README

Cluster Setup and MPI Execution Instructions

This README provides instructions for setting up a cluster environment using Docker and executing MPI programs within the cluster.

1. Cluster Setup

Follow these steps to set up the cluster environment:

- Clone the Cluster-Setup repository from GitHub:

```
git clone https://github.com/MARafey/Cluster-Setup.git
```

- Navigate to the `PDC-Cluster-Setup` directory:

```
cd PDC-Cluster-Setup
```

- Navigate to the `cluster` directory:

```
cd cluster
```

- Execute the `cluster.sh` script with the `up` command to bring up the cluster. Specify the number of desired slaves using the `size` parameter (from 1 to 100):

```
./cluster.sh up size=4
```

2. Cluster Execution

After setting up the cluster, follow these steps to execute MPI programs within the cluster:

- Once the cluster is up, execute the `cluster.sh` script with the `exec` command followed by the `mpirun` command to run MPI programs:

```
./cluster.sh exec mpirun -n <num_processes> <mpi_program>
```

Replace `<num_processes>` with the desired number of MPI processes and `<mpi_program>` with the name of the MPI program you want to run.

For example, to execute the `mpi_hello_world` program:

./cluster.sh exec mpirun -n 4 mpi_hello_world

3. Exiting the Cluster

To exit the cluster environment, follow these steps:

- Execute the `exit` command to exit from the kernel level:

exit

4. Additional Notes

- Ensure Docker is installed on your system before setting up the cluster.

- Adjust the size of the cluster according to your requirements by changing the `size` parameter during setup.

- Ensure that MPI programs are compiled and available within the cluster environment before execution.

- Monitor the execution of MPI programs for errors and performance optimization.