Staging Data into Snowflake

Data Sheet | LumenData

A comprehensive guide involving an introduction to internal staging, followed by a detailed explanation of how to perform external staging from AWS S3 bucket to Snowflake.

REQUIREMENTS:

1. **Snowflake account:** Click on the link to create a Snowflake free trial account.

2. Snow SQL

2.1 Go to the official Snowflake page to install

snowflake" DOCUME	NTATION	Getting Started	Guides	Developer	Reference	Releases	Status 🕑	۹	Search documentation	Ctrl+K	
		What do you	think of our S	Snowflake docum	nentation? Take t	the survey				,	×
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2.2 Click the "SnowSQL Download" link. And download the latest version for your OS.

snowflake DEVELOPERS pocs	COMMUNITY MEDIUM YOUTUB BLOG CHANNE	E OPEN DOWNLOADS START FOR FREE
Download the latest ve	rsion for your OS	
SNOWSQL FOR LINUX	SNOWSQL FOR MACOS	SNOWSQL FOR WINDOWS

2.3 You can check if Snow SQL is installed in your system by running the following command in command prompt. "SnowSQL -v"





INTERNAL STAGE:

The data is stored internally. There are 3 types of Internal Stages:

- Each user's Personal Storage Area is called the User Stage. These Stages are personal to the user, which means no one else can see them. By default, each user is assigned a User Stage, which cannot be changed or removed.
- Within a Table Object, Table Stages are Storage locations. This is useful when only a few files need to be imported into a certain table, and these Stages will get the job done the quickest. They are, however, limited to that one table, and other tables cannot access the files.
- Within a Snowflake Database/Schema, Internal Named Stages are Storage Location Objects. Since they are Database Objects, they are subject to the same Security Permissions as other Database Objects. Unlike User and Table Stages, these Stages are not created automatically. They do, however, offer more versatility when it comes to importing files into different Tables and/or allowing Multiple Users to access the same Stage.

To perform Internal Stage, you need to follow the steps given below

1. Sign in to our Snowflake account by following the command(example) "-a bs43004.ap-southeast-1 -u Hushalld" In this command "-a" stands for account accessing point and "-u" stands for the username of the Snowflake account. Press 'enter' and put the password.

2. After entering the password, you will get a prompt to select the database and schema.



3. You can select "USE WAREHOUSE followed by the warehouse name" to specify the warehouse name to be used.



4. Then, you need to specify the Database name using "Use Database and followed by the database name".

🕾 Command Prompt - snowsql X + 🗸 — 🗇	×
<pre>C:\Users\HushalBarmar>snowsql -a bsu3004.ap-southeast-1 -u Hushalld We were unable to create or write to the/snowsql_rt.log_bootstrap. Make sure you have permission to write to the log file's parent folder or t odify the location of the log file specified in the SnowSQL log_file configuration option. See docs: https://docs.snowflake.com/en/user-guide/snow l-config.html#log-file Observed error: [Errno 13] Permission denied: 'C:\\Users\\snowsql_rt.log_bootstrap' We were unable to create or write to the/snowsql_rt.log. Make sure you have permission to write to the log file's parent folder or to modify t location of the log file specified in the SnowSQL log_file configuration option. See docs: https://docs.snowflake.com/en/user-guide/snowsql-config tubelog-file Observed error: [Errno 13] Permission denied: 'C:\\Users\\snowsql_rt.log' Passmord: * SnowSQL * v1.2.24 Type SQL statements or !help Hushalld#COMPUTE_HM#(no database).(no schema)>USE WAREHOUSE COMPUTE_WH;</pre>	com wsq :he ig.h
status l	
HUSHAlld#COMPUTE_WH@(no database).(no schema)>USE DATABASE LUMENDATA_SF ;	
to a sector of the sector of t	
Statement executed successfully.	
1 Rom(s) produced. Time Elapsed: 0.598s Hushalld#COMPUTE_WH@LUMENDATA_SF.PUBLIC거	

5. Here, you can create the stages by using the following command "CREATE OR REPLACE STAGE FOLLOWED BY STAGE NAME".

Hushalld#COMPUTE_WH@LUMENDATA_SF.PUBLIC>CREATE	OR REPLACE STAGE LD_MOVIES;
++	
status	
Stage area LD_MOVIES successfully created.	

6. You can check the same in Snowflake web UI after signing in to web UI.

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™ LD_MOVIES ₩ > O SNOWFLAKE > O SNOWFLAKE_SAMPLE_DATA	LD_MOVIES C Type Internal Stage Region — Cloud — Owner A ACCOUNTADMIN Created just now Comment —			

7. You need to "Put" API call in command prompt with the CSV file location form your local system.

" put file://C: \Users\HushalParmar\movies.csv @LD_MOVIES;"

Hushalld#COMPL	TE_WH@LUMENDATA_	SF.PUBLIC>put	file://C:\Usen	<pre>S\HushalParmar\movie</pre>	s.csv @LD_MOVIES;			
source	target	source_size	target_size	source_compression	target_compression	status	message	
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1 Row(s) produ Hushalld#COMPL	iced. Time Elapse ITE_WH@LUMENDATA_	d: 2.274s SF.PUBLIC≯						

8. Check the Snowflake dashboard if the file is loaded in the right stage. "list @ld_movies;

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					Rows Query ID 01acf009-320	1 0-c15e-0

9. You will have to create a table where you can store data and utilize it. After internal staging, it is a convenient option if your files need to be accessible to multiple users and only need to be copied into a single table.

To support bulk loading of the data into tables, Snowflake utilizes stages where the files containing the data to be loaded are stored. Snowflake supports both internal stages and external stages. " CREATE OR REPLACE TABLE MOVIES

(movie_id varchar, movie_title varchar, movie_genres varchar);"

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> O SNOWFLAKE SAMPLE D	Results ~ Chart status Table MOVIES successfully created.	Q III ± II Query Details ···· Query duration 145ms Rows 1 Query ID <u>01act030-3200-c15e-0</u>

10. Next, you can create a file format. Creating file formats in Snowflake is useful when you have data in a specific format that you want to load into Snowflake tables.

CREATE OR REPLACE FILE FORMAT CSV_FORMAT_1 TYPE = CSV FIELD_DELIMITER = ',' SKIP_HEADER = 1 FIELD_OPTIONALLY_ENCLOSED_BY = '"';"

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11. Copy the data from internal stage into table."COPY INTO MOVIESFROM @LD_MOVIES/movies.csvFILE_FORMAT = (FORMAT_NAME = 'CSV_FORMAT_1');"

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12. Verify if the data is loaded correctly. "Select * from movies;"

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	Y Results	Chart	√ Ш ₹ Ш
	MOVIE_ID	MOVIE_TITLE	··· MOVIE_GENRES
	1 1	Toy Story (1995)	Adventure Animation Children Comedy Fantasy
	2 2	Jumanji (1995)	Adventure Children Fantasy
	3 3	Grumpier Old Men (1995)	Comedy Romance
	4 4	Waiting to Exhale (1995)	Comedy Drama Romance
0 0 0			

EXTERNAL STAGE:

When stages are located outside of Snowflake, they are External Stages.

Ex: The files are with external cloud vendors such as AWS S3, Azure BLOB and GCP storage. Unlike internal stages, loading and unloading the data can be directly done using COPY command.

To load files from Amazon S3 into a Snowflake table, you can use External Snowflake stages. All you need to do is create an Amazon S3 bucket, upload files on S3, and use S3 Keys to generate external Snowflake stages for the same.

Requirement: AWS Amazon Account.

/* Creating a stage object by pointing to AWS S3 bucket Here URL -> Go to S3 bucket and select the file, select Copy S3 URI */

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AWS_KEY_ID and AWS_SECRET_KEY we have to get using below steps

Go to AWS account-> Security Credentials -> Go to Access Keys -> Click on Create New Access Key, this will download rootkey.csv file which contains the details.



Access keys (access key ID and secret access key)

Create a bucket in AWS to store the file:

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in S3. Learn more 🔁						
global namespace and follow the bucket naming rules. See rules for bucket naming 🗹						
*						
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	this bucket from other AWS accounts and the use of access control lists (ACLs). Object ownership	this bucket from other AWS accounts and the use of access control lists (ACLs). Object ownership jects.	this bucket from other AWS accounts and the use of access control lists (ACLs). Object ownership jects. d) ACLs enabled Objects in this bucket can be owned by other AWS	this bucket from other AWS accounts and the use of access control lists (ACLs). Object ownership jects. c) ACLs enabled Objects is this bucket can be evened by other AWS is account.	this bucket from other AWS accounts and the use of access control lists (ACLs). Object ownership jects.	this bucket from other AWS accounts and the use of access control lists (ACLs). Object ownership piets.

Upload a file into the S3 bucket that is created.

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Destination s3J/moviedatabucket1 Succeeded	Summary											
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Now, the File is available in AWS.

-	Services Q. Search	[Alt+S]	Ð	\$ Ø	Global	•	•
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STAGING THE AWS FILE INTO SNOWFLAKE:

Create a table for Movies: create table movies (movie_id string(100), movie_title string(100), movie_genres string(100));

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	22 Second Second Seco	Q III ±)1ms

Create a Stage: CREATE or replace STAGE "SF_MOVIES" URL = 's3://moviedatabucket1' CREDENTIALS = (AWS_KEY_ID = '------' AWS_SECRET_KEY ='------

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As you have created the stage, you now have access to the entire bucket on AWS: list @SF_MOVIES;

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> C TPCH_SF1000	35								
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		name	size	md5	last_modified	Query Details			
	1	s3://moviedatabucket1/movies (1).csv	458,390	0509b8c989cd5efd1102ef50a51b20a8	Tue, 13 Jun 2023 06:51:28 GMT	Query duration		90	4ms
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						MOWS			-

CREATION OF FILE FORMAT OBJECT

CREATE FILE FORMAT CSV_FORMAT_1 TYPE = CSV FIELD_DELIMITER = ','

SKIP_HEADER = 1 FIELD_OPTIONALLY_ENCLOSED_BY = ' " ';

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> C TPCH_SF1000	33 34 35				
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	status		Query Details		
	1 File format CSV_FORMAT_1 successfully created.		Query duration		78ms
			Rows		1
			Query ID 01acef	56-3200-c1	5d-0

COPY THE DATA FROM EXTERNAL STAGE TO SNOWFLAKE TABLE.

Copy into movies From @SF_MOVIES/movies.csv File_format = (format_name = 'CSV_FORMAT_1');

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After running the following query "select * from movies;" you can see the loaded data in Snowflake.

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		MOVIE_ID	MOVIE_TITLE	MOVIE_GENRES	Query Details	
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	2	2	Jumanji (1995)	Adventure Children Fantas:		0 mms
	3	3	Grumpler Old Men (1995)	Comedy Romance	Rows	7K
	4	4	Waiting to Exhale (1995)	Comedy[Drama Romance	Query ID 01ad21ff-3	3200-c541-0
	5	5	Father of the Bride Part II (1995)	Comedy	MOVIE ID	A
	6	6	Heat (1995)	Action Crime Thriller		-
	7	7	Sabrina (1995)	Comedy Romance		164977
	8	8	Tom and Huck (1995)	Adventure Children		
	9	9	Sudden Death (1995)	Action	MOVIE_TITLE	≜
	10	10	GoldenEye (1995)	Action Adventure Thriller	100% filled	
	11	12	Dracula: Dead and Loving It (1995)	Comedy Horror		

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The following are some best practices for working with Snowflake Stages:

- If you need to load a file into Numerous Tables, the User Stage is the way to go.
- If you only need to load into one Table, use the Table Stage.
- Numerous Users can access the Internal Named Stages, which can be utilized to Load Multiple Tables. If you want to share files with different users and load them into Multiple Tables, the Internal Named Stage is the way to go.
- For huge files, it is always recommended to use an External Named Stage.

ABOUT LUMENDATA:

LumenData is a leading provider of Enterprise Data Management, Cloud & Analytics solutions. We help businesses navigate their data visualization and analytics anxieties and enable them to accelerate their innovation journeys. Founded in 2008, with locations in multiple countries, LumenData is privileged to serve over 100 leading companies, including KwikTrip, Versant Health, US Food & Drug Administration, US Department of Labor, Cummins Engine, BCG, and others. LumenData is SOC2 certified and has instituted extensive controls to protect client data, including adherence to GDPR and CCPA regulations.

Get in touch to discuss how we can facilitate data-driven transformation for your organization.



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