Installation 6.5.x

Revised: June 22nd, 2020

“Supported Platforms”

Operating System	Supported Version	
Amazon Linux 2	LTS	
Amazon Linux AMI	2018.03	2017.09
CentOS	8.x	7.x
Debian	9.X	8.x
Oracle Linux[1]	8.X	7.x
Red Hat Enterprise Linux (RHEL)	8.X	7.x
SUSE Linux Enterprise Server (SLES)	15.x	12.x
Ubuntu	18.04	16.04
Windows Server	2019	2016

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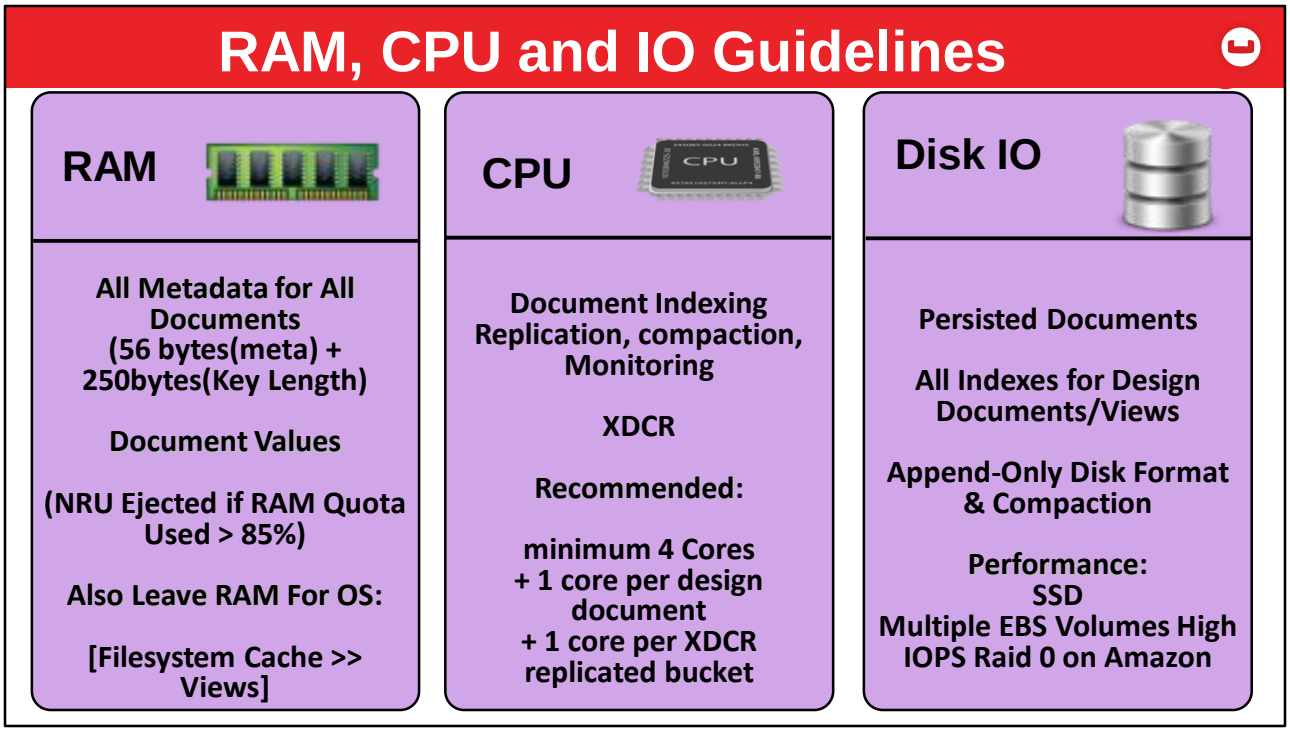
Supported platforms

System requirements for supported platforms.

Couchbase Server provides platform support for Windows 2012 and separate packages for Ubuntu 12.04 and CentOS 6.

clusters with mixed platforms are not supported. Specifically, Couchbase Server on Mac OS X uses 64 vBuckets as opposed to the 1024 vBuckets used by other platforms. Due to this difference, if you need to move data between a Mac OS X cluster and a cluster hosted on another platform use cbbackup and cbrestore.

RAM, CPU and IO Guidelines



Hardware Requirements

Recommended:
Quad-core 64-bit CPU running at 3GHz
Six cores if you use XDCR and views
16GB RAM (physical)
Block-based storage device (hard disk, SSD, EBS, iSCSI). Network filesystems (e.g. CIFS, NFS) are not supported.

Minimum:
Dual-core CPU running at 2GHz
4GB RAM (physical)

For development and testing purposes a reduced CPU and RAM than the minimum specified can be used. This can be as low as 1GB of free RAM beyond operating system requirements and a single CPU core. However, you should not use a configuration lower than that specified in production. Performance on machines lower than the minimum specification will be significantly lower and should not be used as an indication of the performance on a production machine.

View performance on machines with less than 2 CPU cores will be significantly reduced.

Best practice for Memory setasisde for the Operating system.
128 GB or below …. Reserve 20%
128GB or Greater reserve 10%

Limits for sizing

Limit	Value
Max key length	250 bytes
Max value size	20 MB (10 MB if using Distributed transactions)
Max data size	none
Max metadata	Approximately 56 bytes per document
Max Buckets per Cluster	30
Max View Key Size	4096 bytes (Recommended to transition to Indexes)

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Network ports

Port	Description	Node to Node	Node to Client
8091	Web Administration Port	Yes	Yes
8092	Couchbase API Port	Yes	Yes
11207	Internal/Ext Bucket Port for SSL	Yes	Yes
11209	Internal Bucket Port	Yes	No
11210	Internal/External Bucket Port	Yes	Yes
11211	Client interface (proxy)	No	Yes
11214	Incoming SSL Proxy	No	No
11215	Internal Outgoing SSL Proxy	No	No
18091	Internal REST HTTPS for SSL	No	No
18092	Internal CAPI HTTPS for SSL	No	No
4369	Erlang Port Mapper (epmd)	Yes	No
21100 to 21299 (inclusive)	Node data exchange	Yes	No

Note: You can also create user-defined ports

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Couchbase Server uses a number of different network ports for communication between the different components of the server, and for communicating with clients that accessing the data stored in the Couchbase cluster. The ports listed must be available on the host for Couchbase Server to run and operate correctly. Couchbase Server will configure these ports automatically, but you must ensure that your firewall or IP tables configuration allow communication on the specified ports for each usage type. On Linux the installer will notify you that you need to open these ports.

Full details: http://docs.couchbase.com/couchbase-manual-2.5/cb-install/#network-ports

User defined ports: http://docs.couchbase.com/couchbase-manual-2.5/cb-install/#using-user-defined-ports

Please note that you have to update your firewall configuration to allow connections to the following ports: 11211, 11210, 11209, 4369, 8091, 8092, 18091, 18092, 11214, 11215 and from 21100 to 21299.

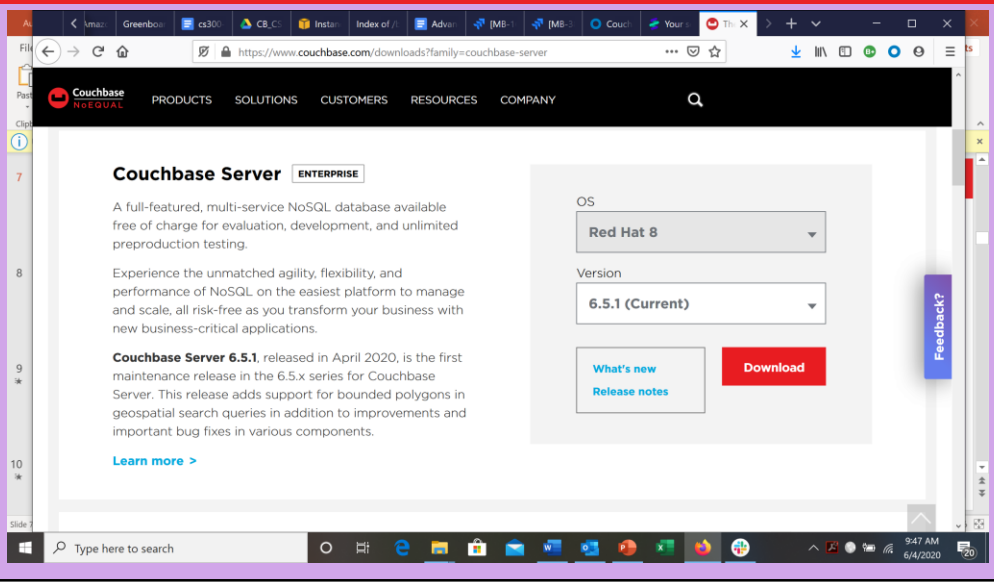
Installation / Initial Setup

- Unattended/programmatic installation
  - **Command-line or REST API**

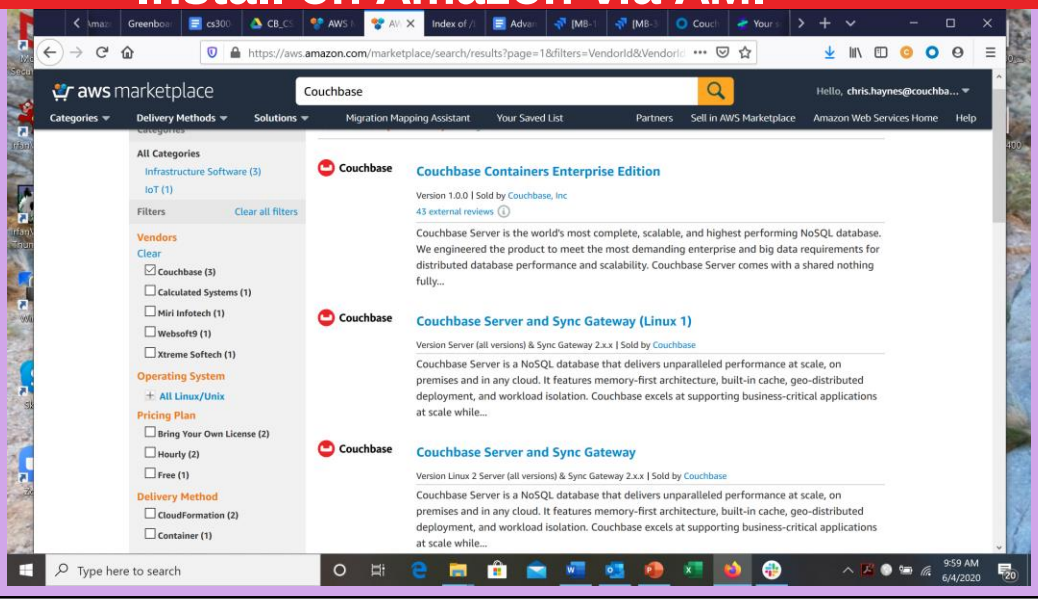
- GUI Installer:
  - **Quickstart Wizard once installed: http://<hostname>:8091**
  - **Start a new cluster**
    - **Default configuration**
    - **Custom/Advanced configuration**
  - **Join an existing cluster**
    - **Choose services**

/opt/couchbase/etc/couchbase/static_config

Download Couchbase www.couchbase.com/downloads



Install on Amazon via AMI



Download Couchbase 6.5.1 EE:

```
[ec2-user@ip-172-31-19-30 ~]$ wget
http://packages.couchbase.com/releases/6.5.1/couchbase-server-enterprise-6.5.1-
centos7.x86_64.rpm
--2016-07-19 16:25:27--  http://packages.couchbase.com/releases/6.5.1/couchbase-
server-enterprise-6.5.1-centos7.x86_64.rpm
Resolving packages.couchbase.com (packages.couchbase.com)... 54.231.49.244
Connecting to packages.couchbase.com
(packages.couchbase.com)|54.231.49.244|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 111171784 (106M) [application/x-redhat-package-manager]
Saving to: 'couchbase-server-enterprise-6.5.1-centos7.x86_64.rpm'

100%[==========================================================================
==========================================>] 111,171,784 44.7MB/s   in 2.4s

2016-07-19 16:25:29 (44.7 MB/s) - 'couchbase-server-enterprise-6.5.1-
centos7.x86_64.rpm' saved [111171784/111171784]
```

Install Couchbase:

```
[ec2-user@ip-172-31-19-30 ~]$ sudo rpm --install couchbase-server-enterprise-
6.5.1-centos7.x86_64.rpm
Minimum RAM required  : 4 GB
System RAM configured : 3.45 GB

Minimum number of processors required : 4 cores
Number of processors on the system    : 1 cores
Starting couchbase-server[  OK  ]

You have successfully installed Couchbase Server.
Please browse to http://ip-172-31-36-52:8091/ to configure your server.
Please refer to http://couchbase.com for additional resources.

Please note that you have to update your firewall configuration to
allow connections to the following ports: 11211, 11210, 11209, 4369,
8091, 8092, 18091, 18092, 11214, 11215 and from 21100 to 21299.

By using this software you agree to the End User License Agreement.
See /opt/couchbase/LICENSE.txt.
```

Be aware of Amazon use of inside addresses which are not normally resolvable from outside

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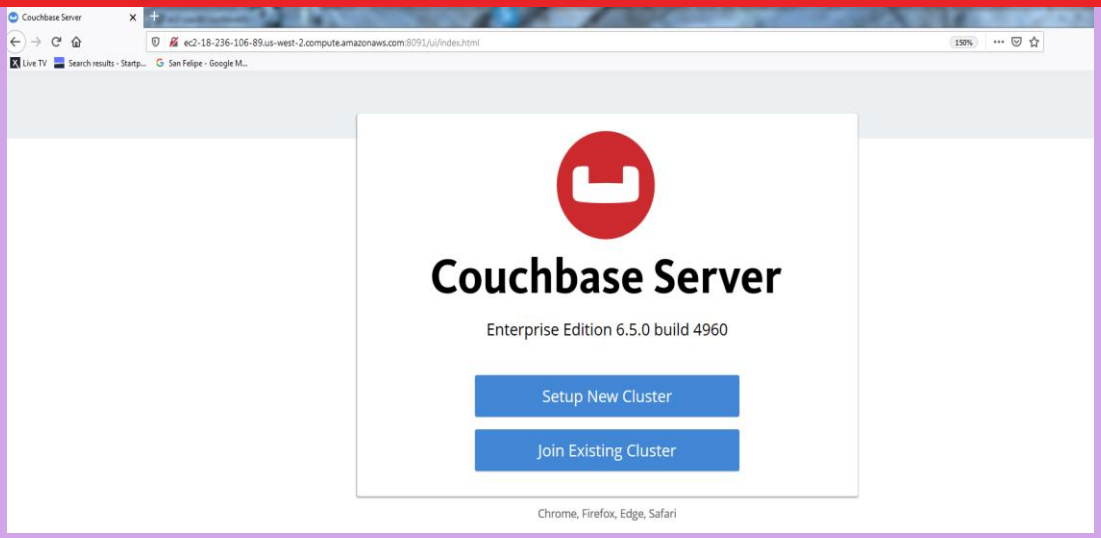
In your lab environment the displayed address for “Please browse to….” will use the inside Amazon address.
This will not resolve in the outside world.
Please use your assigned EC2-w-x.y.z.amazonaws.com addresses

Initial login screen on first node and subsequent



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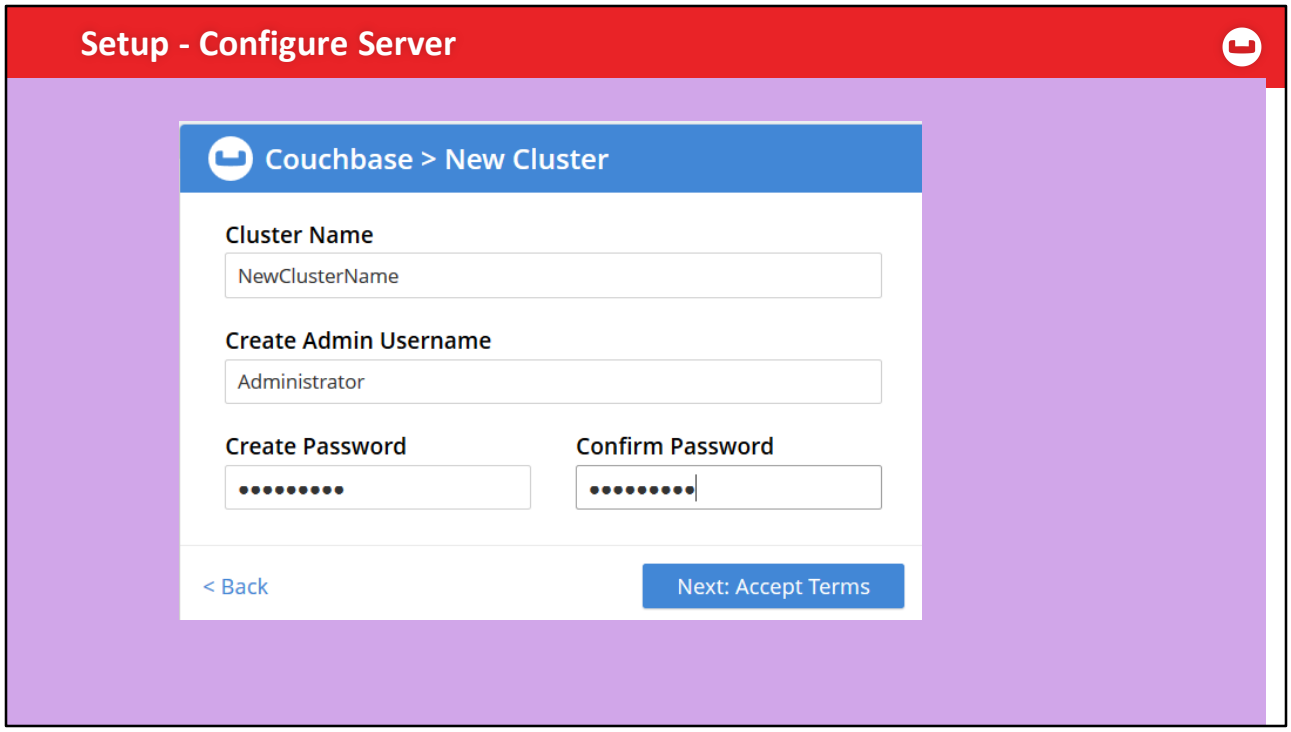


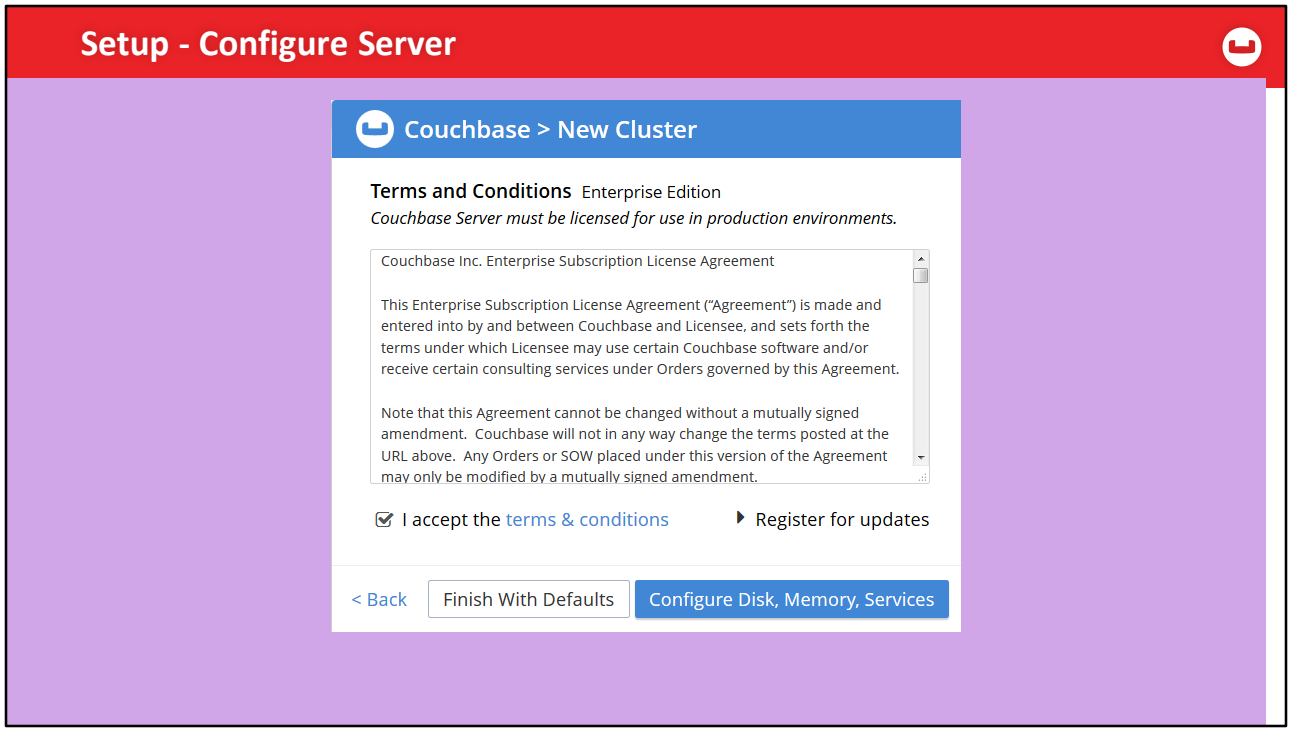
In Windows, the data files by default are at:
C:\Program Files\couchbase\server\var\lib\couchbase\data

The Configure Server Memory section sets the amount of physical RAM that will be allocated by Couchbase Server for storage.

If you are creating a new cluster, this is the amount of memory that will be allocated on each node within your Couchbase cluster. The memory for each node in a cluster must be the same amount. You must specify a value that can be supported by all the nodes in your cluster as this setting will apply to the entire cluster.

The default value is 60% of your total RAM. This figure is designed to allow RAM capacity for use by the operating system caching layer when accessing and using views.

Services
Data: enter data service ram quota, holds data, views, and copies of data
Index: enter Index service ram quota, holds indexes,
Query: run query service, ram automatically calculated and set.



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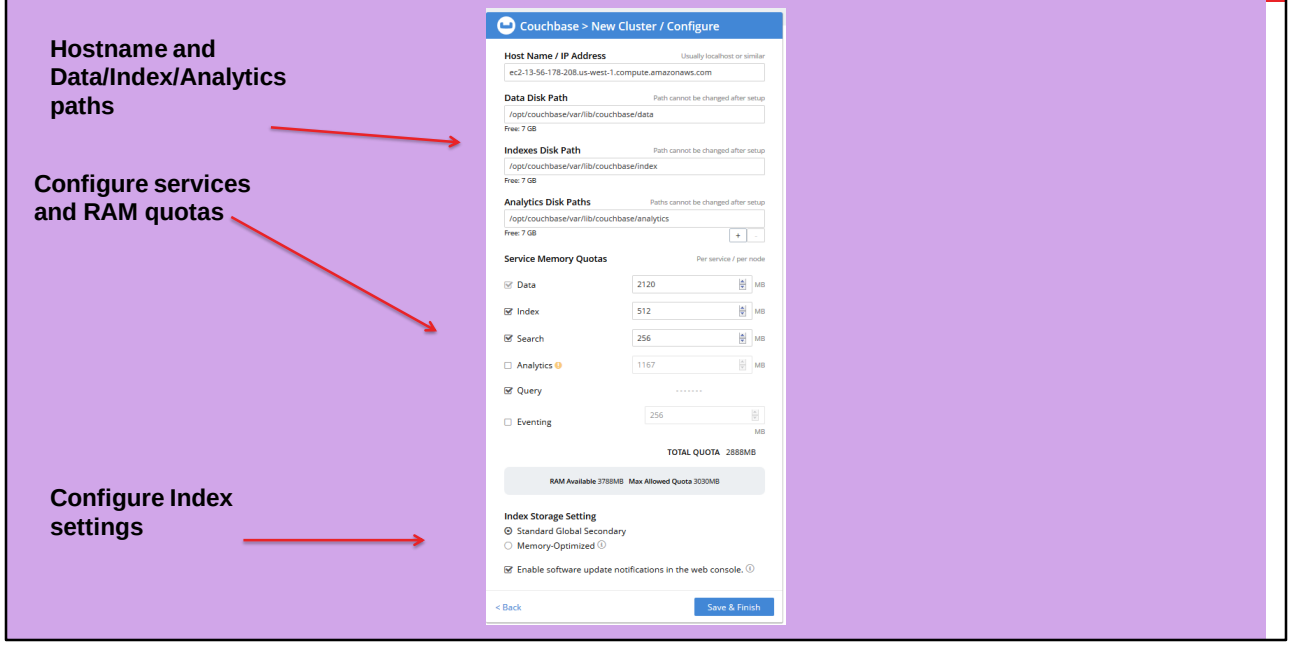
Setup - Configure Server



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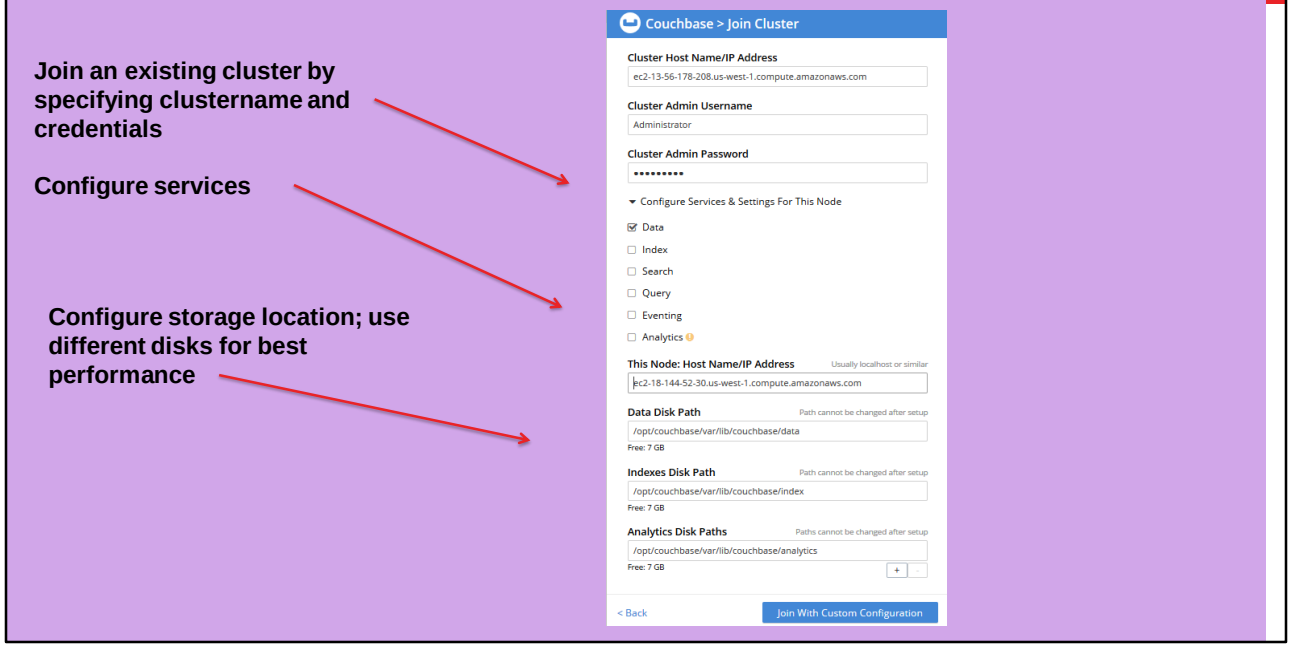
Setup – Join an existing cluster



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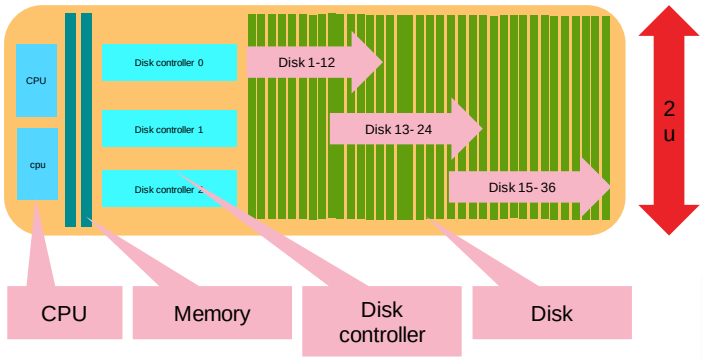
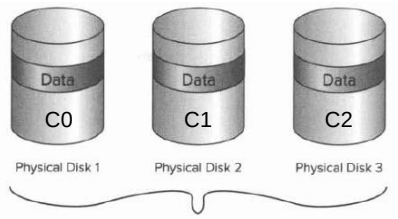
Parental directory setup (using volume management)



Disk Controller = $, $$, $$$
And differ in amount of IOPS



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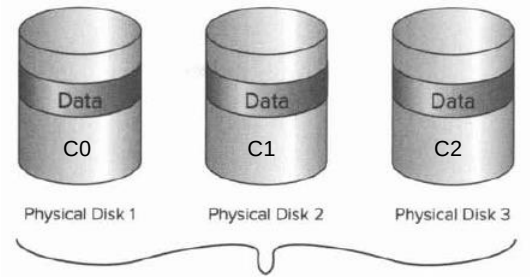
Parental directory setup (using volume management)



Striped volume = logical volume 1

Stripe unit(SU) = X KB, or MB
Stripe width = num disks x SU

Ideally stripe width would marry up with document size , key and metadata

</opt/couchbase/var/lib/couchbase/data> = parent directory(both data buckets and indexes)
Should be changed for index pathing

mount /dev/VolGroupOO/Log/VolO1 /opt/couchbase/var/lib/couchbase/data/bucket_1

Make sure to make fstab entries for persistence between reboots!!!

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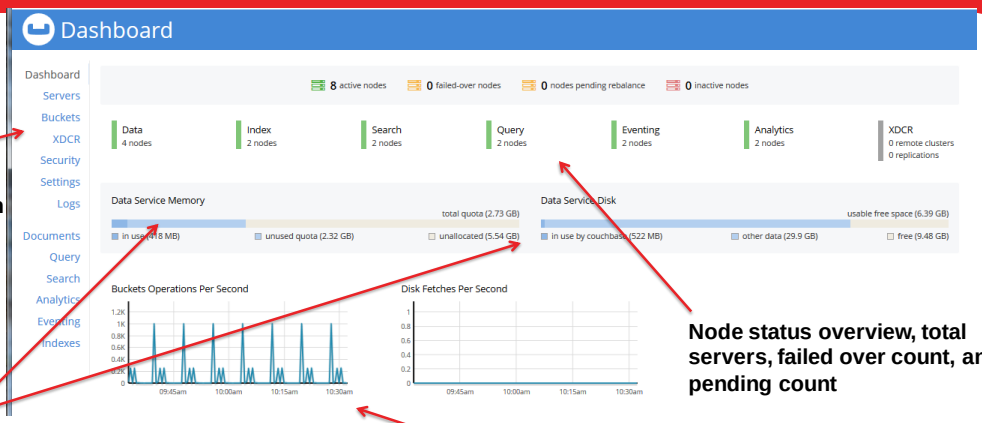
Web UI - Overview



Navigation

Node status overview, total servers, failed over count, and pending count

RAM and Disk Usage overview. Shows actual usage, remaining quota, and system RAM; shows disk usage, other data and disk free

Bucket activity overview

Systemctl command to stop/start

 # systemctl start couchbase-server

Starting couchbase-server

 # systemctl stop couchbase-server

Stopping couchbase-server

 # systemctl status couchbase-server

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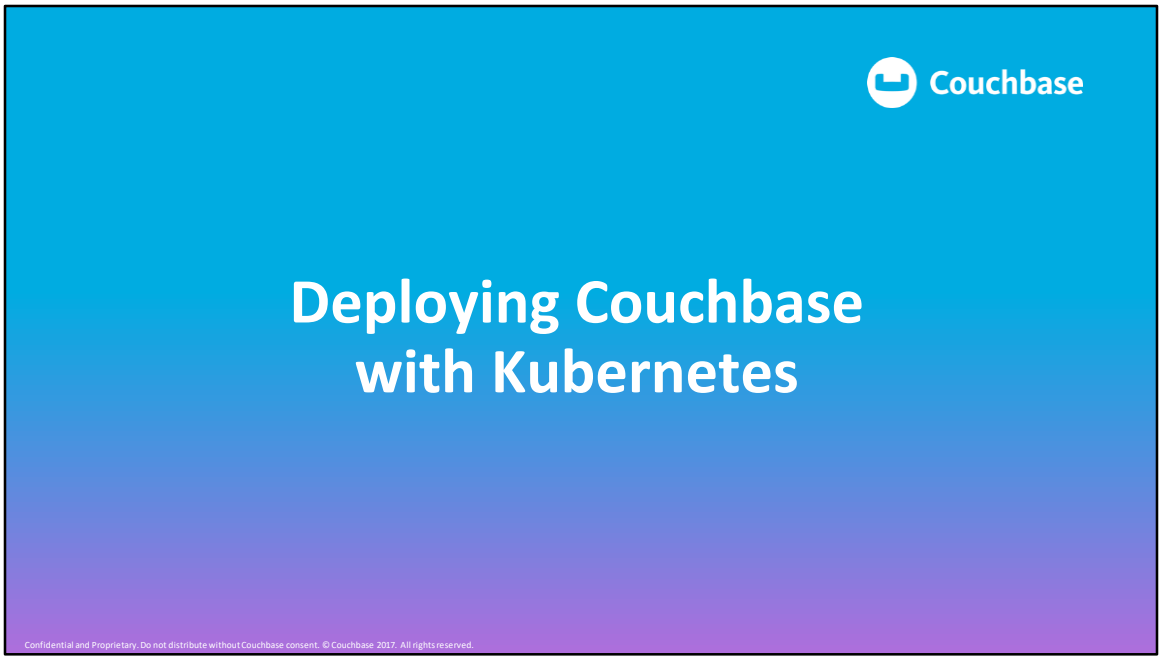
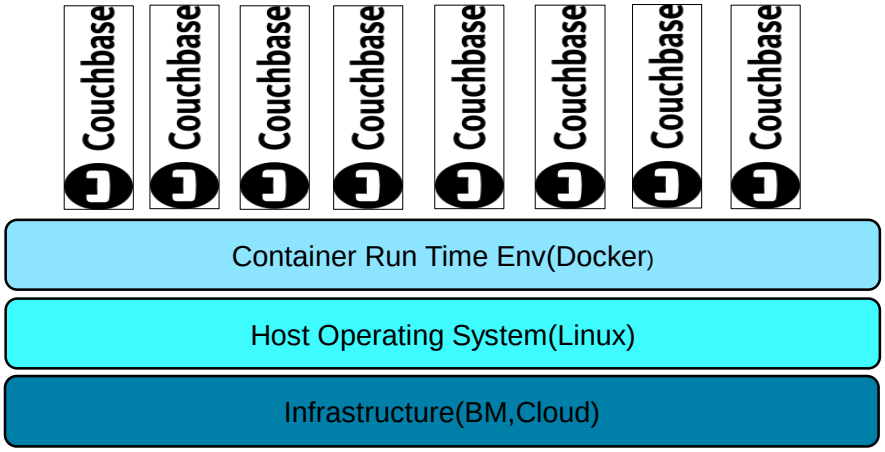


The Couchbase Autonomous Operator extends the Kubernetes API by creating a Custom Resource Definition(CRD) and registering a Couchbase specific controller (the Autonomous Operator) to manage Couchbase clusters.

How It Works

The Operator extends the Kubernetes API by creating a Custom Resource Definition (CRD) and registering a custom Couchbase controller (the Operator) to manage Couchbase clusters. The CRD allows you to define a configuration describing what a Couchbase cluster should look like. For example, a configuration might define a cluster with three nodes, one bucket, and 8 GB of memory for the data service. Once the CouchbaseCluster custom resource is loaded into Kubernetes, the configuration is passed to the Operator which takes actions to ensure a Couchbase cluster with the specified configuration is provisioned. The controller can also detect updates to the configuration and reacts to changes that occur in the cluster itself. Like all Kubernetes standard built-in resources, the Operator doesn't just manage a single Couchbase cluster, it can manage multiple Couchbase clusters across an entire Kubernetes deployment

Containerized Applications



Package Software into Standardized Units for Development, Shipment and Deployment

A container image is a lightweight, standalone, executable package of software that includes everything needed to run an application: code, runtime, system tools, system libraries and settings.

Container images become containers at runtime and in the case of Docker containers - images become containers when they run on Engine(Docker). Available for both Linux and Windows-based applications, containerized software will always run the same, regardless of the infrastructure.
Containers isolate software from its environment and ensure that it works uniformly despite differences for instance between development and staging.

Docker containers that run on Docker Engine:

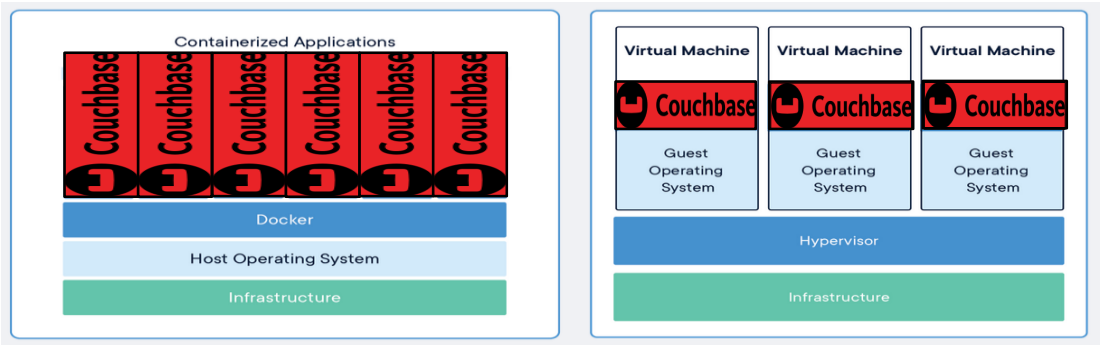
Standard: Docker created the industry standard for containers, so they could be portable anywhere

Lightweight: Containers share the machine's OS system kernel and therefore do not

require an OS per application, driving higher server efficiencies and reducing server and licensing costs

Secure: Applications are safer in containers

Comparing Containers and Virtual Machines



Containers and virtual machines have similar resource isolation and allocation benefits,

but function differently because containers virtualize the operating system instead of hardware.

Comparing Containers and Virtual Machines
Containers and virtual machines have similar resource isolation and allocation benefits,
but function differently because containers virtualize the operating system instead of hardware.
Containers are more portable and efficient.

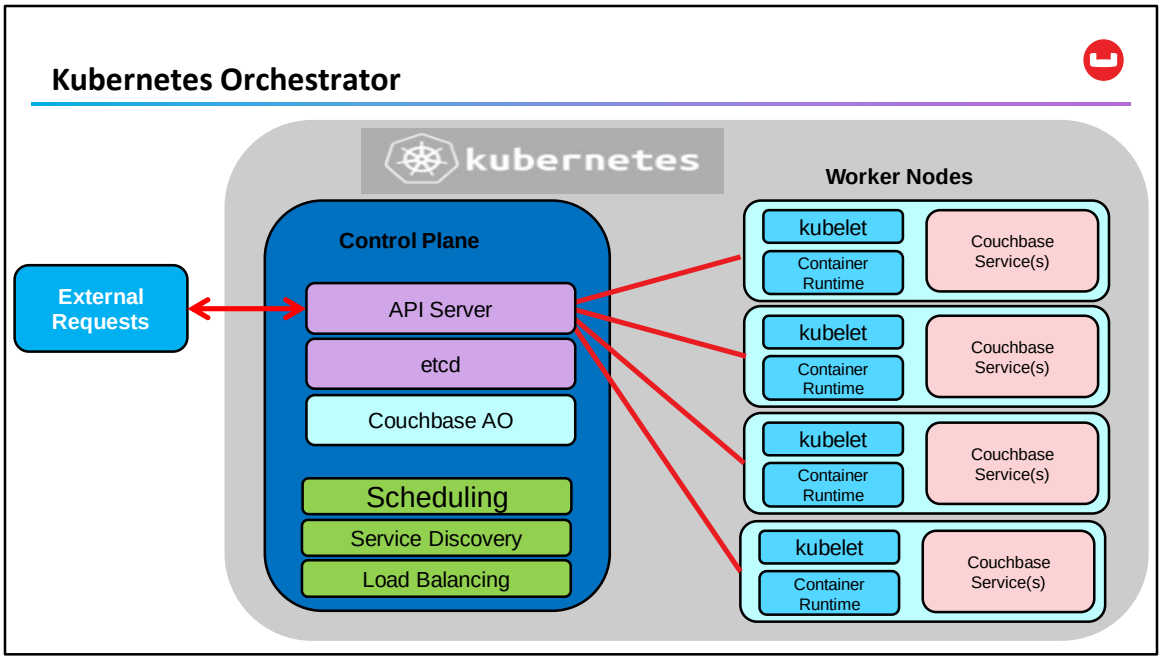
CONTAINERS

Containers are an abstraction at the app layer that packages code and dependencies together. Multiple containers can run on the same machine and share the OS kernel with other containers, each running as isolated processes in user space. Containers take up less space than VMs (container images are typically tens of MBs in size), can handle more applications and require fewer VMs and Operating systems.

VIRTUAL MACHINES

Virtual machines (VMs) are an abstraction of physical hardware turning one server into many servers. The hypervisor allows multiple VMs to run on a single machine. Each VM includes a full copy of an operating system, the application, necessary binaries and libraries - taking up tens of GBs. VMs can also be slow to boot.

Containers and Virtual Machines Together
Containers and VMs used together provide a great deal of flexibility in deploying and managing app



- External requests

Users interact with Kubernetes through a declarative API. Here, they tell Kubernetes what their requirements are, describing their applications and services, and Kubernetes then does the hard work managing the cluster and implementing that declaration for them.

- Control plane

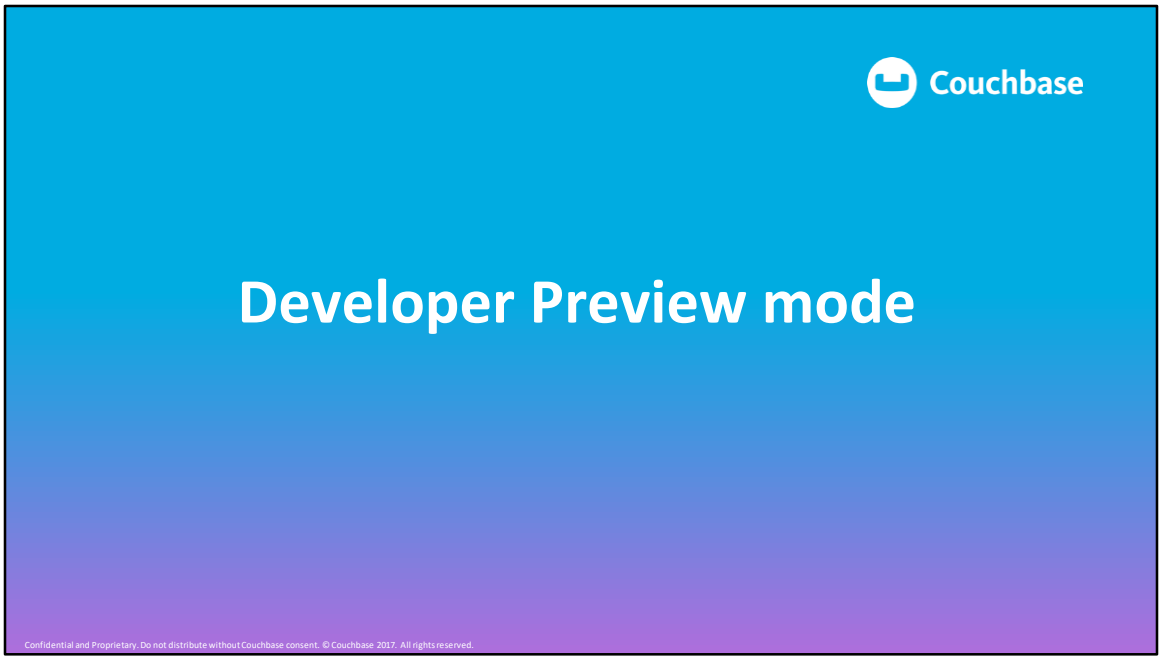
The control plane is roughly equivalent to the concept of a controller. It acts as the brain of any Kubernetes cluster. Scheduling, service discovery, load balancing and resource management capabilities are all provided by the control plane. For this high-level architecture discussion, we will not get into the details of these functions. Rather, we will present them as parts of the control plane.

URL Autonomous Operator to deploy a Couchbase Server cluster

https://docs.couchbase.com/operator/2.0/reference-couchbasecluster.html

AUTONOMOUS OPERATOR 2.0

```
apiVersion: couchbase.com/v2
kind: CouchbaseCluster
metadata:
  name: cb-example
spec:
  image: couchbase/server:6.5.0
  paused: false
  antiAffinity: true
  softwareUpdateNotifications: true
  serverGroups:
  - us-east-1a
  - us-east-1b
  - us-east-1c
  securityContext:
    runAsUser: 1000
    runAsNonRoot: true
    fsGroup: 1000
  platform: aws
  cluster:
    clusterName: cb-example
    dataServiceMemoryQuota: 256Mi
    indexServiceMemoryQuota: 256Mi
    searchServiceMemoryQuota: 256Mi
    eventingServiceMemoryQuota: 256Mi
    analyticsServiceMemoryQuota: 1Gi
    indexStorageSetting: memory_optimized
    autoFailoverTimeout: 120s
    autoFailoverMaxCount: 3
    autoFailoverOnDataDiskIssues: true
```



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Developer preview mode (Summary):

- Developer Preview mode provides early access to features which may be GA in a future release and enables you to get a sense of how they work. Preview mode features are not supported by Couchbase Legal Agreements, may not be functionally complete, and are not intended for production use. They are intended for development and testing purposes only.
- Introduced in Couchbase Server Enterprise Edition 6.5.1, When Preview mode is enabled:
  - The cluster is converted to a Developer Preview cluster and cannot be switched back.
  - Preview mode features are under development and as such Couchbase cannot guarantee the stability of these features.
  - Additionally, clusters in Preview mode cannot be upgraded to subsequent releases.
- Developer Preview Mode can be enabled using the CLI or REST API, however as noted above, once enabled, it cannot be disabled.

Developer Preview mode

You can also verify whether Preview mode has been enabled on your cluster by running the couchbase-cli enable-developer-preview command with the --list flag, and specifying the cluster-address, and the Full Administrator username and password as shown:

```
# /opt/couchbase/bin/couchbase-cli enable-developer-preview --list -c
localhost:8091 -u Administrator -p password
```

- If the cluster is not in Preview Mode, the following output is displayed:

```
# Cluster is NOT in developer preview mode
```

- If the cluster is in Preview Mode, the output is as follows:

```
# Cluster is in developer preview mode
```

Developer Preview mode eble at CLI

To enable

```
# /opt/couchbase/bin/couchbase-cli enable-developer-preview --enable -c
localhost:8091 -u Administrator -p couchbase

Developer preview cannot be disabled once it is enabled. If you enter
developer preview mode you will not be able to upgrade. DO NOT USE IN
PRODUCTION.

Are you sure [y/n]: y

SUCCESS: Cluster is in developer preview mode
```

Developer features in this release

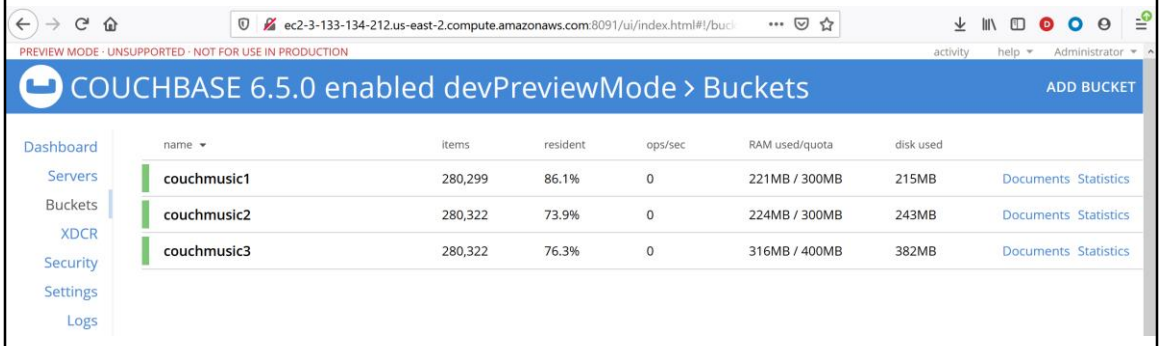
The Developer Preview mode in Couchbase Server 6.5 Beta unlocks the following features:

- Collections - These are data containers that can be created within any bucket whose type is either Couchbase or Ephemeral.

This allows data-items optionally to be assigned to different collections according to content-type. For the Developer Preview, collections can be managed by either the REST API or the CLI. For more information, see Collections Overview.

- High Data Density
- Cost-based Optimizer
- Index Advisor

Developer Preview mode



Lab #1: Installation on one node

- Lab 1.0 and 1.1
- Installation of Couchbase 6.5.1
- Introduction to the Web UI
- Couchbase CLI and Rest API
- Data files vs Index files
- cbworkloadgen & pillowfight

Time: 1 hour

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