Step-by-step for Guide Data Graphs

Introduction to Data Graphs

Now that we have our data insights in hand, let's explore creating **Graphs** in Data Cloud. We'll use these graphs to retrieve related data efficiently within Data Cloud. A ***data graph*** combines and transforms normalized table data from data model objects (DMOs) into new, materialized views of your data which can then be used in cross-platform use cases such as surfacing these views on a record in CRM or querying the graph from an internal platform.

A common use case for Data Graphs are to surface Data Cloud attributes or insights within CRM/Core. Additionally, Data Graphs can commonly be used to offer a Unified view that other external systems can query against. Data Graphs in Data Cloud offer a powerful solution for business to harness your data effectively.

Technical Benefits of Data Graphs

The technical benefits of data graphs within Data Cloud include the ability to run real-time identity resolution, real-time calculated insights, and real-time segments. Structured around at least one primary DMO, Data Graphs are built within a Data Space and can include calculated insights and streaming insights. Data Graphs are dynamic and can be used to enhance instructions sent to the LLM. Data in Data Graphs is pre-calculated, allowing responses in near real-time. With Data Graphs, you consume less data with your queries, allowing you to reduce costs if you need to query relevant data at a high volume (e.g. 1000+ queries per day). Data Graphs transform normalized table data from DMOs into materialized views of the data.

Key Technical Features:

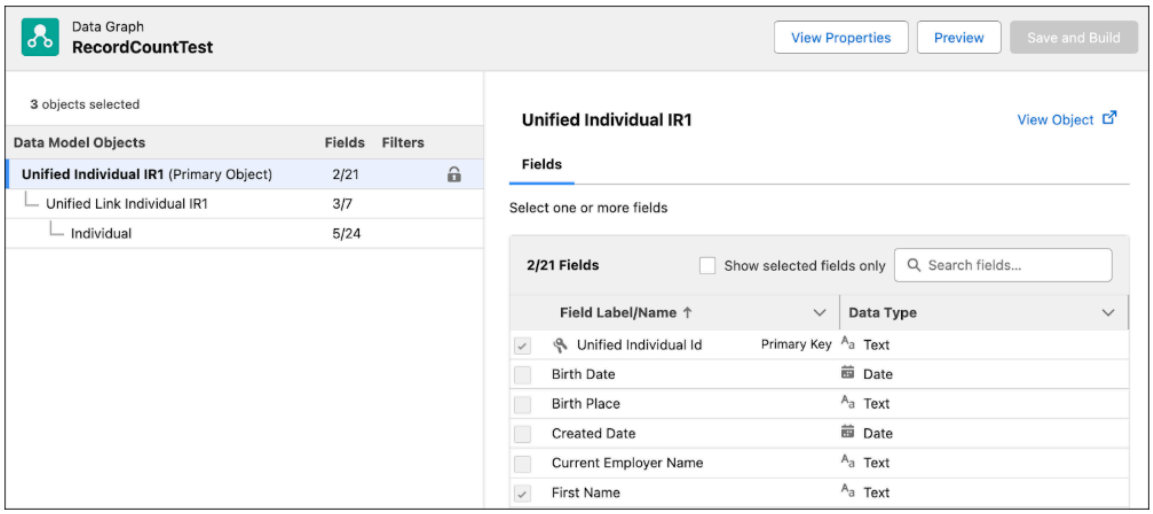
- **Updates** allow for the refresh of only newly added or changed data, instead of reprocessing the entire data set.
- **Contains Metadata** such as the data space & data graph names.
- **Includes data from the Primary DMO** and the related objects as queryable JSON blob.
- **Reduces Manual Effort** and complexity in creating Data Graphs.
- Provides a **pre-computed, denormalized** graph of DMOs, Calculated Insights, and Segments.
- Supports Data Actions in **milliseconds.**

Creating Data Graphs

When creating a Data Graph, it's important to understand **Data Graph Structures**.

- A data graph is built within a data space and must have one primary data model object (DMO). You select a DMO in the data space to use as the foundation for the data graph.

- A primary DMO or a DMO from the “Other” category identifies the information for your Data Graph. Related object DMOs can belong to the Profile, Other, or Engagement category.
- When you create the data graph, the selected objects and fields are denormalized into a single, flattened, read-only data graph record in the form of a JSON blog. The data graph record contains metadata, such as the data space and data graph names.



Create a Data Graph

1. From the App Launcher, select **Data Graphs**.
2. Click **New** > click **Start from Scratch** > Choose a near real-time data graph ***OR*** a real-time data graph > Name your Data Graph, along with selecting the appropriate Data Space and Primary Data Model Object you would like the graph to be built off of > click **Next**.
3. If you're creating a real-time data graph with the real-time SKU, set the consumption limits > click **Next**.
4. Select fields from the primary DMO to include in the data graph.
    a. The primary key field, related key qualifier field, and applicable foreign key fields are selected by default and added to the data graph for the primary DMO and its related objects.
5. To add related objects, click **+** or , and select fields for each related object.
    a. If there’s more than one path to a DMO, choose a path from the list of results. Longer paths add more levels to your data graph.

Choosing the correct path based on your use case needs, is crucial. Always take into account the relationship between the DMO and your business context for each available path.

6. After adding the related object in the Engagement category, navigate to the Filters tab and fill in Data Recency filter details.

Filtering your selection of objects, including the number of records and time limit, is crucial. This ensures efficient data processing and consumption of your Data Graph by focusing only on the required objects.

7. To view the structure of the JSON blob, click **Preview**.
8. Save your work.
    a. To save the data graph without making it active, click Save Draft. The data graph is saved in draft status.
    b. To create the data graph, click Save and Build.
9. If you're creating the data graph, select a refresh interval.
    a. The default refresh interval is daily. Selecting a shorter refresh interval can raise costs. You can't select a refresh interval for draft data graphs.

After the data graph is created, you can view, edit, clone, refresh, and delete it. You can also query the metadata and the JSON blob data using Data Cloud Metadata API and Query API. Draft data graphs can't be cloned or refreshed.

Create a Data Graph from a Data Kit

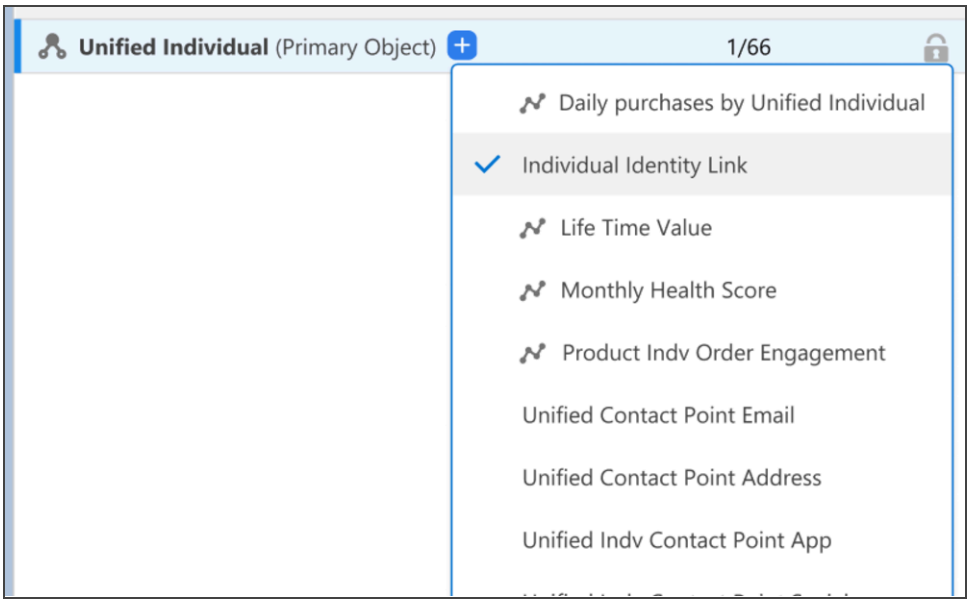
Save time by deploying a data kit that already contains data graphs, which were created and packaged in a separate Data Cloud instance or Org.

1. From the App Launcher, search for and select Data Graphs > click New > click Use a Data Kit.
2. Select a data kit > select a data graph.
3. Edit the properties of the new data graph.
   The properties are prepopulated from the original data kit data graph.
4. Edit the data graph's related objects and fields.
   All the related objects and fields that the data graph references must exist in your org. If any don't exist, you must create them or remove them from the data graph.

Add Calculated Insights to a Data Graph

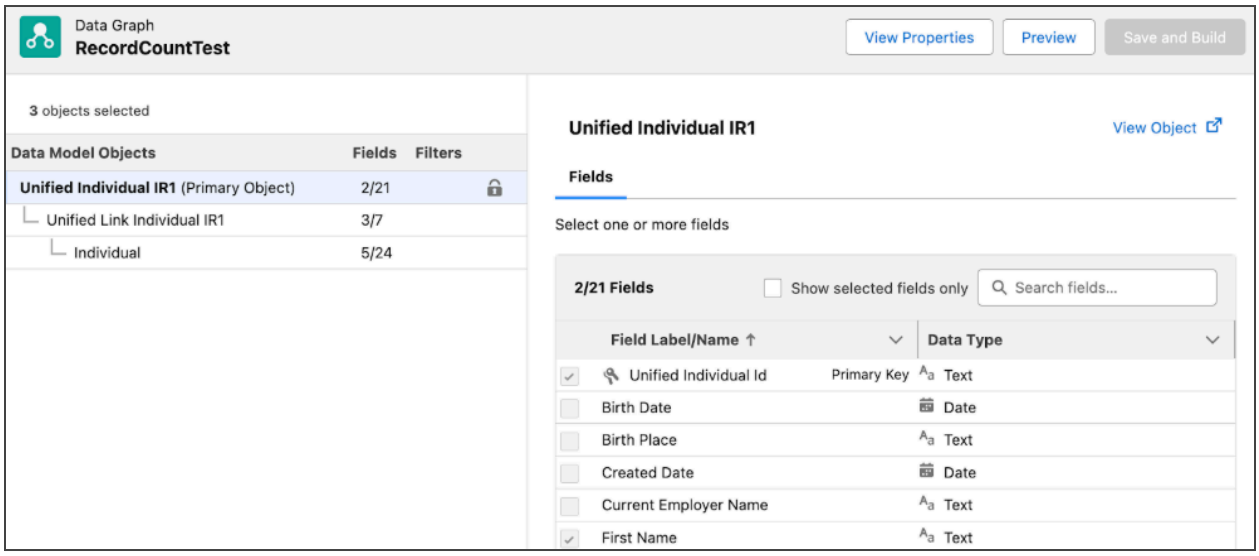
Adding Calculated Insights to a Data Graph is a powerful way of visualizing the information. In our example of Sunshine Trails Hospitality, we created a Calculated Insights to identify high-value members and provide targeted marketing campaigns to them or to understand the lifetime value of a customer. Let's take the next step with Sunshine Trails Hospitality, and see how they can visualize the Life Time Value allowing us to target these customers with promotions and loyalty deals to increase this potential. Let's look at how to add a Calculated Insight

1. Next to the DMO name, click the "**+**" icon and select a related Calculated Insight Object (CIO). In our case, this would be the Life Time Value. In the object picker, CIOs are denoted with the (Data Graph) icon.



2. Select **dimensions and measures** on the Fields tab.

You can include calculated insights in a data graph as long as they're based on a data model object (DMO) that's also included in the data graph. The DMO's primary key field must be configured as a dimension on the calculated insight object (CIO).



Refresh or Change Frequency Schedule of a Data Graph

1. In Data Graphs, next to the data graph that you want to schedule, select **Schedule**.
2. Select a refresh interval. Selecting a shorter refresh interval can raise costs.
3. Save your work.
4. To manually refresh a data graph, select **Refresh Now**.

Record Caching & User Session Length in Real Time Data Graphs
Record Caching keeps records of recently active users in the real-time layer. It also allows instant personalization from the first page of your website

Meanwhile, **User Session Length** defines the amount of time after a user stops engaging with your website that the session is considered to be active. If the website receives high traffic, the user's session record doesn't always remain in the real-time layer's data cache after the session times out.

Real Time Capabilities
With Data Cloud, you have access to sub-second data processing across multiple customer interactions. By harnessing the power of Data Cloud, you can synchronize customer data across all platforms. The first step to tapping into these capabilities is creating a real-time data graph.

Real Time Capability	Use Case
Real-Time Identity Resolution	Merge customer profiles across devices, unifying known & unknown users in real time.
Real-Time Segments	Create a real-time segment that completes on demand in milliseconds.
Real-Time Insights	Use real-time insights to build more complex personalization logic for your website.
Real-Time Predictions in Flow Builder	Create automation using outputs from an activated model for decision-making.

Automate a Real-Time Data Graph Event
Using a set of pre-determined conditions, run a flow in a real-time Data Graph.

1. Choose the DMO object that will trigger your flow.
2. Add one of more conditions from the DMO.
    a. Select condition requirements (i.e.: All Conditions are Met; Any Condition is Met).
    b. Select the field in the DMO that is evaluated by the condition.
    c. Select the operator > enter the field value. (Note that field and value in the same row must have compatible data types.)
3. Specify when to trigger the flow
    a. Every time conditions are met
    b. Only the first-time conditions are met
    c. Every time the conditions evaluate from false to true

Selecting the checkbox next to **Only after the user exits the flow** will prevent a user from starting the flow again before completing the previous run.

Optimize Data Graph Performance and Credit Usage

Data graphs allow you to include the specific data model objects (DMOs) and can improve performance by pre-calculating and denormalizing the data. As you define your data graphs, there are a few things to keep in mind:

- Are you including only data that is relevant for the use case?
- Are you including data that can inordinately delay the refresh process?

Because data is precalculated, it has a ***billing impact.*** Note that billing is primarily impacted based on how many rows are processed while keeping the data graph up-to-date, and that data graphs are updated daily. To optimize billing, consider some of the following:

1. **Know when to use a data graph.** Your application is repeatedly accessing a piece of data. This data/query requires multiple joins (across several DMOs). You don't need the latest data—it can be a few hours old for your use case. Because the calculation is done once and used multiple times, it's more efficient billing-wise and it's faster to retrieve.
2. **Include only the needed data**: Include only those DMOs/attributes/CIs/Segment Memberships that are frequently accessed. Exclude additional data that is needed but not as often and query those DMOs separately. Note: you can combine the data from a data graph with data queried directly from DMOs at your application layer. This makes sure that only frequently accessed data is precomputed.
3. **Consider breaking a big data graph into smaller data graphs:** A bigger (and more complicated) data graph is more costly to keep updated. In some cases, it can help to break the data graph into smaller ones.
4. **Make sure data modeling is done correctly**: When you build a data graph, you can add related DMOs based on relationships defined in the data modeling stage. When Data Cloud pre-calculates the data graphs, it joins the different DMOs using the join keys set in the modeling stage. If these relationships aren't configured correctly, joins can take a long time to run, affecting performance.
5. **Prevent unbounded explosion while adding related DMO:** While adding a related DMO into the data graph definition, watch out for related DMOs which have a 1:N relationship from the parent DMO to the child DMO. This is important because if there are multiple related records for a given parent record, it'll all be included (unless it is an engagement type DMO where it's limited). If you aren't sure about the potential limit on cardinality of such 1:N relationships consider removing such DMOs from the data graph.

Best Practices

Common Discovery Questions	Design Considerations
• How frequently do you need to query	• Data Graphs consume less data than

your DMOs?	querying a DMO.
• What volume of data will be queried?	• What is the look back period you will need in your Data Graph?

Conclusion

Data Graphs are powerhouse tools within Data Cloud. By tapping into their power, you'll easily transform your data into a 360 view of your customer, providing in-depth insights that will aid in forecasting and future planning. The steps outlined in this guide will help you to quickly & easily access the power of Data Cloud by maximizing your use of these tools.

Resources

Help Article: Data Graphs
Help Article: Data Graph Structures
Help Article: Add Calculated Insights to a Data Graph
Help Article: Edit a Data Graph
Help Article: Delete a Data Graph
Help Article: Refresh a Data Graph
Help Article: Record Caching and User Session Length
Help Article: Real-Time Capabilities in Data Cloud
Help Article: Event: Custom Real-Time Data Graph Event
Trailblazer Community: Optimize Data Graph Performance & Credit Usage