

Database  
Management  
System

# LINTER<sup>®</sup>

Version 5.9

## The Linter Desktop Utility

Relational Expert Systems

---



# Table of Contents

Starting the Desktop .....	4
Navigation .....	5
Working with Tables.....	6
Accessing Table Functions .....	6
Browsing Table List and Tables.....	6
Edit a Table .....	7
Working with BLOB Columns .....	9
Creating and Viewing Synonyms.....	11
Using Filters.....	11
Create a Table.....	12
Delete a Table .....	14
Press a Table .....	14
Rebuild a Table .....	14
Import a Table .....	14
Export a Table .....	16
Managing Users and Permissions .....	17
Navigating User Functions.....	18
Overview of Access Rights .....	19
Basic access categories .....	20
Discretionary access.....	20
Public access .....	20
Mandatory access.....	20
To tables .....	20
For users.....	20
Levels .....	20
Groups .....	21
Roles .....	21
Create and Edit Levels.....	21
Create a User .....	22
Edit User Password and Access Rights .....	22
Create a Group.....	23
Managing Groups.....	24
Change Group Name .....	24
Assign Users to Groups.....	24
Delegate Group Access.....	25
View Delegated Access.....	26
Set and Edit Discretionary Access to Tables .....	27
Grants via Table Functions.....	27
Grants via User Functions .....	28
Set Public Access .....	29
Set and Edit Mandatory Access Levels to Tables and Columns.....	29
User Properties .....	30
View Access Schedule .....	31
User Properties: View Access Permissions.....	31
Create a Role .....	32
Assign a User to a Role .....	32

Connecting and Disconnecting .....33  
SQL Queries .....33

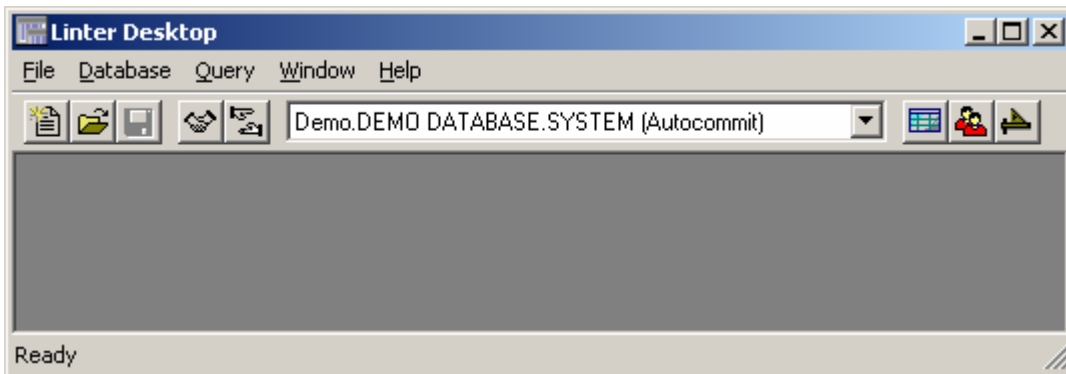
## Starting the Desktop

The Linter Desktop is a DB administration utility available only under MS Windows.

The Desktop is launched from **Start>Programs>Linter SQL Server** by first clicking on Linter Kernel and then on Linter Desktop.

## Navigation

The Desktop is a standard MS window. Access to the available functions is via clicking on the icons or selecting options from the drop down menus on the menu bar.



Screen 1 – Desktop Base Window

The icons provide:


<u>Icon</u>	<u>Function</u>
	Open new SQL icon.
	Opens a blank SQL window in which SQL statements may be entered.
	Open SQL icon.
	Presents directory structure from which an SQL script file may be selected. When selected, the file is opened in an editing window.
	Save icon. Saves current SQL query.
	Connection icon. Connect to DB.
	Disconnect icon. Disconnect from DB

The database selection box on the icon bar allows you to move among several instances of Linter and use the Desktop on whichever is selected.

# Working with Tables

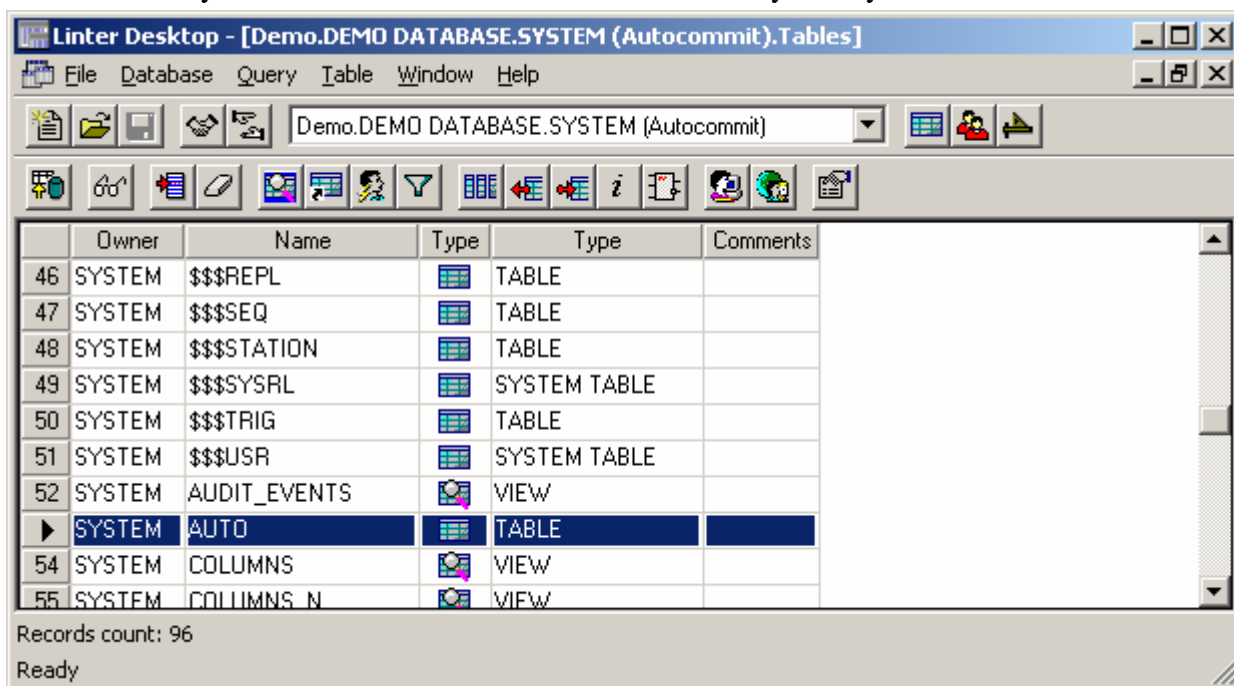
## Accessing Table Functions

You access the Desktop's table functions from the Base Window, Screen 1 via:

- the table icon, ;
- the Tables option in Database submenu;
- the key combination CTL+T.

## Browsing Table List and Tables

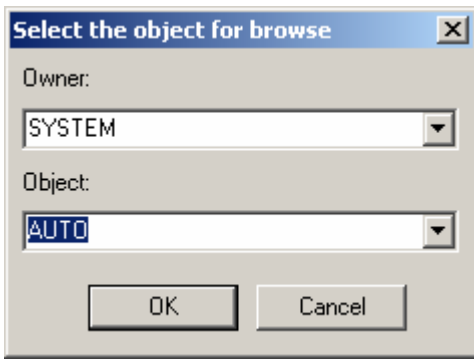
You may browse a DB's list of tables. From that list you may select a table and browse its rows.



Screen 2 – Table List and Functions Window








Select the table you want to browse or edit by double clicking on the table name, pressing F3 selecting the View option from the Table menu or using the T and 4- keys and clicking on the view icon. When a table is selected, its row is highlighted.

Alternatively, you may go directly to a table by pressing CTL+V. Linter then presents you with a login screen. Fill in the Object text box with the name of the table you wish to browse or edit.



Screen 3 – Table Browsing Login

The Table List and Functions window provides the following cons. The Desktop Base Window, Screen 1, adds a Table menu with equivalent options and keystroke access to the indicated functions.

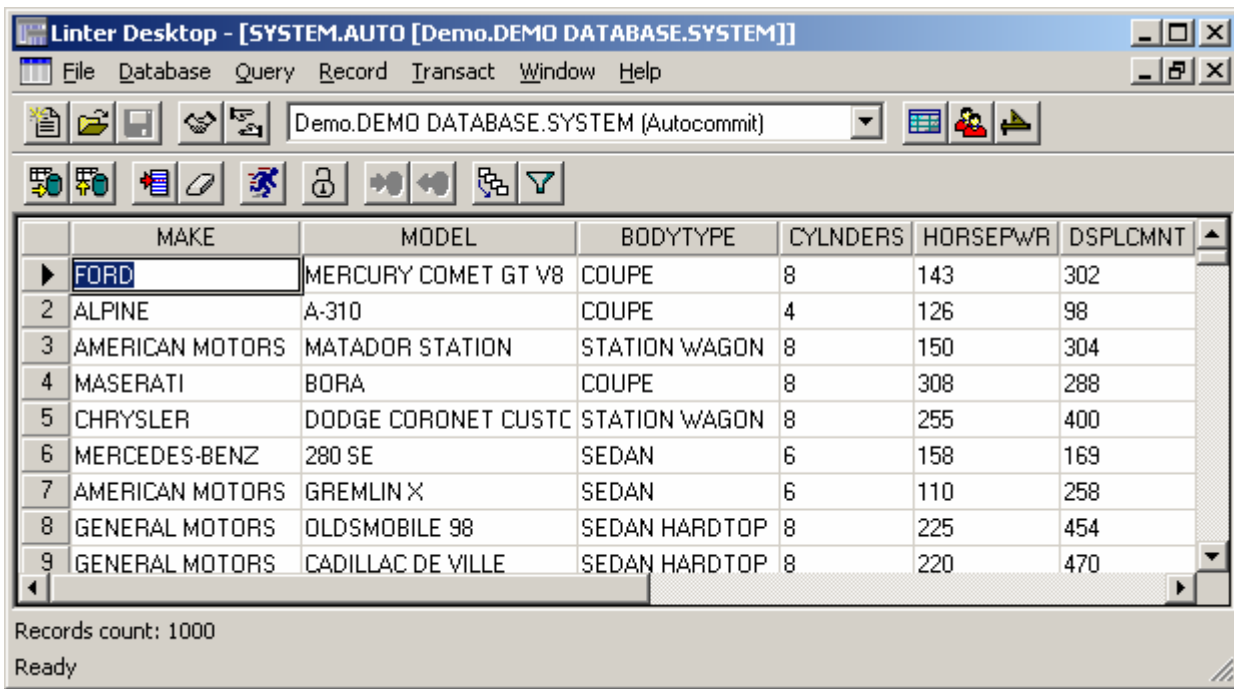
<u>Icon</u>	<u>Menu Option/ Key Press</u>	<u>Description</u>
	Refresh list F5	Reread the list of tables to pick up any tables added since you opened the Table List and Functions window.
	View F3	Display the selected table and, optionally, edit it.
	Create table CTL+Ins	Create a new table. Generates a popup window in which the table may be created.
	Drop Ctl+Del	Delete the selected table.
	Synonyms	This option toggles display of table synonyms in table list on and off.
	Filter F4	Create a filter for the displayed tables. Produces a pop-up window in which the filter may be written.
	Properties	Displays a list of submenus that allow display and editing of a selected table's properties.

In addition, the Desktop Base Windows menu bar adds a **Table** menu providing access to the same function provided by the icons as reflected in the table immediately above. The **Table** menu also provides or navigation and other functions and that are described in later sections.

## Edit a Table








When you have selected the table you want to browse or edit (see the immediately preceding section) Desktop displays a window in which the table rows are displayed. **Record** and **Transact** menus are added to the Desktop Base Window menu bar and the **Table** menu is removed.



The ↑ and ↓ keys, cursor, and scrolling bar are used to move up and down the list of rows. The ENTER key, CTL+ ← or → keys, and cursor can select a column within a row.



Screen 4 – Browse a Table Window

The Table List and Functions window, Screen 2, provides the cons, **Record** and **Transact** menu options and keystrokes listed below to access its functions. The **Record** menu also provides options for navigation, handling BLOB data, and restricting access to the selected table.

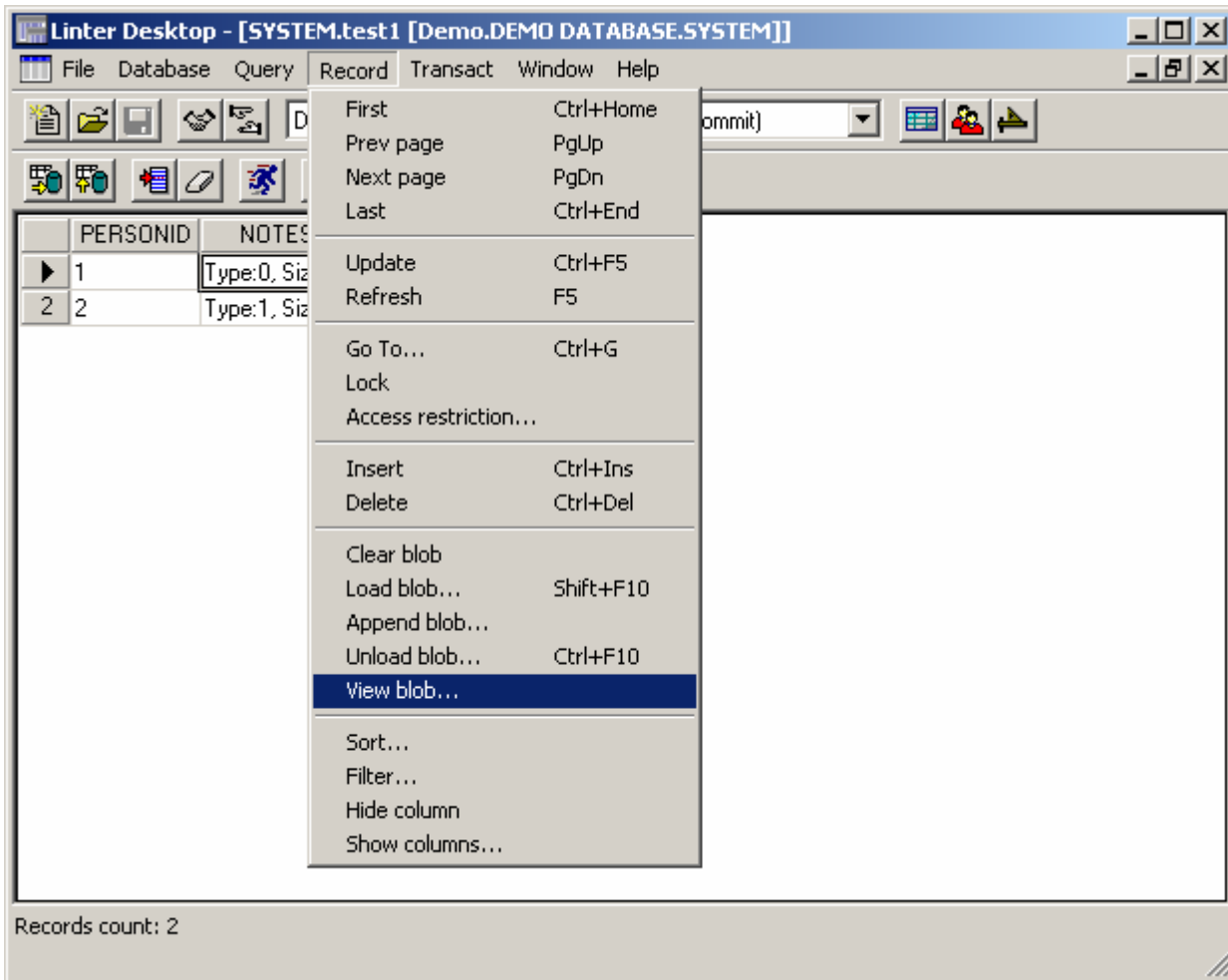
<u>Icon</u>	<u>Menu &amp; Option Key</u> <u>Press</u>	<u>Description</u>
	Record>Update CTL+F5	Update the selected table. Writes edited changes to the DB.
	Record>Refresh F5	Refresh the selected table. Reads changes made by others since you opened the table browsing window and writes them to the screen.
	Record>Insert CTL+Ins	Add a new row. A pop-up window will allow you to enter data for each column in a new row.
	Record>Delete CTL+Del	Delete the currently selected row.
	Record>Go To CTL+G	Go to. A pop-up window provides a text box in which a record number may be entered.
	Record>Lock	Lock the currently selected column.
	Transact>Commit CTL+C	Commit

<u>Icon</u>	<u>Menu &amp; Option Key Press</u>	<u>Description</u>
	Transact>Rollback CTL+R	Rollback
	Record>Sort	A pop-up window allows you to select, from a selection box, the row on which to sort. Check or uncheck the Ascending box to sort in ascending or descending order.

## Working with BLOB Columns

Actual BLOB data is contained in a separate file within the table space. Table space holds three file types: index, data, and blob. Importing (loading) and exporting (unloading) BLOB data is equivalent to changing data in other data type columns. The content of a Linter BLOB column cannot be directly edited.

While we speak of loading BLOB data into a Linter table, what we are in fact loading into the Linter table is information about the file. Unloading BLOB data to a new file is a file copying operation, creating a new instance of the actual BLOB data file. Unloading to an existing file manually updates the BLOB file's content when changes exist in buffers that have not been written to disk.



Screen 5 – Blob Column and Record Menu Options

In the above example, DRIVTEST is a BLOB column in a table that is being browsed. The last four options in the Record menu on the menu bar of the Desktop Base Window provide for BLOB operations.

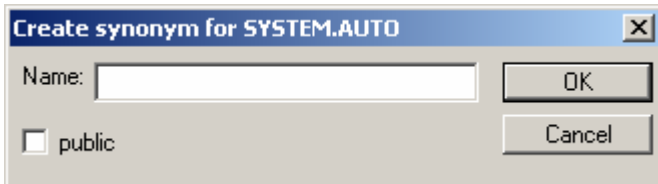
Select the column entry you want to work on using the cursor or ENTER and ↑ and ↓ keys. When selected, the column field will be surrounded with a double box. The options and their results are:

- Clear blob** Deletes VAR file information, displaying zeros.
- Load blob** Generates pop-up window from which you can select the VAR file to be referenced in this cell.
- Append blob** Generates pop-up window from which you can select the VAR file to be appended to the existing VAR file referenced in this cell.
- Unload blob** Generates pop-up window in which you can specify a text file into which the VAR file is to be written.

## Creating and Viewing Synonyms

Synonyms are alternative names for tables. They are primarily used to simplify programming by shortening table names.

To create a synonym, select the table for which you want a synonym from the Table List and Functions window, Screen 2. Then select the Create synonym option from the **Table** menu on the Desktop Base Window, Screen 1. You will get this pop-up:



Screen 6 – Create Synonym Form

Enter the name of the synonym you want and check or uncheck the public box to create a public or private synonym.

A private synonym can be used by a user other than the creator of the synonym only by including the creating user's name and a dot before the synonym in an SQL query.

For example, user *s a m* wants to use *sally*'s table *sally.southamerican\_customers*, for which she has created a private synonym: *s a c . s a m* can use the following query:


```
select * from sally.sac;
```

Sally can use:


```
select * from sac;
```

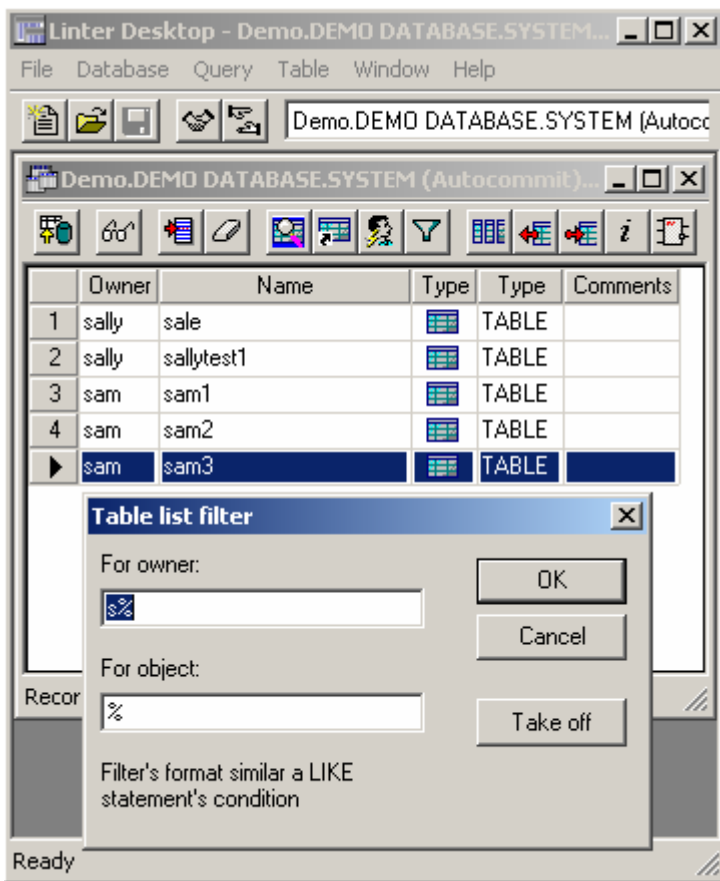
If *sally* had created *sac* as a public synonym, everyone could use *sac* without the *sally.* prefix.

When you have completed the form, click **OK** to create the synonym. Clicking **Cancel** aborts without creating the synonym.

**To view** synonyms in the list of tables, click the synonym button, , on the Table List and Functions window, Screen 2. The synonym button toggles display of the synonym on an off. Public synonyms are displayed at the top of the list.

## Using Filters


Clicking on the filter icon, , on the Table List and Functions window's menu bar generates a pop-up in which you may insert the name of the user(s) and the name of the file(s) you want listed.



Screen 7 – Table List Filter & Output

The percent, %, symbol functions as a wild card. In the above example, all files for the users whose names begin with "s" have been listed.

## Create a Table

Pressing the Add icon, , on the Table List and Functions window's icon bar, selecting the Create table option from the Table drop down menu or pressing CTL+Insert, presents the New table form.

	Name	Type	Precision	Scale	Default	Init value	Not Null	Unique	Primary key
1	personid	int					<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	first	char	240				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	last	char	240				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	dob	date					<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▶	comment	blob					<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Screen 8 – New Table Form

Screen 6 shows the table `testtbl` in mid-creation. When the form is first displayed, no rows are shown. Buttons at the bottom of the form enable its use:

- Add** Appends a new row in the form to describe each column.
- Delete** Deletes the currently selected row.
- Import** Pops up a window from which a table may be selected. When selected, the column descriptions for that table are inserted in the New Table form.
- OK** When all column entries are complete, pressing OK creates the new table.
- Cancel** Terminate table creation without saving any entered data.

The description fields in the form are:


- Name** The name of the new table (case sensitive).
- Column Block** The column names (case sensitive).
- Name Type** The column's data type. Select the data type from the selection box..
- Precision** The column length ( applicable only for char and decimal data types). For decimal, includes entire length of string.
- Scale** Applicable only to decimal data type. Number of digits to the right of the decimal point.
- Default** Default value, if any.
- Init value** Initial value, if any, of column (to be displayed when entering data in a new row).
- Null** If checked, column value may be null.

---

<b>Unique</b>	If checked, each column field must be unique.
<b>Primary key</b>	If checked, column is a primary key.

When the Type field is selected, a drop down list of possible data types is displayed. Clicking on the desired type selects it.

## Delete a Table

You can delete a table from the Table List and Functions window, Screen 2, by selecting it and clicking the delete icon, . Alternatively, press CTL+Del, or select the Drop option from the Table menu on the Desktop Base Window menu bar, Screen 1. No undo function is available to correct a mistaken deletion.

## Press a Table

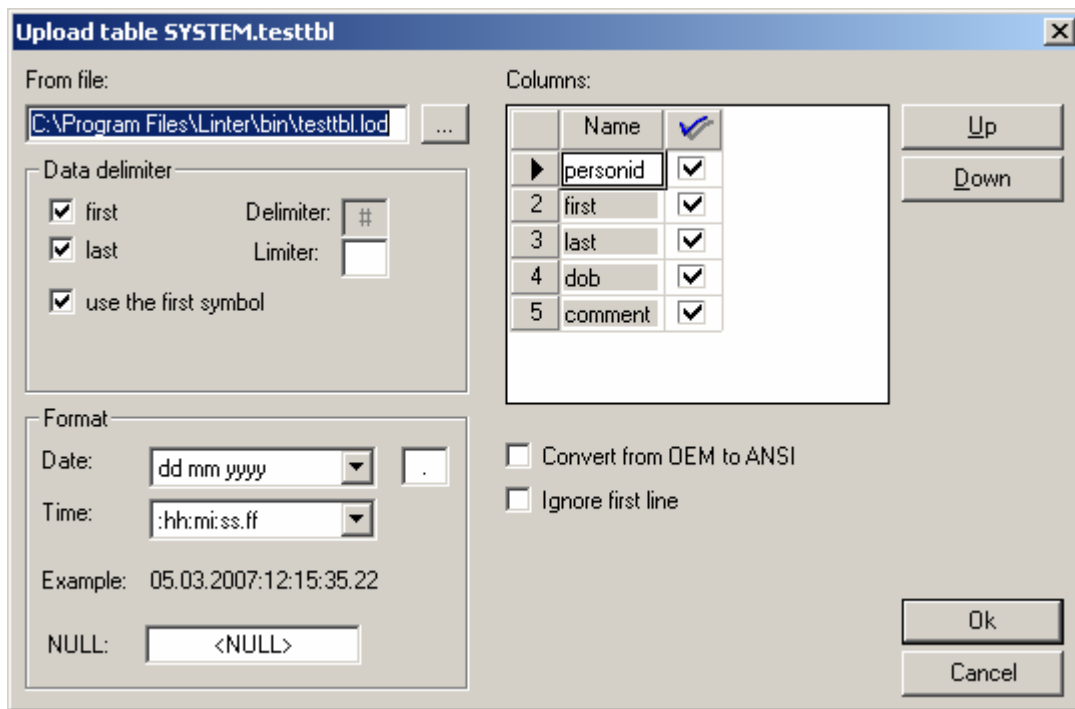
A table may be pressed, i.e., the ROWID numbers of deleted rows may be reclaimed, by selecting the Press table option from the Table drop down menu on the Desktop Base Window menu bar, Screen 1.

## Rebuild a Table

Rebuild a table by selecting the Rebuild table option from the Table drop down menu on the Desktop Base Window menu bar, Screen 1.

## Import a Table

A table selected in the Table List and Functions Window, Screen 2, may be loaded from a data file. Select the **Import>From text file** option from the Table drop-down menu on the Desktop Base Window menu bar, Screen 1. SHI FT+F10 will also launch the table loading form. If the file from which you are loading is in DBF format, select that option instead of the text file option.



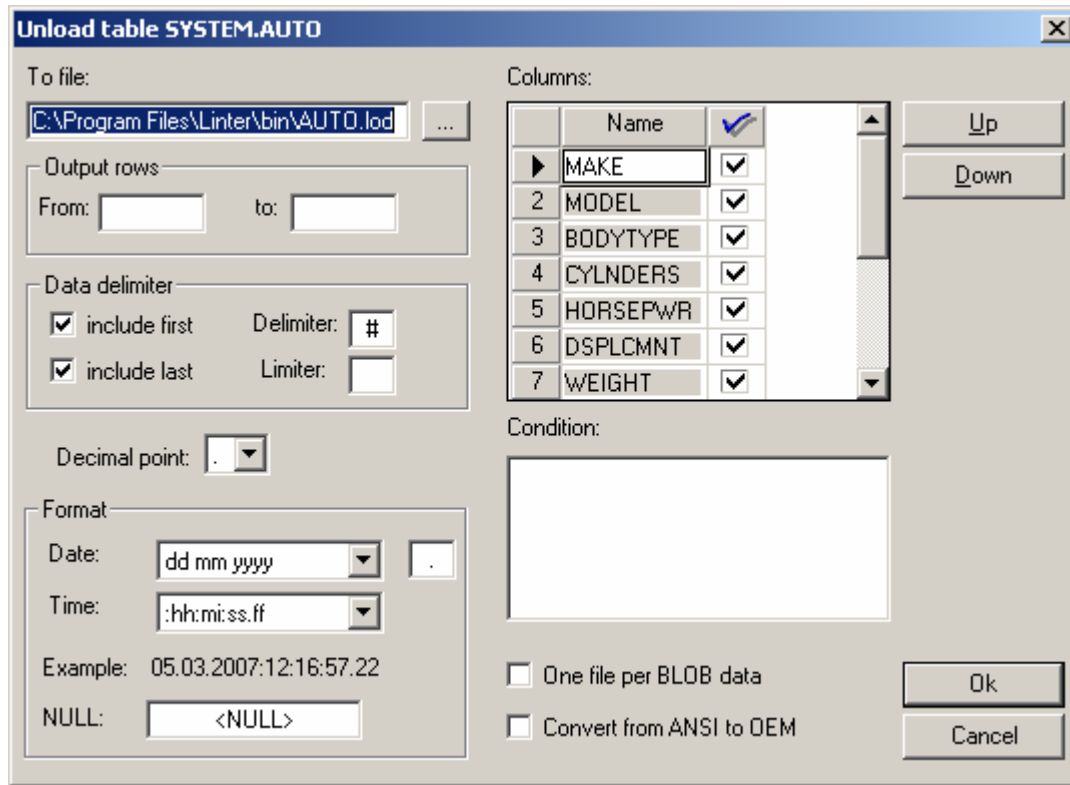
Screen 9 – Load Table Form

The following list describes use of the components of the Load Table Form.

<u>Component</u>	<u>Usage</u>
From file:	This text box contains the full path to the file to be loaded. Clicking the button to the right of the text box will provide a MS Windows directory structure pop up to allow locating the file. Alternatively, the path may be typed in directly.
First	If checked, the first character in a row is the field delimiter.
Last	If checked, the last character in a row is a delimiter.
Use the first Symbol	If checked, the first character in the row will be treated as a column delimiter when loading the table.
Delimiter	This box displays the column delimiter in use in the text file to be loaded.
Date & Time	These drop-down selection boxes allow you to select among various time and date formats. The single-character text box to the right of the Date box contains the delimiter to be used, e.g., colon, period, or slash.
Null	The character specified in the Null text box is the character in the text file the represents a null value.
Columns	The columns block, and the two buttons to its right, allow you specify the sequence and identity of the columns in the text file. Uncheck each box for which there is no data in the text file. Select a column and use the Up or Down buttons to the right to organize the columns in this field in conformity with the table’s column structure.
Convert from OEM	OEM refers to a legacy Cyrillic code page.
Cancel	Click this button to terminate the function without loading.

## Export a Table

A table selected in the Table List and Functions window, Screen 2, may be unloaded into a text file. Select the **Export>To text file** option from the Table drop down menu on the Desktop Base Window menu bar, Screen 1. CTL+F10 will also launch the table unloading form.



Screen 10 – Unload Table Form


The following list describes use of the components of the Unload Table Form.

<u>Component</u>	<u>Usage</u>
To file	This text box contains the full path to the file into which the table is to be unloaded. Clicking the button to the right of the text box will provide a MS Windows directory structure pop up to allow locating the file. Alternatively, the path may be typed in directly
Include first	If checked, the first character in each row of the table is a field delimiter.
Include last	If checked, each row in the text file will be terminated with a field delimiter.
Delimiter	The character to be used as a column delimiter in the text file may be set in this box.
Date & Time	These drop-down selection boxes allow you to select among various time and date formats. The single-character text box to the right of the Date box contains the delimiter to be used, e.g., colon, period, or slash.
NULL	The character specified in the Null text box is the character in the text file the represents a null value.

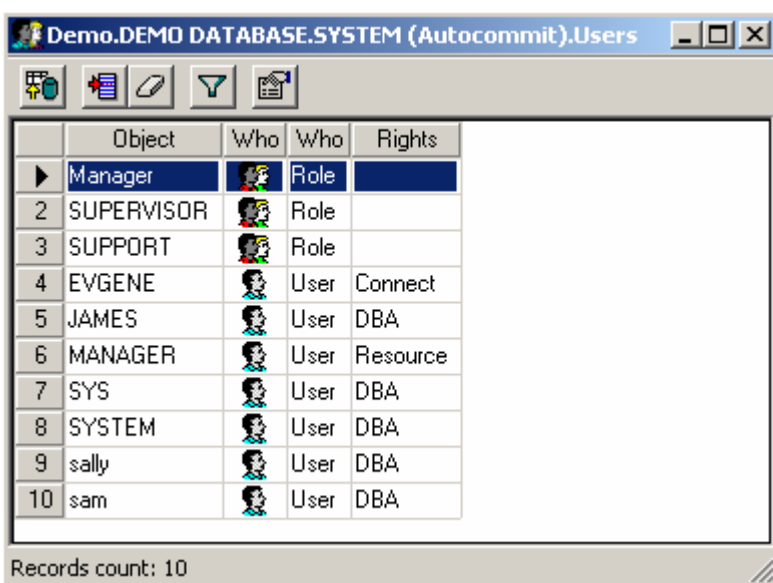
<u>Component</u>	<u>Usage</u>
Columns	The columns field, and the two buttons to its right, allow you specify the sequence and identity of the columns in the text file. Uncheck each box for which there is no data in the text file. Select a column and use the Up or Down buttons to the right to organize the columns in this field in the sequence in which you want them to appear in the text file.
Condition	You may insert an SQL statement in this text box to control output to the text file.
One file for BLOB fields	This checkbox allows you to have all blob files unloaded into a single file. If unchecked, each blob file will be loaded into a separate file.
Convert from ANSI	OEM refers to a legacy Cyrillic code page.
OK	Click this button when you are satisfied with all fields in the form. The file will then be loaded.
Cancel	Click this button to terminate the function without loading.

## Managing Users and Permissions

You access the Desktop’s user administration functions from the Desktop Base Window, Screen 1 via:

- the users icon, ;
- the Users option in Database submenu;
- the key combination CTL+U.






Any of these generate the User List and Functions window, Screen 2, on top of the Desktop Base Window.



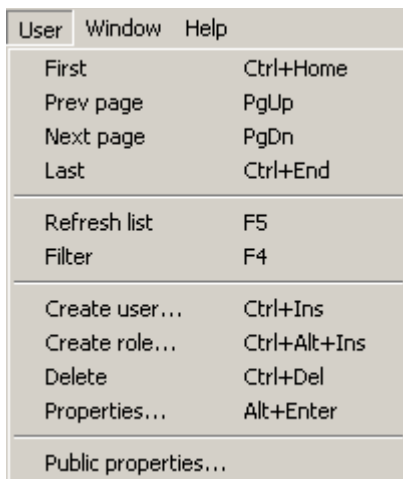
Screen 11 – User List and Functions

## Navigating User Functions

The icons on the User List and Functions window provide the functions listed in the following table.

<u>Icon</u>	<u>Menu &amp; Option Key Press</u>	<u>Description</u>
	Refresh F5	Reads the users table and writes to the screen any changes made since the window was opened.
	Create user CTL+INS	Produces a pop-up form for adding a new user.
	Delete CTL+DEL	Delete the currently selected user. A user is selected by clicking on the row in which his name appears. When selected, the user's name is highlighted.
	Filter F4	Create a filter for the list of users displayed.
	Properties ALT+ENTER	View and edit the properties of the currently selected user, including permissions and passwords.

When the User List and Functions window is displayed, the User drop down menu is added to the menu bar of the Desktop Base Window, Screen 1.



Screen 12 – User Menu from Desktop Base Window

The first four options on the User menu allow you to move around the list of users.

The Create role and Public properties functions are available only from the User menu and are discussed below. The remaining options duplicate the icon options.

## Overview of Access Rights

To understand the access rights, or permissions, options available when creating a new user, or when setting or editing access rights, it is helpful to understand the structure of Linter's permissions.

Access rights are directly associated with user, role, table, and column objects. With the exception of Basic Access Rights, access means access to a table or to one or more columns in a table.

Broadly, access may be divided into the three structures outlined in the following table. These structures are not independent: settings in one structure may affect settings in another structure.

<b>Basic Categories</b> are associated only with users	<b>Access Category</b>	<b>Description</b>
	DBA	modify DB structure, manage users, groups, roles, levels, and access to system tables.
	Resource	create, edit, and add columns to tables plus Connect access rights.
	Connect	connect to db and have access to tables as granted by table owners. Cannot create tables.
<b>Discretionary</b> access applies to all columns in a table	<b>Access Type    Description</b>	
	Select	SQL select permission
	Insert	Add a row to a table
	Update	Alter column data in a table
	Delete	Delete a row from a table
	Index	Create an index
	Alter	Add a new column to a table
<b>Mandatory</b> access may be required for an entire table or for one or more columns within a table	<b>Access Type    Description</b>	
	RAL	Read Access Level
	WAL	Write Access Level

## Basic access categories

An access category is assigned to a user when he is created. A DBA user may change his user's category.

## Discretionary access

The owner of a table may grant one or more types of discretionary access to other users.

"Discretionary" means a grant within the discretion of a table owner. It is distinct from, and overridden by, "mandatory" access, which may be set only by a user with DBA basic access.

If the owner is not a member of any group, he may grant access only to users who are not members of any group. If the owner is a member of a group, he may grant access only to other members of his group.

A user who has been granted discretionary access rights might still not be able to access a table if his mandatory access level is lower than the level set for that table.

## Public access

Is a special case of discretionary access. A table owner may grant discretionary access to the public. This grant overrides group limitations, i.e., a table owner who is a member of a group may grant public access with the result that anyone with access to the DB will have access to his table.

## Mandatory access

"Mandatory" means that a user **must** have been granted a mandatory level of access that is greater than or equal to the mandatory level assigned to a table or column being accessed.

Only a DBA user may set levels. After levels have been created by a DBA, she may assign a level to a user, table, or column.

Users, tables, and columns have the lowest level of mandatory access if mandatory levels are not assigned to them.

## To tables

Mandatory access alone is not enough to allow a user access to a table. The table owner must also have granted discretionary access to the user. Thus, the table owner's control of access is absolute.

## For users

Users may be assigned mandatory access levels. Such a grant gives the user access to any table or column having an access level equal to or less than the access level of the table or column. Discretionary access must also have been granted to the user.

## Levels

Are levels of mandatory access. A level may be assigned to a table or column. A level may also be assigned to a user. A user with an assigned access level lower than the level assigned to a table or column may not access that table or column, regardless of the discretionary access he may have been granted.

A user's access level gives him access to all tables or columns to which he has been given discretionary access that have mandatory access levels equal to or less than his own level.

Once created, a level cannot be deleted. However, levels can be renamed and the levels of an assignment to table, column, or user may be changed.

There may be up to 10 access levels plus the default zero, ID=0, level that cannot be set but specifies the lowest possible level.

Levels cannot be assigned to groups and roles.

## Groups

Are sometimes called security groups and abbreviated SGR in various system table views. They are another structure providing access control. There may be up to 250 groups per db.

A member of one group can only grant discretionary access to tables she owns to a user who is a member of her group. Public access may be granted by a table owner regardless of her group membership.


Again, mandatory access restrictions will block a user with an access level lower than the table or column he is trying to read, regardless of the discretionary access granted.

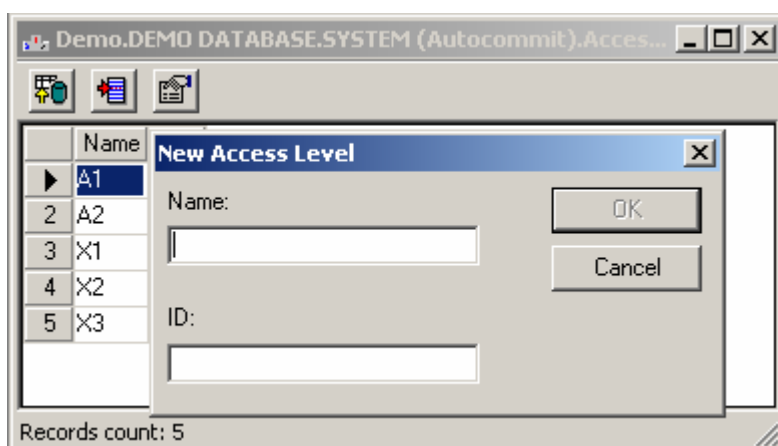
## Roles

Are not property a part of access control. They simply grants of discretionary access rights. Only a DBA may create or assign users and roles to roles.

Roles are objects similar to users in that a role may itself be assigned discretionary access rights. When a user is assigned to a role, he inherits all of that role's discretionary access permissions.

## Create and Edit Levels

To create a level, select the Levels option from the Database menu on the menu bar of the Desktop Base Window, Screen 1. Then click the add icon, , to get the New Access Level form.



Screen 13 – Create Access Level Form

Fill in the name of the new level. It may contain up to 18 alphanumeric characters.


Fill in the desired ID number and click OK.

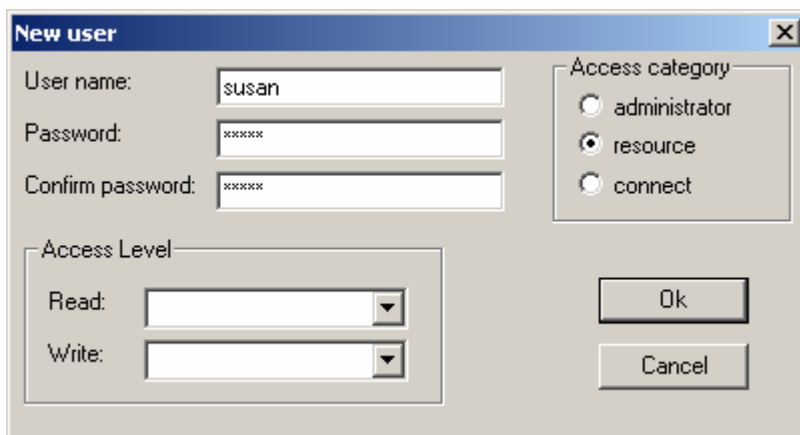
The form does not display ID numbers. Browsing the \$\$\$LEVEL able displays the ID numbers in the \$\$\$ID column.

To edit the name of a level, select the level to be renamed and click on the properties icon. Then fill in the new name in the pop-up that s generated and click OK. No other editing of a level is possible.

For more information on levels, see section “Levels”.

## Create a User

To create a new user, select the add icon, , on the User List and Functions window, Screen 11. Alternatively, press CTL+Ins or select the Create user option from the User menu on the menu bar of the Desktop Base Window, Screen 1. The result will be the Create New User Form.



Screen 14 – Create New User Form

Enter the new user's name and password (twice) in the labeled ext boxes. The user's name does not need to be one recognized by the operating system.

### Basic Access Permissions

Select one of the three options from the Access category block to set the user's basic access permission. See section “Basic access categories” and is preceding table for information on basic access.


### Mandatory Access Level

The read/write drop-down selection boxes in the Access level block contain the mandatory access levels previously created. Click on the desired access level for the new users.

An explanation of mandatory access levels is in section “Mandatory access” and the able preceding it. Section “Levels” describes levels. Section “Create and Edit Levels” covers creating levels.

When you are satisfied with all the information in the Create New User Form click the OK button. To quit without creating the new user, click Cancel.

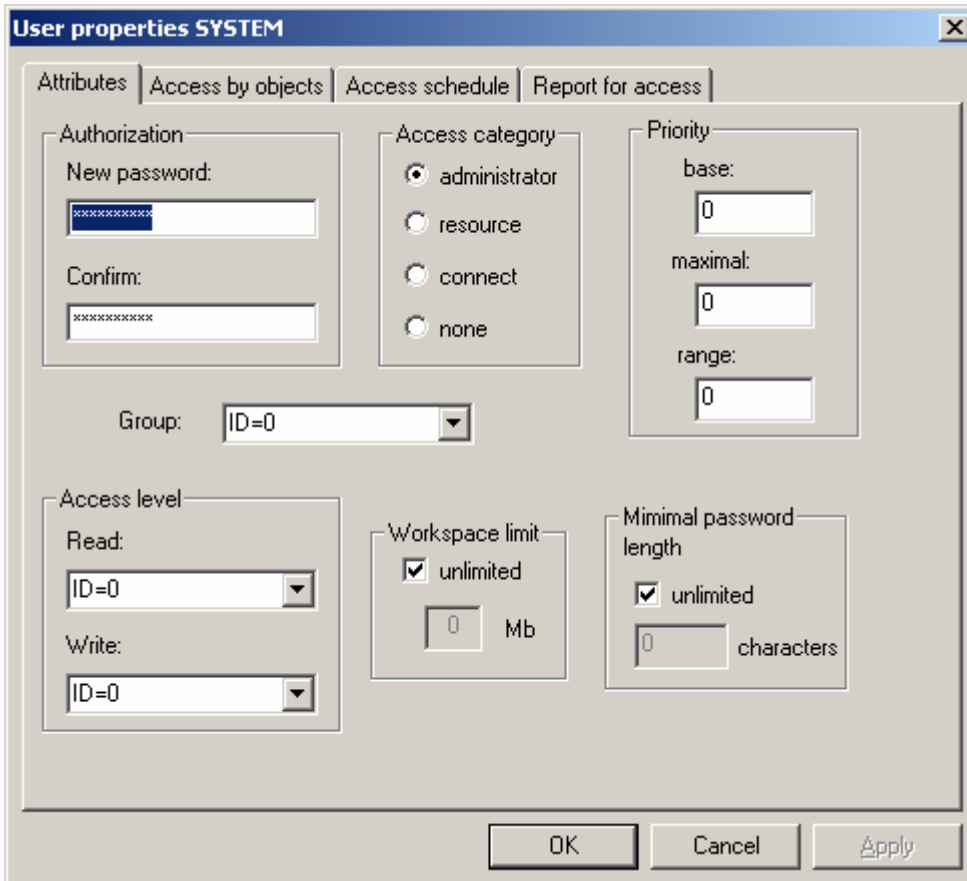
## Edit User Password and Access Rights

To view and edit users' passwords and access rights, select the properties icon, , on the User List and Functions window, above. Alternatively, press ALT+Enter, or select the Properties option from the User menu on the menu bar of the Desktop Base Window, Screen 1.

The User Properties window has four tabs. The first, Attributes allows you to change the password and basic and mandatory level access of the user. The properties available on this tab are substantially the same as those you saw on the Create New User Form.

The Access category option none provides an alternative, not available when setting up a new user, to using the delete icon on the User List and Functions window, Screen 11. It excludes the user from DB access.

In addition, the user's group ID is displayed.




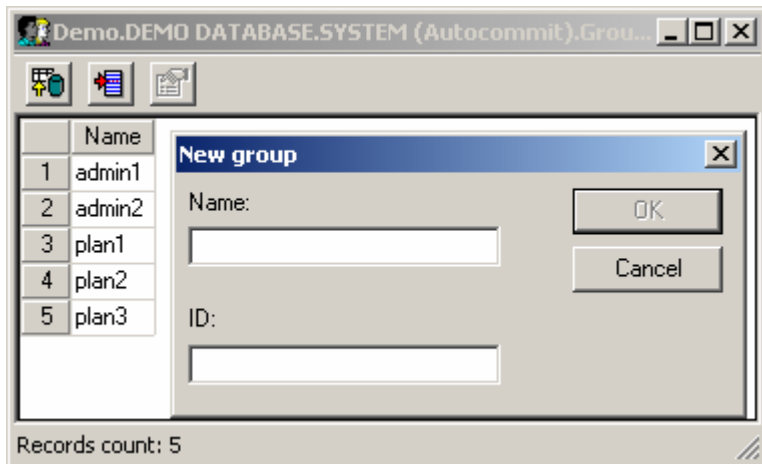
Screen 15 – User Properties Window: Edit Password and Access

Make the changes you want and click the OK button when satisfied. Click Cancel to exit User Properties without making changes.

The significance of the Access category and Access level blocks is explained in section “Create a User” and is references.

## Create a Group

Each db may have up to 250 groups. To create a group, select the Groups option from the Database menu on the menu bar of the Desktop Base Window, Screen 1 to get the Group List and Function window. Then click the add icon, , to get the New Group Form.




Screen 16 – Group List and Function Window with New G Form

Fill in the name of the new group. It may contain up to 66 alphanumeric characters.

The form does not display ID numbers. Browsing the \$\$\$GROUP able displays the ID numbers in the \$\$\$ID column.

## Managing Groups

Group functions are available, to a DBA only, with the Properties icon, , on the Group List and Functions window, Screen 16. The functions are available on 3 tabs and allow you to:

<u>Tab</u>	<u>Function</u>
Users	Assign user to a group. Change a group's name.
Delegate access	Delegate the access of one group to another group or groups.
Obtained access	View a delegated group's delegating group(s).

Select the group you need to work with from the Group List and Functions, Screen 16, window and click the properties icon. The options available will be for the group you selected.

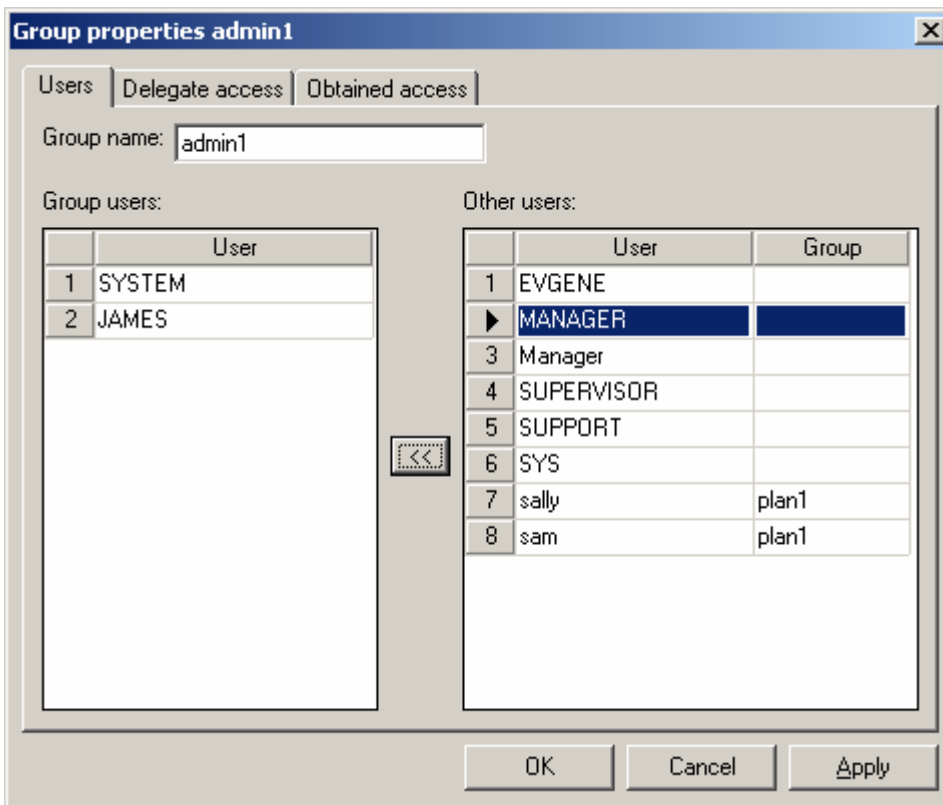
### Change Group Name

The first tab, Users, shown in the following section, allows you to change the name of the group you selected. Highlight the name in the Group name text box and type in the new name. Then click the Apply button.

### Assign Users to Groups

The first tab, Users, displays current members of the selected group in the Group users block and all other users and roles in the Other users block. Roles may be assigned to groups.

Select the user you want to add to the group from the Other users block by clicking on his name. Then click the << button between the blocks. The selected user or role will be transferred from the Other users to the Group users block.



Screen 17 – Group Properties: Assign User to Group Form

Once users have been assigned to a group, they cannot be directly removed from the group. However, you may delete a user using the delete option on the User List and Function window, Screen 11, and then recreate her.

When you have made the desired changes, click the OK button. Click Cancel to exit the group properties window without making any changes.

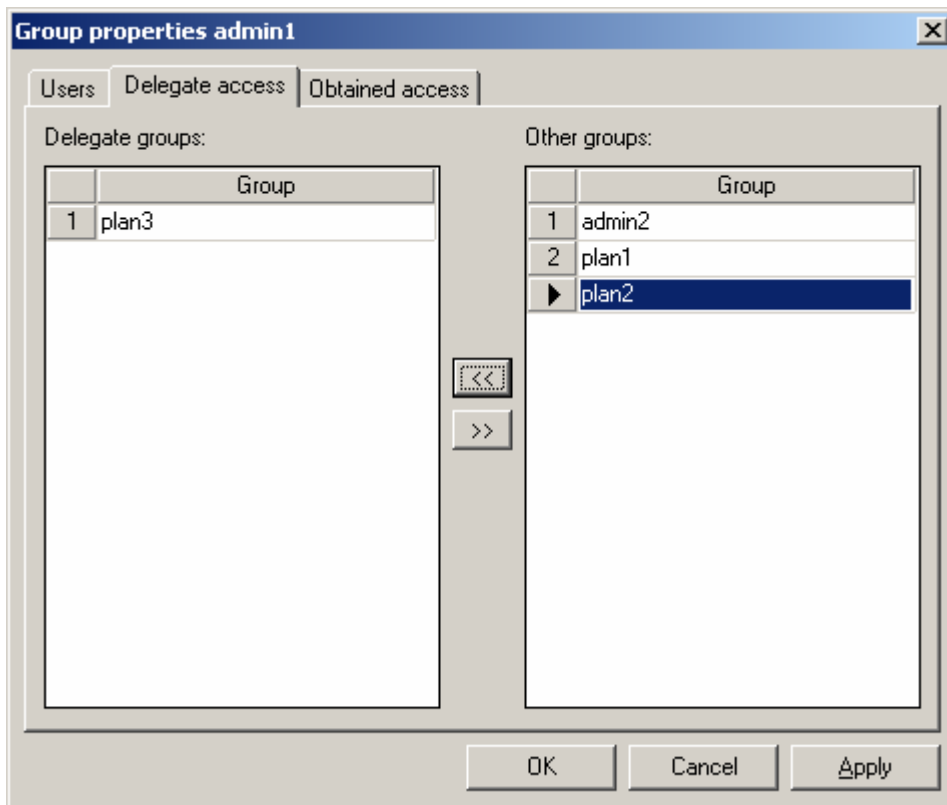
### Delegate Group Access

A DBA may delegate a group's access to another group or groups. The second tab of the Group Properties window, Delegate access, enables this function. See section “Managing Groups” for accessing group properties.

The tab is divided into Delegate groups and Other groups blocks. In the following example, the group admin 1 has been selected as the group to work with. Currently, its access has been delegated to plan6. All other groups are listed under Other groups.

To delegate admin 1's access to an additional group, select the group to which access is to be delegated by clicking on it. Then click the << button.

To remove admin 1's delegated access to a group, select the group to be removed by clicking on it and pressing the >> button.



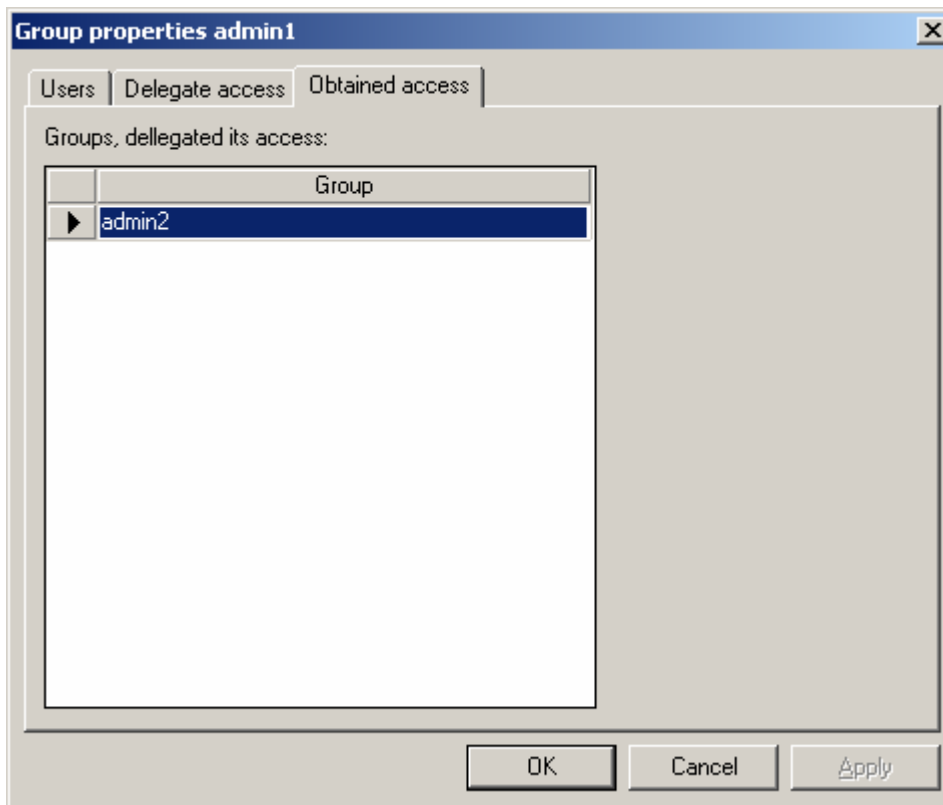
Screen 18 – Group Properties: Delegated Group Access Form

When you have made the desired changes, click the OK button. Click Cancel to exit the group properties window without making any changes.

### View Delegated Access

A DBA may view the group(s) that have delegated access to a selected group. The third Group Properties tab, Obtained access enables his function. See section “Managing Groups” for accessing group Properties.

The Group text box displays all groups that have delegated access o the selected group. In this example, the group plan6 has been delegated group admin 1 s access.



Screen 19 – Group Properties: View Delegated Access


## Set and Edit Discretionary Access to Tables

The setting and editing of discretionary table access may be handled from either table functions or user functions. Approached from table functions, a table is selected first and multiple users may be assigned discretionary rights to the table. Approached from user functions, a user is selected and may then be granted discretionary rights to a number of tables.

A table's owner may grant a user one or several of the discretionary access types. However, the following structural constraints limit this ability:

- A table owner who is a member of a group may not grant access to an individual user who is not a member of his group. He may, however, grant public access;
- A table owner who is not a member of a group may not grant access to an individual user who is a member of any group. He may, however, grant public access;
- A grant of discretionary access to a user otherwise eligible for access will fail if the grantee has a mandatory access level below that of the table

## Grants via Table Functions

Select the table to which you want to grant access from the Table List and Functions window, Screen 2. Click the Properties icon, , and select the Discretion access option from the resulting drop-down menu. You will then have the following form listing all the users and roles to whom discretionary access may be granted. A user without DBA access will see only those users to whom he may grant access.

A check mark in an access type box indicates the access has been granted. Click the check mark to remove an access right.

**Discretion access for SYSTEM.AUTO**

PUBLIC permissions:

User	Type	Select	Insert	Update	Delete	Index	Alter
PUBLIC		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Personal permissions:

User	Type	Select	Insert	Update	Delete	Index	Alter
▶ EVGENE		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 JAMES		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 MANAGER		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4 Manager		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 SUPERVISOR		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 SUPPORT		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7 SYS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
8 sally		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9 sam		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Buttons: OK, Apply, Cancel

Screen 20 – Discretionary Table Access Form

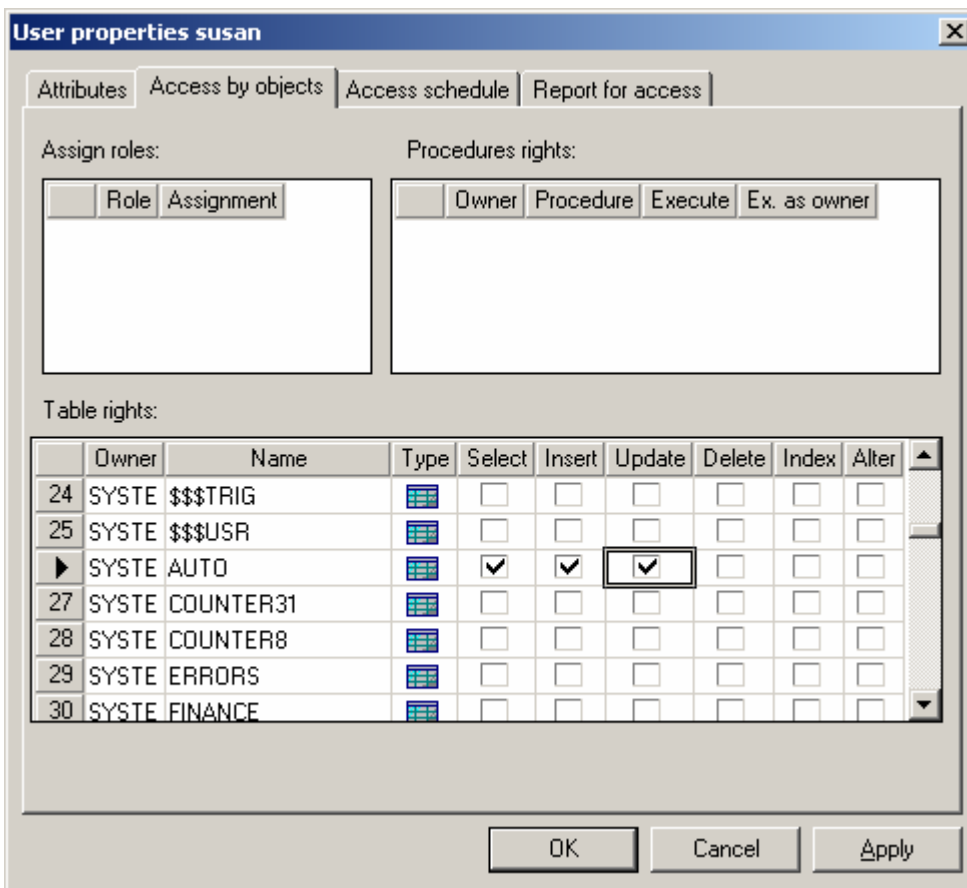
When all your intended access rights have been granted, click the Apply button. The rights you have checked will be set and the form remains open. Clicking the Cancel button at any time before clicking Apply will exit the form without implementing any grants you have made since the last Apply. Clicking OK will exit the form and set any pending grants.

## Grants via User Functions

On the User List and Functions window, Screen 11, select the user to whom you want to grant access. Then click the Properties icon, . You will be presented with the User Properties window containing 4 tabs.

The Access by objects tab allows you to set or change discretionary access permissions for selected tables. This tab also displays the role(s) to which the selected user has been assigned. A DBA user may assign roles to the selected user here.

Discretionary access rights are described in section “Discretionary access” and the table preceding it.



Screen 21 – User Properties Window: Access by Objects

All tables in the database are listed under the Name column. Locate the table for which you wish to set or change permissions using the ↑ and ↓ keys or the scrolling bar at the right of the form.

A check mark in a box grants the access described at the top of hat box's column. Clicking on a box toggles the check mark on and off.


When all your intended access rights have been granted, click the Apply button. The rights you have checked will be set and the form remains open. Clicking the Cancel button at any time before clicking Apply will exit the form without implementing any grants you have made since the last Apply. Clicking OK will exit the form and set any pending ants.

## Set Public Access

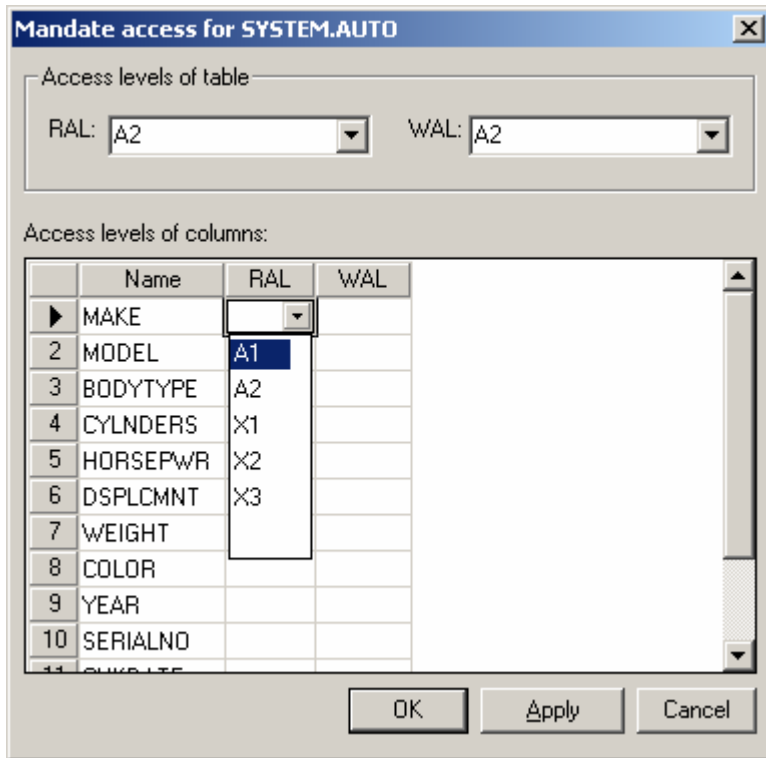
The top line of the Discretionary Table Access Form, Screen 20, provides for granting discretionary access to public users. See the immediately preceding section for a description of granting access rights.

## Set and Edit Mandatory Access Levels to Tables and Columns

Granting mandatory access is restricted to DBA users.

Select the table you want to work with from the Table List and Functions window, Screen 2. Then select the Mandate access option from the Properties icon, , or take the Properties>Mandate access

option from the Tables menu on the menu bar of the Desktop Base Window, Screen 1. You will then have the form for setting mandatory access rights to the table and/or columns of the table you selected.




Screen 22 – Set Mandatory Table Access Level Form

Set the mandatory level(s) you need for the table and/or each column from the pull-down menus. When the cursor is placed in an RAL or WAL column field, a pull-down for that access right is displayed. RAL is Read Access Level. WAL is We Access Level.

See section “Mandatory access” and the table preceding it or a description of mandatory access. See section “Levels” for an explanation of levels.

When all your intended access rights have been chosen, click the Apply button. The rights you have selected will be set and the form remains open. Clicking the Cancel button at any time before clicking Apply will exit the form without implementing any grants you have made since the last Apply. Clicking OK will exit the form and set any pending ants.

## User Properties

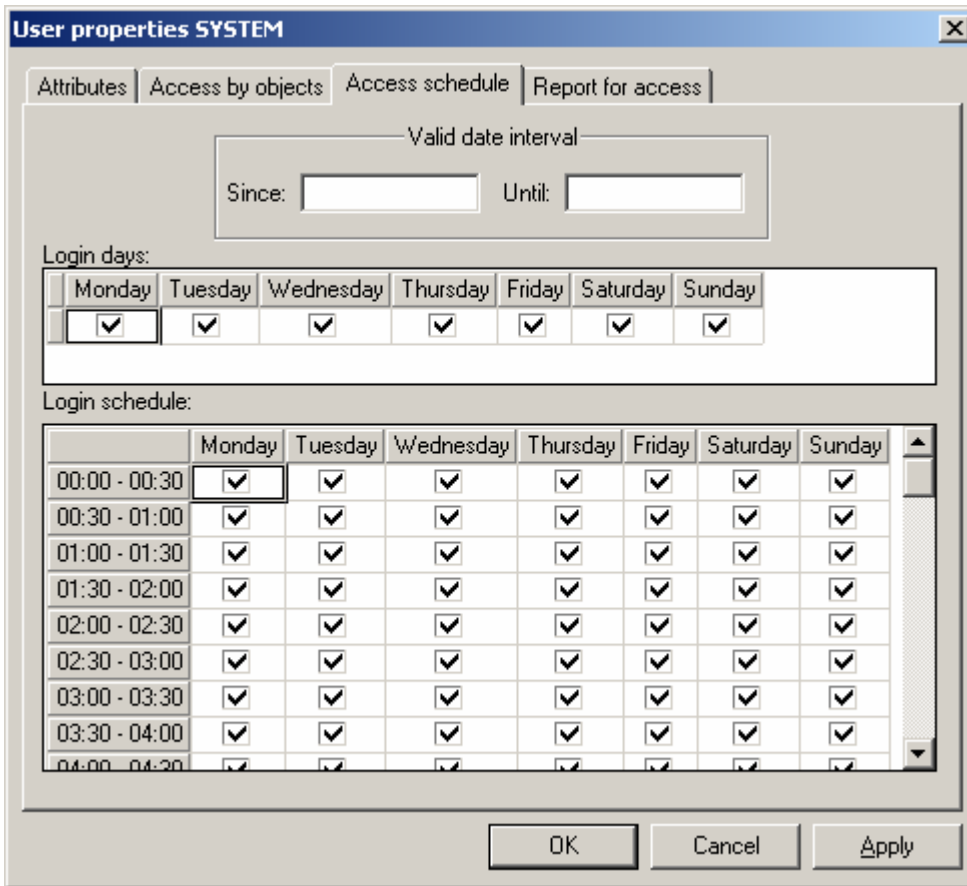
Some user information and functions are available by clicking the Properties icon, , on the User List and Functions window, Screen 11. The Properties displayed are the Properties of the selected (highlighted) user.

The resulting User Properties window has four tabs, each providing a form for a set of Properties you may view or edit.

The first two tabs have been discussed. Attributes in section “Edit User Password and Access Rights”, and Access by objects in section “Grants via User Functions”, which describes granting discretionary access to tables via user functions as an alternative to grants via table functions.

### View Access Schedule

The third tab, Schedule, of the User Properties window shows the times, in half-hour increments, during which the selected user has access to the database.

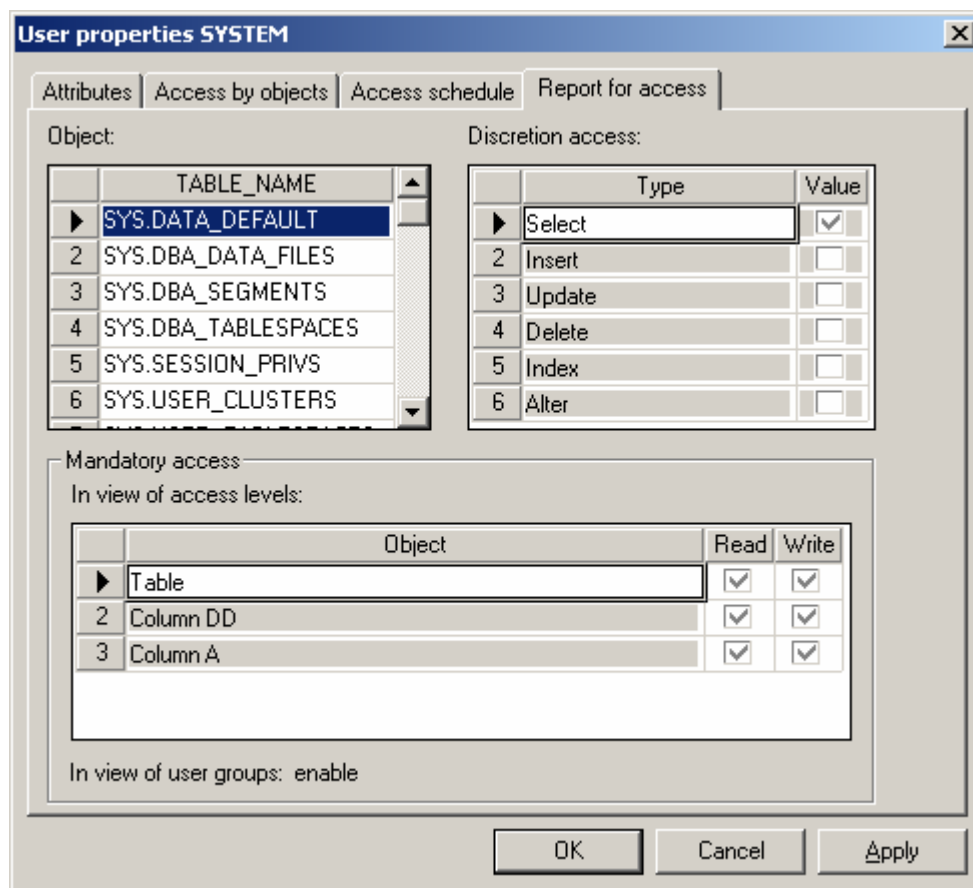


Screen 23 – User Properties Window: Schedule

The Valid date interval block on this form allows you to set starting and ending dates between which the user is to have access to the database.

### User Properties: View Access Permissions

The fourth tab of the User Properties window displays, for the user you have previously selected in the User List and Functions window, his mandatory and discretionary access for the table you select in the TABLE NAME selection box.




Screen 24 – User Properties Window: Report for Access

Setting discretionary access to tables is described in section “Set and Edit Discretionary Access to Tables”. Setting a user's mandatory access rights is discussed in section “Create a User” and section “Edit User Password and Access Rights”. Setting mandatory access restrictions for tables is covered in section “Set and Edit Mandatory Access Levels to Tables and Columns”.


## Create a Role


Linter uses roles to simply grants of discretionary access rights. Roles are objects similar to users in that a role may be assigned discretionary access rights. When a user is assigned to a role, he inherits all of that role's access rights.

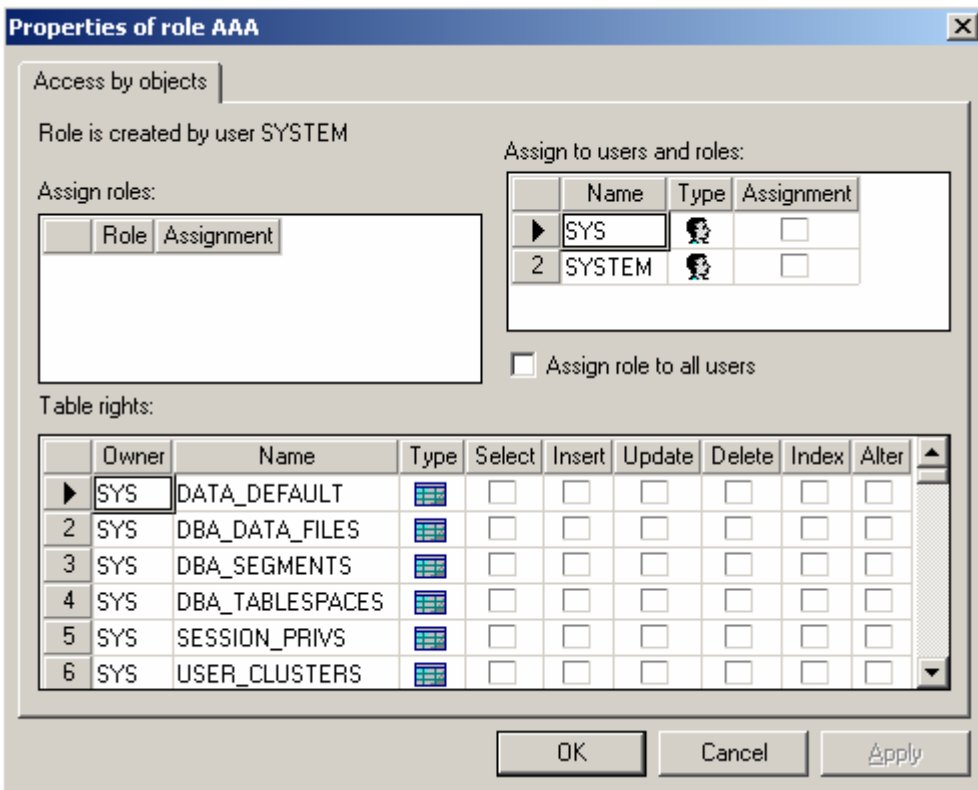
To create a role, first click the user icon, , of the Desktop Base Menu, Screen 1. Then select the Create role option from the User menu on the menu bar of the Desktop Base Menu, Screen 11 or press CTL+ALT+INS.

You will get a pop-up window in which the name of the role is to be entered.

## Assign a User to a Role

Roles may be assigned to other roles. To assign a user or a role to role click the user icon, ; on the Desktop Base Window, Screen 1, to get the User List and Functions window, Screen 11.

On that window select the role you want to use and click the Properties icon, . You will then be presented with a screen similar to the following.



Screen 25 – Assign User to Role Form



The Assign to users and roles block in the form contains a list of all users and all roles other than the selected role.

In the above example, the users jean and sally have been assigned o the role Accounting2. Note that the selected role is surrounded by a double box. Select the desired role by clicking on it.

A user or another role is assigned to a role by clicking on the box next to their name. When assigned, a checkmark appears in the box. To remove the assignment, click the box again to remove the check.



The bottom half of the form allows you to assign discretionary access rights to the selected role for a table selected from the Table rights block. This is an alternative to the assignment of discretionary access rights that is described in the Set and Edit Discretionary Access to Tables, section “Set and Edit Discretionary Access to Tables”.

## Connecting and Disconnecting

The connect,  , and disconnect,  , buttons on the Desktop Base Windows icon bar, Screen 1, allow you to perform those actions or the database displayed in the icon bar's selection box. Alternative access is through Database menu options on the Desktop Base Windows menu bar, and with F2 (connect) and CTL+F2 (disconnect).

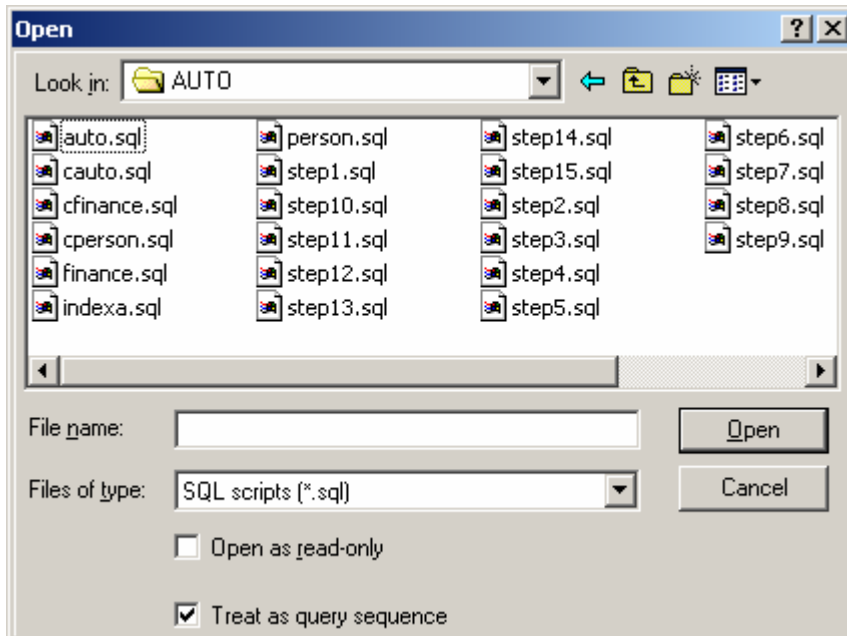
When you select connect you are presented with a logon screen. You may log on more than once so that you have quick access to multiple connected users through the icon bar's selection box.

## SQL Queries

An SQL query form may be obtained by clicking on the New,  , or Open,  icon on the icon bar of the Desktop Base Window, Screen 1. The same options are available from that

window's File menu on the menu bar or with CTL+O (open) or CTL+N (new). You may open multiple query forms. Multiple new queries will be numbered sequentially on the title bar of the window. Each query window launched with open will have the name of the file opened on the title bar.

The Open option presents you with a standard MS Windows' directory browser with which you can locate, select, and open an existing SQL script.



Screen 26 – Choose SQL Script

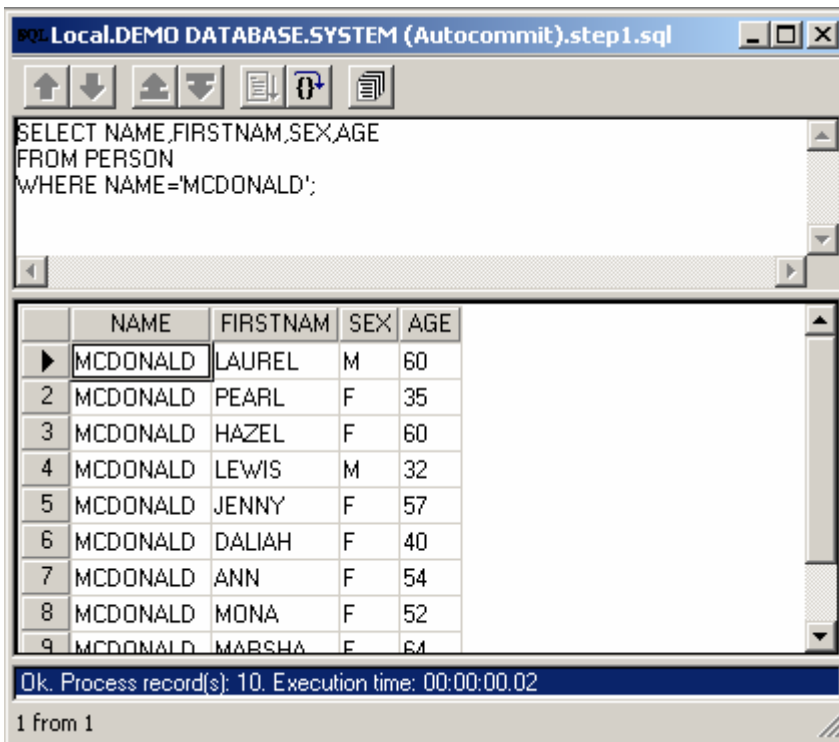
The selected script will be opened in the Desktop's SQL query form on top of the Desktop Base Window, Screen 1.

To prevent inadvertent editing, click on the Open as read-only box.

If checked, the Treat as query sequence box will display only one SQL statement at a time. Otherwise, the entire script will be displayed.

If you use New, the SQL query form will be opened with a blank form.







The SQL query form is divided into three horizontal frames. The top frame contains the script you enter or that was loaded from an existing file. The middle frame is used to display the results of the query. The bottom frame contains informational messages from Linter.



Screen 27 – SQL Query Form

The first three icon buttons are available only when you have opened an existing SQL file. If that file contains multiple statements, one or both of the Switch to... icons will be active. Clicking on those icons selects the next or prior query in the SQL file.

The step-through option provided by the first 3 buttons enables you to avoid the problem caused by triggers, which use the semi-colon (used in SQL statements exclusively to terminate the statement) internally.

- | <u>Icon</u>   | <u>Function</u>   |
|---|---|
|  | Switch to next query.   |
|  | Switch to previous query.   |
|  | Switch to last query.   |
|  | Switch to first query.  |
|  | Execute to end. Within a multiple statement script, clicking on this icon will execute the current statement and all subsequent statements in the script. |
|  | Execute the query currently displayed in the form.  |