[MS-OLEDBSTR]:
OLEDB Connection String Structure Specification

Revision Summary

Date	Revision History	Revision Class	Comments
06/27/2008	1.0	Major	First release.
10/06/2008	1.01	Editorial	Revised and edited the technical content.
12/12/2008	1.02	Editorial	Revised and edited the technical content.
08/07/2009	1.1	Minor	Updated the technical content.
11/06/2009	1.1.2	Editorial	Revised and edited the technical content.
03/05/2010	1.1.3	Editorial	Revised and edited the technical content.
04/21/2010	1.1.4	Editorial	Revised and edited the technical content.
06/04/2010	1.1.5	Editorial	Revised and edited the technical content.
09/03/2010	1.1.5	No change	No changes to the meaning, language, or formatting of the technical content.
02/09/2011	1.1.5	No change	No changes to the meaning, language, or formatting of the technical content.
07/07/2011	1.1.5	No change	No changes to the meaning, language, or formatting of the technical content.

Release: Thursday, July 7, 2011

Contents

1 Introduction

The OLE DB Connection String Structure Specification is a specification of the format of **connection strings** that are used by **OLE DB consumers**. A connection string is a string that is sent from an OLE DB consumer to an **OLE DB provider** and that specifies the information that is needed to establish a **connection** to a **data source**.

1.1 Glossary

The following terms are defined in [MS-GLOS]:

> **Authentication Service (AS)**
> **code page**
> **connection**
> **domain**
> **encryption**
> **Internet Protocol version 4 (IPv4)**
> **IPv4 address in string format**
> **IPv6 address in string format**
> **Kerberos**
> **language code identifier (LCID)**
> **named pipe**
> **NT LAN Manager (NTLM) Authentication Protocol**
> **OEM character**
> **path**
> **plaintext**
> **remote procedure call (RPC)**
> **session**
> **Stored Procedure**
> **Unicode**
> **XML**

The following terms are defined in [MS-OFCGLOS]:

> **connection string**
> **data source**
> **OLE DB**

The following terms are specific to this document:

database instance: A database that has a unique set of services that can have unique settings.

data source object: An instance of a COM class that exposes a set of **OLE DB** interfaces. A data source object can be used to establish a **connection** to a **data source**.

generic key: A key in a **connection string**, the meaning of which is the same across all **OLE DB providers**. Different OLE DB providers can define their own valid values (as a subset of the generic valid values) and default values for a generic key.

OLE DB consumer: A software component that requests information through a set of **OLE DB** interfaces.

OLE DB provider: A software component that returns information to an **OLE DB consumer** through a set of **OLE DB** interfaces. Each provider exposes data access to a particular type of **data source**.

provider-specific key: A key in a **connection string**, the meaning of which is determined by an individual provider.

MAY, SHOULD, MUST, SHOULD NOT, MUST NOT: These terms (in all caps) are used as described in [RFC2119]. All statements of optional behavior use either MAY, SHOULD, or SHOULD NOT.

1.2 References

1.2.1 Normative References

We conduct frequent surveys of the normative references to assure their continued availability. If you have any issue with finding a normative reference, please contact dochelp@microsoft.com. We will assist you in finding the relevant information. Please check the archive site, http://msdn2.microsoft.com/en-us/library/E4BD6494-06AD-4aed-9823-445E921C9624, as an additional source.

[MS-LCID] Microsoft Corporation, "Windows Language Code Identifier (LCID) Reference".

[MS-ODBCSTR] Microsoft Corporation, "ODBC Connection String Structure Specification".

[MS-SSAS8] Microsoft Corporation, "SQL Server Analysis Services Version 8.0 Protocol Specification".

[MS-SSAS9] Microsoft Corporation, "SQL Server Analysis Services Protocol Specification".

[MS-TDS] Microsoft Corporation,"Tabular Data Stream Protocol Specification".

[RFC791] Postel, J., "Internet Protocol", STD 5, RFC 791, September 1981, http://www.ietf.org/rfc/rfc791.txt

[RFC793] Postel, J., "Transmission Control Protocol", STD 7, RFC 793, September 1981, http://www.ietf.org/rfc/rfc0793.txt

[RFC1002] Network Working Group, "Protocol Standard for a NetBIOS Service on a TCP/UDP Transport: Detailed Specifications", STD 19, RFC 1002, March 1987, http://www.ietf.org/rfc/rfc1002.txt

[RFC2460] Deering, S., and Hinden, R., "Internet Protocol, Version 6 (IPv6) Specification", RFC 2460, December 1998, http://www.ietf.org/rfc/rfc2460.txt

[RFC4234] Crocker, D., Ed., and Overell, P., "Augmented BNF for Syntax Specifications: ABNF", RFC 4234, October 2005, http://www.ietf.org/rfc/rfc4234.txt

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997, http://www.ietf.org/rfc/rfc2119.txt

1.2.2 Informative References

[MS-GLOS] Microsoft Corporation, "Windows Protocols Master Glossary".

[MS-OFCGLOS] Microsoft Corporation, "Microsoft Office Master Glossary".

[MSDN-CDIM] Microsoft Corporation, "Impersonation Levels", http://msdn.microsoft.com/en-us/library/ms686632(VS.85).aspx

[MSDN-COMCS] Microsoft Corporation, "COM+ (Component Services)", http://msdn.microsoft.com/en-us/library/ms685978(VS.85).aspx

[MSDN-CSOLEDB] Microsoft Corporation, "The Cursor Service for OLE DB", http://msdn.microsoft.com/en-us/library/ms714397(VS.85).aspx

[MSDN-DAD] Microsoft Corporation, "Detaching and Attaching Databases", http://msdn.microsoft.com/en-us/library/ms190794.aspx

[MSDN-ODBPG] Microsoft Corporation, "OLE DB Programmer's Guide", http://msdn.microsoft.com/en-us/library/ms713643(VS.85).aspx

[MSDN-ODBS] Microsoft Corporation, "OLE DB Services", OLE DB Programmer's Guide, http://msdn.microsoft.com/en-us/library/ms717922(VS.85).aspx

[MSDN-SD] Microsoft Corporation, "Selecting a Database", http://msdn.microsoft.com/en-us/library/ms180770.aspx

[MSDN-SQLOLEDB] Microsoft Corporation, "SQL Server Provider", http://msdn.microsoft.com/en-us/library/ms720897(VS.85).aspx

[MSDN-UNI] Microsoft Corporation, "Using Named Instances", http://msdn.microsoft.com/en-us/library/ms165614.aspx

[MSFT-KB313295] Microsoft Corporation, "How to use the server name parameter in a connection string to specify the client network library", http://support.microsoft.com/kb/313295

[MSFT-KB328383] Microsoft Corporation, "SQL Server clients may change protocols when the client computers try to connect to an instance of SQL Server", http://support.microsoft.com/kb/328383

[PIPE] Microsoft Corporation, "Named Pipes", http://msdn.microsoft.com/en-us/library/aa365590.aspx

[SSPI] Microsoft Corporation, "SSPI", http://msdn.microsoft.com/en-us/library/aa380493.aspx

1.3   Structure Overview (Synopsis)

A connection string consists of zero or more key/value pairs that specify a set of properties of a connection to a data source, including information such as the provider name, user ID, password, and provider-specific information.

1.4   Relationship to Protocols and Other Structures

None.

1.5   Applicability Statement

This document specifies a persistence format for **OLE DB** connection strings. The connection strings are used to facilitate establishing a connection between an OLE DB consumer and a data source in scenarios in which network or local connectivity is available.

Further, this document specifies the format of a connection string that is used to establish a connection between an OLE DB consumer and the Microsoft OLE DB Provider for Microsoft® SQL Server® and the Microsoft OLE DB Provider for SQL Server Analysis Services. This persistence format provides interoperability with OLE DB consumers that create or use portions of documents that conform to this structure.

1.6 Versioning and Localization

None.

1.7 Vendor-Extensible Fields

Vendors can define **provider-specific keys** and can specify the meanings of these keys and the corresponding valid values. The name of a provider-specific key MUST conform to the naming rules that are specified in section 2.2 and MUST NOT be the same as the name of any **generic key** that is specified in section 2.3.

2 Structures

An OLE DB connection string MUST be a **Unicode** string and MUST conform to the ABNF [RFC4234] grammar that is specified in section 2.2.

2.1 Requirements for Connection Strings

2.1.1 Empty Connection String

A connection string can be empty.

2.1.2 Case-sensitivity

Keys are case-insensitive.

2.1.3 Multiple Occurrences of the Same Key

If the same key occurs multiple times in one connection string, the value from the last key/value pair MUST be used.

2.1.4 Conflicts Between Keys

If there are conflicts between values that are specified for different keys, the behavior of the provider is provider-specific.

2.2 ABNF Rules

2.2.1 Common ABNF Rules

The following ABNF [RFC4234] rules are used by sections 2.2.2 and 2.2.3 and are included for reference.

ABNF Syntax:

```
SC              = %x3B      ; semicolon
HTAB            = %x09      ; horizontal tab
SP              = %x20      ; space
WSP             = SP / HTAB ; space or horizontal tab
SQUOTE          = %x27      ; single quote
ESCAPEDSQUOTE   = 2SQUOTE   ; escaped single quote
DQUOTE          = %x22      ; double quote
ESCAPEDDQUOTE   = 2DQUOTE   ; escaped double quote
EQ              = %x3D      ; equals sign
ESCAPEDEQ       = 2EQ       ; escaped equal sign
PLUS            = %x2B      ; plus sign
MINUS           = %x2D      ; minus sign
```

2.2.2 OLE DB Connection String Format

OleDBConnectionString specifies a set of keys and associated values. The string MUST conform to the following ABNF [RFC4234] grammar:

```
 OleDBConnectionString = *(ConnStringClause SC) [ConnStringClause [SC]]
 ConnStringClause = KeyValuePair / *WSP
 KeyValuePair = *WSP Key *WSP EQ *WSP Value *WSP
 Key = (ESCAPEDEQ / NonWSPSemiColonEqualChar) [*(ESCAPEDEQ / NonSemiColonEqualChar)
(ESCAPEDEQ / NonWSPSemiColonEqualChar)]
 Value = NotQuotedLiteralValue / SQUOTE SQuotedLiteralValue SQUOTE / DQUOTE
DQuotedLiteralValue DQUOTE / CompoundValue
 NotQuotedLiteralValue = [NonWSPQuoteSemiColonEqualChar [ *NonSemiColonChar
NonWSPSemiColonChar] ]
 SQuotedLiteralValue = *((ESCAPEDSQUOTE) / NonSQUOTEChar)
 DQuotedLiteralValue = *((ESCAPEDDQUOTE) / NonDQUOTEChar)
 NonWSPSemiColonEqualChar = %x01-08 / %x0A-1F / %x21-3A / %x3C / %x3E-FFFF
 NonSemiColonEqualChar = %x01-3A / %x3C / %x3E-FFFF
 NonWSPQuoteSemiColonEqualChar = %x01-08 / %x0A-1F / %x21 / %x23-26 / %x28-3A / %x3C / %x3E-
FFFF
 NonSemiColonChar = %x01-3A / %x3C-FFFF
 NonWSPSemiColonChar = %x01-08 / %x0A-1F/ %x21-3A / %x3C-FFFF
 NonSQUOTEChar = %x01-26 / %x28-FFFF
 NonDQUOTEChar = %x01-21 / %x23-FFFF
```

CompoundValue is specified in section 2.3.

2.2.2.1 KeyValuePair

A **KeyValuePair** is composed of a key and a value, separated by an "EQ".

2.2.2.2 Key

A key can be composed of any character except "%x00", "SC", or "EQ", unless the "EQ" is part of an "ESCAPEDEQ".

2.2.2.3 Value

A value that is a string can be enclosed by SQUOTE or DQUOTE. Any space that precedes the first quote is not a part of a key and MUST be ignored. Characters other than "WSP" MUST NOT be included after the second quote. To include preceding or trailing spaces in a value, the value MUST be enclosed in either SQUOTE or DQUOTE.

2.2.2.4 SQUOTE, DQUOTE, SC

SQUOTE, DQUOTE and SC each have a specific meaning in a connection string. If a value contains one of these characters, the value MUST be enclosed in either SQUOTE or DQUOTE.

To include a single quote character in an **SQuotedLiteralValue**, ESCAPEDSQUOTE MUST be used. To include a double quote character in a **DQuotedLiteralValue**, ESCAPEDDQUOTE MUST be used.

2.2.3 Keys with Compound Values

Some keys can have compound values. A compound value for a key consists of zero or more valid value components, separated by the pipe character (|). Either the symbolic names of the valid value components or their corresponding numeric values can be used. Symbolic names are case-insensitive.

CompoundValue specifies a compound value for a key. The format of the string MUST conform to the following ABNF [RFC4234] grammar:

```
CompoundValue = *((SymbolicComponent / NumericComponent) *WSP "|" *WSP) (SymbolicComponent/
NumericComponent)
SymbolicComponent = 1*SymbolicComponentChar
SymbolicComponentChar = %x01-08 / %x0A-1F / %x21-3A / %x3C / %x3E-7B / %x7D-FFFF
NumericComponent = HexValue / OctValue / DecValue
HexValue = ("+0" / "-0" / "0") ("x" / "X") 1*(HEXDIG / %x61-66)
OctValue = ("+0" / "-0" / "0") *%x30-37
DecValue = ("+" %x31-39 / "-" %x31-39 / %x31-39) *DIGIT
```

2.2.4 Using Symbolic Names in Values

When a symbolic name is used in a value, the symbolic name is case-insensitive.

2.3 Generic Keys

The following table specifies generic keys that can be used in a connection string.<1>

Key	Meaning
Provider	Specifies the name of the OLE DB provider.<2>
Cache Authentication	Specifies whether authentication information can be stored in a cache of the OLE DB provider. The valid values are "true" and "false".
Encrypt Password	Specifies whether the password is encrypted before it is sent to the data source. The valid values are "true" and "false".
Integrated Security	Specifies the name of the **Authentication Service (AS)** that the data source uses to identify the user who is using the identity that is provided by an authentication **domain**.<3>
Mask Password	Specifies whether the password cannot be sent to the data source in **plaintext**. The valid values are "true" and "false".
Password	Specifies the password to be used when connecting to the data source.
Persist Encrypted	Specifies whether the OLE DB consumer requests authentication information to be encrypted if the connection string is persisted.<4> The valid values are "true" and "false".
Persist Security Info	Specifies whether authentication information can be persisted by the OLE DB provider. The valid values are "true" and "false".
User ID	Specifies the user ID to be used when connecting to the data source.
Asynchronous Processing	Specifies the asynchronous processing operations that the OLE DB consumer requests to be performed on the **data source object**. This key can have a compound value. Only the following value component is valid: "Initialize": Specifies that the data source object is initialized asynchronously.<5> The corresponding numeric value is 0x1.
Bind Flags	Reserved and MUST NOT be used.
Initial Catalog	Specifies the name of the database to be used after the connection is established.
Data Source	Specifies the name of the data source to which to connect.<6>
General	Specifies the number of seconds before a request for a data source object times out.

Key	Meaning
Timeout	The valid values are signed integers that range from greater than or equal to -2147483648 to less than or equal to 2147483647.
Window Handle	Specifies the element of a graphical user interface that a provider can use to prompt for additional connection information. The valid values are signed integers that range from greater than or equal to -2147483648 to less than or equal to 2147483647 on a 32-bit platform and that range from greater than or equal to -9223372036854775808 to less than or equal to 9223372036854775807 on a 64-bit platform.
Impersonation Level	Specifies the OLE DB consumer-requested impersonation level that is to be used by the data source when it is impersonating the data source object. For more information about impersonation levels, see [MSDN-CDIM]. The valid values are the following: "Anonymous": Anonymous level. The corresponding numeric value is 0x0. "Identify": Identify level. The corresponding numeric value is 0x1. "Impersonate": Impersonate level. The corresponding numeric value is 0x2. "Delegate": Delegate level. The corresponding numeric value is 0x3.
Locale Identifier	Specifies the **language code identifier (LCID)** to be sent to the data source.<7> The valid values are an LCID or one of the following predefined literals: "User Default": The default LCID of the user of the OLE DB consumer. "System Default": The default LCID of the system of the OLE DB consumer.
Location	Specifies the **path** to the data source.<8>
Lock Owner	Reserved and MUST NOT be used.
Mode	Specifies the mode in which the OLE DB consumer requests to open the data source. This key can have a compound value. The valid value components are the following: "Read": Read-only access permission. The corresponding numeric value is 0x1. "Write": Write-only access permission. The corresponding numeric value is 0x2. "ReadWrite": Read/write access permission. The corresponding numeric value is 0x3. "Share Deny Read": Prevents other data source open requests from opening a connection in read mode. The corresponding numeric value is 0x4. "Share Deny Write": Prevents other data source open requests from opening a connection in write mode. The corresponding numeric value is 0x8. "Share Exclusive": Prevents other data source open requests from opening a connection in read/write mode. The corresponding numeric value is 0xC. "Share Deny None": Specifies that neither read nor write access can be denied to other data source open requests. The corresponding numeric value is 0x10.
OLE DB Services	Specifies the services that the OLE DB consumer requests the OLE DB Services component to enable or disable for the data source object. For more information about OLE DB Services, see [MSDN-ODBS]. This key can have a compound value. The valid value components are the following: "ResourcePooling": Resource pooling is enabled. The corresponding numeric value is 0x1. "TxnEnlistment": **Sessions** in a Component Services environment are automatically enlisted in a global transaction where required. See [MSDN-COMCS] for more information about Component Services and Global Transaction. The corresponding numeric value is 0x2. "ClientCursor": The Client Cursor Engine is enabled.<9> See [MSDN-CSOLEDB] for

Key	Meaning
	more information about Client Side Cursor. The corresponding numeric value is 0x4.
	"AgrAfterSession": Services that operate beyond the session level, including the Client Cursor Engine, are enabled. The corresponding numeric value is 0x8.
	"EnableAll": All services are enabled. The corresponding numeric value is 0xFFFFFFFF.
	"DisableAll": All services are disabled. The corresponding numeric value is 0x0.
Prompt	Specifies the OLE DB consumer-requested level of prompting for connection information during initialization of a data source object. The connection information that is required is provider-specific. The valid values are the following:
	"Prompt": Always prompt for connection information. The corresponding numeric value is 0x1.
	"Complete": Prompt only if the connection string does not contain sufficient information to establish a connection. The corresponding numeric value is 0x2.
	"CompleteRequired": Prompt only for required information if more required information is needed. The corresponding numeric value is 0x3.
	"NoPrompt": Do not prompt for connection information. The corresponding numeric value is 0x4.
Protection Level	Specifies the OLE DB consumer-requested level of protection for the data that is sent between a data source object and a data source. This key applies only to network connections other than **remote procedure call (RPC)** connections. The valid values are the following:
	"None": Performs no authentication of data sent to the data source. The corresponding numeric value is 0x0.
	"Connect": Authenticates only when the data source object establishes the connection with the data source. The corresponding numeric value is 0x1.
	"Call": Authenticates the source of the data at the beginning of each request from the data source object to the data source. The corresponding numeric value is 0x2.
	"Pkt": Verifies that all data received is from the data source object. The corresponding numeric value is 0x3.
	"Pkt Integrity": Verifies that all data received is from the data source object and that it has not been changed in transit. The corresponding numeric value is 0x4.
	"Pkt Privacy": Verifies that all data received is from the data source object and that it has not been changed in transit, and encrypts the data. The corresponding numeric value is 0x5.
Extended Properties	Specifies provider-specific extended connection information.
Connect Timeout	Specifies the amount of time, in seconds, to wait for a connection to complete. The valid values are signed integers that range from greater than or equal to -2147483648 to less than or equal to 2147483647.

2.4 Microsoft OLE DB Provider for SQL Server Connection String

A Microsoft OLE DB Provider for Microsoft® SQL Server® connection string is an **OleDBConnectionString** that has additional provider-specific keys allowed. For more information about the Microsoft OLE DB Provider for SQL Server, see [MSDN-SQLOLEDB]. The following table specifies the provider-specific keys for the Microsoft OLE DB Provider for SQL Server.

Key	Meaning
Application Name	Specifies the name of the OLE DB consumer. This key does not have a default value.
Auto Translate	Specifies whether the OLE DB consumer requests the provider to convert **OEM characters** or ANSI characters between the **code page** of the OLE DB consumer and the code page of the database when characters are retrieved from or sent to the database. The valid values are "true" and "false." The default value is "true".
Current Language	Specifies the language that is used for database message selection and formatting. This key does not have a default value.
Network Address	Specifies the network address of an instance of the database server. If the value of the **Network Address** key is not specified, the default value is the value of the **Data Source** key. If the value of the **Data Source** key contains an instance name, the instance name that is contained in the value of the **Data Source** key will be appended to the value of the **Network Address** key. For more information about instance names, see [MSDN-UNI]. The network address MUST be in TCP format or NP format. **TCP format** tcp:<host name>\<instance name> tcp:<host name>,<TCP/IP port number> TCP format MUST start with the prefix "tcp:" and is followed by the **database instance**, specified by a <host name> and an <instance name>. The <host name> MUST be specified in one of three ways: NetBIOSName [RFC1002], **IPv4Address** [RFC791], or **IPv6Address** [RFC2460]. The <instance name> is used to resolve to a particular TCP/IP port number [RFC793] on which a database instance is hosted. Alternatively, a <TCP/IP port number> can be specified directly. If both <instance name> and <port number> are not present, the default database instance is used. **NP format** np:\\<host name>\pipe\<pipe name> NP format MUST start with the prefix "np:" and is followed by a **named pipe** name. The <host name> MUST be specified in one of three ways: NetBIOSName [RFC1002], IPv4Address [RFC791], or IPv6Address [RFC2460]. The <pipe name> is used to identify the database instance to which to be connected. If the value of the **Network Library** key is specified, the prefixes "tcp:" and"np:" SHOULD NOT be specified.<10> For more information about the format of the **Network Address** key, see [MSFT-KB313295]. For more information about named pipes, see [PIPE].
Network Library	This key is the name of the network component that is used to communicate with the database server*. This key does not have a default value.
Packet Size	Sets the network packet size in bytes (as specified by the **PacketSize** field in section 2.2.6.3 of [MS-TDS]) to be used for data exchange between the data source object and the database. The valid values are unsigned integers that range from greater than or equal to 512 to less than or equal to 32767. The default packet size is 4096 bytes.
Use Procedure for Prepare	Specifies that the OLE DB consumer requests a temporary **stored procedure** to be created on the database when a command is prepared. The valid values are the following: "1": A temporary Stored Procedure is created when a command is prepared. All

Key	Meaning
	temporary Stored Procedures are dropped when the session is released.
	"2": A temporary stored procedure is created when a command is prepared. The procedure is dropped when the command is unprepared, when a new command is specified, or when all application references to the command are released.
	The default value is "1".
Workstation ID	Sets the workstation identifier as specified by the **ibHostName** and **cchHostName** fields in section 2.2.6.3 of of **[MS-TDS]**. The default value is the name of the workstation that is running the OLE DB consumer.
Initial File Name	Sets the name of the primary file of an attachable database as specified by the **ibAtchDBFile** and **cchAtchDBFile** fields in section 2.2.6.3 of of **[MS-TDS]**. This key does not have a default value. For more information about attachable databases, see [MSDN-DAD]. If a value for this key is specified, a value for the **Initial Catalog** key MUST also be specified.
Use **Encryption** for Data	Specifies whether data should be encrypted before sending it over the network. The valid values are "true" and "false". The default value is "false".
Replication server name connect option	Sets the server name (as specified by the **ibServerName** and **cchServerName** fields in section 2.2.6.3 of of **[MS-TDS]**) and replication login type (as specified by the **fUserType** field in section 2.2.6.3 of **[MS-TDS]**) that the OLE DB consumer requests to send to the database server.
Tag with column collation when possible	Specifies whether the OLE DB consumer requests that data be tagged with collation information that is obtained from the database server instead of from the code page on the provider. The valid values are "true" and "false". The default value is "false".

*There are several of these named components (values),<11> each of which implements a specific protocol behavior.

2.5   Microsoft OLE DB Provider for SQL Server Analysis Services Connection String

A Microsoft OLE DB Provider for Microsoft® SQL Server® Analysis Services connection string is an **OleDBConnectionString** that has additional provider-specific key allowed. The following table specifies the provider-specific keys for the Microsoft OLE DB Provider for Microsoft® SQL Server® 2005 Analysis Services [MS-SSAS9] and the Microsoft OLE DB Provider for Microsoft® SQL Server® 2000 Analysis Services [MS-SSAS8].

Key	Meaning
SSPI	Specifies the type of Security Support Provider Interface that is requested by the OLE DB consumer. For more information about Security Support Provider Interface, see [SSPI]. The valid values are the following:
	"Negotiate": Negotiate authentication
	"Kerberos": **Kerberos** authentication
	"NTLM": **NT LAN Manager (NTLM) Authentication Protocol** authentication
	"Anonymous": No authentication
	The default value is "Negotiate".
	This key applies to the Microsoft OLE DB Provider for SQL Server 2005 Analysis Services [MS-SSAS9] and the Microsoft OLE DB Provider for SQL Server 2000 Analysis Services [MS-SSAS8].
Protocol	Specifies the OLE DB consumer-requested encoding format for **XML** messages on this

Key	Meaning
Format	connection. The valid values are the following:
	"Default": Binary encoding
	"XML": Text encoding
	"Binary": Binary encoding
	This key applies to the Microsoft OLE DB Provider for SQL Server 2005 Analysis Services [MS-SSAS9].
Transport Compression	Specifies whether the OLE DB consumer requests messages on this connection to be compressed. The valid values are the following:
	"Default": Messages are compressed.
	"None": Messages are not compressed.
	"Compressed": Messages are compressed.
	This key applies to the Microsoft OLE DB Provider for SQL Server 2005 Analysis Services [MS-SSAS9].
Compression Level	Specifies the OLE DB consumer-requested level of compression when the value of the **Transport Compression** key is "Compressed". A value of "0" specifies minimum compression, and a value of "9" specifies maximum compression. The valid values are integers that range from greater than or equal to 0 to less than or equal to 9.
	When the value of the **Transport Compression** key is not "Compressed", the value of the **Compression Level** key MUST be ignored if present.
	This key applies to the Microsoft OLE DB Provider for SQL Server 2005 Analysis Services [MS-SSAS9].
SessionID	Specifies the ID of the session to use in this connection.<12>
	This key applies to the Microsoft OLE DB Provider for SQL Server 2005 Analysis Services [MS-SSAS9].
Auto Synch Period	Specifies the OLE DB consumer-requested frequency, in milliseconds, of synchronization between the OLE DB provider and the server. The default frequency is 10000 milliseconds.
	This key applies to the Microsoft OLE DB Provider for SQL Server 2000 Analysis Services [MS-SSAS8].

Release: Thursday, July 7, 2011

3   Structure Examples

The following examples illustrate the structure and syntax of OLE DB connection strings that are used in common scenarios.

Identical key/value pairs that occur in multiple examples are described in only the first example in which they occur but have the same meaning in each example.

3.1   Integrated Security

```
Provider=sqloledb;Data Source=ServerName;Integrated Security=SSPI;
```

"Provider=sqloledb" specifies that the Microsoft OLE DB Provider for Microsoft® SQL Server® is the OLE DB provider for this connection.

"Data Source=ServerName" specifies that "ServerName" is the name of the data source to which the connection is established.

"Integrated Security=SSPI" specifies that Security Support Provider Interface [SSPI] is used as the Authentication Service (AS) for this connection.

3.2   Standard Security Connection

```
Provider=sqloledb;Data Source=ServerName;User Id=UserName;Password=UserPassword;
```

"User ID=UserName" specifies that "UserName" is the name of the user who is establishing the connection.

"Password=UserPassword" specifies that "UserPassword" is the password of the user who is establishing the connection.

3.3   Named Instance

```
Provider=sqloledb;Data Source=ServerName\InstanceName;Integrated Security=SSPI;
```

"Data Source=ServerName\InstanceName" specifies that the connection is being established to the "InstanceName" named instance on the server whose name is "ServerName".

3.4   IP Address as Data Source

```
Provider=sqloledb;Data Source=192.168.2.1\InstanceName;Integrated Security=SSPI;
```

"Data Source=192.168.2.1\InstanceName" specifies that the connection is being established to the "InstanceName" named instance on the server whose **IPv4** address is 192.168.2.1.

3.5   Initial Catalog

```
Provider=sqloledb;Data Source=ServerName;Initial Catalog=DatabaseName;Integrated
Security=SSPI;
```

"Initial Catalog=DatabaseName" specifies that the database named "DatabaseName" is used after the connection is established.

3.6 Network Library

```
Provider=sqloledb;Data Source=ServerName;Integrated Security=SSPI;Network Library=DBMSSOCN;
```

"Network Library=DBMSSOCN" specifies that the name of the network component that is used to communicate with the data source is "DBMSSOCN".

3.7 Encryption

```
Provider=sqloledb;Data Source=ServerName;Integrated Security=SSPI;Use Encryption for
Data=true;
```

"Use Encryption for Data=true" specifies that the OLE DB consumer is requesting that the OLE DB provider encrypt the data.

3.8 Escaped Equals Sign

```
Provider=ProviderName;Data Source=ServerName;Verification==Security=True;Many====One=Valid
```

"Provider=ProviderName" specifies that "ProviderName" is the OLE DB provider for this connection.

"Verification==Security=True" specifies that the provider-specific key **Verification=Security** has the value "True".

"Many====One=Valid" specifies that the provider-specific key **Many==One** has the value "Valid".

3.9 Leading and Trailing Spaces

```
Provider=ProviderName;Data Source=ServerName;
MyKeyword1=" My Value1 ";MyKeyword2=' MyValue2 '
```

This example illustrates the use of leading and trailing spaces in the value of a key/value pair. To include preceding or trailing spaces in the value, the value is enclosed in either single or double quotes.

3.10 Spaces Within a Connection String

This example illustrates that white space between the parts of a connection string is ignored. The following connection string

```
Provider=sqloledb;Data Source=ServerName;Integrated Security=SSPI;
```

is equivalent to the following connection string:

```
Provider = sqloledb ; Data Source = ServerName  ; Integrated Security = SSPI ;
```

3.11 Multiple Occurrences of the Same Key

This example illustrates the fact that if multiple occurrences of the same key occur in a connection string, the value from the last key/value pair overrides all previous occurrences. For example, in the following connection string, "user2" is used as the value of the **User ID** key:

```
User ID = user1; User ID = user2
```

4   Security Considerations

4.1   Security Considerations for Implementers

A connection string can contain credential information in clear text. Applications should take special care when accessing credential information, and should avoid passing this information in the connection string whenever possible. Instead, it is recommended that applications use the **Integrated Security** generic key.

4.2   Index of Security Parameters

Security Parameter	Section
Cache Authentication	Section 2.3
Encrypt Password	Section 2.3
Integrated Security	Section 2.3
Impersonation Level	Section 2.3
Mask Password	Section 2.3
Password	Section 2.3
Persist Encrypted	Section 2.3
Persist Security Info	Section 2.3
Protection Level	Section 2.3
SSPI	Section 2.5
Use Encryption for Data	Section 2.4
User ID	Section 2.3

5   Appendix A: Product Behavior

The information in this specification is applicable to the following Microsoft products or supplemental software. References to product versions include released service packs:

- Microsoft® SQL Server® 2005

- 2007 Microsoft® Office system

- Windows Vista® operating system

- Windows Server® 2008 operating system

- Microsoft® SQL Server® 2008

- Microsoft® Office 2010

- Windows® 7 operating system

- Windows Server® 2008 R2 operating system

Exceptions, if any, are noted below. If a service pack or Quick Fix Engineering (QFE) number appears with the product version, behavior changed in that service pack or QFE. The new behavior also applies to subsequent service packs of the product unless otherwise specified. If a product edition appears with the product version, behavior is different in that product edition.

Unless otherwise specified, any statement of optional behavior in this specification that is prescribed using the terms SHOULD or SHOULD NOT implies product behavior in accordance with the SHOULD or SHOULD NOT prescription. Unless otherwise specified, the term MAY implies that the product does not follow the prescription.

<1> Section 2.3:

Key	Microsoft OLE DB Provider for SQL Server Requirements
General Timeout	The valid values are unsigned integers that range from greater than or equal to 0 to less than or equal to 65534. A value of 0 specifies an infinite time-out. The default value is 0.
Window Handle	This key does not have a default value.
Integrated Security	The valid values are "SSPI" or an empty string. The default value is an empty string. The value "SSPI" specifies that Security Support Provider Interface [SSPI] is used as the Authentication Service (AS) for this connection.
Locale Identifier	The language code identifier (LCID) that is specified is supported by the operating system on which the data source object resides.
Password	This key does not have a default value.
Persist Security Info	If the value of this key is "true", the provider persists the value of the **Password** key if requested to persist the connection information. If the value of this key is "false", the provider does not persist the value of the **Password** key.
User ID	This key is the SQL Server login name. This key does not have a default value.
Prompt	The default value is "NoPrompt".

Key	Microsoft OLE DB Provider for SQL Server Requirements
Initial Catalog	If a value for this key is not specified in the connection string, the provider opens the user's default database on the data source by default. For more information about default databases, see [MSDN-SD].
Data Source	This key is the name of the SQL Server instance to which to connect. If a value for this key is not specified in the connection string, the provider connects to the database server on the same computer that is hosting the data source object by default.
Connect Timeout	The valid values are unsigned integers that range from greater than or equal to 0 to less than or equal to 65534. A value of 0 specifies an infinite time-out. If a value for this key is not specified in the connection string, a connection fails if the login time exceeds 15 seconds.
Extended Properties	The provider accepts an ODBC connection string as specified by [MS-ODBCSTR]. This key does not have a default value.

The following table specifies the generic keys that are supported by the Microsoft SQL Server Analysis Services OLE DB Provider. Unless specified otherwise, a key is supported by both the Microsoft OLE DB Provider for SQL Server 2005 Analysis Services [MS-SSAS9] and the Microsoft OLE DB Provider for SQL Server 2000 Analysis Services [MS-SSAS8].

Key	Microsoft OLE DB Provider for SQL Server Analysis Services Requirements
General Timeout	The valid values are unsigned integers that range from greater than or equal to 0 to less than or equal to 65534. A value of 0 specifies an infinite time-out. The default value is 0.
Window Handle	This key does not have a default value.
Integrated Security	The valid values are "SSPI" or an empty string. The default value is "SSPI". The value "SSPI" specifies that Security Support Provider Interface [SSPI] is used as the (AS) for this connection.
Locale Identifier	The LCID that is specified is supported by the operating system on which the data source object resides.
Password	This key does not have a default value.
Persist Security Info	If the value of this key is "true", the provider persists the value of the **Password** key if requested to persist the connection information. If the value of this key is "false", the provider does not persist the value of the **Password** key.
User ID	This key does not have a default value.
Prompt	The default value is "NoPrompt".
Initial Catalog	If a value for this key is not specified in the connection string, the provider can default to any database on the data source.
Data Source	This key is the name of the Microsoft SQL Server Analysis Services instance to which to connect. The value for this key is specified.
Connect Timeout	The valid values are unsigned integers that range from greater than or equal to 0 to less than or equal to 65534. A value of 0 specifies an infinite time-out. The default value is 60 seconds.
Impersonation	The default value is "Impersonate". This key is supported by only the Microsoft OLE

Key	Microsoft OLE DB Provider for SQL Server Analysis Services Requirements
Level	DB Provider for SQL Server 2005 Analysis Services [MS-SSAS9].
Protection Level	The supported values are "None", "Connect", "Pkt Integrity" and "Pkt Privacy". The "Call" and "Pkt" values are not supported. The default value is "Pkt Privacy". This key is supported by only the Microsoft OLE DB Provider for SQL Server 2005 Analysis Services [MS-SSAS9].

If an OLE DB provider does not support a given generic key or if the key has an invalid value, the behavior of the OLE DB provider is provider-specific.

<2> Section 2.3: If the **Provider** key is not specified in a connection string, OLE DB Services [MSDN-ODBS] uses the following default values:

"MSDASQL" on 32-bit operating systems, including Microsoft Windows-32-bit-On-Windows-64-bit (WOW64)

"SQLOLEDB" on 64-bit operating systems

<3> Section 2.3: If a value is specified for the **Integrated Security** key, the values of the following keys are ignored if present: **Cache Authentication**, **Encrypt Password**, **Mask Password**, **Password**, **Persist Encrypted**, **Persist Security Info**, and **User ID**.

<4> Section 2.3: When the value of the **Persist Security Info** key is "false", the value of the **Persist Encrypted** key is ignored if present.

<5> Section 2.3: The initialization process returns immediately, but the actual initialization of the data source object is performed asynchronously. If the "Initialize" value is not specified, the data source object is initialized synchronously.

<6> Section 2.3: The OLE DB provider can use the value of the **Data Source** key together with the value of the **Location** key to determine the location of the data source.

<7> Section 2.3: Using the **Locale Identifier** key does not guarantee that all text that is returned to the consumer will be translated according to the LCID.

<8> Section 2.3: The OLE DB provider can use the value of the **Location** key together with the value of the Data Source key to determine the location of the data source.

<9> Section 2.3: When the "ClientCursor" value is part of the compound value for the **OLE DB Services** key, the "AgrAfterSession" value is ignored if present.

<10> Section 2.4: If the value of the **Network Library** key is specified as "DBNETLIB", the protocol prefix ("tcp:" and "np:") can still be used.

<11> Section 2.4: For Windows Vista, the behaviors of the values are listed in the following table.

Value	Meaning
DBNMPNTW	The DBNMPNTW component implements the named pipes protocol [PIPE].
DBMSSOCN	The DBMSSOCN component implements the TCP/IP protocol.
DBMSSPXN	The DBMSSPXN component implements the NWLink IPX/SPX protocol.
DBMSRPCN	The DBMSRPCN component implements the Multi-Protocol protocol.

Value	Meaning
DBMSVINN	The DBMSVINN component implements the Banyan Vines protocol.
DBMSADSN	The DBMSADSN component implements the ADSP protocol.
DBMSSHRN	The DBMSSHRN component implements the Shared Memory protocol.
DBMSLPCN	The DBMSLPCN component implements the Shared Memory protocol.
DBNETLIB	The default search order of network component can be used.

If the specified value is not listed in this table or if the **Network Library** key is not specified, the default search order of network component can be used. For more information about the default search order of network component, see [MSFT-KB328383].

<12> Section 2.5: If a value for the **SessionID** key is not specified, a new session is created for the duration of this connection.

6 Change Tracking

No table of changes is available. The document is either new or has had no changes since its last release.

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