



InterSystems IRIS Adaptive Analytics

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InterSystems IRIS Adaptive Analytics

1 Overview of InterSystems IRIS Adaptive Analytics

InterSystems IRIS® Adaptive Analytics is an optional extension that provides a business-oriented, virtual data model layer between InterSystems IRIS and popular Business Intelligence (BI) and Artificial Intelligence (AI) client tools. It includes an intuitive user interface for developing a data model in the form of *virtual cubes* where data can be organized, calculated measures consistently defined, and data fields clearly named. By having a centralized common data model, enterprises solve the problem of differing definitions and calculations to provide their end users with one consistent view of business metrics and data characterization.

Adaptive Analytics provides the following key features:

- The Adaptive Analytics modeler, which makes data accessible for business users without exposing complex data structures, tables, or relationships.
- Publication of data model changes as virtual cubes, preventing disruption caused by lengthy rebuilds.
- Unified access to an online analytical processing (OLAP) model via the BI tool of your choice.
- Live connectivity to all data stored within InterSystems IRIS.
- Automated data structure aggregation for frequently-used queries.

Adaptive Analytics is powered by AtScale®, a product of AtScale, Inc. For documentation of AtScale functionality, consult their [official documentation](#). Note that only users licensed for InterSystems IRIS Adaptive Analytics can view this documentation.

Important: This version of InterSystems IRIS is compatible with InterSystems IRIS Adaptive Analytics version 2024.1 or later. It is not compatible with earlier versions of Adaptive Analytics.

2 Set Up InterSystems IRIS Adaptive Analytics

To set up InterSystems IRIS Adaptive Analytics, you must complete the following steps:

1. [Install or upgrade an instance of AtScale](#)
2. [Configure your InterSystems IRIS instance](#) for Adaptive Analytics User-Defined Aggregate Functions
3. [Configure AtScale](#) to integrate with your InterSystems IRIS instance

This section describes each step in the setup process in further detail. [Troubleshooting](#) provides guidance for common issues you may encounter during this process.

2.1 Install or Upgrade AtScale

InterSystems IRIS Adaptive Analytics integrates your InterSystems IRIS instance with an AtScale installation. InterSystems IRIS Adaptive Analytics uses the latest validated version of AtScale. This version is listed on the [WRC software distribution page](#), in the **Version** column for the Adaptive Analytics package.

In order to install or upgrade your instance of AtScale:

1. Download the AtScale installation package appropriate for your operating system from the **Components** section of the [WRC software distribution page](#). Search for **Adaptive Analytics** in the **Name** column to find the available packages. The filename for the download has the form `AdaptiveAnalytics-[AtScaleVersion]-[PlatformVersion].rpm` or `AdaptiveAnalytics-[AtScaleVersion]-[PlatformVersion].deb`, where `[AtScaleVersion]` is the version of AtScale the package installs, and `[PlatformVersion]` is the operating system the package is for.
2. Install or upgrade AtScale and then activate it by following the instructions provided in the [official AtScale documentation](#).

Note: When you purchase InterSystems IRIS Adaptive Analytics, you should receive a separate AtScale license which is applied to the AtScale server. This license is required to activate AtScale. If you have any questions about your license, please contact an InterSystems sales representative.

After you have installed AtScale, [import the Adaptive Analytics User-Defined Aggregate Functions](#) to configure InterSystems IRIS Adaptive Analytics as described in the next section.

2.2 Configure InterSystems IRIS for Adaptive Analytics

The configuration instructions provided here will assume that you have already successfully installed InterSystems IRIS and configured your primary namespace and databases. If you have not done so, consult the instructions in the *InterSystems IRIS Installation Guide* and the [Create/Modify a Namespace](#) section of the *System Administration Guide*. These instructions also assume that you have already successfully [installed the appropriate version of AtScale](#).

In order to leverage Adaptive Analytics *User-Defined Aggregate Functions* (UDAF), you must first import and register the UDAF class file available from [the WRC](#) with the following procedure:

1. Download the latest Adaptive Analytics UDAF Package file (`AdaptiveUDAF.xml`) from the **Components** section of the [WRC software distribution page](#).
2. On your Adaptive Analytics instance, log in to the Management Portal as a user with administrative privileges and ensure you are in your Adaptive Analytics namespace.
3. Navigate to **System Explorer** > **Classes** and click **Go**.
4. Click **Import**. In the modal window, select the **My Local Machine** option for the **The import file resides on** field and select the `AdaptiveUDAF.xml` file.
5. Check the **Compile imported items** box and set the **Compile flags** to `cuk`. Click **Import**.
6. Navigate to **System Explorer** > **SQL**. Execute the following command:

SQL

```
CALL AtScaleUDAF.Register()
```

7. To verify your configuration, navigate to **System Explorer** > **SQL** and execute the following query:

SQL

```
SELECT ATSCALE_HONEYBEE_VERSION()
```

The configuration thus far will result in a system where aggregates are stored in the same database as source data. InterSystems strongly recommends separating aggregates so that they can be managed and assessed without needing to manually filter them from a more general data set. To separate aggregates from source data, perform the following steps:

1. Log in to a Terminal session as a user with administrative privileges. Ensure you are in your Adaptive Analytics namespace.
2. Call the following command to configure your aggregate database and global mappings:

ObjectScript

```
write ##class(AtScaleUDAF.Utils).CreateDatabase("/<instancePath>/mgr/AtScale/")
```

Where `<instancePath>` is the full path to your Adaptive Analytics instance.

2.3 Configuring AtScale for Adaptive Analytics

After you have [installed AtScale](#) and [configured InterSystems IRIS](#) to use Adaptive Analytics User-Defined Aggregate Functions, configure AtScale according to the procedure described in [Adding InterSystems IRIS Data Warehouses](#).

2.4 Troubleshooting Common Setup Issues

2.4.1 Design Center Does Not Load Upon First Login

The Design Center may fail to load the initial setup wizard upon first login, displaying a blank background instead. In such cases, ensure that the `atscale.yaml` file is properly configured to access the host using a publicly-routable, fully-qualified domain name. For further guidance, refer to the [Advanced Configuration](#) section in the AtScale installation documentation.

2.4.2 Service Registry (or Other Service) Fails to Start

An AtScale service may fail to start upon installation if the host has multiple private IP addresses. In such cases, you must bind the malfunctioning service to the specific private IP address which it should use. This can be accomplished by editing the service's properties in the `atscale.yaml` file or by setting an environment variable; for detailed instructions, refer to the [Advanced Configuration](#) section in the AtScale installation documentation.

3 Exporting InterSystems IRIS Business Intelligence Cubes to AtScale

Adaptive Analytics supports the export of Business Intelligence cubes to Adaptive Analytics cubes. The following procedure for cube export assumes that you have already completed all of the configuration described in the previous section. This process does not in any way alter the source Business Intelligence cube.

1. Open a Terminal session on the InterSystems IRIS instance from which you wish to export a cube.
2. Ensure you are in the namespace of the cube you wish to export.
3. Execute the following commands:

ObjectScript

```
set cube = "CUBENAME"
set caltab = "CALENDARTABLE"
set file = "PATH/EXPORTFILENAME"
```

Where `CUBENAME` is the InterSystems IRIS BI cube name, `CALENDARTABLE` is the name of your optional calendar table for managing dates, and `PATH/EXPORTFILENAME` is the target path of the cube export. The following example places an output file with the cubename and datetime stamp:

ObjectScript

```
set cube = "HoleFoods"
set caltab = "MyCalendarTable"
set file = "/tmp/ cubeExport "_cube_" "_$TRANSLATE($ZDT($h,3), " :","--")_" .json"
set sc=##class(%DeepSee.Utils).%AtScaleExportCube(cube,file,caltab)
```

If no calendar file is used, simply omit the *caltab* argument from the final command.

Execute the following command to verify that the cube was exported:

ObjectScript

```
write sc
```

If the export was successful, this command will return the full file path of the resulting `.json` file. You will need this path for a later step. You may view this file in your text editor or IDE of choice.

4. Log in to your AtScale Design Center and, on the home page, select the **Import from InterSystems IRIS** Quick Start option.
5. In the modal window, click **Browse**, navigate to the `.json` cube file observed previously, and open it. Back in the primary modal window, click **Next**.
6. From the **Data Warehouse** and **Schema** dropdown menus, select the name of the data warehouse you have configured for this project and the appropriate schema respectively. Click **Next** to perform the import.
7. In the **Review Import** screen, click **Download Report**. This report provides details of import performance and recommendations for adjustments to models, if necessary.
8. You may receive warnings on this screen concerning incompatibilities between the structure of the export `.json` file and Adaptive Analytics's expected data model. These chiefly concern InterSystems IRIS BI calculated measures and drill-throughs due to use of proprietary MDX operations in InterSystems IRIS BI. InterSystems recommends manually reviewing all calculated measures and drill-throughs and adjust them as needed to ensure compliance with Adaptive Analytics's data model. This review process will be outlined in a later step. Click **Next**.

Additionally, cubes based on data connectors and cube relationships do not export in this process.

9. Set design-time and run-time permissions according to your needs and click **Next** to finalize the import process.
10. Review your calculated measures and drill-throughs as follows:
 - a. In the AtScale Design Center, navigate to your Adaptive Analytics project.
 - b. Click on your imported cube to open it in the Main Canvas.
 - c. Click on the **Calculated Measures** tool on the Main Canvas.
 - d. For each Calculated Measure, click **Edit** and, in the modal window, click **Test MDX**. Consult the displayed error messages to determine appropriate adjustments to each MDX definition.

You may now review your imported cube as you would review any other Adaptive Analytics model.

4 Integrating Adaptive Analytics with InterSystems Reports

Adaptive Analytics integrates with InterSystems Reports, allowing users to share a common data model—virtual cubes—with other Business Intelligence tools such as Microsoft PowerBI and Tableau. Users can thereby leverage common calculations and definitions across their tool kits.

The following procedure for report generation assumes that you have already completed all the configuration described earlier in this guide, as well as the configuration described in both “[InterSystems Reports Designer](#)” and “[InterSystems Reports Server with InterSystems IRIS](#)”.

1. Configure the Report Designer to connect to Adaptive Analytics with the Hive Driver:
 - a. Launch the Report Designer and click on **Hive**.
 - b. In the **Create Connection to Hive** modal window, select **New Catalog**. You may set **Directory** to a path of your choice; select the catalog you used to create the Dynamic Connection earlier for the **Catalog** field and click **OK**.
 - c. In the **Get JDBC Connection Information** modal window, click the **Driver** checkbox and enter `org.apache.hive.jdbc.HiveDriver` in the adjacent field. Set the **URL** to that of your Adaptive Analytics instance, and the **User** and **Password** fields to match the administrative user of your Adaptive Analytics instance.
 - d. Click **More Options**. In the modal window, under the **Qualifier** tab, select **2-Part Names** from the **Name Pattern** pane and **User Defined** from the **Quote Qualifier** pane, accepting the provided value of `"`. Click **OK**.
 - e. Once the Catalog has been generated, edit the **Push Down Group Query** field to **true**. You may now publish reports based on this catalog as normal with InterSystems Reports.
2. Add a Report User to Adaptive Analytics:
 - a. Log in to your AtScale Design Center, navigate to **Security** and click **Create User**.
 - b. Enter the desired information for your InterSystems Reports user and, in the **Roles** pane, select **Runtime Query User**. Click **Create User**.
3. Ensure the Reports Server is configured:
 - a. On your InterSystems Reports Server instance, log in to the Management Portal as a user with administrative privileges.
 - b. Navigate to **System Administration > Configuration > InterSystems Reports**.
 - c. In the table of server definitions, click **Configure** on the row of the Reports server you wish to connect to Adaptive Analytics. If this server does not exist, follow the configuration instructions in “[InterSystems Reports Server with InterSystems IRIS](#)” to create it.
4. Configure the Reports Server to access Adaptive Analytics:
 - a. In the icon menu, click **My Folder**.
 - b. Navigate to **Administration > Connections > Dynamic Connections** and click **New Connection**.
 - c. From the **Catalog** dropdown menu, select the catalog file you wish to use; if it does not yet exist, create it following the instructions in “[InterSystems Reports Designer](#)”. Check that the automatically filled fields have the expected values.

- d. Click **Add Database User Mapping** and, in the autogenerated profile, double-click on the **Database User** field to edit the name. Replace it with the name of the user you created earlier in the Design Center. Accept the other defaults and click **OK**.
- e. In the **Dynamic Connections** list, click on the newly created connection.
- f. In the **Properties** list, double-click on the name of the connection to edit it to your liking.
- g. Navigate to **Resources** and run the desired report.