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Query Data with DynamoDB

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Introducing Today's Project!

What is Amazon DynamoDB?

Amazon DynamoDB is a fully managed NoSQL (key-value) database from AWS. It's useful because it's serverless, auto-scales, gives millisecond reads/writes, has flexible schemas, and you only pay for what you use.

How I used Amazon DynamoDB in this project

In today's project, I used Amazon DynamoDB to store and query app data. I created four tables (ContentCatalog, Forum, Post, Comment) with CloudShell/CLI, loaded sample JSON, and explored items in the console. I ran queries with partition/sort keys and get-item, saw why queries need the partition key, and finished with a transaction that added a new Comment and atomically bumped the Comments counter on the related Forum.

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On thing that I didn't expect in this project is queries must use the partition key - filters alone won't work. Also, "strongly consistent" reads cost more than eventual reads.

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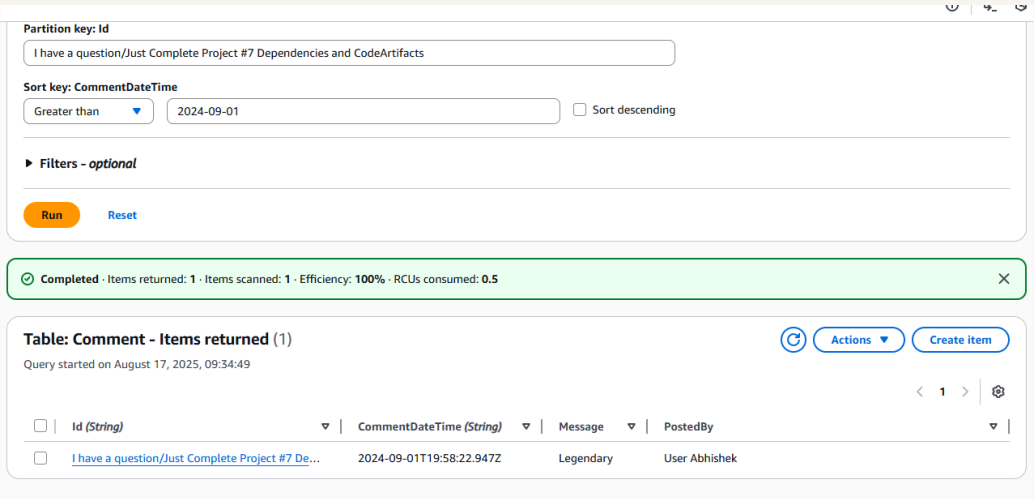
This project took me...

This project took me 2 hours.

Querying DynamoDB Tables

A partition key is the main ID DynamoDB uses to find and group items. If there's no sort key, it must be unique per item.

A sort key is an optional second ID that orders items with the same partition key (e.g., by date), letting you store many items under one key and query by ranges.



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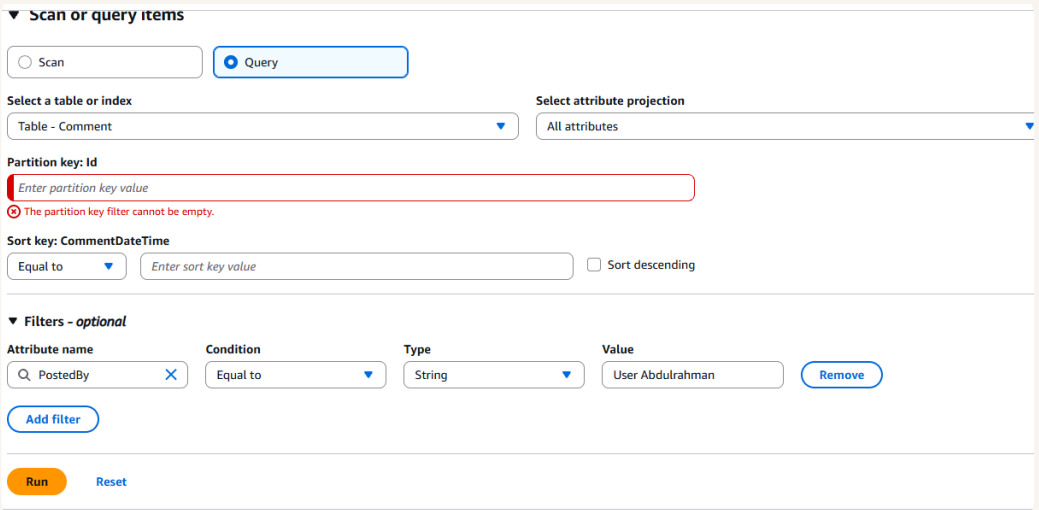
Limits of Using DynamoDB

I ran into an error when I queried for all comments by “User Abdulrahman”. This was because I cleared the partition key and tried to filter only on PostedBy.

Insights we could extract from our Comment table include: comments within each thread (by Id), newest/oldest comments using the date, and when threads are most active. Insights we can't easily extract from the Comment table include: all comments by a specific user, top commenters across threads, or keyword searches - because the keys are set by thread, not by user/content.



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Running Queries with CLI

A query I ran in CloudShell was: aws dynamodb get-item --table-name ContentCatalog --key '{"Id":{"N":"202"}}' --projection-expression "Title, ContentType, Services" --return-consumed-capacity TOTAL This query will fetch the item with Id 202, show only Title, ContentType, Services, and include a note about how much capacity the read used.

Query options I could add to my query are: --consistent-read → get the latest version (strong consistency, costs more). --projection-expression → return only the fields I ask for. --return-consumed-capacity TOTAL → show the capacity used by the request.

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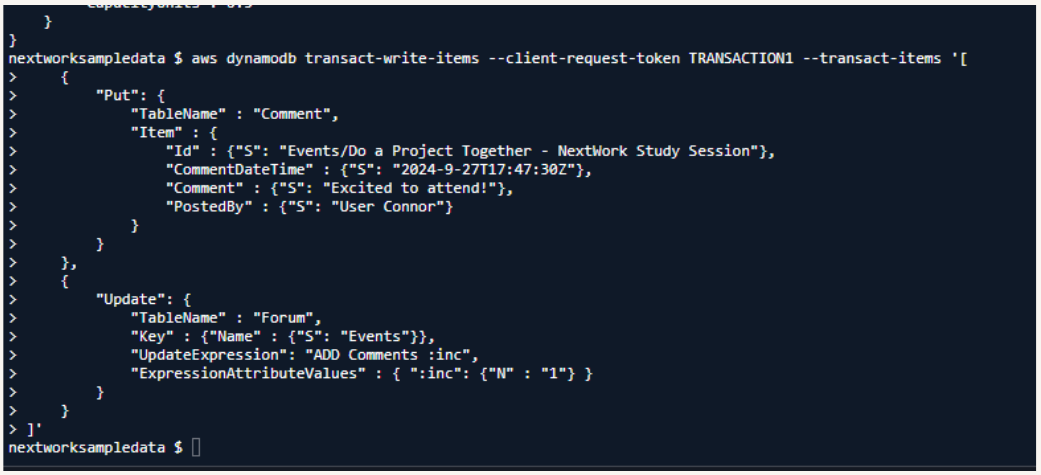
Transactions

A transaction is a bundled set of database actions that succeed or fail together. In DynamoDB, a transaction guarantees all-or-nothing updates - so related writes stay consistent even if something goes wrong.

I ran a transaction using aws dynamodb transact-write-items. This transaction did two things in one atomic step: Put a new item in the Comment table (the new comment). Update the Forum item for Name = "Events" to increment its Comments count by 1. If either step failed, neither change was saved.



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