***2014.11.16***

1. Spin up Ubuntu server VM

I called it TachyonCluster\_Master

2. Install AWS EC2 CLI tools

Had to install Java

sudo apt-get install openjdk-7-jre

I had to create an IAM user and add the Administrator User Policy;

the user's name is nieltown

saved the credential in credential.csv

I added ec2-api-tools.sh to set up environment variables:

put it in /etc/profile.d/ec2-api-tools.sh

^^^ you don't have to make these executable; they'll

just run every time you start a bash session

had to set up 4 different environment variables for the keys

3. Set Up Spark & Tachyon on EC2

Following this guide:

https://github.com/amplab/tachyon/wiki/Running-Tachyon-on-EC2

I did all of this from TachyonCluster\_Master, specifying

-a ami-5bb18832

^^^ (as per

https://github.com/mesos/spark-ec2/blob/v4/ami-list/us-east-1/pvm)

-k DriveStoredKey

-i ~/keys/DriveStoredKey.pem

-s 3

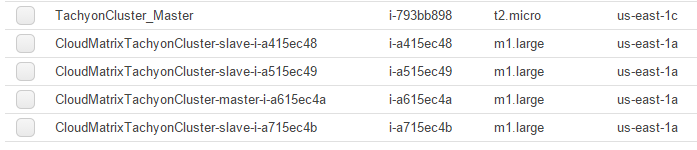
^^^ that's three (3) slaves

-w 600

^^^ wait 600 seconds

read that somewhere in a forum post; not sure if it's actually doing anything for me

it in turn created 4 EC2 instances:



Took a long time (I did say to wait 600 seconds after all), but it did a lot of setup on the servers it created (software installation, etc)

I noticed installing these things:

Scala

Spark/Shark

Hadoop (1.0.4)

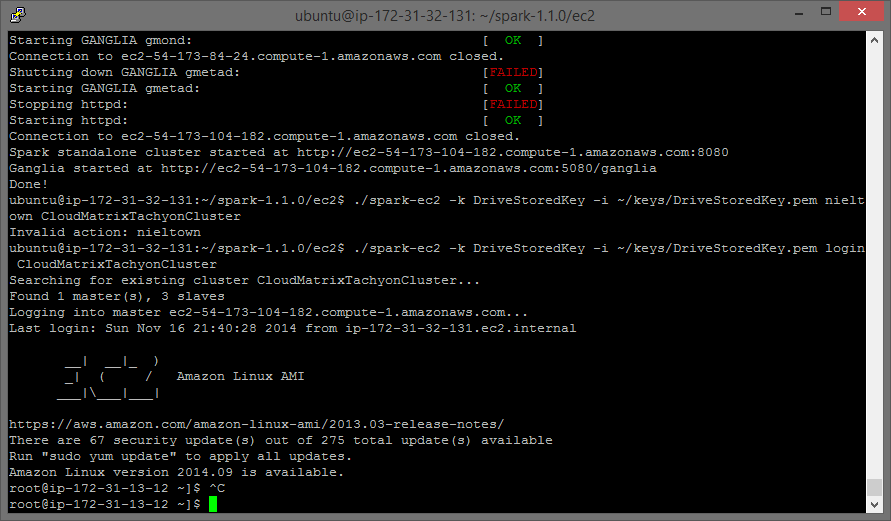
Tachyon (0.4.1)

Ganglia

After it finished, I ran this command:

./spark-ec2 -k DriveStoredKey -i ~/keys/DriveStoredKey.pem login CloudMatrixTachyonCluster

And it logged me into the Cluster



I ran ‘sudo yum update’ and updated all my shit (446 M)

4. Setting up Git on my local VM

This is the local VM on my own desktop. I set up Git on it in the same directory as the Eclipse project, i.e. /home/nieltown/cloudmatrix

This is what I did to do that:

cd cloudmatrix/

touch README.md

git init

git add README.md

git commit -m "first commit"

git remote add origin [git@github.com:nieltown/CloudMatrix.git](mailto:git@github.com:nieltown/CloudMatrix.git)

git push -u origin master

But then there was an error! I had to fix my public key. So to do that, I took the following steps:

ssh-keygen -t rsa -C [mr.john.nielson@gmail.com](mailto:mr.john.nielson@gmail.com)

ssh-agent –s

eval $(ssh-agent)

ssh-add ~/.ssh/id\_rsa

Then I copied the key to my clipboard and added it to GitHub via the web interface:

ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABAQC0CADpzpmdt1tdiQUk/777sNpT9gBDoBjtbtDoMOdSDpbLThvBEMBi8PKRcKljUlFbuh3E4AiuMeXEL3Tl0nxCo0CrJULXoE9LCZk4V6ro4nOgvUGsOiUvfv4PBI0Mj8VhKkSTSNzDEMGWq4LzfqdZJwuAq/A4P+6xYvfz9cfEWYykryYVFdl8ajxo9nP25WURQcx2J/U90+ygErVJV5h4984swS4cE3H4R0zKNGVw/FWDNxMiRIBrSj0C+uVmLXULoIi69c7OZf2r8BlwecNvd9TGQmuxo9QzVkS1zm9Mv87LTiUX2DmziCDZ3kMl2SYMRfdR5XoKjfZl0VqtzEi5 mr.john.nielson@gmail.com

So then I went back to try to push to GitHub again:

cd ~/cloudmatrix

git push -u origin master

And everything worked fine.

Next I added the contents of the project to GitHub:

git add \*

git commit -m "initial load of project files and flask app"

git push –u origin master

Note that this will NOT add empty directories. I also added this document to the repo – wow!!

5. Set Up Spark & Tachyon on EC2 – Part II

Remember in 3. I logged into the Spark cluster using this command:

./spark-ec2 -k DriveStoredKey -i ~/keys/DriveStoredKey.pem login CloudMatrixTachyonCluster

Then I updated all my yum packages. Well, I’ve gone back to the Spark cluster now.

Time to config Tachyon on the Spark cluster.

cd /root/tachyon/conf

cp tachyon-env.sh.template tachyon-env.sh # creating the config script

Added the following to tachyon-env.sh:

export TACHYON\_HDFS\_ADDRESS=hdfs://HDFS\_HOSTNAME:HDFS\_PORT

Edit Spark /root/spark/conf/spark-env.sh by adding to top:

export SPARK\_CLASSPATH+=/root/tachyon/target/tachyon-0.4.1-SNAPSHOT-jar-with-dependencies.jar

SPARK\_JAVA\_OPTS+=" -Dtachyon.hdfs.address=hdfs://HDFS\_HOSTNAME:HDFS\_PORT -Dspark.default.parallelism=1 "

export SPARK\_JAVA\_OPTS

Edit Spark’s hdfs-site.xmls by adding:

<property>

<name>fs.tachyon.impl</name>

<value>tachyon.hadoop.TachyonFileSystem</value>

<description></description>

</property>

There are multiple hdfs-site.xml files; they can be found here:

/root/spark-ec2/templates/root/ephemeral-hdfs/conf

/root/spark-ec2/templates/root/mapreduce/conf

/root/spark-ec2/templates/root/persistent-hdfs/conf/hdfs-site.xml

Sync configuration to all nodes:

cd /root/tachyon/conf

/root/spark-ec2/copy-dir.sh .

I went back and took OUT the stuff from /root/spark/conf/spark-env.sh about the SPARK\_CLASSPATH and SPARK\_JAVA\_OPTS, i.e. these lines:

export SPARK\_CLASSPATH+=/root/tachyon/target/tachyon-0.4.1-SNAPSHOT-jar-with-dependencies.jar

SPARK\_JAVA\_OPTS+=" -Dtachyon.hdfs.address=hdfs://HDFS\_HOSTNAME:HDFS\_PORT -Dspark.default.parallelism=1 "

export SPARK\_JAVA\_OPTS

Spark won’t create a working SparkContext with those lines in there for some reason.

Run Spark (this takes a while):

/root/spark/bin/spark-shell

Found out that my AWS account had been compromised. Attackers started about 160 servers under my account. Waiting to hear back from Amazon about billing remedies, e.g. refunds, credits, or whatever to cover the almost $700 in charges created by the attackers. Shut everything down, deleted all instances, and deleted my IAM role. Starting over with VoltDB.

***2014.11.17***

Gonna try VoltDB today. Tachyon isn’t really what I want anyway. I don’t want a filesystem. I want a database. I plan to run VoltDB on a cluster. I also got a 30-day trial license for MemSQL today. I might try that if VoltDB doesn’t work out for some reason.

In light of recent AWS account-related circumstances, I’ll be doing everything on a local VM for a while.

***2014.11.22***

Screw everything I said last time. BTW, I heard back from Amazon and they refunded all the charges incurred by the account compromise. I even got back my $100 in credits from Dr. Roussev. Anyway, I’m setting up a Redis cluster a la this guide:

<http://docs.aws.amazon.com/AmazonElastiCache/latest/UserGuide/GettingStarted.CreateCluster.Redis.html>

Key-value store makes more sense anyway since I’m just going to pickle big matrices. I might try to do something with databases for matrix transformations and see the difference between the two, but that won’t make any difference if I’m just using NumPy – only if I’m writing my own algorithms.

Just finished the system diagram, cloudmatrix\_SystemDiagram.vsdx aww yeah

Setting up Ubuntu Server EC2 instance. Installing the following:

sudo apt-get install python-pip

sudo pip install flask

sudo pip install kazoo

**ZooKeeper setup:**

Setting up ZooKeeper server. Creating an image from this. You have to open the following ports:

2181 (client port)

2888 (peer port)

3888 (peer leader election port)

Using Virtual Private Cloud (VPC) to create static IPs for servers. Setting this up for all compute and ZK servers. Hopefully I can do the same for the Redis cluster, though I don’t know if that’s even necessary.

Had to

sudo apt-get update

sudo apt-get install openjdk-7-jre-headless

Edited zk.Env.sh to change the ZooKeeper bin directory to where I stupidly installed it in ~/

Edited the init.d script

* to point to the correct location of zkEnv.sh
* changed shebang at top of init.d script to read

#!/usr/bin/env bash

* changed

chown zookeeper:hadoop ${ZOOPIDDIR}

to

chown ubuntu:ubuntu ${ZOOPIDDIR}

* changed calls to

${ZOOKEEPER\_PREFIX}/sbin/zkServer.sh

to

${ZOOKEEPER\_PREFIX}/bin/zkServer.sh

* removed ‘-c zookeeper’ option to just run as default user (was throwing “user ‘zookeeper’ not found error”

Then I copied the init.d script to /etc/init.d and chmodded 0755 the file

Create a myid file in the ZooKeeper dataDir. It’s a file with a single line representing which server that machine is in the quorum. So if you’re creating the myid file for server.1, the file should just have

1

in it.

**USE THE HOSTNAMES - DON’T USE THE IP**

**IT’S A VPC-SPECIFIC THING**

**ALSO**

**SUDO EVERY TIME YOU RUN zkServer.sh**