



# Couchbase Workshop

## Lab Handbook

### DAY 1


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# Lab 1. Get Started

**OBJECTIVE:** Create a free Capella account and deploy your first database.

1. Go to : <https://cloud.couchbase.com/sign-up>
2. On the Sign-up page, enter your name, a corporate email address and a password that meets the security requirements. Check the boxes and click “**Get Started**”



Accelerate your development process with Couchbase Capella.

Capella offers a simple, automated setup on AWS, GCP, and Azure, handling critical aspects of management, maintenance, backups, and scaling to deliver secure, high-availability services.

- Flexible and Fast:**  
Align JSON documents to objects in your applications and use your preferred programming languages. Leverage our integrated cache for proven in-memory speeds at scale.
- Versatile with AI coding**  
Access data via SQL or key-value with built-in vector and full-text search, eventing, and analytics. Use Capella iQ and natural language to write SQL, create sample docs, and much more.
- Mobile App Services**  
Create always-on apps with seamless offline functionality. Sync, store, query, search, and analyze at the edge.
- Affordable**  
Benefit from competitive pricing or explore our robust perpetual free tier.

## Create Account

[GitHub](#) [Google](#)

or sign up with email and password

Stephane Lang

stephane.lang@couchbase.com

\*\*\*\*\*

☒ 8+ characters ☒ lower ☒ upper ☒ special ☒ number


☒ I agree to the [Terms of Use](#) and the [Privacy Policy](#).

☒ I agree to be updated on offers, products, and services from Couchbase.  
You can unsubscribe at any time.

[Get Started](#)

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

3. Confirm your email address by entering in the code that should be in your inbox.



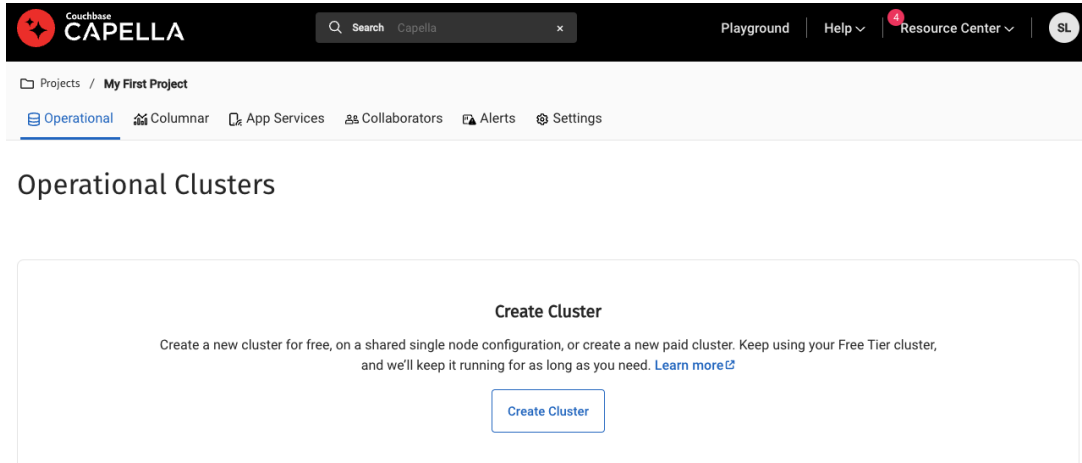
## Check your email

Confirmation code sent

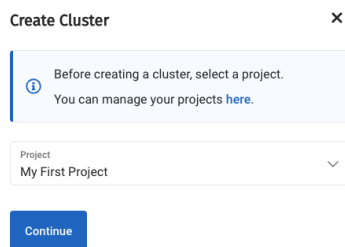
Did not get an email?

[Request confirmation link](#)

4. Welcome into your free Capella account. While it is a limited in terms of deployment options, services and capabilities, you are able to deploy a cluster for free that will serve your applications. Note that a free account can always be upgraded at any time to enjoy the full capabilities of Couchbase Capella.



5. Let's create our first cluster. You should be on the “Operational” page of the menu. Click on “Create Cluster” and select the project “My First Project”.



6. This is the cluster creation screen.
  - Choose the category “Free” cluster
  - Give it name of your choice, for instance “workshop”
  - Select “AWS” as the Cloud Service Provider
  - Select the region “Asia Pacific (Singapore)”
  - Leave other options as default
  - Finally, click on “Create Cluster”.

## Create Cluster

### 1. Cluster Option

Choose an option to automatically configure some of your cluster settings. Need More Options? [See All Cluster Options](#) ⓘ

#### Single Node

REQUIRES ACTIVATION ID

Get the lowest cost and streamlined options. Best for creating a prototype or learning more about Capella features.

#### Free

Our Free Tier single node cluster. Runs in our shared environment. Keep using your cluster, and we will keep it running for as long as you need.

#### 1: Cluster Option

Option: Free

#### 2: Details & Cloud Service

Name: Workshop

Cloud: AWS

Region: Asia Pacific (Singapore)

CIDR: 10.0.0.0/24

#### 3: Cluster Configuration

Storage 10GB

#### Estimated Cost\*

FREE

### 2. Cluster Details and Cloud Service Provider

Give your cluster a name and description. ⓘ

Cluster Name \*

Workshop

Description

Couchbase workshop for Amadeus

8/128

Choose one of our cloud service providers and your preferred region. ⓘ

aws



Available Regions

Asia Pacific (Singapore)

CIDR Block \*

10.0.0.0/24

### 3. Node and Services Configuration

Data Index Query Search

Disk Size: 10GB

[See All Cluster Options](#)

[Cancel](#)

[Create Cluster](#)

- The deployment of your Capella Database will take 2 to 3 minutes.

NAME	STATUS	SCHEDULE ON/...	PROVIDER	CIDR	LINKED APP SE...	CREATED BY	VERSION
workshop Free	Deploying	-	AWS aws Asia Pacific (Singapore)	10.0.0.0/24	-	Stephane Lang	7.6.3

- Once deployed, you should see your database called “**workshop**” (or whatever you named it) that is available and ready to explore.

## Welcome to Capella!

workshop

HEALTHY

①

Explore Data

Import Data

Connect

Provider  
AWS, Asia Pacific (Singapore)

Nodes  
1

Services  
Query Data Index Search

Version  
7.6.3

CIDR  
10.0.0.0/24

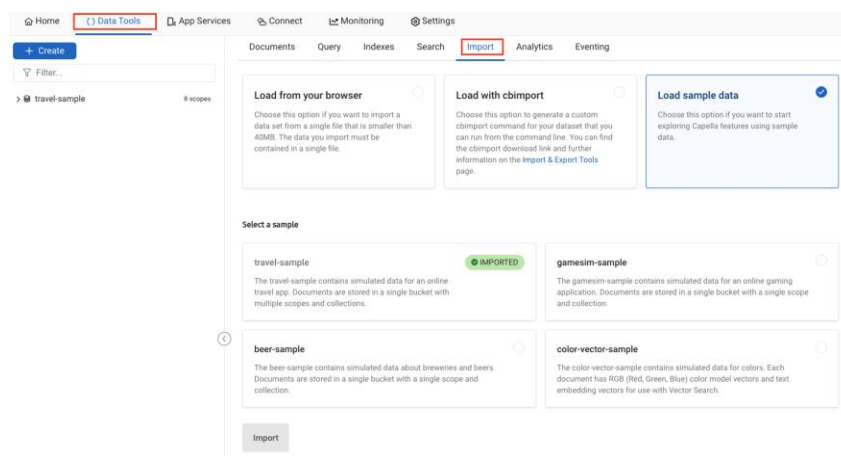
- Explore the Capella user interface. It is dynamic, so menus change depending on where you are in the interface (at the organization level or project level or database level). We may not

cover every capability and service of Capella in this workshop. Feel free to ask questions if you want to know more about a specific item.

10. The free cluster comes with a pre-loaded dataset **“travel-sample”**. Other datasets are available, and you can import your own data.

In the **“Operational”** menu, click on your database name, then go to **“Data Tools”** to see some of the tools and utilities available to interact with the documents stored in the database.

Click on the **“Import”** sub-menu and select **“Load sample data”** to see the different datasets available. The **“travel-sample”** should be already imported. If not, select it and click on **“Import”**.



11. From the import menu, you could also load a file from your computer via the browser (which is slow and recommended for small files only, less than 40MB). The next labs will use the **“travel-sample”** dataset only, so importing another dataset is not required.

**Congratulations**, you have successfully prepared your first Couchbase Capella environment. You have now a Couchbase cluster up and running with data available. The next step will be to connect an application and read/write from this cluster.

## Lab 2. Connect an Application

**OBJECTIVE:** Review security mechanisms to go through in order to enable an application to access a Capella cluster.

**Note:** For the sake of convenience of the workshop, every participant will connect to the same application server. The URL or IP address of the application server is provided in class by the instructor. Afterwards, you can follow the same instructions below to connect any server, including your own.

### A. Connect to the application server

1. The application that we will run against the Capella cluster is a utility named *cbc-pillowfight*. It comes with every distribution of Couchbase Server, and it is used to generate a workload of reads and writes. For this workshop, we will run the utility from a server in AWS.  
To access the server, you need the access key file `cb-singapore.pem` that your instructor will provide.  
Get the file `cb-singapore.pem` and copy it onto your local laptop. We recommend putting that file in the `/tmp` folder.

2. Go to the folder that contains the key file and set proper permissions to this file:

```
chmod 400 cb-singapore.pem
```

3. Make sure you are still in the folder that contains the access key file and run this command to connect to the AWS server

```
ssh -i "cb-singapore.pem" ec2-user@ec2-url
```

Where [ec2-url](#) is the URL or the IP address of the application server that your instructor will communicate in class.

4. Enter “yes” when you are asked to continue connecting. Your terminal should look like that :

```
ssh -i "cb-singapore.pem" ec2-user@ec2-47-129-211-67.ap-southeast-1.compute.amazonaws.com

The authenticity of host 'ec2-47-129-211-67.ap-southeast-1.compute.amazonaws.com (47.129.211.67)' can't be established.
ED25519 key fingerprint is SHA256:hzSgJmhVKAtmNNeUWjNKppfk7Eo7Dm1YEwxC37Rigtw.
This host key is known by the following other names/addresses:
  ~/.ssh/known_hosts:405: ec2-18-136-202-170.ap-southeast-1.compute.amazonaws.com
Are you sure you want to continue connecting (yes/no/[fingerprint])? Yes
Warning: Permanently added 'ec2-47-129-211-67.ap-southeast-1.compute.amazonaws.com' (ED25519) to the list of known hosts.
Register this system with Red Hat Insights: insights-client -register
Create an account or view all your systems at https://red.ht/insights-dashboard
Last login: Mon Aug 26 12:23:38 2024 from 109.221.162.101
```

Keep the terminal window open, we will use it later in this lab.

## B. Create the destination bucket

5. Go into your cluster interface and click the **“Settings”** menu. Then go to **“Buckets”**

The screenshot shows the Couchbase Capella console interface. At the top, there's a navigation bar with 'Operational Clusters' and a cluster named 'workshop' in a 'HEALTHY' state. Below this, a menu bar includes 'Home', 'Data Tools', 'App Services', 'Connect', 'Monitoring', and 'Settings' (which is highlighted with a red box). The main content area is titled 'Buckets' and features a '+ Create Bucket' button. On the left, a sidebar shows 'General' and 'CONFIGURATION' options, with 'Buckets' highlighted by a red box. A table lists the existing bucket 'travel-sample' with 63288 documents, Memory and Disk type, Couchstore storage, 0 ops/sec, 65 MiB disk used, and 80 MiB / 200 MiB RAM quota.

BUCKET NAME	DOCUMENTS	TYPE	STORAGE	OPS/SEC	DISK USED	RAM USED/QUOTA
travel-sample	63288	Memory and Disk	Couchstore	0	65 MiB	80 MiB / 200 MiB

6. Click on **“Create Bucket”** to create a new bucket. Choose **“pillow”** as the bucket name and **“1000”** as the memory quota. Then click on **“Create bucket”**

### Create Bucket

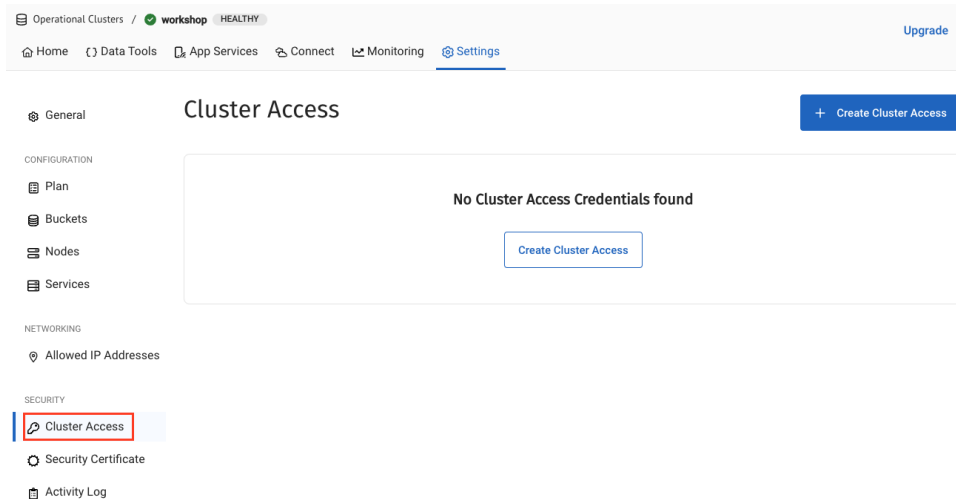
The 'Create Bucket' form is shown with the following fields and options:

- Bucket Name (cannot change later) \***: pillow
- Memory Quota**: A dropdown menu set to 1000. Below it, a progress bar indicates '1,347 MiB available'.
- Legend**:
  - This bucket 1,000 MiB (represented by a blue bar)
  - Other buckets 200 MiB (represented by a grey bar)
  - Remaining memory 347 MiB (represented by a black bar)
- Buttons**: 'Create Bucket' and 'Cancel'.

## C. Create database credentials

7. Go to **“Cluster Access”** and click the **“Create Cluster Access”** button.





8. Choose **“appuser”** as the username and **“P@ssword123”** as the password. Alternatively, you may choose a username and password of your own, but make sure to remember it as we will need those credentials later in the labs. Then, select bucket **“pillow”**, scope **“All scopes”** and **“Read/Write”** access to allow the database user to read and write documents from/into the pillow bucket. Finally, click on **“Create Cluster Access”**

### Create Cluster Access

Cluster Access Name  
appuser  
Enter a memorable name for the account. Names cannot contain (?) 7/35

Password  
P@ssword123  
8+ characters lower upper special number

#### Bucket-Level Access

+ Add Another

Bucket  
pillow

Scope  
All Scopes

Access  
Read/Write

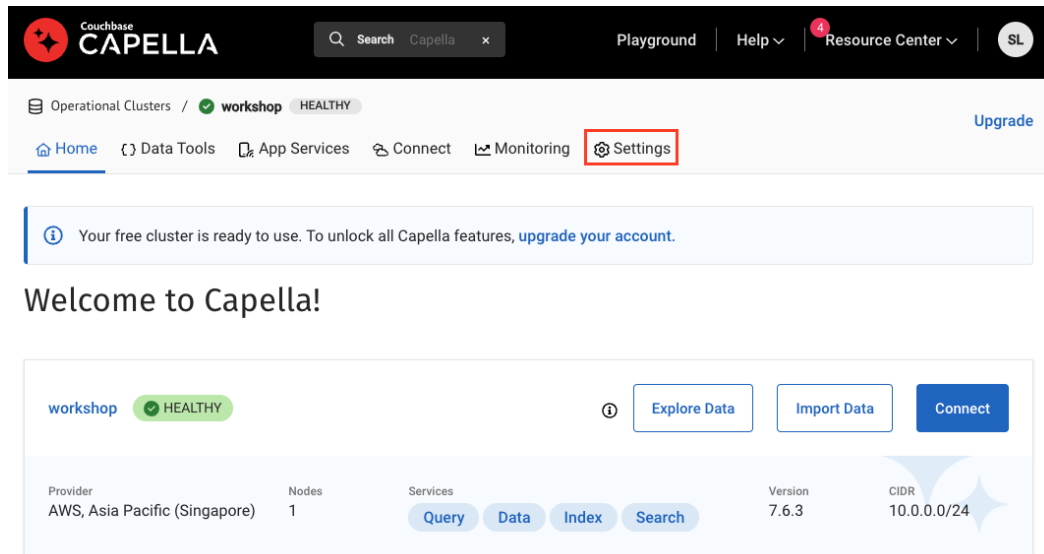
Create Cluster Access
Cancel

9. You should see the user listed in the interface.

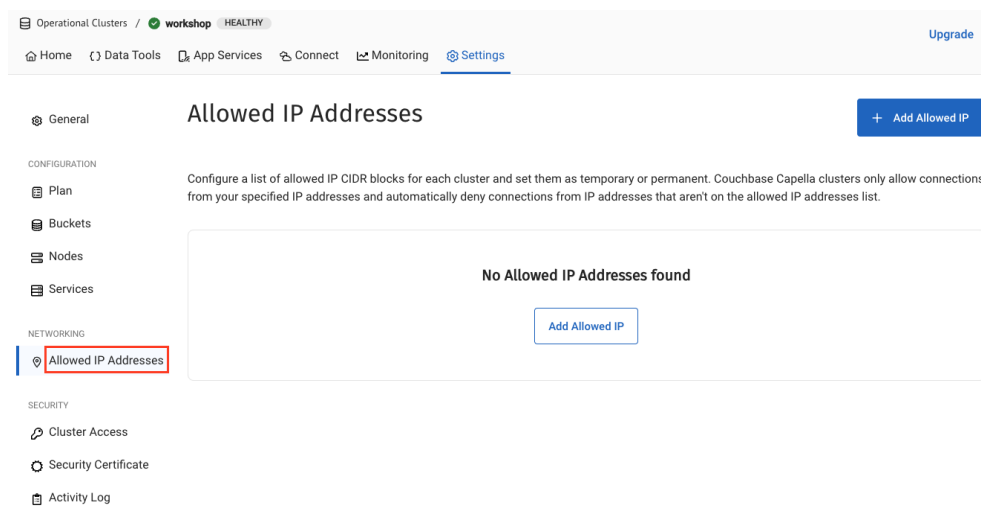
CLUSTER ACCESS NAME ▾	CREATED BY ▾	CREATED ON ▾	
appuser	Stephane Lang	Today Sep 18, 2024 16:26:43 GMT+2	🗑️

### D. Allow IP address

10. Go back into the “**Settings**” of your cluster.



11. Go to “**Allowed IP addresses**” and click the “**Add Allowed IP**” button



12. Add the IP address provided by your instructor and choose “**Permanent**” to keep it permanently. If you are unsure of which IP address to add, you can also, just for this exercise authorize every IP to access your cluster, by clicking on “*Allow Access from Anywhere*”.

13. You should see the IP listed in the allowed IP addresses.

IP ADDRESS/CIDR BLOCK	STATUS	EXPIRATION	TYPE	CREATED BY	COMMENT	
52.47.106.55/32	Active	Never	Permanent	Stephane Lang	-	

## E. Get cluster certificate

14. Go to the Capella interface, in the “**Settings**” menu, then, go to “**Security Certificate**”. This is where you can get the cluster certificate which is required for secured connection. Click on “**Copy**” to copy this certificate, you will need to paste it on the application server.

15. Back to your terminal window, go to the /tmp directory of the application server and create a file named “cert-**yourname**.pem”, replacing **yourname** with your actual name to make it unique. As every participant will connect to the same application server, everyone must create a file containing the certificate of his own cluster to be able to access it.

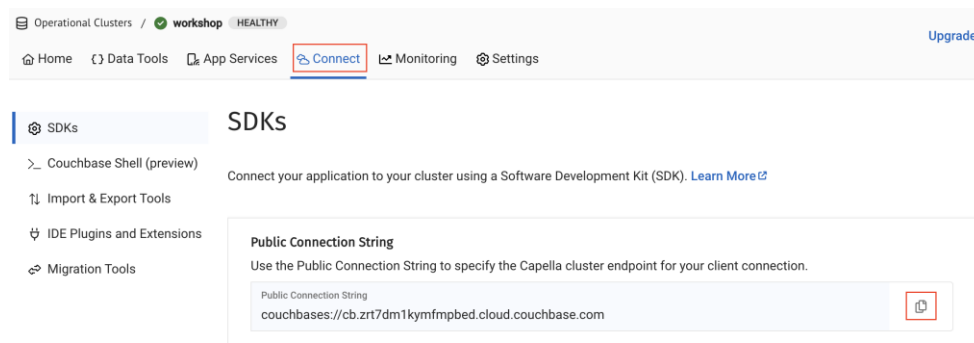
In this file, paste the certificate of the Capella cluster, and save your changes.

## F. Cluster URL and run the utility

16. Still in the terminal window, go to the folder `/opt/couchbase/bin` of the AWS server

```
cd /opt/couchbase/bin
```

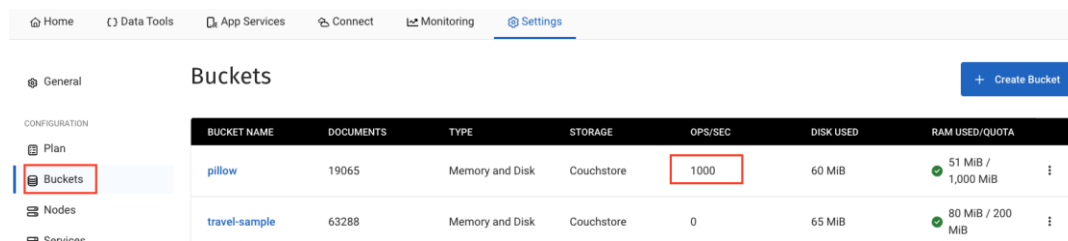
17. Get your unique Capella cluster URL which is displayed in the “**Connect**” menu of you cluster interface. Copy the Public connection string by clicking on the icon next to it:



18. Update this command line with your specific connection string, as well as your specific certificate file name and execute it from the terminal window.

```
./cbc-pillowfight -U couchbases://xxxxxxxxxxxxx.cloud.couchbase.com/pillow -u  
appuser -P P@ssword123 --certpath /tmp/cert-xxxxxxxxx.pem --json --num-items  
200000 --rate-limit 1000
```

19. If you obtain an error, please inform your instructor. Otherwise, you should see some activity in your cluster, in the “**Settings**” → “**Buckets**” section. You can also check the “**Monitoring**” section to observe the charts available.



20. Then you can stop the utility with `Ctrl + C`. You may also close the terminal window as we won't need to connect to the application server anymore.

**Congratulations**, you have successfully connected an application to your Capella cluster. You are now able to enjoy the speed and capabilities of Couchbase into your client application.

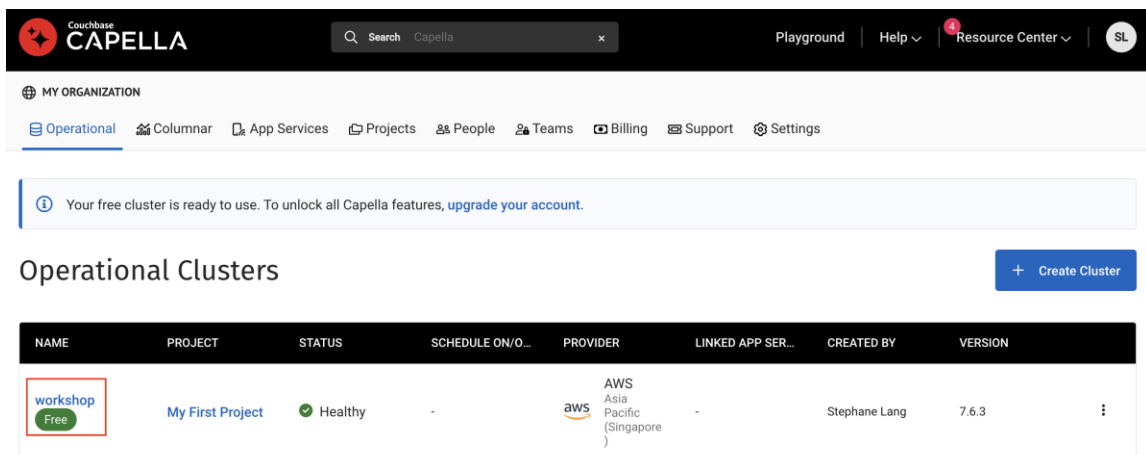
## Lab 3. Read from the database

**OBJECTIVE:** Understand how data is stored, organized and queried in Capella, through SQL++ and Full-text Search.

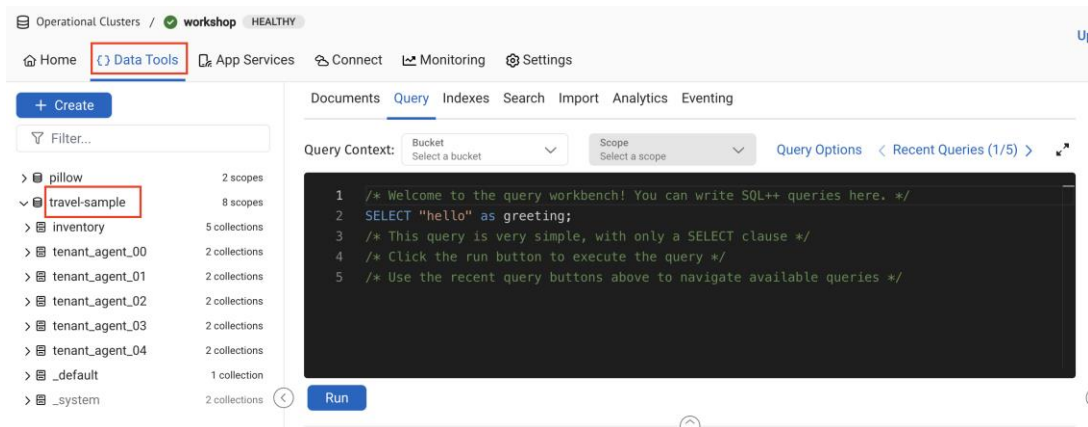
**Reminder:** In this lab, we will explore one of the default dataset which is “travel-sample”.

### A. SQL++ Queries

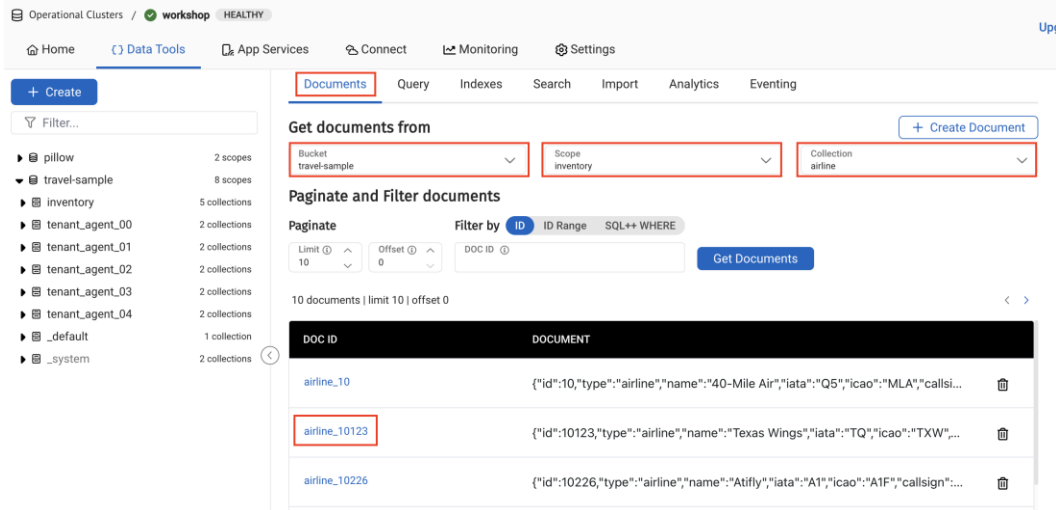
1. From the root screen (click on the Capella logo on the top left corner), click on “Operational” and then your cluster name to enter the database user interface.



2. Go to the “Data Tools” section, then click on the “travel-sample” bucket on the left hand-side to unfold it and see what scope is under the bucket. Unfold the “inventory” scope to see what collections are under this scope. Scopes and collections segregate data of different types for more efficient indexing, querying and resource utilization.

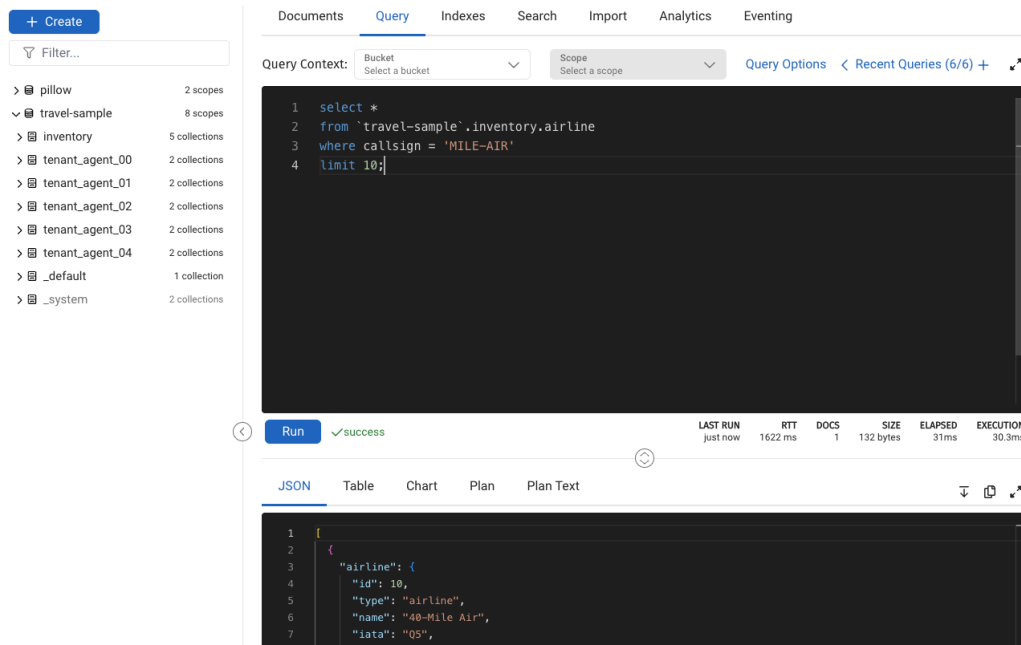


- To do an initial data exploration, click on **“Documents”** and select the **“travel-sample”** bucket then a scope and a collection of your choice to review a subset of documents. You can click on the Doc ID of any document to see the content of that document.



- In the **“Query”** tab data can be queried using SQL++. If you know SQL, then you will find the syntax almost identical making querying of data very easy. For instance, to get a list of 10 airlines this query could be used:

```
SELECT *
FROM `travel-sample`.inventory.airline
WHERE callsign = 'MILE-AIR'
LIMIT 10;
```



5. Note the statistics under the query editor window. The “**EXECUTION**” time represents the time it takes to the database to run the query. The “**RTT**” is the Round-Trip Time, which is the total time elapsed from the user perspective. It includes the execution time plus the transfer over the network, in other words the latency due to the distance between the client and the Couchbase database. To minimize this time, the Couchbase cluster should always reside in the same region as the client server

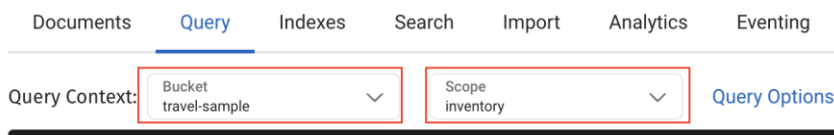


6. Explore the different views on the result set pane. Results may be displayed as JSON (native), tabular for convenience, and you can have a look at the execution plan to identify which index was used, and which step took the most time. “Chart” let you build visualization very easily.

callsign	country	iata	icao	id	name	type
MILE-AIR	United States	Q5	MLA	10	40-Mile Air	airline

7. To simplify the writing of SQL++ queries, it is possible to specify a default bucket and scope. This is known as setting the context of the query. In the UI, locate the context settings and position the default bucket to “**travel-sample**” as well as the default scope as “**inventory**”.





8. Then you can run the same query with a simpler syntax:

```
SELECT *  
FROM airline  
WHERE callsign = 'MILE-AIR'  
LIMIT 10;
```

9. Run another query, this one adds a filter clause:

```
SELECT name, address, city, description  
FROM hotel  
WHERE country= "United Kingdom";
```

10. This next query aggregates the number of reviews, stored in lists/arrays:

```
SELECT city, SUM(ARRAY_COUNT(reviews)) AS num_reviews  
FROM hotel WHERE country="United Kingdom"  
GROUP BY city  
ORDER BY num_reviews DESC
```

11. Feel free to make up your own queries to explore SQL++ capabilities

## B. Full-text Search

**Note:** Before using full-text search, it is necessary to know the schema of the document, especially the access path of the fields you want to search. In this exercise, we will index the hotel collection. This is the schema of the documents. Highlighted are the fields that will be indexed:

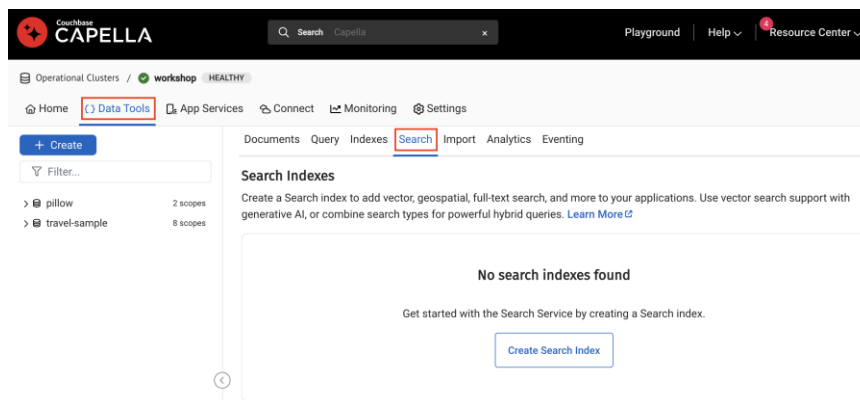
hotel 917 documents

```

address null | string
alias null | string
checkin null | string
checkout null | string
city null | string
country string
description string
directions null | string
email null | string
fax null | string
free_breakfast boolean
free_internet boolean
free_parking boolean
geo object {
  accuracy string
  lat number
  lon number
}
id number
name string
pets_ok boolean
phone null | string
price null | string
public_likes [string]
reviews [object]
  author string
  content string
  date string
  ratings object {
    Business service number
    Business service (e.g., internet access) number
    Check in / front desk number
    Cleanliness number
    Location number
    Overall number
    Rooms number
    Service number
    Sleep Quality number
    Value number
  }
state null | string
title string
tollfree null | string
type string
url null | string
vacancy boolean

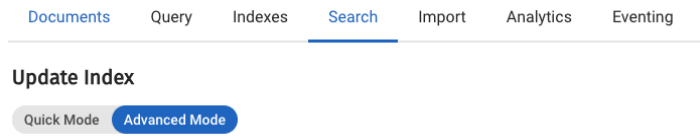
```

1. From the root screen, in the “**Operational**” menu, click on your cluster name to enter the database interface, and go to “**Data Tools**” menu, then select “**Search**” to access the Full-text Search workbench.



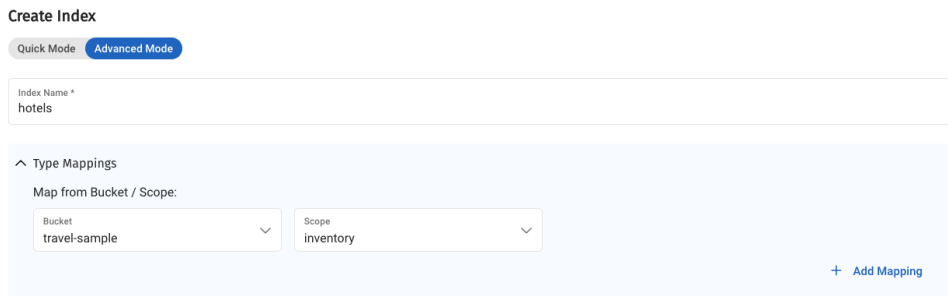
2. Click on the “**Create Search Index**” button to create your first full-text search index. You have 2 modes for creating an index: the “Quick Mode” and the “Advanced Mode”. “Quick mode” is more convenient for simple indexes, its wizard facilitates and speed up the process of index creation by inferring the schema and setting parameters automatically. In this example, as we will define complex structures (objects and nested objects), toggle

to **“Advanced Mode”**.



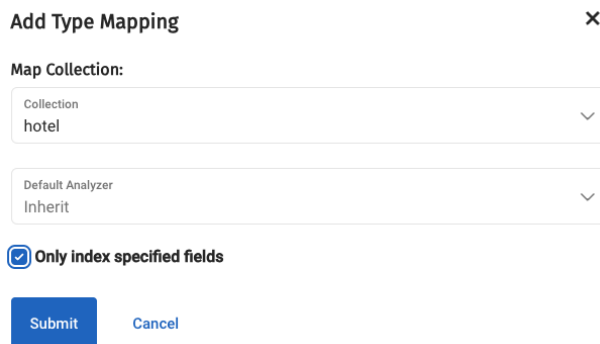
The screenshot shows the 'Update Index' section of a software interface. At the top, there is a navigation bar with tabs: Documents, Query, Indexes, Search (highlighted), Import, Analytics, and Eventing. Below the navigation bar, the title 'Update Index' is displayed. Underneath the title, there are two buttons: 'Quick Mode' and 'Advanced Mode' (which is selected and highlighted in blue).

3. Enter **“hotels”** as the index name. Then choose the bucket **“travel-sample”** and the scope **“inventory”**.



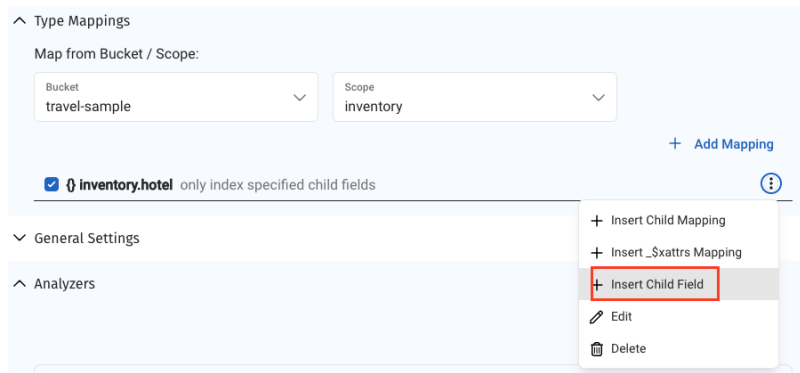
The screenshot shows the 'Create Index' section of a software interface. At the top, there is a navigation bar with tabs: Quick Mode and Advanced Mode (selected and highlighted in blue). Below the navigation bar, the title 'Create Index' is displayed. Underneath the title, there is a text input field labeled 'Index Name \*' with the value 'hotels'. Below this, there is a section titled 'Type Mappings' with a dropdown arrow. Inside this section, there is a label 'Map from Bucket / Scope:' followed by two dropdown menus. The first dropdown menu is labeled 'Bucket' and has the value 'travel-sample'. The second dropdown menu is labeled 'Scope' and has the value 'inventory'. To the right of these dropdowns, there is a button labeled '+ Add Mapping'.

4. Then click on **“Add Mapping”** and choose the **“hotel”** collection to search in. Leave the Default Analyzer as **“Inherit”** and check the box **“Only index specified fields”**.



The screenshot shows the 'Add Type Mapping' dialog box. At the top, there is a title bar with the text 'Add Type Mapping' and a close button (X). Below the title bar, there is a label 'Map Collection:' followed by a dropdown menu labeled 'Collection' with the value 'hotel'. Below this, there is a dropdown menu labeled 'Default Analyzer' with the value 'Inherit'. At the bottom, there is a checkbox labeled 'Only index specified fields' which is checked. At the very bottom, there are two buttons: 'Submit' and 'Cancel'.

5. Click on the 3 dots near the **“inventory.hotel”** line and **“Insert Child Field”**



6. Name it **“description”** and check all the boxes. It determines which metadata will be included in the index, enabling different usage of the index. Then click **“Submit”**

**Attention:** At the time of writing this lab, there might be a bug in this interface that let it display only one option **“Index”**. In that case, **“Submit”** the index, then edit it by clicking on the 3 dots near **“description”** then **“Edit”** and check all boxes that appear now.

Edit Child Field
×

Field \*  
description

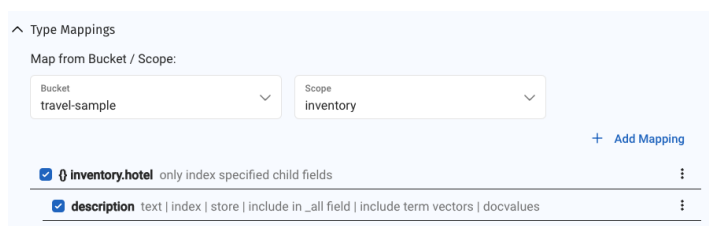
Type  
text

Searchable As \*  
description

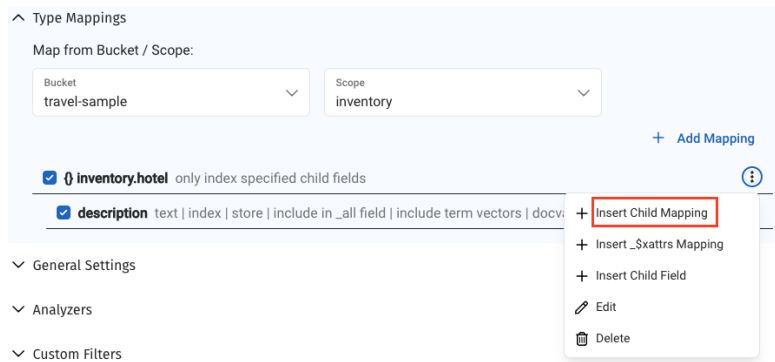
Analyzer  
Inherit

☒ Index
☒ Store
☒ Include in \_all field  
☒ Include Term Vectors
☒ Doc Values

Submit
Cancel



7. Then, the field **“reviews”** is an object. To declare it, click on the 3 dots near **“inventory.hotel”** and **“Insert Child Mapping”**



8. Name it **“reviews”** and check the box **“Only index specified fields”**

**Add Child Mapping** ×

Name \*

reviews

Default Analyzer

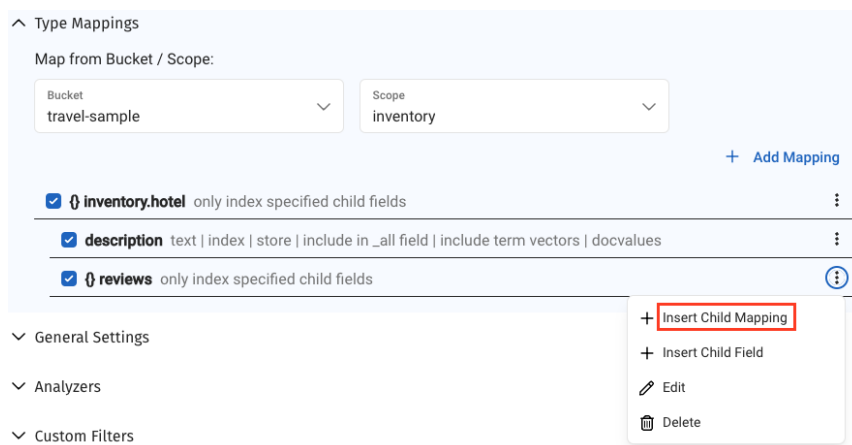
Inherit

☒ **Index only specified fields**

Submit

Cancel

9. Again, **“ratings”** is an object within **“reviews”**, so click on the 3 dots near **“reviews”** and **“Insert Child Mapping”**.



10. Name it **“ratings”** and leave the box **“Only index specified fields”** unchecked so that it will index every field under ratings. Then **“Submit”**.

Add Child Mapping
X

Name \*  
ratings

Default Analyzer  
Inherit

☐ Index only specified fields

Submit
Cancel

11. Your index mapping should look like this.

Type Mappings

Map from Bucket / Scope:

Bucket  
travel-sample

Scope  
inventory

+ Add Mapping

☒ **inventory.hotel** only index specified child fields

☒ **description** text | index | store | include in \_all field | include term vectors | docvalues

☒ **reviews** only index specified child fields

☒ **ratings** index all contained fields

12. Finally, click on **“Create Index”** at the bottom to create the index. Couchbase will then start scanning and indexing the field. Once the index is complete, you will see 917 documents count in the index.

Documents	Query	Indexes	Search	Import	Analytics	Eventing
-----------	-------	---------	--------	--------	-----------	----------

Search Indexes
Create Search Index

Create a Search index to add vector, geospatial, full-text search, and more to your applications. Use vector search support with generative AI, or combine search types for powerful hybrid queries. [Learn More](#)
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Name	Scoped	Source	Scope	Doc Count	Ingest
hotels	✓	travel-sample	inventory	917	idle

13. To test the index, click on the magnifier next to the index name

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14. Try to search the following terms and observe the results returned:

- description:location (see results derivated from the root *locat*)

- description:hotel
- description:hotel~1 (fuzzy search that allows 1 character difference in the results set)
- reviews.ratings.Cleanliness:5
- reviews.ratings.Cleanliness:>3

**Congratulations**, you have successfully defined indexes to run SQL++ queries as well as full-text searches. Those are the most popular ways to manipulate data stored in Couchbase. But there are other ways to interact with your data. While “Eventing” and “Analytics” are not available with a trial account, these services will be demonstrated by the instructor.

**END OF WORKSHOP INSTRUCTIONS DAY 1**