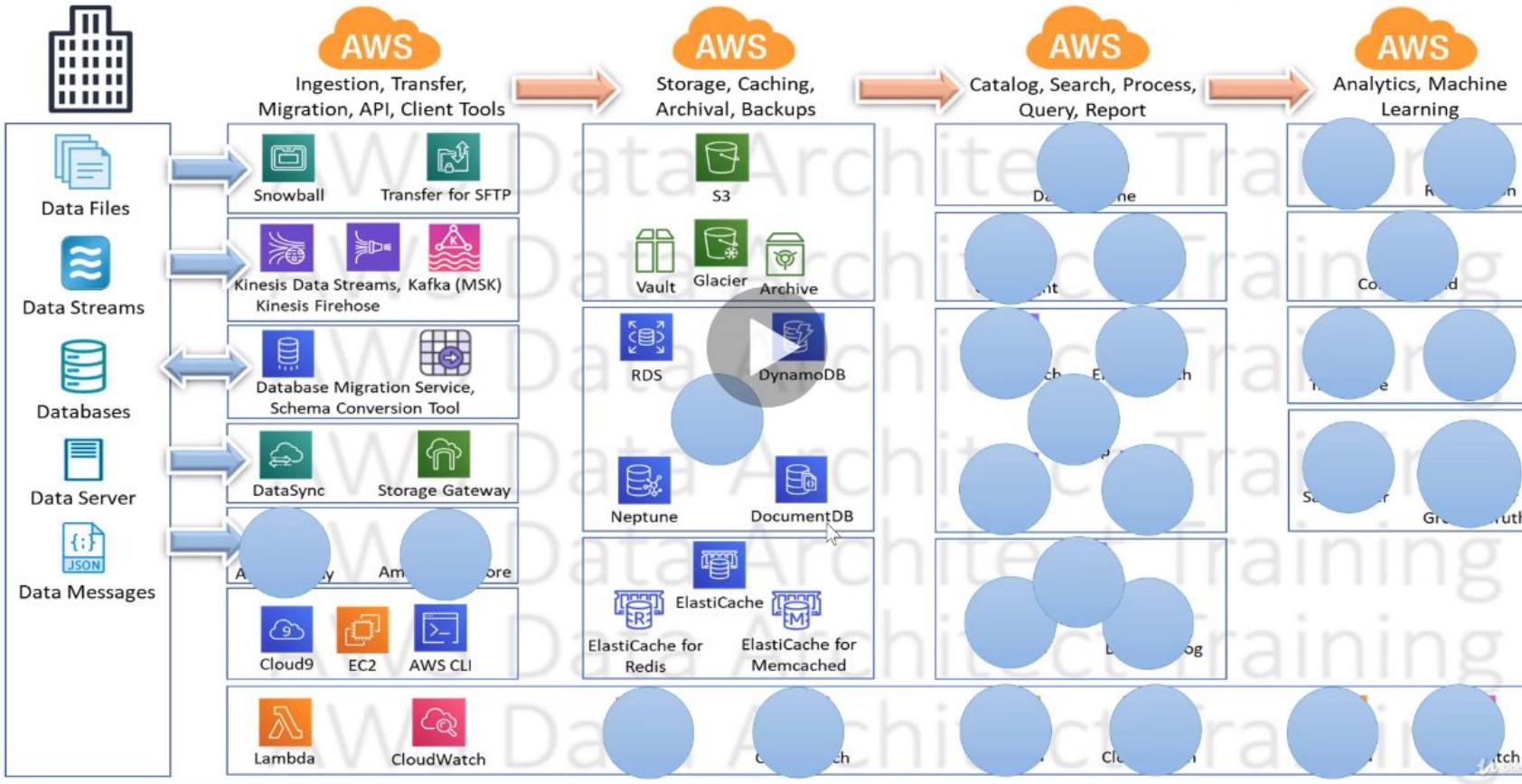


sec_19_DynamoDB_API_G
ateway_Lambda

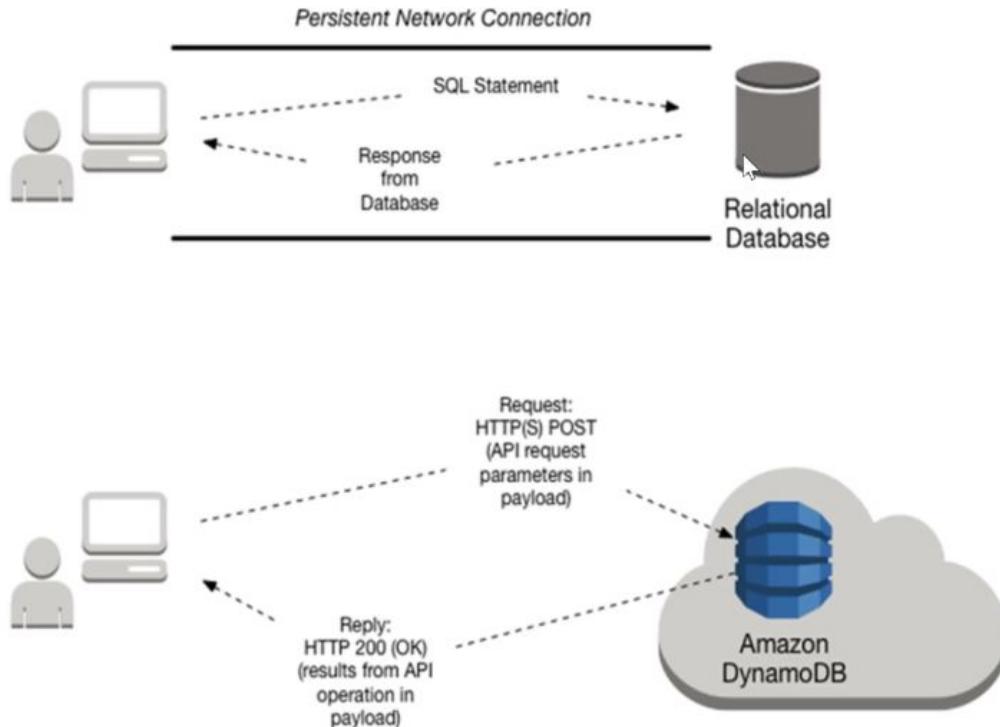
AWS Data Architect Training



Characteristic	Relational Database Management System (RDBMS)	Amazon DynamoDB
Optimal Workloads	Ad hoc queries; data warehousing; OLAP (online analytical processing).	Web-scale applications, including social networks, gaming, media sharing, and IoT (Internet of Things).
Data Model	The relational model requires a well-defined schema, where data is normalized into tables, rows and columns. In addition, all of the relationships are defined among tables, columns, indexes, and other database elements.	DynamoDB is schemaless. Every table must have a primary key to uniquely identify each data item, but there are no similar constraints on other non-key attributes. DynamoDB can manage structured or semi-structured data, including JSON documents.
Data Access	SQL (Structured Query Language) is the standard for storing and retrieving data. Relational databases offer a rich set of tools for simplifying the development of database-driven applications, but all of these tools use SQL.	You can use the AWS Management Console or the AWS CLI to work with DynamoDB and perform ad hoc tasks. Applications can leverage the AWS software development kits (SDKs) to work with DynamoDB using object-based, document-centric, or low-level interfaces.
Performance	Relational databases are optimized for storage, so performance generally depends on the disk subsystem. Developers and database administrators must optimize queries, indexes, and table structures in order to achieve peak performance.	DynamoDB is optimized for compute, so performance is mainly a function of the underlying hardware and network latency. As a managed service, DynamoDB insulates you and your applications from these implementation details, so that you can focus on designing and building robust, high-performance applications.
Scaling	It is easiest to scale up with faster hardware. It is also possible for database tables to span across multiple hosts in a distributed system, but this requires additional investment. Relational databases have maximum sizes for the number and size of files, which imposes upper limits on scalability.	DynamoDB is designed to scale out using distributed clusters of hardware. This design allows increased throughput without increased latency. Customers specify their throughput requirements, and DynamoDB allocates sufficient resources to meet those requirements. There are no upper limits on the number of items per table, nor the total size of that table.

ACCESSING RDBMS vs DynamoDB

The following diagram shows client interaction with a relational database, and with DynamoDB.

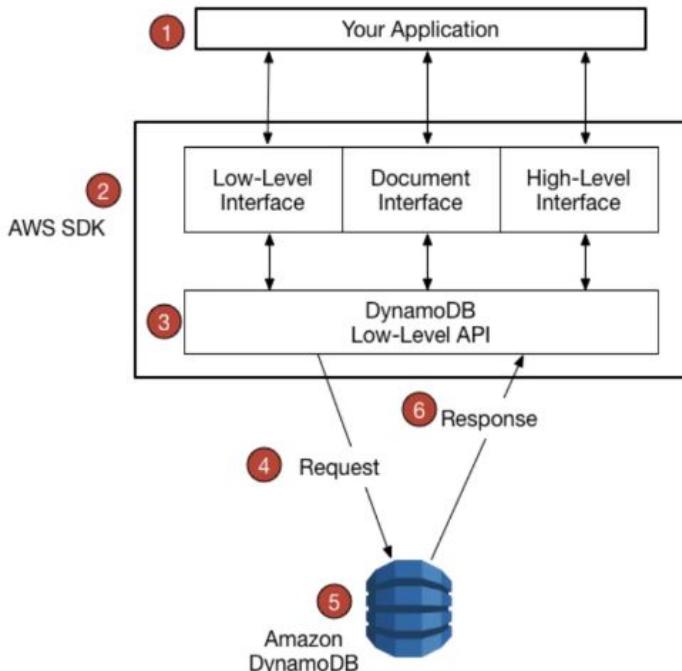


Characteristic	Relational Database Management System (RDBMS)	Amazon DynamoDB
Tools for Accessing the Database	Most relational databases provide a command line interface (CLI), so that you can enter ad hoc SQL statements and see the results immediately.	In most cases, you write application code. You can also use the AWS Management Console or the AWS Command Line Interface (AWS CLI) to send ad hoc requests to DynamoDB and view the results.
Connecting to the Database	An application program establishes and maintains a network connection with the database. When the application is finished, it terminates the connection.	DynamoDB is a web service, and interactions with it are stateless. Applications do not need to maintain persistent network connections. Instead, interaction with DynamoDB occurs using HTTP(S) requests and responses.
Authentication	An application cannot connect to the database until it is authenticated. The RDBMS can perform the authentication itself, or it can offload this task to the host operating system or a directory service.	Every request to DynamoDB must be accompanied by a cryptographic signature, which authenticates that particular request. The AWS SDKs provide all of the logic necessary for creating signatures and signing requests. For more information, see Signing AWS API Requests in the AWS General Reference .
Authorization	Applications can only perform actions for which they have been authorized. Database administrators or application owners can use the SQL GRANT and REVOKE statements to control access to database objects (such as tables), data (such as rows within a table), or the ability to issue certain SQL statements.	In DynamoDB, authorization is handled by AWS Identity and Access Management (IAM). You can write an IAM policy to grant permissions on a DynamoDB resource (such as a table), and then allow IAM users and roles to use that policy. IAM also features fine-grained access control for individual data items in DynamoDB tables. For more information, see Authentication and Access Control for Amazon DynamoDB .
Sending a Request	The application issues a SQL statement for every database operation that it wants to perform. Upon receipt of the SQL statement, the RDBMS checks its syntax, creates a plan for performing the operation, and then executes the plan.	The application sends HTTP(S) requests to DynamoDB. The requests contain the name of the DynamoDB operation to perform, along with parameters. DynamoDB executes the request immediately.
Receiving a Response	The RDBMS returns the results from the SQL statement. If there is an error, the RDBMS returns an error status and message.	DynamoDB returns an HTTP(S) response containing the results of the operation. If there is an error, DynamoDB returns an HTTP error status and message(s).

DynamoDB Transactions

- Transactions provide atomicity, consistency, isolation, and durability (ACID) in DynamoDB, enabling you to maintain data correctness in your applications easily.
- You can use the DynamoDB transactional read and write APIs to manage complex business workflows that require adding, updating, or deleting multiple items as a single, all-or-nothing operation.
- With the transaction write API, you can group multiple Put, Update, Delete, and ConditionCheck actions and submit them as a single TransactWriteItems operation that either succeeds or fails as a unit. The same is true for multiple Get actions, which you can group and submit as a single TransactGetItems operation.
- There is no additional cost to enable transactions for your DynamoDB tables. You pay only for the reads or writes that are part of your transaction.
- DynamoDB performs two underlying reads or writes of every item in the transaction: one to prepare the transaction and one to commit the transaction. These two underlying read/write operations are visible in your Amazon CloudWatch metrics.

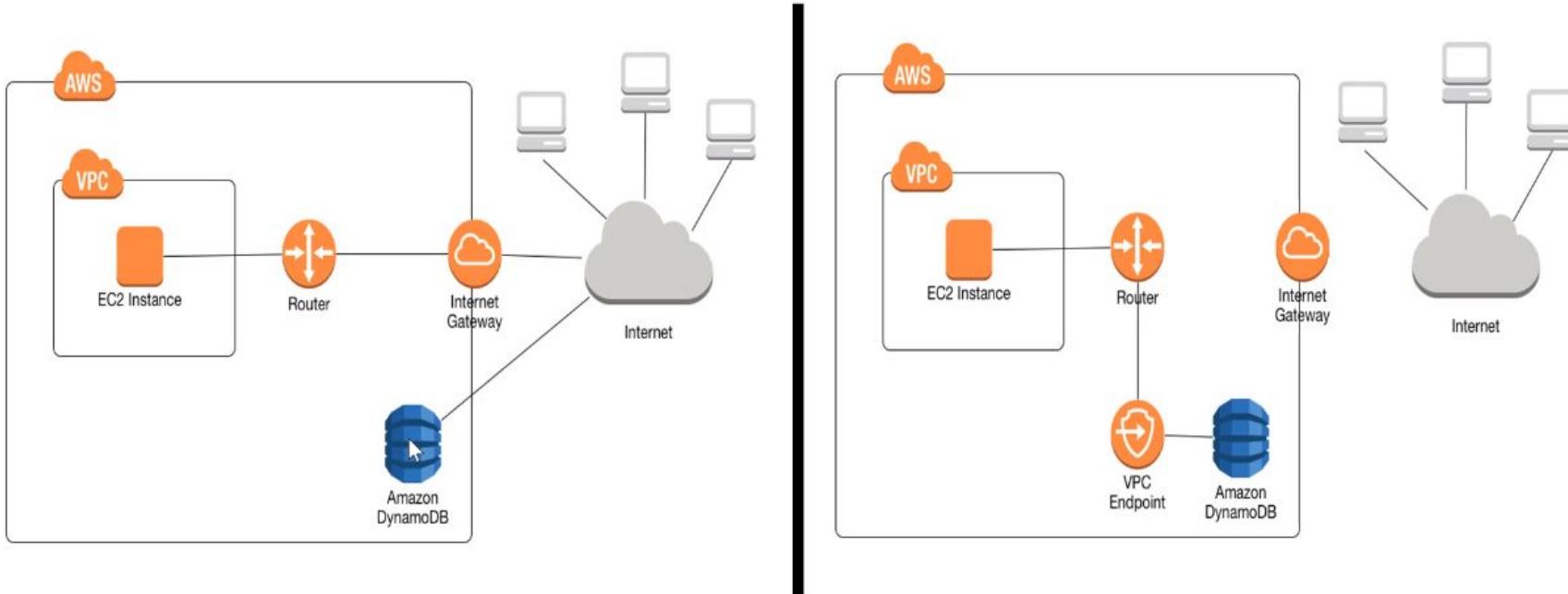
Application Integration with DynamoDB



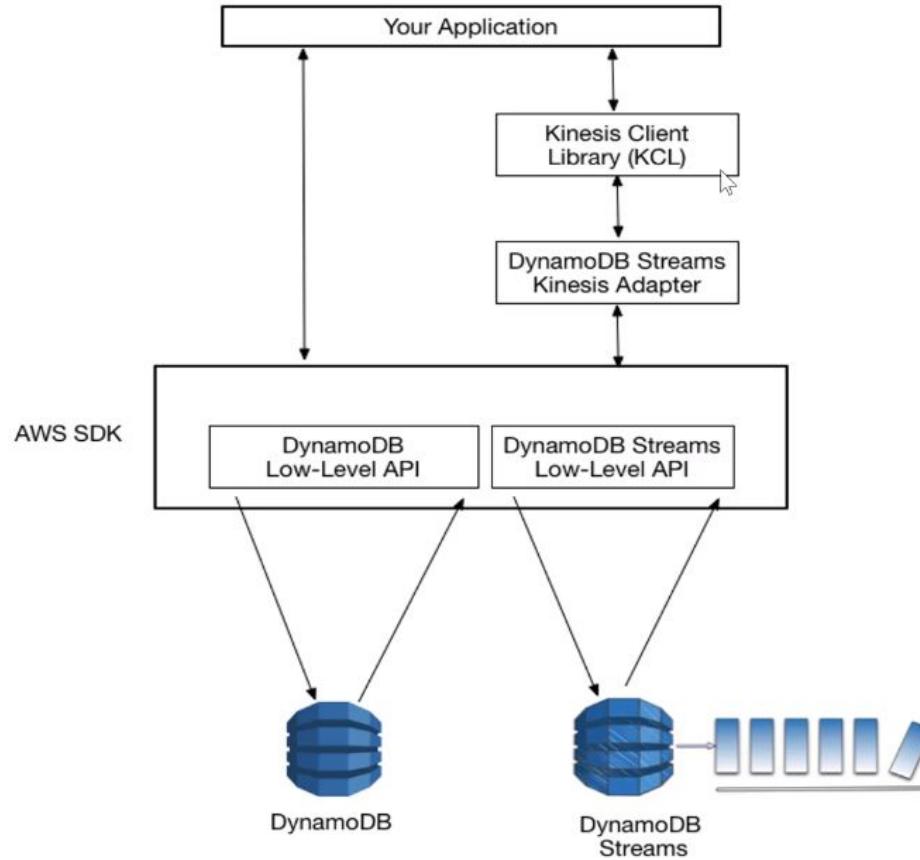
1. You write an application using an AWS SDK for your programming language.
2. Each AWS SDK provides one or more programmatic interfaces for working with DynamoDB. The specific interfaces available depend on which programming language and AWS SDK you use.
3. The AWS SDK constructs HTTP(S) requests for use with the low-level DynamoDB API.
4. The AWS SDK sends the request to the DynamoDB endpoint.
5. DynamoDB executes the request. If the request is successful, DynamoDB returns an HTTP 200 response code (OK). If the request is unsuccessful, DynamoDB returns an HTTP error code and an error message.
6. The AWS SDK processes the response and propagates it back to your application.



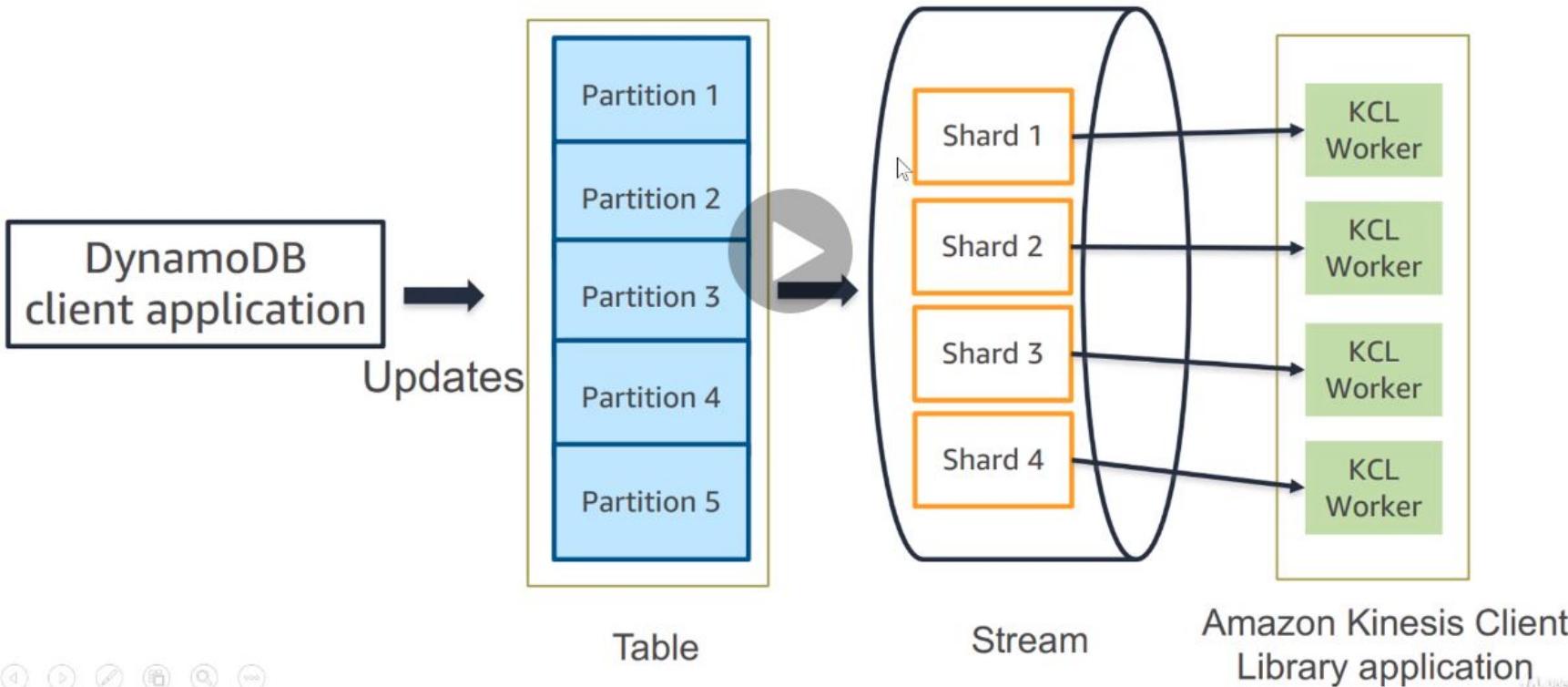
DynamoDB VPC Endpoints



DynamoDB Kinesis Streams Adapter

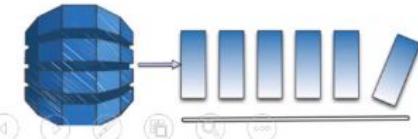
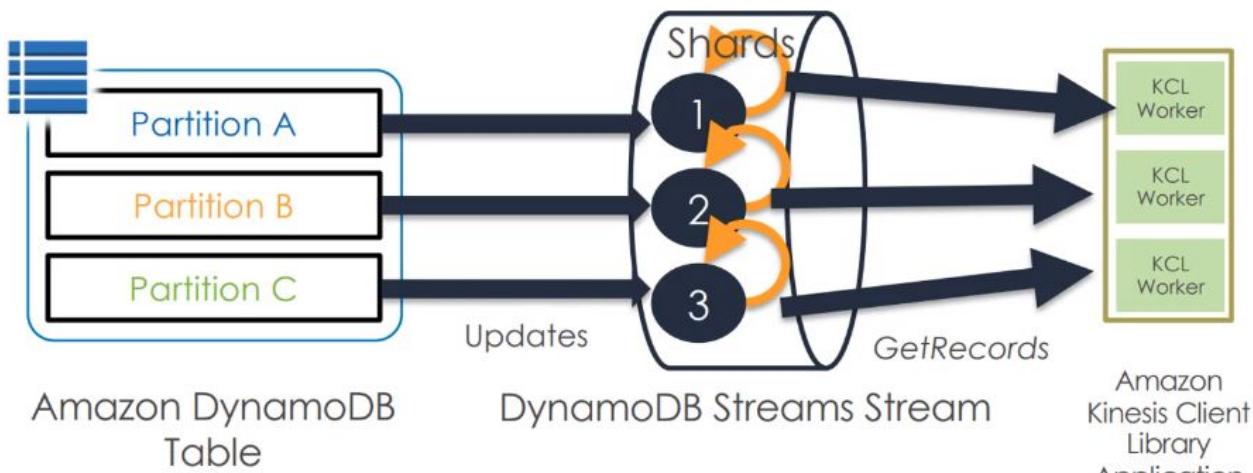
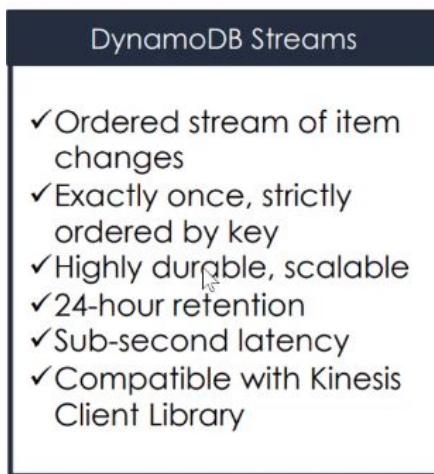


DynamoDB Streams and Amazon Kinesis Client Library



DynamoDB Streams

Shards have a lineage and automatically close after time or when the associated DynamoDB partition splits





Amazon DynamoDB pricing

DynamoDB charges for reading, writing, and storing data in your DynamoDB tables, along with any optional features you choose to enable. DynamoDB has two capacity modes and those come with specific billing options for processing reads and writes on your tables: on-demand and provisioned. Click the following links to learn more about the billing options for each capacity mode.

Pricing for on-demand capacity mode

With on-demand capacity mode, DynamoDB charges you for the data reads and writes your application performs on your tables. You do not need to specify how much read and write throughput you expect your application to perform because DynamoDB instantly accommodates your workloads as they ramp up or down.

On-demand capacity mode might be best if you:

- Create new tables with unknown workloads.
- Have unpredictable application traffic.
- Prefer the ease of paying for only what you use.

[Learn more »](#)

Pricing for provisioned capacity mode

With provisioned capacity mode, you specify the number of reads and writes per second that you expect your application to require. You can use auto scaling to automatically adjust your table's capacity based on the specified utilization rate to ensure application performance while reducing costs.

Provisioned capacity mode might be best if you:

- Have predictable application traffic.
- Run applications whose traffic is consistent or ramps gradually.
- Can forecast capacity requirements to control costs.

[Learn more »](#)





Amazon DynamoDB

Overview

Features

Pricing

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• Basic example



This example demonstrates how pricing is calculated for an auto scaling-enabled table with the provisioned capacity mode. Auto scaling continuously sets provisioned capacity in response to actual consumed capacity so that actual utilization stays near target utilization.

Assume that you create a new table in the US East (N. Virginia) Region with target utilization set to the default value of 70 percent, minimum capacity units at 100 RCU and 100 WCU, and maximum capacity set to 400 RCU and 400 WCU (see [Limits in DynamoDB](#)). For simplicity, assume that each time a user interacts with your application, one write of 1 KB and one strongly consistent read of 1 KB are performed.

For the first 10 days, assume that the consumed RCU and WCU vary between 1 and 70. Auto scaling does not trigger any scaling activities and your bill per hour is \$0.078 (\$0.065 for the 100 WCU provisioned [$\$0.00065 \times 100$] and \$0.013 for the 100 RCU [$\$0.00013 \times 100$]).

Now assume that on day 11 the consumed capacity increases to 100 RCU and 100 WCU. Auto scaling starts triggering scale-up activities to increase the provisioned capacity to 143 WCU and 143 RCU ($100 \text{ consumed} \div 143 \text{ provisioned} = 69.9 \text{ percent}$). The per-hour bill is \$0.11109 (\$0.0925 for 143 WCU and \$0.01859 for 143 RCU).

On day 21, assume the consumed capacity decreases to 80 RCU and 80 WCU. Auto scaling starts triggering scale-down activities to decrease provisioned capacity to 114 WCU and 114 RCU ($80 \text{ consumed} \div 114 \text{ provisioned} = 70.2 \text{ percent}$). The per-hour bill is \$0.08952 (\$0.0741 for 114 WCU and \$0.01482 for 114 RCU).

For the month, you will be charged \$66.86 as follows:

Days 1 – 10: \$18.72 (\$0.078 per hour x 24 hours x 10 days)



Days 11 – 20: \$26.66 (\$0.11109 per hour x 24 hours x 10 days)

Days 21 – 30: \$21.48 (\$0.08952 per hour x 24 hours x 10 days)

The AWS Free Tier includes 25 WCU and 25 RCU, reducing your monthly bill by \$14.04

25 WCU x \$0.00065 per hour x 24 hours x 30 days = \$11.70

25 RCU x \$0.00013 per hour x 24 hours x 30 days = \$2.34

Data storage: Assume your table occupies 25 GB of storage at the beginning of the month and grows to 29 GB by the end of the month, averaging 27 GB based on the continuous monitoring of your table size. The first 25 GB of storage are included in the AWS Free Tier. The remaining 2 GB of storage are charged at \$0.25 per GB, resulting in a table storage cost of \$0.50 for the month.

For the month, your total bill will be \$53.32, a total that includes \$52.82 for read and write capacity and \$0.50 for data storage.



A screenshot of a web browser window displaying the Amazon DynamoDB Developer Guide. The URL in the address bar is <https://docs.aws.amazon.com/amazondynamodb/latest/developerguide/DynamoDBLocal.html>. The page title is "Setting Up DynamoDB Local (Downloadable Version)". The left sidebar contains a navigation tree for the developer guide, including sections like "Setting Up DynamoDB Local (Downloadable Version)" which is currently expanded. The main content area describes the downloadable version of DynamoDB and its benefits. At the bottom right of the page, there are links for "Have a question? Try the Forums.", "Did this page help you?", "Yes", "No", and "Feedback".

Amazon DynamoDB

Developer Guide (API Version 2012-08-10)



Documentation - This Guide

Search



+ What Is Amazon DynamoDB?

- Setting Up DynamoDB

+ Setting Up DynamoDB Local (Downloadable Version)

- DynamoDB (Downloadable Version) on Your Computer

- DynamoDB (Downloadable Version) and Apache Maven

- DynamoDB (Downloadable Version) and Docker

- Usage Notes

- Setting Up DynamoDB (Web Service)

+ Accessing DynamoDB

+ Getting Started with DynamoDB

+ Programming with DynamoDB

+ Working with DynamoDB

+ On-Demand Backup and Restore

- Delete in Three Clicks

AWS Documentation » Amazon DynamoDB » Developer Guide » Setting Up DynamoDB » Setting Up DynamoDB Local (Downloadable Version)

Setting Up DynamoDB Local (Downloadable Version)

The downloadable version of DynamoDB lets you write and test applications without accessing the DynamoDB web service. Instead, the database is self-contained on your computer. When you're ready to deploy your application in production, you can make a few minor changes to the code so that it uses the DynamoDB web service.

Having this local version helps you save on provisioned throughput, data storage, and data transfer fees. In addition, you don't need an internet connection while you're developing your application.

DynamoDB local is available as a download, as an Apache Maven dependency, or as a Docker image.

If you prefer to use the Amazon DynamoDB web service instead, see [Setting Up DynamoDB \(Web Service\)](#).

Topics

- [DynamoDB \(Downloadable Version\) on Your Computer](#)
- [DynamoDB \(Downloadable Version\) and Apache Maven](#)
- [DynamoDB \(Downloadable Version\) and Docker](#)
- [DynamoDB Usage Notes](#)

Document Conventions

[« Previous](#) [Next »](#)

File Home Share View

This PC > Downloads > dynamodb_local_latest >

Name	Date modified	Type	Size
DynamoDBLocal_lib	3/31/2019 5:57 PM	File folder	
third_party_licenses	3/31/2019 5:57 PM	File folder	
DynamoDBLocal	2/7/2019 10:09 PM	Executable Jar File	3,783 KB
LICENSE	2/7/2019 10:09 PM	Text Document	9 KB
README	2/7/2019 10:09 PM	Text Document	2 KB

5 items



C:\windows\system32\cmd.exe - java -Djava.library.path=../DynamoDBLocal_lib -jar DynamoDBLocal.jar -port 8001

```
:\\Users\\siddharth\\Downloads\\dynamodb_local_latest>java -Djava.library.path=../DynamoDBLocal_lib -jar DynamoDBLocal.jar -port 8001
initializing DynamoDB Local with the following configuration:
port: 8001
nMemory: false
bPath: null
haredDb: false
houldDelayTransientStatuses: false
orsParams: *
```

DynamoDB (Downloadable Version) x DynamoDB JavaScript Shell x +

localhost:8001/shell/

amazon web services

DynamoDB JavaScript Shell

>Welcome to the DynamoDB Web Shell

Get started with some API templates by clicking the </> button on the menu screen or start the tutorial by typing in 'tutorial.start()'

Or take a getting started tour:

DynamoDB Developer Guide AWS JavaScript SDK API Reference DynamoDB API Reference

Navigation icons: back, forward, search, etc.

A screenshot of a web browser window displaying the DynamoDB JavaScript Shell. The title bar shows tabs for 'DynamoDB (Downloadable Version)' and 'DynamoDB JavaScript Shell'. The address bar shows 'localhost:8001/shell/'. The main content area features the Amazon Web Services logo and the title 'DynamoDB JavaScript Shell'. A large central panel displays a dark-themed interface with a blue 3D cube icon, the text 'Welcome to the DynamoDB Web Shell', instructions for getting started with API templates or a tutorial, and a link to a 'getting started tour' with an info icon. On the left, there's a vertical sidebar with a tab labeled '1' and navigation controls (back, forward, search). At the bottom, there are links to 'DynamoDB Developer Guide', 'AWS JavaScript SDK API Reference', and 'DynamoDB API Reference'. A toolbar at the top right contains icons for file operations (cube, save, settings, help).



API Templates



▶ PutItem

▶ UpdateItem

▶ DeleteItem

▶ BatchWriteItem

▶ GetItem

▶ BatchGetItem

▶ Query

▶ Scan

▶ CreateTable

▶ UpdateTable

▶ DeleteTable



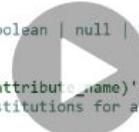


PutItem



SDK Docs API Docs

```
1+ var params = {
2   TableName:'table_name',
3   Item: {} // a map of attribute name to AttributeValue
4
5   attribute_name: attribute_value,
6   // attribute_value (string | number | boolean | null | Binary | DynamoDBSet | Array | Object)
7   // more attributes...
8 },
9 ConditionExpression: 'attribute_not_exists(attribute_name)', // optional String describing the constraint t
10 ExpressionAttributeNames: { // a map of substitutions for attribute names with special characters
11   //'#name': 'attribute name'
12 },
13 ExpressionAttributeValues: { // a map of substitutions for all attribute values
14   //':value': 'VALUE'
15 },
16 ReturnValues: 'NONE', // optional (NONE | ALL_OLD)
17 ReturnConsumedCapacity: 'NONE', // optional (NONE | TOTAL | INDEXES)
18 ReturnItemCollectionMetrics: 'NONE', // optional (NONE | SIZE)
19 };
20 docClient.put(params, function(err, data) {
21   if (err) ppJson(err); // an error occurred
22   else ppJson(data); // successful response
23 });
```





DynamoDB JavaScript Shell

i 1 tutorial.start()


i 1 tutorial.start()

Getting Started

Let's get started with [Amazon DynamoDB](#) and the shell by taking a quick tour. We'll create some sample tables, load them with data, and perform some queries. For a more in-depth introduction, visit the [Amazon DynamoDB Developer Guide](#). A documentation link will always be below at the foot of the page.

To go to the next step in the tutorial, type `tutorial.next()`. You can also type `tutorial.help()` for a listing of available commands, or `tutorial.steps()` to list the table of contents.



```
1 // The PutItem API inserts a new item into DynamoDB.
2 // If an item already exists with the same primary key value,
3 // the item is replaced with the new item.
4 // The API has several other useful parameters not shown here, including:
5 // * Expected: DynamoDB will perform the write only if certain attributes
6 //   match the values you expect them to have
7 // * ReturnValue: DynamoDB can return the value you are replacing
8 * var params = {
9     TableName: 'Image',
10    Item: {
11        Id: 'dynamodb.png',
12        DateAdded: new Date().toISOString(),
13        VoteCount: 0
14    }
15};
16 console.log("Calling PutItem");
17 ppJson(params);
18 * docClient.put(params, function(err, data) {
19     if (err) ppJson(err); // an error occurred
20     else console.log("PutItem returned successfully");
21});
```

PutItem: Adding Items to the Image Table

Now that you have a table created, you can add [items](#) to the table using the [PutItem API](#). This request puts a new Image item into the Image table. An Item is a map of attribute name to attribute value. Each attribute value in an item must be one of the [supported data types](#). This example puts a new item with 3 attributes: Id, DateAdded, and VoteCount. You can see more details about the PutItem API in the [Working with Items](#) section of the Developer Guide.

Run the PutItem command now (▶). Notice that by default, this API does not return anything.



```
1 // The PutItem API inserts a new item into DynamoDB.
2 // If an item already exists with the same primary key value,
3 // the item is replaced with the new item.
4 // The API has several other useful parameters not shown here, including:
5 // * Expected: DynamoDB will perform the write only if certain attributes
6 //   match the values you expect them to have
7 // * ReturnValue: DynamoDB can return the value you are replacing
8 * var params = ({});
16 console.log("Calling PutItem");
17 ppJson(params);
18 * docClient.put(params, function(err, data) {});
```

```
"TableName":"Image"
  "Item" {
    "Id":"dynamodb.png"
    "DateAdded":"2019-04-01T00:55:39.677Z"
    "VoteCount":0
  }
```

```
Calling PutItem
▶
PutItem returned successfully
```





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[Create table](#)[Getting started guide](#)

Create tables

Create DynamoDB tables with a few clicks. Just specify the desired read and write throughput for your table, and DynamoDB handles the rest.

[More about DynamoDB throughput](#)

Add and query items

Once you have created a DynamoDB table, use the AWS SDKs to write, read, modify, and query items in DynamoDB.

[DynamoDB API reference](#)

Monitor and manage tables

Using the AWS Management Console, you can monitor performance and adjust the throughput of your tables, enabling you to scale seamlessly.

[Monitoring tables](#)

DynamoDB documentation & support

[Getting started guide](#) | [FAQ](#) | [Developer guide](#) | [Forums](#) | [Report an issue](#)

DynamoDB · AWS Console + Create a Table with Partition Keys and Add Data

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#create-table:

Services Resource Groups

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Create DynamoDB table

Tutorial

DynamoDB is a schema-less database that only requires a table name and primary key. The table's primary key is made up of one or two attributes that uniquely identify items, partition the data, and sort data within each partition.

Table name*



Primary key* Partition key

String



Add sort key

Table settings

Default settings provide the fastest way to get started with your table. You can modify these default settings now or after your table has been created.

Use default settings

- No secondary indexes.
- Provisioned capacity set to 5 reads and 5 writes.
- Basic alarms with 80% upper threshold using SNS topic "dynamodb".
- Encryption at Rest with DEFAULT encryption type **NEW!**



You do not have the required role to enable Auto Scaling by default.

Please refer to [documentation](#).



Create DynamoDB table

Tutorial



DynamoDB is a schema-less database that only requires a table name and primary key. The table's primary key is made up of one or two attributes that uniquely identify items, partition the data, and sort data within each partition.

Table name*

Users



Primary key*

Partition key

userid



String

Binary

Number

 Add sort key

Table settings

Default settings provide the fastest way to get started with your table. You can modify these default settings now or after your table has been created.

 Use default settings

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- Basic alarms with 80% upper threshold using SNS topic "dynamodb".
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Create DynamoDB table

Tutorial



DynamoDB is a schema-less database that only requires a table name and primary key. The table's primary key is made up of one or two attributes that uniquely identify items, partition the data, and sort data within each partition.

Table name*

Users



Primary key*

Partition key

userid

String

 Add sort key

String



The sort key allows for searching within a partition. For example, an Orders table with primary attribute CustomerId and sort attribute OrderTimestamp would allow for queries for all orders by a specific customer in a given date range.

Table settings

Default settings provide the fastest way to get started with your table. You can modify these default settings now or after your table has been created.

 Use default settings

- No secondary indexes.
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Create DynamoDB table

[Tutorial](#)

DynamoDB is a schema-less database that only requires a table name and primary key. The table's primary key is made up of one or two attributes that uniquely identify items, partition the data, and sort data within each partition.

Table name*

Users



Primary key*

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 Add sort key

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Users Close

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Table details

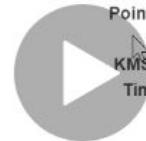


Table name	Users
Primary partition key	userid (String)
Primary sort key	-
Point-in-time recovery	DISABLED Enable
Encryption Type	DEFAULT
KMS Master Key ARN	Not Applicable
Time to live attribute	DISABLED Manage TTL
Table status	Active
Creation date	December 26, 2018 at 1:38:44 PM UTC-5
Read/write capacity mode	Provisioned
Last change to on-demand mode	-
Provisioned read capacity units	5 (Auto Scaling Disabled)
Provisioned write capacity units	5 (Auto Scaling Disabled)
Last decrease time	-
Last increase time	-
Storage size (in bytes)	0 bytes
Item count	0
Region	US West (Oregon)
Amazon Resource Name (ARN)	arn:aws:dynamodb:us-west-2: :table/Users

Storage size and item count are not updated in real-time. They are updated periodically, roughly every six hours.

DynamoDB · AWS Console

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#tables:selected=Users;tab=items

DynamoDB

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Dashboard Clusters Subnet groups Parameter groups Events

Create item

Tree Item {1}

+ userid String : VALUE

Cancel Save

Feedback English (US)

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U Ude

DynamoDB · AWS Console x +

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#tables:selected=Users;tab=items

Services ▼ Resource Groups ▼ ★

Oregon ▼ Support ▼

DynamoDB

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Create table Delete table

Filter by table name X

Name

Users

Items Overview Metrics Alarms Capacity Indexes Global Tables Backups Triggers More ▾

Create item Actions ⚙️ ⚡

Scan: [Table] Users: userid Viewing 1 to 1 items

Scan ▼ [Table] Users: userid ▼ ▲

+ Add filter

Start search Cancel changes

	userid i	age	income	name
<input type="checkbox"/>	1	10	100	Sid

Feedback English (US)

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DynamoDB Fundamentals

- DynamoDB is a non-relational NoSQL database, and does not support table joins. Instead, applications read data from one table at a time.
- DynamoDB provides native support for documents, using JSON. This makes DynamoDB ideal for storing semi-structured data, such as Tags. You can also retrieve and manipulate data from within JSON documents.
- In DynamoDB, tables, items, and attributes are the core components that you work with.
- A table is a collection of items, and each item is a collection of attributes. DynamoDB uses primary keys to uniquely identify each item in a table and secondary indexes to provide more querying flexibility.
- You can use DynamoDB Streams to capture data modification events in DynamoDB tables.
- When you create a table, in addition to the table name, you must specify the primary key of the table. The primary key uniquely identifies each item in the table, so that no two items can have the same key.
- Most SQL databases are transaction-oriented. When you issue an INSERT statement, the data modifications are not permanent until you issue a COMMIT statement. With Amazon DynamoDB, the effects of a write action (using PutItem action) are permanent when DynamoDB replies with an HTTP 200 status code (OK).
- In DynamoDB, there is a 1 MB limit on data returned per result set.

Table



Mandatory
Key-value access pattern
Determines data distribution

Optional
Model 1:N relationships
Enables rich query capabilities

All items for key
==, <, >, >=, <=
“begins with”
“between”
“contains”
“in”
sorted results
counts
top/bottom N values

Data types



Type	DynamoDB Type
String	String
Integer, Float	Number
Timestamp	Number or String
Blob	Binary
Boolean	Bool
Null	Null
List	List
Set	Set of String, Number, or Binary
Map	Map

DynamoDB Indexes

- Whenever a write occurs on a table, all of the table's indexes must be updated. In a write-heavy environment with large tables, this can consume large amounts of system resources. In a read-only or read-mostly environment, this is not as much of a concern—however, you should ensure that the indexes are actually being used by your application, and not simply taking up space.
- You can create one or more secondary indexes on a table. A secondary index lets you query the data in the table using an alternate key, in addition to queries against the primary key.
- After you create a secondary index on a table, you can read data from the index in much the same way as you do from the table. DynamoDB supports two kinds of indexes:
 - Global secondary index – An index with a partition key and sort key that can be different from those on the table.
 - Local secondary index – An index that has the same partition key as the table, but a different sort key
- Each table in DynamoDB has a limit of 20 global secondary indexes (default limit) and 5 local secondary indexes per table.
- DynamoDB ensures that the data in a secondary index is eventually consistent with its table. You can request strongly consistent Query or Scan actions on a table or a local secondary index. However, global secondary indexes only support eventual consistency.
- In DynamoDB, you perform Query operations directly on the index, in the same way that you would do so on a table.

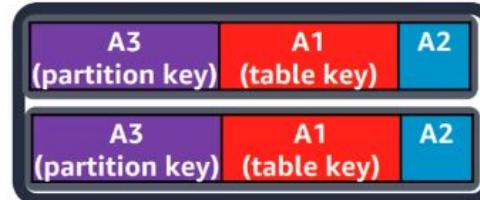
DynamoDB GSIs

Global secondary indexes

- Alternate partition (+sort) key
- Index is across all table partition keys
- Can be added or removed anytime
- Eventually consistent



ALL



INCLUDE A2



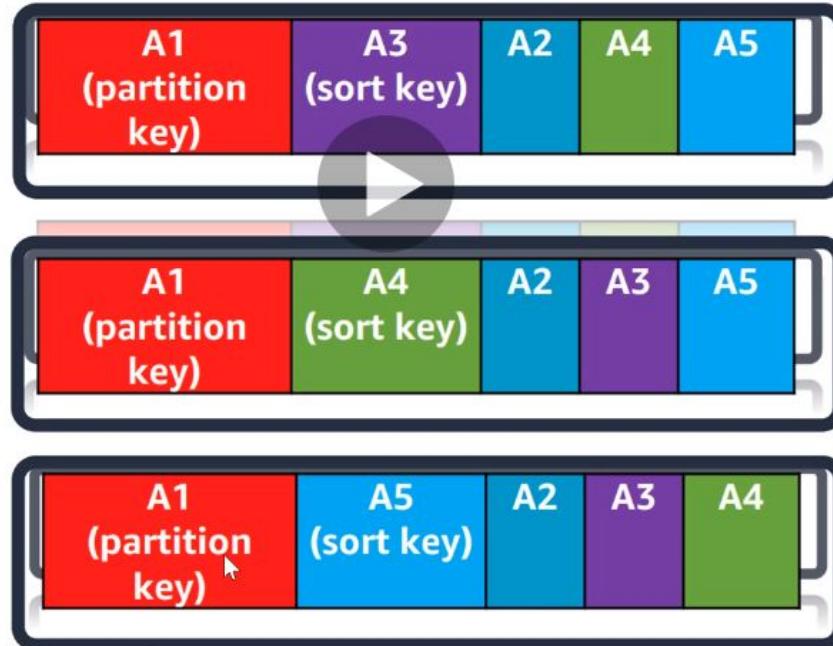
KEYS_ONLY

RCUs/WCUs provisioned separately for GSIs

DynamoDB LSIs

Local secondary indexes

- Alternate sort key attribute
- Index is local to a partition key



Can only be defined as part of initial table creation

Throughput



Provisioned at the table level

- Write capacity units (WCUs) are measured in 1 KB per second
- Read capacity units (RCUs) are measured in 4 KB per second
 - RCUs measure strictly consistent reads
 - Eventually consistent reads cost 1/2 of consistent reads

Read and write throughput limits are independent



RCU



WCU





Services

Resource Groups



Oregon

Support

Create DynamoDB table

[Tutorial](#)

DynamoDB is a schema-less database that only requires a table name and primary key. The table's primary key is made up of one or two attributes that uniquely identify items, partition the data, and sort data within each partition.

Table name*



Primary key*

Partition key

String

 Add sort key

String



Table settings

Default settings provide the fastest way to get started with your table. You can modify these default settings now or after your table has been created.

 Use default settings

- No secondary indexes.
- Provisioned capacity set to 5 reads and 5 writes.
- Basic alarms with 80% upper threshold using SNS topic "dynamodb".
- Encryption at Rest with DEFAULT encryption type.



You do not have the required role to enable Auto Scaling by default.

Please refer to documentation.

Table settings

Default settings provide the fastest way to get started with your table. You can modify these default settings now or after your table has been created.

Use default settings

Secondary indexes

Add index

Primary key* Partition key

String

Add sort key

String

Index name*

Projected attributes

Read capacity units Write capacity units

Table 5 5

Read/write capacity

Select on-demand if you save on throughput costs
DynamoDB Developer Guide

Read/write capacity mode

Provisioned capacity

Projected attributes are attributes stored in the index, and can be returned by queries and scans performed on the index. Local secondary index queries can also return attributes that are not projected by fetching them from the table. Global secondary index queries can only return projected attributes. Note, that projected attributes incur write and storage costs. For more information and performance tuning tips, see [Projections](#).



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Table settings

Default settings provide the fastest way to get started with your table. You can modify these default settings now or after your table has been created.

 Use default settings

Secondary indexes

Read/write capacity

Select on-demand if you save on throughput costs
DynamoDB Developer Guide

Read/write capacity mode

Provisioned capacity

Add index

Primary key* Partition key

String

Add sort key

String

Index name* departmentId-userId-index

Projected attributes Keys only

Create as Local Secondary Index

Read capacity units

Table

5

Write capacity units

5

Estimated cost \$2.91 / month (Capacity calculator)



Services

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Support

Table settings

Default settings provide the fastest way to get started with your table. You can modify these default settings now or after your table has been created.

 Use default settings

Secondary indexes

Read/write capacity

Select on-demand if you want to save on throughput costs.
DynamoDB Developer Guide

Read/write capacity mode

Provisioned capacity

Add index

Primary key* Partition key

String

Add sort key String

Index name* departmentid-userid-index

Projected attributes Include

Add

Create as Local Secondary Index

Estimated cost \$2.91 / month (Capacity calculator)



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Table settings

Default settings provide the fastest way to get started with your table. You can modify these default settings now or after your table has been created.

 Use default settings

Secondary indexes

Read/write capacity

Select on-demand if you save on throughput cost
DynamoDB Developer C

Read/write capacity mod

Provisioned capacity

Add index

Primary key*

Partition key
 String

Add sort key

String

Index name*

Projected attributes

All

Create as Local Secondary Index

Cancel

Add index

Table

5

Read capacity units

Write capacity units

5



Services

Resource Groups



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Provisioned capacity

Table
5Write capacity units
5Estimated cost \$2.91 / month ([Capacity calculator](#))

Auto Scaling

 Read capacity Write capacityTarget utilization
70 %

70 %

Minimum provisioned capacity
5 units

5 units

Maximum provisioned capacity
40000 units

40000 units

 Apply same settings to global secondary indexes Apply same settings to global secondary indexes

Please check your IAM permissions to create new service linked role for enabling Auto Scaling.
[See permissions.](#)

IAM Role I authorize DynamoDB to scale capacity using the following role:

 [DynamoDB AutoScaling Service Linked Role](#)



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Support

See permissions.

IAM Role I authorize DynamoDB to scale capacity using the following role:

- DynamoDB AutoScaling Service Linked Role
- Existing role with pre-defined policies [\[Instructions\]](#)

Note: If you have the required IAM permissions, a Service Linked Role will automatically be created on your behalf. [Learn more](#)

Role Name*



Encryption At Rest

Select Encryption settings for your DynamoDB table to help protect [data at rest](#). [Learn more](#)

- DEFAULT**

Server-side encryption using AWS owned CMK
(Customer Master Key)

- KMS**

Server-side encryption using AWS managed CMK
(Customer Master Key)

Additional charges may apply if you exceed the AWS Free Tier levels for CloudWatch or Simple Notification Service. Advanced alarm settings are available in the CloudWatch management console.

Cancel

Create

DynamoDB · AWS Console + New tab

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#tables:selected=User_History;tab=indexes

AWS Services Resource Groups Oregon Support

DynamoDB

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User_History Close

Overview Items Metrics Alarms Capacity Indexes Global Tables Backups Triggers Access control Tags

Create index Delete index

Name	Status	Type	Partition key	Sort key	Attributes	Read capacity	Write capacity	Size	Item count
userid-departmentid-index	N/A	LSI	userid (String)	departmentid (String)	ALL	-	-	0 bytes	0

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DynamoDB Primary Keys

DynamoDB supports two different kinds of primary keys:

- Partition key – A simple primary key, composed of one attribute known as the partition key. DynamoDB uses the partition key's value as input to an internal hash function. The output from the hash function determines the partition (physical storage internal to DynamoDB) in which the item will be stored. In a table that has only a partition key, no two items can have the same partition key value.
-  Partition key and sort key – Referred to as a composite primary key, this type of key is composed of two attributes. The first attribute is the partition key (same as mentioned above), and the second attribute is the sort key. All items with the same partition key value are stored together, in sorted order by sort key value. In a table that has a partition key and a sort key, it's possible for two items to have the same partition key value. However, those two items must have different sort key values.
- The partition key of an item is also known as its hash attribute. The sort key of an item is also known as its range attribute.

DynamoDB · AWS Console + X

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#tables:selected=Users;tab=metrics

AWS Services Resource Groups

DynamoDB

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View all CloudWatch metrics

Time Range Last Hour

Capacity: table

Read capacity (Units/Second - 1 min avg) Throttled read requests (Count) Throttled read events (Count) Write capacity (Units/Second - 1 min avg)

Throttled write requests (Count) Throttled write events (Count)

Capacity: table

Read capacity (Units/Second - 1 min avg) Throttled read requests (Count) Throttled read events (Count) Write capacity (Units/Second - 1 min avg)

Throttled write requests (Count) Throttled write events (Count)

Time Range Last Hour

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DynamoDB · AWS Console

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View all CloudWatch metrics

Time Range Last Hour

Capacity: table

Read capacity (Units/Second - 1 min avg) Throttled read requests (Count) Throttled read events (Count) Write capacity (Units/Second - 1 min avg)

Throttled write requests (Count) Throttled write events (Count)

Capacity: table

Read capacity (Units/Second - 1 min avg) Throttled read requests (Count) Throttled read events (Count) Write capacity (Units/Second - 1 min avg)

Throttled write requests (Count) Throttled write events (Count)

Time Range Last Hour

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Users Close

[Overview](#) [Items](#) [Metrics](#) [Alarms](#) [Capacity](#) [Indexes](#) [Global Tables](#) [Backups](#) [Triggers](#) [Access control](#) [Tags](#)[View all CloudWatch metrics](#)Time Range [Last Hour](#)

System errors read (Count)



System errors write (Count)



User errors (Count)



Conditional check failed (Count)



Transaction

Transaction conflict errors (Count)





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<input type="checkbox"/>	Name	State	Metric	Threshold	Action
<input type="checkbox"/>	Users-ReadCapacityUnitsLimit-BasicAlarm	Ok	ConsumedReadCapacityUnits	≥ 4 for 5 minutes	Notify SNS topic dynamodb
<input type="checkbox"/>	Users-WriteCapacityUnitsLimit-BasicAlarm	Ok	ConsumedWriteCapacityUnits	≥ 4 for 5 minutes	Notify SNS topic dynamodb





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Scaling activities

Read/write capacity mode

Select on-demand if you want to pay only for the read and writes you perform, with no capacity planning required. Select provisioned to save on throughput costs if you can reliably estimate your application's throughput requirements. See the [DynamoDB pricing page](#) and [DynamoDB Developer Guide](#) to learn more.

Read/write capacity mode can be changed later.

- Provisioned (free-tier eligible)
 On-demand



Last change to on-demand mode: No read/write capacity mode changes have been made.

Next available change to on-demand mode: You can update to on-demand mode at any time.

Provisioned capacity



Read capacity units

Table

5

Write capacity units

5

Estimated cost \$2.91 / month ([Capacity calculator](#))

Auto Scaling

 Read capacity Write capacity



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Read/write capacity mode

Select on-demand if you want to pay only for the read and writes you perform, your application's throughput requirements. See the [DynamoDB pricing page](#)

Read/write capacity mode can be changed later.

- Provisioned (free-tier eligible)
- On-demand

Last change to on-demand mode: No read/write capacity mode changes have been made.

Next available change to on-demand mode: You can update to on-demand mode at any time.

Provisioned capacity

Read capacity units

Table

5

Estimated cost: \$2.91 / month ([Capacity calculator](#))

Auto Scaling

Capacity calculator

Avg. item size KBItem read/sec Eventually consistentItem write/sec StandardRead capacity Write capacity Estimated cost
per table/index

Cancel

Update

 Read capacity Write capacity[Save](#)[Cancel](#)

AWS Data Architect Bootcamp - 43 Services 500 FAQs 20+ Tools | Udemy - Chromium

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DynamoDB - AWS Console

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#tables:selected=Users;tab=indexes

AWS Services Resource Groups Oregon Support

DynamoDB

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- Tables
- Backups
- Reserved capacity
- Preferences

DAX

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Tables

Overview Items Metrics

Create index Delete index

Name

Global Secondary Indexes present in all items. M

Create index

Primary key* Partition key

Add sort key

Index name*

Projected attributes All

Read capacity units 5 Write capacity units 5

Estimated cost \$2.91 / month (Capacity calculator)

Approximate creation time is 5 minutes. Additional write capacity may decrease creation time. A notification will be sent to the SNS topic dynamodb once the index creation is complete. Basic Alarms with 60% upper threshold using SNS topic 'dynamodb' will be automatically created. Additional charges may apply if you exceed the AWS Free Tier levels for CloudWatch or Simple Notification Service. Advanced configuration for alarms can be done in the alarms tab.

Create index

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Course content Overview Q&A Notes Announcements

Section 1: Introduction

3 / 3 | 13min

The screenshot shows a browser window with the Udemy 'AWS Data Architect Bootcamp' course page. A video player is playing 'Section 1: Introduction'. An 'indexing' effect is applied to the video frame. Overlaid on the video is a 'Create index' dialog from the AWS DynamoDB console. The dialog is titled 'Create index' and contains fields for 'Primary key*', 'Index name*', 'Projected attributes' (set to 'All'), and capacity units (5 for both read and write). It also displays an estimated cost of \$2.91/month. A note at the bottom of the dialog explains creation times and notifications. The background shows the Udemy course navigation bar and the AWS services sidebar.

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AWS Data Architect BC

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154. Lab: AWS DynamoDB - Table Properties and Features Walkthrough

DynamoDB · AWS Console

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#tables:selected=Users;tab=globaltables

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Global Tables enable you to use DynamoDB as a fully-managed, multi-region, multi-master database. [Learn more](#)

⚠ To create a global table, ensure that this table is empty and that DynamoDB Streams are enabled.
A table must meet the following requirements to become part of a global table.

Empty table: No ⓘ
Streams: Disabled ⓘ
Stream type: -
[Enable streams](#)

IAM role AWSServiceRoleForDynamoDBReplication ⓘ
Automatically created on your behalf.

Global Table regions

A global table cannot be edited once any of its replica tables are populated. [Learn more](#)

Add region Remove region

Region Name	Status	Read capacity units	Write capacity units	Auto Scaling	Endpoint
-------------	--------	---------------------	----------------------	--------------	----------

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DynamoDB - AWS Console

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#tables:selected=Users;tab=backups

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Point-in-time Recovery

DynamoDB maintains continuous backups of your table for the last 35 days. [Learn more](#)

Status	DISABLED	Enable
Earliest restore date	-	
Latest restore date	-	

Restore to point-in-time

On-Demand Backup and Restore

You can create and restore a complete backup of your DynamoDB table data and its settings at any time. [Learn more](#)

Create backup Restore backup Delete backup

Filter by backup name Time Range Last 30 Days No Backups

Backup name Status Creation time Size Backup type Expiration date

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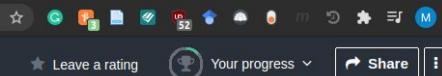
Course content Overview Q&A Notes Announcements

Section 1: Introduction

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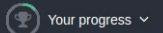
The screenshot shows the AWS DynamoDB console for the 'Users' table. The 'Backups' tab is selected. Under 'Point-in-time Recovery', it says 'DynamoDB maintains continuous backups of your table for the last 35 days.' There are fields for 'Earliest restore date' and 'Latest restore date', both currently showing '-'. A 'Restore to point-in-time' button is present. Below this, the 'On-Demand Backup and Restore' section allows creating, restoring, or deleting backups. It includes a 'Create backup' button and a table for filtering backups by name, status, creation time, size, backup type, and expiration date. The time range is set to 'Last 30 Days'. The footer contains links for Feedback, English (US), Privacy Policy, and Terms of Use.

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154. Lab: AWS DynamoDB - Table Properties and Features Walkthrough

DynamoDB · AWS Console

<https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#tables:selected=Users;tab=triggers>

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Create trigger



Edit/Test trigger

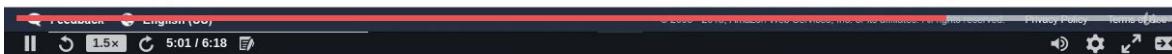
Delete trigger



?

Function name State Last result

DynamoDB triggers connect DynamoDB streams to Lambda functions. Whenever an item in the table is modified, a new stream record is written, which in turn triggers the Lambda function and causes it to execute. [More info](#)



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DynamoDB - AWS Console

<https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#tables:selected=Users;tab=accesscontrol>

aws

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[Overview](#) [Items](#) [Metrics](#) [Alarms](#) [Capacity](#) [Indexes](#) [Global Tables](#) [Backups](#) [Triggers](#) **Access control** [Tags](#)

Fine-grained access control is an optional feature that enables additional filtering and control that is helpful for direct database access by mobile apps. Web Identity Federation allows your mobile apps to use identity providers such as Login with Amazon, Facebook, and Google.

Identity provider

Actions

Facebook

Google

Login with Amazon

 PutItem Query UpdateItem

Allowed attributes

Create policy[Attach policy instructions](#)[Feedback](#) [English \(US\)](#)© 2008 - 2018, Amazon Web Services, Inc. or its affiliates. All rights reserved. [Privacy Policy](#) [Terms](#)[Course content](#) [Overview](#) [Q&A](#) [Notes](#) [Announcements](#)

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DynamoDB - AWS Console

<https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#tables:selected=Users;tab=tags>

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Tags

Apply tags to your resources to help organize and identify them. A tag consists of a case-sensitive key-value pair. For example, you could define a tag with key = Name and value = Webserver. [Learn more](#) about tagging your AWS resources.

Applied Tags

Key	Value	Delete

Add Tags

Key	Value
<input type="text" value="Add key"/>	<input type="text" value="Empty value"/>

[Cancel](#)[Apply Changes](#)[Feedback](#) [English \(US\)](#)© 2008 - 2018, Amazon Web Services, Inc. or its affiliates. All rights reserved. [Privacy Policy](#) [Terms](#)[Course content](#)[Overview](#)[Q&A](#)[Notes](#)[Announcements](#)

Section 1: Introduction

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155. Lab: AWS DynamoDB - Backups, Reserved Capacity and Preferences

DynamoDB · AWS Console

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#backups:

aws Services Resource Groups Oregon Support

DynamoDB Dashboard Tables Backups Reserved capacity Preferences

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Create backup Restore backup Delete backup

Filter by backup or table name Time Range Last 30 Days Backup type All backups

No Backups < >

Backup name	Status	Table	Creation time	Size	Backup type	Exp.
You have no backups in the current selected time range. Click "Create backup" above to create one. Learn more						

Feedback English (US) 1.5x 0:07 / 3:59 Privacy Policy Terms of Use

Course content Overview Q&A Notes Announcements

Section 1: Introduction 3 / 3 | 13min

The image shows a dual-browser setup. The top window is a Chromium browser displaying the AWS DynamoDB 'Backups' page. The sidebar on the left lists 'DynamoDB' services like Tables, Backups, and DAX. The main content area shows a table with no data, with a message encouraging users to 'Create backup'. The bottom window is an Udemy course page titled 'AWS Data Architect Bootcamp - 43 Services 500 FAQs 20+ Tools'. It shows a navigation bar with 'Course content', 'Overview', 'Q&A', 'Notes', and 'Announcements'. A specific lecture is selected, indicated by a blue header bar. The video player at the bottom shows a duration of 3:59. Both windows have standard Linux-style window controls.

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155. Lab: AWS DynamoDB - Backups, Reserved Capacity and Preferences

DynamoDB · AWS Console

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#backups:

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Oregon Support

Dashboard Tables Backups Reserved capacity Preferences

DAX Dashboard Clusters Subnet groups Parameter groups Events

Create backup Restore backup Delete backup

Filter by backup or table name Time Range Last 30 Days Backup type All backups

No Backups < < > >

Backup name Status Table Creation time Size Backup type Exp

Create table backup

Table name Select a table.

Backup name Type the backup name.

Cancel Create

Course content Overview Q&A Notes Announcements

Section 1: Introduction

3 / 3 | 13min

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AWS Data Architect BC

udemy.com/course/aws-data-architect-bootcamp-training/learn/lecture/14343530#content

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155. Lab: AWS DynamoDB - Backups, Reserved Capacity and Preferences

DynamoDB - AWS Console

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#reserved-capacity:

Services Resource Groups

DynamoDB

Dashboard Tables Backups Reserved capacity Preferences

DAX Dashboard Clusters Subnet groups Parameter groups Events

Total capacity for US West (Oregon)

Provisioned read capacity 5 Reserved read capacity 0
Provisioned write capacity 5 Reserved write capacity 0

Purchase reserved capacity

Filter: Active

Status	Capacity type	Capacity units	Hourly price	Upfront price	Days remaining	Purchase date	Term
--------	---------------	----------------	--------------	---------------	----------------	---------------	------

Reserved capacity is a billing feature that allows you to obtain discounts on your provisioned throughput capacity in exchange for a one-time up-front payment and commitment to a minimum monthly usage level. Reserved capacity applies within a single AWS region and can be purchased with 1-year or 3-year terms. [More info](#)

Course content Overview Q&A Notes Announcements

Section 1: Introduction

3 / 3 | 13min

This screenshot shows a dual-pane interface. The top pane displays a Udemy course page for 'AWS Data Architect Bootcamp' with a specific lecture selected. The bottom pane shows the AWS DynamoDB console, specifically the 'Reserved Capacity' section under the 'DynamoDB' service. The AWS navigation bar is visible at the top of the bottom pane. The main content area shows current capacity usage (5 provisioned read/write units) and a prominent 'Purchase reserved capacity' button. A tooltip explains what reserved capacity is. The bottom of the screen shows the standard Linux desktop taskbar with various application icons.

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155. Lab: AWS DynamoDB - Backups, Reserved Capacity and Preferences

DynamoDB - AWS Console

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#purchase-reserved-capacity:

aws Services Resource Groups Oregon Support

Purchase reserved capacity

DynamoDB now offers reserved capacity. You can purchase DynamoDB capacity at a discounted rate via an upfront payment and a minimum monthly commitment of read or write throughput capacity. Purchasing this reserved capacity will charge an upfront fee to the payment method associated with this Amazon Web Services account. Hourly usage charges will appear on your monthly bill for the duration of the reserved capacity term, even if you choose not to provision that capacity. Reserved capacity is applied to the aggregate capacity of all DynamoDB tables owned by your account within the specified region. Any capacity provisioned beyond your reserved capacity will be billed at normal on-demand rates. For more information, see [Amazon DynamoDB pricing](#).

Region US West (Oregon)

Provisioned Capacity Type*

Term*

Provisioned Capacity Units*

* Required

Course content Overview Q&A Notes Announcements

Section 1: Introduction

3 / 3 | 13min

AWS Data Architect BC



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155. Lab: AWS DynamoDB - Backups, Reserved Capacity and Preferences

DynamoDB · AWS Console

aws

Services

Resource Groups

DynamoDB

Dashboard

Tables

Backups

Reserved capacity

Preferences

DAX

Dashboard

< Clusters

Subnet groups

Parameter groups

Events

Preferences



Choose and save your preferences for viewing and interacting with the AWS DynamoDB console. To reset the default view settings for the console, choose 'Reset to defaults'.

Layout and navigation settings

Table detail view mode

Vertical
(default)

Horizontal



Full



Show navigation bar

 Yes (default) No

Default entry page

 Dashboard (default) Tables

Favorite table tab

Overview



Items tab settings



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Overview

Q&A

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155. Lab: AWS DynamoDB - Backups, Reserved Capacity and Preferences

DynamoDB - AWS Console https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#preferences:

aws Services Resource Groups Oregon Support

DynamoDB

Dashboard

Tables

Backups

Reserved capacity

Preferences

DAX

Dashboard Clusters Subnet groups Parameter groups Events

Show navigation bar Yes (default) No

Default entry page Dashboard (default) Tables

Favorite table tab Overview

Items tab settings

Items editor mode Tree (default) Text

Items default query type Scan (default) Query

Automatic scan operation when accessing the items tab Yes (default) No

Items tab page size 100 (default) 200 300

Cancel Reset to defaults Save

Section 1: Introduction

3 / 3 | 13min

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156. Lab: AWS DynamoDB - Create API Gateway and Lambda Function AWS Management Console

https://us-west-2.console.aws.amazon.com/console/home?region=us-west-2

aws Services Resource Groups Oregon Support

AWS Management Console

AWS services

Find services
You can enter names, keyword or acronyms.

API Gateway Build, Deploy and Manage APIs

API Gateway Alexa for Business Alexa for Business Provides Tools to Manage Alexa in Your Organization

Amazon Transcribe Powerful Speech Recognition

CloudFront Global Content Delivery Network

CloudTrail Track User Activity and API Usage

Secrets Manager Easily rotate, manage, and retrieve secrets throughout their lifecycle

Lambda OpsWorks AWS Amplify

Batch Service Catalog Mobile Hub

Elastic Beanstalk Systems Manager AWS AppSync

Managed Services Trusted Advisor Device Farm

Storage

S3 Control Tower

Access resources on the go

Access the Management Console using the AWS Console Mobile App. Learn more

Explore AWS

Scalable, Durable, Secure Backup & Restore with Amazon S3
Discover how customers are building backup & restore solutions on AWS that save money. Learn more

Amazon Redshift
Fast, simple, cost-effective data warehouse that can extend queries to your data lake. Learn more

AWS Marketplace

Course content Overview Q&A Notes Announcements

Section 1: Introduction

3 / 3 | 13min

The screenshot shows a browser window with the Udemy AWS Data Architect Bootcamp course page open. The address bar shows the URL for the course's lecture page. The main content area displays the AWS Management Console interface. In the search bar under 'AWS services', 'API Gateway' is typed. To the right, a sidebar titled 'Access resources on the go' shows a mobile device icon and text about using the AWS Console Mobile App. Another sidebar titled 'Explore AWS' highlights 'Scalable, Durable, Secure Backup & Restore with Amazon S3' and 'Amazon Redshift'. At the bottom, there are navigation links for 'Course content', 'Overview', 'Q&A', 'Notes', and 'Announcements'. A video player at the bottom indicates the current video is 'Section 1: Introduction' at 3 / 3 | 13min.

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156. Lab: AWS DynamoDB - Create API Gateway and Lambda Function

API Gateway

https://us-west-2.console.aws.amazon.com/apigateway/home?region=us-west-2#/apis/create

Services Resource Groups

Amazon API Gateway APIs > Create

Oregon Support

Create Example API

Welcome to Amazon API Gateway. To create your first API, we have pre-populated the import form with a Pet Store API defined using Swagger 2.0. To get started, close this modal and select Import in the Create API form.

OK

Choose the protocol

Select whether you would like to create a REST API or a WebS...

REST WebSocket

Create new API

In Amazon API Gateway, a REST API refers to a collection of res...

New API Import from Swagger or Open API 3 Example API

Example API

Learn about the service by importing an example API and turning on hints throughout the console.

```
1 {
2     "swagger": "2.0",
3     "info": {
4         "description": "Your first API with Amazon API Gateway. This is a sample API that integrates via HTTP with our demo Pet Store endpoints",
5         "title": "PetStore"
6     },
7     "schemes": [
8         "https"
9     ],
10    "paths": {
11        "/": {
12            "get": {
13                "tags": [
14                    "pets"
15                ],
16                "description": "PetStore HTML web page containing API usage information",
17                "consumes": [
18                    "application/json"
19                ]
20            }
21        }
22    }
23}
```

Course content Overview Q&A Notes Announcements

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156. Lab: AWS DynamoDB - Create API Gateway and Lambda Function

API Gateway

https://us-west-2.console.aws.amazon.com/apigateway/home?region=us-west-2#/apis/create

aws Services Resource Groups Oregon Support

Amazon API Gateway APIs > Create Show all hints ?

Choose the protocol

Select whether you would like to create a REST API or a WebSocket API.

REST WebSocket

Create new API

In Amazon API Gateway, a REST API refers to a collection of resources and methods that can be invoked through HTTPS endpoints.

New API Import from Swagger or Open API 3 Example API

Settings

Choose a friendly name and description for your API.

API name*

Description

Endpoint Type

* Required

Section 1: Introduction

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156. Lab: AWS DynamoDB - Create API Gateway and Lambda Function API Gateway

https://us-west-2.console.aws.amazon.com/apigateway/home?region=us-west-2#/apis/create

aws Services Resource Groups Oregon Support

Amazon API Gateway APIs > Create Show all hints ?

Choose the protocol

Select whether you would like to create a REST API or a WebSocket API.

REST WebSocket

Create new API

In Amazon API Gateway, a REST API refers to a collection of resources and methods that can be invoked through HTTPS endpoints.

New API Import from Swagger or Open API 3 Example API

Settings

Choose a friendly name and description for your API.

API name*

Description

Endpoint Type

* Required

Create API

Feedback English (US) 3:59 / 8:42 1.5x 1.5x 3:59 / 8:42

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156. Lab: AWS DynamoDB - Create API Gateway and Lambda Function

API Gateway https://us-west-2.console.aws.amazon.com/apigateway/home?region=us-west-2#/apis/xx98027sl/resources/vyw49su5hf Oregon Support

aws Services Resource Groups APIs > DynamoDBOps (xx98027sl) > Resources > / (vyw49su5hf) Show all hints ?

APIs

DynamoDBOps

Resources (selected)

Stages

Authorizers

Gateway Responses

Models

Resource Policy

Documentation

Settings

Usage Plans

API Keys

Custom Domain Names

Client Certificates

VPC Links

Settings

No methods defined for the resource.

Feedback English (US)

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Course content Overview Q&A Notes Announcements

Section 1: Introduction

3 / 3 | 13min

The screenshot shows the AWS API Gateway console. On the left, a sidebar lists various API management features like DynamoDBOps, Stages, Authorizers, etc. The 'Resources' option is selected. In the main pane, a breadcrumb navigation path shows 'APIs > DynamoDBOps (xx98027sl) > Resources > / (vyw49su5hf)'. Below the path, it says 'No methods defined for the resource.' There are tabs for 'Actions' and 'Methods'. A large text input field is present for defining methods. At the bottom of the main pane, there are navigation arrows and a 'Show all hints' button. The top of the browser window shows the Udemy course navigation bar and the address bar with the URL for the AWS API Gateway.

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156. Lab: AWS DynamoDB - Create API Gateway and Lambda Function

API Gateway

https://us-west-2.console.aws.amazon.com/apigateway/home?region=us-west-2#/apis/xx98027sl/resources/vyw49su5hf

aws Services Resource Groups Oregon Support

Amazon API Gateway APIs > DynamoDBOps (xx98027sl) > Resources > / (vyw49su5hf) Show all hints ?

APIs

DynamoDBOps

Resources

Stages

Authorizers

Gateway Responses

Models

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API Keys

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VPC Links

Settings

Actions / Methods

No methods defined for the resource.

Create Method

Create Resource

Enable CORS

Edit Resource Documentation

API Actions

Deploy API

Import API

Edit API Documentation

Delete API

https://us-west-2.console.aws.amazon.com/apigateway/home?region=us-west-2#

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156. Lab: AWS DynamoDB - Create API Gateway and Lambda Function API Gateway

https://us-west-2.console.aws.amazon.com/apigateway/home?region=us-west-2#/apis/xx98027sl/resources/vyw49su5hf

aws Services Resource Groups Oregon Support

Amazon API Gateway APIs > DynamoDBOps (xx98027sl) > Resources > / (vyw49su5hf) Show all hints ?

APIs

DynamoDBOps

Resources (selected)

Stages

Authorizers

Gateway Responses

Models

Resource Policy

Documentation

Settings

Usage Plans

API Keys

Custom Domain Names

Client Certificates

VPC Links

Settings

No methods defined for the resource.

Actions / Methods

GET

Play button

Feedback English (US) 1.5x 4:55 / 8:42

Course content Overview Q&A Notes Announcements

Section 1: Introduction

3 / 3 | 13min

This screenshot captures a session in the AWS API Gateway console during a Udemy course. The user is in the 'Resources' section of a newly created API named 'DynamoDBOps'. They are in the process of defining a new method for a specific resource path, indicated by the 'Actions' dropdown menu. A large, prominent play button is centered in the main content area, likely a placeholder or a UI element related to the video player at the bottom of the screen. The browser's address bar shows the URL for the AWS API Gateway home page, and the Udemy navigation bar is visible at the top.

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156. Lab: AWS DynamoDB - Create API Gateway and Lambda Function API Gateway

https://us-west-2.console.aws.amazon.com/apigateway/home?region=us-west-2#/apis/xx98027sl/resources/vyw49su5hf/methods/GET

aws Services Resource Groups Oregon Support

Amazon API Gateway APIs > DynamoDBOps (xx98027sl) > Resources > / (vyw49su5hf) > GET Show all hints ?

APIs Resources Actions / - GET - Setup

Choose the integration point for your new method.

Integration type Lambda Function HTTP Mock AWS Service VPC Link

Requests will be proxied to Lambda with request details available in the 'event' of your handler function.

Use Lambda Proxy Integration Lambda Region us-west-2

Lambda Function

You do not have any Lambda Functions in us-west-2. Create a Lambda Function in your current account, or provide an Lambda Function ARN for Cross-Account Access.

Use Default Timeout

Save

Course content Overview Q&A Notes Announcements

Section 1: Introduction

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This screenshot shows the AWS API Gateway console within a browser window. The user is creating a new GET method for a resource under the 'DynamoDBOps' API. The 'Actions' dropdown is open, and the 'Lambda Function' option is selected. A tooltip explains that requests will be proxied to Lambda with request details available in the 'event' of the handler function. The 'Lambda Region' is set to 'us-west-2'. A note at the bottom indicates that no Lambda functions exist in this region, prompting the user to create one or provide an ARN for cross-account access. The 'Save' button is visible at the bottom right of the form.

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156. Lab: AWS DynamoDB - Create API Gateway and Lambda Function API Gateway Lambda Management Console

https://us-west-2.console.aws.amazon.com/lambda/home?region=us-west-2#/create

aws Services Resource Groups Oregon Support

Lambda Functions Create function

Create function

Author from scratch Blueprints AWS Serverless Application Repository

Start with a simple "hello world" example. Choose a preconfigured template as a starting point for your Lambda function. Find and deploy serverless applications published by AWS, AWS partners, and other developers.

Author from scratch Info

Name myFunctionName

Runtime You can select a supported AWS Lambda runtime or provide your own runtime as part of the function deployment package or Lambda layer after creating the function. Node.js 8.10

Role Defines the permissions of your function. Note that new roles may not be available for a few minutes after creation. Learn more about Lambda execution roles. Choose an existing role

Feedback English (US) 1.5x 6:49 / 8:42

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156. Lab: AWS DynamoDB - Create API Gateway and Lambda Function API Gateway Lambda Management Console

https://us-west-2.console.aws.amazon.com/lambda/home?region=us-west-2#/create?f0=a3c%3D%3ARHluYW1vREI%3D&tab=blueprints

Services Resource Groups Oregon Support

AWS Lambda

Blueprints Info Export

Add filter keyword : DynamoDB

dynamodb-process-stream An Amazon DynamoDB trigger that logs the updates made to a table. nodejs - dynamodb

dynamodb-process-stream-python An Amazon DynamoDB trigger that logs the updates made to a table. python2.7 - dynamodb

dynamodb-process-stream-python An Amazon DynamoDB trigger that logs the updates made to a table. python3.6 - dynamodb

splunk-dynamodb-stream-proc ssor Stream AWS DynamoDB table activity from DynamoDB Stream to Splunk's HTTP event collector nodejs6.10 - splunk - dynamodb - dynamodb-stream

Cancel Configure

Feedback English (US) Privacy Policy Terms of Service

1.5x 7:07 / 8:42

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API Gateway Lambda Management Console

https://us-west-2.console.aws.amazon.com/lambda/home?region=us-west-2#/create

AWS Services Resource Groups Oregon Support

AWS Lambda

Dashboard Applications Functions Layers

Author from scratch Info

Name: ReadUserData

Runtime: Node.js 8.10

Role: Choose an existing role

Existing role: service-role/LambdaServiceRole

Cancel Create function

Feedback English (US)

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Course content Overview Q&A Notes Announcements

Section 1: Introduction

3 / 3 | 13min

The screenshot shows a browser window with the Udemy 'AWS Data Architect Bootcamp' course page. The main content is the 'Lambda Management Console' showing the creation of a new Lambda function named 'ReadUserData'. The function is configured with 'Node.js 8.10' runtime and the 'service-role/LambdaServiceRole' role. The 'Create function' button is highlighted. At the bottom, there's a navigation bar with 'Course content', 'Overview', 'Q&A', 'Notes', and 'Announcements'. A footer includes links for 'Feedback', 'English (US)', and legal notices.

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156. Lab: AWS DynamoDB - Create API Gateway and Lambda Function

API Gateway

Lambda Management Console



https://us-west-2.console.aws.amazon.com/lambda/home?region=us-west-2#/functions/ReadUserData?newFunction=true&tab=graph



Services

Resource Groups



Oregon

Support



Lambda > Functions > ReadUserData

ARN - arn:aws:lambda:us-west-2:█████████████████████:function:ReadUserData

Throttle

Qualifiers ▾

Actions ▾

Select a test event... ▾

Test

Save

ReadUserData

Congratulations! Your Lambda function "ReadUserData" has been successfully created. You can now change its code and configuration. Choose Test to input a test event when you want to test your function.

Configuration Monitoring

▼ Designer

Add triggers

Choose a trigger from the list below to add it to your function.

API Gateway

AWS IoT

Alexa Skills Kit

Alexa Smart Home

Application Load Balancer



ReadUserData



(0)



Amazon CloudWatch Logs

Resources that the function's role has access to appear here

Feedback English (US)

1.5x 8:29 / 8:42



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157. Lab: AWS DynamoDB - Configure Lambda Function API Gateway Lambda Management Console

https://us-west-2.console.aws.amazon.com/lambda/home?region=us-west-2#/functions/ReadUserData?newFunction=true&tab=graph

aws Services Resource Groups Oregon Support

Lambda > Functions > ReadUserData

ARN - arn:aws:lambda:us-west-2:█████████████████████:function:ReadUserData

Throttle Qualifiers Actions Select a test event... Test Save

Congratulations! Your Lambda function "ReadUserData" has been successfully created. You can now change its code and configuration. Choose Test to input a test event when you want to test your function.

Configuration Monitoring

Designer

Add triggers Choose a trigger from the list below to add it to your function.

API Gateway AWS IoT Alexa Skills Kit Alexa Smart Home Application Load Balancer

ReadUserData Layers (0)

API Gateway Configuration required Amazon CloudWatch Logs

Add triggers from the list on the left Resources that the function's role has access to appear here

Feedback English (US)

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157. Lab: AWS DynamoDB - Configure Lambda Function API Gateway Lambda Management Console

https://us-west-2.console.aws.amazon.com/lambda/home?region=us-west-2#/functions/ReadUserData?newFunction=true&tab=graph

Services Resource Groups Oregon Support

ReadUserData

AWS IoT Alexa Skills Kit Alexa Smart Home Application Load Balancer CloudWatch Events

API Gateway Configuration required

Add triggers from the list on the left

Amazon CloudWatch Logs Resources that the function's role has access to appear here

Configure triggers

We'll set up an API Gateway endpoint with a proxy integration type (learn more about the input and output format). Any method (GET, POST, etc.) will trigger your integration. To set up more advanced method mappings or subpath routes, visit the Amazon API Gateway console.

API Pick an existing API, or create a new one. DynamoDBOps

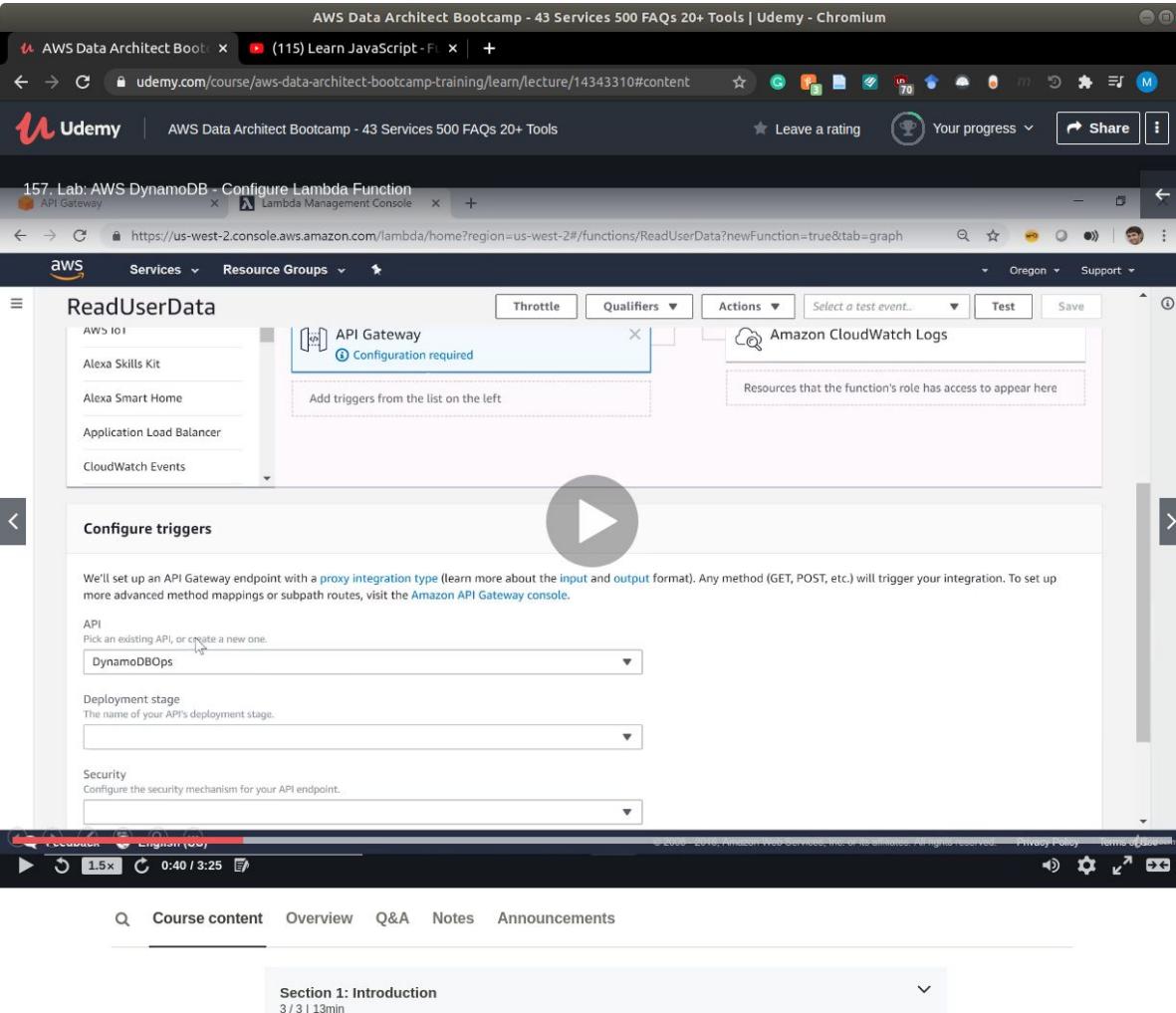
Deployment stage The name of your API's deployment stage.

Security Configure the security mechanism for your API endpoint.

Feedback English (US) 1.5x 0:40 / 3:25 Privacy Policy Terms of Service

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157. Lab: AWS DynamoDB - Configure Lambda Function API Gateway Lambda Management Console

https://us-west-2.console.aws.amazon.com/apigateway/home?region=us-west-2#/apis/xx98027sl/resources/vyw49su5hf/methods/GET

aws Services Resource Groups Oregon Support

Amazon API Gateway APIs > DynamoDBOps (xx98027sl) > Resources > / (vyw49su5hf) > GET Show all hints ?

APIs Resources Actions / - GET - Setup

DynamoDBOps

Resources

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VPC Links

Settings

Choose the integration point for your new method.

Integration type Lambda Function HTTP Mock AWS Service vPC Link

Save

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157. Lab: AWS DynamoDB - Configure Lambda Function

API Gateway Lambda Management Console

https://us-west-2.console.aws.amazon.com/apigateway/home?region=us-west-2#/apis/xx98027sl/resources/vyw49su5hf/methods/GET

aws Services Resource Groups

Amazon API Gateway APIs > DynamoDBOps (xx98027sl) > Resources > / (vyw49su5hf) > GET

Show all hints ?

APIs

DynamoDBOps

Resources

Stages

Authorizers

Gateway Responses

Models

Resource Policy

Documentation

Settings

Usage Plans

API Keys

Custom Domain Names

Client Certificates

VPC Links

Settings

Actions

/ - GET - Method Execution

METHOD ACTIONS

- Edit Method Documentation
- Delete Method

RESOURCE ACTIONS

- Create Method
- Create Resource
- Enable CORS
- Edit Resource Documentation

API ACTIONS

- Deploy API
- Import API
- Edit API Documentation
- Delete API

Method Request

Auth: NONE

ARN: arn:aws:execute-api:us-west-2:123456789012:xx98027sl/*/GET/

Integration Request

Type: MOCK

Mock Endpoint

Method Response

HTTP Status: 200

Models: application/json => Empty

Integration Response

HTTP status pattern: -

Output passthrough: Yes

https://us-west-2.console.aws.amazon.com/apigateway/home?region=us-west-2#

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Course content Overview Q&A Notes Announcements

Section 1: Introduction

3 / 3 | 13min

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API Gateway Lambda Management Console

https://us-west-2.console.aws.amazon.com/apigateway/home?region=us-west-2#/apis/xxx98027sl/resources/vyw49su5hf/methods/GET

aws Services Resource Groups

Amazon API Gateway APIs DynamoDBOps (x)

APIs

DynamoDBOps

Resources (x)

Stages

Authorizers

Gateway Responses

Models

Resource Policy

Documentation

Settings

Usage Plans

API Keys

Custom Domain Names

Client Certificates

VPC Links

Settings

Feedback English (US)

Deploy API

Choose a stage where your API will be deployed. For example, a test version of your API could be deployed to a stage named beta.

Deployment stage [New Stage] Dev

Stage name* Dev

Stage description Deploy in Dev

Deployment description Mock Deployment

Cancel Deploy

Integration Request Type: MOCK

Integration Response HTTP Status: 200 Models: application/json => Empty

HTTP status pattern: - Output passthrough: Yes

Mock Endpoint

Course content Overview Q&A Notes Announcements

Section 1: Introduction

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157. Lab: AWS DynamoDB - Configure Lambda Function

API Gateway

Lambda Management Console

https://us-west-2.console.aws.amazon.com/lambda/home?region=us-west-2#/functions/ReadUserData?newFunction=true&tab=graph

aws Services Resource Groups Oregon Support

ReadUserData

Throttle Qualifiers Actions Select a test event... Test Save

Configure triggers

We'll set up an API Gateway endpoint with a [proxy integration type](#) (learn more about the [input](#) and [output](#) format). Any method (GET, POST, etc.) will trigger your integration. To set up more advanced method mappings or subpath routes, visit the [Amazon API Gateway console](#).

API

Pick an existing API, or create a new one.

DynamoDBOps



Deployment stage

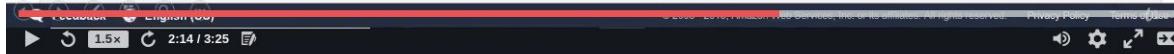
The name of your API's deployment stage.

Dev Dev 

Lambda will add the necessary permissions for Amazon API Gateway to invoke your Lambda function from this trigger. [Learn more](#) about the Lambda permissions model.

Cancel

Add



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157. Lab: AWS DynamoDB - Configure Lambda Function

API Gateway

Lambda Management Console

<https://us-west-2.console.aws.amazon.com/lambda/home?region=us-west-2#/functions/ReadUserData?newFunction=true&tab=graph>

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ReadUserData

Throttle Qualifiers Actions Select a test event... Test Save

Configure triggers

We'll set up an API Gateway endpoint with a [proxy integration type](#) (learn more about the [input](#) and [output](#) format). Any method (GET, POST, etc.) will trigger your integration. To set up more advanced method mappings or subpath routes, visit the [Amazon API Gateway console](#).

API

Pick an existing API, or create a new one.

DynamoDBOps



Deployment stage

The name of your API's deployment stage.

Dev

Security

Configure the security mechanism for your API endpoint.

Open

Warning: Your API endpoint will be publicly available and can be invoked by all users.

Lambda will add the necessary permissions for Amazon API Gateway to invoke your Lambda function from this trigger. [Learn more](#) about the Lambda permissions model.

Cancel

Add



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157. Lab: AWS DynamoDB - Configure Lambda Function API Gateway Lambda Management Console

https://us-west-2.console.aws.amazon.com/lambda/home?region=us-west-2#/functions/ReadUserData?newFunction=true&tab=graph

aws Services Resource Groups Oregon Support

ReadUserData

Add triggers Choose a trigger from the list below to add it to your function.

API Gateway

AWS IoT Alexa Skills Kit Alexa Smart Home Application Load Balancer CloudWatch Events

API Gateway

New trigger 1

API: xxy98027sl Security: NONE Stage: Dev

Throttle Qualifiers Actions Select a test event... Test Save

ReadUserData Layers (0)

API Gateway (Unsaved changes)

Amazon CloudWatch Logs

Add triggers from the list on the left Resources that the function's role has access to appear here

Section 1: Introduction

3 / 3 | 13min

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158. Lab: AWS DynamoDB - Configure API Gateway and IAM Role

API Gateway Lambda Management Console

https://us-west-2.console.aws.amazon.com/lambda/home?region=us-west-2#/functions/ReadUserData?newFunction=true&tab=graph

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ReadUserData

Throttle Qualifiers Actions Select a test event... Test Save

Execution role

Defines the permissions of your function. Note that new roles may not be available for a few minutes after creation. [Learn more](#) about Lambda execution roles.

Choose an existing role

Existing role
You can use an existing role with this function. Lambda must be able to assume this role, and the role must have Amazon CloudWatch Logs permissions.

service-role/LambdaServiceRole

Basic settings

Description

Memory (MB) [Info](#)
Your function is allocated CPU proportional to the memory configured.
128 MB

Timeout [Info](#)
1 min 0 sec

Network

VPC [Info](#)
Choose a VPC for your function to access.

No VPC

Debugging and error handling

DLQ resource [Info](#)
Choose the AWS service to send the event payload to after maximum retries are exceeded.

None

Enable active tracing [Info](#)

Feedback English (US)

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Section 1: Introduction

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This screenshot shows the AWS Lambda function configuration interface for a function named 'ReadUserData'. The 'Basic settings' tab is selected, displaying options for memory (128 MB), timeout (1 minute), and a description field. The 'Execution role' section shows that a role named 'service-role/LambdaServiceRole' has been chosen. In the 'Network' section, it is noted that no VPC is selected. The interface includes tabs for Throttle, Qualifiers, Actions, and a test event selector, along with a 'Save' button.

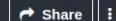
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158. Lab: AWS DynamoDB - Configure API Gateway and IAM Role

API Gateway x Lambda Management Console x +

<https://us-west-2.console.aws.amazon.com/lambda/home?region=us-west-2#/functions/ReadUserData?newFunction=true&tab=graph>

aws Services Resource Groups Oregon Support

ReadUserData

Throttle Qualifiers Actions Select a test event... Test Save

Network

VPC Info Choose a VPC for your function to access.

No VPC

Debugging and error handling

DLQ resource Info Choose the AWS service to send the event payload to after maximum retries are exceeded.

None

Enable active tracing Info

Concurreny

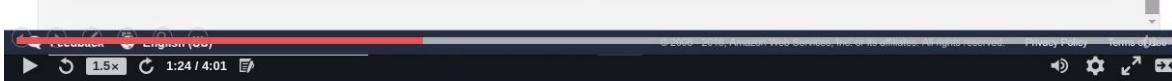
Unreserved account concurrency 1000

Use unreserved account concurrency

Reserve concurrency

Auditing and compliance

AWS CloudTrail can log this function's invocations for operational and risk auditing, governance, and compliance. [Get started](#) on the CloudTrail console.



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158. Lab: AWS DynamoDB - Configure API Gateway and IAM Role API Gateway Lambda Management Console IAM Management Console

https://console.aws.amazon.com/iam/home?#/roles/LambdaServiceRole

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Search IAM

Dashboard Groups Users Roles Policies Identity providers Account settings Credential report

Encryption keys

Roles > LambdaServiceRole Summary Delete role

Role ARN arn:aws:iam::██████████:role/service-role/LambdaServiceRole

Role description Edit

Instance Profile ARNs

Path /service-role/

Creation time 2018-12-23 23:05 EST

Maximum CLI/API session duration 1 hour Edit

Permissions Trust relationships Tags Access Advisor Revoke sessions

Permissions policies (1 policy applied)

Attach policies Add inline policy

Policy name AWSLambdaBasicExecutionRole Policy type Managed policy

Permissions boundary (not set)

Feedback English (US) 1.5x 1:55 / 4:01

Course content Overview Q&A Notes Announcements

Section 1: Introduction 3 / 3 | 13min

The screenshot shows the AWS IAM service interface for managing roles. The 'LambdaServiceRole' is selected under the 'Roles' section. The 'Permissions' tab is active, showing one policy attached: 'AWSLambdaBasicExecutionRole'. This policy is a managed policy. There is no permissions boundary defined. The browser's status bar indicates a video player is active at 1:55 / 4:01. The overall context is a Udemy course on AWS Data Architect Bootcamp.

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https://console.aws.amazon.com/iam/home?#/roles/LambdaServiceRole

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Search IAM

Dashboard Groups Users Roles Policies Identity providers Account settings Credential report

Encryption keys

Roles > LambdaServiceRole Summary Delete role

Policy AmazonDynamoDBFullAccess has been attached for the LambdaServiceRole.

Role ARN am:aws:iam::[REDACTED]:role/service-role/LambdaServiceRole Edit

Role description Edit

Instance Profile ARNs [REDACTED]

Path /service-role/

Creation time 2018-12-23 23:05 EST

Maximum CLI/API session duration 1 hour Edit

Permissions Trust relationships Tags Access Advisor Revoke sessions

▼ Permissions policies (2 policies applied)

Attach policies Add inline policy

Policy name	Policy type
▶ AmazonDynamoDBFullAccess	AWS managed policy
▶ AWSLambdaBasicExecutionRole	Managed policy

▼ Permissions boundary (not set)

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Course content Overview Q&A Notes Announcements

Section 1: Introduction

3 / 3 | 13min

This screenshot shows a browser window with two tabs open. The active tab is the AWS IAM service, specifically the 'Roles' section, displaying the configuration for the 'LambdaServiceRole'. The role has the 'AmazonDynamoDBFullAccess' policy attached. The browser's address bar shows the URL for the Udemy course 'AWS Data Architect Bootcamp - 43 Services 500 FAQs 20+ Tools'. The Udemy interface includes course navigation links like 'Course content', 'Overview', 'Q&A', 'Notes', and 'Announcements'. The overall environment is a Linux desktop with a dark theme.

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https://us-west-2.console.aws.amazon.com/apigateway/home?region=us-west-2#/apis/xx98027sl/resources/vyw49su5hf/methods/GET

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Amazon API Gateway APIs > DynamoDBOps (xx98027sl) > Resources > / (vyw49su5hf) > GET Show all hints ?

APIs

DynamoDBOps

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VPC Links

TEST

Method Request

Auth: NONE

ARN: arn:aws:execute-api:us-west-2:xx98027sl/*:GET/

Integration Request

Type: MOCK

Method Response

HTTP Status: 200

Models: application/json => Empty

Integration Response

HTTP status pattern: -

Output passthrough: Yes

Mock Endpoint

Section 1: Introduction

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158. Lab: AWS DynamoDB - Configure API Gateway and IAM Role

API Gateway Lambda Management Console

https://us-west-2.console.aws.amazon.com/apigateway/home?region=us-west-2#/apis/xxv98027sl/resources/vyw49su5hf/methods/GET

aws Services Resource Groups Oregon Support

Amazon API Gateway APIs > DynamoDBOps (xxv98027sl) > Resources > / (wyv49su5hf) > GET Show all hints ?

APIs Resources Actions Method Execution / - GET - Integration Request

Provide information about the target backend that this method will call and whether the incoming request data should be modified.

Integration type Lambda Function HTTP Mock AWS Service vPC Link

Use Lambda Proxy Integration

Lambda Region us-west-2 Lambda Function R ReadUserData Use Default Timeout Save

Mapping Templates

Course content Overview Q&A Notes Announcements

Section 1: Introduction

3 / 3 | 13min

The screenshot shows the AWS API Gateway configuration interface. On the left, a sidebar lists various API management features like APIs, Resources, Stages, and Models. The main panel shows a GET method for a resource named '/'. Under 'Integration type', 'Lambda Function' is selected. A dropdown menu for 'Lambda Function' shows 'R' and 'ReadUserData' listed. Below the integration section, there's a 'Save' button. At the bottom, there's a navigation bar with links for Course content, Overview, Q&A, Notes, and Announcements. A video player at the very bottom indicates the current video is 'Section 1: Introduction' at 3/3 minutes, with a playback speed of 1.5x and a timestamp of 2:50 / 4:01.

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158. Lab: AWS DynamoDB - Configure API Gateway and IAM Role

API Gateway Lambda Management Console

https://us-west-2.console.aws.amazon.com/apigateway/home?region=us-west-2#/apis/xx98027sl/resources/vyw49su5hf/methods/GET

aws Services Resource Groups Oregon Support

Amazon API Gateway APIs > DynamoDBOps (xx98027sl) > Resources > / (vyw49su5hf) > GET Show all hints ?

APIs

DynamoDBOps

Resources

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Models

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Dashboard

Settings

Usage Plans

API Keys

Custom Domain Names

Client Certificates

VPC Links

Actions

/ - GET - Method Execution

Method Request

Auth: NONE
ARN: arn:aws:execute-api:us-west-2:xx98027sl:vyw49su5hf/GET/

Integration Request

Type: LAMBDA
Region: us-west-2

Lambda ReadUserData

Method Response

HTTP Status: 200
Models: application/json => Empty

Integration Response

HTTP status pattern: -
Output passthrough: Yes

Section 1: Introduction

3 / 3 | 13min

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150. Lab: AWS DynamoDB - Code lambda function to read and write data

API Gateway Lambda Management Console

https://us-west-2.console.aws.amazon.com/lambda/home?region=us-west-2#/functions/ReadUserData?newFunction=true&tab=graph

aws Services Resource Groups Oregon Support

ReadUserData

Add triggers Choose a trigger from the list below to add it to your function.

API Gateway

AWS IoT Alexa Skills Kit Alexa Smart Home Application Load Balancer CloudWatch Events CloudWatch Logs CodeCommit Cognito Sync Trigger DynamoDB Kinesis S3

Throttle Qualifiers Actions Select a test event... Test Save

ReadUserData (2)

Layers (0)

API Gateway AWS Lambda Amazon CloudWatch Amazon CloudWatch Logs Amazon DynamoDB Amazon DynamoDB Accelerator (DAX) Amazon EC2 Amazon SNS

Add triggers from the list on the left

Feedback English (US)

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159. Lab: AWS DynamoDB - Code lambda function to read and write data

API Gateway Lambda Management Console aws sdk nodejs dynamodb - Google Search

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Amazon DynamoDB | Fully managed

Ad aws.amazon.com/dynamodb

A serverless database that automatically scales, and continuously backs up your data. Fast, Flexible & Secure. Reliable Performance. Highly Scalable. Types: Mobile, Web, Gaming, IoT.

Pricing
Pay only for the resources that DynamoDB provisions.

Getting Started
Set up your AWS account, learn with tutorials, & start building today.

Class: AWS.DynamoDB – AWS SDK for JavaScript
<https://docs.aws.amazon.com/AWSJavaScriptSDK/latest/AWS/DynamoDB.html>

In order to ensure that the `DynamoDB` object uses this specific API, you can construct the object by This feature is only available in the `Node.js` environment.

People also search for

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dynamodb batch write nodejs typescript dynamodb

Node.js and DynamoDB - Amazon DynamoDB - AWS Documentation

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159. Lab: AWS DynamoDB - Code lambda function to read and write data

API Gateway

Lambda Management Console

Class: AWS.DynamoDB — AWS S

Class List

Classes | Methods | Properties | Files

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- ▶ DirectConnect < Service
- ▶ DirectoryService < Service
- ▶ Discovery < Service
- ▶ DLM < Service
- ▶ DMS < Service
- ▼ **DynamoDB < Service**

2012-08-10
2011-12-05
DynamoDBStreams < Service

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- ▶ ELB < Service
- ▶ ELBV2 < Service
- ▶ EMR < Service
- ▶ ES < Service
- ▶ Firehose < Service
- ▶ EMS < Service

Method Summary

collapse

`batchGetItem(params = {}, callback) => AWS.Request`

The BatchGetItem operation returns the attributes of one or more items from one or more tables.

`batchWriteItem(params = {}, callback) => AWS.Request`

The BatchWriteItem operation puts or deletes multiple items in one or more tables.

`createBackup(params = {}, callback) => AWS.Request`

Creates a backup for an existing table.

`createGlobalTable(params = {}, callback) => AWS.Request`

Creates a global table from an existing table.

`createTable(params = {}, callback) => AWS.Request`

The CreateTable operation adds a new table to your account.

`deleteBackup(params = {}, callback) => AWS.Request`

Deletes an existing backup of a table.

`deleteItem(params = {}, callback) => AWS.Request`

Deletes a single item in a table by primary key.

`deleteTable(params = {}, callback) => AWS.Request`

The DeleteTable operation deletes a table and all of its items.

`describeBackup(params = {}, callback) => AWS.Request`

Describes an existing backup of a table.

`describeContinuousBackups(params = {}, callback) => AWS.Request`

Checks the status of continuous backups and point in time recovery on the specified table.

`describeEndpoints(params = {}, callback) => AWS.Request`

Calls the DescribeEndpoints API operation.

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API Gateway | Lambda Management Console | AWS.DynamoDB — AWS S | +

https://us-west-2.console.aws.amazon.com/lambda/home?region=us-west-2#/functions/ReadUserData?tab=graph

aws Services Resource Groups Oregon Support

ReadUserData

Function code [Info](#)

Code entry type: Edit code inline Runtime: Node.js 8.10 Handler: [index.handler](#)

File Edit Find View Goto Tools Window

Environment ReadUserData index.js Index.js

```
1 const AWS = require('aws-sdk');
2 const docClient = new AWS.DynamoDB.DocumentClient({region: 'us-west-2'});
3
4 exports.handler = function(e, ctx, callback) {
5
6     var scanningParameters = {
7         TableName: 'Users',
8         Limit: 100
9     };
10
11     docClient.scan(scanningParameters, function(err, data){
12         if(err)
13             callback(err, null);
14         else
15             callback(null, data);
16     });
17 });
18 }
```

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159. Lab: AWS DynamoDB - Code lambda function to read and write data API Gateway Lambda Management Console Class: AWS.DynamoDB — AWS Services Services Resource Groups Oregon Support

https://us-west-2.console.aws.amazon.com/lambda/home?region=us-west-2#/functions/ReadUserData?tab=graph

ReadUserData

Function code [Info](#)

Code entry type: Edit code inline Runtime: Node.js 8.10 Handler: [index.handler](#)

File Edit Find View Goto Tools Window

Environment ReadUserData index.js Index.js

```
index.js
1 const AWS = require('aws-sdk');
2 const docClient = new AWS.DynamoDB.DocumentClient({region: 'us-west-2'});
3
4 exports.handler = function(e, ctx, callback) {
5
6     var scanningParameters = {
7         TableName: 'Users',
8         Limit: 100
9     };
10
11     docClient.scan(scanningParameters, function(err, data){
12         if(err)
13             callback(err, null);
14         else
15             callback(null, data);
16     });
17 });
18 }
```

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API Gateway Lambda Management Console Class: AWS.DynamoDB — AWS

https://us-west-2.console.aws.amazon.com/lambda/home?region=us-west-2#/functions/ReadUserData?tab=graph

S Services Resource Groups Oregon Support

ReadUserData

Throttle Qualifiers Actions Test Test Save

Environment ReadUserData index.js

index.js

```
const AWS = require('aws-sdk');
const docclient = new AWS.DynamoDB.DocumentClient({region: 'us-west-2'});

exports.handler = function(event, context, callback) {
  var scanningParameters = {
    TableName: 'Users',
    Limit: 100
  };

  docclient.scan(scanningParameters, function(err, data){
    if(err){
      callback(err, null);
    }else{
      callback(null, data);
    }
  });
}
```

18:3 JavaScript Spaces: 4

Execution Result

Execution results

Status: Succeeded Max Memory Used: 30 MB Time: 1111.50 ms

Response:

```
{
  "items": [
    {
      "income": 100,
      "name": "Sid",
      "userid": "1",
      "age": 10
    }
  ],
  "Count": 1,
  "ScannedCount": 1
}
```

Course content Overview Q&A Notes Announcements

About this course

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159. Lab: AWS DynamoDB - Code lambda function to read and write data API Gateway Lambda Management Console Class: AWS.DynamoDB — AWS S | +

https://us-west-2.console.aws.amazon.com/apigateway/home?region=us-west-2#/apis/xx98027sl/stages/Dev

AWS Services Resource Groups Oregon Support

APIs APIs > DynamoDBOps (xx98027sl) > Stages > Dev Show all hints ?

Stages Create Dev Stage Editor Delete Stage

Invoke URL: https://xx98027sl.execute-api.us-west-2.amazonaws.com/Dev

Settings Logs/Tracing Stage Variables SDK Generation Export Deployment History Documentation History Canary Cache Settings Enable API cache Default Method Throttling Choose the default throttling level for the methods in this stage. Each method in this stage will respect these rate and burst settings. Your current account level throttling rate is **10000** requests per second with a burst of **5000** requests. Read more about API Gateway throttling

Enable throttling Rate 10000 requests per second Burst 5000 requests

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About this course

APIs

- DynamoDBOps
- Resources
- Stages**
- Authorizers
- Gateway Responses
- Models
- Resource Policy
- Documentation
- Dashboard
- Settings

Usage Plans

API Keys

Custom Domain Names

1.5x 3:44 / 6:39

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https://xxv98027sl.execute-api.us-west-2.amazonaws.com

Lambdas Management Console

Class: AWS.DynamoDB — AWS S

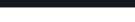
+

{ "Items": [{ "income": 100, "name": "Sid", "userid": "1", "age": 10 }], "Count": 1, "ScannedCount": 1 }



1.5x

3:49 / 6:39



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Lambda Management Console

Class: AWS.DynamoDB — AWS S



AWS

Services

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ReadUserData

Throttle **Qualifiers** ▾ **Actions** ▾ Test ▾ Test ▾ Save

```
> 6  /* var scanningParameters = {  
7   TableName: 'Users',  
8   Limit: 100  
9 };  
10 docClient.scan(scanningParameters, function(err, data){  
11   if(err){  
12     callback(err, null);  
13   }else{  
14     callback(null, data);  
15   }  
16 });  
17 */  
18 var params = {  
19   Item: {  
20     userid: "2",  
21     age: 20,  
22     income: 200,  
23     name: "$Id-2"  
24   },  
25   TableName: 'Users'  
26 };  
27 docClient.put(params, function(err, data){  
28   if(err){  
29     callback(err, null);  
30   }else{  
31     callback(null, data);  
32   }  
33 });  
34 }  
35 }  
36 }  
37 }  
38 }  
39 })
```



39:3 JavaScript Spaces: 4



Feedback English (US)

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159. Lab: AWS DynamoDB - Code lambda function to read and write data

API Gateway

https://xy98027sl.execute-api.us-west-2.amazonaws.com/lambda/home?region=us-west-2#/functions/ReadUserData?tab=graph

Lambda Management Console

Class: AWS.DynamoDB — AWS S...

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Throttle Qualifiers Actions Test Test Save

```
> 6  /* var scanningParameters = {  
7   TableName: 'Users',  
8   Limit: 100  
9 };  
10 docClient.scan(scanningParameters, function(err, data){  
11   if(err){  
12     callback(err, null);  
13   }else{  
14     callback(null, data);  
15   }  
16 });  
17 */  
18 var params = {  
19   Item: {  
20     userid: "2",  
21     age: 20,  
22     income: 200,  
23     name: "Sid-2"  
24   },  
25   TableName: 'Users'  
26 };  
27 docClient.put(params, function(err, data){  
28   if(err){  
29     callback(err, null);  
30   }else{  
31     callback(null, data);  
32   }  
33 });  
34 }  
35 }  
36 );  
37 );  
38 }  
39 } ]
```



Save

39:3 JavaScript Spaces: 4

AWS Data Architect Bootcamp (US)

5:49 / 6:39

Mute Volume

Settings

Full Screen

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159. Lab: AWS DynamoDB - Code lambda function to read and write data

API Gateway

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Lambda Management Console

Class: AWS.DynamoDB — AWS S...



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Throttle

Qualifiers

Actions

Test

Save



```
1 const docClient = new AWS.DynamoDB.DocumentClient({ region: 'us-west-2' });
2
3 exports.handler = function(event, context, callback) {
4
5   /* var scanningParameters = {
6     TableName: 'Users',
7     Limit: 100
8   };
9
10  docClient.scan(scanningParameters, function(err, data){
11    if(err){
12      callback(err, null);
13    }else{
14      callback(null, data);
15    }
16  });
17 */
18
19  var params = {
20    Item: {
21      userId: "2",
22      age: 20,
23      income: 200,
24      name: "Sid-2"
25    },
26    TableName: 'Users'
27  };
28
29  docClient.put(params, function(err, data){
30    if(err){
31      callback(err, null);
32    }else{
33      callback(null, data);
34    }
35  });
36
37 });
38 }
```



38:3 JavaScript Spaces: 4



1.5x 5:51 / 6:39



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API Gateway x DynamoDB - AWS Console x Lambda Management Console x Class: AWS.DynamoDB — AWS S x

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#tables:selected=Users;tab=items

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Create table Delete table

Filter by table name Name

Users

Overview Items Metrics Alarms Capacity Indexes Global Tables More

Create item Actions

Scan: [Table] Users: userid Viewing 1 to 2 items

Scan Add filter Start search

userid	age	income	name
1	10	100	Sid
2	20	200	Sid-2

Course content Overview Q&A Notes Announcements

About this course

The screenshot shows a browser window with two tabs open. The active tab is the AWS Data Architect Bootcamp course on Udemy, specifically a lecture titled '159. Lab: AWS DynamoDB - Code lambda function to read and write data'. Below the course header, there's a navigation bar with links for 'Course content', 'Overview', 'Q&A', 'Notes', and 'Announcements'. The main content area displays the AWS DynamoDB console, showing the 'Users' table. A scan operation is running, displaying two items with the following data:

userid	age	income	name
1	10	100	Sid
2	20	200	Sid-2

The AWS navigation bar on the left includes links for 'DynamoDB', 'DAX', and various management services like 'Clusters', 'Subnet groups', 'Parameter groups', and 'Events'. At the bottom of the browser window, there's a video player interface showing a video at 1.5x speed, 6:01 / 6:39.

DynamoDB Streams Use-Cases

- An application in one AWS region modifies the data in a DynamoDB table. A second application in another AWS region reads these data modifications and writes the data to another table, creating a replica that stays in sync with the original table.
- A popular mobile app modifies data in a DynamoDB table, at the rate of thousands of updates per second. Another application captures and stores data about these updates, providing near real time usage metrics for the mobile app.
- A global multi-player game has a multi-master topology, storing data in multiple AWS regions. Each master stays in sync by consuming and replaying the changes that occur in the remote regions.
- An application automatically sends notifications to the mobile devices of all friends in a group as soon as one friend uploads a new picture.
- A new customer adds data to a DynamoDB table. This event invokes another application that sends a welcome email to the new customer.

AWS Data Architect Bc x

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160. AWS DynamoDB - DynamoDB Streams Architecture and Use Cases

- A DynamoDB stream is an ordered flow of information about changes to items in an Amazon DynamoDB table. When you enable a stream on a table, DynamoDB captures information about every modification to data items in the table.
- Whenever an application creates, updates, or deletes items in the table, DynamoDB Streams writes a stream record with the primary key attribute(s) of the items that were modified. A stream record contains information about a data modification to a single item in a DynamoDB table. You can configure the stream so that the stream records capture additional information, such as the "before" and "after" images of modified items.
- DynamoDB Streams captures a time-ordered sequence of item-level modifications in any DynamoDB table, and stores this information in a log for up to 24 hours. Applications can access this log and view the data items as they appeared before and after they were modified, in near real time. Encryption at rest encrypts the data in DynamoDB streams.
- DynamoDB Streams is an optional feature that captures data modification events in DynamoDB tables. The data about these events appear in the stream in near real time, and in the order that the events occurred.
- Each event is represented by a stream record. If you enable a stream on a table, DynamoDB Streams writes a stream record whenever one of the following events occurs:
 - A new item is added to the table: The stream captures an image of the entire item, including all of its attributes.
 - An item is updated: The stream captures the "before" and "after" image of any attributes that were modified in the item.
 - An item is deleted from the table: The stream captures an image of the entire item before it was deleted.
- Each stream record also contains the name of the table, the event timestamp, and other metadata. Stream records have a lifetime of 24 hours; after that, they are automatically removed from the stream.
- You can use DynamoDB Streams together with AWS Lambda to create a trigger—code that executes automatically whenever an event of interest appears in a stream

DynamoDB Streams





160. AWS DynamoDB - DynamoDB Streams Architecture and Use Cases

DynamoDB Streams

- DynamoDB Streams guarantees the following:
 - Each stream record appears exactly once in the stream.
 - For each item that is modified in a DynamoDB table, the stream records appear in the same sequence as the actual modifications to the item.
- AWS maintains separate endpoints for DynamoDB and DynamoDB Streams. To work with database tables and indexes, your application will need to access a DynamoDB endpoint. To read and process DynamoDB Streams records, your application will need to access a DynamoDB Streams endpoint in the same region.
- Each stream record is assigned a sequence number, reflecting the order in which the record was published to the stream.

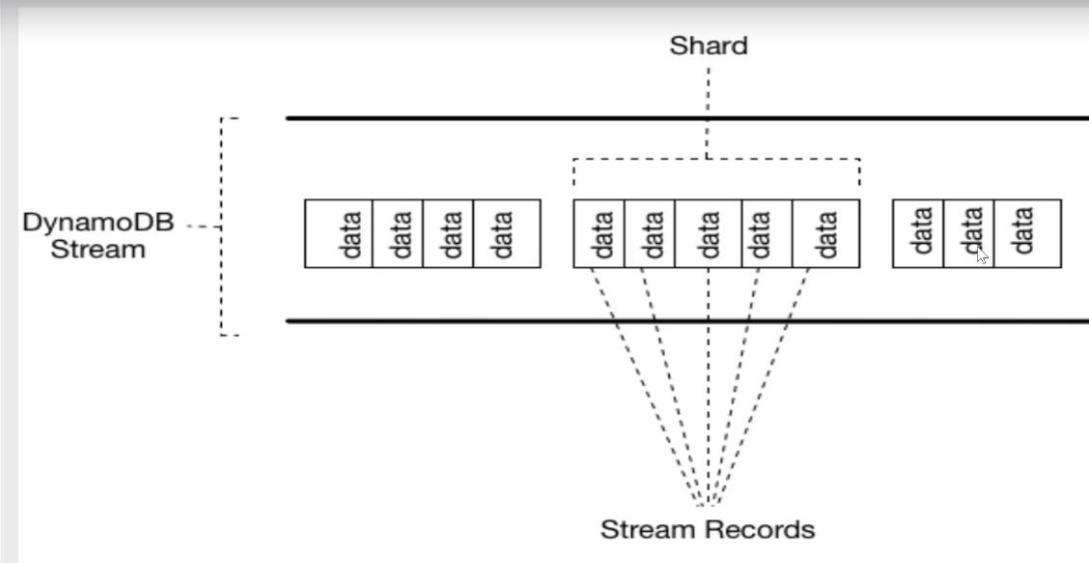
160. AWS DynamoDB - DynamoDB Streams Architecture and Use Cases

DynamoDB Streams

- Stream records are organized into groups, or shards. Each shard acts as a container for multiple stream records, and contains information required for accessing and iterating through these records. The stream records within a shard are removed automatically after 24 hours.
- Shards are ephemeral: They are created and deleted automatically, as needed. Any shard can also split into multiple new shards; this also occurs automatically. (Note that it is also possible for a parent shard to have just one child shard.) A shard might split in response to high levels of write activity on its parent table, so that applications can process records from multiple shards in parallel.
- If you disable a stream, any shards that are open will be closed.



160. AWS DynamoDB - DynamoDB Streams Architecture and Use Cases



160. AWS DynamoDB - DynamoDB Streams Architecture and Use Cases



DynamoDB Streams TTL

- When Time To Live is enabled on a table, a background job checks the TTL attribute of items to see if they are expired.
- TTL compares the current time in epoch time format to the time stored in the Time To Live attribute of an item. If the epoch time value stored in the attribute is less than the current time, the item is marked as expired and subsequently deleted.
- This processing takes place automatically in the background and does not affect read or write traffic to the table.
- DynamoDB typically deletes expired items within 48 hours of expiration.
- As items are deleted, they are removed from any Local Secondary Index and Global Secondary Index immediately in the same eventually consistent way as a standard delete operation.
- Due to the potential delay between expiration and deletion time, you might get expired items when you query for items. If you don't want to view expired items when you issue a read request, you should filter them out.

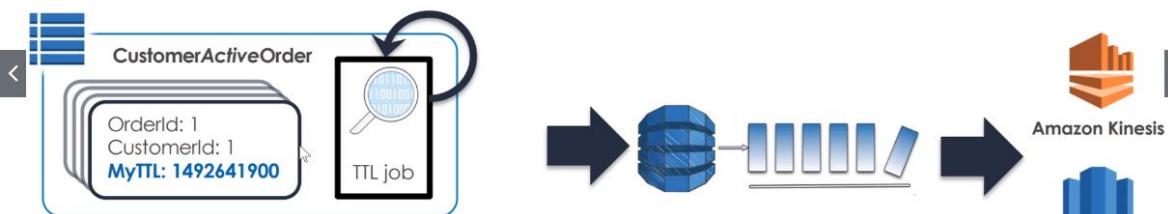


160. AWS DynamoDB - DynamoDB Streams Architecture and Use Cases

Time-To-Live (TTL)

Removes data that is no longer relevant

Time-To-Live
An epoch timestamp marking when an item can be deleted by a background process, without consuming any provisioned capacity



Amazon DynamoDB
Table

DynamoDB Streams



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161. Lab: AWS DynamoDB - Create DynamoDB Stream, Trigger and Lambda function

DynamoDB - AWS Console

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#tables:selected=Users;tab=overview

AWS Services Resource Groups Oregon Support

DynamoDB

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Dashboard

Clusters

Subnet groups

Parameter groups

Events

Create table Delete table

Filter by table name Name

Users

Recent alerts

No CloudWatch alarms have been triggered for this table.

Stream details

Stream enabled No

View type -

Latest stream ARN -

Manage Stream

Table details

Table name	Users
Primary partition key	userid (String)
Primary sort key	-
Point-in-time recovery	DISABLED Enable
Encryption Type	DEFAULT
KMS Master Key ARN	Not Applicable
Time to live attribute	DISABLED Manage TTI

English (US) 1.5x 0:30 / 5:30

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Section 1: Introduction

3 / 3 | 13min

The screenshot shows a browser window with two main panes. The left pane is the AWS DynamoDB console, specifically the 'Tables' section for the 'Users' table. It displays table details like primary partition key (userid), encryption type (DEFAULT), and a disabled time-to-live attribute. The right pane is a Udemy course video player for 'AWS Data Architect Bootcamp'. The video is at 0:30 of 5:30, with a 1.5x speed setting. The course navigation bar at the bottom includes 'Course content', 'Overview', 'Q&A', 'Notes', and 'Announcements'. A progress bar at the bottom of the video player indicates 3/3 sections completed in 13 minutes.

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DynamoDB - AWS Console

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aWS Services Resource Groups Oregon Support

DynamoDB Dashboard Tables Backups Reserved capacity Preferences

DAX Dashboard Clusters Subnet groups Parameter groups Events

Create table Delete table

Filter by table name Name

Recent alerts No CloudWatch alarms have been triggered for this table.

Manage Stream

View type

- Keys only - only the key attributes of the modified item
- New image - the entire item, as it appears after it was modified
- Old Image - the entire item, as it appeared before it was modified
- New and old images - both the new and the old images of the item

Cancel Enable

Table name: Users
Primary partition key: userid (String)
Primary sort key: -
Point-in-time recovery: DISABLED Enable
Encryption Type: DEFAULT
KMS Master Key ARN: Not Applicable
Time to live attribute: DISABLED Manage TTI

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1.5x 0:47 / 5:30

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161 Lab: AWS DynamoDB - Create DynamoDB Stream, Trigger and Lambda function

DynamoDB - AWS Console

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#tables:selected=Users;tab=triggers

Oregon Support



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Access control

Tags

Create trigger

Edit/Test trigger

Delete trigger



Function name

State

Last result

DynamoDB triggers connect DynamoDB streams to Lambda functions. Whenever an item in the table is modified, a new stream record is written, which in turn triggers the Lambda function and causes it to execute. [More Info](#)



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161. Lab: AWS DynamoDB - Create DynamoDB Stream, Trigger and Lambda function

DynamoDB - AWS Console Lambda Management Console

https://us-west-2.console.aws.amazon.com/lambda/home?region=us-west-2#/create/new?bp=dynamodb-process-stream

AWS Services Resource Groups Oregon Support

Lambda > Functions > Create function > Using blueprint dynamodb-process-stream

Basic information Info

Name: DynamoDBTrigger

Role: Create a custom role

Choose an existing role

Create a new role from one or more templates.

Create a custom role: DynamoDB trigger

Remove

DynamoDB table: Select a DynamoDB table to listen for updates on. Users

Batch size: The largest number of records that will be read from your table's update stream at once. 1000

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161. Lab: AWS DynamoDB - Create DynamoDB Stream, Trigger and Lambda function

DynamoDB AWS Console Lambda Management Console IAM Management Console

https://console.aws.amazon.com/iam/home#/one_click_role?request=%7B"context": "lambda", "returnURI": "https://Fus-west-2.console.a... me... Global Support

AWS Services Resource Groups

AWS Lambda requires access to your resources

AWS Lambda uses an IAM role that grants your custom code permissions to access AWS resources it needs.

▼ Hide Details

Role Summary

Role Description Lambda execution role permissions

IAM Role Create a new IAM Role

Role Name DynamoDBTrigger

▼ Hide Policy Document

Edit

```
{ "Effect": "Allow", "Action": [ "logs:CreateLogGroup", "logs:CreateLogStream", "logs:PutLogEvents" ], "Resource": "arn:aws:logs:*:*" }
```

Cancel Allow

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DynamoDB AWS Console Lambda Management Console

https://us-west-2.console.aws.amazon.com/lambda/home?region=us-west-2#/create/new?bp=dynamodb-process-stream

AWS Services Resource Groups Oregon Support

DynamoDB trigger

DynamoDB table
Select a DynamoDB table to listen for updates on.

Users

Batch size
The largest number of records that will be read from your table's update stream at once.

100

Starting position
The position in the stream to start reading from. For more information, see [ShardIteratorType](#) in the Amazon DynamoDB Streams API Reference.

Latest

In order to read from the DynamoDB trigger, your execution role must have proper permissions.

Enable trigger
Enable the trigger now, or create it in a disabled state for testing (recommended).

Lambda function code

aws-lambda-dynamodb-process-stream.js

1.5x 4:08 / 5:30

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DynamoDB - AWS Console

Lambda Management Console

+

<https://us-west-2.console.aws.amazon.com/lambda/home?region=us-west-2#/create/new?bp=dynamodb-process-stream>

Services

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Oregon

Support

Lambda function code

Code is pre-configured by the chosen blueprint. You can configure it after you create the function. [Learn more](#) about deploying Lambda functions.

Runtime

Node.js 8.10

```
1 console.log('Loading function');
2
3 - exports.handler = async (event, context) => {
4     //console.Log('Received event:', JSON.stringify(event, null, 2));
5     event.Records.forEach((record) => {
6         console.log(record.eventID);
7         console.log(record.eventName);
8         console.log('DynamoDB Record: %j', record.dynamodb);
9     });
10    return `Successfully processed ${event.Records.length} records.`;
11};
12
```

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DynamoDB - AWS Console

Lambda Management Console

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```
3 exports.handler = async (event, context) => {
4     //console.log('Received event:', JSON.stringify(event, null, 2));
5     event.Records.forEach((record) => {
6         console.log(record.eventID);
7         console.log(record.eventName);
8         console.log('DynamoDB Record: %j', record.dynamodb);
9     });
10    return `Successfully processed ${event.Records.length} records.`;
11};
12};
```



* These fields are required.

Cancel

Previous

Create function

Feedback English (US)

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161. Lab: AWS DynamoDB - Create DynamoDB Stream, Trigger and Lambda function

DynamoDB - AWS Console Lambda Management Console

https://us-west-2.console.aws.amazon.com/lambda/home?region=us-west-2#/functions/DynamoDBTrigger?newFunction=true&tab=graph

AWS Services Resource Groups Oregon Support

Lambda > Functions > DynamoDBTrigger

ARN - arn:aws:lambda:us-west-2:█████████████████████:function:DynamoDBTrigger

Throttle Qualifiers Actions Select a test event... Test Save

Congratulations! Your Lambda function "DynamoDBTrigger" has been successfully created and configured with Users as a trigger. Choose Test to input a test event and test your function.

Configuration Monitoring

Designer

Add triggers Choose a trigger from the list below to add it to your function.

API Gateway

AWS IoT

Alexa Skills Kit

DynamoDBTrigger

DynamoDB AWS Lambda

Amazon CloudWatch Logs

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AWS Data Architect Bootcamp - 43 Services 500 FAQs 20+ Tools | udemy.com/course/aws-data-architect-bootcamp-training/learn/lecture/14343406#content

DynamoDB - AWS Console Lambda Management Console

<https://us-west-2.console.aws.amazon.com/lambda/home?region=us-west-2#/functions/DynamoDBTrigger?newFunction=true&tab=graph>

DynamoDBTrigger

Function code [Info](#)

Code entry type: Edit code inline Runtime: Node.js 8.10 Handler: [index.handler](#)

index.js

```
i 1 const AWS = require('aws-sdk')
2 /**
3 //console.log('Loading function');
4
5 exports.handler = async (event, context, callback) => {
6     console.log('Received event:', JSON.stringify(event, null, 2));
7     callback();
8 }
9 /*
10 exports.handler = async (event, context) => {
11     //console.log('Received event:', JSON.stringify(event, null, 2));
12     event.Records.forEach((record) => {
13         console.log(record.eventID);
14         console.log(record.eventName);
15         console.log(`DynamoDB Record: ${record.dynamodb}`);
16     });
17     return `Successfully processed ${event.Records.length} records.`;
18 };
19 */
20
```

Feedback English (US)

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The image shows a dual-pane interface. On the left, the AWS Lambda function editor displays the code for a 'DynamoDBTrigger' function. The code is written in Node.js 8.10 and uses the AWS SDK to handle incoming events from DynamoDB. It logs the received event and processes each record by outputting its event ID and name, and the contents of the dynamodb field. On the right, a separate browser tab for the Udemy course 'AWS Data Architect Bootcamp' is visible, showing the course navigation bar and a section titled 'Section 1: Introduction'.

AWS Data Architect Bootcamp - 43 Services 500 FAQs 20+ Tools | Udemy - Chromium

AWS Data Architect Bootcamp x (115) Learn JavaScript - F x +

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162. Lab: AWS DynamoDB - Code Lambda function and Test DynamoDB Streams

DynamoDB - AWS Console Lambda Management Console

https://us-west-2.console.aws.amazon.com/lambda/home?region=us-west-2#/functions/DynamoDBTrigger?newFunction=true&tab=graph

aWS Services Resource Groups Oregon Support

DynamoDBTrigger

Throttle Qualifiers Actions Select a test event... Test Save

Function code Info

Code entry type Runtime Handler Info

Edit code inline Node.js 8.10 index.handler

File Edit Find View Goto Tools Window

Environment

DynamoDBTrigger

index.js

Index.js

```
i 1 const AWS = require('aws-sdk')
2 |
3 //console.log('Loading function');
4
5 exports.handler = async (event, context, callback) => {
6     console.log('Received event:', JSON.stringify(event, null, 2));
7     callback();
8 }
9 /*
10 exports.handler = async (event, context) => {
11     //console.log('Received event:', JSON.stringify(event, null, 2));
12     event.Records.forEach((record) => {
13         console.log(record.eventID);
14         console.log(record.eventName);
15         console.log(`DynamoDB Record: ${record.dynamodb}`);
16     });
17     return `Successfully processed ${event.Records.length} records.`;
18 };
19 */
20
```

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162. Lab: AWS DynamoDB - Code Lambda function and Test DynamoDB Streams

DynamoDB - AWS Console

Lambda Management Console

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#tables:selected=Users;tab=triggers



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Delete trigger



Function name

State

Last result

DynamoDBTrigger

Enabled

No records processed



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162. Lab: AWS DynamoDB - Code Lambda function and Test DynamoDB Streams

DynamoDB - AWS Console

Lambda Management Console

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#tables:selected=Users;tab=items

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Overview Items Metrics Alarms Capacity Indexes Global Tables Backups Triggers Access control Tags

Create item Actions

Scan: [Table] Users

Duplicate Edit Delete Export to csv Manage TTL

Scan

Viewing 1 to 2 items

	userid	age	income	name
<input checked="" type="checkbox"/>	1	10	100	Sid
<input type="checkbox"/>	2	20	200	Sid-2

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1.5x 1:36 / 4:58

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AWS Data Architect Bootcamp x (115) Learn JavaScript - F x +

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Udemy AWS Data Architect Bootcamp - 43 Services 500 FAQs 20+ Tools

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162. Lab: AWS DynamoDB - Code Lambda function and Test DynamoDB Streams

DynamoDB - AWS Console Lambda Management Console

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#tables:selected=Users;tab=triggers

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Feedback English (US)

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The screenshot shows a dual-browser setup. The top window is a Chromium browser displaying the AWS DynamoDB 'Triggers' page for the 'Users' table. It shows a single trigger named 'DynamoDBTrigger' which is enabled and has a status of 'OK'. Below the table is a large play button. The bottom window is a Udemy course page for 'AWS Data Architect Bootcamp'. The current lecture is '162. Lab: AWS DynamoDB - Code Lambda function and Test DynamoDB Streams'. The course navigation bar at the bottom includes 'Course content', 'Overview', 'Q&A', 'Notes', and 'Announcements'. A footer at the bottom of the page contains links for 'Feedback', 'English (US)', and copyright information for Amazon Web Services.

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162. Lab: AWS DynamoDB - Code Lambda function and Test DynamoDB Streams

DynamoDB - AWS Console Lambda Management Console

https://us-west-2.console.aws.amazon.com/lambda/home?region=us-west-2#/functions/DynamoDBTrigger?newFunction=true&tab=monitoring

aWS Services Resource Groups Oregon Support

Lambda > Functions > DynamoDBTrigger ARN - arn:aws:lambda:us-west-2:█████████████████████:function:DynamoDBTrigger

DynamoDBTrigger Throttle Qualifiers Actions Select a test event... Test Save

Configuration Monitoring

CloudWatch metrics at a glance

View logs in CloudWatch View traces in X-Ray 1h 3h 12h 1d 3d 1w custom < >

Invocations Duration Errors, Availability (%)

Count Milliseconds Count

	19:00	20:00	21:00
Invocations	0	1.00	2.00
Duration	56.0	55.5	55.1
Errors	0	0.5	1.00
Availability (%)	99.5	99.0	100

Duration Minimum Duration Average Duration Maximum Errors Availability (%)

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1.5x 2:13 / 4:58

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162. Lab: AWS DynamoDB - Code Lambda function and Test DynamoDB Streams

DynamoDB - AWS Console Lambda Management Console CloudWatch Management Console

https://us-west-2.console.aws.amazon.com/cloudwatch/home?region=us-west-2#logEventViewer:group=/aws/lambda/DynamoDBTrigger;stream=2018/12/31/\$LATEST|4ca2b2329893478db987b07fa7b6836e

CloudWatch Logs Insights is now available! Try now

CloudWatch > Log Groups > /aws/lambda/DynamoDBTrigger > 2018/12/31/\$LATEST|4ca2b2329893478db987b07fa7b6836e

Expand all Row Text

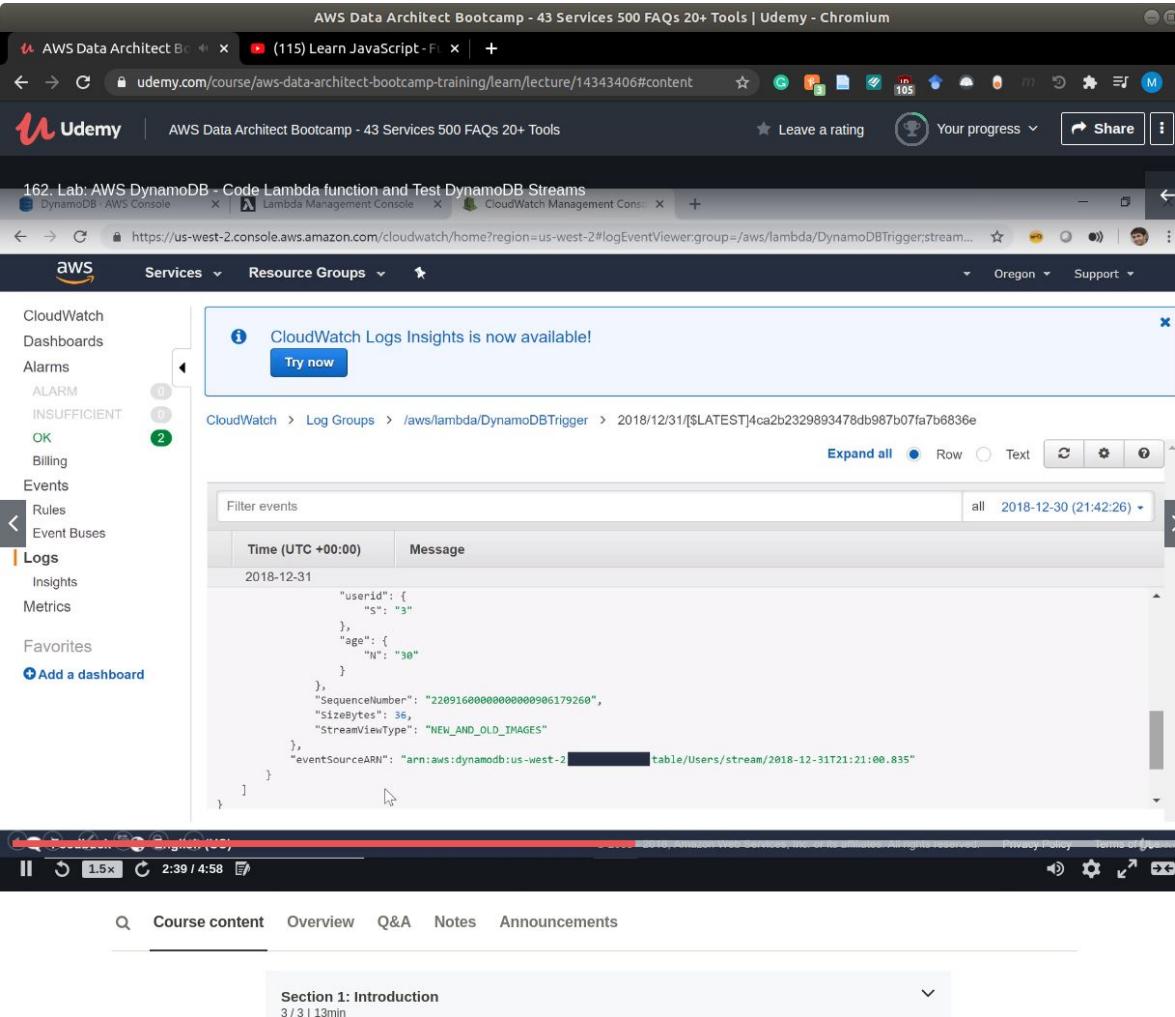
Filter events all 2018-12-30 (21:42:26)

Time (UTC +00:00)	Message
2018-12-31	<pre>"userId": { "S": "3" }, "age": { "N": "30" }, "SequenceNumber": "220916000000000006179260", "SizeBytes": 36, "StreamViewType": "NEW_AND_OLD_IMAGES" }, "eventSourceARN": "arn:aws:dynamodb:us-west-2:█████████████████████:table/Users/stream/2018-12-31T21:21:00.835"] }</pre>

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162. Let's AWS DynamoDB - Create Lambda Function and Test DynamoDB Streams

DynamoDB - AWS Console x Lambda Management Console x CloudWatch Management Console x

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#tables:selected=Users;tab=items

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Create item Actions

Scan: [Table] Users Duplicate Edit Delete Export to csv Manage TTL

Viewing 1 to 3 items

	userid	age	income	name
<input checked="" type="checkbox"/>	1	10	100	Sid
<input type="checkbox"/>	2	20	200	Sid-2
<input type="checkbox"/>	3	30	300	Sid-3

Feedback English (US)

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	userid	age	income	name
<input checked="" type="checkbox"/>	1	10	100	Sid
<input type="checkbox"/>	2	20	200	Sid-2
<input type="checkbox"/>	3	30	300	Sid-3

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AWS Data Architect Bootcamp - (115) Learn JavaScript - F... | udemy.com/course/aws-data-architect-bootcamp-training/learn/lecture/14343406#content

162. Lab: AWS DynamoDB - Code Lambda function and Test DynamoDB Streams

DynamoDB - AWS Console | Lambda Management Console | CloudWatch Management Console

https://us-west-2.console.aws.amazon.com/cloudwatch/home?region=us-west-2#logEventViewer:group=/aws/lambda/DynamoDBTrigger;stream=2018/12/31/\$LATEST|4ca2b2329893478db987b07fa7b6836e

CloudWatch Logs Insights is now available! Try now

CloudWatch > Log Groups > /aws/lambda/DynamoDBTrigger > 2018/12/31/\$LATEST|4ca2b2329893478db987b07fa7b6836e

Expand all Row Text

Filter events

Time (UTC +00:00) Message

2018-12-31

2018-12-31T21:47:04.048Z af57b8f9-ef59-4b04-858c-ed78b606c409 Received event:

```
{ "Records": [ { "eventID": "cbb6cf1f15217f919fc19a5b17b88a83", "eventName": "MODIFY", "eventVersion": "1.1", "eventSource": "aws:dynamodb", "awsRegion": "us-west-2", "dynamodb": { "ApproximateCreationDateTime": 1546292823, "Keys": { "userId": { "S": "1" } } } } ] }
```

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162. Lab: AWS DynamoDB - Code Lambda function and Test DynamoDB Streams

DynamoDB - AWS Console Lambda Management Console CloudWatch Management Console

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#tables:selected=Users;tab=items

AWS Services Resource Groups Oregon Support

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Users Close

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Create item Actions

Scan: [Table] Users: userid Viewing 1 to 3 items

Are you sure you want to delete the selected item?

Cancel Delete

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userid	age
1	10
2	20
3	30

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DynamoDB - AWS Console | Lambda Management Console | CloudWatch Management Console

https://us-west-2.console.aws.amazon.com/cloudwatch/home?region=us-west-2#logEventViewer:group=/aws/lambda/DynamoDBTrigger;stream=2018/12/31/\$LATEST|4ca2b2329893478db987b07fa7b6836e

CloudWatch Logs Insights is now available! Try now

CloudWatch > Log Groups > /aws/lambda/DynamoDBTrigger > 2018/12/31/\$LATEST|4ca2b2329893478db987b07fa7b6836e

Expand all Row Text

Filter events all 2018-12-30 (21:42:26)

Time (UTC +00:00)	Message
2018-12-31	<pre> }, "OldImage": { "income": { "N": "300" }, "name": { "S": "Sid-3" }, "userid": { "S": "3" }, "age": { "N": "30" } }, },</pre>

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Section 1: Introduction

3 / 3 | 13min

This screenshot shows a dual-browser setup. The top browser window is a Chromium instance displaying the Udemy course 'AWS Data Architect Bootcamp - 43 Services 500 FAQs 20+ Tools'. The course page is at the URL udemy.com/course/aws-data-architect-bootcamp-training/learn/lecture/14343406#content. The bottom browser window is an AWS Chromium instance showing the CloudWatch Logs Insights interface for a Lambda function named 'DynamoDBTrigger'. The logs for December 31, 2018, are displayed, showing a single log entry with a timestamp of 2018-12-31 21:42:26. The log message is a JSON object containing fields like 'OldImage', 'name', 'userid', and 'age'. A modal dialog from CloudWatch is visible, announcing the availability of CloudWatch Logs Insights.

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AWS Data Architect Bootcamp - 43 Services 500 FAQs 20+ Tools

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Your progress

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163. Lab: AWS DynamoDB - Enable and Configure TTL Feature

Epoch Converter - Unix Timestamp

<https://www.epochconverter.com>

Epoch & Unix Timestamp Conversion Tools

The current Unix epoch time is **1554158809**

Convert epoch to human readable date and vice versa

 [Timestamp to Human date](#) [batch convert]

Mon	Day	Yr	Hr	Min	Sec
4	/ 1	/ 2019	10	: 46	: 46
			PM ▾	GMT ▾	Human date to Timestamp

Pages

[Home](#) •
[Preferences](#)
[Toggle theme](#)

Tools

[Epoch converter](#)
[Batch converter](#)
[Time zone converter](#)
[Epoch timestamp list](#)
[LDAP converter](#)
[WebKit/Chrome timestamp](#)
[Unix hex timestamp](#)
[Cocoa Core Data timestamp](#)
[Mac HFS+ timestamp](#)
[SAS timestamp](#)
[Seconds/days since year 0](#)
[Bin/Oct/Hex converter](#)

|| 1.5x 0:05 / 4:26

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163. Lab: AWS DynamoDB - Enable and Configure TTL Feature Epoch Converter - Unix Timestamp +

DynamoDB · AWS Console https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#tables:selected=Users;tab=items

Services Resource Groups

DynamoDB

Dashboard Tables Backups Reserved capacity Preferences DAX Dashboard Clusters Subnet groups Parameter groups Events

Edit item

Tree Item (5)

- age Number : 10
- income Number : 100
- name String : Sid-1
- userid String : 1
- ttl Number : 1554159600

Cancel Save

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1.5x 1:30 / 4:26

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AWS Data Architect Bootcamp x (115) Learn JavaScript - F x +

udemy.com/course/aws-data-architect-bootcamp-training/learn/lecture/14343492#content

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163. Lab: AWS DynamoDB - Enable and Configure TTL Feature

Epoch Converter - Unix Timestamp

DynamoDB · AWS Console

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#tables:selected=Users;tab=overview

aws Services Resource Groups

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Overview Items Metrics Alarms Capacity Indexes Global Tables Backups Triggers Access control Tags

Recent alerts

No CloudWatch alarms have been triggered for this table.

Stream details

Stream enabled Yes

View type New and old images

Latest stream ARN arn:aws:dynamodb:us-west-2:█████████████████████:table/Users/stream/2018-12-31T21:21:00.835

Manage Stream

Table details

Table name	Users
Primary partition key	userId (String)
Primary sort key	-
Point-in-time recovery	DISABLED Enable
Encryption Type	DEFAULT Manage Encryption
KMS Master Key ARN	Not Applicable
Time to live attribute	DISABLED Manage TTL
Table status	Active
Creation date	December 26, 2018 at 1:38:44 PM UTC-5
Read/write capacity mode	Provisioned
Last change to on-demand mode	-

Feedback English (US)

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163. Lab: AWS DynamoDB - Enable and Configure TTL Feature

DynamoDB · AWS Console

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#tables:selected=Users;tab=overview

aws Services Resource Groups

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Overview

Recent alerts

No CloudWatch Metrics

Stream details

Table details

Enable TTL

TTL is a mechanism to set a specific timestamp for expiring items from your table. The timestamp should be expressed as an attribute on the items in the table. The attribute should be a Number data type containing time in epoch format. Once the timestamp expires, the corresponding item is deleted from the table in the background.

TTL attribute: ttl

Enabling TTL can take up to 1 hour to apply across all partitions, and you will not be able to make further TTL changes until the action is complete. Please verify all information is correct to avoid loss of important data from your table.

DynamoDB Streams: Streams are currently enabled with view type New and old images

Preview TTL

Before enabling TTL, it is recommended you run a preview to see samples of what items will be deleted once TTL is enabled on this table.

Run preview preview items expiring by April 1, 2019 19:00 UTC-4

Creation date: December 20, 2018 at 1:36:44 PM UTC-0

Read/write capacity mode: Provisioned

Last change to on-demand mode:

Cancel Continue

Course content Overview Q&A Notes Announcements

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163. Lab: AWS DynamoDB - Enable and Configure TTL Feature

Epoch Converter - Unix Timestamp

DynamoDB - AWS Console

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Events

Table details

Enable TTL

TTL is a mechanism to set a specific timestamp for expiring items from your table. The timestamp should be expressed as an attribute on the items in the table. The attribute should be a Number data type containing time in epoch format. Once the timestamp expires, the corresponding item is deleted from the table in the background.

TTL attribute

ttl

Enabling TTL can take up to 1 hour to apply across all partitions, and you will not be able to make further TTL changes until the action is complete. Please verify all information is correct to avoid loss of important data from your table.

DynamoDB Streams

 Streams are currently enabled with view type New and old images

Preview TTL

Before enabling TTL, it is recommended you run a preview to see samples of what items will be deleted once TTL is enabled on this table.

Run preview

preview items expiring by April 1, 2019 19:00 UTC-4

userid	ttl	age	income	name
1	1554159600	10	100	Sid-1

Cancel

Continue

Section 1: Introduction

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1.5x 2:48 / 4:26

AWS Data Architect Bootcamp - 43 Services 500 FAQs 20+ Tools | Udemy - Chromium

AWS Data Architect Bootcamp x (115) Learn JavaScript - F x +

udemy.com/course/aws-data-architect-bootcamp-training/learn/lecture/14343492#content

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163. Lab: AWS DynamoDB - Enable and Configure TTL Feature Epoch Converter - Unix Timestamp + DynamoDB - AWS Console

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#tables:selected=Users;tab=overview

aws Services Resource Groups Oregon Support

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Users Close

Overview Items Metrics Alarms Capacity Indexes Global Tables Backups Triggers Access control Tags

Recent alerts

No CloudWatch alarms have been triggered for this table.

Stream details

Stream enabled Yes View type New and old images Latest stream ARN arn:aws:dynamodb:us-west-2:█████████████████████:table/Users/stream/2018-12-31T21:21:00.835 Manage Stream

Table details

Table name	Users
Primary partition key	userId (String)
Primary sort key	-
Point-in-time recovery	DISABLED Enable
Encryption Type	DEFAULT Manage Encryption
KMS Master Key ARN	Not Applicable
Time to live attribute	ttl Manage TTL
Table status	Active
Creation date	December 26, 2018 at 1:38:44 PM UTC-5
Read/write capacity mode	Provisioned
Last change to on-demand mode	-

Feedback English (80) 1.5x 2:57 / 4:26

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163. Lab: AWS DynamoDB - Enable and Configure TTL Feature

DynamoDB - AWS Console

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#tables:selected=Users;tab=metrics

aws Services Resource Groups Oregon Support

DynamoDB

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Metrics Overview Items Alarms Capacity Indexes Global Tables Backups Triggers Access control Tags

View all CloudWatch metrics

Time Range Last Hour

4/1 4/1 4/1 4/1 4/1 4/1
22:30 23:00 22:30 23:00 22:30 23:00

Time to Live (TTL)

TTL deleted items (Count)

Scan and Query

Scan returned item count (Average) 4 3 0.75

Query returned item count (Average) 1

Feedback English (US) 1.5x 4:01 / 4:26

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164. Lab: AWS DynamoDB - Global Database and On-Demand Capacity Provisioning

Amazon DynamoDB Global Tables

[Products Solutions Pricing Documentation Learn Partner Network AWS Marketplace Explore More](https://aws.amazon.com/dynamodb/global-tables/)[Contact Sales](#) [Support](#) [English](#) [My Account](#) [Sign in to the Console](#)

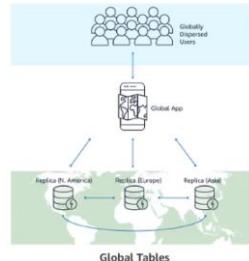
Global Tables

Multi-Region, Multi-Master tables for fast local performance for globally distributed apps

Global Tables builds upon DynamoDB's global footprint to provide you with a fully managed, multi-region, and multi-master database that provides fast, local, read and write performance for massively scaled, global applications. Global Tables replicates your Amazon DynamoDB tables automatically across your choice of AWS regions.

Global Tables eliminates the difficult work of replicating data between regions and resolving update conflicts, enabling you to focus on your application's business logic. In addition, Global Tables enables your applications to stay highly available even in the unlikely event of isolation or degradation of an entire region.

You can setup Global Tables with just a few clicks in the AWS Management Console. No application changes are required because Global Tables use existing DynamoDB APIs. There are no upfront costs or commitments for using Global Tables, and you pay only for the resources provisioned. Learn more about setting up Global Tables in the [DynamoDB Developer Guide](#).



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164. Lab: AWS DynamoDB - Global Database and On-Demand Capacity Provisioning

Global Tables - Amazon DynamoDB

https://docs.aws.amazon.com/amazondynamodb/latest/developerguide/GlobalTables.html

aws

Amazon DynamoDB Developer Guide (API Version 2012-08-10)

Documentation - This Guide Search

What Is Amazon DynamoDB? Setting Up DynamoDB Accessing DynamoDB Getting Started with DynamoDB Programming with DynamoDB Working with DynamoDB On-Demand Backup and Restore Point-in-Time Recovery Global Tables How It Works Requirements and Best Practices Creating a Global Table Monitoring Global Tables Using IAM with Global Tables Encryption at Rest DynamoDB Transactions

AWS Documentation » Amazon DynamoDB » Developer Guide » Global Tables

Global Tables

Amazon DynamoDB global tables provide a fully managed solution for deploying a multi-region, multi-master database, without having to build and maintain your own replication solution. When you create a global table, you specify the AWS regions where you want the table to be available. DynamoDB performs all of the necessary tasks to create identical tables in these regions, and propagate ongoing data changes to all of them.

To illustrate one use case for a global table, suppose that you have a large customer base spread across three geographic areas—the US east coast, the US west coast, and western Europe. Customers would need to update their profile information while using your application. To address these requirements, you could create three identical DynamoDB tables named *CustomerProfiles*, in three different AWS regions. These three tables would be entirely separate from each other, and changes to the data in one table would not be reflected in the other tables. Without a managed replication solution, you could write code to replicate data changes among these tables; however, this would be a time-consuming and labor-intensive effort.

Instead of writing your own code, you could create a global table consisting of your three region-specific *CustomerProfiles* tables. DynamoDB would then automatically replicate data changes among those tables, so that changes to *CustomerProfiles* data in one region would be seamlessly propagated to the other regions. In addition, if one of the AWS regions were to become temporarily unavailable, your customers could still access the same *CustomerProfiles* data in the other regions.

DynamoDB global tables are ideal for massively scaled applications, with globally dispersed users. In such an environment, users expect very fast application performance. Global tables provide automatic multi-master replication to AWS regions world-wide, so you can deliver low-latency data access to your users no matter where they are located.

For information about the AWS Region availability and pricing, see [Amazon DynamoDB Pricing](#).

Did this page help you? Yes No Feedback

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164. Lab: AWS DynamoDB - Global Database and On-Demand Capacity Provisioning

DynamoDB - AWS Console

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#create-table:

AWS Services Resource Groups Oregon Support

Create DynamoDB table

DynamoDB is a schema-less database that only requires a table name and primary key. The table's primary key is made up of one or two attributes that uniquely identify items, partition the data, and sort data within each partition.

Table name* GlobalTable-Oregon

Primary key* Partition key id String Add sort key

Table settings

Default settings provide the fastest way to get started with your table. You can modify these default settings now or after your table has been created.

Use default settings

- No secondary indexes.
- Provisioned capacity set to 5 reads and 5 writes.
- Basic alarms with 80% upper threshold using SNS topic "dynamodb".
- Encryption at Rest with DEFAULT encryption type NEW.

You do not have the required role to enable Auto Scaling by default.
Please refer to documentation.

Additional charges may apply if you exceed the AWS Free Tier levels for CloudWatch or Simple Notification Service. Advanced alarm settings are available in the CloudWatch management console.

Cancel Create

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#

2.10 / 8:12 1.5x

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DynamoDB AWS Console

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#tables:selected=GlobalTable-Oregon;tab=globaltables

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GlobalTable-Oregon Close

Overview Items Metrics Alarms Capacity Indexes Global Tables Backups Triggers Access control Tags

Global Tables enable you to use DynamoDB as a fully-managed, multi-region, multi-master database. Learn more

To create a global table, ensure that this table is empty and that DynamoDB Streams are enabled. A table must meet the following requirements to become part of a global table.

Empty table: Yes Streams: Disabled Stream type: -

Enable streams

IAM role AWSServiceRoleForDynamoDBReplication Automatically created on your behalf

Global Table regions

Create a replica table in another region. Learn more

Add region Remove region

Region Name	Status	Read capacity units	Write capacity units	Auto Scaling	Endpoint
-------------	--------	---------------------	----------------------	--------------	----------

You do not have a global table with this name. Click "Add region" to create one.

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2:20 / 8:12

1.5x

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DynamoDB - AWS Console

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To create a global table, ensure that this table is empty and that DynamoDB Streams are enabled. A table must meet the following requirements to become part of a global table.

Empty table: Yes Streams: Disabled Stream type: -

Enable streams

Manage Stream

View type: New and old images - both the new and the old images of the item

CANCEL Enable

IAM role AWSServiceRoleForDynam Automatially created on

Global Table regions

Create a replica table in another region. Learn more

Add region Remove region

Region Name Status Read capacity units Write capacity units Auto Scaling Endpoint

You do not have a global table with this name. Click "Add region" to create one.

Feedback English (US)

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DynamoDB - AWS Console

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Add region to global table

Choose a region.

Region US West (N. California)

We will create a replica table in your intended region. [Learn more](#)

You can expand your global table to more regions as long as each replica table contains zero items.

Region is ready. Click continue to proceed.

Cancel Continue

You do not have a global table with this name. Click "Add region" to create one.

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DynamoDB - AWS Console

DynamoDB - AWS Console

https://us-west-1.console.aws.amazon.com/dynamodb/home?region=us-west-1#tables:selected=GlobalTable-Oregon;tab=overview

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DynamoDB Dashboard Tables Backups Reserved capacity Preferences DAX Dashboard Clusters Subnet groups Parameter groups Events

Create table Delete table

Filter by table name Name GlobalTable-Oregon

GlobalTable-Oregon Close

Overview Items Metrics Alarms Capacity Indexes Global Tables Backups Triggers Access control Tags

Recent alerts

No CloudWatch alarms have been triggered for this table.

Stream details

Stream enabled Yes New and old images View type Latest stream ARN am:aws:dynamodb:us-west-1:█████████████████████:table/GlobalTable-Oregon/stream/2019-04-03T17:45:57.076 Manage Stream

Table details

Table name	GlobalTable-Oregon
Primary partition key	id (String)
Primary sort key	-
Point-in-time recovery	DISABLED Enable
Encryption Type	DEFAULT Manage Encryption
KMS Master Key ARN	Not Applicable
Time to live attribute	DISABLED Manage TTL
Table status	Active
Creation date	April 3, 2019 at 1:45:57 PM UTC-4
Read/write capacity mode	Provisioned
Last change to on-demand mode	-
Provisioned read capacity units	5 (Auto Scaling Disabled)
Provisioned write capacity units	5 (Auto Scaling Disabled)
Last decrease time	-

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Global Tables enable you to use DynamoDB as a fully-managed, multi-region, multi-master database. Learn more

IAM role AWSServiceRoleForDynamoDBReplication ⓘ
Automatically created on your behalf.

Global Table regions

Create a replica table in another region. Learn more

Add region Remove region

Region Name	Status	Read capacity units	Write capacity units	Auto Scaling	Endpoint
US West (N. California)	Active	5	5	DISABLED	dynamodb.us-west-1.amazonaws.com
US West (Oregon)	Active	5	5	DISABLED	dynamodb.us-west-2.amazonaws.com

View all CloudWatch metrics ⓘ Time Range [Last Hour]

Global table metrics

Replication latency (Milliseconds) Pending replication count (Count)

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Region Name	Status	Read capacity units	Write capacity units	Auto Scaling	Endpoint
US West (N. California)	Active	5	5	DISABLED	dynamodb.us-west-1.amazonaws.com
US West (Oregon)	Active	5	5	DISABLED	dynamodb.us-west-2.amazonaws.com

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164. Lab: AWS DynamoDB - Global Database and On-Demand Capacity Provisioning

DynamoDB - AWS Console

DynamoDB - AWS Console

<https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#tables:selected=GlobalTable-Oregon;tab=capacity>

AWS Services Resource Groups

⋮

DynamoDB Dashboard Tables Backups Reserved capacity Preferences

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GlobalTable-Oregon Close

Overview Items Metrics

Scaling activities

Global table read/write capacity

Select on-demand if you want to pay on throughput requirements. See the Dyna

ave on throughput costs if you can reliably estimate your application's

Read/write capacity mode can be changed later.

 Provisioned (free-tier eligible) On-demand

Last change to on-demand mode: No read/write capacity mode changes have been made.

Next available change to on-demand mode: You can update to on-demand mode at any time.

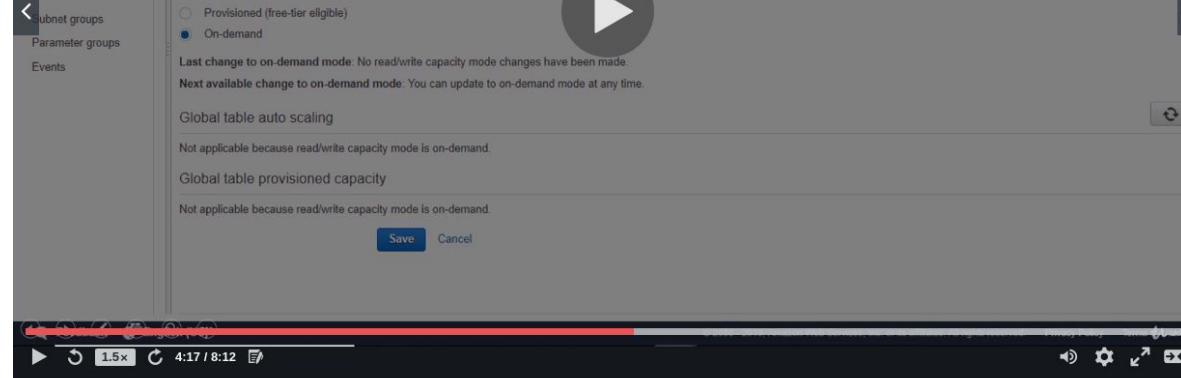
Global table auto scaling

Not applicable because read/write capacity mode is on-demand.

Global table provisioned capacity

Not applicable because read/write capacity mode is on-demand.

Close



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GlobalTable-Oregon Close

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Scaling activities

Global table read/write capacity mode

Select on-demand if you want to pay only for the read and writes you perform, with no capacity planning required. Select provisioned to save on throughput costs if you can reliably estimate your application's throughput requirements. See the [DynamoDB pricing page](#) and [DynamoDB Developer Guide](#) to learn more.

Read/write capacity mode can be changed later.

Provisioned (free-tier eligible)

On-demand

Last change to on-demand mode: No read/write capacity mode changes have been made.

Next available change to on-demand mode: You can update to on-demand mode at any time.

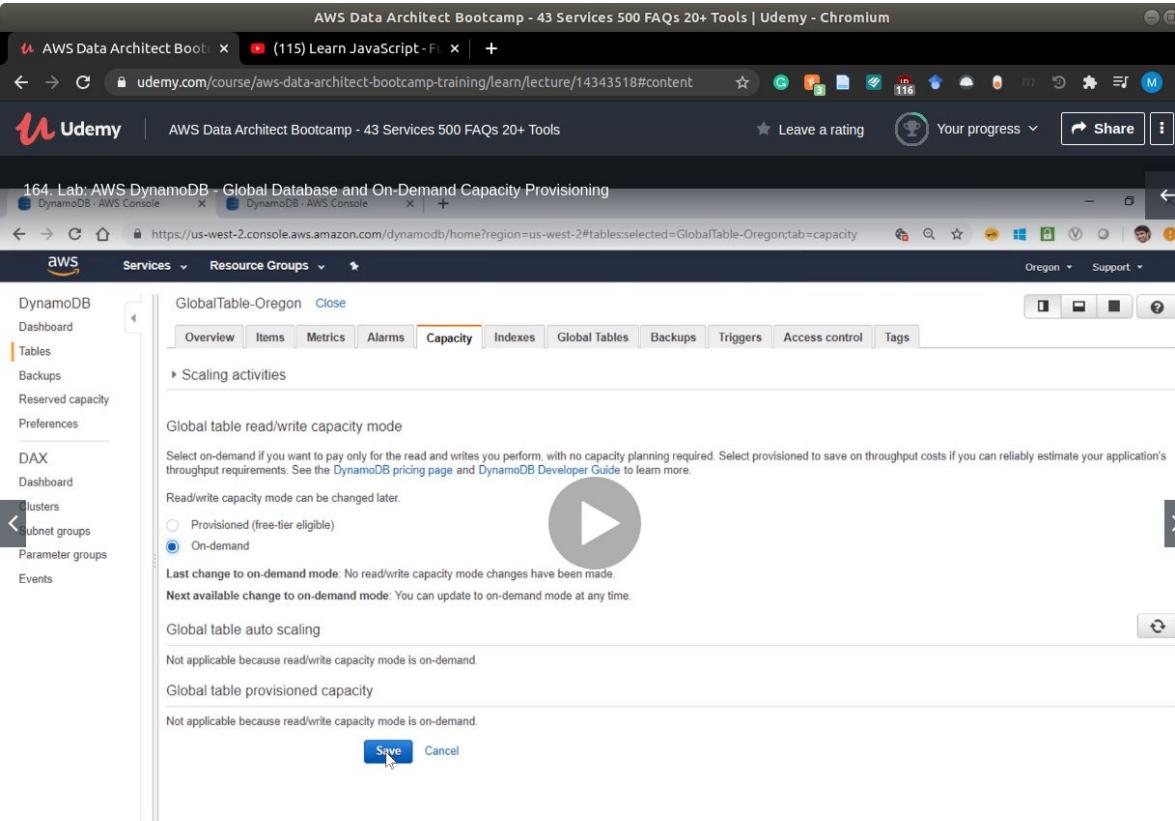
Global table auto scaling

Not applicable because read/write capacity mode is on-demand.

Global table provisioned capacity

Not applicable because read/write capacity mode is on-demand.

Save Cancel



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Create table Delete table

Filter by table name Name GlobalTable-Oregon

GlobalTable-Oregon Close

Overview Items Metrics Alarms Capacity Indexes Global Tables Backups Triggers Access control Tags

Recent alerts

No CloudWatch alarms have been triggered for this table.

Stream details

Stream enabled Yes
View type New and old images
Latest stream ARN am:aws:dynamodb:us-west-1:█████████████████████/GlobalTable-Oregon/stream/2019-04-03T17:45:57.076
Manage Stream

Table details

Table name	GlobalTable-Oregon
Primary partition key	id (String)
Primary sort key	-
Point-in-time recovery	DISABLED Enable
Encryption Type	DEFAULT Manage Encryption
KMS Master Key ARN	Not Applicable
Time to live attribute	DISABLED Manage TTL
Table status	Active
Creation date	April 3, 2019 at 1:45:57 PM UTC-4
Read/write capacity mode	On-Demand
Last change to on-demand mode	April 3, 2019 at 1:53:50 PM UTC-4
Provisioned read capacity units	-
Provisioned write capacity units	-
Last decrease time	-

Feedback English (US)

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DynamoDB - AWS Console

DynamoDB - AWS Console

<https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#tables:selected=GlobalTable-Oregon;tab=items>

AWS Services Resource Groups



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Scan: [Table] GlobalTable-Oregon: id ▾

Viewing 1 to 1 items

Scan ▾ [Table] GlobalTable-Oregon: id ▾

+ Add filter

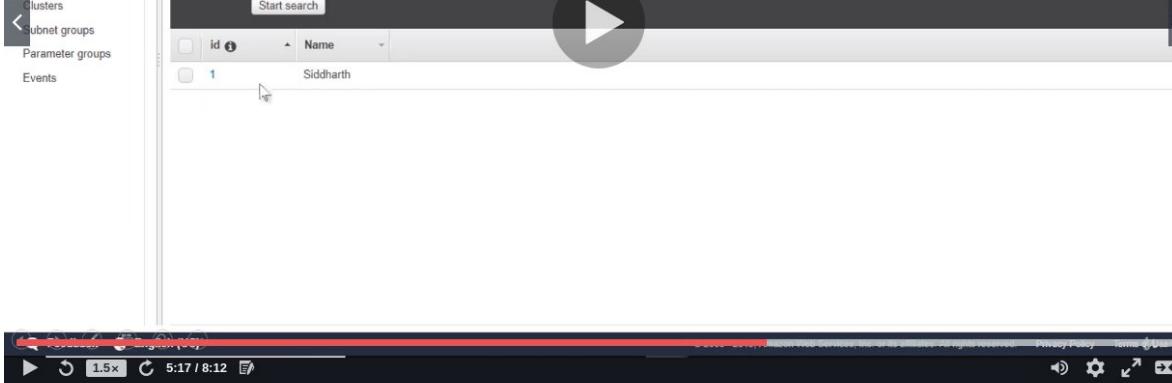
Start search

	id	Name
1	Siddharth	

▶

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Create item Actions

Scan [Table] GlobalTable-Oregon: id ^ Viewing 1 to 1 items

Scan [Table] GlobalTable-Oregon: id Add filter Start search

	id	Name	aws:rep:deleting	aws:rep:updateregion	aws:rep:updatetime
1	Siddharth	false	us-west-2	1554314575.851001	

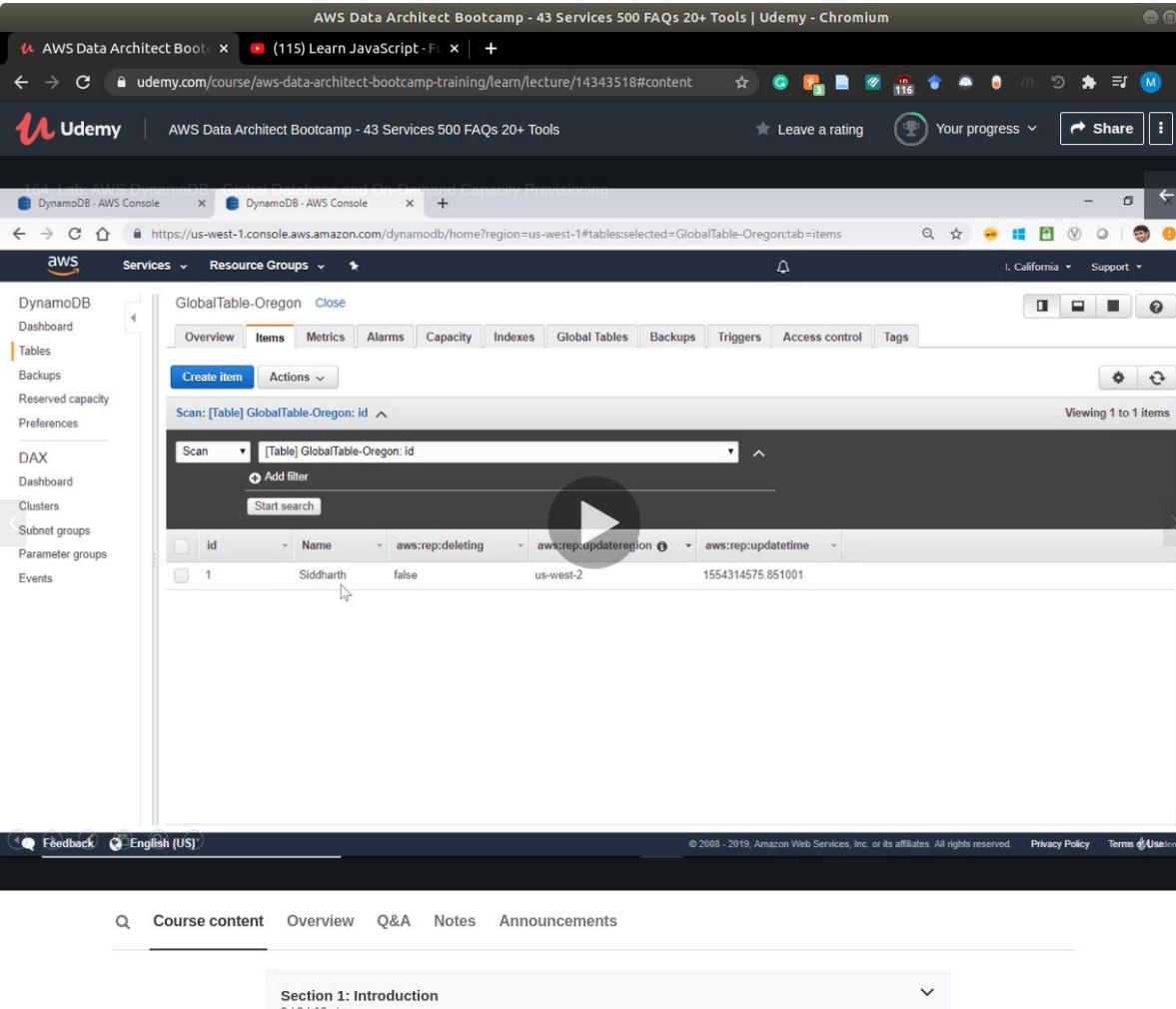
Feedback English (US)

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DynamoDB - AWS Console

DynamoDB - AWS Console

<https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#tables:selected=GlobalTable-Oregon;tab=items>

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Edit item

Tree



Item (2)

id String : 1

Name String : Siddharth Mehta



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Overview Items Metrics Alarms Capacity Indexes Global Tables Backups Triggers Access control Tags

Create item Actions

Scan [Table] GlobalTable-Oregon: id ^ Viewing 1 to 1 items

Start search

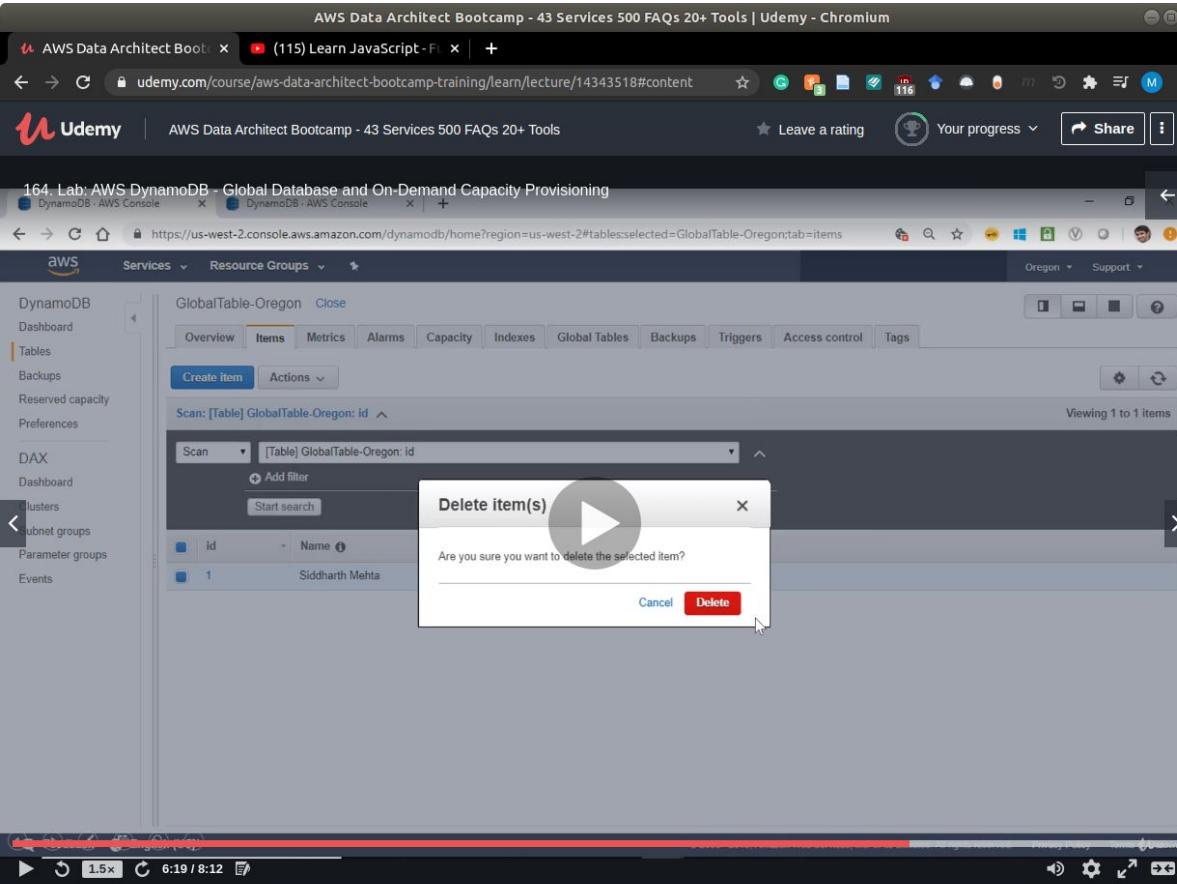
	id	Name	aws:rep:deleting	aws:rep:updateregion	aws:rep:updatetime
1	Siddharth Mehta	false	us-west-2	1554314759.890001	

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Section 1: Introduction

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The screenshot captures a dual-pane interface. The left pane displays the Udemy course navigation bar with tabs for Course content, Overview, Q&A, Notes, and Announcements. Below this is a video player showing a video titled 'Section 1: Introduction' at 3 / 3 | 13min, with playback controls including a play button, volume, and zoom. The right pane is a full-screen view of the AWS DynamoDB console. The top navigation bar of the AWS console includes links for Services, Resource Groups, and the current table, 'GlobalTable-Oregon'. The main content area shows the 'Items' tab selected, displaying a single item with the ID '1'. The item details are: Name 'Siddharth Mehta', 'aws:rep:deleting' status 'false', 'aws:rep:updateregion' set to 'us-west-2', and 'aws:rep:updatetime' recorded as '1554314759.890001'. The AWS navigation sidebar on the left lists various services like DynamoDB, DAX, and Lambda.



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https://us-west-1.console.aws.amazon.com/dynamodb/home?region=us-west-1#tables:selected=GlobalTable-Oregon;tab=items

Services Resource Groups i. California Support

DynamoDB Dashboard Tables Backups Reserved capacity Preferences

DAX Dashboard Clusters Subnet groups Parameter groups Events

GlobalTable-Oregon Close

Overview Items Metrics Alarms Capacity Indexes Global Tables Backups Triggers Access control Tags

Create item Actions

Scan: [Table] GlobalTable-Oregon: id ▾ Viewing 0 to 0 items

Scan [Table] GlobalTable-Oregon: id Add filter Start search

id

An item consists of one or more attributes. Each attribute consists of a name, a data type, and a value. When you read or write an item, the only attributes that are required are those that make up the primary key. More info

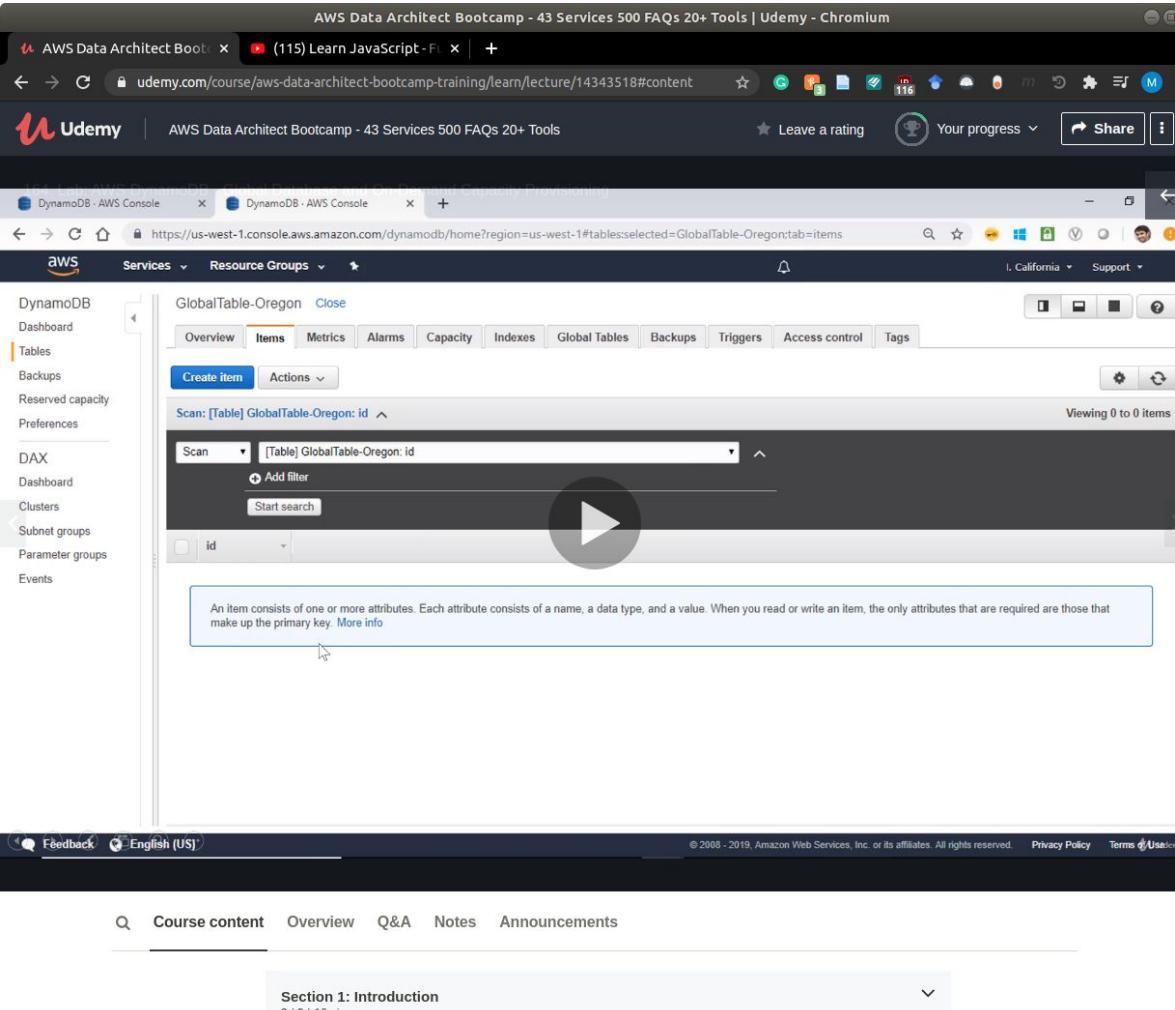
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164. Lab: AWS DynamoDB - Global Database and On-Demand Capacity Provisioning

DynamoDB - AWS Console DynamoDB - AWS Console

Services Resource Groups

DynamoDB Dashboard Tables Backups Reserved capacity Preferences DAX Dashboard Clusters Subnet groups Parameter groups Events

Create table Delete table

GlobalTable-Oregon Close

Overview Items Metrics Alarms Capacity Indexes Global Tables Backups Triggers Access control Tags

Global Tables enable you to use DynamoDB as a fully-managed, multi-region, multi-master database. [Learn more](#)

IAM role AWSServiceRoleForDynamoDBReplication ⓘ Automatically created on your behalf.

Global Table regions

Create a replica table in another region. [Learn more](#)

Add region Remove region

Region Name	Status	Read capacity units	Write capacity units	Auto Scaling	Endpoint
US West (N. California)	Active	5	5	DISABLED	dynamodb.us-west-1.amazonaws.com
US West (Oregon)	Active	5	5	DISABLED	dynamodb.us-west-2.amazonaws.com

View all CloudWatch metrics Time Range [Last Hour]

Global table metrics

1 Pending replication count (Count)

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Section 1: Introduction

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Region Name	Status	Read capacity units	Write capacity units	Auto Scaling	Endpoint
US West (N. California)	Active	5	5	DISABLED	dynamodb.us-west-1.amazonaws.com
US West (Oregon)	Active	5	5	DISABLED	dynamodb.us-west-2.amazonaws.com

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164. Lab: AWS DynamoDB - Global Database and On-Demand Capacity Provisioning

DynamoDB - AWS Console DynamoDB - AWS Console

https://us-west-1.console.aws.amazon.com/dynamodb/home?region=us-west-1#tables:selected=GlobalTable-Oregon;tab=globaltables

AWS Services Resource Groups

DynamoDB Dashboard Tables Backups Reserved capacity Preferences DAX Dashboard Clusters Subnet groups Parameter groups Events

Create table Delete table

GlobalTable-Oregon Close

Remove replica table from global table

You are removing a replica table from a global table. This will remove the region: US West (N. California)

Note that this operation is non-reversible. This replica table cannot be re-added later to the global table.

Enter the word remove in the box below to confirm:

remove

Cancel Remove

Region Name Status Read Capacity Write Capacity Auto Scaling Endpoint

US West (N. California)	Active	5	5	DISABLED	dynamodb.us-west-1.amazonaws.com
US West (Oregon)	Active	5	5	DISABLED	dynamodb.us-west-2.amazonaws.com

View all CloudWatch metrics Time Range Last Hour

Global table metrics

1 1

1 1

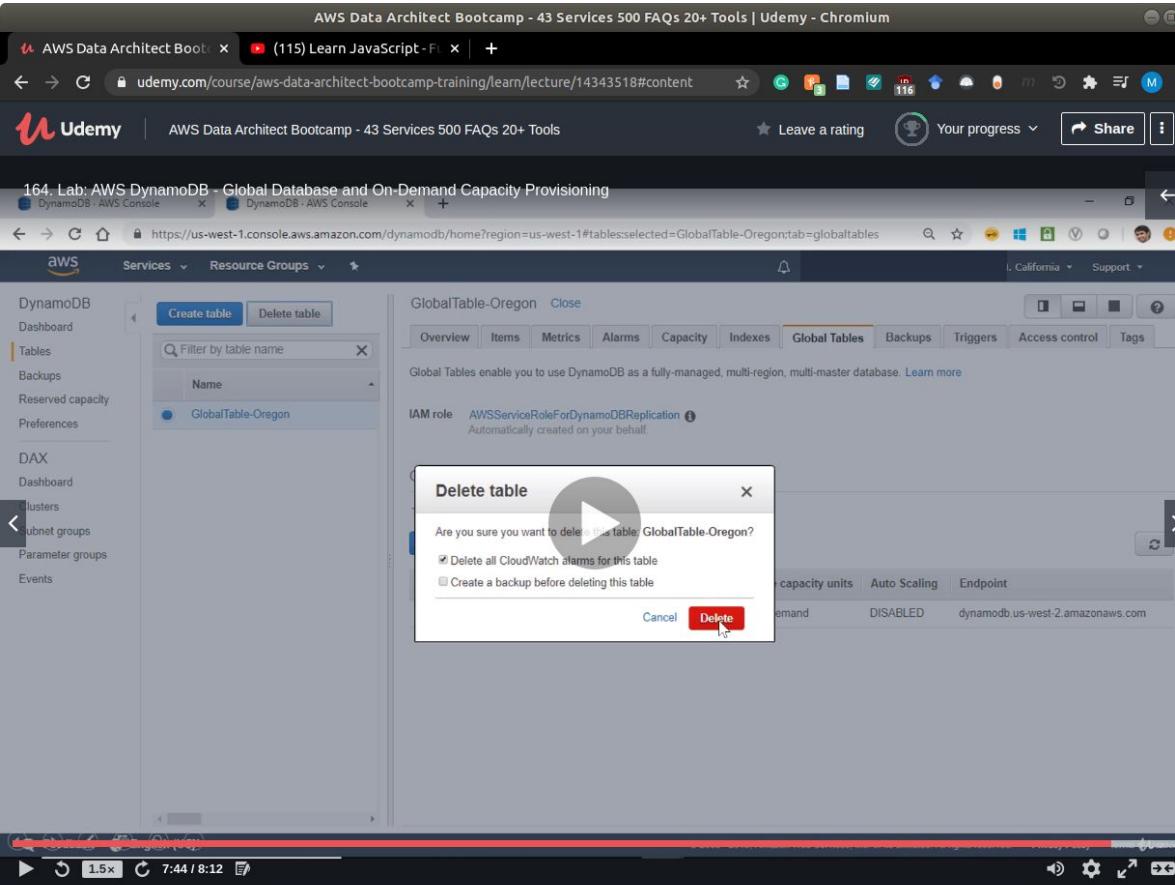
Replication latency (Milliseconds) Pending replication count (Count)

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1.5x 6:52 / 8:12



Course content Overview Q&A Notes Announcements

Section 1: Introduction

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165. AWS DynamoDB - DAX (DynamoDB Accelerator)

Amazon DynamoDB Accelerator

https://aws.amazon.com/dynamodb/dax/

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Amazon DynamoDB Accelerator (DAX)

Fully managed, in-memory cache for DynamoDB.
Reduces DynamoDB response times from milliseconds to microseconds.

Amazon DynamoDB Accelerator (DAX) is a fully managed, highly available, in-memory cache for DynamoDB that delivers up to a 10x performance improvement – from milliseconds to microseconds – even at millions of requests per second. DAX does all the heavy lifting required to add in-memory acceleration to your DynamoDB tables, without requiring developers to manage cache invalidation, data population, or cluster management. Now you can focus on building great applications for your customers without worrying about performance at scale. You do not need to modify application logic, since DAX is compatible with existing DynamoDB API calls. You can enable DAX with just a few clicks in the AWS Management Console or by using the AWS SDK. Just as with DynamoDB, you only pay for the capacity you provision. Learn more about DAX pricing on the [pricing page](#).

DynamoDB Accelerator (DAX)
Get started with DAX

You can enable DAX with just a few clicks in the AWS Management Console or by using the AWS SDK.

AWS SUMMIT 2018
Amazon DynamoDB
DynamoDB Just Got Faster with DAX and Aurora Serverless v2
See Details, Get Started, Learn More

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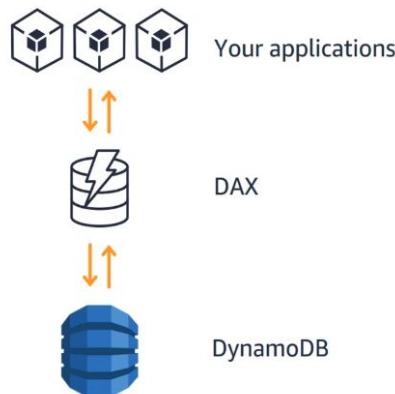
Section 1: Introduction

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165. AWS DynamoDB - DAX (DynamoDB Accelerator)

High performance

Amazon DynamoDB Accelerator (DAX)



Fully managed, highly available cache for DynamoDB

Even faster—
microsecond latency

Scales to millions of
requests per second

API compatible

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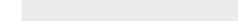
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165. AWS DynamoDB - DAX (DynamoDB Accelerator)

DynamoDB Accelerator (DAX)

- DAX is a DynamoDB-compatible caching service that enables you to benefit from fast in-memory performance for demanding applications. DAX addresses three core scenarios:
- As an in-memory cache, DAX reduces the response times of eventually-consistent read workloads by an order of magnitude, from single-digit milliseconds to microseconds.
- DAX reduces operational and application complexity by providing a managed service that is API-compatible with Amazon DynamoDB, and thus requires only minimal functional changes to use with an existing application.
- For read-heavy or bursty workloads, DAX provides increased throughput and potential operational cost savings by reducing the need to over-provision read capacity units. This is especially beneficial for applications that require repeated reads for individual keys.
- DAX supports server-side encryption. With encryption at rest, the data persisted by DAX on disk will be encrypted. DAX writes data to disk as part of propagating changes from the primary node to read replicas.



1.5x 1:19 / 6:37



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165. AWS DynamoDB - DAX (DynamoDB Accelerator)

DynamoDB Accelerator (DAX)

- DAX is ideal for:

- Applications that require the fastest possible response time for reads. Some examples include real-time bidding, social gaming, and trading applications. DAX delivers fast, in-memory read performance for these use cases.
- Applications that read a small number of items more frequently than others. For example, consider an e-commerce system that has a one-day sale on a popular product. During the sale, demand for that product (and its data in DynamoDB) would sharply increase, compared to all of the other products. To mitigate the impacts of a "hot" key and a non-uniform data distribution, you could offload the read activity to a DAX cache until the one-day sale is over.
- Applications that are read-intensive, but are also cost-sensitive. With DynamoDB, you provision the number of reads per second that your application requires. If read activity increases, you can increase your tables' provisioned read throughput (at an additional cost). Alternatively, you can offload the activity from your application to a DAX cluster, and reduce the amount of read capacity units you'd need to purchase otherwise.
- Applications that require repeated reads against a large set of data. Such an application could potentially divert database resources from other applications. For example, a long-running analysis of regional weather data could temporarily consume all of the read capacity in a DynamoDB table, which would negatively impact other applications that need to access the same data. With DAX, the weather analysis could be performed against cached data instead.



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DynamoDB Accelerator (DAX)

- DAX is *not* ideal for:
 - Applications that require strongly consistent reads (or cannot tolerate eventually consistent reads).
 - Applications that do not require microsecond response times for reads, or that do not need to offload repeated read activity from underlying tables.
 - Applications that are write-intensive, or that do not perform much read activity.
 - Applications that are already using a different caching solution with DynamoDB, and are using their own client-side logic for working with that caching solution.



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165. AWS DynamoDB - DAX (DynamoDB Accelerator)

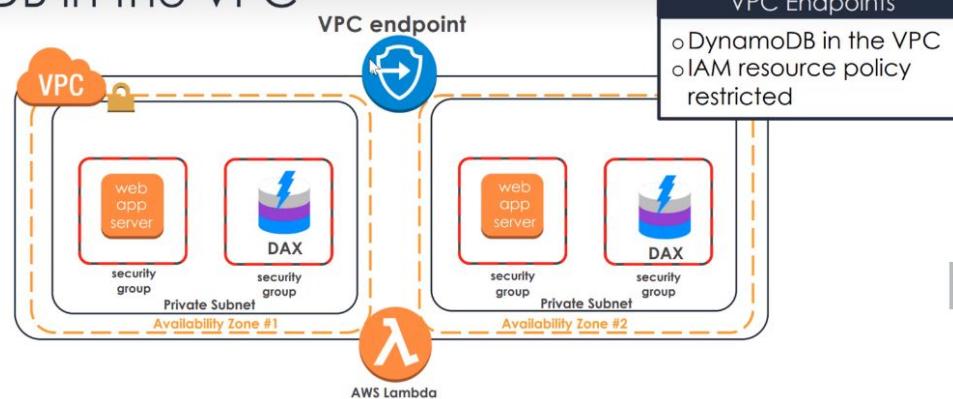
- A DAX cluster consists of one or more nodes. Each node runs its own instance of the DAX caching software. One of the nodes serves as the primary node for the cluster. Additional nodes (if present) serve as read replicas.
- Your application can access DAX by specifying the endpoint for the DAX cluster. The DAX client software works with the cluster endpoint to perform intelligent load-balancing and routing, so that incoming requests are evenly distributed across all of the nodes in the cluster.
- If the request specifies *eventually consistent reads* (the default behavior), it attempts to read the item from DAX:
 - If DAX has the item available (a *cache hit*), DAX returns the item to the application without accessing DynamoDB.
 - If DAX does not have the item available (a *cache miss*), DAX passes the request through to DynamoDB. When it receives the response from DynamoDB, DAX returns the results to the application—but it also writes the results to the cache on the primary node.
- If the request specifies strongly consistent reads, DAX passes the request through to DynamoDB. The results from DynamoDB are not cached in DAX; instead, they are simply returned to the application.
- DAX does not recognize any DynamoDB operations for managing tables (such as CreateTable, UpdateTable, and so on). If your application needs to perform these operations, it will need to access DynamoDB directly rather than using DAX.

DynamoDB Accelerator (DAX)

3:18 / 6:37



DynamoDB in the VPC



DAX

- Microseconds latency in-memory cache
- Millions of requests per second
- Fully managed, highly available
- Role-based access control
- No IGW or VPC endpoint required



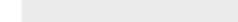
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165. AWS DynamoDB - DAX (DynamoDB Accelerator)

DynamoDB Accelerator (DAX)

- DAX maintains an item cache to store the results from GetItem and BatchGetItem operations. The items in the cache represent eventually consistent data from DynamoDB, and are stored by their primary key values.
- The item cache has a time-to-live setting (TTL), which is 5 minutes by default. DAX assigns a timestamp to every item that it writes to the item cache. An item expires if it has remained in the cache for longer than the TTL setting. If you issue a GetItem request on an expired item, this is considered a cache miss, so DAX will send the GetItem request to DynamoDB.
- DAX also maintains a least recently used list (LRU) for the item cache. The LRU list keeps track of when an item was first written to the cache, and when the item was last read from the cache. If the item cache becomes full, DAX will evict older items (even if they have not expired yet) to make room for new items.
- DAX also maintains a query cache to store the results from Query and Scan operations. The items in this cache represent result sets from queries and scans on DynamoDB tables. These result sets are stored by their parameter values.



4:58 / 6:37



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166. Lab: AWS DynamoDB - DynamoDB Accelerator (DAX)

DynamoDB · AWS Console

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#cache-dashboard:

aws Services Resource Groups Oregon Support

Create cluster

Amazon DynamoDB Accelerator (DAX) is a fully-managed, highly-available, in-memory caching service for DynamoDB.

[Create cluster](#)

Resources

You are currently using the following DAX components:

- Clusters (0)
- Cluster subnet groups (0)
- Cluster parameter groups (1)
- Cluster events (0)

Alarms

No CloudWatch alarms have been triggered.

DAX service health

Current Status	Details
Green Amazon DAX (Oregon)	Service is operating normally

[View complete service health details](#)

Learn more

Amazon DynamoDB Accelerator ...

Amazon DynamoDB Accelerator (DAX)

DynamoDB Just Got Faster

What's new

- DAX Now Supports T2 Instances
- Blog: Werner Vogels' DAX blog
- Blog: In-Memory Caching for Read-Intensive Workloads
- Video: DynamoDB Just Got Faster: Deep Dive on DAX

Related services

- Amazon DynamoDB
- Amazon ElastiCache

Additional resources

- Getting started guide

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166. Lab: AWS DynamoDB - DynamoDB Accelerator (DAX)

DynamoDB Accelerator (DAX) is a fully-managed, highly-available, in-memory caching service for DynamoDB.

Create cluster

Amazon DynamoDB Accelerator (DAX) is a fully-managed, highly-available, in-memory caching service for DynamoDB.

Learn more

Amazon DynamoDB Accelerator ...

Amazon DynamoDB Accelerator (DAX)

DynamoDB Just Got Faster

What's new

- DAX Now Supports T2 Instances
- Blog: Werner Vogels' DAX blog
- Blog: In-Memory Caching for Read-Intensive Workloads
- Video: DynamoDB Just Got Faster: Deep Dive on DAX

Related services

- Amazon DynamoDB
- Amazon ElastiCache

Getting started guide

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166. Lab: AWS DynamoDB - DynamoDB Accelerator (DAX)

DynamoDB - AWS Console https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#create-cluster:

aws Services Resource Groups Oregon Support

Create a DynamoDB Accelerator (DAX) cluster

DAX is advantageous for read intensive applications that are latency sensitive and/or experience spikes in traffic for repeatedly read keys. When creating a DAX cluster, things to consider include the node type (i.e. how much memory), cluster size, and the access control policies for the IAM service role.

Cluster name: Your cluster name

Provide a meaningful name that uniquely identifies your DAX cluster. A cluster name must contain between 1 and 20 alphanumeric characters or hyphens, must start with a letter, and cannot end with a hyphen.

Node type: dax.r4.large

Node type determines the maximum amount of memory for a DAX cluster.

Cluster size: 3 node(s)

For production clusters, we recommend at least a three-node cluster for high availability. Additional nodes can be added for read scale.

Encryption: Enable encryption

You may enable encryption for your DAX cluster to help protect data at rest.
[Learn more](#)

IAM role: Select IAM service role for DAX cluster

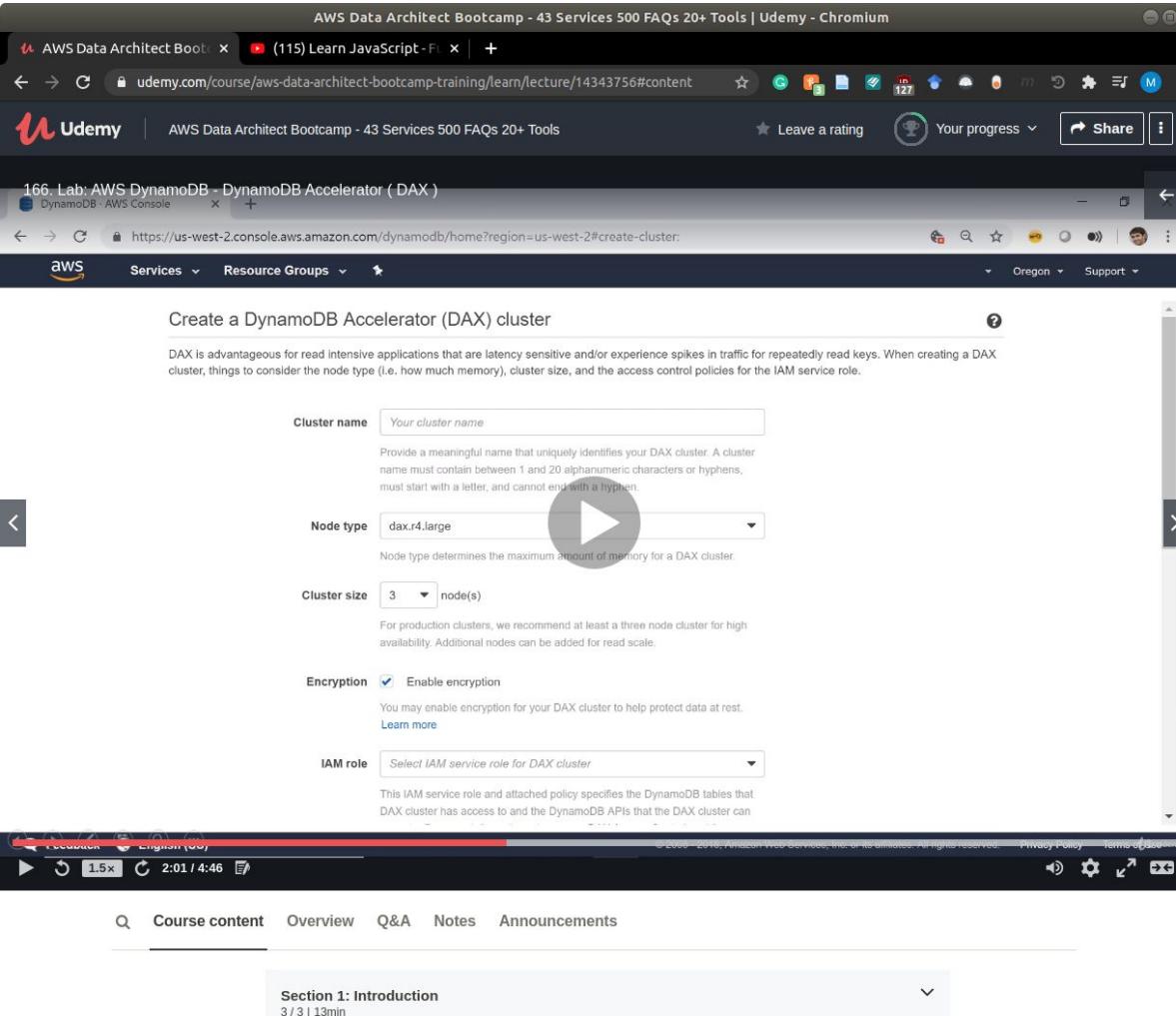
This IAM service role and attached policy specifies the DynamoDB tables that the DAX cluster has access to and the DynamoDB APIs that the DAX cluster can use.

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166. Lab: AWS DynamoDB - DynamoDB Accelerator (DAX)

DynamoDB - AWS Console

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#create-cluster:

aws Services Resource Groups

Subnet group: [dropdown]

Select the subnet group for your DAX cluster, which determines the VPC and Availability Zones (AZs) for your DAX nodes. By default, we will distribute the DAX nodes across the available subnets/AZs.

Security group: [dropdown]

A security group acts as a firewall that controls network access to your DAX cluster. To access the DAX cluster from your application, you must enable inbound access on port 8111 for this security group, for more information, please see [Creating a DAX Cluster](#).

Cluster settings

Default settings provide the fastest way to get started with your cluster. You can modify these default settings now or after your cluster has been created.

Use default settings

- Automatic cache eviction enabled with TTL of 5 minutes
- No preference set for availability zones
- No preference set for maintenance windows
- Notifications disabled

Cancel Launch cluster

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166. Lab: AWS DynamoDB - DynamoDB Accelerator (DAX)

DynamoDB - AWS Console

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#cache-cluster;

aws Services Resource Groups Oregon Support

Create cluster Actions ▾

Filter by cluster Edit Delete

No Clusters

Clusters Status Nodes Node type Availability zone Endpoint

No clusters found in this region. To get started with DAX, please see the following documentation.

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166. Lab: AWS DynamoDB - DynamoDB Accelerator (DAX) Tutorial: Running a Sample Application

DynamoDB - AWS Console Tutorial: Running a Sample Application

https://docs.aws.amazon.com/amazondynamodb/latest/developerguide/DAX.client.sample-app.html

aws

AWS Documentation > Amazon DynamoDB > Developer Guide > In-Memory Acceleration with DAX > Using the DAX Client in an Application > Tutorial: Running a Sample Application Using DAX

Tutorial: Running a Sample Application Using DAX

This tutorial demonstrates how to launch an Amazon EC2 instance in your default virtual private cloud (VPC), connect to the instance, and run a sample application that uses Amazon DynamoDB Accelerator (DAX).

Note

To complete this tutorial, you must have a DAX cluster running in your default VPC. If you haven't created a DAX cluster, see [Creating a DAX Cluster](#) for instructions.

Topics

- Using the DAX Client in an Application
- Tutorial: Running a Sample Application**
- Step 1: Launch an Amazon EC2 Instance
- Step 2: Create an IAM User and Policy
- Step 3: Configure Your Amazon EC2 Instance
- Step 4: Run a Sample Application

Document Conventions

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DynamoDB - AWS Console

04-query-test.py - Amazon Dyn...

https://docs.aws.amazon.com/amazondynamodb/latest/developerguide/DAX.client.run-application-python.04-query-test.html



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Point-in-Time Recovery

Global Tables

Encryption at Rest

DynamoDB Transactions

In-Memory Acceleration with DAX

Concepts

DAX Cluster Components

Creating a DAX Cluster

DAX and DynamoDB Consistency Models

Using the DAX Client in an Application

Tutorial: Running a Sample Application

Step 1: Launch an Amazon EC2 Instance

Step 2: Create an IAM User and Policy

Step 3: Configure Your Amazon EC2 Instance

Step 4: Run a Sample Application

Go and DAX

Java and DAX

.NET and DAX

Node.js and DAX

```
from __future__ import print_function

import os, sys, time
import amazondax
import botocore.session

region = os.environ.get('AWS_DEFAULT_REGION', 'us-west-2')

session = botocore.session.get_session()
dynamodb = session.create_client('dynamodb', region_name=region) # low-level client

table_name = "TryDaxTable"

if len(sys.argv) > 1:
    endpoint = sys.argv[1]
    dax = amazondax.AmazonDaxClient(session, region_name=region, endpoints=[endpoint])
    client = dax
else:
    client = dynamodb

pk = 5
sk1 = 2
sk2 = 9
iterations = 5

params = {
    'TableName': table_name,
    'KeyConditionExpression': 'pk = :pkval and sk between :skval1 and :skval2',
    'ExpressionAttributeValues': {
        ':pkval': {'N': str(pk)},
        ':skval1': {'N': str(sk1)},
        ':skval2': {'N': str(sk2)}
    }
}
start = time.time()
for i in range(iterations):
    result = client.query(**params)

end = time.time()
print('Total time: {} sec - Avg time: {} sec'.format(end - start, (end-start)/iterations))
```



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166. Lab: AWS DynamoDB - DynamoDB Accelerator (DAX)

DynamoDB - AWS Console

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#cache-parameter-group:

aws Services Resource Groups

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Dashboard

Tables

Backups

Reserved capacity

Preferences

DAX

Dashboard

Clusters

Subnet groups

Parameter groups

Events

Create parameter group Actions

Filter by parameter group name

Name Description

default_dax1.0 Default parameter group for dax1.0

Viewing 1 of 1 Parameter groups

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1.5x 3:42 / 4:46

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DynamoDB - AWS Console

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#cache-parameter-group:selected=default.dax1.0

Services Resource Groups Oregon Support

DynamoDB

Dashboard

Tables

Backups

Reserved capacity

Preferences

DAX

Dashboard Clusters Subnet groups Parameter groups Events

Create parameter group Actions

Filter by parameter group name

Name default.dax1.0

default.dax1.0 Close

Edit Delete

Name default.dax1.0

Query TTL 5 minutes

Item TTL 5 minutes

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The screenshot captures a dual-task environment in a Chromium browser. The top half of the screen shows the AWS DynamoDB Accelerator (DAX) configuration interface within the AWS Management Console. The left sidebar is focused on 'Parameter groups'. A single parameter group, 'default.dax1.0', is selected and displayed in the main pane. This group has two defined TTL values: 'Query TTL' set to 5 minutes and 'Item TTL' also set to 5 minutes. The bottom half of the screen shows an Udemy course page for 'AWS Data Architect Bootcamp - 43 Services 500 FAQs 20+ Tools'. The current lecture, '166. Lab: AWS DynamoDB - DynamoDB Accelerator (DAX)', is being viewed. The browser's address bar and title bar reflect the course URL and title. The overall layout suggests the user is learning how to configure DAX while performing the task.

AWS Data Architect Bootcamp - 43 Services 500 FAQs 20+ Tools | Udemy - Chromium

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udemy.com/course/aws-data-architect-bootcamp-training/learn/lecture/14343756#content

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166. Lab: AWS DynamoDB - DynamoDB Accelerator (DAX)

DynamoDB - AWS Console

https://us-west-2.console.aws.amazon.com/dynamodb/home?region=us-west-2#cache-event:

aws Services Resource Groups

Oregon Support

DynamoDB

Dashboard

Tables

Backups

Reserved capacity

Preferences

DAX

Dashboard

Clusters

Subnet groups

Parameter groups

Events

Events

Filter: All events

No Events

Event Date Source ID Type

No events found in this region. To get started with DAX, please see the following documentation.

Feedback English (US) Privacy Policy Terms of Service

1.5x 4:06 / 4:46

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This screenshot shows a dual-browser setup. The top window is a Chromium browser displaying the Udemy course 'AWS Data Architect Bootcamp'. The current lecture is '166. Lab: AWS DynamoDB - DynamoDB Accelerator (DAX)'. The bottom window is an AWS Lambda browser tab showing the 'Events' section of the AWS DynamoDB Accelerator (DAX) console. The AWS sidebar on the left is visible, showing navigation links for DynamoDB, DAX, and other AWS services. A message in the DAX console states, 'No events found in this region. To get started with DAX, please see the following documentation.' The bottom of the screen shows the system tray and a media control bar.

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Q: What is Amazon DynamoDB?

DynamoDB is a fast and flexible nonrelational database service for any scale. DynamoDB enables customers to offload the administrative burdens of operating and scaling distributed databases to AWS so that they don't have to worry about hardware provisioning, setup and configuration, throughput capacity planning, replication, software patching, or cluster scaling.

Q: What does DynamoDB manage on my behalf?

DynamoDB takes away one of the main stumbling blocks of scaling databases: the management of database software and the provisioning of the hardware needed to run it. You can deploy a nonrelational database in a matter of minutes. DynamoDB automatically scales throughput capacity to meet workload demands, and partitions and repartitions your data as your table size grows. Also, DynamoDB synchronously replicates data across three facilities in an AWS Region, giving you high availability and data durability.

Q: What is the minimum throughput I can provision for a single DynamoDB table?

The smallest provisioned throughput you can request is 1 write capacity unit and 1 read capacity unit for both auto scaling and manual throughput provisioning. Such provisioning falls within the free tier which allows for 25 units of write capacity and 25 units of read capacity. The free tier applies at the account level, not the table level. In other words, if you add up the provisioned capacity of all your tables, and if the total capacity is no more than 25 units of write capacity and 25 units of read capacity, your provisioned capacity would fall into the free tier.

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167. AWS DynamoDB - FAQ

Q: What is the consistency model of DynamoDB?

When reading data from DynamoDB, users can specify whether they want the read to be eventually consistent or strongly consistent:

- Eventually consistent reads (the default) – The eventual consistency option maximizes your read throughput. However, an eventually consistent read might not reflect the results of a recently completed write. All copies of data usually reach consistency within a second. Repeating a read after a short time should return the updated data.
- Strongly consistent reads — In addition to eventual consistency, DynamoDB also gives you the flexibility and control to request a strongly consistent read if your application, or an element of your application, requires it. A strongly consistent read returns a result that reflects all writes that received a successful response before the read.

Q: How am I charged for my use of DynamoDB?

Each DynamoDB table has provisioned read-throughput and write-throughput associated with it. You are billed by the hour for that throughput capacity if you exceed the free tier. Note that you are charged by the hour for the throughput capacity, whether or not you are sending requests to your table. If you would like to change your table's provisioned throughput capacity, you can do so using the [AWS Management Console](#), the [UpdateTable API](#), or the [PutScalingPolicy API](#) for auto scaling. Also, DynamoDB charges for data storage as well as the standard internet data transfer fees.



1.5x

1:04 / 2:30



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167. AWS DynamoDB - FAQ

Q: What kind of query functionality does DynamoDB support?

DynamoDB supports GET/PUT operations by using a user-defined primary key. The primary key is the only required attribute for items in a table. You specify the primary key when you create a table, and it uniquely identifies each item. DynamoDB also provides flexible querying by letting you query on nonprimary key attributes using [global secondary indexes](#) and [local secondary indexes](#).

A primary key can be either a [single-attribute partition key](#) or a [composite partition-sort key](#). A single-attribute partition key could be, for example, **UserID**. Such a single attribute partition key would allow you to quickly read and write data for an item associated with a given user ID.

DynamoDB indexes a composite partition-sort key as a partition key element and a sort key element. This multipart key maintains a hierarchy between the first and second element values. For example, a composite partition-sort key could be a combination of **UserID** (partition) and **Timestamp** (sort). Holding the partition key element constant, you can search across the sort key element to retrieve items. Such searching would allow you to use the [Query API](#) to, for example, retrieve all items for a single **UserID** across a range of time stamps.



1.5x 1:25 / 2:30

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