



Technical Take-Home Exercise

Core Exercise

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December 2023



CockroachDB

A distributed SQL database
designed for speed, scale,
and survival

Agenda

- Launch and Initialize CRDB
- Generate a load against the cluster
- Scaling and Failing
- Executing a Code Example
- Next Steps

Launch and Initialize CRDB

**What's your
favourite?**

Let's take a look at:

- A Kubernetes install with CockroachDB Operator
- vs
- A standard configuration

Creating a kubernetes cluster

- An easy way to get up started with cockroachdb and distributed SQL is via Cockroach Operator.

```
kholman@KH-X20W:~/k8s$ kubectl create \
-f https://raw.githubusercontent.com/cockroachdb/cockroach-operator/v2.12.0/examples/client-secure-operator.yaml
pod/cockroachdb-client-secure created
kholman@KH-X20W:~/k8s$
kholman@KH-X20W:~/k8s$
kholman@KH-X20W:~/k8s$ kubectl get pods
NAME                           READY   STATUS        RESTARTS   AGE
cockroach-operator-manager-6fd5c68d58-lvh7x   1/1    Running      0          2m59s
cockroachdb-client-secure           0/1    ContainerCreating   0          3s
cockroachdb-vcheck-28380394-wshtc   1/1    Running      0          75s
cockroachdb-vcheck-28380395-z7565   1/1    Running      0          62s
```

 Cockroach Labs

```
khollman@KH-X20W:~/k8s$ kubectl apply -f example.yaml
crdbcluster.crdb.cockroachlabs.com/cockroachdb created
khollman@KH-X20W:~/k8s$ ls -lrt
total 91508
-rw-rw-r-- 1 khollman khollman      64 dic 12 23:34 kubectl.sha256
-rw-rw-r-- 1 khollman docker  93670363 dic 12 23:45 minikube-linux-amd64
-rw-rw-r-- 1 khollman khollman  18057 dic 17 15:33 operator.yaml
-rw-rw-r-- 1 khollman khollman   2193 dic 17 15:34 example.yaml
khollman@KH-X20W:~/k8s$ kubectl get pods
NAME                      READY   STATUS    RESTARTS   AGE
cockroach-operator-manager-6fd5c68d58-lvh7x   1/1     Running   0          117s
cockroachdb-vcheck-28380394-wshtc           1/1     Running   0          13s
khollman@KH-X20W:~/k8s$
```

```
khollman@KH-X20W:~/k8s$ kubectl get pods
NAME                      READY   STATUS        RESTARTS   AGE
cockroach-operator-manager-6fd5c68d58-lvh7x   1/1     Running       0          4m57s
cockroachdb-0                0/1     Running       0          17s
cockroachdb-1                0/1     Running       0          17s
cockroachdb-2                0/1     Running       0          17s
cockroachdb-client-secure      0/1     ContainerCreating 0          2m1s
cockroachdb-vcheck-28380394-wshtc           0/1     Completed      0          3m13s
cockroachdb-vcheck-28380395-z7565           0/1     Completed      0          3m
cockroachdb-vcheck-28380397-4vp2m            1/1     Terminating   0          24s
khollman@KH-X20W:~/k8s$
```

Connecting in

- Via the secure pod, we can use the CockroachDB SQL client:

```
kubectl exec -it cockroachdb-client-secure -- ./cockroach sql --certs-dir=/cockroach/cockroach-certs --host=cockroachdb-public
```

```
khollman@KH-X20W:~/k8s$ kubectl exec -it cockroachdb-client-secure \
-- ./cockroach sql \
--certs-dir=/cockroach/cockroach-certs \
--host=cockroachdb-public
#
# Welcome to the CockroachDB SQL shell.
# All statements must be terminated by a semicolon.
# To exit, type: \q.
#
# Server version: CockroachDB CCL v23.1.11 (x86_64-pc-linux-gnu, built 2023/09/27 01:53:43, go1.19.10
) (same version as client)
# Cluster ID: 7c995e1a-bb50-4c2f-a9e6-1791462c7f49
#
# Enter \? for a brief introduction.
#
root@cockroachdb-public:26257/defaultdb> █
M-? toggle key help • C-d erase/stop • C-c clear/cancel • M-. hide/show prompt
```



Console access

- As with all CockroachDB installs, we want to be able to see the UI, so we map the K8s port using “kubectl port-forward”

Cockroach Labs

CockroachDB

Cluster id: 7c995e1a-bb50-4c2f-a9e6-1791462c7f49

V23.1.11

Overview Metrics Databases SQL Activity Insights Network Hot Ranges Jobs Schedules Advanced Debug

Keep up-to-date with CockroachDB software releases and best practices.

Enter your email Sign up

Capacity Usage

1.4% 0 GiB 10 GiB 20 GiB

USED: 354.6 MiB USABLE: 23.9 GiB

Node Status

LIVE NODES	SUSPECT NODES	DRAINING NODES	DEAD NODES
3	0	0	0

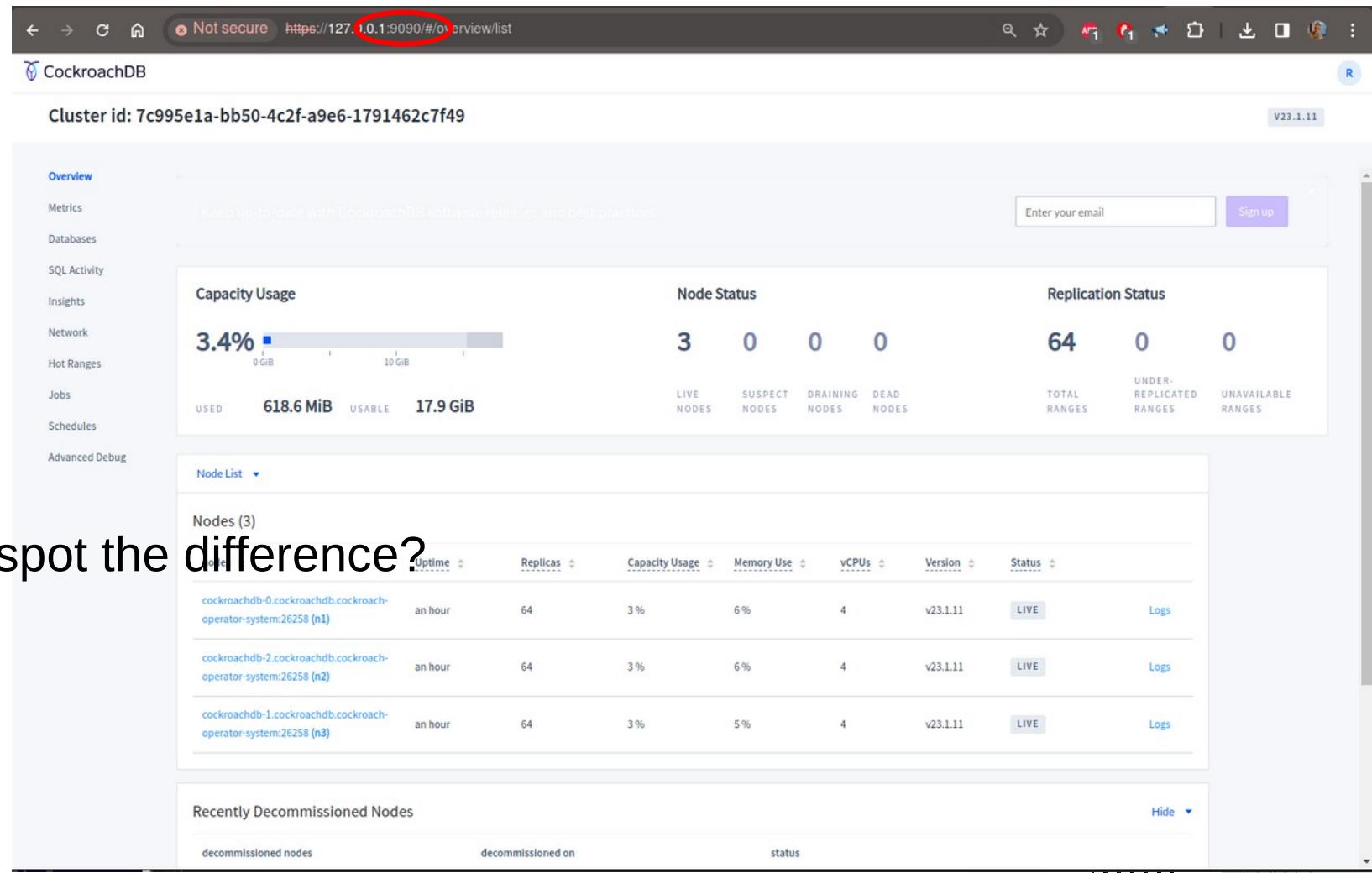
Replication Status

TOTAL RANGES	UNDER-REPPLICATED RANGES	UNAVAILABLE RANGES
63	0	0

Node List

Nodes (3)

nodes	Uptime	Replicas	Capacity Usage	Memory Use	vCPUs	Version	Status	Logs
cockroachdb-0.cockroachdb.ckroach-operator-system:26258 (n1)	10 minutes	63	1 %	4 %	4	v23.1.11	LIVE	Logs
cockroachdb-2.cockroachdb.ckroach-operator-system:26258 (n2)	10 minutes	63	1 %	4 %	4	v23.1.11	LIVE	Logs
cockroachdb-1.cockroachdb.ckroach-operator-system:26258 (n3)	10 minutes	63	1 %	3 %	4	v23.1.11	LIVE	Logs



The screenshot shows the CockroachDB Overview page at <https://127.0.0.1:9090/#/overview/list>. A red circle highlights the URL in the browser's address bar.

Cluster id: 7c995e1a-bb50-4c2f-a9e6-1791462c7f49

V23.1.11

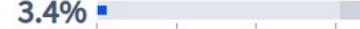
Overview

- Metrics
- Databases
- SQL Activity
- Insights
- Network
- Hot Ranges
- Jobs
- Schedules
- Advanced Debug

Keep up-to-date with CockroachDB software releases and best practices.

Enter your email Sign up

Capacity Usage

3.4% 

USED 618.6 MiB USABLE 17.9 GiB

Node Status

LIVE NODES	SUSPECT NODES	DRAINING NODES	DEAD NODES
3	0	0	0

Replication Status

TOTAL RANGES	UNDER-REPLICATED RANGES	UNAVAILABLE RANGES
64	0	0

Nodes (3)

Name	Uptime	Replicas	Capacity Usage	Memory Use	vCPUs	Version	Status	Logs
cockroachdb-0.rockroachdb.rockroach-operator-system:26258 (n1)	an hour	64	3 %	6 %	4	v23.1.11	LIVE	Logs
cockroachdb-2.rockroachdb.rockroach-operator-system:26258 (n2)	an hour	64	3 %	6 %	4	v23.1.11	LIVE	Logs
cockroachdb-1.rockroachdb.rockroach-operator-system:26258 (n3)	an hour	64	3 %	5 %	4	v23.1.11	LIVE	Logs

Recently Decommissioned Nodes

decommissioned nodes	decommissioned on	status

- Can you spot the difference?

Scaling with K8s & Operator

Via the using example.yaml, via just changing a 3 to a 6 we're looking at a 6 node cockroachdb cluster:

```
apiVersion: v1
kind: StatefulSet
name: cockroachdb/cockroachdb
# nodes refers to the number of nodes
# via the statefulset
nodes: 3
#nodes: 6
additionalLabels:
  crdb: is-cool
# affinity is a new API feature
# disabled by default. To
```

```
khollman@KH-X20W:~/k8s$ kubectl apply -f example.yaml
crdbcluster.crdb.cockroachlabs.com/cockroachdb configured
khollman@KH-X20W:~/k8s$
khollman@KH-X20W:~/k8s$
khollman@KH-X20W:~/k8s$ kubectl get nodes
NAME      STATUS    ROLES      AGE     VERSION
minikube  Ready     control-plane  135m   v1.28.3
khollman@KH-X20W:~/k8s$ vi operator.yaml Handling connection for 8080
kubectl get pvc
NAME                STATUS    VOLUME                                     CAPACITY   ACCESS MODES   STORAGECLASS   AGE
datadir-cockroachdb-0  Bound    pvc-5272dd0a-4bbd-4425-998c-b6c53d93d402  60Gi      RWO          standard       41m
datadir-cockroachdb-1  Bound    pvc-0c574db1-1444-4de9-b75c-c9e51d20bf8a  60Gi      RWO          standard       41m
datadir-cockroachdb-2  Bound    pvc-36a5299c-8f6e-4d06-a531-49b6c284fc5  60Gi      RWO          standard       41m
datadir-cockroachdb-3  Bound    pvc-3e17e9d1-fa39-455e-b138-61c18bdb27ae  60Gi      RWO          standard       10s
datadir-cockroachdb-4  Bound    pvc-3c992b7a-d663-43ba-8933-4cc30889dd9e  60Gi      RWO          standard       10s
datadir-cockroachdb-5  Bound    pvc-ccf4fd05-1909-4d31-8443-c0cb1645018e  60Gi      RWO          standard       10s
khollman@KH-X20W:~/k8s$ 
khollman@KH-X20W:~/k8s$ 
khollman@KH-X20W:~/k8s$ kubectl get pods
NAME                  READY   STATUS    RESTARTS   AGE
cockroach-operator-manager-6fd5c68d58-lvh7x  1/1    Running   0          46m
cockroachdb-0          1/1    Running   0          42m
cockroachdb-1          1/1    Running   0          42m
cockroachdb-2          1/1    Running   0          42m
cockroachdb-3          1/1    Running   0          23s
cockroachdb-4          1/1    Running   0          23s
cockroachdb-5          1/1    Running   0          23s
cockroachdb-client-secure  1/1    Running   0          43m
khollman@KH-X20W:~/k8s$
```

Cockroach Labs

CockroachDB

R

Cluster id: 7c995e1a-bb50-4c2f-a9e6-1791462c7f49

V23.1.11

Overview

Capacity Usage

2.1%



Metrics

Databases

SQL Activity

Insights

Network

Hot Ranges

Jobs

Schedules

Advanced Debug

Node Status

6

0

0

0

LIVE
NODES

SUSPECT
NODES

DRAINING
NODES

DEAD
NODES

Replication Status

64

9

0

TOTAL
RANGES

UNDER-REPLICATED
RANGES UNAVAILABLE
RANGES

USED

719.1 MiB

USABLE

33.1 GiB

Node List ▾

Nodes (6)

nodes

Uptime

Replicas

Capacity Usage

Memory Use

vCPUs

Version

Status

cockroachdb-0.cockroachdb.rockroach-operator-system:26258 (n1)

43 minutes

49

5 %

5 %

4

v23.1.11

LIVE

Logs

cockroachdb-2.cockroachdb.rockroach-operator-system:26258 (n2)

43 minutes

49

3 %

4 %

4

v23.1.11

LIVE

Logs

cockroachdb-1.cockroachdb.rockroach-operator-system:26258 (n3)

43 minutes

49

3 %

4 %

4

v23.1.11

LIVE

Logs

cockroachdb-3.cockroachdb.rockroach-operator-system:26258 (n4)

a minute

53

0 %

3 %

4

v23.1.11

LIVE

Logs

cockroachdb-4.cockroachdb.rockroach-operator-system:26258 (n5)

a minute

54

0 %

5 %

4

v23.1.11

LIVE

Logs

cockroachdb-5.cockroachdb.rockroach-operator-system:26258 (n6)

a minute

54

0 %

3 %

4

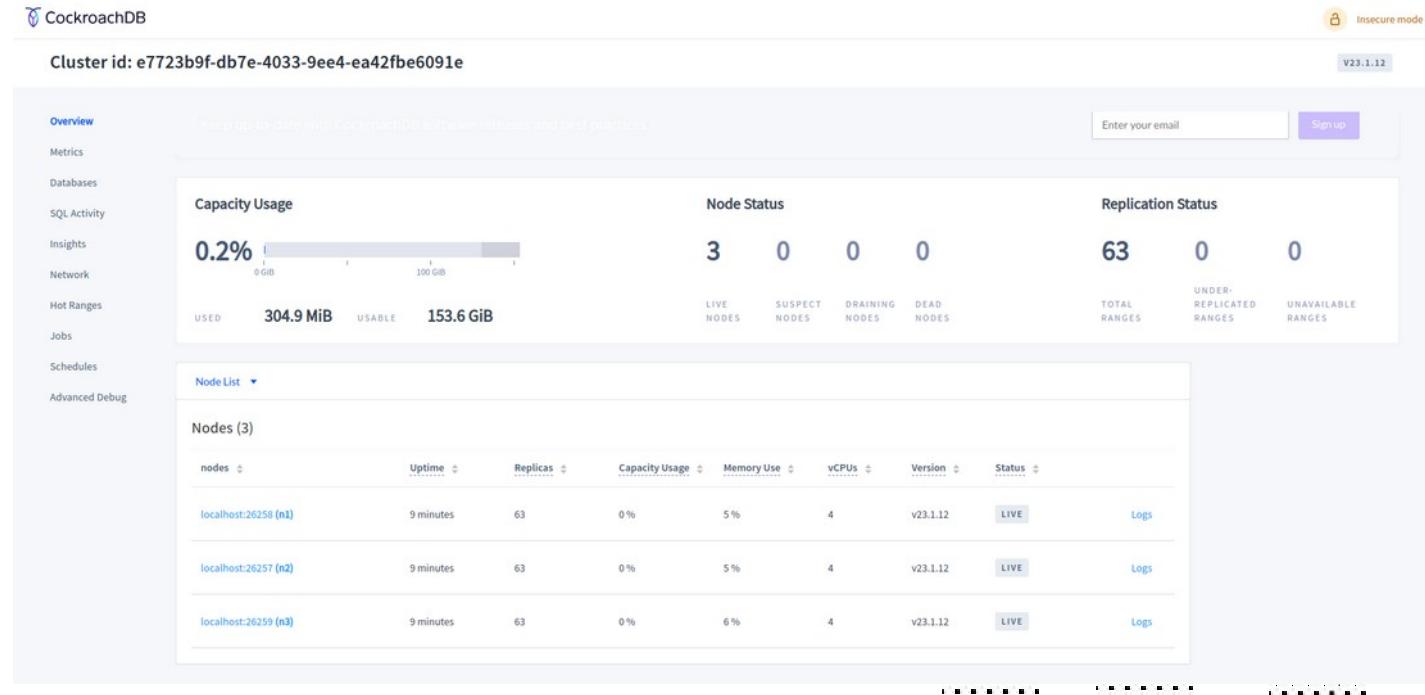
v23.1.11

LIVE

Logs

A standard configuration

- Using virtualbox & vagrant we can also quickly generate CockroachDB cluster.



The screenshot shows the CockroachDB Cluster Overview page with the following details:

- Cluster id:** e7723b9f-db7e-4033-9ee4-ea42fbe6091e
- Version:** v23.1.12
- Insecure mode:** Enabled
- Capacity Usage:** 0.2% (0 GiB to 100 GiB)
- Used:** 304.9 MiB
- Usable:** 153.6 GiB
- Node Status:** 3 LIVE NODES, 0 SUSPECT NODES, 0 DRAINING NODES, 0 DEAD NODES
- Replication Status:** 63 TOTAL RANGES, 0 UNDER-REPLICATED RANGES, 0 UNAVAILABLE RANGES
- Nodes (3):**

nodes	Uptime	Replicas	Capacity Usage	Memory Use	vCPUs	Version	Status	Logs
localhost:26258 (n1)	9 minutes	63	0 %	5 %	4	v23.1.12	LIVE	Logs
localhost:26257 (n2)	9 minutes	63	0 %	5 %	4	v23.1.12	LIVE	Logs
localhost:26259 (n3)	9 minutes	63	0 %	6 %	4	v23.1.12	LIVE	Logs



```
vagrant@ol7demo:~/crdb$  
[vagrant@ol7demo crdb]$  
[vagrant@ol7demo crdb]$
```



The console

Not secure 192.168.1.160:8081/#/overview/list

CockroachDB Insecure mode

Cluster id: f10584c4-c09d-430f-bbac-ba5ad0439cab V23.1.12

Overview Metrics Databases SQL Activity Insights Network Hot Ranges Jobs Schedules Advanced Debug

Capacity Usage 0.2% 0 GiB 100 GiB USED 320.0 MiB USABLE 153.6 GiB

Node Status 3 0 0 0 62 0 0

LIVE NODES SUSPECT NODES DRAINING NODES DEAD NODES TOTAL RANGES UNDER-REPPLICATED RANGES UNAVAILABLE RANGES

Replication Status

Node List ▾

Nodes (3)

nodes	Uptime	Replicas	Capacity Usage	Memory Use	vCPUs	Version	Status	Logs
192.168.1.160:26258 (n1)	9 minutes	62	0 %	5 %	4	v23.1.12	LIVE	Logs
192.168.1.160:26257 (n2)	9 minutes	62	0 %	5 %	4	v23.1.12	LIVE	Logs
192.168.1.160:26259 (n3)	9 minutes	62	0 %	5 %	4	v23.1.12	LIVE	Logs

Configure your HAProxy

```
cockroach gen haproxy --insecure --host=192.168.1.160:26257
```

```
scp haproxy.cfg 192.168.1.161:/home/vagrant/
```

- **@192.168.1.161**

```
sudo apt-get install haproxy
```

```
haproxy -f haproxy.cfg > haproxy.log &
```

- **Test it, from 192.168.1.160:**

```
cockroach sql --insecure --host=192.168.1.161:26257
```



```
.rw-r--r--- 1 vagrant vagrant 1524 dic 17 16:56 haproxy.cfg
[vagrant@ol7demo crdb]$ cat haproxy.cfg

global
  maxconn 4096

defaults
  mode      tcp

  # Timeout values should be configured for your specific use.
  # See: https://cbonte.github.io/haproxy-dconv/1.8/configuration.html#4-timeout%20connect

  # With the timeout connect 5 secs,
  # if the backend server is not responding, haproxy will make a total
  # of 3 connection attempts waiting 5s each time before giving up on the server,
  # for a total of 15 seconds.
  retries     2
  timeout connect  5s

  # timeout client and server govern the maximum amount of time of TCP inactivity.
  # The server node may idle on a TCP connection either because it takes time to
  # execute a query before the first result set record is emitted, or in case of
  # some trouble on the server. So these timeout settings should be larger than the
  # time to execute the longest (most complex, under substantial concurrent workload)
  # query, yet not too large so truly failed connections are lingering too long
  # (resources associated with failed connections should be freed reasonably promptly).
  timeout client    10m
  timeout server    10m

  # TCP keep-alive on client side. Server already enables them.
  option      clitcpka

listen psql
  bind :26257
  mode tcp
  balance roundrobin
  option httpchk GET /health?ready=1
  server cockroach1 localhost:26258 check port 8081
  server cockroach2 localhost:26257 check port 8080
  server cockroach3 localhost:26259 check port 8082
```

```
vagrant@ol7demo:~$ cockroach sql --insecure --host=192.168.1.161:26257
#
# Welcome to the CockroachDB SQL shell.
# All statements must be terminated by a semicolon.
# To exit, type: \q.
#
# Server version: CockroachDB CCL v23.1.12 (x86_64-pc-linux-gnu, built 2023/11/09 06:15:38, go1.19.13
# (same version as client)
# Cluster ID: f10584c4-c09d-430f-bbac-ba5ad0439cab
#
# Enter \? for a brief introduction.
#
root@192.168.1.161:26257/defaultdb> \q
[vagrant@ol7demo crdb]$ 
[vagrant@ol7demo crdb]$ 
[vagrant@ol7demo crdb]$ ip address show dev eth2
4: eth2: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 08:00:27:3d:1c:1e brd ff:ff:ff:ff:ff:ff
        inet 192.168.1.160/24 brd 192.168.1.255 scope global noprefixroute eth2
            valid_lft forever preferred_lft forever
        inet6 fe80::a00:27ff:fe3d:1c1e/64 scope link
            valid_lft forever preferred_lft forever
[vagrant@ol7demo crdb]$ 
[vagrant@ol7demo crdb]$ 

vagrant@ol7demo1:~$ pwd
/home/vagrant
vagrant@ol7demo1:~$ ls -lrt
total 8
drwxrwxr-x 1 vagrant vagrant 4096 Dec 17 13:38 shared
-rw-r--r-- 1 vagrant vagrant 1536 Dec 17 17:21 haproxy.cfg
-rw-rw-r-- 1 vagrant vagrant 0 Dec 17 21:21 haproxy.log
vagrant@ol7demo1:~$ ps
    PID TTY          TIME CMD
  1787 pts/0    00:00:00 bash
  1797 pts/0    00:00:00 haproxy
  1824 pts/0    00:00:00 ps
vagrant@ol7demo1:~$ jobs
[1]+  Running                  haproxy -f haproxy.cfg > haproxy.log &
vagrant@ol7demo1:~$ ip address show dev eth2
4: eth2: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:3b:01:13 brd ff:ff:ff:ff:ff:ff
        inet 192.168.1.161/24 brd 192.168.1.255 scope global eth2
            valid_lft forever preferred_lft forever
        inet6 fe80::a00:27ff:fe3b:113/64 scope link
            valid_lft forever preferred_lft forever
vagrant@ol7demo1:~$ 
```

Generate a load against the cluster

Now to stress the cluster. A number of ways are possible:

- cockroach workload init movr
- sysbench
- hammerDB
- tpcc
- Etc.

tpcc

- Quickest way to freeze something:

```
[vagrant@ol7demo crdb]$ cockroach workload fixtures import tpcc --warehouses=2500 'postgres://root@192.168.1.161:26257?sslmode=disable'  
I231217 18:06:01.666359 1 ccl/workloadccl/fixture.go:315 [-] 1 starting import of 9 tables
```

- So let's adjust. First import the dataset:

```
cockroach workload fixtures import tpcc --warehouses=10 \  
'postgresql://root@192.168.1.161:26257?sslmode=disable'
```

- Then run it:

```
cockroach workload run tpcc --warehouses=10 --ramp=3m --duration=10m \  
'postgresql://root@192.168.1.161:26257?sslmode=disable'
```

 Cockroach Labs

```
kholman@KH-X20W:~
```

```
top - 23:23:42 up 9:32, 1 user, load average: 4.34, 5.07, 4.88
Tasks: 290 total, 1 running, 289 sleeping, 0 stopped, 0 zombie
%Cpu(s): 7.3 us, 90.1 sy, 0.8 ni, 1.8 id, 0.0 wa, 0.0 hi, 0.1 si, 0.0 st
MiB Mem : 15899.3 total, 470.3 free, 12706.9 used, 2722.1 buff/cache
MiB Swap: 1953.0 total, 542.7 free, 1410.3 used. 2029.0 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
423962	kholman	20	0	9739576	7.7g	7.7g	S	357.1	49.7	204:09.34	VBoxHeadless
489997	kholman	20	0	5989884	206020	94808 S	10.3	1.3	16:29.19	gnome-shell	
490343	kholman	20	0	957472	41236	24212 S	4.7	0.3	1:04.38	terminator	
656168	kholman	20	0	1131.3g	290188	122076 S	3.0	1.8	0:55.69	chrome	
490036	kholman	9	-11	2625072	17368	12888 S	2.7	0.1	3:50.45	pulseaudio	
497887	kholman	20	0	32.7g	301208	173632 S	2.3	1.9	5:36.24	chrome	
612541	kholman	20	0	3026432	159924	82752 S	2.3	1.0	4:32.88	spotify	
653227	kholman	20	0	2484912	1.0g	997.1m S	2.0	6.6	2:48.05	VBoxHeadless	
20830	kholman	20	0	1098088	28364	10148 S	0.7	0.2	5:53.50	VBoxSVC	
490245	kholman	20	0	317680	5088	2560 S	0.7	0.0	0:48.84	ibus-daemon	
492097	kholman	20	0	16200	2176	1280 R	0.7	0.0	1:21.60	top	
497932	kholman	20	0	32.8g	81080	60948 S	0.7	0.5	2:11.30	chrome	
610	systemd+	20	0	14848	1536	1152 S	0.3	0.0	1:39.41	systemd-oomd	
1034	root	20	0	1430940	16980	8192 S	0.3	0.1	2:14.18	containerd	
20824	kholman	20	0	77560	888	512 S	0.3	0.0	3:18.95	VBoxXPComIPCD	
490162	kholman	20	0	1750948	25620	6980 S	0.3	0.2	0:22.35	xdg-desktop-por	
490479	kholman	20	0	166164	2432	1792 S	0.3	0.0	0:10.28	ibus-engine-sim	
490531	root	20	0	396660	6188	2732 S	0.3	0.0	0:09.12	fwupd	
491174	kholman	20	0	763448	25076	9664 S	0.3	0.2	1:08.75	Kwayland	
492362	kholman	20	0	2010064	138928	58804 S	0.3	0.9	1:10.24	VirtualBox	

```
kholman@KH-X20W:~
```

```
khollman@KH-X20W:~$ cockroach workload fixtures import tpcc --warehouses=10 'postgresql://root@192.168.1.160:26257?sslmode=disable'
I231217 22:14:55.729263 1 ccl/workloadccl/fixture.go:315 [-] 1 starting import of 9 tables
```

```
^C
khollman@KH-X20W:~$
```

```
khollman@KH-X20W:~$
```

```
khollman@KH-X20W:~$ cockroach workload fixtures import tpcc --warehouses=10 'postgresql://root@192.168.1.160:26257?sslmode=disable'
I231217 22:19:31.143988 1 ccl/workloadccl/fixture.go:315 [-] 1 starting import of 9 tables
Error: importing fixture: importing table order_line: pq: relation "order_line" is offline: importing
khollman@KH-X20W:~$
```

```
khollman@KH-X20W:~$
```

```
khollman@KH-X20W:~$ cockroach workload fixtures import tpcc --warehouses=10 'postgresql://root@192.168.1.160:26257?sslmode=disable'
I231217 22:23:09.489455 1 ccl/workloadccl/fixture.go:315 [-] 1 starting import of 9 tables
I231217 22:23:17.444413 11 ccl/workloadccl/fixture.go:492 [-] 2 imported 534 B in warehouse table (10 rows, 0 index entries, took 5.340966384s, 0.00 MiB/s)
I231217 22:23:18.696534 12 ccl/workloadccl/fixture.go:492 [-] 3 imported 10 KiB in district table (100 rows, 0 index entries, took 6.592890365s, 0.00 MiB/s)
```

```
vagrant@ol7demo:~/crdb
```

database_name	owner	primary_region	secondary_region	regions	survival_goal
defaultdb	root	NULL	NULL	{}	NULL
postgres	root	NULL	NULL	{}	NULL
system	node	NULL	NULL	{}	NULL
tpcc	root	NULL	NULL	{}	NULL

(4 rows)

Time: 179ms total (execution 160ms / network 18ms)

```
root@192.168.1.161:26257/tpcc> use postgres
-> ;
SET
```

Time: 89ms total (execution 84ms / network 5ms)

```
root@192.168.1.161:26257/postgres>
root@192.168.1.161:26257/postgres>
root@192.168.1.161:26257/postgres> show tables;
SHOW TABLES 0
```

Time: 656ms total (execution 654ms / network 2ms)

```
root@192.168.1.161:26257/postgres>
root@192.168.1.161:26257/postgres>
root@192.168.1.161:26257/postgres>
```

M-? toggle key help * C-d erase/stop * C-c clear/cancel * C-r search hist * M-. hide/show prompt

```
vagrant@ol7demo:~
```

nfo: "OK", check duration: 141ms. 3 active and 0 backup servers online. 0 sessions requeued, 0 total in queue.

[WARNING] 350/221549 (1797) : Server psql/cockroach2 is DOWN, reason: Layer7 wrong status, code: 503, info: "Service Unavailable", check duration: 1985ms. 2 active and 0 backup servers left. 0 sessions active, 0 requeued, 0 remaining in queue.

[WARNING] 350/221550 (1797) : Server psql/cockroach1 is DOWN, reason: Layer7 wrong status, code: 503, info: "Service Unavailable", check duration: 848ms. 1 active and 0 backup servers left. 0 sessions active, 0 requeued, 0 remaining in queue.

[WARNING] 350/221603 (1797) : Server psql/cockroach2 is UP, reason: Layer7 check passed, code: 200, info: "OK", check duration: 682ms. 2 active and 0 backup servers online. 0 sessions requeued, 0 total in queue.

[WARNING] 350/221612 (1797) : Server psql/cockroach2 is DOWN, reason: Layer7 wrong status, code: 503, info: "Service Unavailable", check duration: 361ms. 1 active and 0 backup servers left. 0 sessions active, 0 requeued, 0 remaining in queue.

[WARNING] 350/221620 (1797) : Server psql/cockroach2 is UP, reason: Layer7 check passed, code: 200, info: "OK", check duration: 479ms. 2 active and 0 backup servers online. 0 sessions requeued, 0 total in queue.

[WARNING] 350/221636 (1797) : Server psql/cockroach1 is UP, reason: Layer7 check passed, code: 200, info: "OK", check duration: 514ms. 3 active and 0 backup servers online. 0 sessions requeued, 0 total in queue.

[WARNING] 350/221749 (1797) : Server psql/cockroach1 is DOWN, reason: Layer7 wrong status, code: 503, info: "Service Unavailable", check duration: 510ms. 2 active and 0 backup servers left. 0 sessions active, 0 requeued, 0 remaining in queue.

[WARNING] 350/221801 (1797) : Server psql/cockroach1 is UP, reason: Layer7 check passed, code: 200, info: "OK", check duration: 306ms. 3 active and 0 backup servers online. 0 sessions requeued, 0 total in queue.



Cockroach Labs

```
khollman@KH-X20W:~$ top - 23:38:03 up 9:47, 1 user, load average: 2,33, 2,19, 3,26
Tasks: 287 total, 1 running, 286 sleeping, 0 stopped, 0 zombie
%Cpu(s): 14,7 us, 27,7 sy, 1,3 ni, 55,4 id, 0,8 wa, 0,0 hi, 0,1 si, 0,0 st
MiB Mem : 15899,3 total, 739,7 free, 12704,3 used, 2455,3 buff/cache
MiB Swap: 1953,0 total, 595,9 free, 1357,1 used. 2162,6 avail Mem

PID USER PR NI VIRT RES SHR S %CPU %MEM TIME+ COMMAND
423962 khollman 20 0 9739000 7,7g S 95,0 49,7 220:29.61 VBoxHeadless
612541 khollman 20 0 30264320 149320 71892 S 25,2 0,9 5:24.41 spotify
612834 khollman 20 0 49,8g 210992 72392 S 16,9 1,3 4:28.92 spotify
489977 khollman 20 0 5963668 226848 94800 S 9,9 1,4 17:39.20 gnome-shell
490343 khollman 20 0 957856 41492 24212 S 7,6 0,3 1:16.40 terminator
490036 khollman 9 -11 2625072 17880 13400 S 4,3 0,1 4:36.16 pulseaudio
612696 khollman 20 0 767280 41220 22440 S 3,6 0,3 0:12.71 spotify
653227 khollman 20 0 2484912 1,0g 997,1M S 3,6 6,6 3:27.21 VBoxHeadless
490245 khollman 20 0 317680 5088 2560 S 3,0 0,0 0:44.35 ibus-daemon
20830 khollman 20 0 1098088 27852 9636 S 1,0 0,2 6:01.12 VBoxSVC
490357 khollman 20 0 350320 7044 2656 S 1,0 0,0 0:10.46 ibus-extension-
```

```
khollman@KH-X20W:~$ 
khollman@KH-X20W:~$ cockroach workload fixtures import tpcc --warehouses=10 'postgresql://root@192.168.1.160:26257?sslmode=disable'
I231217 22:37:02.391705 1 ccl/workloadccl/fixtures.go:315 [-] 1 starting import of 9 tables
I231217 22:37:11.999198 56 ccl/workloadccl/fixtures.go:492 [-] 2 imported 1.2 MiB in new_order table (90000 rows, 0 index entries, took 9.400404528s, 0.13 MiB/s)
I231217 22:37:14.003196 57 ccl/workloadccl/fixtures.go:492 [-] 3 imported 7.9 MiB in item table (100000 rows, 0 index entries, took 11.404309679s, 0.69 MiB/s)
I231217 22:37:20.988690 52 ccl/workloadccl/fixtures.go:492 [-] 4 imported 10 KiB in district table (100 rows, 0 index entries, took 18.390019528s, 0.00 MiB/s)
I231217 22:37:24.173054 51 ccl/workloadccl/fixtures.go:492 [-] 5 imported 537 B in warehouse table (10 rows, 0 index entries, took 21.574714874s, 0.00 MiB/s)
I231217 22:37:25.407929 54 ccl/workloadccl/fixtures.go:492 [-] 6 imported 22 MiB in history table (300000 rows, 0 index entries, took 22.809473636s, 0.96 MiB/s)
I231217 22:37:27.022489 55 ccl/workloadccl/fixtures.go:492 [-] 7 imported 16 MiB in order table (300000 rows, 300000 index entries, took 24.423812766s, 0.64 MiB/s)
I231217 22:37:32.044221 53 ccl/workloadccl/fixtures.go:492 [-] 8 imported 176 MiB in customer table (300000 rows, 300000 index entries, took 29.445425257s, 5.98 MiB/s)
I231217 22:37:32.676263 59 ccl/workloadccl/fixtures.go:492 [-] 9 imported 168 MiB in order_line table (3002106 rows, 0 index entries, took 30.077747048s, 5.58 MiB/s)
I231217 22:37:32.996275 58 ccl/workloadccl/fixtures.go:492 [-] 10 imported 307 MiB in stock table (1000000 rows, 0 index entries, took 30.397374093s, 10.09 MiB/s)
I231217 22:37:33.072308 1 ccl/workloadccl/fixtures.go:323 [-] 11 imported 697 MiB bytes in 9 tables (took 30.680394778s, 22.73 MiB/s)
I231217 22:37:34.137516 1 ccl/workloadccl/cliccl/fixtures.go:343 [-] 12 fixture is restored; now running consistency checks (ctrl-c to abort)
I231217 22:37:34.171868 1 workload/tpcc/tpcc.go:517 [-] 13 check 3.3.2.1 took 34.009648ms
I231217 22:37:34.614095 1 workload/tpcc/tpcc.go:517 [-] 14 check 3.3.2.2 took 442.028488ms
I231217 22:37:34.698566 1 workload/tpcc/tpcc.go:517 [-] 15 check 3.3.2.3 took 84.425798ms
I231217 22:37:38.425875 1 workload/tpcc/tpcc.go:517 [-] 16 check 3.3.2.4 took 3.727259725s
I231217 22:37:39.177566 1 workload/tpcc/tpcc.go:517 [-] 17 check 3.3.2.5 took 751.6400934ms
I231217 22:37:43.479525 1 workload/tpcc/tpcc.go:517 [-] 18 check 3.3.2.7 took 4.301785179s
I231217 22:37:43.991291 1 workload/tpcc/tpcc.go:517 [-] 19 check 3.3.2.8 took 511.691263ms
I231217 22:37:44.563515 1 workload/tpcc/tpcc.go:517 [-] 20 check 3.3.2.9 took 572.173322ms
```

```
vagrant@ol7demo:~/crdb
public | item | table | root | 0 | NULL
public | new_order | table | root | 0 | NULL
public | warehouse | table | root | 0 | NULL
(4 rows)

Time: 4.049s total (execution 3.908s / network 0.141s)

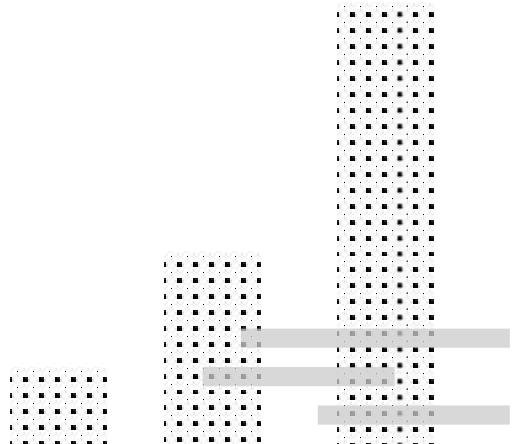
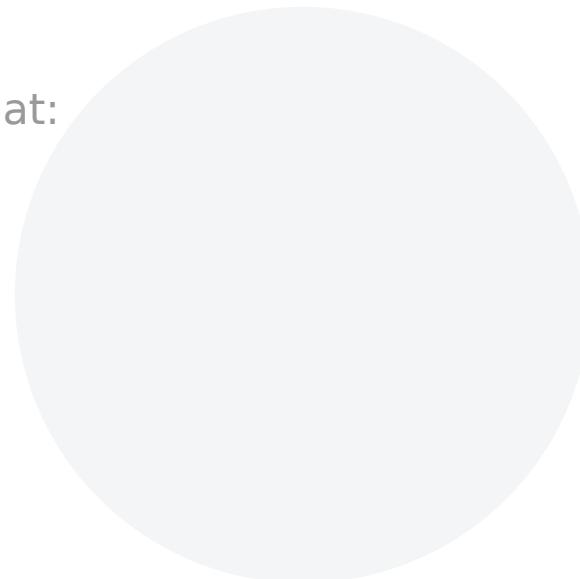
root@192.168.1.161:26257> show tables;
schema_name | table_name | type | owner | estimated_row_count | locality
-----+-----+-----+-----+-----+-----+
public | customer | table | root | 300000 | NULL
public | district | table | root | 100 | NULL
public | history | table | root | 300000 | NULL
public | item | table | root | 100000 | NULL
public | new_order | table | root | 90000 | NULL
public | order | table | root | 300000 | NULL
public | order_line | table | root | 3000000 | NULL
public | stock | table | root | 1000000 | NULL
public | warehouse | table | root | 10 | NULL
(9 rows)
```

```
Time: 162ms total (execution 142ms / network 20ms)

root@192.168.1.161:26257> tpcc>
root@192.168.1.161:26257> tpcc>
root@192.168.1.161:26257> tpcc>
M-? toggle key help * C-d erase/stop * C-c clear/cancel * C-r search hist * M-. hide/show prompt
vagrant@ol7demo1:~
info: "Service Unavailable", check duration: 361ms. 1 active and 0 backup servers left. 0 sessions active, 0 requested, 0 remaining in queue.
[WARNING] 350/221620 (1797) : Server psql/cockroach2 is UP, reason: Layer7 check passed, code: 200, info: "OK", check duration: 479ms. 2 active and 0 backup servers online. 0 sessions requeued, 0 total in queue.
[WARNING] 350/221636 (1797) : Server psql/cockroach1 is UP, reason: Layer7 check passed, code: 200, info: "OK", check duration: 514ms. 3 active and 0 backup servers online. 0 sessions requeued, 0 total in queue.
[WARNING] 350/221749 (1797) : Server psql/cockroach1 is DOWN, reason: Layer7 wrong status, code: 503, info: "Service Unavailable", check duration: 510ms. 2 active and 0 backup servers left. 0 sessions active, 0 requested, 0 remaining in queue.
[WARNING] 350/221801 (1797) : Server psql/cockroach1 is UP, reason: Layer7 check passed, code: 200, info: "OK", check duration: 306ms. 3 active and 0 backup servers online. 0 sessions requeued, 0 total in queue.
[WARNING] 350/222415 (1797) : Server psql/cockroach1 is DOWN, reason: Layer7 wrong status, code: 503, info: "Service Unavailable", check duration: 47ms. 2 active and 0 backup servers left. 0 sessions active, 0 requested, 0 remaining in queue.
[WARNING] 350/222417 (1797) : Server psql/cockroach3 is DOWN, reason: Layer7 wrong status, code: 503, info: "Service Unavailable", check duration: 10ms. 1 active and 0 backup servers left. 0 sessions active, 0 requested, 0 remaining in queue.
[WARNING] 350/222419 (1797) : Server psql/cockroach1 is UP, reason: Layer7 check passed, code: 200, info: "OK", check duration: 21ms. 2 active and 0 backup servers online. 0 sessions requeued, 0 total in queue.
[WARNING] 350/222421 (1797) : Server psql/cockroach3 is UP, reason: Layer7 check passed, code: 200, info: "OK", check duration: 3ms. 3 active and 0 backup servers online. 0 sessions requeued, 0 total in queue.
```

Scaling and Failing

Now let's have a look at:
**adding
remove
& loosing
a node.**



What do we have?

```
[vagrant@ol7demo crdb]$ cockroach node ls --insecure --host=192.168.1.161:26257
  id
  -----
  1
  2
  3
(3 rows)
[vagrant@ol7demo crdb]$
[vagrant@ol7demo crdb]$
[vagrant@ol7demo crdb]$ cockroach node status --insecure --host=192.168.1.161:26257
  id |      address      |    sql_address    |   build   |          started_at
      |      updated_at      |    locality | is_available | is_live
-----+-----+-----+-----+-----+
      +-----+-----+-----+-----+
  1 | 192.168.1.160:26258 | 192.168.1.160:26258 | v23.1.12 | 2023-12-17 20:55:09.111213 +0000 UTC |
  2023-12-17 21:38:03.162719 +0000 UTC |           | true     | true
  2 | 192.168.1.160:26257 | 192.168.1.160:26257 | v23.1.12 | 2023-12-17 20:55:10.681396 +0000 UTC |
  2023-12-17 21:38:01.718775 +0000 UTC |           | true     | true
  3 | 192.168.1.160:26259 | 192.168.1.160:26259 | v23.1.12 | 2023-12-17 20:55:10.954105 +0000 UTC |
  2023-12-17 21:38:02.001279 +0000 UTC |           | true     | true
(3 rows)
```

Add a new node

```
cockroach start --insecure --store=node4 --listen-addr=192.168.1.160:26260 \  
--http-addr=192.168.1.160:8083 \  
--join=192.168.1.160:26257,192.168.1.160:26258,192.168.1.160:26259, \  
192.168.1.160:26260 --background --pid-file=node4.pid
```

- Let's see what the console shows:

```

khollman@KH-X20W:~ top - 23:39:43 up 9:48, 1 user, load average: 1,89, 2,12, 3,12
Tasks: 288 total, 2 running, 286 sleeping, 0 stopped, 0 zombie
%Cpu(s): 6,9 us, 27,5 sy, 1,9 ni, 63,6 id, 0,1 wa, 0,0 hi, 0,1 si, 0,0 st
MiB Mem : 15899,3 total, 665,7 free, 12641,4 used, 2592,2 buff/cache
MiB Swap: 1953,0 total, 595,9 free, 1357,1 used. 2106,7 avail Mem

PID USER PR NI VIRT RES SHR S %CPU %MEM TIME+ COMMAND
423962 khollman 20 0 9738568 7,7g 7,7g S 97,7 49,7 222:13.74 VBoxHeadless
489997 khollman 20 0 6014564 227300 94872 S 11,9 1,4 17:53.13 gnome-shell
612541 khollman 20 0 3026432 149320 71892 S 7,9 0,9 5:30.72 spotify
490036 khollman 9 -11 2625072 18008 13528 S 7,6 0,1 4:42.16 pulseaudio
653227 khollman 20 0 2484912 1,0g 997,1M s 5,3 6,6 3:31.93 VBoxHeadless
497887 khollman 20 0 32,7g 259396 132228 S 2,0 1,6 5:57.93 chrome
656168 khollman 20 0 1131,3g 288868 122324 S 1,7 1,8 1:24.81 chrome
492097 khollman 20 0 16200 2176 1280 R 1,3 0,0 1:28.83 top
20830 khollman 20 0 1098088 27852 9636 S 1,0 0,2 6:02.07 VBoxSVC
490427 khollman 20 0 3160464 214744 35220 S 1,0 1,3 1:58.15 dropbox
497933 khollman 20 0 32,4g 58564 44144 S 1,0 0,4 1:37.81 chrome

khollman@KH-X20W:~ 1231217 22:37:11.999198 56 ccl/workloadccl/fixture.go:492 [-] 2 imported 1.2 MiB in new_order table
(90000 rows, 0 index entries, took 9.400404528s, 0.13 MiB/s)
1231217 22:37:14.003196 57 ccl/workloadccl/fixture.go:492 [-] 3 imported 7.9 MiB in item table (100
000 rows, 0 index entries, took 11.404309679s, 0.69 MiB/s)
1231217 22:37:20.988690 52 ccl/workloadccl/fixture.go:492 [-] 4 imported 10 KiB in district table (
100 rows, 0 index entries, took 18.390019528s, 0.00 MiB/s)
1231217 22:37:24.173054 51 ccl/workloadccl/fixture.go:492 [-] 5 imported 537 B in warehouse table (
10 rows, 0 index entries, took 21.574714874s, 0.00 MiB/s)
1231217 22:37:25.407929 54 ccl/workloadccl/fixture.go:492 [-] 6 imported 22 MiB in history table (3
00000 rows, 0 index entries, took 22.809473636s, 0.96 MiB/s)
1231217 22:37:27.022489 55 ccl/workloadccl/fixture.go:492 [-] 7 imported 16 MiB in order table (300
000 rows, 300000 index entries, took 24.423812766s, 0.64 MiB/s)
1231217 22:37:32.044221 53 ccl/workloadccl/fixture.go:492 [-] 8 imported 176 MiB in customer table
(300000 rows, 300000 index entries, took 29.445425257s, 5.98 MiB/s)
1231217 22:37:32.676263 59 ccl/workloadccl/fixture.go:492 [-] 9 imported 168 MiB in order_line tabl
e (3002106 rows, 0 index entries, took 30.077747048s, 5.58 MiB/s)
1231217 22:37:32.996275 58 ccl/workloadccl/fixture.go:492 [-] 10 imported 307 MiB in stock table (1
000000 rows, 0 index entries, took 30.397374093s, 10.09 MiB/s)
1231217 22:37:33.072308 1 ccl/workloadccl/fixture.go:323 [-] 11 imported 697 MiB bytes in 9 tables
(took 30.680394778s, 22.73 MiB/s)
1231217 22:37:34.137516 1 ccl/workloadccl/cliccl/fixtures.go:343 [-] 12 fixture is restored; now ru
nning consistency checks (ctrl-c to abort)
1231217 22:37:34.171868 1 workload/tpcc/tpcc.go:517 [-] 13 check 3.3.2.1 took 34.009648ms
1231217 22:37:34.614095 1 workload/tpcc/tpcc.go:517 [-] 14 check 3.3.2.2 took 442.028488ms
1231217 22:37:34.698566 1 workload/tpcc/tpcc.go:517 [-] 15 check 3.3.2.3 took 84.425798ms
1231217 22:37:38.425875 1 workload/tpcc/tpcc.go:517 [-] 16 check 3.3.2.4 took 3.727259725s
1231217 22:37:39.177566 1 workload/tpcc/tpcc.go:517 [-] 17 check 3.3.2.5 took 751.640034ms
1231217 22:37:43.479525 1 workload/tpcc/tpcc.go:517 [-] 18 check 3.3.2.7 took 4.301785179s
1231217 22:37:43.991291 1 workload/tpcc/tpcc.go:517 [-] 19 check 3.3.2.8 took 511.691263ms
1231217 22:37:44.563515 1 workload/tpcc/tpcc.go:517 [-] 20 check 3.3.2.9 took 572.173322ms
khollman@KH-X20W:~$ khollman@KH-X20W:~$ khollman@KH-X20W:~$ cockroach workload run tpcc --warehouses=10 --ramp=3m --duration=10m \
'postgresql://root@192.168.1.161:26257?sslmode=disable'

```

public	item	table	root	0	NULL
public	new_order	table	root	0	NULL
public	warehouse	table	root	0	NULL
(4 rows)					

Time: 4.049s total (execution 3.908s / network 0.141s)

```

root@192.168.1.161:26257> show tables;
schema_name | table_name | type | owner | estimated_row_count | locality
-----+-----+-----+-----+-----+-----+
public | customer | table | root | 300000 | NULL
public | district | table | root | 100 | NULL
public | history | table | root | 300000 | NULL
public | item | table | root | 100000 | NULL
public | new_order | table | root | 90000 | NULL
public | order | table | root | 300000 | NULL
public | order_line | table | root | 3000000 | NULL
public | stock | table | root | 1000000 | NULL
public | warehouse | table | root | 10 | NULL
(9 rows)

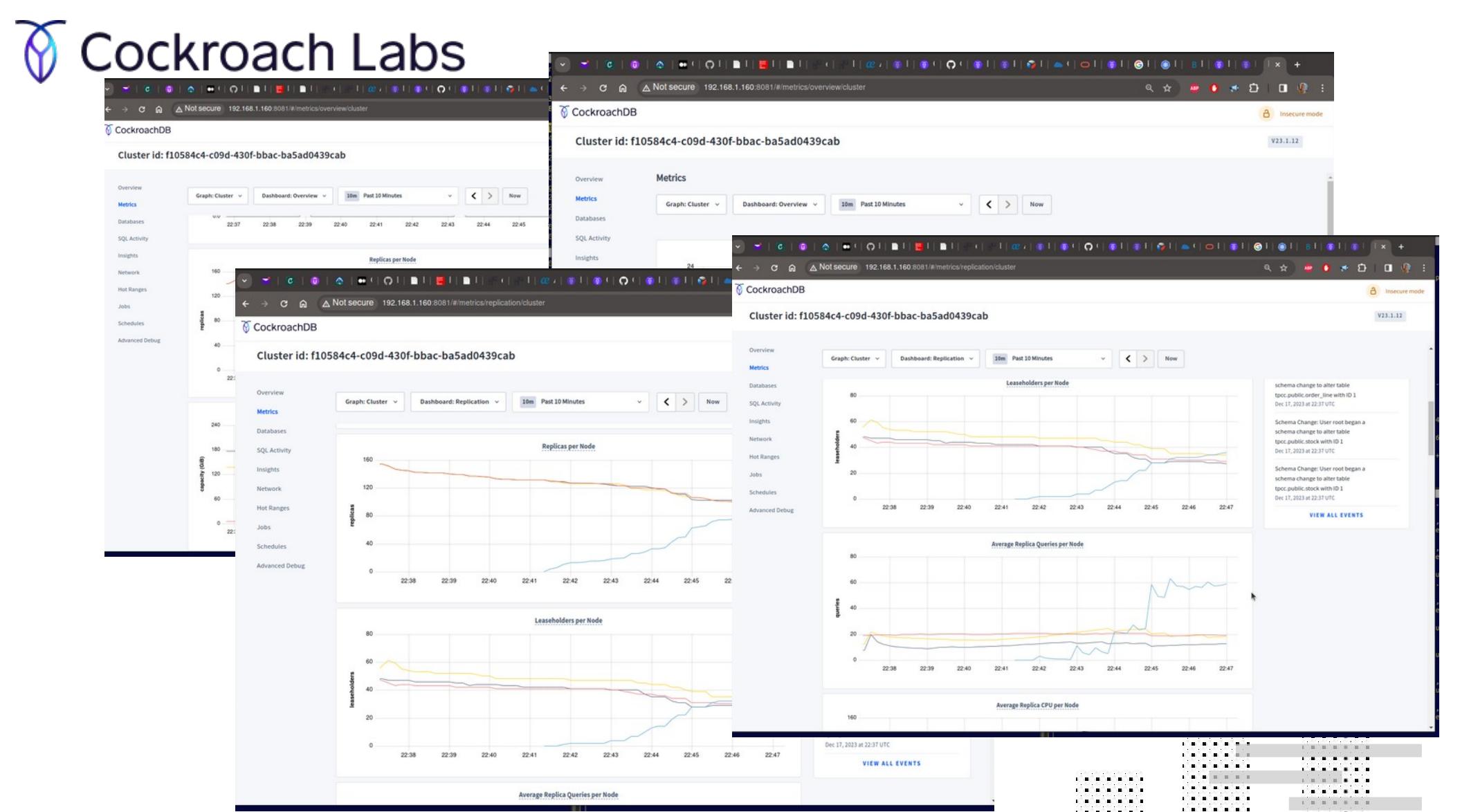
```

Time: 162ms total (execution 142ms / network 20ms)

```

root@192.168.1.161:26257>
root@192.168.1.161:26257>
root@192.168.1.161:26257>
M-? toggle key help * C-d erase/stop * C-c clear/cancel * C-r search hist * M-. hide/show prompt
vagrant@ol7demo1:~ info: "Service Unavailable", check duration: 361ms. 1 active and 0 backup servers left. 0 sessions active, 0 requeued, 0 remaining in queue.
[WARNING] 350/221620 (1797) : Server psql/cockroach2 is UP, reason: Layer7 check passed, code: 200, info: "OK", check duration: 479ms. 2 active and 0 backup servers online. 0 sessions requeued, 0 total in queue.
[WARNING] 350/221636 (1797) : Server psql/cockroach1 is UP, reason: Layer7 check passed, code: 200, info: "OK", check duration: 514ms. 3 active and 0 backup servers online. 0 sessions requeued, 0 total in queue.
[WARNING] 350/221749 (1797) : Server psql/cockroach1 is DOWN, reason: Layer7 wrong status, code: 503, info: "Service Unavailable", check duration: 510ms. 2 active and 0 backup servers left. 0 sessions active, 0 requeued, 0 remaining in queue.
[WARNING] 350/221801 (1797) : Server psql/cockroach1 is UP, reason: Layer7 check passed, code: 200, info: "OK", check duration: 306ms. 3 active and 0 backup servers online. 0 sessions requeued, 0 total in queue.
[WARNING] 350/222415 (1797) : Server psql/cockroach1 is DOWN, reason: Layer7 wrong status, code: 503, info: "Service Unavailable", check duration: 47ms. 2 active and 0 backup servers left. 0 sessions active, 0 requeued, 0 remaining in queue.
[WARNING] 350/222417 (1797) : Server psql/cockroach3 is DOWN, reason: Layer7 wrong status, code: 503, info: "Service Unavailable", check duration: 10ms. 1 active and 0 backup servers left. 0 sessions active, 0 requeued, 0 remaining in queue.
[WARNING] 350/222419 (1797) : Server psql/cockroach1 is UP, reason: Layer7 check passed, code: 200, info: "OK", check duration: 21ms. 2 active and 0 backup servers online. 0 sessions requeued, 0 total in queue.
[WARNING] 350/222421 (1797) : Server psql/cockroach3 is UP, reason: Layer7 check passed, code: 200, info: "OK", check duration: 3ms. 3 active and 0 backup servers online. 0 sessions requeued, 0 total in queue.

```



Removing a node ...

- ... gracefully:

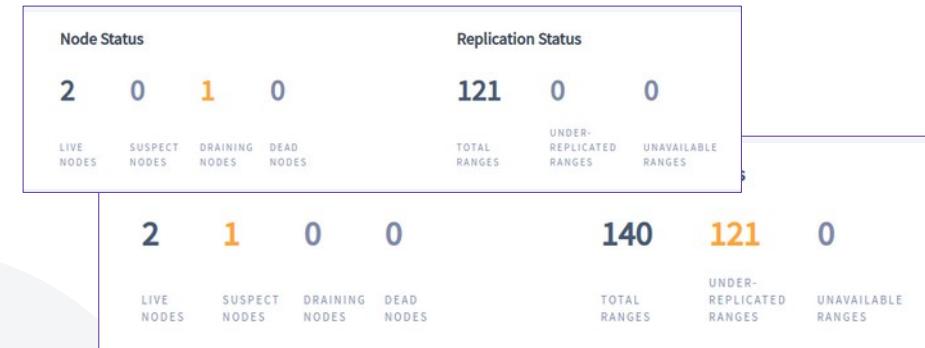
```
kill -TERM 9371 (cat node1_pid)
```

- Or

```
cockroach --insecure --host=192.168.1.161:26257 node decommission 4
```

- ... forcibly:

```
kill -9 9331 (cat node3_pid)
```





A suspect node appears:

System Load and Resource Usage														
Process ID		User	Priority	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME	COMMAND		
290	-	root	0	0	0	0	0	0	0.0	0.0	00:11:12	up 10:20, 1 user, load average: 3,33, 3,66, 3,46		
asks:	290	total,	2	running,	288	sleeping,	0	stopped,	0	zombie				
cu(s):	9.2	us,	33.1	sy,	1.9	ni,	55.7	id,	0.0	wa,	0.0	st,	0.0	st
LB Mem:	15899.3	total,			436.4	free,	13026.0	used,	2436.9	buff/cache				
LB Swap:	1953.0	total,			745.8	free,	1207.2	used.	1610.8	avail Mem				
PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME	COMMAND			
423962	Kholman	20	0	9737244	7,7g	7,7g	S	119.9	49.7	278:59.61	VBoxHeadless			
899997	Kholman	20	0	6130776	267336	99344	R	22.9	1.6	20:56.53	gnome-shell			
553227	kholman	20	0	2484912	1.0g	996.4m	S	9.3	6.5	5:43.47	VBoxHeadless			
125241	kholman	20	0	3026432	148144	70460	S	7.3	0.9	6:56.60	spotify			
190036	kholman	9	-11	2625072	19288	14808	S	7.0	0.1	5:58.09	pulseaudio			
97887	kholman	20	0	32,7g	250248	125376	S	1,3	1.5	6:46.79	chrome			
659481	kholman	20	0	1143872	175564	103424	S	1,3	1.1	0:08.61	cockroach			
20830	kholman	20	0	1098888	26282	8612	S	1.0	0.2	6:14.22	VBoxSVC			
190343	kholman	20	0	958084	43868	25436	S	1.0	0.3	1:42.11	terminator			
97933	kholman	20	0	32,4g	57480	43148	S	1.0	0.4	1:48.83	chrome			
559102	root	20	0	0	0	0	I	1,0	0,0	0:03.54	kworker/0:3-events			

khollman@KH-X20W: ~							
442.0s	0	2.0	0.2	58.7	92.3	92.3	orderStatus
442.0s	0	1.0	2.1	104.4	104.9	104.9	payment
442.0s	0	0.0	0.2	0.0	0.0	0.0	stockLevel
443.0s	0	0.0	0.2	0.0	0.0	0.0	delivery
443.0s	0	2.0	2.1	100.7	142.6	142.6	newOrder
443.0s	0	0.0	0.2	0.0	0.0	0.0	orderStatus
443.0s	0	2.0	2.1	54.5	96.5	96.5	payment
443.0s	0	0.0	0.2	0.0	0.0	0.0	stockLevel
444.0s	0	0.0	0.2	0.0	0.0	0.0	delivery
444.0s	0	1.0	2.1	159.4	159.4	159.4	newOrder
444.0s	0	0.0	0.2	0.0	0.0	0.0	orderStatus
444.0s	0	1.0	2.1	65.0	65.0	65.0	payment
444.0s	0	0.0	0.2	0.0	0.0	0.0	stockLevel
elapsed __errors__ops/sec(inst) __ops/sec(cum) __p50(ms) __p95(ms) __p99(ms) __pMax(ms)							
445.0s	0	0.0	0.2	0.0	0.0	0.0	delivery
445.0s	0	2.0	2.1	54.5	134.2	134.2	newOrder
445.0s	0	0.0	0.2	0.0	0.0	0.0	orderStatus
445.0s	0	4.0	2.1	30.4	109.1	109.1	payment
445.0s	0	1.0	0.2	79.7	79.7	79.7	stockLevel
446.0s	0	0.0	0.2	0.0	0.0	0.0	delivery
446.0s	0	0.0	2.1	0.0	0.0	0.0	newOrder
446.0s	0	1.0	0.2	71.3	71.3	71.3	orderStatus
446.0s	0	1.0	2.1	33.6	33.6	33.6	payment
446.0s	0	0.0	0.2	0.0	0.0	0.0	stockLevel
447.0s	0	0.0	0.2	0.0	0.0	0.0	delivery
447.0s	0	0.0	2.1	0.0	0.0	0.0	newOrder
447.0s	0	0.0	0.2	0.0	0.0	0.0	orderStatus
447.0s	0	2.0	2.1	100.7	121.6	121.6	payment
447.0s	0	0.0	0.2	0.0	0.0	0.0	stockLevel
448.0s	0	0.0	0.2	0.0	0.0	0.0	delivery
448.0s	0	1.0	2.1	151.0	151.0	151.0	newOrder
448.0s	0	0.0	0.2	0.0	0.0	0.0	orderStatus
448.0s	0	1.0	2.1	67.1	67.1	67.1	payment
448.0s	0	1.0	0.2	130.0	130.0	130.0	stockLevel

```
(1 row)
No more data reported on target nodes. Please verify cluster health before removing the nodes.
[vagrant@ol7demo crdb]$ [vagrant@ol7demo crdb]$ pwd
/home/vagrant/crdb
[vagrant@ol7demo crdb]$ ls -lrt
total 76
-rw-r--r--. 1 vagrant vagrant 1536 dic 17 18:46 haproxy.cfg
-rw-r----- 1 vagrant vagrant 5 dic 17 22:07 node1.pid
-rw-r----- 1 vagrant vagrant 5 dic 17 22:08 node2.pid
-rw-r----- 1 vagrant vagrant 5 dic 17 22:08 node3.pid
-rw-r----- 1 vagrant vagrant 5 dic 17 22:41 node4.pid
drwxr-x---. 5 vagrant vagrant 4096 dic 17 23:06 node4
drwxr-x---. 5 vagrant vagrant 12288 dic 17 23:08 node2
drwxr-x---. 5 vagrant vagrant 12288 dic 17 23:08 node1
drwxr-x---. 5 vagrant vagrant 12288 dic 17 23:10 node3
[vagrant@ol7demo crdb]$ cat node3.pid
7959
[vagrant@ol7demo crdb]$ ps -ef | grep 7959
vagrant 7959 1 47 22:08 pts/0 00:29:36 cockroach start --insecure --store=node3 --listen-addr=tcp://192.168.1.160:26259 --http-addr=tcp://192.168.1.160:8082 --join=tcp://192.168.1.160:26257,tcp://192.168.1.160:26258,vagrant 9088 5827 0 23:10 pts/0 00:00:00 grep --color=auto 7959
[vagrant@ol7demo crdb]$ [vagrant@ol7demo crdb]$ [vagrant@ol7demo crdb]$ [vagrant@ol7demo crdb]$ vagrant@ol7demo1:~ in queue.
[vWARNING] 350/221749 (1797) : Server psql/cockroach1 is DOWN, reason: Layer7 wrong status, code: 503, info: "Service Unavailable", check duration: 510ms. 2 active and 0 backup servers left. 0 sessions active, 0 requeued, 0 remaining in queue.
[vWARNING] 350/221801 (1797) : Server psql/cockroach1 is UP, reason: Layer7 check passed, code: 200, info: "OK", check duration: 306ms. 3 active and 0 backup servers online. 0 sessions requeued, 0 total in queue.
[vWARNING] 350/222415 (1797) : Server psql/cockroach1 is DOWN, reason: Layer7 wrong status, code: 503, info: "Service Unavailable", check duration: 47ms. 2 active and 0 backup servers left. 0 sessions active, 0 requeued, 0 remaining in queue.
[vWARNING] 350/222417 (1797) : Server psql/cockroach3 is DOWN, reason: Layer7 wrong status, code: 503, info: "Service Unavailable", check duration: 10ms. 1 active and 0 backup servers left. 0 sessions active, 0 requeued, 0 remaining in queue.
[vWARNING] 350/222419 (1797) : Server psql/cockroach1 is UP, reason: Layer7 check passed, code: 200, info: "OK", check duration: 21ms. 2 active and 0 backup servers online. 0 sessions requeued, 0 total in queue.
[vWARNING] 350/222421 (1797) : Server psql/cockroach3 is UP, reason: Layer7 check passed, code: 200, info: "OK", check duration: 3ms. 3 active and 0 backup servers online. 0 sessions requeued, 0 total in queue.

vagrant@ol7demo1:~$ vagrant@ol7demo1:~$ vagrant@ol7demo1:~$ whoami
vagrant
vagrant@ol7demo1:~$ who am i
vagrant pts/0 2023-12-17 21:29 (10.0.2.2)
```

Leaving a single node in the cluster

```
[vagrant@ol7demo crdb]$ cockroach node status --insecure --host=192.168.1.160:26257
ERROR: cannot dial server.
Is the server running?
If the server is running, check --host client-side and --advertise server-side.

failed to connect to 'host=192.168.1.160 user=root database=system': dial error (dial tcp 192.168.1.1
60:26257: connect: connection refused)
Failed running "node status"
[vagrant@ol7demo crdb]$
[vagrant@ol7demo crdb]$ cockroach node status --insecure --host=192.168.1.160:26258
  id |      address      |    sql_address    |   build   |          started_at          |
      |      updated_at      |      locality     | is_available | is_live
-----+-----+-----+-----+-----+
      |      +-----+-----+-----+-----+
  1 | 192.168.1.160:26258 | 192.168.1.160:26258 | v23.1.12 | 2023-12-17 22:08:13.82142 +0000 UTC |
2023-12-17 23:20:31.919183 +0000 UTC |           | false     | false
  2 | 192.168.1.160:26257 | 192.168.1.160:26257 | v23.1.12 | 2023-12-17 22:07:59.330224 +0000 UTC |
2023-12-17 23:20:32.529821 +0000 UTC |           | false     | false
  3 | 192.168.1.160:26259 | 192.168.1.160:26259 | v23.1.12 | 2023-12-17 22:08:22.790006 +0000 UTC |
2023-12-17 23:11:34.964193 +0000 UTC |           | false     | false
(3 rows)
[vagrant@ol7demo crdb]$
```

Questions to answer

As you were adding and removing nodes from the cluster, how did that impact performance? What kinds of metrics were you tracking to identify that impact?

- Lots of IO started due to occur due to replication, snapshot and range activity. Also CPU was affected due to increase in activity and leader reassignment.

What other kinds of behaviour did you witness as you were changing the cluster topology? How did the system handle the hard node failure differently than the graceful shutdown?

- Graceful shutdown caused a temporary drain and then the node became suspect of being unavailable but a hard kill caused it to become “dead” after the suspect period.

When you killed all of the nodes but one, what happened to the database?

- The database froze and didn't allow any connections and the log on the remaining node declared “probably not enough nodes in the cluster”.

Did the platform behave differently than you would expect in any of the above scenarios? If so please describe.

- When the database froze, I was expected some sort of attempt for the system to restart a decommissioned node. But I understand that any previous action upon a node for a given reason doesn't imply that any attempt is valid.

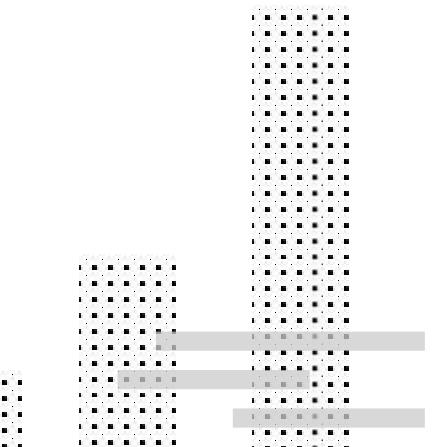
Executing a Code Example

Choosing amongst one of the available sample apps from:

Advanced Example Applications Overview

Let's look at one that gave a couple of errors:

Psycopg3





Build a Python App with CockroachDB and Psycopg 3

```
WEBAPP:          http://localhost:8080
sql:             postgresql://root@localhost:26257?sslmode=disable
```

You'll use the `sql` connection string to connect to the cluster later in this tutorial.

The database connection string

It should read a little different, as per v23.1 documentation:

postgres://<username>:<password>@<host>:<port>/<database>?<parameters>

```
vagrant@ol7demo1:~/example-app-python-psycopg3$ export DATABASE_URL="postgresql://root@192.168.1.160:26257?sslmode=disable"
vagrant@ol7demo1:~/example-app-python-psycopg3$ python3 example.py
CRITICAL:root:database connection failed
CRITICAL:root:no database or schema specified
```

The database connection

After trying different schemas, IP's, install locations:

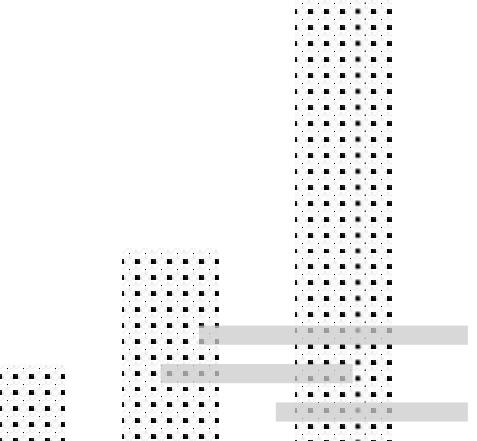
```
vagrant@ol7demo1:~/example-app-python-psycopg3$ export DATABASE_URL="postgres://root@192.168.1.161:26257/defaultdb?sslmode=disable"
vagrant@ol7demo1:~/example-app-python-psycopg3$ python3 example.py
Balances at Mon Dec 18 09:44:16 2023:
account id: 1d21bbb9-d8d7-4779-8d1d-5d4507914b42 balance: $250
account id: 9dd7d47f-7e7f-4481-9d4b-79d26c3d278a balance: $1000
Balances at Mon Dec 18 09:44:16 2023:
account id: 1d21bbb9-d8d7-4779-8d1d-5d4507914b42 balance: $350
account id: 9dd7d47f-7e7f-4481-9d4b-79d26c3d278a balance: $900
```

Next Steps?

We've arrived this far but is that it?
By no means!

Have a look at the marketplace and other cloud
vendors to see what they're doing with CockroachDB.

Or look at the true native cloud solutions offered for
CockroachDB, such as **Dedicated** or **Serverless**.



Community Blog Events Webinars Tutorials Forum

Community > Blog > How to Setup CockroachDB Cluster on Ubuntu 16.04

How to Setup CockroachDB Cluster on Ubuntu 16.04

Alibaba Clouder July 6, 2018 28,858 0

In this tutorial, we will be learning how to setup a CockroachDB cluster on an Alibaba Cloud E...

By Hitesh Jethva, Alibaba Cloud Tech Share Author. Tech Share is Alibaba Cloud's initiative to encourage the sharing of technical knowledge and best practices within the cloud community.

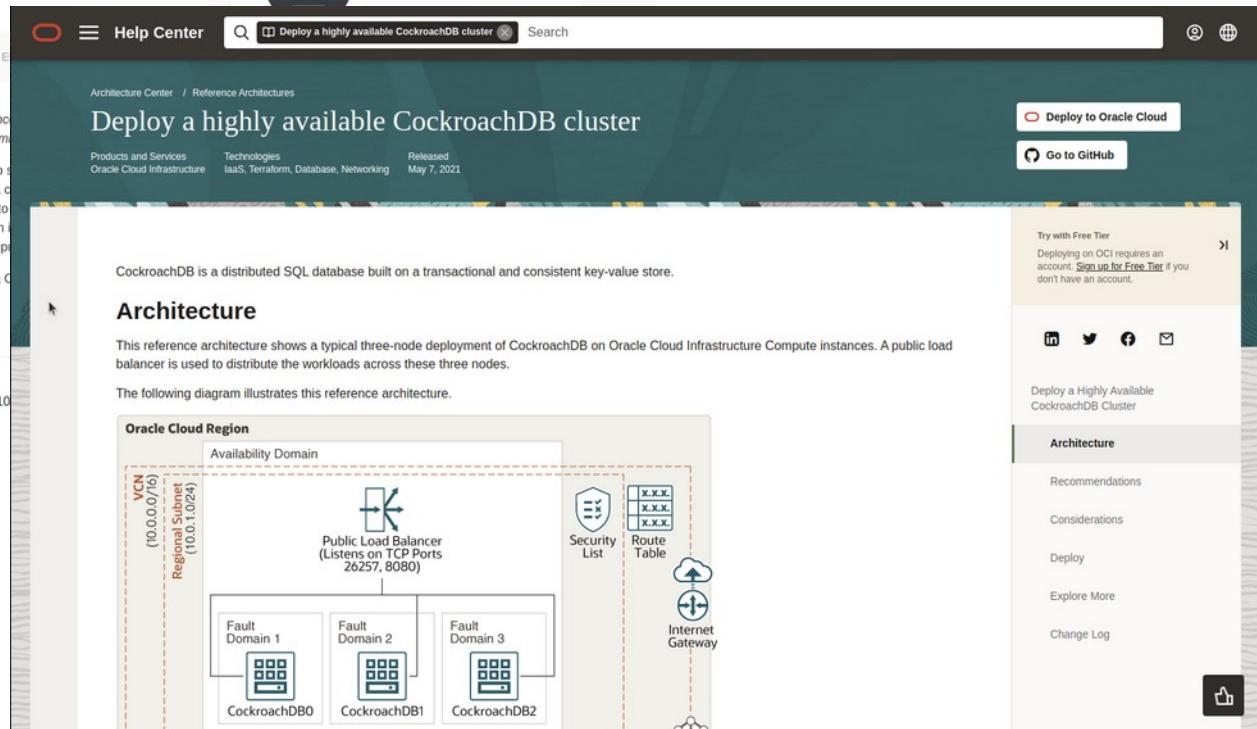
CockroachDB is a free and open source distributed SQL database that is designed to store data across multiple locations in order to deliver requested data when needed. CockroachDB is a distributed database for building global, scalable cloud services that survive disasters. It is built to handle rebalance, and recover with minimal configuration and operational overhead. You can run CockroachDB on your local computer, a single server, a corporate development cluster, or a private or public cloud.

In this tutorial, we will be learning how to setup a CockroachDB cluster on an Alibaba Cloud Compute Service (ECS) instance with Ubuntu 16.04.

Prerequisites

- Three fresh Alibaba Cloud ECS instance with Ubuntu 16.04 server installed.
- A static IP address 192.168.0.103 is configured on the first instance, 192.168.0.102 on the second instance and 192.168.0.105 is configured on the third instance.
- Minimum 2GB RAM per instance.
- A Root password is setup on each instance.

Waiting for h5-global.alimbot.aliexpress.com...



The screenshot shows the Alibaba Cloud Help Center interface. At the top, there is a search bar with the query "Deploy a highly available CockroachDB cluster". Below the search bar, the title "Deploy a highly available CockroachDB cluster" is displayed, along with the date "Released May 7, 2021". On the right side, there are buttons for "Deploy to Oracle Cloud" and "Go to GitHub". The main content area contains a detailed diagram of the architecture. The diagram illustrates a three-node deployment of CockroachDB on Oracle Cloud Infrastructure Compute instances. A Public Load Balancer (listening on TCP Ports 26257, 8080) distributes workloads across three nodes: Fault Domain 1 (CockroachDB0), Fault Domain 2 (CockroachDB1), and Fault Domain 3 (CockroachDB2). These nodes are connected to an Availability Domain. To the right, a network stack is shown with a Security List, Route Table, and Internet Gateway. A VCN (Virtual Cloud Network) and Regional Subnet (IP range [10.0.0.0/16] to [10.0.1.0/24]) are also indicated. On the left, there is a sidebar with links for "Architecture", "Recommendations", "Considerations", "Deploy", "Explore More", and "Change Log". A "Try with Free Tier" button is also present.



Cloud native solutions

The image shows a mobile device screen with a dark background. It displays two cards side-by-side, each representing a different deployment option for CockroachDB.

CockroachDB Dedicated
/* Ideal deployment for a cloud database */

- Fully managed service
- Dedicated, single-tenant hardware
- Flexible configurations
- Storage and compute-based pricing

[Get started for Free](#)

CockroachDB serverless /* Great for starter projects and evaluation */

- Fully managed service
- Shared, multi-tenant hardware
- Auto-scaling
- Consumption-based pricing

[Get started for Free](#)

CockroachDB self-hosted /* For teams that need to use their own infrastructure */

- Self-managed
- Can run in any cloud or on-prem
- Enterprise license available

[Contact us](#)

Learn more

- Performance Benchmarking with TPC-C
- Cockroach Labs - Kubernetes Overview
- Oracle Cloud - Deploy a highly available CockroachDB cluster
- Alibaba Cloud - How to Setup CockroachDB Cluster on Ubuntu 16.04
- Cockroach Labs - Monitoring and Alerting
- Github: K8s cockroachdb/cockroach-operator
- Client Connection Parameters



Thank you for this opportunity!

I would like to thank you all for the openness
in the interview process and the huge
amount of information readily available.

Keith Hollman
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[keithh@cockroachlabs.com?](mailto:keithh@cockroachlabs.com)

