HEPCloud Project's Meeting

HEPCloud Leadership Team

Projects Meeting

Aug 2020

HEPCloud Notes

- HEPCloud presented yesterday (12-Aug) at the Monthly HEPCloud Stakeholders Meeting.

- Focus of stakeholders meeting was reporting on the plans for Theta integration and the progress that has been made

- Meet with Regetti Quantum computing yesterday (12-Aug)

- Working up plan for Glidein + HEPCloud transition of front end functionality

Highlights:

- **Presented the Madison idea for condor within HPC**

- **Regetti project to move forward with AWS based prototype**

- **Frontier and CVMFS both are working at Theta**

- **Wilson cluster prototype continues to progress**

- **TACC has agreed to us standing up a new Condor-CE based on our security plan**

🐦 **Fermilab**

Phase 4: Framework

- Project focus continues to be on framework development
- First quarterly release on July 23
  - Release of the **new configuration system**
  - https://hepcloud.github.io/decisionengine/release_notes/release_notes_1.3.html
  - https://hepcloud.github.io/decisionengine_modules/release_notes/release_notes_1.3.html
- First milestone/release, latest release (1.3.0) still not fully tested
  - **Waiting on python3 glideinWMS**
- Work continues on logging, design of error handling and produces/consumes redesign

Krista M.

Monitoring

- HEP Cloud monitoring requirements document is on the HEP Cloud Facility sharepoint:
  - https://fermipoint.fnal.gov/project/fnalhcf/Documents/HEPCloud%20Monitoring%20Requirements.docx?d=wce0c43a64aa347f685ac6fc439c8d4d4&csf=1&e=SSwtqx

- We are reviewing these requirements

Krista M.

Theta Project

- A plan was created and documented a few weeks ago

- Proceeding with the "login node" design plan
  - So no reliance on Kubernetes@ANL

- Plan has 6 main steps:
  - <mark>Transfer work from CMS Global Pool to HEPCloud – 100%</mark>
  - <mark>Transfer and execute work on Wilson Cluster for "proof of concept" – 100%</mark>
  - Replicate Wilson Cluster work on Theta – 3%
  - Perform end-to-end test on Theta – 0%
  - Execute production CMS workflow at Theta – 0%
  - Post mortem work – 0%

- <mark>Work is currently 3 weeks ahead of schedule</mark>

Krista M.

Meeting w/ Madison

- Had a "special" meeting with Miron and Brian B. on the 27th.

- Intent was to do a deep dive on our theta plans
  - Notes and minutes are on indico:
  - https://indico.fnal.gov/event/44661/

- There was a focus on communications and project goals
  - Our intent is to setup a template for how we move forward more generally with other HPC environments
  - We want to establish a *standing* **point of contact** with each **organization** and establish a regular cadence for technical communications.
    - Example: For HEPCloud/Condor the regular Friday meetings are a first step (Need more regular contact for real work).
  - **Let's discuss how we want to structure this (in a minute)**
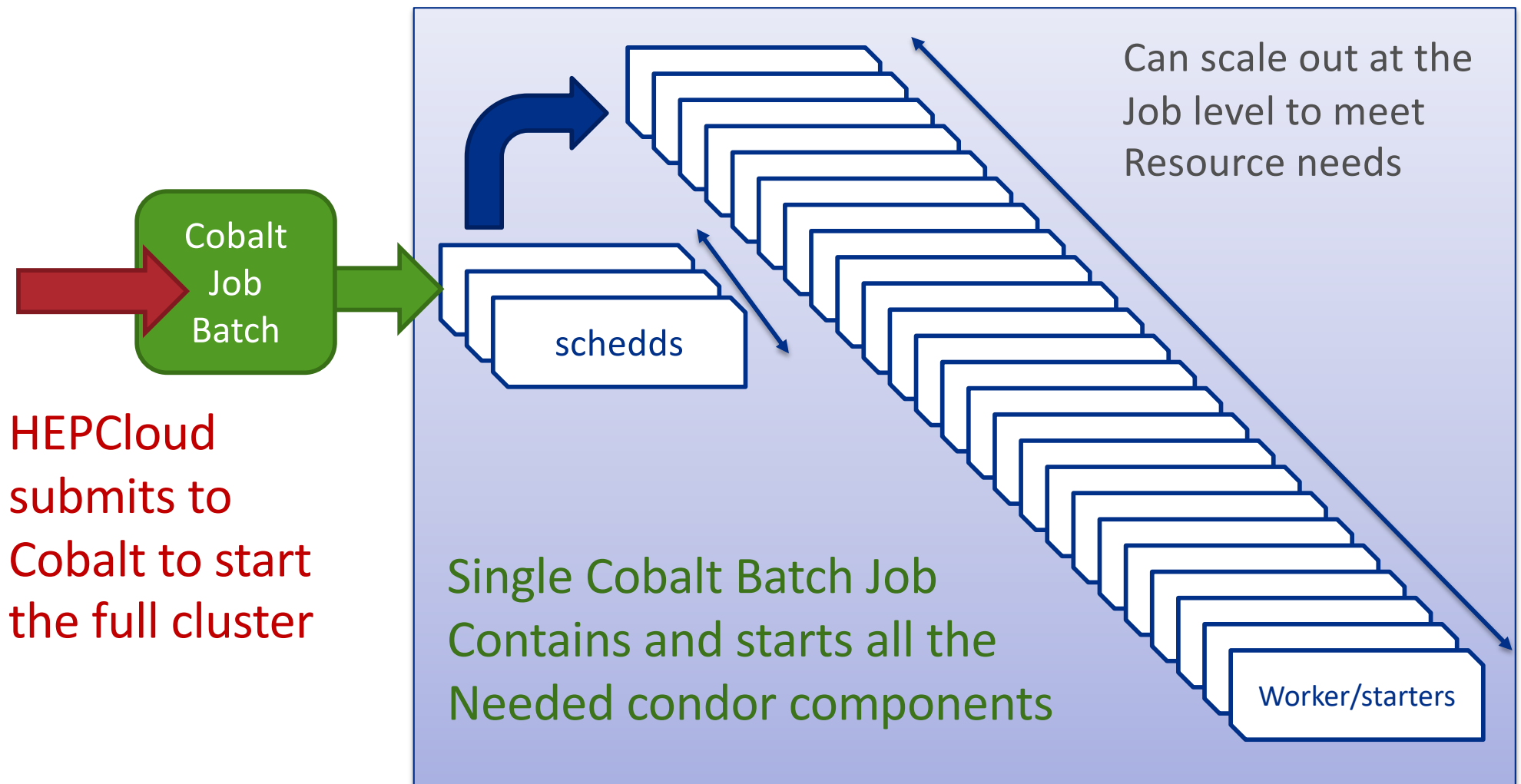
🔶 **Fermilab**

Meeting w/ Madison

- 2nd part of our meeting was technically focused on current plans for HPC integration on network isolated sites

- Big take aways:
  - Our original computing model of trickling jobs to sites is not well matched to this HPC model.
    - Instead we need to think in terms of aggregated campaigns
    - This would let us think about scheduling the ensembles as a whole
  - One proposal is placing the schedd's within the compute environment (not on the edge) and allowing them to scale out as needed
  - Essentially this takes something like "Rank 0" of the campaign being run and places the schedd there and the starters on the other ranks

All within Compute Domain

- My interpretation of the Madison plan

Can scale out at the
Job level to meet
Resource needs

Cobalt
Job
Batch

schedds

HEPCloud
submits to
Cobalt to start
the full cluster

Single Cobalt Batch Job
Contains and starts all the
Needed condor components

Worker/starters

HEPCloud

Fermilab

Meeting w/ Madison

- This design would be work that Madison does

- Fits nicely with further integration of HPC environments
  - Reduces complexity of some edge service needs and scaling

- Need to map out what this would look like (time wise) with our current plans to get Theta working with the CMS workflows

HEPCloud + Rigetti

- Met with Rigetti Quantum computing
  - This is a restart of the work that we initially began in Fall '19 that went on hiatus while the quantum centers and statements of work were being were established
  - This is back on now
- Baseline designs is to provide access to their QPUs as "accelerators" (so classical compute jobs that call out to the QPU for a specific computation)
- There are two infrastructure setups that are proposed
  - #1 uses AWS for hosting the classical compute and batch infrastructure
  - #2 uses computing resources housed in an independent data center "near" Rigetti's QPUs to reduce latency

🔷 **Fermilab**

HEPCloud Progress

- Software development continues along on the decision engine

- There is a real bottleneck in our python 3 upgrade deployment
  - Dependency on Glideinwms. We need the Glidein upgrade pushed and have been stuck waiting for them for almost 2 months now.

- Kevin R. has gathered requirements on monitoring from experiments for improved monitoring
  - Document should be out ~next week
  - Separately Elizabeth Petit-Bois (GEM summer intern) has been working with Mike Kirby, Ken Herner and Andrew N. on monitoring interfaces (with a focus on DUNE but applicable too all of HEPCloud) and has been making significant progress

- Operations continues to be solid.
  - Mu2e was onboarded and completed a 5M hour campaign with minimal intervention
  - New record for concurrent claimed cores for CMS (@NERSC) was hit

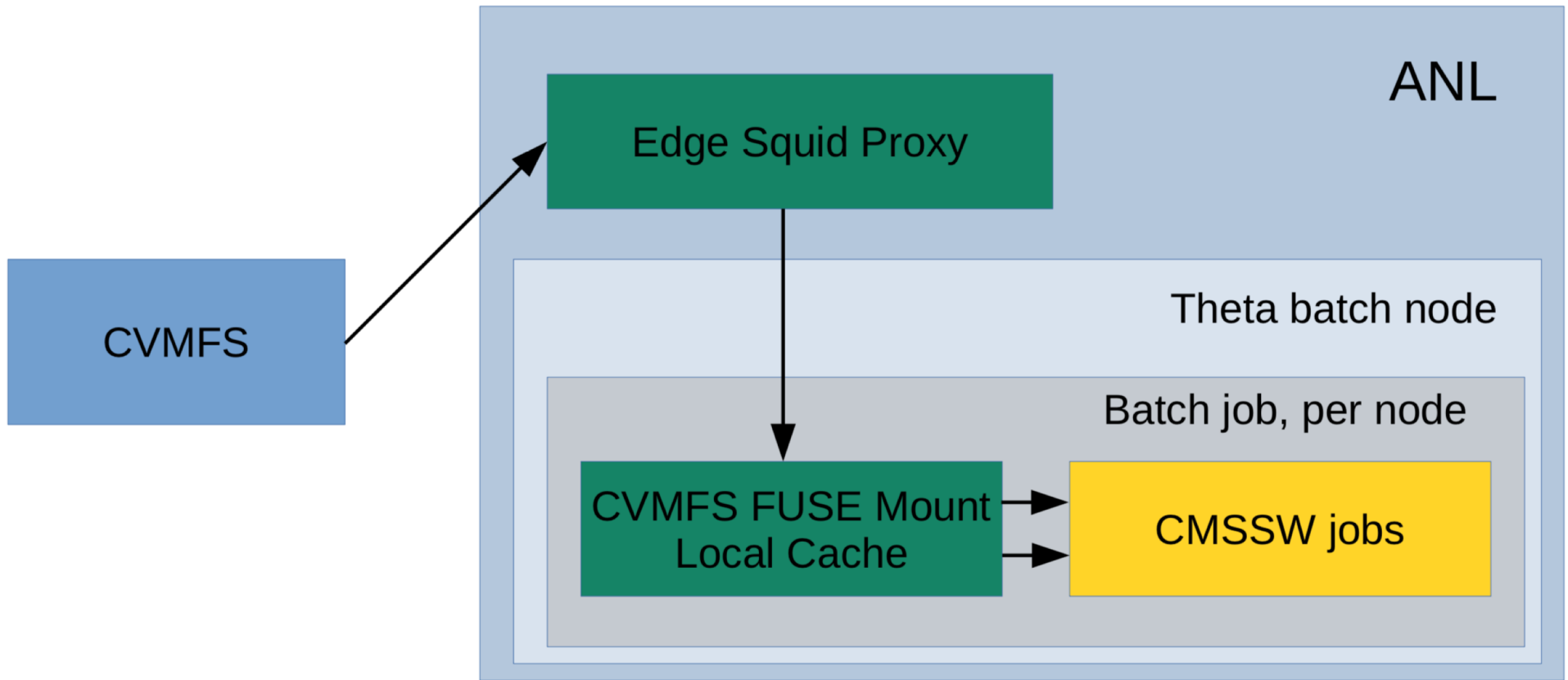- Plan for Integration of Theta with HEPCloud is solidifying

Frontier @ ANL

Frontier

CVMFS@ANL
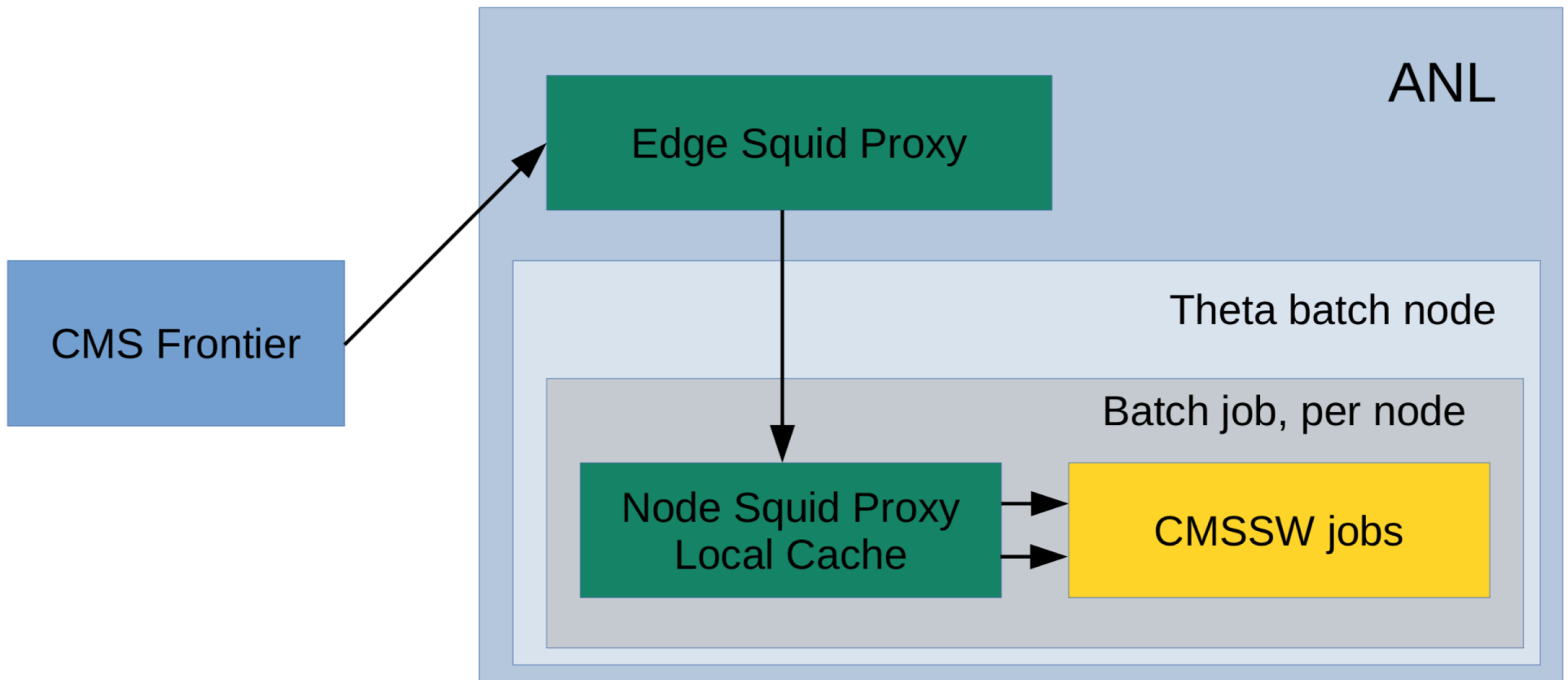
CVMFS

Glidein + HEPCloud

- Presented the plans we discussed last week at the Project Meeting.
- Planning to present at the OSG All hands.

GlideinWMS

GlideinWMS is a pilot based resource provisioning tool for distributed High Throughput Computing

- Provides reliable and uniform virtual clusters
- Submits Glideins to unreliable heterogeneous resources
- Leverages HTCondor
  - Provides HTCondor pools
  - Uses HTCondor capabilities
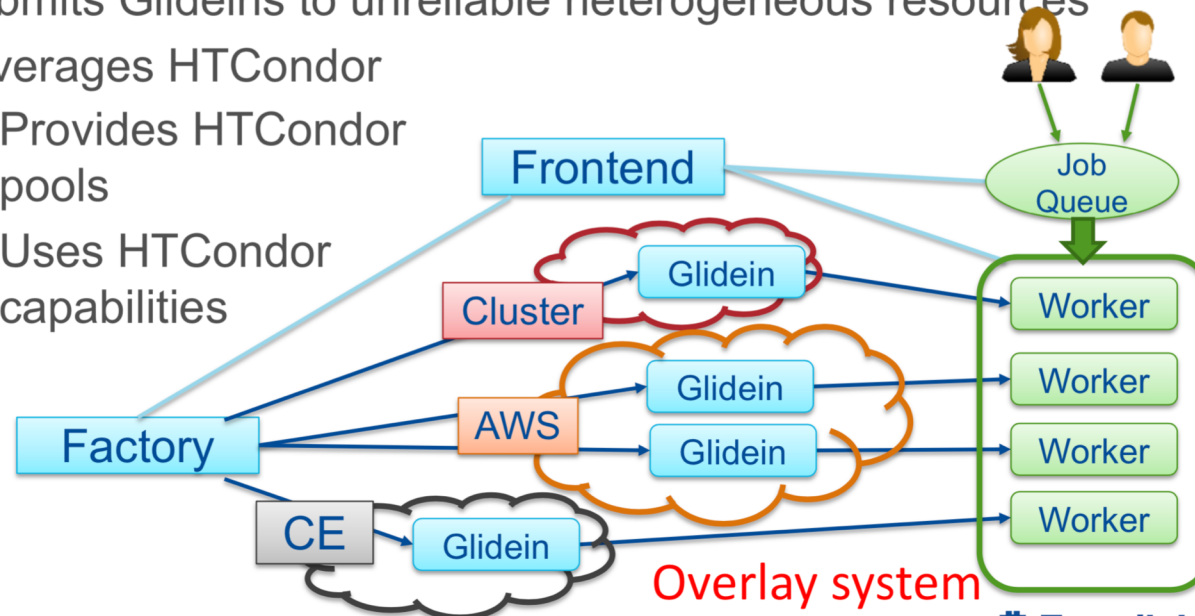
Dar Be Monster's Here
(backup slides)