Informix OLE DB Provider

Programmer's Guide

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In This Manual

This manual contains information about how to use Informix OLE DB Provider to enable OLE DB consumers, for example, ADO (Active Data Objects) applications and Web pages, to access Informix Dynamic Server.

Types of Users

This manual is written for the following audience:

- Database administrators who install and configure Informix database servers, databases, and connectivity products
- Developers who write applications using Informix OLE DB Provider

This manual is written with the assumption that you have the following background:

- A working knowledge of your computer, your operating system, and the utilities that your operating system provides
- Some experience with Microsoft OLE DB
- Some experience working with relational databases or exposure to database concepts

If you have limited experience with relational databases, SQL, or your operating system, refer to the *Getting Started* manual for your database server for a list of supplementary titles.

Software Dependencies

This manual is written with the assumption that you are using one of the following database servers:

- Informix Dynamic Server, Version 7.3 or later

- Informix Dynamic Server with Advanced Decision Support and Extended Parallel Options, Version 8.2 or later
- Informix Dynamic Server with Universal Data Option, Version 9.14.UC5 or 9.14.TC4 or later

Assumptions About Your Locale

Informix products can support many languages, cultures, and code sets. All the information related to character set, collation and representation of numeric data, currency, date and time is brought together in a single environment, called a GLS (Global Language Support) locale.

The examples in this manual are written with the assumption that you are using the default locale, **en_us.8859-1**. This locale supports U.S. English format conventions for dates, times, and currency. In addition, this locale supports the ISO 8859-1 code set, which includes the ASCII code set plus many 8-bit characters such as é, è, and ñ.

If you plan to use nondefault characters in your data or your SQL identifiers, or if you want to conform to the nondefault collation rules of character data, you need to specify the appropriate nondefault locale.

For instructions on how to specify a nondefault locale, additional syntax, and other considerations related to GLS locales, see the *Informix Guide to GLS Functionality*.

Additional Documentation

Informix OLE DB Provider documentation is provided in a variety of formats:

- **Printed documentation.** This manual, the *Informix OLE DB Provider Programmer's Guide*.
- **On-line manuals.** The Informix Answers OnLine CD allows you to print chapters or entire books and perform full-text searches for information in specific books or throughout the documentation set.

- **Documentation notes and release notes.** Documentation notes, which contain additions and corrections to the manuals, and release notes are located in the directory where the product is installed.

  Please examine these files because they contain vital information about application and performance issues.

The following publications provide related information:

- Microsoft's OLE DB specification (distributed with OLE DB SDK and available at Microsoft's Web site: http://www.microsoft.com/) describes the architecture and functionality of OLE DB providers in general.
- The *Getting Started* manual for your database server provides a comprehensive list of references about databases and operating systems.

Installing Informix OLE DB Provider

Informix OLE DB Provider is distributed with Informix Connect and the Informix Client Software Developer's Kit (SDK). Informix Connect or the Client SDK setup installs on your computer redistributable Microsoft Data Access components necessary for OLE DB data access. Setup also registers the provider DLL and copies the registration and unregistration SQL scripts into **INFORMIXDIR\ETC**. For installation instructions, see the *Informix Client Products Installation Guide for Microsoft Windows Environments*.

Conformance with OLE DB Specifications

Informix OLE DB Provider implements functionality for Base-level providers as described in the OLE DB leveling supplement distributed with the OLE DB specification, Version 2.0.

Informix OLE DB Provider also implements the following extended interfaces:

- DataSource (IPersistFile, IDBInfo, IDataSourceAdmin)

- Session (ITransactionLocal, IDBSchemaRowset, IDBCreate Command, IIndexDefinition, ITableDefinition)
- Command (IAccessor, ICommand, ICommandText, IColumnsInfo, ICommandProperties, ICommandWithParameters, IConvertType, ISupportErrorInfo)
- Rowset (IRowsetIdentity, IRowsetUpdate)

The following caveats apply to the use of scrollable rowsets and bookmarks:

- DBPROP_REMOVEDELETED, DBPROP_OWNINSERT, DBPROP_OTHERINSERT, and DBPROP_OTHERUPDATEDELETE for scrollable rowsets are read-only VARIANT_FALSE (corresponding ADO flags are: adOpenDynamic, adOpenKeyset, adOpenStatic). Use nonscrollable rowsets (ADO flags: adOpenForwardOnly) if you want the functionality that corresponds to setting these properties to VARIANT_TRUE.
- Bookmarks (corresponding ADO flags are: adOpenStatic, adOpen-Keyset) and updatability with pre-Version 9.2 servers can be requested only when a rowset is opened with IOpen-Rowset::OpenRowset() (corresponding ADO flagis adCmdTableDirect).
- A server-side scrollable cursor (corresponding ADO flags: adOpen-Dynamic, adOpenStatic, adOpenKeyset) cannot be opened if results include simple large objects (BYTE and TEXT) or collections. You can use server-side nonscrollable cursors (adOpenForwardOnly) or client-side scrollable cursors (adUseClient) with these types.
- DBPROP_IRowsetScroll is read-only VARIANT_FALSE for rowsets not opened with IOpenRowset::OpenRowset(). It is VARIANT_TRUE for rowsets opened with IOpenRowset::OpenRowset() if bookmarks are requested (corresponding ADO flags are: adOpenStatic, adOpenKeyset).

- Bookmarks (corresponding ADO flags are: adOpenStatic, adOpenKeyset) and modification or deletion of rows (ADO lock types: adLockPessimistic, adLockOptimistic, adLockBatchOptimistic) require a ROWID column in the table (insertion of rows does not). All nonfragmented tables and fragmented tables created with the WITH ROWIDS parameter (or altered with the WITH ROWIDS parameter applied) have this column. The ROWID column itself is not visible to consumers unless it is explicitly requested with '**select** rowid, ...'). If consumers require a persistent unique ID, use columns of SERIAL or SERIAL8 types (SERIAL8 is available in Informix Dynamic Server with Universal Data Option).

Data Types

Informix OLE DB Provider supports all built-in and user-defined data types. However, see the caveats regarding scrollable rowset limitations with simple large objects and collections in "Conformance with OLE DB Specifications" on page 3.

Support for large objects and user-defined data types is implemented as follows:

- The BYTE data type is reported by **IColumnsInfo::GetColumnInfo()** and appropriate schema rowsets as DBTYPE_BYTES; the TEXT data type is reported as DBTYPE_STR. Values of BYTE and TEXT types are cached in memory.
- Complex types available with the Universal Data Option are reported by **IColumnsInfo::GetColumnInfo()** and appropriate schema rowsets as DBTYPE_VARIANT. The corresponding value is SAFEARRAY of VARIANTs. This mapping is known to work with ADO and Visual Basic / VBScript.
- The CLOB data type available with the Universal Data Option is reported by **IColumnsInfo::GetColumnInfo()** and appropriate schema rowsets as DBTYPE_STR with the IS_LONG flag set; the BLOB data type as DBTYPE_BYTES with the IS_LONG flag set.

  This mapping allows ADO to open storage objects on the smart large object data and manipulate it with **GetChunk()** and **AppendChunk()**.

- Distinct types are generally resolved to the source: for example, if you define an HTML type as a distinct CLOB, **IColumnsInfo::GetColumnInfo()** and appropriate schema rowsets report it as DBTYPE_STR with the IS_LONG flag set. However, if a mapping to an IPersist* object has been created for the type (see below), it will be reported as DBTYPE_IUNKNOWN.
- User-defined data types (UDTs) are reported by **IColumnsInfo::GetColumnInfo()** and appropriate schema rowsets as DBTYPE_BYTES unless mappings to IPersist* objects are created for them (see the next bullet item).
- With the Universal Data Option, IPersistStream* and IPersistStorage objects can be persisted as instances of BLOB type. **IColumnsInfo::GetColumnsInfo()** and appropriate schema rowsets report these objects as DBTYPE_IUNKNOWN. Informix OLE DB Provider creates storage objects on the persisted data when bindings to DBTYPE_IUNKNOWN are requested for these types. If the bindings to DBTYPE_IDISPATCH are requested, Informix OLE DB Provider instantiates and loads appropriate IPersist* objects (assuming they are registered on the client computer). To support this functionality, the database administrator must insert information for IPersist* objects into the table **oledboleobjects** in the **sysmaster** database. For example:

```
insert into informix.oledboleobjects
values('thisdb', 'typeowner','typename', 't', 't',
        'app-progid');
```

  The columns in the **oledboleobjects** table are:

  - **database**—the database in which the type is created; specify an empty string if the type is available in all databases on the server.
  - **typeowner**—the owner of the type as specified in **sysxtdtypes**.
  - **typename**—the name of the type as specified in **sysxtdtypes**.
  - **persistsmartblob**—specify `True` if the in-row data is a smart large object handle; otherwise `False`.
  - **persiststorage**—specify `True` if the data is structured storage; specify `False` if it is stream.
  - **progid**—for an IPersist* object, specify `PROGID`; specify `null` for a storage object

Informix OLE DB Provider loads the contents of the **oledboleobjects** table when it connects to the database and uses the information to create appropriate storage objects and to instantiate IPersist* objects according to the specified binding.

Warning: *Because adding information to this table can cause Informix OLE DB Provider to instantiate IPersist* objects on client computers, the database administrator should have a complete understanding of the possible security risks of using a specific object.*

Informix OLE DB Provider maps the Informix decimal type to OLE DB 2 VARNUMERIC, and the Informix MONEY type to OLE DB NUMERIC. Some ADO consumers (for example, Microsoft Visual Basic 6) attempt to convert these VARNUMERIC values into OLE DECIMAL values that might not be able to represent Informix decimal or money values. To allow these consumers to work with Informix decimal and money values, Informix OLE DB Provider has the decasr8 DBPROP_PROVIDERSTRING parameter that will tell it to map these values to R8 (double precision). OLE DB consumers often allow the setting of DBPROP_PROVIDERSTRING as "Extended Properties." When you open ADO connections or record sets, you can specify these settings as a part of the connection string (the settings are case sensitive).

Informix OLE DB Provider maps Informix interval values to OLE DB NUMERIC. The whole part of NUMERIC represents the years, months, days, hours, minutes, and seconds parts of an interval. The fractional part of NUMERIC represents the fractions part of an interval. For example, an interval of 2 days, 01 hours, 10 minutes, 0 seconds and 1 / 100 fractions would be represented by NUMERIC value 2011000.01.

Support for Threading, Transactions, and MTS

Informix OLE DB Provider supports an apartment threading model and local transactions. (Refer to Microsoft's COM specification, available at its Web site, for more information about apartment threading.)

Informix OLE DB Provider works with MTS (Microsoft Transaction Server) packages; however, pooling and distributed transaction support are not implemented in Version 2.0.

Internationalization and Identifiers

Informix OLE DB Provider uses Win32 functions to convert between Unicode and MBCS (Multibyte Character Sequence). Informix OLE DB Provider assumes that the client locale corresponds to the Windows code page.

If DELIMIDENT is set, Informix OLE DB Provider encloses all identifiers in quotes in the SQL it generates (for example, when it executes an update). You should set DELIMIDENT if the user's tool encloses identifiers in quotes. Identifiers are case sensitive only when enclosed in quotes.

Data Source Considerations

Informix OLE DB Provider treats the database (rather than the database server instance) as a data source.

Informix OLE DB Provider requires data source names to be in the format [*database*][**@***server*]. If the database part is missing, the client user name is used. If the *@server* part is missing, the default database server (corresponding to the value specified by the **INFORMIXSERVER** environment variable) is used.

Resolving Installation and Configuration Problems

This section describes problems that you might encounter during installation and configuration of Informix OLE DB Provider; it provides resolutions to these problems.

Tip: *If the problem you are experiencing does not match one listed here, or the proposed resolution does not work for you, call Informix Technical Support.*

Informix OLE DB Provider Not Registered

Problem: When you attempt to connect to an Informix data source, a message says that Informix OLE DB Provider is not registered. Informix OLE DB Provider is not visible in the enumeration (for example, in the Initialize Data Source dialog box in Microsoft's OLE DB query demo).

Possible cause: Informix OLE DB Provider is not installed.

Resolution: Informix OLE DB Provider is a Custom installation option. You need to install Informix Connect or Informix Client SDK with the Custom option and choose Informix OLE DB Provider if you want it installed. Installing Informix OLE DB Provider also installs redistributable Microsoft Data Access components that Informix OLE DB Provider requires. You must also have administrative account privileges. If Informix OLE DB Provider is copied to your computer (**INFORMIXDIR\bin\ifxoledbc.dll**) but still is not visible in the enumeration, try to go to **INFORMIXDIR\bin** and run `regsvr32 ifxoledbc.dll`.

Class Not Registered

Problem: When you attempt to connect to an Informix data source, the message `Class not registered` appears.

Possible cause: The Informix OLE DB Provider DLL could not be loaded.

Resolution: Check that the Informix OLE DB Provider DLL is in the location recorded in the Registry entry. The Registry entry should point to **bin\ifxoledbc.dll** in your Informix Connect or INFORMIX Client SDK Version 2.30 or later installation. If that is not the case, reregister Informix OLE DB Provider (see "Informix OLE DB Provider Not Registered" on page 8). Refer to the Registry entries section in the Microsoft OLE DB documentation for more information.

Cannot Establish a Connection

Problem: You cannot establish a connection.

Possible cause: Basic connectivity was not set up.

Resolution: Use ILogin demo (included with your Informix Client SDK) to verify that you can connect.

Database Not Found

Problem: A connection attempt fails; a message appears saying that the database is not found.

Possible cause: A bad database name or no database name at all was specified, and no database corresponding to your client user name exists on the server.

Resolution: Make sure that your data source name is specified correctly; see "Data Source Considerations" on page 8.

Oledbversion Table Not Found

Problem: A connection attempt fails; a message appears saying that the table **oledbversion** was not found.

Possible cause: The setup script, **coledbp.sql**, has not been run against that server's **sysmaster** database.

Resolution: The database administrator must run the setup script against the **sysmaster** database on the server to which you are trying to connect.

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