

Guided Lab: Querying a Global Secondary Index

Description

A **Global Secondary Index (GSI)** in DynamoDB is an index with a partition key and a sort key that can be different from those on the base table. It allows for efficient querying of data based on different attributes. A global secondary index is considered 'global' because queries on the index can span all of the data in the base table, across all partitions. GSIs provide flexibility in querying data in various ways without impacting the performance of the base table. Additionally, a global secondary index has no size limitations and has its own provisioned throughput settings for read and write activity that is separate from those of the table, allowing for independent scaling and optimization.

Prerequisites

This lab assumes you have experience creating an Amazon DynamoDB table and are familiar with its basic components

If you find any gaps in your knowledge, consider taking the following labs:

- Creating an Amazon DynamoDB table

Objectives

In this lab, you will learn how to:

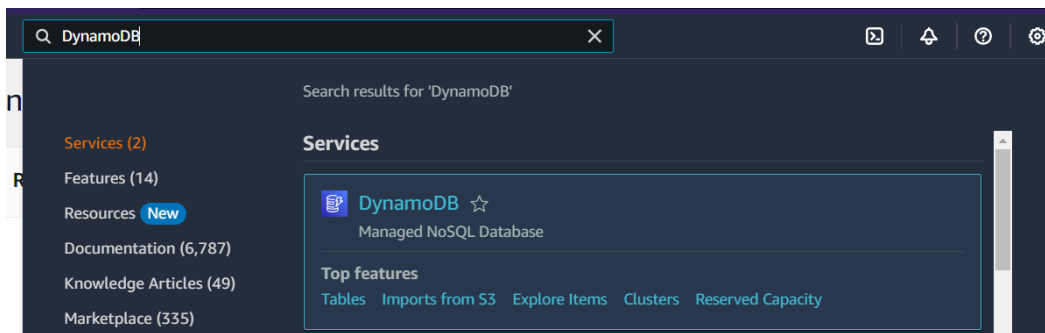
- Understand the concept of Global Secondary Indexes in DynamoDB.
- Learn how to create a Global Secondary Index.
- Learn how to query a Global Secondary Index.

Lab Steps

Creating the DynamoDB Table

1. Navigate to DynamoDB.

- In the AWS Management Console, navigate to the DynamoDB service.



2. Create a DynamoDB table with the following configurations.

- Table name: **Movies**
- Partition key: **MovieTitle (String)**
- Sort key: **ReleaseYear (Number)**

[DynamoDB](#) > [Tables](#) > Create table

Create table

Table details [Info](#)

DynamoDB is a schemaless database that requires only a table name and a primary key when you create the table.

Table name
This will be used to identify your table.

Between 3 and 255 characters, containing only letters, numbers, underscores (_), hyphens (-), and periods (.).

Partition key
The partition key is part of the table's primary key. It is a hash value that is used to retrieve items from your table and allocate data across hosts for scalability and availability.

1 to 255 characters and case sensitive.

Sort key - optional
You can use a sort key as the second part of a table's primary key. The sort key allows you to sort or search among all items sharing the same partition key.

1 to 255 characters and case sensitive.

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Scroll down, and click, **"Create table"**.

Creating and Querying a Global Secondary Index

3. Create a GSI:

- You can create a GSI using the AWS Management Console by navigating to your `Movies` table, selecting the `Indexes` tab, and clicking on `Create index`.
- Enter the following **Index details** for this lab:
 - Partition key: **Genre (String)**
 - Sort key: **Rating (Number)**
 - Index name: **Genre-Rating-index**

DynamoDB > Tables > Movies > Create index

Create global secondary index [Info](#)

Global secondary indexes allow you to perform queries on attributes that are not part of a table's primary key. Note that global secondary index read and write capacity settings are separate from those of the table, and they will incur additional costs.

Index details [Info](#)

Partition key

Genre

1 to 255 characters.

Data type

String

Sort key - optional

Rating

1 to 255 characters.


Data type

Number

Index name

Genre-Rating-index

Between 3 and 255 characters. Only A-Z, a-z, 0-9, underscore characters, hyphens, and periods allowed.



Scroll down, and click, **"Create index"**

- It will take a few minutes to create the GSI.

DynamoDB > Tables > Movies

Tables (1)

Any tag key

Any tag value

Find tables by table name

1

Movies

Movies

Overview **Indexes** Monitor Global tables Backups Exports and streams Additions

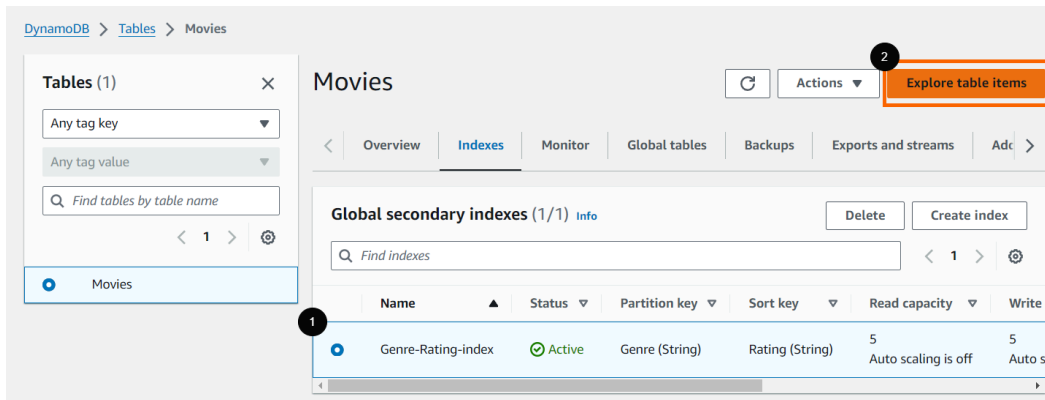
Global secondary indexes (1) [Info](#)

Find indexes

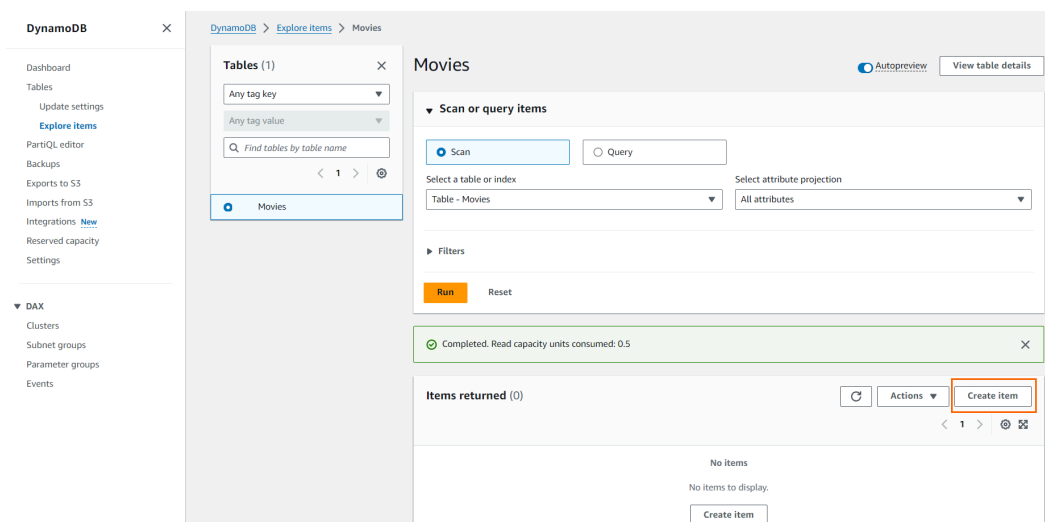
1

Name	Status	Partition key	Sort key	Read capacity	Write capacity
Genre-Rating-index	Creating	Genre (String)	Rating (String)	5 Auto scaling is off	5 Auto scaling is off

4. Once done, select the created GSI, then click **“Explore table items”**.

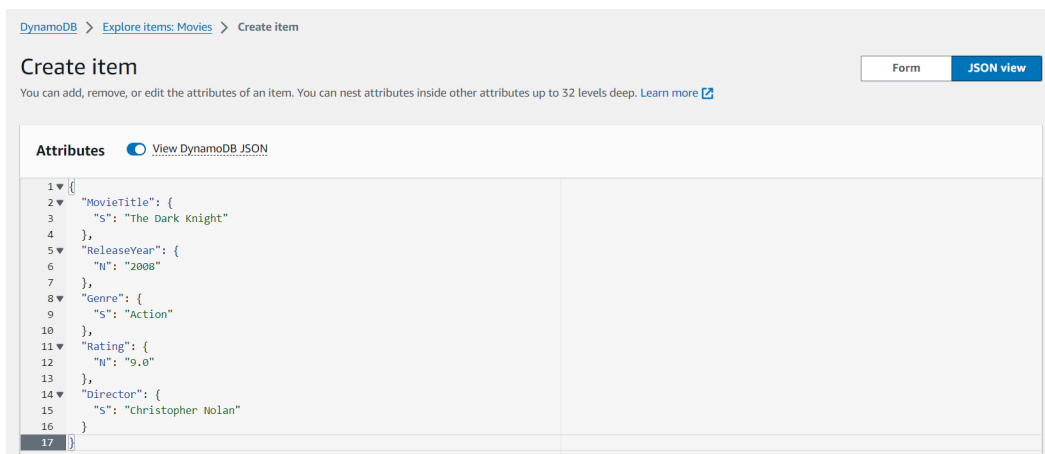


5. Once you're there, click the **“Create Item”** button.



6. **Add Sample Data:** Now, let's add sample data to the 'Movies' table. You can do this one-by-one for each item.

To do this, after clicking the “Create item”, look for the **“JSON view”**, and click it. Then, Copy and Paste the sample data set below, and click, **“Create item”**.



```
{
  "MovieTitle": {
    "S": "The Dark Knight"
  },
  "ReleaseYear": {
    "N": "2008"
  },
  "Genre": {
    "S": "Action"
  },
  "Rating": {
    "N": "9.0"
  },
  "Director": {
    "S": "Christopher Nolan"
  }
}
```

```
{
  "MovieTitle": {
    "S": "Inception"
  },
  "ReleaseYear": {
    "N": "2010"
  },
  "Genre": {
    "S": "Sci-Fi"
  },
  "Rating": {
    "N": "8.8"
  },
  "Director": {
    "S": "Christopher Nolan"
  }
}
```

```
{
  "MovieTitle": {
    "S": "The Godfather"
  },
  "ReleaseYear": {
    "N": "1972"
  },
  "Genre": {
    "S": "Crime"
  },
  "Rating": {
    "N": "9.2"
  },
  "Director": {
    "S": "Francis Ford Coppola"
  }
}
```

```
{
  "MovieTitle": {
    "S": "The Shawshank Redemption"
  },
  "ReleaseYear": {
    "N": "1994"
  },
  "Genre": {
    "S": "Drama"
  },
  "Rating": {
    "N": "9.3"
  },
  "Director": {
    "S": "Frank Darabont"
  }
}
```

```
{
  "MovieTitle": {
    "S": "Pulp Fiction"
  },
  "ReleaseYear": {
    "N": "1995"
  },
  "Genre": {
    "S": "Crime"
  },
  "Rating": {
    "N": "8.9"
  },
  "Director": {
    "S": "Quentin Tarantino"
  }
}
```

Output:

Items returned (6)						<input type="button" value="Refresh"/> <input type="button" value="Actions"/> <input type="button" value="Create item"/>	
						<input type="button" value="Previous"/> <input type="button" value="1"/> <input type="button" value="Next"/> <input type="button" value="Settings"/> <input type="button" value="Fullscreen"/>	
<input type="checkbox"/>	MovieTitle (String)	ReleaseYear (Number)	Director	Genre	Rating		
<input type="checkbox"/>	Pulp Fiction	1995	Quentin Tar...	Crime	8.9		
<input type="checkbox"/>	The Shawshank Redem...	1994	Frank Dara...	Drama	9.3		
<input type="checkbox"/>	Pulp Fiction	1994	Quentin Tar...	Crime	8.9		
<input type="checkbox"/>	The Godfather	1972	Francis For...	Crime	9.2		
<input type="checkbox"/>	Inception	2010	Christopher...	Sci-Fi	8.8		
<input type="checkbox"/>	The Dark Knight	2008	Christopher...	Action	9		

7. Query the GSI: Now you can query the `GenreRatingIndex` GSI using the AWS Management Console.

To do this, scroll up to see the **Scan or query items** section. Select **Query**, and follow the examples below:

- **Example 1: Querying for Action Movies**
 - Click on the **"Select a table or index"** dropdown and select **"Genre-Rating-index"**.
 - Enter **Action** into the **Partition key** field, and click **"Run"** to initiate the query.

Movies
Autopreview
View table details

▼ Scan or query items

☐ Scan
☒ Query

Select a table or index
Select attribute projection

Index - Genre-Rating-index
Projected attributes

Table
Index
Genre-Rating-index

☐ Sort descending

► Filters

Run
Reset

Movies
Autopreview
View table details

▼ Scan or query items

☐ Scan
☒ Query

Select a table or index
Select attribute projection

Index - Genre-Rating-index
Projected attributes

Genre (Partition key)
Rating (Sort key)

Action
Equal to
Enter sort key value
☐ Sort descending

► Filters

Run
Reset

Completed. Read capacity units consumed: 0.5

Items returned (1)

	MovieTitle (String)	ReleaseYear (Number)	Director	Genre	Rating
<input type="checkbox"/>	The Dark Knight	2008	Christopher...	Action	9

This will return all movies in the `Action` genre, sorted by `Rating` in descending order, so the highest-rated action movie is returned first.

• Example 2: Querying for Drama Movies

- Enter `Drama` into the `Partition key` field, and click "Run" to initiate the query.

Movies

Autopreview

View table details

▼ Scan or query items

☐ Scan

☒ Query

Select a table or index

Index - Genre-Rating-index

Select attribute projection

Projected attributes

Genre (Partition key)

Drama

Rating (Sort key)

Equal to

Enter sort key value

☐ Sort descending

► Filters

Run

Reset

Completed. Read capacity units consumed: 0.5

Items returned (1)

⌂

Actions ▼

Create item

<

1

>

⚙

🔍

<input type="checkbox"/>	MovieTitle (String) ▼	ReleaseYear (Number) ▼	Director ▼	Genre ▼	Rating ▼
<input type="checkbox"/>	The Shawshank Redem...	1994	Frank Dara...	Drama	9.3

This will return all movies in the `Drama` genre, sorted by `Rating` in descending order, so the highest-rated drama movie is returned first.

Congratulations! You just successfully learned how to create and query a Global Secondary Index.