

ICN Multitenant Secure Cloud Native

R5 Release Overview

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Agenda

- › Overview of Multitenant Secure Cloud Native (MTSCN)
- › ICN MTSCN R5 features
- › Future work
- › Call to Action

Overview

- › BP in incubation phase, part of the ICN family.
- › Reuses most ICN components integrating **Kata Containers** runtime.
- › First release in Akraino R5.

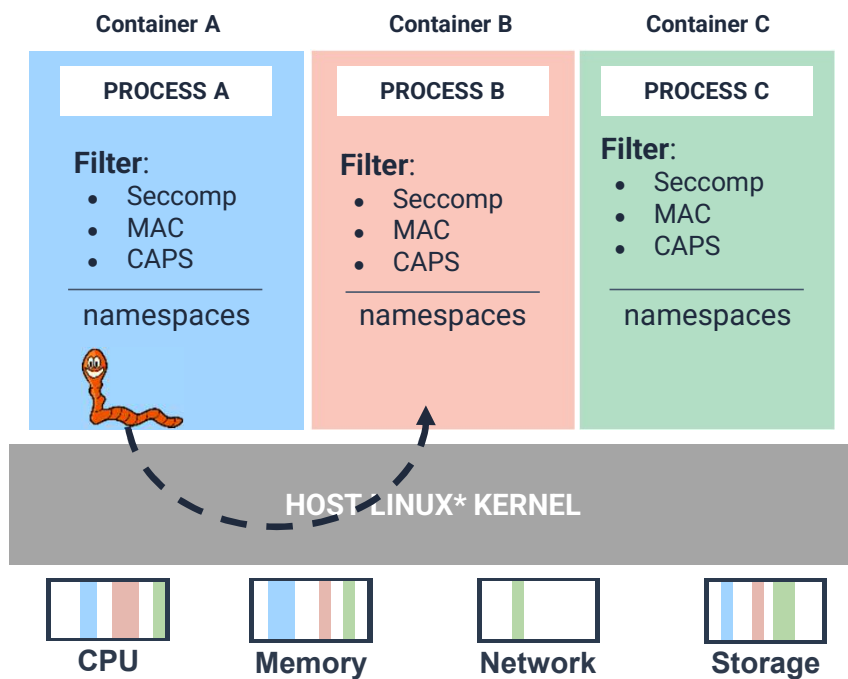
What is MTSCN

- › This BP enhances security isolation by using Kata Containers runtime.
 - › Uses lightweight VMs
 - › No shared kernel
- › Its goal is to be able to run multitenant and untrusted workloads on same Kubernetes nodes.

Kata Containers comparison

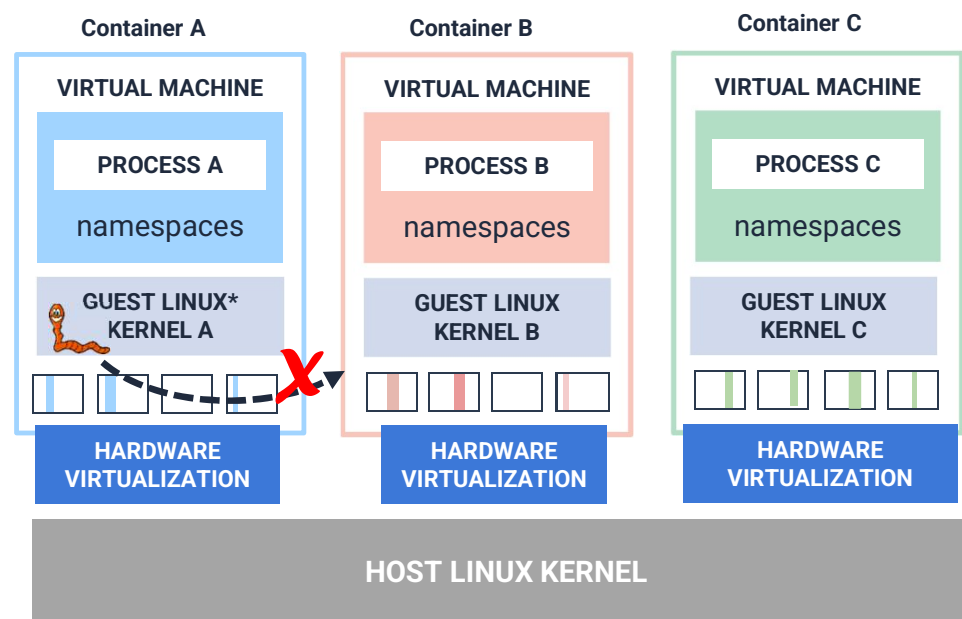
Traditional Containers

Isolation by namespaces, cgroups with shared kernel



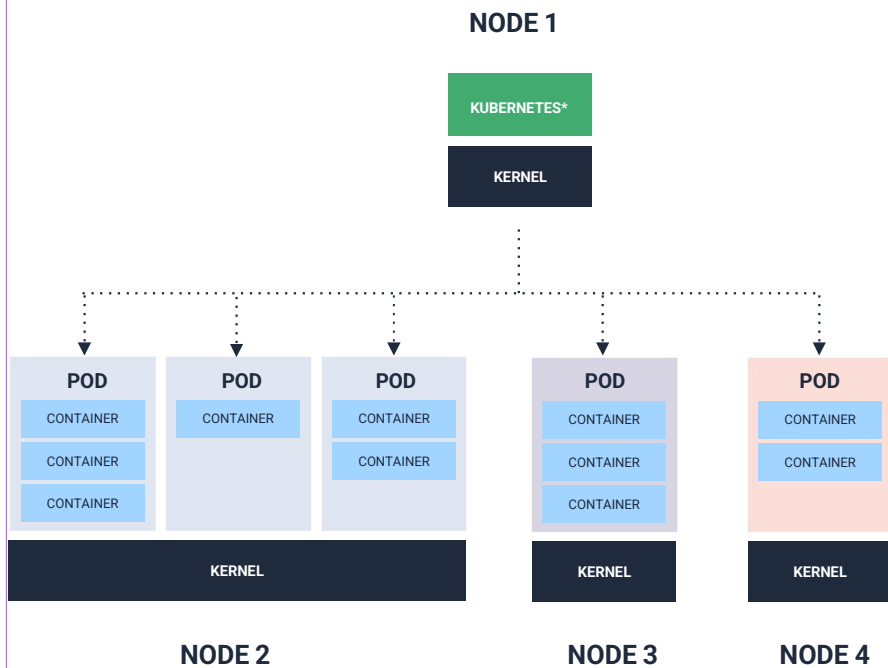
Kata Containers

Each container or pod is more isolated in its own lightweight VM



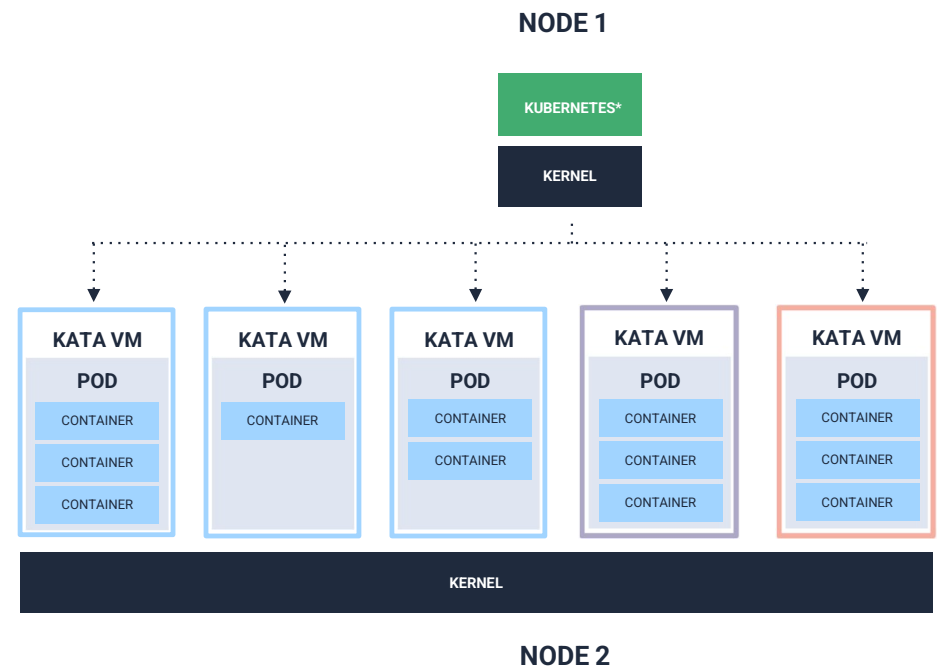
Multi-tenant Kubernetes example

Standard Containers



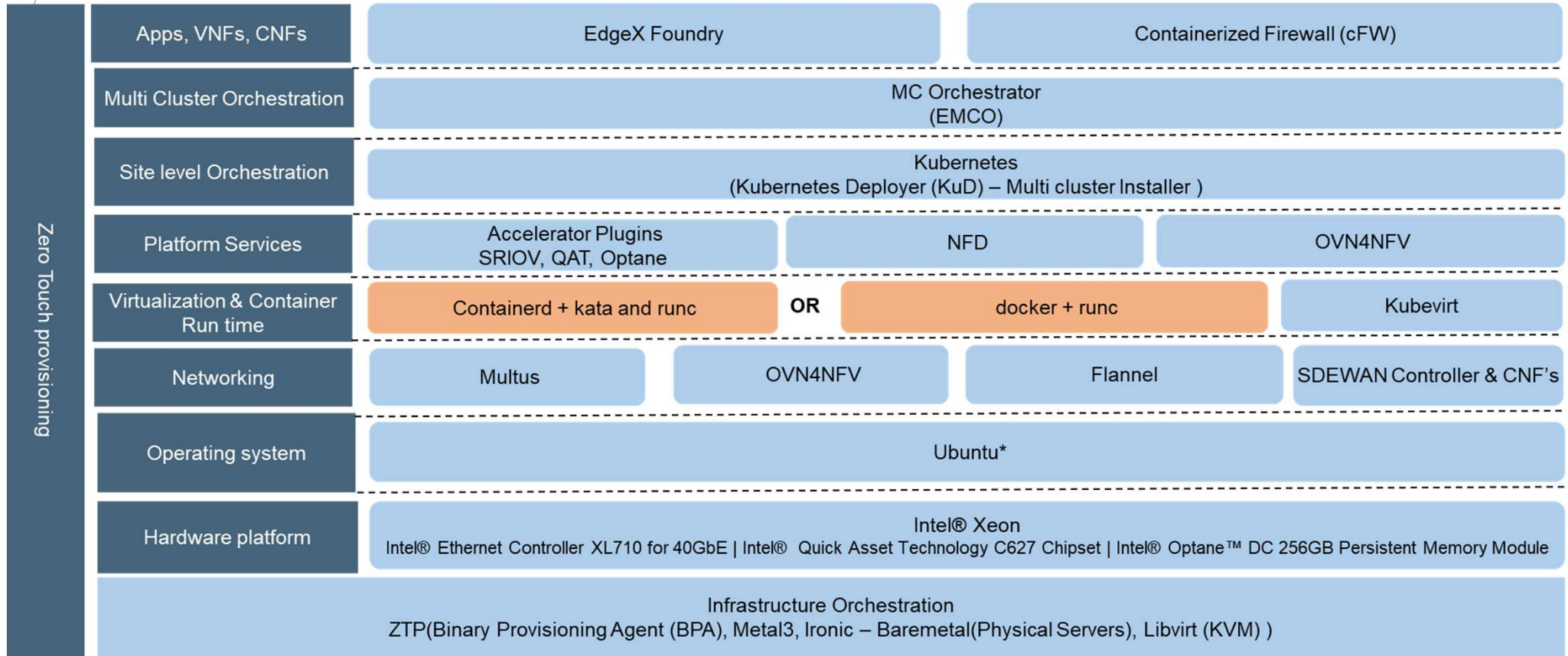
Isolate sensitive workloads by node

Kata Containers*



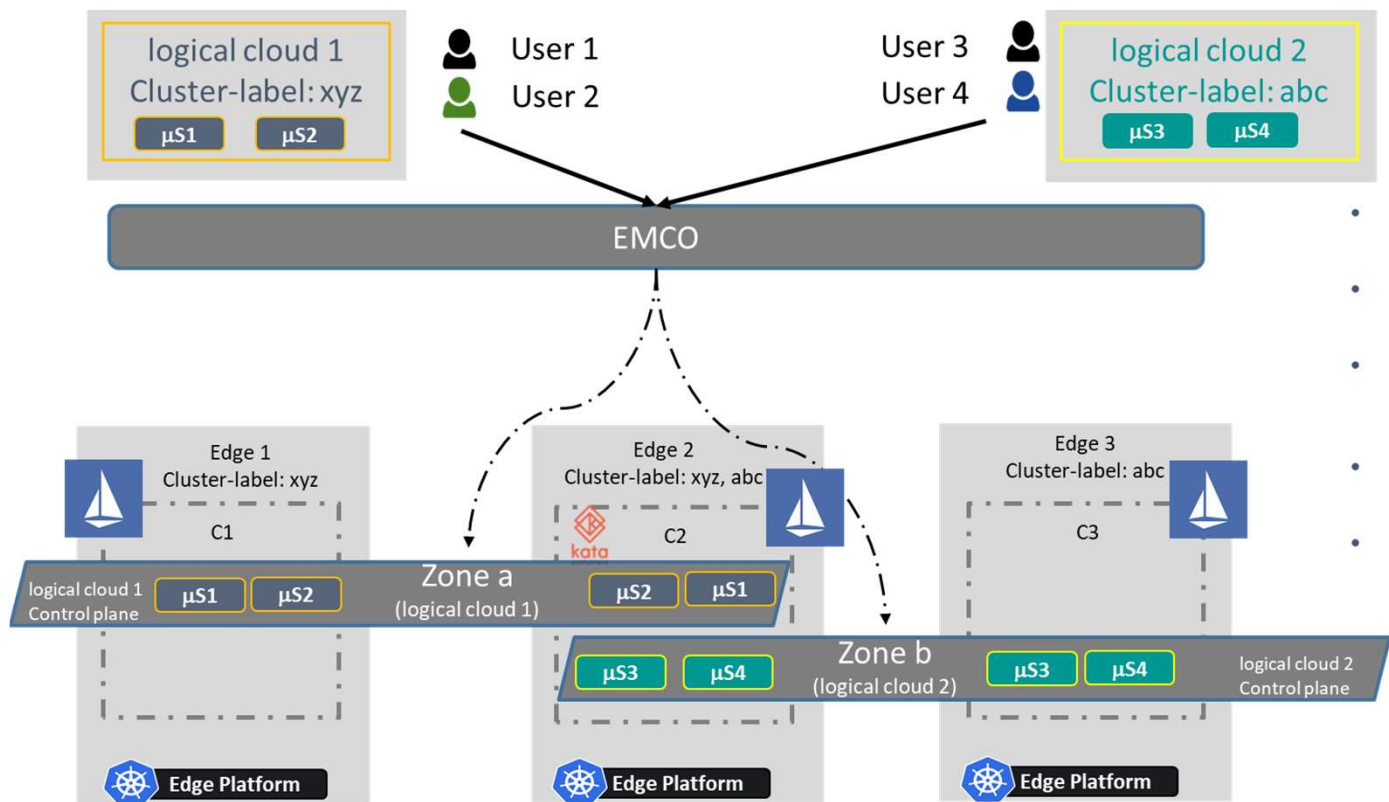
Isolate sensitive workloads **within** a node

Stack architecture



Existing MICN Components New changes

Hard Multitenancy use case with Kata in EMCO



EMCO - DCM

- EMCO – Distributed Cloud Manager(DCM) provides multi-tenancy
- DCM isolate microservice with respect to logical cloud and users
- Using Docker will share kernel, cgroup and network namespaces and it expose the node vulnerability
- Kata container provides hard Multitenancy for tenants
- Provides hard isolation for containers using HW virtualization.



R5 release features

- › Focus on multitenancy use cases.
- › Supported Kubernetes addons:
 - › Multus
 - › Nodus
 - › NFD
- › Limitations:
 - › QAT device plugin does not work due to bug in containerd.
 - › Some features like SDEWAN or addons like SRIOV may work, but not broadly tested.

Future work

- › Confidential computing use case.
- › Broader testing on current ICN features that should run in a more isolated way.

Call to Action

- › Try it yourself

- › <https://wiki.akraino.org/display/AK/ICN-MTSCN+R5+Installation+Guide>

- › Provide feedback

- › Report issues, missing features.

- › Want to know more about Kata?

- › <https://www.katacontainers.io/>

- › <https://github.com/kata-containers/kata-containers/tree/main/docs>

Thank you!

