

Launch 5 EC2 Ubuntu 18.04 Instances on AWS

	Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)	IPv4 Public IP
	BigChainDB Node 1	i-002c017a3857c9c9c	t2.micro	us-west-2b	running	2/2 checks ...	None	ec2-34-213-113-185.us-west-2.compute.amazonaws.com	34.213.113.185
	BigChainDB Node 2	i-005fc55a492f2c63	t2.micro	us-west-2b	running	2/2 checks ...	None	ec2-54-186-91-238.us-west-2.compute.amazonaws.com	54.186.91.238
	BigChainDB Node 3	i-045322584c05b344c	t2.micro	us-west-2b	running	2/2 checks ...	None	ec2-54-201-8-176.us-west-2.compute.amazonaws.com	54.201.8.176
	BigChainDB Node 4	i-061cb3d42eabb075f	t2.micro	us-west-2b	running	2/2 checks ...	None	ec2-54-188-123-47.us-west-2.compute.amazonaws.com	54.188.123.47
	BigChainDB Node 5	i-0feb8c6b71b129619	t2.micro	us-west-2b	running	2/2 checks ...	None	ec2-54-213-146-105.us-west-2.compute.amazonaws.com	54.213.146.105

Connect to each via SSH

```
benjaminwilkie@benjaminwilkies-MacBook-Pro-2:~$ ssh -i "/Users/benjaminwilkie/.ssh/MyFirstKeyPair.pem" ubuntu@ec2-34-213-113-185.us-west-2.compute.amazonaws.com
The authenticity of host 'ec2-34-213-113-185.us-west-2.compute.amazonaws.com (34.213.113.185)' can't be established.
ECDSA key fingerprint is SHA256:Ngril445TTe440CEmZyMF6zrvkDS34N
gU1M2pqzNFW.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'ec2-34-213-113-185' (ECDSA) to the list of known hosts.
Welcome to Ubuntu 18.04.1 LTS (GNU/Linux 4.15.0-1021-aws x86_64)

 * Documentation: https://help.ubuntu.com
 * Management: https://landscape.canonical.com
 * Support: https://ubuntu.com/advantage

System information as of Sat Feb 23 19:00:00 UTC 2019

System load: 0.0 Processes: 85
Usage of /: 13.3% of 7.69GB Users logged in: 0
Memory usage: 13% IP address for eth0: 172.31.31.4
Swap usage: 0%

Get cloud support with Ubuntu Advantage Cloud Guest:
http://www.ubuntu.com/business/services/cloud

0 packages can be updated.
0 updates are security updates.

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted
by
applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-172-31-31-45: ~
```

```
benjaminwilkie@benjaminwilkies-MacBook-Pro-2:~$ ssh -i "/Users/benjaminwilkie/.ssh/MyFirstKeyPair.pem" ubuntu@ec2-54-186-91-238.us-west-2.compute.amazonaws.com
Last login: Sat Feb 23 12:57:31 on ttys004
Benjamins-MacBook-Pro-2:~ benjaminwilkie$ ssh -i "/Users/benjaminwilkie/.ssh/MyFirstKeyPair.pem" ubuntu@ec2-54-201-8-176.us-west-2.compute.amazonaws.com
The authenticity of host 'ec2-54-201-8-176.us-west-2.compute.amazonaws.com (54.201.8.176)' can't be established.
ECDSA key fingerprint is SHA256:W0bjcFkQHfgSiWYhHTAtk+AylA6dC5p1oh
gU1M2pqzNFW.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'ec2-54-201-8-176' (ECDSA) to the list of known hosts.
Welcome to Ubuntu 18.04.1 LTS (GNU/Linux 4.15.0-1021-aws x86_64)

 * Documentation: https://help.ubuntu.com
 * Management: https://landscape.canonical.com
 * Support: https://ubuntu.com/advantage

System information as of Sat Feb 23 19:05:08 UTC 2019

System load: 0.0 Processes: 84
Usage of /: 13.3% of 7.69GB Users logged in: 0
Memory usage: 13% IP address for eth0: 172.31.19.55
Swap usage: 0%

Get cloud support with Ubuntu Advantage Cloud Guest:
http://www.ubuntu.com/business/services/cloud

0 packages can be updated.
0 updates are security updates.

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applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-172-31-19-55: ~
```

```
benjaminwilkie@benjaminwilkies-MacBook-Pro-2:~$ ssh -i "/Users/benjaminwilkie/.ssh/MyFirstKeyPair.pem" ubuntu@ec2-54-188-123-47.us-west-2.compute.amazonaws.com
System information as of Sat Feb 23 19:05:17 UTC 2019

System load: 0.08 Processes: 85
Usage of /: 13.3% of 7.69GB Users logged in: 0
Memory usage: 13% IP address for eth0: 172.31.28.45
Swap usage: 0%

Get cloud support with Ubuntu Advantage Cloud Guest:
http://www.ubuntu.com/business/services/cloud

packages can be updated.
updates are security updates.

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applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-172-31-28-45: ~
```

```
benjaminwilkie@benjaminwilkies-MacBook-Pro-2:~$ ssh -i "/Users/benjaminwilkie/.ssh/MyFirstKeyPair.pem" ubuntu@ec2-54-188-123-47.us-west-2.compute.amazonaws.com
System load: 0.08 Processes: 85
Usage of /: 13.3% of 7.69GB Users logged in: 0
Memory usage: 13% IP address for eth0: 172.31.27.9
Swap usage: 0%

* 'snap info' now shows the freshness of each channel.
Try 'snap info microk8s' for all the latest goodness.

Get cloud support with Ubuntu Advantage Cloud Guest:
http://www.ubuntu.com/business/services/cloud

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individual files in /usr/share/doc/*copyright.

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To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-172-31-27-9: ~
```

Update each VM OS-level Packages

Install Python 3.6

```

benjaminwilke@ubuntu:~$ ssh -l /ssh/MyFirstKeyPair.pem ubuntu@ip-172-31-21-45 -- ssh -l /ssh/MyFirstKeyPair.pem ubuntu@ip-172-31-21-45 -- ssh -l /ssh/MyFirstKeyPair.pem ubuntu@ip-172-31-21-45
Unpacking python3-secretstorage (3.1.1-2) ...
Selecting previously unselected package python3-keyring.
Preparing to unpack .../python3-keyring_10.6.0-1_all.deb ...
Unpacking python3-keyring (10.6.0-1) ...
Selecting previously unselected package python3-keyrings.alt.
Preparing to unpack .../python3-keyrings.alt_3.0-1_all.deb ...
Unpacking python3-keyrings.alt (3.0-1) ...
Selecting previously unselected package python3-pip.
Preparing to unpack .../55-python3-pip_9.0.1-2.3-ubuntu1_all.deb ...
Unpacking python3-pip (9.0.1-2.3-ubuntu1) ...
Selecting previously unselected package python3-setuptools.
Preparing to unpack .../56-python3-setuptools_39.0.1-2_all.deb ...
Unpacking python3-setuptools (39.0.1-2) ...
Selecting previously unselected package python3-wheel.
Preparing to unpack .../57-python3-wheel_0.30.0-2_all.deb ...
Unpacking python3-wheel (0.30.0-2) ...
Selecting previously unselected package python3-xdg.
Preparing to unpack .../58-python3-xdg_0.25-4ubuntu1_all.deb ...
Unpacking python3-xdg (0.25-4ubuntu1) ...
Setting up libquadmath0:amd64 (8.2.0-1ubuntu2-18.04) ...
Setting up libomp1:amd64 (8.2.0-1ubuntu2-18.04) ...
Setting up libatomic1:amd64 (8.2.0-1ubuntu2-18.04) ...
Setting up python-pip-whl (9.0.1-2.3-ubuntu1) ...
Setting up libcc1-0:amd64 (8.2.0-1ubuntu2-18.04) ...
Setting up make (4.1-9.1ubuntu1) ...
Setting up python3-crypto (2.6.1-2ubuntu2) ...
Setting up libtsan0:amd64 (8.2.0-1ubuntu2-18.04) ...
Setting up libasan0:amd64 (8.2.0-1ubuntu2-18.04) ...
Setting up python3-xdg (0.25-4ubuntu1) ...
Setting up python3-keyrings.alt (3.0-1) ...
Setting up linux-libc-dev:amd64 (4.15.0-45.48) ...
Setting up libdpkg-perl (1.19.0.5ubuntu2.1) ...
Setting up python3-wheel (0.30.0-2) ...
Setting up libtsan0:amd64 (8.2.0-1ubuntu2-18.04) ...
Setting up gcc-7-base:amd64 (7.3.0-27ubuntu1-18.04) ...
Setting up binutils-common:amd64 (2.30-2ubuntu1-18.04) ...
Setting up libfile-fcntllock-perl (0.22-3build2) ...
Setting up libmpx2:amd64 (8.2.0-1ubuntu2-18.04) ...
Processing triggers for libc-bin (2.27-3ubuntu1) ...
Setting up libfakeroot:amd64 (1.22-2ubuntu1) ...
Setting up libalgorithm-diff-perl (1.19.03-1) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
[Progress: [====] [45%] [#####])

benjaminwilke@ubuntu:~$ ssh -l /ssh/MyFirstKeyPair.pem ubuntu@ip-172-31-29-23 -- ssh -l /ssh/MyFirstKeyPair.pem ubuntu@ip-172-31-29-23
Unpacking python3-lib2to3 (3.6.7-1-18.04) ...
Selecting previously unselected package python3-distutils.
Preparing to unpack .../34-python3-distutils_3.6.7-1-18.04_all.deb ...
Unpacking python3-distutils (3.6.7-1-18.04) ...
Selecting previously unselected package dh-python.
Preparing to unpack .../35-dh-python_3.20180325ubuntu2_all.deb ...
Unpacking dh-python (3.20180325ubuntu2) ...
Selecting previously unselected package libfakeroot:amd64.
Preparing to unpack .../36-libfakeroot_1.22-2ubuntu1_amd64.deb ...
Unpacking libfakeroot:amd64 (1.22-2ubuntu1) ...
Selecting previously unselected package fakeroot.
Preparing to unpack .../37-fakeroot_1.22-2ubuntu1_amd64.deb ...
Unpacking fakeroot (1.22-2ubuntu1) ...
Selecting previously unselected package libalgorithmdiff-perl.
Preparing to unpack .../38-libalgorithmdiff-perl_1.19.03-1_all.deb ...
Unpacking libalgorithmdiff-perl (1.19.03-1) ...
Selecting previously unselected package libalgorithmdiff-xs-perl.
Preparing to unpack .../39-libalgorithmdiff-xs-perl_0.04-5_amd64.deb ...
Unpacking libalgorithmdiff-xs-perl (0.04-5) ...
Selecting previously unselected package libalgorithmmerge-perl.
Preparing to unpack .../40-libalgorithmmerge-perl_0.08-3_all.deb ...
Unpacking libalgorithmmerge-perl (0.08-3) ...
Selecting previously unselected package libexpat1-dev:amd64.
Preparing to unpack .../41-libexpat1-dev_2.2.5-3_amd64.deb ...
Unpacking libexpat1-dev:amd64 (2.2.5-3) ...
Selecting previously unselected package libfile-fcntllock-perl.
Preparing to unpack .../42-libfile-fcntllock-perl_0.22-3build2_amd64.deb ...
Unpacking libfile-fcntllock-perl (0.22-3build2) ...
Selecting previously unselected package libpython3.6-dev:amd64.
Preparing to unpack .../43-libpython3.6-dev_3.6.7-1-18.04_amd64.deb ...
Unpacking libpython3.6-dev:amd64 (3.6.7-1-18.04) ...
[Progress: [====] [45%] [#####])

benjaminwilke@ubuntu:~$ ssh -l /ssh/MyFirstKeyPair.pem ubuntu@ip-172-31-19-04 -- ssh -l /ssh/MyFirstKeyPair.pem ubuntu@ip-172-31-19-04
Unpacking libitm1:amd64 (8.2.0-1ubuntu2-18.04) ...
Selecting previously unselected package libatomic1:amd64.
Unpacking libatomic1:amd64 (8.2.0-1ubuntu2-18.04) ...
Selecting previously unselected package libasan4:amd64.
Preparing to unpack .../15-libatomic1_8.2.0-1ubuntu2-18.04_amd64.deb ...
Unpacking libasan4:amd64 (8.2.0-1ubuntu2-18.04) ...
Selecting previously unselected package liblsan0:amd64.
Preparing to unpack .../16-liblsan4_7.3.0-27ubuntu1-18.04_amd64.deb ...
Unpacking liblsan4:amd64 (7.3.0-27ubuntu1-18.04) ...
Selecting previously unselected package libtsan0:amd64.
Preparing to unpack .../17-libtsan0_8.2.0-1ubuntu2-18.04_amd64.deb ...
Unpacking libtsan0:amd64 (8.2.0-1ubuntu2-18.04) ...
Selecting previously unselected package libubsan0:amd64.
Preparing to unpack .../19-libubsan0_7.3.0-27ubuntu1-18.04_amd64.deb ...
Unpacking libubsan0:amd64 (7.3.0-27ubuntu1-18.04) ...
Selecting previously unselected package liblkrts5:amd64.
Preparing to unpack .../20-liblkrts5_7.3.0-27ubuntu1-18.04_amd64.deb ...
Unpacking liblkrts5:amd64 (7.3.0-27ubuntu1-18.04) ...
Selecting previously unselected package libmpx2:amd64.
Preparing to unpack .../21-libmpx2_8.2.0-1ubuntu2-18.04_amd64.deb ...
Unpacking libmpx2:amd64 (8.2.0-1ubuntu2-18.04) ...
Selecting previously unselected package libquadmath0:amd64.
Preparing to unpack .../22-libquadmath0_8.2.0-1ubuntu2-18.04_amd64.deb ...
Unpacking libquadmath0:amd64 (8.2.0-1ubuntu2-18.04) ...
Selecting previously unselected package libgcc-7-dev:amd64.
Preparing to unpack .../23-libgcc-7-dev_7.3.0-27ubuntu1-18.04_amd64.deb ...
Unpacking libgcc-7-dev:amd64 (7.3.0-27ubuntu1-18.04) ...
Selecting previously unselected package gcc-7.
Preparing to unpack .../24-gcc-7_7.3.0-27ubuntu1-18.04_amd64.deb ...
Unpacking gcc-7 (7.3.0-27ubuntu1-18.04) ...
Selecting previously unselected package gcc.
Preparing to unpack .../25-gcc_4%3a7.3.0-3ubuntu2.1_amd64.deb ...
Unpacking gcc (4.7.3-0-3ubuntu2.1) ...
Selecting previously unselected package libstdc++-7-dev:amd64.
Preparing to unpack .../26-libstdc++-7-dev_7.3.0-27ubuntu1-18.04_amd64.deb ...
Unpacking libstdc++-7-dev:amd64 (7.3.0-27ubuntu1-18.04) ...
Selecting previously unselected package g++-7.
Preparing to unpack .../27-g++-7_7.3.0-27ubuntu1-18.04_amd64.deb ...
Unpacking g++-7 (7.3.0-27ubuntu1-18.04) ...
[Progress: [====] [27%] [#####])

benjaminwilke@ubuntu:~$ ssh -l /ssh/MyFirstKeyPair.pem ubuntu@ip-172-31-27-9 -- ssh -l /ssh/MyFirstKeyPair.pem ubuntu@ip-172-31-27-9
Unpacking pcc-7-base:amd64 (7.3.0-27ubuntu1-18.04_amd64.deb) ...
Selecting previously unselected package libisl19:amd64.
Preparing to unpack .../08-libisl19_0.19-1_amd64.deb ...
Unpacking libisl19:amd64 (0.19-1) ...
Selecting previously unselected package libmpc3:amd64.
Preparing to unpack .../09-libmpc3_1.1.0-1_amd64.deb ...
Unpacking libmpc3:amd64 (1.1.0-1) ...
Selecting previously unselected package cpp-7.
Preparing to unpack .../10-cpp-7_7.3.0-27ubuntu1-18.04_amd64.deb ...
Unpacking cpp-7 (7.3.0-27ubuntu1-18.04) ...
Selecting previously unselected package cpp.
Preparing to unpack .../11-cpp_4%3a7.3.0-3ubuntu2.1_amd64.deb ...
Unpacking cpp (4.7.3-0-3ubuntu2.1) ...
Selecting previously unselected package libcc1-0:amd64.
Preparing to unpack .../12-libcc1-0_8.2.0-1ubuntu2-18.04_amd64.deb ...
Unpacking libcc1-0:amd64 (8.2.0-1ubuntu2-18.04) ...
Selecting previously unselected package libomp1:amd64.
Preparing to unpack .../13-libomp1_8.2.0-1ubuntu2-18.04_amd64.deb ...
Unpacking libomp1:amd64 (8.2.0-1ubuntu2-18.04) ...
Selecting previously unselected package libitm1:amd64.
Preparing to unpack .../14-libitm1_8.2.0-1ubuntu2-18.04_amd64.deb ...
Unpacking libitm1:amd64 (8.2.0-1ubuntu2-18.04) ...
Selecting previously unselected package libatomic1:amd64.
Preparing to unpack .../15-libatomic1_8.2.0-1ubuntu2-18.04_amd64.deb ...
Unpacking libatomic1:amd64 (8.2.0-1ubuntu2-18.04) ...
[Progress: [====] [27%] [#####]]

benjaminwilke@ubuntu:~$ ssh -l /ssh/MyFirstKeyPair.pem ubuntu@ip-172-31-23-148 -- ssh -l /ssh/MyFirstKeyPair.pem ubuntu@ip-172-31-23-148
[Progress: [====] [27%] [#####]]

```

Install BigChainDB Server

Configure BigChainDB Server

```
benjaminwilkеле ubuntu@ip-172-31-31-45: ~ ssh -i /ssh/MYFirstKeyPair.pem ubuntu@ec2-54-188-123-47.us-west-2.compute.amazonaws.com - 100% [root@ip-172-31-31-45 ~]# Running setup.py install for logstats ... done Found existing installation: requests 2.18.4 Not uninstalling requests at /usr/lib/python3/dist-packages, outside environment /usr Running setup.py install for setproctitle ... done Successfully installed PyNaCl-1.1.2 Werkzeug-0.14.1 aiohttp-3.5.4 aniso8601-4.1.0 async-timeout-3.0.1 atomicwrites-1.3.0 base58-2.0.0.1 bigchaindb-0.10.0 bigchaindb-abci-0.5.1 cffi-1.12.1 colorlog-4.0 coverage-4.5.2 cryptoconditions-0.8.0 cryptography-2.1.1 flask-1.0.2 flask-cors-3.0.7 flask-restful-0.3.7 gevent-1.4.0 greenlet-0.4.15 unicorn-19.9.0 idna-ssl-1.1.0 itsdangerous-1.1.0 jsonschema-2.5.1 logstats-0.2.1 more-itertools-6.0.0 multidict-4.5.2 packaging-18.0 pluggy-0.8.1 protobuf-3.6.1 py-1.8.0 pytest-4.3.0 pytest-cov-2.6.1 pytest-asyncio-3.7.2 pyasn1-0.2.0 pycares-2.19.0 pytz-2018.9 requests-2.21.0 setproctitle-1.1.10 typing-extensions-3.7.2 yaml-1.3.0 [root@ip-172-31-31-45 ~]# $ bigchaindb config INFO:bigchaindb.config_utils:Cannot find config file '/home/ubuntu/.bigchaindb' Generating default configuration for backend localmongodb API Server bind? (default 'localhost:9984'): 0.0.0.0:9984 WebSocket Server scheme? (default 'ws'): WebSocket Server host? (default 'localhost'): WebSocket Server port? (default '9985'): Database host? (default 'localhost'): Database port? (default '27017'): Database name? (default 'bigchain'): Tendermint host? (default 'localhost'): Tendermint port? (default '26657') Configuration written to /home/ubuntu/.bigchaindb Ready to go! [root@ip-172-31-31-45 ~]# $ [root@ip-172-31-29-232: ~]# Running setup.py install for bigchaindb-abci ... done Found existing installation: cryptography 2.1.4 Not uninstalling cryptography at /usr/lib/python3/dist-packages, outside environment /usr Running setup.py install for pycparser ... done Found existing installation: pycparser 2.14 Not uninstalling pycparser at /usr/lib/python3/dist-packages, outside environment /usr Running setup.py install for cryptoconditions ... done Found existing installation: jsonschema 2.6.0 Not uninstalling jsonschema at /usr/lib/python3/dist-packages, outside environment /usr Running setup.py install for logstats ... done Found existing installation: requests 2.18.4 Not uninstalling requests at /usr/lib/python3/dist-packages, outside environment /usr Running setup.py install for setproctitle ... done Successfully installed PyNaCl-1.1.2 Werkzeug-0.14.1 aiohttp-3.5.4 aniso8601-4.1.0 async-timeout-3.0.1 atomicwrites-1.3.0 base58-2.0.0.1 bigchaindb-0.10.0 bigchaindb-abci-0.5.1 cffi-1.12.1 colorlog-4.0 coverage-4.5.2 cryptoconditions-0.8.0 cryptography-2.1.1 flask-1.0.2 flask-cors-3.0.7 flask-restful-0.3.7 gevent-1.4.0 greenlet-0.4.15 unicorn-19.9.0 idna-ssl-1.1.0 itsdangerous-1.1.0 jsonschema-2.5.1 logstats-0.2.1 more-itertools-6.0.0 multidict-4.5.2 packaging-18.0 pluggy-0.8.1 protobuf-3.6.1 py-1.8.0 pytest-4.3.0 pytest-cov-2.6.1 pytest-asyncio-3.7.2 pyasn1-0.2.0 pycares-2.19.0 pytz-2018.9 requests-2.21.0 setproctitle-1.1.10 typing-extensions-3.7.2 yaml-1.3.0 [root@ip-172-31-29-232: ~]# $ bigchaindb configure INFO:bigchaindb.config_utils:Cannot find config file '/home/ubuntu/.bigchaindb' Generating default configuration for backend localmongodb API Server bind? (default 'localhost:9984'): 0.0.0.0:9984 WebSocket Server scheme? (default 'ws'): WebSocket Server host? (default 'localhost'): WebSocket Server port? (default '9985'): Database host? (default 'localhost'): Database port? (default '27017'): Database name? (default 'bigchain'): Tendermint host? (default 'localhost'): Tendermint port? (default '26657') Configuration written to /home/ubuntu/.bigchaindb Ready to go! [root@ip-172-31-19-55: ~]# [root@ip-172-31-21-27-9: ~]# Running setup.py install for idna-ssl ... done Found existing installation: cryptography 2.1.4 Not uninstalling cryptography at /usr/lib/python3/dist-packages, outside environment /usr Running setup.py install for pycparser ... done Found existing installation: pycparser 2.14 Not uninstalling pycparser at /usr/lib/python3/dist-packages, outside environment /usr Running setup.py install for cryptoconditions ... done Found existing installation: jsonschema 2.6.0 Not uninstalling jsonschema at /usr/lib/python3/dist-packages, outside environment /usr Running setup.py install for logstats ... done Found existing installation: requests 2.18.4 Not uninstalling requests at /usr/lib/python3/dist-packages, outside environment /usr Running setup.py install for bigchaindb-abci ... done Found existing installation: bigchaindb-abci 0.1.0 Not uninstalling bigchaindb-abci at /usr/lib/python3/dist-packages, outside environment /usr Running setup.py install for pycparser ... done Found existing installation: pycparser 2.14 Not uninstalling pycparser at /usr/lib/python3/dist-packages, outside environment /usr Running setup.py install for cryptoconditions ... done Found existing installation: jsonschema 2.6.0 Not uninstalling jsonschema at /usr/lib/python3/dist-packages, outside environment /usr Running setup.py install for logstats ... done Found existing installation: requests 2.18.4 Not uninstalling requests at /usr/lib/python3/dist-packages, outside environment /usr Running setup.py install for bigchaindb ... done Successfully installed PyNaCl-1.1.2 Werkzeug-0.14.1 aiohttp-3.5.4 aniso8601-4.1.0 async-timeout-3.0.1 atomicwrites-1.3.0 base58-2.0.0.1 bigchaindb-0.10.0 bigchaindb-abci-0.5.1 cffi-1.12.1 colorlog-4.0 coverage-4.5.2 cryptoconditions-0.8.0 cryptography-2.1.1 flask-1.0.2 flask-cors-3.0.7 flask-restful-0.3.7 gevent-1.4.0 greenlet-0.4.15 unicorn-19.9.0 idna-ssl-1.1.0 itsdangerous-1.1.0 jsonschema-2.5.1 logstats-0.2.1 more-itertools-6.0.0 multidict-4.5.2 packaging-18.0 pluggy-0.8.1 protobuf-3.6.1 py-1.8.0 pytest-4.3.0 pytest-cov-2.6.1 pytest-asyncio-3.7.2 pyasn1-0.2.0 pycares-2.19.0 pytz-2018.9 requests-2.21.0 setproctitle-1.1.10 typing-extensions-3.7.2 yaml-1.3.0 [root@ip-172-31-21-27-9: ~]# $ bigchaindb configure INFO:bigchaindb.config_utils:Cannot find config file '/home/ubuntu/.bigchaindb' Generating default configuration for backend localmongodb API Server bind? (default 'localhost:9984'): 0.0.0.0:9984 WebSocket Server scheme? (default 'ws'): WebSocket Server host? (default 'localhost'): WebSocket Server port? (default '9985'): Database host? (default 'localhost'): Database port? (default '27017'): Database name? (default 'bigchain'): Tendermint host? (default 'localhost'): Tendermint port? (default '26657') Configuration written to /home/ubuntu/.bigchaindb Ready to go! [root@ip-172-31-21-27-9: ~]# $ [root@ip-172-31-27-9: ~]# Running setup.py install for requests ... done Found existing installation: requests 2.18.4 Not uninstalling requests at /usr/lib/python3/dist-packages, outside environment /usr Running setup.py install for setproctitle ... done Successfully installed PyNaCl-1.1.2 Werkzeug-0.14.1 aiohttp-3.5.4 aniso8601-4.1.0 async-timeout-3.0.1 atomicwrites-1.3.0 base58-2.0.0.1 bigchaindb-0.10.0 bigchaindb-abci-0.5.1 cffi-1.12.1 colorlog-4.0 coverage-4.5.2 cryptoconditions-0.8.0 cryptography-2.1.1 flask-1.0.2 flask-cors-3.0.7 flask-restful-0.3.7 gevent-1.4.0 greenlet-0.4.15 unicorn-19.9.0 idna-ssl-1.1.0 itsdangerous-1.1.0 jsonschema-2.5.1 logstats-0.2.1 more-itertools-6.0.0 multidict-4.5.2 packaging-18.0 pluggy-0.8.1 protobuf-3.6.1 py-1.8.0 pytest-4.3.0 pytest-cov-2.6.1 pytest-asyncio-3.7.2 pyasn1-0.2.0 pycares-2.19.0 pytz-2018.9 requests-2.21.0 setproctitle-1.1.10 typing-extensions-3.7.2 yaml-1.3.0 [root@ip-172-31-27-9: ~]# $ bigchaindb configure INFO:bigchaindb.config_utils:Cannot find config file '/home/ubuntu/.bigchaindb' Generating default configuration for backend localmongodb API Server bind? (default 'localhost:9984'): 0.0.0.0:9984 WebSocket Server scheme? (default 'ws'): WebSocket Server host? (default 'localhost'): WebSocket Server port? (default '9985'): Database host? (default 'localhost'): Database port? (default '27017'): Database name? (default 'bigchain'): Tendermint host? (default 'localhost'): Tendermint port? (default '26657') Configuration written to /home/ubuntu/.bigchaindb Ready to go! [root@ip-172-31-27-9: ~]# $
```

Install (and Start) MongoDB

```

benjaminwilke@ubuntu:~$ ssh -l jessf@ec2-54-201-8-176.us-west-2.compute.amazonaws.com -t
Preparing to unpack .../11-mongodb-clients_1%3a3.6.3-0ubuntu1_amd64...
Unpacking mongodb-clients (1:3.6.3-0ubuntu1) ...
Selecting previously unselected package mongodb-server-core.
Preparing to unpack .../12-mongodb-server-core_1%3a3.6.3-0ubuntu1_amd64.deb ...
Unpacking mongodb-server-core (1:3.6.3-0ubuntu1) ...
Selecting previously unselected package mongodb-server.
Preparing to unpack .../13-mongodb-server_1%3a3.6.3-0ubuntu1_all.deb ...
Unpacking mongodb-server (1:3.6.3-0ubuntu1) ...
Selecting previously unselected package mongodb.
Preparing to unpack .../14-mongodb_1%3a3.6.3-0ubuntu1_amd64.deb ...
Unpacking mongodb (1:3.6.3-0ubuntu1) ...
Setting up libboost-iostreams1.65.1:amd64 (1.65.1+dfsg-0ubuntu5) ...
Processing triggers for ureadahead (0.100.0-20) ...
Setting up libstemmer0:amd64 (0+svn585-1build1) ...
Setting up libboost-system1.65.1:amd64 (1.65.1+dfsg-0ubuntu5) ...
Setting up libtcmalloc-minimal4 (2.5-2.2ubuntu3) ...
Setting up libgoogle-perftools4 (2.5-2.2ubuntu3) ...
Processing triggers for libc-bin (2.27-3ubuntu1) ...
Setting up libsnappy1v5:amd64 (1.1.7-1) ...
Processing triggers for systemd (237-3ubuntu10.13) ...
Processing triggers for libc-bin (2.27-3ubuntu1) ...
Processing triggers for libsnappy1v5:amd64 (2.8.39-9) ...
Setting up libpcrecpp0v5:amd64 (2.8.39-9) ...
Setting up libyaml-cpp0.v5v5:amd64 (0.5.2-4ubuntu1) ...
Setting up libboost-program-options1.65.1:amd64 (1.65.1+dfsg-0ubuntu5) ...
Setting up mongo-tools (3.6.3-0ubuntu1) ...
Setting up libboost-fs1.65.1:amd64 (1.65.1+dfsg-0ubuntu5) ...
Setting up mongodb-server-core (1:3.6.3-0ubuntu1) ...
Setting up mongodb-clients (1:3.6.3-0ubuntu1) ...
Setting up mongodb-server (1:3.6.3-0ubuntu1) ...
Created symlink /lib/systemd/system/multi-user.target.wants/mongodb.service → /lib/systemd/system/mongodb.service.
Setting up mongodb (1:3.6.3-0ubuntu1) ...
Processing triggers for libc-bin (2.27-3ubuntu1) ...
Processing triggers for systemd (237-3ubuntu10.13) ...
Processing triggers for ureadahead (0.100.0-20) ...
ubuntu@ip-172-31-31-45: ~ [ ]
```



```

benjaminwilke@ubuntu:~$ ssh -l jessf@ec2-54-213-146-105.us-west-2.compute.amazonaws.com -t
Selecting previously unselected package mongodb.
Preparing to unpack .../11-mongodb-clients_1%3a3.6.3-0ubuntu1_amd64...
Unpacking mongodb (1:3.6.3-0ubuntu1) ...
Selecting previously unselected package libboost-filesystem1.65.1:amd64.
Preparing to unpack .../01-libboost-filesystem1.65.1-1.65.1+dfsg-0ubuntu5_amd64.deb ...
Unpacking libboost-filesystem1.65.1:amd64 (1.65.1+dfsg-0ubuntu5) ...
Selecting previously unselected package libboost-iostreams1.65.1:amd64.
Preparing to unpack .../02-libboost-iostreams1.65.1-1.65.1+dfsg-0ubuntu5_amd64.deb ...
Unpacking libboost-iostreams1.65.1:amd64 (1.65.1+dfsg-0ubuntu5) ...
Selecting previously unselected package libboost-program-options1.65.1:amd64.
Preparing to unpack .../03-libboost-program-options1.65.1-1.65.1+dfsg-0ubuntu5_amd64.deb ...
Unpacking libboost-program-options1.65.1:amd64 (1.65.1+dfsg-0ubuntu5) ...
Selecting previously unselected package libtcmalloc-minimal4.
Preparing to unpack .../04-libtcmalloc-minimal4.2.5-2.2ubuntu3_amd64.deb ...
Unpacking libtcmalloc-minimal4 (2.5-2.2ubuntu3) ...
Selecting previously unselected package libgoogle-perftools4.
Preparing to unpack .../05-libgoogle-perftools4.2.5-2.2ubuntu3_amd64.deb ...
Unpacking libgoogle-perftools4 (2.5-2.2ubuntu3) ...
Selecting previously unselected package libpcrecpp0v5:amd64.
Preparing to unpack .../06-libpcrecpp0v5:amd64 (2.8.39-9) ...
Unpacking libpcrecpp0v5:amd64 (2.8.39-9) ...
Selecting previously unselected package libstemmer0:amd64.
Preparing to unpack .../07-libstemmer0:0+svn585-1build1_amd64.deb ...
Unpacking libstemmer0:amd64 (0+svn585-1build1) ...
Selecting previously unselected package libyaml-cpp0.v5v5:amd64.
Preparing to unpack .../08-libyaml-cpp0.v5v5:amd64 (0.5.2-4ubuntu1) ...
Unpacking libyaml-cpp0.v5v5:amd64 (0.5.2-4ubuntu1) ...
Selecting previously unselected package mongo-tools.
Preparing to unpack .../09-mongo-tools_3.6.3-0ubuntu1_amd64.deb ...
Unpacking mongo-tools (3.6.3-0ubuntu1) ...
Selecting previously unselected package libsnappy1v5:amd64.
Preparing to unpack .../10-libsnappy1v5:1.1.7-1_amd64.deb ...
Unpacking libsnappy1v5:1.1.7-1_amd64.deb ...
Selecting previously unselected package mongodb-clients.
Preparing to unpack .../11-mongodb-clients_1%3a3.6.3-0ubuntu1_amd64.deb ...
Unpacking mongodb-clients (1:3.6.3-0ubuntu1) ...
Selecting previously unselected package mongodb-server-core.
Preparing to unpack .../12-mongodb-server-core_1%3a3.6.3-0ubuntu1_amd64.deb ...
Progress: [ 47%] [#########################################.....]
```



```

benjaminwilke@ubuntu:~$ ssh -l jessf@ec2-54-213-213-146-105.us-west-2.compute.amazonaws.com -t
unpacking mongodb (1:3.6.3-0ubuntu1) ...
etting up libboost-iostreams1.65.1:amd64 (1.65.1+dfsg-0ubuntu5) ...
rocessing triggers for ureadahead (0.100.0-20) ...
etting up libstemmer0:amd64 (0+svn585-1build1) ...
etting up libtcmalloc-minimal4 (1.65.1+dfsg-0ubuntu5) ...
etting up libtcmalloc-minimal4 (2.5-2.2ubuntu3) ...
rocessing triggers for libc-bin (2.27-3ubuntu1) ...
etting up libsnappy1v5:amd64 (1.1.7-1) ...
rocessing triggers for systemd (237-3ubuntu10.13) ...
rocessing triggers for man-db (2.8.3-2ubuntu0.1) ...
etting up libpcrecpp0v5:amd64 (2.8.39-9) ...
etting up libyaml-cpp0.v5v5:amd64 (0.5.2-4ubuntu1) ...
etting up libboost-program-options1.65.1:amd64 (1.65.1+dfsg-0ubuntu5) ...
etting up mongo-tools (3.6.3-0ubuntu1) ...
etting up libboost-fs1.65.1:amd64 (1.65.1+dfsg-0ubuntu5) ...
etting up mongodb-server-core (1:3.6.3-0ubuntu1) ...
etting up mongodb-clients (1:3.6.3-0ubuntu1) ...
etting up mongodb-server (1:3.6.3-0ubuntu1) ...
reated symlink /etc/systemd/system/multi-user.target.wants/mongodb.service → /lib/systemd/system/mongodb.service.
etting up mongodb (1:3.6.3-0ubuntu1) ...
rocessing triggers for libc-bin (2.27-3ubuntu1) ...
rocessing triggers for systemd (237-3ubuntu10.13) ...
rocessing triggers for ureadahead (0.100.0-20) ...
buntu@ip-172-31-28-45: ~ [ ]
```



```

benjaminwilke@ubuntu:~$ ssh -l jessf@ec2-54-213-213-146-105.us-west-2.compute.amazonaws.com -t
Selecting previously unselected package mongodb.
Preparing to unpack .../14-mongodb_1%3a3.6.3-0ubuntu1_amd64.deb ...
Unpacking mongodb (1:3.6.3-0ubuntu1) ...
Setting up libboost-iostreams1.65.1:amd64 (1.65.1+dfsg-0ubuntu5) ...
Processing triggers for ureadahead (0.100.0-20) ...
Setting up libstemmer0:amd64 (0+svn585-1build1) ...
Setting up libboost-system1.65.1:amd64 (1.65.1+dfsg-0ubuntu5) ...
Setting up libtcmalloc-minimal4 (2.5-2.2ubuntu3) ...
Setting up libgoogle-perftools4 (2.5-2.2ubuntu3) ...
Processing triggers for libc-bin (2.27-3ubuntu1) ...
Setting up libsnappy1v5:amd64 (1.1.7-1) ...
Processing triggers for systemd (237-3ubuntu10.13) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Setting up libpcrecpp0v5:amd64 (2.8.39-9) ...
Setting up libyaml-cpp0.v5v5:amd64 (0.5.2-4ubuntu1) ...
Setting up libboost-program-options1.65.1:amd64 (1.65.1+dfsg-0ubuntu5) ...
Setting up mongo-tools (3.6.3-0ubuntu1) ...
Setting up libboost-fs1.65.1:amd64 (1.65.1+dfsg-0ubuntu5) ...
Setting up mongodb-server-core (1:3.6.3-0ubuntu1) ...
Setting up mongodb-clients (1:3.6.3-0ubuntu1) ...
Setting up mongodb-server (1:3.6.3-0ubuntu1) ...
reated symlink /etc/systemd/system/multi-user.target.wants/mongodb.service → /lib/systemd/system/mongodb.service.
Setting up mongodb (1:3.6.3-0ubuntu1) ...
Processing triggers for libc-bin (2.27-3ubuntu1) ...
Processing triggers for systemd (237-3ubuntu10.13) ...
Processing triggers for ureadahead (0.100.0-20) ...
Progress: [ 99%] [#########################################.....]
```

Install Tendermint

Start Configuring Tendermint

I cannot finish configuring Tendermint until we have some more information from all the nodes, but I can start the service now.

As the Coordinator – collect hostname, pub_key.value and node_id from all other Members (nodes)

Each BigchainDB node is identified by its:

- `hostname`, i.e. the node's DNS subdomain, such as `bnode.example.com`, or its IP address, such as
`46.145.17.32`
 - Tendermint `pub_key.value`
 - Tendermint `node_id`

Viewing the priv_validator.json file in each instance (to get pub_key.value)

```

<iv_validator.json> [noeol] 14L, 406C          1,1      All  <_validator.json> [noeol] 14L, 406C          1,1      All  "priv_validator.json" [noeol] 14L, 406C          1,1      All
benjaminwilke@ubuntu:~$ ssh -i ~/ssh/MyFirstKeyPair.pem ubuntu@ip-172-31-29-232 ~ ssh -i ~/ssh/MyFirstKeyPair.pem ubuntu@ec2-54-188-123-47.us-west-2.compute.amazonaws.com
"address": "FC02F0BDB43202CF80F98EC61F203B0B9370BD9",
"pub_key": {
  "type": "tendermint/PubKeyEd25519",
  "value": "CzPewu/vxoUuEuTAh2cenSf8lwFTUr40W7XQIkFsFs="
},
"last_height": "0",
"last_round": "0",
"last_step": 0,
"priv_key": {
  "type": "tendermint/PrivKeyEd25519",
  "value": "bEVz+kTYxz8wL3o5t9NlN4FrxxKA10MnD0CRGZ4dgL5xmkTC+/GjH64SSMCH2x6dJzXCUVNSvg5btldAISwWw=="
}

"address": "1C37CEBBCA68693BA4FB0988D8887EC87A7AD9",
"pub_key": {
  "type": "tendermint/PubKeyEd25519",
  "value": "gT2j1ycVez7L3yhe0VkJZ3+bx36EhJJotMV3vOPmsLh4="
},
"last_height": "0",
"last_round": "0",
"last_step": 0,
"priv_key": {
  "type": "tendermint/PrivKeyEd25519",
  "value": "Vzk3tgkY1kZn0D091Krc638SrL0cB4i+v1g5IFg0qBPvapJxV7PsvfKF7RWnf5vhfoStkm0xExB4+awuHg=="
}

"address": "0FE36C1C55568702F0EA7C5A3CAF151BF18464A",
"pub_key": {
  "type": "tendermint/PubKeyEd25519",
  "value": "UuP9YL/PnycTKwOzKzf5n0vT/0RrXT150nakc2RiIc="
},
"last_height": "0",
"last_round": "0",
"last_step": 0,
"priv_key": {
  "type": "tendermint/PrivKeyEd25519",
  "value": "SJAHuwUzG16vwZeskTL+VdWe5co/YRyh/kvSSuFNPF54/1iX8+fJxMrAPMrN/DmC9P/RGtd0LnSd0RzZGihw=="
}

"address": "F4EFC2C0301A6CD1FD253C50168FC89DB9AA81B",
"pub_key": {
  "type": "tendermint/PubKeyEd25519",
  "value": "EjDPaP0s5deascusu0Ed1S1/E1FM1Cw5LGH9CgqBr9E="
},
"last_height": "0",
"last_round": "0",
"last_step": 0,
"priv_key": {
  "type": "tendermint/PrivKeyEd25519",
  "value": "t8L9VKV0dRb4CjLJLhgRCCLXRFS/acJN3tSF7zu5S0SM90+hJJ15qxy6y5AR2JKL8TUUzULDksYf0KCAGv00=TA0StJfA=="
}

"address": "AC2C23E6772697544180CD805DDE5C5C1159B5AD",
"pub_key": {
  "type": "tendermint/PubKeyEd25519",
  "value": "TgVaswL688PA9IBe8KT5UvVPfmckgwXe5qCluNErSXw="

}

```

The screenshot shows four terminal tabs. The first tab contains a JSON object with a public key. The second, third, and fourth tabs also contain JSON objects with public keys. Red arrows point from the 'priv_validator.json' tab to the 'pub_key' fields in the other three tabs, indicating they share the same public key.

Retrieve Tendermint node_id:

```

* benjaminwilke — ubuntu@ip-172-31-31-45: ~/.tendermint/config — ssh -i ~/ssh/MyFirstKeyPair.pem ubuntu@ec2-54-188-123-47.us-west-2.compute.amazonaws.com
ubuntu@ip-172-31-31-45: ~/.tendermint/config$ ls
config.toml genesis.json node_key.json priv_validator.json
ubuntu@ip-172-31-31-45: ~/.tendermint/config$ vi priv_validator.json
ubuntu@ip-172-31-31-45: ~/.tendermint/config$ tendermint show_node_id
ic59225094dd228ecedfbef964bbc36197cd94156
ubuntu@ip-172-31-31-45: ~/.tendermint/config$ []

e0e0e15?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=AKIAIWNJYAX4CSVEH53A%2F20190223%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20190223T191650Z&X-Amz-Expires=300&X-Amz-SignedHeaders=host&actor_id=0&response-content-disposition=attachment;filename=tendermint_0.22.8_linux_amd64.zip&response-content-type=application%2Foctet-stream
Resolving github-production-release-asset-2e65be.s3.amazonaws.com (github-production-release-asset-2e65be.s3.amazonaws.com)... 52.216.164.171
Connecting to github-production-release-asset-2e65be.s3.amazonaws.com (github-production-release-asset-2e65be.s3.amazonaws.com) | 52.216.164.171|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 28931107 (28M) [application/octet-stream]
Saving to: 'tendermint_0.22.8_linux_amd64.zip'

tendermint_0.22 100%[=====] 27.59M 9.25MB/s in 3.0s
2019-02-23 19:16:54 (9.25 MB/s) - 'tendermint_0.22.8_linux_amd64.zip' saved [28931107/28931107]

ubuntu@ip-172-31-29-232: $ unzip tendermint_0.22.8_linux_amd64.zip
Archive: tendermint_0.22.8_linux_amd64.zip
tendermint_40d6dc2ee55a34a075e7b7e73c3525c84ae705ea_linux_amd64
extracting: tendermint
ubuntu@ip-172-31-29-232: $ rm tendermint_0.22.8_linux_amd64.zip
ubuntu@ip-172-31-29-232: $ sudo mv tendermint /usr/local/bin
ubuntu@ip-172-31-29-232: $ tendermint init
I[02-23|19:19:17.241] Generated private validator
    module=main path=/home/ubuntu/.tendermint/config/priv_validator.json
I[02-23|19:19:17.241] Generated node key
    module=main path=/home/ubuntu/.tendermint/config/node_key.json
I[02-23|19:19:17.241] Generated genesis file
    module=main path=/home/ubuntu/.tendermint/config/genesis.json
ubuntu@ip-172-31-29-232: $ vi ~/.tendermint/config/priv_validator.json
ubuntu@ip-172-31-29-232: $ tendermint show_node_id
ec2ae7b4e62035b1b157d05f760caa0f28c921c
ubuntu@ip-172-31-29-232: $ []

* benjaminwilke — ubuntu@ip-172-31-29-232: ~/.tendermint/config — ssh -i ~/ssh/MyFirstKeyPair.pem ubuntu@ec2-54-188-123-47.us-west-2.compute.amazonaws.com
Length: 28931107 (28M) [application/octet-stream]
Saving to: 'tendermint_0.22.8_linux_amd64.zip'

tendermint_0.22.8_linux_ 100%[=====] 27.59M 7.33MB/s in 4.1s
2019-02-23 19:16:58 (6.68 MB/s) - 'tendermint_0.22.8_linux_amd64.zip' saved [28931107/28931107]

ubuntu@ip-172-31-28-45: ~$ unzip tendermint_0.22.8_linux_amd64.zip
Archive: tendermint_0.22.8_linux_amd64.zip
tendermint_40d6dc2ee55a34a075e7b7e73c3525c84ae705ea_linux_amd64
extracting: tendermint
ubuntu@ip-172-31-28-45: ~$ rm tendermint_0.22.8_linux_amd64.zip
ubuntu@ip-172-31-28-45: ~$ sudo mv tendermint /usr/local/bin
ubuntu@ip-172-31-28-45: ~$ tendermint init
I[02-23|19:19:20.453] Generated private validator
    module=main path=/home/ubuntu/.tendermint/config/priv_validator.json
I[02-23|19:19:20.454] Generated node key
    module=main path=/home/ubuntu/.tendermint/config/node_key.json
I[02-23|19:19:20.454] Generated genesis file
    module=main path=/home/ubuntu/.tendermint/config/genesis.json
ubuntu@ip-172-31-28-45: ~$ ~/.tendermint/config/priv_validator.json
bash: /home/ubuntu/.tendermint/config/priv_validator.json: Permission denied
ubuntu@ip-172-31-28-45: ~$ cd .tendermint
ubuntu@ip-172-31-28-45: ~$ tendermint config
ubuntu@ip-172-31-28-45: ~$ tendermint config $ vi priv_validator.json
ubuntu@ip-172-31-28-45: ~$ tendermint config $ tendermint show_node_id
43b63c5561efdf05fd73cbe5113e3ae8920c222
ubuntu@ip-172-31-28-45: ~$ tendermint config $ []

* benjaminwilke — ubuntu@ip-172-31-29-232: ~/.tendermint/config — ssh -i ~/ssh/MyFirstKeyPair.pem ubuntu@ec2-54-213-146-105.us-west-2.compute.amazonaws.com
Length: 28931107 (28M) [application/octet-stream]
Saving to: 'tendermint_0.22.8_linux_amd64.zip'

tendermint_0.22.8_linux_ 100%[=====] 10.4 MB/s - 'tendermint_0.22.8_linux_amd64.zip' saved [28931107/28931107]

ubuntu@ip-172-31-29-9: ~$ unzip tendermint_0.22.8_linux_amd64.zip
Archive: tendermint_0.22.8_linux_amd64.zip
tendermint_40d6dc2ee55a34a075e7b7e73c3525c84ae705ea_linux_amd64
extracting: tendermint
ubuntu@ip-172-31-29-9: ~$ rm tendermint_0.22.8_linux_amd64.zip
ubuntu@ip-172-31-29-9: ~$ sudo mv tendermint /usr/local/bin
ubuntu@ip-172-31-29-9: ~$ tendermint init
I[02-23|19:19:22.188] Generated private validator
    module=main path=/home/ubuntu/.tendermint/config/priv_validator.json
I[02-23|19:19:22.188] Generated node key
    module=main path=/home/ubuntu/.tendermint/config/node_key.json
I[02-23|19:19:22.188] Generated genesis file
    module=main path=/home/ubuntu/.tendermint/config/genesis.json
ubuntu@ip-172-31-29-9: ~$ ~/.tendermint/config/priv_validator.json
bash: /home/ubuntu/.tendermint/config/priv_validator.json: Permission denied
ubuntu@ip-172-31-29-9: ~$ cd .tendermint
ubuntu@ip-172-31-29-9: ~$ tendermint config
config.toml genesis.json node_key.json priv_validator.json
ubuntu@ip-172-31-29-9: ~$ vi priv_validator.json
ubuntu@ip-172-31-29-9: ~$ tendermint config $ tendermint show_node_id
d8762988d1f5f64ae72292d76ae5a26a4cb3eff
ubuntu@ip-172-31-29-9: ~$ tendermint config $ []

```

All information collected from Members and shared with Coordinator

```
hostname Node 1: ec2-34-213-113-185.us-west-2.compute.amazonaws.com
pub_key.value Node 1: cZpEwu/vxox+uEuTAh2cenSf81wlFTUr40W7XQIkFs=
node_id Node 1: 1c59225094dd228ecedfbe964bbc36197cd94156

hostname Node 2: ec2-54-186-91-238.us-west-2.compute.amazonaws.com
pub_key.value Node 2: gT72jycVez7L3yhe0VkJz3+bx36EhJJotMV3v0PmsLh4=
node_id Node 2: ec2ae7b4e82035b1bb157d05f760caa0f28c921c

hostname Node 3: ec2-54-201-8-176.us-west-2.compute.amazonaws.com
pub_key.value Node 3: UuP9Yl/PnycTKwDzKzfw5nQvT/0RrXTi50nakc2RiIc=
node_id Node 3: 12adc97bdbcc17505f62ec636cbdf8a26f0103b82

hostname Node 4: ec2-54-188-123-47.us-west-2.compute.amazonaws.com
pub_key.value Node 4: EjDPaPoSSdeascusuQEdiSi/E1FM1Cw5LGH9CggBr9E=
node_id Node 4: f43b63c5561efdf05db73cbe5113e3ae8920c222

hostname Node 5: ec2-54-213-146-105.us-west-2.compute.amazonaws.com
pub_key.value Node 5: TgVaswL688PA9IBe8KT5UvVPFmckgwXe5qCUwNErSXw=
node_id Node 5: d87629d8d1f5f64ae72292dd76ae5a26a4cb3eef
```

Create the genesis.json file

```
genesis.json •
{
  "genesis_time": "2019-02-23T19:19:15.236961892Z",
  "chain_id": "test-chain-EpJKzs",
  "consensus_params": {
    "block_size_params": {
      "max_bytes": "22020096",
      "max_txs": "10000",
      "max_gas": "-1"
    },
    "tx_size_params": {
      "max_bytes": "10240",
      "max_gas": "-1"
    },
    "block_gossip_params": {
      "block_part_size_bytes": "65536"
    },
    "evidence_params": {
      "max_age": "100000"
    }
  },
  "validators": [
    {
      "pub_key": {
        "type": "tendermint/PubKeyEd25519",
        "value": "cZpEwu/vxox+uEuTAh2cenSf81wlFTUr40W7XQIkFs="
      },
      "power": "10",
      "name": "BigChainDB Node 1"
    },
    {
      "pub_key": {
        "type": "tendermint/PubKeyEd25519",
        "value": "gT72jycVez7L3yhe0VkJ3+bx36EhJJotMV3v0PmsLh4="
      },
      "power": "10",
      "name": "BigChainDB Node 2"
    },
    {
      "pub_key": {
        "type": "tendermint/PubKeyEd25519",
        "value": "UuP9Yl/PnycTKwDzKzf5nQvT/0RrXTi50nakc2RiIc="
      },
      "power": "10",
      "name": "BigChainDB Node 3"
    },
    {
      "pub_key": {
        "type": "tendermint/PubKeyEd25519",
        "value": "EjDPaPoSSdeascusuQEdiSi/E1FM1Cw5LGH9CggBr9E="
      },
      "power": "10",
      "name": "BigChainDB Node 4"
    },
    {
      "pub_key": {
        "type": "tendermint/PubKeyEd25519",
        "value": "TgVaswL688PA9IBe8KT5UvVPFmckgwXe5qCUwNErSXw="
      },
      "power": "10",
      "name": "BigChainDB Node 5"
    }
  ],
  "app_hash": ""
}
```

Copy genesis.json to all Members (nodes)

```
Benjamins-MacBook-Pro-2:~ benjaminwilke$ scp -i "/Users/benjaminwilke/.ssh/MyFirstKeyPair.pem" /Users/benjaminwilke/genesis.json ubuntu@ec2-34-213-113-185.us-west-2.compute.amazonaws.com:genesis.json
 100% 1484      1.5KB/s  00:00
Benjamins-MacBook-Pro-2:~ benjaminwilke$ scp -i "/Users/benjaminwilke/.ssh/MyFirstKeyPair.pem" /Users/benjaminwilke/genesis.json ubuntu@ec2-54-186-91-238.us-west-2.compute.amazonaws.com:genesis.json
 100% 1484      1.5KB/s  00:00
Benjamins-MacBook-Pro-2:~ benjaminwilke$ scp -i "/Users/benjaminwilke/.ssh/MyFirstKeyPair.pem" /Users/benjaminwilke/genesis.json ubuntu@ec2-54-201-8-176.us-west-2.compute.amazonaws.com:genesis.json
 100% 1484      1.5KB/s  00:00
Benjamins-MacBook-Pro-2:~ benjaminwilke$ scp -i "/Users/benjaminwilke/.ssh/MyFirstKeyPair.pem" /Users/benjaminwilke/genesis.json ubuntu@ec2-54-188-123-47.us-west-2.compute.amazonaws.com:genesis.json
 100% 1484      1.5KB/s  00:00
Benjamins-MacBook-Pro-2:~ benjaminwilke$ scp -i "/Users/benjaminwilke/.ssh/MyFirstKeyPair.pem" /Users/benjaminwilke/genesis.json ubuntu@ec2-54-213-146-105.us-west-2.compute.amazonaws.com:genesis.json
 100% 1484      1.5KB/s  00:00
Benjamins-MacBook-Pro-2:~ benjaminwilke$
```

Move from /home/ubuntu/genesis.json to ~/.tendermint/config/

```
[ubuntu@ip-172-31-27-9:~/tendermint/config]$ mv /home/ubuntu/genesis.json ~/.tendermint/config/
[ubuntu@ip-172-31-27-9:~/tendermint/config]$
```

Verify that genesis.json overwritten on each EC2 Member (node)

The screenshot displays five terminal windows side-by-side, comparing the contents of the `genesis.json` file on two different hosts. The leftmost window shows the original `genesis.json` file on the local host (Ubuntu 17.10). The other four windows show the same file as it appears on four separate EC2 instances (Ubuntu 16.04 LTS). Each window highlights specific sections of the JSON object, such as the validators and app_hash fields, to demonstrate that the file has been copied and modified for each node.

```
genesis.json [noeol] 60L, 1484C 60,1 Bot
genesis.json [noeol] 60L, 1484C 58,1 Bot
genesis.json [noeol] 60L, 1484C 56,1 Bot
genesis.json [noeol] 60L, 1484C 34,1 87%
genesis.json [noeol] 60L, 1484C 36,1 90%
```

Update ~/.tendermint/config/config.toml on each Member (persistent_peers and other configs)

```
benjaminwilke@ubuntu:~/tendermint/config$ ssh -i ./ssh/MyFirstKeyPair.pem benjaminwilke@ip-172-31-31-45:~/tendermint/config
```

does not include gRPC connections. See `grpc_max_open_connections`. If you want to accept more significant number than the default, you can:

```
# You increase your OS limits.
```

`max_open_connections = 900`

Peer to peer configuration options ######
[p2p]

```
#Address to listen for incoming connections
laddr = "tcp://0.0.0.0:26656"
```

#Address to advertise to peers for them to dial
#If empty, will use the same port as the laddr,
#and will introspect on the listener or use UPnP
#to figure out the address.
external_address = ""

#Comma separated list of seed nodes to connect to
seeds = ""

#Comma separated list of nodes to keep persistent connections to
persistent_peers = "c159225094d0d28ecedfbefb64bbcb36197cd94156@ec2-213-113-185.us-west-2.compute.amazonaws.com:26656,ec2ae7b4e82035bb1b57d05f760ca1c@ec2-54-186-91-238.us-west-2.compute.amazonaws.com:26656,12adc97bdbcc17505f62ec63cbd8a2670f03bb2e6c2-54-201-8-176.us-west-2.compute.amazonaws.com:26656,f43b63c5561efdf05db73cbe5113e3ae8920c22@ec2-54-188-123-47.us-west-2.compute.amazonaws.com:26656,26850,d87629d81f5f64ae72292dd76ae5a26a4cb3eef@ec2-54-213-14-105.us-west-2.compute.amazonaws.com:26656"

UPnP port forwarding
upnp = false

#Path to address book
addr_book_file = "config/addrbook.json"

#Set true for strict address routability rules
addr_book_strict = true

#Time to wait before flushing messages out on the connection, in ms
flush_throttle_timeout = 100

101,47 40%

```
benjaminwilke@ubuntu:~/tendermint/config$ ssh -i ./ssh/MyFirstKeyPair.pem benjaminwilke@ip-172-31-29-232:~/tendermint/config
```

If you want to accept more significant number than the default, you can:

```
# If you want to accept more significant number than the default, you can:
# Increase your OS limits.
# If empty, will use the same port as the laddr, and will introspect on the listener or use UPnP to figure out the address.
max_open_connections = 900
```

Peer to peer configuration options ######
[p2p]

```
#Address to listen for incoming connections
laddr = "tcp://0.0.0.0:26656"
```

#Address to advertise to peers for them to dial
#If empty, will use the same port as the laddr, and will introspect on the listener or use UPnP to figure out the address.
external_address = ""

#Comma separated list of seed nodes to connect to
seeds = ""

#Comma separated list of nodes to keep persistent connections to
persistent_peers = "c159225094d0d28ecedfbefb64bbcb36197cd94156@ec2-34-213-113-185.us-west-2.compute.amazonaws.com:26656,ec2ae7b4e82035bb1b57d05f760ca1c@ec2-54-186-91-238.us-west-2.compute.amazonaws.com:26656,12adc97bdbcc17505f62ec63cbd8a2670f0103bb2e6c2-54-201-8-176.us-west-2.compute.amazonaws.com:26656,f43b63c5561efdf05db73cbe5113e3ae8920c22@ec2-54-188-123-47.us-west-2.compute.amazonaws.com:26656,d87629d81f5f64ae72292dd76ae5a26a4cb3eef@ec2-54-213-146-105.us-west-2.compute.amazonaws.com:26656"

UPnP port forwarding
upnp = false

#Path to address book
addr_book_file = "config/addrbook.json"

#Set true for strict address routability rules
addr_book_strict = true

#Time to wait before flushing messages out on the connection, in ms
flush_throttle_timeout = 100

#Maximum number of peers to connect to
max_num_peers = 50

#Maximum size of a message payload, in bytes
max_packet_msg_payload_size = 1024

#Rate at which packets can be sent, in bytes/second
-- INSERT --

94,1 40%

```
benjaminwilke@ubuntu:~/tendermint/config$ ssh -i ./ssh/MyFirstKeyPair.pem benjaminwilke@ip-172-31-21-155:~/tendermint/config
```

If you want to accept more significant number than the default, you can:

```
# If you want to accept more significant number than the default, you can:
# Increase your OS limits.
# If empty, will use the same port as the laddr, and will introspect on the listener or use UPnP to figure out the address.
max_open_connections = 900
```

Peer to peer configuration options ######
[p2p]

```
#Address to listen for incoming connections
laddr = "tcp://0.0.0.0:26656"
```

#Address to advertise to peers for them to dial
#If empty, will use the same port as the laddr, and will introspect on the listener or use UPnP to figure out the address.
external_address = ""

#Comma separated list of seed nodes to connect to
seeds = ""

#Comma separated list of nodes to keep persistent connections to
persistent_peers = "c159225094d0d28ecedfbefb64bbcb36197cd94156@ec2-34-213-113-185.us-west-2.compute.amazonaws.com:26656,ec2ae7b4e82035bb1b57d05f760ca1c@ec2-54-186-91-238.us-west-2.compute.amazonaws.com:26656,12adc97bdbcc17505f62ec63cbd8a2670f0103bb2e6c2-54-201-8-176.us-west-2.compute.amazonaws.com:26656,f43b63c5561efdf05db73cbe5113e3ae8920c22@ec2-54-188-123-47.us-west-2.compute.amazonaws.com:26656,d87629d81f5f64ae72292dd76ae5a26a4cb3eef@ec2-54-213-146-105.us-west-2.compute.amazonaws.com:26656"

UPnP port forwarding
upnp = false

#Path to address book
addr_book_file = "config/addrbook.json"

#Set true for strict address routability rules
addr_book_strict = true

#Time to wait before flushing messages out on the connection, in ms
flush_throttle_timeout = 100

93,507 42%

```
benjaminwilke@ubuntu:~/tendermint/config$ ssh -i ./ssh/MyFirstKeyPair.pem benjaminwilke@ip-172-31-19-55:~/tendermint/config
```

If you want to accept more significant number than the default, you can:

```
# If you want to accept more significant number than the default, you can:
# Increase your OS limits.
# If empty, will use the same port as the laddr, and will introspect on the listener or use UPnP to figure out the address.
max_open_connections = 900
```

Peer to peer configuration options ######
[p2p]

```
#Address to listen for incoming connections
laddr = "tcp://0.0.0.0:26656"
```

#Address to advertise to peers for them to dial
#If empty, will use the same port as the laddr, and will introspect on the listener or use UPnP to figure out the address.
external_address = ""

#Comma separated list of seed nodes to connect to
seeds = ""

#Comma separated list of nodes to keep persistent connections to
persistent_peers = "c159225094d0d28ecedfbefb64bbcb36197cd94156@ec2-34-213-113-185.us-west-2.compute.amazonaws.com:26656,ec2ae7b4e82035bb1b57d05f760ca1c@ec2-54-186-91-238.us-west-2.compute.amazonaws.com:26656,12adc97bdbcc17505f62ec63cbd8a2670f0103bb2e6c2-54-201-8-176.us-west-2.compute.amazonaws.com:26656,f43b63c5561efdf05db73cbe5113e3ae8920c22@ec2-54-188-123-47.us-west-2.compute.amazonaws.com:26656,d87629d81f5f64ae72292dd76ae5a26a4cb3eef@ec2-54-213-146-105.us-west-2.compute.amazonaws.com:26656"

UPnP port forwarding
upnp = false

#Path to address book
addr_book_file = "config/addrbook.json"

#Set true for strict address routability rules
addr_book_strict = true

#Time to wait before flushing messages out on the connection, in ms
flush_throttle_timeout = 100

93,507 42%

Install Monit (to ensure BigChainDB server and Tendermint are running together and restart either if they crash)

```

benjaminwilkie@ubuntu:~$ ssh -i ./ssh/MyFirstKeyPair.pem ip-172-31-31-45
ubuntu@ip-172-31-31-45: ~/.tendermint/config $ systemctl status mongod
● mongod.service - An object/document-oriented database
  Loaded: loaded (/lib/systemd/system/mongod.service; enabled; v
  Active: active (running) since Sat 2019-02-23 19:15:09 UTC; 1h
    Docs: man:mongod(1)
   Main PID: 31320 (mongod)
      Tasks: 23 (limit: 1152)
     CGroup: /system.slice/mongod.service
             └─31320 /usr/bin/mongod --unixSocketPrefix=/run/mongodb

Feb 23 19:15:09 ip-172-31-31-45 systemd[1]: Started An object/docu
lines 1-10/10 (END)
[1]+  Stopped      systemctl status mongod

ubuntu@ip-172-31-31-45:~/.tendermint/config$ sudo apt install monit
Reading package lists... Done
Building dependency tree
Reading state information... Done
Suggested packages:
  exim4 | postfix | mail-transport-agent sysvinit-core
The following NEW packages will be installed:
  monit
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 318 kB of archives.
After this operation, 946 kB of additional disk space will be used.

Get:1 http://us-west-2.ec2.archive.ubuntu.com/ubuntu bionic/unive
rse amd64 monit amd64 1:5.25.1-1build1 [318 kB]
Fetched 318 kB in 0s (12.3 MB/s)
Selecting previously unselected package monit.
(Reading database ... 93965 files and directories currently instal
led.)
Preparing to unpack .../monit_1%3a5.25.1-1build1_amd64.deb ...
Unpacking monit (1:5.25.1-1build1) ...
Processing triggers for ureadahead (0.100.0-20) ...
Setting up monit (1:5.25.1-1build1) ...
Processing triggers for systemd (237-3ubuntu10.13) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Processing triggers for ureadahead (0.100.0-20) ...
ubuntu@ip-172-31-31-45:~/.tendermint/config$ 

I[02-23|19:19:17.241] Generated node key
  module=main path=/home/ubuntu/.tendermint/config/node_key.json
I[02-23|19:19:17.241] Generated genesis file
  module=main path=/home/ubuntu/.tendermint/config/genesis.json
ubuntu@ip-172-31-29-232: ~ vi ~/.tendermint/config/priv_validator.json
ubuntu@ip-172-31-29-232: ~ tendermint show_node_id
ec2ae7b4e82035b1bb157d05f760aa0f28c921c
ubuntu@ip-172-31-29-232: ~ mv /home/ubuntu/genesis.json ~/.tende
rmint/config/
ubuntu@ip-172-31-29-232: ~ cd /home/ubuntu/.tendermint/config
ubuntu@ip-172-31-29-232: ~ vi genesis.json
ubuntu@ip-172-31-29-232: ~ vi config.toml
ubuntu@ip-172-31-29-232: ~ .tendermint/config$ sudo apt install m
onit
Reading package lists... Done
Building dependency tree
Reading state information... Done
Suggested packages:
  exim4 | postfix | mail-transport-agent sysvinit-core
The following NEW packages will be installed:
  monit
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 318 kB of archives.
After this operation, 946 kB of additional disk space will be used.

Get:1 http://us-west-2.ec2.archive.ubuntu.com/ubuntu bionic/unive
rse amd64 monit amd64 1:5.25.1-1build1 [318 kB]
Fetched 318 kB in 0s (23.8 MB/s)
Selecting previously unselected package monit.
(Reading database ... 93965 files and directories currently instal
led.)
Preparing to unpack .../monit_1%3a5.25.1-1build1_amd64.deb ...
Unpacking monit (1:5.25.1-1build1) ...
Processing triggers for ureadahead (0.100.0-20) ...
Setting up monit (1:5.25.1-1build1) ...
Processing triggers for systemd (237-3ubuntu10.13) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Processing triggers for ureadahead (0.100.0-20) ...
ubuntu@ip-172-31-29-232: ~ .tendermint/config$ 

I[02-23|19:19:18.732] Generated private validator
  module=priv_validator path=/home/ubuntu/.tendermint/config/priv_validator.json
I[02-23|19:19:18.732] Generated node key
  module=priv_validator path=/home/ubuntu/.tendermint/config/node_key.json
I[02-23|19:19:18.733] Generated genesis file
  module=priv_validator path=/home/ubuntu/.tendermint/config/genesis.json
ubuntu@ip-172-31-19-55: ~ cd .tendermint
ubuntu@ip-172-31-19-55: ~ .tendermint/config$ vi priv_validator.json
12ad97bdbc17505f62ec636cbdf8a26f0103082
ubuntu@ip-172-31-19-55: ~ .tendermint/config$ tendermint show_node_id
endermint/config/
ubuntu@ip-172-31-19-55: ~ .tendermint/config$ cd /home/ubuntu/.tendermint/
ubuntu@ip-172-31-19-55: ~ .tendermint/config$ vi genesis.json
ubuntu@ip-172-31-19-55: ~ .tendermint/config$ vi config.toml
ubuntu@ip-172-31-19-55: ~ .tendermint/config$ sudo apt install monit
Reading package lists... Done
Building dependency tree
Reading state information... Done
Suggested packages:
  exim4 | postfix | mail-transport-agent sysvinit-core
The following NEW packages will be installed:
  monit
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 318 kB of archives.
After this operation, 946 kB of additional disk space will be used.

Get:1 http://us-west-2.ec2.archive.ubuntu.com/ubuntu bionic/unive
rse amd64 monit amd64 1:5.25.1-1build1 [318 kB]
Fetched 318 kB in 0s (14.2 MB/s)
Selecting previously unselected package monit.
(Reading database ... 93965 files and directories currently instal
led.)
Preparing to unpack .../monit_1%3a5.25.1-1build1_amd64.deb ...
Unpacking monit (1:5.25.1-1build1) ...
Processing triggers for ureadahead (0.100.0-20) ...
Setting up monit (1:5.25.1-1build1) ...
Processing triggers for systemd (237-3ubuntu10.13) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Processing triggers for ureadahead (0.100.0-20) ...
ubuntu@ip-172-31-19-55: ~ .tendermint/config$ 

benjaminwilkie@ubuntu:~$ ssh -i ./ssh/MyFirstKeyPair.pem ubuntu@ip-2-54-198-123.us-west-2.compute.amazonaws.com
ubuntu@ip-172-31-28-45: ~/.tendermint/config $ cd /home/ubuntu/.tendermint/config
ubuntu@ip-172-31-28-45: ~/.tendermint/config $ vi genesis.json
ubuntu@ip-172-31-28-45: ~/.tendermint/config $ vi config.toml
ubuntu@ip-172-31-28-45: ~/.tendermint/config $ sudo apt install monit
Reading package lists... Done
Building dependency tree
Reading state information... Done
Suggested packages:
  exim4 | postfix | mail-transport-agent sysvinit-core
The following NEW packages will be installed:
  monit
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 318 kB of archives.
After this operation, 946 kB of additional disk space will be used.

Get:1 http://us-west-2.ec2.archive.ubuntu.com/ubuntu bionic/universe amd64 monit amd64 1:5.25.1-1bu
ild1 [318 kB]
Fetched 318 kB in 0s (21.0 MB/s)
Selecting previously unselected package monit.
(Reading database ... 93965 files and directories currently installed.)
Preparing to unpack .../monit_1%3a5.25.1-1build1_amd64.deb ...
Unpacking monit (1:5.25.1-1build1) ...
Processing triggers for ureadahead (0.100.0-20) ...
Setting up monit (1:5.25.1-1build1) ...
Processing triggers for systemd (237-3ubuntu10.13) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Processing triggers for ureadahead (0.100.0-20) ...
ubuntu@ip-172-31-28-45: ~/.tendermint/config$ 

I[02-23|19:27:00.000] Generated node key
  module=main path=/home/ubuntu/.tendermint/config/node_key.json
I[02-23|19:27:00.000] Generated genesis file
  module=main path=/home/ubuntu/.tendermint/config/genesis.json
ubuntu@ip-172-31-27-9: ~/.tendermint/config $ vi genesis.json
ubuntu@ip-172-31-27-9: ~/.tendermint/config $ vi config.toml
ubuntu@ip-172-31-27-9: ~/.tendermint/config $ sudo apt install monit
Reading package lists... Done
Building dependency tree
Reading state information... Done
Suggested packages:
  exim4 | postfix | mail-transport-agent sysvinit-core
The following NEW packages will be installed:
  monit
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 318 kB of archives.
After this operation, 946 kB of additional disk space will be used.

Get:1 http://us-west-2.ec2.archive.ubuntu.com/ubuntu bionic/universe amd64 monit amd64 1:5.25.1-1bu
ild1 [318 kB]
Fetched 318 kB in 0s (22.5 MB/s)
Selecting previously unselected package monit.
(Reading database ... 93965 files and directories currently installed.)
Preparing to unpack .../monit_1%3a5.25.1-1build1_amd64.deb ...
Unpacking monit (1:5.25.1-1build1) ...
Processing triggers for ureadahead (0.100.0-20) ...
Setting up monit (1:5.25.1-1build1) ...
Processing triggers for systemd (237-3ubuntu10.13) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Processing triggers for ureadahead (0.100.0-20) ...
ubuntu@ip-172-31-27-9: ~/.tendermint/config$ 

```

Build configuration file and run Monit as daemon

```
benjaminwille@benjaminwille-ubuntu:~$ ./tendermint/config --ssh -l ~/ssh/MyFirstKeyPair.pem ubuntu@ec2-54-188-123-47.us-west-2.compute.amazonaws.com
```

Docs: man:mongod(1)
Main PID: 31328 (mongod)
Tasks: 23 (limit: 1152)
CGroup: /system.slice/mongod.service
└─31328 /usr/bin/mongod mongod socketPrefix=/run/mongodb

Feb 23 19:15:09 ip-172-31-31-45 systemd[1]: Started An object/docu
Lines 1-10/10 (END)

[1]+ Stopped systemct status mongod

ubuntu@ip-172-31-31-45:~/tendermint/config\$ sudo apt install monit
Reading package lists... Done
Building dependency tree
Reading state information... Done
Suggested packages:
 exim4 | postfix | mail-transport-agent sysvinit-core
The following NEW packages will be installed:
 monit
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 318 kB of archives.
After this operation, 946 kB of additional disk space will be used.
Get:1 http://us-west-2.ec2.archive.ubuntu.com/ubuntu bionic/unive
rse amd64 monit amd64 1:5.25.1-1build1 [318 kB]
Fetched 318 kB in 0s (12.3 MB/s)
Selecting previously unselected package monit.
(Reading database ... 93965 files and directories currently instal
led.)
Preparing to unpack .../monit_1%3a5.25.1-1build1_amd64.deb ...
Unpacking monit (1:5.25.1-1build1) ...
Processing triggers for ureadahead (0.100.0-20) ...
Setting up monit (1:5.25.1-1build1) ...
Processing triggers for systemd (237-3ubuntu10.13) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Processing triggers for ureadahead (0.100.0-20) ...
ubuntu@ip-172-31-31-45:~/tendermint/config\$ bigchaindb-monit-conf
ig
BigchainDB process manager configured!
ubuntu@ip-172-31-31-45:~/tendermint/config\$ monit -d 1
New Monit id: 756a1a2861c68add39e10e50500add491b
Stored in '/home/ubuntu/.monit.id'
Starting Monit 5.25.1 daemon with http interface at [*]:2812
ubuntu@ip-172-31-31-45:~/tendermint/config\$ █

benjaminwille@benjaminwille-ubuntu:~\$./tendermint/config --ssh -l ~/ssh/MyFirstKeyPair.pem ubuntu@ec2-54-188-123-47.us-west-2.compute.amazonaws.com

Reading package lists... Done
Building dependency tree
Reading state information... Done
Suggested packages:
 exim4 | postfix | mail-transport-agent sysvinit-core
The following NEW packages will be installed:
 monit
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 318 kB of archives.
After this operation, 946 kB of additional disk space will be used.
Get:1 http://us-west-2.ec2.archive.ubuntu.com/ubuntu bionic/unive
rse amd64 monit amd64 1:5.25.1-1build1 [318 kB]
Fetched 318 kB in 0s (21.0 MB/s)
Selecting previously unselected package monit.
(Reading database ... 93965 files and directories currently installed.)
Preparing to unpack .../monit_1%3a5.25.1-1build1_amd64.deb ...
Unpacking monit (1:5.25.1-1build1) ...
Processing triggers for ureadahead (0.100.0-20) ...
Setting up monit (1:5.25.1-1build1) ...
Processing triggers for systemd (237-3ubuntu10.13) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Processing triggers for ureadahead (0.100.0-20) ...
ubuntu@ip-172-31-28-45:~/tendermint/config\$ bigchaindb-monit-conf
ig
BigchainDB process manager configured!
ubuntu@ip-172-31-28-45:~/tendermint/config\$ monit -d 1
New Monit id: f512762b79810b0c02c93c08e48b037
Stored in '/home/ubuntu/.monit.id'
Starting Monit 5.25.1 daemon with http interface at [*]:2812
ubuntu@ip-172-31-28-45:~/tendermint/config\$ █

benjaminwille@benjaminwille-ubuntu:~\$./tendermint/config --ssh -l ~/ssh/MyFirstKeyPair.pem ubuntu@ip-172-31-19-55

I02-23 [19:18: 733] Generated genesis file
path:/home/ubuntu/.tendermint/config/genesis.json
ubuntu@ip-172-31-19-55:~\$ cd .tendermint
ubuntu@ip-172-31-19-55:~/tendermint\$ cd config
ubuntu@ip-172-31-19-55:~/tendermint/config\$ vi priv_validator.json
ubuntu@ip-172-31-19-55:~/tendermint/config\$./tendermint show_node_id
12acd97bdb17505f62e c36cbdf8a26f0103b02
ubuntu@ip-172-31-19-55:~/tendermint/config\$ mv /home/ubuntu/genesis.j
tendermint/config
ubuntu@ip-172-31-19-55:~/tendermint/config\$ cd /home/ubuntu/.tendermi
t
ubuntu@ip-172-31-19-55:~/tendermint/config\$ vi genesis.json
ubuntu@ip-172-31-19-55:~/tendermint/config\$ vi config.toml
ubuntu@ip-172-31-19-55:~/tendermint/config\$ sudo apt install monit
Reading package lists... Done
Building dependency tree
Reading state information... Done
Suggested packages:
 exim4 | postfix | mail-transport-agent sysvinit-core
The following NEW packages will be installed:
 monit
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 318 kB of archives.
After this operation, 946 kB of additional disk space will be used.
Get:1 http://us-west-2.ec2.archive.ubuntu.com/ubuntu bionic/univer
se amd64 monit amd64 1:5.25.1-1build1 [318 kB]
Fetched 318 kB in 0s (14.2 MB/s)
Selecting previously unselected package monit.
(Reading database ... 93965 files and directories currently instal
led.)
Preparing to unpack .../monit_1%3a5.25.1-1build1_amd64.deb ...
Unpacking monit (1:5.25.1-1build1) ...
Processing triggers for ureadahead (0.100.0-20) ...
Setting up monit (1:5.25.1-1build1) ...
Processing triggers for systemd (237-3ubuntu10.13) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Processing triggers for ureadahead (0.100.0-20) ...
ubuntu@ip-172-31-29-232:~/tendermint/config\$ bigchaindb-monit-c
onfig
BigchainDB process manager configured!
ubuntu@ip-172-31-29-232:~/tendermint/config\$ monit -d 1
New Monit id: effb49554836c4ad81fe2cd44c9672eaf
Stored in '/home/ubuntu/.monit.id'
Starting Monit 5.25.1 daemon with http interface at [*]:2812
ubuntu@ip-172-31-29-232:~/tendermint/config\$ █

benjaminwille@benjaminwille-ubuntu:~\$./tendermint/config --ssh -l ~/ssh/MyFirstKeyPair.pem ubuntu@ip-172-31-27-9

Building dependency tree
Reading state information... Done
Suggested packages:
 exim4 | postfix | mail-transport-agent sysvinit-core
The following NEW packages will be installed:
 monit
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 318 kB of archives.
After this operation, 946 kB of additional disk space will be used.
Get:1 http://us-west-2.ec2.archive.ubuntu.com/ubuntu bionic/unive
rse amd64 monit amd64 1:5.25.1-1build1 [318 kB]
Fetched 318 kB in 0s (22.5 MB/s)
Selecting previously unselected package monit.
(Reading database ... 93965 files and directories currently installed.)
Preparing to unpack .../monit_1%3a5.25.1-1build1_amd64.deb ...
Unpacking monit (1:5.25.1-1build1) ...
Processing triggers for ureadahead (0.100.0-20) ...
Setting up monit (1:5.25.1-1build1) ...
Processing triggers for systemd (237-3ubuntu10.13) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Processing triggers for ureadahead (0.100.0-20) ...
ubuntu@ip-172-31-27-9:~/tendermint/config\$ bigchaindb-monit-conf
ig
BigchainDB process manager configured!
ubuntu@ip-172-31-27-9:~/tendermint/config\$ monit -d 1
New Monit id: 20c34659d074ec50229ce893a4e3c69
Stored in '/home/ubuntu/.monit.id'
Starting Monit 5.25.1 daemon with http interface at [*]:2812
ubuntu@ip-172-31-27-9:~/tendermint/config\$ █

Update AWS Security Group so All Member Nodes can Receive Traffic from all Others

Name	Group ID	Group Name	VPC ID	Description
BigChainDB Security Group	sg-0fc380b5f744357a0	launch-wizard-2	vpc-84ae9af	launch-wizard-2 created 2019-02-2

Security Group: sg-0fc380b5f744357a0

Edit inbound rules

Type: SSH | Protocol: TCP | Port Range: 22 | Source: Custom 0.0.0.0/0 | Description: e.g. SSH for Admin

Type: All traffic | Protocol: All | Port Range: 0 - 65535 | Source: Custom sg-0fc380b5f744357a0 | Description: e.g. SSH for Admin

Add Rule

NOTE: Any edits made on existing rules will result in the edited rule being deleted and a new rule created with the new details. This will cause traffic on that rule to be dropped for a very brief period of time until the new rule can be created.

Setup the Nodes to accept traffic from my IP (for making calls from the Python driver)

0fc380b5f744357a0

Edit inbound rules

Type: All traffic | Protocol: All | Port Range: 0 - 65535 | Source: Custom sg-0fc380b5f744357a0 | Description: e.g. SSH for Admin

Type: SSH | Protocol: TCP | Port Range: 22 | Source: Custom 0.0.0.0/0 | Description: e.g. SSH for Admin

Add Rule

Type: All traffic | Protocol: All | Port Range: 0 - 65535 | Source: My IP 99.189.76.68/32 | Description: e.g. SSH for Admin

NOTE: Any edits made on existing rules will result in the edited rule being deleted and a new rule created with the new details. This will cause traffic on that rule to be dropped for a very brief period of time until the new rule can be created.