



Enzo Server

Installation and Configuration Guide

Version 2.0 – RTM

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Pre-Requisites

In order to successfully install Enzo Server you will need to have the following configuration:

- Windows 2012 R2 or higher, 64-bit Operating System
- A dedicated instance of SQL Server Express 2016 or higher
- .NET 4.5 must be installed; some adapters may require .NET 4.6 or higher

It is important to note that Enzo Server uses SQL Server to store its configuration settings and other parameters. Four databases will be created on the SQL Server instance.

For compatibility reasons, it is highly recommended to install a dedicated instance of SQL Server for Enzo Unified. We recommend creating a dedicated SQL Server Instance and naming your instance 'Enzo'.

Install Enzo Server

Download and start the setup program on the server where Enzo will run; this can be a physical machine, or a virtual machine running locally or in the cloud. There are two setup files available: one for Intel processors and another for ADM processors.

You must be an administrator on the machine.

The installation will make the following significant changes to your machine:

- A new Windows Service will be created (the name will start with Enzo)
- A new self-signed SSL certificate will be created in the machine certificate store (contact support for directions on how to install your own certificates)
- Firewall rules will be changed to allow the TCP protocol to communicate on the selected port during installation
- Four databases will be created on the database server
- A shortcut to Enzo Manager will be created on the desktop

Key Enzo Server Settings

The installer will prompt you for specific information, including:

- The Port on which Enzo Server will listen for incoming SQL requests; by default this value is 9550, but you can change it if desired. This will be the Enzo SQL port.

Enzo Server 2.0 supports SSL connections on its SQL port; for instructions on how to enable SSL on the Enzo SQL port, please contact support.

- The HTTP and HTTPS ports on which Enzo Server will listen for incoming HTTP traffic; you can also change the default values. **You should consider setting the HTTPS port to 443 instead of the default value of 49550.**

During the installation process, you will be asked to select the Adapters you want to install. Although you can select all available adapters, it is recommended to pick only the adapters you want to use on a production machine for performance and security reasons.

The Enzo Service will start quickly; however the Enzo instance will not be available until all the adapters have loaded, which could take a minute or two.

During the installation process, you will be asked to connect to the SQL Server instance where Enzo databases will be created. The Database Server name can be in any of the following formats:

- `ipaddress` (ex: 10.1.1.15)
 - o This assumes that the Enzo databases will be installed on the default instance of SQL Server on port 1433
- `Servename` (ex: laptop-ny)
 - o This assumes that the Enzo databases will be installed on the default instance of SQL Server on port 1433
- `ipaddress,port` (ex: 10.1.1.15,14388)
- `servername\instance` (ex: localhost\Enzo)
 - o NOTE : when specifying an instance name, make sure the SQL Server Browser service is running
- `.\instance` (ex: .\Enzo)
 - o NOTE : when specifying an instance name, make sure the SQL Server Browser service is running

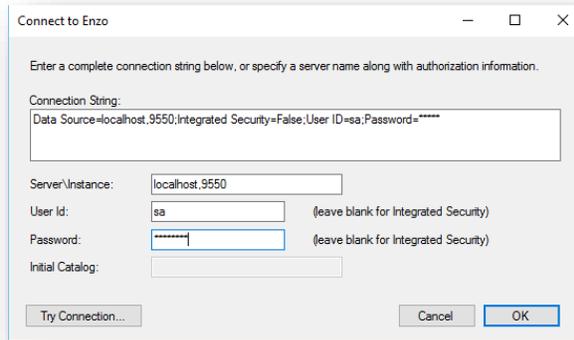
Change sa Password

Enzo Server emulates SQL Server, including the 'sa' administrative account. Upon installation, the 'sa' account has its password set to **password**. The installer gives you the opportunity to change this default password; however if you do not change it during installation, consider changing this password as soon as the installation of Enzo Server is completed.

Follow these steps to change the 'sa' password:

- Start Enzo Manager (the shortcut should be on your Desktop)
- Select File -> Connect... and provide the connection information to Enzo Server and click OK
 - o The Server should be your machine name (or localhost), followed by a comma, and the port on which Enzo is listening for SQL connections (9550 by default), as such:
 - Localhost,9550
 - o UserId: sa

- Password: password



- Select Configuration -> Change 'sa' Password, enter the new password, and click OK
 - Current password: **password**
 - New Password: ***your new password***
 - Re-enter password: ***your new password***

Configure Adapters with Enzo Manager

Once Enzo Server is installed, many of the adapters need to be configured before they can be used. The following section covers the adapters that come with the installer of Enzo Server. To configure an adapter, simply click on it on the left. After installing Enzo Server, only the 'sa' account will be available in the Login dropdown window; if you have created additional logins, they will also need to be configured separately (each login requires its own configuration settings per adapter).

When selecting a login, you can either create a new configuration, or update an existing one. To create a new configuration, choose New Config. To edit a configuration, select it from the list and click on Save after changing values.

Refreshing Configuration Settings in SSMS

Although changes to security settings take effect almost immediately, changes to configuration settings may require users to either login, or to refresh manually using the `_configFlush` command.

For example, if you are currently logged in with SSMS as the 'sa' account, and you make a change to the configuration settings of the Couchbase adapter (such as the password of the bucket), use the following command to refresh all opened sessions with the new settings:

```
EXEC couchbase._configFlush
```

Adapter-Specific Configurations

Amazon PA

This adapter provides access to Amazon's Product Advertising API.

Signup URL: <https://aws.amazon.com/api-gateway/>

Parameter Name	Type	Comment
associateTag	string	The associate tag provided by Amazon
awsAccessKeyId	string	The Access Key identifier
awsSecretKey	string	The secret key
url	string	The product URL as provided by Amazon

Azure Bus

Provides access to the Microsoft Azure Service Bus (Queues, Topics and Subscriptions).

Signup URL: <http://azure.microsoft.com>

Parameter Name	Type	Comment
BusNamespace	string	The Azure Bus namespace
Name	string	The name of the ACS account
Key	string	The access key for the bus
Retries	int	Number of automatic retries

Azure IoT Hub

Provides access to the Microsoft Azure IoT Hub.

Signup URL: <http://azure.microsoft.com>

Parameter Name	Type	Comment
name	string	The name of the IoT Hub
connectionStringSecret	string	The Azure connection string to the Hub
transportType	String	Enter AMQP
startMessageListener	bool	If enabled, Enzo will capture outbound messages using a background thread for devices to retrieve

Azure Key Vault

Provides access to the Microsoft Azure Key Vault. To use this adapter you must register a new application in your Azure AD environment; this will be your clientId.

Signup URL: <http://azure.microsoft.com>

Parameter Name	Type	Comment
clientId	string	The Azure AD Client Id of Enzo
connectionSecret	string	The Azure connection string to the Key Vault service
keyVaultName	String	The KeyVault name to use

Azure Storage

This adapter provides access to Azure Storage information, including Azure Tables, Azure Blobs and Azure Queues.

Signup URL: <http://azure.microsoft.com>

Parameter Name	Type	Comment
Account	string	The Azure Storage Account name
Key	string	The Azure Storage Account key
UseSSL	bool	1 to use SSL
Retries	int	Number of automatic retries

Couchbase

This adapter provides access to Couchbase buckets. NOTE: This adapter is designed to work for Couchbase version 3.0

Parameter Name	Type	Comment
userName	string	The bucket user name
password	string	The bucket password
nodes	string	A comma separated list of couchbase nodes listening (ex: http://devlap03:8091/pools)

CSV

This adapter provides access to flat files and represents them as read-only tables.

The following settings are required at a minimum:

Parameter Name	Type	Comment
Name	string	The name of the CSV definition
Column Delimiter	string	The file column delimiter
Columns on First Row	bool	Yes if file contains headers

In addition, a Columns tab is available allowing you to specify a list of columns for the file. Add a column definition for each consecutive header in the flat file. Defining Columns is optional; if not defined, Enzo will attempt to dynamically determine column names and data types.

DataGov

This adapter provides access to demographics information as provided by public US Government data sources. No specific configuration is required.

DB

This adapter provides REST access to relational databases, including SQL Server, Oracle and MySQL.

Parameter Name	Type	Comment
connectionString	string	The connection string to the database
defaultTimeout	int	The default execution timeout

Note that the SQLServer adapter is specifically designed for the SQL Server database.

Facebook

This adapter provides access to certain Facebook requests.

Parameter Name	Type	Comment
accessToken	string	The temporary access token for Facebook as returned by the User Authorization sequence provided by Facebook.

Files

Provides access to files and directories on your network. This adapter has no configuration settings.

FlightAware

Provides access to many of the APIs made available by FlightAware.

Signup URL: <http://flightaware.com/account/join/?referer=/account/join/>

Parameter Name	Type	Comment
userName	string	The user name of your FlightAware account
apiKey	string	The FlightAware API Key

FTP

Provides access to files on FTP and FTPS servers. Accessing files on the FTP server is done through the CSV adapter.

Parameter Name	Type	Comment
URI	string	The FTP site address
uid	string	The user id of the FTP site
pwd	string	The password of the FTP site
isPassive	bool	True if using passive FTP connection
isBinary	bool	True if accessing binary data (obsolete)
isSSL	bool	True if using FTPS

GAnalytics

Provides access to Google Analytics.

Parameter Name	Type	Comment
serviceAccountEmail	string	The user name of your FlightAware account
privateKeyFile	String	The private key file provided by Google
certificatePassword	String	The certificate password
defaultTableId	String	The default table to access

GeoNames

Provides access to Geo-coding information from GeoNames.

Signup URL: <http://www.geonames.org/login>

Parameter Name	Type	Comment
userName	string	The user name of your FlightAware account

Insteon

Provides access to certain Insteon devices (SmartHome HouseLinc devices). Requires downloading a driver to be installed on the server where Enzo Server is installed.

General information: <http://www.smarthome.com/houselinc.html>

Driver download http://cache-m2.smarthome.com/manuals/2413U_Drivers.zip

Parameter Name	Type	Comment
commPort	string	The COM port where the device modem is located

Integration

This adapter is used for generic data integration scenarios. It requires advanced knowledge of the Enzo Server platform. Contact support for more information.

Messaging

Provides access to SMTP servers to send text messages and emails.

Parameter Name	Type	Comment
MailServerType	string	(ignored)
FromName	string	The From name
FromEmail	string	The From email
Host	string	The address of the SMTP host
Port	int	The SMTP port number
userId	string	The user id for authenticated SMTP servers
password	string	The password for authenticated servers
enableSSL	bool	True if the SMTP server requires SSL connections

Msad

Provides access to Active Directory user management.

Parameter Name	Type	Comment
userName	string	A domain user with sufficient administrative privileges
Domain	string	The domain name
Password	string	The password for the user
Server	string	The domain server name or IP address

MSMQ

Provides access to local and remote Microsoft queues (MSMQ).

RabbitMQ

Provides access to RabbitMQ queues.

Parameter Name	Type	Comment
hostname	string	The machine hostname where RabbitMQ is installed
exchange	string	Name of the exchange (leave blank for the default exchange)
exchangeType	string	Type of the exchange (leave empty for the default, or specify: direct, fanout or topic)
queueName	string	Name of the queue
persist	Int	1 to persist messages
userId	String	User name
password	String	Password
durable	Bool	1 to make messages durable
autoDelete	Bool	1 to auto delete old messages
exclusive	Bool	1 to mark the queue as exclusive
expiration	Int	Message expiration in millisecond (0: never expires)

DLX	String	Dead letter queue exchange
DLXR	String	When DLX specified, changes default routing to the specified value

SalesForce

This adapter provides the ability to connect to a SalesForce site in order to read/write any data element in SalesForce.

Parameter Name	Type	Comment
userId	string	The user id to impersonate
Password	string	The password of the user to impersonate
authToken	string	The account AuthToken as provided by SalesForce

This adapter also allows defining virtual tables that abstract a SalesForce SOQL query, so that any information provided by SalesForce can be accessible through LinkedServer and simple SQL syntax. In addition, it is possible to update one or more records through special Enzo Server handlers that accept XML as input.

Shard

This adapter provides the ability to connect to multiple databases and adapters in parallel, and represents the information as single result set. Setting up this adapter requires an understanding on how shards are implemented in Enzo Server; contact support for further information.

Parameter Name	Type	Comment
type	string	The type of definition (data, view, shard)
connectionString	string	Database connection string or comma-separated list of shard names, views, or data sources.
sqlCommand	string	Default SQL command to use for 'data' connection types. For 'view' connection types, overrides the default SQL statement of downstream data sources.
options	string	Comma-separated list of options for the definition: strict, breadcrumb,readonly
tableName	string	Actual table name of the underlying data source when issuing DELETE, INSERT or UPDATE operations.

This adapter also allows defining virtual tables that point to a shard, view, or data source. Virtual Tables are necessary to perform searches across data sources and to be used through Linked Server.

SharePoint

Provides access to SharePoint lists and documents. You will need to install the SharePoint 2013 SDK to run this adapter: <http://www.microsoft.com/en-us/download/details.aspx?id=35585>.

Parameter Name	Type	Comment
userName	string	A SharePoint user with sufficient administrative privileges

Password	string	The password for the user
Url	string	The HTTP endpoint where SharePoint is listening on. Example: https://mysitename.sharepoint.com/teamsite/
useLookups	int	1 to return lookup values instead of names (used for replication scenarios)

SQLServer

SQL Server adapter used primarily for REST access from mobile and IoT devices with advanced change tracking capabilities.

Parameter Name	Type	Comment
connectionString	string	Database connection string
defaultDB	string	Default database name to use
appName	string	Application name to use as part of the connection
ssl	Bool	1 to force an SSL connection to the database
retries	Int	Number of automatic retries
defaultTimeout	Int	Default execution timeout

Threading

Adapter that provides synchronization capabilities between disconnected devices.

Parameter Name	Type	Comment
resourceGroup	string	Logical name of a group of devices that want to participate in synchronization
defaultTimeout	Int	The default timeout in seconds for threading objects
defaultSleep	String	The default sleep duration in seconds OR a CRON schedule defining a rally point in the future

Twilio

This adapter provides the ability to send Text messages and making phone calls. For this adapter to work, Enzo Server must be reachable from the Internet as Twilio makes HTTP callbacks. If Enzo Server is not installed on an Internet facing machine, you will need to configure port forwarding rules so that Enzo Server can receive the callbacks. If the machine Enzo Server is installed on does not have a static public IP address, you can use a Dynamic IP service (such as DynAlias) to enable the callbacks.

Signup URL: <https://www.twilio.com/api>

The URL ports are those defined during the installation of Enzo Server.

Parameter Name	Type	Comment
AccountSid	string	The Twilio account Sid
AuthToken	string	The Twilio auth token
CallerId	string	Your Twilio called id
defaultCountryCode	string	Your country code (ex: +1)

StatusUrl	string	The Status Twilio URL where Enzo can be reached (ex: http://www.machinerunningenzo.com:19550 /bsc/twilio/status)
TwimlUrl	string	The Twiml XML Twilio URL where Enzo can be reached (ex: http://www.machinerunningenzo.com:19550 /bsc/twilio/twiml.xml)
mediaUrl	string	The Media Twilio URL where Enzo can be reached (ex: http://www.machinerunningenzo.com:19550 /bsc/twilio/media)

Twitter

Provides access to Twitter search and posting. This adapter requires you to register a new Application that Enzo Server can impersonate.

Signup URL: <https://dev.twitter.com/>

Parameter Name	Type	Comment
accessToken	string	Your Twitter access token
accessTokenSecret	string	Your Twitter access secret
apiSecret	string	Your API secret
apiKey	string	Your API Key

US Census

Accesses some of the US Census data sets.

Signup URL: <http://www.census.gov/developers/>

Parameter Name	Type	Comment
apiKey	string	Your US Census API Key

Velleman DMX

Accesses devices exposed through the Velleman DMX interface (K8062 DMX lighting controllers). This adapter does not use configuration settings.

Weather

Accesses the Weather Underground service.

Signup URL: <https://www.wunderground.com/weather/api/>

Parameter Name	Type	Comment
apiKey	string	Your API Key

WMI

Accesses the WMI engine.

Signup URL: <https://www.wunderground.com/weather/api/>

Parameter Name	Type	Comment
Username	string	The UPN name of the user to impersonate. Leave null to use the service account Enzo runs under
password	String	The password to use
scope	String	The scope for the service management connection (cimv2)
domain	String	The default domain of the management connection
enablePrivileges	Bool	True to enable privileges to the WMI connection
impersonate	String	The Impersonation Level for the connection (default, impersonate, anonymous, delegate, identify)
authenticationLevel	String	The authentication level for the connection (default, connect, call, none, packet, packetintegrity, packetprivacy, unchanged)
continueOnError	Bool	True to continue running the WMI query on all the other servers even if errors are thrown/reported
defaultComputers	String	Default list of comma-separated list of IP Addresses or Computer names to use for this definition

Zip

Accesses Zip file content. This adapter is used along with the CSV adapter.

Managing Logins

The Enzo Manager application allows you to create logins in Enzo, and manage their Access Control List (ACL) for enhanced security. To manage logins, select **Configuration -> Manage Logins**.

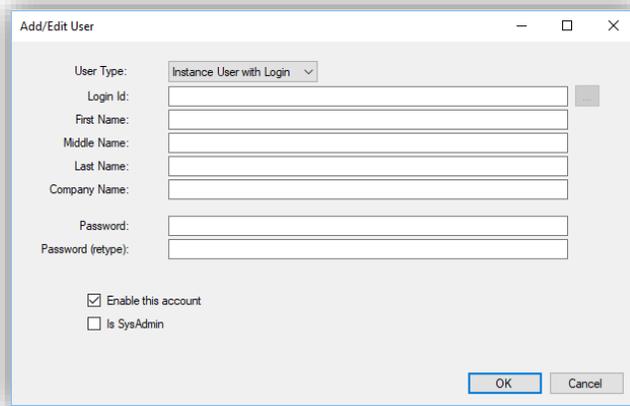
NOTE: The 'sa' account has access to all features and all adapters of Enzo Server and as a result its password should be strong and secured.

Add/Edit a Login

To add a login, click on the Add button; to edit a login select the login and click on Edit. Enter the necessary information and click OK.

By default, a new login will not have access to any adapter. You must define permissions for the login in order to use adapters.

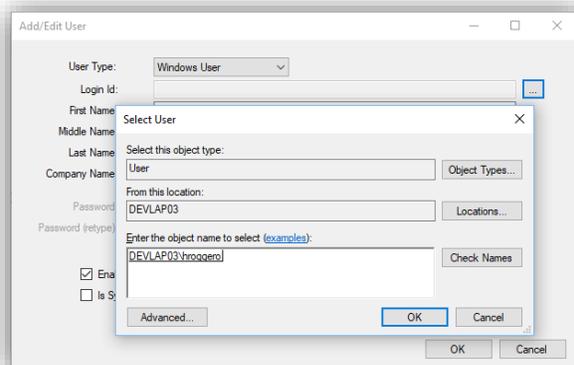
NOTE: In edit mode, the login and password fields are disabled. To change the password of a login, select the login id and choose Change Password.



The screenshot shows the 'Add/Edit User' dialog box. The 'User Type' dropdown is set to 'Instance User with Login'. The fields for 'Login Id', 'First Name', 'Middle Name', 'Last Name', and 'Company Name' are empty. The 'Password' and 'Password (retype)' fields are also empty. There are two checkboxes: 'Enable this account' (checked) and 'Is SysAdmin' (unchecked). 'OK' and 'Cancel' buttons are at the bottom right.

Adding a Windows Login

Enzo Server 2.0 supports Windows logins (local and Active Directory users). To add a Windows login, select the Windows User option from the User Type dialog box.



The screenshot shows the 'Add/Edit User' dialog box with 'User Type' set to 'Windows User'. A 'Select User' sub-dialog is open over it. In the sub-dialog, 'Select this object type:' is 'User'. 'From this location:' is 'DEV LAP03'. The 'Enter the object name to select (examples):' field contains 'DEV LAP03\hroggero'. There are 'Object Types...', 'Locations...', and 'Check Names' buttons in the sub-dialog. The 'OK' and 'Cancel' buttons are at the bottom of the sub-dialog.

NOTE: You cannot add Windows Groups in the current release of Enzo Server.

Enable/Disable a Login

To disable a login, select the login id and click on the Disable button. Once disabled, the login will not be able to connect to Enzo Server. If a login id is disabled, you can click on the Enable button to enable the login.

Change Password

To change the password of an Enzo login, select the login id and click on Change Password. The change takes place immediately.

NOTE: If you change the 'sa' password, you will need to reconnect Enzo Manager by selecting File -> Connect.

NOTE: You cannot change the password of Windows Logins; these are managed through the operating system.

Copy the REST Authentication Key

The REST Authentication Token can be used by REST clients, such as mobile phones, to connect to Enzo Server. To copy the REST token, select the login id and click the **Copy Auth Token** button.

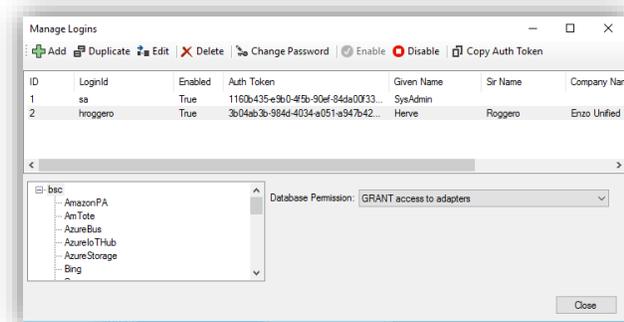
Change Login Permissions

To change the permissions of a login, select the login id from the list. The permissions section will show the list of adapters available for configuration.

Enable bsc Access Permission

By default the ACL on the bsc database is set to **Deny Access to all adapters**; this setting prevents the login from using Enzo. To allow the login to use adapters, click on the 'bsc' database and set the permission to **Grant Access to Adapters**.

NOTE: Permission changes are saved immediately; however it may take a minute for the new permissions to take effect in Enzo.



Once the login has been granted access at the database level, all the adapters and their methods are also available unless otherwise specified.

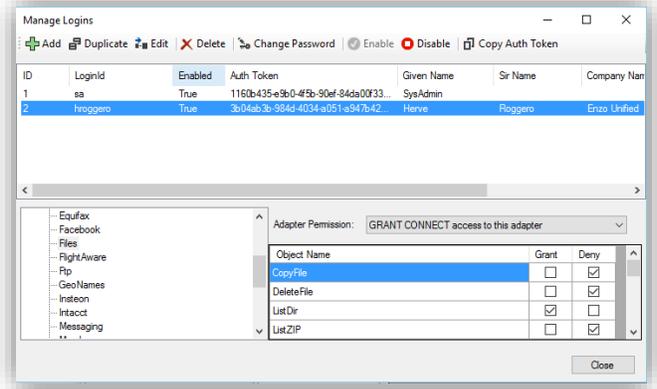
Change Adapter Permissions

Select an adapter by clicking on the adapter name under the bsc database. Choose from one of the following options:

- DENY access to this adapter
- GRANT ALL access to this adapter

- GRANT CONNECT access to this adapter

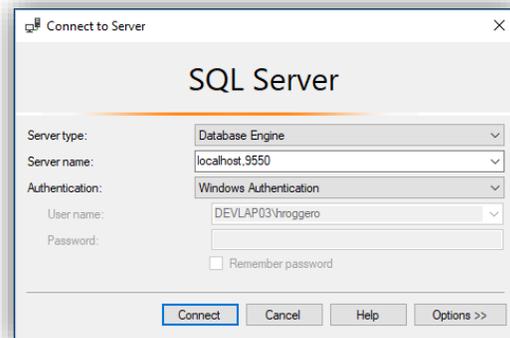
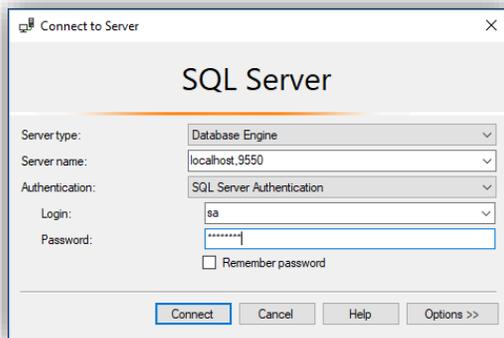
When granting the CONNECT permission to an adapter, you will need to specify which methods are available for access; by default none of the methods are accessible. To grant access to the **ListDir** method on the Files adapter, click on the **Grant** checkbox on the **ListDir** method.



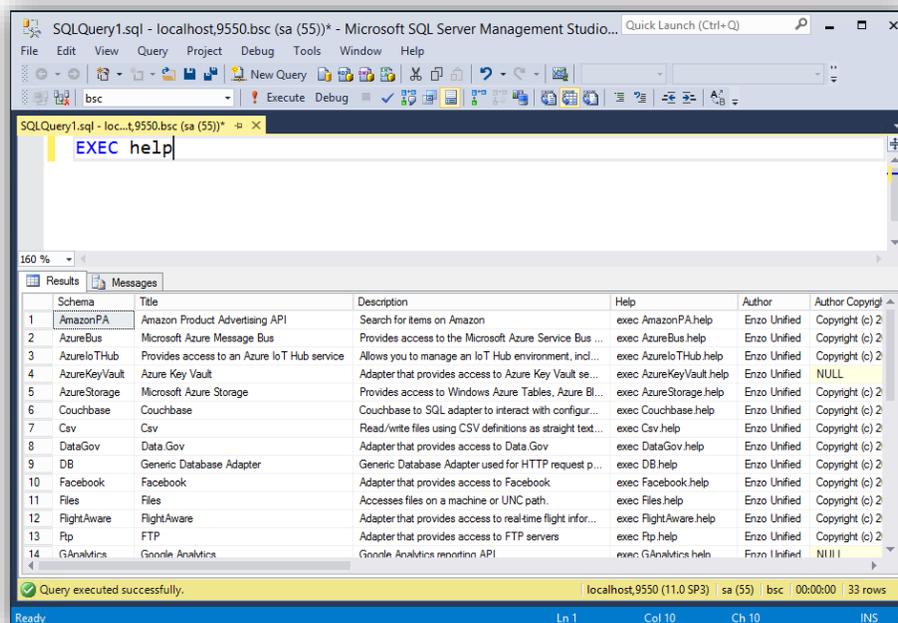
Connecting to Enzo Server

Once Enzo has been configured and is running, you can connect to it using SQL Server Management Studio (SSMS). Start SSMS and login to Enzo using the sa account.

This is the sa account of Enzo; not the sa account of your database server. As a result make sure to use the Enzo password. If you created a network login using the Enzo Manager, you can choose Windows Authentication.



To test connectivity, try running the **EXEC Help** command. You should see an output like this:



If you are unable to see a list of adapters, make sure that:

- You are indeed connected to Enzo; not the local database server
- You waited a couple of minutes after starting the Enzo service so the adapters finished loading

Adapter Built-In Help

Each adapter provides built-in documentation on its use.

To get help on an adapter, such as the AzureStorage adapter, login to Enzo using SQL Server Management Studio, and type the following command:

EXEC AzureStorage.help

This will return all the available commands for the AzureStorage adapter.

You can also request help on a specific method within the adapter; for example you can get help on the CreateVirtualTable method on the AzureStorage adapter by running this command:

EXEC AzureStorage.CreateVirtualTable help

Known Issues and Limitations

The Enzo Server 2.0 RTM build has a few known issues which will be addressed in a future release:

- **ADO.NET and Entity Framework**

It is possible to connect to Enzo Unified with ADO.NET with the SqlCommand object, including support for SqlParameter. However the Entity Framework is not supported.

- **Linked Server**

Linked Server is supported with the following options set:

Collation Compatible	False
Data Access	True
RPC	True
RPC Out	True
Use Remote Collation	True
Collation Name	
Connection Timeout	3600
Query Timeout	0
Distributor	False
Publisher	False
Subscriber	False
Lazy Schema Validation	False
Enable Promotion of Distributed Transaction	False