ADDRESSING RESOURCE CONSTRAINTS ON AURORA WITH ADMIN ACCESS NODES

PETER UPTON
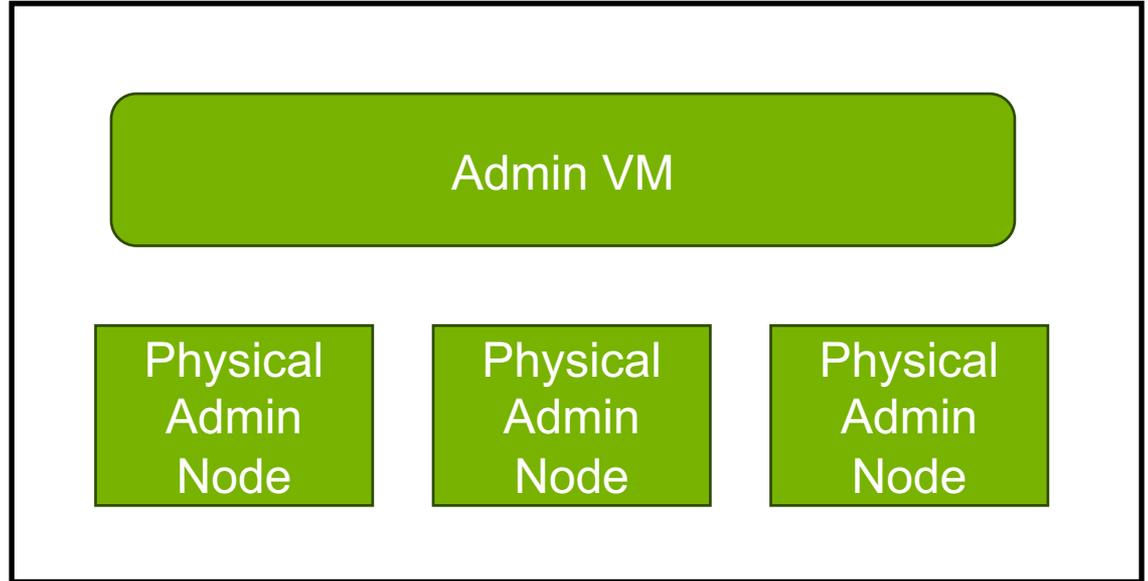Linux Systems Administration Specialist

Argonne NATIONAL LABORATORY | Argonne Leadership Computing Facility

MOTIVATION
The Admin VM

- HPCM's QHA configuration requires a VM

- Result is limited resources

- More resources required

- 100s of admin users

OUR SOLUTION

Admin Access Nodes (AANs)

- Another node type

- Based on UANS

- Additional features

- Multiple AANs

FEATURES OF AANS

- Useful admin packages

- Useful admin mount points
  - /var/log/consoles
  - Logs from admin VM

- New tools written for the AANs
  - Cm-remote
  - Cmn

Argonne NATIONAL LABORATORY | Argonne Leadership Computing Facility

CM-REMOTE
HPCM Interface for Admins

- Cm-remote takes the place of 'cm' on the AANs

- Cm-remote uses SSH for commands it cannot handle

- Most common commands are processed locally on the AAN

Argonne NATIONAL LABORATORY | Argonne Leadership Computing Facility

CMN
An HPCM Interface for Scripting

- Simple HPCM API front-end

- Supports the
  — Power API
  — CMDB API
  — Node Update Config interface

- Used for scripting

U.S. DEPARTMENT of ENERGY   Argonne National Laboratory is a
U.S. Department of Energy laboratory
managed by UChicago Argonne, LLC.

Argonne NATIONAL LABORATORY | Argonne Leadership
Computing Facility

CM-REMOTE AND CMN

Cm-remote

- Designed for interactive sessions
- Provides the same interface as cm
- Uses SSH to support all cm commands

Cmn

- Designed for use in scripting
- Uses an interface modeled after the APIs
- Does not support all functions of cm

Argonne NATIONAL LABORATORY | Argonne Leadership Computing Facility
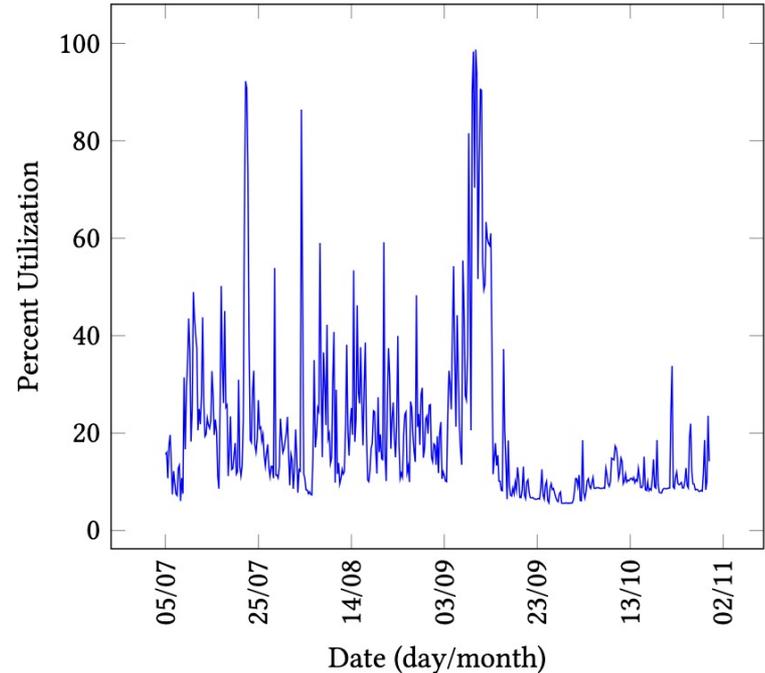
CONFIGURATION MANAGEMENT

How We Manage Node Configuration

- Node images are built using Ansible

- Git is used to track all changes

- Ensures stability and consistency for the AANs and the cluster

Argonne NATIONAL LABORATORY | Argonne Leadership Computing Facility

RESULTS
Admin VM CPU Utilization Improvements

CPU Utilization Graph

- CPU utilization fell dramatically

- Stability increased

- Better admin user experience

U.S. DEPARTMENT of ENERGY Argonne National Laboratory is a U.S. Department of Energy laboratory managed by UChicago Argonne, LLC.

Argonne NATIONAL LABORATORY | Argonne Leadership Computing Facility

CONCLUSION

- It works

- A solution to a difficult problem

- Significant room for improvement

- Concept may be applied in other areas

Argonne NATIONAL LABORATORY | Argonne Leadership Computing Facility