The Importance of Hybrid Cloud Platforms for Open Programmable Infrastructure

Kris Murphy
Senior Principal Software Engineer, Red Hat
Billy McFall
Open Source is the Innovation Engine for the Industry

1M+ projects

150M+ repositories

2M+ businesses

50M+ developers

https://github.com
Red Hat is an Enterprise Software Company with an Open Source Development Model
Pets vs Cattle

Homogeneous hardware that does not require special care
Pets vs Cattle

Domain specific hardware is making compute less homogeneous
Pets Masquerading as Cattle

Performance needs and increasing demands of workloads are leading to more and more specialized hardware.
Hybrid Cloud is the Predominant Operational Paradigm

63% of IT leaders use hybrid cloud today

54% of those not using hybrid cloud today plan to within 24 months

Source: Red Hat, 2020 State of Enterprise Open Source Report
The Hybrid Cloud Data Center

- Everything-as-a-Service
- Modern apps
- Containers and microservices
- ISVs

Red Hat OpenShift

- Physical
- Virtual
- Private cloud
- Public cloud
- Edge

Red Hat Enterprise Linux
Extending operational simplicity to DPUs

- **Offload Infrastructure Software** to enhance CPU efficiency and increase security
- **Common Kubernetes** tooling and experience
- **Common management** system and methodology

Kubernetes made managing containers simple and robust. Red Hat is extending this to DPUs
Integrating DPU’s into OpenShift

- Brief (very brief) introduction to what we did
- Challenges Encounter
- Need for OPI and Common APIs
Integrating DPU’s into OpenShift

Move Networking (OVN and OvS) to DPU
Integrating DPU’s into OpenShift

Use SR-IOV to plumb interfaces into host
Integrating DPU’s into OpenShift

OpenShift 4.10 Tenant and Infrastructure clusters
Challenges Encounter

- Initial Deployment - RHEL running on DPU
- SR-IOV has its Challenges
- HW Offload of OvS Flows
- Managing OVN/OvS/Kernel patches/version
- Lifecycle Management

All demonstrate the increased complexity of deploying with DPUs/IPUs.
Need for Common APIs/Tools/Ecosystem

- Can’t duplicate complexity for every vendor
- Upstream and Open Solutions
- Debuggability is Key
- Keep Complexity out of Applications

This project needs to move fast and not get bogged down. Integration is already happening!
THANK YOU!

STAY ENGAGED

Next.redhat.com
Stay in touch with the Office of the CTO
https://next.redhat.com/