

# Cluster Competition Recap

## ISC18: High Performance Container Workshop

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# Agenda

**1** The Team

**2** The Competition

**3** Docker

**4** Future

# The Team



# Our Booth



# Our Setup

- 12 Intel Xeon Phi 7250F
- 1 as a head node with more memory
- all the others diskless over PXE
- Spack to manage the applications

# Our Sponsors



# Student Cluster Competition

- Held by the HPC-AI Advisory Council
- 12 teams
- 6 students per team
- 3000 watts power limit
- no reboots!

# Monday: Benchmarks

- High Performance Linpack (HPL)
- HPC Challenge (HPCC)
  - HPL
  - DGEMM
  - STREAM
  - PTRANS
  - RandomAccess
  - FFT
  - Communication bandwidth and latency
- High Performance Conjugate Gradient

# Tuesday: HPC Applications

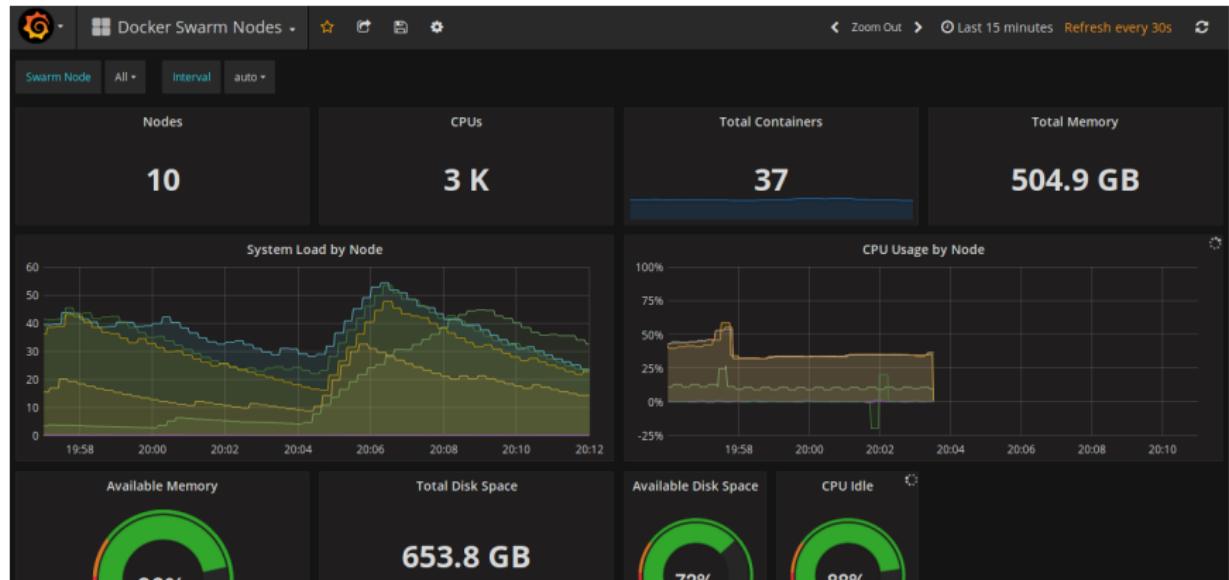
- Grid
  - Lattice QCD
  - SIMD, OpenMP and MPI
- Nektar++
  - Spectral/HP Element Framework
  - MPI
- Surprise Application: Nek5000

# Wednesday: AI Challenge

- TensorFlow
  - VGG16 on Imagenet 2012

# How we used Docker: Visualisation

- Grafana & Prometheus
- Easy deployment



# The scripts

## Node01

```
function start-monitoring {
    systemctl start docker;
    docker stack deploy -c /home/danielb/swarmprom/docker-compose.yml manager;
}

function stop-monitoring {
    docker stack rm manager;
    docker stop $(docker ps -a -q);
    docker rm $(docker ps -a -q);

    docker stop $(docker ps -a -q);
    docker rm $(docker ps -a -q);
    systemctl stop docker;
}
```

# The scripts

## PXE Nodes

```
function start-monitoring() {
    echo "Starting Docker service";
    systemctl start docker;
    echo "Joining Swarm";
    CMD=$(ssh -t node01 docker swarm join-token worker | grep docker);
    TOKEN=$(echo $CMD | cut -c27-111);
    echo "Starting monitoring containers";
    docker swarm join --token $TOKEN 192.168.178.1:2377;
}

function stop-monitoring() {
    echo "Leaving Swarm";
    docker swarm leave --force;
    echo "Stopping Docker service";
    systemctl stop docker;
}
```

# Future

One container for each application