

Creation of a Redshift Cluster

Screenshots of the configuration of the Redshift cluster that I have created:

Cluster Configuration-

The screenshot displays the Amazon Redshift console interface. At the top, a navigation bar shows the AWS logo, 'Services', a search bar, and the user's profile 'upgradahinain @ 9348-8784-5151'. A blue banner at the top left announces 'Amazon Redshift query editor v2 is now available'. The main content area is titled 'redshift-cluster-2' and includes buttons for 'Actions', 'Edit', 'Add partner integration', and 'Query data'. Below this, the 'General information' tab is active, showing a table of cluster details:

General information			
Cluster identifier	Status	Node type	Endpoint
redshift-cluster-2	Available	dc2.large	redshift-cluster-2.c7at6hu2hluf.us-east-1.red...
Cluster namespace	Date created	Number of nodes	JDBC URL
7b8dbefc-cbb8-4fb0-8dc3-b90c0fa87538	December 17, 2022, 12:28 (UTC+05:30)	2	jdbcredshift://redshift-cluster-2.c7at6hu2hlu...
Cluster configuration	Storage used		ODBC URL
Production	0.08% (0.26 of 320 GB used)		Driver={Amazon Redshift (x64)}; Server=reds...
	Multi-AZ		
	No		

Below the table, there are tabs for 'Cluster performance', 'Query monitoring', 'Schedules', 'Maintenance', and 'Properties'. At the bottom, a file explorer shows several CSV files: 'part-00000-f05e0e...csv', 'atm.csv', 'cardType.csv', 'date.csv', and 'location.csv'.

Database Configuration-

The screenshot displays the Amazon Redshift console interface, specifically the 'Properties' tab for the cluster 'redshift-cluster-2'. The navigation bar at the top shows the AWS logo, 'Services', a search bar, and the user's profile 'upgradahinain @ 9348-8784-5151'. The main content area is titled 'Database configurations' and includes buttons for 'Edit admin credentials', 'Rotate encryption keys', and 'Edit'. Below this, the 'Database configurations' section shows a table of database settings:

Database configurations			
Database name	Parameter group	Encryption	Audit logging
etl_project_vpd	Defines database parameter and query queues for all the databases.	Disabled	Disabled
Port	default:redshift-1.0	AWS KMS key ID	
5439		-	
Admin user name	SSH ingestion setting (cluster public key)		
awsuser	ssh-rsa AAAAB3NzaC1yc2EAAAADAQAB...		

Below the table, there are tabs for 'Cluster performance', 'Query monitoring', 'Schedules', 'Maintenance', and 'Properties'. The 'Network and security settings' section is also visible, showing a table of network settings:

Network and security settings			
Virtual private cloud (VPC)	Availability Zone	VPC security group	Publicly accessible
vpc-00d8a07a	us-east-1a	Specify which instances and devices can connect to the cluster.	Allow connections from outside the VPC.
Subnet	Enhanced VPC routing	sg-d68bda8a	Disabled
cluster-subnet-group-1	Disabled		
Endpoint URL			
-			

At the bottom, a file explorer shows several CSV files: 'part-00000-f05e0e...csv', 'atm.csv', 'cardType.csv', 'date.csv', and 'location.csv'.

IAM roles associated-

The screenshot shows the AWS IAM console page for 'Cluster permissions' of a Redshift cluster. The URL is `us-east-1.console.aws.amazon.com/redshiftv2/home?region=us-east-1#cluster-details?cluster=redshift-cluster-2&tab=properties`. The page includes a notification to create an IAM role with the `AmazonRedshiftAllCommandsFullAccess` policy. Below this, the 'Associated IAM roles (1)' section shows a table with one role: `ETL_VPD_ROLE` with status 'In-sync'. The 'Granted accounts (0)' section shows no accounts are currently granted access.

IAM roles	Status	Role type
<code>ETL_VPD_ROLE</code>	In-sync	--

Account ID	VPC	Endpoints created
No granted accounts You haven't granted access to this cluster.		

Setting up a database in the Redshift cluster and running queries to create the dimension and fact tables:

1) S3 Provision

The screenshot shows the AWS S3 console page for the bucket `etl-project-dsc42-vpd`. The URL is `s3.console.aws.amazon.com/s3/buckets/etl-project-dsc42-vpd?region=us-east-1&tab=objects`. The 'Objects (4)' section displays a table of objects in the bucket.

Name	Type	Last modified	Size	Storage class
<code>dataset/</code>	Folder	-	-	-
<code>dimension table/</code>	Folder	-	-	-
<code>fact table/</code>	Folder	-	-	-
<code>notebook/</code>	Folder	-	-	-

IAM Role

The screenshot shows the AWS IAM console interface. The left sidebar contains navigation links for Identity and Access Management (IAM), Access management, and Access reports. The main content area displays the details for the **ETL_VPD_ROLE**. The role's description is "Allows Redshift clusters to call AWS services on your behalf." The summary section shows the creation date as December 17, 2022, 12:24 (UTC+05:30), the ARN as `arn:aws:iam:934887845151:role/ETL_VPD_ROLE`, and the maximum session duration as 1 hour. The permissions tab is active, showing one policy attached: **AmazonS3FullAccess**, which is an AWS managed policy providing full access to all S3 resources. The right sidebar contains a "Permissions" section with a brief explanation of IAM policies and a link to "Learn more" about creating IAM policies.

us-east-1.console.aws.amazon.com/iamv2/home?region=us-east-1#/roles/details/ETL_VPD_ROLE?section=permissions

Identity and Access Management (IAM)

Search IAM

Dashboard

Access management

- User groups
- Users
- Roles**
- Policies
- Identity providers
- Account settings

Access reports

- Access analyzer
- Archive rules
- Analysts
- Settings
- Credential report
- Organization activity
- Service control policies (SCPs)

ETL_VPD_ROLE

Allows Redshift clusters to call AWS services on your behalf.

Summary

Creation date
December 17, 2022, 12:24 (UTC+05:30)

ARN
`arn:aws:iam:934887845151:role/ETL_VPD_ROLE`

Last activity
None

Maximum session duration
1 hour

Permissions

Trust relationships

Tags

Access Advisor

Revoke sessions

Permissions policies (1)

You can attach up to 10 managed policies.

Filter policies by property or policy name and press enter.

Policy name	Type	Description
AmazonS3FullAccess	AWS managed	Provides full access to all b

Permissions

You manage access in AWS by creating policies and attaching them to IAM identities (users, groups, users, or roles) or AWS resources. A policy is an object in AWS that, associated with an identity or resource, defines their permissions.

[Learn more](#)

[Creating IAM policies](#)

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S3 Dimension table

The screenshot shows the AWS S3 console interface. The left sidebar contains navigation links for Amazon S3, Buckets, Access Points, Object Lambda Access Points, Multi-Region Access Points, Batch Operations, Access analyzer for S3, Block Public Access settings for this account, Storage Lens, Dashboards, AWS Organizations settings, Feature spotlight, and AWS Marketplace for S3. The main content area displays the details for the **dimension table/** bucket. The "Objects" tab is active, showing a list of 4 objects: **atm.csv**, **cardType.csv**, **date.csv**, and **location.csv**. Each object is a CSV file with a size and a storage class of "Standard". The right sidebar contains a "Copy S3 URI" button.

s3.console.aws.amazon.com/s3/buckets/etl-project-dsc42-vpd?region=us-east-1&prefix=dimension+table/&showversions=false

Amazon S3

Buckets

- Access Points
- Object Lambda Access Points
- Multi-Region Access Points
- Batch Operations
- Access analyzer for S3

Block Public Access settings for this account

Storage Lens

- Dashboards
- AWS Organizations settings

Feature spotlight

AWS Marketplace for S3

dimension table/

Objects

Properties

Objects (4)

Objects are the fundamental entities stored in Amazon S3. You can use [Amazon S3 Inventory](#) to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. [Learn more](#)

Find objects by prefix

Name	Type	Last modified	Size	Storage class
atm.csv	csv	December 18, 2022, 11:01:12 (UTC+05:30)	2.6 KB	Standard
cardType.csv	csv	December 18, 2022, 11:01:03 (UTC+05:30)	195.0 B	Standard
date.csv	csv	December 18, 2022, 11:01:09 (UTC+05:30)	478.8 KB	Standard
location.csv	csv	December 18, 2022, 11:01:11 (UTC+05:30)	5.7 KB	Standard

Copy S3 URI

Feedback Looking for language selection? Find it in the new Unified Settings.

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S3 Fact table

The screenshot shows the Amazon S3 console interface. The left sidebar contains navigation options like Buckets, Access Points, and Storage Lens. The main content area shows the 'fact table/' bucket. Under the 'Objects' tab, there is a list of objects. The first object is a CSV file named 'part-00000-f05e0e52-e198-4d2c-bca2-9b3d3fd47f74-c000.csv' with a size of 201.4 MB and a storage class of Standard. The console also includes a search bar, a 'Copy S3 URI' button, and a 'Find objects by prefix' input field.

Name	Type	Last modified	Size	Storage class
part-00000-f05e0e52-e198-4d2c-bca2-9b3d3fd47f74-c000.csv	csv	December 18, 2022, 11:02:17 (UTC+05:30)	201.4 MB	Standard

2) Creation of schema

```
Create schema etl_project;
```

The screenshot shows the Amazon Redshift console interface. The top section displays the SQL query 'create schema etl_project;'. Below the query, there are buttons for 'Run', 'Save', 'Schedule', and 'Clear'. The 'Run' button is highlighted. The bottom section shows the 'Query results' tab, which displays the query execution status: 'Completed, started on December 18, 2022 at 11:46:48' and 'ELAPSED TIME: 00 m 15 s'. There are also buttons for 'Execution', 'Data', and 'Visualize'.

```
1 create schema etl_project;
```

Run Save Schedule Clear

Send feedback

Query results Table details

Query

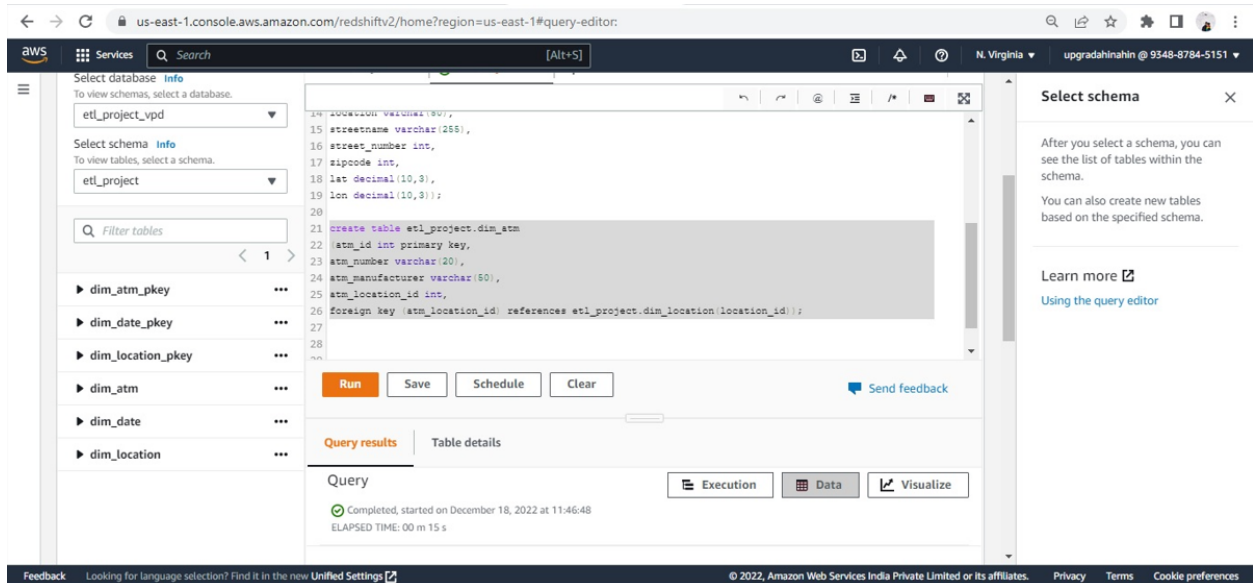
Completed, started on December 18, 2022 at 11:46:48
ELAPSED TIME: 00 m 15 s

Execution Data Visualize

3) Queries to create the various dimension and fact tables

DIM_ATM

```
create table etl_project.dim_atm(  
    atm_id int PRIMARY KEY,  
    atm_number varchar(20),  
    atm_manufacturer varchar(50),  
    atm_location_id int,  
    FOREIGN KEY(atm_location_id) references etl_project.DIM_LOCATION(location_id)  
);
```



DIM_CARD_TYPE

```
create table etl_project.dim_card_type
(  
    card_type_id int PRIMARY KEY,  
    card_type varchar(30)  
);
```

The screenshot displays the AWS Redshift Query Editor interface. On the left, a sidebar shows the database structure with 'etl_project_vpd' selected as the database and 'etl_project' as the schema. A list of tables is visible, including 'dim_atm_pkey', 'dim_card_type_pkey', 'dim_date_pkey', 'dim_location_pkey', 'dim_atm', 'dim_card_type', 'dim_date', and 'dim_location'. The main editor area contains SQL code for creating the 'dim_card_type' table, which is highlighted. The code is as follows:

```
21 create table etl_project.dim_atm  
22 (atm_id int primary key,  
23 atm_number varchar(20),  
24 atm_manufacturer varchar(50),  
25 atm_location_id int,  
26 foreign key (atm_location_id) references etl_project.dim_location(location_id);  
27  
28  
29 create table etl_project.dim_card_type(  
30 card_type_id int primary key,  
31 card_type varchar(30)  
32 );  
33  
34  
35
```

Below the code editor, there are buttons for 'Run', 'Save', 'Schedule', and 'Clear'. To the right of these buttons is a 'Send feedback' link. The 'Query results' tab is active, showing a 'Query' section with a green checkmark indicating successful execution. The execution details state: 'Completed, started on December 18, 2022 at 11:51:47' and 'ELAPSED TIME: 00 m 08 s'. There are also buttons for 'Execution', 'Data', and 'Visualize'. On the far right, a 'Select schema' dialog box is open, providing instructions on how to select a schema and create new tables. At the bottom of the interface, there is a footer with 'Feedback', a link to 'Unified Settings', and copyright information for Amazon Web Services India Private Limited.

DIM_DATE

```
create table etl_project.dim_date
(
    date_id int PRIMARY KEY,
    full_date_time datetime not null,
    year int not null,
    month varchar(20) not null,
    day int not null,
    hour int not null,
    weekday varchar(20) not null
);
```

The screenshot displays the AWS Redshift Query Editor interface. The browser address bar shows the URL: `us-east-1.console.aws.amazon.com/redshiftv2/home?region=us-east-1#query-editor:`. The interface includes a sidebar on the left for schema navigation, a central query editor, and a right-hand panel for schema selection and query results.

Schema Selection: The left sidebar shows the database `etl_project_vpd` selected. Under the `etl_project` schema, the tables `dim_date_pkey` and `dim_date` are listed.

Query Editor: The central pane contains the following SQL code:

```
1 create schema etl_project;
2
3 create table etl_project.dim_date
4 (date_id int primary key,
5 full_date_time datetime not null,
6 year int not null,
7 month varchar(20) not null,
8 day int not null,
9 hour int not null,
10 weekday varchar(20) not null);
11
12
13
```

Below the query editor are buttons for `Run`, `Save`, `Schedule`, and `Clear`, along with a `Send feedback` link.

Query Results: The bottom section shows the query execution status: `Query` completed on December 18, 2022, at 11:41:56, with an elapsed time of 00 m 09 s. It includes tabs for `Execution`, `Data`, and `Visualize`.

Right Panel: The `Select schema` panel on the right provides instructions on how to use the schema selection feature and includes a `Learn more` link.

Footer: The bottom of the interface features a `Feedback` link, a language selection prompt, and copyright information for Amazon Web Services India Private Limited.

DIM_LOCATION

```
create table etl_project.dim_location
(
    location_id int PRIMARY KEY,
    location varchar(50),
    streetname varchar(255),
    street_number int,
    zipcode int,
    lat decimal(10,3),
    lon decimal(10,3),
);
```

The screenshot displays the Amazon Redshift Query Editor interface. The browser address bar shows the URL: `us-east-1.console.aws.amazon.com/redshiftv2/home?region=us-east-1#query-editor`. The interface includes a sidebar on the left with a search bar and a list of schemas: `etl_project_vpd` and `etl_project`. The `etl_project` schema is selected, showing a list of tables: `dim_date_pkey`, `dim_location_pkey`, `dim_date`, and `dim_location`. The main editor area contains the SQL code for creating the `etl_project.dim_location` table, which is highlighted in a light blue box. The code is as follows:

```
9 hour int not null,
10 weekday varchar(20) not null);
11
12 create table etl_project.dim_location
13 (location_id int primary key,
14 location varchar(50),
15 streetname varchar(255),
16 street_number int,
17 zipcode int,
18 lat decimal(10,3),
19 lon decimal(10,3));
20
21
```

Below the code editor, there are buttons for `Run`, `Save`, `Schedule`, and `Clear`. A `Send feedback` link is also present. The bottom section of the interface shows the `Query results` tab, which indicates that the query was completed successfully on December 18, 2022, at 11:43:47, with an elapsed time of 00 m 16 s. The footer of the page includes a feedback link, a language selection prompt, and copyright information for Amazon Web Services India Private Limited.

FACT_ATM_TRANS

```
create table etl_project.fact_atm_trans
(
    trans_id bigint PRIMARY KEY,
    atm_id int,
    weather_loc_id int,
    date_id int,
    card_type_id int,
    atm_status varchar(20),
    currency varchar(10),
    service varchar(20),
    transaction_amount int,
    message_code varchar(255),
    message_text varchar(255),
    rain_3h decimal(10,3),
    clouds_all int,
    weather_id int,
    weather_main varchar(50),
    weather_description varchar(255),
    PRIMARY KEY(trans_id),
    FOREIGN KEY(weather_loc_id) REFERENCES etl_project.dim_location(location_id),
    FOREIGN KEY(atm_id) REFERENCES etl_project.dim_atm (atm_id),
    FOREIGN KEY(date_id) REFERENCES etl_project.dim_date (date_id)
);
```

The screenshot displays the AWS Redshift console's query editor interface. On the left, a sidebar shows the database structure with 'etl_project_vpd' selected as the database and 'etl_project' as the schema. A list of tables is visible, including 'dim_atm_pkey', 'dim_card_type_pkey', 'dim_date_pkey', 'dim_location_pkey', 'fact_atm_trans_pkey', 'dim_atm', 'dim_card_type', 'dim_date', and 'dim_location'. The main editor area contains the SQL query for creating the 'fact_atm_trans' table, which is identical to the one shown in the first block. Below the query, buttons for 'Run', 'Save', 'Schedule', and 'Clear' are present. The 'Query results' tab is active, showing a green checkmark and the message 'Completed, started on December 18, 2022 at 12:07:05' with an 'ELAPSED TIME: 00 m 46 s'. On the right, a 'Select schema' dialog box is open, providing instructions on how to use the schema to view tables or create new ones. The footer of the console shows the AWS logo, a feedback link, a language selection prompt, the copyright notice '© 2022, Amazon Web Services India Private Limited or its affiliates.', and links for 'Privacy', 'Terms', and 'Cookie preferences'.

4) Loading data into a Redshift cluster from Amazon S3 bucket

Copying the data to dim_location table

```
copy etl_project.dim_location from
's3://etl-project-dsc42-vpd/dimension table/location.csv'
iam_role 'arn:aws:iam::934887845151:role/ETL_VPD_ROLE'
delimiter ',' region 'us-east-1'
CSV;
```

The screenshot displays the AWS Redshift console interface. The top navigation bar shows the AWS logo, 'Services', a search bar with 's3', and the region 'N. Virginia'. The main content area is divided into a left sidebar and a central workspace. The sidebar contains a 'Filter tables' search bar and a message 'No resources' with 'No resources to display' below it. The central workspace features a SQL query editor with the following text:

```
61
62
63 copy etl_project.dim_location from
64 's3://etl-project-dsc42-vpd/dimension table/location.csv'
65 iam_role 'arn:aws:iam::934887845151:role/ETL_VPD_ROLE'
66 delimiter ',' region 'us-east-1'
67 CSV;
68
69
```

Below the editor are buttons for 'Run', 'Save', 'Schedule', and 'Clear'. A 'Send feedback' link is also present. The 'Query results' tab is active, showing 'Query 401743' with a status of 'Completed, started on December 18, 2022 at 13:09:24' and 'ELAPSED TIME: 00 m 40 s'. To the right of the query details are buttons for 'Execution', 'Data', and 'Visualize'. The footer contains a 'Feedback' link, a note about language selection, and copyright information for Amazon Web Services India Private Limited.

Copying the data to dim_atm table

```
copy etl_project.dim_atm from
's3://etl-project-dsc42-vpd/dimension table/atm.csv'
iam_role 'arn:aws:iam::934887845151:role/ETL_VPD_ROLE'
delimiter ',' region 'us-east-1'
CSV;
```

The screenshot displays the AWS Redshift console interface. On the left, the 'etl_project_vpd' database is selected, and the 'public' schema is chosen. The main area shows a SQL query being executed: `copy etl_project.dim_atm from 's3://etl-project-dsc42-vpd/dimension table/atm.csv' iam_role 'arn:aws:iam::934887845151:role/ETL_VPD_ROLE' delimiter ',' region 'us-east-1' CSV;`. Below the query editor, the 'Run' button is highlighted. The 'Query results' tab is active, showing 'Query 401905' as 'Completed, started on December 18, 2022 at 13:18:07' with an 'ELAPSED TIME: 00 m 08 s'. The bottom of the console features a footer with 'Feedback', a language selection prompt, copyright information for 2022, and links for 'Privacy', 'Terms', and 'Cookie preferences'.

Copying the data to dim_date table

```
copy etl_project.dim_date from
's3://etl-project-dsc42-vpd/dimension table/date.csv'
iam_role 'arn:aws:iam::934887845151:role/ETL_VPD_ROLE'
delimiter ',' region 'us-east-1'
CSV
TIMEFORMAT 'auto';
```

The screenshot displays the AWS Redshift Query Editor interface. The left sidebar shows the database schema 'etl_project_vpd' with a 'public' schema selected. The main editor area contains a SQL query (lines 54-68) that copies data from an S3 bucket into the 'dim_date' table. Below the query editor, the 'Run' button is highlighted. The bottom section shows the query results for 'Query 401792', indicating it was completed successfully on December 18, 2022, at 13:11:31, with an elapsed time of 00 m 35 s. The footer includes a feedback link and copyright information for Amazon Web Services India Private Limited.

us-east-1.console.aws.amazon.com/redshiftv2/home?region=us-east-1#query-editor?cluster=redshift-cluster-2

etl_project_vpd

Select schema Info

To view tables, select a schema.

public

Filter tables

No resources

No resources to display

```
54
55 copy etl_project.dim_date from
56 's3://etl-project-dsc42-vpd/dimension table/date.csv'
57 iam_role 'arn:aws:iam::934887845151:role/ETL_VPD_ROLE'
58 delimiter ',' region 'us-east-1'
59 CSV
60 TIMEFORMAT 'auto';
61
62
63
64
65
66
67
68
```

Run Save Schedule Clear

Send feedback

Query results Table details

Query 401792

Completed, started on December 18, 2022 at 13:11:31

ELAPSED TIME: 00 m 35 s

Execution Data Visualize

Feedback Looking for language selection? Find it in the new Unified Settings

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Copying the data to dim_card_type table

```
copy etl_project.dim_card_type from
's3://etl-project-dsc42-vpd/dimension table/cardType.csv'
iam_role 'arn:aws:iam::934887845151:role/ETL_VPD_ROLE'
delimiter ',' region 'us-east-1'
CSV;
```

The screenshot displays the AWS Redshift console interface. On the left sidebar, the 'etl_project_vpd' database is selected, and the 'public' schema is chosen. The main editor area contains the SQL query for copying data from an S3 bucket to the 'dim_card_type' table. Below the query editor, the 'Run' button is highlighted in orange. The 'Query results' tab is active, showing the query ID '401852' and a status of 'Completed, started on December 18, 2022 at 13:15:32' with an 'ELAPSED TIME: 00 m 10 s'. The bottom of the console features a footer with 'Feedback', a link to 'Unified Settings', and copyright information for Amazon Web Services India Private Limited.

us-east-1.console.aws.amazon.com/redshiftv2/home?region=us-east-1#query-editor?cluster=redshift-cluster-2

Services

etl_project_vpd

Select schema [Info](#)

To view tables, select a schema.

public

< 1 >

No resources

No resources to display

```
69
70
71 copy etl_project.dim_card_type from
72 's3://etl-project-dsc42-vpd/dimension table/cardType.csv'
73 iam_role 'arn:aws:iam::934887845151:role/ETL_VPD_ROLE'
74 delimiter ',' region 'us-east-1'
75 CSV;
```

Run Save Schedule Clear

[Send feedback](#)

Query results Table details

Query [401852](#)

Execution Data Visualize

Completed, started on December 18, 2022 at 13:15:32
ELAPSED TIME: 00 m 10 s

Feedback Looking for language selection? Find it in the new [Unified Settings](#)

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Copying the data to fact_atm_trans table

```
copy etl_project.fact_atm_trans from  
's3://etl-project-dsc42-vpd/fact table/part-00000-f05e0e52-e198-4d2c-bca2-9b3d3fd47f74-c000.csv'  
iam_role 'arn:aws:iam::934887845151:role/ETL_VPD_ROLE'  
delimiter ',' region 'us-east-1'  
CSV;
```

The screenshot displays the AWS Redshift Query Editor interface. On the left, the 'etl_project_vpd' database is selected, and the 'public' schema is chosen. The main editor area contains a SQL query (lines 69-75) that copies data from an S3 location into the 'fact_atm_trans' table. Below the query editor, the 'Run' button is highlighted. The 'Query results' tab is active, showing a successful execution of Query 401852 on December 18, 2022, at 13:15:32, with an elapsed time of 00 m 10 s. The interface also includes a 'Table details' tab and buttons for 'Execution', 'Data', and 'Visualize'.

```
69  
70  
71 copy etl_project.fact_atm_trans from  
72 's3://etl-project-dsc42-vpd/fact table/part-00000-f05e0e52-e198-4d2c-bca2-9b3d3fd47f74-c000.csv'  
73 iam_role 'arn:aws:iam::934887845151:role/ETL_VPD_ROLE'  
74 delimiter ',' region 'us-east-1'  
75 CSV;
```

Query 401852
Completed, started on December 18, 2022 at 13:15:32
ELAPSED TIME: 00 m 10 s