Hands on Ceph Administration and Troubleshooting

Hands-on means that each student will have their own 3-node environment that they will practice skill building. Initially, students will start their work with a fully operational system, basically like learning how to drive. As the course progresses advanced labs requires students to deploy major parts of the system on their own, with the final day dedicated to log analysis and troubleshooting. All that is required to access the labs is a browser and no plugins, it just works.

Day 1 - Storage Basics and Ceph Architecture
An overview of ceph architecture, why ceph was developed, plus an explanation of the compelling reasons to use ceph over other storage solutions. Students will develop administrative skills by performing labs on a fully functional ceph cluster. Labs will illustrate how to admin ceph and well as demonstrate basic troubleshooting technique. Ultimately, this section will teach students how to administer

1. Introduction to Ceph
2. Ceph Architecture
3. Scaling Ceph
4. Ceph Administration

Day 2 - Containers and Kubernetes
Learn how Kubernetes may be used to deploy and manage Ceph in a containerized environment. Ceph admin skills developed on day one will drill down into a containerized deployment. Students will learn hardware requirements, software dependencies, Persistent volumes, deploy routers, ceph clients, study journaling and deploy at least two OSDs per container. Students will be provided with 3 nodes per student.

5. Introduction to Docker and LXC
6. Kubernetes Architecture
7. Kubernetes and the Calico networking plugin
8. Running Ceph in containers

Day 3 - Ceph and Helm
Learn how to deploy and control ceph clusters using Helm. Studies will include rbac permissions, kublets, configure a pod to use PVs, as well as logging.

9. Introduction to Helm and Tiller
10. A deep dive into Charts
11. Add ceph-helm to helm local repos
12. A deep dive into Ceph-Helm

Day 4 - Monitoring Ceph
Given a working Ceph cluster, learn best practices on how to monitor and manage a Ceph cluster, using Prometheus and Grafana.

13. Introduction to Prometheus
14. How Prometheus is used to monitor Ceph
15. How Grafana is used with Ceph
16. Working with Ceph-exporter

Day 5 - Ceph in Depth
Emphasis on this day will focus on monitoring and troubleshooting ceph. Students will practice solving real-world problems in their own 3-node environment.

17. Hands on Ceph Troubleshooting
18. Log analysis