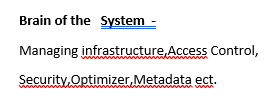
**Snewflake:**

**Snowflake Architecture:**

**Cloud Service **

**Query Processing** Virtual Virtual virtual -**Muscle of the system-**

Warehouse Warehouse Warehouse Performs MMP

(Massive parallel Processing)

**Storage -Hybrid Columnar Storage-**

Saved in blobs

**Virtual Warehouse Sizes:**

**Xs -1(server) -Billed by Second- with 1 minute as minimum**

**S -2(server) -Multi-Clustering(more queries)**

**M -4(servers)**

**L—8**

**XL-16**

**4XL-128**

**Multi clustering**

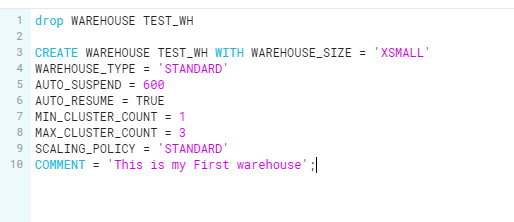
**S \* \***

**S \* \***

**S \* \***

**Create Warehouse**

CREATE WAREHOUSE TEST\_WH WITH WAREHOUSE\_SIZE = 'XSMALL' WAREHOUSE\_TYPE = 'STANDARD' AUTO\_SUSPEND = 600 AUTO\_RESUME = TRUE MIN\_CLUSTER\_COUNT = 1 MAX\_CLUSTER\_COUNT = 3 SCALING\_POLICY = 'STANDARD' COMMENT = 'This is my First warehouse';



**Scaling:**

**>Auto Scaling 🡪 When to start an additional cluster**

**Scalling**

**Standared (Default) Economy**

**(Favor starting additiona WH(SAWH)) (Favors Conserving credits rather then SAWH)**

**Standered:**

1.Immediately when either a query is queued or the system detects that there are more queries then can be executed by the currentlyavailable cluster.

2. After 2 to 3 consecutive successful checks(performed at 1 minute intervals),

Which determine whether the load on the least-loaded cluster could be redistributed to the other cluster

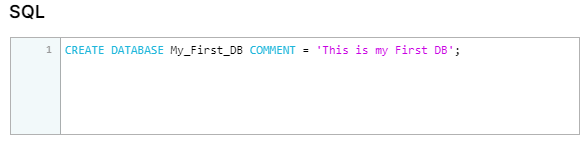
**Economy:**

1.Only if the system estimates there’s enough query load to keep the cluster busy for at least 6 minutes

2.After 5 to 6 consecutive successdul check

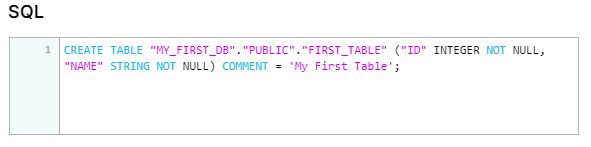
**Creationg DB:**

**CREATE DATABASE My\_First\_DB COMMENT = 'This is my First DB';**

****

**Creating the Table :**

**CREATE TABLE "MY\_FIRST\_DB"."PUBLIC"."FIRST\_TABLE" ("ID" INTEGER NOT NULL, "NAME" STRING NOT NULL) COMMENT = 'My First Table';**

****

**//Creating the table / Meta data**

**CREATE TABLE "OUR\_FIRST\_DB"."PUBLIC"."LOAN\_PAYMENT" (**

**"Loan\_ID" STRING,**

**"loan\_status" STRING,**

**"Principal" STRING,**

**"terms" STRING,**

**"effective\_date" STRING,**

**"due\_date" STRING,**

**"paid\_off\_time" STRING,**

**"past\_due\_days" STRING,**

**"age" STRING,**

**"education" STRING,**

**"Gender" STRING);**

**//Check that table is empy**

**USE DATABASE OUR\_FIRST\_DB;**

**SELECT \* FROM LOAN\_PAYMENT;**

**//Loading the data from S3 bucket**

**COPY INTO LOAN\_PAYMENT**

**FROM s3://bucketsnowflakes3/Loan\_payments\_data.csv**

**file\_format = (type = csv**

**field\_delimiter = ','**

**skip\_header=1);**

**//Validate**

**SELECT \* FROM LOAN\_PAYMENT;**

**Data WareHouse**

**HR data**

**ETL**

**Sales data**

**Data Warehouse**

**=Database that is used for reporting and data analysis**

**ETL=Extract , Transform & Load**

**Reporting**

**Different Layer**

**HR data data Science**

**Other apps**

**Sales data**

**Raw Data --🡪 data integration🡪 Access layer**

**Data Sources**

**Raw layer -- Staging Area**

**Data Integration --- Data Transformation**

**Cloud Computing**

**Data centre(infrastructure,security, electricity,software/hardware Upgrades)**

**Software-as-a Services**

**Application databases,tables,ect**

**|**

**Software Snowflake**

**| managing data storage,Virtual**

**Software as a service Data Warehouses,**

**| Upgrades/Metadata ect.**

**Operation System**

**|**

**Physical Servers**

**| Cloud Provider**

**Virtual Machines AWS,Azure,GCP**

**|**

**Physical Storage**

**GCP-Google Cloud Platform**

**Snowflack Editions**

**1.Standard - ----** introductory level

**2.Enterprise ---**additional features for the needs of large-scale enterprises (multi-cluster warehouse)

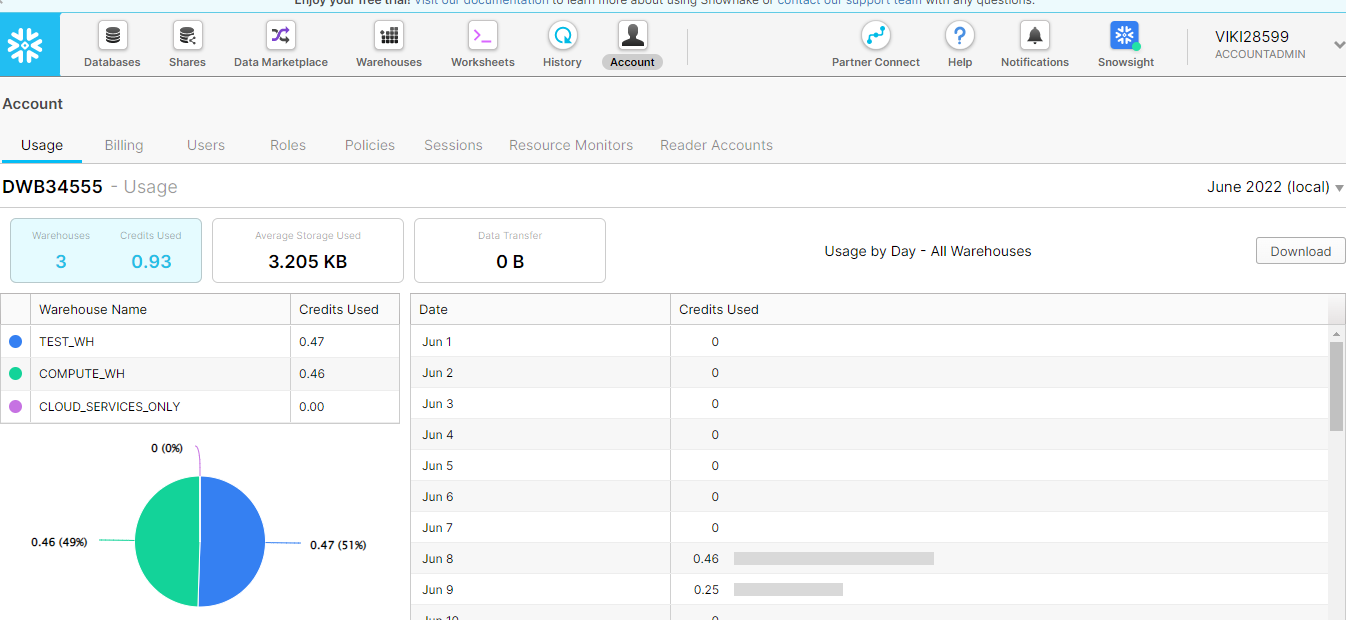
**3.Business Critical ---**even higher level of data protection for orrganizations with extremely sensitive data(Extended support)

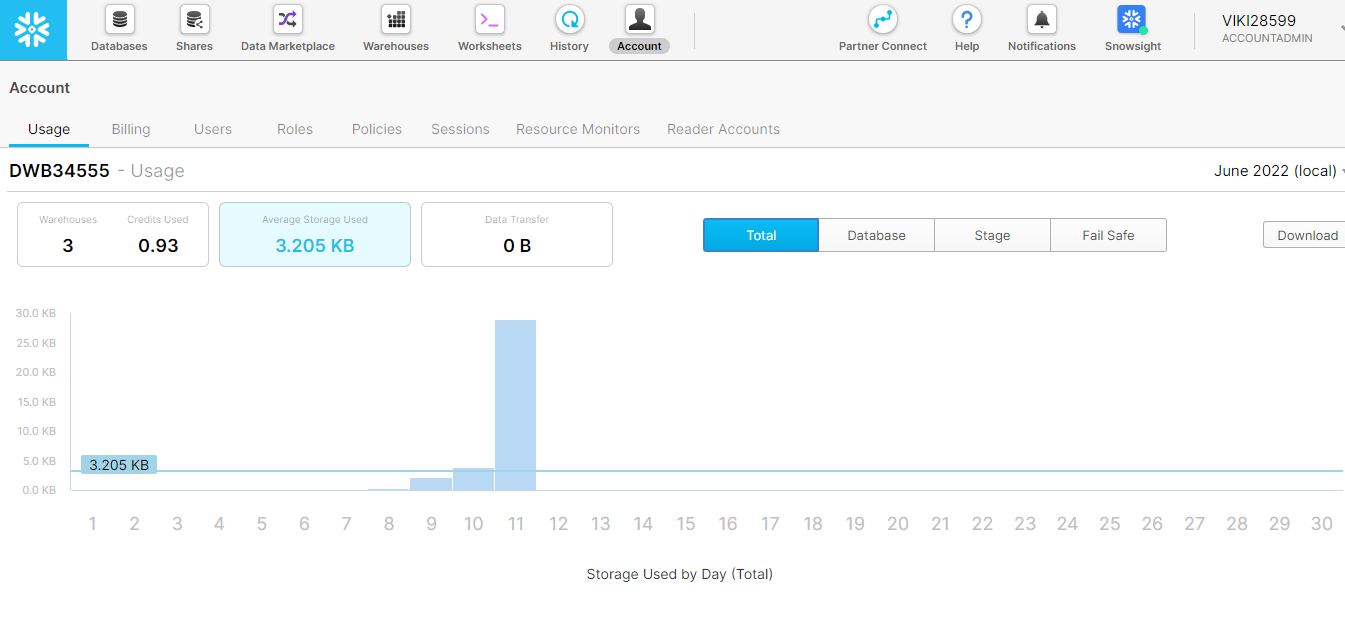
**4.Virtual Private –** Highest level of security

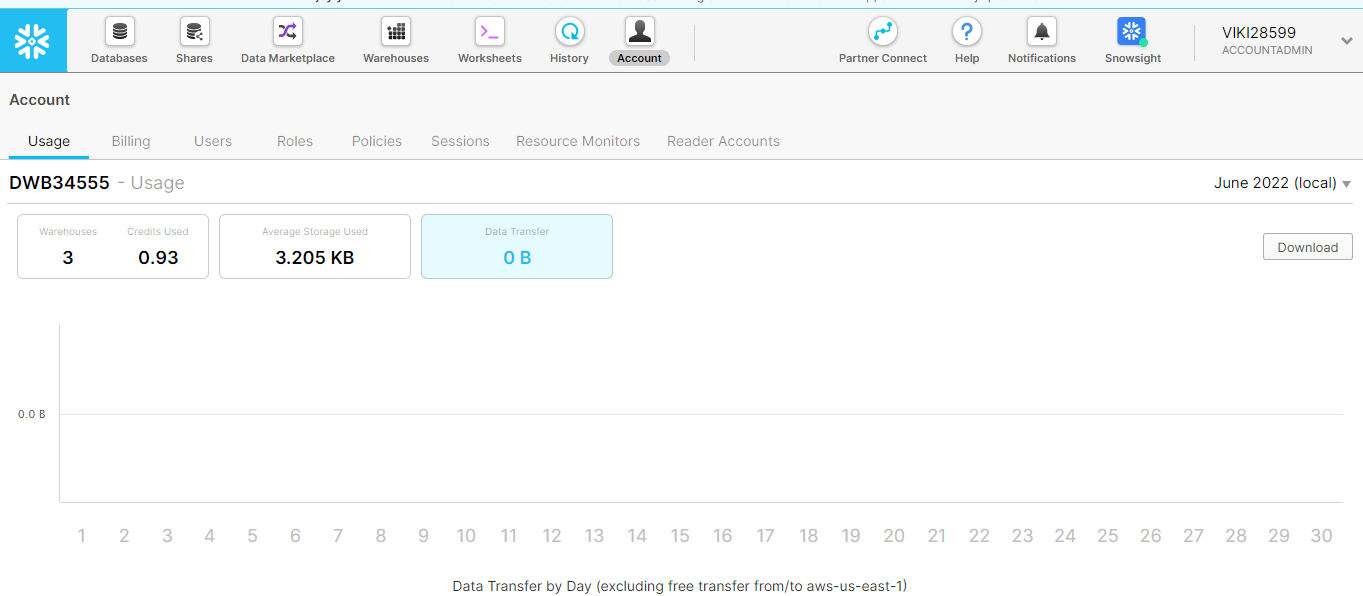
Snowflack pricking depends on region,Plotform,service, size

Compute cast

Storage cast -🡪 1.on Demand storage 2.Capacity Storage







SnowFlack Roles

ACCOUNTADMIN

SYSADMIN

SECURITYADMIN

Custom Role Custom Role

Custom Role 2

Custom Role 1

USERADMIN

Custom Role 3

PUBLIC

**ACCOUNTADIMN :**

**1.SYSADMIN and SECURITYADIMN**

**2.Top-levelrole in the system**

**3.should be granted only to a limites number of users**

**SECURITYADMIN:**

**1.USERADMINrole is granted to SECURITYADMIN**

**2.Can manage users and roles**

**3.Can manage any object grant globally**

**SYSADMIN:**

**1.create warehouses and databases(and more objects)**

**2.REcommented that all custom roles are assigned**

**USERADMIN:**

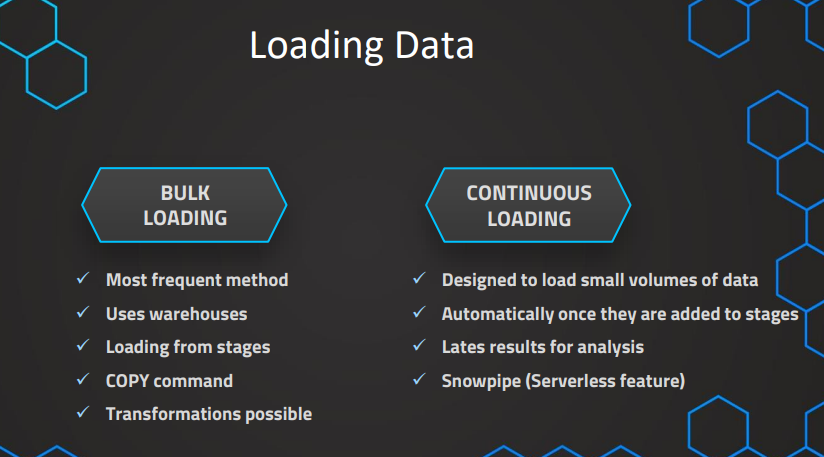
**1.Dedicated to user and role management only**

**2.Can create users and roles**

**PUBLIC:**

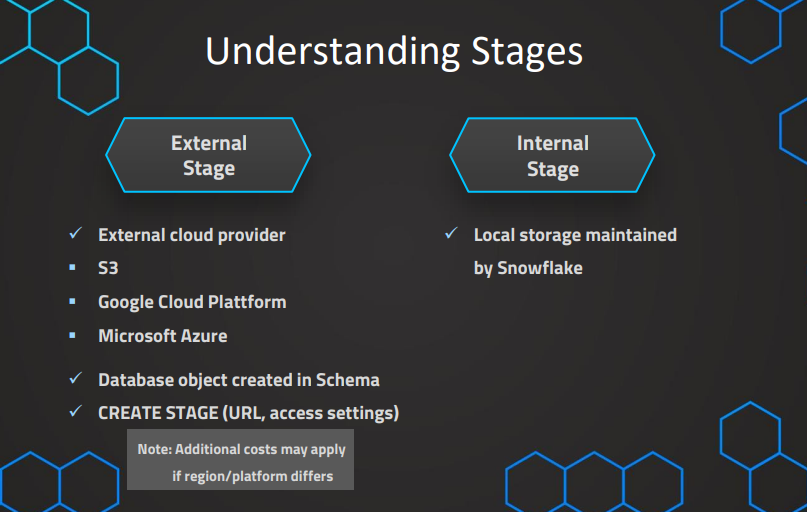
**1.Automatically granted to every user**

**2.can create own objects like every other role(available to every other user/role)**

****

**Snowpipe (Serverless feature)**

**Stages:**

****

// Database to manage stage objects, fileformats etc.

CREATE OR REPLACE DATABASE MANAGE\_DB;

CREATE OR REPLACE SCHEMA external\_stages;

// Creating external stage

CREATE OR REPLACE STAGE MANAGE\_DB.external\_stages.aws\_stage

url='s3://bucketsnowflakes3'

credentials=(aws\_key\_id='ABCD\_DUMMY\_ID' aws\_secret\_key='1234abcd\_key');

Copy Comment

// Creating ORDERS table

CREATE OR REPLACE TABLE OUR\_FIRST\_DB.PUBLIC.ORDERS (

ORDER\_ID VARCHAR(30),

AMOUNT INT,

PROFIT INT,

QUANTITY INT,

CATEGORY VARCHAR(30),

SUBCATEGORY VARCHAR(30));

SELECT \* FROM OUR\_FIRST\_DB.PUBLIC.ORDERS;

// First copy command

COPY INTO OUR\_FIRST\_DB.PUBLIC.ORDERS

FROM @aws\_stage

file\_format = (type = csv field\_delimiter=',' skip\_header=1);

// Copy command with fully qualified stage object

COPY INTO OUR\_FIRST\_DB.PUBLIC.ORDERS

FROM @MANAGE\_DB.external\_stages.aws\_stage

file\_format= (type = csv field\_delimiter=',' skip\_header=1);

// List files contained in stage

LIST @MANAGE\_DB.external\_stages.aws\_stage;

// Copy command with specified file(s)

COPY INTO OUR\_FIRST\_DB.PUBLIC.ORDERS

FROM @MANAGE\_DB.external\_stages.aws\_stage

file\_format= (type = csv field\_delimiter=',' skip\_header=1)

files = ('OrderDetails.csv');

// Copy command with pattern for file names

COPY INTO OUR\_FIRST\_DB.PUBLIC.ORDERS

FROM @MANAGE\_DB.external\_stages.aws\_stage

file\_format= (type = csv field\_delimiter=',' skip\_header=1)

pattern='.\*Order.\*';

// Description of external stage

DESC STAGE MANAGE\_DB.external\_stages.aws\_stage;

// Alter external stage

ALTER STAGE aws\_stage

SET credentials=(aws\_key\_id='XYZ\_DUMMY\_ID' aws\_secret\_key='987xyz');

// Publicly accessible staging area

CREATE OR REPLACE STAGE MANAGE\_DB.external\_stages.aws\_stage

url='s3://bucketsnowflakes3';

// List files in stage

LIST @aws\_stage;

//Load data using copy command

COPY INTO OUR\_FIRST\_DB.PUBLIC.ORDERS

FROM @aws\_stage

file\_format= (type = csv field\_delimiter=',' skip\_header=1)

pattern='.\*Order.\*';

Transforming Data

// Transforming using the SELECT statement

COPY INTO OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX

FROM (select s.$1, s.$2 from @MANAGE\_DB.external\_stages.aws\_stage s)

file\_format= (type = csv field\_delimiter=',' skip\_header=1)

files=('OrderDetails.csv');

// Example 1 - Table

CREATE OR REPLACE TABLE OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX (

ORDER\_ID VARCHAR(30),

AMOUNT INT

)

SELECT \* FROM OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX;

// Example 2 - Table

CREATE OR REPLACE TABLE OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX (

ORDER\_ID VARCHAR(30),

AMOUNT INT,

PROFIT INT,

PROFITABLE\_FLAG VARCHAR(30)

)

// Example 2 - Copy Command using a SQL function (subset of functions available)

COPY INTO OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX

FROM (select

s.$1,

s.$2,

s.$3,

CASE WHEN CAST(s.$3 as int) < 0 THEN 'not profitable' ELSE 'profitable' END

from @MANAGE\_DB.external\_stages.aws\_stage s)

file\_format= (type = csv field\_delimiter=',' skip\_header=1)

files=('OrderDetails.csv');

SELECT \* FROM OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX

// Example 3 - Table

CREATE OR REPLACE TABLE OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX (

ORDER\_ID VARCHAR(30),

AMOUNT INT,

PROFIT INT,

CATEGORY\_SUBSTRING VARCHAR(5)

)

// Example 3 - Copy Command using a SQL function (subset of functions available)

COPY INTO OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX

FROM (select

s.$1,

s.$2,

s.$3,

substring(s.$5,1,5)

from @MANAGE\_DB.external\_stages.aws\_stage s)

file\_format= (type = csv field\_delimiter=',' skip\_header=1)

files=('OrderDetails.csv');

SELECT \* FROM OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX

//Example 3 - Table

CREATE OR REPLACE TABLE OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX (

ORDER\_ID VARCHAR(30),

AMOUNT INT,

PROFIT INT,

PROFITABLE\_FLAG VARCHAR(30)

)

//Example 4 - Using subset of columns

COPY INTO OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX (ORDER\_ID,PROFIT)

FROM (select

s.$1,

s.$3

from @MANAGE\_DB.external\_stages.aws\_stage s)

file\_format= (type = csv field\_delimiter=',' skip\_header=1)

files=('OrderDetails.csv');

SELECT \* FROM OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX;

//Example 5 - Table Auto increment

CREATE OR REPLACE TABLE OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX (

ORDER\_ID number autoincrement start 1 increment 1,

AMOUNT INT,

PROFIT INT,

PROFITABLE\_FLAG VARCHAR(30)

)

//Example 5 - Auto increment ID

COPY INTO OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX (PROFIT,AMOUNT)

FROM (select

s.$2,

s.$3

from @MANAGE\_DB.external\_stages.aws\_stage s)

file\_format= (type = csv field\_delimiter=',' skip\_header=1)

files=('OrderDetails.csv');

SELECT \* FROM OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX WHERE ORDER\_ID > 15;

DROP TABLE OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX

// Create new stage

CREATE OR REPLACE STAGE MANAGE\_DB.external\_stages.aws\_stage\_errorex

url='s3://bucketsnowflakes4'

// List files in stage

LIST @MANAGE\_DB.external\_stages.aws\_stage\_errorex;

// Create example table

CREATE OR REPLACE TABLE OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX (

ORDER\_ID VARCHAR(30),

AMOUNT INT,

PROFIT INT,

QUANTITY INT,

CATEGORY VARCHAR(30),

SUBCATEGORY VARCHAR(30));

// Demonstrating error message

COPY INTO OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX

FROM @MANAGE\_DB.external\_stages.aws\_stage\_errorex

file\_format= (type = csv field\_delimiter=',' skip\_header=1)

files = ('OrderDetails\_error.csv');

// Validating table is empty

SELECT \* FROM OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX

// Error handling using the ON\_ERROR option

COPY INTO OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX

FROM @MANAGE\_DB.external\_stages.aws\_stage\_errorex

file\_format= (type = csv field\_delimiter=',' skip\_header=1)

files = ('OrderDetails\_error.csv')

ON\_ERROR = 'CONTINUE';

// Validating results and truncating table

SELECT \* FROM OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX

SELECT COUNT(\*) FROM OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX

TRUNCATE TABLE OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX;

// Error handling using the ON\_ERROR option = ABORT\_STATEMENT (default)

COPY INTO OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX

FROM @MANAGE\_DB.external\_stages.aws\_stage\_errorex

file\_format= (type = csv field\_delimiter=',' skip\_header=1)

files = ('OrderDetails\_error.csv','OrderDetails\_error2.csv')

ON\_ERROR = 'ABORT\_STATEMENT';

// Validating results and truncating table

SELECT \* FROM OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX

SELECT COUNT(\*) FROM OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX

TRUNCATE TABLE OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX;

// Error handling using the ON\_ERROR option = SKIP\_FILE

COPY INTO OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX

FROM @MANAGE\_DB.external\_stages.aws\_stage\_errorex

file\_format= (type = csv field\_delimiter=',' skip\_header=1)

files = ('OrderDetails\_error.csv','OrderDetails\_error2.csv')

ON\_ERROR = 'SKIP\_FILE';

// Validating results and truncating table

SELECT \* FROM OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX

SELECT COUNT(\*) FROM OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX

TRUNCATE TABLE OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX;

Copy Option ONERROR

// Error handling using the ON\_ERROR option = SKIP\_FILE\_<number>

COPY INTO OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX

FROM @MANAGE\_DB.external\_stages.aws\_stage\_errorex

file\_format= (type = csv field\_delimiter=',' skip\_header=1)

files = ('OrderDetails\_error.csv','OrderDetails\_error2.csv')

ON\_ERROR = 'SKIP\_FILE\_2';

// Validating results and truncating table

SELECT \* FROM OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX

SELECT COUNT(\*) FROM OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX

TRUNCATE TABLE OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX;

// Error handling using the ON\_ERROR option = SKIP\_FILE\_<number>

COPY INTO OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX

FROM @MANAGE\_DB.external\_stages.aws\_stage\_errorex

file\_format= (type = csv field\_delimiter=',' skip\_header=1)

files = ('OrderDetails\_error.csv','OrderDetails\_error2.csv')

ON\_ERROR = 'SKIP\_FILE\_0.5%';

SELECT \* FROM OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX

CREATE OR REPLACE TABLE OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX (

ORDER\_ID VARCHAR(30),

AMOUNT INT,

PROFIT INT,

QUANTITY INT,

CATEGORY VARCHAR(30),

SUBCATEGORY VARCHAR(30));

COPY INTO OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX

FROM @MANAGE\_DB.external\_stages.aws\_stage\_errorex

file\_format= (type = csv field\_delimiter=',' skip\_header=1)

files = ('OrderDetails\_error.csv','OrderDetails\_error2.csv')

ON\_ERROR = SKIP\_FILE\_3

SIZE\_LIMIT = 30;

File Formater

// Specifying file\_format in Copy command

COPY INTO OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX

FROM @MANAGE\_DB.external\_stages.aws\_stage\_errorex

file\_format = (type = csv field\_delimiter=',' skip\_header=1)

files = ('OrderDetails\_error.csv')

ON\_ERROR = 'SKIP\_FILE\_3';

// Creating table

CREATE OR REPLACE TABLE OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX (

ORDER\_ID VARCHAR(30),

AMOUNT INT,

PROFIT INT,

QUANTITY INT,

CATEGORY VARCHAR(30),

SUBCATEGORY VARCHAR(30));

// Creating schema to keep things organized

CREATE OR REPLACE SCHEMA MANAGE\_DB.file\_formats;

// Creating file format object

CREATE OR REPLACE file format MANAGE\_DB.file\_formats.my\_file\_format;

// See properties of file format object

DESC file format MANAGE\_DB.file\_formats.my\_file\_format;

// Using file format object in Copy command

COPY INTO OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX

FROM @MANAGE\_DB.external\_stages.aws\_stage\_errorex

file\_format= (FORMAT\_NAME=MANAGE\_DB.file\_formats.my\_file\_format)

files = ('OrderDetails\_error.csv')

ON\_ERROR = 'SKIP\_FILE\_3';

// Altering file format object

ALTER file format MANAGE\_DB.file\_formats.my\_file\_format

SET SKIP\_HEADER = 1;

// Defining properties on creation of file format object

CREATE OR REPLACE file format MANAGE\_DB.file\_formats.my\_file\_format

TYPE=JSON,

TIME\_FORMAT=AUTO;

// See properties of file format object

DESC file format MANAGE\_DB.file\_formats.my\_file\_format;

// Using file format object in Copy command

COPY INTO OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX

FROM @MANAGE\_DB.external\_stages.aws\_stage\_errorex

file\_format= (FORMAT\_NAME=MANAGE\_DB.file\_formats.my\_file\_format)

files = ('OrderDetails\_error.csv')

ON\_ERROR = 'SKIP\_FILE\_3';

// Altering the type of a file format is not possible

ALTER file format MANAGE\_DB.file\_formats.my\_file\_format

SET TYPE = CSV;

// Recreate file format (default = CSV)

CREATE OR REPLACE file format MANAGE\_DB.file\_formats.my\_file\_format

// See properties of file format object

DESC file format MANAGE\_DB.file\_formats.my\_file\_format;

// Truncate table

TRUNCATE table OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX;

// Overwriting properties of file format object

COPY INTO OUR\_FIRST\_DB.PUBLIC.ORDERS\_EX

FROM @MANAGE\_DB.external\_stages.aws\_stage\_errorex

file\_format = (FORMAT\_NAME= MANAGE\_DB.file\_formats.my\_file\_format field\_delimiter = ',' skip\_header=1 )

files = ('OrderDetails\_error.csv')

ON\_ERROR = 'SKIP\_FILE\_3';

DESC STAGE MANAGE\_DB.external\_stages.aws\_stage\_errorex;

---- VALIDATION\_MODE ----

// Prepare database & table

CREATE OR REPLACE DATABASE COPY\_DB;

CREATE OR REPLACE TABLE COPY\_DB.PUBLIC.ORDERS (

ORDER\_ID VARCHAR(30),

AMOUNT VARCHAR(30),

PROFIT INT,

QUANTITY INT,

CATEGORY VARCHAR(30),

SUBCATEGORY VARCHAR(30));

// Prepare stage object

CREATE OR REPLACE STAGE COPY\_DB.PUBLIC.aws\_stage\_copy

url='s3://snowflakebucket-copyoption/size/';

LIST @COPY\_DB.PUBLIC.aws\_stage\_copy;

//Load data using copy command

COPY INTO COPY\_DB.PUBLIC.ORDERS

FROM @aws\_stage\_copy

file\_format= (type = csv field\_delimiter=',' skip\_header=1)

pattern='.\*Order.\*'

VALIDATION\_MODE = RETURN\_ERRORS

COPY INTO COPY\_DB.PUBLIC.ORDERS

FROM @aws\_stage\_copy

file\_format= (type = csv field\_delimiter=',' skip\_header=1)

pattern='.\*Order.\*'

VALIDATION\_MODE = RETURN\_5\_ROWS