



IBM

# **Administrative Supplement for Client APIs**

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# Preface

This manual introduces IBM's six common APIs. It also provides important information that developers using any of the common APIs will need. It includes information about the UniRPC, the UCI Config Editor, the *ud\_database* file, and device licensing.

# Organization of This Manual

This manual contains the following:

- Chapter 1, “[Introduction](#),” introduces the six common APIs.
- Chapter 2, “[Maintaining the UniRPC](#),” describes the UniRPC daemon (*unirpcd*) or service (*unirpc*), and the *unirpcservices* file.
- Chapter 3, “[The UCI Config Editor](#),” describes how to use the UCI Config Editor to create and maintain data source definitions in the UCI configuration file.
- Chapter 4, “[Accessing UniData Accounts](#),” describes UniData’s *ud\_database* file.
- Chapter 5, “[Device Licensing](#),” describes how device licensing on UniVerse and UniData servers works with multiple client connections.

# Documentation Conventions

This manual uses the following conventions:

Convention	Usage
<b>Bold</b>	In syntax, bold indicates commands, function names, and options. In text, bold indicates keys to press, function names, menu selections, and MS-DOS commands.
UPPERCASE	In syntax, uppercase indicates database commands, keywords, and options; BASIC statements and functions; and SQL statements and keywords. In text, uppercase also indicates database identifiers such as file names, account names, schema names, and Windows file names and paths.
<i>Italic</i>	In syntax, italic indicates information that you supply. In text, italic also indicates UNIX commands and options, file names, and paths.
Courier	Courier indicates examples of source code and system output.
<b>Courier Bold</b>	In examples, courier bold indicates characters that the user types or keys the user presses (for example, <b>&lt;Return&gt;</b> ).
[ ]	Brackets enclose optional items. Do not type the brackets unless indicated.
{ }	Braces enclose nonoptional items from which you must select at least one. Do not type the braces.
itemA   itemB	A vertical bar separating items indicates that you can choose only one item. Do not type the vertical bar.
...	Three periods indicate that more of the same type of item can optionally follow.
↪	A right arrow between menu options indicates you should choose each option in sequence. For example, “Choose <b>File</b> ↪ <b>Exit</b> ” means you should choose <b>File</b> from the menu bar, then choose <b>Exit</b> from the File menu.

## Documentation Conventions

The following are also used:

- Syntax definitions and examples are indented for ease in reading.
- All punctuation marks included in the syntax—for example, commas, parentheses, or quotation marks—are required unless otherwise indicated.
- Syntax lines that do not fit on one line in this manual are continued on subsequent lines. The continuation lines are indented. When entering syntax, type the entire syntax entry, including the continuation lines, on the same input line.

## API Documentation

The following books document application programming interfaces (APIs) used for developing client applications that connect to UniVerse and UniData servers.

***Administrative Supplement for Client APIs:*** Introduces IBM's seven common APIs, and provides important information that developers using any of the common APIs will need. It includes information about the UniRPC, the UCI Config Editor, the *ud\_database* file, and device licensing.

***UCI Developer's Guide:*** Describes how to use UCI (UniCall Interface), an interface to UniVerse and UniData databases from C-based client programs. UCI uses ODBC-like function calls to execute SQL statements on local or remote UniVerse and UniData servers. This book is for experienced SQL programmers.

***IBM JDBC Driver for UniData and UniVerse:*** Describes UniJDBC, an interface to UniData and UniVerse databases from JDBC applications. This book is for experienced programmers and application developers who are familiar with UniData and UniVerse, Java, JDBC, and who want to write JDBC applications that access these databases.

***InterCall Developer's Guide:*** Describes how to use the InterCall API to access data on UniVerse and UniData systems from external programs. This book is for experienced programmers who are familiar with UniVerse or UniData.

***UniObjects Developer's Guide:*** Describes UniObjects, an interface to UniVerse and UniData systems from Visual Basic. This book is for experienced programmers and application developers who are familiar with UniVerse or UniData, and with Visual Basic, and who want to write Visual Basic programs that access these databases.



***UniObjects for Java Developer's Guide:*** Describes UniObjects for Java, an interface to UniVerse and UniData systems from Java. This book is for experienced programmers and application developers who are familiar with UniVerse or UniData, and with Java, and who want to write Java programs that access these databases.

***UniObjects for .NET Developer's Guide:*** Describes UniObjects, an interface to UniVerse and UniData systems from .NET. This book is for experienced programmers and application developers who are familiar with UniVerse or UniData, and with .NET, and who want to write .NET programs that access these databases.

***Using UniOLEDB:*** Describes how to use UniOLEDB, an interface to UniVerse and UniData systems for OLE DB consumers. This book is for experienced programmers and application developers who are familiar with UniVerse or UniData, and with OLE DB, and who want to write OLE DB programs that access these databases.

# Introduction

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## What Are the Client APIs?

IBM provides seven common APIs for writing client application programs that connect to UniVerse and UniData databases. We call them *common APIs* because programs written in them can access data in both databases.

The seven Client APIs are:

- UCI (Uni Call Interface)
- UniOLEDB
- InterCall
- UniObjects
- UniObjects for Java
- UniObjects for .NET
- UniJDBC (IBM JDBC Driver for UniData and UniVerse)

### UCI

UCI is a C-language API. It lets developers write UNIX and Windows client programs that use SQL statements to access and manipulate data in UniVerse and UniData databases. UCI is modelled on the ODBC standard as defined in the Microsoft ODBC 2.0 specification. It models only the API side of the ODBC standard, not the driver/transport side. Unlike the standard ODBC interface, UCI is more closely integrated with the extended relational database model used by UniVerse and UniData, with their nested tables, transaction processing support, and so forth.

### UniOLEDB

UniOLEDB is IBM's OLE DB provider for UniData and UniVerse. It uses Microsoft's Universal Data Access (UDA) technology to provide applications in an enterprise network with direct access to UniData and UniVerse databases.



## InterCall

InterCall is an open API that lets client application programs developed on UNIX or Windows systems access data on UniVerse or UniData servers. On UNIX systems, developers can write client programs using any tool that accesses static libraries, typically a C compiler. On Windows platforms, developers can write client programs using any tool that accesses DLLs, for example, Visual Basic, C, or Visual C/C++.

***Note:** InterCall replaces and supersedes ICI (Integrated Calling Interface).*

## UniObjects

UniObjects is an API to UniVerse or UniData from Visual Basic, or from any other program development environment that uses the Microsoft ActiveX interface. It is fully integrated with the Microsoft environment.

## UniObjects for Java

UniObjects for Java is an API that lets developers create Java-based applications that access UniVerse and UniData databases. UniObjects for Java, based on the UniObjects model, is a 100% Pure Java™ Class Library whose objects can take full advantage of any Java-based IDE (Integrated Development Environment).

## UniObjects for .NET

UniObjects for .NET is an API that lets developers create .NET-based applications that access UniVerse and UniData databases. UniObjects for .NET is fully integrated with the Microsoft environment.

## UniJDBC (IBM JDBC Driver for UniData and UniVerse)

UniJDBC is an interface to UniData and UniVerse databases from JDBC applications. This book is for experienced programmers and application developers who are familiar with UniData and UniVerse, Java, JDBC, and who want to write JDBC applications that access these databases.



***Note:*** *UniJDBC does not require any configuration for UCI and will not need an entry within the UCI configuration file.*

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# Maintaining the UniRPC

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The UniRPC lets local UniVerse and UniData systems communicate with remote systems. The communicating systems must use TCP/IP networking software to make connections.

**Note:** *In this chapter the terms local and remote refer to client and server programs or systems. However, because client programs can connect to server programs running on the same computer, remote does not necessarily imply that the server is on another physical computer system.*

This chapter describes:

- The UniRPC daemon (on UNIX servers)
- The UniRPC service (on Windows servers)
- The contents of the *unirpcservices* file

The UniRPC on UniData servers requires little maintenance, other than starting and stopping the UniRPC daemon or service. On UniVerse servers, you can also do the following:

- Change the port number
- Add entries to a UNIX *hosts* file

## System Requirements

Before installing layered or third-party products that use the UniRPC, such as the UniDK, UniOLEDB, UniJDBC, or UniAdmin, you must install and configure TCP/IP using the instructions supplied by the TCP/IP facility vendor. On UniVerse systems, you should then identify the systems to be networked with the database by defining them in the */etc/hosts* file. See “[Maintaining the hosts File \(UniVerse Only\)](#)” on page 6 for more information.



## How the UniRPC Works

The UniRPC daemon *unirpcd* (or the UniRPC service *unirpc*) waits for a request from a client system to connect to a server process. When it receives a connection request, it checks the *unirpcservices* files to verify that the client system is allowed to request a particular service. If it can, the UniRPC starts the requested service, then returns to the listening state. Each client process connects to its own server process. Each server process uses the same amount of system resources as a local database user.

# Maintaining the UniRPC

This section describes the following:

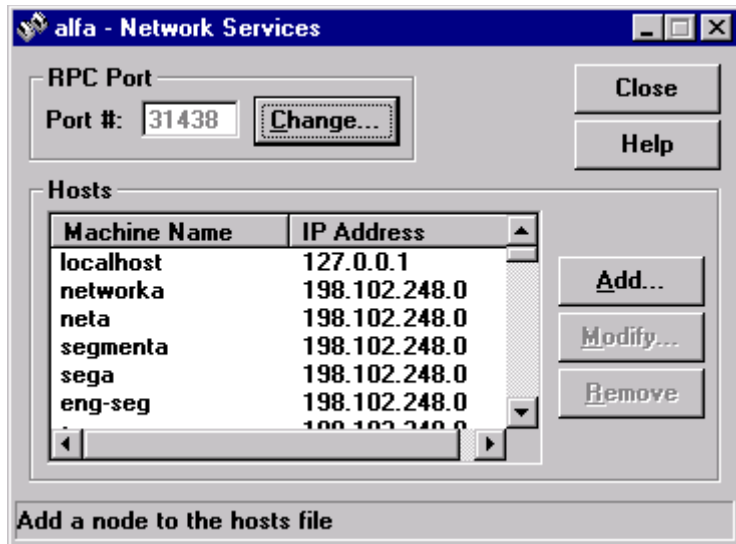
- How to change the UniRPC port number (UniVerse only)
- How to maintain a UNIX server's *hosts* file (UniVerse only)
- How to start and stop the UniRPC daemon (*unirpcd*)

## UniRPC Maintenance on UniVerse Systems

Use UniAdmin to:

- Define the UniRPC port number
- Maintain the *hosts* file on a UNIX server

Choose **Network Services** from the UniAdmin menu. The Network Services window appears, as shown in the following example:



This window has the following components:

- **Port #** field. The current port number for the UniRPC daemon.



- **Hosts** list. Displays the machine name and IP address for each node in the `/etc/hosts` file.

***Note:** If you are using the Network Information Services (NIS, also known as Yellow Pages), you do not need to use the `/etc/hosts` file to define, change, and delete network nodes. See the UNIX networking documentation provided with your system for more information.*

### ***Defining the UniRPC Port Number (UniVerse Only)***

Before you can use the UniRPC, you must specify the number of the port that the UniRPC is to use. You specify the port number on the client and the server systems.



***Note:** If you specify a port number other than the default, it must be the same on all systems that communicate via the UniRPC.*

The current UniRPC daemon port number is displayed in the **Port #** field in the Network Services window. To change the number, do the following:

1. Click **Change**. The **Change Port Number** dialog box appears. Enter a new number in the **Enter new Port number** field.
2. Click **OK**. The new port number is saved and the **Network Services** window is updated with the new setting.



***Note:** To use the new port number, you must restart the UniRPC daemon (see “[Starting the UniRPC Daemon](#)” on page 10).*

### ***Maintaining the hosts File (UniVerse Only)***

Use the **Network Services** option of UniAdmin to add, modify, and remove nodes in the `hosts` file. These tasks are performed from the **Network Services** window.

#### ***Adding a Node***

To add a new node to the `hosts` file:

1. Click **Add...** on the Network Services window. The **Add Node** dialog box appears.
2. Enter the node name in the **Machine Name** field.
3. Enter the node address in the **IP Address** field.

4. Click **OK**. The new node's machine name and IP address are checked against existing entries in the *hosts* file. If the new node matches an existing entry, a message box appears. You must acknowledge the message before you can enter alternative values. If the new node details are unique, the new node definition is added to the *hosts* file and the Network Services window is updated.

### *Modifying a Node*

To modify the name or IP address of an existing entry in the *hosts* file:

1. Choose the node to modify by doing one of the following:
  - Double-click the node in the **Hosts** list.
  - Choose the node and click **Modify...**The **Modify Node** dialog box appears.
2. Edit the entries in the **Machine Name** and **IP Address** fields.
3. Click **OK**. The node's machine name and IP address are checked against existing entries in the *hosts* file. If the node details match an existing entry, a message box appears. You must acknowledge the message before you can enter alternative values. If the node details are unique, the node definition is added to the *hosts* file and the Network Services window is updated.

### *Removing a Node*

To remove a node definition from the *hosts* file:

1. Select the node from the Hosts list.
2. Click **Remove**. A message box appears.
3. Click **Yes**. The node definition is removed from the *hosts* file and the **Network Services** window is updated.

### *Starting and Stopping the UniRPC on Windows Platforms*

On UniVerse systems you cannot use UniAdmin to start or stop the UniRPC daemon because it uses the UniRPC daemon to connect to the UniVerse server. On Windows platforms, you can start the UniRPC daemon or service in one of three ways:

- From the Windows Control Panel

- From the UniVerse Control Panel
- At the MS-DOS prompt

### *From the Windows Control Panel*

To start the UniRPC:

1. Double-click the **Services** icon.
2. Scroll down the list of services until you find three entries for UniVerse: UniVerse Resource Service, UniRPC Service, and UniVerse Telnet Service.
3. Choose **UniRPC Service**, then choose **Start**.
4. Click **Startup**, then Click **Automatic**. This ensures that UniVerse starts automatically when the server is rebooted.

### *From the UniVerse Control Panel*

To start the UniRPC:

1. Choose **Start -> Programs -> IBM U2 -> UniVerse Control**.
2. Click the **Start All Services** button to start all UniVerse services.

### *At the MS-DOS Prompt*

Enter the following command:

```
D:\users>net start unirpc
```

The system reports the name of the service it is starting and whether the startup is successful.

**Note:** The UniVerse services are started automatically when the operating system is loaded unless you clear the automatic startup boxes during UniVerse installation.



## ***Stopping the UniRPC on Windows Systems***

You can shut down the UniRPC daemon or service in one of three ways:

- From the Windows Control Panel
- From the UniVerse Control Panel
- At the MS-DOS prompt



***Note:** If users are connected to the services when they are shut down, the users do not lose their connections; the connections remain active until the users terminate them. However, it is not possible for new users to connect to UniVerse.*

*If you want to do a complete shutdown of UniVerse to restart the services, be sure that all connections are terminated first.*

### *From the Windows Control Panel*

To stop the UniRPC:

1. Double-click the **Services** icon.
2. Scroll down the list of services until you find three entries for UniVerse:
  - UniVerse Resource Service
  - UniRPC Service
  - UniVerse Telnet Service
3. Choose **UniRPC Service**, then choose **Stop**.
4. Click **OK**. The UniRPC daemon or service is shut down.

### *From the UniVerse Control Panel*

To stop the UniRPC:

1. Choose **Start -> Programs -> IBM U2 -> UniVerse Control**.
2. Click **Stop All Services** to stop all UniVerse services. Wait for all services to stop.
3. Click **OK** to exit the UniVerse Control Panel. All four services are shut down.

### *At the MS-DOS Prompt*

To stop the UniRPC:

1. Enter the following command at the MS-DOS prompt:  
`D:\users>net stop unirpc`  
A message appears prompting you to confirm that you want to stop the UniRPC.
2. Enter **Y** to stop the UniRPC daemon or service.

## *Starting and Stopping the UniRPC Daemon on UNIX Systems*

Use the UniVerse System Administration menus on the UniVerse server to start and stop the UniRPC daemon. See *Administering UniVerse* for more information.

### *Starting the UniRPC Daemon*

To start the UniRPC daemon:

1. Choose **Rpc administration** from the Package menu, then choose **Start the rpc daemon**.
2. At the prompt, do one of the following to handle any error messages:
  - Enter the name of the file to send all error and system messages to.
  - Enter a space to display messages on your screen.
  - Press **Return** if you do not want to display or save messages.
3. At the next prompt, click **Yes** to start the UniRPC daemon or **No** to return to the Rpc administration menu.

***Note:** The file that receives all error and system messages can grow unchecked unless you monitor it periodically.*

Once you start the UniRPC daemon, it automatically restarts whenever you boot UniVerse.

### *Stopping the UniRPC Daemon*

To stop the UniRPC daemon:

1. Choose **Rpc administration** from the Package menu, then choose **Halt the rpc daemon**.
2. At the prompt, click **Yes** to stop the UniRPC daemon or **No** to return to the Rpc administration menu.

***Note:** Stopping the UniRPC daemon does not interrupt active UniRPC processes.*

## **UniRPC Maintenance on UniData Servers**

On UniData servers, UniRPC maintenance is minimal. You cannot change the port number of the UniRPC, and there is no need to maintain a *hosts* file.



Use the *stopud* command to stop the UniRPC daemon or service. Use the *startud* command to start the UniRPC.



## About the *unirpcservices* File

Each process that uses the UniRPC automatically configures the *unirpcservices* file when it first starts up. If no *unirpcservices* file exists, it is created in the *unishared* directory.

- On UNIX systems the default location of this file is */usr/ibm/unishared/unirpc*.
- On Windows platforms the default location is *<drive>:\ibm\unishared\unirpc*.

To determine the location of the *unirpcservices* file on your system, do the following:

- On UNIX systems, execute the command:  
**\$ cat /.unishared**
- On Windows platforms, find the registry entry under the subkey *\HKEY\_LOCAL\_MACHINE\SOFTWARE\ibm\unishared*.

When a client system requests a connection to a service on a server system, the UniRPC daemon (*unirpcd*) on the server uses the *unirpcservices* file to verify that the client system can start the requested service.

The UniRPC software uses field 3 of the *unirpcservices* file to verify that a machine making a request for a service is allowed to do so. The following table lists the fields in the *unirpcservices* file:

Field	Contents
1	The name of the UniRPC service (for example, <i>uvserver</i> ).
2	The full path of the service engine executed by the UniRPC daemon.
3	The names of nodes allowed to execute this service. This field is multivalued, with values separated by commas (no spaces). If the field contains * (asterisk), all hosts defined in <i>/etc/hosts</i> can execute this service.

### *unirpcservices* File Fields

Field	Contents
4	The network transport mechanism for the service (TCP/IP).
5	Reserved for future use.
6	The value (in tenths of a second) specifying how long an open connection can be idle before automatic closure from the remote connection. The default is 3600, or 6 minutes.

---

#### *unirpcservices* File Fields (Continued)

---

### *UniVerse Systems*

On UniVerse systems the *unirpcservices* file might contain entries such as the following:

```

uvnet /usr/ibm/uv/bin/uvnetd host1,host2,host3 TCP/IP 3 3600
uvdrsrv /usr/ibm/uv/bin/uvdrsrvd * TCP/IP 0 3600
uvcs /usr/ibm/uv/bin/uvapi_server * TCP/IP 0 3600
uvfilefix /usr/ibm/uv/bin/uvfilefix_server * TCP/IP 0 3600
uvserver /usr/ibm/uv/bin/uvsrvd * TCP/IP 0 3600

```

The version of *uv.rc* shipped with UniVerse systems (*/usr/ibm/uv/sample/uv.rc*) contains commands that:

- Check for the existence of the *unirpcservices* file
- Verify that services are defined in it
- Start the UniRPC daemon if the file contains services

The UniRPC daemon is executed as part of the UniVerse reboot procedure.

### *UniData Systems*

On UniData systems the *unirpcservices* file might contain:

```

udcs /usr/ud71/bin/udapi_server * TCP/IP 0 3600
udserver /usr/ud71/bin/udsrvd * TCP/IP 0 3600

```

---

# The UCI Config Editor

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The UCI Config Editor lets you define and configure data sources. When an application requests a connection to a data source, UCI uses the information in the UCI configuration file (*uci.config* or another UCI configuration file you create) to connect to the data source.

The UCI Config Editor lets you:

- Add, modify, or delete data sources.
- Create your own UCI configuration file.
- Set up your system registry to access a particular UCI configuration file.
- Open a UCI configuration file different from the one that currently appears in the UCI Config Editor window.
- Enable or disable logging for the UCI Config Editor.

## UCI Configuration File

Applications access data sources through entries in the UCI configuration file. This file contains connection parameters needed to route connection requests to the appropriate UniData or UniVerse server.

When an application tries to connect to a data source, the UCI configuration file on the client machine is read to determine the name of the host system, the DBMS type, and other information.

The UCI configuration file that UCI uses is specified in the `UciCfgFile` key in the system registry under `HKEY_LOCAL_MACHINE \SOFTWARE\IBM\UCI`.

Each entry in the UCI configuration file describes the physical attributes of a connection in sufficient detail to perform three tasks:

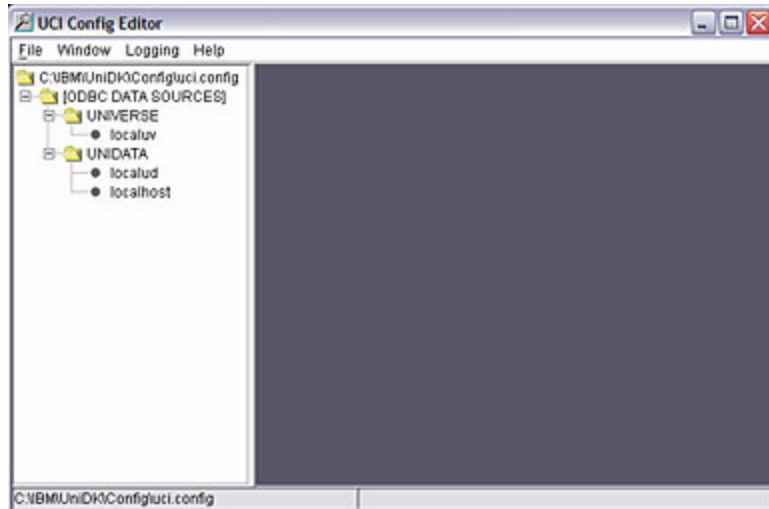
- Establish communications
- Start a UniData or UniVerse server process
- Route query and update requests

In the UCI configuration file on the client machine, you must define the UCI data sources to which you want applications to connect. Use the UCI Config Editor to define and modify data source definitions.

For more information about the UCI configuration file, see *UCI Developer's Guide*.

## Starting the UCI Config Editor

To start the UCI Config Editor, from the Windows Start menu choose **Programs -> IBM U2 -> UniDK -> UCI Editor**. The UCI Config Editor window appears:



The data source information in this example represents the default settings in *uci.config* as shipped with the client product.

## Adding a Data Source

To add a data source:

1. From the UCI Config Editor, right-click the folder icon for [ODBC DATA SOURCES], then click **Add**. The New Data Source dialog box appears, as shown in the following example:

The image shows a Windows-style dialog box titled "New Data Source". It has a blue title bar with a small icon on the left and a close button (X) on the right. The main area is light gray. At the top, it says "Please enter source name" above a text input field containing "corp1". Below this, the label "DBMSTYPE" is followed by three radio button options: "UNIDATA" (which is selected), "UNIVERSE", and "OTHERS". To the right of these options are two buttons: "Ok" and "Cancel". At the bottom, it says "Please enter host name" above a text input field containing "hq1".

2. Enter a data source name.
3. Under **DBMSTYPE**, click the type of database to which you want to connect.
4. Enter the host name or the network IP address of the server to which you want to connect.

5. Click **Ok** to save your definition and exit the **New Data Source** dialog box. Click **Cancel** to exit the dialog box without saving your definition. The **Data Source Adding** dialog box appears, as shown in the following example:

The screenshot shows a dialog box titled "Data Source Adding - testmachine". It contains a table with the following data:

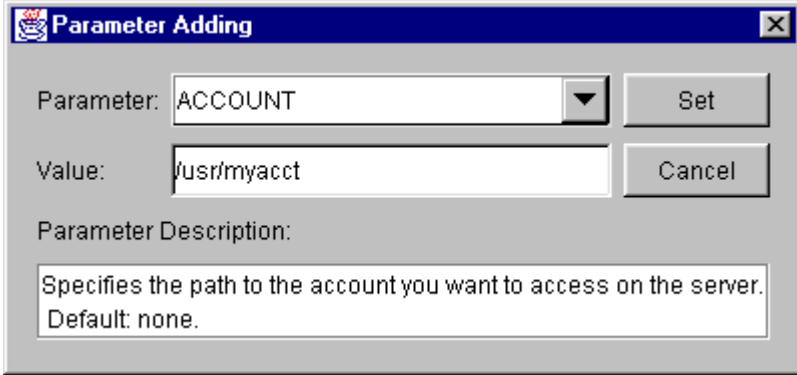
Parameter	Value
DBMSTYPE	UNIVERSE
NETWORK	TCP/IP
SERVICE	uvserver
HOST	testmachine

Below the table is a "Parameter Editor" section with two input fields: "Parameter:" (containing "DBMSTYPE") and "Value:" (containing "UNIVERSE"). To the right of the table and below the input fields are buttons: "Add", "Save", "Cancel", "Change", and "Remove".

The parameters that appear automatically on the **Data Source Adding** dialog box are required for each data source you add. Their values are set according to the information you provide on the **New Data Source** dialog box.



6. To add additional parameters, click **Add**. The **Parameter Adding** dialog box appears, as shown in the following example:

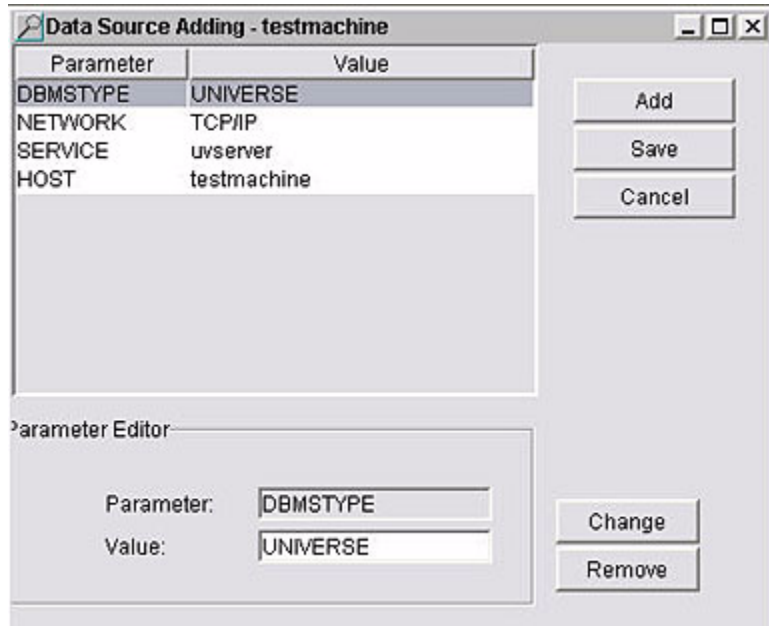


The image shows a Windows-style dialog box titled "Parameter Adding". It has a blue title bar with a small icon on the left and a close button (X) on the right. The dialog contains the following elements:

- A "Parameter:" label followed by a text box containing "ACCOUNT" and a small downward-pointing arrow button.
- A "Value:" label followed by a text box containing "/usr/myacct".
- A "Parameter Description:" label followed by a text box containing "Specifies the path to the account you want to access on the server. Default: none."
- A "Set" button located to the right of the "Parameter:" text box.
- A "Cancel" button located to the right of the "Value:" text box.

7. Click the parameter you want to add from the **Parameter** list. For a list of parameters, see ["Data Source Parameters"](#) on page 8.
8. In the **Value** field, enter an appropriate value for the parameter. Information about the parameter appears under **Parameter Description**.
9. Click **Set** to add the parameter.

10. After you finish adding parameters, click **Cancel**. The **Data Source Adding** dialog box displays all parameters associated with the data source:



*Note:* To edit parameters, see [“Modifying a Data Source”](#) on page 14.

11. After you finish adding parameters for the data source, click **Save**.
12. When you finish adding data sources, choose **File -> Save disk file** to save your changes.

## Data Source Parameters

Each data source definition in the UCI configuration must include the following parameters:

- DBMSTYPE
- NETWORK
- SERVICE
- HOST

You also should include the ACCOUNT and USERNAME parameters for each entry.



Two parameters you might want to change are MAXFETCHBUFF and MAXFETCHCOLS. Use these parameters to increase the amount of data in each buffer sent from the server to the client. This will improve performance by reducing the number of data transfers between server and client. For more information about these two parameters, see the *UCI Developer's Guide*.

If the UniVerse server you are connecting to has NLS enabled, you also can add or change the NLS parameters. For information about setting the NLS parameters, see the *UCI Developer's Guide*.

**Warning:** Adding or changing other parameters can make UCI unusable.

The following table describes the parameters that are required for each data source entry:

Parameter	Description	Default
DBMSTYPE	Specifies the type of database you want to access (UNIDATA, UNIVERSE, or any other database type, such as DB2).	<i>none</i>
NETWORK	Specifies the network used to access the data source (TCP/IP or LAN).	<i>none</i>
SERVICE	Specifies the name of the server process for the DBMSTYPE you specified. For UniData, specify <i>udserver</i> ; for UniVerse, specify <i>uvserver</i> .	<i>none</i>
HOST	Specifies the name of the server machine or its network IP address.	<i>none</i>

**Parameters for Data Source Entry**

The following table describes other parameters in the **Parameters** list that you may want to add or change:

Parameter	Description	Default
ACCOUNT	Specifies one of the following: <ul style="list-style-type: none"> <li>n The full path of a UniData or UniVerse account directory</li> <li>n A valid UniVerse schema name</li> <li>n A valid UniData database name</li> </ul> A UniData database name is valid if it appears as an entry in the ud_database file. For UNIX systems, this file is located in the <i>/usr/ud71/include</i> path. For Windows systems, it is located in <i>\udthome\include</i> .	<i>none</i>
AUTOINC	Produces an <b>SQLColAttributes</b> report if the column is an auto-increment column.	No
CASE	Produces an <b>SQLColAttributes</b> report if the column is case-sensitive.	Yes
DESCB4EXEC	(For internal use only) Indicates if the database's describe operation is legal before executing the SQL statement.	Yes
DSPSIZE	Produces an <b>SQLColAttributes</b> report showing the column display size.	Yes
MAPERROR	Maps UniVerse error codes to standard ODBC SQLSTATE error codes. Whenever the server returns one of the mapped codes as an error condition, UCI sets the SQLSTATE variable equal to the five-character code defined in the ODBC standard.	List
MARKERNAME	Indicates if the database uses names for parameter markers. If not, the ? (question mark) is the marker character.	No

---

#### Other Parameters for Data Source Entry

Parameter	Description	Default
MAXFETCHBUFF	Controls the maximum buffer size on the server to hold data rows. The server usually fills this buffer with as many rows as possible before sending data to the client. If any single row exceeds the length of MAXFETCHBUFF, <b>SQLFetch</b> fails, and you should increase the value of this parameter.	8192 bytes
MAXFETCHCOLS	Controls the maximum number of column values the server can put in the buffer before sending data to the client. If the number of columns in the result set exceeds the number specified by MAXFETCHCOLS, <b>SQLFetch</b> fails, and you should increase the value of this parameter.	400 column values
NLSLCALL	Specifies all components of a locale.	<i>none</i>
NLSLCCOLLATE	Specifies the name of a locale whose sort order to use.	<i>none</i>
NLSLCCTYPE	Specifies the name of a locale whose character type to use.	<i>none</i>
NLSLCMONETARY	Specifies the name of a locale whose monetary convention to use.	<i>none</i>
NLSLCNUMERIC	Specifies the name of a locale whose numeric convention to use.	<i>none</i>
NLSLCTIME	Specifies the name of a locale whose time convention to use.	<i>none</i>
NLSLOCALE	Specifies all components of a locale.	<i>none</i>
NLSMAP	Specifies the name of the server's NLS map for the connection. For a client to connect to the server successfully, the server must be able to locate the specified map, which must also be installed in the server's shared memory segment.	<i>none</i>
NULLABLE	Produces an <b>SQLDescribeCol</b> and <b>SQLColAttributes</b> report if the column is nullable.	Yes
SEARCH	Produces an <b>SQLColAttributes</b> report if the column is searchable.	Yes

**Other Parameters for Data Source Entry (Continued)**

Parameter	Description	Default
TXBEHAVIOR	Defines default autocommit/ manual-commit transaction behavior. Normally, UniVerse is autocommit by default.	1
TXCOMMIT	(For internal use only) Database SQL statement for committing a transaction.	No
TXROLL	(For internal use only) Database SQL statement for rolling back a transaction.	No
TXSTART	(For internal use only) Database SQL statement for starting a transaction.	No
TYPENAME	Produces an <b>SQLColAttributes</b> report showing the name of the SQL TYPE for the column.	Yes
UNSIGNED	Produces an <b>SQLColAttributes</b> report if the column is UNSIGNED.	No
UPDATE	Produces an <b>SQLColAttributes</b> report if the column is updatable.	Yes
USERNAME	Specifies the user's login name on the server.	<i>none</i>

#### Other Parameters for Data Source Entry (Continued)

## New Data Source Parameters and Comments

You can define additional parameters or comments to include in the UCI configuration file. To do either of these, click **New Items** in the **Parameter** list, then under **Parameter Editor** enter one of the following in the **Parameter** field:

- A new parameter name
- A hash sign (#) to indicate a comment

### *New Parameters*

New parameters must begin with a C– prefix. For example, you might name a new parameter C–CATEGORY. UCI ignores any parameter beginning with the C– prefix, but UCI applications can get the parameter information using the `SQLDataSources` function.

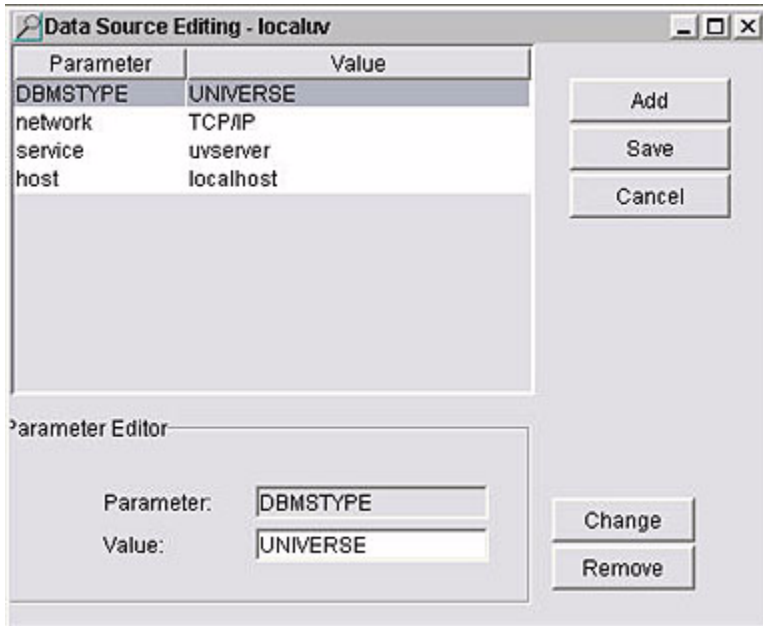
## Comments

To include a comment in a data source definition, enter a hash sign (#) in the **Parameter** field, then enter your comment in the **Value** field. Comments appear before parameters in the data source definition.

## Modifying a Data Source

To modify a data source:

1. From the UCI Config Editor, right-click the data source you want to modify, then click **Edit**. The **Data Source Editing** dialog box appears, as shown in the following example:



The dialog box titled "Data Source Editing - localuv" contains a table with two columns: "Parameter" and "Value". The table lists three parameters: DBMSTYPE (UNIVERSE), network (TCP/IP), and service (uvserver). The host parameter is listed with the value localhost. To the right of the table are three buttons: Add, Save, and Cancel. Below the table is a section labeled "Parameter Editor" which contains two input fields: "Parameter:" with the value DBMSTYPE and "Value:" with the value UNIVERSE. To the right of these fields are two buttons: Change and Remove.

Parameter	Value
DBMSTYPE	UNIVERSE
network	TCP/IP
service	uvserver
host	localhost

Parameter Editor

Parameter: DBMSTYPE  
Value: UNIVERSE

2. You can add new parameters or edit existing ones. To add new parameters, see [“Adding a Data Source”](#) on page 5. To edit parameters, continue with the following steps.
3. Click the parameter you want to modify. The parameter name and current value appear under **Parameter Editor**.
4. To remove the parameter, click **Remove**. To modify the parameter value, enter a new value in the **Value** field, then click **Change**.

***Note:** You also can modify a parameter value by double-clicking the value at the top of the dialog box, then entering the new value.*

5. After you finish modifying parameters for the data source, click **Save**.





6. When you finish modifying data source information, choose **File** ã **Save disk file** to save your changes.

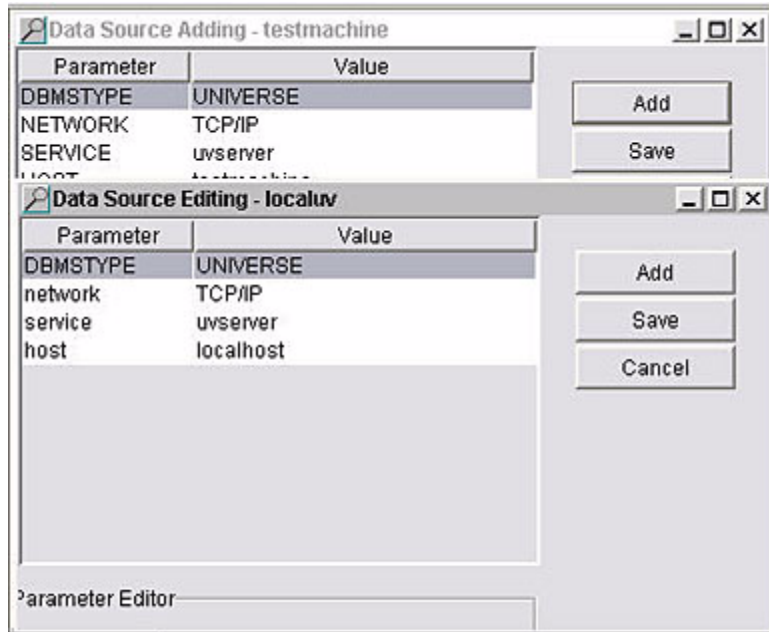
## Deleting a Data Source

To delete a data source:

1. From the UCI Config Editor, right-click the data source you want to delete, then click **Delete**.
2. When you finish deleting data sources, choose **File -> Save disk file** to save your changes.

## Working with Multiple Data Sources

You can add or modify several data sources at the same time. Each data source appears in its own dialog box. For example, while editing the *corp1* data source, you could add a new data source named *corp2*. You can resize and move the **Data Source Editing** and **Data Source Adding** dialog boxes within the UCI Config Editor window.



You also can use conventional Windows key combinations to copy (**Ctrl-C**) and paste (**Ctrl-V**) data source information.

To switch between dialog boxes, on the Window menu, click the dialog box you want to make active.

## Creating a UCI Configuration File

Complete the following steps to create your own UCI configuration file:

1. From the UCI Config Editor, open a UCI configuration file you want to use as a base for the new UCI configuration file. To open a file, see [“Opening an Alternative UCI Configuration File”](#) on page 20.
2. Choose **File -> Save As**.
3. From the **Save As** dialog box, navigate to the folder to which you want to save the new UCI configuration file, specify a file name with the extension *.config*, then click **Save**.
4. Modify the new UCI configuration file with the appropriate data source information.

## Setting the UciCfgFile Key in the Registry

The UCI configuration file that the client uses is specified in the UciCfgFile key in the system registry under HKEY\_LOCAL\_MACHINE \SOFTWARE\IBM\UCI. Initially this is set to *uci.config*, the UCI configuration file IBM ships to you.

To change this setting to point to a different UCI configuration file:

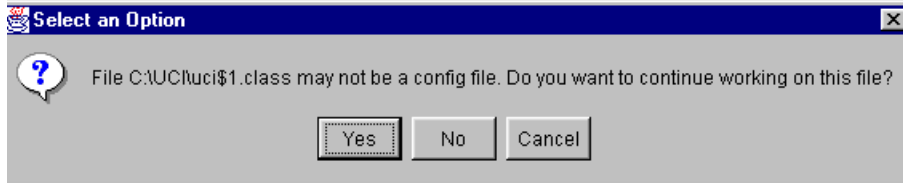
1. From the UCI Config Editor, make sure the data source information in the left pane of the UCI Config Editor window represents the UCI configuration file you want to set in the UciCfgFile registry key.
2. Choose **File -> Reset Registry**.

## Opening an Alternative UCI Configuration File

To open the UCI configuration file that is set in the UciCfgFile registry key, choose **File → Get Registry**.

To open a UCI configuration file that is different from the one set in the UciCfgFile registry key:

1. From the UCI Config Editor, choose **File → Open disk file**.
2. From the **Open File** dialog box, choose the appropriate UCI configuration file (the file should have the extension *.config*), then click **Open**.
3. If you try to open a file with an extension other than *.config*, the following dialog box appears:



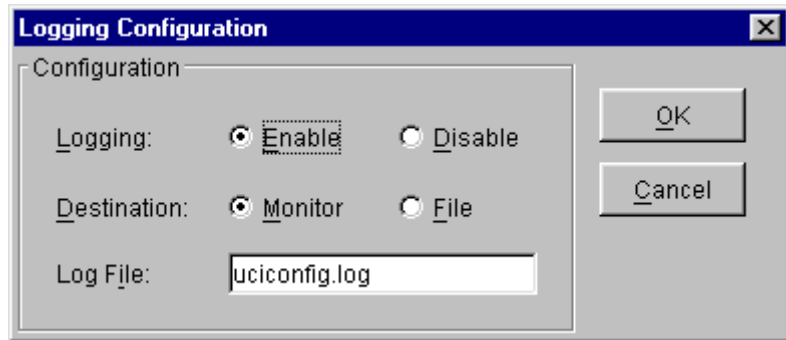
In this case, indicate whether you want to continue working on this file.

## Enabling and Disabling Logging

You can produce log information for the UCI Config Editor that can help IBM troubleshoot problems in your UCI configuration file.

To enable or disable logging:

1. From the UCI Config Editor, on the Logging menu, click **Logging**.



2. From the **Logging Configuration** dialog box, specify the appropriate configuration information. The following table describes each parameter that appears on the **Logging Configuration** dialog box:

Parameter	Description
Logging	Enables or disables logging.
Destination	Indicates whether logging information is written to the monitor or to the file specified in the <b>Log File</b> field.
Log File	Specifies the file to which logging information is written if <b>File</b> is specified as the Destination. By default, logging information is written to <i>uciconfig.log</i> .

### Logging Configuration Dialog Box Parameters

3. Click **OK** to save your settings and exit the **Logging Configuration** dialog box. Click **Cancel** to exit the dialog box without saving changes.

## Logging Client Connections

Beginning at UniVerse 10.0, a server-side debugging log is available for tracking client connections.

The debugging log is located in the /tmp/ directory on UNIX, or C:\tmp on Windows platforms, by default.

Complete the following steps to set up the debugging log:

1. Edit the serverdebug file in the UVHOME directory.
2. In the first column, enter uvcs, indicating that you want to log the connection progress for both uvapi\_server and uvapi\_slave.
3. In the next column, enter an integer indicating the level of logging information you want to maintain. The valid integers are:
  - 0 – No debugging.
  - 1 – Captures information about the startup connection only.
  - 9 – Captures information about every call.
4. In the third column, enter the full path for the log file location. If this value does not exist, the logs are written to /tmp/uvapiserver\_###.log as the default on UNIX systems, or C:\tmp\uvapiserver####.log as the default on Windows systems. #### is the uvapi\_server process ID.



---

# Accessing UniData Accounts

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UniData databases are organized into accounts. A consumer connects to a UniData account and can access the files there. You optionally can define the account as a database in the *ud\_database* file on the server. You can also include the account path or database name in the UCI data source definition in the UCI configuration file. For information about setting up the UCI Configuration file, see Chapter 3, “[The UCI Config Editor](#).”

You can also specify the account path or database name each time you try to connect to the account. In this case you need not include the account path or database name in the UCI configuration file. When you try to connect, you are prompted to specify either the full path to the account or the database name.

If you want to access an account that has a UDTHOME directory different from the default UDTHOME directory, you must include a definition for that account in the *ud\_database* file on the server. On UNIX systems this file is located in the */usr/ud71/include* path. On Windows platforms it is located in *\udthome\include*. You can find the path for *udthome* by looking in the registry under *HKEY\_LOCAL\_MACHINE\SOFTWARE\IBM\UniData\7.1*. Use any text editor to modify the *ud\_database* file.

To determine your default UniData home directory, use the UNIX *env* command. Output from this command includes the default setting for the UDTHOME environment variable.

The following Windows example shows an entry in the *ud\_database* file for a database named *db2*:

```
DATABASE=db2
UDTHOME=d:\disk2\test71
UDTACCT=d:\disk2\test71\testacct
```

In the *ud\_database* file entry the UDTHOME parameter is optional. You should include it only when the UDTHOME directory is different from the default UDTHOME directory.

## Running Concurrent UniData Versions

When you install UniData 7.1 on a machine where a previous version of UniData was installed, the unirpcservices file is overwritten with UniData 7.1 information. If you want to run a previous version concurrently with UniData 7.1, you must edit certain files to enter the definitions for the previous version.

## Running UCI, UniData ODBC, or UniOLEDB Concurrently

If you are running UCI, UniData ODBC, or UniOLEDB with concurrent versions of UniData, you must edit the unirpcservices file and the uci.config file to define locations of executables from the previous version of UniData.

The following example illustrates unirpcservices file entries when running UniData 5.2 concurrently with UniData 7.1:

```
udserver_52 d:\Informix\ud52\bin\udsrvd.exe * TCP/IP 0 3600
udserver_71 c:\IBM\ud71\bin\udsrvd.exe * TCP/IP 0 3600
```

Make sure the uci.config file contains an entry for the server for each version of UniData, as shown in the following example:

```
<unidata52>
DBMSTYPE = UNIDATA
network = TCP/IP
service = udserver_52
host = server1

<unidata71>
DBMSTYPE = UNIDATA
network = TCP/IP
service = udserver_71
host = server2
```

## Running InterCall, UniObjects, or UniObjects for Java Concurrently

If you are running InterCall, UniObjects, or UniObjects for Java with concurrent versions of UniData, you must edit the unirpcservices file to define the location of the udapi\_server executable for the previous version you are running.

The following example illustrates unirpcservices file entries when running UniData 5.2 concurrently with UniData 7.1:

```
udcs_52 C:\Informix\ud52\bin\udapi_server.exe * TCP/IP 0 3600
udcs C:\IBM\ud71\bin\udapi_server.exe * TCP/IP 0 3600
```

You can now set your service name to either service defined in the unirpcservices file, for example, udcs\_52 for UniData 5.2 or udcs for UniData 7.1.

## Tracing Events

You can use the tracing feature to create logs of events between clients and the database through the server. Logs enable support personnel to help troubleshoot problems. You can define trace levels for database entries in the *ud\_database* file.

The following table describes the valid trace levels and the associated information that is written to the trace log:

Trace Level	Description
0	Includes all fatal error information.
1	Includes all UCI functions in addition to the information provided by trace level 0.
2	Includes parameter information and column descriptions in addition to the information provided by trace levels 0 and 1.
3	Includes data values in addition to the information provided by trace levels 0, 1, and 2.

### Valid Trace Levels

The following UNIX example shows a tracing level setting for a database named *dbase3*:

```
DATABASE=dbase3
UDTHOME=/disk1/ud71
UDTACCT=/home/test/udtest
TRACE_LEVEL=3
```

---

# Device Licensing

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*Beta Beta*

This chapter describes how device licensing works. For more information about device licensing, see *Installing and Licensing UniData Products* and *Administering UniVerse*.



## Licensing Modes

UniVerse and UniData provide two licensing modes:

- Session licensing
- Device licensing

### *Session Licensing*

Session licensing is like the licensing system used before Release 9.5 of UniVerse and Release 5.1 of UniData. Every connection from telnet or an API, even from the same PC, consumes one database license. On UniVerse systems, session licensing has been enhanced to include a new licensing tool, *uvlictool*, that reports on the current licensing state and cleans up current licensing.

### *Device Licensing*

Device licensing, sometimes called client-side licensing, tries to combine all remote connections from a single device to a database server at both the database license level and the package level.

Device licensing works with the following connection types (among others):

- UCI
- UniObjects
- UniObjects for Java
- UniObjects for .NET
- InterCall
- UniOLEDB

## **Why Do I Need Device Licensing?**

Users accessing a database server through one or more client application programs may want to put their licensing scheme on a one-license-per-device basis. Such applications often open multiple connections to a database server. For example, an application might use one connection to browse, another connection to check data, yet another connection to update the database, and so forth.

Before UniVerse Release 9.5 and UniData Release 5.1, each connection to the server consumed its own separate license, even though only one user was using all those connections from one PC. Device licensing lets such users consume one database license and one license for all the connections to the server from a single PC.

## **Device Licensing Requirements**

Device licensing has the following requirements:

- Clients must run on a Windows platform.
- Clients must run on a LAN or TCP/IP with an Ethernet card.

## Connection Types

There are three ways to connect to a database server:

- Direct connection. This is not a client/server connection.
- Two-tier client/server connection.
- Multiple-tier client/server connection.

Each PC can have up to ten connections to the server, but not all connections from a PC can be combined.

### Direct Connections

Direct connections are not really client/server connections because there is no real client. Examples of direct connections are:

- Directly invoking the database on a system
- TTY serial line

### Two-Tier Connections

Two-tier connections are typical client/server connections where a client application connects to a database server either on the same machine or on a different machine. Telnet connections to the database are an example of a two-tier connection.

Client applications running on PCs different from the database server appear to the server with unique identifiers.

### Multiple-Tier Connections

Multiple-tier connections are client applications that connect from a PC to a database server either through one or more different PCs, or through an application server component. Examples of multiple-tier connections are:

- An HTTP server running scripts that use UniObjects or UniObjects for Java.
- An application that connects first to an application server either on a different PC or on the server system. The application server connects to the database server.

## Using Device Subkeys

Each PC that connects immediately to the database server can have up to ten connections.

Using multiple-tier connections, each PC that connects to an intermediate application component consumes a separate license. But each of these PCs, at one or more removes from the server, can have up to ten connections.

In order for a PC to have multiple connections to the database server and still consume only one license, users must ensure that each PC connecting to the server through another system specify a unique *device subkey* before requesting a connection to the server. This subkey is a string of up to 24 characters. All client applications on a given device that connect to one database server must use the same unique subkey.

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