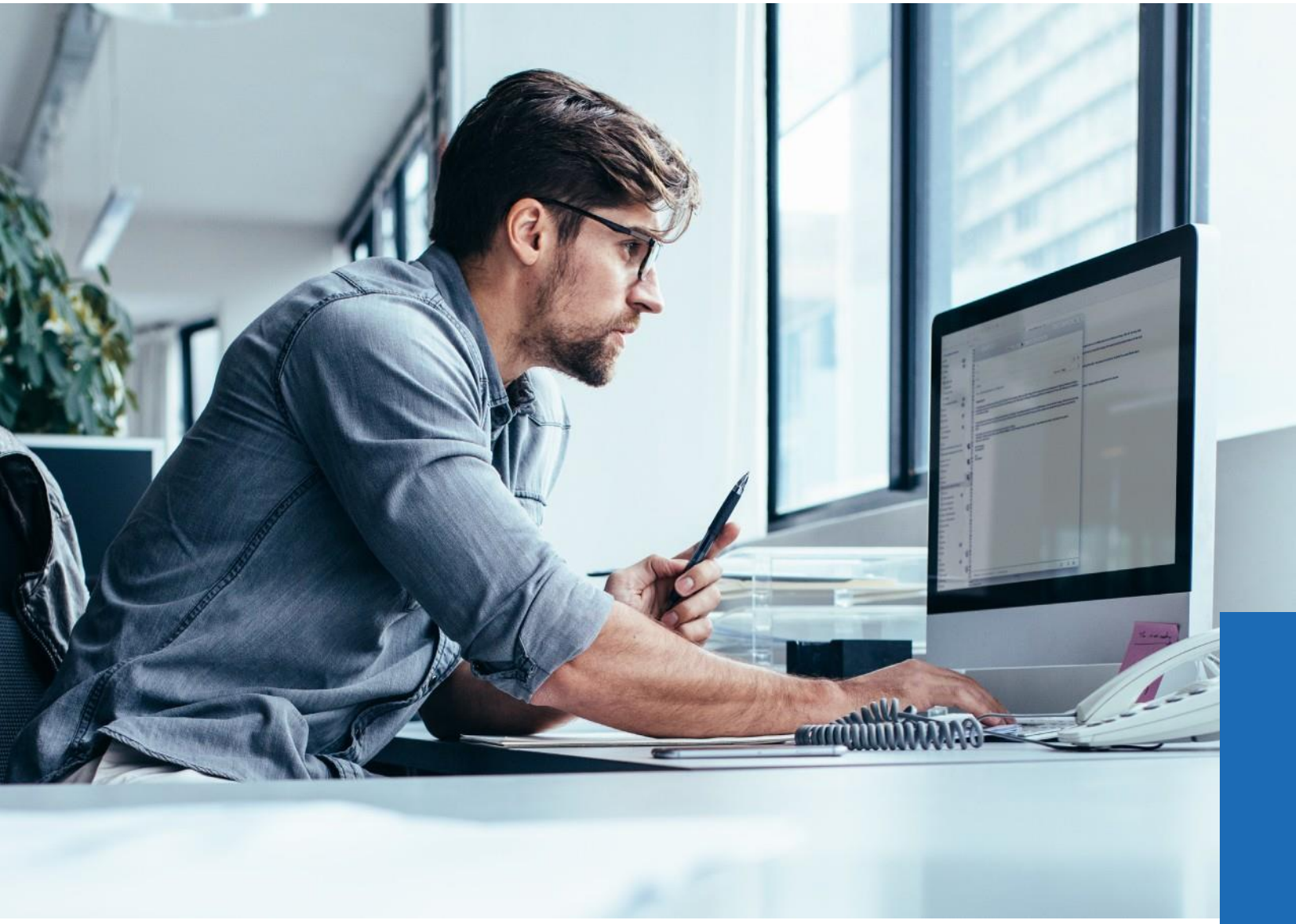
solver



Data Source Integrations

Get Complete Insight

A Solver White Paper

Updated: Nov/2020

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Introduction

The purpose of this white paper is to provide a non-technical overview of integration options between Solver and other systems.

With frequent, automated cloud updates, the solution is continuously being enhanced to drive faster, better decisions across its global customer base. For the latest information or to discuss your specific needs, please contact your local Solver partner, visit Solver's web-site or email us at info@solverglobal.com.

Note: The content of this white paper is valid for Solver Cloud and Solver Private Host 5.0 and later.

Product Summary

Solver provides a single, cloud-based solution that automates reporting and planning processes and supports faster and better decisions based on key information from across the organization's data sources.

Key benefits that Solver provides include:

- A top-rated Corporate Performance Management (CPM) solution by G2 based on user satisfaction
- Global partner channel with industry expertise to help you whenever and wherever
- Cloud software, support, and upgrades, packaged into a subscription price, providing unmatched ROI over traditional CPM solutions
- Built for business users to manage the entire solution without the need for developers
- Executive and management data from across the organization that is easily accessible in ONE place with Solver's intelligent Data Warehouse
- Solver's multi-tenant cloud application provides quick initiation, SOC 2 compliance, automatic software upgrades, and scalability at one's convenience
- Solver provides the power and the familiarity of cloud-connected Excel to solve the most complex formula and layout requirements for reporting and planning template designers
- Easy-to-use, pre-built integration to Power BI, the world's #1 visualization solution
- Fast and cost-effective integrations provided with Solver's wizard-driven Excel, CSV, SQL, and prebuilt ERP/CRM Connectors
- Unlimited access to reports and dashboards from secure web portal
- Hybrid cloud option provides customers with real-time cloud reporting capabilities for their on-premise ERP system

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Company Summary

Solver, Inc. is redefining the category of cloud-based reporting and planning. The Solver solution is built to enable faster and better business decisions across the entire organization. Solver combines financial and other key data into a single tool, powered by the most flexible report and planning form designer on the market.

Organizations use this solution to automate and streamline financial and operational reports, consolidations, and budgeting and forecasting processes. Solver empowers users with complete insight that drives intelligent decisions and competitive advantages. Headquartered in the United States, Solver, Inc. has more than a dozen offices and hundreds of partners globally that provide local and industry expertise. To learn more, visit www.solverglobal.com.

Executive Summary

There are two main deployment options for Solver:

1. Solver Cloud: A multi-tenant platform managed by Solver and running in the Microsoft Azure Cloud.
2. Solver Private Host (Version 5+): A single tenant platform installed on a server(s) in a customer's network or in a private hosting environment.

As of Solver Private Host 5.0 (released in October 2018) and later versions, both deployment options above are based on the same product code, with equivalent

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functionality, look and feel. Due to this equivalency, it is quite easy for a customer to migrate from Solver Private Host to Solver Cloud or, in special cases, from Solver Cloud to Solver Private Host. Solver Cloud will have more frequent product updates due to its multi-tenant architecture and the related ease for Solver to push out updates.

As this white paper describes, there are numerous integration options to get data in and out of Solver, allowing customers to choose which options are most suitable for their needs.

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Important Technology Terms

The terminology below is used throughout this white paper. API –

Application Programming Interface (API).

ETL – Extraction, Transformation and Loading (ETL)

Solver API – refers to Solver's own API which has the purpose of easy, automated data extraction from Solver and into other solutions such as Power BI, Tableau etc.

Data Source API – refers to the APIs of 3rd party data sources that Solver can connect to in order to load data into Solver.

Integrations – Solver ETL feature

Connector – Connectors are used to access specific external applications. Found in the Solver Marketplace, connectors can be purchased to facilitate the loading of data.

Integration Options

Solver integrations – Solver has its own data integration feature which in combination with Solver Connectors allow users to load data into Solver.

1. Connector: A connector is a Solver product that allows a user to connect their ERP system to Solver Cloud for data loading.
2. Integration: An integration, in Solver Cloud terminology, is a configured connector that is successfully loading in data.

SQL Server Integration Services (SSIS) – This powerful integration tool is part of the Microsoft SQL Server platform and can be used as an optional integration option for Solver Private Host.

Integration Architecture Overview

The simplified architecture diagram below shows three major integration options:

1. Solver Reporting module integrates directly into supported ERP systems. These are pre-built integrations that directly query the ERP database when a user runs a Solver report. This type of "real time" integration is currently only available for Solver Private Host and with a special technology for Solver Cloud (connecting real time to on-premise ERPs) referred to as Solver "Hybrid cloud".
2. Solver's Data Warehouse module integrates into one or many data sources. Two typical ways to load data:
   a. SSIS - Only supported for Solver Private Host (Solver is installed on-premise or hosted and it has direct access to query the ERP database).

   b. Solver Integrations – Using pre-built Solver Connectors, SQL Views or file loading.

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3. Third party tools such as a dashboard solution (like Power BI) depicted below connecting to Solver through its API. For Solver Private Host installations direct query of the Solver Data Warehouse (SQL Server) is also supported.

It should be noted that it is possible to have both a Solver Cloud deployment and Solver Private Host deployment should there be very unique customer requirements needing this. An example could be a headquarters with an on-premise ERP system where the accounting team wants an on-premise reporting solution, while the budget manager and controller want to run their budget process and consolidations in the Solver Cloud. Discuss with Solver or your partner for licensing and other requirements.

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Loading Data into Solver

This section specifically focuses on the features and steps to load data into Solver.

Overview of Integration Options

	Solver Deployment	
Integration Options	Solver Cloud	Private Host
Solver Data Integrations	Yes	Yes
Solver Gateway	Yes	No
Solver Connectors	Yes	Yes
Solver API*	Yes	Yes
Solver Meta Data (for real time ERP read/write)	Yes	Yes
Solver File Export (export report)	Yes	Yes
<Data Source> API (see Solver Marketplace for supported APIs)	Yes	Yes
SSIS	No	Yes

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Other integration tools that supports SQL Server	No	Yes

The Solver API supports Power BI and Tableau as of November 2020.

These integration options are explained in the following sections.

Solver Integrations

The Solver Integration feature is found in the Solver Web Portal and facilitates secure/validated data loading into the Solver Data Warehouse. Features include data source field mapping, simple data transformation, log files of jobs, job scheduling, email alerts and more.

Solver Connectors

Solver Connectors are used by Solver Integrations and can either be unique for certain data sources (such as a specific ERP- or CRM system) or generic for certain data sources such as Excel & CSV files, SQL databases, etc. Connectors either plug directly into the data source API or, in the case of the SQL Connector, it plugs into the Solver Gateway (see info below) which then connects to the on-premise data source with SQL views.

If an organization is using a cloud-based transaction system (e.g. an industry specific operational system) where no Solver connector exists, and file transfer is not an option, contact Solver for on-demand connector request.

Solver Gateway

The Solver Gateway is a connector that allows for secure extraction of data from within a company's network or hosting environment. The Solver Gateway is installed in the organization's environment where their data source(s) is located. Solver Cloud uses Solver Gateway in combination with the SQL connector to connect to SQL views that are located in the customer's own environment. The support for SQL Views means that in addition to any SQL views that may be provided out-of-the-box from Solver, a customer or consultant can make their own SQL views giving complete flexibility to access and transform data from the data source and make this available for Solvers SQL Connector.

Solver API

The Solver API provides a means for easy, secure data extraction from Solver Cloud. Currently (as of November 2020) supports Microsoft Power BI and Tableau. Later, support for other third-party tools is also planned.

Meta Data Integration

This refers to a pre-built (by Solver) integration layer for real-time (live without first transferring data to the Solver Data Warehouse) reporting directly from select on-

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premise ERP databases. Available with both Solver Private Host and Solver Cloud (as of February 2020) for supported ERPs.

Solver File Export

Using the Solver Report Designer, a user can create simple, yet powerful reports that export data from Solver in exactly the Excel import format that another system needs for data import. Most typically used to export completed budgets back to the ERP system.

Data Source APIs

A rapidly increasing number of transaction systems today provide an API that solutions like Solver can connect to in order to extract data. Solver offers both pre- built and generic Connectors to integrate to these APIs.

If an organization is using a cloud-based transaction system (e.g. an industry specific operational system) where no Solver Connector exists, and file transfer is not an option, contact Solver for an on-demand connector request.

SSIS

Microsoft SQL Server comes with the powerful SQL Server Integration Services (SSIS) tool. For all private host deployments of Solver where it has access to the data source's database, SSIS can be used to transfer data to the Solver Data Warehouse. In some cases, SSIS and other methods can be used to create a SQL Server staging database with data from a local data source. For Solver Cloud, the Solver Gateway can be used to move the data from the staging database (or directly from the source database) and up to the Solver Cloud.

Other Integration Options

For Solver Cloud, data will always be loaded using the Solver Integration feature with connectors (with Solver Gateway if the data source is on-premise). For Solver private host, any integration application that supports SQL Server (Solver's private host Data Warehouse platform) can be utilized.

Preparing Solver for Data Loading

This section provides an overview of the main steps in the Solver portal to install and configure a connector.

Overview of Solver Data Warehouse

The Solver Data Warehouse is based on an Azure SQL database (Solver Cloud) or SQL Server (Private Host) and uses a Dimensional Model (star schema) configuration.

The Solver Data Warehouse dimensions, attributes and fact tables are automatically created the first time an integration is configured. They can also be modified or amended later in the Data Warehouse menu in the Solver Portal.

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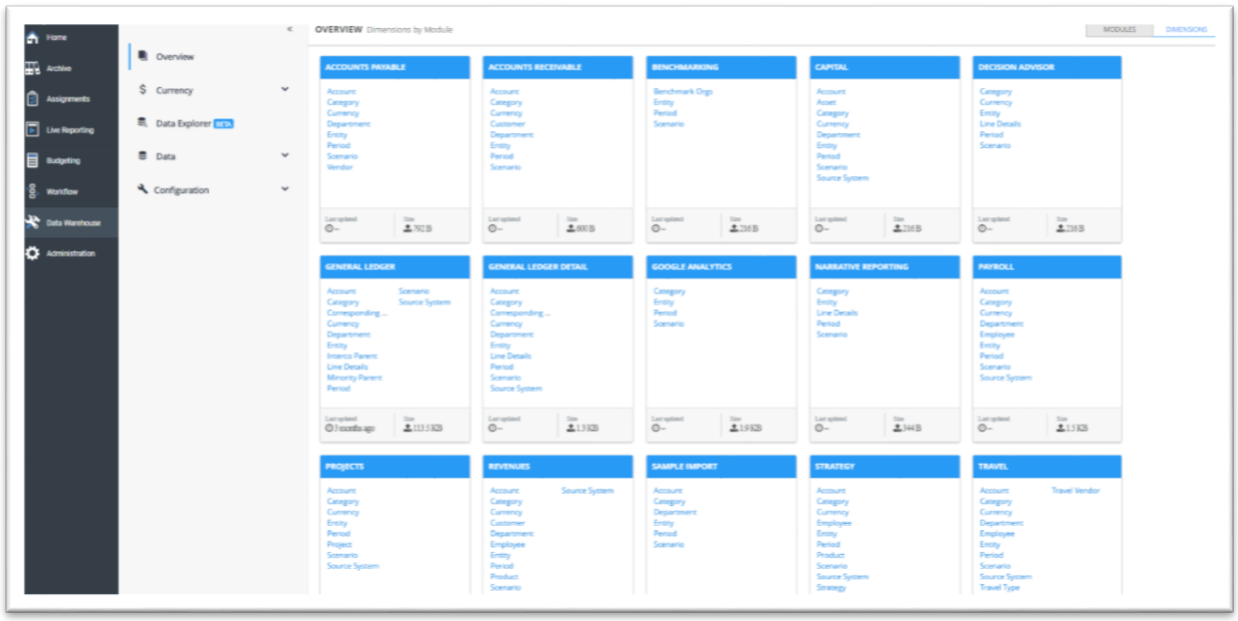

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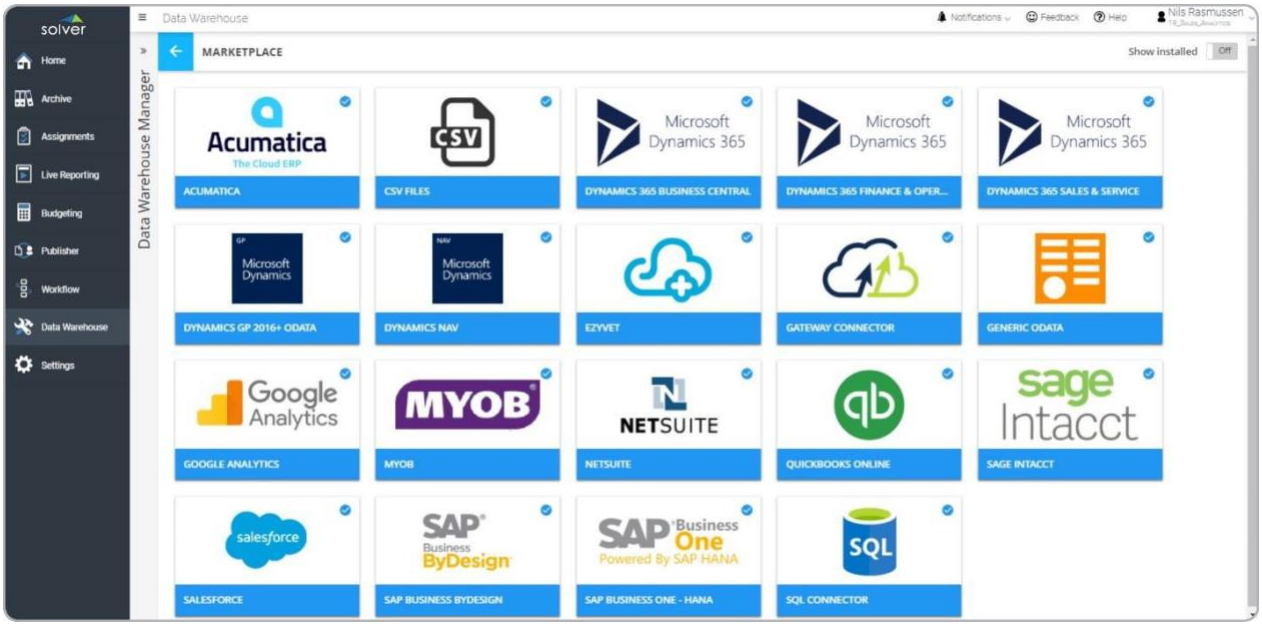
Overview of Solver Connectors

Selecting the relevant Connector in the Solver Marketplace.



Each connector requires a valid user on the source system. Refer to the Solver Connector User Guides found on the Solver Support site for documentation about your specific connector. You can also find information in the Help file inside the Solver Portal (search for “integration” or “connector”).

In this example, the screenshots below show the Microsoft Dynamics 365 (D365) Business Central connector. Note that the Solver integration interface is the same across all connectors. After successfully logging in, users will begin the process of configuring the integration. An integration consists of one or multiple tasks that load data. As an example, a user can create a task that loads dimensions and another task that loads data from the source system to Solver Cloud.

As you configure each task, you will select the source object as shown below.

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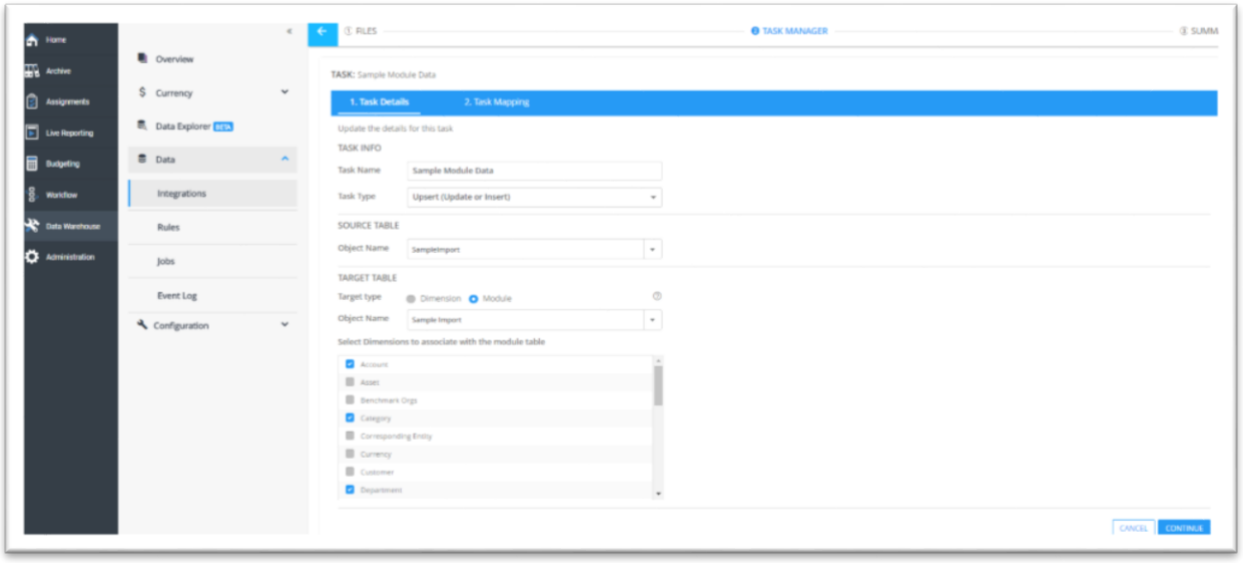
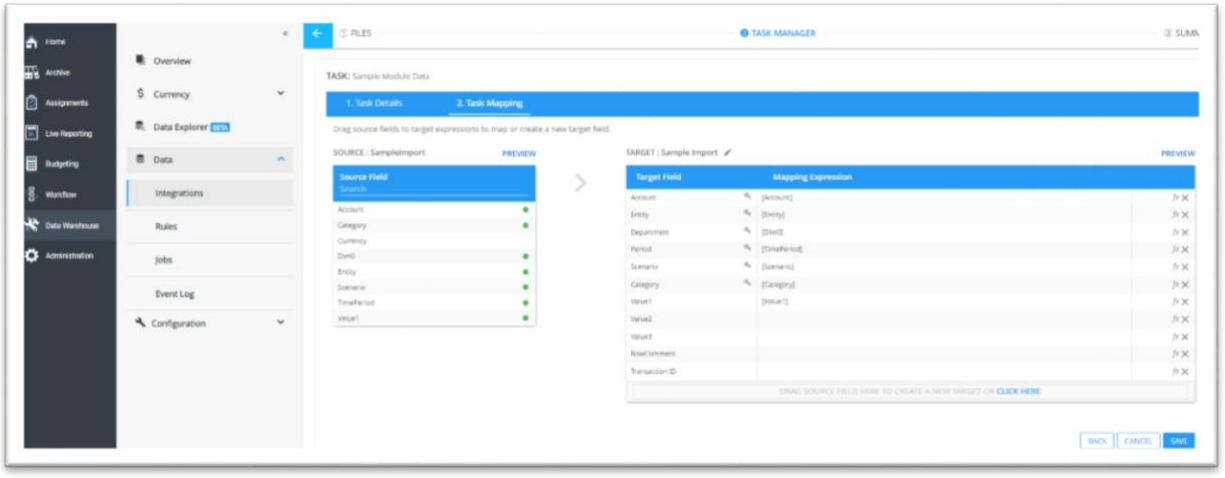


Mapping D365 fields to Solver's Data Warehouse: The left side table in the image below shows fields selected from the data source (e.g. the General Ledger in the ERP system) and the right table shows fields in the Solver Data Warehouse and the mapping to selected fields from the data source shown on the left. New fields can automatically be added to the Solver Data Warehouse by dragging them from the data source fields (left) to the area at the bottom of the screen on the right.



Once the integration has been configured, the user can refresh the data on-demand from Solver's Integration menu or you can set up a scheduled refresh automatically…

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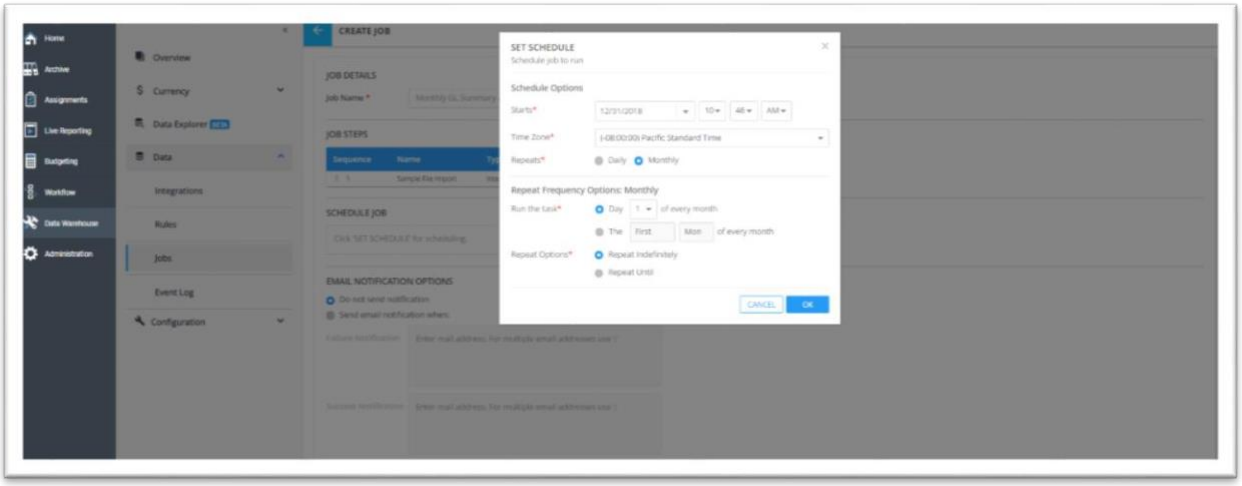

E-mail alerts can be set up to message the responsible person should a scheduled data load fail. The Solver Event Log also keeps track of the status of every load.

Data Transformation

In some cases, there may be a requirement to transform data in various ways as it is loaded into Solver. Examples could be flipping the sign on revenues and expenses, changing the data source format of a date field to the required Solver date format, etc.

There are several options for this; The Solver Integrations (has built-in data transformation functions), SSIS, or manipulation (manual or macros) through file transfers in e.g. Excel.

Viewing Data after Upload to Solver

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

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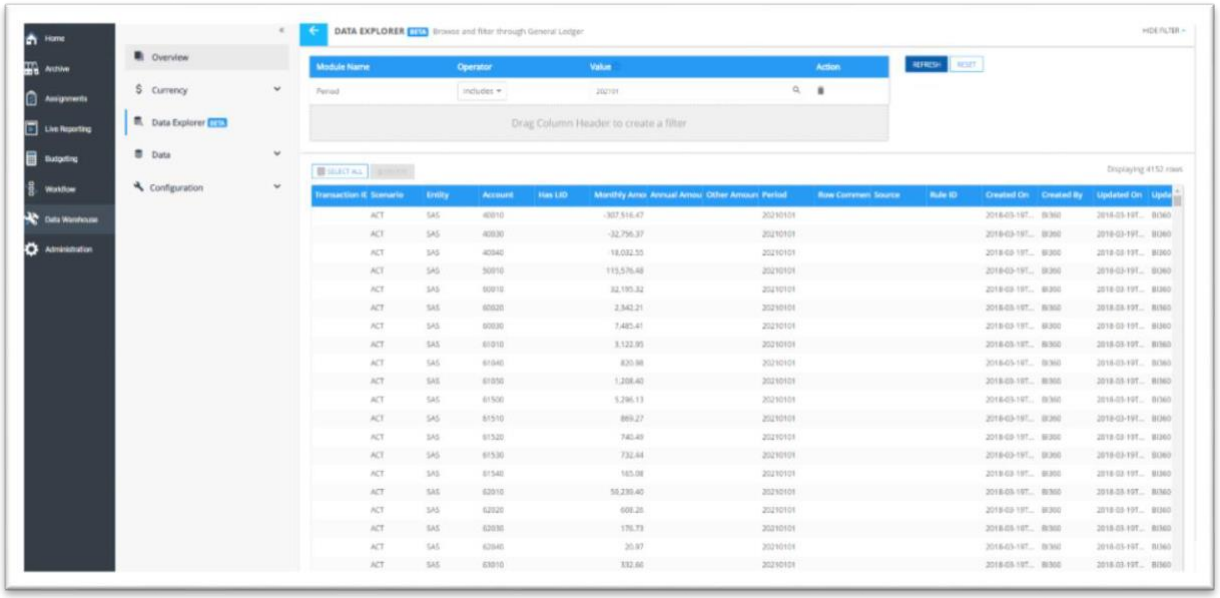
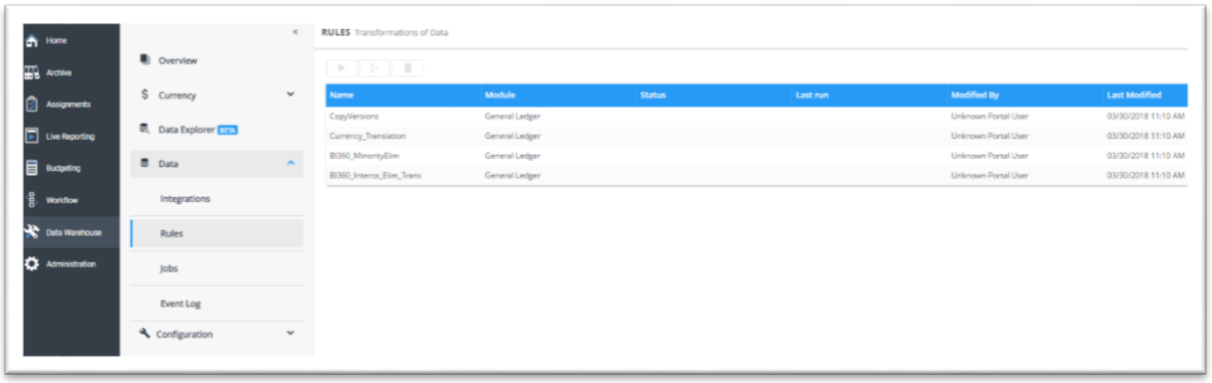


In addition, you can use Solver's report writer to create virtually any report layout in the format you desire to validate the data you uploaded to Solver.

Automated Data Generation Rules Available in Solver

As data is being loaded from your data source and into Solver, there are other optional Rules that can automatically be triggered, such as:

- Currency conversion
- Intercompany eliminations
- Copy data (for example from Actual to Budget scenarios)



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Exporting Data from Solver

Below are four situations where it may be important to export data out of Solver and into another system:

1. Transferring a completed budget from Solver and back to the ERP system
2. Transferring consolidation adjustments or allocations from Solver and back to the ERP system
3. Transferring data from Solver and into a 3rd party analytical tool (i.e. Dashboard)
4. Transferring actual or budget data from a subsidiary company using Solver and up to a parent company (HQ) using Solver or that is using a different corporate performance management tool.

Transferring Budget Data from Solver to the ERP System

Use a Solver budget export report (can be built/updated with Solver Report Designer)

1. Creates Excel export file from Solver in the exact Budget import format of your ERP system
2. Go to the import feature in your ERP system to import the Excel file from Solver

Transferring Adjustment Entries or Allocations back to the ERP System

Same method as above. For Solver private host deployments, you can also use tools like SSIS to automate this step.

Transferring Data to a 3rd Party Analytical Tool such as a Dashboard

Connect to the Solver API (currently as of November 2020 available for Power BI and Tableau). For Power BI there is also a Microsoft-approved Solver connector available from within Power BI Desktop. For Solver private host deployments, you can also use tools like SSIS.

Transferring Actual or Budget Data to a Parent Company

Several options may be used depending on the parent company's requirements. For example: SSIS, connect to Solver API (planned future option), file export and report export (create Solver report that exports data to Excel in desired export format).

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Appendix 1 – Additional Resources and Documentation

Users have multiple resources to learn about integrating Solver Cloud to their ERP system. The most detailed information is found in the Data Warehouse integration courses in Solver Academy, which also include ERP specific integration video instructions. Another information source is under the Help button available in the upper right-hand corner of the Solver portal. While in the Solver portal, click into the Data Warehouse, and navigate to Data -> Integrations and select the desired Solver Connector.

If your cloud ERP is not listed, please contact support@solverglobal.com. For on- premise data sources where no Solver Connector exists, select the SQL Connector and the Gateway.

- Videos and other integration training material:
  - High level video material
  - Solver Academy
- Solver Support site (white papers and various knowledgebase articles)
- Solver Connector User Guides

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Appendix 2 – Available Pre-built Solver Integrations

The list of pre-built integrations is growing. Please always check with the Solver Marketplace (found inside the Solver application) for the latest list. The hyperlinks below show links to SQL views and documentation for on-premise data sources.

- Acumatica
- Google Analytics
- Microsoft Dynamics 365
    - Finance and Operations
    - Business Central
    - Sales & Service
    - GP
    - SL
    - NAV
    - AX2012 R2-R3
- NetSuite
- QuickBooks Online
- Sage
    - Intacct
    - Sage 100
    - Sage 300
    - Sage 500
    - Sage X3
- Salesforce
- SAP
    - SAP Business One – SQL Server
    - SAP Business One – Hana
    - SAP ByDesign

Contact Solver (info@solverglobal.com) for Connector requests to additional cloud data sources.

Note: You can set up your own SQL views and use the Solver Gateway with any data source on the market that supports SQL Views. Solver Gateway allows an organization to connect their databases located within their network firewall to Solver Cloud. Once a connection is made with the Solver Gateway, users can begin configuring the Solver SQL Connector to load in data. Solver, Inc. provides pre-built SQL views for many popular ERP systems to enable the user to get up and running quickly with Solver Cloud. These template views can be found on the Solver Support site.

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