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Introduction to FAIR Cluster

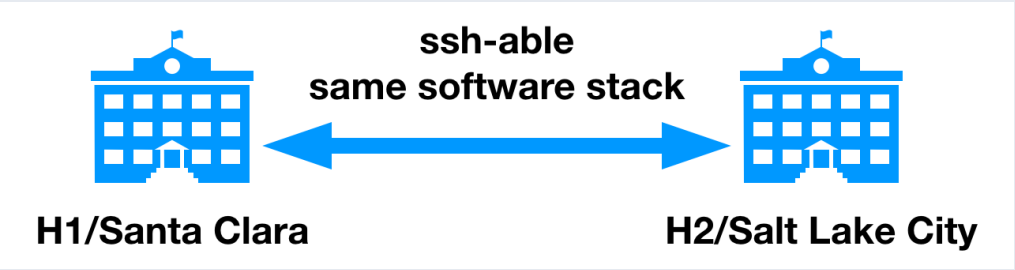
FAIR Cluster team
Contents subject to change
March 14, 2019

Plan of the Talk

- What is FAIR Cluster?
- Day 0 as a new FAIRie
- Do's and Dont's
- Links to wikis/docs

What's FAIR Cluster?

- FAIR clusters are two GPU clusters live **outside** FB datacenter.
- Jumphost: security gatekeeper between FB and FAIR clusters



- Access : laptop → jumphost → cluster
- NO FB production data
- NO FB source code
- NO FB internal tools (Phab/hg/arc/jf...)
- All info about FAIR cluster is CONFIDENTIAL

Cluster Management

- Penguin Computing is our external cluster admin. Don't share FB internal info!
- We work with them through task system.
- Internal Q&A: FAIR Cluster Users workplace group
- Support account: Aptenodytes Forsteri, **default** owner of all operational issues
- Remember to set **owner** to Aptenodytes Forsteri.

Get access to FAIR cluster

- Can I use FAIR cluster?
  FAIR clusters are for **GPU heavy** project that runs on **open source datasets** using **open source codebase**.

Set up accounts

- In parallel:
  - Join the FAIR Cluster Users workplace group: $<$ 24 hours
    - creates a jumphost account
  - Request a devfair : $<$ 2 hours
    - devfair is your personal workstation like a devserver: 2Pascal GPUs, sudo access
    - At most one devfair per person across both H1 & H2.
    - Share with coworkers on the same project.
    - Shared devfairs: devfair001(H1), devfair0101(H2)
  - Read the docs(links in the last slide)!

Access your machine

macbook → jumphost → devfair

- Currently available jumphosts:
  - prn-fairjmp01/02
  - frc-fairjmp01/02
- Jumphosts are not meant to save **ANY** data

To make your life easier:

- make your ssh password-less
- ET: setup instruction

Where is my code & dataset?

- Shared filesystem across all devfairs & learnfairs in each cluster.
- /private/home/<USERNAME>: code & scripts. 8TB/user
- /checkpoint/<USERNAME>: checkpoints, logs, intermediate files. 8TB/user
- /datasets01: read only, commonly used open source datasets
- We have setup AWS S3 for long term storage

How can I install a dependency?

- Conda environment is the recommended way.
  - conda install ...
  - pip install ...
  - project based conda env
- Module: cluster wide package management
  - module available/list/purge
  - module load anaconda3
- Singularity if you need containers
- apt-get install on devfair is discouraged. You can't schedule jobs anywhere else.
  - Find the package in conda
  - If not, open a task to install it globally on the cluster

How can I submit jobs?

SLURM is open source cluster management tool and job scheduling system.

- **learnfair** machines are shared resource managed by SLURM.
  - 8 Volta GPUs / 2 Pascal GPUs
  - same software stack as devfairs
- Extensive documentation

Which partition should I use?

Priority based pre-emptable partition system:

- **learnfair:** DEFAULT, where you run majority of your jobs
  - med turnaround time, pre-emptable
- **dev:** "guaranteed" resource for daily workload
  - low turnaround time, limited resource, not pre-emptable
- **priority:** for conference ddl $<$ 2 weeks only
  - low turnaround time, limited resource, not pre-emptable
- **scavenge:** try out crazy ideas you don't mind waiting
  - low priority, pre-emptable

Srun example

For **debugging** only, attached to terminal.

```
srun --gres=gpu:1 # 1 GPU
--partition=dev # in partition dev
--time=5 # duration 5 mins
--cpus-per-task 1 # 1 CPU
--pty /bin/bash -l # bash terminal
```

Sbatch example

Sbatch runs a script, for experiments.

```
#SBATCH --job-name=sample
#SBATCH --output=/checkpoint/%u/jobs/sample-%j.out
#SBATCH --error=/checkpoint/%u/jobs/sample-%j.err
#SBATCH --partition=dev
#SBATCH --gres=gpu:1
#SBATCH --nodes=1
#SBATCH --cpus-per-task=1
./wrapper.sh
```

Check before you submit!

- Default wall clock: 5mins. Change this!
- Recommended ncpus: 1-10, no large CPU jobs!
- Default partition: learnfair
- priority queue requires a descriptive comment:
  - ICCV Mar 22 2019
- Submit to a pre-emptable partition
  - submitit
  - implement signal handler for preemption

Useful commands

Make aliases for these commands

- How busy is the cluster?
  sinfo
- Where are my jobs?
  squeue -u $USER
- Cancel this job please
  scancel jobid
- How do I get a volta machine?
  sbatch -C volta

FAIR Cluster Portal

i fcu_portal

- request devfair
- request dataset
- Job info : squeue
- Node info: sinfo
- Ping Caleb Ho for feature requests/questions

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- check lighthouse/VPN
- ssh to jumphost; ssh to devfair from there
- ssh to a jumphost in different data center
- ssh to shared devfair
- ask a colleague to ssh to your devfair
- google the error message
- check the user group

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- Finally, open a task and let Penguin know what you've tried

Once you leave...

- Account **disabled**
- Home dir & checkpoint **deleted**
- Devfair **reimaged** and **reassigned**
- Intructions for intern/managers/HAMs

Dos

- Avoid using sudo
- Backup your data to S3
- Only use priority for conference deadline before 2 weeks. Include conference name & date in comment. Split your workload between priority & learnfair.
- Please be respectful to your coworkers, this is shared resource.

Dont's

- Don't transfer production data & code to FAIR cluster.
- Don't share your credentials with others. Don't use your fb password on the cluster
- Don't EVER ssh into learnfair and run jobs directly.

Links to wiki/docs

- Devfair assignment
- FAIR Cluster FAQ
- SLURM on FAIR Cluster
- submitit
- Man page for sbatch
- ET on FAIR Cluster
- Using AWS S3 for long term storage

Please contribute and share your cool ideas!

Conclusion

- Thank you!
- Questions?


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