Ingres 10.0 for Linux

Quick Start Guide

INGRES

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Chapter 1: Installing Ingres

This section contains the following topics:

Installing Ingres for Linux (see page 5)
How You Access the Instance on Linux and UNIX (see page 8)
Start the Ingres Installation on Linux and UNIX (see page 9)
Ingres Navigation (see page 9)

Installing Ingres for Linux

Ingres is installed on Linux using RPM Package Manager. You can install Ingres using an installation wizard or from the command line.

Note: Installation of Ingres requires root access. If you are logged in as another user, you will need the root password.

Note: If your system does not have RPM, Ingres for Linux is also distributed in a format that lets you use the ingbuild installation program. Follow the instructions described in "Installing Ingres on UNIX" in the *Installation Guide*.

For details on installation considerations and more information on using RPM to install and upgrade Ingres, see the *Installation Guide*.

Install Ingres for Linux Using the Installation Wizard

The installation wizard easily installs Ingres without your having to know RPM commands.

To start the Ingres Installation Wizard

1. Run the ingres_install script located in the root directory of the Ingres distribution.

   The first page of the Ingres Installation Wizard is displayed.

2. Respond to the installation wizard dialogs.

   If you need more information about a specific item, click the item's information button.

   After you provide the required information in the installation wizard dialogs, the installation program installs Ingres.

Installing Ingres for Linux at the Command Line

You can install the Ingres RPM packages at the command line by doing either of the following:

- Using the ingres_express_install command
- Using RPM commands

ingres_express_install Command—Install Ingres

The ingres_express_install command quickly installs Ingres RPM packages.

This command has the following format:

```
ingres_express_install [-tar] [instance_PATH] [instance_ID]
```

-tar

Installs from ingres.tar instead of RPMs. (Linux only)

instance_PATH

Identifies the full path to the location where Ingres is to be installed (II_SYSTEM).

Default: /opt/Ingres/IngresII

instance_ID

Defines a two-character string where the first character must be an uppercase letter and the second character must be an uppercase letter or a number from 0 to 9.

Default: II

Notes:

1. The ingres_express_install command must be run as the "root" system user.
2. An "ingres" system user must exist; otherwise ingres_express_install fails.
3. The "ingres" system user must have read, write, and execute premissions on the II_SYSTEM directory; otherwise ingres_express_install fails.
4. If an alternate *instance ID* (for example, A2) is specified and the *instance PATH* is not specified, ingres_express_install tries to install into "/opt/Ingres/IngresII", which can corrupt an existing II installation.
5. If an alternate *instance ID* (for example, A2) is specified, we recommend that the *instance PATH* be specified (for example, "/opt/Ingres/IngresA2").
6. When ingres_express_install completes, if the instance will be managed by the "ingres" system user, shut down the instance (ingstop), log off from the "root" system user, log on to the "ingres" system user, and execute .ingXXsh or .ingXXcsh (where XX is the instance ID), which are found in the $II_SYSTEM/ingres directory, then start ingres (ingstart).
7. ingres_express_install will not upgrade an instance. If a previous instance is found, the installation is aborted.

Examples: ingres_express_install Command

This command installs all RPM packages in the current working directory with the default configuration:

```
ingres_express_install
```

This command installs all RPM packages with the default configuration into "/opt/Ingres/IngresII", but with an instance ID of A1:

```
ingres_express_install A1
```

This command installs all RPM packages with the default configuration into "/opt/Ingres/IngresA2", with an instance ID of A2:

```
ingres_express_install /opt/Ingres/IngresA2 A2
```

How You Access the Instance on Linux and UNIX

When the installation is complete, the instance is running.

To access your instance, you must source the environment file that was created during installation.

During installation, an environment file is written to the home directory of the operating-system user ID that was defined during installation (the default is "ingres"). The name of the environment file depends on the value of II_INSTALLATION.

To source the environment file created during installation, issue the following command.

Note: The following examples assume an operating-system user ID of ingres.

For bash:

```
. ~ingres/.ingXXbash
```

For tcsh:

```
source ~ingres/.ingXXtsch
```

where XX is the instance ID of the instance.

For other users to have access to the instance and the Ingres tools, they must have access to the .ingXXbash and .ingXXtsch scripts. The scripts can be copied to the home directory of any user.

Start the Ingres Installation on Linux and UNIX

Use the ingstart command to start Ingres.

Note: If you are using a raw device for your transaction log file, you must configure the log file before starting your instance.

Note: If your operating system has shadow passwords, you must install the password validation program before starting a networked DBMS Server instance.

To start the Ingres instance

1. Log on to your system through the system administrator account for the instance.
2. Enter the following command:

   ```
   % ingstart
   ```

   The ingstart command checks whether you have sufficient operating system resources to run the Ingres components, and whether the raw log file (if used) is configured. If these conditions are met, ingstart starts all servers that are part of your instance.

To stop the Ingres instance

Enter the following command:

```
% ingstop
```

The instance is stopped.

Ingres Navigation

You can navigate Ingres using Eclipse and the Ingres Eclipse DTP available at www.ingres.com. Connecting to Ingres from Eclipse (see page 17) describes how to configure Eclipse for Ingres.

The default configuration for Ingres may not be suitable for all applications or environments. To change configuration parameters, type CBF (for Configuration-By-Forms) at the command line. For more information, see How You Navigate in CBF in the *System Administrator Guide*.

Chapter 2: Creating a Database

This section contains the following topics:

Demonstration Database (demodb) (see page 11)
How You Create a Database (see page 11)
How You Create a Database Using Ingres Commands (see page 11)

Demonstration Database (demodb)

Ingres provides a demonstration database (demodb) and application to help you get started. Demodb is automatically created and populated for you during installation.

Examples used in this guide are from demodb.

How You Create a Database

A database can be created using Visual DBA (available on Windows only), or by using Ingres commands and SQL statements.

The process for creating a database is as follows:

1. Create a database.
2. Create base tables for the database.
3. Populate the tables with data.

How You Create a Database Using Ingres Commands

The process for creating a database using Ingres commands and SQL statements is as follows:

1. Create a database using the createdb command.
2. Create tables for the database using the CREATE TABLE statement.
3. Populate the tables with data using the COPY statement.

Create a Database Using Createdb Command

Use the createdb command to create a database. The user who creates a database becomes its database administrator. For a complete description of the createdb command, see the *Command Reference Guide*.

Note: You must have the createdb privilege to create a database. For details, see the *Database Administrator Guide*.

To create the demodb database using the createdb command

Issue the following command:

```
createdb -i demodb
```

This command creates a public database named demodb on the local node in the default locations. The database is Unicode-enabled using Normalization Form C.

Create a Table Using the CREATE TABLE Statement

The CREATE TABLE statement creates a new base table that is owned by the user issuing the statement. The CREATE TABLE statement creates entries in the system catalogs for the table created.

You can create tables using any of these methods:

Tool	Command	See
Ingres Terminal Monitor (line-based)	sql	*SQL Reference Guide*
Ingres Interactive Terminal Monitor (forms-based)	isql	*Character-based Querying and Reporting Tools User Guide*
Ingres Tables utility	tables	*Character-based Querying and Reporting Tools User Guide*
Ingres Applications-By-Forms and Ingres 4GL (referred to as ABF/4GL)	abf	*Forms-based Application Development Tools User Guide*
An Embedded SQL program		*Embedded SQL Companion Guide*

For a complete description of the CREATE TABLE statement, refer to the *SQL Reference Guide*.

To create the airport table using the CREATE TABLE statement

The following statement creates the airport table with columns ap_id, ap_iatacode, ap_place, ap_name, and ap_ccode:

```
CREATE TABLE airport(
       ap_id integer not null not default,
       ap_iatacode nchar(3) not null not default,
       ap_place nvarchar(30),
       ap_name nvarchar(50),
       ap_ccode nchar(2)
);
```

Populate a Table Using the COPY Statement

The SQL statement COPY can be used to copy the contents of a file into a table.

Note: The input file for the following COPY statement is a binary file. To create this file, use this statement:

```
COPY TABLE airport () INTO 'airport.in';
```

To load the airport table from a binary file

Issue the following statement:

```
COPY TABLE airport () FROM 'airport.in';
```

To load the airport table from a CVS file

Alternatively, if the data file is in comma-separated value (.csv) format, you must specify the character types and the delimiter on the COPY statement. This method allows more flexibility and lets you skip fields. The COPY statement would look like this:

```
COPY airport (
    ap_id=char(0) comma,
    ap_iatacode=char(0) comma,
    ap_place=char(0) comma,
    ap_name=char(0) comma,
    ap_ccode=char(0) nl)
FROM 'airport.csv';
```

For more information on the COPY statement, see the *SQL Reference Guide* and the *Database Administrator Guide*.

Chapter 3: Using the Ingres Demonstration Application

This section contains the following topics:

Ingres Demonstration Application (see page 15)
What You Should Know (see page 15)
Requirements for the Demonstration Application (see page 16)
Java Demonstration Application (see page 16)

Ingres Demonstration Application

Ingres provides a sample transactional based application that demonstrates common programming tasks required to develop an application using Ingres.

The application shows how information is retrieved from Ingres and presented in a user interface control. Novice users can "borrow" code from the application to use in their own application development.

The demonstration application provides a working example of the main tasks required to insert, update, and retrieve data from an Ingres database, including:

- SELECT queries that require parameters
- Execution of a row producing procedure
- INSERT, UPDATE, and DELETE queries
- Transaction commit and rollback
- Use of Unicode character types
- Handling of binary large objects (BLOBs)

What You Should Know

The application developer should be familiar with the development language and environment, and somewhat familiar with SQL.

Requirements for the Demonstration Application

The demonstration application requires that the DBMS Server be installed.

You can access the demonstration application if you opted to create and populate a demonstration database (demodb) during the installation process.

Note: If demodb was not created during installation, it can be created with scripts located in II_SYSTEM\ingres\demo\data.

Java Demonstration Application

A sample Java application is available at http://community.ingres.com/wiki/Ingres_Examples (http://community.ingres.com/wiki/Ingres_Examples).

The Java application can be loaded into Eclipse, NetBeans, or similar IDE.

Chapter 4: Connecting to Ingres from Eclipse

This section contains the following topics:

Required Software (see page 17)
Install Plug-ins (see page 17)
How You Connect to Ingres from Eclipse (see page 18)
Create a Connection Profile (see page 19)
Define an Ingres Driver (see page 21)
Create a New Database Connection (see page 24)
Connect to a Database (see page 25)
Create an SQL Scratch File (see page 26)

Required Software

To connect to Ingres from the Eclipse SDK, you must download and install the following software and necessary plug-ins, which you can obtain from the Eclipse Data Tools Project page at http://www.eclipse.org/datatools/ (http://www.eclipse.org/datatools/).

- Eclipse Software Development Kit (SDK)
- Eclipse Modeling Framework (EMF)
- Graphical Editing Framework (GEF)
- Data Tools Platform (DTP)
- Ingres DTP plug-in

The required versions are described in the Ingres readme.

Install Plug-ins

You can check which plug-ins your copy of Eclipse has by accessing the Eclipse Help menu. If your copy of Eclipse does not have the required versions, you must download and install them.

To install a plug-in

1. Extract the downloaded plug-in into your Eclipse plug-in area.
2. Re-start Eclipse to load the plug-ins.

How You Connect to Ingres from Eclipse

The process for connecting to Ingres from the Eclipse SDK is as follows:

1. Create a Connection Profile.
2. Define an Ingres driver.
3. Create a new database connection.
4. Connect to a database.
5. Create an SQL scratch file.

Note: Before you connect to Ingres, ensure that your Ingres instance is running.

Create a Connection Profile

To connect to Ingres, you must create a Connection Profile. You can create a connection file from Eclipse's Database Development perspective.

Note: Depending on the development language you are using, you must use the appropriate connection method. The following procedure instructs how to create a JDBC connection profile. For more information on JDBC connectivity, see the *Connectivity Guide*.

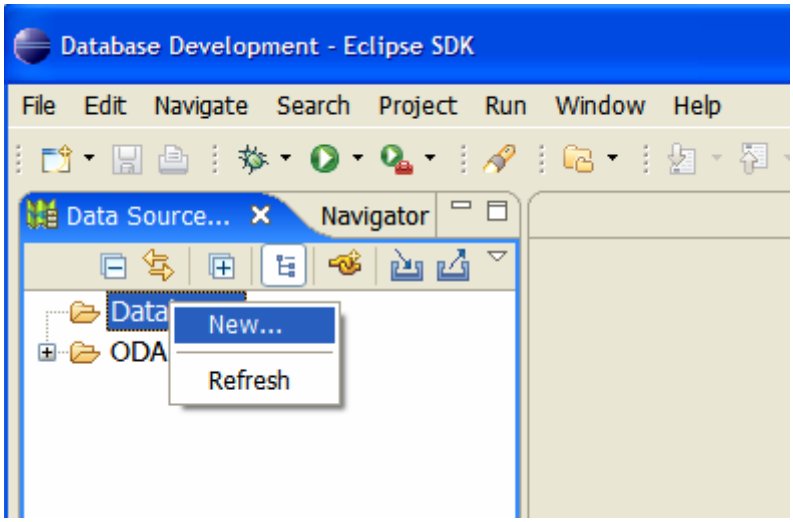
To create a JDBC connection profile

1. Click Window, Open Perspective, Other in the Eclipse SDK.

   The Open Perspective dialog appears.

2. Select the Database Development perspective and click OK.

   The Data Source Explorer tab is added to the SDK.



3. In the Data Source Explorer, right-click the Database folder and select New from the context menu.

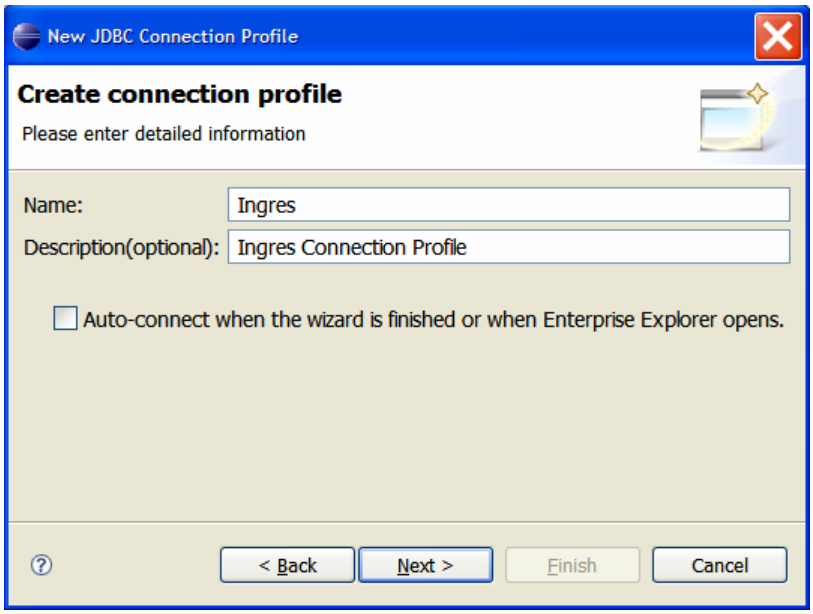
   The New Connection Profile dialog appears.

4. Select the "Ingres JDBC Connection" wizard and click Next.

   The Create connection profile panel is displayed.

5. Enter a name and description for your connection.

   For example:



   Click Next.

   The Specify a Driver and Connection Details panel is displayed.

If you have already defined an Ingres driver, proceed to Create a New Database Connection (see page 24). If you need to define a driver, continue with Define an Ingres Driver.

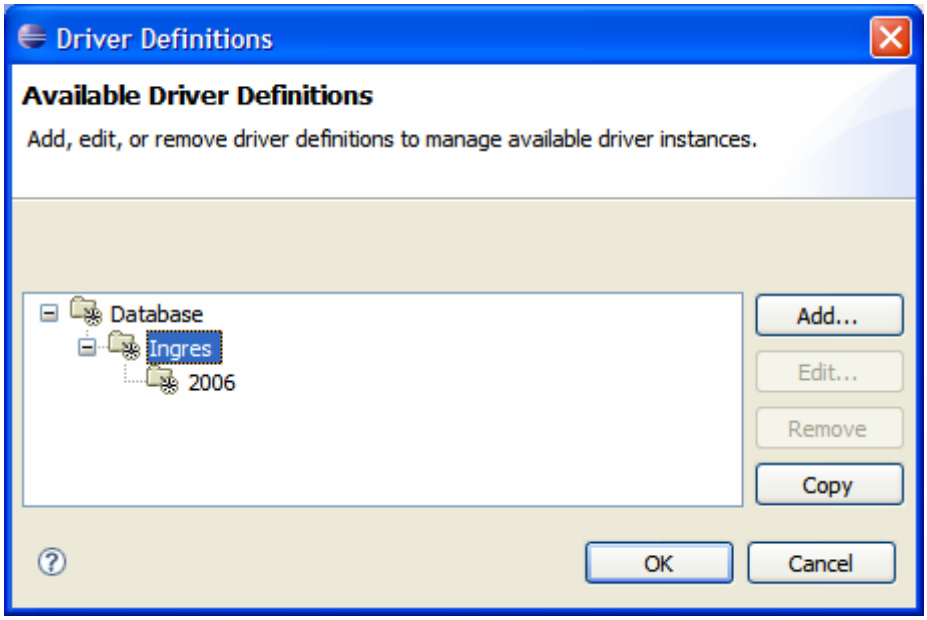
Define an Ingres Driver

Note: If you have not defined an Ingres Driver, you must define one. If you have already defined an Ingres driver, skip to Create a New Database Connection.

To define an Ingres driver

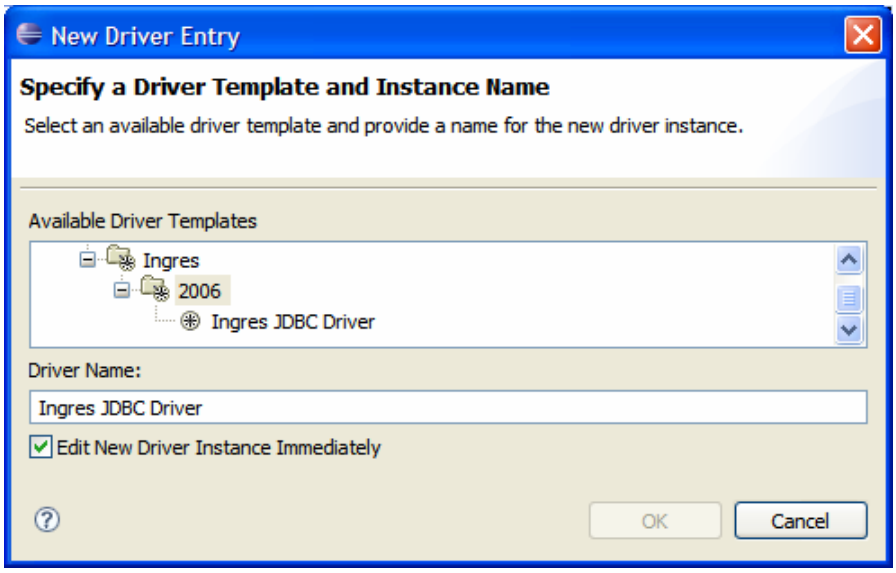
1. On the Specify a Driver and Connection Details panel of the wizard, click the Browse button next to the Select a driver drop-down menu.

   The Driver Definitions dialog appears.



2. If no driver is listed in the Ingres 2006 branch, select the Ingres branch and click Add.

   The New Driver Entry dialog appears.



3. In the Available Driver Templates list, select Ingres JDBC Driver.

   The Driver Name field will contain: **Ingres JDBC Driver**.

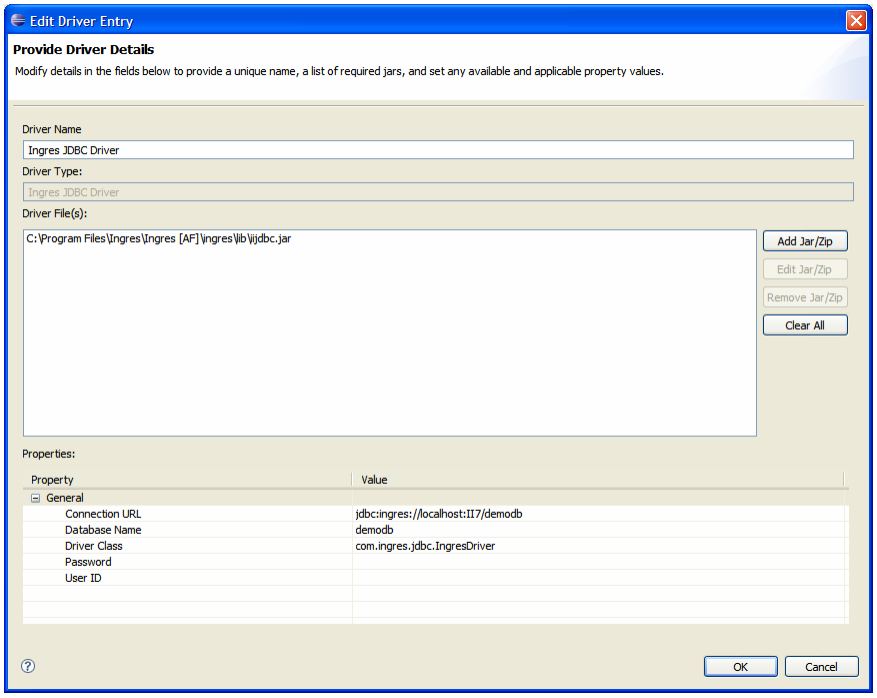
4. Ensure that the Edit New Driver Instance Immediately option is selected, and then click OK.

   The Edit Driver Entry dialog appears.

   Note: In most cases Eclipse will be unable to locate the driver file.

5. Select the Driver File iijdbc.jar and click Edit Jar/Zip. Browse to your Ingres Instance system area (defined in the Ingres system variable II_SYSTEM) then to the subdirectories: ingres, lib to locate and select the driver file.

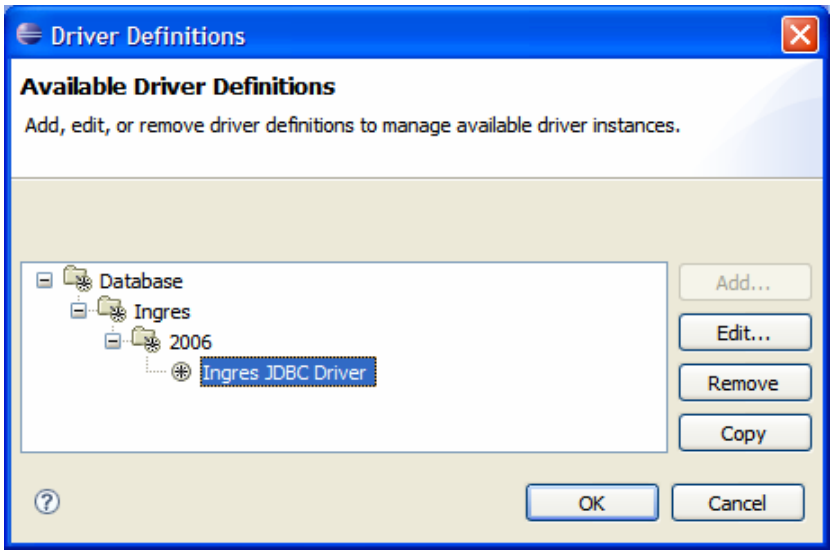
6. Ensure that the other driver details, including the Driver Class (**com.ingres.jdbc.IngresDriver**) and the instance ID (for example, **II**) are correct. For example:



Note: You can specify User credentials at connect time, rather than on the generic driver form.

Click OK.

7. In the Driver Definitions dialog, select the Ingres JDBC Driver from the list.



Click OK.

Continue with Create a New Database Connection.

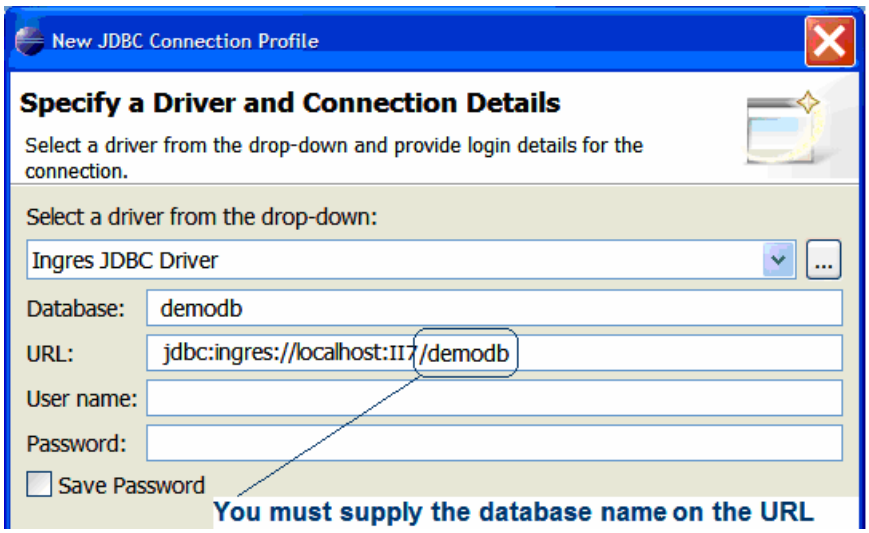
Create a New Database Connection

After you have created an Ingres JDBC Driver, you can create a new database connection using this driver.

To create a new database connection

1. Select the Ingres Driver from the list of Available Driver Definitions.
2. Specify the database name in the New JDBC Connection Profile dialog.

   Note: You must specify the database name in the URL field. For example: jdbc:ingres://localhost:II7/demodb

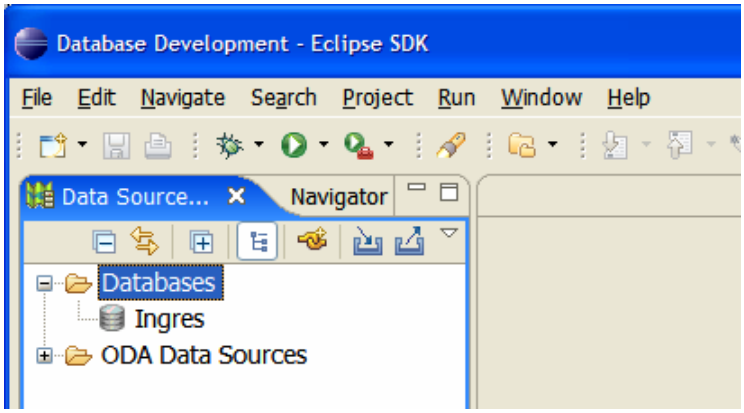


   If your current user ID is not a valid Ingres user you must also specify User name and Password values. We recommend using the user credentials of the Ingres instance owner.

3. Test the connection by clicking Test Connection.

4. Click Finish to close the profile wizard.

   An Ingres database is listed in the Data Source Explorer. For example:

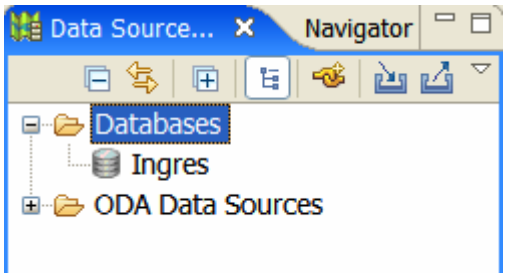


Connect to a Database

After you have created a database connection profile, you can connect to the database from the Data Source Explorer.

To connect to a database

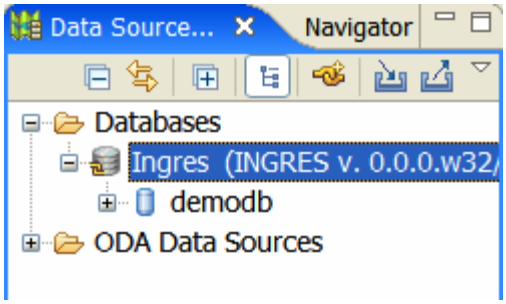
1. Open the Databases root folder in the Data Source Explorer.



   Available databases are listed.

2. Right-click on the Ingres database and select Connect from the context menu.

   The connection is established. For example:



You can now explore the objects in your database.

Create an SQL Scratch File

An SQL scratch file is required to work with the database, and the file must belong to an Eclipse Project. If you have not created an Eclipse project, you must create one by clicking File, New, General Project. You can then create an SQL scratch file in the Eclipse SDK and connect it to a database.

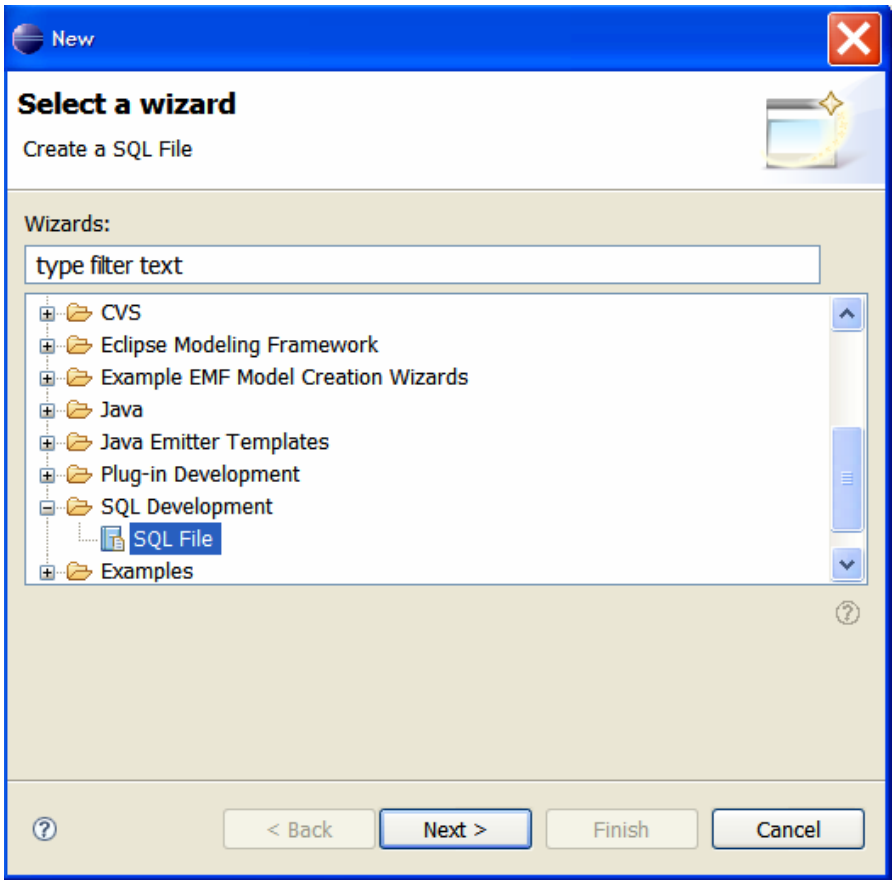
To create an SQL scratch file

1. Click File, New, Other.

   The New dialog appears.

2. Open the SQL Development folder and select the SQL File wizard.

   For example:



   Click Next.

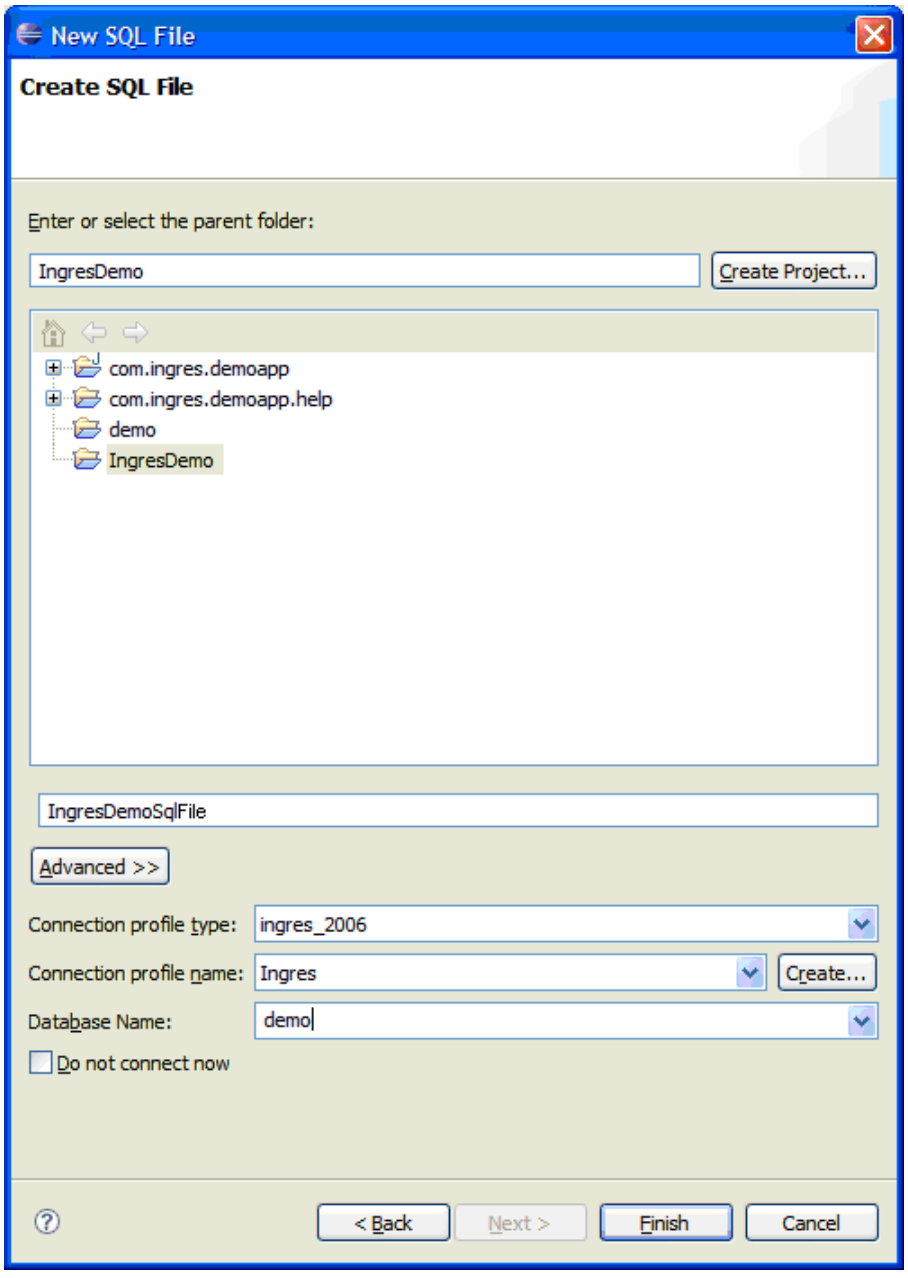
   The SQL File wizard appears.

3. Select the parent folder.

   The folder name is the same as the project name.

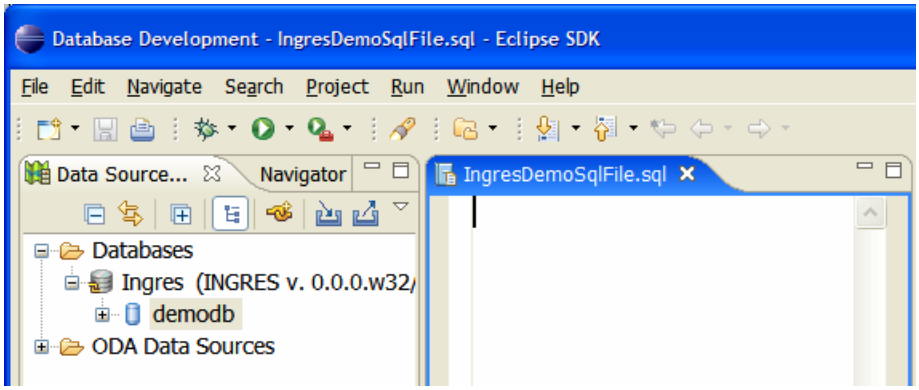
4. Enter a file name.

   For example, "IngresDemoSqlFile":



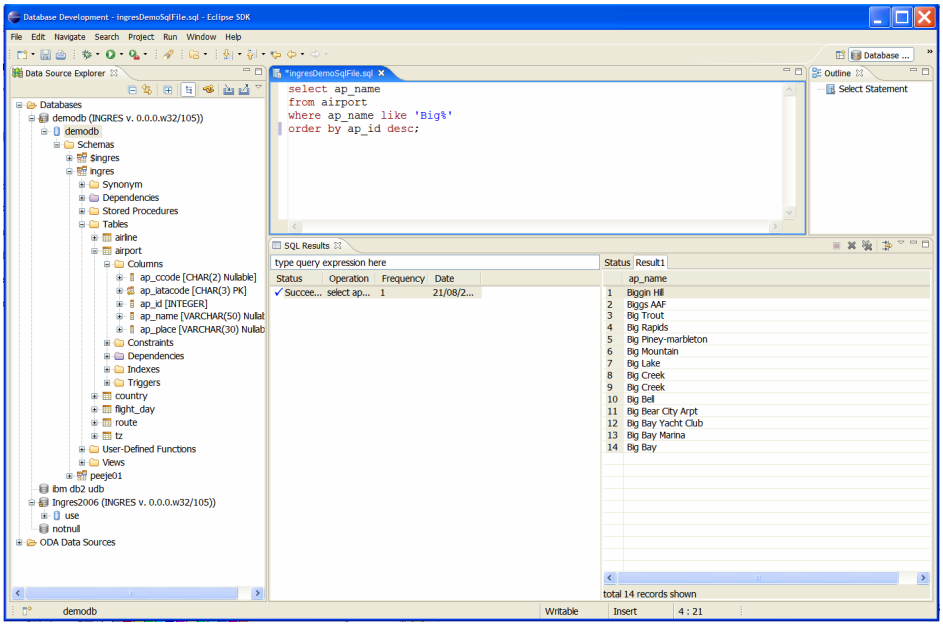
5. Set the connection details as shown, and then click Finish.

   The Eclipse editor opens the new SQL file you created.



   The SQL scratch file is connected to the database.

   You can now issue SQL requests. Use the context menu or shortcut keys to execute your request. For example:



Chapter 5: Connecting to Ingres from Python

This section contains the following topics:

Requirements (see page 29)
Ingres Python DBI Driver and the Ingres ODBC Driver (see page 29)
Create a Connection to Ingres (see page 30)
Example—Connect to Ingres and Select from a Table (see page 30)

Requirements

To connect to Ingres from Python, you must meet the following prerequisites:

- Have Python installed in your development environment
- Build or download the Ingres Python DBI driver
- Create a connection from Python to Ingres

You can download the latest version of Python from http://www.python.org/ (http://www.python.org/).

Ingres Python DBI Driver and the Ingres ODBC Driver

To connect to Ingres from Python using the Ingres Python DBI driver, you must build and install the driver. Instructions are included in the Ingres Python DBI Driver readme, available on http://www.ingres.com/downloads/prod-download-drivers.php (http://www.ingres.com/downloads/prod-download-drivers.php).

The Ingres Python DBI driver requires that you have installed Ingres and the Ingres ODBC driver. For more information about the Ingres ODBC driver, see the chapter "Understanding ODBC Connectivity" in the *Connectivity Guide*. The Ingres ODBC driver is located in the following Ingres directory: ingres\lib (shared library).

Create a Connection to Ingres

To connect to Ingres, you must instantiate an instance of the Connection class using the ingresdbi.connect() function.

If you have created a DSN, you could use the following code:

```
conn = ingresdbi.connect(dsn="myDSN")
```

Or you could connect directly to an Ingres database:

```
conn = ingresdbi.connect(database="myDB")
```

The ingresdbi.connect() function has other keywords that you can specify. For complete information, see the Ingres Python DBI Driver readme.

Example—Connect to Ingres and Select from a Table

The following is a simple segment of code that connects to the Ingres database iidbdb and selects from iitables.

```
import ingresdbi

conn = ingresdbi.connect(database='iidbdb')
curs = conn.cursor()
curs.execute('select table_owner, table_name from iitables')
for x in curs:
     print x
curs.close()
conn.close()
```

Chapter 6: Connecting to Ingres from PHP

This section contains the following topics:

Requirements (see page 31)
Download the PECL Extension (see page 31)
ingres_connect() Function—Connect to Ingres (see page 34)
Code Examples (see page 35)

Requirements

To connect to Ingres from PHP, you need to download or build the PECL extension and install it. (*PECL* stands for PHP Extension Community Library, which is a repository for PHP extensions.)

Download the PECL Extension

Download the source code for the PECL extension for Linux from the following page:

http://pecl.php.net/package/ingres (http://pecl.php.net/package/ingres)

Or you can build the extension from the latest source code, available from the PHP project's Concurrent Versions System (CVS).

The source code for the Ingres PECL library is stored in the PHP project's CVS server, *cvs.php.net*. A CVS client is required to access this CVS server. Most Linux distributions have a CVS client available for installation from the installation media an online repository.

Install the Extension on UNIX or Linux

The installation process for the PECL Ingres library requires a PHP development environment.

Note: You must first obtain the source code from CVS (see Download the PECL Extension) or http://pecl.php.net/get/ingres (http://pecl.php.net/get/ingres).

To install the extension on UNIX or Linux

1. Examine your PATH statement to determine if it contains one of the following commands:
   - phpize
   - php-config

   Note: Certain distributions of Linux rename these files to avoid version conflicts. To build the PECL Ingres library you need a C compiler.
2. Ensure that the environment variable II_SYSTEM is defined; use the following command to confirm that it is set correctly:

   ```
   echo $II_SYSTEM
   ```
3. Move to the directory that contains the source code for the extension.
4. Generate the configuration file for the extension by issuing the following command:

   ```
   phpize
   ```
5. Generate the Makefile needed to build the extension:

   ```
   ./configure --with-ingres
   ```
6. Build the extension:

   ```
   make
   ```
7. Install the extension:

   ```
   make install
   ```

   Note: Root access may be required to issue this command.
8. Edit the php.ini file, adding the following line:

   ```
   extension=ingres.so
   ```
9. Ensure that the web server process owner is a valid Ingres user:

   Note: If you use Apache, the Apache directive, *User*, found in httpd.conf, defines which operating system user runs Apache.

Configure Apache for UNIX/Linux

If you are using Apache, you must configure it for use with Ingres and the PHP extension. Because the Apache web server does not make available operating system environment variables automatically, additional steps are needed.

Note: The following procedure assumes that Ingres is installed to /opt/Ingres/II.

1. The shared library mod_env must be loaded to pass variables from the operating system to Apache. Generally, this can be done using the Apache configuration directive:

   ```
   LoadModule env_module modules/mod_env.so
   ```

   Note: Certain Linux distributions use alternative mechanisms for configuring the modules available to Apache. Check the documentation for your operating system to see what steps are required.

2. Add the variables II_SYSTEM and LD_LIBRARY_PATH to Apache. Edit the configuration file, httpd.conf, adding the following to the bottom of the file:

   ```
   SetEnv II_SYSTEM /opt/Ingres/II
   SetEnv LD_LIBRARY_PATH /opt/Ingres/II/ingres/lib
   ```

3. Restart the Apache server to initiate the changes.

ingres_connect() Function—Connect to Ingres

You connect to Ingres using the ingres_connect() function and disconnect using ingres_close(). ingres_connect() returns an Ingres II link resource on success, or FALSE on failure.

This function has the following syntax:

```
resource = ingres_connect([database[,username[,password]]])
```

database

Specifies a database with the following syntax:

[*vnode_id*::]*dbname*[/*svr_class*]

vnode_id

Specifies the virtual node name used to connect to a remote machine

dbname

Specifies the database name

svr_class

Specifies the Ingres server class, which defaults to INGRES if not specified. It is used when connecting to different server classes.

username

Specifies an Ingres user name to use for the connection

password

Specifies the password for the user name

Note: If any parameters are missing, ingres_connect() uses the values in php.ini for ingres.default_database, ingres.default_user, and ingres.default_password.

Example: ingres_connect()

```
<?php
$link = ingres_connect("mydb", "username", "password");
     or die("Could not connect");
echo "Connected successfully";
ingres_close($link);
?>
```

Note: You can use ingres_pconnect() function to create a persistent connection.

Code Examples

The following are examples of PHP code you can use for various Ingres operations.

Example: Error checking

```
<?php
    $link = ingres_connect(“mydb”, “username”, “password”);
    if (ingres_errno($link) != 0) {
    echo ingres_errno($link) . “ : “ . ingres_error($link) . “<BR/>\n”;
    }
?>
```

Example: Simple query

```
<?php
    $link = ingres_connect(“mydb”, “username”, “password”);
    // Gives a list of the tables
    $sql = “select * from iirelation order by relid asc”;
    $rc = ingres_query($sql,$link);
    // Do some error checking...
    while ( $iirelation = ingres_fetch_object($link) ) {
    echo $iirelation->relid “<BR/>\n”;
    }
?>
```

Example: Query with parameters

```
<?php
    $link = ingres_connect(“iidbdb”, “ingres”, “ingres”);
    // Gives a list of the tables based on a parameter
    $sql = “select * from iirelation where relowner = ? order by relid asc”;
    $params[“owner1”] = (“usrname”);
    $rc = ingres_query($sql,$link,$params);
    // Do some error checking...
    while ( $iirelation=ingres_fetch_object($link) ) {
    echo $iirelation->relid “<BR/>\n”;
    }
?>
```

Example: Loading a BLOB

```
<?php
    // Fetch the image to be inserted
    $handle = fopen (“usrname.png”,”r”);
    $login_image = stream_get_contents($handle);
    fclose($handle);
    // Set up the query
    $sql = “insert into login_images values (?,?)”;
    // Type the parameters being passed
    $types = “vB”; // varchar, BLOB
    // Set up the parameter values
    $params[“login”] = “usrname”;
    $params[“image”] = $login_image;
    // Execute
    $rc = ingres_query($sql,$link,$params,$types);
?>
```

Chapter 7: Connecting to Ingres from Perl

This section contains the following topics:

Requirements (see page 37)
Ingres Perl DBI Extension (see page 37)
Requirements for Building the Ingres Perl DBI Extension (see page 38)
Build the DBD::Ingres Extension (see page 38)
Test and Install the DBD::Ingres Extension (see page 39)
How to Use the DBD::Ingres Extension (see page 39)
Example—Connect to Ingres and Select from a Table (see page 40)

Requirements

To connect to Ingres from Perl, you must meet the following prerequisites:

- Install and test Perl in your development environment
- Build and test the Ingres Perl DBI (database interface) driver
- Create a connection from Perl to Ingres

You can download the latest version of Perl from http://www.perl.org/ (http://www.perl.org/).

System requirements and other installation information are contained in the Ingres Perl DBI Extension readme, available from http://www.ingres.com/downloads/prod-download-drivers.php (http://www.ingres.com/downloads/prod-download-drivers.php).

Ingres Perl DBI Extension

The Ingres Perl DBI is a database extension for the Perl DBI system that enables access to Ingres databases. It is built on top of the standard Perl DBI extension. The driver supports database access to Ingres 9.0 (Ingres 2006) and prior versions.

The source code is available for download from the Comprehensive Perl Archive Network (CPAN) repository for Perl extensions at http://search.cpan.org/dist/DBD-Ingres/ (http://search.cpan.org/dist/dbd-ingres/).

For more information, see the Ingres Perl DBI Driver readme, available from http://search.cpan.org/~htoug/DBD-Ingres-0.51/Ingres.pm (http://search.cpan.org/~htoug/DBD-Ingres-0.51/Ingres.pm).

Requirements for Building the Ingres Perl DBI Extension

Before you can use the Ingres Perl extension, DBD::Ingres, you must first build and install it. Building the extension requires a C development environment and Ingres ESQL/C.

Build the DBD::Ingres Extension

The steps required to build the extension are common to all platforms except for a slight difference in the commands used.

To download and build the extension on Linux

1. Download the latest version of the DBD::Ingres extension from http://search.cpan.org/dist/DBD-Ingres/ (http://search.cpan.org/dist/dbd-ingres/).
2. Use a suitable tool to extract the downloaded files.

   A common command for UNIX or Linux would be:

   ```
   gzip -cd DBD-Ingres-0.51.tar.gz | tar xvf -
   ```
3. Open a command prompt or shell and change the directory to the location of the extracted files.
4. Ensure the Ingres environment is properly set up.

   Ensure that II_SYSTEM and platform-specific paths have LD_LIBRARY_PATH defined.
5. Enter the following command to generate the Makefile needed to build the extension:

   ```
   perl Makefile.PL
   ```
6. Build the extension:

   ```
   make
   ```

Test and Install the DBD::Ingres Extension

Perform the following procedure to test and install the DBD::Ingres extension.

To test and install the extension

1. Set the environment variable DBI_DSN to the name of a valid Ingres database, for example, **perldb**:

   ```
   DBI_DSN=perldb #ksh, bash, sh
   setenv DBI_DSN=perldb #tcsh, csh
   ```

2. Run the tests using the following command:

   ```
   make test
   ```

   If everything is set up correctly, the message "All tests successful" will be displayed.

3. Install the extension using the following command:

   ```
   make install
   ```

How to Use the DBD::Ingres Extension

To use the Ingres Perl module, the Perl DBI module must be included using the **use** statement. The data source name supplied to the DBI->connect() method is used determine the correct DBD module to load to make the database connection.

Example—Connect to Ingres and Select from a Table

The following is a simple segment of code that connects to the Ingres database iidbdb and selects from iitables.

```
use DBI;

# Define the database to used
$dbname = "dbi:Ingres:iidbdb";

# Connect to the database
my $dbh = DBI->connect($dbname, "", "");

# Prepare a statement
$cursor = $dbh->prepare("SELECT table_name, table_owner FROM iitables order by
table_name asc");

# Execute the cursor
$cursor->execute;

# Fetch the results
while ($row = $cursor->fetchrow_arrayref) {
     print(DBI::neat_list($row), "\n");
}

# Close the cursor
$cursor->finish;
```

Appendix A: Frequently Asked Questions on Ingres for Linux

This section contains the following topics:

Does Ingres Shut Down Automatically? (see page 41)
What Character Set Should I Use on Japanese SUSE Linux 9? (see page 41)
Which Linux Shell Should I Use? (see page 42)
Why Is Createdb Issuing Error Messages? (see page 42)
How Do I Get the Function Keys to Work? (see page 42)
How Do I Map Function Keys? (see page 43)
Should I Modify System Kernel Parameters? (see page 43)
What Switches Do I Use to Compile C Applications? (see page 44)
Do I Need to Change Permissions? (see page 44)
Why Does the Fortran Compiler Fail When Using G77? (see page 44)
How Do I Get Characters to Display Properly? (see page 45)

Does Ingres Shut Down Automatically?

I notice that Ingres starts automatically when the machine is started. Does it also stop automatically when the machine is shut down?

Yes. The ingstop command is issued when the machine is shut down.

What Character Set Should I Use on Japanese SUSE Linux 9?

I installed Ingres on Japanese SUSE Linux 9. Japanese SUSE's default encoding is set to ja_JP.UTF-8, which is not an Ingres-supported character set. What character set should I use?

Use kanjieuc for Ingres non-Unicode data types (for example char and varchar). If you want to use the Ingres Unicode data types, you must convert your UTF-8 data to UTF-16 format for storage in Ingres (regardless of the Ingres character set setting). To convert to UTF-16 format, you can use, for example, iconv(3).

Which Linux Shell Should I Use?

Linux provides multiple sh-type shells. Which should I use with Ingres?

On Linux systems, the file /bin/sh is a link to a shell such as bash, ash, ksh, or zsh. This shell is invoked when a Bourne shell script is run. Ingres was developed and tested on a Linux system using GNU bash, version 2.05b-50. Limited, successful testing has also been done with the ksh and zsh shells.

Why Is Createdb Issuing Error Messages?

I am having trouble creating databases with the createdb program. The program is issuing error messages. Why?

Make sure that you are not running the "createdb" program that is provided by PostgreSQL. Make sure that the PATH setting for the shell from which you install and start Ingres includes Ingres executable directories before other executable directories.

How Do I Get the Function Keys to Work?

How do I get the function keys to work with the forms-based Ingres applications on Linux?

The TERM_INGRES environmental variable defines the type of terminal you are using, so that the function keys will work when using the forms-based tools, such as CBF or QBF. On Linux, setting TERM_INGRES to konsolel will work for most terminals.

During installation, the value of TERM_INGRES is set to konsolel. You can change this value if it does not meet your needs.

How Do I Map Function Keys?

How can I map function keys PFK1 through PFK4 for an xterm?

Running Ingres in an xterm, set TERM to xterm and set TERM_INGRES to vt100fx. Then use xmodmap to determine and set your function keys. To show current settings, use the command xmodmap –pke . (To determine the syntax for your version of xmodmap, use man xmodmap.)

You will probably find that there are no bindings for KP_F1 through KP_F4; you will need to bind them.

For example: to bind keys Shift+F1 through Shift+F4, create a file "mykeys" that contains:

```
keycode 67 = F1 KP_F1
keycode 68 = F2 KP_F2
keycode 69 = F3 KP_F3
keycode 70 = F4 KP_F4
```

Then issue the command:

```
xmodmap mykeys
```

Shift+F1 through Shift+F4 will now be defined as PFK1 through PFK4.

Should I Modify System Kernel Parameters?

Do I need to modify system kernel parameters before running Ingres?

No. Standard kernels and kernels compiled with default values (without modifying the Linux source headers) should provide adequate resources. For additional information, see the Readme file.

You might, however, need to increase the maximum allowable size for shared memory segments. You can do this by running /sbin/sysctl –w kernel.shmmax=<*new value*> as root. Change is immediate and does not require a reboot.

Ingres will fail to start if any of the kernel parameters do not meet required values. You can check these parameters using the syscheck utility in $II_SYSTEM/ingres/utility, as follows:

```
syscheck
```

If syscheck reports any potential problems, use the following to generate a list of suitable parameters:

```
syscheck -c
```

The output is in the format expected by /sbin/sysctl. If the output is written to a file, the new values can be applied as follows:

```
syscheck -c > out.file
/sbin/sysctl -p outfile
```

What Switches Do I Use to Compile C Applications?

What compiler and compiler switches were used to create the Linux version of Ingres? Are additional switches needed for compiling C-language application programs?

Ingres was compiled using the GCC compiler version 3.3.3 with the following switches:

-fsigned-char -fno-strength-reduce -D_REENTRANT -DLINUX -D_GNU_SOURCE -DXLIB_ILLEGAL_ACCESS -D_FILE_OFFSET_BITS=64 -D_LARGEFILE_SOURCE -fPIC -O

Do I Need to Change Permissions?

Do I need to change the permissions for /dev/kmem to run Ingres on Linux?

No. While this step is required on some UNIX systems, it is not required for this version of Ingres for Linux.

Why Does the Fortran Compiler Fail When Using G77?

When I compile the Fortran code generated by the ESQLF pre-compiler using g77, it fails with 'Unrecognized statement name.....'. Why?

The g77 compiler (which is bundled with many, if not all, Linux distributions) does not support some of the statements that the ESQLF pre-compiler generates. More information is available at gnu.org.

How Do I Get Characters to Display Properly?

When using alternative Ingres character sets, must I do anything other than setting II_CHARSETXX, to get the characters to display correctly?

If your terminal is using the same character set as Ingres, you should not have a problem. If characters are not displaying correctly, try starting the terminal with a specific character set.

For example, if you are using SHIFTJIS (Japanese Double Byte character set) as the II_CHARSETXX setting in a kterm, start the kterm with the following command:

```
kterm -km sjis
```

If you encounter problems using double byte character sets and kterm, try using the rxvt terminal instead. For example, to start the rxvt terminal with the SHIFTJIS character set, issue this command:

```
rxvt -km sjis
```

Appendix B: Tools Quick Reference

The following table lists tools that are used frequently to perform operations in Ingres. Many of these operations can also be performed using the Visual Tools on Windows.

Note: This table uses the following conventions:

- Lowercase = Line-based command
- Lowercase **bold** = Command that starts a forms-based utility
- Uppercase = SQL statement

For command syntax and examples, see the *Command Reference Guide*.

Task	Tools	Also See
Start or stop Ingres	ingstart, ingstop	*Installation Guide*
Create or destroy databases	createdb, destroydb	*Database Administrator Guide*
Create tables	CREATE TABLE	*SQL Reference Guide*
Load or unload data	copydb, unloaddb, fastload	*Database Administrator Guide*
Back up or recover data	copydb, unloaddb, relocatedb, auditdb, chkpdb, rollforwarddb	*Database Administrator Guide*
Query	**isql**, sql, vdba	*SQL Reference Guide*
Maintain or tune databases	MODIFY, usermod, sysmod, optimizedb, alterdb, statdump	*Database Administrator Guide*
Configure installation	**cbf**, netutil, ingprenv, ingsetenv, ingunset, iigetres, iisetres, iiinitres	*System Administrator Guide*
Manage or monitor	**ipm**, iimonitor, lockstat, logstat, iinamu, cacheutil, syscheck, verifydb, infodb	*Interactive Performance Monitor Tools User Guide* *System Administrator Guide*
Authorize user access	**accessdb** GRANT, REVOKE	*Security Guide* *SQL Reference Guide*

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