

- Master-Worker implement을 위한 test code에 대한 문서

1. Directory 구성
 - a. /example/master_slave_test/port_test.sh
 - b. /example/master_slave_test/make_data.sh
2. Master & Worker 구현 방법
 - a. 여러 개의 서버를 이용하여 각기 다른 ip 부여
 - b. 한 개의 서버를 이용하여 다른 port 부여 - **Test 완료**
 - i. Concurrent 하게 작업 처리가 가능한가?
 - ii. 접근 하는 방법
3. Gensort 사용법
 - a. Gensort 홈페이지(<http://www.ordinal.com/gensort.html>) 에서 gensort-linux-1.5.tar.gz download 후 unzip
 - b. cd gensort-linux-1.5/64
 - c. ./gensort -a 10 partition1 (example execution command)

2-b) 에 대한 설명

1. Apache2 설치(Ref : <https://programmer-eun.tistory.com/30>)
2. linux command/script 만들기
 - a. script
 - i. vim (shell_script_name.sh)
 - ii. 첫줄에 #!/bin/bash
 - iii. chmod u+x (script.sh) - 권한 부여
 - b. command
 - i. vi ~/.bashrc 에서 alias 편집
 - ii. master 명령어 추가
 - iii. source ~/.bashrc (update)

```
hong@hong-vm:~$ master
Hello World!
```

<= master 명령어로 port_test.sh

라는 bash script 실행

3. port_test.sh

- a. master (# of slave(worker)) 를 command line에 입력하면 port_test.sh 이 실행됨 - *sudo 권한 필요(Probably)

```

port_test.sh (-) - VIM
File Edit View Search Terminal Help
1 #!/bin/bash
2
3 INIT_PORT=8000
4 echo $INIT_PORT
5 echo "number of slave: $1"
6
7 echo "add ports"
8
9 for i in $(seq 1 $1)
10 do
11     echo "sequence $i"
12     PORT=$((i + $INIT_PORT))
13
14     echo "Listen $PORT" | sudo tee -a /etc/apache2/ports.conf > /dev/null
15
16     echo -e "<VirtualHost *: $PORT>\n</VirtualHost>" | sudo tee -a /etc/apache2/sites-enabled/000-default.conf > /dev/null
17
18     echo "successfully open port $PORT"
19 done
20
21 sudo service apache2 restart
22 echo "apache2 restart complete"
23
24 netstat -nplt

```

b.

```

hong@hong-vm:~$ master 3
8000
number of slave: 3
add_ports
sequence 1
successfully open port 8001
sequence 2
successfully open port 8002
sequence 3
successfully open port 8003
apache2 restart complete
(Not all processes could be identified, non-owned process info
will not be shown, you would have to be root to see it all.)
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State       PID/Program nam
e
tcp        0      0 127.0.0.53:53          0.0.0.0:*               LISTEN      -
tcp        0      0 127.0.0.1:631          0.0.0.0:*               LISTEN      -
tcp6       0      0 :::8001                :::*                    LISTEN      -
tcp6       0      0 :::7777                :::*                    LISTEN      -
tcp6       0      0 :::8002                :::*                    LISTEN      -
tcp6       0      0 :::8003                :::*                    LISTEN      -
tcp6       0      0 :::80                  :::*                    LISTEN      -
tcp6       0      0 :::1:631               :::*                    LISTEN      -

```

c.

d. 코드 설명

- i. Argument parsing 을 통해 command line 에서 입력된 slave number를 \$1 변수로 사용 가능.
- ii. Initial port number 를 8000으로 설정하고 slave 개수 만큼 initial port number에 1씩 더하여 새로운 port open - c의 image 를 보면 “master 3” 이라는 command 를 입력하였을때 8001, 8002, 8003 port 가 open 된 것을 확인할 수 있음.

e. Problem

- i. port number를 포함한 ip address 를 출력하는 방법?

4. make_data.sh

- a. gensort로 data를 만들어서 directory 에 separate 하는 script.

```
make_data.sh (-) - VIM
File Edit View Search Terminal Help
1 #!/bin/bash
2
3 NUM_FILE=3
4 Index=10
5
6 echo "Generate dataset with $NUM_FILE partitions"
7
8 rm ./dataset
9 mkdir ./dataset
10
11 for i in $(seq 1 $NUM_FILE)
12 do
13     mkdir ./dataset/input
14     let idx=$((i-1)*Index
15     ./Downloads/gensort-linux-1.5/64/gensort -a -b$idx $Index ./dataset/input/input$i
16 done
17
18 echo "Data generation complete"
```

b.

```
hong@hong-vm:~$ bash make_data.sh
Generate dataset with 3 partitions
rm: cannot remove './dataset': Is a directory
mkdir: cannot create directory './dataset': File exists
mkdir: cannot create directory './dataset/input': File exists
mkdir: cannot create directory './dataset/input': File exists
mkdir: cannot create directory './dataset/input': File exists
Data generation complete
hong@hong-vm:~$ cd dataset/input/
hong@hong-vm:~/dataset/input$ cat input1
AsfAGHM5om 00000000000000000000000000000000 00002222000022220000222200002222000000000000
111
~sHd0jDv6X 00000000000000000000000000000000 77779999444488885555CCCC777755555555BBB66664444
666
uI*EYm8s=| 00000000000000000000000000000000 CCCCCFFFF777799995555FFFF11112222999988884444DDDDF
FFF
Q)JN)R9z-L 00000000000000000000000000000000 FFFF1111000000000066668888BBB33333333AAA1111C
CCC
o4FoBkqERn 00000000000000000000000000000004 7777AAAABBBB888822224444444499995555BBB11118888D
DDD
*)-Wz1;TD- 00000000000000000000000000000005 AAAA888833338888888888884444777722227777999900002
222
0fsx]-[oB 00000000000000000000000000000006 FFFF999977774444AAAA7777EEEEDDDDAAAAAA99998888B
BBB
nz4VCN@a# 00000000000000000000000000000007 DDDDBBBB1111FFFF2222DDDDFFFFBBB8888FF6666444477778
888
ny+5r7(N) 00000000000000000000000000000008 22226666CCCC66662222FFFF0000EEEE11118888444455559
999
SHA\z%qt{% 00000000000000000000000000000009 0000AAAA8888FFFF0000888800000000222255551111FFFFE
EEE
hong@hong-vm:~/dataset/input$
```

c.

```
hong@hong-vm:~/dataset/input$ ls
input1 input2 input3
```

d.

e. 코드 설명

- NUM_FILE - 생성된 data를 나누는 개수
- Index - 한 folder에 들어가는 data 수
- 예시 코드에서는 NUM_FILE=3, Index=10 으로 설정되어 있다. Input data를 3개의 partition 으로 나누어서 저장, partition 마다 10개의 data가 있다는 뜻. (Image c 참고)
- 결과 : image c, d 를 보면 3개의 partition(input1, input2, input3)로 나누어지고 각 partition 에는 10개의 (key, value)가 포함되어 있음을 확인할 수 있음.