

## Creating Master and Slave

[illegible]

## SSH Configuration

[illegible]

# NFS Configuration, dan MPI Installation

```
#!/bin/bash
# This script sets up NFS and MPI on a Ubuntu system.
# It creates a new user 'nfsuser' and sets up NFS services.
# It also installs MPI and sets up the environment.

# Create a new user 'nfsuser'
useradd -m -s /bin/bash nfsuser

# Set password for 'nfsuser'
echo 'nfsuser:nfsuser' | chpasswd

# Create a new directory for NFS
mkdir /home/nfsuser/bubble

# Set permissions for 'nfsuser'
chown -R nfsuser:nfsuser /home/nfsuser/bubble

# Install NFS services
sudo apt-get install nfs-kernel-server nfs-common

# Create a new file for NFS exports
cat > /etc/exports
echo '/home/nfsuser/bubble *(r,w,sync,root_squash,no_subtree_check)' | tee -a /etc/exports

# Restart NFS services
sudo systemctl restart nfs-kernel-server

# Install MPI
sudo apt-get install openmpi-bin openmpi-dev

# Set environment variables
export OMPI_MCA_btl_tcp_if_include=eth0
export OMPI_MCA_btl_tcp_if_exclude=lo,lo6

# Run the code on the slave nodes
mpirun -np 4 -x OMPI_MCA_btl_tcp_if_include=eth0 python bubble.py
```

# Running Python Code - Bubble Sort

```
#!/bin/bash
# This script sets up MPI and runs a Python code.
# It creates a new user 'nfsuser' and sets up NFS services.
# It also installs MPI and sets up the environment.

# Create a new user 'nfsuser'
useradd -m -s /bin/bash nfsuser

# Set password for 'nfsuser'
echo 'nfsuser:nfsuser' | chpasswd

# Create a new directory for NFS
mkdir /home/nfsuser/bubble

# Set permissions for 'nfsuser'
chown -R nfsuser:nfsuser /home/nfsuser/bubble

# Install NFS services
sudo apt-get install nfs-kernel-server nfs-common

# Create a new file for NFS exports
cat > /etc/exports
echo '/home/nfsuser/bubble *(r,w,sync,root_squash,no_subtree_check)' | tee -a /etc/exports

# Restart NFS services
sudo systemctl restart nfs-kernel-server

# Install MPI
sudo apt-get install openmpi-bin openmpi-dev

# Set environment variables
export OMPI_MCA_btl_tcp_if_include=eth0
export OMPI_MCA_btl_tcp_if_exclude=lo,lo6

# Run the code on the slave nodes
mpirun -np 4 -x OMPI_MCA_btl_tcp_if_include=eth0 python bubble.py
```

Kesimpulan :

MPI dapat digunakan untuk mempercepat proses paralel pada komputer cluster. Dengan menggunakan MPI, proses paralel dapat dilakukan secara efisien pada sejumlah komputer yang berbeda. Hal ini dapat meningkatkan kecepatan proses paralel secara signifikan.