Distributed Computing Cluster to run a MPI “Hello world Program”

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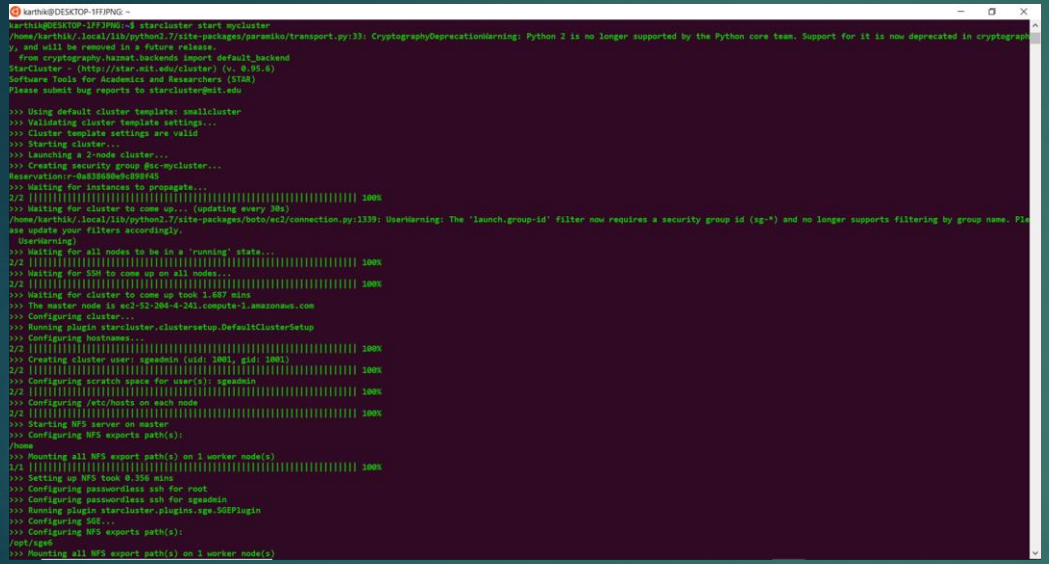
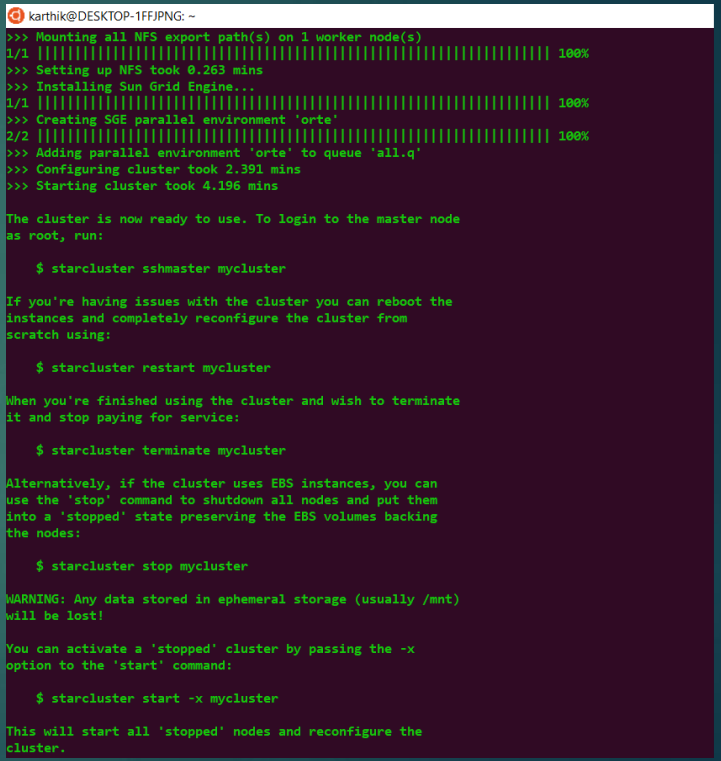
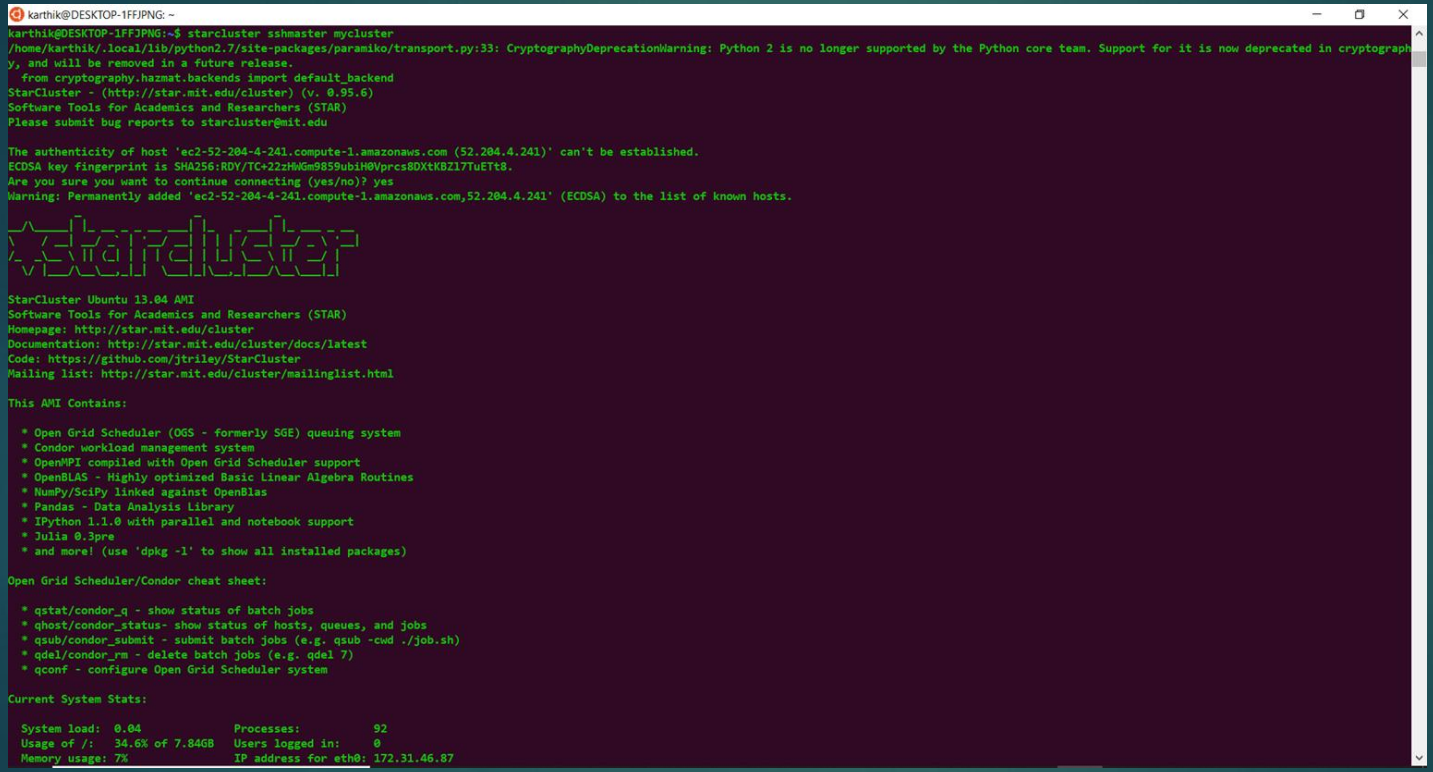
Setting Up Starcluster





Login into the Master node



Verify 2 cluster nodes within /etc/hosts

```
root@master:~# cat /etc/hosts
127.0.0.1 localhost

# The following lines are desirable for IPv6 capable hosts
::1 ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
ff02::3 ip6-allhosts
172.31.46.87 master
172.31.36.141 node001
```

Mount /home in NFS Shared

```
root@master:~# ssh node001 mount
/dev/xvda1 on / type ext4 (rw)
proc on /proc type proc (rw,noexec,nosuid,nodev)
sysfs on /sys type sysfs (rw,noexec,nosuid,nodev)
none on /sys/fs/cgroup type tmpfs (rw)
none on /sys/fs/fuse/connections type fusectl (rw)
none on /sys/kernel/debug type debugfs (rw)
none on /sys/kernel/security type securityfs (rw)
udev on /dev type devtmpfs (rw,mode=0755)
devpts on /dev/pts type devpts (rw,noexec,nosuid,gid=5,mode=0620)
tmpfs on /run type tmpfs (rw,noexec,nosuid,size=10%,mode=0755)
none on /run/lock type tmpfs (rw,noexec,nosuid,nodev,size=5242880)
none on /run/shm type tmpfs (rw,nosuid,nodev)
none on /run/user type tmpfs (rw,noexec,nosuid,nodev,size=104857600,mode=0755)
rpc_pipefs on /run/rpc_pipefs type rpc_pipefs (rw)
/dev/xvdaa on /mnt type ext3 (rw,_netdev)
master:/home on /home type nfs (rw,vers=4,addr=172.31.46.87,clientaddr=172.31.36.141)
master:/opt/sge6 on /opt/sge6 type nfs (rw,vers=4,addr=172.31.46.87,clientaddr=172.31.36.141)
```

Logging into sgeadmin from Master node

```
root@master:~# ssh node001 hostname
node001
root@master:~# su - sgeadmin
sgeadmin@master:~$ ssh node001 hostname
node001
```

Importing file created through vi editor to cluster (using put command already done before.)

```
starcluster put mycluster helloworldmpi.c /home/sgeadmin
```

Running the program file in the cluster

```
sgeadmin@master:~$ vi helloworldmpi.c
sgeadmin@master:~$ mpicc helloworldmpi.c -o hellompi
sgeadmin@master:~$ mpirun -n 2 -host master,node001 ./hellompi
master: hello world from process 0 of 1
node001: hello world from process 0 of 1
```

Terminating the Cluster

```
karthik@DESKTOP-1FFJPNG:~$ starcluster terminate mycluster
/home/karthik/.local/lib/python2.7/site-packages/paramiko/transport.py:33: CryptographyDeprecationWarning: Python 2 is no longer supported by the Python core team. Support for it is now deprecated in cryptograph
y, and will be removed in a future release.
  from cryptography.hazmat.backends import default_backend
StarCluster - (http://star.mit.edu/cluster) (v. 0.95.6)
Software Tools for Academics and Researchers (STAR)
Please submit bug reports to starcluster@mit.edu

Terminate EBS cluster mycluster (y/n)? y
>>> Running plugin starcluster.plugins.sge.SGEPlugin
>>> Running plugin starcluster.clustersetup.DefaultClusterSetup
>>> Terminating node: master (i-0e937d7f449f82b31)
>>> Terminating node: node001 (i-05f6728353f7dbd3f)
/home/karthik/.local/lib/python2.7/site-packages/boto/ec2/connection.py:1339: UserWarning: The 'launch.group-id' filter now requires a security group id (sg-*) and no longer supports filtering by group name. Ple
ase update your filters accordingly.
  UserWarning)
>>> Waiting for cluster to terminate...
>>> Removing security group: @sc-mycluster
karthik@DESKTOP-1FFJPNG:~$
```