**Difference Between OpenShift and Rancher Cluster**

**RedHat OpenShift:**

* OpenShift is a Kubernetes distribution, downstream from the Kubernetes open-source project.
* It adds additional features and relies on Kubernetes operators to run.
* OpenShift is available on Amazon, Azure, and GCP as a managed service.
* OpenShift has two versions where one is the Red Hat Enterprise version and the other is the community version.
* **IBM** Closed Landmark Acquisition of **Red Hat** during 2019, which means that **OpenShift** is now an **IBM** product.
* **OpenShift** cluster deploys and manages itself. Installation and deployment consist of a bundle of **Ansible** Playbooks built into a container image with an **Ansible** runtime. The infrastructure is immutable. **OpenShift** initial installation is reported that it usually takes days, in some cases weeks, especially in complex environments.
* **OpenShift** uses operators for everything, which brings operational knowledge into how **Kubernetes** applications are deployed.
* **OpenShift** Includes tools like S2I and Builds that enable developers to build container images without Dockerfiles. (Although, this approach may implicitly move you away from the general community practices)
* **OpenShift** has security controls for cluster administrators when designating what applications users are permitted to deploy.
* The cluster can scale itself and **Kubernetes** resources as needed.
* **OpenShift** has relatively longer installation and upgrade times. This is not suitable for CI/CD solutions that deploy the entire clusters during the platform deployment pipelines. Version upgrades on **OpenShift** are reported to be risky and painful. Some major upgrades have been reported to take all night till the morning. And a specific version upgrade has been reported that it created disruption on the overall system.
* The heavy use of operators gives less flexibility overall. Operation Teams may find it harder to administrate because it relies on Operators for everything.
* **OpenShift** positions itself more packaging platform which takes open-source solutions and modifies them and ships them as a proprietary solution.
* **OpenShift** in general, has an alternative toolset and approach rather than using **CNCF**practices.
* It has its own practices like its **non-Kubernetes-native** cli called **oc-client.**
* Once you installed **OpenShift**, there is no way to switch back to vanilla Kubernetes.
* OpenShift is costly as compare to Rancher.
* There are multiple ways to deploy application on OpenShift Cluster.

1. Using CLI (oc client)
2. Using OpenShift Console
3. Using Helm Chart (YAML Files)

**Rancher Platforms:**

* A rancher is a tool for managing Kubernetes clusters it can manage both the clusters i.e., the cluster it creates and the cluster it imports.
* It provides web UI and CLI for automation and adds user roles that can be applied across clusters.
* It runs on RKE- an easy-to-build Kubernetes cluster.
* Rancher Labs delivers the industry’s most widely adopted open-source Kubernetes management platform, which is founded in 2014, Cupertino, CA. Rancher currently have 150+ employees, operations in 12 countries and got Series ’C’, total funding of $55M.
* **Rancher** simplifies complex Kubernetes operations while maintaining the flexibility.
* **Rancher** follows industry best practices and uses tooling from CNCF.
* **Rancher** extends these best practices through automation and by making complex configurations easier to build.
* The principal architect of Rancher Darren Shepherd is a Docker contributor and also on Docker Advisory Team, who later also heavily invested in Kubernetes.
* Rancher is a company whose Longhorn project accepted to CNCF.
* **Rancher** delivers a single suite of tools for managing multiple clusters.
* **Rancher Apps** install and upgrade apps on multiple clusters at the same time. Global DNS makes them all available.
* **Rancher** launches clusters in minutes and capable to run Kubernetes anywhere.
* Rancher follows **API-first** design, which means that all functions have an API equivalence.

**OpenShift vs Rancher: Software Comparison:**

* OpenShift comes with a full installer.
* It can be provisioned on many cloud providers such as AWS, Azure, and GCP, etc.
* Ranchers provide a web UI and a CLI tool to manage clusters.
* It can manage any cluster and not just rancher-created clusters.

**OpenShift Software:**

* OpenShift runs on RHEL CoreOS for the master nodes and RHEL for the worker nodes.
* It integrates many projects to add features from Kubernetes like Jenkins pipelines, private container registry, etc.

**Rancher Software:**

* A Rancher docker deploy uses k3s, and a full HA deployment utilizes RKE and a Helm chart.
* RKE is based primarily on containers. Rancher can run on any system that has docker.
* Ranchers can easily manage multiple clusters.