **Internal** directory and the **BLF**, then in the *Rules Directory Group* tab the user must also add the 'Default' directory group into the 'Rule Groups' field for these rules. This is done by selecting the rule that is set to import **Internal** contacts, selecting 'Default' from the 'Available Groups' field and then clicking the single right-facing arrow.

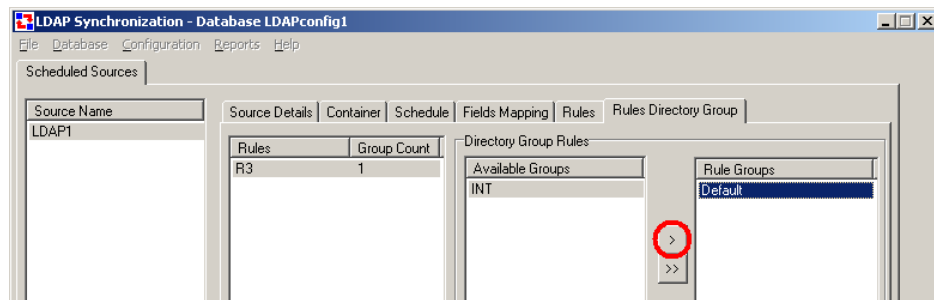


Figure 3-9: Rules Directory Group

Once the user has moved the 'Default' directory group to the 'Rule Groups' field (for all relevant rules) then the user must click the update button to save these changes. If this is not done then the operator will not see the contacts specified in these rules in the **Internal** or **BLF** fields in Arc Console.

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