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Slurm User's Group 2019

LANL Site Report

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HPC at LANL

System	Nodes	Type
Ising	1	D-Wave
Gadget	24	Cray
Fog	32	
Kodiak	66	GPU
ViewMaster III	92	
Capulin	175	ARM
Thunder	175	ARM
Woodchuck	190	
Trinitite	200	Cray (Haswell/KNL)
Snow	368	
Badger	372	
Fire	1,104	
Ice	1,104	
Cyclone	1,104	
Grizzly	1,490	
Trinity	20,000	Cray (Haswell/KNL)

Paid Requests For Enhancement

- *DataWarp Improvements*
  - StageIn and StageOut logic
  - Job cancellation considerations

- *Resiliency Features*
  - Timing of task signaling for cleanup
  - Sbcast communications over High Speed (or other) Network
  - Slurmdbd messages fast fail

Paid Requests For Enhancement

- ***JobComp Script additions***
  - Which Scheduler Launched Job
    - Main, Backfill or Submit
  - Job's Requested Features
  - Last 'Reason' a Job was waiting in the queue

- http://bugs.schedmd.com/
  - Advanced Search:
    - Status=Open
    - (Detailed Bug Info) Severity = 5 - Enhancement

Investigations and Solutions

- ## *File System Aware Scheduling*
  - Implemented using licensing mechanism instead of GRES
  - Defaults to requiring ALL networked file systems via submit filter

- ## *YeTi – security zone inheritance*
  - Cluster compute nodes with two independent security domains
  - Late provisioning, Environment Validation and Job Requeue
  - Implemented with active node features
  - Prolog & Epilogue environment is now richer

Investigations and Solutions

- *Immediate (as possible) Interactive Jobs*
  - Small reservation with replaceable nodes to minimize waste
  - Utilizes Qos and Partition to limit 1 per User and Max Total Nodes

- *Diminishing Account Share Fairshare Strategy*
  - Equal Access in a Usage-based Allocation World
  - Faux Bank Accounting
  - Fast Decay to adjust to dynamic demand

Investigations and Solutions

- ## *Orchestration of Rolling Updates*
  - Goal of eliminating significant amount of downtime
  - Dependencies on Facilities Work
  - Dependencies on System & Infrastructure Nodes & Resources
  - Dependencies of Jobs on Compute Environment
  - Management of Prior and New Workload
  - Boot and Provisioning Integration
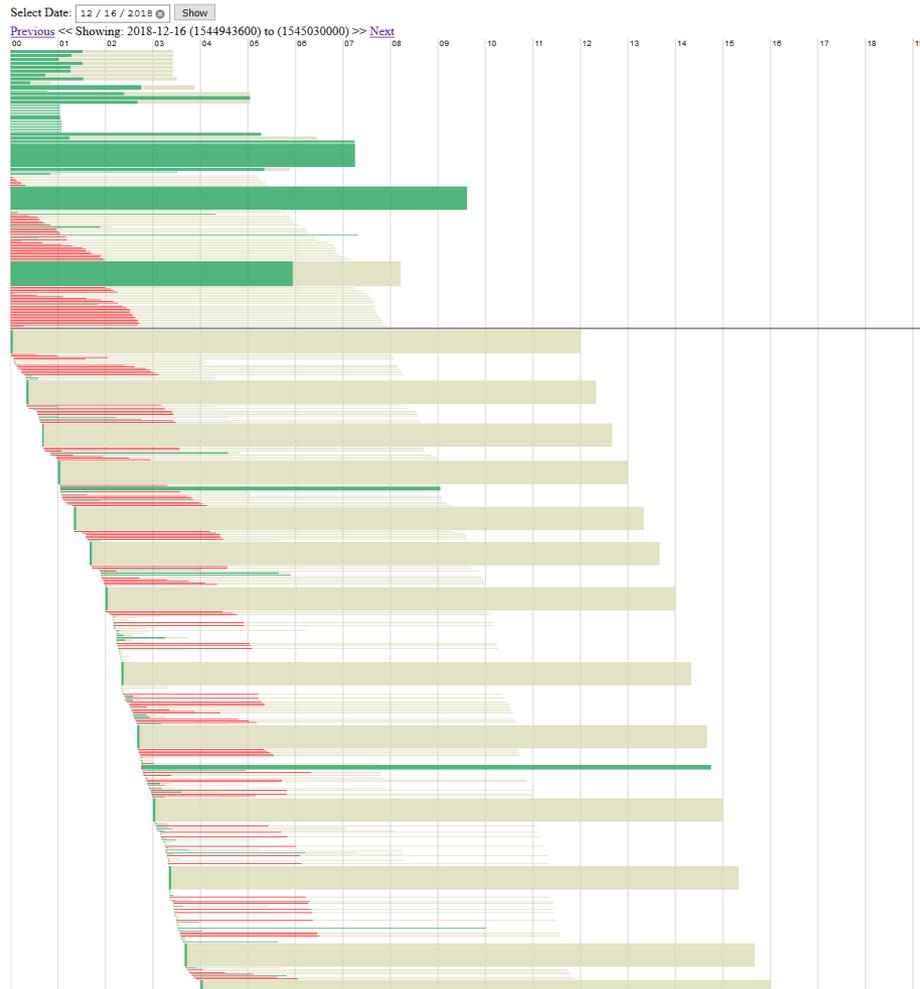 - Use of Active Node Features & Submit Script

Tools, Tech & Toys

- ## *Workflow Cascade Visualization*

Tools, Tech & Toys

- *Workflow Cascade Visualization*

Future Work & Collaborations

- *Federated/Multi-Cluster Dependencies*

- *End-of-Job Reports to Users*

- *Job Profiling and Deviation Detection*

- *Task Signal Mechanism on Task Failure*

- *Adoption of DataWarp RESTful API for Data Staging Clusters*

LANL Workload Management Group

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