# Manage workloads on disconnected far edge

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# Agenda

- Edge Computing
- Ecosystem Challenges
- What is MicroShift? Where MicroShift fits in?
- Deep Dive MicroShift Pieces
- Deployment Models
- Microshift-AIO

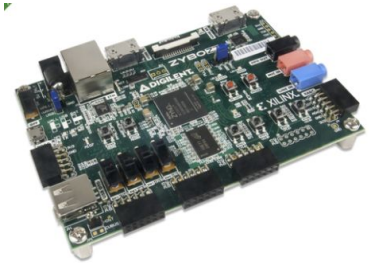
# Edge Computing | Where ?

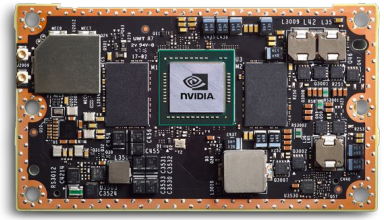
- Micro data centres
- Embedded system
- Field devices

# Context: Field-deployed Devices

## Field-deployed:

- “plug&go” provisioning & replacement
- not remotely recoverable → must not “brick”
- network rare & expensive
- no physical access security






## Devices:

- single board computer or system-on-chip
- no remote management support
- resource-constrained, not extensible

# Why field-deployed devices are different?

- “Field-deployed” refers to mass-deployment and operations in remote, uncontrolled locations with highly challenging network connectivity.

# Why field-deployed devices are different?

- In contrast, highly controlled data centers are high available infrastructures
- Usually very stable power and network conditions

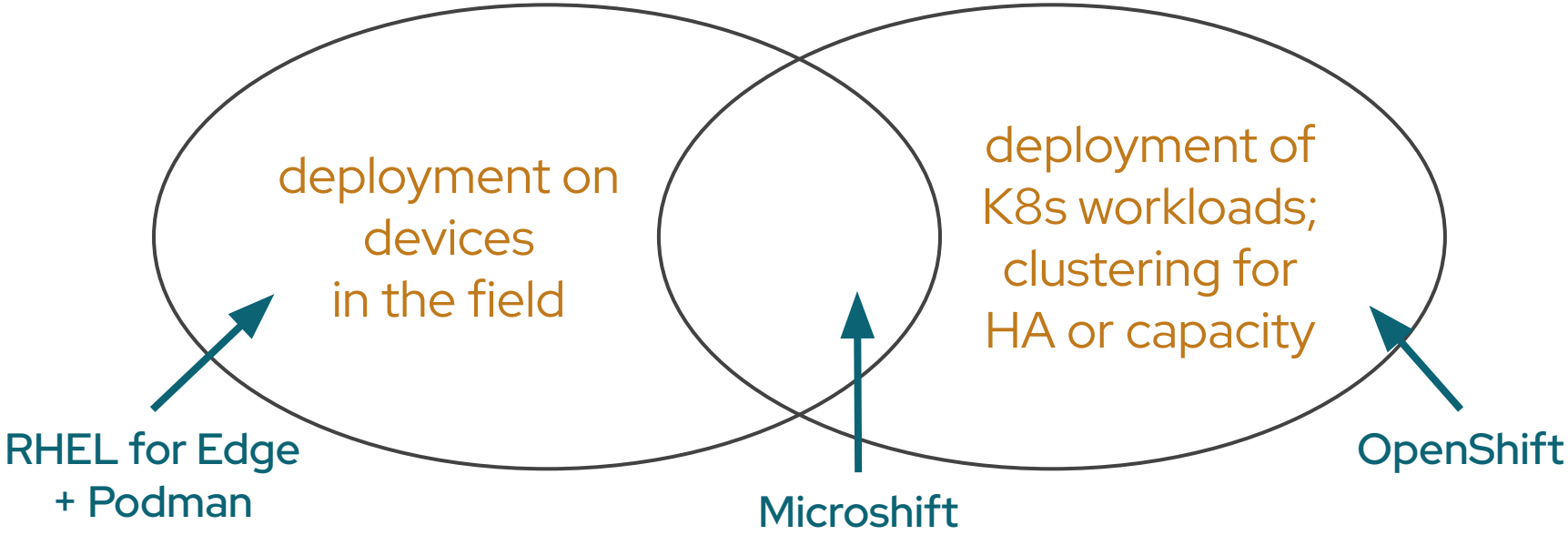
# The problem

- Kubernetes distributions have traditionally been engineered for the cloud and data center-like environments.
- Systems deployed in remote edge locations often use device management software to lifecycle-manage these systems including the OS

# Solution

- Best of both worlds
- Kubernetes to manage cloud-native applications
- Device management to manage OS and underlying hardware

# Requirements of Customer Edge Computing Use Cases



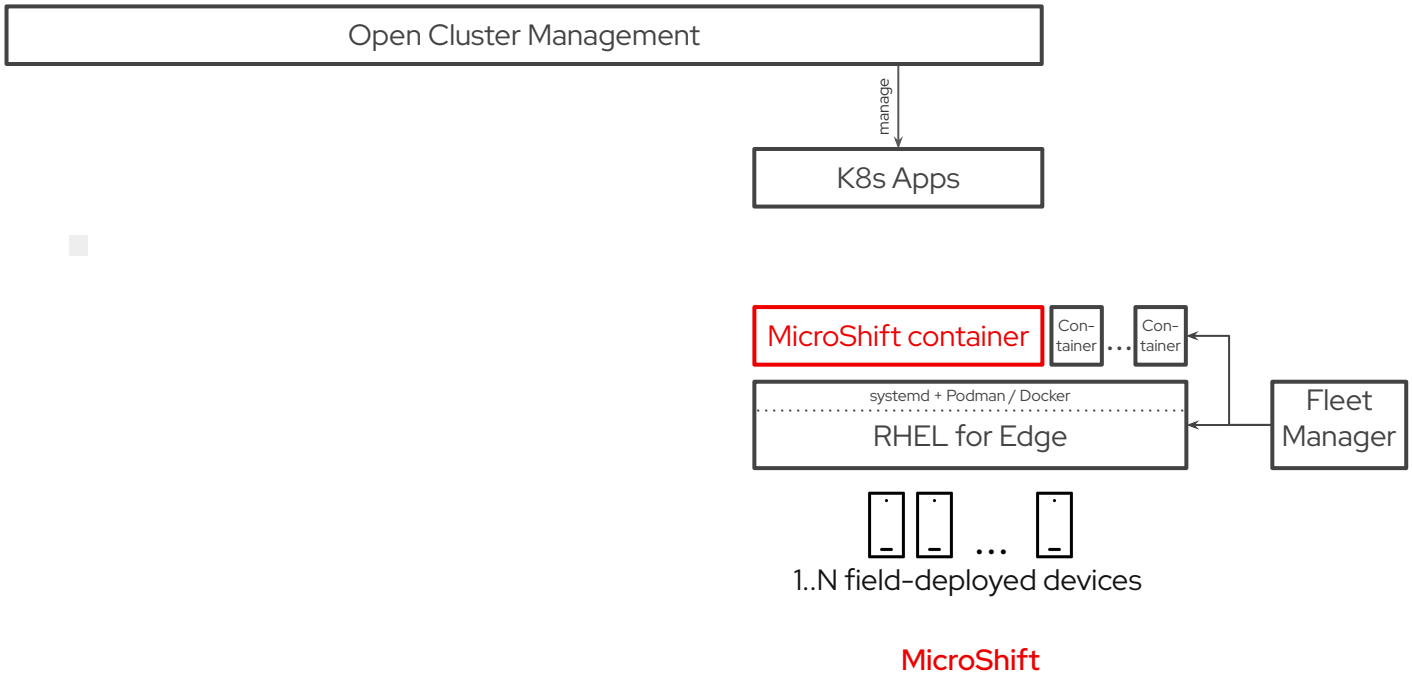
# Introducing Microshift

- An explorative project created by the Edge Computing team in Red Hat’s Office of the CTO.
- Repackages OpenShift core components** into a single tiny binary 160MB

# Introducing Microshift

- As a monolith, it provides an “all-or-nothing” start/stop behavior that works well with systemd and enables fast (re)start times of a few seconds

# Introducing MicroShift

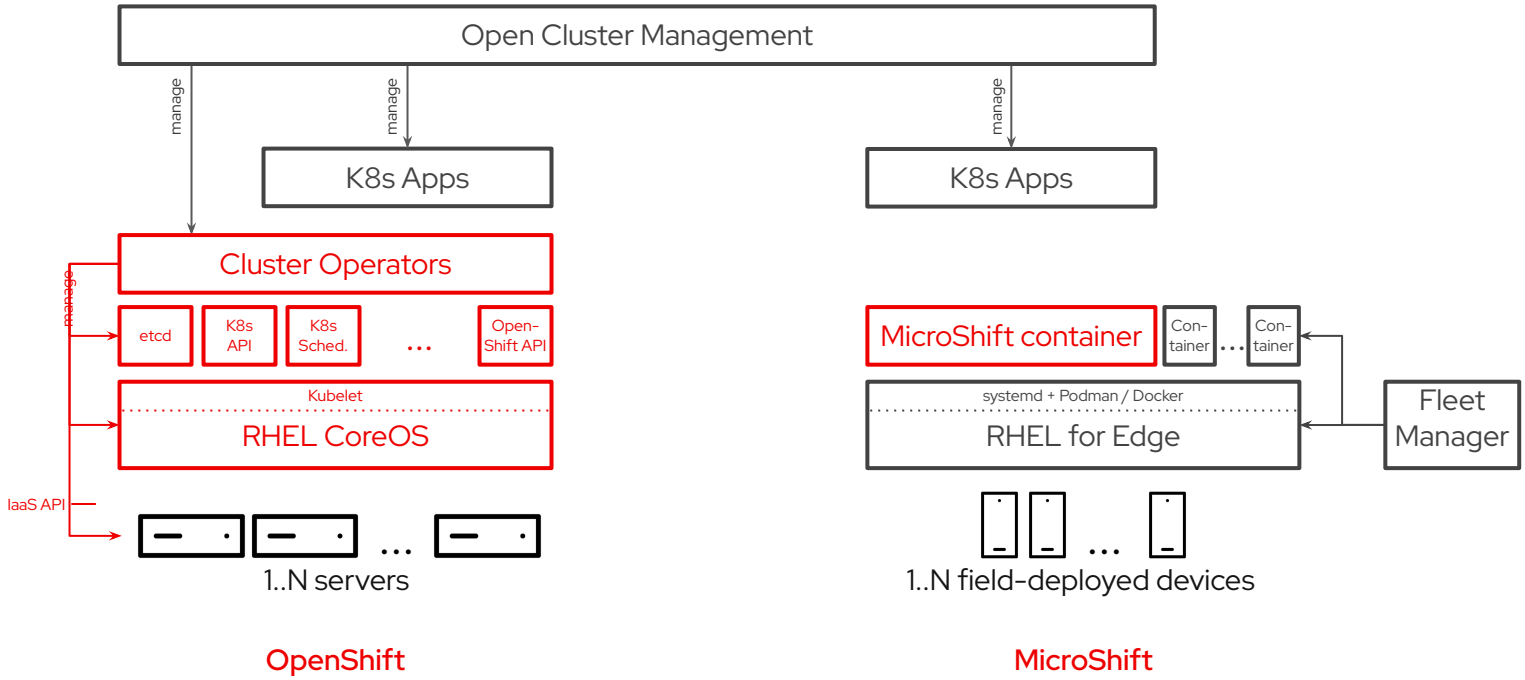



MicroShift

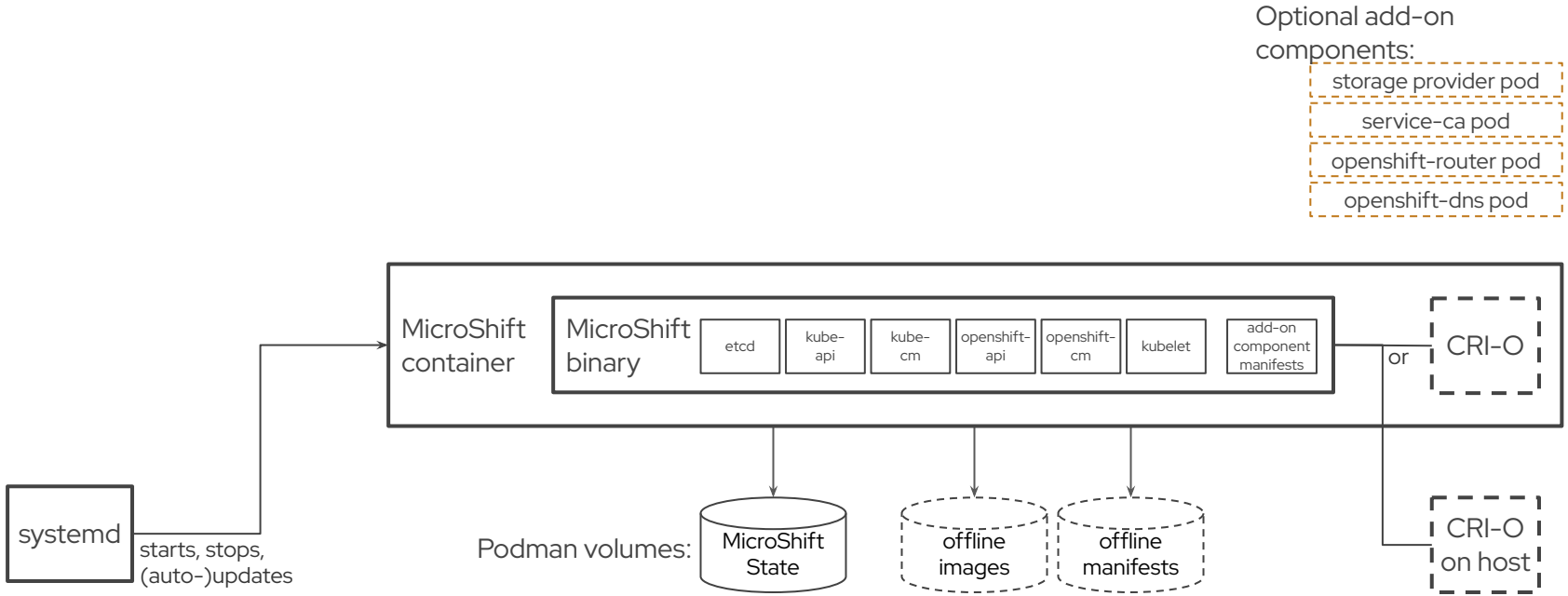
# Introducing Microshift

- Simplifies changes including updates and roll-backs
- Obviates the need for cluster operators to orchestrate across components.

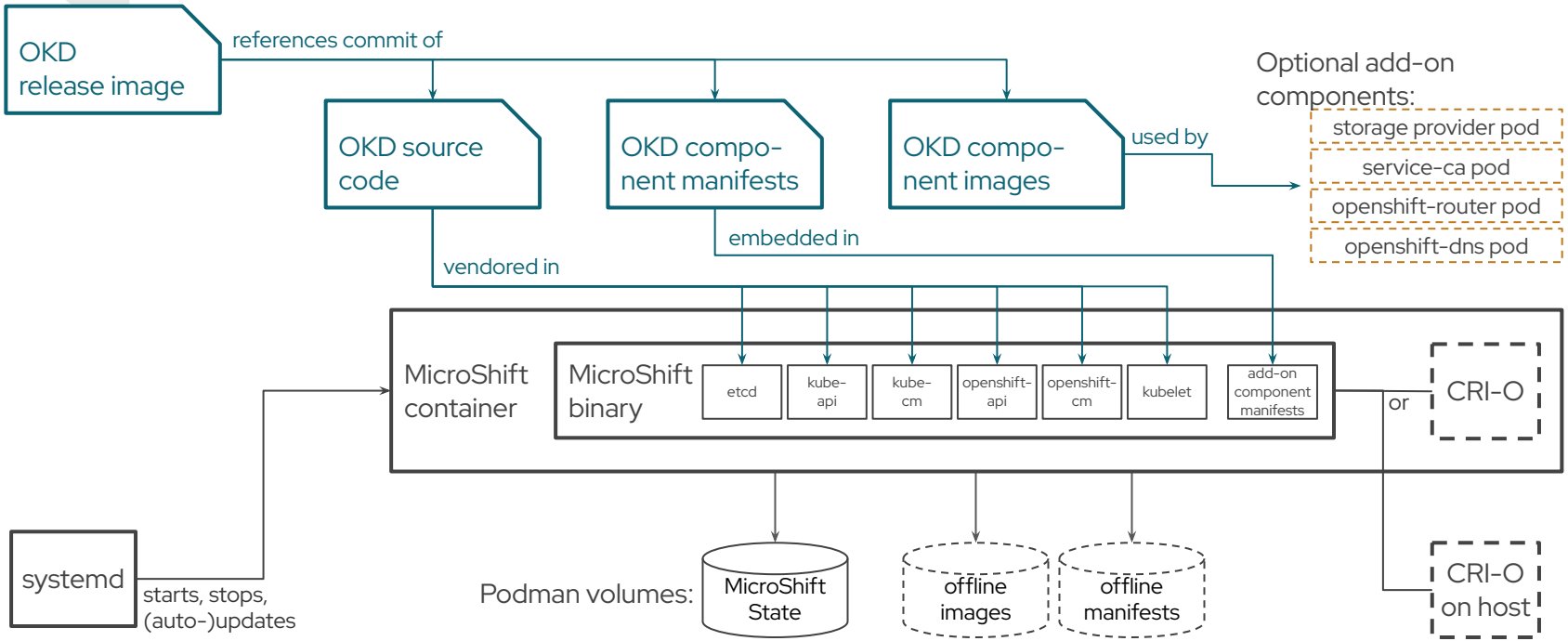
# Introducing MicroShift



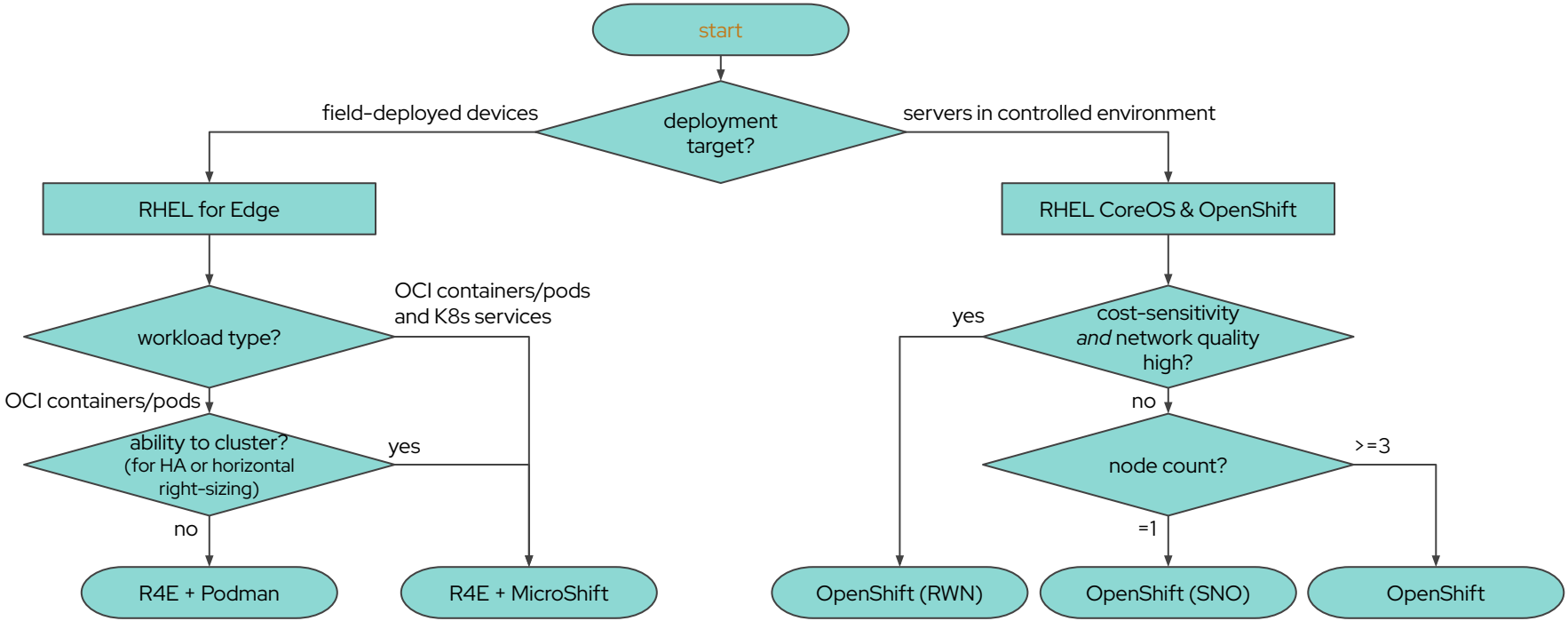
# MicroShift Architecture



# MicroShift Production



# Edge computing platforms



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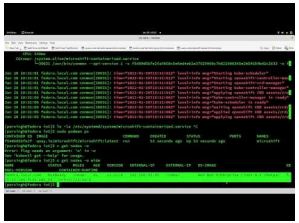
# Microshift - Deployment Models

- Rpm install
- Podman with systemd

# Microshift Podman Deployment

- For immutable OS Fedora IoT, Rhel for Edge
- Uses podman to deploy and manage containerized applications using systemd
  - Start/Stop/Restart
  - auto-updates
  - rollbacks



# Microshift-AIO | Microshift for developers

- Microshift-AIO - **All In One**
- Handy for developers that want to run a minimal OpenShift flavor on their laptops.
- Write, test, and deploy new cloud-native applications using Microshift-AIO
- Use it in CI pipeline

# Links

https://microshift.io/

https://github.com/redhat-et/microshift

https://next.redhat.com/2022/01/19/introducing-microshift/

https://next.redhat.com/project/microshift/

**https://youtu.be/100tT5tuCrI** MicroShift AIO demo

**https://youtu.be/qwTGn8lyp4k** AI at the Edge With MicroShift

# Thank you