Commands for creating master Node

1) docker pull husseinabdallah2/mpi4py-cluster:master

Explain: This command is used to pull husseinabdallah2/mpi4py-cluster image from docker hub to our local system.

2) docker run --name t2_node0 --mount type=bind,source=C:\Users\nalin\Desktop\Assignment_2\implementation,target=/COMP6231 -it

husseinabdallah2/mpi4py-cluster:master bash

Explain: This command is used to create and run in bash mode t2_node0 container and it will also mount this local C:\Users\nalin\Desktop\Assignment_2\implementation folder with target folder /COMP6231.

3) Inside t2_node0 bash commands

a) passwd: Used to change password.

b) apt-get update: It downloads and installs the updates for each outdated package and dependency on your system.

c) apt-get install nano net-tools iputils-ping: To install ping, ifconfig and nano tools on container.

d) service ssh start: to start ssh service to test its working or not.

e) service ssh stop: to stop ssh service.

f) ifconfig: to get inet address of the container.

g) ssh root@172.17.0.5 : to add login to this node address for remote login

h) yes: to add fingerprint

i) exit: exit from the remote machine back to our current.

j) ssh root@172.17.0.6 :to add login to this node address for remote login

k) yes: to add fingerprint

l) exit: exit from the remote machine

m) ssh root@172.17.0.7: to add login to this node address for remote login

n) yes: to add fingerprint

p) exit: exit from the remote machine

q) cd ~/ : to come to root directory

r) nano machinefile: to open machinefile in terminal text editor so we can add all nodes IP addresses including ours as well.

s) ssh-keygen -t rsa: tries to find the matching public key file and prints its fingerprint

t) ssh-copy-id -i ~/.ssh/id_rsa.pub root@172.17.0.5: It copies the public key of first worker node to the appliance.

u) ssh-copy-id -i ~/.ssh/id_rsa.pub root@172.17.0.6: It copies the public key of second worker node to the appliance.

v) ssh-copy-id -i ~/.ssh/id_rsa.pub root@172.17.0.7: It copies the public key of third worker node to the appliance.

w) eval 'ssh-agent: stores the SSH key in a process memory so that users can log into SSH servers without having to type password every time they authenticate with the server.

x) cd COMP6231 : to go to directory COMP6231

y) cd Q1 to go to directory Q1

z) mpiexec -n 4 -machinefile ~/machinefile python -m mpi4py T3.py: TO execute T3 mpi code.

Commands for creating worker node 1

1) docker run --name t2_node1 --mount type=bind,source=C:\Users\nalin\Desktop\Assignment_2\implementation,target=/COMP6231 -it husseinabdallah2/mpi4py-cluster:master bash

Explain: This command is used to create and run in bash mode t2_node1 container and it will also mount this local C:\Users\nalin\Desktop\Assignment_2\implementation folder with target folder /COMP6231.

2) Inside t2_node1 bash commands:

a) apt-get update It downloads and installs the updates for each outdated package and dependency on your system.

b) apt-get install nano net-tools iputils-ping openssh-client openssh-server: To install ping, ifconfig and nano tools on container.

c) ifconfig: to get IP address of this container.

d) passwd: Used to change password of linux machine

e) service ssh start: to start ssh service to master can access this one through ssh service

Commands for creating worker node 2

1) docker run --name t2_node2 --mount type=bind,source=C:\Users\nalin\Desktop\Assignment_2\implementation,target=/COMP6231 -it husseinabdallah2/mpi4py-cluster:master bash

Explain: This command is used to create and run in bash mode t2_node2 container and it will also mount this local C:\Users\nalin\Desktop\Assignment_2\implementation folder with target folder /COMP6231.

2) Inside t2_node2 bash commands:

a) apt-get update It downloads and installs the updates for each outdated package and dependency on your system.

b) apt-get install nano net-tools iputils-ping openssh-client openssh-server: To install ping, ifconfig and nano tools on container.

c) ifconfig: to get IP address of this container.

d) passwd: Used to change password of linux machine

e) service ssh start: to start ssh service to master can access this one through ssh service.

Commands for creating worker node3

1) docker run --name t2_node3 --mount type=bind,source=C:\Users\nalin\Desktop\Assignment_2\implementation,target=/COMP6231 -it husseinabdallah2/mpi4py-cluster:master bash

Explain: This command is used to create and run in bash mode t2_node3 container and it will also mount this local C:\Users\nalin\Desktop\Assignment_2\implementation folder with target folder /COMP6231.

2) Inside t2_node2 bash commands:

a) apt-get update It downloads and installs the updates for each outdated package and dependency on your system.

b) apt-get install nano net-tools iputils-ping openssh-client openssh-server: To install ping, ifconfig and nano tools on container.

c) ifconfig: to get IP address of this container.

d) passwd: Used to change password of linux machine

e) service ssh start: to start ssh service to master can access this one through ssh service

---

IP/Ports used in each container and the shared storage paths

1) IP address of containers:

Master: 172.17.0.4

Worker1: 172.17.0.5

Worker2: 172.17.0.6

Worker3: 172.17.0.7

2) Shared Storage paths

C:\Users\nalin\Desktop\Assignment_2\implementation