- **GCP Plug/Overview**
  - V2 features/func

- **Slurm + GCP work**
  - HPC Days demo?
    - This is 20-30 minutes
  - V3

- **UNC POC**
  - Bursting from on-premise
  - scenario/infrastructure
  - results/numbers?
  - nss-slurm
In 1H 2019

Slurm-GCP scripts spun up over 400K nodes within GCP
Slurm GCP Scripts v2 Improvements

- Preemptible VM support
- Image-based scaling
- Attachable GPUs
- Attachable secondary disks
- Scalability
- Burst to 5000 nodes < 10m
- 19.05 cloud capabilities

Open Source on Github: https://github.com/schedmd/slurm-gcp
Hybrid Slurm

Architecture: Slurm Burst to Cloud

On-Prem
- Login
- Compute Engine
- Slurm CLI
- Controller
- Compute Engine
- SlurmCtld, NFS
- Worker Nodes
- Compute Engine
- Slurmd, Stepd

Cloud
- Cloud VPN/Interconnect
- Google Cloud Platform
- Worker Nodes
  - Compute Engine
  - Slurmd, Stepd
- Storage
  - Storage Bucket
    - Cloud Storage
Slurm 19.05 Cloud Improvements

- Better responsiveness to creation and deletion of nodes
- Efficient allocation of nodes
- nss_slurm
Hybrid Slurm: Acme University

Foundational Elements

● Networking
  ○ VPN / Interconnect for [hybrid networking](#)
  ○ [Bi-directional DNS](#) for node resolution

● Storage
  ○ Mounted on-premise NFS
    ■ Dedicated Interconnect Recommended (10Gbps)

● Authentication
  ○ nss_slurm

● Compute
  ○ Pre-baked image with requisite drivers (i.e CUDA)
Acme Architecture
Acme Scale

Bursted from 4K to 12K cores in 10 mins
What's coming in 2020

- Multiple Partitions
- Terraform integration
- Even faster scaling
- Storage options flexibility
- NFS; LUSTRE; GCS
- OMPI Support
- External Database (Cloud SQL)
- Hybrid Configuration
Demo

Burst from 0 to 1000 nodes in under 10 min

Using Elastifile managed service
QUESTIONS?