tools4ever

User Management Resource Administrator

UMRA tables User Guide

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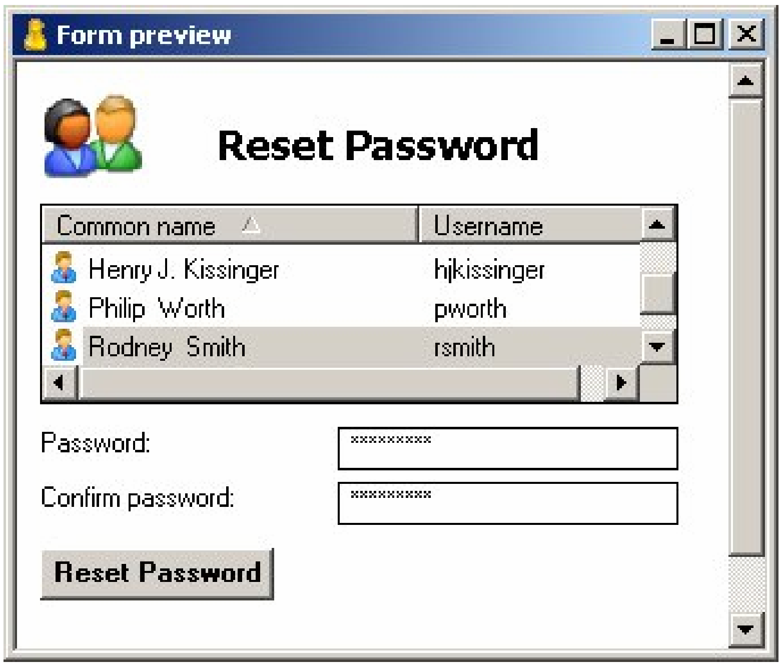
Introduction

Many employees nowadays have access to a wide variety of systems and applications. Some examples are access to a company's intranet, phone systems, HR systemss, printers, etc. User accounts and associated resources are usually maintained in Active Directory (or other directory services). Larger organizations often have multiple information systems, in which case user resource data are also stored outside Active Directory (a SQL server holding HR data, phone book applications, location systems, etc.). Using UMRA, an administrator can create projects to deal with virtually any user management task.

In UMRA, the use of tables is an important instrument for supporting this concept of managing users and associated resources in Active Directory and other information systems, by facilitating the following tasks :

1. **Managing and selecting user accounts, resources and other input fields -** In case of a delegation project, a list table can be included in a form window to display and select fixed data (a list table), Active Directory data (LDAP query), results of an NT 4 network call or database data. Some examples:

- to select a user for whom the password needs to be reset. Figure 1 shows a form table listing the users obtained through an LDAP query on Active Directory.

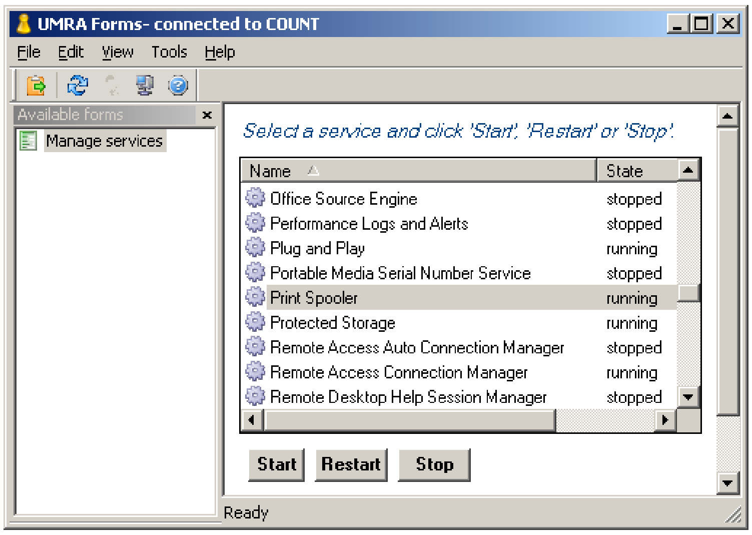


Common name	Username
Henry J. Kissinger	hjkissinger
Philip Worth	pworth
Rodney Smith	rsmith

Password:	**********
Confirm password:	**********

Figure 1 – Delegated project for resetting a password

- to show a list of services or printers you wish to manage. A script action can then be executed for the selected table entry (see Figure 2) ;

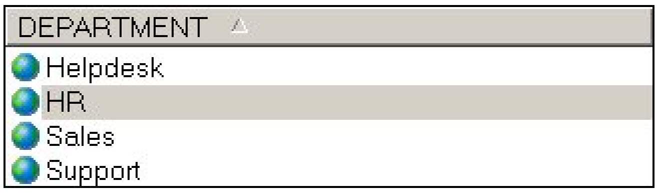


Select a service and click 'Start', 'Restart' or 'Stop'.

Name	State
Office Source Engine	stopped
Performance Logs and Alerts	stopped
Plug and Play	running
Portable Media Serial Number Service	stopped
Print Spooler	running
Protected Storage	running
Remote Access Auto Connection Manager	stopped
Remote Access Connection Manager	running
Remote Desktop Help Session Manager	stopped

Figure 2 – List of services as part of a delegation project to manage services (e.g. stop, start, pause, resume services)

- to select data from a database (e.g. a list of departments or a table containing corporate telephone numbers)



DEPARTMENT
Helpdesk
HR
Sales
Support

Figure 3 – List of departments as a result of a database query

2. **Manage the processing of tabular data (row by row) –** this method is used to run actions against each row of a table. It can be used for instance, to query Active Directory for all the groups of which a user is a member and to perform an action for each group in the resulting table (e.g. setting a new group membership and removing the existing one(s)).

3. **Bulk data processing -** Tables are also used to facilitate the mass update of user data (e.g. mass creating Exchange mailboxes or bulk create and edit users as part of a migration project). In such mass projects, where a table is based on an imported CSV file, script actions can be executed for each row in a table (containing user resource objects, for instance). This specific use of a table will not be discussed in this document.

The last chapter of this user guide contains several hands-on examples to get familiar with the various table types. Each hands-on (marked with a pointing finger symbol (☞) will take approximately 30 minutes to complete.

The concept of tables in UMRA

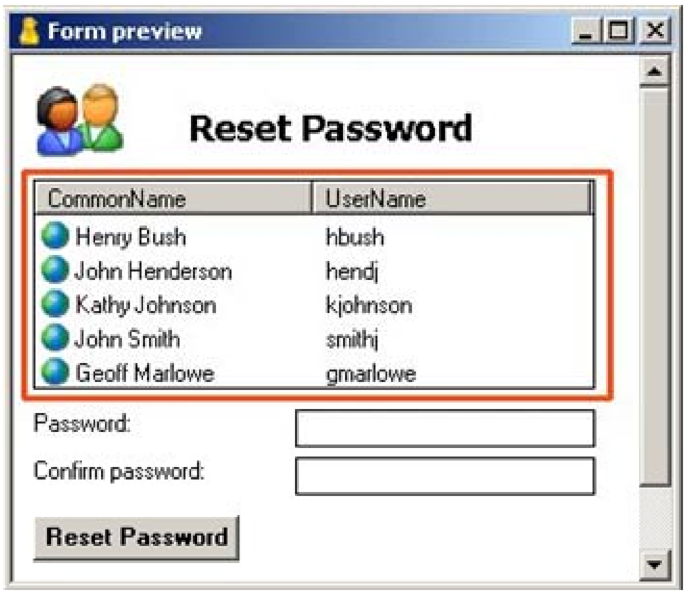
General

With UMRA, solutions can be created for the delegation of one or more user management tasks. Forms & Delegation includes two separate applications, the **UMRA Console** and **UMRA Forms**. In this document, it is assumed that you already have basic knowledge of working with UMRA. If this is not the case, please make yourself familiar first with the UMRA basics.

The **UMRA Console** is used by systems administrator to build an interface for the end user and to add and configure built-in script actions for the delegation project. The interface is created using forms which can be fully customized with your own titles, text fields, user input fields, buttons, tables, graphics, etc. Once the form project has been properly set up, the delegate user can run it in the UMRA Forms application to perform a specific user management task. The underlying scripting intelligence is neither accessible nor visible for the delegate user.

Selecting data using form tables

In a form, the administrator can also add form tables. Form tables are used to display user resource data from Active Direcory and other information systems.



CommonName	UserName
Henry Bush	hbush
John Henderson	hendj
Kathy Johnson	kjohnson
John Smith	smithj
Geoff Marlowe	gmarlowe

Figure 4 – LDAP table showing users in Active Directory as part of a Reset Password delegation form

In the UMRA Console, the administrator specifies which script actions should be run on the selected table entries. The execution of these script actions can be assigned to a button (e.g. “Reset Password”). In UMRA, a wide variety of script actions is included to create, manage and delete Active Directory objects. Finally, the administrator also specifies who has priviliges to run the project.

In figures 5 and 6, the use of a form table is shown in more detail. As part of a delegation project to reset passwords, an LDAP table is inserted in the form window to retrieve all users in a specific organizational unit in Active Directory using the query

(&(objectClass=user)(!(objectClass=computer)))

with a binding to LDAP://OU=*<NameOU>*, DC=*MyDomain*, DC=local.

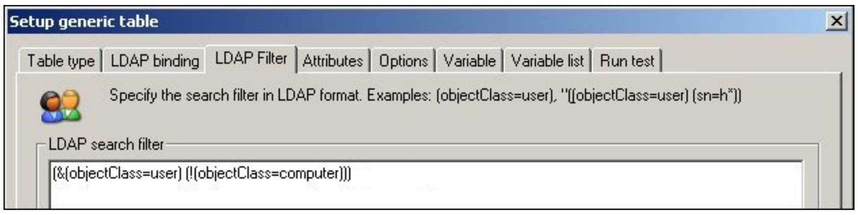

Setup generic table

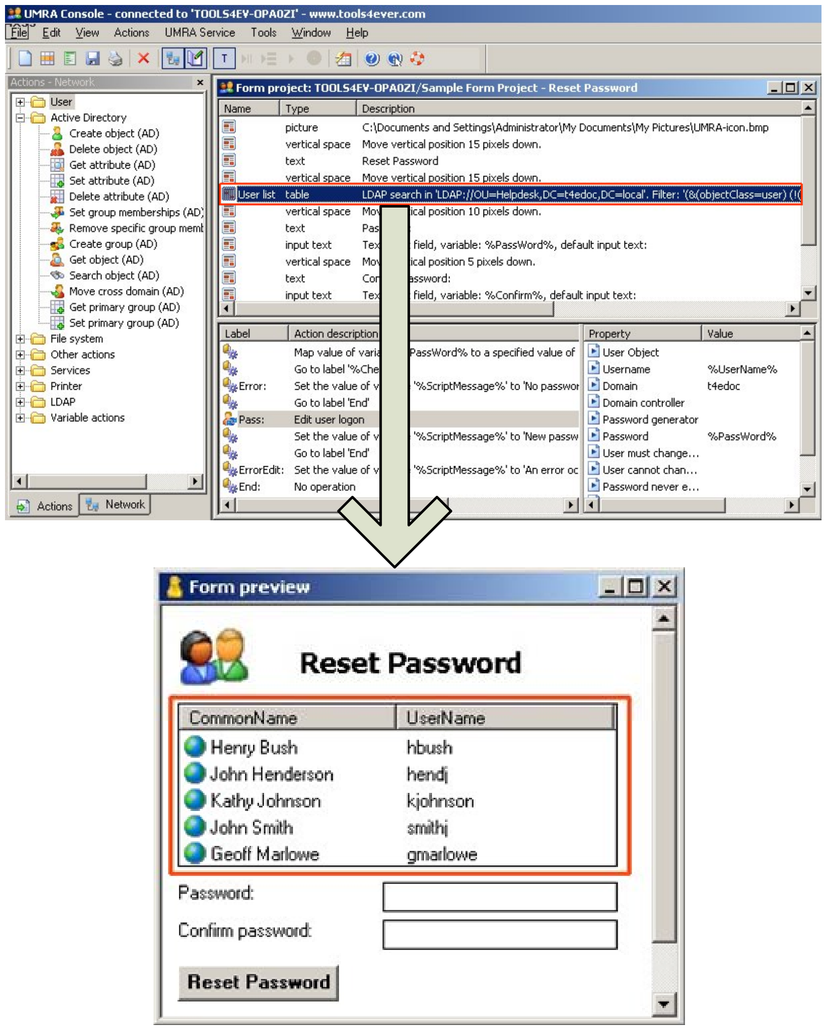
Table type | LDAP binding | LDAP Filter | Attributes | Options | Variable | Variable list | Run test

Specify the search filter in LDAP format. Examples: (objectClass=user), "(|(objectClass=user) (sn=h*))

LDAP search filter: (&(objectClass=user) (!(objectClass=computer)))

Figure 5 – Defining an LDAP query for an LDAP table

This query retrieves all objects of the "user" object class in the OU "*<NameOU>*". Computer accounts are exempted from the results. In the resulting form table (Figure 6), a user can be selected for whom the password needs to be reset.



Form project: TOOLS4EV-OPA0ZI/Sample Form Project - Reset Password

Name	Type	Description
	picture	C:\Documents and Settings\Administrator\My Documents\My Pictures\UMRA-icon.bmp
	vertical space	Move vertical position 15 pixels down.
	text	Reset Password
	vertical space	Move vertical position 15 pixels down.
User list	table	LDAP search in 'LDAP://OU=Helpdesk,DC=t4edoc,DC=local'. Filter: '(&(objectClass=user) (!(
	vertical space	Mov ical position 10 pixels down.
	text	Pas
	input text	Tex field, variable: %PassWord%, default input text:
	vertical space	Mov ical position 5 pixels down.
	text	Cor assword:
	input text	Tex field, variable: %Confirm%, default input text:

Label	Action description
	Map value of varia PassWord% to a specified value of
	Go to label '%Che
Error:	Set the value of v '%ScriptMessage%' to 'No passwor
	Go to label 'End'
Pass:	Edit user logon
	Set the value of v '%ScriptMessage%' to 'New passw
	Go to label 'End'
ErrorEdit:	Set the value of v '%ScriptMessage%' to 'An error oc
End:	No operation

Property	Value
User Object	
Username	%UserName%
Domain	t4edoc
Domain controller	
Password generator	
Password	%PassWord%
User must change…	
User cannot chan…	
Password never e…	

Form preview

Reset Password

CommonName	UserName
Henry Bush	hbush
John Henderson	hendj
Kathy Johnson	kjohnson
John Smith	smithj
Geoff Marlowe	gmarlowe

Password:	
Confirm password:	

Figure 6 – Reset password delegation project. The result of the LDAP query is displayed in the LDAP table (shown here with a red marquee)

In a project form, several table types are available which are shown in the table below:

Table type	Subtyp e	Description
Network table		Used to obtain the user accounts of an OU, global group, domain or single computer using an NT network call.
Fixed table		Used to display a list of fixed content in a table (e.g. a list of department names).
Generic table	LDAP	Used to show the results of an LDAP query in a table.
Generic table	Databas e	Used to show the results of a database query in a table.
Generic table	Variable	See section Special table type – Generic table Variable for more information.

Network table

A network table is used for Windows NT 4 environments and can be of one of the following network data types:

- User accounts of an OU,
- User accounts of a global group,
- User accounts of a domain
- User accounts of a single computer.

Specifying the network data type **only** determines the scope of the network calls to be executed by UMRA and the columns that can be shown for the corresponding network data table. To determine the data that must be collected, you must specify the actual parameters or arguments that are used to collect the network data. These are different for each network data type (see the table below).

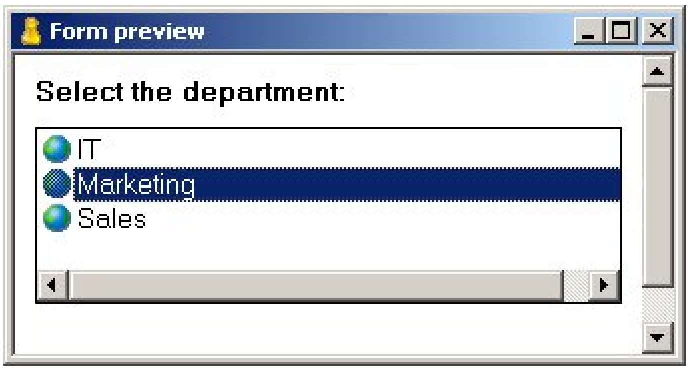
Network table type	Scope	Arguments	Columns
OU	User accounts of one or more OUs (including child OUs)	<Domain>/<OU>/<OU> or LDAP name of the object.	Common name Description Username Display name Domain OrganizationalUnit Object distinguished name

Network table type	Scope	Arguments	Columns
Global group	User accounts that are a member of one or more groups	<Domain>\<Global Group> or <DomainController \<GlobalGroup>	Full name Description Username Global group Domain
Domain	User accounts in a domain	Domain name (NETBIOS or DNS format)	Full name Description Username Domain
Single computer	User accounts that are maintained on a computer (not necessarily a domain controller).	Computer name (NETBIOS or DNS format)	Full name Description Username Computer Domain Type

The columns can be assigned to a variable. When a delegate user selects an entry in the resulting network table, the name of the variable and the corresponding value will be passed to the UMRA service. See the section **Processing user input** for more information.

Fixed table

The content of this table is either entered directly in UMRA or taken from a flat text file. It is used to to present the end user with specific fixed content in a form, such as a division, department, OU, domain etc. The characteristics of a fixed table are that the information is not derived from Active Directory, that it only contains 1 column and that it always has the same contents.


Form preview

Select the department:

IT
Marketing
Sales

Figure 7 – Simple fixed table (list of entries)

Generic table – LDAP query

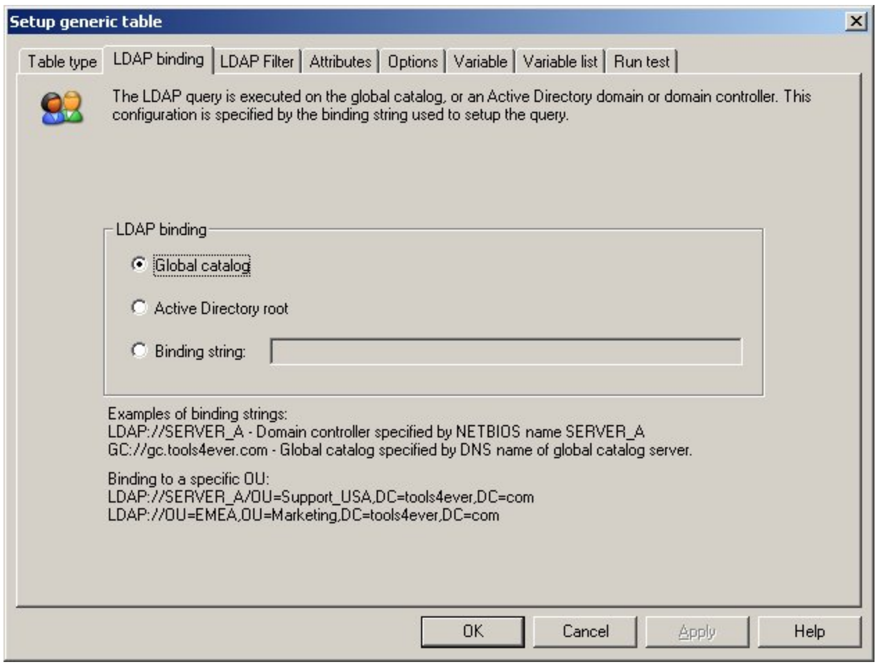
This powerful generic table type allows you to query Active Directory and show the results in a form table. To run a (complex) LDAP search, the following information should be specified:

1. **LDAP binding** - the scope of the LDAP search;
2. **LDAP filter** - the objects you wish to filter on;
3. **Attributes** – the attributes you wish to retrieve for these objects. These components will be individually discussed.

LDAP binding

Starting with Windows 2000, the LDAP provider is used to access Active Directory. This binding method requires a binding string, which can be defined in three different ways in UMRA:

Binding method	**Description**
Global Catalog	The global catalog is a searchable master index containing directory data of all domains in a forest. It contains an entry for every object in the forest, but it does not include all properties of each object. The Global Catalog is used to improve the response time of LDAP searches. The properties included in the Global Catalog are generally useful for searches and are considered static.
Active Directory root	This option will bind to the Active Directory root of a domain controller. The Active Directory contains all the network information for the forest. This binding method is suitable for retrieving dynamic properties.
Manual	You can also enter a binding string yourself. This binding string is the AdsPath of an object in Active Directory, consisting of the LDAP provider moniker (LDAP://) appended to the Distinguished Name of the object. The Distinguished Name specifies both the name and the location of an object in the Active Directory hierarchy.



The LDAP query is executed on the global catalog, or an Active Directory domain or domain controller. This configuration is specified by the binding string used to setup the query.

LDAP binding

- (●) Global catalog
- ( ) Active Directory root
- ( ) Binding string:

Examples of binding strings:
LDAP://SERVER_A - Domain controller specified by NETBIOS name SERVER_A
GC://gc.tools4ever.com - Global catalog specified by DNS name of global catalog server.

Binding to a specific OU:
LDAP://SERVER_A/OU=Support_USA,DC=tools4ever,DC=com
LDAP://OU=EMEA,OU=Marketing,DC=tools4ever,DC=com

Figure 8 – LDAP binding options to bind to Active Directory

LDAP filter

An LDAP search filter can be defined as a clause specifying the conditions that must be met by Active Directory objects. Only those objects meeting the requirements are returned.

A condition takes the form of of a conditional statement, such as "(cn=TestUser)". Each condition must be enclosed in parenthesis. In general, a condition includes an attribute and a value, separated by an operator.

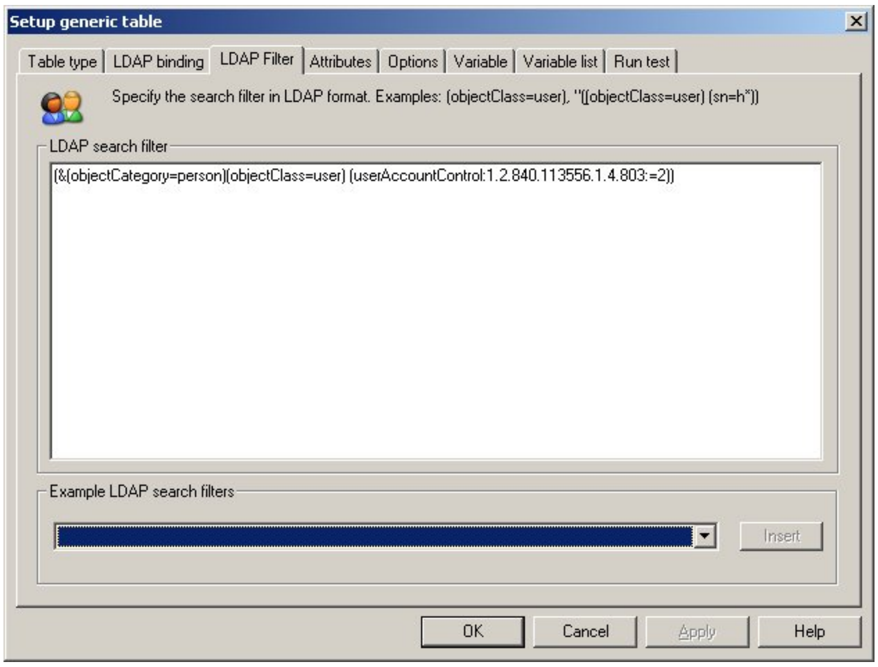
Conditions can be combined using the following operators (note that the operators "<" and ">" are not supported).

Operator	Description
=	Equal to
~=	Approximately equal to
<=	Less than or equal to
>=	Greater than or equal to
&	AND
|	OR
!	NOT

Conditions can also be nested using parenthesis. Furthermore, you can use the "*" wildcard character in the search filter.

An example of an LDAP filter is shown in Figure 9:

**(&(objectCategory=person)(objectClass=user)
(userAccountControl:1.2.840.113556.1.4.803:=2))**



Specify the search filter in LDAP format. Examples: (objectClass=user), "(|(objectClass=user) (sn=h*))

LDAP search filter: (&(objectCategory=person)(objectClass=user) (userAccountControl:1.2.840.113556.1.4.803:=2))

Figure 9 – Defining an LDAP filter

This filter, used to obtain disabled user objects, includes 3 conditions, which should all be met (indicated by the AND ("&") operator).

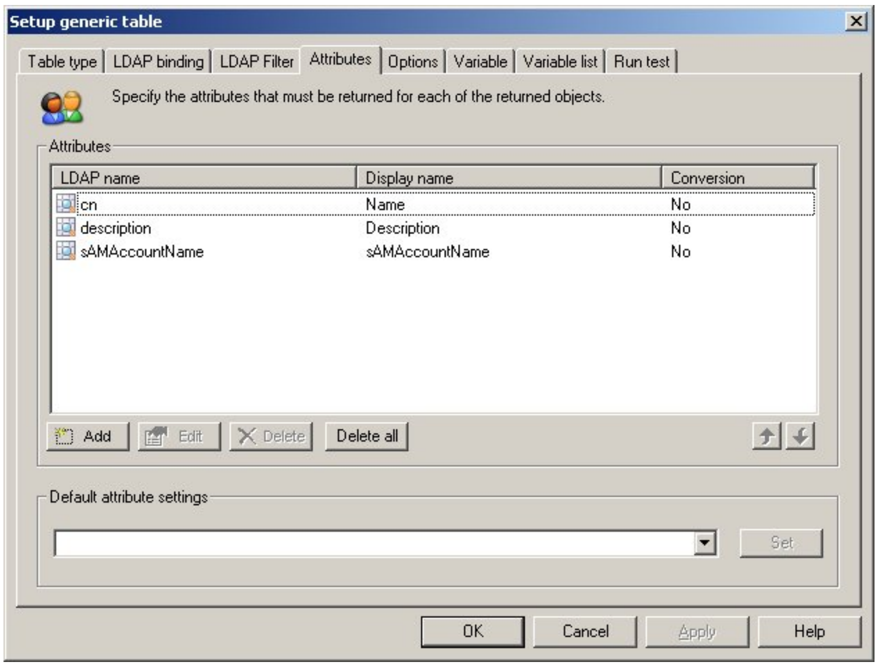
The **userAccountControl** attribute in this example needs some further explanation. This is a so called bitmask attribute, a single attribute containing numerous property values for controlling user account behaviour. A bitmask attribute can be evaluated using an LDAP matching rule using the following syntax:

attributename:ruleOID:=value

where *attributename* is the LDAPDisplayName of the attribute, *ruleOID* is the object ID (OID) for the matching rule control, and *value* is the decimal value you want to use for comparison. In the example above, the string "**1.2.840.113556.1.4.803=2"** represents an LDAP matching rule for disabled user accounts.

Attributes

Each object in Active Directory has a set of attributes, defined by and depending on its type and class. Using the LDAP filter you have filtered on some objects representing single entities (users, computers, printers, applications, etc.) and their attributes. In the **Attributes** tab you can define the LDAP display name for the attributes you wish to return for the filtered objects. In the example shown in Figure 10, the attributes **Name**, **Description** and **sAMAccountName** are specified as the attributes to be returned.



Specify the attributes that must be returned for each of the returned objects.

Attributes

LDAP name	Display name	Conversion
cn	Name	No
description	Description	No
sAMAccountName	sAMAccountName	No

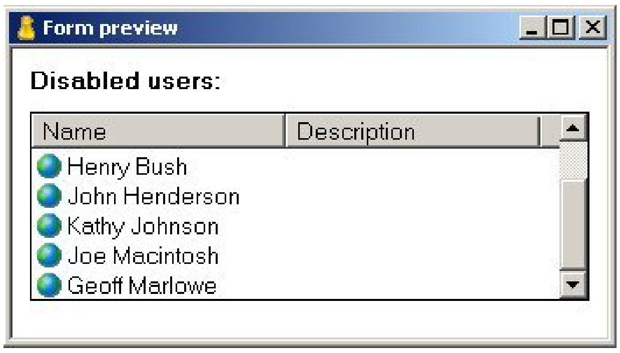
Default attribute settings

Figure 10 – Specifying attributes to be returned for filtered objects

Attributes can either be selected from an extensive list of built-in attributes, or entered by the user. For a full list of attributes, see http://msdn.microsoft.com/library/default.asp?url=/library/en-us/adschema/adschema/attributes_all.asp or check the MSDN library.

The final result of an LDAP search is displayed in a generic table (see Figure 11). In the same way, you can retrieve user accounts in a specific OU, show a list of groups, etc.

To process selected table entries, the column holding the attribute values can be assigned to a variable and used as input for a script action. For more information, see section **Processing user input**.


Form preview

Disabled users:

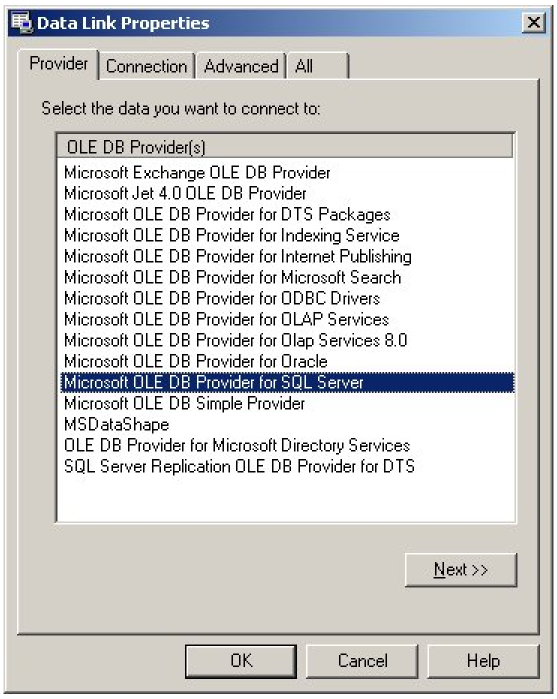
Name	Description
Henry Bush	
John Henderson	
Kathy Johnson	
Joe Macintosh	
Geoff Marlowe	

Figure 11 – Table as a result of an LDAP search on all disabled user accounts in a domain

Generic table – Database query

In a large enterprise environment, not all user resource data are stored in Active Directory. Other information systems, an HR system or a phone system for example, may also hold user related information. In an UMRA project form, a generic table can be inserted to display information from these systems. As part of the table setup, the administrator needs to specify the database to connect to, as well as a database query to define which data should be retrieved and shown in the table.

The generic table for databases can be used to connect to **any** database or information system. MS Access databases can be accessed directly through the Jet engine. Other databases (SQL, ERP, HR systems, PeopleSoft, etc.) can be accessed through OLE DB. The number of available OLE DB providers will depend on your local configuration (see Figure 12).

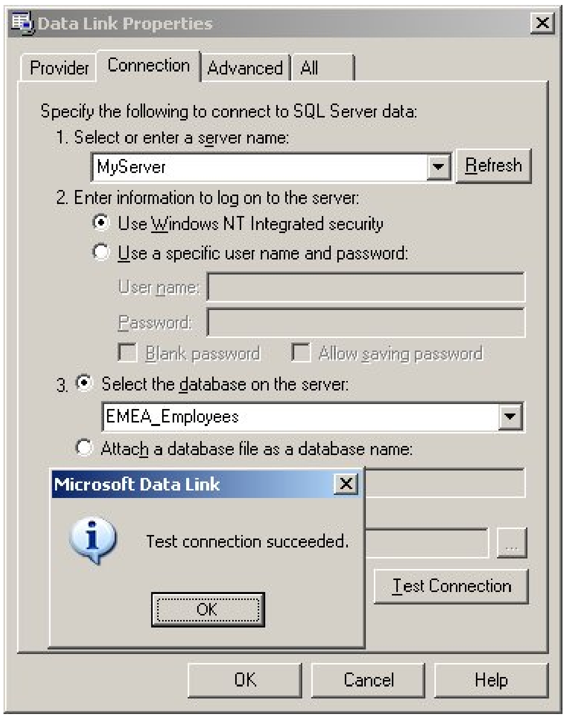


Select the data you want to connect to:

OLE DB Provider(s)
Microsoft Exchange OLE DB Provider
Microsoft Jet 4.0 OLE DB Provider
Microsoft OLE DB Provider for DTS Packages
Microsoft OLE DB Provider for Indexing Service
Microsoft OLE DB Provider for Internet Publishing
Microsoft OLE DB Provider for Microsoft Search
Microsoft OLE DB Provider for ODBC Drivers
Microsoft OLE DB Provider for OLAP Services
Microsoft OLE DB Provider for Olap Services 8.0
Microsoft OLE DB Provider for Oracle
Microsoft OLE DB Provider for SQL Server
Microsoft OLE DB Simple Provider
MSDataShape
OLE DB Provider for Microsoft Directory Services
SQL Server Replication OLE DB Provider for DTS

Figure 12 – List of available OLE DB database connections

The option to connect to other databases is an extremely powerful feature in UMRA, since it allows you to combine Active Directory with user data from a wide range of other information systems. Figures 9 and 10 show an example where a generic form table is configured to connect to an HR system (SQL server). When the connection settings have been specified correctly, the message “Test connection succeeded” will be displayed when you click the **Test Connection** button.

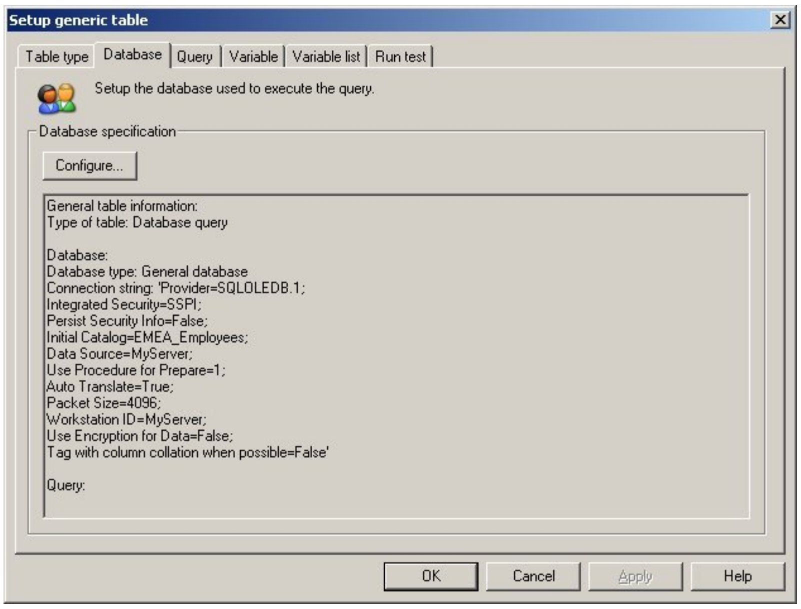


Specify the following to connect to SQL Server data:
1. Select or enter a server name: MyServer
2. Enter information to log on to the server:
[✓ Use Windows NT Integrated security]
Use a specific user name and password:
User name:
Password:
Blank password
Allow saving password
3. [✓ Select the database on the server:] EMEA_Employees
Attach a database file as a database name:

Test connection succeeded.

Figure 13 - Setting up a SQL database connection

When the connection data have been specified, a binding string is created to connect to the database.

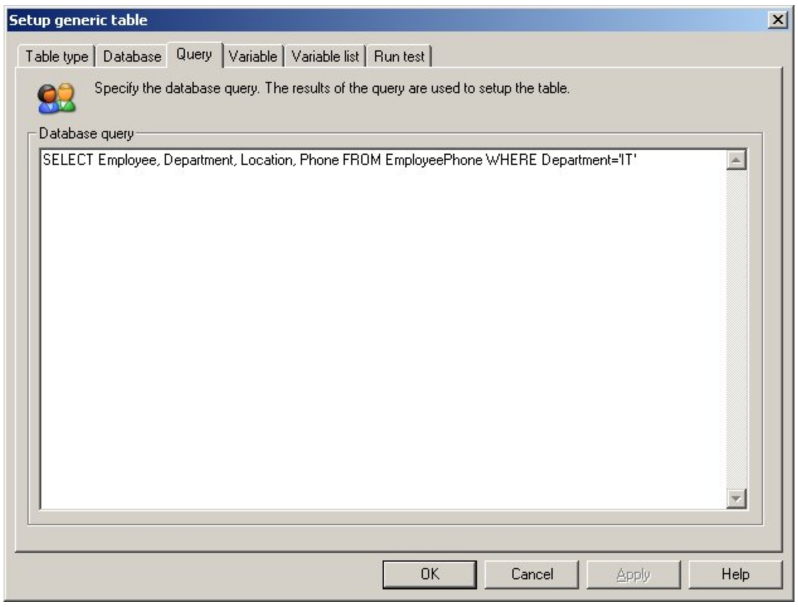


```
General table information:
Type of table: Database query

Database:
Database type: General database
Connection string: 'Provider=SQLOLEDB.1;
Integrated Security=SSPI;
Persist Security Info=False;
Initial Catalog=EMEA_Employees;
Data Source=MyServer;
Use Procedure for Prepare=1;
Auto Translate=True;
Packet Size=4096;
Workstation ID=MyServer;
Use Encryption for Data=False;
Tag with column collation when possible=False'

Query:
```

Figure 14 – Binding string to connect to the database

Once the connection has been properly set up, a SQL query can be created. In the example in Figure 15, a SQL query has been specified to retrieve names of employees, locations and phone numbers for the IT department from the **EmployeePhone** table:

SELECT Employee, Department, Location, Phone FROM EmployeePhone WHERE Department='IT'.



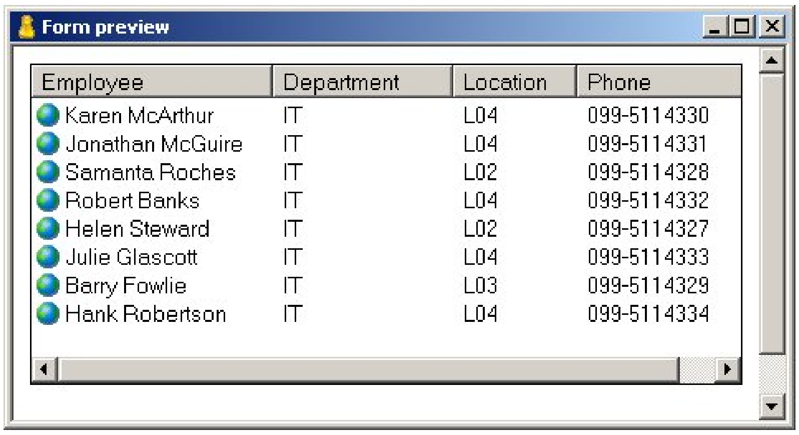
Specify the database query. The results of the query are used to setup the table.

Database query

```
SELECT Employee, Department, Location, Phone FROM EmployeePhone WHERE Department='IT'
```

Figure 15 – Specifying the database query

The result of this database query is shown in Figure 16. The query has returned the data in the columns Employee, Department, Location and Phone for all rows where Department is equal to “IT”.



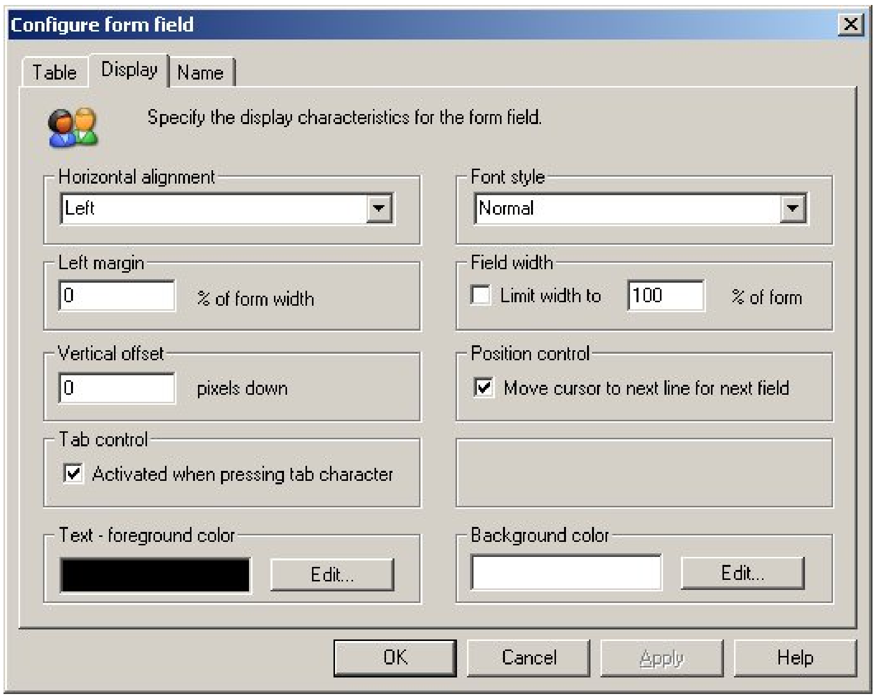
Employee	Department	Location	Phone
Karen McArthur	IT	L04	099-5114330
Jonathan McGuire	IT	L04	099-5114331
Samanta Roches	IT	L02	099-5114328
Robert Banks	IT	L04	099-5114332
Helen Steward	IT	L02	099-5114327
Julie Glascott	IT	L04	099-5114333
Barry Fowlie	IT	L03	099-5114329
Hank Robertson	IT	L04	099-5114334

Figure 16 – Result of a database query is shown in an UMRA form

Formatting tables

In UMRA, the display of tables can be fully customized. The table lay-out can be fully configured in the Configure form field window for tables (**Display** tab).

- Table alignment
- Margins
- Vertical offset
- Fonts
- Background colour
- Etc.

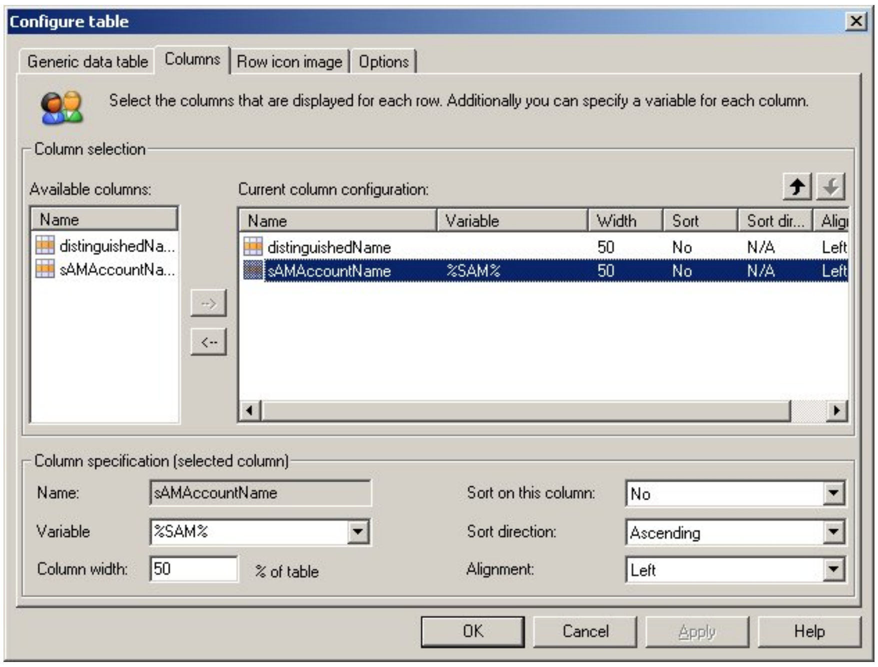


Specify the display characteristics for the form field.

Horizontal alignment: Left
Font style: Normal
Left margin: 0 % of form width
Field width: [ ] Limit width to 100 % of form
Vertical offset: 0 pixels down
Position control: [✓] Move cursor to next line for next field
Tab control: [✓] Activated when pressing tab character
Text - foreground color: ■ Edit...
Background color: □ Edit...

Specifying columns

For each of the before mentioned generic tables you need to specify which columns of the table you would like to display. This can be configured in the **Column** tab of the **Configure table** window (see figure below). In the same window, you can specify the sort order for the selected column and assign a variable to the selected column..



Select the columns that are displayed for each row. Additionally you can specify a variable for each column.

Column selection

Available columns:

Name
distinguishedNa...
sAMAccountNa...

Current column configuration:

Name	Variable	Width	Sort	Sort dir...	Aligi
distinguishedName		50	No	N/A	Left
sAMAccountName	%SAM%	50	No	N/A	Left

Column specification (selected column)

Name:	sAMAccountName	Sort on this column:	No
Variable	%SAM%	Sort direction:	Ascending
Column width:	50 % of table	Alignment:	Left

For the generic table **Variable** you first need to specify the column headers, which is discussed in *Special table type – Generic table Variable*.

Special table type – Generic table Variable

Not all user relevant data can be captured using an LDAP or database query. Table data are also generated by some specific script actions, in which case the collected data are stored in a variable, **instead of being generated as part of a form table object**. UMRA comes with several built-in script actions producing table output, stored in a variable:

List services status – script action to manage services;

List printer documents – script action to manage printers and printer queues;

Generate generic table – script action to generate a generic table (LDAP query, database query or variable) and store the result in a variable for further processing;

LDAP script actions to access other (non-Active Directory) directory service like Novell eDirectory and Linux OpenLDAP;

Manage table data script action – script action for creating, editing, and merging tables. See section **Programmatically creating and evaluating tables** and the **Help** for more information.

Projects making use of these script actions, usually consist of two parts. The first project, or "auxiliary" project can be defined as the project in which the project data are collected using one of the above mentioned script actions. The result is stored in a variable. In the second project, or "main" project, a table of the variable type can be inserted to show the contents of this variable. Script actions can then be executed for selected rows in the table (see the figure below).

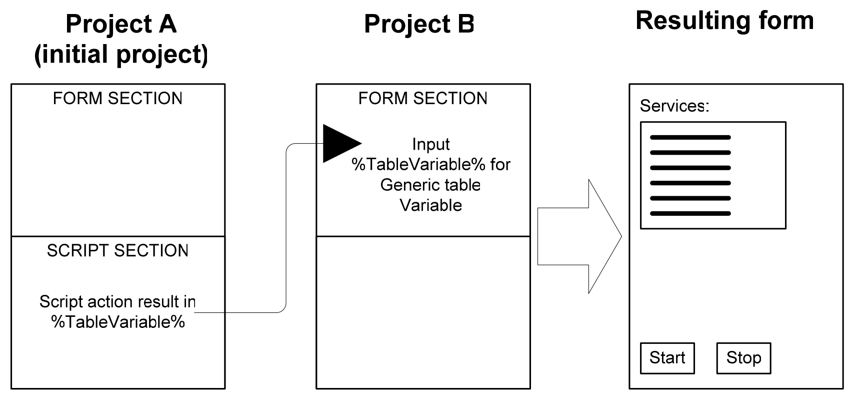
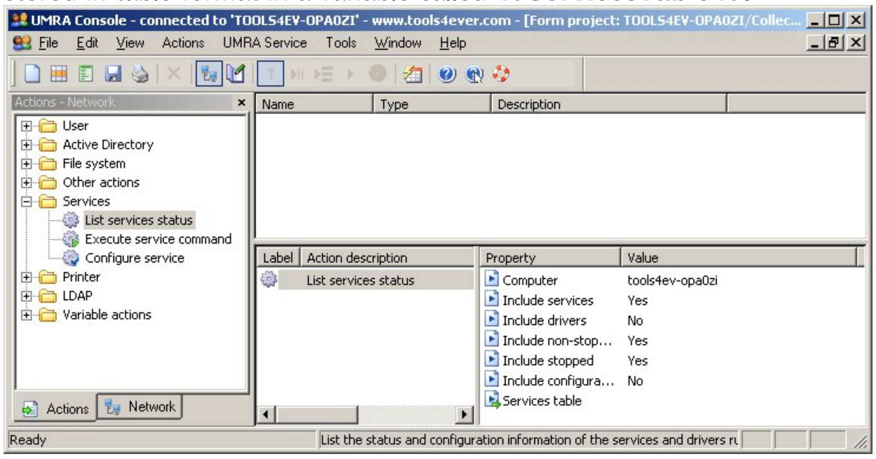

Project A (initial project)
Project B
Resulting form
FORM SECTION
SCRIPT SECTION
Script action result in %TableVariable%
FORM SECTION
Input %TableVariable% for Generic table Variable
Services:
Start
Stop

Figure 17 – Concept of the generic table Variable

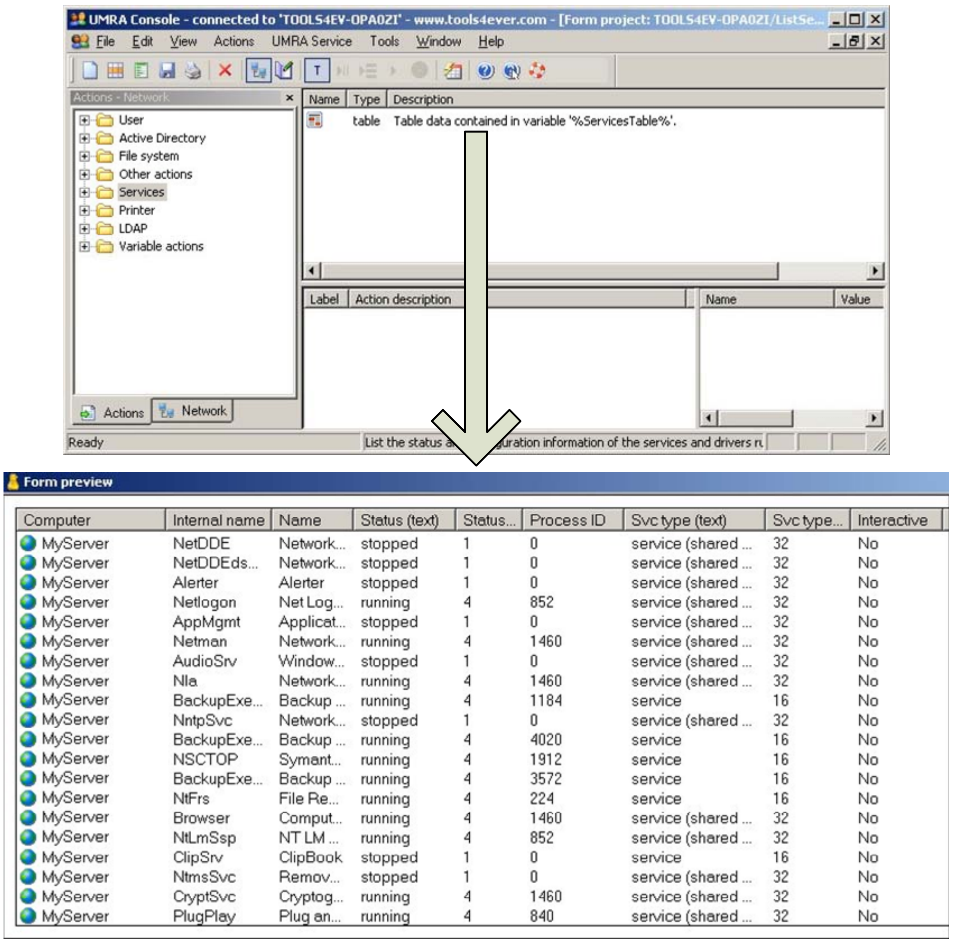
The practical use of this powerful concept is illustrated in Figure 18 and 16. Project A contains the script action "List services status". The result of this script action is stored in table format in a variable called **%ServicesTable%**.



Property	Value
Computer	tools4ev-opa0zi
Include services	Yes
Include drivers	No
Include non-stop…	Yes
Include stopped	Yes
Include configura…	No
Services table	

Figure 18 – Project A – Running a script action collecting data in table format. The results are stored in a variable.

By defining project A as an initial project in project B, the script in project A will be executed before the form of project B is displayed. The variables in project A will be passed to project B. In project B (see Figure 15), a generic table of the variable type can now be inserted in the form window to display content of the variable **%ServicesTable%**.


UMRA Console - connected to 'TOOLS4EV-OPA0ZI' - www.tools4ever.com - [Form project: TOOLS4EV-OPA0ZI/ListSe...
File Edit View Actions UMRA Service Tools Window Help
Actions - Network
User
Active Directory
File system
Other actions
Services
Printer
LDAP
Variable actions
Actions
Network
Label Action description
Name Value
Ready
List the status a…guration information of the services and drivers ru
Form preview

Name	Type	Description
	table	Table data contained in variable '%ServicesTable%'.

Computer	Internal name	Name	Status (text)	Status...	Process ID	Svc type (text)	Svc type...	Interactive
MyServer	NetDDE	Network...	stopped	1	0	service (shared ...	32	No
MyServer	NetDDEds...	Network...	stopped	1	0	service (shared ...	32	No
MyServer	Alerter	Alerter	stopped	1	0	service (shared ...	32	No
MyServer	Netlogon	Net Log...	running	4	852	service (shared ...	32	No
MyServer	AppMgmt	Applicat...	stopped	1	0	service (shared ...	32	No
MyServer	Netman	Network...	running	4	1460	service (shared ...	32	No
MyServer	AudioSrv	Window...	stopped	1	0	service (shared ...	32	No
MyServer	Nla	Network...	running	4	1460	service (shared ...	32	No
MyServer	BackupExe...	Backup ...	running	4	1184	service	16	No
MyServer	NntpSvc	Network...	stopped	1	0	service (shared ...	32	No
MyServer	BackupExe...	Backup ...	running	4	4020	service	16	No
MyServer	NSCTOP	Symant...	running	4	1912	service	16	No
MyServer	BackupExe...	Backup ...	running	4	3572	service	16	No
MyServer	NtFrs	File Re...	running	4	224	service	16	No
MyServer	Browser	Comput...	running	4	1460	service (shared ...	32	No
MyServer	NtLmSsp	NT LM ...	running	4	852	service (shared ...	32	No
MyServer	ClipSrv	ClipBook	stopped	1	0	service	16	No
MyServer	NtmsSvc	Remov...	stopped	1	0	service (shared ...	32	No
MyServer	CryptSvc	Cryptog...	running	4	1460	service (shared ...	32	No
MyServer	PlugPlay	Plug an...	running	4	840	service (shared ...	32	No

Figure 19 – Project B - The content of the variable is now displayed using the generic table Variable

Specifying columns for table type Variable

The special table type Variable takes its input from a variable contaning table data. This variable (which is the the result of script actions such as Generate Generic table, List services status, Get User Table) does not contain any header info. This means that you need to specify the correct column names. For variables which are the result of one of the before mentioned script actions, this is simply a matter of selecting the right column template.

Script action	Variable	Use column template
Get user table	%UsersTable%	User info
List services status	%ServicesTable%	Services status (without config info) Services status (with config info). If you choose this template, 3 column names will be added.
List printer documents	%DocumentsTable%	Printer documents
List files and/or directories	User defined	Files and or directories list

Once you have defined the column names as indicated above, you can select the columns to be displayed and assign variables to columns using the **Columns** tab. This is done in the same way as for the other generic tables.

Generate Generic table – Script

It is also possible to perform LDAP queries and database queries as part of a script action and have the result stored as a variable. This is done using the script action **Generate generic table**. The principle of operation is identical to the one described above.

Programmatically creating and evaluating tables

Using the tables described in this document, you should be able to manage table data for most user management tasks. There are situations however, where these standard tables may not be sufficient:

- You wish to evaluate an existing table programmatically and / or create a new table from scratch ;
- You need to combine data from the tables described earlier, with data which are not contained in a table.

In such cases, you can use the For-Each and Manage table data script actions to create your own tables.

Processing user input

When your form project includes a table from which the (Helpdesk) user can make a selection, the selected data will have to be processed. To understand how this works, we need to have a closer look at UMRA.

In the UMRA architecture, the form project as presented to the delegate user in **UMRA Form** (client) has been separated from the actual script. In other words, the UMRA project as shown on the client side does not contain any scripting. The project script, developed by the administrator in the **UMRA Console**, is part of the project maintained by the **UMRA Service**. The script actions in this project script make use of variables. As soon as a delegate user hits an action button in the project form on the client side, the following data are submitted to the **UMRA service:**

- the project form ID
- the name of the variables and their corresponding values
- the ID of the button which has been clicked

The **UMRA Service** then retrieves the project with the corresponding project ID from the forms database and executes the script of the project, substituting the variables in the script actions with the actual values. This principle is shown in Figure 20.

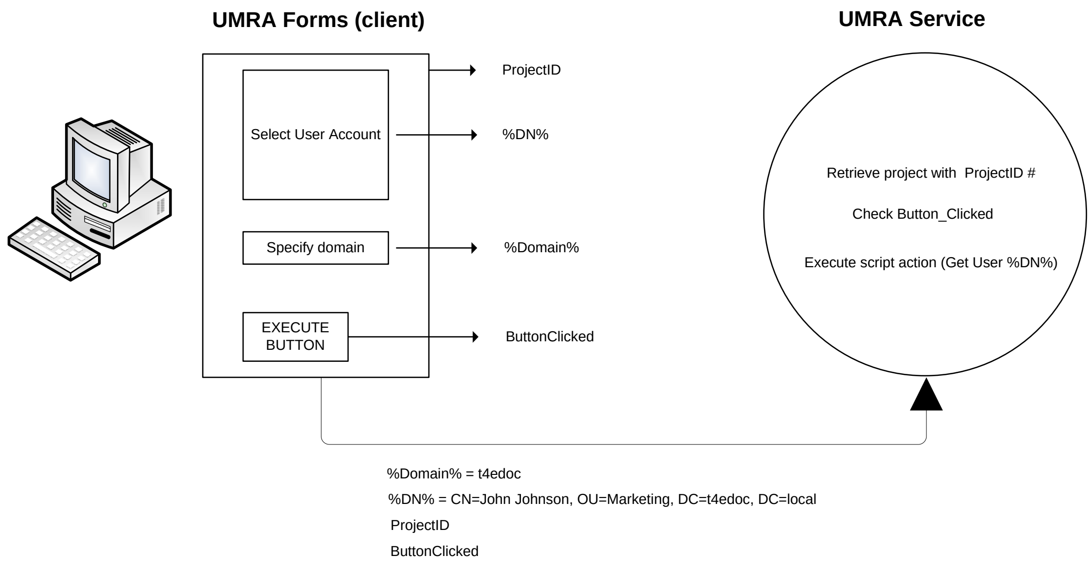
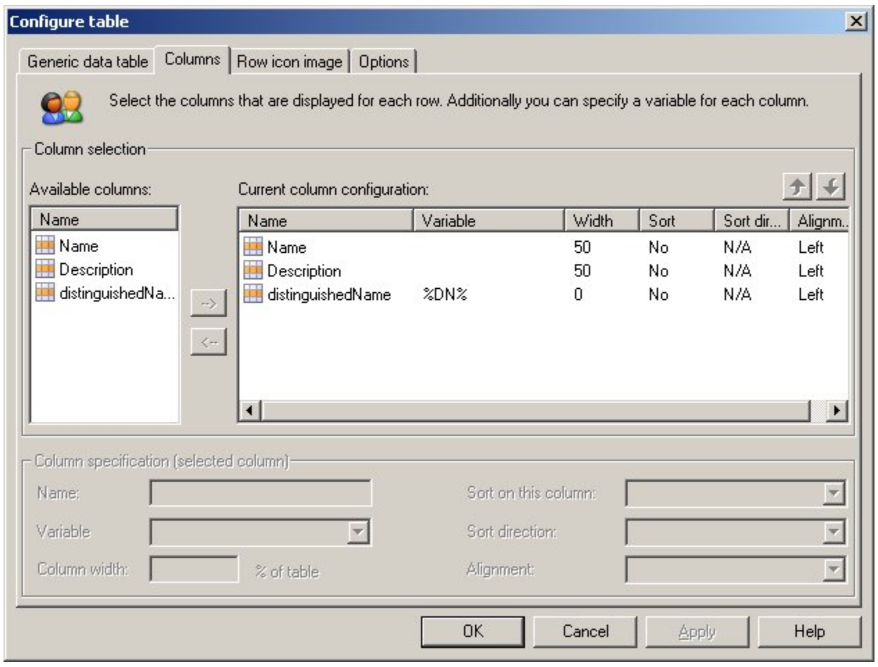


Figure 20 – Submitting variable values to the UMRA Service

In the case of form tables, table columns can be assigned to a variable. This could be a table column holding the **distinguishedName** attribute as part of an LDAP table (see Figure 21).



Configure table

Generic data table | Columns | Row icon image | Options

Select the columns that are displayed for each row. Additionally you can specify a variable for each column.

Column selection

Available columns:

Name
Name
Description
distinguishedNa...

Current column configuration:

Name	Variable	Width	Sort	Sort dir...	Alignm...
Name		50	No	N/A	Left
Description		50	No	N/A	Left
distinguishedName	%DN%	0	No	N/A	Left

Column specification (selected column)

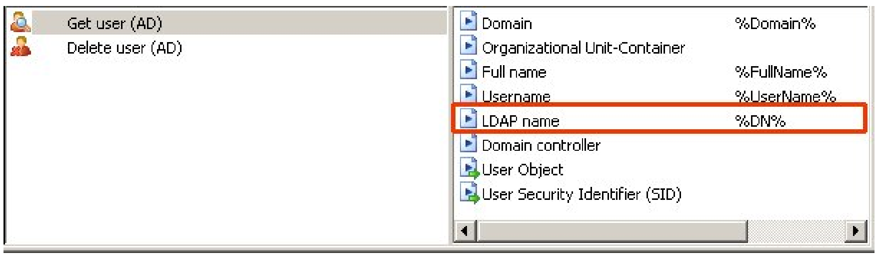
Name:		Sort on this column:	
Variable		Sort direction:	
Column width:	% of table	Alignment:	

Figure 21 – Assigning variables to table columns

The **distinguishedName** attribute uniquely identifies users with the full LDAP string. For example:

CN=John Johnson,OU=Marketing,DC=T4EDOC, DC=LOCAL

When the user hits the action button in the form, the variable %DN% for the selected user (e.g “CN=John Johnson,OU=Marketing,DC=T4EDOC, DC=LOCAL”) is submitted to the **UMRA Service**. The UMRA Service then executes the script (e.g. **Get User (AD)**) of the project, substituting the variable %DN% in the script action property LDAP name with its actual value (see Figure 22).



Get user (AD)
Delete user (AD)

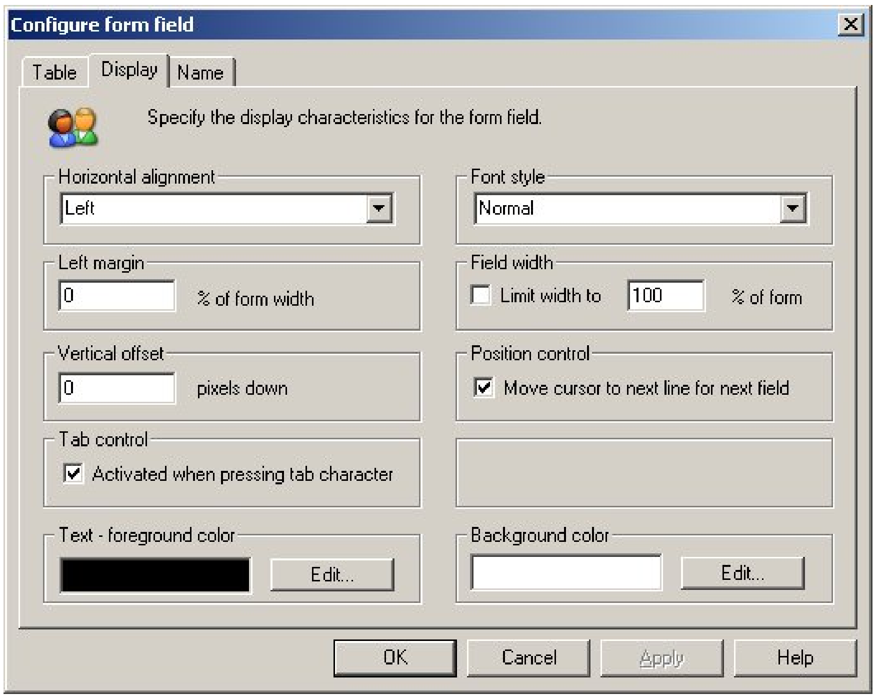
Domain	%Domain%
Organizational Unit-Container	
Full name	%FullName%
Username	%UserName%
LDAP name	%DN%
Domain controller	
User Object	
User Security Identifier (SID)	

Figure 22 – Passing a variable holding the distinguishedName attribute to the Get user script action

Formatting tables

In UMRA, the display of tables can be fully customized. The table lay-out can be fully configured in the Configure form field window for tables (**Display** tab).

- Table alignment
- Margins
- Vertical offset
- Fonts
- Background colour
- Etc.



Specify the display characteristics for the form field.

Horizontal alignment: Left

Font style: Normal

Left margin: 0 % of form width

Field width: ☐ Limit width to 100 % of form

Vertical offset: 0 pixels down

Position control: ☑ Move cursor to next line for next field

Tab control: ☑ Activated when pressing tab character

Text - foreground color: ■ Edit...

Background color: □ Edit...

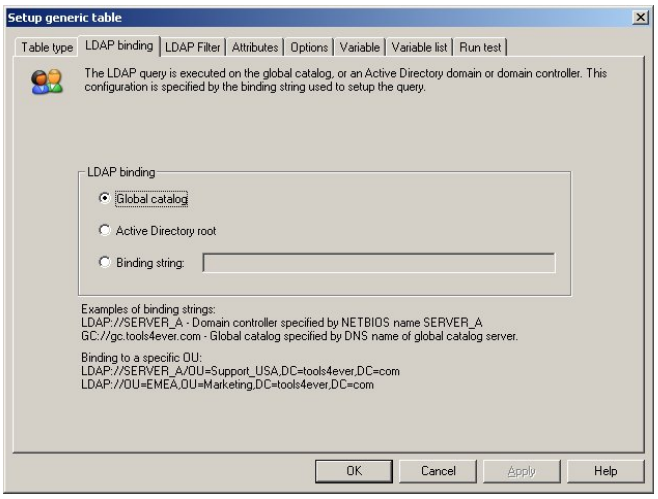
Using tables in UMRA – Forms & Delegation – Hands-on

Example 1 – Creating an LDAP table showing all disabled users in a domain

The project created in this example can also be found in the directory **\Tools4ever\User Management Resource Administrator\Example Projects\Forms\DisabledUsers.ufp**.

LDAP table – Creating a table listing all disabled users in a domain

1. Start the **UMRA Console** application and connect to the **UMRA Service**: Select **UMRA Service, Connect…** and connect to the computer on which **the UMRA Service** is installed.
2. Start the **UMRA Console** and create a new Forms project.
3. Right-click in the **Forms** window and choose the **Add form field** command.
4. Select the **Table** option.
5. Select the **Generic table** option and click the **Configure** button.
6. Click the **Configure** button once more.
7. Select the option **LDAP query** under **Table type**. A dialog box appears to configure your LDAP table.
8. Click the **LDAP binding** tab. In this window, the binding method for the LDAP query is specified. You can either choose a default binding to the Global Catalog or Active Directory root, or define your own binding string. For this example, we want to perform an LDAP search on all user objects in a domain, so we can select the option **Global Catalog**. This is is a searchable master index with data about all objects in the domain.



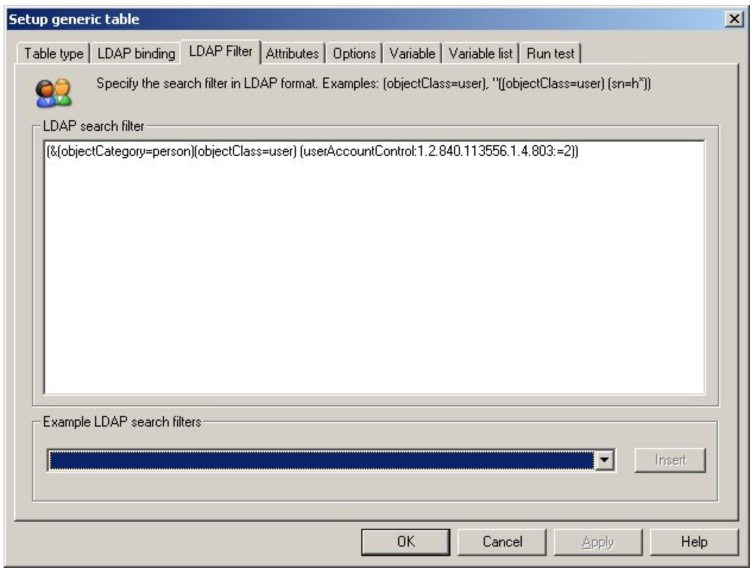
The LDAP query is executed on the global catalog, or an Active Directory domain or domain controller. This configuration is specified by the binding string used to setup the query.

LDAP binding
[✓ Global catalog] Active Directory root Binding string:

Examples of binding strings:
LDAP://SERVER_A - Domain controller specified by NETBIOS name SERVER_A
GC://gc.tools4ever.com - Global catalog specified by DNS name of global catalog server.

Binding to a specific OU:
LDAP://SERVER_A/OU=Support_USA,DC=tools4ever,DC=com
LDAP://OU=EMEA,OU=Marketing,DC=tools4ever,DC=com

9. Click the **LDAP Filter** tab to define a search filter.


Setup generic table
Table type | LDAP binding | LDAP Filter | Attributes | Options | Variable | Variable list | Run test
Insert
OK
Cancel
Apply
Help

Specify the search filter in LDAP format. Examples: (objectClass=user), "(|(objectClass=user) (sn=h*))

LDAP search filter

```
(&(objectCategory=person)(objectClass=user) (userAccountControl:1.2.840.113556.1.4.803:=2))
```

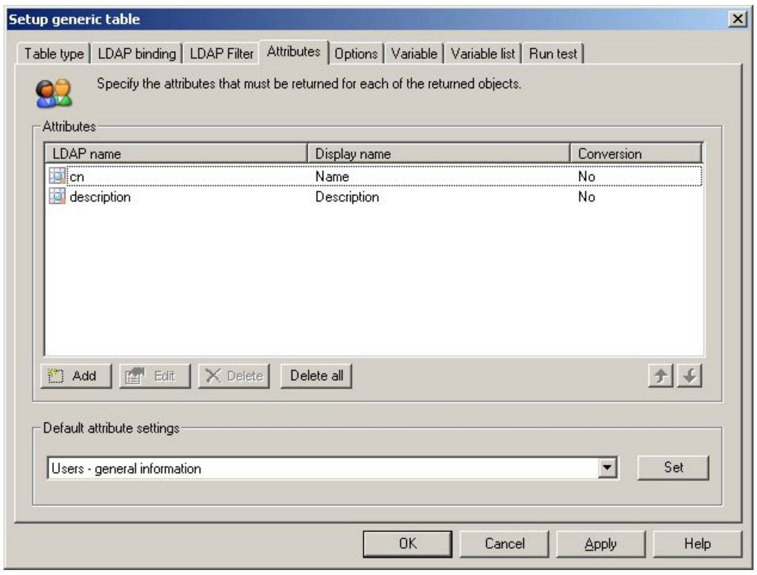
Example LDAP search filters

You can either enter an LDAP search query directly in the **LDAP search filter** window or select a predefined search filter from the **Example LDAP search filters** list box. For this example, please enter the following LDAP query:

(&(objectCategory=person)(objectClass=user) (userAccountControl:1.2.840.113556.1.4.803:=2)).

The next step is to specify which attributes should be returned.

10. Click the **Attributes** tab.


Setup generic table
Table type | LDAP binding | LDAP Filter | Attributes | Options | Variable | Variable list | Run test
Add
Edit
Delete
Delete all
Set
OK
Cancel
Apply
Help

Specify the attributes that must be returned for each of the returned objects.

Attributes

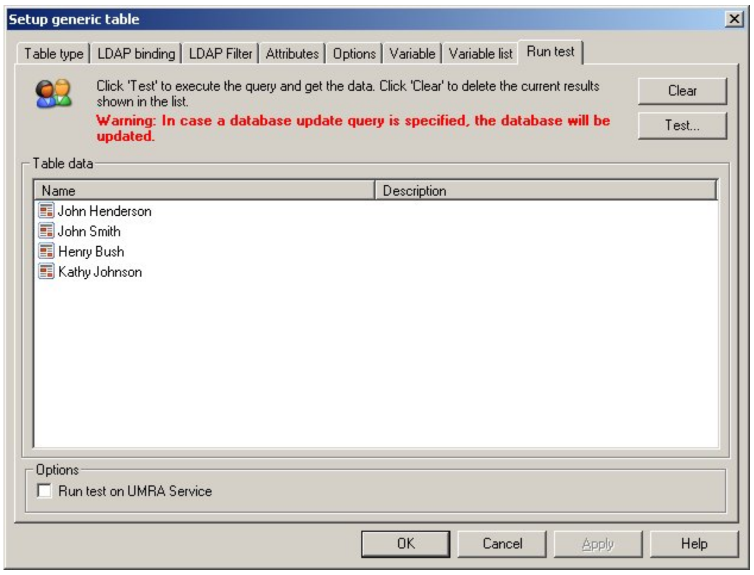
LDAP name	Display name	Conversion
cn	Name	No
description	Description	No

Default attribute settings: Users - general information

The list of attributes for an Active Directory is endless. Which one you need to choose, also depends on the script action you wish to perform on the user selection. For this simple example, select the predefined attribute setting “Users – general information”. This will return the **cn** attribute and the

description attribute. Click the **Set** button when you are done. The LDAP query is now ready to be tested.

11. Click the **Run test** tab.



Click 'Test' to execute the query and get the data. Click 'Clear' to delete the current results shown in the list.

Warning: In case a database update query is specified, the database will be updated.

Table data

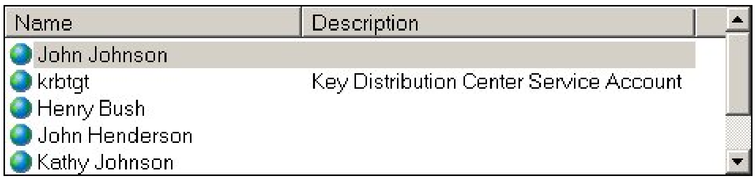
Name	Description
John Henderson	
John Smith	
Henry Bush	
Kathy Johnson	

Options

☐ Run test on UMRA Service

Click the **Test** button. The result of your LDAP query will appear in the **Table data** section. Click **OK** three times to return to the Forms window.

12. Right-click in the form window and choose the **Toggle auto preview** command to preview your table. The result should be similar to the figure shown below (the user names in your network will of course be different).



Name	Description
John Johnson	
krbtgt	Key Distribution Center Service Account
Henry Bush	
John Henderson	
Kathy Johnson	

You have now created an LDAP table which returns all the disabled users in a domain. Script actions can now be added to your project specifying what action needs to be performed on the selected data.

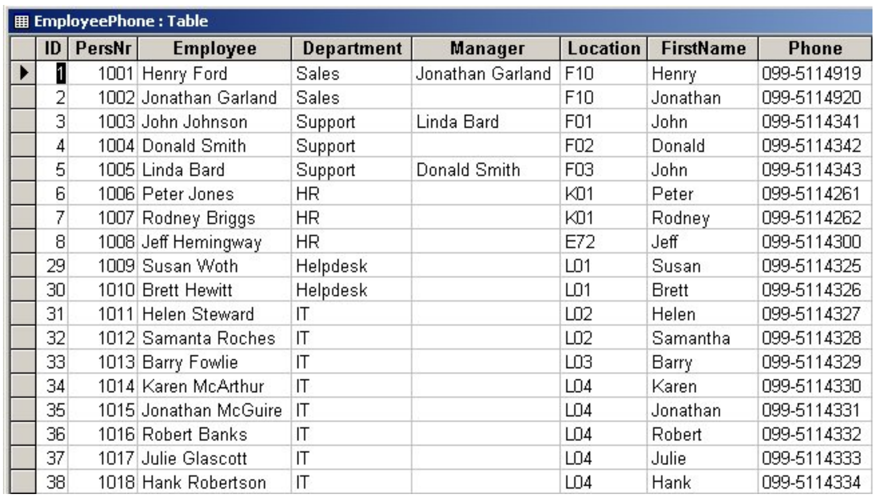
Example 2 – Creating a form table to connect to a database

As part of a delegation project, you want to show a delegate user a table containing the phone numbers of employees in the IT department. These data are available in the database EmployeePhoneNrs.mdb. In the example below we will show you how a table can be created in UMRA to display these data.

The project created in this section can also be found in the directory **\Tools4ever\User Management Resource Administrator\Example Projects\Forms\GetPhoneNumbers.ufp**.

LDAP table – Linking UMRA to an MS-Access database containing phone numbers for all employees, listed by department

The MS Access database we need to link to, contains one table which is called **EmployeePhone**. This table holds the columns **ID**, **PersNr**, **Employee**, **Department**, **Manager**, **Location**, **FirstName** and **Phone**:



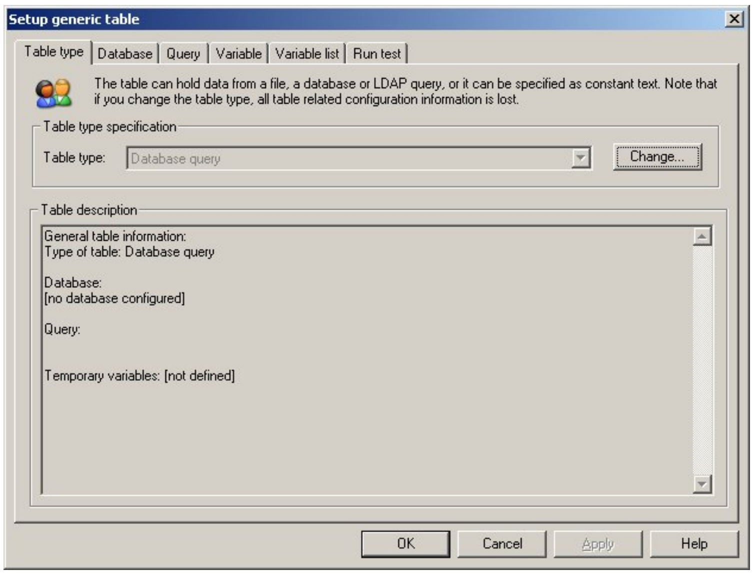
EmployeePhone : Table

ID	PersNr	Employee	Department	Manager	Location	FirstName	Phone
1	1001	Henry Ford	Sales	Jonathan Garland	F10	Henry	099-5114919
2	1002	Jonathan Garland	Sales		F10	Jonathan	099-5114920
3	1003	John Johnson	Support	Linda Bard	F01	John	099-5114341
4	1004	Donald Smith	Support		F02	Donald	099-5114342
5	1005	Linda Bard	Support	Donald Smith	F03	John	099-5114343
6	1006	Peter Jones	HR		K01	Peter	099-5114261
7	1007	Rodney Briggs	HR		K01	Rodney	099-5114262
8	1008	Jeff Hemingway	HR		E72	Jeff	099-5114300
29	1009	Susan Woth	Helpdesk		L01	Susan	099-5114325
30	1010	Brett Hewitt	Helpdesk		L01	Brett	099-5114326
31	1011	Helen Steward	IT		L02	Helen	099-5114327
32	1012	Samanta Roches	IT		L02	Samantha	099-5114328
33	1013	Barry Fowlie	IT		L03	Barry	099-5114329
34	1014	Karen McArthur	IT		L04	Karen	099-5114330
35	1015	Jonathan McGuire	IT		L04	Jonathan	099-5114331
36	1016	Robert Banks	IT		L04	Robert	099-5114332
37	1017	Julie Glascott	IT		L04	Julie	099-5114333
38	1018	Hank Robertson	IT		L04	Hank	099-5114334

The link to the MS Access database is established through the Jet Engine, so there is no need to have MSAccess installed. In case you wish to explore the database yourself, you will find it in \Tools4ever\User Management Resource Administrator\Example Projects\Forms\EmployeePhoneNrs.mdb.

1. Start the **UMRA Console** application and connect to the **UMRA Service**: Select **UMRA Service, Connect...** and connect to the computer on which **the UMRA Service** is installed.
2. Create a new Forms project.
3. Right-click in the Forms window and choose the **Add form field** command.
4. Select the **Table** option.
5. Select the **Generic table** option and click the **Configure** button.
6. Click the **Configure** button once more.

7. Select the option **Database query** under **Table type**. A dialog box appears in which you can configure your database table. The following step is to define the database type and name.



The table can hold data from a file, a database or LDAP query, or it can be specified as constant text. Note that if you change the table type, all table related configuration information is lost.

Table type specification

Table type: Database query

Table description

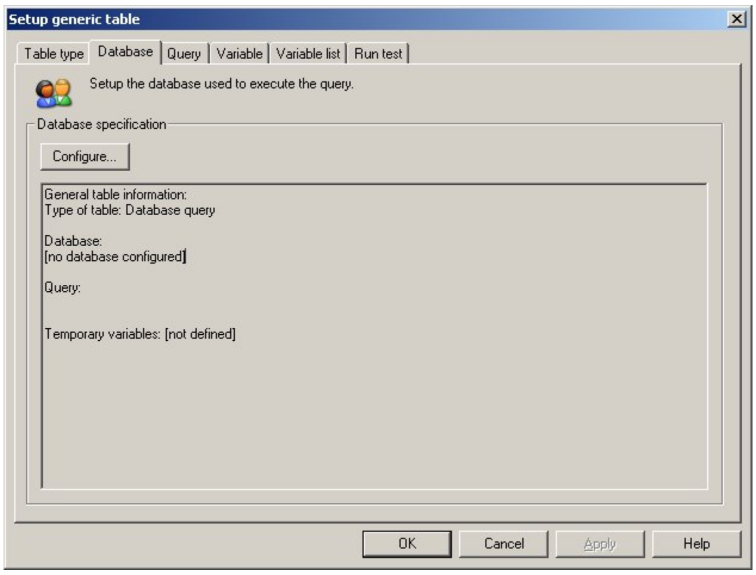
General table information:
Type of table: Database query

Database:
[no database configured]

Query:

Temporary variables: [not defined]

8. Click the **Database** tab. The following dialog box will appear:



Setup the database used to execute the query.

Database specification

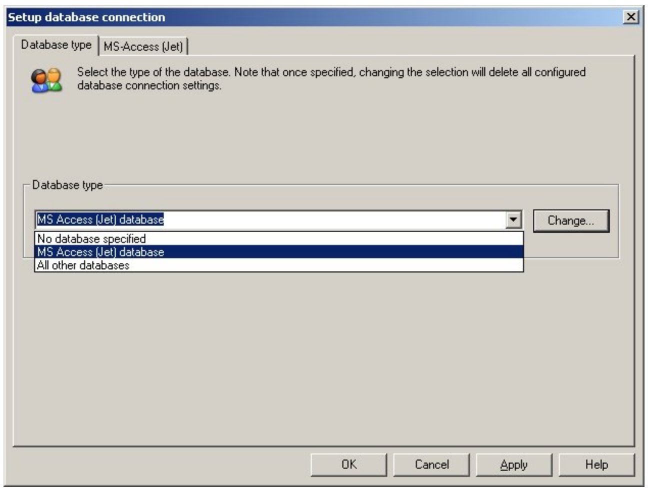
General table information:
Type of table: Database query

Database:
[no database configured]

Query:

Temporary variables: [not defined]

9. Click the **Configure** button to specify the database you wish to use. Select the option **MS Access (Jet) database** from the **Database type** list.

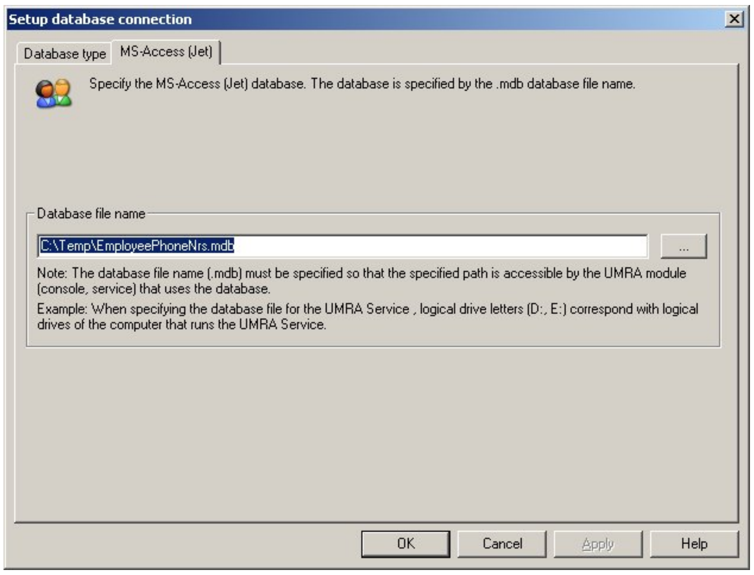


Select the type of the database. Note that once specified, changing the selection will delete all configured database connection settings.

Database type: MS Access (Jet) database

Note - linking to a database is not limited to an MS Access database. You can connect to any database for which a OLE DB provider is available. If your database is not included in the standard OLE DB list of OLE DB providers, please check with your database provider.

10. Click the **MS-Access (Jet)** tab and browse to the file **EmployeePhoneNrs.mdb**. Click the **Open** button.



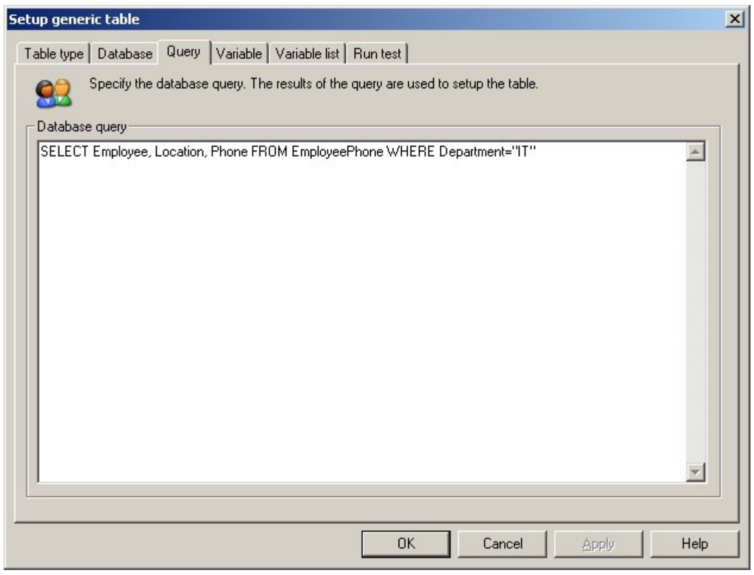
Specify the MS-Access (Jet) database. The database is specified by the .mdb database file name.

Database file name: C:\Temp\EmployeePhoneNrs.mdb

Note: The database file name (.mdb) must be specified so that the specified path is accessible by the UMRA module (console, service) that uses the database.

Example: When specifying the database file for the UMRA Service , logical drive letters (D:, E:) correspond with logical drives of the computer that runs the UMRA Service.

11. Click **OK** to return to the database setup window. We have now specified which database needs to be used. In order to specify which data we want to retrieve from the database, a database query must be specified. Click the **Query** tab. The following dialog box will appear:



Specify the database query. The results of the query are used to setup the table.

Database query

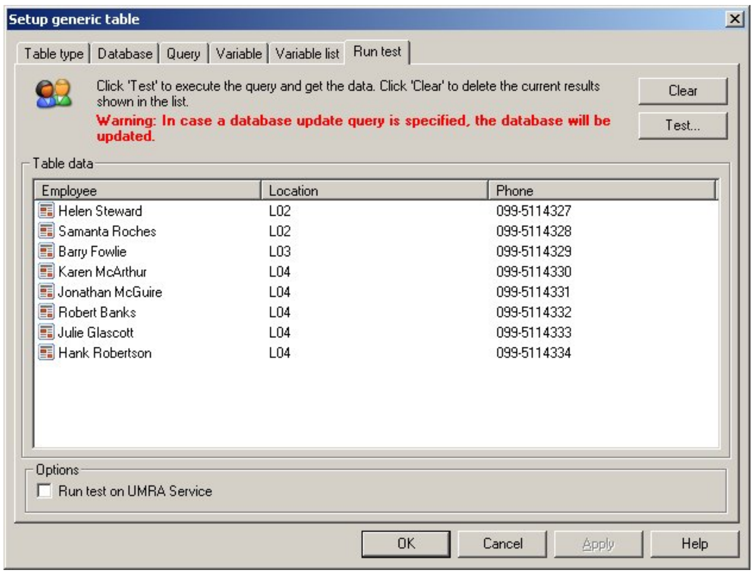
```
SELECT Employee, Location, Phone FROM EmployeePhone WHERE Department="IT"
```

12. Enter the following query:

    SELECT Employee, Location, Phone FROM EmployeePhone WHERE Departments=”IT”

13. This query will return all records in the columns Employee, Location and Phone of the **EmployeePhone** table (the table name you obtained in step 2) where the column Department is “IT”.

14. Click the **Run test** tab and click the Test button. The following data should appear:



Click 'Test' to execute the query and get the data. Click 'Clear' to delete the current results shown in the list.

Warning: In case a database update query is specified, the database will be updated.

Table data

Employee	Location	Phone
Helen Steward	L02	099-5114327
Samanta Roches	L02	099-5114328
Barry Fowlie	L03	099-5114329
Karen McArthur	L04	099-5114330
Jonathan McGuire	L04	099-5114331
Robert Banks	L04	099-5114332
Julie Glascott	L04	099-5114333
Hank Robertson	L04	099-5114334

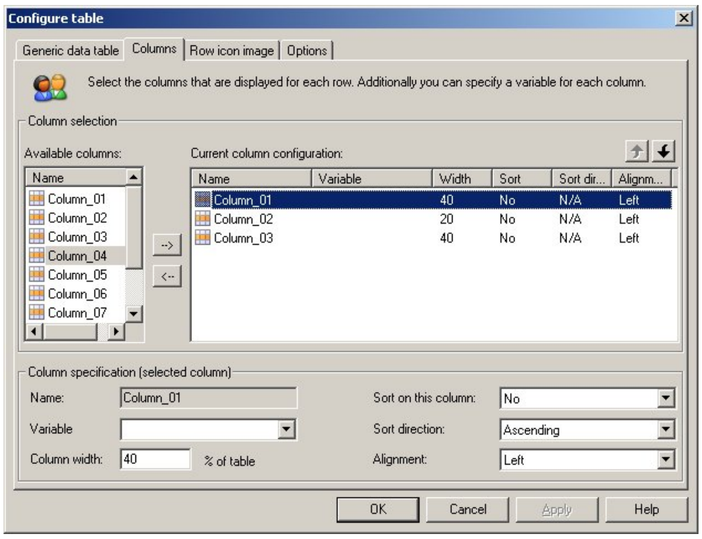
Options

☐ Run test on UMRA Service

In the **Columns** tab, the displayed columns can be changed.

16. Click the **Columns** tab.

    This window is used to configure which columns must be shown in the form. Here you also specify the variables that are passed to the UMRA Service when the end-user selects a table entry and presses a submit button. On the left side, the **Available columns** are shown. When the **Run test** was performed successfully in step 13, the actual column names will be shown here. Change the column width for column 1-3 as shown in Figure 23. Exclude the columns 4-10 by selecting the column and clicking the left arrow (←). Finally, click **OK**.



Select the columns that are displayed for each row. Additionally you can specify a variable for each column.

Column selection

Available columns:

Name
Column_01
Column_02
Column_03
Column_04
Column_05
Column_06
Column_07

Current column configuration:

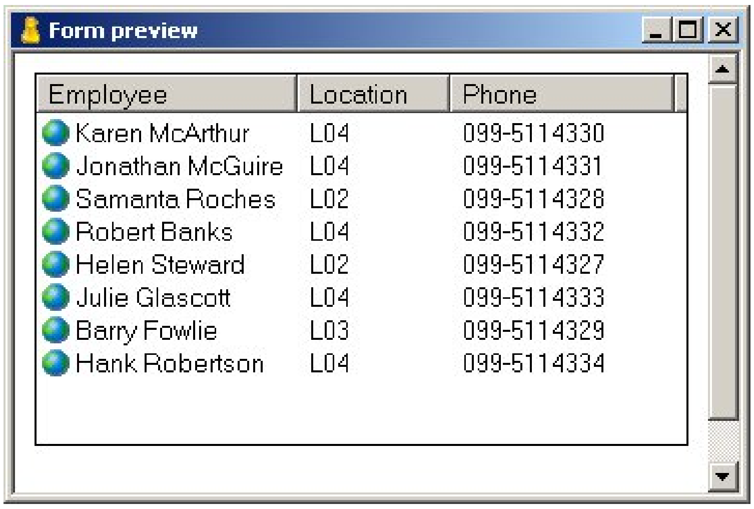
Name	Variable	Width	Sort	Sort dir...	Alignm...
Column_01		40	No	N/A	Left
Column_02		20	No	N/A	Left
Column_03		40	No	N/A	Left

Column specification (selected column)

Name:	Column_01	Sort on this column:	No
Variable		Sort direction:	Ascending
Column width:	40 % of table	Alignment:	Left

Figure 23 – Configuring the columns to be displayed in the form table

17. Click **OK**. When you run the preview, the resulting table as shown in Figure 24 will be displayed.



Employee	Location	Phone
Karen McArthur	L04	099-5114330
Jonathan McGuire	L04	099-5114331
Samanta Roches	L02	099-5114328
Robert Banks	L04	099-5114332
Helen Steward	L02	099-5114327
Julie Glascott	L04	099-5114333
Barry Fowlie	L03	099-5114329
Hank Robertson	L04	099-5114334

Figure 24 – Displaying database data in a form table

You have now succcessfully created a form table object to hold database content.

Excercise 3 – Creating a variable with table data and showing the content in a form table

In this excercise, the project **Collect Services** is created which collects the services information of a specific computer. These data can subsequently be shown in another project defining how to manage these services. Assigning script actions to the table data in the second project falls outside the scope of this exercise, but is described in detail in the document "*UMRA Example projects: Service Management*".

The project created in this example can also be found in the directory **\Tools4ever\User Management Resource Administrator\Example Projects\Forms\CollectServices.ufp and ShowServices.ufp**.

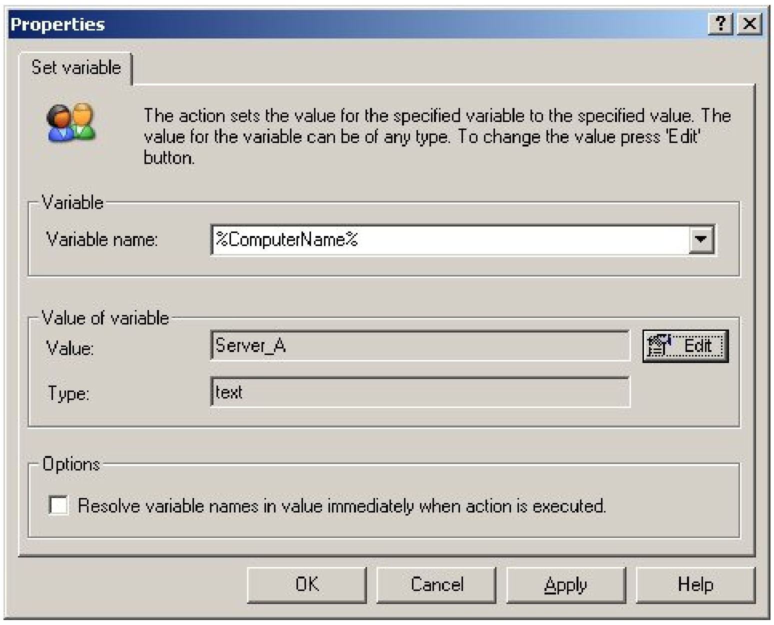
Creating project A – Collecting services

1. Start the **UMRA Console** application and connect to the **UMRA Service**: Select **UMRA Service, Connect...** and connect to the computer on which **the UMRA Service** is installed.

2. Choose **File→New**. Select the option **Form project** and click **OK**. Enter the name of the project, **Collect Services,** and click **OK**.

   First we will set up the action that creates and initializes the variable holding the name of the computer of which we want to manage the services.

3. Drag the **Set variable** script action into the script action window and configure this script action as shown in Figure 25. In this example, the name of the computer is "SERVER_A".



The action sets the value for the specified variable to the specified value. The value for the variable can be of any type. To change the value press 'Edit' button.

Variable
Variable name: %ComputerName%

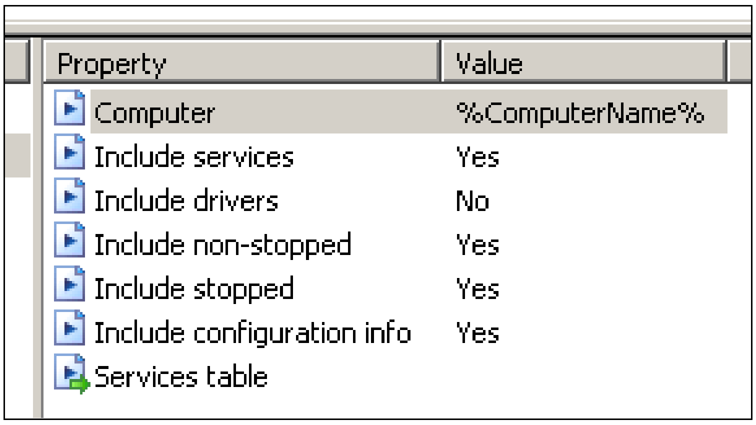
Value of variable
Value: Server_A
Type: text

Options
☐ Resolve variable names in value immediately when action is executed.

Figure 25 – Defining the variable for the computer name

Next, we need to collect the service status information for the computer “SERVER_A”.

4. In the **Actions** bar, drag the script action **List services status** from the **Services** folder to the script section window. Specify the properties for this script action as shown in *Figure 26*.



Property	Value
Computer	%ComputerName%
Include services	Yes
Include drivers	No
Include non-stopped	Yes
Include stopped	Yes
Include configuration info	Yes
Services table	

Figure 26 – Configuring the properties for the List services status script action

The UMRA software will connect to the computer specified by **%ComputerName%** and collect the status of all services. The status information includes the name of the service, the operational state of each service (running, stopped), type of service (automatic, manual, disabled) and so on. This information is stored as a table in the variable **%ServicesTable%**. In other words, this single variable will hold a table with multiple rows and columns. The content of this variable can be displayed as a form table in another project for managing the collected services.

Finally, the security settings for the project **Collect Services** must be specified.

5. Choose the **Form properties** command from the **Actions** menu and click the **Security** tab. For this exercise, you can set the group to “Everyone”.

6. Save the project and close the project window

In the second project, a form table will be set up to display the content of the variable **%ServicesTable%**.

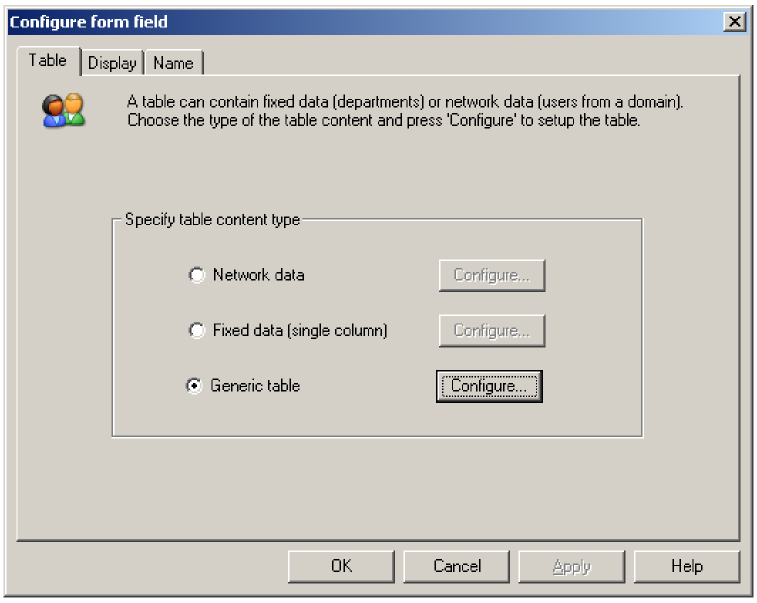
Project B – Inserting a form table to display table content in a variable

1. Choose **File→New**. Select the option **Form project** and click **OK**. Enter the project name, **Show Services,** and click **OK.**

   Next, the project **CollectServices** must be specified as an initial project to ensure that the variable %ServicesTable% is properly passed to the **Show Services** project.

2. Right-click the Form window and select **Form properties**.... Select the **Initial project** tab and select **CollectServices** as the initial project. Click **OK.**

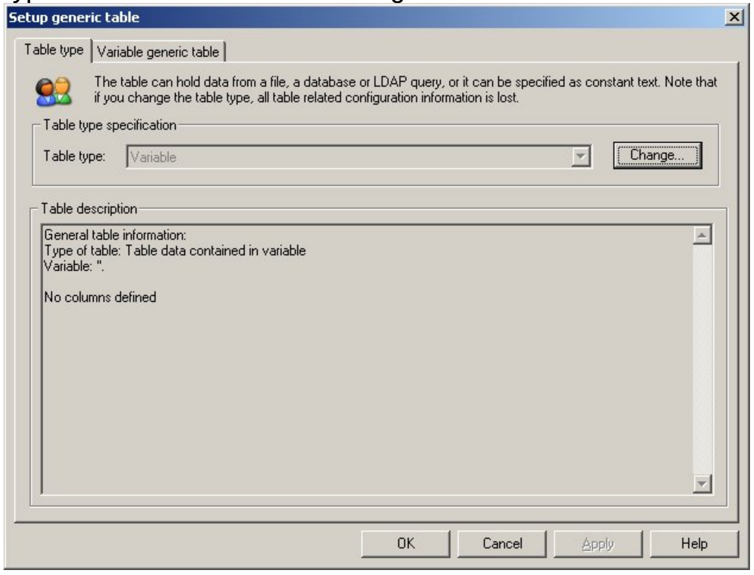
3. Insert a table object in the Forms window. Select the **Generic table** option and click the **Configure** button.



A table can contain fixed data (departments) or network data (users from a domain). Choose the type of the table content and press 'Configure' to setup the table.

Specify table content type
- Network data
- Fixed data (single column)
- [✓ Generic table]

4. The table data we wish to use are contained in the variable **%ServicesTable%**, so we need to select the generic table type **Variable** as shown in the figure below.



The table can hold data from a file, a database or LDAP query, or it can be specified as constant text. Note that if you change the table type, all table related configuration information is lost.

Table type specification

Table type: Variable

Table description

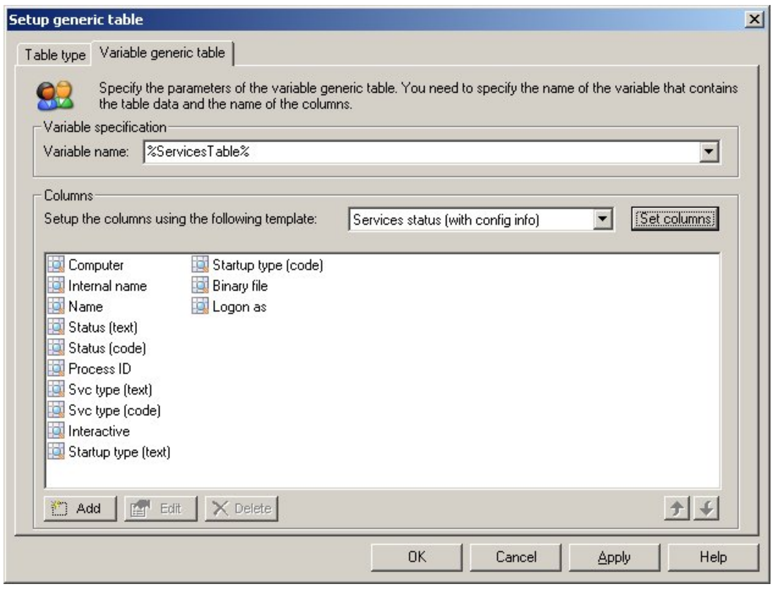
```
General table information:
Type of table: Table data contained in variable
Variable: ''.

No columns defined
```

For this table type, the name of the variable and the columns contained in this variable need to be specified in the **Variable generic table** tab.

5. Enter **%ServicesTable%** in the **Variable name** list.

   Specifying the column names is necessary because a table variable only holds the data of the table, not the column names. Built-in column templates are available for this purpose.

6. Select the column template **Services status (with config info)** in the **Columns** section and click the **Set columns** button. This will include the column names "Computer", "Internal name", "Name", "Service", "Status (text)", "Status (code)", "Process ID", "Svc type (text)", "Svc type (code)", "Interactive", "Startup-type (text)", "Startup-type (code)", "Binary file" and "Logon as"|. See the Help for more detailed information regarding these status fields. Finally, click **OK**.



Setup generic table

Table type | Variable generic table

Specify the parameters of the variable generic table. You need to specify the name of the variable that contains the table data and the name of the columns.

Variable specification

Variable name: %ServicesTable%

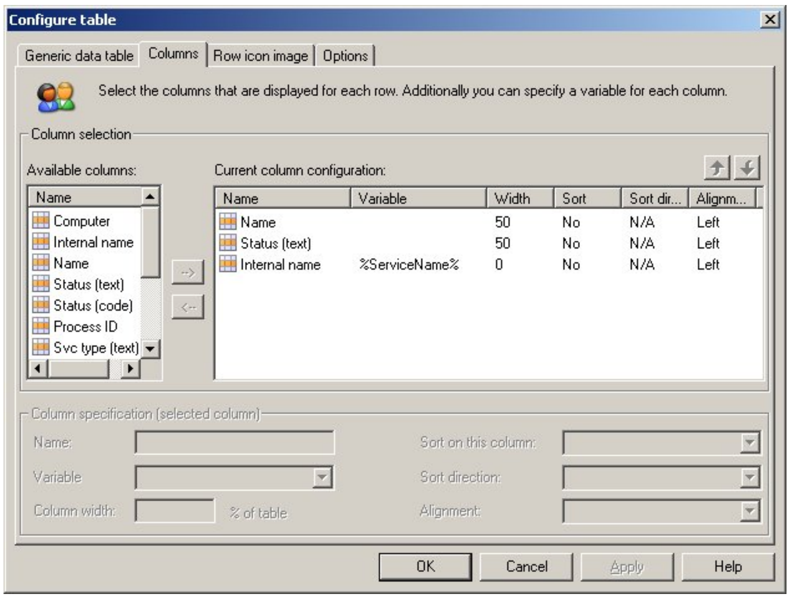
Columns

Setup the columns using the following template: Services status (with config info)

Computer, Internal name, Name, Status (text), Status (code), Process ID, Svc type (text), Svc type (code), Interactive, Startup type (text), Startup type (code), Binary file, Logon as

   If you wish to make changes to the displayed columns, you can do so in the **Columns** tab.

7. Click the **Columns** tab.



Configure table

Generic data table | Columns | Row icon image | Options

Select the columns that are displayed for each row. Additionally you can specify a variable for each column.

Column selection

Available columns:

Name
Computer
Internal name
Name
Status (text)
Status (code)
Process ID
Svc type (text)

Current column configuration:

Name	Variable	Width	Sort	Sort dir...	Alignm...
Name		50	No	N/A	Left
Status (text)		50	No	N/A	Left
Internal name	%ServiceName%	0	No	N/A	Left

Column specification (selected column)

Name:

Variable

Column width: % of table

Sort on this column:

Sort direction:

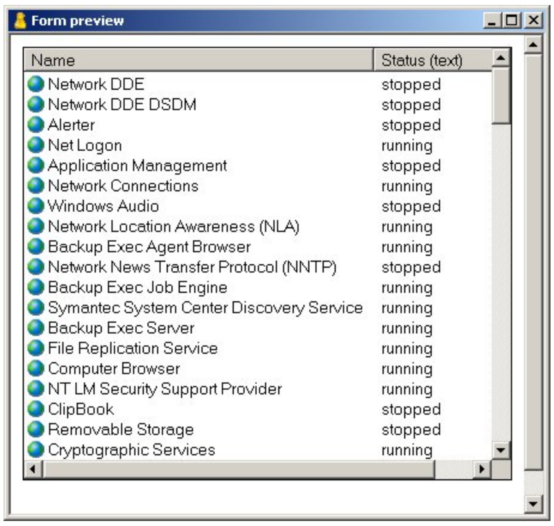
Alignment:

OK Cancel Apply Help

This window is used to configure which columns must be shown in the form. Here you also specify the variables that are passed to the UMRA Service when the end-user selects a service and presses a submit button. On the left hand side, the available columns are shown. These columns correspond with the columns configured in the previous step.

By using the add (->) and remove (<-) buttons you can set up and modify a column configuration. In the example shown, the form will have a table with 3 columns. The third column (Internal name) will not be visible since it has a width of 0%. This column is included since it uniquely specifies the name of the service, but there is no need to display it for the end user. When the user selects a service and presses a button, the value of this column is stored in variable **%ServiceName%**. This variable is passed to the UMRA Service and used for further processing.

18. Click **OK**. When you run the preview, the resulting table as shown in the figure below.



Form preview

Name	Status (text)
Network DDE	stopped
Network DDE DSDM	stopped
Alerter	stopped
Net Logon	running
Application Management	stopped
Network Connections	running
Windows Audio	stopped
Network Location Awareness (NLA)	running
Backup Exec Agent Browser	running
Network News Transfer Protocol (NNTP)	stopped
Backup Exec Job Engine	running
Symantec System Center Discovery Service	running
Backup Exec Server	running
File Replication Service	running
Computer Browser	running
NT LM Security Support Provider	running
ClipBook	stopped
Removable Storage	stopped
Cryptographic Services	running

Contacts

If you have any comments regarding the content of this tables guide, please contact EmielVanWezel@tools4ever.com.

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   Introduction\Doc
Template:        C:\Program Files\AuthorIT
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Creation Date:   11/28/2005 10:47:00 AM
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Last Saved On:   1/12/2006 1:29:00 PM
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