Setting up an MPI Cluster in Ubuntu 14.04

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I Rename Hosts to ensure unique names in the cluster. Master machine may be named master and slaves as slave1,slave2,.. The following shows the modifications in master system. The same should be done on all slaves.

a sudo nano hostname

b replace the current hostname with master, save and exit

c sudo nano /etc/hosts

i Give name and IP address of all nodes in the cluster
For example, in master
127.0.0.1 localhost
10.7.7.155 master
10.7.7.156 slave1
10.7.7.157 slave2

And in slave, say slave2
127.0.0.1 localhost
10.7.7.155 master
10.7.7.157 slave2

ii Comment out (#) any other entries starting with 127.
e.g. #127.0.1.1 administrator-system-product-name

iii keep other entries in tact

d Restart the system

II Add the same user mpiuser in all nodes

a sudo adduser mpiuser

b Set the password

c Just press Enter for all other fields

III Setup ssh server in all nodes

a Install ssh server
sudo apt-get install openssh-server

b Setting passwordless login

i su mpiuser

ii Enter password of mpiuser

iii ssh-keygen -t dsa
Use default locations and keep pass phrase Blank(just press Enter)

iv Copy key to slaves
ssh-copy-id slave1
ssh-copy-id slave2

v ssh all machines ones (They get added to list of known hosts)

vi Enable Passwordless login

1 eval ‘ssh-agent‘ (using Command substitution in shell. The character is grave accent, below the tilde character on keyboard. This is *not* the single quote.)

2 ssh-add home/mpiuser/.ssh/id_dsa

IV Setup NFS

a In master, setup NFS Server

i sudo apt-get install nfs-kernel-server

ii su mpiuser

iii mkdir /home/mpiuser/storage
storage is the shared folder, to be mounted in all slaves

iv exit (from mpiuser)

v edit /etc/exports and add a new entry for /home/mpiuser/storage as shown

1 sudo nano /etc/exports

2 /home/mpiuser/storage *(rw,sync,no_root_squash,no_subtree_check)

3 save & exit

vi sudo exportfs -a

vii restart nfs server
sudo service nfs-kernel-server restart

b In slaves, setup NFS client

i sudo apt-get install nfs-common

ii su mpiuser

iii mkdir /home/mpiuser/storage
storage is the shared folder, to be mounted from master

iv exit (from mpiuser)

v add the following entry to /etc/fstab so that the mounting of master's storage folder to the client will be done everytime the system boots.

1 sudo nano /etc/fstab

2 master:/home/mpiuser/storage /home/mpiuser/storage nfs

3 save & exit

vi Restart the slave machine

V Testing

a login to master as mpiuser

b cd storage

c create a program, say helollo.c

d mpicc hello.c -o hello

e mpirun -np 6 -hosts master:2,slave1:2,slave2:2 ./hello