



## Connect

Estensione delle infrastrutture con  
modelli edge e multicloud: nuove  
necessità di business

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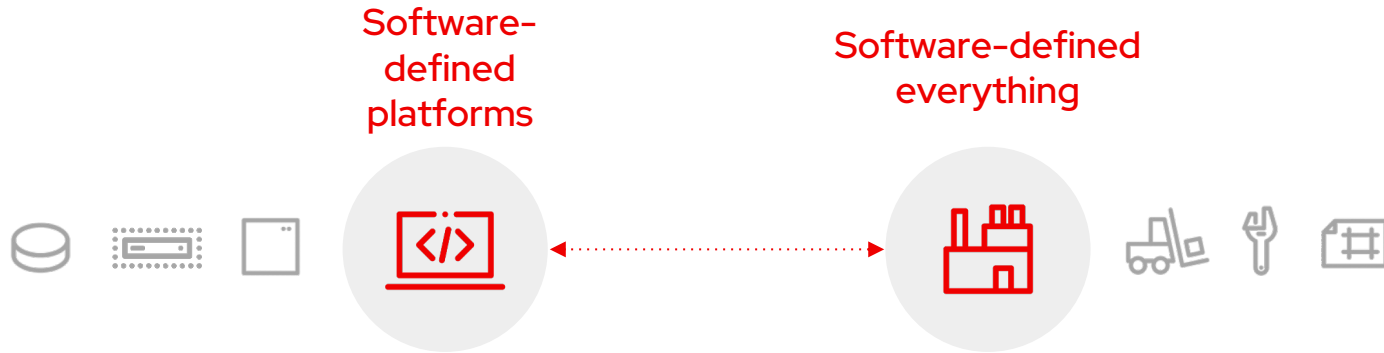
Senior Solution Architect  
Red Hat

# Evolving Company Retail Business



The Edge solutions offered by Red Hat can help the Tree of Taste company in its growth process by supporting retail stores interaction between ordering services and warehouse management. The same platform will be used in the future to introduce new edge-centric AI/ML features.

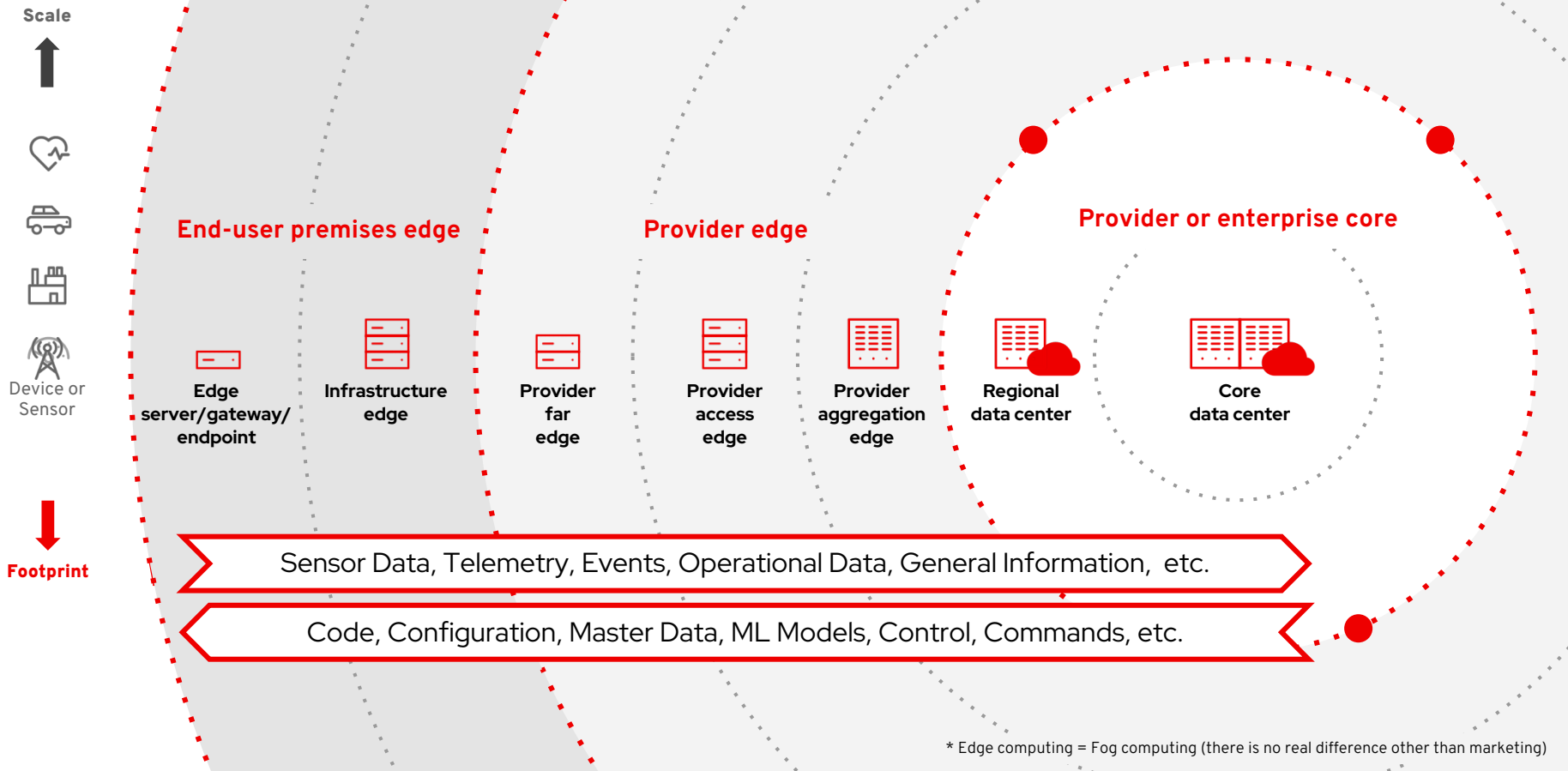
# Edge computing extends digital transformation to where business happens



- ▶ Standard, scalable hardware
- ▶ Cloud-native applications
- ▶ Flexibility and agility
- ▶ Convergence of data platforms

- ▶ Real-world, real-time interaction
- ▶ Convergence of planning and execution
- ▶ Implementation of data-driven insights
- ▶ Integration of formerly closed systems

# Red Hat's coverage from core to edge



# RHEL for Edge: Small footprint edge OS



**RHEL for Edge** ensures operational stability and flexibility to easily adapt deployments. Quick image generation, transactional OS updates, and intelligent OS rollbacks, provide both traditional and containerized workloads the additional security and resiliency required for edge environments.

Use cases



Edge servers  
and gateways\*



Standalone  
container host

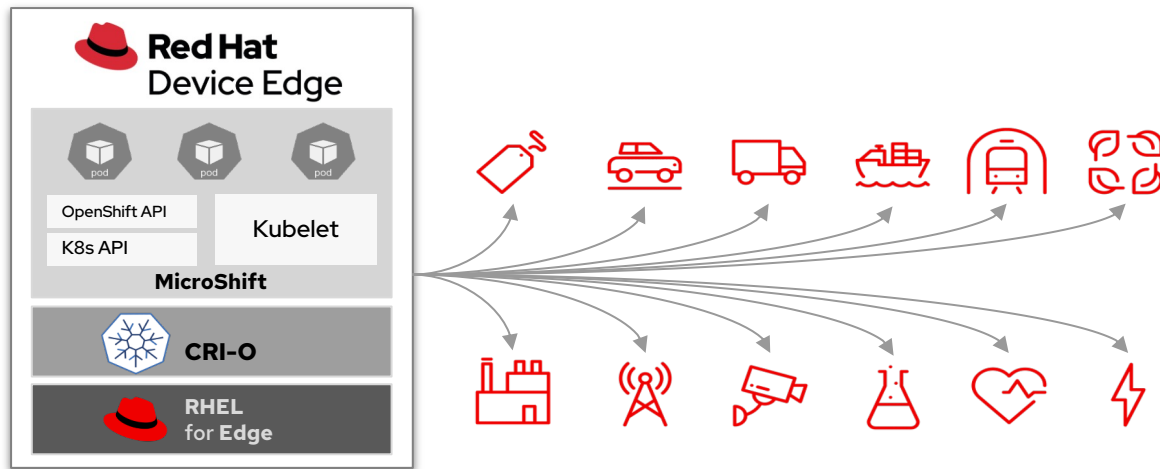


Customer premise  
equipment



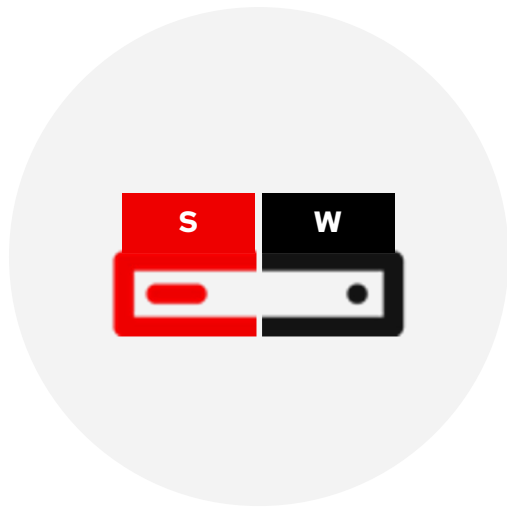
Intermittently  
connected

## Red Hat Device Edge (R4E + MicroShift)



**Red Hat Device Edge** brings **MicroShift** (a minimal OpenShift implementation) and **RHEL for Edge** to small form factor devices optimized for edge computing and headless devices with as conservative a resource overhead as possible.

## Single node edge cluster



Supervisor  
node



Worker  
node

Red Hat OpenShift deployment on a single box (supervisor + worker) with resources to run full a Kubernetes orchestrator as well as application workloads.

### Use cases



Server class  
hardware



Telco 5G  
far edge - RAN



In-vehicle  
field operations

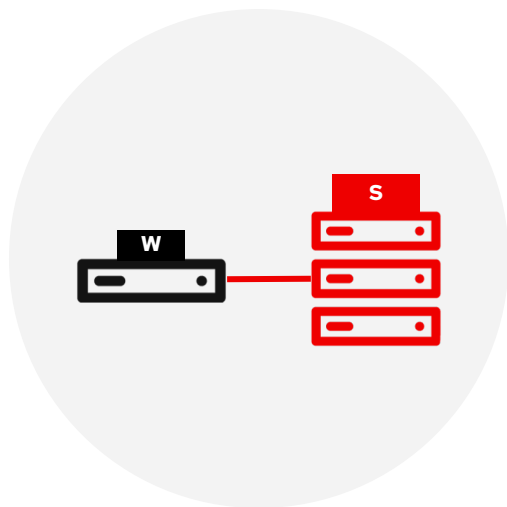


Asset  
monitoring



Telco 5G sparsely  
populated areas

## Remote worker nodes



Supervisor  
node



Worker  
node

Red Hat OpenShift deployment with on-premise master and worker nodes combined with worker nodes located at the network edge that connect to the cluster.

Use cases



Data aggregation  
and analysis



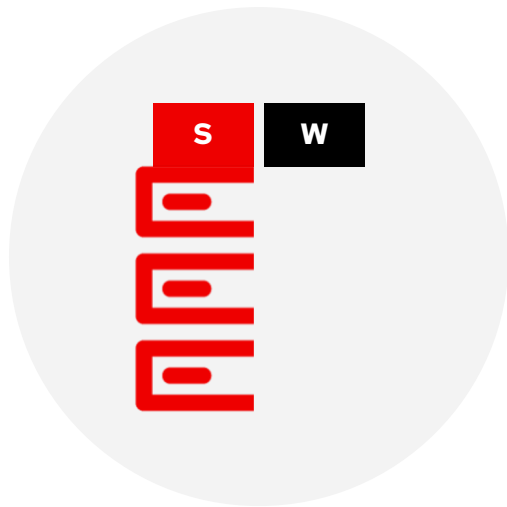
Telco 5G/RAN  
far edge (dense)



HA workloads  
(w/ 2 remote nodes)



## Edge clusters (3+ node HA)



Supervisor  
node



Worker  
node

Red Hat OpenShift supervisor and workers reside on the same node. High Availability (HA) setup with 3 servers.

Use cases



Edge AI  
and data pipelining



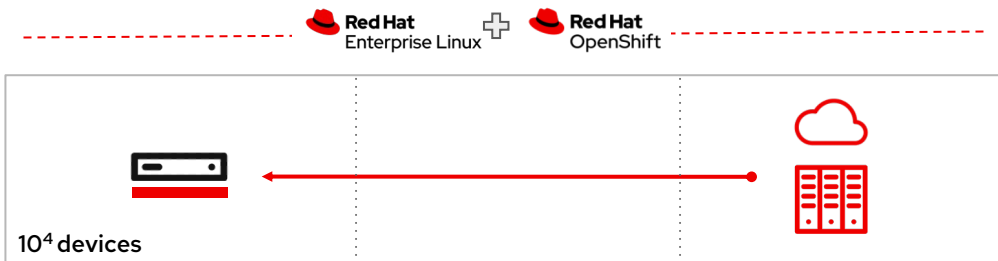
Telco 5G near edge and  
mobile edge computing



Disconnected  
clusters

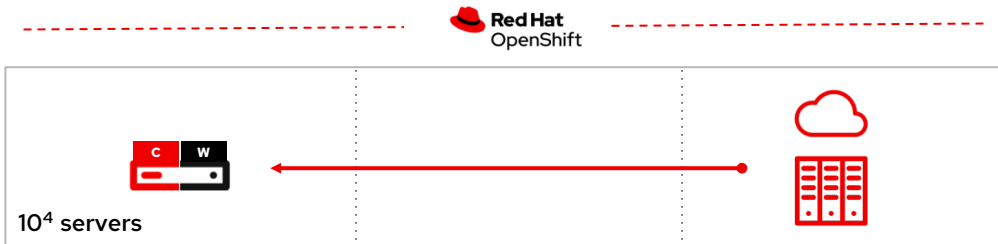
## Device edge platform

RHEL minimal profile and tooling for Edge devices + MicroShift



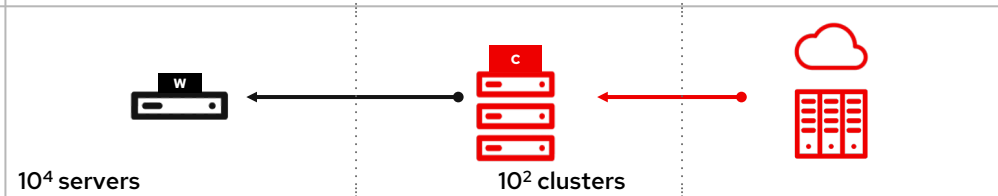
## Single-node edge servers

Low bandwidth or disconnected sites



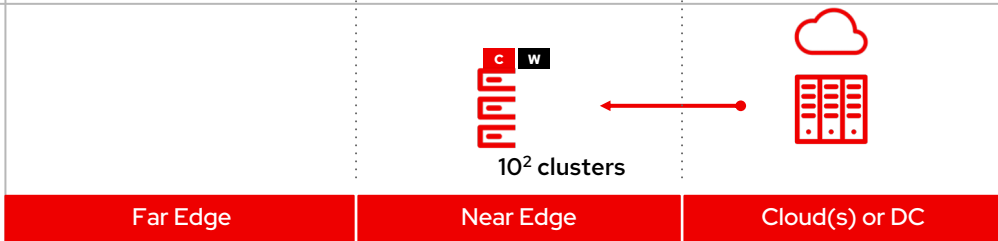
## (Remote) worker nodes

Space-constrained environments



## 3 node Clusters

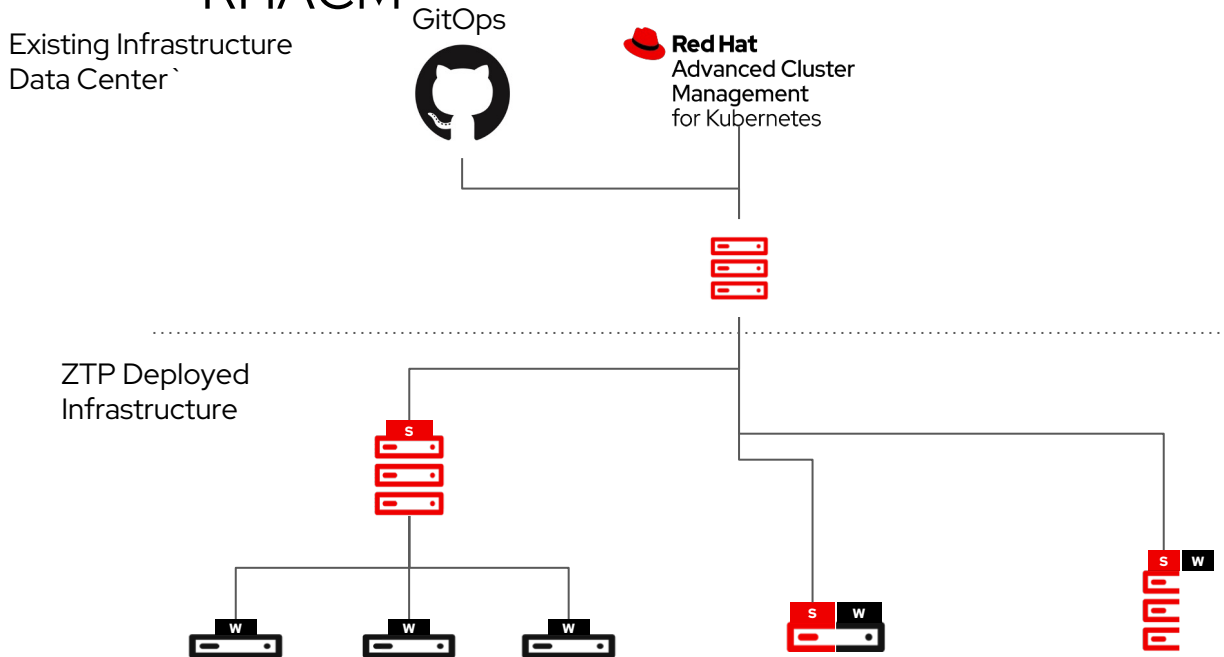
Low footprint clusters with high availability



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# Defining and provisioning infrastructures with RHACM



## Zero Touch Provisioning

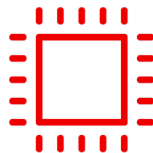
(ZTP) leverages RHACM and GitOps approach to remotely manage edge sites.

ACM manages clusters in a **hub/spoke** architecture, where a single hub cluster manages many spoke clusters

## Single Node OpenShift



Support on bare-metal, vSphere,  
Red Hat OpenStack



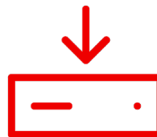
4 cores 16GB mem minimal  
requirements



Not have a dependency on a  
central control plane



Bootstrap In Place - no additional  
bootstrap node needed

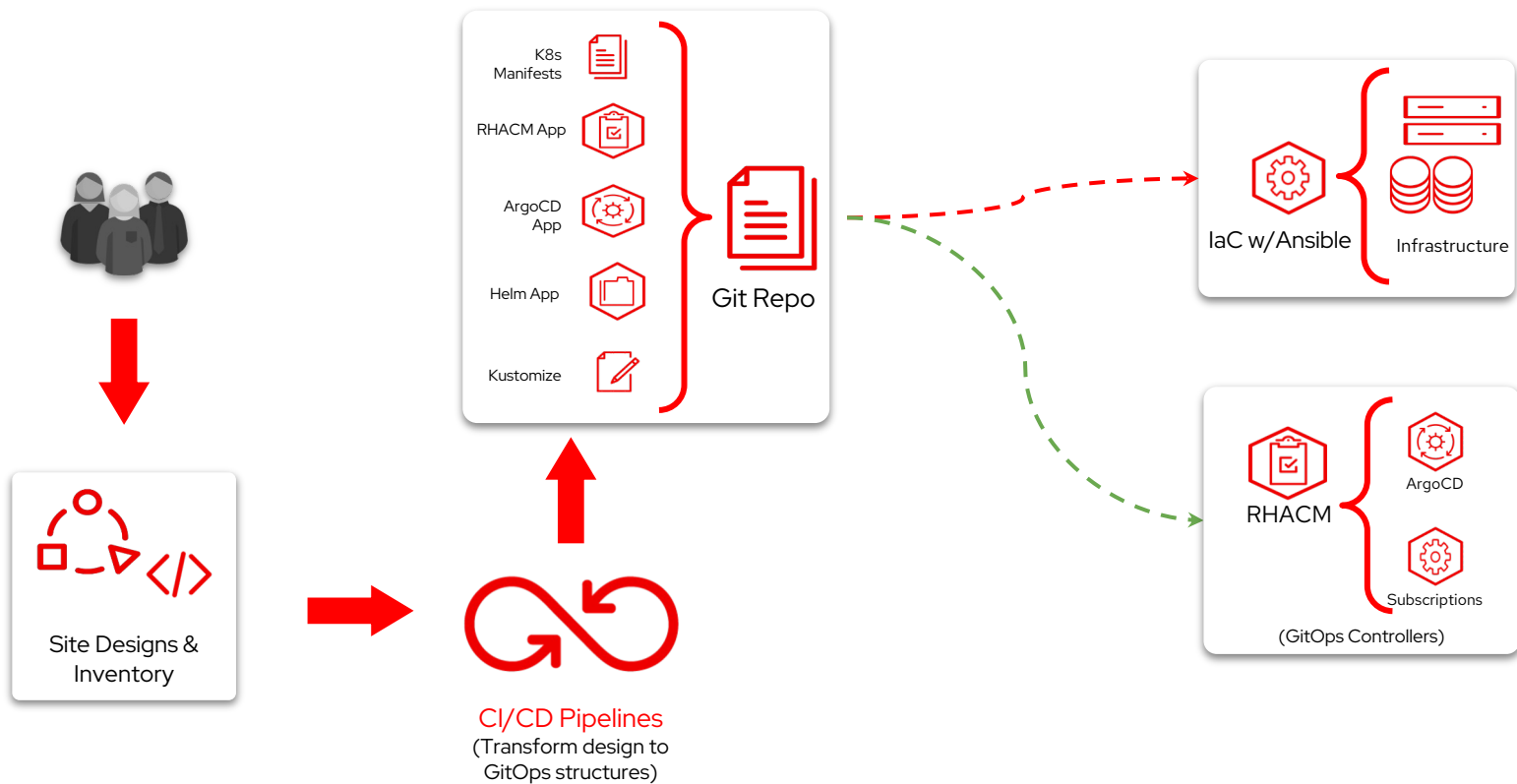


Deployment via openshift-  
install or via RHACM (ZTP)  
/Assisted installer



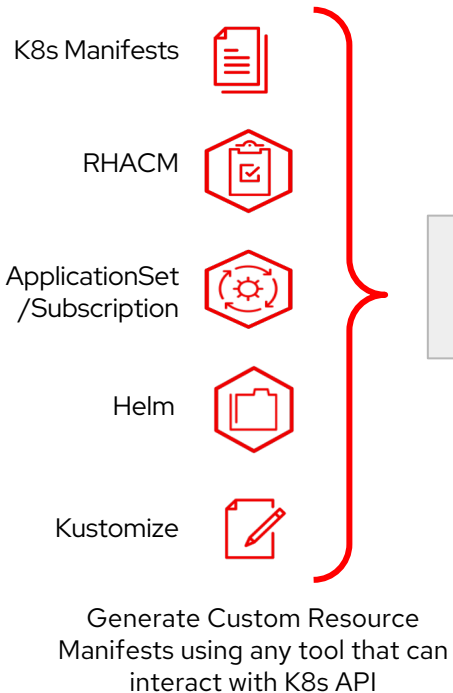
Can manage additional  
worker nodes for per site  
capacity

# Operational Flow with GitOps

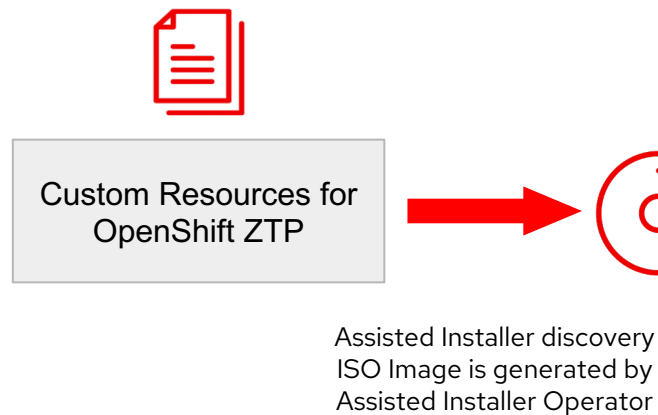


# Zero Touch provisioning in OpenShift

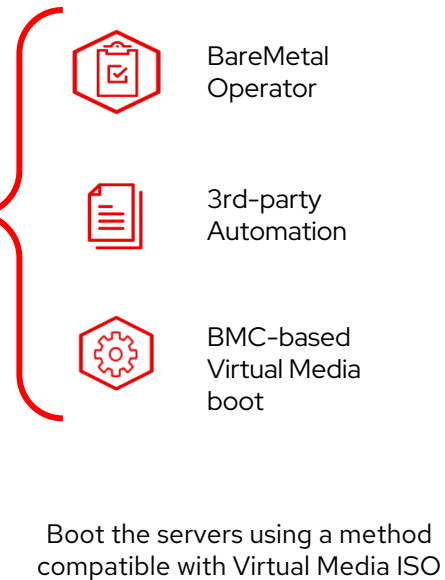
## STEP 1



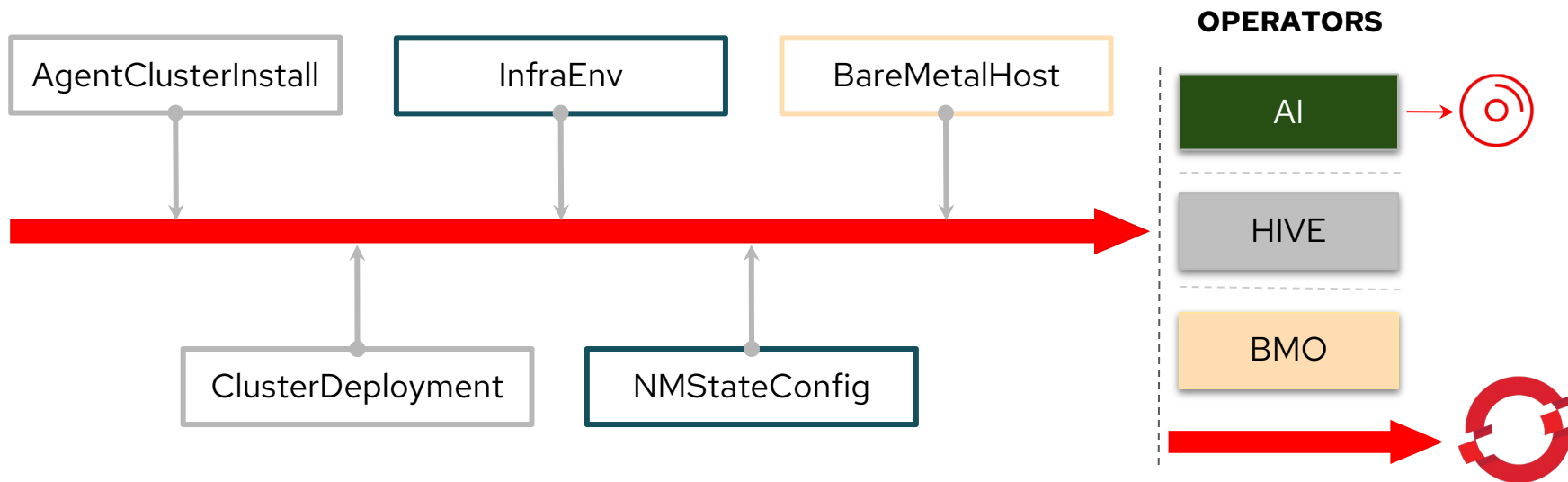
## STEP 2



## STEP 3



## Custom Resources (CRs) for OpenShift ZTP

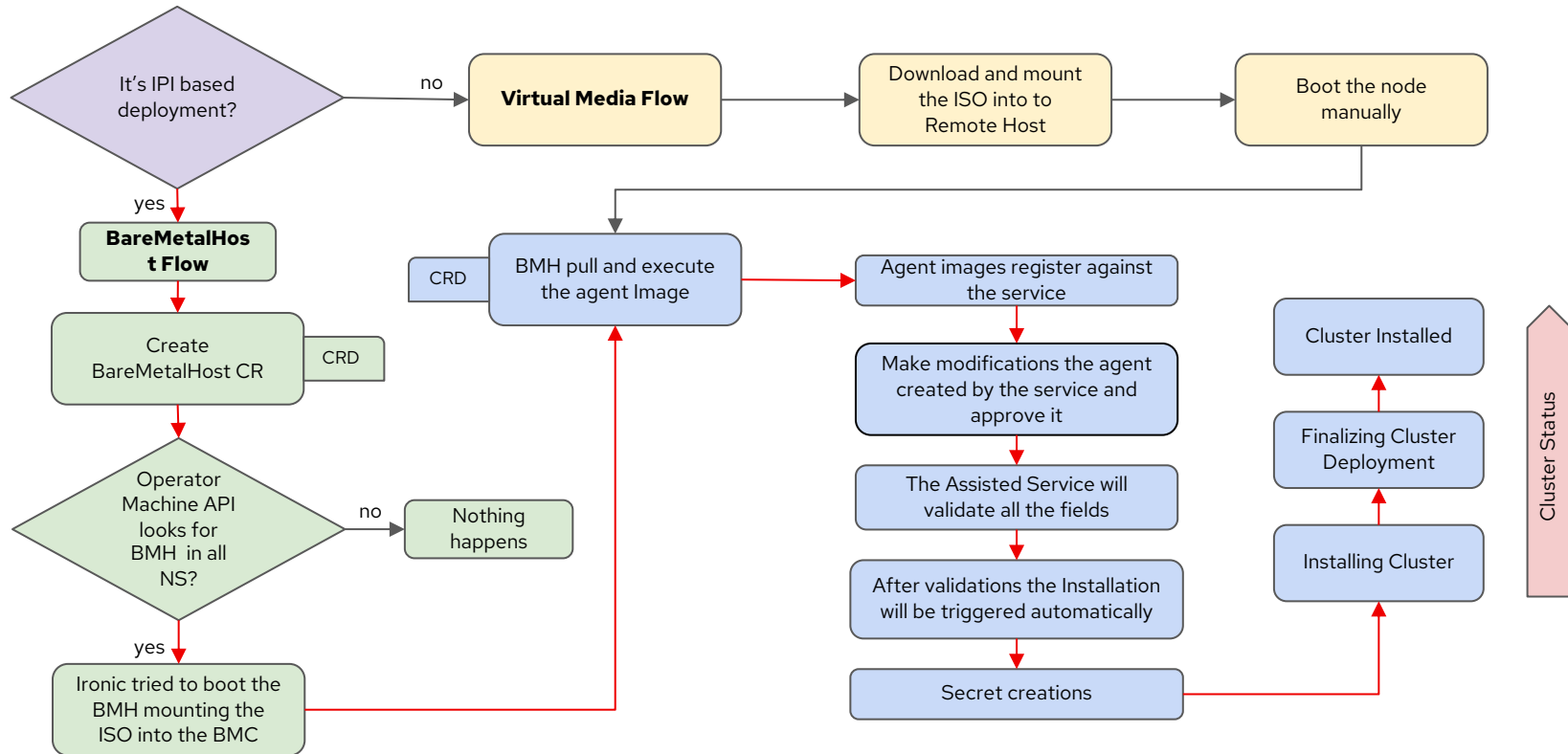


AI = Assisted Installer

BMO = Bare Metal Operator

Hive = API driven OpenShift 4 cluster provisioning and management

# ZTP Flow on Connected Environments

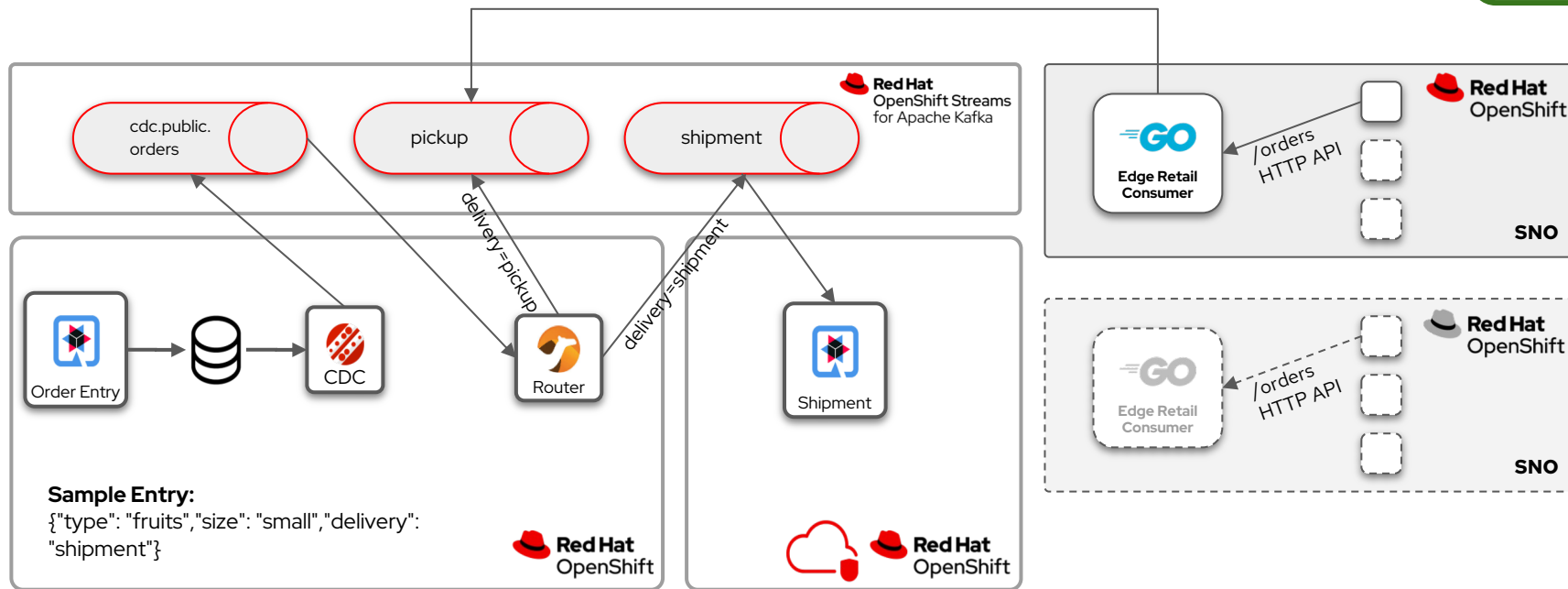




# Hands-on GitOps-based ZTP with RHACM



# Consuming Topics from Retail Stores



A basic Kafka consumer is deployed on the Edge SNO using a GitOps approach with RHACM. It captures all the pickups for the store and exposes them via HTTPS to other remote services.

# Hands-on

## Connecting Edge Retail Services

# Demo Sessions Repositories

## Session 1: Application Modernization

- <https://github.com/redhat-italy/order-entry>

## Session 2: Managed Services

- <https://github.com/redhat-italy/rhosak-cdc-demo>

## Session 3: GitOps + DevSecOps

- <https://github.com/redhat-italy/pac-demo>
- <https://github.com/redhat-italy/food-app>
- <https://github.com/redhat-italy/food-app-config>
- <https://github.com/redhat-italy/food-app-gatling>

## Session 4: Edge

- <https://github.com/redhat-italy/summit-ztp-edge>
- <https://github.com/redhat-italy/edge-retail-consumer>