Foglight for Snowflake

Cartridge Guide

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Introduction to Snowflake

Snowflake is a rapidly growing cloud computing and services company founded in 2012 with 1300+ partners and thousands of customers across multiple industries and government. Data currently managed by Snowflake exceeds 250PB, with 515 million data workloads run every day.

Snowflake is a fully managed database that offers data storage and analytics along with a host of other features that provide automation, data resiliency, and secure access. Snowflake provides a highly scalable cross-platform service that unifies structured or unstructured data hosted on cloud storage platforms currently including Amazon S3, Microsoft Azure, and Google Cloud Platform. Compute and cloud service resources are charged for only active usage by the second and highly configurable for cost-saving and scalability.

Foglight for Snowflake Overview

Foglight for Snowflake brings comprehensive, non-siloed, enterprise-class monitoring to the industry's most innovative cloud data management platform. Used standalone, Foglight for Snowflake is a robust monitoring solution providing insight into database performance and usage. When used in conjunction with other Foglight monitoring components, operators can collect and correlate information across infrastructure layers. This added value makes Foglight for Snowflake an invaluable part of this industry-leading Database Performance Monitoring solution.

Foglight for Snowflake monitors all editions of Snowflake, bringing in critical performance data of compute warehouses, storage, and data intake and highlights queries using large amounts of resources or experiencing failures or bottlenecks in the database. Additionally, Foglight for Snowflake monitors credit usage at the query, warehouse, and account level as well as tracking user security roles and failed login attempts.

Ease of Installation

Installation of the solution takes only minutes. One remote agent monitors a single Snowflake Account in an organization. Configuration requires only a valid Snowflake user with the necessary permissions and details of the account you wish to monitor. Additional configuration to exclude certain databases, modify collection intervals, and customize the number and sorting dimension of tables and queries collected is also possible.

Data Visualization and Reporting

Foglight for Snowflake provides quick access to vital performance data. The solution leverages rich dashboards and robust data analysis to quickly uncover critical issues affecting bottlenecking, data intake problems, and higher than expected credit usage.

Extensibility

As the range of Snowflake offerings grows, Foglight for Snowflake will continue to grow with them, bringing new insight into a powerful APM platform to decrease problem resolution time and optimize efficiency.

Paying Dividends

With feature-rich out-of-the-box dashboards and rules, Foglight for Snowflake provides unparalleled insight into your Snowflake account and offers immediate benefits to database administrators. As data is collected, the solution pays additional dividends delivering historical trend analysis, scheduled reports, and improved alerting. Operators can easily create user-defined dashboards to represent data in a manner unique to their organization.

Combined, these features bring great insight into database and application availability and ensure improved access to mission-critical data.

Foglight for Snowflake Requirements

Foglight for Snowflake uses the official Snowflake JDBC connector and is compatible with all active versions of Snowflake.

The agent may be run on a FglAM located on any compatible operating system as long as the Snowflake URL is reachable and the Snowflake user has the necessary privileges. More information on configuration can be found in the Installing and Configuring Agents section of this document.

Installing and Configuring Agents

Installation instructions for Foglight for Snowflake are detailed in the following sections and should be performed in order:

- Snowflake Pre-Configuration
- Cartridge Installation
- Creating and Configuring Agents

Foglight for Snowflake Pre-Configuration

Monitoring requires the agent to be provided with a Snowflake user. That user should have sufficient privileges to access limited data and functions in system tables located in the Snowflake and user-created databases. It is recommended that you create a role and assign it to the user for this purpose. The following is a brief list of steps on how to do this. Skip any steps in configuration that were previously completed. For additional information, refer to the complete Snowflake User Management documentation.

Snowflake Role Setup

1. In the Snowflake console, with a user that has the ACCOUNTADMIN role selected, navigate to Admin>Users & Roles in the navigation pane on the left.

2. Select “Roles” at the top of the page, then “Table” below it and at the top-right of the page, click the “+ Role” button to create a new role and name it *MONITORADMIN* or a name of your choice.

3. Select the new role in the list of roles and then on the details page click the “…” at the top-right, then “Manage global privileges” in the menu.

4. In the Manage Global Privileges for Role popup, use the “Global privilege to grant” dropdown to select “Monitor Execution” and “Monitor Usage”, then click “Update Privileges”.

5. If the user already exists, click the “Grant to User” button in the bottommost section of the details page to grant the *MONITORADMIN* role to the user. Otherwise, the role can be attached during user creation.

6. Next, we need to assign the role the ability to execute queries on a warehouse. In the left navigation panel, go to Admin>Warehouses and select or create the warehouse that will be assigned to the monitoring user. In the bottommost section of the details page, grant the “USAGE” privilege to *MONITORADMIN*. Read Selecting a Compute Warehouse below for important information to consider when designating a warehouse.

7. Next, we need to assign the role privileges on data objects. In the left navigation panel, go to Data>Databases, and select the Snowflake database first. In the Privileges section, click the “+ Privilege” button and assign to the *MONITORADMIN* role “IMPORTED PRIVILEGES”, then click “Grant Privileges”.

8. For each other database that you wish for the agent to monitor, assign the USAGE role for the database to *MONITORADMIN* and for each existing pipe (found in *database>schema*>Pipes, the *MONITOR* privilege. You can also assign in the database “MONITOR - FUTURE PIPE” so that each new pipe that is created will automatically assign its monitoring privilege to *MONITORADMIN*.

Snowflake User Setup

1. In the Snowflake console, with a user that has the ACCOUNTADMIN role selected, navigate to Admin>Users & Roles in the navigation pane on the left.

2. At the top-right of the page, click the “+ User” button to create a new user and provide the relevant details.

3. Then, expand “Advanced User Options” and assign the default role *MONITORADMIN* or the role you have created with appropriate privileges and a default warehouse for the user to use when performing queries. Read Selecting a Compute Warehouse below for important information to consider when designating a warehouse.

4. Finish by clicking “Create User”.

FMS Configuration

Because data gathered from some Snowflake sources are only available after a window of latency, some additional configuration steps are required for the FMS to handle this delay correctly.

FMS Host Machine

1. Navigate to C:\Quest\Foglight\config or the corresponding directory on the host where your FMS is installed and open the server.config file.

2. In the section with server VM options, add the following line (increment the option number if other options are already present). This increases the time limit for historical data to be submitted from 2 hours to 3 hours.

   server.vm.option0 = "-Dfoglight.data_service.max_past_timestamp_delta=10800000";

FMS Web Console

1. In the FMS web console, navigate to Administration>Schedules>Manage Schedules in the left navigation tab.

2. Click on the “Daily Database Maintenance” schedule and then the item in the table and modify the start time to 3am. This ensures that any historical data collected for the previous day with a latency of up to 3 hours will be included in the nightly observation data rollup.

Selecting a Compute Warehouse

While the Snowflake agent requires minimal resources to execute monitoring queries, there are important technical and billing implications to consider when designating a warehouse for the Snowflake user to employ. The warehouse is assigned to the user either through the default warehouse setting for the Snowflake user or through the Agent Properties.

First, the Snowflake user must have the privilege to execute queries on a warehouse. This requires the USAGE privilege. It is preferred that the warehouse be either constantly running or set to auto-resume. Otherwise, an admin with OPERATE privilege on the warehouse will be required to start it from a suspended state. If auto-suspend is enabled, the warehouse will suspend itself when it has not received a query in the last *x* minutes. If the warehouse is set to auto-resume, then it will automatically resume to execute a query when one is submitted. There is generally a delay of several seconds in query execution when a warehouse resumes while it provisions resources, but this will have no impact on the agent’s data collection.

Secondly, it is important to understand how Snowflake charges for compute resources. Based on the size of a warehouse, Snowflake will charge *x* credits per hour of usage. While charges are calculated per second (minimum 60 seconds) of usage, usage simply means that the warehouse is in an active (not suspended or provisioning) state. This also means that if a warehouse were to resume from a suspended

state to run queries for 5 seconds, it will still be charged for 60 seconds of usage. If it were to do this once a minute, the cost would be the same as if the warehouse was constantly active and running queries.

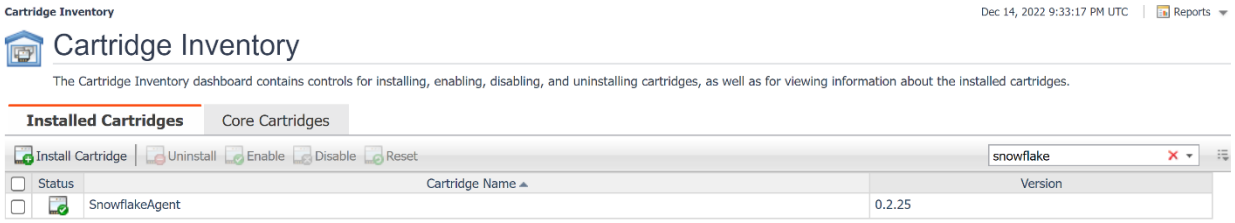
Therefore, there are two recommended configurations for maximum benefit at low cost:

1. Assign the monitoring user to a warehouse handling other workloads that has compute resources to spare that is either constantly running or not expected to receive a significant spike in query submissions while auto-suspended. Running agent queries on this type of warehouse will not result in any additional costs and very low impact on existing workload.

2. Run the agent on a dedicated warehouse. This will have no impact on other workloads, but will increase costs. However, we have several recommendations on how to reduce these costs:

    a. Use a warehouse of X-Small size. Agent queries do not require many compute resources.
    b. Enable auto-resume and auto-suspend with a very low suspension delay, like 15 seconds. Queuing while waiting for a suspended warehouse to resume will not affect data integrity.
    c. Set collection intervals in the Agent Properties to similar intervals and none shorter than 5 or 10 minutes. If different collections are run at the same time and at a longer interval, this will maximize the amount of time that a warehouse can remain suspended and thus not using credits.

Cartridge Installation



1. Open the Foglight Web Console.
2. From the navigation pane, select: **Administration** > **Setup** > **Manage Licenses**. The Licenses screen appears. Click the Install button in the table and then upload a valid Snowflake .license file from your computer.
3. From the navigation pane, select: **Administration** > **Cartridges** > **Cartridge Inventory**. The Cartridge Inventory screen appears.
4. Load the ***SnowflakeAgent-6_xx.car*** file by browsing to the location where the .car file exists and then clicking on "Install Cartridge." Leave the "Enable on Install" check box checked.
5. Once the installation is complete on the Foglight Management Server, the SnowflakeAgent Cartridge will appear in this list below as an installed cartridge.

For more information on these dashboards, read the *Foglight User Guide.*

Creating and Configuring Agents

Using the Agent Status Dashboard

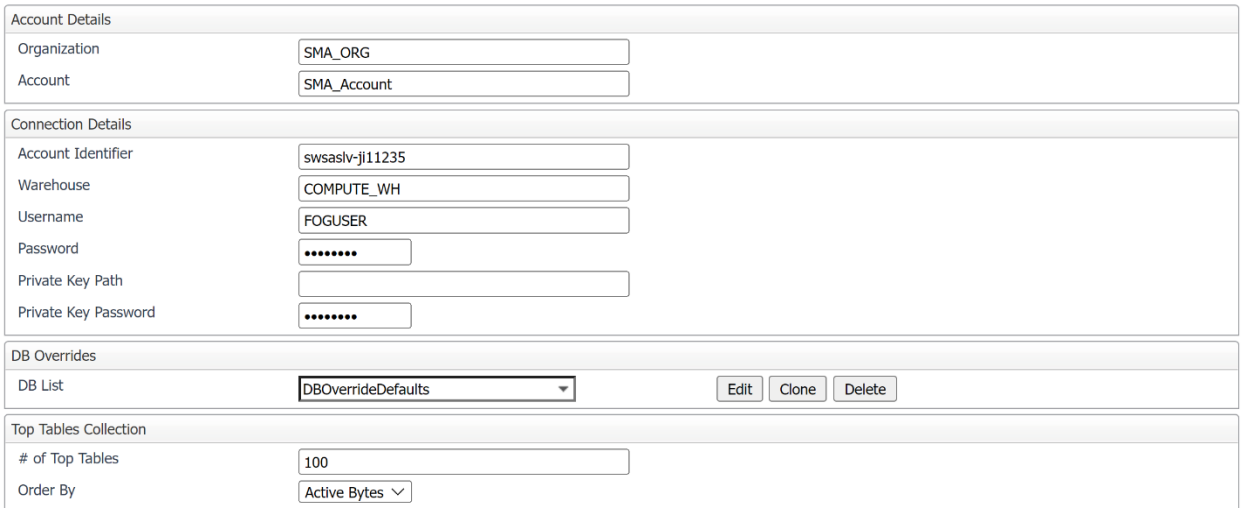
The Agent Status page can be used to create new agents and configure and manage existing agents. To access the page from the navigation pane, select: **Dashboards > Administration > Agents > Agent Status**.

Use the following steps to create a new agent instance:

1. If the Snowflake agent package was not previously deployed to the FglAM hosting the agent, it must be done before an agent has been created, or it will be performed automatically when the first agent is created on that FglAM. You can use the Deploy Agent Package button on the Agent Status or Agent Managers page to perform this.
2. Click the Create Agent button and follow the instructions for the cards:
    a. **Host Selector** - Choose the Agent Manager on which the agent should run. Considerations for this may include physical or virtual locality to the monitored instance, allocated resources, or grouping with other agents of the same type or monitored environment.
    b. **Agent Type and Instance Name** – Select the SnowflakeAgent type. Then, select the Specify Name radio button and provide a name for the agent that will be created. This is not canonical and should be representative of the account that this agent will monitor.
    c. **Summary** – Click Finish.
3. Once the agent has been created, click the checkbox next to the Snowflake agent.
4. Click the **Edit Properties** button.
5. Select **Modify the default properties for this agent**.
6. Edit the agent properties for the Snowflake agent instance:
    - Setting Account Details (mandatory)
    - Setting Connection Details (mandatory)
    - Setting DB Overrides (optional)
    - Setting Top Tables Collection (optional)
    - Setting Top SQL Collection (optional)
    - Setting Collection Intervals (optional)
7. Click the **Activate** button.

To modify the properties for an existing agent, skip to step 3 and Deactivate, then Reactivate the agents after changing the configuration.

Agent Properties



Setting Account Details (mandatory)

- **Organization** – The organization that this account belongs to. The Foglight topology created for this account will be under this organization, so it is very important that any accounts belonging to this organization are all provided the exact same string in the agent properties. It is not required for this to match the organization name used by Snowflake.
- **Account** – The name this account will be given in Foglight. This is not used for connection purposes, so it is not required for this to match the account name used by Snowflake.

Setting Connection Details (mandatory)

- **Account Identifier** – This is generally in the format of *organization-account* and used in the URL for accessing an account like *account_identifier*.snowflakecomputing.com. You can also find the organization and account ID in the Snowflake console Admin>Accounts page. Hovering over the account name will make visible a link icon with the URL for the account containing the account ID.
- **Warehouse** – Sets a default compute warehouse for the user provided to the agent to use when executing monitoring queries. If left blank, it will use the default warehouse assigned to the Snowflake user, if this exists. Read Selecting a Compute Warehouse earlier in this document for important information to consider when designating a warehouse.
- **Username** – The Snowflake user that will be running monitoring queries.
- **Password** – The password for the Snowflake user.
- **Private Key Path** – File path to an optional private key file for user authentication.
- **Private Key Password** – Password for the private key file.

Setting DB Overrides (optional)

- **Database Name** – The name of a database to override default collection properties for.
- **Exclude DB-level Stats** – If true, data will not be collected for schema, pipes, and tables belonging to this database.

Setting Top Tables Collection (optional)

- **# of Top Tables** – Maximum number of tables that will be included for each sample collection.

- **Order By** – Dimension by which to order the tables collected before the cutoff limit. For example, if Active Bytes is selected, then the *x* tables with the largest Active Bytes will be collected.

Setting Top SQL Collection (optional)

Collects individual top SQL statements run during the sample period according to the configured order by and limit properties.

- **Enable Statement Tracking** – If true, top statements will be collected based on the limit and order by values.
- **# of Top Statements** – Maximum number of statements that will be included in each sample collection.
- **Statement Text Length** – Cutoff limit for characters collected in a single SQL statement text string. If set to 0 or lower, the entire query text will be collected.
- **Order by** – Dimension by which to order the tables collected before the cutoff limit. For example, if Execution Time is selected, then the *x* statements with the longest Execution Time will be collected.

Setting Collection Intervals (optional)

The Collection Interval fields in the agent properties are used to set sample frequencies for collections. The values provided are the recommended default intervals. Certain collections are not included in this list due to technical requirements that they take place at specific intervals. Any collections that are removed from this list will be scheduled at their default interval, while providing an interval of 0 for a collection will disable it entirely.

- **Collection Name** – Name of the collection to override.
- **Interval (sec)** – Number of seconds between collection samples.

Upgrading the Agent

1. Go to **Administration > Cartridges > Cartridge Inventory** and click the Install Cartridge button.
2. Locate the .car file on your system and install it with auto-enable selected.
3. Once the Cartridge is installed and enabled, go to **Administration > Agents > Agent Managers**. Agent Managers that can be upgraded with newer agent packages will show "yes" in the Upgradable | Agents column. Select all Agent Managers you wish to upgrade and click the Upgrade or Deploy Agent Package button and select the SnowflakeAgent package. This action can also be performed on the **Agent Status** page with the same effect. It is not possible to run two different versions of the same agent on a single FglAM, so upgrading any agent of a type on a FglAM will affect all hosted agents of that type.

Note: If an Agent Manager is not upgradable, check that the Agent Manager version is compatible with the newer agent version. If it is not, the Agent Manager will need to be upgraded first. If it is compatible even though the page does not show it as upgradeable, you can deploy the new package anyway and the agent will be updated.

Snowflake Dashboards

The installation of the Snowflake Cartridge includes the Snowflake Dashboards. The Snowflake Cartridge offers these main dashboards:

- Snowflake Accounts
- Overview
- Warehouses
- Queries
- Storage
- Pipes
- Users

Snowflake Accounts

Search

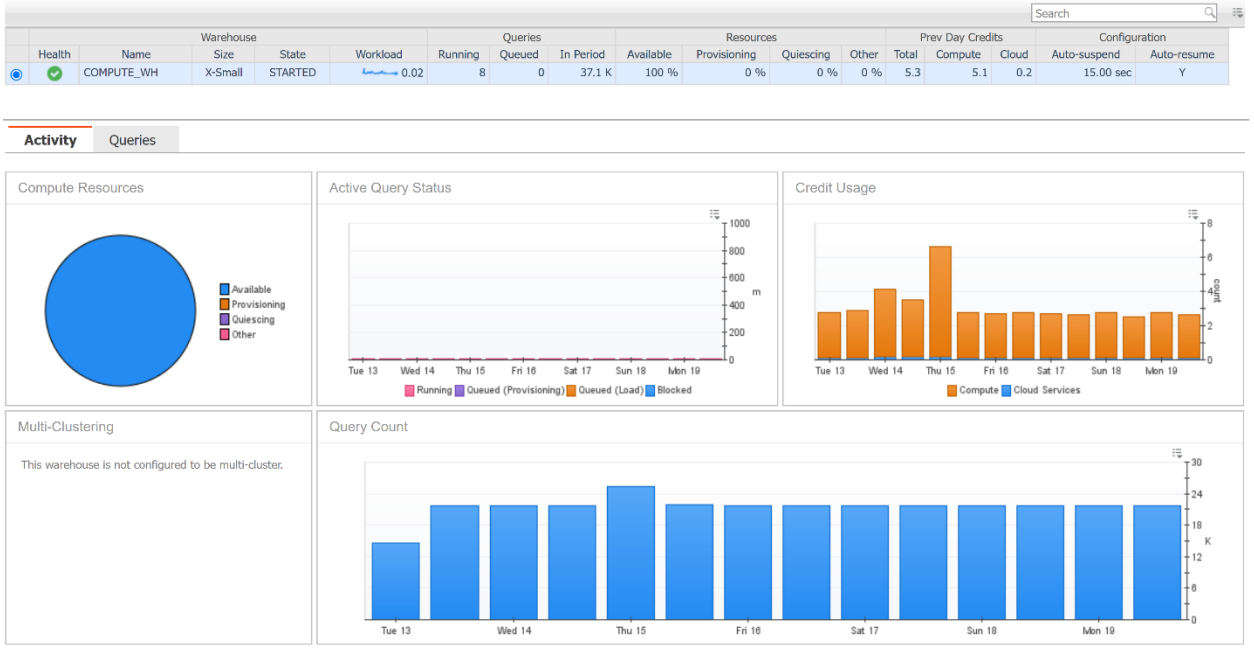
Account						Alarms			Storage			Objects				
Health	Organization	Name	Availability	Workload	Prev Day Credits	F	C	W	Stage	Storage	Failsafe	Warehouses	Databases	Tables	Pipes	Users
	SMA	SMA_Account3	100 %	0.01	5.62				15.5 MB	7 KB	69 KB	2	4	6	2	7

The Snowflake Accounts dashboard shows all accounts monitored with this FMS. Displayed for each account are availability and workload, health and alarms, daily credit usage, and object counts and storage size by type. Clicking on the account name will drill down to the Overview page for the selected account, while clicking or hovering on many other column values will expose more data.

Overview

The Overview page gives an overview of key segments for a Snowflake account. Information includes availability, storage distribution and growth, performance and pipe activity and queueing, and warehouse status, resources, and credit. The page's right side features an expandable summary box that displays the Top 10 Alarms by severity currently active for this account as well as the top 10 queries collected.

Warehouses



The Warehouses dashboard lists all warehouses in the account along with their configuration information, active query counts, status and resource availability, and credit usage. When a warehouse from the table is selected, the bottom section will update with more information on the selected warehouse.

The Activity tab features several graphs with a historical view of activity for the warehouse. Graphs display average queries by state run on the warehouse, total credit usage, and total number of queries run. Additionally, a pie chart shows a visual representation of compute resource allocation if the warehouse is currently running and the number of started instances for the warehouse if multi-clustering is enabled.

The Queries tab features a table that groups queries run on the warehouse by type (SELECT, INSERT, etc.) and displays for the time period selected the query outcomes (successful, failed, incident), information on elapsed time and queueing, query load percent, and credit usage. When a query type is selected, the other area in this section will update with a more detailed visual breakdown of metrics related to that query type.

Queries

Samples in history: 12/14/22 7:49 PM - 12/14/22 8:19 PM

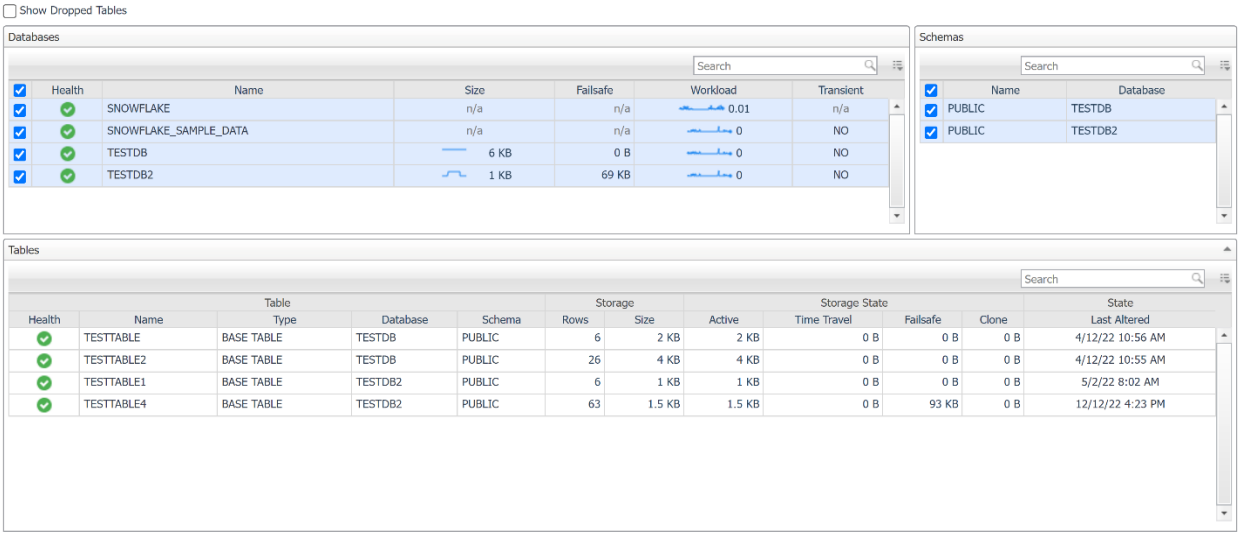
Search

Time		User	Query		Warehouse	Status		Query Times			Queue Times					
Start	End	Name	Query Text	Database	Name	Exec Status	Error Code	Total	Compilation	Execution	Trans Blocked	Provisioning	Repair	Overload	Produced	In
12/13/22 10:07 AM	12/13/22 10:07 AM	FOGUSER	SELECT ANY_VALUE(WAREHOUSE_NAM...	SNOWFLAKE	COMPUTE_WH	SUCCESS	0	3.2 sec	2.7 sec	378 ms	0 ms	107 ms	0 ms	0 ms	1	
12/13/22 10:07 AM	12/13/22 10:07 AM	FOGUSER	SELECT ANY_VALUE(DATABASE_NAME) ...	SNOWFLAKE	COMPUTE_WH	SUCCESS	0	3.1 sec	2.7 sec	337 ms	0 ms	107 ms	0 ms	0 ms	1	
12/13/22 10:22 AM	12/13/22 10:22 AM	FOGUSER	SELECT ANY_VALUE(WAREHOUSE_NAM...	SNOWFLAKE	COMPUTE_WH	SUCCESS	0	3 sec	2.3 sec	642 ms	0 ms	0 ms	0 ms	0 ms	2	
12/13/22 10:22 AM	12/13/22 10:22 AM	FOGUSER	SELECT *, m.ACTIVE_BYTES + m.TIME...	SNOWFLAKE	COMPUTE_WH	SUCCESS	0	22.8 sec	1.9 sec	20.9 sec	0 ms	0 ms	0 ms	0 ms	6	
12/13/22 10:22 AM	12/13/22 10:22 AM	FOGUSER	SELECT * FROM INFORMATION_SCHEM...	TESTDB	COMPUTE_WH	SUCCESS	0	1.6 sec	1.4 sec	237 ms	0 ms	0 ms	0 ms	0 ms	2	
12/13/22 10:22 AM	12/13/22 10:22 AM	FOGUSER	SELECT PIPE_SCHEMA, PIPE_NAME, CO...	TESTDB2	COMPUTE_WH	SUCCESS	0	1.4 sec	1.3 sec	57 ms	0 ms	0 ms	0 ms	0 ms	0	
12/13/22 10:22 AM	12/13/22 10:22 AM	FOGUSER	SELECT * FROM INFORMATION_SCHEM...	TESTDB2	COMPUTE_WH	SUCCESS	0	1.3 sec	1.2 sec	122 ms	0 ms	0 ms	0 ms	0 ms	0	
12/13/22 10:22 AM	12/13/22 10:22 AM	FOGUSER	SELECT * FROM INFORMATION_SCHEM...	SNOWFLAKE_SAMPLE_DATA	COMPUTE_WH	SUCCESS	0	1.3 sec	1.1 sec	193 ms	0 ms	0 ms	0 ms	0 ms	0	
12/13/22 10:22 AM	12/13/22 10:22 AM	FOGUSER	SELECT CONCAT(PIPE_SCHEMA,'.',PIPE...	TESTDB2	COMPUTE_WH	SUCCESS	0	1.3 sec	1.1 sec	141 ms	0 ms	0 ms	0 ms	0 ms	0	
12/13/22 10:22 AM	12/13/22 10:22 AM	FOGUSER	SELECT * FROM INFORMATION_SCHEM...	TESTDB	COMPUTE_WH	SUCCESS	0	1.3 sec	724 ms	303 ms	0 ms	0 ms	0 ms	271 ms	2	
12/13/22 10:12 AM	12/13/22 10:12 AM	FOGUSER	SELECT ANY_VALUE(DATABASE_NAME) ...	SNOWFLAKE	COMPUTE_WH	SUCCESS	0	1.1 sec	553 ms	410 ms	0 ms	127 ms	0 ms	0 ms	4	
12/13/22 10:22 AM	12/13/22 10:22 AM	FOGUSER	SELECT * FROM ACCOUNT_USAGE.USE...	SNOWFLAKE	COMPUTE_WH	SUCCESS	0	2.1 sec	677 ms	1.3 sec	0 ms	145 ms	0 ms	0 ms	6	
12/13/22 10:22 AM	12/13/22 10:22 AM	FOGUSER	SELECT * FROM ACCOUNT_USAGE.GRA...	SNOWFLAKE	COMPUTE_WH	SUCCESS	0	1.9 sec	664 ms	1.2 sec	0 ms	0 ms	0 ms	0 ms	9	
12/13/22 10:17 AM	12/13/22 10:17 AM	FOGUSER	SELECT ANY_VALUE(WAREHOUSE_NAM...	SNOWFLAKE	COMPUTE_WH	SUCCESS	0	1 sec	473 ms	412 ms	0 ms	136 ms	0 ms	0 ms	1	
12/13/22 10:32 AM	12/13/22 10:32 AM	FOGUSER	SELECT ANY_VALUE(DATABASE_NAME) ...	SNOWFLAKE	COMPUTE_WH	SUCCESS	0	1 sec	352 ms	583 ms	0 ms	104 ms	0 ms	0 ms	4	
12/13/22 10:32 AM	12/13/22 10:32 AM	FOGUSER	SELECT ANY_VALUE(WAREHOUSE_NAM...	SNOWFLAKE	COMPUTE_WH	SUCCESS	0	941 ms	367 ms	466 ms	0 ms	104 ms	0 ms	0 ms	1	

The Queries page displays the top *x* number of queries for each sample period according to the configuration specified in the agent properties. Each row of the table contains data associated with the query, along with the query text itself, which can be viewed fully by clicking or hovering on the abbreviated text. Available data includes when the query executed, the user, role, and session associated with the query, the database and warehouse it was performed on, queue and execution timings and result status, and the credit usage of that query. Some columns are hidden by default and can be shown by using the table customizer at the top-right of the table.

The “Samples in history” dropdown indicates which sample period is represented by the queries in the table below. You can navigate between sample periods by selecting another period. Also, the samples available in the dropdown are restricted to the time range for the dashboard. When the time range is changed, the list of sample periods available will subsequently be updated.

Storage



The Storage page contains information on the databases, schema, and tables in the Snowflake account. The number and qualifying metric for whether a table is available on this page is determined by the configuration of the Top Tables section in the agent properties of the agent monitoring this account. Also, any tables in databases appearing in the DB Overrides section of the agent properties will similarly be excluded.

The Databases table lists all databases, the space used for storage and failsafe data, the workload for that specific database, and other configuration information. If a database row is unselected, schemas and tables belonging to that database will not be shown in other tables on this page.

The Schema table lists all schemas contained in selected databases and other configuration information. Like the Databases table, deselecting a schema will hide any tables found within that schema from the Tables table.

The Tables table features configuration information, storage usage by rows and size, usage by storage state, the current state of the table, and clustering information if applicable. The “Show Dropped Tables” checkbox at the top of the page will show dropped tables if selected. Even if dropped, Snowflake users are still billed for storage for as long as data remains in the active, time travel, or failsafe storage spaces.

For all tables, some columns are hidden by default and can be shown by using the table customizer at the top-right of that table. Additionally, metric information can be clicked on or hovered over for a popup graph of that metric’s history within the page’s time range.

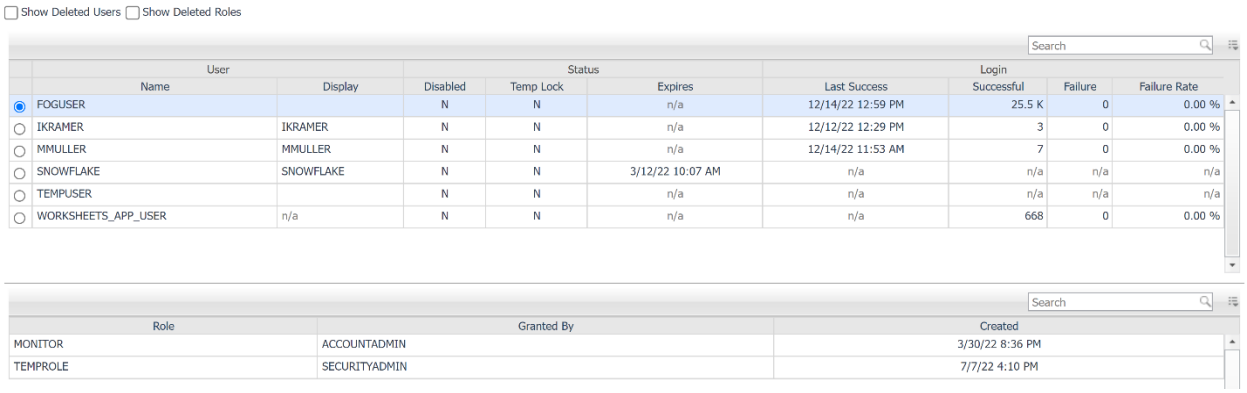
Pipes

Search

Pipe				Activity			Current Execution			Errors			
Database	Schema	Name	Autoingest	Credits Used	Bytes Inserted	Files Inserted	State	Pending Files	Outstanding Msg	Channel	Last Error	Compilation	Fault
TESTDB	PUBLIC	TESTPIPE	N	0	0 B	0	RUNNING	0	n/a	n/a	n/a	n/a	n/a
TESTDB	PUBLIC	TESTPIPE2	N	0	0 B	0	RUNNING	0	n/a	n/a	n/a	n/a	n/a

The Pipes page lists all pipes in the account. Pipes are used in order to ingest data into Snowflake from other sources. Each row features identifying information on the pipe, configuration, pipe activity for the current time range (total credit usage and data and files inserted), and the current state of the pipe and any associated errors.

Users



The Users page lists all users in the Snowflake account. User information includes identifying information for the user, current status of the user account, and other configuration details. The Login columns show when the last successful login occurred as well as the number of successful and failed login attempts in the page time range. A number of failed logins can indicate a password misconfiguration in an application or unauthorized attempts to gain access into the system. The “Snowflake User Failed Logins” rule is available to watch for this and can be customized with a higher/lower threshold for how many failed attempts to allow before generating an alarm. When a user is selected, the table on the bottom section of the page will update with a list of all roles granted to that user, as well as by who and when it was created/deleted. If the checkboxes at the top of the page are selected, users/roles that have been deleted will be shown in the tables if they exist.

Snowflake Rules

The following is a summary of rules available out-of-the-box with the Snowflake cartridge. Default threshold values can be changed or scoped to specific values, generally through registry variables. These rules can be copied, modified, disabled, or customized in a wide variety of ways. For more information on this, refer to Foglight documentation or contact Quest Software PSO.

Snowflake Availability

Alert if the availability is less than 100% for two consecutive periods.

Snowflake High Account Workload

Alert if the account workload is significantly higher than its historical weekly average.

Snowflake High Database Storage Growth

Alert if the database workload is significantly higher than its historical weekly average.

Snowflake High Database Workload

Alert if the database growth is significantly higher than its historical weekly average.

Snowflake High Percentage of Queries Blocked

Alert if there is a high percentage of queries blocked.

Snowflake High Percentage of Queries Failed

Alert if there is a high percentage of failed queries.

Snowflake High Percentage of Queries Queued

Alert if there is a high percentage of queries queued.

Snowflake Pipe Execution State

Alert if the pipe execution state is not running or paused.

Snowflake User Failed Logins

Alert if a user has had failed login attempts in a period of time.

Snowflake Warehouse Credit Usage

Alert if a warehouse's average daily credit usage is significantly higher than its historical weekly average.

Snowflake Reports

Snowflake Credit Usage Report

Displays credit usage for compute and cloud services by warehouse along with workload and total queries run in the time period.

Snowflake Pipes Report

Displays all pipes in account with information on data insertion size, credit usage, and current status.

Snowflake Queries Report

Displays top *x* queries by the selected metric in the time range with result, query and queue timing, and credits used.

Snowflake Tables Report

Displays top *x* tables by the selected metric with table configuration, size and storage distribution, and last alteration date.

Snowflake Users Report

Displays Snowflake users in an account with configuration, active roles, login activity, and security information.