onestream

Smart Integration Connector Guide

8.4.0 Release

Table of Contents

Revision History

Date	Smart Integration Connector Release	Summary of Changes
22 Aug, 2024	8.4.0	Updated for release features, including the following enhancements: • Improved performance and reliability of multi-threaded / parallel processing for larger payloads. • Streamlined process of setting up a redundant Gateway Server. • The active Gateway Server is now displayed within the Gateway Setup in the Windows App.

		• For Remote Business Rules, the number of rows returned per query threshold has increased to 5M / 5GB of data. • Added ability to check if the gateway is online via a BRAPI.
17 Mar. 2024	8.2.0	Updated for release features, including the following enhancements: • Query results that contain NULL values are now being returned. • Added ability to mask the password when creating a database connection string. • Queries that run longer than 10 minutes will consistently return data.

		• Improved the reliability of multi-threaded connections. • SIC Local Gateway Configuration Utility will automatically open the configuration file for non-default install locations. • DataTable / Datasets can now be sent via a Remote Business Rule.
21 Nov. 2023	8.1.0	Updated to add WebAPI examples.
17 Nov. 2023	8.1.0	Updated for release features, including the following enhancements: • Customers can test their SIC Gateways during set-up to ensure there is nothing blocking port 443.

		• The default Referenced Assemblies folder is in C:\Program Files\OneStream Software\OneStream Gateway\Referenced Assemblies. • The database connection strings in the OneStream Local Gateway Configuration are encrypted when saved. • Specific IPs or CIDRs (a range of IPs) can be whitelisted from the OneStream Windows Client Application. • The OneStream Local Gateway Configuration utility automatically opens the configuration file for the user.

21 Aug. 2023	8.0.0	With this release, Smart Integration Connector is a General Availability feature. Updated for release features, including the following enhancements: • The 2GB .NET limit and 1 million return rows is increased to 5GB and 5 million return rows. • Business rules decompress automatically.

About This Guide

This guide is intended for OneStream administrators and IT professionals. It describes how to manage Smart Integration Connector to connect local data sources to your OneStream Cloud instance. OneStream Cloud Operations and Support can assist with the tasks needed to set up Smart Integration Connector:

- Installing or upgrading to OneStream platform version 8.4.

  > **IMPORTANT:** The Smart Integration Connector Local Gateway Server version 8.4 is required to use with OneStream 8.4. Previous versions of Local Gateway Server will not communicate with OneStream 8.4. Upgrade your Local Gateway Server to v8.4 to continue using Smart Integration Connector.

- Installing Smart Integration Connector Local Gateway Server in your environment.

Benefits

OneStream applications are strategic components in your financial environment. Data from financial systems is imported to OneStream and contributes to financial closing and reporting processes. While performing analysis, you leverage data lineage capabilities to make contextual associations to data sources in your network.

You will need to set up and configure data sources that may be accessed by OneStream processes. Traditionally, data connectivity between a OneStream Cloud instance and local data sources is established using a Virtual Private Network (VPN) and all data source credentials and supporting files are located on OneStream application servers.

The goals for Smart Integration Connector are to establish all required data source connections without VPN and establish residency and management of data source connections solely in your network.

With Smart Integration Connector, you can:

- Securely establish connectivity between OneStream Cloud and data sources in your network without a VPN connection.
- Create and manage network data source integration using OneStream administration interfaces.
- Locally manage database credentials and ancillary files.

Common Understanding

Use the reference charts below to understand common terms used throughout the product and this document.

OneStream Client Application Terms

Term	Definition
OneStream Windows Application client	The Windows client facilitating user interface access for all user personas to OneStream applications.
OneStream Windows Application Server (App Server)	The application server executing all OneStream business logic and processing.
Gateway	Gateways define direct channels of integration between the OneStream Cloud and a local customer network. Gateways are represented by a unique gateway key and are configured for communication to an Azure Relay endpoint. Gateways carry a 1:1 correlation to a local gateway. The channel of communication established from the OneStream gateway and a local gateway created in Smart Integration Connector.
Gateway Server	A gateway server carries no unique technical definition or configuration address. It is a node in the tree control UI to organize gateways and typically corresponds to an installed local gateway server name.
Custom Database Connections	Custom database connections define a named data source to which OneStream may connect using Smart Integration Connector for the purpose of data import, data export, or drill through querying. The named custom database connection is referenced in OneStream business logic (data management objects or business rules) to initiate data source connectivity. Credentials and ancillary files required for a designated data source connection are configured to and reside on the corresponding local gateway server.

Direct Connection (for example, SFTP, WebAPI)	A direct connection represents a point-to-point channel to designated resources such as an sFTP server or Web API (including iPaaS services). The OneStream Local Gateway Server Configuration Utility UI facilitates configuration of mapped connections to resources where the on-premises TCP port is mapped to a server (hostname/IP).
Database Connection	A database connection represents the ultimate datasource destination for Smart Integration Connector. A local gateway connection may be a designated database. The OneStream Local Gateway Server Configuration Utility facilitates configuration of required credentials and supporting files. The identification of a local gateway connection must correspond to a custom database connection established to the OneStream Application Server.
Whitelist (Whitelisting)	Whitelisting provides the capability of providing a list of IP addresses or namespaces that data can flow through the Smart Integration Connector. Whitelisting can be applied to the Relay in the OneStream Windows Application client and also applied to your firewall through your IT Admin.

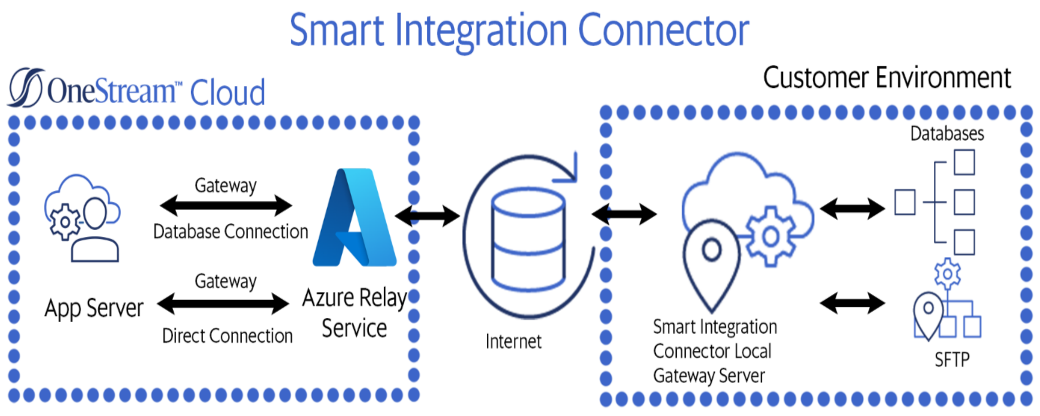
OneStream Local Gateway Configuration Terms

Term	Definition
Local Gateway Server	Smart Integration Connector requires a client installation on Windows servers to establish a local gateway server. The local gateway server

	houses one or more local gateways which are configured through the OneStream Local Gateway Configuration.
Local Gateway	Local gateways define the local customer endpoint for distinct channels of communication used by Smart Integration Connector. A local gateway facilitates connections to local databases, Web API connections, iPaaS servers, or sFTP servers and corresponds 1:1 with a gateway definition on the OneStream Application Server. To ensure a valid connection, a local gateway must be configured by importing the corresponding gateway definition exported from the OneStream Windows Application client.
Local Gateway Connections	Local gateway connections are the database connections defined in the utility and confirm the connection between the local gateway and the local data sources.
OneStream Local Gateway Configuration	This utility is where you configure the Local Gateway Server, Local Gateways and Local Gateway Connections to data sources.

Architecture

In contrast to a direct data source connection established using a VPN, Smart Integration Connector makes an indirect connection to data sources. Smart Integration local gateways integrate with on-premises customer environments through a cloud hosted service called Azure Relay. The locally installed and configured local gateway server makes the direct connection to data sources and responds to the OneStream application.



> **NOTE:** In OneStream, Custom Database Server Connections define the connection through the gateway to the data source.

The two primary services of Smart Integration Connector are:

- **OneStream Application Server:** The application server brokers communication between the OneStream Cloud instance application and the Azure Relay service.
- **Local Gateway Server:** Instances of the Smart Integration Connector Local Gateway Server are installed inside your network and configured to make direct connections to designated data sources. The Smart Integration Connector Local Gateway Server runs as a Windows service and brokers communication between local data sources and Azure Relay using an outbound connection over port 443. All communication is encrypted end to end through TLS.

The components of the Smart Integration Connector are:

- OneStream Windows Application client

  Direct and Database connections (Gateways) configured through **System** > **Administration** > **Smart Integration Connector**.

> **NOTE:** The SmartIntegrationConnectorAdminPage role must be assigned to a user for this to be visible.

- A Custom Database Connection to the local gateway data source. Custom Database Connections are configured in
  System > System Configuration > Application Server Configuration > Database Server Connections.

  > **NOTE:** The ManageSystemConfiguration role must be assigned to a user for this to be visible.

- OneStream Smart Integration Connector Local Gateway Server
  - Local Gateway Settings provide the connection information to establish the gateway connection to the OneStream Windows Application. Gateway settings are exported from the gateway settings in the OneStream Windows Application and imported to the Local Gateway section of the **OneStream Local Gateway Configuration**.
  - Local Gateway Connections provide the setup information necessary for the Smart Integration Connector Local Gateway to connect to local data sources. Local Gateway Connections are set up through the **OneStream Local Gateway Configuration** in the Gateway Connections Settings section.

Additional Considerations

- To provide high availability in a active / passive (fail over) manner, there can be multiple instances of a designated local gateway server, each running on a separate server bound to the same gateway.
- Multiple local gateways can be installed to establish global connectivity to data sources in different subnetworks.
- Local gateway configuration must align to the corresponding gateway as defined in the OneStream Windows application. An export process from the OneStream Windows application gateway user interface can assist with the alignment to ensure corresponding names and keys are identical.

Requirements

OneStream Smart Integration Connector Environment Setup

- Install or upgrade OneStream to the latest version. See Setup and Installation.

> **IMPORTANT:** The Smart Integration Connector Local Gateway Server version 8.4 is required to use with OneStream 8.4. Previous versions of Local Gateway Server will not communicate with OneStream 8.4. Upgrade your Local Gateway Server to v8.4 to continue using Smart Integration Connector.

- Work with your IT team to install the latest version of the Smart Integration Connector Local Gateway Server in your environment.
    - Windows Server 2019+
    - .NET Framework 4.8
    - 2 newer generation processors (or virtual processors)
    - Memory (RAM)
        - Minimum 16GB for queries / jobs returning less than 1M / 3M rows or 1GB / 3GB of data respectively.

        - Minimum 32GB for queries / jobs returning less than 5M / 15M rows or 5GB / 15GB of data respectively.

> **NOTE:** Memory and processor requirements are driven by the frequency and volume of remote data accessed through the gateway service or if remote business rules / long running jobs are leveraged. For queries returning over 1 million records, 32 GB or more RAM is recommended.

    - The installer requires administrative permission on the server to perform the installation.

    - See Smart Integration Connector Local Gateway Server Installation.

- Create a valid Gateway of type Database Connection to be used as the baseline communication between OneStream Cloud and the Smart Integration Connector Local Gateway Server. See Create a Database Connection for more information.

- Be a OneStream administrator to configure corresponding data sources in the OneStream environment.

Advanced Networking and Whitelisting

It is a best practice to filter and/or whitelist network traffic for the Smart Integration Connector, you will need to work with your IT team to restrict this traffic. See Advanced Networking / Whitelisting for more information. For any additional questions, please reach out to Customer Support.

Upgrade Smart Integration Connector

The following section describes how to upgrade Smart Integration Connector.

> **IMPORTANT:** The Smart Integration Connector Local Gateway Server version 8.4 is required to use with OneStream 8.4. Previous versions of Local Gateway Server will not communicate with OneStream 8.4. Upgrade your Local Gateway Server to v8.4 to continue using Smart Integration Connector.

Upgrade from

- Private Preview versions 7.2, 7.3,
- Limited Availability version 7.4, or
- General Availability versions 8.x to 8.4

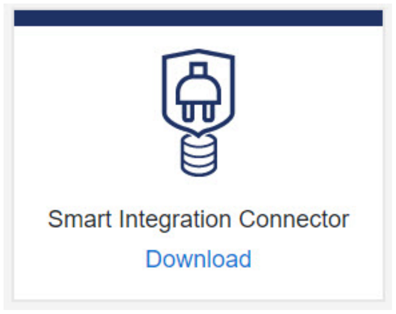
As part of the upgrade, you can expect the following:

- A copy of the original configuration file from the prior version will be saved.
- Existing gateways should continue to function as they did prior to the install.
- If the Smart Integration Connector Windows Service is running, then the service will automatically be started after install.

  > **IMPORTANT:** OneStream 8.4 will only communicate with Smart Integration Connector Local Gateway Server 8.4.

If you perform an upgrade and have issues or do not achieve these results, contact OneStream Support.

1. Install the latest version of OneStream. The latest version can be requested and scheduled through the OneStream Software Cloud Customer Service Catalog. Make a note in the details section of the ticket that you want to install and configure the Smart Integration Connector.
2. Download the Smart Integration Connector install (OneStream_Connector_#.#.#.zip) file from the Platform section of the Solution Exchange.



3. Extract the OneStreamSmartIntegrationConnectorGateway.msi from the downloaded zip file.
4. Back up a copy of your configuration folder and sub folders before upgrading. Default is: `C:\Program Files\OneStream Software\OneStream Gateway\`.
5. Follow the steps in Setup and Installation to complete your upgrade.

If the Smart Integration Connector Windows Service was configured to start using a custom service account prior to upgrading, confirm that the service is set to start using the correct service account after the upgrade is completed.

NOTE: For OneStream Local Gateway Server version 8.1 and above, the new default location for Reference Assembly Folder is C:\Program Files\OneStream Software\OneStream Gateway\Referenced Assemblies.

Prior to v8.0, it was required that a OneStream Business Rule developer invoking a remote Smart Integration Function be aware of the data type returned and convert accordingly after the result is returned.

Example: An example where the returned result was a byte array involved code that appeared as follows:

```
bytesFromFile = CompressionHelper.InflateJsonObject(Of System.Byte())
(si,objRemoteRequestResultDto.resultDataCompressed)
```

The Smart Integration Connector Gateway now provides this type of information back to OneStream and streamlines this conversion process using a newly added property called ObjectResultValue, which is populated.

When invoking the same operation shown above that previously required the type to be converted, a BR developer can do the following:

```
bytesFromFile = objRemoteRequestResultDto.ObjectResultValue
```

Migration from VPN Considerations

If you are migrating from a VPN solution to Smart Integration Connector, there are items to take into consideration. Use the checklist below to prepare yourself for migrating from VPN to Smart Integration Connector.

> **NOTE:** While migrating, a VPN and Smart Integration Connector can be used in tandem. This allows for A/B testing and validation prior to disconnecting the VPN tunnel.

Checklist Item	**Complete**
Check if your VPN connection is used for securing authentication paths to OneStream. SIC is not providing this capability, however other considerations such as whitelisting IP access are options see Modify Inbound Client Access Rules.	☐
Determine how many VPN connections exist. If OneStream is integrating with data sources from multiple subnetworks, you may have multiple VPN connections. This configuration can be managed with multiple Local Gateway Servers.	☐
Smart Integration Connector requires the installation and operation of a Local Gateway Service . Make sure you have identified a Virtual Machine or physical server to operate the Local Gateway Server. See Requirements.	☐

Take inventory of what you currently use for example, business rules, workspaces, queries, grid views, drill-backs, and whitelisted endpoints for each plan for any updates needed when using Smart Integration Connector.	☐
Set up a time with your OneStream Cloud Support Representative to plan when the VPN can be disconnected.	☐

Setup and Installation

Smart Integration Connector Setup Overview

You must set up Smart Integration Connector in this order:

1. Install the **OneStream Smart Integration Connector Local Gateway Server** (OneStreamSmartIntegrationConnectorGateway.msi) on a Windows Server 2019+ in your environment.

2. Create a gateway in the OneStream Windows application to connect OneStream Cloud instance to a **Local Gateway on the Local Gateway Server**.

3. Export the gateway configuration and import this configuration to the **Gateway Settings** in the **OneStream Local Gateway Configuration**.

4. For Database Connection gateways, to allow connections to local databases:

   a. Define a Local Gateway connection including **Data Sources** through the **OneStream Local Gateway Configuration**.

   b. Test any configured **Data Sources** to confirm they are communicating properly.

      > **NOTE:** Testing direct connections may involve building test business rules to perform proper validation.

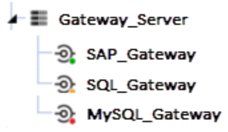
   c. Define a custom database connection in the OneStream System Configuration Setup.

When installation is complete, you can access remote data sources using business rules, member formulas, or dashboard data adapters in OneStream through the Smart Integration Connector.

Gateway Terms

The Smart Integration fields define the gateway. You can find more information about this below.

Relay Name	Refers to the internal namespace of the relay service that is responsible for managing the data flow for all defined Gateways. For example, arn-mysite.servicebus.windows.net.
IPv4 Whitelist	Contains the list of IPs or CIDR addresses that are allowed to transfer data through Smart Integration Connector.
Name	The name of the gateway. Gateway names are completely arbitrary and typically refer to the region (North East) or data source such as (SAP). The gateway name cannot be changed once created, and they must be unique across all environments—both development and production. You can delete an existing gateway and recreate it with a new name.
Description	Text describing the role and purpose for the gateway and the data sources to which it is connecting.
Gateway Server Name	This is the name of the gateway server associated with the gateway. You can select an existing gateway

	server or enter a new one.
Web API Key (Database Connections only)	This is an editable field. You can change your key as needed. If changed, it must also be changed in the Smart Integration Connector Local Gateway Server. It is designed to offer an additional layer of protection within your network when invoking APIs embedded in the Smart Integration Connector Local Gateway Server. The purpose of the Web API Key is to give you full control on who can access the data sources in your network.
Gateway Key	This is the cloud key used to authenticate the Smart Integration Connector gateway to the customer OneStream environment. This key can be rotated in the OneStream application by Smart Integration Connector Gateway administrators and must be the same in both the remote Gateway service and in OneStream.
Status	Value will be Online if the local gateway is running and returning heartbeat messages back to OneStream. If the Smart Integration Connector Local Gateway Server is unavailable, stopped, or network connectivity is interrupted, it will display Offline.
Status Indicators  Gateway_Server SAP_Gateway SQL_Gateway MySQL_Gateway	Status indicators give a visual notification based on the **Gateway** status. An indicator turns green on the side menu if the **Gateway** is **Online**, red if the **Gateway** is **Offline**, and yellow if the **Gateway** is **Online** but there is a newer version of the Local Gateway Server available.

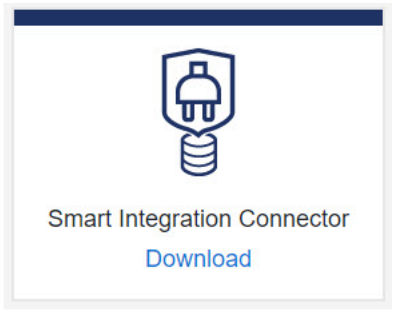
	For **Direct Connections**, the yellow status will never display as these connections do not report a version number back to OneStream.
Instance Count	Displays the count of active gateways. Grayed out by default. While this value is typically 1 when the gateway is online, you may have a listener count of two or more if there are redundant active gateways for high availability. By default, OneStream allows a total of five active gateways per environment. This can be increased by contacting Support.
Version (Database Connections Only)	Displays the Smart Integration Connector Local Gateway Server version. This version may be different from the deployed version of OneStream and allows administrators to observe and monitor versions of Smart Integration Connector Gateway software deployed.
Active Local Gateway Server Computer Name (Database Connections Only)	Displays the computer name of the currently active local gateway server.
Bound Port at Gateway	Remote port bound to Gateway endpoint. Database Connection Gateways default to 20433 and should not be changed without consulting support. Direct Connection Gateways allow any port running on a remote host to be used. This port represents the well-known TCP service to expose from an on-premises host such as sFTP, which would equate to port 22.

Remote Gateway Host (Direct Connections Only)	Remote port host to Gateway Server. Used if surfacing an endpoint such as an SFTP Server. This could be the hostname or IP address on the network that the Gateway Server resides in. For example: 172.168.4.7 or sftp.mycompany.com
Bound Port in OneStream (Direct Connections Only)	This is an customer defined port that can be referenced in data management or business rules to directly access services such as sFTP and WebAPI. This must be a globally unique port in a OneStream deployment environment per direct connection and should be a TCP port number > 1024 and <65535. When creating the gateway, use the default of -1 and OneStream will automatically assign an open port.
Gateway failures reporting interval (min)	Minutes to wait between reporting gateway failures into the OneStream Error Log. The default is five minutes and the max is 1440 minutes. If a gateway is unreachable, an item is put in the error log using this interval value in minutes and the minutes can be adjusted.

Local Gateway Server Installation

Smart Integration Connector is available in OneStream from the **System** > **Administration** tab.

1. Download the Smart Integration Connector installer (OneStream_Connector_#.#.#.zip) file from the Platform section of the Solution Exchange.

2. Copy the **Smart Integration Connector Local Gateway Server** installer to a Windows Server within your environment.

3. Run the installer as an administrator. Accept all the default prompts. When completed, the Local Gateway Server will be installed on your Windows Server.

   > IMPORTANT: If you are upgrading, you must follow steps 4-7.

4. Run the **OneStream Local Gateway Configuration Utility**.

5. The **XFGatewayConfiguration.xml** file will open by default.

   > IMPORTANT: Do not change the name of the XFGatewayConfiguration.xml file. The OneStream Smart Integration Connector Gateway Service only references this XFGatewayConfiguration.xml file upon start-up. The **Save As** functionality is used to create a backup of the file. Do not rename, move, or change the location of the XFGatewayConfiguration.xml file.

6. Save the configuration file.

7. Follow the dialog prompts and restart the service.

Create a New Gateway

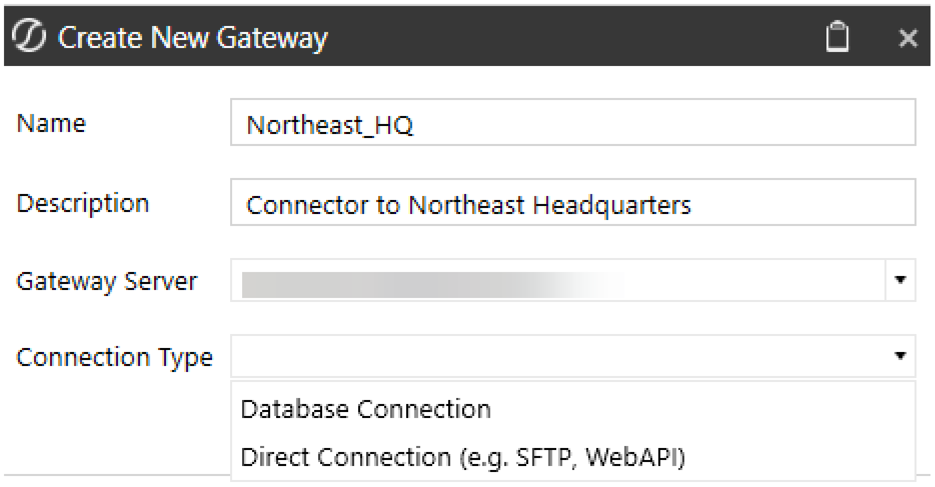
Gateways are used to connect OneStream to the Smart Integration Connector Local Gateway Server over the Azure Relay. You will establish whether the gateway is a direct or database connection. After the gateway is created, you will need to copy the configuration to the Smart Integration Connector Local Gateway Server using the OneStream Local Gateway Configuration.

1. Go to **System** > **Administration** > **Smart Integration Connector**.
2. Click **Create New Gateway**.
3. Enter the **Name** and **Description**. For descriptions of the fields in steps 3-5, see Gateway Information section.

   > NOTE: The Gateway name cannot be changed once created and must be deleted and re-created.

4. Select the **Gateway Server** from the drop-down, or enter a new Gateway Server name in the same field.
5. From **Connection Type**, select Database Connection or Direct Connection. You will

have to enter different information depending on the connection type.



Name: Northeast_HQ

Description: Connector to Northeast Headquarters

Gateway Server: [redacted]

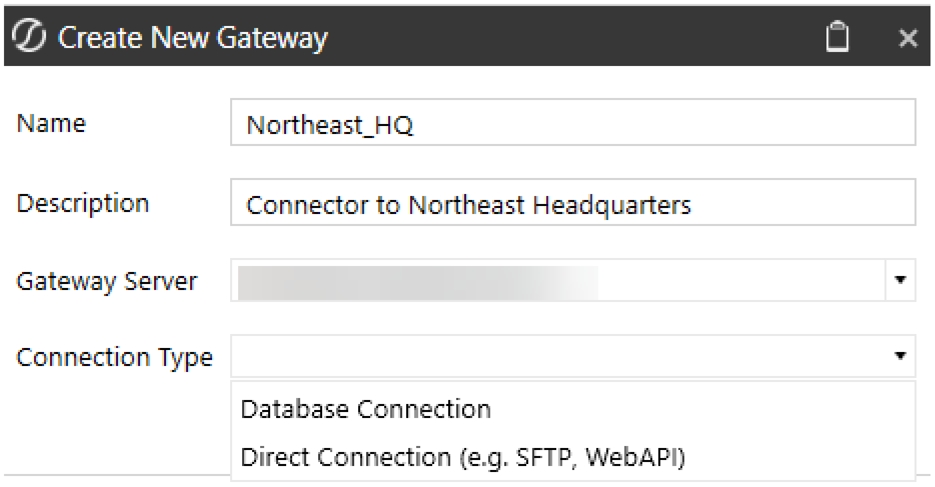
Create a Database Connection

A database connection is used to connect to relational databases, such as SQL Server or MySQL, using ODBC, OleDB, or .NET drivers and is also necessary for remote Smart Integration Functions to run. It is recommended to have at least one database connection endpoint per Gateway Server even if relational databases will not be accessed by OneStream. The Local Gateway Configuration Utility facilitates the configuration of required credentials for the associated local gateway. The identification of a local gateway connection must correspond to a custom database connection established to the OneStream Application Server.

After you create a new gateway, you can complete the database connection by following these steps:

1. From **Connection Type**, select **Database Connection**. For descriptions of the fields in steps 1 and 2, see Gateway Information section.

2. Enter a Web API Key.



Name	Northeast_HQ
Description	Connector to Northeast Headquarters
Gateway Server	
Connection Type	

Database Connection
Direct Connection (e.g. SFTP, WebAPI)

NOTE: The Web API Key is used as an additional layer of security when communicating with the Smart Integration Connector Local Gateway Server internal APIs. WebAPI keys are not required, but are best practice to enhance security and can be modified or added at any time. The Local Gateway Service introduces a WebAPI exposed only to OneStream and bound only to localhost on the server it is deployed to. This WebAPI is inaccessible on the remote network. If the Local Gateway Service is bound to other network interfaces, it is suggested to use the WebAPI as a mechanism to enhance security on the remote network preventing unauthorized use of OneStream WebAPIs.

Create a Direct Connection

A gateway direct connection represents a point-to-point channel to specific remote network resources such as an sFTP server or Web API (including iPaaS services).

> **NOTE:** It is required to have at least one database connection to use a Direct Connection because the database connection is used to monitor the availability of the remote Smart Integration Connector Gateway server.
>
> The existence of a database connection does not necessarily mean it must be used or configured to a data source if only Direct Connections are desired.

After you create a new gateway, you can configure the direct connection by following these steps:

1. From **Connection Type**, select **Direct Connection (e.g, SFTP, WebAPI)**. For descriptions of the fields in steps 1-4, see **Gateway Information section**.

2. Enter the Bound Port at Gateway. This port represents the well-known TCP service to expose from an on-premises host such as SFTP, which would equate to port 22.

   > **NOTE:** The remote service port is required to configure the connection and may require consultation with network or IT resources to obtain it. It is also required that any firewalls between the Local Gateway Server and the remote host allow traffic to the destination port specified.

3. Enter the Remote Gateway Host (for example, localhost). This represents the remote host name or IP address accessible by the OneStream Smart Integration Connector Local Gateway Server. If the host or IP address is accessible or resolvable from the OneStream Smart Integration Connector Gateway service or using remote resources accessible through on-premises WAN, it can be exposed for use.

4. Enter a Bound Port in OneStream. It is a best practice to use -1 for this value as the OneStream application servers will locate an unused and available port to map to this connection. This port number must be globally unique across all application servers in a OneStream deployment, and care should be taken if a port is specified. This is the port that is used to access the remote host through business rules and data management jobs from OneStream application servers to allow network traffic to traverse to the remote host and port.

5. Using this direct connection in OneStream is done by accessing localhost: [Bound Port In OneStream] which will tunnel traffic back to the configured remote Gateway Host to the configured bound port at gateway.

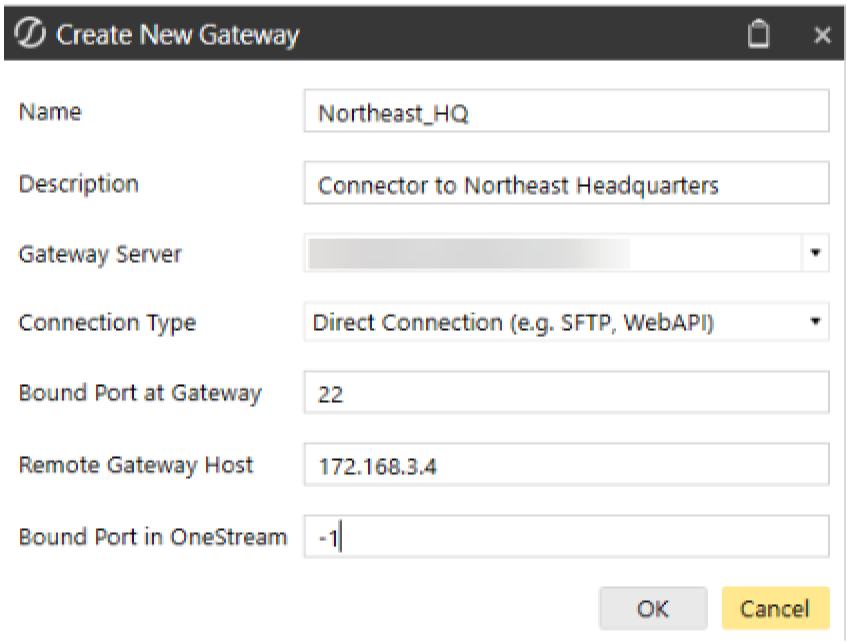
   a. Example: Remote SFTP server at 172.168.3.4 listening on port 22.

   b. Bound Port in OneStream is configured as port 45000. Note that when -1 is used, the selected port number is available/displayed after saving and also surfaced in the OneStream Error Log.

   c. In OneStream Business Rules, you can access the remote host by connecting to localhost:45000.

   d. In a OneStream Business Rule, this port can also be obtained in code allowing this port number to be changed without updating Business Rules:

   ```
   Dim gatewayDetails As GatewayDetails = BRApi.Utilities.GetGatewayConnectionInfo(si,
   "northamerica_sftp")
   Dim remotePort = gatewayDetails.OneStreamPortNumber
   ```

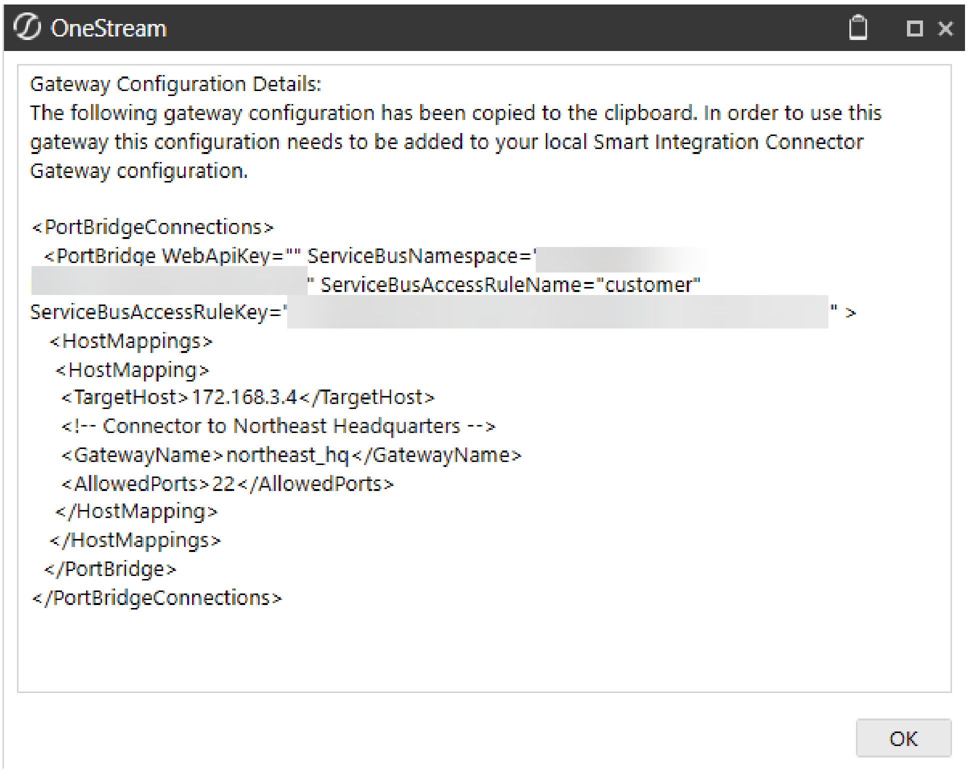


Name	Northeast_HQ
Description	Connector to Northeast Headquarters
Gateway Server	
Connection Type	Direct Connection (e.g. SFTP, WebAPI)
Bound Port at Gateway	22
Remote Gateway Host	172.168.3.4
Bound Port in OneStream	-1

Export and Import the Gateway Configuration

You must copy the gateway configuration settings and paste them into your Smart Integration Connector Gateway to establish the connection.

1. Go to **System** > **Administration** > **Smart Integration Connector**.
2. Select the Gateway to export.
3. Click **Export Gateway Configuration**. The Gateway Configuration Details are copied to the clipboard.


OneStream

Gateway Configuration Details:
The following gateway configuration has been copied to the clipboard. In order to use this gateway this configuration needs to be added to your local Smart Integration Connector Gateway configuration.

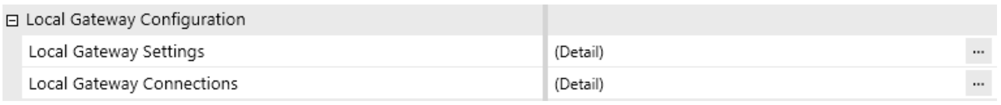
```
<PortBridgeConnections>
  <PortBridge WebApiKey="" ServiceBusNamespace='[redacted]
[redacted]" ServiceBusAccessRuleName="customer"
ServiceBusAccessRuleKey='[redacted]" >
   <HostMappings>
    <HostMapping>
     <TargetHost>172.168.3.4</TargetHost>
     <!-- Connector to Northeast Headquarters -->
     <GatewayName>northeast_hq</GatewayName>
     <AllowedPorts>22</AllowedPorts>
    </HostMapping>
   </HostMappings>
  </PortBridge>
</PortBridgeConnections>
```

OK

4. On your Windows Server, open the **OneStream Local Gateway Configuration**. This runs as administrator by default.

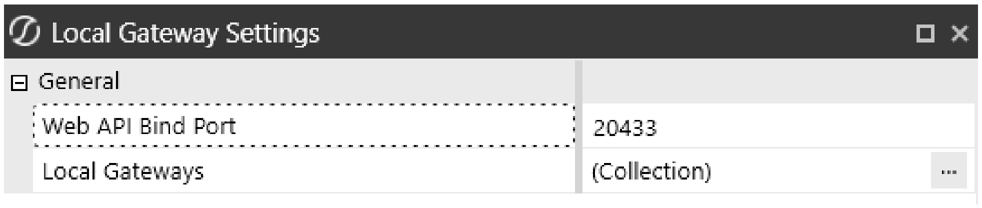
5. The existing **XFGatewayConfiguration.xml** opens by default.

6. Click ... next to **Local Gateway Settings**.



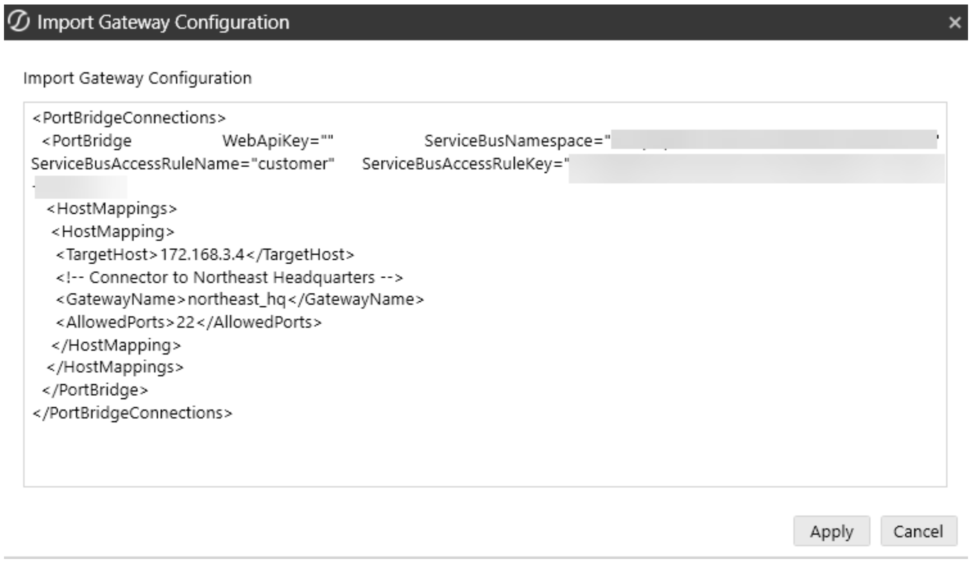
⊟ Local Gateway Configuration	
Local Gateway Settings	(Detail) ...
Local Gateway Connections	(Detail) ...

7. Click ... next to **Local Gateways**.



General	
Web API Bind Port	20433
Local Gateways	(Collection)

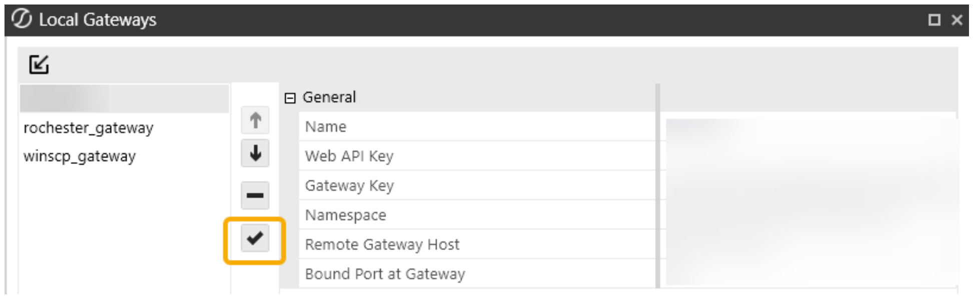
8. Import the previously copied **Gateway Configuration**.



```
<PortBridgeConnections>
  <PortBridge          WebApiKey=""          ServiceBusNamespace="[redacted]"
ServiceBusAccessRuleName="customer"    ServiceBusAccessRuleKey="[redacted]
[redacted]
   <HostMappings>
    <HostMapping>
     <TargetHost>172.168.3.4</TargetHost>
     <!-- Connector to Northeast Headquarters -->
     <GatewayName>northeast_hq</GatewayName>
     <AllowedPorts>22</AllowedPorts>
    </HostMapping>
   </HostMappings>
  </PortBridge>
</PortBridgeConnections>
```

9. Click **Apply**.

10. Click **Test Connection** to test the connection.



11. Click **OK** twice.

12. Save the configuration.

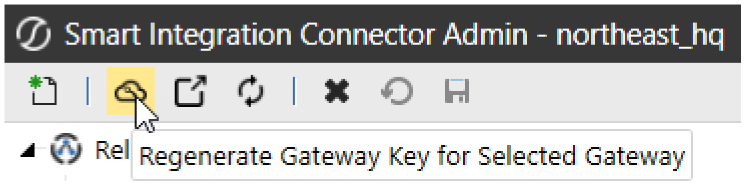
13. Click **Yes** to apply the changes and restart the Local Gateway Server.

New Gateway Key Generation

Smart Integration Connector administrators can rotate the Gateway Key maintained by the underlying cloud service; however, it must be the same for both the Smart Integration Connector local gateway and the gateway configuration in the OneStream Windows Application to function properly.

1. Select an existing gateway.

2. Click **Regenerate Gateway Key for Selected Gateway**.

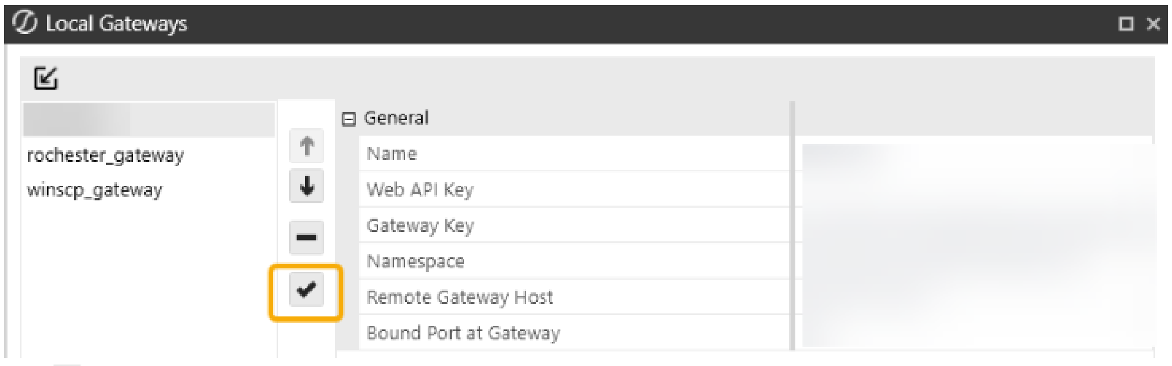

Smart Integration Connector Admin - northeast_hq
Rel
Regenerate Gateway Key for Selected Gateway

3. You must re-export your Gateway Configuration and apply the new settings throughout the OneStream Local Gateway Configuration. See Export and Import the Gateway Configuration.
4. Click **OK**.

Create a Local Gateway Connection to a Data Source

A data source contains the name, connection string, and database provider for the database of your choice. You can set up a PostgreSQL, SQL, Oracle, OleDb, MySQL, ODP.net, or Microsoft ODBC connection. The data source is configured using the Local Gateway Configuration Utility. The utility was installed as part of the Smart Integration Connector Local Gateway installation.

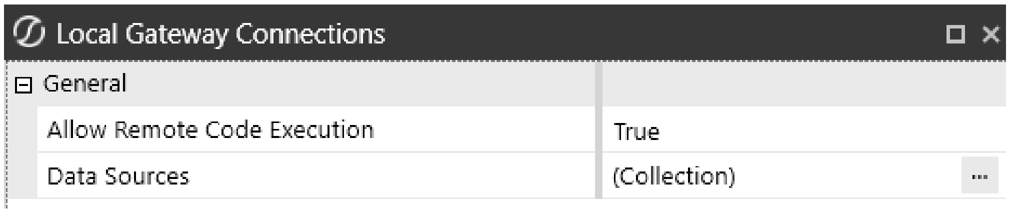
1. Start the **OneStream Local Gateway Configuration**.
2. The existing **XFGatewayConfiguration.xml** opens by default.
3. Click ... to configure **Local Gateway Connections** details to set up the **Data Sources** to local databases, APIs, or other on-premises resources.


Local Gateways

rochester_gateway
winscp_gateway

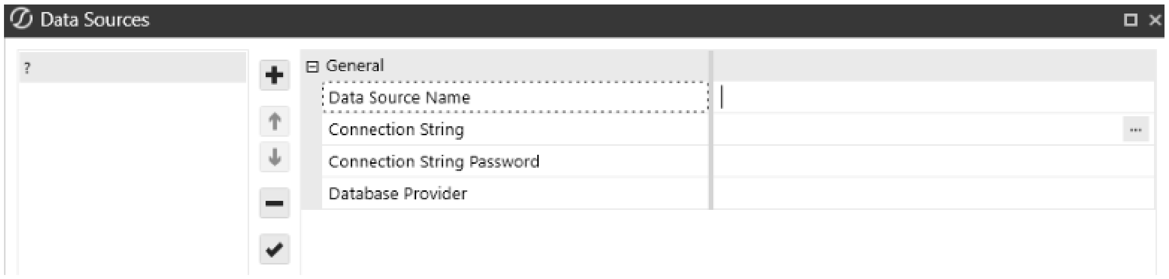
General	
Name	
Web API Key	
Gateway Key	
Namespace	
Remote Gateway Host	
Bound Port at Gateway	

4. Click ··· next to **Data Sources**.


Local Gateway Connections

General	
Allow Remote Code Execution	True
Data Sources	(Collection)

5. Click ✚ **Add Item** to add a new data source.


Data Sources

General	
Data Source Name	
Connection String	
Connection String Password	
Database Provider	

6. If you have a password for the connection string, enter it in the **Connection String Password** field. The password is masked for security. Then, when you need to enter your connection string password, use the substitution variable: |password|
   Example:
   Data Source=localhost;Initial Catalog=Sales_DB;Persist Security Info=True;User ID=sa;Password=|password|;

   > **IMPORTANT:** The maximum character count for Connection Strings is 245 characters.

7. Enter the **Data Source Name**, **Connection String**, and select a **Database Provider**.

   > **NOTE:** For security purposes, we recommend using the Connection String Password field and the substitution variable to ensure the password is not shown on screen. However, you can also embed the password directly within your connection string. For example: Server = localhost;Port=3306;uid=root;pwd=my_password;database=gatewaymysql;

   You can add as many data sources as necessary. The **Data Source Name** must be unique for each connection defined within a specific OneStream Smart Integration Connector Local Gateway Server. Names can be re-used across deployed instances of the Windows Service across your network. See the examples below for connection string examples to a variety of relational data sources such as PostgreSQL, SQL, and ODBC, and Oracle. **Connection Strings** are encrypted automatically. You can edit the plain text string by clicking the ellipsis.

> NOTE: Oracle databases require drivers and specific configuration provided by Oracle.

8. Click **OK** to save your configuration.

> IMPORTANT: The connection strings below include user IDs and the password substitution variable. You can also use integrated security to remove plain text user IDs and passwords from connection strings in Smart Integration Connector. See Remove UserID and Passwords by Integrated Security.

Microsoft SQL Server

Below is an example for setting up a SQL database using the SqlClient provider.

1. Click ⋯ next to **Data Sources**.
2. Click ➕ **Add Item** to add the data source.
3. **Data Source Name:** Northeast_Sales
4. **Connection String:**

   with UserID / Password:

   Server=localhost;Initial Catalog=Sales_DB;User ID=sa;Password=|password|;Max Pool Size=1000;Connect Timeout=60;

   > IMPORTANT: The maximum character count for Connection Strings is 245 characters.

5. Enter your **Connection String Password**.

> **NOTE:** The Connection String Password is substituted in place of |password| in the connection string above.

6. From Database Provider, select **SqlClient Data Provider**.
7. Click ✓ **Test Connection** to test the data source.
8. Click **OK** to save.

MySQL Data Provider

Below is an example for setting up a MySQL Data Provider.

1. Click ··· next to **Data Sources**.
2. Click ✚ **Add Item** to add a new data source.
3. **Data Source Name:** Sales_UK
4. **Connection String:**

   Server = localhost;Port=3306;uid=root;pwd=|password|;database=gatewaymysql;

> **IMPORTANT:** The maximum character count for Connection Strings is 245 characters.

5. Enter your **Connection String Password**.

> NOTE: The Connection String Password is substituted in place of |password| in the connection string above.

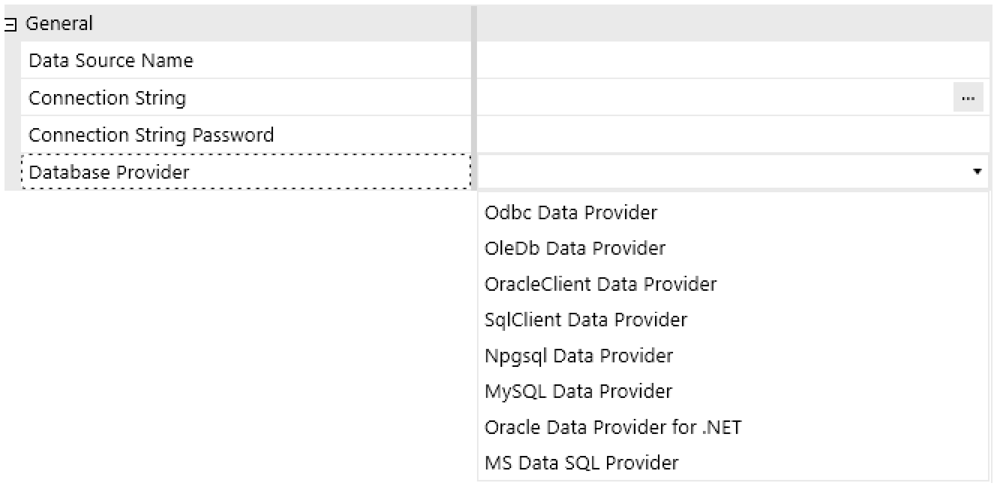
6. From **Database Provider**, select **MySQL Data Provider**.
7. Click ✓ **Test Connection** to test the data source.
8. Click **OK** to save.

Oracle Database Examples

Connecting to Oracle requires the download and configuration of the Oracle Data Access Components (ODAC) obtained directly from Oracle’s website. Follow the steps below to get access to these drivers and files.

1. Go to the latest web page for Oracle .NET and Visual Studio ODAC Downloads for Oracle Database.
2. After installation, the ODP.NET Provider will display as an available Database Provider in the utility when adding a new data source.
3. The connection string for Oracle databases can be set up to either reference or require

a locally defined tnsnames.ora file for the requested data sources.



Example Connection Strings:

- **Oracle Data Provider for .NET:** Data Source=oracletest;User Id=OneStream1;Password=|password|;
- **Oracle Data Provider without TNSNames.ora:** Data Source=(DESCRIPTION= (ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=MyHost)(PORT=MyPort))) (CONNECT_DATA=(SERVER=DEDICATED)(SERVICE_NAME=MyOracleSID))); User Id=myUsername;Password=|password|;

> **IMPORTANT:** The maximum character count for Connection Strings is 245 characters.

OracleClient Database Provider

Below is an example for setting up a OracleClient database provider.

1. Click next to **Data Sources**.
2. Click **Add Item** to add the data source.
3. **Data Source Name:** Sales_EMEA
4. **Connection String:** Data Source=oracletest;User Id=OneStream1;Password=|password|

   > **IMPORTANT:** The maximum character count for Connection Strings is 245 characters.

5. Enter your **Connection String Password**.

   > **NOTE:** The Connection String Password is substituted in place of |password| in the connection string above.

6. From **Database Provider**, select **OracleClient Data Provider**.
7. Click **Test Connection** to test the data source.
8. Click **OK** to save.

Oracle Data Provider for .NET

Below is an example for setting up a Oracle Data Provider for .NET.

1. Click ⋯ next to **Data Sources.**
2. **Data Source Name:** Sales_SouthAmerica
3. **Connection String:**

   Data Source=oracletest;User Id=OneStream1;Password=|password|

   > IMPORTANT: The maximum character count for Connection Strings is 245 characters.

4. Enter your **Connection String Password**.

   > NOTE: The Connection String Password is substituted in place of |password| in the connection string above.

5. From **Database Provider**, select **Oracle Data Provider for .NET**.
6. Click ✚ **Add Item** to add a new data source.
7. Click ✓ **Test Connection** to test the data source.
8. Click **OK** to save.

PostgreSQL (Npgsql Data Provider)

Below is an example for setting up a PostGres database.

1. Click ··· next to **Data Sources**.
2. Click ✚ **Add Item** to add the data source.
3. **Data Source Name:** RevenueMgmtPostGres
4. **Connection String:** Server=localhost;Port=5432;Database=revmgt;User Id=onestream;Password=|password|;

   > IMPORTANT: The maximum character count for Connection Strings is 245 characters.

5. Enter your **Connection String Password**.

   > NOTE: The Connection String Password is substituted in place of |password| in the connection string above.

6. From **Database Provider**, select **Npgsql Data Provider**.
7. Click ✔ **Test Connection** to test the data source.
8. Click **OK** to save.

OleDb Data Provider

Below is an example for setting up an Oracle database. This does not require additional download and configurations.

1. Click ··· next to **Data Sources**.

2. Click ✚ **Add Item** to add the data source.

3. **Data Source Name:** Sales_Asia

4. **Connection String:** Provider=OraOLEDB.Oracle;Data Source=localhost:1521/XE;Initial Catalog=myDataBase;User Id=myUsername;Password=|password|;

   > **IMPORTANT:** The maximum character count for Connection Strings is 245 characters.

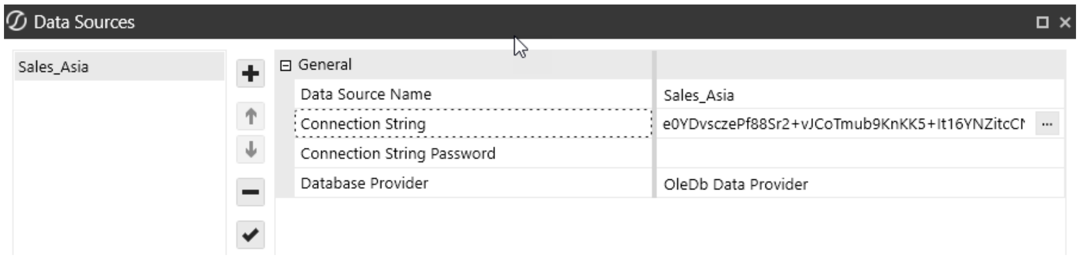
5. Enter your **Connection String Password**.

   > **NOTE:** The Connection String Password is substituted in place of |password| in the connection string above.

6. From **Database Provider**, select **OleDb Data Provider**.

7. Click ✔ **Test Connection** to test the data source.

8. Click **OK** to save.



Data Source Name	Sales_Asia
Connection String	e0YDvsczePf88Sr2+vJCoTmub9KnKK5+It16YNZitcC
Connection String Password	
Database Provider	OleDb Data Provider

ODBC Data Provider

ODBC data sources can be defined (using a system DSN) to remove credentials from the configuration file. For ODBC connections, most ODBC drivers will allow you to setup a system DSN entry on the server, then the connection string in the gateway will be to only point to the DSN entry. See Administer ODBC data sources for more information. Below is an example for setting up a ODBC data source for Oracle.

1. Click ··· next to **Data Sources**.
2. Click + **Add Item** to add the data source.
3. **Data Source Name:** Sales_Europe
4. **Connection String:** Driver={Microsoft ODBC for Oracle};Server=(DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=199.199.199.199)(PORT=1523))(CONNECT_DATA=(SID=dbName)));Uid=myUsername;Pwd=|password|;

   IMPORTANT: The maximum character count for Connection Strings is 245 characters.

5. Enter your **Connection String Password**.

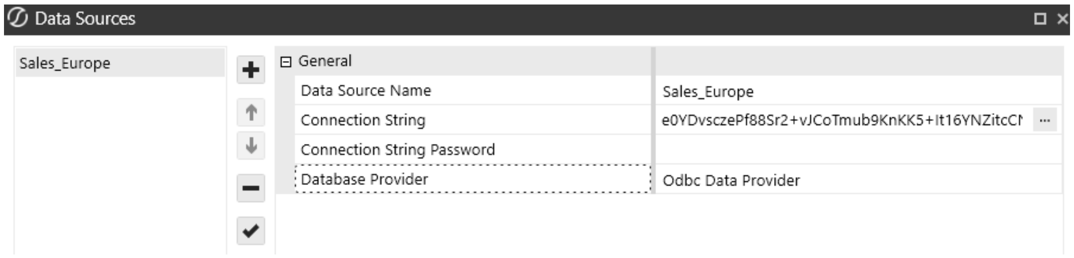
   NOTE: The Connection String Password is substituted in place of |password| in the connection string above.

6. From **Database Provider** , select **Odbc Data Provider**.

7. Click ✓ **Test Connection** to test the data source.

8. Click **OK** to create the new source.

9. Click **Save**.



Sales_Europe

General

Data Source Name	Sales_Europe
Connection String	e0YDvsczePf88Sr2+vJCoTmub9KnKK5+It16YNZitcCI
Connection String Password	
Database Provider	Odbc Data Provider

(Optional) Remove UserID and Passwords by Integrated Security

You can remove UserIDs and Passwords from connection strings in Smart Integration Connector if your organization has concerns over credential storage in the Smart Integration Connector Gateway configuration file. This requires running the Windows Service under a **Service Account** identity and using integrated security to connect to remote data sources, which eliminates local storage of any plain text credentials. Additionally, ODBC data sources can be defined (using a system DSN) to remove credentials from the configuration file.

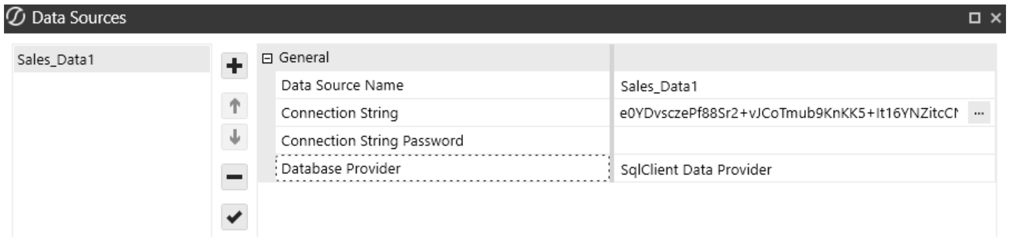
Update the Local Gateway Connection String

1. Open your **OneStream Local Gateway Configuration**.

2. Open a **Local Gateway Connection**.

3. Navigate to the Connection String and use an Integrated or Trusted Security string. For example: Data Source=localhost,Initial Catalog=OneStream_GolfStreamDemo_2022;Trusted_Connection=True;

   IMPORTANT: The maximum character count for Connection Strings is 245 characters.



Sales_Data1

General	
Data Source Name	Sales_Data1
Connection String	e0YDvsczePf88Sr2+vJCoTmub9KnKK5+It16YNZitcCl
Connection String Password	
Database Provider	SqlClient Data Provider

   NOTE: Trusted Connections use the UserID and password you use to log into the Windows Server.

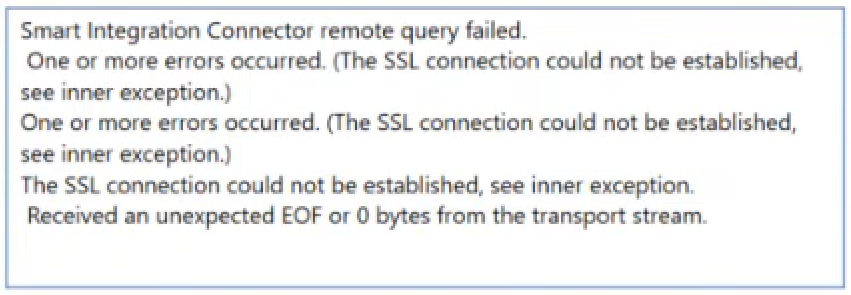
   NOTE: The example above is for SQL server. Trusted connections vary by Data Provider type.

4. Click **OK**.

5. Save your **Data Source**.

Update Permissions on the Service

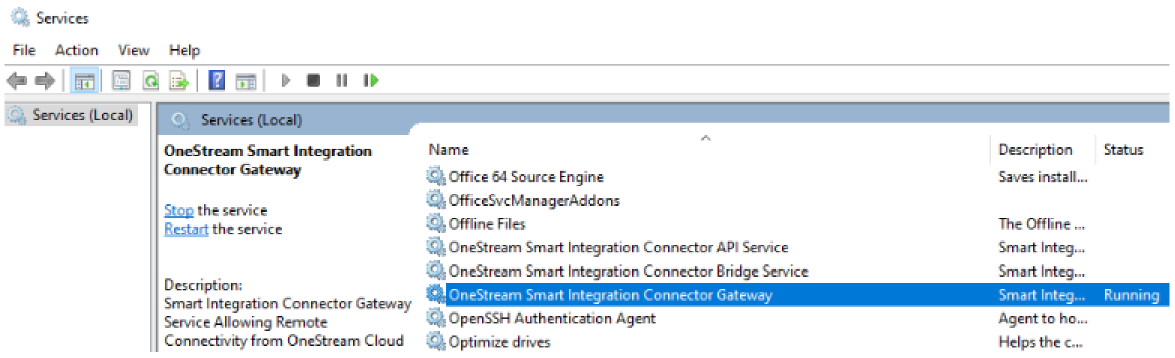
Next, you need to update the service to run as the user. If the service is not updated, the connection does not update and errors will occur.



```
Smart Integration Connector remote query failed.
 One or more errors occurred. (The SSL connection could not be established,
see inner exception.)
One or more errors occurred. (The SSL connection could not be established,
see inner exception.)
The SSL connection could not be established, see inner exception.
 Received an unexpected EOF or 0 bytes from the transport stream.
```

1. Open Windows Services.

2. Navigate to **OneStream Smart Integration Connector Gateway**. The service should be running.



OneStream Smart Integration Connector Gateway

Stop the service
Restart the service

Description:
Smart Integration Connector Gateway Service Allowing Remote Connectivity from OneStream Cloud

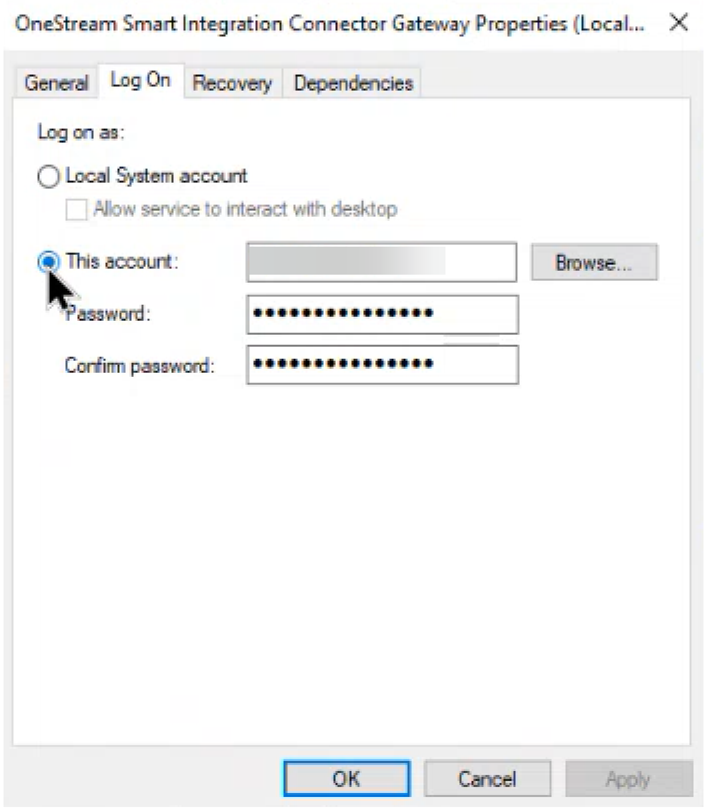
Name	Description	Status
Office 64 Source Engine	Saves install...	
OfficeSvcManagerAddons		
Offline Files	The Offline ...	
OneStream Smart Integration Connector API Service	Smart Integ...	
OneStream Smart Integration Connector Bridge Service	Smart Integ...	
OneStream Smart Integration Connector Gateway	Smart Integ...	Running
OpenSSH Authentication Agent	Agent to ho...	
Optimize drives	Helps the c...	

3. Right-click and open **Properties**.

4. Click the **Log On** tab. Typically, this will default to the **Local System account**.

> **IMPORTANT:** Before moving to the next step, ensure that you have the appropriate permissions and approvals from your IT Administrators to complete the Log On change. The service account used will require local Administrative rights to access resources on the Windows server, such as the machine certificate store and private keys used for encryption. This account will also require the appropriate permissions to access the database such as Microsoft SQL Server.

5. Change log on from **Local System account** to **This account** and enter your domain or login that has access to the data source. Depending on how your SSO is configured, your account could require your domain name, UserID, and password. Contact your IT Administrator if you have questions about your account domain.


OneStream Smart Integration Connector Gateway Properties (Local...

General | Log On | Recovery | Dependencies

Log on as:

Local System account

Allow service to interact with desktop

This account: [redacted]

Password: •••••••••••••••

Confirm password: •••••••••••••••

6. Click **Apply**.

7. Click **OK**.

8. Right-click and select **Restart** to restart and update the service.

Test the Updated Integrated Connection String

You should test your connection through a Data Adapter query to verify your access to Smart Integration Connector. An alternate SQL Query to pulling the first 10-50 rows is sufficient. See Data Adapters Example.

Microsoft Entra Authentication for Azure SQL

The ability to use Microsoft Entra using service principal authentication to access Azure SQL is supported.

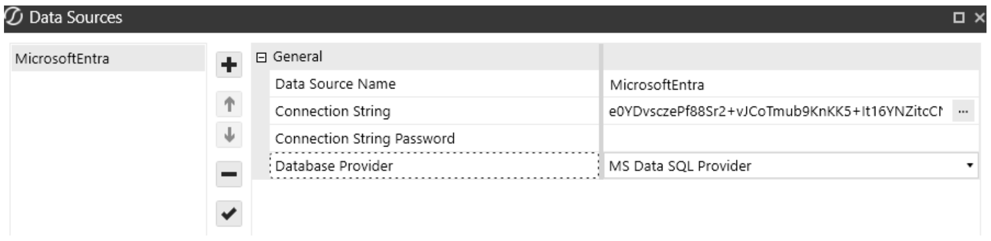
1. Open your **OneStream Local Gateway Configuration**.
2. Open a **Local Gateway Connection**.
3. Enter a **Data Source Name** of **MicrosoftEntra**.
4. Navigate to the Connection String and enter a connection string. Example: Server=demo.database.windows.net; Authentication=Active Directory Service Principal; Encrypt=True; Database=testdb; User Id=AppId; Password=|password|;

   IMPORTANT: The maximum character count for Connection Strings is 245 characters.

5. Enter your **Connection String Password**.

   NOTE: The Connection String Password is substituted in place of |password| in the connection string above.

6. Select **MS Data SQL Provider** as your **Database Provider**.



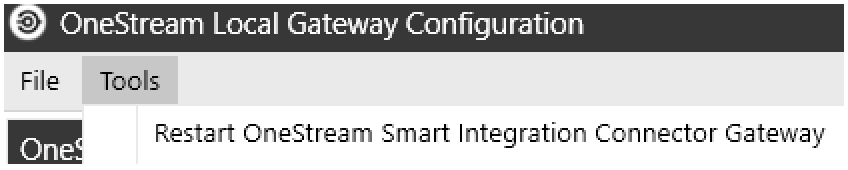
Data Source Name	MicrosoftEntra
Connection String	e0YDvsczePf88Sr2+vJCoTmub9KnKK5+It16YNZitcCI
Connection String Password	
Database Provider	MS Data SQL Provider

7. Click ✓ **Test Connection** to test the data source.
8. Click **OK**.
9. Click **Save**.

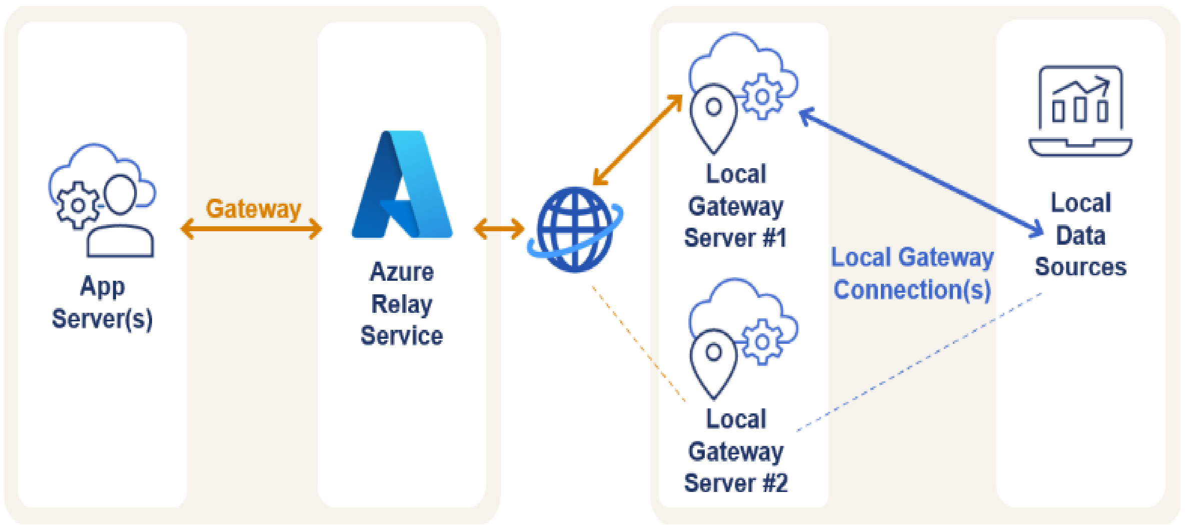
Restart OneStream Smart Integration Connector Gateway

After communication has been verified, the following Windows Service needs to run to maintain communication with the OneStream Cloud instance. By default, these services are set to start after a Windows reboot. You can also manually start them using the Windows Service control manager or the command line using the net start/net stop commands. If you are having issues restarting the service, see Troubleshooting.

1. Open the **OneStream Local Gateway Configuration**.
2. Click **Tools** > **Restart OneStream Smart Integration Connector Gateway**.


OneStream Local Gateway Configuration
File
Tools
OneS
Restart OneStream Smart Integration Connector Gateway

Redundant and Fail-over Gateways



The Smart Integration Connector Local Gateway Server can be installed on a separate Windows Server to operate as a fail-over. The Local Gateway Server Gateway establishes connection to the Relay that becomes the ac/primary Local Gateway Server instance while the second Local Gateway Server environment remains idle until the primary goes offline. The second Local Gateway Server Gateway would be the fail-over in this scenario and automatically accept traffic if the primary server instance were to go offline. See Create a Redundant or Fail-over Gateway.

Create a Redundant or Fail-over Gateway

To create a redundant or fail-over gateway, you must set up Smart Integration Connector in this order:

1. Complete installation on the primary Local Gateway Server and verify all data connections transfer data.

2. On the secondary server, install the OneStream Smart Integration Connector Local Gateway Server (OneStreamSmartIntegrationConnectorGateway.msi) on a Windows Server 2019+ in your environment.

> NOTE: If you are using custom DLLs, SAP, or referenced DLLs, you must copy the existing Referenced Assemblies Folder. Locations must be in sync and in the same location on the primary server. See Smart Integration Connector Settings.

1. On the secondary server, perform the following steps:

    a. Open the **OneStream Local Gateway Configuration**.

    b. Go to **Tools** > **Import Configuration from Primary Gateway Server**.

        a. Choose the location of the file and select Open.

        > CAUTION: You will overwrite the existing local gateway configuration. If you use Connection String Passwords, you will need to reenter a connection string password.

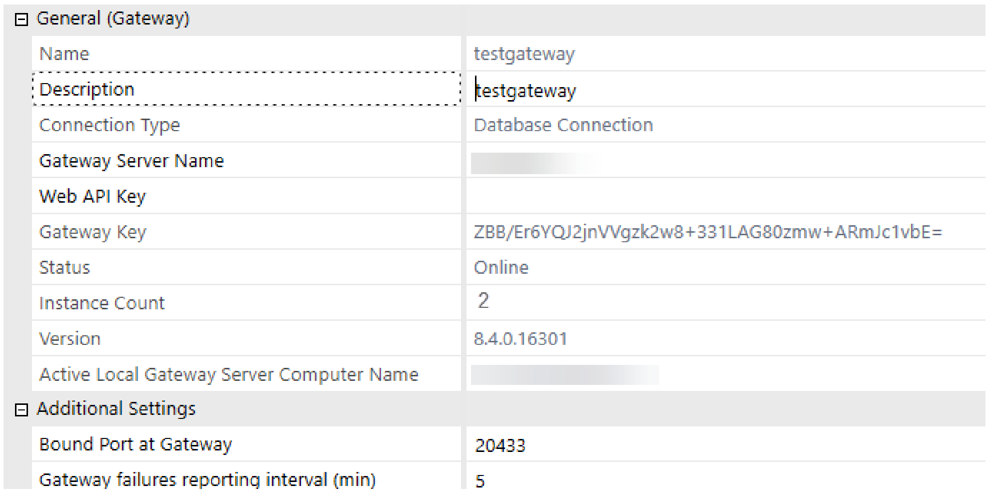
        > CAUTION: If you installed a custom database driver, you must install the customer database driver on the backup gateway server.

        b. Click **Local Gateway Connections** > **Data Sources**.

        c. Select a **Data Source** and the **Connection String Passwords**.

    d. Select **OK** to provide a new Connection string.
    e. Delete the encrypted text and replace it with a valid connection string from the primary server.
    f. Select **OK** to encrypt the connection string and close the dialog box.
    g. Repeat steps a through f for all the remaining data sources.
    h. Click **OK** to close the **Data Sources**.
    i. Click **OK** to close the **Local Gateway Connections**.
    j. Click **Save** to save the **Local Gateway Configuration**.
    k. Click **Yes** to restart the service.
    l. Test the Smart Integration Connector Local Gateway Server in OneStream.

2. Verify the **Instance Count** is **2** when both the primary and secondary servers are running in the OneStream Windows App.



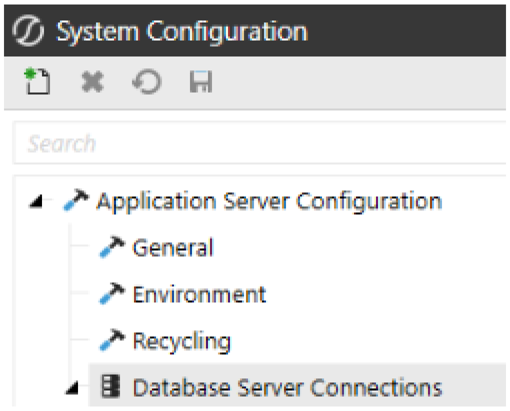
General (Gateway)	
Name	testgateway
Description	testgateway
Connection Type	Database Connection
Gateway Server Name	
Web API Key	
Gateway Key	ZBB/Er6YQJ2jnVVgzk2w8+331LAG80zmw+ARmJc1vbE=
Status	Online
Instance Count	2
Version	8.4.0.16301
Active Local Gateway Server Computer Name	
Additional Settings	
Bound Port at Gateway	20433
Gateway failures reporting interval (min)	5

NOTE: If Instance Count is over 2, the active gateway will display and not the fail-over.

Define Custom Database Connections in OneStream System Configuration Setup

Now that the gateway is set up and communicating with the Smart Integration Connector Gateway, the final step is to set up the location of the remote data source in OneStream. To continue adding the Custom Database Connection, you must assign a user to the `ManageSystemConfiguration` role.

1. Go to **System** > **Administration** > **System Configuration**.
2. Select **Application Server Configuration** > **Database Server Connections**.

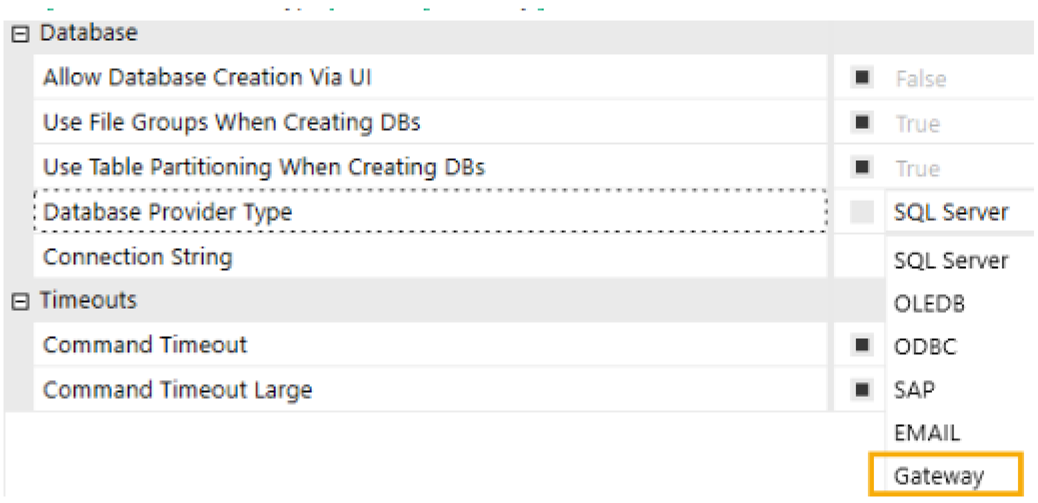


3. Select **Create Item** to create a new **Custom** database server connection.

> **NOTE:** If the only fields displayed are Name and External Database properties, verify that the current user is assigned to the ManageSystemConfiguration role.

4. Enter the **Name** of the **Database Server Connection**.

5. For **Database Provider Type**, select **Gateway**.



Database	
Allow Database Creation Via UI	False
Use File Groups When Creating DBs	True
Use Table Partitioning When Creating DBs	True
Database Provider Type	SQL Server
Connection String	
Timeouts	
Command Timeout	
Command Timeout Large	

6. The **Gateway Name** drop-down menu will be populated with a list of configured Gateways. Select the Gateway.

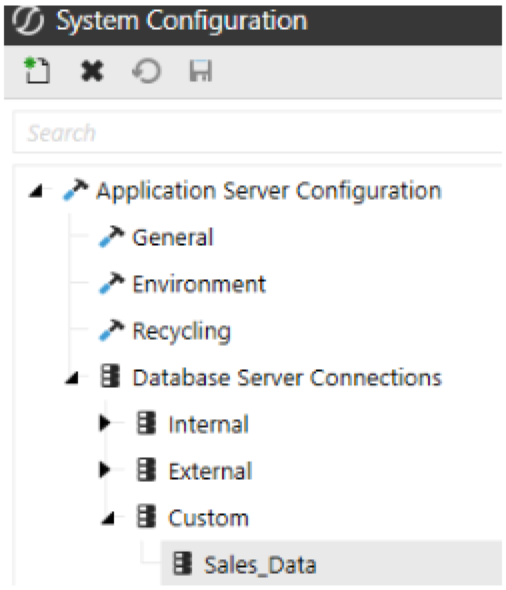
7. After the Gateway is selected, the **Data Source Name** drop-down menu populates with a list of the Local Gateway Server Database Connections.

8. Select a **Database Connection** from the drop-down menu.

   NOTE: If the remote data source is not displayed or the Gateway is offline, you can select **Custom** to allow the data source to be manually specified. It is advised to wait up to five minutes for the Gateway to populate first.

9. Click **Save** to complete the configuration.

10. Verify the custom database connection is under **Custom**.

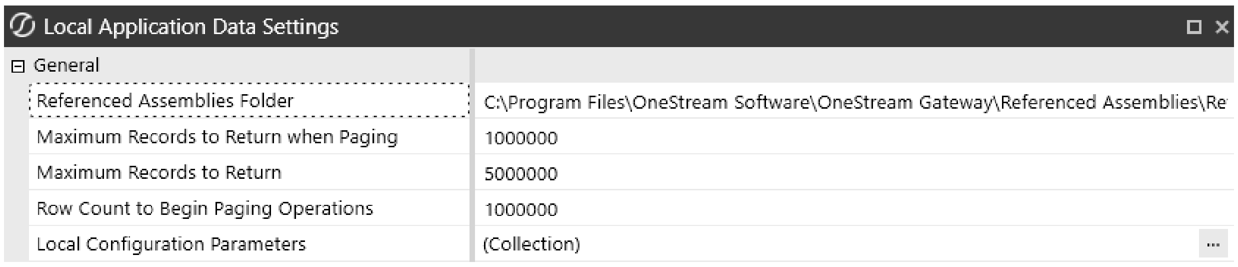

System Configuration
Search
Application Server Configuration
General
Environment
Recycling
Database Server Connections
Internal
External
Custom
Sales_Data

Smart Integration Additional Settings

Local Application Data Settings

Additional application configurations can be applied within the Local Application Data Settings.

Once you open a configuration file within the utility, open Local Application Data Settings.



Referenced Assemblies Folder	C:\Program Files\OneStream Software\OneStream Gateway\Referenced Assemblies\Re
Maximum Records to Return when Paging	1000000
Maximum Records to Return	5000000
Row Count to Begin Paging Operations	1000000
Local Configuration Parameters	(Collection)

You can:

- Reference a location to additional DLLs that will be used in remote business rules.
- Adjust the Maximum Records to Return. These are optional and are only defined if needed or if further tuning is necessary by a consultant or as instructed by Support.
- Store Configuration Parameters and associated values.

Referenced Assemblies Folder

The Referenced Assemblies Folder specifies the location of customer-supplied DLLs that can be referenced when remote Smart Integration Functions are compiled and executed. You will need to add the DLL name to the Smart Integration Functions Referenced Assemblies property. The default value is C:\Program Files\OneStream Software\OneStream Gateway\Referenced Assemblies.

> **NOTE:** If you are integrating with SAP, ERPConnect and supporting DLLs will need to be added to your Referenced Assemblies Folder. Refer to Support for SAP Integration.

Record Count Adjustments

Maximum Records to Return when Paging

Defaults to 1000000 and defines the number of rows to return per page/block to OneStream APIs. This value is used only when greater than the "Row Count to Begin Paging Operations" rows are returned from a query. Example: If the query returns 3 million rows and Row Count to Begin Paging is set to 1 million, there would be 3 blocks of 1 million rows returned to OneStream.

> **NOTE:** Maximum Records to Return when Paging, Maximum Records to Return, and Row Count to Begin Paging Operations are optional and should only be applied by a OneStream consultant or OneStream Support.

Maximum Records to Return

Defaults to 5000000 and is the maximum number of rows that can be returned from any one query.

The maximum recommended number of records to return is 5 million and is the default. Additional RAM/CPU resources would be required on the Smart Integration Connector Gateway Server and on the remote database server to surface large quantities of data. If this limit is exceeded, you will receive a "Smart Integration Connector Remote Query" error.

> **NOTE:** Maximum Records and Row Counts Settings: When large data volumes are returned (over 1000000 rows), to maintain performance and reliability, Smart Integration Connector automatically transfers the data in pages.

> **NOTE:** Smart Integration Connector has a threshold limit of 5 million rows and 5GB.

> **NOTE:** It is a best practice that you review any queries that return more than 1 million rows with your Database Administrator, because additional tuning may be required. Tuning these queries will improve performance, reduce resource usage, and make them more efficient.

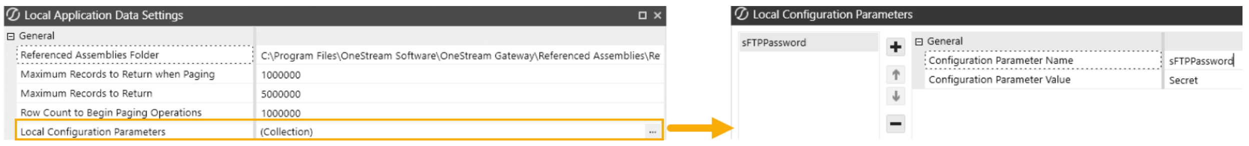
Row Count to Begin Paging Operations

Defaults to 1000000 and is the number of rows returned before the dataset is returned through pages/blocks.

Local Configuration Parameters

This is where you can set key value pairs, such as Web API keys, usernames, and passwords, that can be referenced from business rules. These key value pairs are defined as Configuration Parameter Name and Configuration Parameter Value.

For example, the **Configuration Parameter Name** is sftpPassword. Sensitive information, such as the password, is stored in the **Configuration Parameter Value** on the Local Gateway Server and does not need to be stored in the OneStream Windows Application.


Local Application Data Settings

General	
Referenced Assemblies Folder	C:\Program Files\OneStream Software\OneStream Gateway\Referenced Assemblies\Re
Maximum Records to Return when Paging	1000000
Maximum Records to Return	5000000
Row Count to Begin Paging Operations	1000000
Local Configuration Parameters	(Collection)

Local Configuration Parameters

sFTPPassword

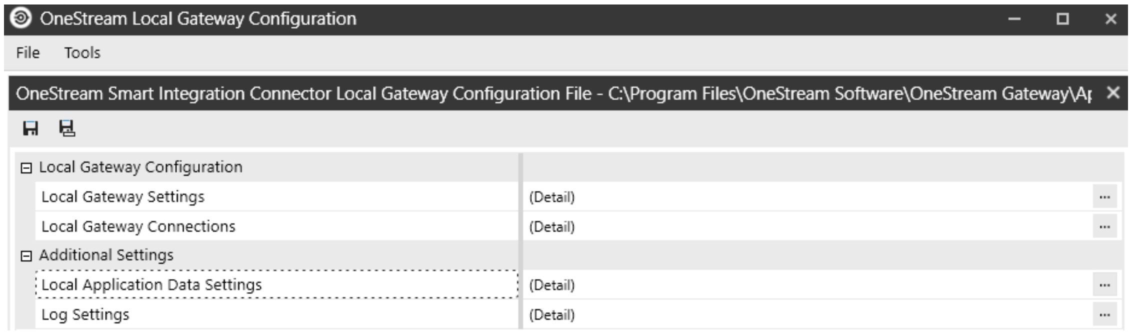
General	
Configuration Parameter Name	sFTPPassword
Configuration Parameter Value	Secret

Then, in a business rule, you can reference the Configuration Parameter Name and do not need to know the password or other sensitive information that is stored in the Configuration Parameter Value. For example, in the following business rule the sftpPassword Configuration Parameter Name is referenced. The GetSmartIntegrationConfigValue API can be used in a Smart Integration Function to reference the Configuration Parameter Name, which may be needed in a business rule to access a local data source.

```
Dim passwordString As String = APILibrary.GetSmartIntegrationConfigValue("sftpPassword")
```

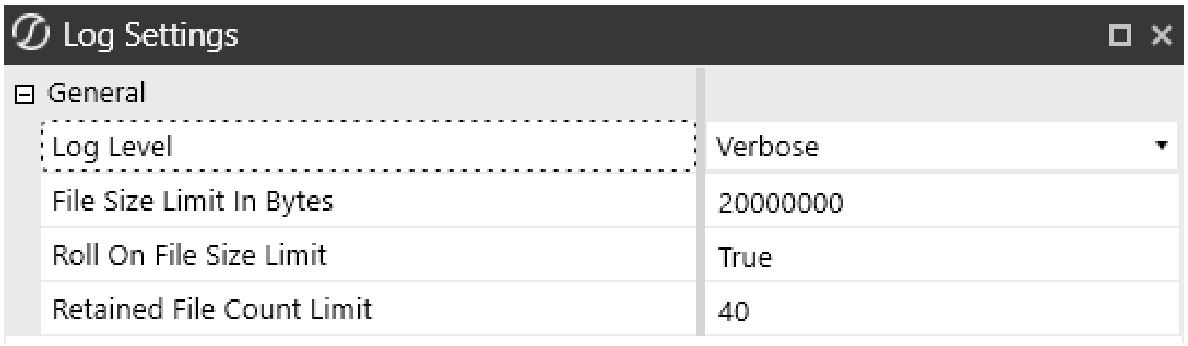
Log Settings

The service uses Serilog for application-level logging and exposes options for controlling naming convention, growth limits, and retention details. For example you can change the verbosity of log messages by changing the **minimum-level** setting from Verbose to Informational. If a catastrophic error happens, you can check the Windows event logs to review the errors. You can edit the **Log Settings** from the **OneStream Local Gateway Configuration Utility**.


OneStream Local Gateway Configuration
File
Tools
OneStream Smart Integration Connector Local Gateway Configuration File - C:\Program Files\OneStream Software\OneStream Gateway\Ap

⊟ Local Gateway Configuration	
Local Gateway Settings	(Detail)
Local Gateway Connections	(Detail)
⊟ Additional Settings	
Local Application Data Settings	(Detail)
Log Settings	(Detail)

Click ··· to access **Log Settings**.



⊟ General	
Log Level	Verbose
File Size Limit In Bytes	20000000
Roll On File Size Limit	True
Retained File Count Limit	40

- **Log Level** descriptions:
  - **Verbose**: The noisiest level, rarely (if ever) enabled for a production application.
  - **Debug**: Used for internal system events that are not necessarily observable from the outside, but useful when determining how something happened.
  - **Information**: Used to describe things happening in the system that correspond to its responsibilities and functions. Generally, these are the observable actions the system can perform. This is recommended for production environments and is the default setting upon installation.
  - **Warning**: Service is degraded, endangered, or may be behaving outside of its expected parameters.
  - **Error**: Logging of situations where functionality is unavailable or a recoverable error condition occurred.
  - **Fatal**: Only the most critical level items would be logged, requiring immediate attention.
- **File Size Limit in Bytes**: The maximum size for the log file, in bytes, before creating a new file for the day. The default is 20 MB.
- **Roll On File Size Limit**: When a log file reaches the specified number of bytes, a new log file is generated.

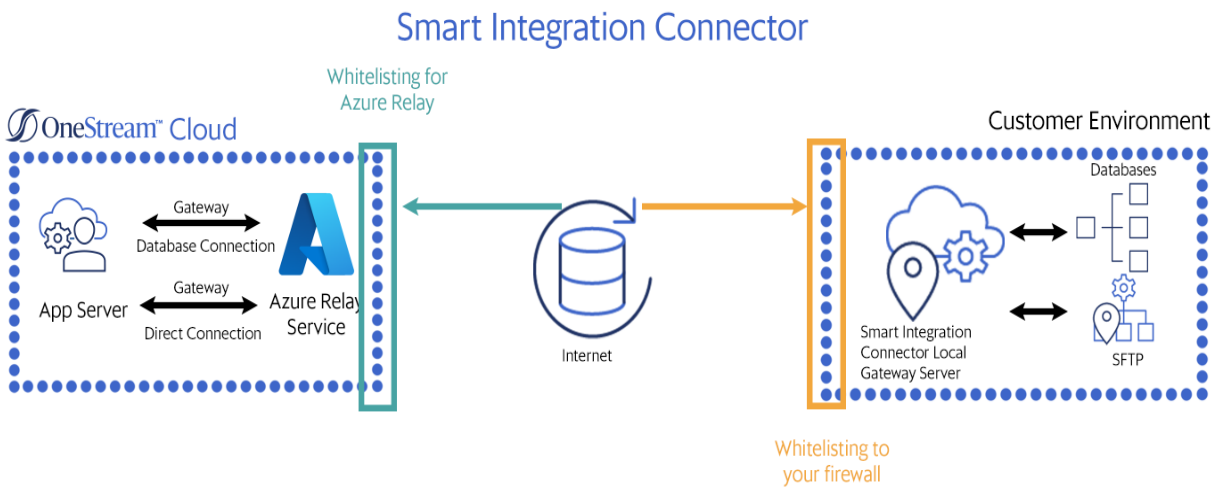
- **Retained File Count Limit**: Number of log files to retain. If logs do not exceed the limit in bytes (one file/day), this would allow for the configured value (with 40 days being the default) of log retention. If the Smart Integration Service is used heavily and log files are set to higher levels of verbosity, this could result in fewer days of log retention. Ensure that the growth rate and retention periods align with your organizational requirements.

The default location for log files is: *%programdata%\OneStream Software\OneStreamGatewayService\Logs*.

NOTE: The log file's output has been updated to reflect the enhanced performance and reliability of multithreaded or parallel processing for larger payloads in the v8.4 update.

Advanced Networking and Whitelisting

Smart Integration Connector supports two different types of whitelisting. You can whitelist traffic from the internet to your environment or from the internet to the Azure Relay Service.



Whitelist the Azure Relay to your Firewall

The best practice is to whitelist the Azure through the “*.servicebus.windows.net” domain or using the fully qualified domain names for your specific Azure Relay namespaces.

1. (Microsoft Best Practice) To limit traffic from your Azure Relay namespace

   Add the namespace <*.servicebus.windows.net> to your firewall rules.
   See https://techcommunity.microsoft.com/t5/messaging-on-azure-blog/azure-relay-wcf-and-hybrid-connections-dns-support/ba-p/370775 for additional info.

2. Additionally, you can limit traffic further from an IP address by following these Azure-specific instructions:

   a. Whitelist all IP addresses returned by this script.

   b. Review these IP addresses periodically as Microsoft may change them.
      You will need to monitor these IPs frequently as between 10-20% of the IPs will change every month.

Whitelist traffic to the Azure Relay

You can limit Azure Relay to only accept traffic from certain IP ranges.

1. Set the outbound port to 443. This port needs to be fully open outbound to communicate with the Azure Relay.

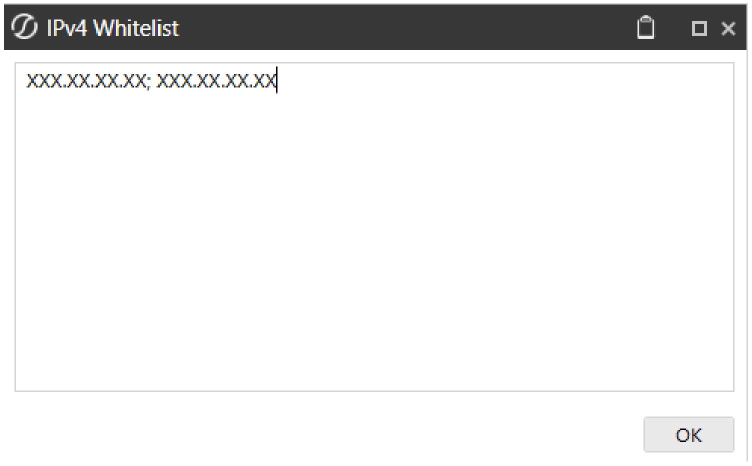
2. From the OneStream Windows Application client go to **System** > **Administration** > **Smart Integration Connector** > **Relay**.

3. Select **IPv4 Whitelist**.

4. Enter IPv4 compatible IP (XXX.XXX.XXX.XXX) or CIDR addresses (XXX.XXX.XXX.XXX/XX) separated by a semi colon in the **IPv4 Whitelist** dialog box.

   NOTE: IPv6 addresses are not currently supported.

   NOTE: Do not include any extra spaces for characters.



```
XXX.XX.XX.XX; XXX.XX.XX.XX
```

5. Restart your Local Gateway Service.

Use Smart Integration Connector

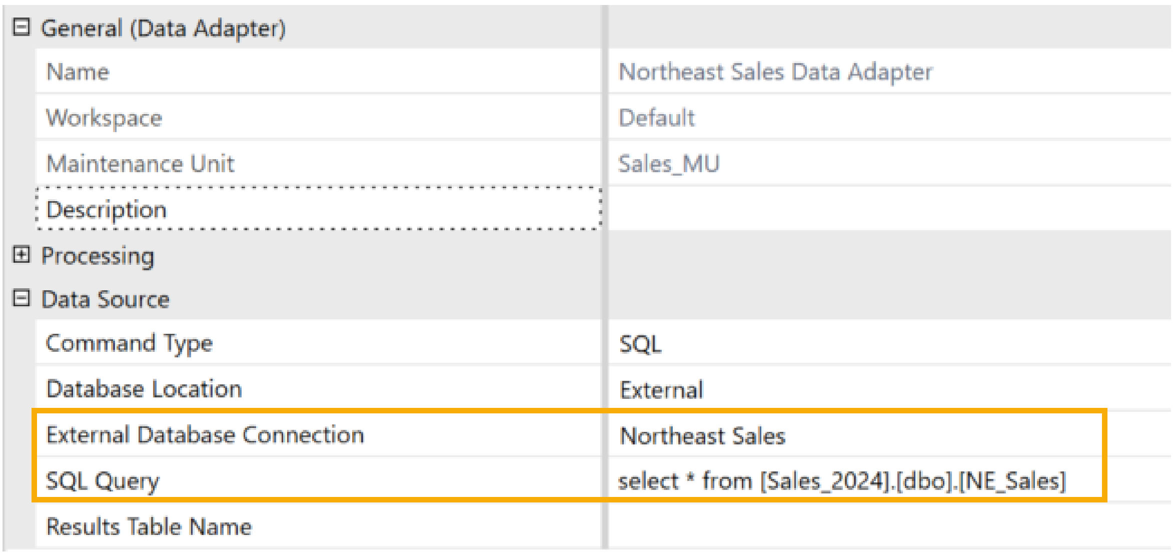
You can use Smart Integration Connector to access data from your Local Gateway Connection Data Sources or through Direct Connections.

Examples

Data Adapters Example

1. Go to **Application** > **Presentation** > **Workspaces** > **[choose Workspace]** > **[choose Maintenance Unit]** > **Data Adapters**.
2. Create or select an existing data adapter.
3. Verify that the **Database Location** is **External** and the **External Database Connection** is the custom connection that you defined earlier.

4. Enter a valid SQL Query.



⊟ General (Data Adapter)	
Name	Northeast Sales Data Adapter
Workspace	Default
Maintenance Unit	Sales_MU
Description	
⊞ Processing	
⊟ Data Source	
Command Type	SQL
Database Location	External
External Database Connection	Northeast Sales
SQL Query	select * from [Sales_2024].[dbo].[NE_Sales]
Results Table Name	

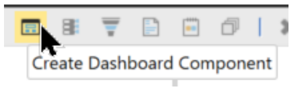
5. Test the data adapter and view the results.

SQL Table Editor Example

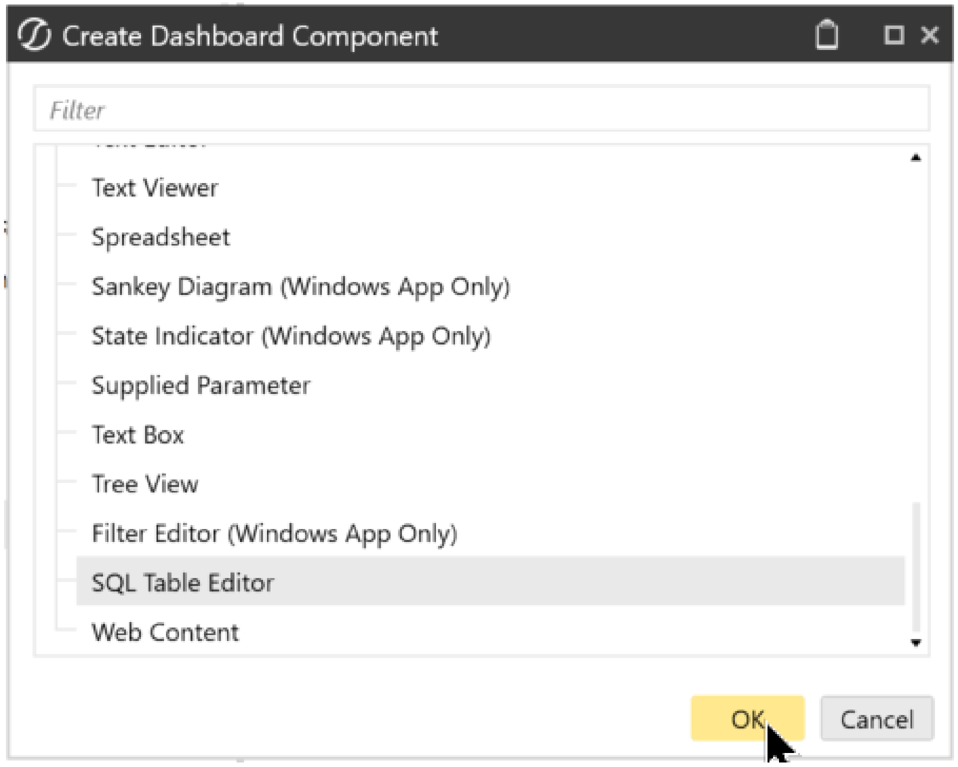
The following use case describes how to send a query after establishing a connection.

1. Go to **Application** > **Presentation** > **Workspaces** > **[choose Workspace]** > **[Maintenance Unit]** > **[choose Maintenance Unit]** > **Components** > **SQL Table Editor**.

2. Create Dashboard Component or open a SQL Table Editor..

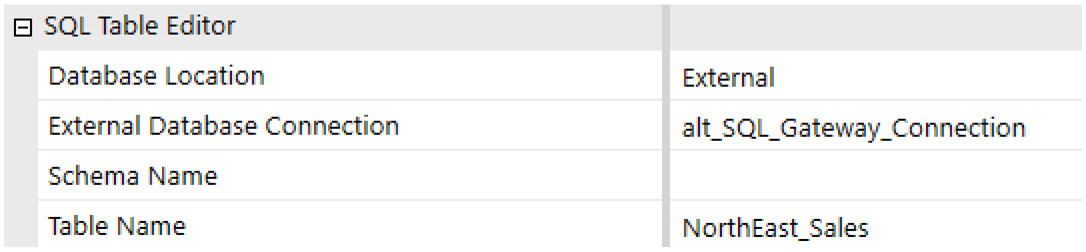


3. Choose SQL Table Editor and select OK


Create Dashboard Component
Filter
Text Viewer
Spreadsheet
Sankey Diagram (Windows App Only)
State Indicator (Windows App Only)
Supplied Parameter
Text Box
Tree View
Filter Editor (Windows App Only)
SQL Table Editor
Web Content
OK
Cancel

4. Verify the following:

   - **Database Location** is **External,**
   - **External Database Connection** is the custom connection that you defined earlier,
   - **Table Name** is defined as the table you want to return data from.



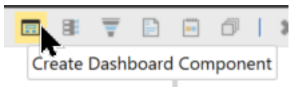
SQL Table Editor	
Database Location	External
External Database Connection	alt_SQL_Gateway_Connection
Schema Name	
Table Name	NorthEast_Sales

5. Open the associated dashboard and run the query. The OneStream Smart Integration Connector will connect to the external database. If it connects correctly, the query will populate.

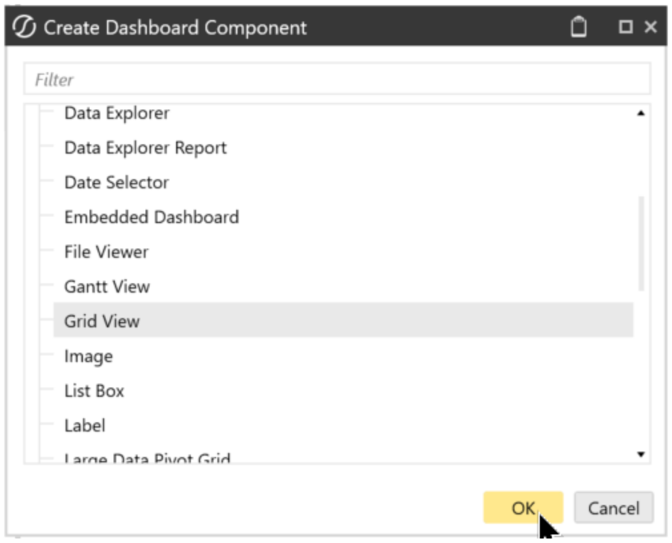
Grid View Example

1. Go to **Application** > **Presentation** > **Workspaces** > [**choose Workspace**] > [Maintenance Unit > **[choose Maintenance Unit]** > **Components** > **Grid View**.

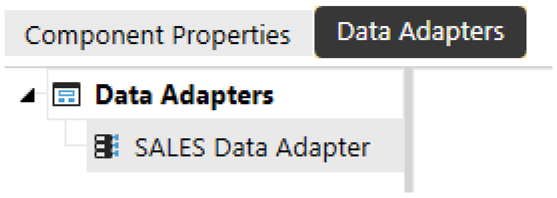
2. Create Dashboard Component or open a grid view.



3. Choose Grid View and select OK.



4. Configure the grid to use the data adapter.



5. Run the associated dashboard to see the data.

Perform a Drill Back

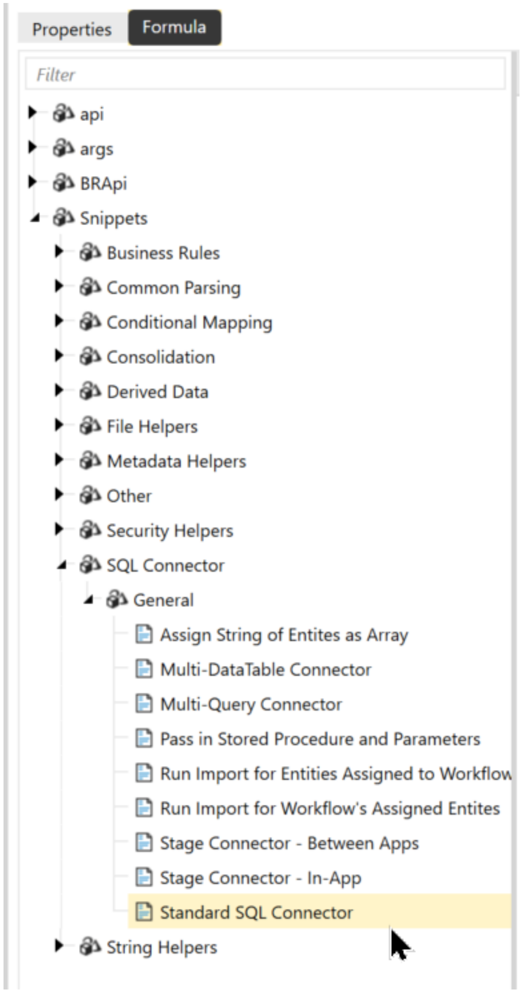
The following snippet describes how to load data from a local gateway connection data source and how to perform a drill back. The example below has been updated from the Standard SQL Connectors business rule. If you do not have the Snippet Editor with the OneStream Application, you can find the Snippet Editor on the MarketPlace.

1. Download and install the Snippet Editor from the MarketPlace.

2. Navigate to **Application** > **Tools** > **Business Rules**.

3. Expand **Connector** and select a **Business Rule**.

4. Navigate to **Snippets** > **SQL Connector** > **Standard SQL Connectors**.



5. Copy the Sample Business Rule.

6. Edit the query information. *Enter*

   dim connectionString_Gateway As String = Your Connection information.

   > **NOTE:** This example assumes that you have completed the setup and installation process and configured a custom database connection in the System Configuration as a Gateway type. Refer to Define Database Location in OneStream for more information.

```
' Get the query information (prior to using the Gateway)
Dim connectionstring As String = GetConnectionString(si, globals, api)
' Get the query information (using the Gateway)
Dim connectionString_gateway As String = GetConnectionString_Gateway(si, global3, api)|
```

7. Enter the connection name. In this example, “Northeast Sales” is the Gateway Connection Name as defined in the application configuration.

```
' Create a Connection string to the External Database (prior to using the gateway)
Private Function GetConnectionString(ByVal si As Sessioninfo, ByVal globals As BRGlobals,
ByVal api As Transformer) As String
  Try
    ' Named External Connection
    ' -------------------------------------------
    Return "Revenue Mgmt System"
  Catch ex As Exception
    Throw ErrorHandler.LogWrite(si, New XFException(si, ex))
  End Try
End Function

' Create a Connection string to the External Database (using the Gateway)
Private Function GetConnectionString_Gateway(ByVal si As Sessioninfo, ByVal globais As
BRGlobals, ByVal api As Transformer) As String
    Try
      ' Named External Connection - Gateway
      ' -------------------------------------------
      Return "Northeast Sales"
    Catch ex As Exception
        Throw ErrorHandler.LogWrite(si, New XFException(si, ex))
    End Try
End Function
```

8. Enter the drill back information to your database.

```
If args.DrillCode.Equals(StageConstants.TransformationGeneral.DrillCodeDefaultValue,
StringComparison.InvariantCultureIgnoreCase) Then
   ' Source GL Drill Down
   drillTypes.Add(New DrillBackTypeInfo(ConnectorDrillBackDisplayTypes.FileShareFile, New
NameAndDesc("InvoiceDocument","Invoice Document")))
   drillTypes.Add(New DrillBackTypeInfo(ConnectorDrillBackDisplayTypes.DataGrid, New
NameAndDesc("MaterialTypeDetail","Material Type Detail")))
   drillTypes.Add(New DrillBackTypeInfo(ConnectorDrillBackDisplayTypes.DataGrid, New
NameAndDesc("MaterialTypeDetail_Gateway","Material Type Detail (Smart Integration)")))
```

9. Edit the level of drill back information returned.

Example: This example shows previously existing code that leverages a VPN based SQL connection and the Gateway based method shown in the second "Else If" block.

```
Else If args.DrillBackType.NameAndDescription.Name.Equals("MaterialTypeDetail",
StringComparison.InvariantCultureIgnoreCase) Then
  ' Level 1: Return Drill Back Detail
  Dim dri1lBackSQL As String - GetDrillBackSQL_Ll(si, globais, api, args)
  Dim drillBackInfo As New DrillBackResultInfo
  drillBackInfo.DisplayType = ConnectorDrillBackDisplayTypes.OataGrid
  drillBackInfo.DataTable = api.Parser.GetXFDataTableForSQLQuery(si, DbProviderType.SqlServer,
connectionstring. True, drillBackSQL, False, args.PageSize, args.PageNumber)
  Return drillBacklnfo

Else If args.DrillBackType.NameAndDescription.Name.Equals("MaterialTypeDetail_Gateway",
StringComparison.lnvariantCultureIgnoreCase) Then
  ' Level 1: Return Drill Back Detail
  Dim drillBackSQL As String = GetDrillBackSQL_Ll(si, globais, api, args)
  Dim drillBackInfo As New DrillBackResultInfo
  drillBackInfo.DisplayType = ConnectorDrillBackDisplayTypes.OataGrid
  drillBackInfo.DataTable = api.Parser.GetXFDataTableForSQLQuery(si, DbProviderType.Gateway,
connectionstring_gateway. True, drillBackSQL, False, args.PageSize, args.PageNumber)
  Return drillBacklnfo
```

Perform a Write Back

You can perform a write back using Smart Integration Connector leveraging the defined credentials to the local gateway dataSource at the Smart Integration Connector Gateway. If the credentials have permission to insert, update, and/or delete records in a remote dataSource, a OneStream business rule could be leveraged to write-back, update, and/or delete data as needed to support a financial process.

> **Example:** The following example shows how to insert rows and columns to a Smart Integration Connector remote database.

```
Imports System
Imports System.Collections.Generic
Imports System.Data
Imports System.Data.Common
Imports System.Globalization
Imports System.IO
Imports System.Linq
Imports System.Windows.Forms
Imports Microsoft.VisualBasic
Imports OneStream.Finance.Database
Imports OneStream.Finance.Engine
Imports OneStream.Shared.Common
Imports OneStream.Shared.Database
Imports OneStream.Shared.Engine
Imports OneStream.Shared.Wcf
Imports OneStream.Stage.Database
Imports OneStream.Stage.Engine

Namespace OneStream.BusinessRule.Extender.SIC_BulkCopyExample
    Public Class MainClass
        Public Function Main(ByVal si As SessionInfo, ByVal globals As BRGlobals, ByVal api
As Object, ByVal args As ExtenderArgs) As Object
            Try
                ' SIC Gateway name
                Dim sicGatewayName As String = "Northeast_HQ"

                ' SIC remote rule
                Dim sicRemoteRule As String = "update_DB"

                ' SIC remote rule function
                Dim sicRemoteRuleFunction As String = "RunOperation"

                ' Create and populate DataTable
                Dim dt As New DataTable()
                dt.Columns.Add("Scenario", GetType(String))
```

```
                    dt.Columns.Add("Time", GetType(String))
                    dt.Columns.Add("Entity", GetType(String))
                    dt.Columns.Add("Account", GetType(String))
                    dt.Columns.Add("Amount", GetType(Double))
                    dt.Rows.Add("Actual", "2023M3", "Houston Heights", "Net Sales", 100.25)
                    dt.Rows.Add("Actual", "2023M3", "South Houston", "Net Sales", 1230.66)

                    ' Compress data table before passing into remote business rule
                    Dim dtCompress As CompressionResult  = CompressionHelper.CompressJsonObject
                    (Of DataTable)(si, dt, XFCompressionAlgorithm.DeflateStream)

                    Dim dtObj(2) As Object ' Create object to store arguments for remote business rule
                    dtObj(0) = dtCompress ' compressed datatable
                    dtObj(1) = "SIC_WriteBack" ' remote database table name
                    dtObj(2) = "RevenueMgmt" ' remote data source name

                    ' Execute remote business rule to bulk copy to target table
                    Dim bulkRemoteResults As RemoteRequestResultDto
                    =BRApi.Utilities.ExecRemoteGatewayBusinessRule(si, sicRemoteRule,
                    dtObj, sicGatewayName,sicRemoteRuleFunction,String.Empty, False, 600)

                    ' Get result status
                    If bulkRemoteResults.RemoteResultStatus <>
                    RemoteMessageResultType.RunOperationReturnObject Then ' Check if successful
                        ' Failed, do something
                        BRAPi.ErrorLog.LogMessage(si,"Failed with status:" & bulkRemoteResults.
                        RemoteResultStatus.ToString)

                    End If

                    ' Get returned message
                    Dim returnedMsg As String = CompressionHelper.InflateJsonObject(Of String)
                    (si,bulkRemoteResults.resultDataCompressed)

                    BRAPi.ErrorLog.LogMessage(si,returnedMsg)

                    Return Nothing
                Catch ex As Exception
                    Throw ErrorHandler.LogWrite(si, New XFException(si, ex))
                End Try
            End Function
        End Class
    End Namespace
```

The Extensibility Rule above calls the following Smart Integration Function:

```
Imports System
Imports System.Collections.Generic
Imports System.Data
Imports System.Data.Common
Imports System.Globalization
Imports System.IO
Imports System.Linq
Imports System.Data.SqlClient
Imports OneStream.Shared.Common
Imports OneStreamGatewayService

Namespace OneStream.BusinessRule.SmartIntegrationFunction.SIC_Functions
    Public Class MainClass

        ' Function to bulk copy a compressed data table to a SQL database table
        ' Pass in compressed data table, database table name and data source name
        Public Shared Function RunOperation(dtCompress As CompressionResult,tablename As String,
        dataSource As String) As String

            ' ------------------------------------------------------------------------------------
---------
            ' Get SQL connection string
            Dim connString As String = APILibrary.GetRemoteDataSourceConnection(dataSource)

            ' Inflate compressed datatable
            Dim dt As DataTable = CompressionHelper.InflateJsonObject(Of DataTable)
            (New SessionInfo,dtCompress)

            If dt IsNot Nothing AndAlso dt.Rows.Count > 0 Then
            ' Check data table has been created and is populated

                ' Create sql connection to DWH
                Using sqlTargetConn As SqlConnection = New SqlConnection(connString)

                    sqlTargetConn.Open ' Open connection

                    Using bulkCopy = New SqlBulkCopy(sqlTargetConn)

                        bulkCopy.DestinationTableName = tableName ' DWH table
                        bulkCopy.BatchSize = 5000
                        bulkCopy.BulkCopyTimeout = 30

                        bulkCopy.WriteToServer(dt) ' Bulk copy data table to database table

                    End Using

                End Using

            Else
                Throw New Exception("Problem uncompressing data in SIC gateway")
            End If

            Return $"{dt.Rows.Count} rows bulk inserted into table {tableName}"

        End Function

    End Class
End Namespace
```

Support for SFTP

Smart Integration Connector provides support for connecting to SFTP servers to send and retrieve files. Perform the steps in the following sections to establish a connection and then send and retrieve files.

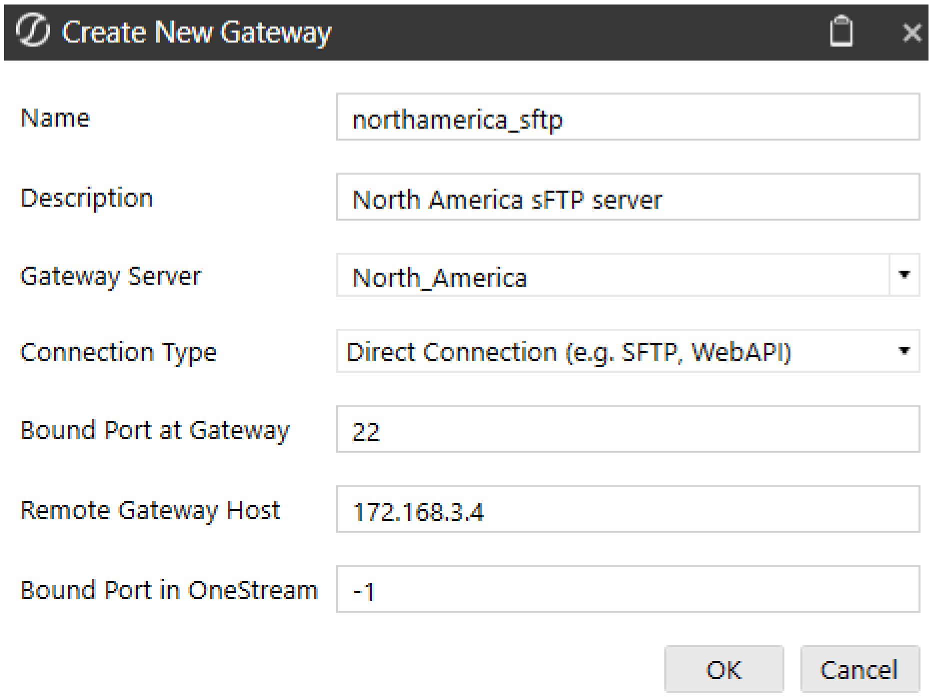
IMPORTANT: It is best practice to utilize SSH.NET for Secure File Transfer Protocol (SFTP) tasks.

IMPORTANT: For current WinSCP users, it is recommended to transition your SFTP operations to the SSH.NET library. In a future release of OneStream, WinSCP will be phased out.

NOTE: You must have an SFTP server available on a port. The port must be allowed for inbound and outbound connections on the Local Gateway Server. For this example, we have used port 22.

1. Login to OneStream.
2. Navigate to **System** > **Administration** > **Smart Integration Connector**.
3. Create a New **Gateway** and fill out all of the corresponding details for your Gateway and the Gateway Server.
4. From **Connection Type**, select Direct Connection (e.g., SFTP, WebAPI).
5. For **Bound Port at Gateway**, enter 22.

6. For **Remote Gateway Host**, enter the IP address or resolvable host name of the machine where your SFTP server is located.



Create New Gateway

Name	northamerica_sftp
Description	North America sFTP server
Gateway Server	North_America
Connection Type	Direct Connection (e.g. SFTP, WebAPI)
Bound Port at Gateway	22
Remote Gateway Host	172.168.3.4
Bound Port in OneStream	-1

7. For **Bound Port in OneStream**, enter -1 to automatically assign an unused port number. You can also specify your own port number by entering a value greater than 1024 and less than 65535. It is a best practice to use a higher value because it is less likely that number will be in use as this port number must be globally unique across all applications hosted on the OneStream servers.

8. Click **OK**.

9. Copy the **Gateway** to the **OneStream Smart Integration Connector Local Gateway Server Configuration**.

10. Save the Local Gateway Server configuration and restart the Smart Integration Connector Gateway service.

> **Example:** Here is an example of how you can upload and download files through an SFTP extensibility rule.

C# SFTP Example

Below you can find the C# example for STFP.

```
using System;
using System.Collections.Generic;
using System.Data;
using System.Data.Common;
using System.Globalization;
using System.IO;
using System.Linq;
using Microsoft.CSharp;
using OneStream.Finance.Database;
using OneStream.Finance.Engine;
using OneStream.Shared.Common;
using OneStream.Shared.Database;
using OneStream.Shared.Engine;
using OneStream.Shared.Wcf;
using OneStream.Stage.Database;
using OneStream.Stage.Engine;
using Renci.SshNet;

namespace OneStream.BusinessRule.Extender.SFTP_SSH_C
{
    public class MainClass
    {
        public object Main(SessionInfo si, BRGlobals globals, object api, ExtenderArgs args)
        {
            try
            {

                // --------------------------------------------------
                // SSH.NET EXAMPLES
                // --------------------------------------------------

                // Setup SSH.NET session options from values in Cloud Administration Tools (CAT) Key
Management - Secrets
                var username = BRApi.Utilities.GetSecretValue(si, "SFTP-UserName");
                var password = BRApi.Utilities.GetSecretValue(si, "SFTP-Password");
                var authenticationMethod = new PasswordAuthenticationMethod(username, password);
                var connectionInfo = new ConnectionInfo("52.151.252.48", username,
authenticationMethod);
```

```
                // Get the filepath - BatchHarvest in this example is File Share / Applications /
GolfStreamDemo_v36 / Batch / Harvest
                var fileDNpath = BRApi.Utilities.GetFileShareFolder(si,
FileShareFolderTypes.BatchHarvest, null);
                var fileSFTPpath = Path.Combine(fileDNpath, "SFTP_TEST_DOWNLOAD_" +
DateTime.UtcNow.ToString("MM-dd-yyyy-HHmmss") + ".txt");
                var fileSCPpath = Path.Combine(fileDNpath, "SCP_TEST_DOWNLOAD_" +
DateTime.UtcNow.ToString("MM-dd-yyyy-HHmmss") + ".txt");

                // SFTP Example
                using (var sftpClient = new SftpClient(connectionInfo))
                {
                       sftpClient.Connect();
                    using (var downloadStream = new FileStream(fileSFTPpath, FileMode.OpenOrCreate,
FileAccess.Write, FileShare.None))
                    {
                        sftpClient.DownloadFile("SFTP_TEST_DOWNLOAD.txt", downloadStream);
                    }
                }

                // SCP Example
                using (var scpClient = new ScpClient(connectionInfo))
                {
                    scpClient.Connect();
                    scpClient.Download("SFTP_TEST_DOWNLOAD.txt", new FileInfo(fileSCPpath));
                }
                return null;
            }
            catch (Exception ex)
            {
                throw ErrorHandler.LogWrite(si, new XFException(si, ex));
            }
        }
    }
}
```

VB STFP Example

Below you can find the VB example for STFP.

```
Imports System
Imports System.Collections.Generic
Imports System.Data
Imports System.Data.Common
Imports System.Globalization
Imports System.IO
Imports System.Linq
Imports System.Windows.Forms
Imports Microsoft.VisualBasic
Imports OneStream.Finance.Database
Imports OneStream.Finance.Engine
Imports OneStream.Shared.Common
Imports OneStream.Shared.Database
Imports OneStream.Shared.Engine
Imports OneStream.Shared.Wcf
Imports OneStream.Stage.Database
Imports OneStream.Stage.Engine
Imports Renci.SshNet

Namespace OneStream.BusinessRule.Extender.SFTP_SSH
    Public Class MainClass
        Public Function Main(ByVal si As SessionInfo, ByVal globals As BRGlobals, ByVal api
As Object, ByVal args As ExtenderArgs) As Object

            Try
                ' -------------------------------------------------
                ' SSH.NET EXAMPLES
                ' -------------------------------------------------

                ' Setup SSH.NET session options from values in Cloud Administration Tools (CAT) Key
Management - Secrets
                Dim username As String = BRApi.Utilities.GetSecretValue(si, "SFTP-UserName")
                Dim password As String = BRApi.Utilities.GetSecretValue(si, "SFTP-Password")
                Dim authenticationMethod = New PasswordAuthenticationMethod(username, password)
                Dim connectionInfo = New ConnectionInfo("52.151.252.48", username,
authenticationMethod)

                'Get the filepath - BatchHarvest in this example is File Share / Applications /
GolfStreamDemo_v36 / Batch / Harvest
                Dim fileDNPath As String = BRAPi.Utilities.GetFileShareFolder(si,
FileShareFolderTypes.BatchHarvest, Nothing)
                Dim fileSFTPpath = Path.Combine(fileDNpath, "SFTP_TEST_DOWNLOAD_" &
DateTime.UtcNow.ToString("MM-dd-yyyy-HHmmss") & ".txt")
                Dim fileSCPpath = Path.Combine(fileDNpath, "SCP_TEST_DOWNLOAD_" &
DateTime.UtcNow.ToString("MM-dd-yyyy-HHmmss") & ".txt")

                ' SFTP Example
                Using sftpClient = New SftpClient(connectionInfo)
                    sftpClient.Connect()
                    Using downloadStream = New FileStream(fileSFTPpath, FileMode.OpenOrCreate,
FileAccess.Write, FileShare.None)
                        sftpClient.DownloadFile("SFTP_TEST_DOWNLOAD.txt", downloadStream)
                    End Using
                End Using

'                ' SCP Example
                Using scpClient As New ScpClient(connectionInfo)
                    scpClient.Connect()
                    scpClient.Download("SFTP_TEST_DOWNLOAD.txt", New FileInfo(fileSCPpath))
                End Using

                Return Nothing

            Catch ex As Exception
                Throw ErrorHandler.LogWrite(si, New XFException(si, ex))
                Return Nothing
            End Try

        End Function

    End Class

End Namespace
```

Transferring Files from Local FileShare

You can use a Data Management job to move files Smart Integration Connector from a local FileShare. To do this, you build an extender business rule and call it through a data management job. This extender business rule will call a Smart Integration Function (remote function) and obtain the results.

Step 1 - Setup the Remote Server / Remote Share

To get started, setup the Smart Integration Function:

1. Navigate to **Application** > **Tools** > **Business Rules**.
2. Open the **Smart Integration Function** folder.
3. Create a new business rule (for example, TestFileRead) .
4. Copy and paste the following business rule code snippet.

```
using System;
using System.Collections.Generic;
using System.Data;
using System.Data.Common;
using System.Globalization;
using System.IO;
using System.Linq;

namespace OneStream.BusinessRule.SmartIntegrationFunction.TestFileRead
{
       public class MainClass
```

```
        {
                public byte[] RunOperation(string year)
                {
                        string fname = @"c:\temp\hw_" +  year + ".csv";
                        byte[] buffer = System.IO.File.ReadAllBytes(fname);
                        return buffer;
                }

                public byte[] GetOtherFileData(string year)
                {
                        string fname = @"c:\temp\zw_" +  year + ".csv";
                        byte[] buffer = System.IO.File.ReadAllBytes(fname);
                        return buffer;
                }

                public bool DeleteOldFileData(string year)
                {
                        string fname = @"c:\temp\zw_" +  year + ".csv";
                        try
                        {
                          System.IO.File.Delete(fname);
                          return true;
                        }
                        catch (IOException)
                        {
                              return false;
                        }
                }
        }
}
```

Step 2 - Pull file from Extender Business Rule

1. Navigate to **Application > Tools > Business Rules**.
2. Open the **Extensibility Rules** folder.
3. Create a new business rule (for example, ProcessRemoteFileData) .
4. Copy and paste the following business rule code snippet.

```
Imports System
Imports System.Data
Imports System.Data.Common
Imports System.IO
Imports System.Collections.Generic
Imports System.Globalization
Imports System.Linq
Imports Microsoft.VisualBasic
Imports System.Windows.Forms
Imports OneStream.Shared.Common
Imports OneStream.Shared.Wcf
Imports OneStream.Shared.Engine
Imports OneStream.Shared.Database
Imports OneStream.Stage.Engine
Imports OneStream.Stage.Database
Imports OneStream.Finance.Engine
Imports OneStream.Finance.Database

Namespace OneStream.BusinessRule.Extender.ProcessRemoteFileData
    Public Class MainClass
        Public Function Main(ByVal si As SessionInfo, ByVal globals As BRGlobals, ByVal
api As Object, ByVal args As ExtenderArgs) As Object
            Try
                Dim stepNumber As String = "1"

                If (Not args.NameValuePairs Is Nothing) Then
                  ' Extracting the value from the parameters collection
                  If (args.NameValuePairs.Keys.Contains("step")) Then
                      stepNumber = args.NameValuePairs.Item("step")
                  End If
                  BRApi.ErrorLog.LogMessage(si, "File Processing Step: " & stepNumber)
                End If

                Select Case stepNumber

                    Case Is = "1"
                        GetData(si)
                        Return Nothing

                    Case Is = "2"
                        CleanupData(si)
                        Return Nothing


                End Select


            Catch ex As Exception
                Throw ErrorHandler.LogWrite(si, New XFException(si, ex))
            End Try

            Return Nothing
        End Function


        Public Sub CleanupData(ByVal si As SessionInfo)
```

```
                Dim argTest(0) As Object
                argTest(0) = "2023"

                ' Here we are telling it to specifically call
                 Dim objRemoteRequestResultDto As RemoteRequestResultDto =
BRApi.Utilities.ExecRemoteGatewayBusinessRule(si, "TestFileRead", argTest,
"entergatewayname", "DeleteOldFileData")
                If (objRemoteRequestResultDto.RemoteResultStatus =
RemoteMessageResultType.RunOperationReturnObject) Then

                    ' The delete method returns a true/false return type
                    Dim result As Boolean
                    ' ObjectResultValue introduced in v7.4 to simplify obtaining the
return value from a method that doesn't return a
                    ' Dataset/Datatable
                    result = objRemoteRequestResultDto.ObjectResultValue

                    Dim objRemoteRequestResultDtoCached As RemoteRequestResultDto =
BRApi.Utilities.ExecRemoteGatewayCachedBusinessRule(si, "TestFileReadCache", argTest,
"entergatewayname", String.Empty)

                    BRApi.ErrorLog.LogMessage(si, "File Deleted: " & result)
                Else
                  If (Not (objRemoteRequestResultDto.remoteException Is Nothing)) Then
                         Throw ErrorHandler.LogWrite(si, New XFException(si,
objRemoteRequestResultDto.remoteException))
                  End If
              End If

        End Sub

        Public Sub GetData(ByVal si As SessionInfo)

                ' Demonstrating how to pass parameters
                ' We create an object array that matches the number of parameters
                ' To the remote function.  In this case, we have 1 parameter that is a
string
                Dim argTest(0) As Object
                argTest(0) = "2023"

                ' This is where you can allow caching of the remote function.  We are
passing in true at the end to force the cache to be updated
                ' We are also allowing the function to run for 90 seconds.
                ' String.empty means this will look for a remote function/method called
"RunOperation"
                 Dim objRemoteRequestResultDto As RemoteRequestResultDto =
BRApi.Utilities.ExecRemoteGatewayBusinessRule(si, "TestFileRead", argTest,
"entertestconnection", String.Empty,"TestFileRead", True, 90)
                If (objRemoteRequestResultDto.RemoteResultStatus =
RemoteMessageResultType.RunOperationReturnObject) Then
                    Dim bytesFromFile As Byte()
                    bytesFromFile = objRemoteRequestResultDto.ObjectResultValue
                    Dim valueAsString As String = System.Text.Encoding.UTF8.GetString
(bytesFromFile)
```

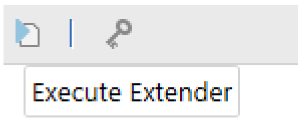
```
                    Return valueAsString
                    bytesFromFile = Convert.FromBase64String
(objRemoteRequestResultDto.ObjectResultValue)
                    'bytesFromFile = objRemoteRequestResultDto.ObjectResultValue


                    Dim valueAsString As String = System.Text.Encoding.UTF8.GetString
(bytesFromFile)

                      ' Do something with the files here....
                    BRApi.ErrorLog.LogMessage(si, "File Contents: " & Left
(valueAsString,10))
                    ' We are saving the file into the OneStream Share here
                    ' This is an option to allow other OneStream functions to process the
data
                    'Dim groupFolderPath As String =
FileShareFolderHelper.GetGroupsFolderForApp(si, True, AppServerConfig.GetSettings
(si).FileShareRootFolder, si.AppToken.AppName)
                    Dim groupFolderPath As String = BRAPi.Utilities.GetFileShareFolder(si,
FileShareFolderTypes.BatchHarvest, Nothing)
                    Using sw As StreamWriter = New StreamWriter(groupFolderPath &
"\outputfile.csv")
                      sw.Write(valueAsString)
                      sw.Close()
                    End Using
                Else
                  If (Not (objRemoteRequestResultDto.remoteException Is Nothing)) Then
                         Throw ErrorHandler.LogWrite(si, New XFException(si,
objRemoteRequestResultDto.remoteException))
                  End If
                End If
        End Sub

    End Class
End Namespace
```

5. Test your Extender Business Rule via the Execute Extender button in the toolbar.



Step 3 - Automate from Data Management / Task Scheduler

After the Extensibility Rule has been created and tested you can automate from a Data Management Job and associate Task Schedule. See Task Scheduler for more information.

Obtain Data through a WebAPI

In this scenario, you have a WebAPI (IPaaS integration or another accessible REST API) to obtain and pass back data to OneStream. You can use the following remote business rule in Smart Integration Connector to invoke the API. If you have results that are in JSON format, you can convert them to a data table and send them back to OneStream. If the data from the WebAPI is in JSON, you can process the data in Smart Integrator Connector. Additionally, you can send the raw data back as a string to a data management job for further testing.

Direct connections are preferred for this method and can be invoked using business rules within OneStream similar to the SFTP example provided above.

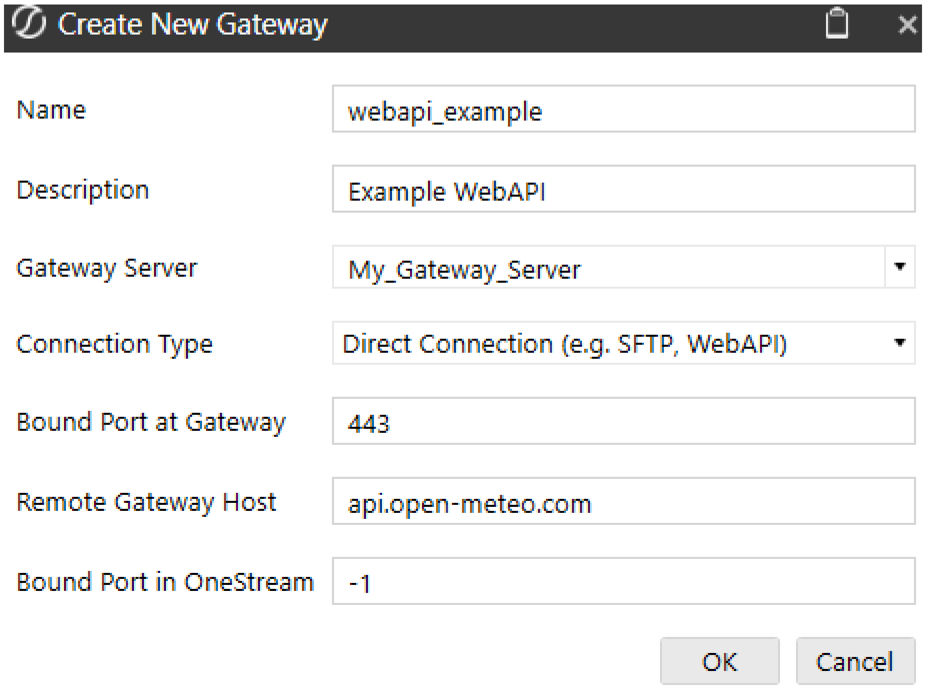
See Multiple WebAPI Connections for best practices on scenarios with multiple WebAPIs.

NOTE: Data transferred over a Direct Connection to a WebAPI is transferred directly over HTTP(S) and not converted to parquet format. OneStream does not control the return format.

Single WebAPI Connection

To set up a single WebAPI connection:

1. Set up a Direct Connection Gateway.

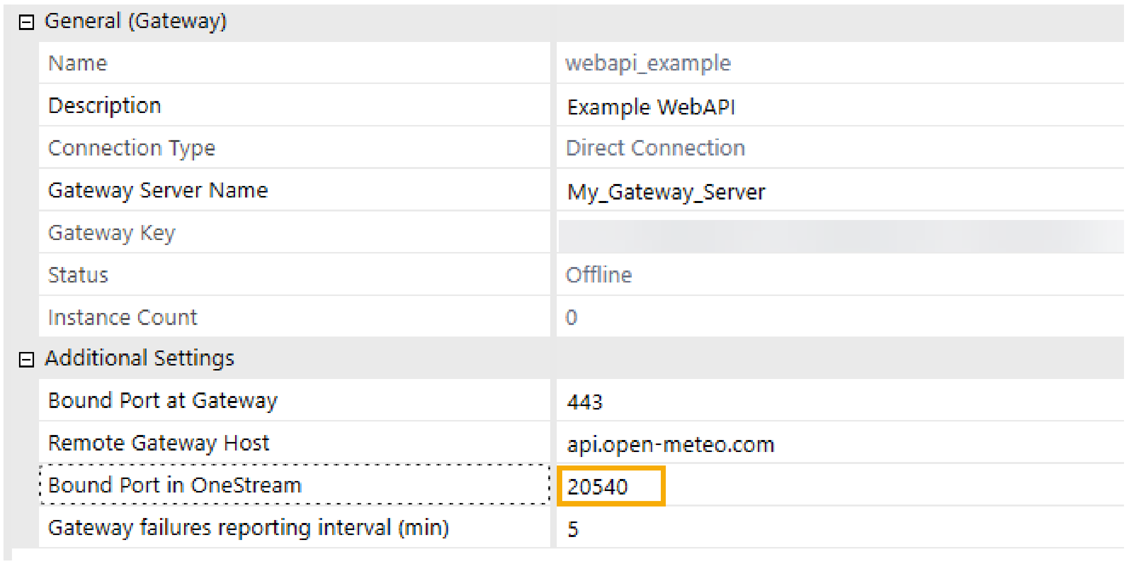


Name	webapi_example
Description	Example WebAPI
Gateway Server	My_Gateway_Server
Connection Type	Direct Connection (e.g. SFTP, WebAPI)
Bound Port at Gateway	443
Remote Gateway Host	api.open-meteo.com
Bound Port in OneStream	-1

2. Export the Configuration and import to your Local Gateway Server. See the Export and Import the Gateway Configuration section for more information on this process.

3. Refresh your Gateways and verify this new Gateway is online.

   IMPORTANT: Copy your **Bound Port in OneStream**. You will reference this later in the extensibility rule.



General (Gateway)	
Name	webapi_example
Description	Example WebAPI
Connection Type	Direct Connection
Gateway Server Name	My_Gateway_Server
Gateway Key	
Status	Offline
Instance Count	0
Additional Settings	
Bound Port at Gateway	443
Remote Gateway Host	api.open-meteo.com
Bound Port in OneStream	20540
Gateway failures reporting interval (min)	5

4. Create the Extensibility Rule below:

> **IMPORTANT:** If you copy the business rule below and are having trouble communicating with your webAPI after compiling, ensure that you have set your host header correctly. Refer to "api.open-meteo.com" in the code sample below.

```
using System;
using System.Collections.Generic;
using System.Data;
using System.Data.Common;
using System.Globalization;
using System.IO;
using System.Linq;
using OneStream.Shared.Common;
using OneStream.Shared.Database;
using OneStream.Shared.Engine;
using OneStream.Shared.Wcf;
using System.Net;
using System.Net.Http;
using Newtonsoft.Json;
using System.Net.Http.Headers;
```

```
namespace OneStream.BusinessRule.Extender.SIC_WebAPI
{
    public class MainClass
    {
        private static readonly HttpClient internalHttpClient = new HttpClient();

        public object Main(SessionInfo si, BRGlobals globals, object api, ExtenderArgs
args)
        {
            try
            {
                internalHttpClient.DefaultRequestHeaders.Accept.Clear();
                   internalHttpClient.DefaultRequestHeaders.Accept.Add
(new MediaTypeWithQualityHeaderValue("application/json"));
                internalHttpClient.DefaultRequestHeaders.Accept.Add
(new MediaTypeWithQualityHeaderValue("application/x-www-form-urlencoded"));
                internalHttpClient.DefaultRequestHeaders.Accept.Add
(new MediaTypeWithQualityHeaderValue("application/octet-stream"));
                internalHttpClient.DefaultRequestHeaders.Accept.Add
(new MediaTypeWithQualityHeaderValue("text/plain"));
                internalHttpClient.DefaultRequestHeaders.Accept.Add
(new MediaTypeWithQualityHeaderValue("*/*"));

                // The header must be set or some connections maybe refused.
                internalHttpClient.DefaultRequestHeaders.Host = "api.open-meteo.com";

                // In this example, 20540 is the Bound Port in OneStream for the Gateway
being used.
                var stringTask = internalHttpClient.GetStringAsync
("https://localhost:20540/v1/forecast?latitude=40.73&longitude=-73.94&daily=temperature_
2m_max,temperature_2m_min&temperature_unit=fahrenheit&timezone=America%2FNew_York");

                // Display the result in the exception dialog as an example.
                throw new Exception(stringTask.Result);
            }
            catch (Exception ex)
            {
                throw ErrorHandler.LogWrite(si, new XFException(si, ex));
            }
        }
    }
}
```

5. Compile and test the business rule. If the extensibility ran successfully, you should see the correct data that corresponds with the business rule in the Exception dialog box.

Multiple WebAPI Connections

If you are using more than one WebAPI, the best practice is to perform this process using a single Gateway and multiple remote Business Rules.

Use the following OneStream business rule to invoke the request.

```
Dim objRemoteRequestResultDto As RemoteRequestResultDto =
BRApi.Utilities.ExecRemoteGatewayBusinessRule(si, "RemoteWebAPISample", Nothing,
"testconnection",String.Empty) If (objRemoteRequestResultDto.RemoteResultStatus =
RemoteMessageResultType.Success) Dim xfDT = New XFDataTable
(si,objRemoteRequestResultDto.resultSet,Nothing,1000) End If
```

Use the following remote business rule to execute the request in C#

```
using System;
using System.Collections.Generic;
using System.Data;
using System.Data.Common;
using System.Globalization;
using System.IO;
using System.Linq;
using System.Net;
using System.Net.Http;
using Newtonsoft.Json;
using System.Net.Http.Headers;

namespace OneStream.BusinessRule.SmartIntegrationFunction.RemoteWebAPISample
{
        public class MainClass
        {
               private static readonly HttpClient internalHttpClient = new HttpClient();

               static MainClass()
               {
               internalHttpClient.DefaultRequestHeaders.Accept.Clear();
            internalHttpClient.DefaultRequestHeaders.Accept.Add(new MediaTypeWithQualityHeaderValue
("application/json"));
            internalHttpClient.DefaultRequestHeaders.Accept.Add(new MediaTypeWithQualityHeaderValue
("application/x-www-form-urlencoded"));
            internalHttpClient.DefaultRequestHeaders.Accept.Add(new MediaTypeWithQualityHeaderValue
("application/octet-stream"));
            internalHttpClient.DefaultRequestHeaders.Accept.Add(new MediaTypeWithQualityHeaderValue
("text/plain"));
            internalHttpClient.DefaultRequestHeaders.Accept.Add(new MediaTypeWithQualityHeaderValue
("*/*"));
               }
```

```
                public DataTable RunOperation()
                {
                 var stringTask = internalHttpClient.GetStringAsync
(https://localhost:44388/WeatherForecast);

                        var msg = stringTask;
                        DataTable dt = (DataTable)JsonConvert.DeserializeObject(stringTask.Result,
(typeof(DataTable)));

                        return dt;
                }
        }
}
```

Sending Email through Smart Integration Direct Connections

Prior to using this business rule, you must have your email server configured. You must establish a direct connection before sending email. See Single Web API Connection for more information on setting up an initial direct connection. The following business rule can send email from an Extender Business rule.

```
using System;
using System.Collections.Generic;
using System.Data;
using System.Data.Common;
using System.Globalization;
using System.IO;
using System.Linq;
using Microsoft.CSharp;
using OneStream.Finance.Database;
using OneStream.Finance.Engine;
using OneStream.Shared.Common;
using OneStream.Shared.Database;
using OneStream.Shared.Engine;
using OneStream.Shared.Wcf;
using OneStream.Stage.Database;
using OneStream.Stage.Engine;
using System.Net.Mail;
using System.Net;
using System.Net.Security;
using System.Text.RegularExpressions;
using System.Security.Cryptography.X509Certificates;
```

```
namespace OneStream.BusinessRule.Extender.smtp_direct_test
{
    public class MainClass
    {
        public SessionInfo SI;
        private const string smtpHostName = "smtp.azurecomm.net"; // expected name to match the
cert.


        public object Main(SessionInfo si, BRGlobals globals, object api, ExtenderArgs args)
        {
            var client = new SmtpClient();
            var email = new MailMessage();
            try
            {
                SI = si;
                // Add custom validation callback to look for expected cert (Host will be localhost,
which causes this to fail without a custom callback)
                ServicePointManager.ServerCertificateValidationCallback +=  ValidationCallback;

                client.UseDefaultCredentials = false;
                client.Port = 20542;
                client.Host = "localhost";
                client.EnableSsl = true;
                client.Credentials = new System.Net.NetworkCredential("AdmixCommunications...",
"OPT8Q~IBBHZG0yQ3Z.2nlsZtnhHoI3L.lPv6~dv2");

                email.From = new MailAddress("DoNotReply@domain.com");
                email.To.Add("test@onestreamsoftware.com");
                email.Subject = "Test from SIC Gateway";
                email.IsBodyHtml = false;
                email.Body = "Forwarded test from SIC Gateway";

                client.Send(email);

                return null;
            }
            catch (Exception ex)
            {
                throw ErrorHandler.LogWrite(si, new XFException(si, ex));
            }
            finally
            {
                // Remove the custom ValidationCallback. It's recommended to remove this before any
other network calls.
                ServicePointManager.ServerCertificateValidationCallback -=  ValidationCallback;
                email.Dispose();
                client.Dispose();
            }
        }

        public bool ValidationCallback(object sender, X509Certificate certificate, X509Chain chain,
SslPolicyErrors sslPolicyErrors)
        {
            var policyErrors = (sslPolicyErrors as SslPolicyErrors?) ?? SslPolicyErrors.None;
            var certSubject = certificate?.Subject ?? string.Empty;
            var certName = string.Empty;

            // Extract the certName from the certSubject
            string namePattern = @"CN=([^,]+)";
            var match = Regex.Match(certSubject, namePattern);
            if (match.Success)
            {
                certName = match.Groups[1].Value;

            }
            if (
                (policyErrors == SslPolicyErrors.RemoteCertificateNameMismatch || policyErrors ==
SslPolicyErrors.None)
                && certName == smtpHostName)
            {
                // verify the certName matches the expected smtpHostName. No other SslPolicyErrors
should be present.
                return true;
            }
            else
            {
                return false;
            }
        }
    }
}
```

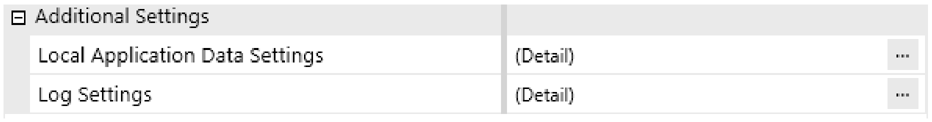
Support for DLL Migration

For OneStream Platform version 8.0 and above, all customer-supplied DLLs will be referenced through Smart Integration Connector. To use a DLL, copy the DLLs to the **Referenced Assemblies Folder** in the Local Gateway Server Utility and reference this DLL within your Smart Integration Function. See Referenced Assemblies Folder.

To verify the Referenced Assemblies Folder path:

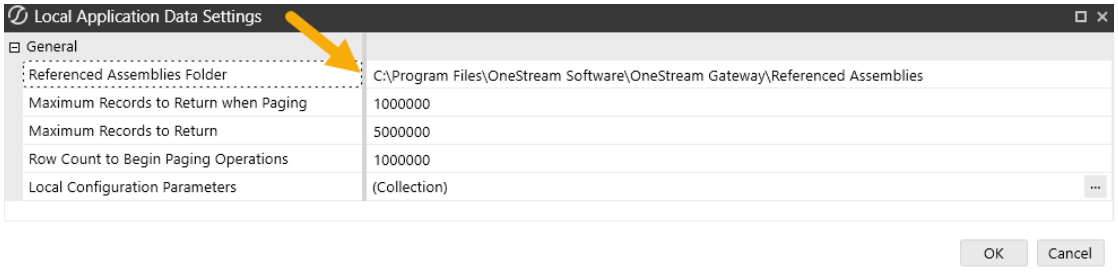
1. Open the **OneStream Local Gateway Configuration** and Run as Administrator.

2. Navigate to and open **Local Application Data Settings**.



⊟ Additional Settings	
Local Application Data Settings	(Detail) ...
Log Settings	(Detail) ...

3. The file path under **Referenced Assemblies Folder** opens to the default location.



Local Application Data Settings

⊟ General	
Referenced Assemblies Folder	C:\Program Files\OneStream Software\OneStream Gateway\Referenced Assemblies
Maximum Records to Return when Paging	1000000
Maximum Records to Return	5000000
Row Count to Begin Paging Operations	1000000
Local Configuration Parameters	(Collection) ...

4. Click the **OK** button.

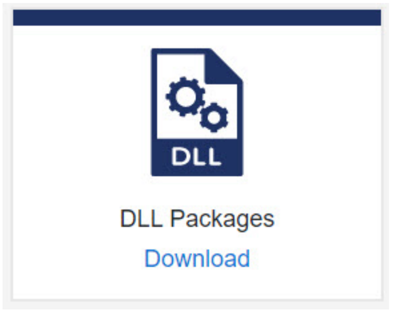
See the following SAP example for this process in use. See Smart Integration Connector Settings for more information on these fields.

Support for ERPConnect (SAP)

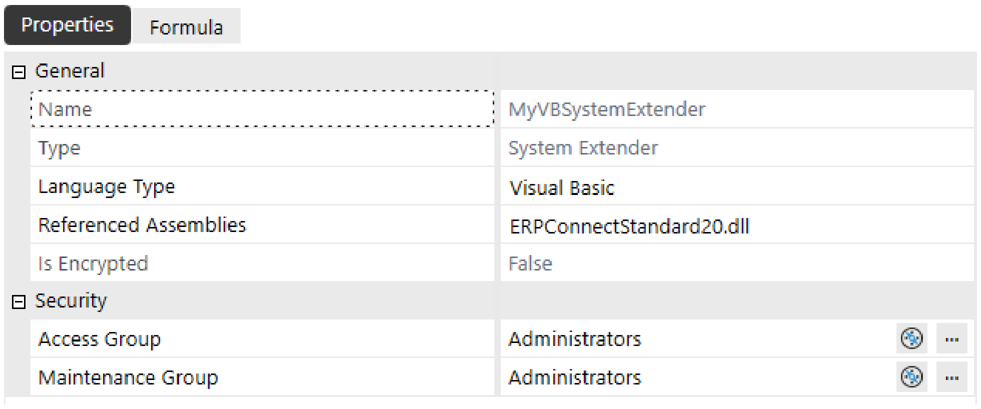
As an alternative to creating a Local Gateway Connection to your SAP database, you can connect to SAP using third-party DLLs, such as ERPConnect##.dll. ERPConnect##.dll can be referenced using a Smart Integration Connector Remote business rule. Although ERPConnect45.dll can no longer enable a connection to SAP systems starting with Platform version 8.0, a newer version ERPConnectStandard20.dll is available through the download DLL Packages from the Platform page of the Solution Exchange. ERPConnect requires additional libraries to be obtained from SAP as well, which can reside in the same reference assembly folder as ERPConnect.

To get started:

1. From the Platform page of the Solution Exchange, download the DLL Packages, which contains the ERPConnectStandard20.dll file.



2. Copy the ERPConnectStandard20.dll to your Referenced Assemblies Folder.
3. Install the required Visual C++ Redistributable latest supported downloads.
4. From SAP, download and copy SAP NetWeaver RFC Library DLL (sapnwrfc.dll) and associated icudt57.dll, icuin57.dll, icuuc57.dll to your Referenced Assemblies Folder. See Theobald Software ERPConnect Requirements for additional information.
5. Modify your business rules to use the ERPConnectStandard20.dll.
6. Navigate to **Application** > **Tools** > **Business Rules**.
7. Expand the Smart Integration Function list.
8. Create a new **Smart Integration Function** or select an existing one.
9. Click the **Properties** tab.



General

Name	MyVBSystemExtender
Type	System Extender
Language Type	Visual Basic
Referenced Assemblies	ERPConnectStandard20.dll
Is Encrypted	False

Security

Access Group	Administrators
Maintenance Group	Administrators

10. Enter **ERPConnectStandard20.dll** in the Referenced Assemblies field.The Smart Integration Connector Gateway server will attempt to locate this DLL in the previously defined folder: **Referenced BusinessRule AssemblyFolder**.

11. Add Imports for **ERPConnect** and **ERPConnect.Utils**.

```
using System;
using System.Collections.Generic;
using System.Data;
using System.Data.Common;
using System.Globalization;
using System.IO;
using System.Linq;
using ERPConnect;
using ERPConnect.Utils;

namespace OneStream.BusinessRule.SmartIntegrationFunction.ERP_Connect_Test
{
  public class MainClass
  {
    public const string UserName = "";
    public const string Password = "";
    public const string Host = "";

    public DataTable RunOperation()
    {
      using (R3Connection con = new R3Connection())
      {
              con.UserName = UserName;
              con.Password = Password;
              con.Language = "EN";
              con.Client = "800";
              con.Host = Host;
              con.SystemNumber = 00;
              con.Protocol = ClientProtocol.NWRFC;   // Optional: If the NW RFC libraries
are used.
              con.UsesLoadBalancing = false;
              con.Open();

              ReadTable table = new ReadTable(con);
              table.AddField("MATNR");
              table.AddField("MAKTX");
              table.WhereClause = "SPRAS = 'EN' AND MATNR LIKE '%23'";
              table.TableName = "MAKT";
              table.RowCount = 10;

              table.Run();

              return table.Result;
      }
    }
  }
}
```

12. Verify you can compile the function on your Gateway.

You are now ready to add your custom code.

Business Rules

The Smart Integration Connector Capabilities introduce additional business rule APIs (BR APIs) to allow for execution and management of remote business rules inside the context of the Smart Integration Connector gateway. These rules are transported using https to the Smart Integration Connector local gateway, compiled locally, executed, and the results returned to the caller for further processing. They provide a mechanism for complex drill backs, data processing scenarios or to invoke remote webAPIs hosted in your network.

NOTE: Gateways must have a local data source defined to invoke remote business rules.

There are two ways business rules can be used with the Smart Integration Connector Gateway:

- OneStream BRAPIs interact with a specific local gateway and run on OneStream application servers.
- Business rules that reference DLLs that are only accessible by the Local Gateway Server. These BRs are compiled and executed on the local gateway (Remote Business Rules when creating them in the Windows Desktop Client).

In these scenarios, the local gateway must have the allowRemoteCodeExec setting configured to True to enable remote execution.

The BR APIs are outlined below:

ExecRemoteGatewayRequest
ExecRemoteGatewayCachedBusinessRule
ExecRemoteGatewayJob

ExecRemoteGatewayBusinessRule
GetRemoteDataSourceConnection
GetRemoteGatewayJobStatus
GetSmartIntegrationConfigValue
GetGatewayConnectionInfo
BRApi.Utilities.IsGatewayOnline(gwName)
Incompatible Business Rules

ExecRemoteGatewayRequest

Initiates a request to a local gateway as specified in the remote request object. This request is dispatched to the Smart Integration Connector local gateway connection data source with the specified command remote invoked.

> **NOTE:** This method is used for request and response type interactions to a remote endpoint that runs for three or less minutes. The default execution timeout is 90 seconds and can be overridden by setting the CommandTimeout property on the RemoteRequestDTO instance provided.

Parameter details:

- RemoteRequestDTO: Remote request object populated with the remote command and endpoint
- Returns: RemoteRequestResultDto - Result of execution including the status and any exceptions which may have occurred on the remote endpoint

Following is an example connector business rule that would run on the OneStream application server sending a remote request and block of code to a Local Gateway Connection:

```
// ExecRemoteGatewayRequest for arbitrary code execution returning a DataTable
string GatewayName = "";
```

```
RemoteRequestResultDto objxfRemoteRequestResultDto;
RemoteCodeRequestDto objxfRemoteRequest = new RemoteCodeRequestDto();
// Indication the desire is to run a remote block of code
objxfRemoteRequest.ConnectionType = RemoteCommandType.RemoteCodeExec;
// Name of the remote host to pass to
objxfRemoteRequest.GatewayHostForRequest = GatewayName;
var strCode = "using System;....";  // Valid block of C# or VB.NET code
objxfRemoteRequest.LanguageType = RemoteCodeLanguageType.CSHARP;
objxfRemoteRequest.RemoteCodeBlock = strCode;
objxfRemoteRequestResultDto = BRApi.Utilities.ExecRemoteGatewayRequest(objxfRemoteRequest);
var xfDT = new XFDataTable(si, objxfRemoteRequestResultDto.ResultSet, null, 1000);
```

Here is the example in VB:

```
' ExecRemoteGatewayRequest for arbitrary code execution returning a DataTable
Dim GatewayName As String = ""
Dim objxfRemoteRequestResultDto As RemoteRequestResultDto
Dim objxfRemoteRequest As New RemoteCodeRequestDto
' Indication the desire is to run a remote block of code
objxfRemoteRequest.connectionType = RemoteCommandType.RemoteCodeExec
' Name of the remote host to pass to
objxfRemoteRequest.gatewayHostforRequest = GatewayName
Dim strCode As String = "using System;...." ' Valid block of C# or VB.NET code
objxfRemoteRequest.LanguageType = RemoteCodeLanguageType.CSHARP
objxfRemoteRequest.remoteCodeBlock = strCode
objxfRemoteRequestResultDto=BRApi.Utilities.ExecRemoteGatewayRequest(objxfRemoteRequest)
Dim xfDT = New XFDataTable(si, objxfRemoteRequestResultDto.ResultSet, Nothing, 1000)
```

This BR API can also be used to invoke arbitrary SQL commands against a Smart Integration Connector local gateway connection data source at your site:

```
/ ExecRemoteGatewayRequest for arbitrary SQL returning a DataTable
string SQL = ""; // SQL SELECT statement goes here
RemoteRequestResultDto objxfRemoteRequestResultDto;
RemoteRequestDto objxfRemoteRequest = new RemoteRequestDto();
// Indicate this is a remote SQL command request
objxfRemoteRequest.ConnectionType = RemoteCommandType.SQLCommand;
objxfRemoteRequest.RelayRemoteDBConnection = "";  // Name of the connection defined in the remote
endpoint
objxfRemoteRequest.GatewayHostForRequest = "";  // Name of the remote host to pass to
objxfRemoteRequest.RemoteCommand = SQL;
objxfRemoteRequestResultDto = BRApi.Utilities.ExecRemoteGatewayRequest(objxfRemoteRequest);
// Evaulate the results to determine if it was successful
if (objxfRemoteRequestResultDto.RemoteResultStatus == RemoteMessageResultType.Success)
{
    // Logic to use results in `objxfRemoteRequestResultDto.ResultSet`
}
else
{
    // Query failed. Add additional logic here to handle this case.
}
```

Here is the example in VB:

```
' ExecRemoteGatewayRequest for arbitrary SQL returning a DataTable
Dim SQL As String = "" ' SQL SELECT statement goes here
Dim objxfRemoteRequestResultDto As RemoteRequestResultDto
Dim objxfRemoteRequest As New RemoteRequestDto
' Indicate this is a remote SQL command request
objxfRemoteRequest.connectionType = RemoteCommandType.SQLCommand
objxfRemoteRequest.RelayRemoteDBConnection =  ""  ' Name of the connection defined in the remote
endpoint
objxfRemoteRequest.GatewayHostforRequest =      ""  ' Name of the remote host to pass to
objxfRemoteRequest.RemoteCommand = SQL
objxfRemoteRequestResultDto=BRApi.Utilities.ExecRemoteGatewayRequest(objxfRemoteRequest)
' Evaulate the results to determine if it was successful
If (objxfRemoteRequestResultDto.RemoteResultStatus = RemoteMessageResultType.Success) Then
    ' Logic to use results in `objxfRemoteRequestResultDto.ResultSet`
Else
    ' Query failed. Add additional logic here to handle this case.
End If
```

Remote function returning a datatable (C#) without parameters:

```
// ExecRemoteGatewayBusinessRule
var GatewayName = "";      // Name of the Gateway
var SICFunctionName = "";  // Name of the SIC Function to run
var RemoteMethodName = ""; // Name of the method inside the SIC Function that will be called
var objRemoteRequestResultDto = BRApi.Utilities.ExecRemoteGatewayBusinessRule(si, GatewayName, null,
SICFunctionName, RemoteMethodName);
if (objRemoteRequestResultDto.RemoteResultStatus == RemoteMessageResultType.Success && !
(objRemoteRequestResultDto.ResultSet is null))
{
    if (objRemoteRequestResultDto.ResultType == RemoteResultType.DataTable)
    {
        BRApi.ErrorLog.LogMessage(si, "Data Returned: " +
objRemoteRequestResultDto.ResultSet.Rows.Count);
    }
}
else
{
    if (!(objRemoteRequestResultDto.RemoteException is null))
    {
        throw ErrorHandler.LogWrite(si, new XFException(si,
objRemoteRequestResultDto.RemoteException));
    }
}
```

Here is the example in VB:

```
' ExecRemoteGatewayBusinessRule

' Call a remote Smart Integration Function
Dim GatewayName As String = ""       ' Name of the Gateway
Dim SICFunctionName As String = ""  ' Name of the SIC Function to run
Dim RemoteMethodName As String = "" ' Name of the method inside the SIC Function that will be called
Dim objRemoteRequestResultDto As RemoteRequestResultDto =
BRApi.Utilities.ExecRemoteGatewayBusinessRule(si, GatewayName, Nothing, SICFunctionName,
RemoteMethodName)
If (objRemoteRequestResultDto.RemoteResultStatus = RemoteMessageResultType.Success AndAlso
objRemoteRequestResultDto.ResultSet IsNot Nothing) Then
    If (objRemoteRequestResultDto.ResultType = RemoteResultType.DataTable) Then
        BRApi.ErrorLog.LogMessage(si, "Data Returned: " &
objRemoteRequestResultDto.ResultSet.Rows.Count)
    End If
Else
    If (Not (objRemoteRequestResultDto.RemoteException Is Nothing)) Then
        Throw ErrorHandler.LogWrite(si, New XFException(si,
objRemoteRequestResultDto.RemoteException))
    End If
End If
```

ExecRemoteGatewayCachedBusinessRule

When a cache flag and key is provided to the ExecRemoteGatewayBusinessRule BR API, this method is used to invoke a previously cached method. This is intended to be used for high-frequency remote business rules to avoid the performance impact of recompiling a remote method on each invocation.

> **NOTE:** Requires allowRemoteCodeExec = True on Smart Integration Connector local gateway. If the previously cached method is not invoked after 60 minutes, the remote cached method is purged.

Parameter details:

- *si*: SessionInfo object used to create connection objects
- *cachedFunctionKey*: Key of previously cached remote function to invoke
- *functionArguments*: Array of objects aligning to function / method parameters. Null / Nothing if there are none required
- *remoteHost*: Name of remote host to invoke operation. (Smart Integration Connector Local Gateway Name)
- *executionTimeOut*: Timeout (in seconds) on the remote job
- *Returns*: RemoteRequestResultDto - Result of execution including the status and any exceptions which may have occurred on the remote endpoint

Here is the rule in C#:

```
// ExecRemoteGatewayCachedBusinessRule

// Execute and cache a remote SIC Function for later use
var GatewayName = "";           // Name of the Gateway
var SICFunctionName = "";       // Name of the SIC Function to run
var RemoteMethodName = "";      // Name of the method inside the SIC Function that will be called
var SICCachedFunctionName = ""; // Name of the cache key for this SIC Function, which can be called
on subsequent requests
RemoteRequestResultDto objRemoteRequestResultDto = BRApi.Utilities.ExecRemoteGatewayBusinessRule(si,
SICFunctionName, null, GatewayName, RemoteMethodName, SICCachedFunctionName, false, 90);

if (objRemoteRequestResultDto.RemoteResultStatus == RemoteMessageResultType.Success
    && !(objRemoteRequestResultDto.ResultSet is null)
    && objRemoteRequestResultDto.ResultType == RemoteResultType.DataTable)
{
    BRApi.ErrorLog.LogMessage(si, "Data Returned - Rows:" +
objRemoteRequestResultDto.ResultSet.Rows.Count);
}
else
{
    if (objRemoteRequestResultDto.RemoteException != null)
    {
        throw ErrorHandler.LogWrite(si, new XFException(si,
objRemoteRequestResultDto.RemoteException));
    }
    else
    {
        BRApi.ErrorLog.LogMessage(si, "Remote Smart Integration Function Succeeded - no
data/datatable returned");
    }
}

// Subsequent invocations of the remote BR can be run by specifying the endpoint and the cached key
name
RemoteRequestResultDto objRemoteRequestResultDtoCached =
BRApi.Utilities.ExecRemoteGatewayCachedBusinessRule(si, SICCachedFunctionName , null, GatewayName,
90);
```

Here is the rule in VB.NET:

```
' ExecRemoteGatewayCachedBusinessRule

' Execute and cache a remote SIC Function for later use
Dim GatewayName As String = ""              ' Name of the Gateway
Dim SICFunctionName As String = ""          ' Name of the SIC Function to run
Dim RemoteMethodName As String = ""         ' Name of the method inside the SIC Function that will
be called
Dim SICCachedFunctionName As String = ""    ' Name of the cache key for this SIC Function, which can
be called on subsequent requests
Dim objRemoteRequestResultDto As RemoteRequestResultDto =
BRApi.Utilities.ExecRemoteGatewayBusinessRule(si, SICFunctionName, Nothing, GatewayName,
RemoteMethodName, SICCachedFunctionName, False, 90)

If (objRemoteRequestResultDto.RemoteResultStatus = RemoteMessageResultType.Success AndAlso
objRemoteRequestResultDto.ResultSet IsNot Nothing AndAlso objRemoteRequestResultDto.ResultType =
RemoteResultType.DataTable) Then
    BRApi.ErrorLog.LogMessage(si, "Data Returned - Rows:" +
objRemoteRequestResultDto.ResultSet.Rows.Count)
Else
    If (objRemoteRequestResultDto.RemoteException IsNot Nothing) Then
        Throw ErrorHandler.LogWrite(si, New XFException(si,
objRemoteRequestResultDto.RemoteException))
    Else
        BRApi.ErrorLog.LogMessage(si, "Remote Smart Integration Function Succeeded - no
data/datatable returned")
    End If
End If

' Subsequent invocations of the remote BR can be run by specifying the endpoint and the cached key
name
Dim objRemoteRequestResultDtoCached As RemoteRequestResultDto =
BRApi.Utilities.ExecRemoteGatewayCachedBusinessRule(si, SICCachedFunctionName, Nothing, GatewayName,
90)
```

ExecRemoteGatewayJob

There may be instances where a remote operation on the Smart Integration Connector Local Gateway host would need to process and assemble data that may take several minutes to run. In this situation, you could use this BR API to queue and run a remote business rule in an asynchronous manner where the remote Smart Integration Connector Local Gateway host returns a Job ID (GUID) that can later be used to obtain the job’s status or the results if the job is complete. When invoking this method, if the RemoteMessageResultStatus is returned as JobRunning (as shown in the example below), the RequestJobID is populated with the ID of the queued job that can later be used to obtain status.

> **NOTE:** Requires allowRemoteCodeExec = True on Smart Integration Connector Local Gateway. There is a defined default limit of 30 minutes for remote jobs to execute before the job is cancelled, and an overloaded version of ExecremoteGatewayJob exists allowing the timeout to be provided, but can never exceed 4 hours. This is not configurable and if this timeout is reached, the status returned shows the timeout. If the result is not obtained within five minutes after the job completes (using the GetRemoteGatewayJobStatus BR API), the remote results are purged to ensure that result objects reclaim server memory on the Smart Integration Service host.

> **NOTE:** This is required to call back into GetRemoteJobStatus with the returned ID to obtain the result:

Here is a basic overview of invoking a remote job and displaying the returned remote Job ID in C#.

```
// ExecRemoteGatewayJob basic example

var GatewayName = "";       // Name of the Gateway
var SICFunctionName = "";   // Name of the SIC Function to run
var argTest = new object[2];
argTest[0] = 100;       // Example first argument to SIC Function
argTest[1] = "test";    // Example second argument to SIC Function

// Invoking a OneStream SIC Function Business Rule as a remote job
var objRemoteRequestResultDto = BRApi.Utilities.ExecRemoteGatewayJob(si, SICFunctionName, argTest,
GatewayName, String.Empty);
if (objRemoteRequestResultDto.RemoteResultStatus == RemoteMessageResultType.JobRunning)
{
    // Logic to wait for job to complete
}
```

Here is the basic example in VB:

```
' ExecRemoteGatewayJob basic example

Dim GatewayName As String = ""       ' Name of the Gateway
Dim SICFunctionName As String = ""  ' Name of the SIC Function to run
Dim argTest(1) As Object
argTest(0) = 100        ' Example first argument to SIC Function
argTest(1) = "test"     ' Example second argument to SIC Function

' Invoking a OneStream SIC Function Business Rule as a remote job
Dim objRemoteRequestResultDto As RemoteRequestResultDto = BRApi.Utilities.ExecRemoteGatewayJob(si,
SICFunctionName, argTest, GatewayName, String.Empty)
If (objRemoteRequestResultDto.RemoteResultStatus = RemoteMessageResultType.JobRunning) Then
    ' Logic to wait for job to complete
End If
```

Here is the rule in C# to invoke a job, obtain the job ID, and 'poll' until completion:

```
// ExecRemoteGatewayJob with polling

var jobID = new Guid();
var GatewayName = "";      // Name of the Gateway
var SICFunctionName = "";  // Name of the SIC Function to run

// Invoke a long-running Job with a Smart Integration Function
var objRemoteRequestResultDto = BRApi.Utilities.ExecRemoteGatewayJob(si, GatewayName, null,
SICFunctionName, String.Empty);

// If Successful, the status is retuned indicating the job is running with the job ID. Use this ID
to interrogate if the job is compleed.
if (objRemoteRequestResultDto.RemoteResultStatus == RemoteMessageResultType.JobRunning)
```

```
{
    jobID = objRemoteRequestResultDto.RequestJobID;
    BRApi.ErrorLog.LogMessage(si, "Remote Job Queued and Running - JobID: " + jobID.ToString());
    // Example waiting 20 seconds for job to complete
    for (var loopControl = 0; loopControl < 10; loopControl++)
    {
        System.Threading.Thread.Sleep(2000);
        var objJobStatus = BRApi.Utilities.GetRemoteGatewayJobStatus(si, jobID, GatewayName);

        if (objJobStatus.RemoteJobState == RemoteJobState.Running)
        {
            BRApi.ErrorLog.LogMessage(si, "Remote Job Still running - JobID: " + jobID.ToString());
        }
        else if (objJobStatus.RemoteJobState == RemoteJobState.Completed)
        {
            // Checking the return type from the remote job
            if (!(objJobStatus.RemoteJobResult.ResultSet is null))
            {
                var xfDT = new XFDataTable(si, objJobStatus.RemoteJobResult.ResultSet, null, 1000);
                BRApi.ErrorLog.LogMessage(si, "Remote Job Completed - Datatable Returned - JobID: "
+ jobID.ToString());
                return null;
            }
            else if (!(objJobStatus.RemoteJobResult.ResultDataSet is null))
            {
                var xfDT = new XFDataTable(si, objJobStatus.RemoteJobResult.ResultDataSet.Tables[0],
null, 1000);
                BRApi.ErrorLog.LogMessage(si, "Remote Job Completed - Dataset Returned - JobID: " +
jobID.ToString());
                return null;
            }
            else if (!(objJobStatus.RemoteJobResult.ResultDataCompressed is null))
            {
                BRApi.ErrorLog.LogMessage(si, "Remote Job Completed - Object Returned - JobID: " +
jobID.ToString());
                var value = CompressionHelper.InflateJsonObject<String>(si,
objJobStatus.RemoteJobResult.ResultDataCompressed);
                BRApi.ErrorLog.LogMessage(si, value);
                return null;
            }
        }
        else if (objJobStatus.RemoteJobState == RemoteJobState.JobNotFound)
        {
            BRApi.ErrorLog.LogMessage(si, "Remote Job Not Found - JobID: " + jobID.ToString());
            return null;
        }
        else if (objJobStatus.RemoteJobState == RemoteJobState.RequestTimeOut)
        {
            BRApi.ErrorLog.LogMessage(si, "Remote Job Timed Out - JobID: " + jobID.ToString());
            return null;
        }
        else if (objRemoteRequestResultDto.RemoteResultStatus == RemoteMessageResultType.Exception)
        {
            BRApi.ErrorLog.LogMessage(si, "Exception During Execution of Job: " +
objRemoteRequestResultDto.RemoteException.ToString());
        }
    }
}
else
{
    // Exception occurred immediately during compile/initial run
    if (objRemoteRequestResultDto.RemoteResultStatus == RemoteMessageResultType.Exception)
    {
        BRApi.ErrorLog.LogMessage(si, "Exception Executing Job: " +
objRemoteRequestResultDto.RemoteException.ToString());
    }
    else
    {
        BRApi.ErrorLog.LogMessage(si, "General Job Execution Error - State: " +
objRemoteRequestResultDto.RemoteResultStatus.ToString());
    }
}

return null;
```

Here is the rule in VB.NET to invoke a job, obtain the job ID, and 'poll' until completion:

```
' ExecRemoteGatewayJob with polling

Dim jobID As Guid
Dim GatewayName As String = ""       ' Name of the Gateway
Dim SICFunctionName As String = ""   ' Name of the SIC Function to run

' Invoke a long-running Job with a Smart Integration Function
Dim objRemoteRequestResultDto As RemoteRequestResultDto = BRApi.Utilities.ExecRemoteGatewayJob(si,
GatewayName, Nothing, SICFunctionName, String.Empty)

' If Successful, the status is retuned indicating the job is running with the job ID. Use this ID to
interrogate if the job is compleed.
If (objRemoteRequestResultDto.RemoteResultStatus = RemoteMessageResultType.JobRunning) Then
    jobID = objRemoteRequestResultDto.RequestJobID
    BRApi.ErrorLog.LogMessage(si, "Remote Job Queued and Running - JobID: " & jobID.ToString())
    ' Example waiting 20 seconds for job to complete
    For loopControl = 0 To 10
        System.Threading.Thread.Sleep(2000)
        Dim objJobStatus As RemoteJobStatusResultDto = BRApi.Utilities.GetRemoteGatewayJobStatus(si,
JobID, GatewayName)

        If (objJobStatus.RemoteJobState = RemoteJobState.Running) Then
            BRApi.ErrorLog.LogMessage(si, "Remote Job Still running - JobID: " & jobID.ToString())
        Else If (objJobStatus.RemoteJobState = RemoteJobState.Completed)
            ' Checking the return type from the remote job
            If (objJobStatus.RemoteJobResult.ResultSet IsNot Nothing) Then
                Dim xfDT As XFDataTable = New XFDataTable(si,
objJobStatus.RemoteJobResult.ResultSet, Nothing, 1000)
                BRApi.ErrorLog.LogMessage(si, "Remote Job Completed - Datatable Returned - JobID: "
& jobID.ToString())
                Return Nothing
            Else If (Not objJobStatus.RemoteJobResult.ResultDataSet Is Nothing) Then
```

```
                Dim xfDT As XFDataTable = New XFDataTable
(si,objJobStatus.RemoteJobResult.ResultDataSet.Tables(0), Nothing, 1000)
                BRApi.ErrorLog.LogMessage(si, "Remote Job Completed - Dataset Returned - JobID: " &
jobID.ToString())
                Return Nothing
            Else If objJobStatus.RemoteJobResult.ResultDataCompressed IsNot Nothing Then
                BRApi.ErrorLog.LogMessage(si, "Remote Job Completed - Object Returned - JobID: " &
jobID.ToString())
                Dim value As String = CompressionHelper.InflateJsonObject(Of String)(si,
objJobStatus.RemoteJobResult.ResultDataCompressed)
                Brapi.ErrorLog.LogMessage(si, value)
                Return Nothing
            End If
        Else If (objJobStatus.RemoteJobState = RemoteJobState.JobNotFound) Then
            BRApi.ErrorLog.LogMessage(si, "Remote Job Not Found - JobID: " & jobID.ToString())
            Return Nothing
        Else If (objJobStatus.RemoteJobState = RemoteJobState.RequestTimeOut) Then
            BRApi.ErrorLog.LogMessage(si, "Remote Job Timed Out - JobID: " & jobID.ToString())
            Return Nothing
        Else If (objRemoteRequestResultDto.RemoteResultStatus = RemoteMessageResultType.Exception)
Then
            BRApi.ErrorLog.LogMessage(si, "Exception During Exeuction of Job: " &
objRemoteRequestResultDto.RemoteException.ToString())
        End If
    Next
Else
    ' Exception occurred immediately during compile/initial run
    If (objRemoteRequestResultDto.RemoteResultStatus = RemoteMessageResultType.Exception) Then
        BRApi.ErrorLog.LogMessage(si, "Exception Executing Job: " &
objRemoteRequestResultDto.RemoteException.ToString())
    Else
        BRApi.ErrorLog.LogMessage(si, "General Job Execution Error - State: " &
objRemoteRequestResultDto.RemoteResultStatus.ToString())
    End If
End If

Return Nothing
```

ExecRemoteGatewayBusinessRule

This is a core BR API that can be used to remotely invoke Smart Integration functions on a specified remote Smart Integration Connector Local Gateway host. The Smart Integration Connector Local Gateway must have allowRemoteCodeExec set to True for this BR API to invoke an operation successfully, otherwise the Smart Integration Connector Local Gateway host returns a result indicating that remote code execution is disabled.

This method takes a previously authored Smart Integration function, written in VB.NET or C#, in the OneStream application and passes it to the remote host for execution. With this BR API, it is expected that remote calls should take no more than 2-3 minutes to return a result to the caller as this BR API will block until a result is returned. If longer running or sync operations are needed, consider using the execRemoteGatewayJob BR API.

NOTE: Requires allowRemoteCodeExec = True on Smart Integration Service

Parameter details:

- *si*: SessionInfo object used to create connection objects
- *brName*: Name of the locally defined (within the OneStream Application scope) Smart Integration function
- *functionArguments*: Array of objects aligning to function / method parameters. Null / Nothing if there are none required.
- *remoteHost*: Name of remote host to invoke operation. (Smart Integration Connector name)
- *functionName*: Name of the function in the Smart Integration function to invoke. If null or empty, a function/method with the name RunOperation is expected to exist within the authored code.
- (Optional) *cachedFunctionKey*: Name used to cache the remote function to avoid recompiling the function on a subsequent call. This is optional and if missing or null the function will not be cached.

- (Optional) *forceCacheUpdate*: Option indicating if a previously cached function should be replaced with this version. When true, and an existing function is found with a name specified in the cachedFunctionKey parameter, the BR is recompiled and recached. This is useful for situations where a remote function is cached and a change was made.
- *executionTimeOut*: Timeout (in seconds) on the remote job (In 7.4, this is now an optional parameter and defaults to 90 seconds if the parameter is missing.)

Here is a C# drill-back example:

```
// ExecRemoteGatewayBusinessRule displaying results in drillback
var GatewayName = "";      // Name of the Gateway
var SICFunctionName = "";  // Name of the SIC Function to run
DrillBackResultInfo drillBackInfo = new DrillBackResultInfo();
DataTable dtf = BRApi.Utilities.ExecRemoteGatewayBusinessRule(si, SICFunctionName, null,
GatewayName, string.Empty).ResultSet;
var xfDT = new XFDataTable(si, dtf, null, 1000);
drillBackInfo.DataTable = xfDT;
drillBackInfo.DisplayType = ConnectorDrillBackDisplayTypes.DataGrid;
return drillBackInfo;
```

Here is a VB example:

```
' ExecRemoteGatewayBusinessRule displaying results in drillback
Dim GatewayName As String = ""       ' Name of the Gateway
Dim SICFunctionName As String = ""   ' Name of the SIC Function to run
Dim drillBackInfo As DrillBackResultInfo = new DrillBackResultInfo()
Dim dtf As DataTable = BRApi.Utilities.ExecRemoteGatewayBusinessRule(si, SICFunctionName, Nothing,
GatewayName, String.Empty).ResultSet
Dim xfDT As XFDataTable = new XFDataTable(si, dtf, Nothing, 1000)
drillBackInfo.DataTable = xfDT
drillBackInfo.DisplayType = ConnectorDrillBackDisplayTypes.DataGrid
Return drillBackInfo
```

Here is a C# drill-back example that invokes a remote business rule accepting 2 parameters:

```
// ExecRemoteGatewayBusinessRule Drillback example
var GatewayName = "";      // Name of the Gateway
var SICFunctionName = "";  // Name of the SIC Function to run
var RemoteMethodName = ""; // Name of the method inside the SIC Function that will be called.
var drillBackInfo = new DrillBackResultInfo();
object[] argTest = new object[2];     // Creating an object array to package the method parameters
argTest[0] = 12;                   // First parameter is an integer
argTest[1] = "test";               // Second parameter is a string

// Remote Smart Integration Function Signature: ' Public Shared Function  RunOperation2(testval As
Integer, teststr As String) As ArrayList
// Invoking method RunOperation2 on endpoint testConnection passing in user defined parameters as an
array

var objRemoteRequestResultDto = BRApi.Utilities.ExecRemoteGatewayBusinessRule(si, SICFunctionName,
argTest, GatewayName, RemoteMethodName);

if (objRemoteRequestResultDto.RemoteResultStatus ==
RemoteMessageResultType.RunOperationReturnObject)
{
    var returnVal = objRemoteRequestResultDto.ObjectResultValue as ArrayList;
    // Simple demonstration without error checking to look at the first element of the arraylist
    drillBackInfo.TextMessage = "Completed! " + returnVal[0].ToString();
    drillBackInfo.DisplayType = ConnectorDrillBackDisplayTypes.TextMessage;
    return drillBackInfo;
}
else if (objRemoteRequestResultDto.RemoteResultStatus == RemoteMessageResultType.Success)
{
    // Demonstrating a 'pattern' whereby the caller can verify what the type is that's returned and
handle properly.
    var xfDT = new XFDataTable(si, objRemoteRequestResultDto.ResultSet, null, 1000);
    drillBackInfo.DataTable = xfDT;
    drillBackInfo.DisplayType = ConnectorDrillBackDisplayTypes.DataGrid;
    return drillBackInfo;
}
else if (!(objRemoteRequestResultDto.RemoteException is null))
{
    throw ErrorHandler.LogWrite(si, new XFException(si, objRemoteRequestResultDto.RemoteException));
}
```

Here is a VB.NET drill-back example that invokes a remote business rule accepting 2 parameters:

```
' ExecRemoteGatewayBusinessRule Drillback example
Dim GatewayName As String = ""       ' Name of the Gateway
Dim SICFunctionName As String = ""   ' Name of the SIC Function to run
Dim RemoteMethodName As String = "" ' Name of the method inside the SIC Function that will be
called.
Dim drillBackInfo As New DrillBackResultInfo
Dim argTest(1) As Object     ' Creating an object array to package the method parameters
argTest(0) = 12              ' First parameter is an integer
argTest(1) = "test"          ' Second parameter is a string

' Remote Smart Integration Function Signature: ' Public Shared Function  RunOperation2(testval As
Integer, teststr As String) As ArrayList
```

```
' Invoking method RunOperation2 on endpoint testConnection passing in user defined parameters as an
array

Dim objRemoteRequestResultDto As RemoteRequestResultDto =
BRApi.Utilities.ExecRemoteGatewayBusinessRule(si, SICFunctionName, argTest, GatewayName,
RemoteMethodName)

If (objRemoteRequestResultDto.RemoteResultStatus = RemoteMessageResultType.RunOperationReturnObject)
Then
    Dim returnVal As ArrayList = objRemoteRequestResultDto.ObjectResultValue
    'Simple demonstration without error checking to look at the first element of the arraylist
    drillBackInfo.TextMessage = "Completed! " & returnVal(0).ToString()
    drillBackInfo.DisplayType = ConnectorDrillBackDisplayTypes.TextMessage
    Return drillBackInfo
Else If (objRemoteRequestResultDto.RemoteResultStatus = RemoteMessageResultType.Success)
    ' Demonstrating a 'pattern' whereby the caller can verify what the type is that's returned and
handle properly.
    Dim xfDT = New XFDataTable(si, objRemoteRequestResultDto.ResultSet, Nothing, 1000)
    drillBackInfo.DataTable = xfDT
    drillBackInfo.DisplayType = ConnectorDrillBackDisplayTypes.DataGrid
    Return drillBackInfo
Else If (Not (objRemoteRequestResultDto.remoteException Is Nothing))
    Throw ErrorHandler.LogWrite(si, New XFException(si, objRemoteRequestResultDto.RemoteException))
End If
```

Below is a TestFileRead Remote Business Rule function in C# Referenced by Examples Below.

Here it is in C#:

```
using System;
using System.Collections.Generic;
using System.Data;
using System.Data.Common;
using System.Globalization;
using System.IO;
using System.Linq;

namespace OneStream.BusinessRule.SmartIntegrationFunction.TestFileRead
{
    public class MainClass
    {
        public byte[] RunOperation(string year)
        {
            string fname = @"c:\temp\hw_" + year + ".csv";
            byte[] buffer = System.IO.File.ReadAllBytes(fname);
            return buffer;
        }
        public byte[] GetOtherFileData(string year)
        {
            string fname = @"c:\temp\zw_" + year + ".csv";
            byte[] buffer = System.IO.File.ReadAllBytes(fname);
            return buffer;
        }

        public bool DeleteOldFileData(string year)
        {
            string fname = @"c:\temp\zw_" + year + ".csv";
            try
            {
                System.IO.File.Delete(fname);
                return true;
            }
            catch (IOException ex)
            {
                return false;
            }
        }
    }
}
```

Here it is in VB:

```
Imports System
Imports System.Collections.Generic
Imports System.Data
Imports System.Data.Common
Imports System.Globalization
Imports System.IO
Imports System.Linq

Namespace OneStream.BusinessRule.SmartIntegrationFunction.TestFileRead
    Public Class MainClass
        Public Function RunOperation(ByVal year As String) As Byte()
            Dim fname As String = "c:\temp\hw_" & year & ".csv"
            Dim buffer As Byte() = System.IO.File.ReadAllBytes(fname)
            Return buffer
        End Function

        Public Function GetOtherFileData(ByVal year As String) As Byte()
            Dim fname As String = "c:\temp\zw_" & year & ".csv"
            Dim buffer As Byte() = System.IO.File.ReadAllBytes(fname)
            Return buffer
        End Function

        Public Function DeleteOldFileData(ByVal year As String) As Boolean
            Dim fname As String = "c:\temp\zw_" & year & ".csv"

            Try
```

```
                System.IO.File.Delete(fname)
                Return True
            Catch ex As IOException
                Return False
            End Try
        End Function
    End Class
End Namespace
```

Below is a remote business rule that queries a database and returns a datatable.

Here is the rule in C#:

```
// SIC Function referenced by other examples here
namespace OneStream.BusinessRule.SmartIntegrationFunction.GetDataFromDB
{
    public class MainClass
    {
        private const string DataSourceName = "";
        public DataTable RunOperation()
        {
            DataTable dataTableResults = new DataTable();
            string connectionString, sql;

            connectionString = OneStreamGatewayService.APILibrary.GetRemoteDataSourceConnection
(DataSourceName);

            SqlConnection conn;
            conn = new SqlConnection(connectionStringconn.Open());
            sql = ""; // Enter SQL Query here
            SqlCommand cmd = new SqlCommand(sql, conn);
            var dbreader = cmd.ExecuteReader();
            dataTableResults.Load(dbreader);
            return dataTableResults;
        }
    }
}
```

Here is the rule in VB:

```
' SIC Function referenced by other examples here
Namespace OneStream.BusinessRule.SmartIntegrationFunction.GetDataFromDB
    Public Class MainClass
        Private Const DataSourceName As String = ""

        Public Function RunOperation() As DataTable
            Dim dataTableResults As DataTable = New DataTable()
            Dim connectionString, sql As String
            connectionString = APILibrary.GetRemoteDataSourceConnection(DataSourceName)
            Dim conn As SqlConnection
            conn = New SqlConnection(connectionStringconn.Open())
            sql = "" ' Enter SQL Query here
            Dim cmd As SqlCommand = New SqlCommand(sql, conn)
            Dim dbreader = cmd.ExecuteReader()
            dataTableResults.Load(dbreader)
            Return dataTableResults
        End Function
    End Class
End Namespace
```

Here is an example of calling a TestFileRead remote business rule in C#.

```
// Here we are telling it to specifically call a remote Smart Integration Function called
TestFileRead at SIC Gateway
// called TestConnection with a method called DeleteOldFileData
var GatewayName = "";      // Name of the Gateway
var SICFunctionName = "TestFileRead";  // Name of the SIC Function from above example
var RemoteMethodName = "DeleteOldFileData"; // Name of the method inside the SIC Function that will
be called.
RemoteRequestResultDto objRemoteRequestResultDto = BRApi.Utilities.ExecRemoteGatewayBusinessRule(si,
SICFunctionName, new object[] {"2024"}, GatewayName, RemoteMethodName);

if (objRemoteRequestResultDto.RemoteResultStatus == RemoteMessageResultType.RunOperationReturnObject
&& !(objRemoteRequestResultDto.ObjectResultValue is null))
{
    bool result;
    if (bool.TryParse(objRemoteRequestResultDto.ObjectResultValue.ToString(), out result))
    {
        BRApi.ErrorLog.LogMessage(si, "File Deleted: " + result.ToString());
    }
    else
    {
        BRApi.ErrorLog.LogMessage(si, "Returned a non-boolean value");
    }
}
else
{
    if (objRemoteRequestResultDto.RemoteException != null)
    {
        throw ErrorHandler.LogWrite(si, new XFException(si,
objRemoteRequestResultDto.RemoteException));
    }

}

return null;
```

Here is an example of calling a TestFileRead remote business rule in VB.NET.

```
'Here we are telling it to specifically call a remote Smart Integration Function called TestFileRead
at SIC Gateway
'called TestConnection with a method called DeleteOldFileData
Dim GatewayName As String = ""                       ' Name of the Gateway
Dim SICFunctionName As String = "TestFileRead"       ' Name of the SIC Function from above example
Dim RemoteMethodName As String = "DeleteOldFileData"  ' Name of the method inside the SIC Function
that will be called.
Dim argTest(0) As Object   ' Creating an object array to package the method parameters
argTest(0) = "2024"        ' First parameter is an integer

Dim objRemoteRequestResultDto As RemoteRequestResultDto =
BRApi.Utilities.ExecRemoteGatewayBusinessRule(si, SICFunctionName, argTest, GatewayName,
RemoteMethodName)
If (objRemoteRequestResultDto.RemoteResultStatus = RemoteMessageResultType.RunOperationReturnObject)
Then
    'The delete method returns a true/false return type
    Dim result As Boolean
    'ObjectResultValue introduced in v7.4 to simplify obtaining the return
    'value from a method that doesn't return a Dataset/Datatable
    result = objRemoteRequestResultDto.ObjectResultValue
    BRApi.ErrorLog.LogMessage(si, "File Deleted: " & result)
Else
    If (Not (objRemoteRequestResultDto.remoteException Is Nothing)) Then
        Throw ErrorHandler.LogWrite(si, New XFException(si,
objRemoteRequestResultDto.remoteException))
    End If
End if
```

Here's an example to call the remote BR called "GetDataFromDB" (C#):

```
// Here we are telling it to specifically call a remote Smart Integration Function called
GetDataFromDB at SIC Gateway called TestConnection with a method called RunOperation
var GatewayName = "";                   // Name of the Gateway
var SICFunctionName = "GetDataFromDB";  // Name of the SIC Function from above example
var RemoteMethodName = "RunOperation";  // Name of the method inside the SIC Function that will be
called.
var objRemoteRequestResultDto = BRApi.Utilities.ExecRemoteGatewayBusinessRule(si, SICFunctionName,
null, GatewayName, RemoteMethodName);

if (objRemoteRequestResultDto.RemoteResultStatus == RemoteMessageResultType.Success
    && objRemoteRequestResultDto.ResultSet != null
    && objRemoteRequestResultDto.ResultType == RemoteResultType.DataTable)
{
    BRApi.ErrorLog.LogMessage(si, "Data Returned - Rows:" +
objRemoteRequestResultDto.ResultSet.Rows.Count);
}
else
{
    if (objRemoteRequestResultDto.RemoteException != null)
    {
        throw ErrorHandler.LogWrite(si, new XFException(si,
objRemoteRequestResultDto.RemoteException));
```

```
    }
    else
    {
        BRApi.ErrorLog.LogMessage(si, "Remote Smart Integration Function Succeeded - no
data/datatable returned");
    }
}
```

Here's an example to call the remote BR called "GetDataFromDB" (VB):

```
' Here we are telling it to specifically call a remote Smart Integration Function called
GetDataFromDB at SIC Gateway called TestConnection with a method called RunOperation
Dim GatewayName As String = ""                               ' Name of the Gateway
Dim SICFunctionName As String = "GetDataFromDB"          ' Name of the SIC Function from above
example
Dim RemoteMethodName As String = "RunOperation"    ' Name of the method inside the SIC Function that
will be called.
Dim objRemoteRequestResultDto = BRApi.Utilities.ExecRemoteGatewayBusinessRule(si, SICFunctionName,
Nothing, GatewayName, RemoteMethodName)

If objRemoteRequestResultDto.RemoteResultStatus = RemoteMessageResultType.Success AndAlso
objRemoteRequestResultDto.ResultSet IsNot Nothing AndAlso objRemoteRequestResultDto.ResultType =
RemoteResultType.DataTable Then
    BRApi.ErrorLog.LogMessage(si, "Data Returned - Rows:" &
objRemoteRequestResultDto.ResultSet.Rows.Count)
Else
    If objRemoteRequestResultDto.RemoteException IsNot Nothing Then
        Throw ErrorHandler.LogWrite(si, New XFException(si,
objRemoteRequestResultDto.RemoteException))
    Else
        BRApi.ErrorLog.LogMessage(si, "Remote Smart Integration Function Succeeded - no
data/datatable returned")
    End If
End If
```

GetRemoteDataSourceConnection

This remote business rule will return the connection string associated with a Local Gateway Configuration Data Source.

> **NOTE:** Requires allowRemoteCodeExec = True on Smart Integration Local Gateway.

Parameter details:

- *Data Source*: The name of the Local Gateway Configuration Data Source.

Here is the rule in C#:

```
// SIC Function to get configured connection string from SIC Gateway
namespace OneStream.BusinessRule.SmartIntegrationFunction.GetRemoteDataSourceSample
{
    public class MainClass
    {
        public DataTable RunOperation()
        {
            DataTable dataTableResults = new DataTable();
             // Get the remotely defined connection string
            string connectionString =
OneStreamGatewayService.APILibrary.GetRemoteDataSourceConnection(""); // enter name of DB Connection
            SqlConnection conn = new SqlConnection(connectionString);
            // Insert custom code
            return dataTableResults;
        }
    }
}
```

Here is the rule in VB.NET :

```
' SIC Function to get configured connection string from SIC Gateway
Namespace OneStream.BusinessRule.SmartIntegrationFunction.GetRemoteDataSource_VB
    Public Class MainClass
        Public Shared Function RunOperation() As DataTable
            Dim dataTableResults As New DataTable
            ' Get the remotely defined connection String
            Dim connectionString As String  =
OneStreamGatewayService.APILibrary.GetRemoteDataSourceConnection("") ' enter name of DB Connection
            Dim conn As SqlConnection = New SqlConnection(connectionString)
            ' Insert custom code

            Return dataTableResults
        End Function
    End Class
End Namespace
```

GetRemoteGatewayJobStatus

This BR API returns the status or the results of a previously remotely queued job invoked against a specified Smart Integration Connector Local Gateway host.

NOTE: Requires allowRemoteCodeExec = true on Smart Integration Service.

Parameter details:

- *si*: SessionInfo object used to create connection objects
- *JobID*: GUID of remote job ID returned upon successful call to ExecRemoteGatewayJob
- *remoteHost*: Name of remote host to invoke operation (Smart Integration Connector Name)

The sample below invokes a job as part of a data management job inside a OneStream extender rule. The example demonstrates a simple Smart Integration Function that sleeps 2 seconds 1000 times in a loop simulating a long running task. The corresponding extender rule illustrates how this long running function can be invoked as a job, returning a job ID and subsequently polled until it's completed.

It would be typical to invoke long running jobs as part of a Data management/Extender Rule and the code below is an example on how this could be accomplished in C#:

```
[6:53 PM] Connor Shields
// Invoke long running job as part of a Data management/Extender rule
public object Main(SessionInfo si, BRGlobals globals, object api, ExtenderArgs args)
{
    Guid jobID;
    RemoteRequestResultDto objRemoteRequestResultDto = BRApi.Utilities.ExecRemoteGatewayJob(si,
"LongRunningTest", null/* TODO Change to default(_) if this is not a reference type */,
"testConnection", string.Empty);

    if ((objRemoteRequestResultDto.RemoteResultStatus == RemoteMessageResultType.JobRunning))
    {
        jobID = objRemoteRequestResultDto.RequestJobID;
        BRApi.ErrorLog.LogMessage(si, "Remote Job Queued and Running - JobID: " + jobID.ToString());

        for (var loopControl = 0; loopControl <= 10; loopControl++)
        {
            System.Threading.Thread.Sleep(2000);
            RemoteJobStatusResultDto objJobStatus = BRApi.Utilities.GetRemoteGatewayJobStatus(si,
jobID, "testconnection2");
            if ((objJobStatus.RemoteJobState == RemoteJobState.Running))
```

```
                BRApi.ErrorLog.LogMessage(si, "Remote Job Still running - JobID: " + jobID.ToString
());
            else if ((objJobStatus.RemoteJobState == RemoteJobState.Completed)
             )
            {
                // Checking the return type from the remote job
                if (!(objJobStatus.RemoteJobResult.ResultSet == null))
                {
                    var xfDT = new XFDataTable(si, objJobStatus.RemoteJobResult.ResultSet, null,
1000);
                    BRApi.ErrorLog.LogMessage(si, "Remote Job Completed - Datatable Returned -
JobID: " + jobID.ToString());
                    return null;
                }
                else if (!(objJobStatus.RemoteJobResult.ResultDataSet == null))
                {
                    var xfDT = new XFDataTable(si, objJobStatus.RemoteJobResult.ResultDataSet.Tables
[0], null, 1000);
                    BRApi.ErrorLog.LogMessage(si, "Remote Job Completed - Dataset Returned - JobID:
" + jobID.ToString());
                }
                else if (!(objJobStatus.RemoteJobResult.ObjectResultValue == null))
                {
                    BRApi.ErrorLog.LogMessage(si, "Remote Job Completed - Object Returned - JobID: "
+ jobID.ToString());
                    return null;
                }
            }
            else if ((objJobStatus.RemoteJobState == RemoteJobState.JobNotFound))
            {
                BRApi.ErrorLog.LogMessage(si, "Remote Job Not Found - JobID: " + jobID.ToString());
                return null;
            }
            else if ((objJobStatus.RemoteJobState == RemoteJobState.RequestTimeOut))
            {
                BRApi.ErrorLog.LogMessage(si, "Remote Job Timed Out - JobID: " + jobID.ToString());
                return null;
            }
            else if ((objRemoteRequestResultDto.RemoteResultStatus ==
RemoteMessageResultType.Exception))
                BRApi.ErrorLog.LogMessage(si, "Exception During Exeuction of Job: " +
objRemoteRequestResultDto.RemoteException.ToString());
        }
    }
    else if ((objRemoteRequestResultDto.RemoteResultStatus == RemoteMessageResultType.Exception))
        BRApi.ErrorLog.LogMessage(si, "Exception Executing Job: " +
objRemoteRequestResultDto.RemoteException.ToString());
    else
        BRApi.ErrorLog.LogMessage(si, "General Job Execution Error - State: " +
objRemoteRequestResultDto.RemoteResultStatus.ToString());
    return null;
}
```

Here is the example in VB:

```
' Invoke long running job as part of a Data management/Extender rule
Public Function Main(ByVal si As SessionInfo, ByVal globals As BRGlobals, ByVal api As Object, ByVal
args As ExtenderArgs) As Object
    Dim jobID As Guid
    Dim objRemoteRequestResultDto As RemoteRequestResultDto = BRApi.Utilities.ExecRemoteGatewayJob
(si, "LongRunningTest", Nothing, "testConnection",String.Empty)

    If (objRemoteRequestResultDto.RemoteResultStatus = RemoteMessageResultType.JobRunning) Then
        jobID = objRemoteRequestResultDto.RequestJobID
        BRApi.ErrorLog.LogMessage(si, "Remote Job Queued and Running - JobID: " & jobID.ToString())
        'Example waiting 20 seconds for job to complete
        For loopControl = 0 To 10
            System.Threading.Thread.Sleep(2000)
            Dim objJobStatus As RemoteJobStatusResultDto = BRApi.Utilities.GetRemoteGatewayJobStatus
(si, JobID, "testconnection2")
            If (objJobStatus.RemoteJobState = RemoteJobState.Running)
                BRApi.ErrorLog.LogMessage(si, "Remote Job Still running - JobID: " & jobID.ToString
())
            Else If (objJobStatus.RemoteJobState = RemoteJobState.Completed)
                ' Checking the return type from the remote job
                If (Not objJobStatus.RemoteJobResult.ResultSet Is Nothing) Then
                    Dim xfDT = New XFDataTable
(si,objJobStatus.RemoteJobResult.ResultSet,Nothing,1000)
                    BRApi.ErrorLog.LogMessage(si, "Remote Job Completed - Datatable Returned -
JobID: " & jobID.ToString())
                    Return Nothing
                Else If (Not objJobStatus.RemoteJobResult.ResultDataSet Is Nothing) Then
                    Dim xfDT = New XFDataTable(si,objJobStatus.RemoteJobResult.ResultDataSet.Tables
(0),Nothing,1000)
                    BRApi.ErrorLog.LogMessage(si, "Remote Job Completed - Dataset Returned - JobID:
" & jobID.ToString())
                    Return Nothing
                Else If (Not objJobStatus.RemoteJobResult.ObjectResultValue Is Nothing) Then
                    BRApi.ErrorLog.LogMessage(si, "Remote Job Completed - Object Returned - JobID: "
& jobID.ToString())
                    Return Nothing
                End If
            Else If (objJobStatus.RemoteJobState = RemoteJobState.JobNotFound)
                BRApi.ErrorLog.LogMessage(si, "Remote Job Not Found - JobID: " & jobID.ToString())
                Return Nothing
            Else If (objJobStatus.RemoteJobState = RemoteJobState.RequestTimeOut)
                BRApi.ErrorLog.LogMessage(si, "Remote Job Timed Out - JobID: " & jobID.ToString())
                Return Nothing
            Else If (objRemoteRequestResultDto.RemoteResultStatus =
RemoteMessageResultType.Exception)
                BRApi.ErrorLog.LogMessage(si, "Exception During Exeuction of Job: " &
objRemoteRequestResultDto.RemoteException.ToString())
            End If
        Next
    Else ' Exception occuring immediately during compile/initial run
        If (objRemoteRequestResultDto.RemoteResultStatus = RemoteMessageResultType.Exception)
            BRApi.ErrorLog.LogMessage(si, "Exception Executing Job: " &
objRemoteRequestResultDto.RemoteException.ToString())
        Else
            BRApi.ErrorLog.LogMessage(si, "General Job Execution Error - State: " &
objRemoteRequestResultDto.RemoteResultStatus.ToString())
        End If
    End If
    Return Nothing
End Function
```

GetSmartIntegrationConfigValue

This BR API allows access to the Local Gateway Local Application Data Settings. Accessing the remotely stored secret or customer-defined configuration values is done using a new "Remote" equivalent of the BR API namespace. This feature can be used to:

- Reference configuration parameters in a remote business rule running on a Smart Integration Connector Local Gateway Server
- Store credentials to network resources allowing the developer of remote business rules to reference values stored in the configuration file instead of having them hard-coded and viewable by anyone with permission to edit a business rule.

These configuration values are defined and edited using the Smart Integration Connector Local Gateway Configuration Utility. The API used to obtain these values is demonstrated in the full business rule example below:

> **NOTE:** Requires allowRemoteCodeExec = True on Smart Integration Local Gateway.

Here is the rule in C#:

```
// SIC Function demonstrating GetSmartIntegrationConfigValue
namespace TestProject.OneStream.BusinessRule.SmartIntegrationFunction.SecretTester
{
    public class MainClass
    {
        public static @bool RunOperation()
        {
            string result;
            // APILibrary is the class containing new remote BRAPI methods
            // GetSmartIntegrationConfigValue returns the string value of a found configuration
            // element -- returns empty string if the specified key is not found
            result = APILibrary.GetSmartIntegrationConfigValue(""); //Enter config value name
            return true;
        }
    }
}
```

Here is another example in VB.NET:

```
' SIC Function demonstrating GetSmartIntegrationConfigValue

Namespace OneStream.BusinessRule.SmartIntegrationFunction.SecretTester

Public Class MainClass
   Public Shared Function RunOperation() as bool
         Dim result As String
          ' APILibrary is the class containing new remote BRAPI methods
          ' GetSmartIntegrationConfigValue returns the string value of a found configuration
          ' element -- returns empty string if the specified key is not found
       result = APILibrary.GetSmartIntegrationConfigValue("") ' Enter config value name
       Return True
   End Function
 End Class
End NameSpace
```

GetGatewayConnectionInfo

From a OneStream business rule, you can invoke this API to obtain gateway details such as:

- GatewayName: Name of the remote gateway
- GatewayVersion: Version of the Smart Integration Connector Gateway Service running on the remote host
- RemoteGatewayPortNumber: Bound Port at Gateway, the port of the remote service this direct connection is associated with.

- RemoteGatewayHost: Name of the remote host associated with the direct connection.
- OneStreamPortNumber: Bound Port in OneStream, the port number defined within OneStream that refers/maps to the specified direct connection.
- SmartIntegrationGatewayType: Type of the Smart Integration Connection (0=Database Connection, 1=Direct Connection)

This API is useful for direct connections where the port number is required before connecting to remote services such as sFTP or remote Web APIs because each endpoint defined in OneStream to Smart Integration Connector Local Gateways has a different port number and would need to be known by the business rule developer at design time. This API makes it easy to look up the remote port by knowing the name of the direct connection defined in OneStream. It returns other useful information outlined below:

Here is the rule in C#:

```
// GetGatewayConnectionInfo
var GatewayName = "" //Name of the Gateway
GatewayDetails gatewayDetailInformation = BRApi.Utilities.GetGatewayConnectionInfo(si, GatewayName);
int oneStreamPortNumber = gatewayDetailInformation.OneStreamPortNumber;
```

Here is the rule in VB:

```
' GetGatewayConnectionInfo
Dim GatewayName As String = "" ' Name of the Gateway
Dim objGatewayDetails As GatewayDetails = BRApi.Utilities.GetGatewayConnectionInfo(si, GatewayName)
Dim oneStreamPortNumber As Integer = objGatewayDetails.OneStreamPortNumber
```

BRApi.Utilities.IsGatewayOnline

The following business rule can check the status of Smart Integration Connector. You will need to replace "gateway-name" with the name of the gateway to be tested.

Here is the rule in C#:

```
// IsGatewayOnline

namespace OneStream.BusinessRule.Extender.TestHealthCheck
{
    public class MainClass
    {
        public const string GatewayName = "";

        public object Main(SessionInfo si, BRGlobals globals, object api, ExtenderArgs args)
        {
            try
            {
                TestGatewayConnection(si, GatewayName);
                return null;
            }
            catch (Exception ex)
            {
                throw ErrorHandler.LogWrite(si, new XFException(si, ex));
            }
        }

        public void TestGatewayConnection(SessionInfo si, string gwName)
        {
            bool response = BRApi.Utilities.IsGatewayOnline(gwName);

            if (response)
            {
                BRApi.ErrorLog.LogMessage(si, $"Health Check Successful for {gwName}");
            }
            else
            {
                BRApi.ErrorLog.LogMessage(si, $"Health Check Failed for {gwName}");
            }
        }
    }
}
```

Here is the rule in VB:

```
Namespace OneStream.BusinessRule.Extender.TestHealthCheck
```

```
    Public Class MainClass
        Public Const GatewayName As String = ""

        Public Function Main(ByVal si As SessionInfo, ByVal globals As BRGlobals, ByVal api
As Object, ByVal args As ExtenderArgs) As Object
            Try
                TestGatewayConnection(si, GatewayName)
                Return Nothing
            Catch ex As Exception
                Throw ErrorHandler.LogWrite(si, New XFException(si, ex))
            End Try
        End Function

        Public Sub TestGatewayConnection(ByVal si As SessionInfo, ByVal gwName As String)
            Dim response As Boolean = BRApi.Utilities.IsGatewayOnline(gwName)

            If response Then
                BRApi.ErrorLog.LogMessage(si, $"Health Check Successful for {gwName}")
            Else
                BRApi.ErrorLog.LogMessage(si, $"Health Check Failed for {gwName}")
            End If
        End Sub
    End Class
End Namespace
```

Business Rules Compatibility

There are some business rules that are not compatible with Smart Integration Connector. If you attempt certain rules, you will run into the following error: This BR API is not compatible with Smart Integration Connector. Refer to Smart Integration Connector Remote BRs.

The following business rules are not compatible with Smart Integration Connector:

BRApi.Database.SaveCustomDataTable

Although, this business rule is not supported, the functionality can be achieved through a remote business rule. You can call this business rule using BRApi.Utilities.ExecRemoteGatewayBusinessRule.

Here is the rule in C#:

```
using System;
using System.Collections.Generic;
using System.Data;
using System.Data.SqlClient;
using System.Data.Common;
using System.Globalization;
using System.IO;
using System.Linq;

namespace OneStream.BusinessRule.SmartIntegrationFunction.SaveCustomDataTable
{
    public class MainClass
    {
        public void RunOperation()
        {
            var tableName = "";         // Enter the name of the table to update
            var connectionName = "";     // Enter the name of the configured database connection
            var connString = OneStreamGatewayService.APILibrary.GetRemoteDataSourceConnection
(connectionName);
            var dataTable = new DataTable();
            using (var connection = new SqlConnection(connString))
            {
                connection.Open();
                var sql = $"SELECT * FROM {tableName}";
                var cmd = new SqlCommand(sql, connection);
                var adapter = new SqlDataAdapter();
                adapter.SelectCommand = cmd;
                var commandBuilder = new SqlCommandBuilder(adapter);
                adapter.Fill(dataTable);
                // Add logic here to update values in DataTable
                // Update database with changes to the DataTable
                adapter.UpdateCommand = commandBuilder.GetUpdateCommand();
                adapter.Update(dataTable);
            }
        }
    }
}
```

Here is the same rule VB:

```
Imports System
Imports System.Collections.Generic
Imports System.Data
Imports System.Data.Common
Imports System.Globalization
Imports System.IO
Imports System.Linq
Namespace OneStream.BusinessRule.SmartIntegrationFunction.SaveCustomDataTableVB
    Public Class MainClass
        Public Sub RunOperation()
            Dim tableName = ""            ' Enter the name of the table to update
            Dim connectionName = ""        ' Enter the name of the configured database connection
            Dim connString = OneStreamGatewayService.APILibrary.GetRemoteDataSourceConnection
(connectionName)
            Dim dataTable = New DataTable()
            Using connection = New SqlConnection(connString)
                connection.Open()
                Dim sql = $"SELECT * FROM {tableName}"
                Dim cmd = New SqlCommand(sql, connection)
                Dim adapter = New SqlDataAdapter()
                adapter.SelectCommand = cmd
                Dim commandBuilder = New SqlCommandBuilder(adapter)
                adapter.Fill(dataTable)
                ' Add logic here to update values in DataTable
                ' Update database with changes to the DataTable
                adapter.UpdateCommand = commandBuilder.GetUpdateCommand()
                adapter.Update(dataTable)
            End Using
        End Sub
    End Class
End Namespace
```

BRApi.DatabaseInsertOrUpdateRow

Although, this business rule is not supported, inserting and updating rows can be accomplished through the same remote business rule referenced above. You can call this business rule using BRApi.Utilities.ExecRemoteGatewayBusinessRule. You will insert your logic at the specific comment in the remote business rule.

SQL Bulk Copy

Use of the SQL Bulk Copy class is not supported to copy to and from databases accessed over Smart Integration Connector. Currently, there is not a workaround available.

Troubleshooting

This section provides help on addressing errors in Smart Integration Connector.

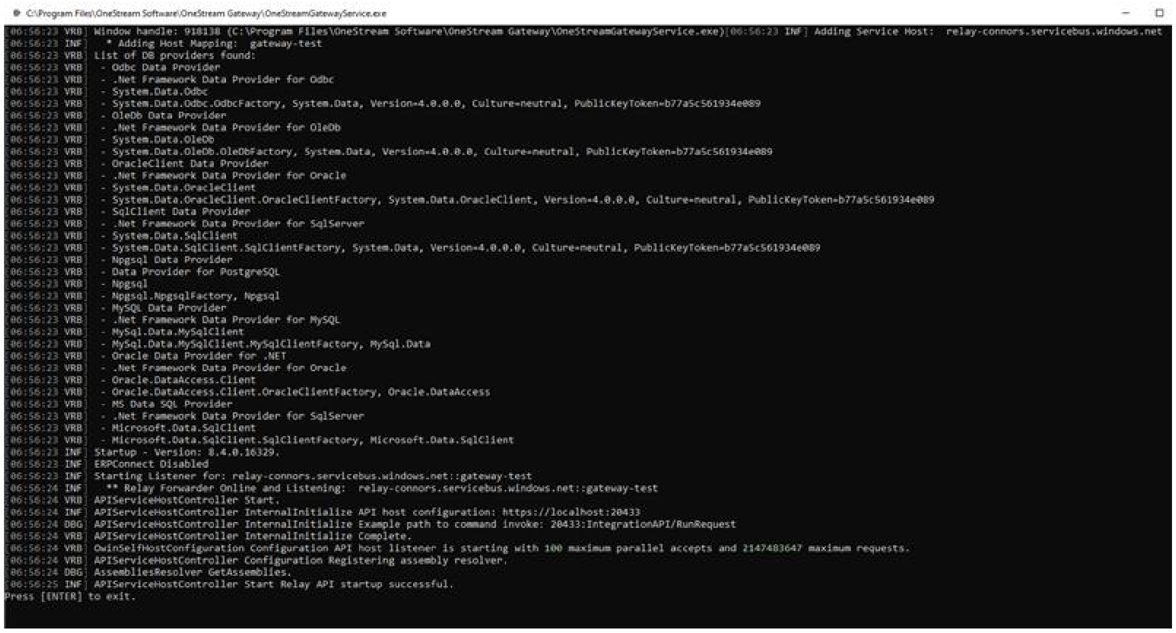
Gateway Testing Issue Resolution

If your connection testing is failing, refer to the steps below to fully test the connection.

1. You can test the gateway by double-clicking the *OneStreamGatewayService.exe* file located in the installation folder.

   > **NOTE:** The Smart Integration Connector Gateway Windows Service must be in a stopped state to run in the console for test purposes.

   The following command window is displayed:



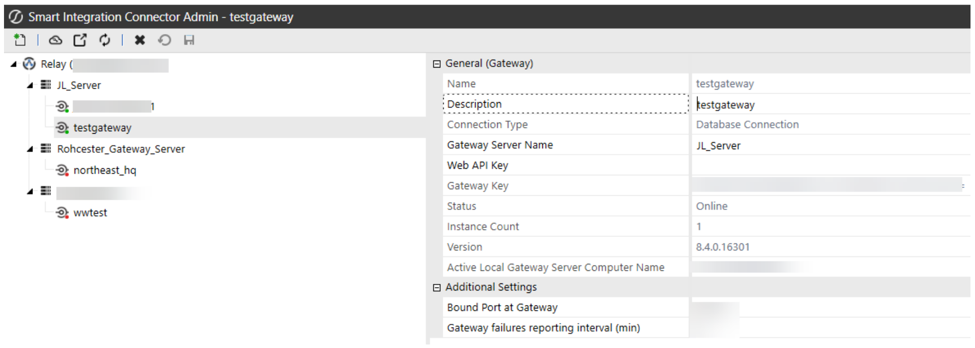
```
C:\Program Files\OneStream Software\OneStream Gateway\OneStreamGatewayService.exe
[06:56:23 VRB] Window handle: 918138 (C:\Program Files\OneStream Software\OneStream Gateway\OneStreamGatewayService.exe)[06:56:23 INF] Adding Service Host:  relay-connors.servicebus.windows.net
[06:56:23 INF]   * Adding Host Mapping:  gateway-test
[06:56:23 VRB] List of DB providers found:
[06:56:23 VRB]  - Odbc Data Provider
[06:56:23 VRB]  - .Net Framework Data Provider for Odbc
[06:56:23 VRB]  - System.Data.Odbc
[06:56:23 VRB]  - System.Data.Odbc.OdbcFactory, System.Data, Version=4.0.0.0, Culture=neutral, PublicKeyToken=b77a5c561934e089
[06:56:23 VRB]  - OleDb Data Provider
[06:56:23 VRB]  - .Net Framework Data Provider for OleDb
[06:56:23 VRB]  - System.Data.OleDb
[06:56:23 VRB]  - System.Data.OleDb.OleDbFactory, System.Data, Version=4.0.0.0, Culture=neutral, PublicKeyToken=b77a5c561934e089
[06:56:23 VRB]  - OracleClient Data Provider
[06:56:23 VRB]  - .Net Framework Data Provider for Oracle
[06:56:23 VRB]  - System.Data.OracleClient
[06:56:23 VRB]  - System.Data.OracleClient.OracleClientFactory, System.Data.OracleClient, Version=4.0.0.0, Culture=neutral, PublicKeyToken=b77a5c561934e089
[06:56:23 VRB]  - SqlClient Data Provider
[06:56:23 VRB]  - .Net Framework Data Provider for SqlServer
[06:56:23 VRB]  - System.Data.SqlClient
[06:56:23 VRB]  - System.Data.SqlClient.SqlClientFactory, System.Data, Version=4.0.0.0, Culture=neutral, PublicKeyToken=b77a5c561934e089
[06:56:23 VRB]  - Npgsql Data Provider
[06:56:23 VRB]  - Data Provider for PostgreSQL
[06:56:23 VRB]  - Npgsql
[06:56:23 VRB]  - Npgsql.NpgsqlFactory, Npgsql
[06:56:23 VRB]  - MySQL Data Provider
[06:56:23 VRB]  - .Net Framework Data Provider for MySQL
[06:56:23 VRB]  - MySql.Data.MySqlClient
[06:56:23 VRB]  - MySql.Data.MySqlClient.MySqlClientFactory, MySql.Data
[06:56:23 VRB]  - Oracle Data Provider for .NET
[06:56:23 VRB]  - .Net Framework Data Provider for Oracle
[06:56:23 VRB]  - Oracle.DataAccess.Client
[06:56:23 VRB]  - Oracle.DataAccess.Client.OracleClientFactory, Oracle.DataAccess
[06:56:23 VRB]  - MS Data SQL Provider
[06:56:23 VRB]  - .Net Framework Data Provider for SqlServer
[06:56:23 VRB]  - Microsoft.Data.SqlClient
[06:56:23 VRB]  - Microsoft.Data.SqlClient.SqlClientFactory, Microsoft.Data.SqlClient
[06:56:23 INF] Startup - Version: 8.4.0.16329.
[06:56:23 INF] ERPConnect Disabled
[06:56:23 INF] Starting Listener for: relay-connors.servicebus.windows.net::gateway-test
[06:56:24 INF]   ** Relay Forwarder Online and Listening:  relay-connors.servicebus.windows.net::gateway-test
[06:56:24 VRB] APIServiceHostController Start.
[06:56:24 INF] APIServiceHostController InternalInitialize API host configuration: https://localhost:20433
[06:56:24 DBG] APIServiceHostController InternalInitialize Example path to command invoke: 20433:IntegrationAPI/RunRequest
[06:56:24 VRB] APIServiceHostController InternalInitialize Complete.
[06:56:24 VRB] OwinSelfHostConfiguration Configuration API host listener is starting with 100 maximum parallel accepts and 2147483647 maximum requests.
[06:56:24 VRB] APIServiceHostController Configuration Registering assembly resolver.
[06:56:24 DBG] AssembliesResolver GetAssemblies.
[06:56:25 INF] APIServiceHostController Start Relay API startup successful.
Press [ENTER] to exit.
```

2. Correct any errors that are displayed in the command window.

> **NOTE:** If the command window output does not proceed beyond the "APIServiceHostController Start Relay API startup successful." line, this indicates that the outbound traffic over port 443 to the Azure Relay is blocked. Open the port to resolve this issue.

3. In the OneStream Windows Application client, refresh Gateway Details from **System** > **Administration** > **SmartIntegration Connector** > *Your gateway*.

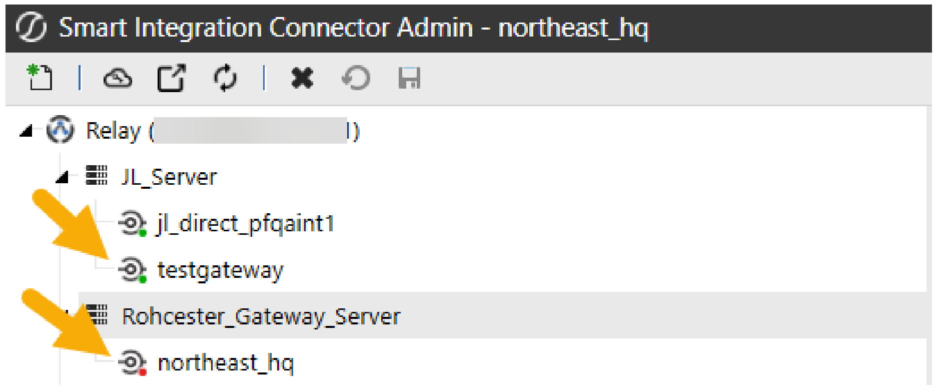
- The **Instance Count** changes from 0 to 1.
- The **Status** changes from **Offline** to **Online**. Additionally, status indicators turn green on the side menu if the **Gateway** is **Online**, red if the Gateway is **Offline**, and yellow if the **Gateway** is **Offline** but there is a newer version of the Local Gateway Server available. See the second screenshot under this step for a close-up of the indicators.
- The **Version** field shows the version of the running Smart Integration Connector Gateway.



Smart Integration Connector Admin - testgateway

- Relay (
  - JL_Server
    - 1
    - testgateway
  - Rohcester_Gateway_Server
    - northeast_hq
  -
    - wwtest

General (Gateway)	
Name	testgateway
Description	testgateway
Connection Type	Database Connection
Gateway Server Name	JL_Server
Web API Key	
Gateway Key	
Status	Online
Instance Count	1
Version	8.4.0.16301
Active Local Gateway Server Computer Name	
Additional Settings	
Bound Port at Gateway	
Gateway failures reporting interval (min)	



Smart Integration Connector Admin - northeast_hq

- Relay ( )
  - JL_Server
    - jl_direct_pfqaint1
    - testgateway
  - Rohcester_Gateway_Server
    - northeast_hq

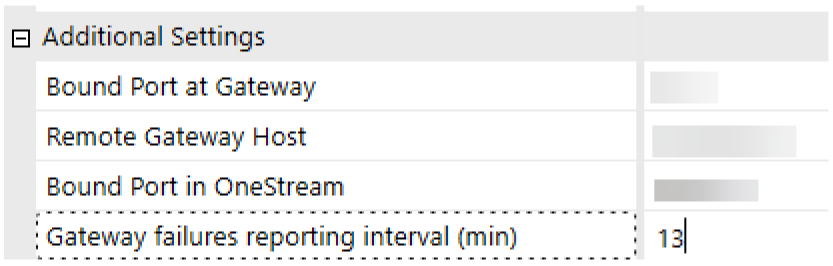
4. Press **Enter** twice on the keyboard to stop the service in the command window and then close the command window.

Error Log

To view the error log, click **System** > **Logging** > **Error Log**.

Every five minutes, by default, the Smart Integration Connector tries to connect to an established Smart Integration Connector local gateway from each application server used in a deployment. If the gateway is unable to connect, it times out and adds an error to the error log. These errors are recorded in the OneStream error log along with other errors related to the OneStream application. You can configure the interval at which OneStream application servers monitor this gateway from 1 minute to 1440 minutes (1 day) to reduce the volume of logged failures for infrequently online test or validation environments.

> **NOTE:** It is recommended to increase the time intervals for queries that run longer than five minutes. For example, if you have a query that runs ten minutes long, you need to set your time interval to above ten minutes (such as fifteen minutes). Time intervals can be adjusted from **System** > **Smart Integration Connector** > Your connection > **Gateway failures reporting interval (min)**.



⊟ Additional Settings	
Bound Port at Gateway	[redacted]
Remote Gateway Host	[redacted]
Bound Port in OneStream	[redacted]
Gateway failures reporting interval (min)	13

Common Errors

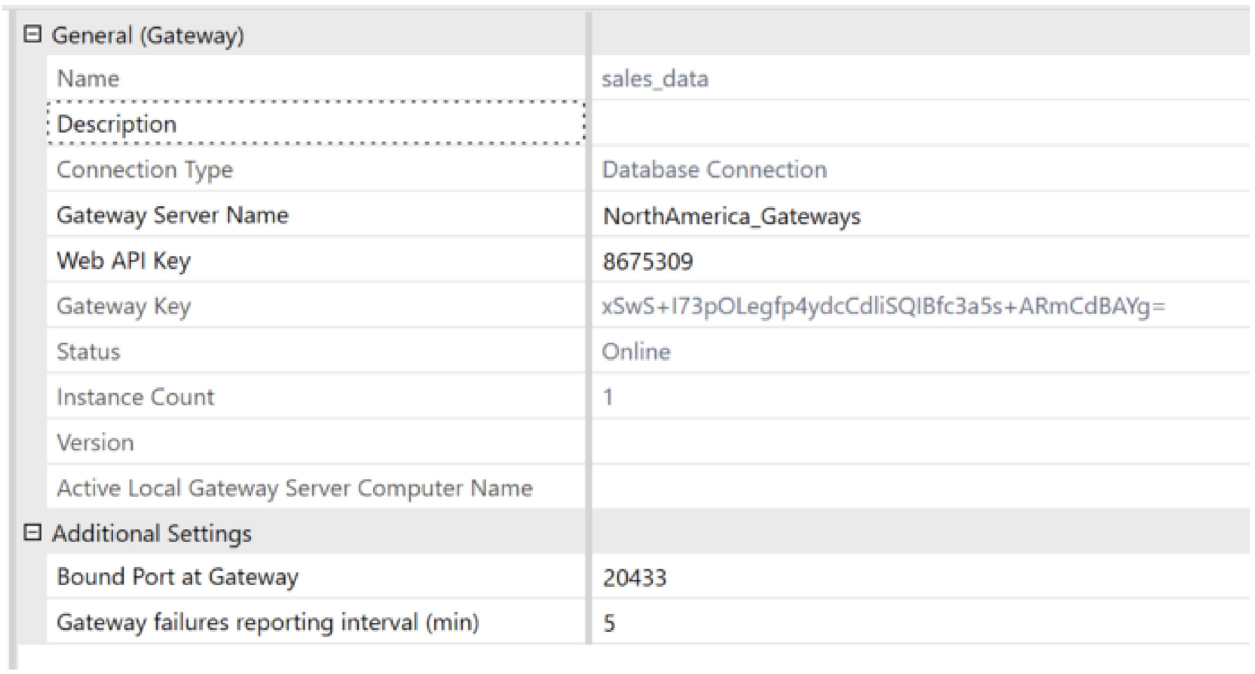
Memory Issues

If you receive any of the following errors, increase the memory in your Smart Integration Connector Local Gateway Server. For queries returning over 1 million records, 32 GB or more RAM is recommended.

- "Error while copying content to a stream. Received an unexpected EOF or 0 bytes from the transport stream."
- "An error occurred while sending the request. The response ended prematurely."

Gateway Version is empty

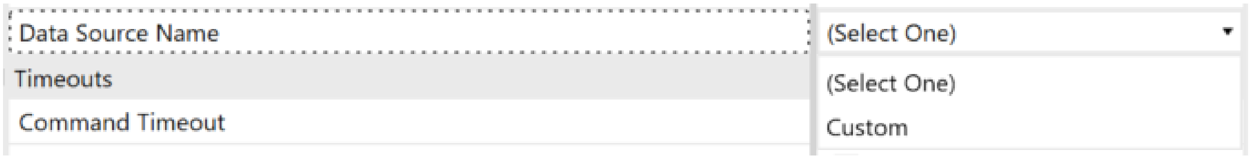
If your gateway is reporting online, is of type "Database Connection" and the Version is empty, verify with your IT Admin that port 443 is fully open outbound between the SIC Local Gateway Server and the Azure Relay and that Deep Packet Inspection or SSL Teardown is not being performed.



⊟ General (Gateway)	
Name	sales_data
Description	
Connection Type	Database Connection
Gateway Server Name	NorthAmerica_Gateways
Web API Key	8675309
Gateway Key	xSwS+I73pOLegfp4ydcCdliSQIBfc3a5s+ARmCdBAYg=
Status	Online
Instance Count	1
Version	
Active Local Gateway Server Computer Name	
⊟ Additional Settings	
Bound Port at Gateway	20433
Gateway failures reporting interval (min)	5

Custom Data Source Names

You may not see the Data Source Names populate when setting up the custom connection with a new gateway. It is recommended to wait for five minutes from creating a new gateway to when you create the custom connection.



Data Source Name	(Select One)
Timeouts	(Select One)
Command Timeout	Custom

Array cannot be null Error

You receive the error: "Array cannot be null. (Parameter 'bytes')" or "System.AggregateException - System.NullReferenceException: Object reference not set to instance of object"

> **NOTE:** CompressionHelper.InflateJsonObject is now automatically executed as part of remote calls resulting in serialized .NET types returned from the Smart Integration Connector Gateway. Update any SIC related business rules accordingly.
> Previously, it was required that a OneStream BR developer invoking a remote Smart Integration Function be aware of the data type returned and convert accordingly after the result is returned. An example where the returned result was a byte array involved code that appeared as follows:

Example:

```
bytesFromFile = CompressionHelper.InflateJsonObject(Of System.Byte())
(si,objRemoteRequestResultDto.resultDataCompressed)
' The Smart Integration Connector Gateway now provides this type information back to OneStream
' and streamlines this conversion process using a newly added property called
' ObjectResultValue which is populated.
' When invoking the same operation shown above that previously required
' the type to be converted, a BR developer can do the following:
bytesFromFile = objRemoteRequestResultDto.ObjectResultValue
```

Opening and Saving Configuration Errors

You may receive an error opening or saving your OneStream Local Gateway Configuration after installing Oracle Data Provider for .NET.

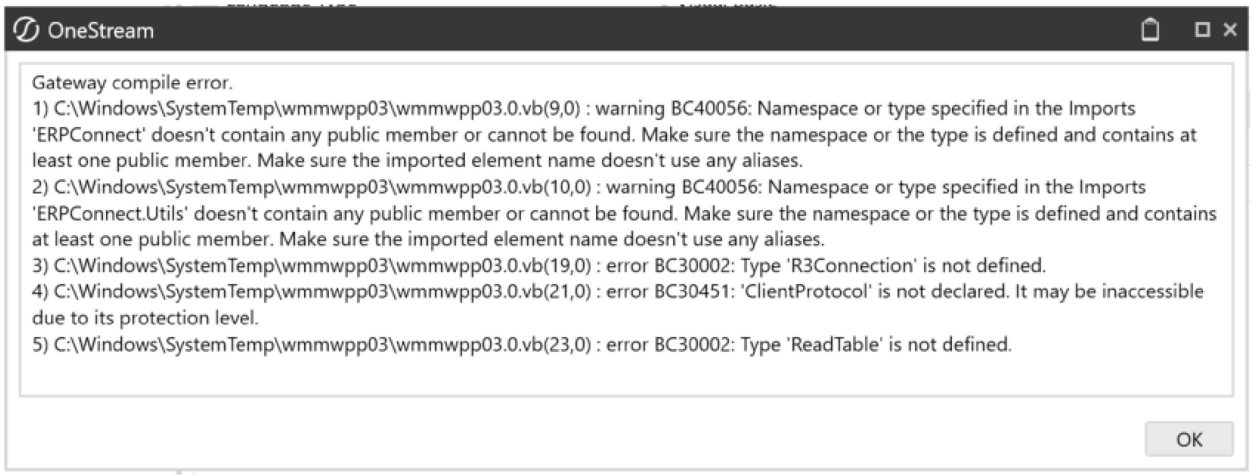
You must comment out the following line *<!--<add name="Oracle Data Provider for .NET" invariant="Oracle.DataAccess.Client" description=".Net Framework Data Provider for Oracle" type="Oracle.DataAccess.Client.OracleClientFactory, Oracle.DataAccess" />-->* when editing your OneStreamLocalGatewayConfiguration.exe.config to resolve this error.

Your configuration should look similar to this:

```
    <DbProviderFactories>
      <add name="Npgsql Data Provider" invariant="Npgsql" description="Data Provider for
PostgreSQL" type="Npgsql.NpgsqlFactory, Npgsql" />
      <add name="MySQL Data Provider" invariant="MySql.Data.MySqlClient" description=".Net Framework
Data Provider for MySQL" type="MySql.Data.MySqlClient.MySqlClientFactory, MySql.Data" />
      <!--<add name="Oracle Data Provider for .NET" invariant="Oracle.DataAccess.Client"
description=".Net Framework Data Provider for Oracle"
type="Oracle.DataAccess.Client.OracleClientFactory, Oracle.DataAccess" />-->
```

Incorrect or Missing Library References

During compilation of remote business rules using .NET DLLs such as the ERPConnect Library to interface with SAP, incorrect or missing library references will result in an error similar (Smart Integration Connector compile error) to the image below.



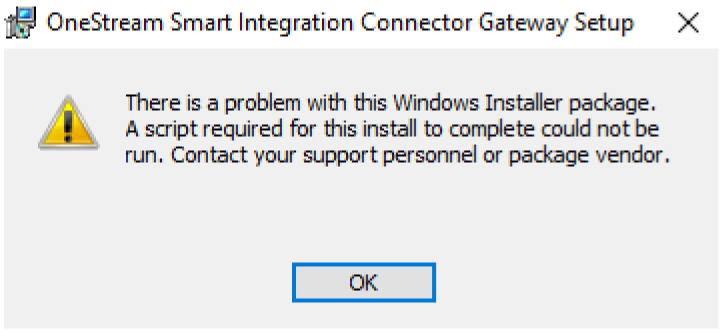
OneStream

```
Gateway compile error.
1) C:\Windows\SystemTemp\wmmwpp03\wmmwpp03.0.vb(9,0) : warning BC40056: Namespace or type specified in the Imports
'ERPConnect' doesn't contain any public member or cannot be found. Make sure the namespace or the type is defined and contains at
least one public member. Make sure the imported element name doesn't use any aliases.
2) C:\Windows\SystemTemp\wmmwpp03\wmmwpp03.0.vb(10,0) : warning BC40056: Namespace or type specified in the Imports
'ERPConnect.Utils' doesn't contain any public member or cannot be found. Make sure the namespace or the type is defined and contains
at least one public member. Make sure the imported element name doesn't use any aliases.
3) C:\Windows\SystemTemp\wmmwpp03\wmmwpp03.0.vb(19,0) : error BC30002: Type 'R3Connection' is not defined.
4) C:\Windows\SystemTemp\wmmwpp03\wmmwpp03.0.vb(21,0) : error BC30451: 'ClientProtocol' is not declared. It may be inaccessible
due to its protection level.
5) C:\Windows\SystemTemp\wmmwpp03\wmmwpp03.0.vb(23,0) : error BC30002: Type 'ReadTable' is not defined.
```

OK

Script Error During Upgrade

During upgrades, you may run into the error "a script required for this install to complete could not be run." The action to resolve this error is to rerun the Smart Integration Connector installer. If you continue to see this error during upgrades, contact OneStream support.



OneStream Smart Integration Connector Gateway Setup

There is a problem with this Windows Installer package. A script required for this install to complete could not be run. Contact your support personnel or package vendor.

OK

Data Returned as a String

Occasionally, data types can return as a string when you are expecting to see data in the original source format. Smart Integration Connector transfers data in Apache Parquet format from the Local Gateway Service to OneStream. If you are transferring a data type that is unsupported by parquet, the data converts and returns as string. You will need to add logic to re-covert the string to the desired and supported data type if needed.

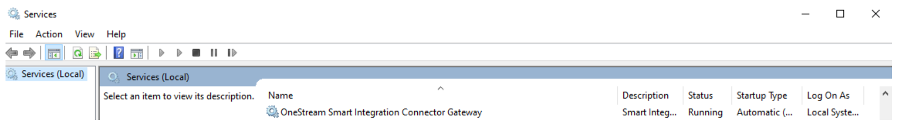
In certain cases, if you receive the error "The method or operation is not implemented" then you can use a remote business rule to transfer data. This occurs when returning the varbinary (max) datatype.

Manual Start and Stop

If you run into errors with the service, you may need to manually stop and restart the service. This can be accomplished in the GUI-based Services control manager as shown below or by using the command-prompt/PowerShell. The name of the service when using command-line tools is "OneStreamSmartIntegration"

Using the Windows Service Control Manager:

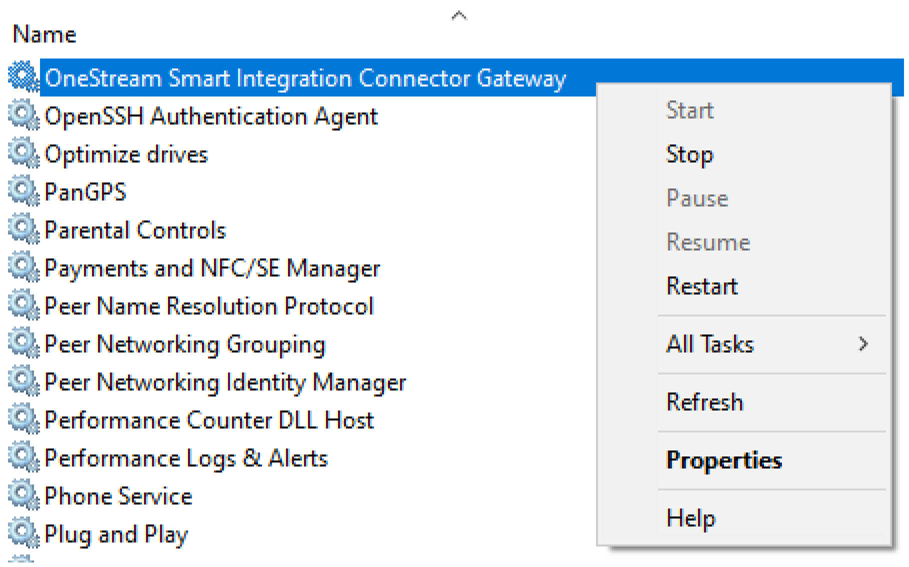
1. Open **Services** from your Windows start menu.



Select an item to view its description.

Name	Description	Status	Startup Type	Log On As
OneStream Smart Integration Connector Gateway	Smart Integ...	Running	Automatic (...	Local Syste...

2. Right-click on **OneStream Smart Integration Connector Gateway**.


Name
OneStream Smart Integration Connector Gateway
OpenSSH Authentication Agent
Optimize drives
PanGPS
Parental Controls
Payments and NFC/SE Manager
Peer Name Resolution Protocol
Peer Networking Grouping
Peer Networking Identity Manager
Performance Counter DLL Host
Performance Logs & Alerts
Phone Service
Plug and Play
Start
Stop
Pause
Resume
Restart
All Tasks
Refresh
Properties
Help

3. Select **Stop**.

4. Right-click again and select **Start**.

Using an elevated command-prompt:

1. net stop OneStreamSmartIntegration

2. net start OneStreamSmartIntegration

Using an elevated PowerShell prompt:

1. stop-service -ServiceName OneStreamSmartIntegration

2. start-service -ServiceName OneStreamSmartIntegration

Remote Endpoint Not Found/Could Not Decrypt

To troubleshoot the errors "Remote Endpoint Not Found" or "Could not decrypt connection string on SIC Gateway Connection: [Gateway Name]", check your service account permissions. The service account used will require local administrative rights to access resources on the Windows server, such as the machine certificate store and private keys used for encryption.

Connections requiring a Signed Certificate

For connections that require a signed certificate in order to establish a connection, then a Certificate Authority (CA) needs to be accessible from the Smart Integration Connector Local Gateway Server in order to function.

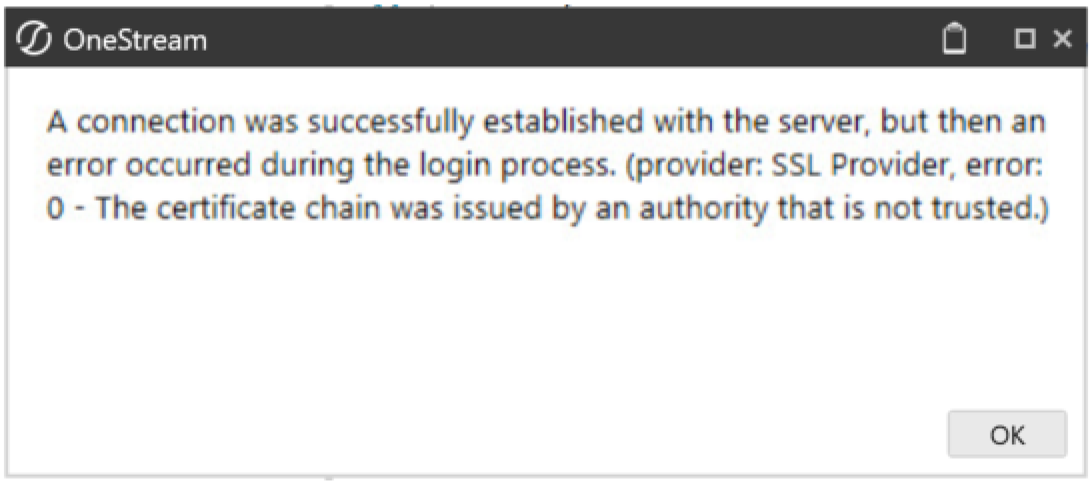
For Database Connections - CA needs to be accessible from the SIC Local Gateway Server.

For Direct Connections - CA needs to be publicly accessible from OneStream.

Trusted Certificate Chain

If you are using Smart Integration Functions and set the SQL Server connection string within the function, you may receive the following error:

A connection was successfully established with the server, but then an error occurred during the login process. (provider: SSL provider, error: 0 - The certificate chain was issued by an authority that is not trusted.)



```
A connection was successfully established with the server, but then an error occurred during the login process. (provider: SSL Provider, error: 0 - The certificate chain was issued by an authority that is not trusted.)
```

If you do not have a trusted certificate installed on your DB server, you can workaround this with TrustServerCertificate. However, this workaround is less secure and discouraged in production environments. To resolve this error, include **TrustServerCertificate=True**; to your connection string within the function.

Gateway Unable to Connect

If your Gateway cannot connect, check your Smart Integration Connector error log for:

```
[2023-10-04 07:09:59 INF] Starting Listener for:  <site name>.servicebus.windows.net

[2023-10-04 07:10:00 ERR] Unable to connect: Generic: Ip has been prevented to connect to the endpoint.
```

To resolve this issue, verify that the IP addresses in your Whitelisting to the Azure Relay is set up properly. See Advanced Networking and Whitelisting.

Communication Error

If you see the following error in the Windows Service Log, it means that you have a mismatched WebAPIKey. This could occur if the WebAPI key is changed in OneStream and the configuration for the Smart Integration Local Gateway service is not exported from OneStream and re-imported into the Local Gateway Server service using the configuration utility.

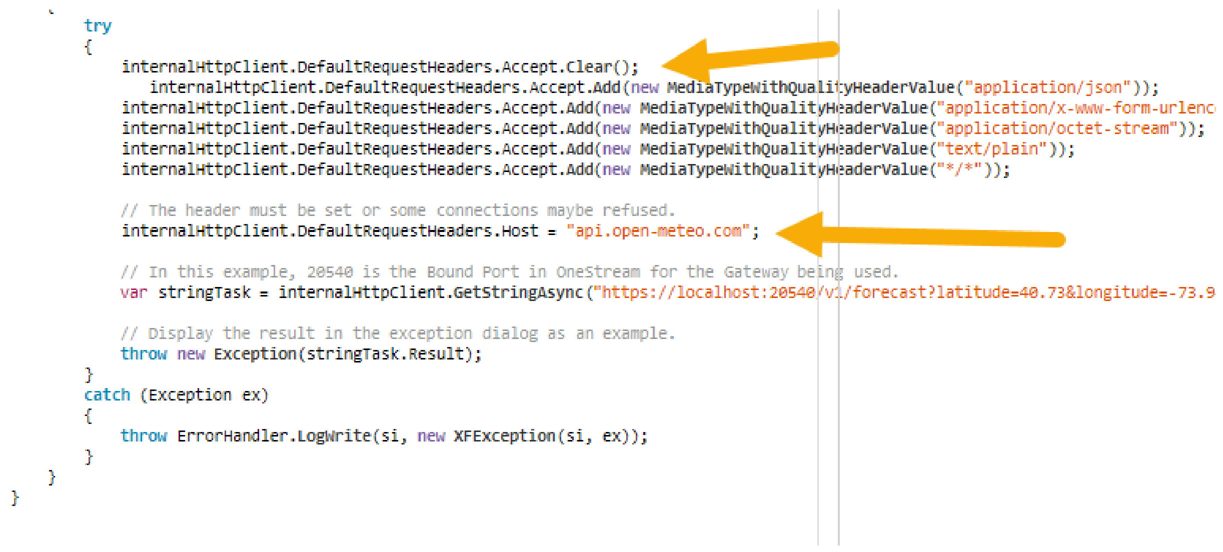
[14:13:36 INF] HTTP Request with invalid API key

You can resolve this error by matching the WebAPIKey in the configuration utility.

NOTE: If the value is changed, you must restart the service.

Host Header Communication Error

If you copy the business rule below and are having trouble communicating with your WebAPI after compiling, ensure that you have set your host header correctly. Refer to highlights in the screenshot below.



```
        try
        {
            internalHttpClient.DefaultRequestHeaders.Accept.Clear();
               internalHttpClient.DefaultRequestHeaders.Accept.Add(new MediaTypeWithQualityHeaderValue("application/json"));
            internalHttpClient.DefaultRequestHeaders.Accept.Add(new MediaTypeWithQualityHeaderValue("application/x-www-form-urlenc
            internalHttpClient.DefaultRequestHeaders.Accept.Add(new MediaTypeWithQualityHeaderValue("application/octet-stream"));
            internalHttpClient.DefaultRequestHeaders.Accept.Add(new MediaTypeWithQualityHeaderValue("text/plain"));
            internalHttpClient.DefaultRequestHeaders.Accept.Add(new MediaTypeWithQualityHeaderValue("*/*"));

            // The header must be set or some connections maybe refused.
            internalHttpClient.DefaultRequestHeaders.Host = "api.open-meteo.com";

            // In this example, 20540 is the Bound Port in OneStream for the Gateway being used.
            var stringTask = internalHttpClient.GetStringAsync("https://localhost:20540/v1/forecast?latitude=40.73&longitude=-73.9

            // Display the result in the exception dialog as an example.
            throw new Exception(stringTask.Result);
        }
        catch (Exception ex)
        {
            throw ErrorHandler.LogWrite(si, new XFException(si, ex));
        }
    }
}
```

Limitations

This section details a list of known limitations in Smart Integration Connector.

Parquet Format Transfer

Smart Integration Connector transfers data in Apache Parquet format from the Local Gateway Service to. If you are transferring a data type that is unsupported by parquet, the data returns as a string. See Troubleshooting.

Returning Multiple DataTables with Remote Business Rules

If you are returning multiple DataTables in a DataSet from a Remote Business Rule, the maximum number of combined rows and size are around 2 million rows and 2GB of data.

Custom Email Connections

Email over Smart Integration Custom ("Notification Connection" in Data Management jobs) Connections is not supported. Remote BRs do support email in Smart Integration Connector.

Connection String Encryption

You may experience an issue where the Connection String will not encrypt. The maximum character count for Connection String encryption is 245 characters. Ensure your connection string meets this requirement.

SSH.NET Transfers

sFTP is supported by the use of SSH.NET. FTP is currently not supported for SSH.NET. Use sFTP for all file transfers.

Precision using Decimals

Smart Integration Connector queries can only return numeric values with up to 38 total digits: 20 integer digits to left of the decimal point and 18 fractional digits to the right of the decimal point.

For example, returning a column with a value of 123456789123456789123 (21 digits) is not supported. Even though there is no decimal point, it still exceeds 20 integer digits, which is the maximum amount.

Similarly, returning a column with a value of 0.1234567891234567891 (19 decimal digits) is not supported, as it contains more than 18 digits on the right side of the decimal point.

If your queries can return values that require more than 20 integer digits or 18 fractional digits, consider casting to a VARCHAR as the following:

- `"SELECT CAST(123456789123456789123 AS VARCHAR)" -- 21 integer digits`

If there is no risk of overflowing the opposite side of the decimal point, you can also divide by a factor of 10 to shift right or multiply by a factor of 10 to shift left. This approach is more efficient than casting to a VARCHAR

For example:

- `SELECT 123456789123456789123 / 100 -- 21 integer digits will shift by two digits to the right`

- `SELECT 0.1234567891234567890 * 100 -- 19 fractional digits will shift by two digits to the left`