OpenShift on Power

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About me

- Working in IT since 2004, mostly in consulting roles
- OpenShift user since 2012
- EMEA Associate Principal Specialist Solution Architect
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Containers advantages

- Less overhead
- Increased portability
- More consistent operation
- Greater efficiency
- Better application development



Containers usecases

- "Lift and shift" existing applications into modern cloud architectures
- Refactor existing applications for containers
- Develop new container-native applications
- Provide better support for microservices architectures
- Provide DevOps support for continuous integration and deployment (CI/CD)
- Provide easier deployment of repetitive jobs and tasks



Kubernetes advantages

- Service discovery and load balancing
- Storage orchestration
- Automated rollouts and rollbacks
- Automatic bin packing
- Self-healing
- Secret and configuration management



Kubernetes naming

- **Container**: a group of processes with limited access to the system and resources, leveraging *cgroups*
- **Container Image**: a tar file containing all the required files and configurations to run a container
- Pod: a group of container
- Service: Kubernetes way to expose Pods ports over network
- Persistent Volume: a disk that is usable by a Pod
- **Config Map**: Kubernetes way to set configuration in Pods via file or *ENV_VARS*
- Secret: Kubernetes way to store and inject secret strings



Kubernetes components

- etcd: a decentralised file storage database
- api-server: Kubernets API Control Plane
- **Control Plane node**: a node that controls the cluster by running *etcd* and *api-server*
- Worker node: a node that runs workload
- Infrastructure node: a node that runs additional system components



Hybrid and multicloud is the new normal

- 95% of enterprises will be using a mix of cloud models
- 31% of all compute capacity will be in a Private, on premises cloud in 2 years
- 60% of enterprises will utilize flexible conumption models by 2023

Sources: IDC Cloud Forecast, BCG, and McKinsey



Red Hat OpenShift - an abstraction platform





Red Hat OpenShift, much more than Kubernetes





Containers will not limit the architectures options, they will them more relevant

Why Red Hat OpenShift on Power

- Application Development Consistency
- Leverage industry knowledge and tools
- Workload portability



Why Power under Red Hat OpenShift

- **Performance and Scalability**: leverage advanced hardware technologies, such as the POWER9 processors, which offer superior processing power, memory bandwidth, and multi-threading capabilities
- Enhanced Security: hardware-based encryption, secure boot, and memory isolation capabilities
- **Reliability and Availability**: redundant components, error detection and correction mechanisms, and dynamic resource allocation
- Al Capabilities: Accelerators



HA and DR in Red Hat OpenShift and Power

- OpenShift only handles Pod failures not Node failures
- OpenShift needs a majority of etcd nodes running to maintain cluster stability. If a majority of etcd nodes go down the recovery might need to be done manually
- Software-defined persistent storage alone cannot achieve zero RTO and zero RPO that mission critical stateful workloads demand
- The Power's HA capabilities can ensure that OpenShift nodes do not go down while providing near zero RTO ane zero RPO for stateful workloads when combined with external storage
- Does not need to be enabled for everything can be partially enabled for workloads that require it



Wrapping up

- It is key to focus on portable applications
- Containers can bring new tooling to Power development
- Power is a great platform to run containerized workloads
- Red Hat OpenShift enables portable applications without giving up the specific platform optimizations



Thank you

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