PROJECT PRESENTATION

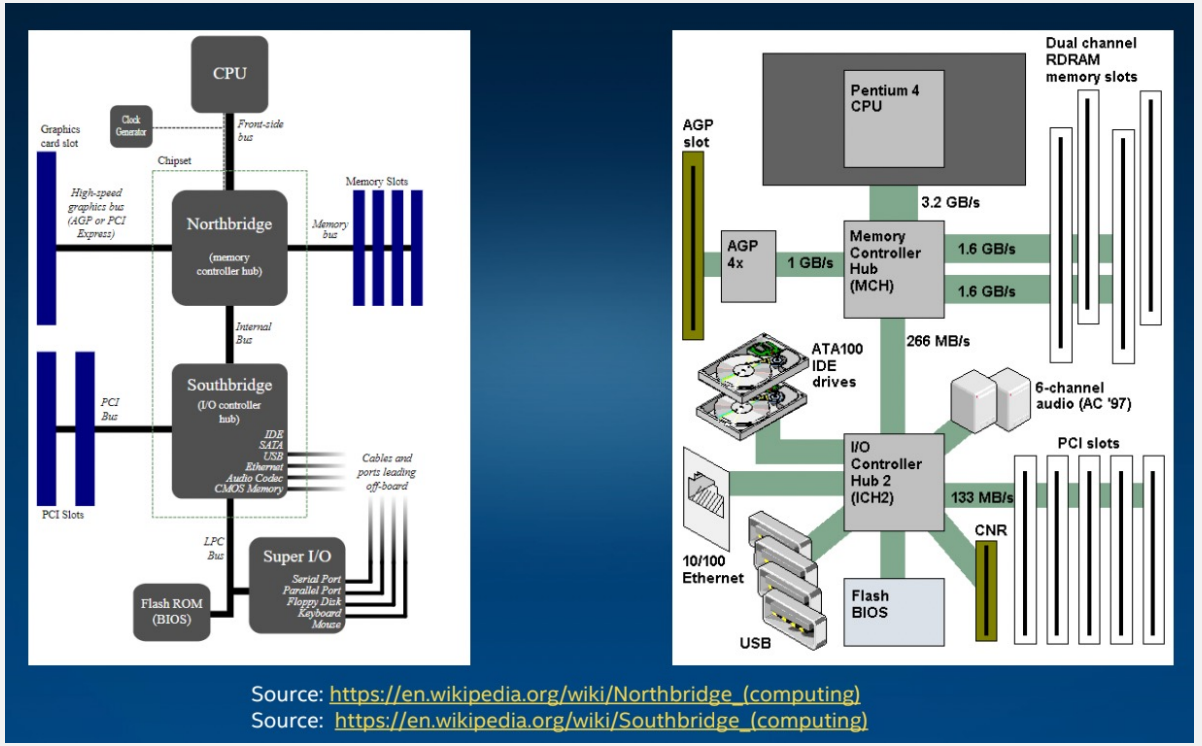
Hyunjae Kim

OVERVIEW

- Topic From Shesha's Lecture
- Slurm
- Containers
- Troubles I've had and Lessons learned

TOPIC FROM SHESHA'S LECTURE

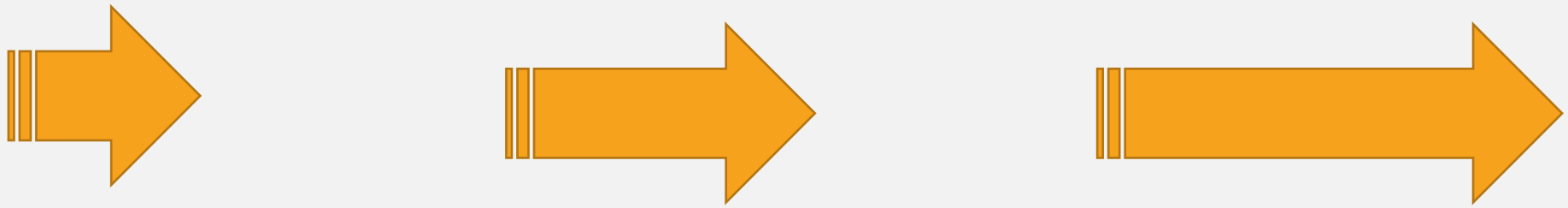
COMPUTER ARCHITECTURE



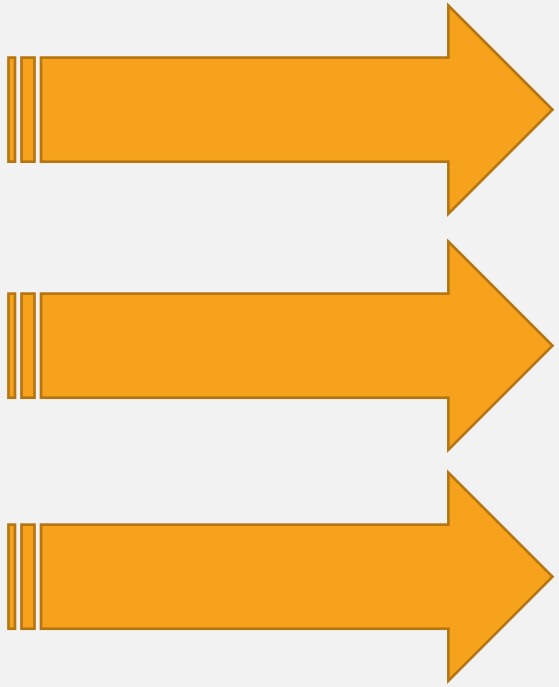
Source: https://en.wikipedia.org/wiki/Northbridge_(computing)
Source: https://en.wikipedia.org/wiki/Southbridge_(computing)

LATENCY VS BANDWIDTH

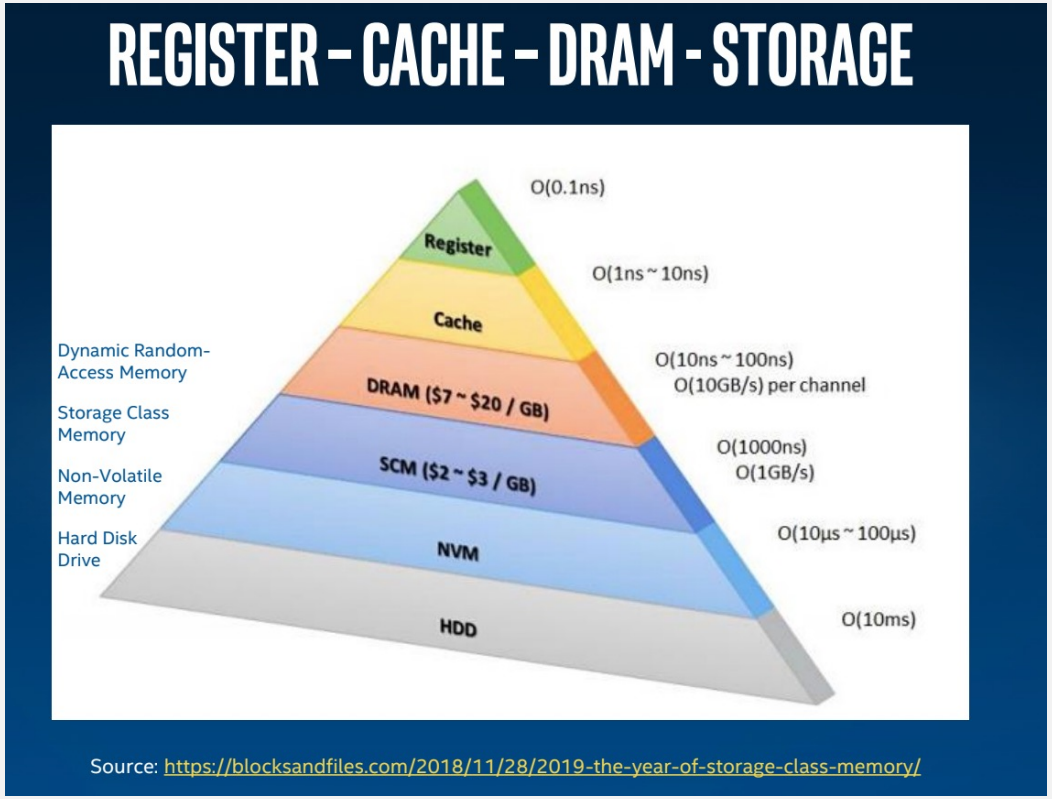
LATENCY



BAND WIDTH



MEMORY HIERARCHY



SLURM

SLURM

- Open source cluster management system
- Job scheduling system

For linux cluster

```
[davidron@hpcc-cluster-login-external ~]$ nano myscript2
[davidron@hpcc-cluster-login-external ~]$ nano myscript3
[davidron@hpcc-cluster-login-external ~]$ sbatch myscript2
Submitted batch job 57
[davidron@hpcc-cluster-login-external ~]$ sbatch myscript3
Submitted batch job 58
[davidron@hpcc-cluster-login-external ~]$ squeue
             JOBID PARTITION     NAME     USER ST       TIME  NODES NODELIST(REASON)
                56    normal  example davidron PD       0:00      1 (BeginTime)
                57    normal example  davidron PD       0:00      1 (BeginTime)
                58    normal example3 davidron PD       0:00      1 (BeginTime)
```

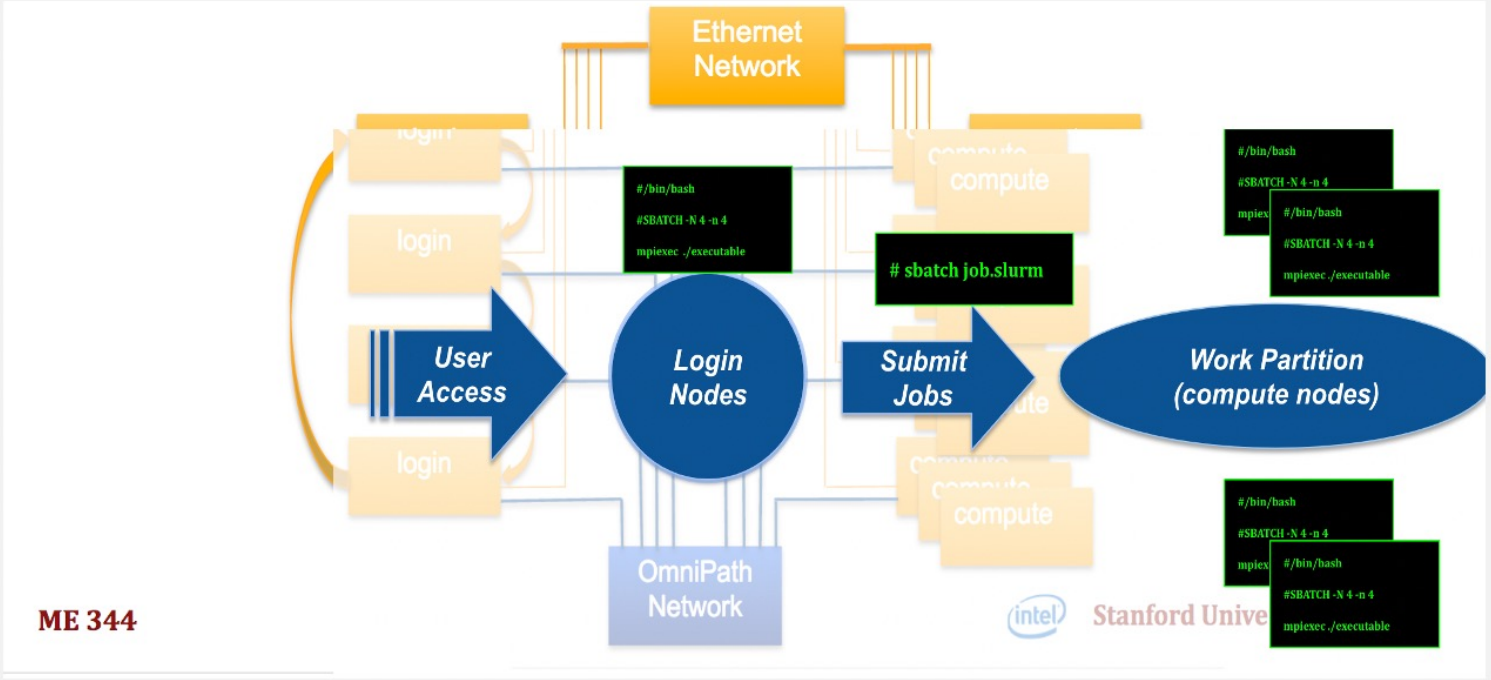
MAIN FUNCTIONS

- Allocates resources
- Provide framework for job submitted to clusters
- Manage queue pending jobs

ADVANTAGE

- Automates the management of jobs submitted to a cluster.
- Modular and has plugins for accounting, resource optimization, time management, power consumption
- Allows administrator to ..
  - provide more resources for certain jobs or users
  - prioritize certain users or jobs

SLURM WORKFLOW



CONTAINER

WHAT IS CONTAINER?

- Executable units of software where application code is packaged, along with its libraries and dependencies

- it can be run anywhere, whether it be a desktop, laptop, HPC system, or the cloud

ADVANTAGE OF CONTAINER

- No need to install the whole program for each machine
- Form of Operating System virtualization for OS which features are leveraged to both isolate processes and control the amount of CPU, memory, and disk those processes have access to

TROUBLES AND LESSONS

TROUBLE IN WEEK1-LAB3

```
[root@hpcc-cluster-10 ~]# wwsh node set compute-1-1 -H 34:40:b5:b9:05:14
Are you sure you want to make the following 1 change(s) to 1 node(s):

     SET: eth0.HWADDR          = 34:40:b5:b9:05:14

Yes/No [no]> Yes
[root@hpcc-cluster-10 ~]# wwsh pxe update
[root@hpcc-cluster-10 ~]# service dhcpd restart
Redirecting to /bin/systemctl restart dhcpd.service
[root@hpcc-cluster-10 ~]# ipmitool -H 10.2.2.2 -U USERID -P PASSW0RD chassis power cycle
Chassis Power Control: Cycle
[root@hpcc-cluster-10 ~]# sinfo
PARTITION AVAIL  TIMELIMIT  NODES  STATE NODELIST
normal*      up 1-00:00:00      0    n/a
[root@hpcc-cluster-10 ~]#
```

```
[root@hpcc-cluster-10 ~]# sinfo
PARTITION AVAIL  TIMELIMIT  NODES  STATE NODELIST
normal*      up 1-00:00:00      1   idle compute-1-1
[root@hpcc-cluster-10 ~]#
```

TROUBLE IN WEE4- INFINIBAND & IPOIB

```
[root@hpcc-cluster-10 ~]# yum install numactl-libs gtk2 atk cairo gcc-gfortran tcsh libnl3 tcl tk python-devel make lsof redhat-rpm-config rpm-build createrepo
```

```
[root@hpcc-cluster-10 ~]# yum -y --installroot=$CHROOT install numactl-libs gtk2 atk cairo gcc-gfortran tcsh libnl3 tcl tk python-devel make lsof redhat-rpm-config rpm-build createrepo
```

TROUBLE IN WEEK5-NHC

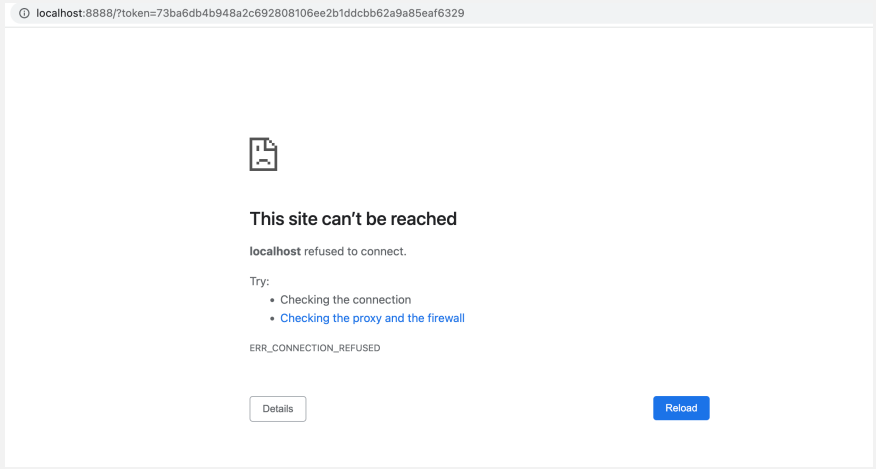
- Node Health Check not properly set/installed by missing components.

```
wwsh -y provision set "compute-*" --vnfs=centos7 --bootstrap=`uname -r` --
files=dynamic_hosts,passwd,group,shadow,network,ifcfg-ib0
```

```
wwsh -y provision set "compute-*" --vnfs=centos7 --bootstrap=`uname -r` --
files=dynamic_hosts,passwd,group,shadow,network,ifcfg-ib0,slurm.conf,munge.key,nhc.conf
```

TROUBLES IN PROJECT 1

- Logging in to user account fail ← not adding user account
- “mdirun_mpi” did not work ← miss the step of installation
- Localhost not working



LESSONS FROM TROUBLES

- Read the instruction thoroughly, .
- Always look close to each step.
- Always consider which account logged in to cluster.
- Check the command is connecting to the same domain/area where I logged in ex)CHROOT
- Check the typo before running the script
- Previous commands affects the current state

THANK YOU