

COEN 241

HW 1

Dylan Hoover

Github repository: <https://github.com/dylanhooover/COEN241>

For my three vm configurations the only differences between them were the RAM allocated, the cores and the threads. The lowest level VM has 2 gigabytes of ram, 1 core and 2 threads. The second level up has 4 gigabytes of ram, 2 cores and 4 threads. The highest level has 8 gigabytes of ram, 4 cores and 8 threads.

The commands for starting these VMs are listed in a shell script on my repo however I will also list them here:

For lowest level:

```
sudo qemu-system-x86_64 -m 2048 -boot d -accel kvm -smp cores=1,threads=2 -boot strict=on -hda ubuntu.img
```

For middle level:

```
sudo qemu-system-x86_64 -m 4096 -boot d -accel kvm -smp cores=2,threads=4 -boot strict=on -hda ubuntu.img
```

For highest level:

```
sudo qemu-system-x86_64 -m 8192 -boot d -accel kvm -smp cores=4,threads=8 -boot strict=on -hda ubuntu.img
```

These are the commands for launching the VM, the command used to create the VM originally is the same as the instruction given in the homework assignment.

To create the lowest level docker container using the lowest amount of ram and cpu usage I used this command:

```
sudo docker run --rm -it --cpuset-cpus 0 -m 2G --entrypoint /bin/sh zyclonite/sysbench
```

The rest of the docker commands are listed in a shell script file on my repository. The following command is an example of a docker command from my test shell script:

```
sudo docker run --rm --cpuset-cpus="0-1" -m 2G zyclonite/sysbench --test=cpu --threads=2 --cpu-max-prime=10000 --time=15 run | grep "events per second: \|total number of events:" >> $filename
```

The important arguments to note are “--cpuset-cpus” which sets the amount of cores, the memory flag “-m” which allocates only 2 gigabytes of ram, and the “--threads” flag which allocates the number of threads.

The way I measured the difference between the different VM setups is crude yet effective. I launch the VMs using the different configurations and then run the test script, making sure to set the correct configuration and I print out how many events happen per second and the total number of events for a 2, 4 and 8 thread cpu. Examining the output files generated shows an increase in the number of events per second in the corresponding section of the test results along with an increased total number of events. For the IO testing I generate 128 files with a total file size of 500M, the reason for such a small size was only allocating a very small amount of space for my ubuntu installation. I then utilized sysbench built in tools to print out the min, max, average, 95 percentile, sum, throughput, read, write and latency. I tested containers

VM test running

[illegible]

Docker test running