ICONICS – Using the Azure Cloud Connector

APPLICATION NOTE

August 2014

Description: Guide to use the Azure Cloud Connector
General Requirement: Valid account for Azure, including Cloud Service, SQL Azure and Azure Storage.

Introduction

Cloud Connector is a FrameWorX Server version for Windows Azure, Microsoft's cloud computing platform and infrastructure (created by Microsoft for building, deploying and managing applications and services through a global network of Microsoft-managed datacenters).

The functionality of Cloud Connector is very similar to FrameWorX Server running in DMZ in forwarding mode.

There are two major differences between Cloud Connector and the standard FrameWorX Server:

- Instead of connecting to other FrameWorX Servers, it allows other FrameWorX Servers to connect to itself. This reverses the direction in which the connection is created and solves the "inbound port 80" issue. The on premises firewall does not have to be open for inbound communication because the connection is initiated by the computers behind the firewall (thus, it goes outbound).

- The functionality of Cloud Connector is limited, partly because the features have not been fully implemented and partly because the features are not yet available on Azure (i.e., there are no OPC servers on the cloud. They are always on premises.). The requests that Cloud Connector cannot handle may be forwarded to a selected FrameWorX Server on premises.

Cloud Connector provides a connection between client computers and FrameWorX Servers on premises. These FrameWorX Servers can then expose any data available in GENESIS64.

Both clients and FrameWorX Servers can run behind firewalls (i.e. no firewall setup is needed).

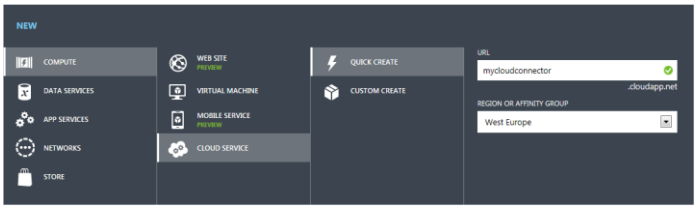
Azure Setup

The following set up assumes the user has an account on Azure. It describes the steps to install Cloud Connector on the Azure account.

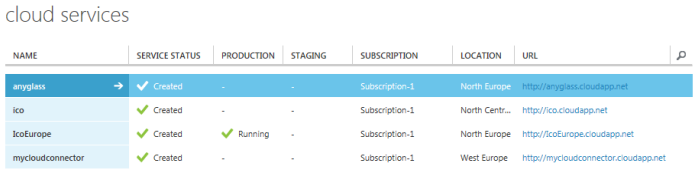
NOTE: ICONICS is not responsible for Azure account. You need to connect Microsoft for detailed information and pricing.

Create a Cloud Service

1. In Windows Azure Management Portal, click NEW (in the bottom left corner), then select COMPUTE – CLOUD SERVICE – QUICK CREATE. Specify a URL for the service, select a region and hit OK.

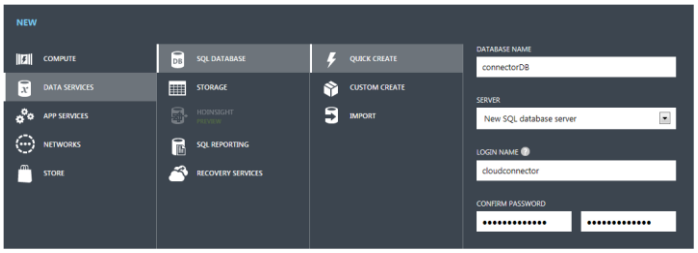


2. The new cloud service will appear in the list of services:

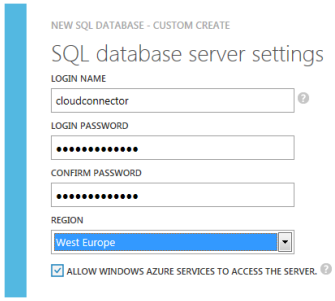


Create a SQL Azure Database

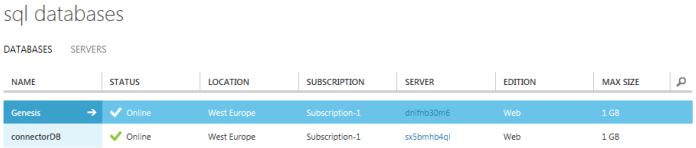
1. You have to create a new SQL Azure database. It will store the configuration for the Cloud Connector. Click NEW, then select DATA SERVICES – SQL DATABASE – QUICK CREATE. Specify a database name, a preferred server, then the login name and password.



2. The QUICK CREATE option creates the SQL server in North Central US region. To change the region, use the CUSTOM CREATE option and specify the region.



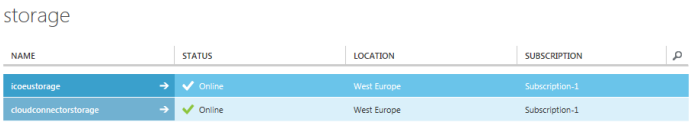
3. The new SQL database will appear in the list of databases.



Create an Azure Storage

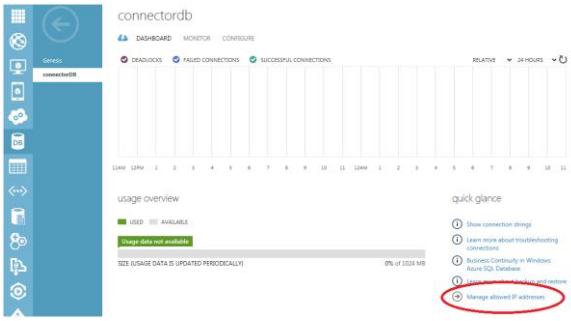
1. The Azure storage will be used for Cloud Connector to exchange data with the FrameWorX Servers on premises. Create the storage with NEW – DATA SERVICES – STORAGE – QUICK CREATE. Select a name for the storage and its location.

2. The new storage will appear in the list of storages.

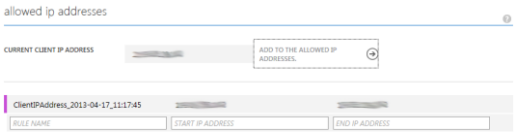


Create Tables in the Configuration Database

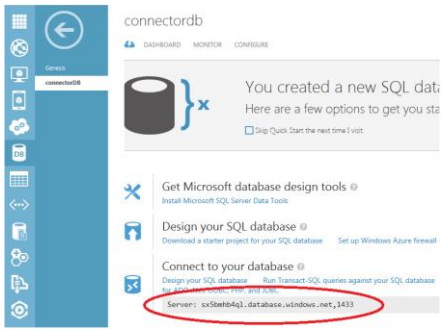
1. Your newly created SQL Azure database is a SQL Server with limited functionality. You may connect to it from your computer with SQL Server Management Studio. However, the connection from the outside of Azure is disabled by default. To allow connection from your computer, select SQL DATABASES in Azure Portal, then select your database (connectorDB). Click on DASHBOARD and Manage allowed IP addresses.



2. Add your client IP address to the list of allowed IP addresses. You may want to add more IP addresses if you plan to configure the database from other computers.

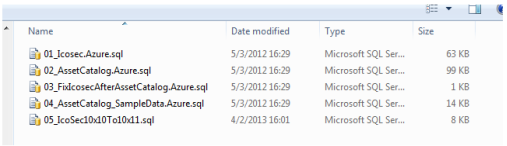


3. Click SAVE to store the configuration.
4. Now you are allowed to connect to your SQL Azure from your computer. Find the name of the SQL server (select SQL DATABASES – then select your database (connector DB)).

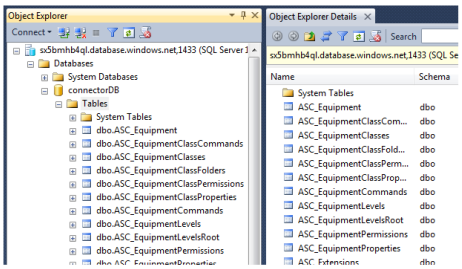


5. Now that you have set the server name, you should be able to connect to the SQL Azure server with SQL Server Management Studio.

6. In SQL Server Management Studio, run the provided SQL scripts. They will create the necessary tables and other structures in the SQL Azure database.

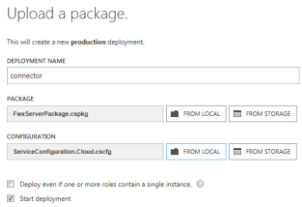


7. The scripts should execute with no errors. Make sure that new tables have been created in the database.



Upload the Cloud Connector Service

1. In the Azure Portal, select CLOUD SERVICES and then your new service (mycloudconnector). Select DASHBOARD and UPLOAD A NEW PRODUCTION DEPLOYMENT. You will be prompted to upload an installation package.

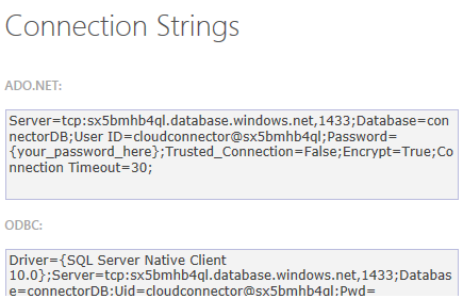


2. Select the service package file on your computer and the service configuration file.

3. The installation package will create the Cloud Connector service in your Azure account.

Configure the Cloud Connector Service

1. Once the Cloud Connector service has been created, you have to connect it with the SQL Azure database and the Azure Storage you created earlier. With the Cloud Connector service selected, click CONFIGURE.
2. Scroll a bit down to see the settings of fwxserverwebrole.
3. Update the ConfigDatabaseConnectionString and StorageConnectionString settings so that they refer to the database and storage created earlier.
4. To find the database connection string, select SQL DATABASES – connectorDB – View SQL Database connection string. A new window will pop up. Copy the first connection string for ADO.NET.



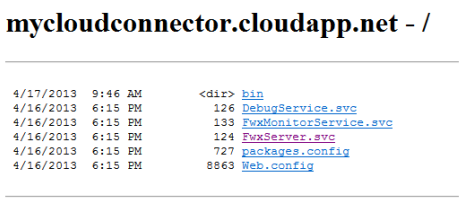
5. Paste the connection string into the ConfigDatabaseConnectionString setting. Don't forget to type in the password to the database instead of {your_password_here}.
6. To get the storage connection string, select STORAGE – cloudconnectorstorage and click MANAGE ACCESS KEYS on the bottom of the window. Copy the STORAGE ACCOUNT NAME and PRIMARY ACCESS KEY. Paste them into the StorageConnectionString setting, so you get something like this:

DefaultEndpointsProtocol=http;AccountName=cloudconnectorstorage;AccountKey=dFGkjiK/yshGJSj34KljdsGp3bgjKLj87423HKkjsjIOuu93jHJrJQiGIC4SA==

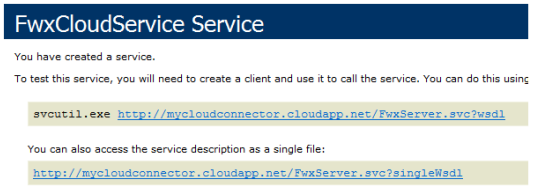
7. Click SAVE.
8. After the Cloud Connector service restarts, it will be ready to use.

Verify that the Cloud Connector Service Works

1. Type the URL of your Cloud Connector service (e.g., http://mycloudconnector.cloudapp.net/) into a Web browser. You should see this:



2. Click FwxServer.svc. You should get this:

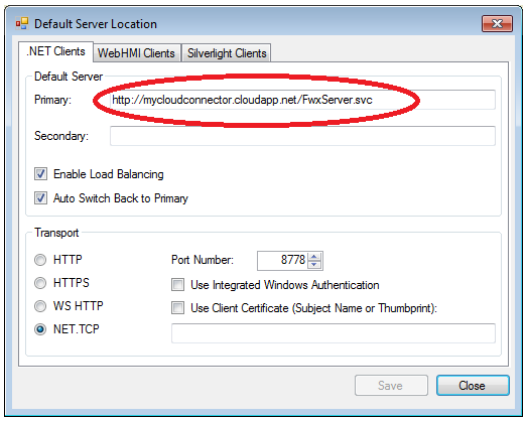


3. Now you are ready to set up the GENESIS64 client and servers to take advantage of Cloud Connector.

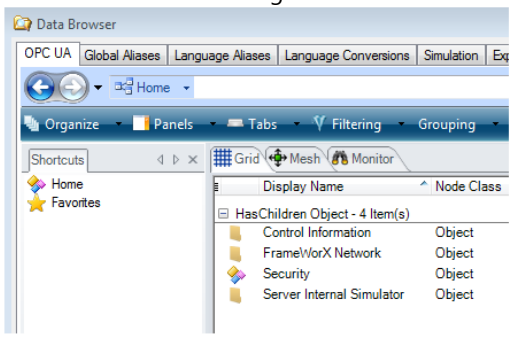
Client Setup

Set up the client computer to use Cloud Connector as its default FrameWorX Server:

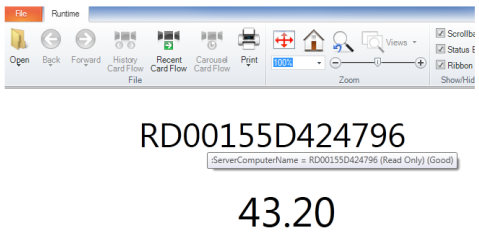
1. Open the Default Server Location dialog (either Workbench – Tools – Default FrameWorX Server Location, or run IcoServerLocationSetup.exe from the Components folder)
2. Type the URL of the Cloud Connector service (http://mycloudconnector.cloudapp.net/FwxServer.svc) into the 'Primary Default Server Node' text box.



3. You may leave the protocol and port number settings as they are. The client app will get all that information from the URL.
4. Click OK or Save.
5. If Cloud Connector is running, you should be able to run the client applications, but you will not get any data from FrameWorX Servers. Also, you may get control and simulation data from the Cloud Connector.
6. You will see a reduced address space of the Cloud Connector when browsing:



7. And, you should be able to get control and simulated data from Cloud Connector (points :ServerComputerName and svrsim:sine):

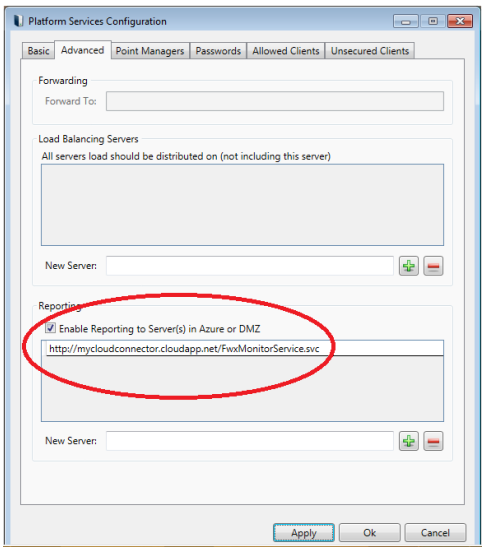


8. Note that ':ServerComputerName' can be browsed under Home – Control Information. Make sure these points work before proceeding.
9. If they do not work, check the TraceWorX log for GraphWorX64.

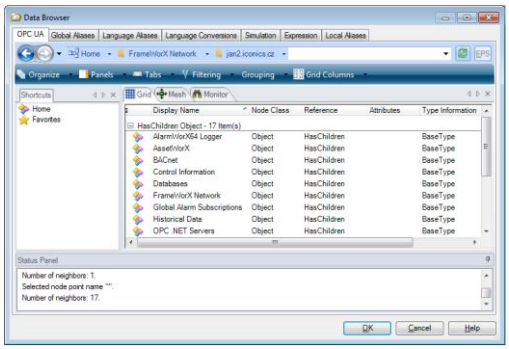
Setup FrameWorX Server on Premises

The following article explains how to setup FrameWorX Server on premises. FrameWorX Server will connect to the Cloud Connector and send data to it. Cloud Connector will make the data available to its clients.

1. Open Platform Services configuration in Workbench (Tools – Platform Services) or run FwxServerConfigApp.exe (located in the Components folder).
2. Select 'Enable Reporting to Server(s) in Azure or DMZ' on the Advanced tab.
3. Type the URL of the FwxMonitorService (http://mycloudconnector.cloudapp.net/FwxMonitorService.svc) into the 'New Server' text box and click '+' to add the server to the list of servers.



4. Click 'Ok'
5. Restart FrameWorX Server.
6. Repeat this for each FrameWorX Server you want to expose via Cloud Connector.
7. When your FrameWorX Server connects to Cloud Connector, you will be able to browse it on the client computer under the FrameWorX network:



8. Now the FrameWorX Server on premises is available to clients connected to Cloud Connector.