FINAL- 4/14/19 (SU)

COURSE NAME	Advanced Deployment with Red Hat OpenShift 4
PROJECT NAME	ocp4_advanced_deployment
NEW / UPDATE	Update
DURATION	32 Hours
MODALITY	ILT
PROFICIENCY LEVEL	Advanced
PRODUCT & VERSION	● OpenShift 4 (with some OpenShift 3.11)
IT CHALLENGE	● Hybrid Cloud Infrastructure, Cloud-Native Application Development
SPECIALIZATION	● Cloud Infrastructure
SKILL	● Container Platform Application Deployment
LEARNING PATH REQUIREMENT?	● Yes ● RHSE Container Platform Infrastructure Deployment - Advanced Technical Learning Path
ROLE	● Delivery
OUTCOME	● 12 CE credits ● Red Hat Delivery Specialist - Container Platform Application Deployment II
CONTENT SPECIFIC KEYWORDS	● Keywords / Tags should be included in a comma delimited list

RHSE TAGS	● For internal use only ● [Tagging structure & values doc](#)

COURSE DESCRIPTION	*Advanced Deployment with Red Hat OpenShift 4* teaches students advanced installation, configuration, and management skills using Red Hat OpenShift Container Platform. After completing this course, students will be able to: ● Describe and install OpenShift in an HA environment ● Describe and configure OpenShift Machines ● Describe and configure networking including creating network policies to secure applications ● Describe and configure the OpenShift Scheduler ● Protect the platform using quotas and limits ● Describe and install OpenShift without an internet connection (disconnected install)
SHORT DESCRIPTION	This course covers installing Red Hat OpenShift Container Platform in an HA environment or without an internet connection. Other topics include networking and security configuration, and management skills using Red Hat OpenShift Container Platform.
SKILLS PREREQUISITES	● Understanding of networking and concepts such as routing and software-defined networking (SDN) ● Understanding of containers and virtualization ● Basic understanding of development life cycle and developer workflow ● Ability to read and modify code
TRAINING PREREQUISITES	● *Introduction to Containers* ● *Red Hat OpenShift Foundations* ● *Red Hat OpenShift Container Platform Implementation*

COURSE OUTLINE	**Introduction to Course and Learning Environment** ● Learn about the Advanced Deployment with Red Hat OpenShift course. ● Understand the prerequisites, training environment, and system designations used during the lab procedures. ● Learn tips for successfully completing the labs. ● Understand course resources. **Disconnected Install** ● Learn what a disconnected install is and about the architectures for disconnected environments. ● Learn about the advanced installed and the reference configuration implemented with Ansible Playbooks.

- Review the software components required for a disconnected install, including Red Hat OpenShift Container Platform installation software, Red Hat OpenShift Container Platform images, a source code repository, and a development artifact repository.
- Learn how to import images from preloaded Docker storage or a local repository.
- Perform an installation of Red Hat OpenShift Container Platform, including importing other images such as Nexus and deploying other infrastructure like the source code repository.

OpenShift 4 Installation

- Review the many components of the OpenShift architecture. ● Use OpenShift installer to deploy an HA OpenShift cluster.
- Understand how application HA is achieved with the replication controller and the scheduler.
- Learn about container log aggregation and metrics collection.
- Use diagnostics tools in server and client environments.

Machine Management
- **Review how OpenShift manages underlying infrastructure**
- **Change MachineSet and Machine Configuration**
- **Add nodes by scaling MachineSets**
- **Understand and configure the Cluster Autoscaler**

Networking
- Review networking goals and software-defined networking (SDN).
- Review packet-flow scenarios and learn about traffic inside an OpenShift cluster.
- Learn about local traffic in a cluster and how OpenShift controls access between different OpenShift namespaces and projects.
- Learn how pods connect to external hosts and how IPTables controls access to networks outside the SDN cluster.
- Study how pods communicate across a cluster and about traffic inside a cluster.
- Learn about pod IP allocation and network isolation.
- Configure SDN and set up external access.
- Study project network management and setting secure network policies.
- Learn about the seven common use cases for NetworkPolicy.
- Learn about OpenShift internal DNS.
- Learn about external access, including load balancing in SDN and establishing a tunnel in ramp mode.

- Understand how OpenShift masters also serve as an internal domain name service (DNS).

Network Policy
- Learn about NetworkPolicy
- Configure NetworkPolicy objects in the cluster
- Protect a complex application using NetworkPolicy

Managing Compute Resources
- Learn what compute resources are and about requesting, allocating, and consuming them.
- Learn about compute requests, CPU limits, and memory limits.
- Learn about quality of service (QoS) tiers.
- Create, edit, and delete project resource limits.
- Learn how limit ranges enumerate and specify project compute resource constraints for pods, containers, images, and image streams.
- Learn about container limits and image limits.
- Learn how to use quotas and limit ranges to limit the number of objects or amount of compute resources that are used in a project.
- Understand which resources can be managed with quotas.
- Learn how BestEffort, NotBestEffort, Terminating, and NotTerminating quota scopes restricts pod resources.
- Understand how quotas are enforced and how to set quotas across multiple projects.
- Learn about overcommitting CPU and memory and how to configure overcommitting.