

Integrating Microsoft Dynamics 365

Finance to Solver Cloud



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AI-powered xFP&A enhances reporting, automates data collection, and provides predictive insights, empowering smarter, faster decisions for long-term success.



Introduction

The purpose of this whitepaper is to provide a general overview of the integration process to bring data from Microsoft Dynamics 365 Finance (D365) into the Solver cloud service. A more in-depth technical white paper is available for Consulting and IT Administrators on the Solver Support Site, <https://support.solverglobal.com>.

About Dynamics 365 Finance (D365)

Microsoft Dynamics 365 Finance is Microsoft's flagship Enterprise Resource Planning (ERP) system for medium to large organizations. <https://dynamics.microsoft.com/en-us/finance/overview/>

About Solver

Solver is a Corporate Performance Management solution running on a multi-tenant platform in the Microsoft Azure cloud. The Solver solution provides advanced budgeting, forecasting, financial reporting & consolidations for D365. It also provides easy integration to Power BI with a pre-built, Microsoft certified connector.

Solver support and documentation can be found here: <https://support.solverglobal.com/>

Solver online training (Solver Academy) can be found here: <https://learn.solvertraining.com/>



Executive Summary

The purpose of this whitepaper is to describe the methodology used to move data from Microsoft Dynamics 365 Finance and into Solver. Direct access to D365 via its OData API has limited performance and for extracting large data volumes Microsoft's preferred method is to use a staging database in the customer's Azure Tenant. Microsoft refers to this method as a so-called "BYOD" database instance in conjunction with data publishing jobs.

Note: *Microsoft has announced that it will replace its BYOD integration method with an Azure Data Lake method as of approximately Q2, 2021. Solver will then also provide a dedicated Azure Data Lake connector. This white paper will be updated to reflect this once Microsoft has released its Azure Data Lake for D365. See the latest integration roadmap [here](#).*

This BYOD database will be the recipient of data export jobs in D365 and will act as a staging location for further transformation and access for the Solver SQL Connector used to integrate to BYOD.

This whitepaper will focus on leveraging the Solver Data Gateway as well as making a direct SQL connection from the Solver Cloud to bring data into the Solver Cloud Service and provide references to other published documentation that details the additional steps required to move data into Solver Cloud.

Note 1: It is important to note that Solver Cloud supports both integration methods mentioned above:

- 1)** Solver standard OData connector integrating to the D365 OData API. In H1, 2021, Solver will also release "Solver QuickStart" which is a pre-mapped integration to D365 using its OData connector. Contact Solver to get the latest information on this as well as the same concept for the D365 Azure data lake expected around mid 2021.
- 2)** Solver QuickStart OData connector (pre-configured integration to D365 to be released in Q1,2021) integrating to the D365 OData API and comes with pre-defined data entities in D365.
- 3)** Solver Gateway & Solver SQL Connector integrating to the D365 BYOD staging database.

Note 2: It is important to note that both D365 and Solver run in the Microsoft Azure cloud. Further synergies also exist in that D365 and Solver both provide out-of-the box integrations to Power BI.

Overview

The process of configuring data extraction from D365 and transferring it into the Solver Cloud contains three steps.

1. Data Entity publishing jobs are created in D365 to push data into a Bring Your Own Database (BYOD) instance.
2. SQL Server direct access is configured from the Solver Gateway server or from the Solver Cloud Service to this BYOD instance. Proper security practice is critical to deployment and the Gateway (if used) may be placed in a customer's on-premises environment or in a hosted virtual machine.
3. The Solver Cloud is configured to use the Solver SQL Connector as a means of accessing the BYOD Azure instance.

Note: In cases where there is an on-premise data source, Solver's Data Gateway is a small footprint application designed to allow the Solver Cloud service to access the data source without opening any customer firewalls. It can be thought of as a "Virtual Private Network" for the Cloud to access any on-premises data source. But, in this whitepaper we focus on connecting Solver to the D365 cloud application and thus the Solver Data Gateway is NOT needed.

Figure 1 below outlines the steps involved in this process:

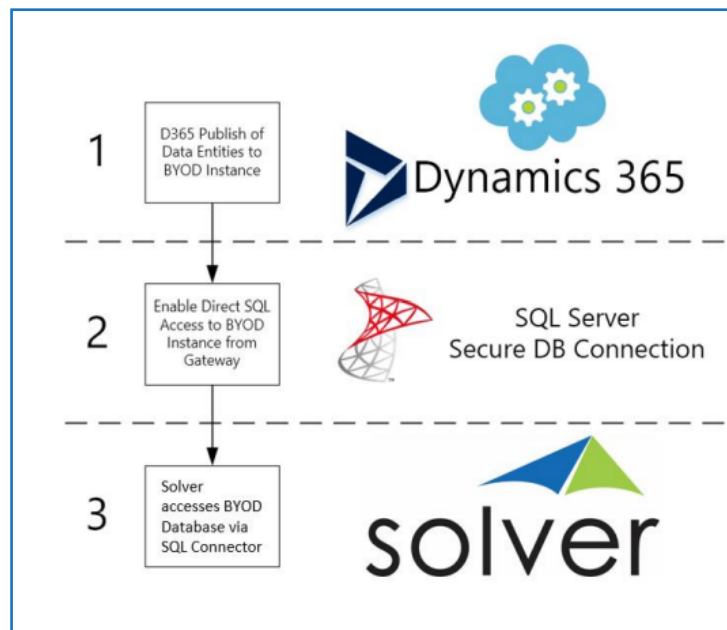


Figure 1: Workflow for loading data into Solver from D365

The process of creating a publishing job (step 1 above) is fairly straight forward and is well documented by Microsoft and Solver, however there are some limitations to be aware of.

1. For each legal entity in D365 that you want to export, a separate D365 export job must be created. If additional legal entities are subsequently created, new jobs are not created automatically.
2. There should be no active sessions in the BYOD database when data are published. Active sessions that are querying data from the BYOD database while data are being inserted can cause deadlock and stop the export process.
3. Entities that don't have unique keys cannot be exported using the incremental push feature. Some entities in D365 do not have a unique key field and this is required for an incremental push. In order to work around this limitation, one may define a unique key on these entities.

The second step in the process calls for setting up the Solver SQL Connector to move data from the BYOD instance into the Solver cloud tenant.

The third and final step in the process is to make the connection from the Solver Cloud service to the BYOD instance. The process of configuring the connection is done from the Solver Cloud integration interface and allows you to choose the specific columns that are required for import into Solver.

Solver Cloud Integration Architecture for D365

Below is a detailed diagram of the overall data architecture of the two integration options:

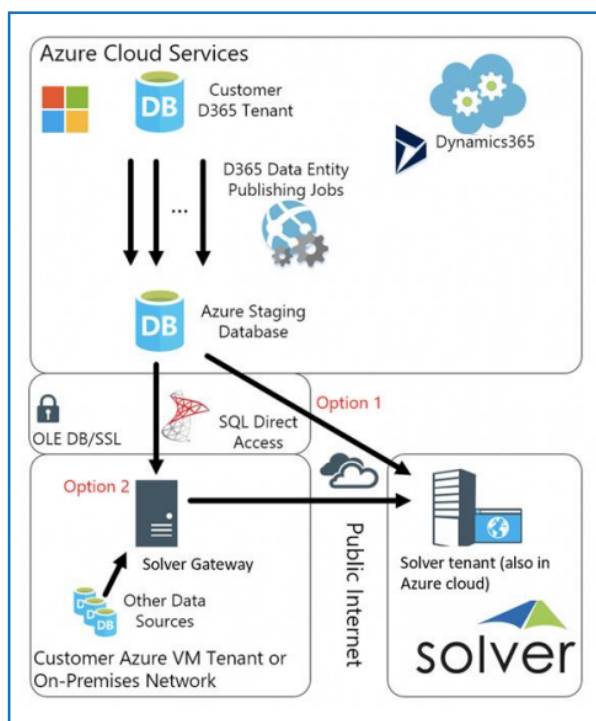


Figure 2: D365 to Solver Cloud integration Architecture

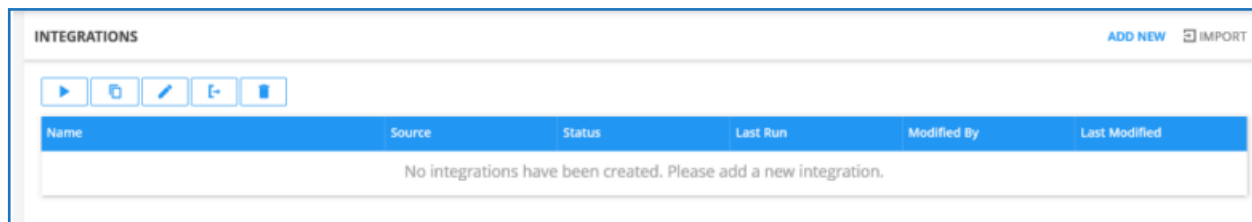
Data Entity Publishing Jobs move data from the D365 environment to the BYOD instance. As noted above, one job needs to be created for each Entity. These jobs can be set up in the Data Management interface of D365 as detailed [here](#) and in the Solver whitepaper Microsoft Dynamics 365 For Operations – A data source for Solver DW.

1. In order to communicate with the Azure BYOD instance, connectivity has to be established between the Solver Gateway server and the Azure instance. Azure SQL can only be deployed with a public IP address and hostname. Because of the inherent risk in exposing a SQL server directly to the internet, by default Microsoft has blocked all access to the Azure SQL instances. The firewall on the Azure instance will need to be configured to allow connectivity to the instance from the network where the Gateway Server is located. The Solver cloud service is a multi-tenant solution hosted on Azure, which presents an excellent opportunity for optimizing the performance of moving large data volumes from D365 into the Solver cloud.
2. The final step of the configuration is to either connect directly to the BYOD instance using the Solver SQL Connector (Option 1 pictured above) or, for on-premise data sources, to use the Solver Data Gateway (Option 2 pictured above). Installation of the Solver Data Gateway is covered in the installation guide [Solver Gateway User Guide](#). In this whitepaper, we shall cover both the setup of the Gateway as well as the direct SQL Connection process. Configuring the Solver Data Gateway is merely an additional step in the connection process, as both Option 1 and Option 2 will leverage the SQL Connection Steps in the Cloud environment.

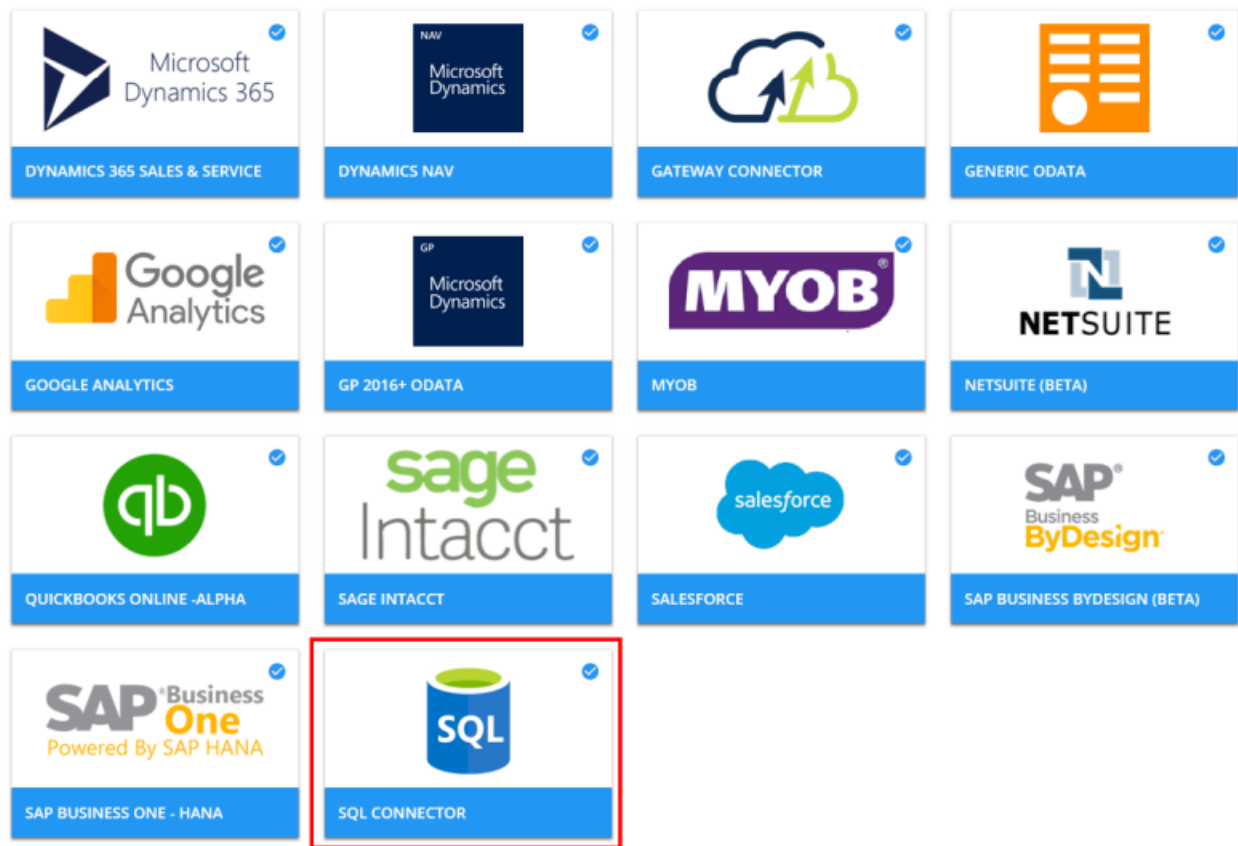
Option 1: Configuring the Direct SQL Access to the Azure BYOD Instance

When you are only using D365 as your data source, you can use the Solver SQL Connector to directly connect to the Azure Instance.

Opening the Solver Cloud Tenant interface (Data Warehouse-> Data-> Integrations), you add a new integration. Choose “Add New” in the upper right hand corner of the screen.



Choose the “SQL Connector” and click “Create”



You will need to enter the Connection information to create the SQL Connection:

←
1 CONNECTOR
2 TASK MANAGER
3 PARAMETERS
4 SUMMARY

CONNECTOR LOGIN

Authentication Type:

Server Address:

Database:

Username:

Password:

Port:

Timeout:

CANCEL SAVE CONTINUE

Authentication Type: Choose “SQL”

Server Address: Enter the address of the Azure instance. It will have a name like “something.database.windows.net”

Database: This is the database name that you chose during the D365 Publishing job creation steps.

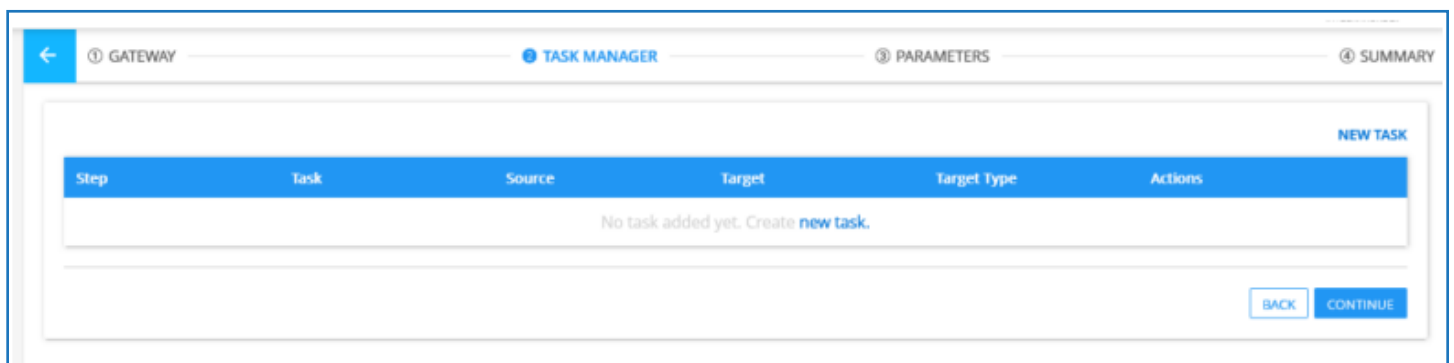
Username: You will need to create a username and password through SQL Server Management Studio to grant access to the Database. It is recommended to only give this user read access to the database. Contact your Azure Administrator for the credentials.

Password: This is the corresponding password to the account created above.

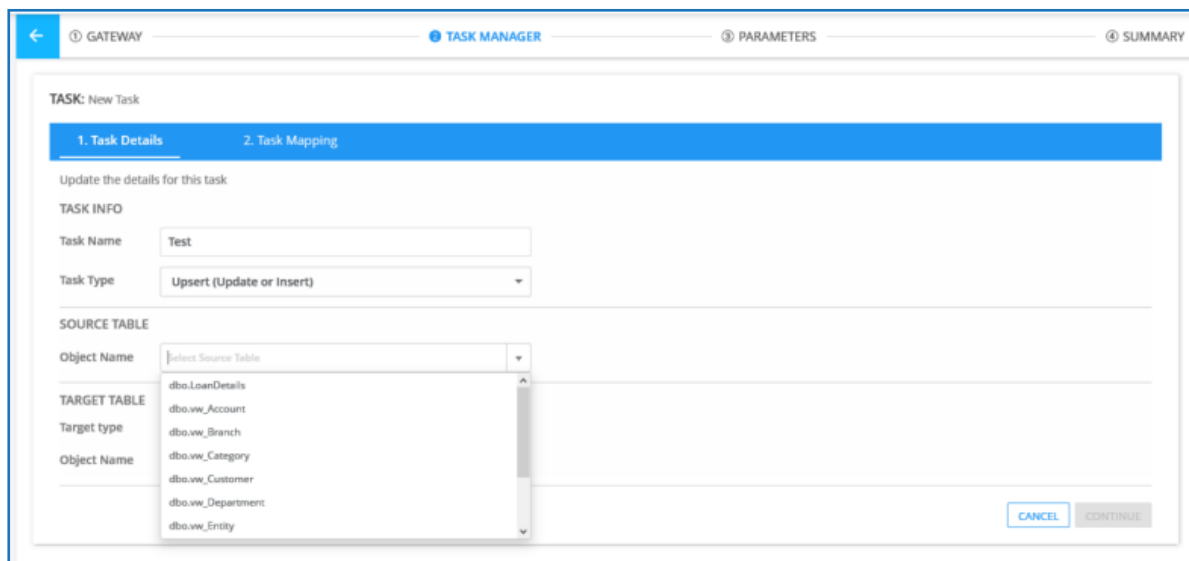
Port: Optional, you may change the port number in Azure and this value must match your selection. The default can be left blank.

Timeout: This can be left blank.

Once the fields are completed, you click “Continue” and start to create a new Task.



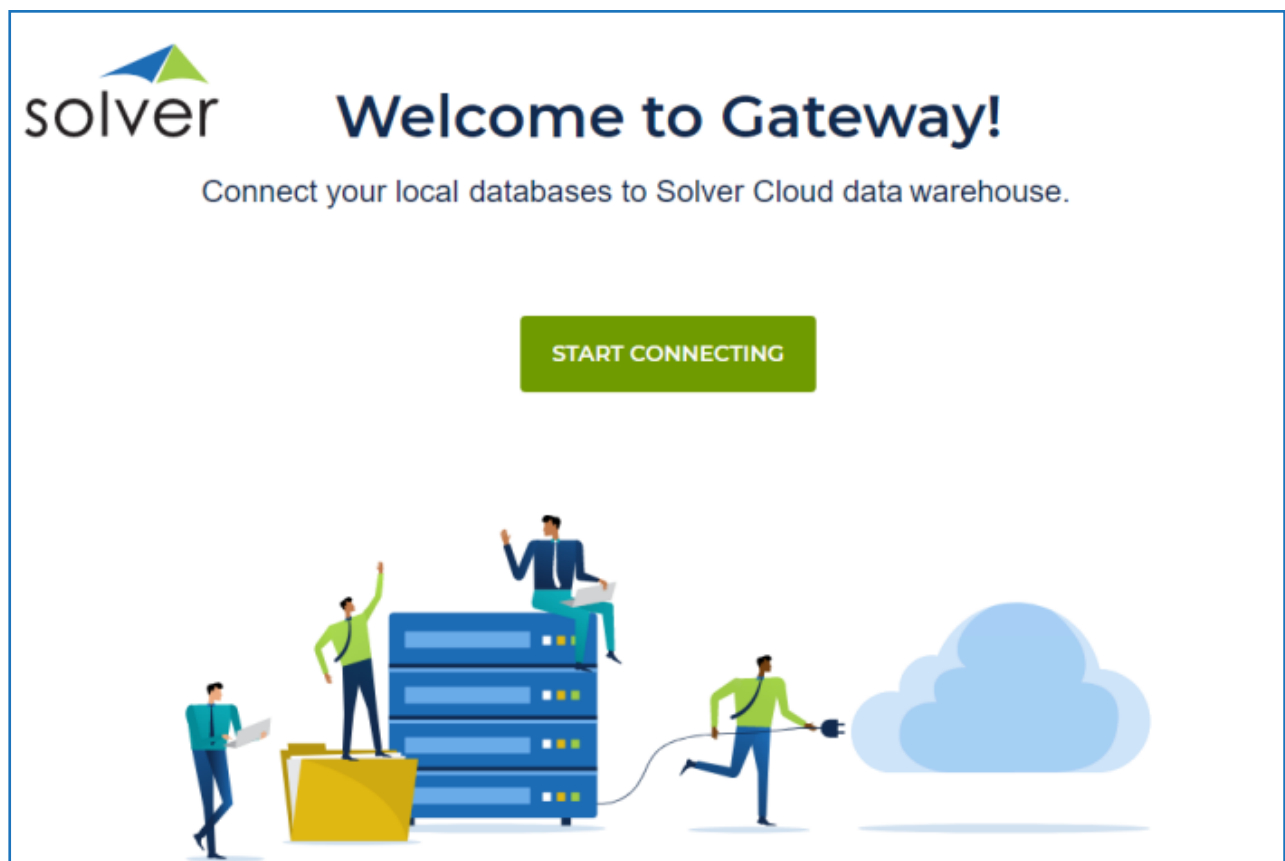
In the “Object Name” selector, you see the tables and views we configured in our IntegrationDev demo database. Now we are ready to map our source data to the Solver Data Warehouse (DW) structure by finishing the dialog and processing the data load.



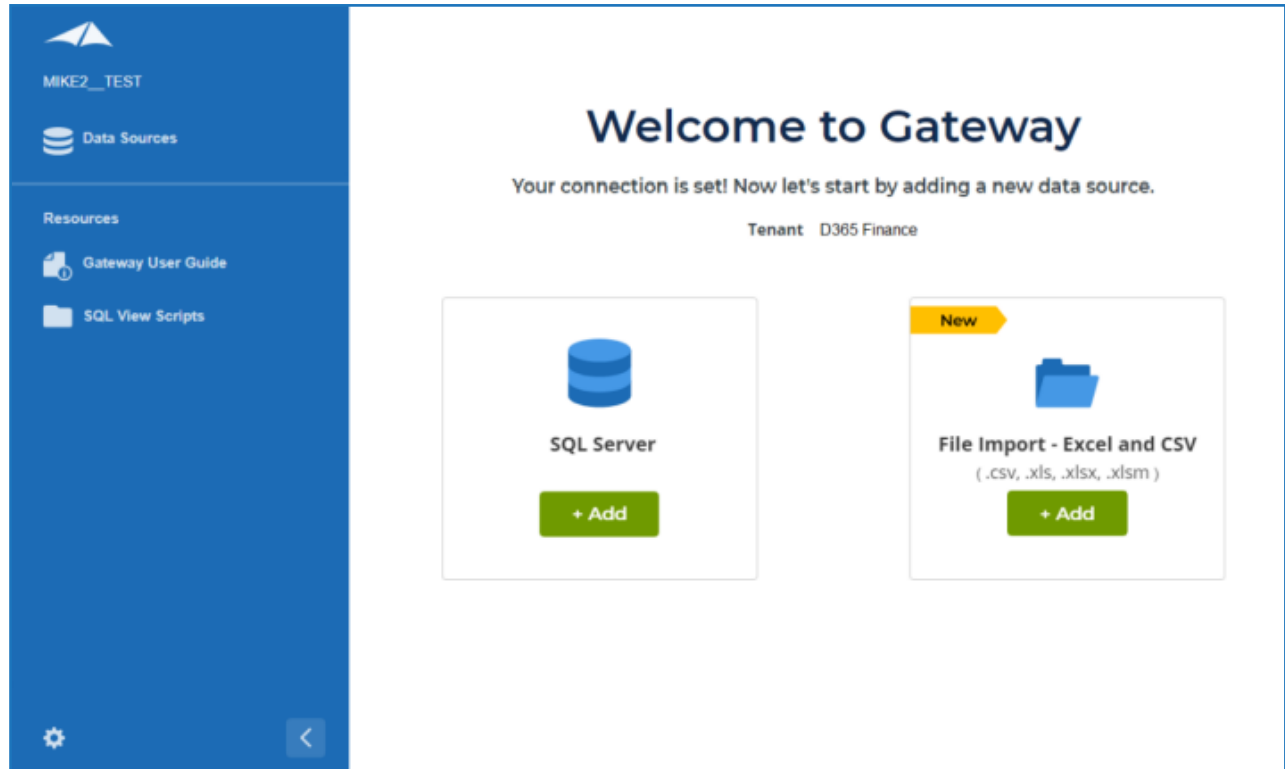
Option 2: Configuring the Solver Gateway to Access On-Premises Data Sources

If you in addition to D365 as a data source also require data from an on-premises data source to be loaded into your Solver cloud environment, you can use the Solver Data Gateway to facilitate transfer of data into Solver. One point to consider, is that if you only have Azure based data sources such as D365 or other Private Azure based systems accessible as a SQL instance, forgoing the Data Gateway or placing it in a private Azure Tenant VM is a better idea as you will avoid the latency overhead of leaving and reentering Azure.

The first step in setting up the Solver Data Gateway is to complete the installation as detailed in the installation guide, Solver Gateway User Guide. As detailed in the guide, you will need a server to install this Solver Module which must reside in either the Customer's environment or in an Azure (if used as a private hosting environment for a data source) tenant. After completing the installation (Instructions in the User Guide up to step 6), launch the localhost site and click the Start Connecting button.



To connect to Microsoft SQL Server or Azure SQL database, select the Add button for SQL Server.



Enter the Azure DB server address, BYOD Database Name, and user/password.

The screenshot shows the 'Add New SQL Server' configuration form. It includes the following fields and options:

- Name Your Connection:** A text input field containing 'D365 BYOD'.
- Authentication Type:** A dropdown menu set to 'SQL Server Authentication'.
- Server Username:** A text input field containing 'username here'.
- Server Password:** A password input field with a toggle icon to show/hide the password.
- Server Address:** A text input field containing 'trainingsql.database.windows.net'.
- Database:** A text input field containing 'd365finance_staging'.
- Port:** A label with the text 'Currently set to default port number' and a 'Change' link.
- Timeout:** A label with the text 'Currently set to default timeout' and a 'Change' link.

At the bottom right, there are 'Cancel' and 'Connect Server' buttons.

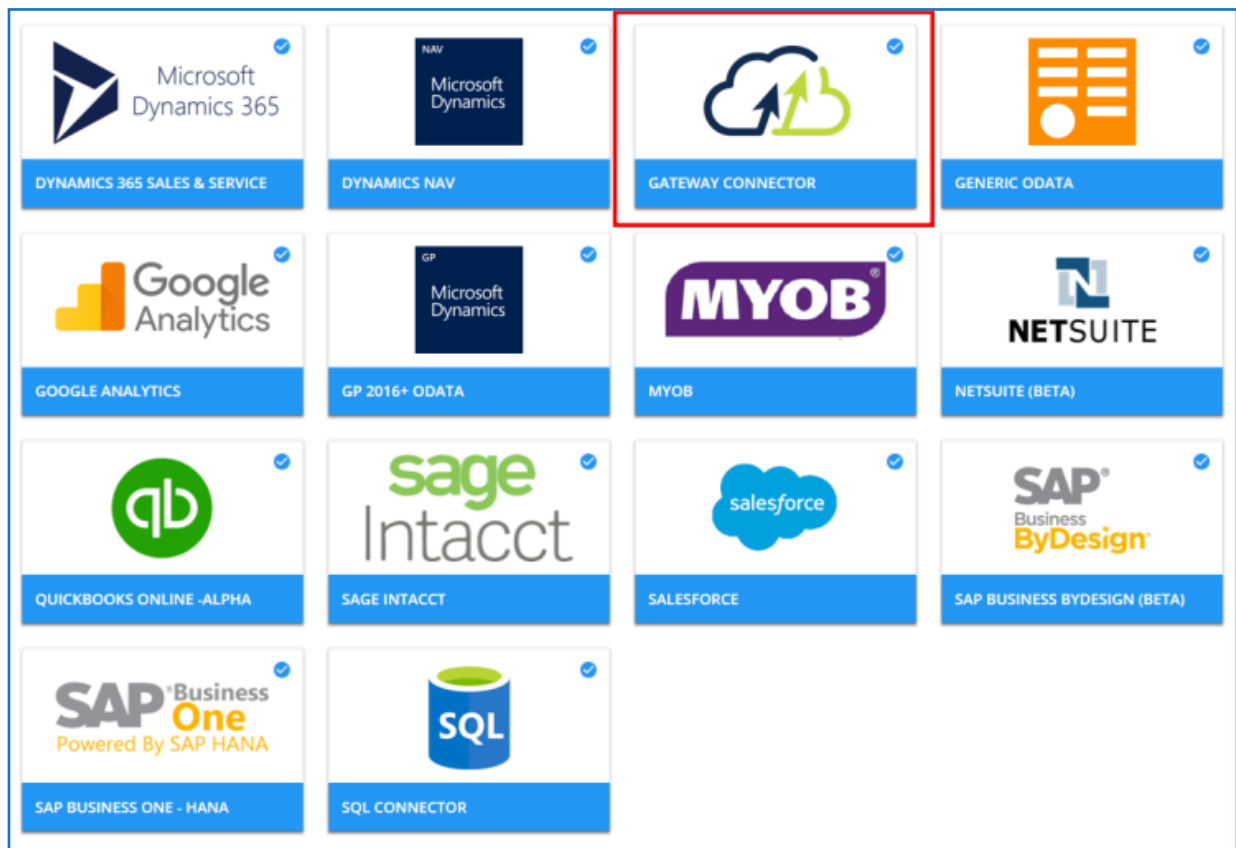
After the Connection is created, we can see it in the Data Sources list.

The screenshot shows the 'Data Sources' section of a software interface. On the left, a sidebar contains icons for 'Data', 'Guide', and 'Scripts'. The main area is titled 'Data Sources' and features a 'D365 BYOD' data source, which is marked as 'Connected' and 'Updated January 25, 2021'. Below the title, the 'SERVER ADDRESS' is 'trainingsql.database.windows.net' and the 'DATABASE' is 'd365finance_staging'. An 'Edit Connection' button is visible. A list of 'SQL Objects (23)' is displayed, including tables like 'dbo.FinancialDimensionValueEntityStaging' and 'dbo.FiscalPeriodStaging', and views like 'dbo.vw_Dim_Account' and 'dbo.vw_Dim_CostCenter'. A search bar is located at the top right of the object list.

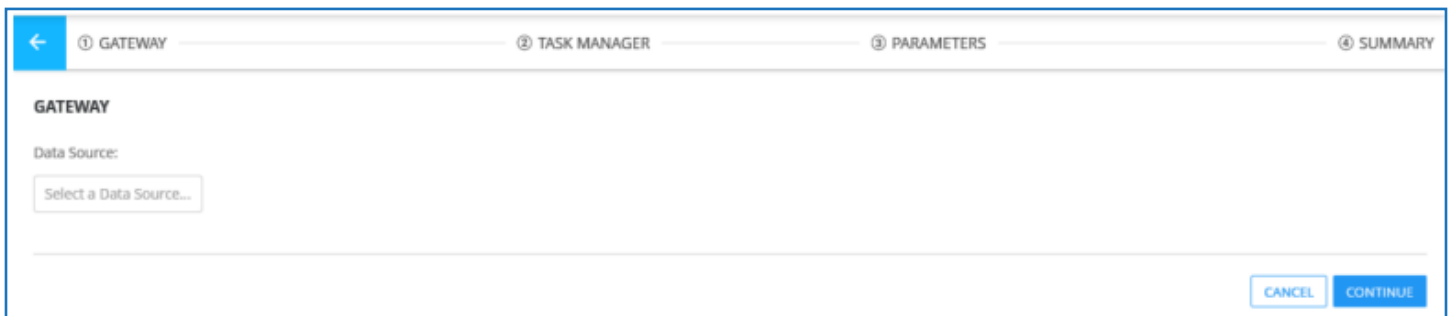
Opening the Solver cloud portal, you can add a new integration. Choose “Integrations” and “Add New”.

The screenshot shows the 'INTEGRATIONS' section of the Solver cloud portal. At the top right, there are buttons for 'ADD NEW' and 'IMPORT'. Below these, there is a toolbar with icons for play, copy, edit, undo, and delete. A table with the following columns is shown: 'Name', 'Source', 'Status', 'Last Run', 'Modified By', and 'Last Modified'. The table is currently empty, and a message below it states: 'No integrations have been created. Please add a new integration.'

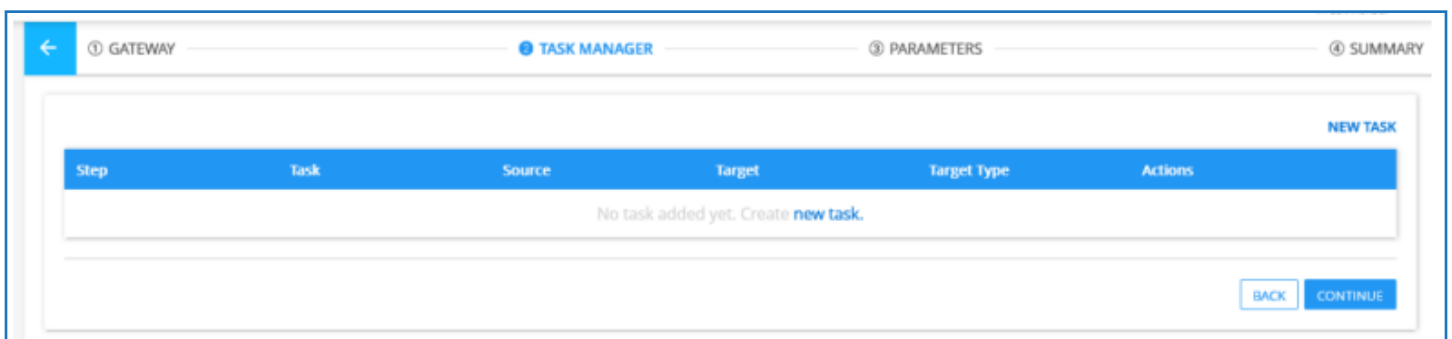
Choose the “Gateway Connector”.



In the Gateway setup menu, choose the data source you configured for the BYOD Database instance and click “Continue”.



Add a new task by clicking on “new task”



In the “Object Name” selector, we see the tables and views we configured in our IntegrationDev database. Now we are ready to map our source data to our pre-configured DW structure by finishing the dialog and processing the data load.

←

1 GATEWAY

2 TASK MANAGER

3 PARAMETERS

4 SUMMARY

TASK: New Task

1. Task Details

2. Task Mapping

Update the details for this task

TASK INFO

Task Name

Test

Task Type

Upsert (Update or Insert)

SOURCE TABLE

Object Name

Select Source Table

TARGET TABLE

Target type

Object Name

dbo.LoanDetails

dbo.vw_Account

dbo.vw_Branch

dbo.vw_Category

dbo.vw_Customer

dbo.vw_Department

dbo.vw_Entity

CANCEL

CONTINUE

Viewing D365 data uploaded to Solver

At any time, the user can click on the Solver module (such as General Ledger data) to view the uploaded data. The user can also drag and drop any field to filter for certain specific transactions.

solver

Home

Active

Assignments

Live Reporting

Budgeting

Workflow

Data Warehouse

Administration

Data Warehouse

DATA EXPLORER BETA Browse and filter through General Ledger

Module Name

Operator

Value

Action

Period

includes

202101

Drag Column Header to create a filter

SELECT ALL

SELECT

Displaying 4152 rows

Transaction ID	Scenario	Entity	Account	Net LID	Monthly Amou	Annual Amou	Other Amou	Period	Row Comment	Source	Rule ID	Created On	Created By	Updated On	Updat
ACT	SAS	40010			-307,516.47			20210101				2018-03-19T...	B360	2018-03-19T...	B360
ACT	SAS	40030			-32,756.37			20210101				2018-03-19T...	B360	2018-03-19T...	B360
ACT	SAS	40040			-18,032.55			20210101				2018-03-19T...	B360	2018-03-19T...	B360
ACT	SAS	50010			115,576.48			20210101				2018-03-19T...	B360	2018-03-19T...	B360
ACT	SAS	60010			32,195.32			20210101				2018-03-19T...	B360	2018-03-19T...	B360
ACT	SAS	60020			2,342.21			20210101				2018-03-19T...	B360	2018-03-19T...	B360
ACT	SAS	60030			7,485.41			20210101				2018-03-19T...	B360	2018-03-19T...	B360
ACT	SAS	61010			3,122.95			20210101				2018-03-19T...	B360	2018-03-19T...	B360
ACT	SAS	61040			820.98			20210101				2018-03-19T...	B360	2018-03-19T...	B360
ACT	SAS	61050			1,208.40			20210101				2018-03-19T...	B360	2018-03-19T...	B360
ACT	SAS	61500			5,296.13			20210101				2018-03-19T...	B360	2018-03-19T...	B360
ACT	SAS	61510			869.27			20210101				2018-03-19T...	B360	2018-03-19T...	B360
ACT	SAS	61520			740.49			20210101				2018-03-19T...	B360	2018-03-19T...	B360
ACT	SAS	61530			752.44			20210101				2018-03-19T...	B360	2018-03-19T...	B360
ACT	SAS	61540			165.08			20210101				2018-03-19T...	B360	2018-03-19T...	B360
ACT	SAS	62010			59,239.40			20210101				2018-03-19T...	B360	2018-03-19T...	B360
ACT	SAS	62020			608.26			20210101				2018-03-19T...	B360	2018-03-19T...	B360
ACT	SAS	62030			176.73			20210101				2018-03-19T...	B360	2018-03-19T...	B360
ACT	SAS	62040			20.87			20210101				2018-03-19T...	B360	2018-03-19T...	B360
ACT	SAS	63010			352.66			20210101				2018-03-19T...	B360	2018-03-19T...	B360

Appendix 1 – Additional Resources

List links to online resources for D365 and Solver here:

1. Solver Support site: <https://support.solverglobal.com>
2. SSIS design for SQL Change Data Capture: <https://docs.microsoft.com/en-us/sql/integrationsservices/change-data-capture/change-data-capture-ssis?view=sql-server-2017>
3. BYOD Data Entity Export Job setup: <https://docs.microsoft.com/en-us/dynamics365/unifiedoperations/dev-itpro/analytics/export-entities-to-your-own-database>

About Solver

Solver is a global provider of a cloud-based extended financial planning and analysis solution (xFP&A) that increases access to actionable insights beyond the finance department to accelerate better decisions. Providing mid-market businesses with planning and reporting software tailored to their specific needs, the all-inclusive Solver Suite consolidates information from any data source to provide a single source of truth. Connected with Solver's budgeting and forecasting, Solver's comprehensive planning tool enables organizations to manage budgets, create detailed reports and automate forecasts all in one place. These insights are then presented in easily shareable graphs and dashboards. Solver provides organizations with a trusted data source to efficiently drive intelligent and accurate decisions.