

Astra DB

Big Data Systems

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Motivation (for this course)

- Managing a cluster of Cassandra is not trivial
Not the focus of this course
- Astra DB is a managed Cassandra DB service
 - Free version
 - We will use it to learn basic Cassandra programming

DataStax

- A commercial company established at 2010
Cassandra was released at 2008

Provides

- Support for Cassandra
- DSE (DataStax Enterprise)
own version of Cassandra with extra features
- Managed Database-as-a-service
based on Apache Cassandra

DataStax Enterprise (DSE)

- Commercial product - NOT open source
an extension of Cassandra

Provides extra features / tools on top of Cassandra

- Cluster management
- GraphQL support
- Analytics
- Search capabilities
- ...

Astra DB

- A managed Cassandra database service
- Launched at 2020
- Support Cassandra +3.11

Astra DB can be configure to run on

- AWS
- GCP
- Azure

Create an account

<https://astra.datastax.com/>

Register



Sign Up With GitHub



Sign Up With Google

OR

First Name

Last Name

Work Email

Password



I agree to the [DataStax MSA](#), including the [Astra Supplement](#).

Create Account

Already have an account? [Sign In](#)

Astra DB

Multi-cloud DBaaS Built on Apache Cassandra™

- Start in minutes. No credit card required. Up to 80 GB free monthly.
- Build faster with REST, GraphQL, CQL and JSON/Document APIs.
- Deploy multi-tenant or dedicated databases on AWS, Azure, or GCP.

Introducing Astra Streaming Beta!

Astra Streaming is an open, multi-cloud event-streaming and data-streaming cloud service powered by Apache Pulsar™, now available within Astra when you sign up for an account.

Welcome to Astra! Let's finish signing up.

Tell us more about you

To provide you with a better experience, we need to know a bit more about you. Afterwards, we may be able to customize your experience, tools, and content.

What's your primary goal in using Astra? *

Learning Cassandra

What is your primary programming language?

Java

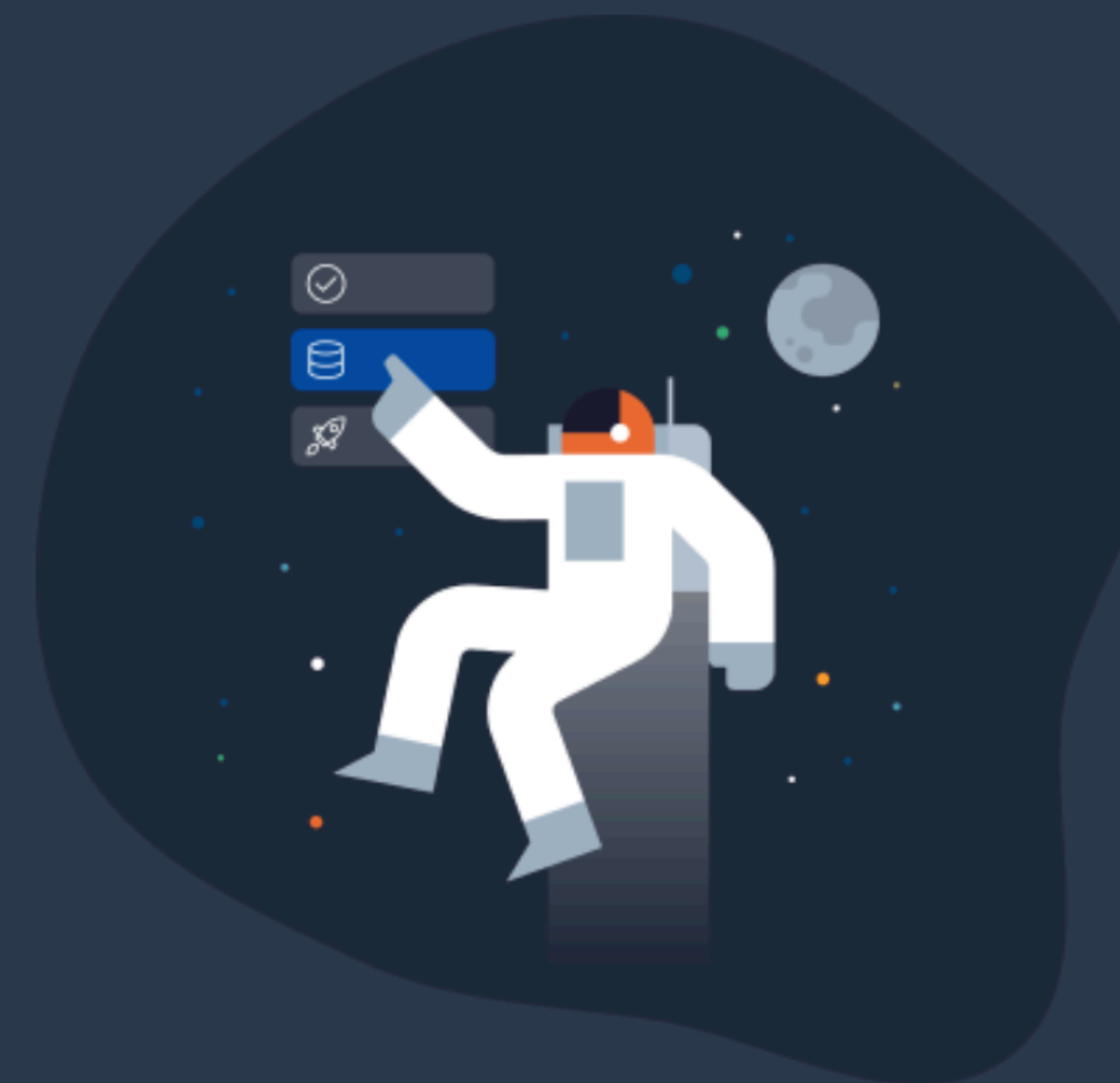
What role best describes you?

Student / Intern

Are you currently running a Cassandra workload?

Yes No

Next



Current Organization
boim@post.tau.ac.il

Dashboard

Databases

Create Database

You currently have no databases.
Get started by [creating your first one](#).

Streaming

BETA

Create Streaming



Sample App Gallery

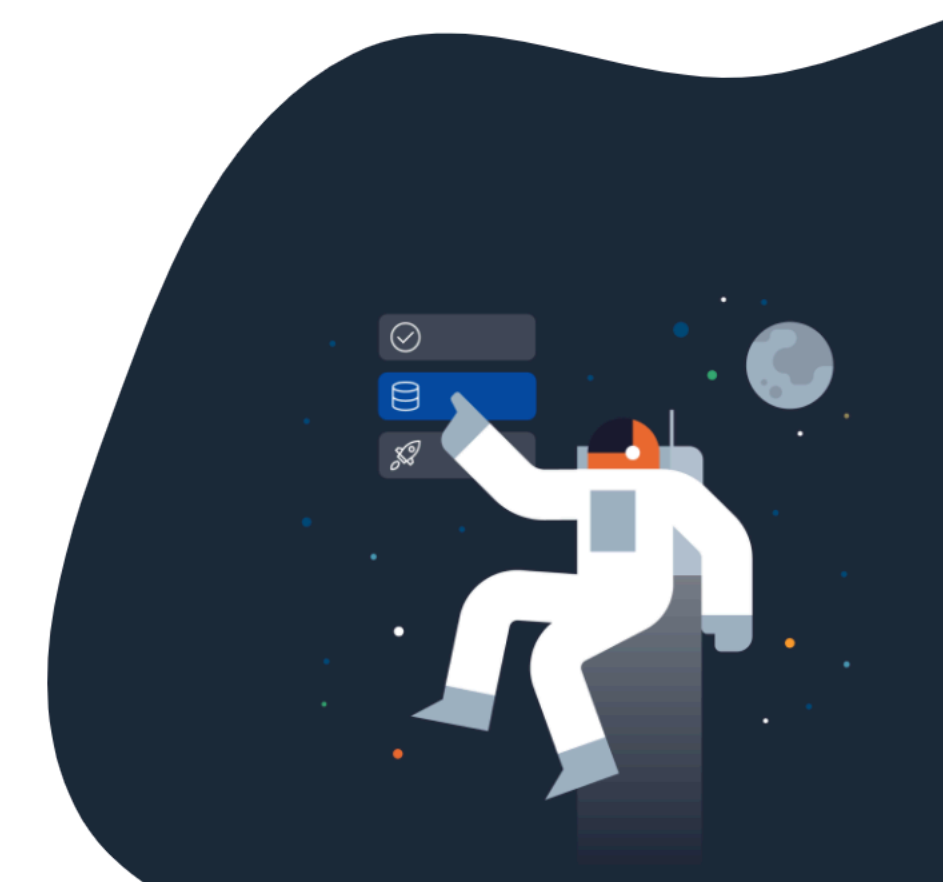
Looking to get up and running?
Get started with a sample app!

Get Started Now

Create your First Database

Get started in a matter of seconds. Deploy to Amazon Web Services, Google Cloud Platform, or Microsoft Azure. 99% uptime. Regional support. Liftoff!

Create Database



Dashboard

Current Plan

Free

Credits Remaining

\$0.00

\$0.00 spent

[Apply Promo Code](#)

Want to [upgrade your Astra serverless experience](#)? Add a credit card to get more.

Upgrade



New! Invite Friends, Get More Free Astra Credits

Both you and your friends will get \$25 in Astra credits when they sign up. That's worth 20 million reads/writes, and 80GB storage!

[Invite Friends](#)

Usage For Current Billing Period

Read Requests

0

Write Requests

0

Storage Consumed

0.00

Data Transfer

0.00

Databases (0)

Create Serverless Database

You haven't created a serverless database yet. Once you create a serverless database, it will appear here.

Other Resources

Documentation

Create a Database

1 Enter the Basic Details

Database Name	Keyspace Name ⓘ
<input type="text" value="TAU / AWS-Ireland"/>	<input type="text" value="bigdatacourse"/>
<small>Give it a memorable name - this can't be changed later.</small>	<small>Want to know more? Read our Docs to learn more about keyspaces.</small>

2 Select a Provider and Region

Google Cloud Amazon Web Services Microsoft Azure

Select an Area	Select a Region	Request a New Region
North America 0 of 3 regions selected	<input type="radio"/> Europe (Frankfurt) eu-central-1	
Europe, Middle East, an... 1 of 2 regions selected >	<input checked="" type="radio"/> Europe (Ireland) eu-west-1	
Asia Pacific 0 of 1 region selected		

Current Plan

Free

You're currently on our free plan, which gives you free credits monthly. That recurring credit should be more than sufficient for your development needs, running sample code or apps, building proof-of-concepts, hackathon participation -- even running small production workloads.

[Learn more](#) about our free accounts.

[Create Database](#)

For HW choose AWS / Ireland

Current Organization
boim@post.tau.ac.il

Dashboard / TAU / AWS-Ireland

Load Data

Connect

Dashboard

Databases

Create Database

TAU / AWS-Ireland

Streaming

BETA

Create Streaming



Sample App Gallery

Looking to get up and running?
Get started with a sample app!

Other Resources

Documentation

Overview Health Connect CQL Console Settings

Usage For Current Billing Period for TAU / AWS-Ireland

Status Pending

Read Requests

0

Write Requests

0

Storage Consumed

0.00

Data Transfer

0.00

Can take a few minutes...

Regions

Our Pay as you go plan allows you to add multiple regions.

Add Region

Provider	Area	Region	Datacenter ID	Region Availability
Amazon Web Services	Europe, Middle East, and Africa	eu-west-1	8f9f3636-7e51-4a26-ad15-e7442194064e-1	Online

Keyspaces

Managing multiple applications? Consider keeping each application in a separate keyspace -- whatever a [keyspace](#) is.

Add Keyspace

Keyspace
bigdatacourse

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boim@post.tau.ac.il

Dashboard / TAU / AWS-Ireland

Load Data

Connect

Dashboard

Databases

Create Database

TAU / AWS-Ireland

Streaming

BETA

Create Streaming



Sample App Gallery

Looking to get up and running?
Get started with a sample app!

Other Resources

Documentation

Live Chat

Overview Health Connect **CQL Console** Settings

```
Connected as boim@post.tau.ac.il.  
Connected to cndb at cassandra.ingress:9042.  
[cqqlsh 6.8.0 | Cassandra 4.0.0.6816 | CQL spec 3.4.5 | Native protocol v4]  
Use HELP for help.  
token@cqqlsh> describe keyspaces;  
  
system_virtual_schema  system_views  data_endpoint_auth  
system_schema         system       system_traces  
system_auth           datastax_sla bigdatacourse  
  
token@cqqlsh> █
```

Useful commands

- Autocomplete with the “tab” key
- `describe keyspaces;`
- `use <keyspace>`
- `describe tables`
- `describe <table>`
- `clear / CTRL+L` (clear screen)
- `create table / select / ...`

Demo - Create table

```
CREATE TABLE users_by_country (  
    country          TEXT,  
    user_id          TEXT,  
    name             TEXT,  
    age              INT,  
    PRIMARY KEY ((country), user_id)  
);
```

users_by_country	
country	K
user_id	▲C
name	
age	

Demo - Insert

```
INSERT INTO users_by_country(country, user_id, name, age)
VALUES ('Israel', 'user_123', 'Rubi Boim', 22);
```

```
INSERT INTO users_by_country(country, user_id, name, age)
VALUES ('USA', 'user_123', 'Rubi Boim', 22);
```

```
INSERT INTO users_by_country(country, user_id, name, age)
VALUES ('Israel', 'user_124', 'Tova Milo', 18);
```

```
INSERT INTO users_by_country(country, user_id, name, age)
VALUES ('USA', 'user_125', 'Lebron James', 35);
```

```
INSERT INTO users_by_country(country, user_id, name)
VALUES ('USA', 'user_125', 'Michael Jordan');
```

users_by_country	
country	K
user_id	▲C
name	
age	

Demo - Insert

```
INSERT INTO users_by_country(country, user_id, name, age)
VALUES ('Israel', 'user_123', 'Rubi Boim', 22);
```

```
INSERT INTO users_by_country(country, user_id, name, age)
VALUES ('USA', 'user_123', 'Rubi Boim', 22);
```

```
INSERT INTO users_by_country(country, user_id, name, age)
VALUES ('Israel', 'user_124', 'Tova Milo', 18);
```

```
INSERT INTO users_by_country(country, user_id, name, age)
VALUES ('USA', 'user_125', 'Lebron James', 35);
```

```
INSERT INTO users_by_country(country, user_id, name)
VALUES ('USA', 'user_125', 'Michael Jordan');
```

users_by_country	
country	K
user_id	▲C
name	
age	

What is Michael's age?

Demo - Select

Which queries are valid?

```
SELECT * FROM users_by_country;
```

```
SELECT * FROM users_by_country WHERE country = 'Israel';
```

```
SELECT * FROM users_by_country WHERE name = 'Rubi Boim';
```

```
SELECT * FROM users_by_country WHERE user_id = 'user_123';
```

```
SELECT * FROM users_by_country WHERE country = 'Israel' AND user_id =  
'user_123';
```

```
SELECT * FROM users_by_country WHERE country = 'Israel' AND name =  
'Rubi Boim';
```

users_by_country	
country	K
user_id	▲C
name	
age	

Demo - Select

Which queries are valid?

```
SELECT * FROM users_by_country;
```

```
SELECT * FROM users_by_country WHERE country = 'Israel';
```

```
SELECT * FROM users_by_country WHERE name = 'Rubi Boim';
```

```
SELECT * FROM users_by_country WHERE user_id = 'user_123';
```

```
SELECT * FROM users_by_country WHERE country = 'Israel' AND user_id =  
'user_123';
```

```
SELECT * FROM users_by_country WHERE country = 'Israel' AND name =  
'Rubi Boim';
```

users_by_country	
country	K
user_id	▲C
name	
age	

Remember - "ALLOW FILTERING is ANTI PATTERN"

Demo - Update

`UPDATE is similar to INSERT
(*)`

`If you prefer to use the UPDATE syntax, "read the..."`

Demo - Delete

Which queries are valid?

users_by_country	
country	K
user_id	▲C
name	
age	

```
DELETE FROM users_by_country WHERE name = 'Rubi Boim';
```

```
DELETE FROM users_by_country WHERE user_id = 'user_123';
```

```
DELETE FROM users_by_country WHERE country = 'Israel';
```

```
DELETE FROM users_by_country WHERE country = 'Israel'  
AND name = 'Rubi Boim';
```

```
DELETE FROM users_by_country WHERE country = 'Israel'  
AND user_id = 'user_123';
```

Demo - Drop table

```
DROP TABLE <table_name>;
```

For HW2

You can connect to your database in a few different ways

Use the Astra DB REST API, GraphQL API, Document API or download the secure connect bundle to connect with DataStax drivers.

Connect using an API [Learn More](#)

Document API

GraphQL API

REST API

Connect using a driver [Learn More](#)

Node.js

Python

Java

C++

C#

Connect using an SDK

JavaScript SDK

Python SDK

Java SDK

Connect using a gRPC client

Download your **Secure Connect Bundle**

If you have multiple regions, you will have the option to download a bundle for each region.

Download Bundle

Using the Java driver to connect to your database

Use the Java driver to connect to your database and begin building your own application.

Prerequisites

1. Use the **Download Bundle** button at the top of this page to obtain connection credentials to your database.
2. [Download](#) and [install](#) Maven.
3. An Application Token (create a new one [here](#)) with the appropriate role set (RO User is needed for example below).

Steps

These steps assume you will be using the maven build system. For help using other Java build systems click the [cheat sheet](#).

1. Open the `build.gradle` file and open it for editing.

2. Add the following dependency to the `dependencies` block in the `build.gradle` file, ensuring that the name of the dependency corresponds to the installed version:

```
<dependency>
```

Download (1)

For HW2 you would need

- “Secure Connect Bundle”
- Application Token

Download (2)

Current Organization
boim@post.tau.ac.il

User Management

Role Management

Token Management

Billing & Payment

Security Settings

Token Management

Application Tokens

Generate a new token

Select which role you want to attach to your token. The permissions for that role will be displayed before generating your token to ensure you give your application the right permissions.

Select Role

Select Role

Generate Token

Once you select a role above, the role permissions will be displayed here.

For more information about role permissions, see [User permissions](#).

Manage existing tokens

Client ID	Generated on	Role
JSXqksRSRwvtXDoxsKjCZmjM	Dec 08, 2021	Admin User

1 generated tokens total

Looking to manage your service account? [Edit your settings here](#).

You will only have access to a service account if you have a classic database that was created before 4 March 2021 that has not been updated to the newest authentication model. The service account is used to interact with the [DevOps API](#).

Choose "Administrator User"