Red Hat for Edge Solutions

Roadmap for Adoption
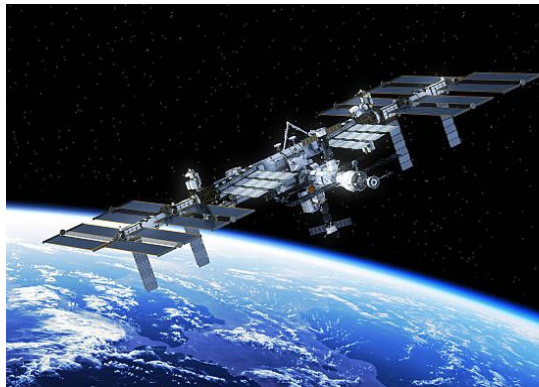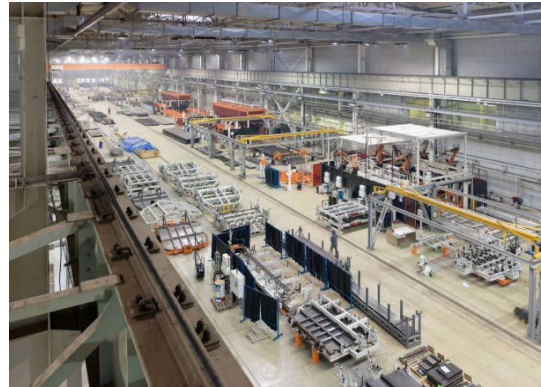
David White

Solutions Architect, Edge & Data Science

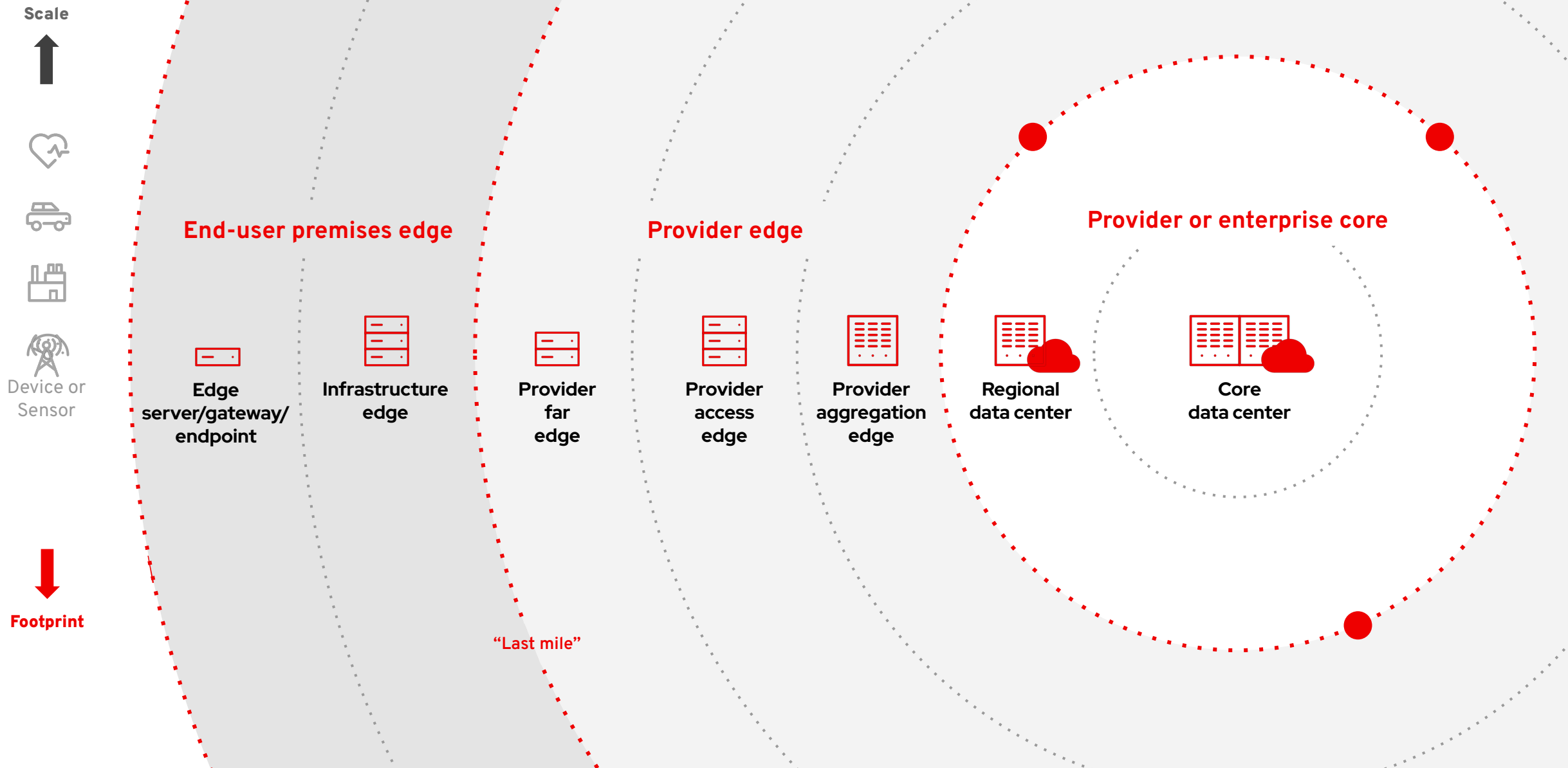North America

dawhite@redhat.com

Red Hat

What Is Edge

- Denied, Disconnected, intermittent connectivity, and low-bandwidth (DDIL)
- Limited physical space for IT infrastructure
- Scaled down IT services and/or staffing
- Some degree of hardware/software integration with custom or purpose built hardware/systems
- Narrow focus on capabilities and integration
- Generally part of a "fleet" or hub and spoke infrastructure
- Simple Recoverability
- Lights Out management

Red Hat's coverage from core to edge

Scale

Device or
Sensor

Footprint

End-user premises edge

Edge
server/gateway/
endpoint

Infrastructure
edge

Provider edge

Provider
far
edge

Provider
access
edge

Provider
aggregation
edge

Provider or enterprise core

Regional
data center

Core
data center

"Last mile"

Red Hat's coverage from core to edge

Scale

Device or Sensor

Footprint

Red Hat OpenShift Container Platform - Enterprise Kubernetes

End-user premises edge

Provider edge

Provider or enterprise core

Edge server/gateway/ endpoint

Infrastructure edge

Provider far edge

Provider access edge

Provider aggregation edge

Regional data center

Core data center

Red Hat Enterprise Linux

"Last mile"

4

Platform Strategy with Ecosystem

Industry Solution Providers

SI

Customer's In house innovation

Partner ecosystem

Industry-agnostic horizontal platform

Edge Bare metal Virtualization Private clouds Public clouds
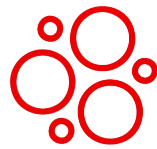
5

Red Hat
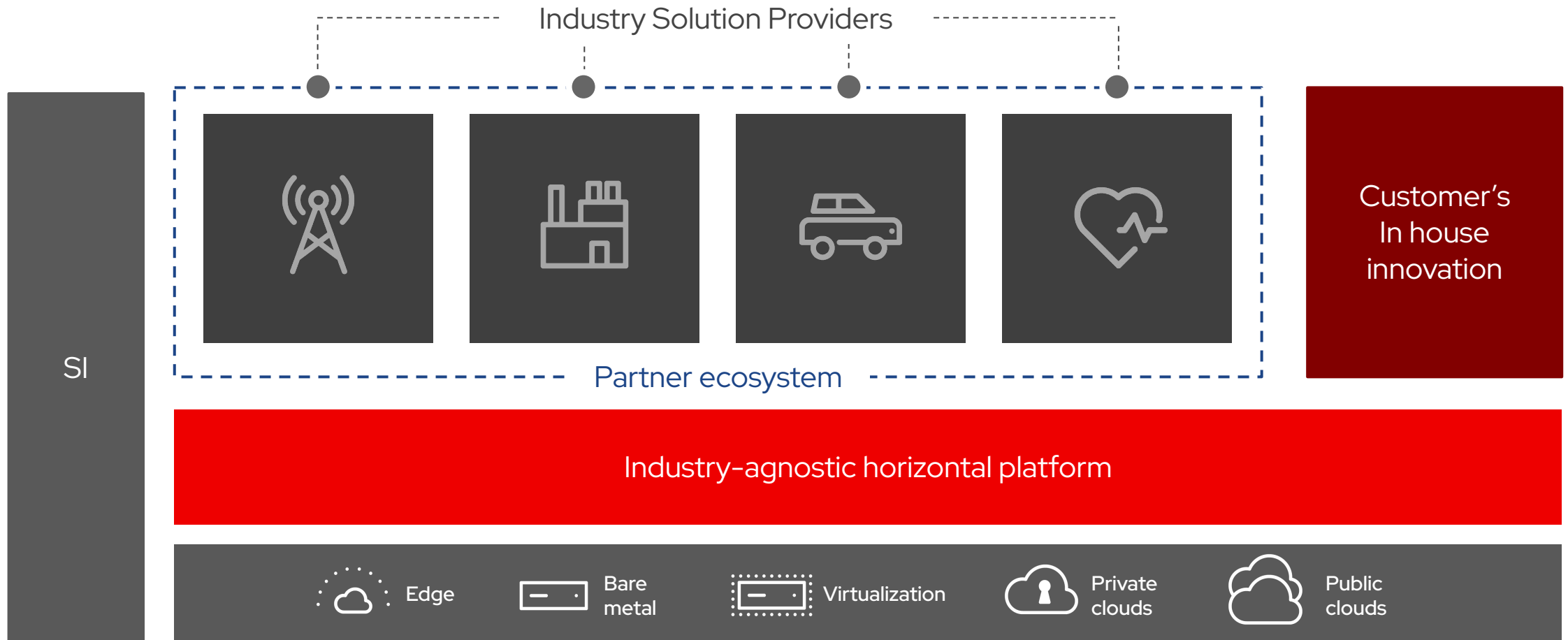
Edge computing is complex
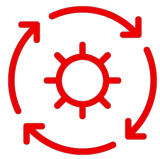
Management at scale

Managing hundreds of thousands workloads in many locations with enough people to scale efficiently
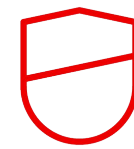
Complexity of infrastructure

Supporting heterogeneous infrastructure increases costs and skill sets

Accelerated innovation to meet business needs

Building an edge infrastructure that supports in house innovation and partnering with specialized 3rd party providers
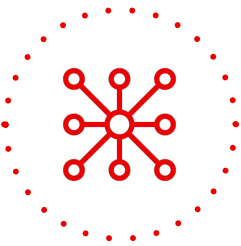
Security and compliance

Processing and managing data at the edge to make decisions while protecting sensitive information and supporting latency-sensitive applications

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Edge computing with Red Hat®

A scalable and secure common platform across hybrid, multi-cloud, and edge architectures
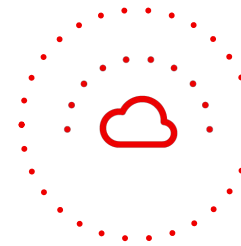
Consistency

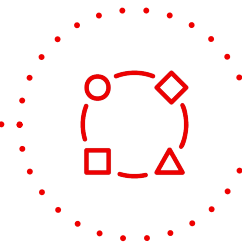Same Red Hat
from core, to
cloud to edge

Manageability

Manage a highly scaled
out architecture with
ACM, Ansible, and the
forthcoming Fleet
Management for RHEL

Flexibility

Topology options to
meet varying edge
locations

Portfolio

Power in the end to end
Red Hat portfolio +
partner ecosystem

Red Hat
Enterprise Linux

Small footprint edge OS
Memory-constrained edge servers/Internet of Things (IoT) Gateways

MicroShift
Small footprint OpenShift on RHEL Edge

Red Hat
OpenShift
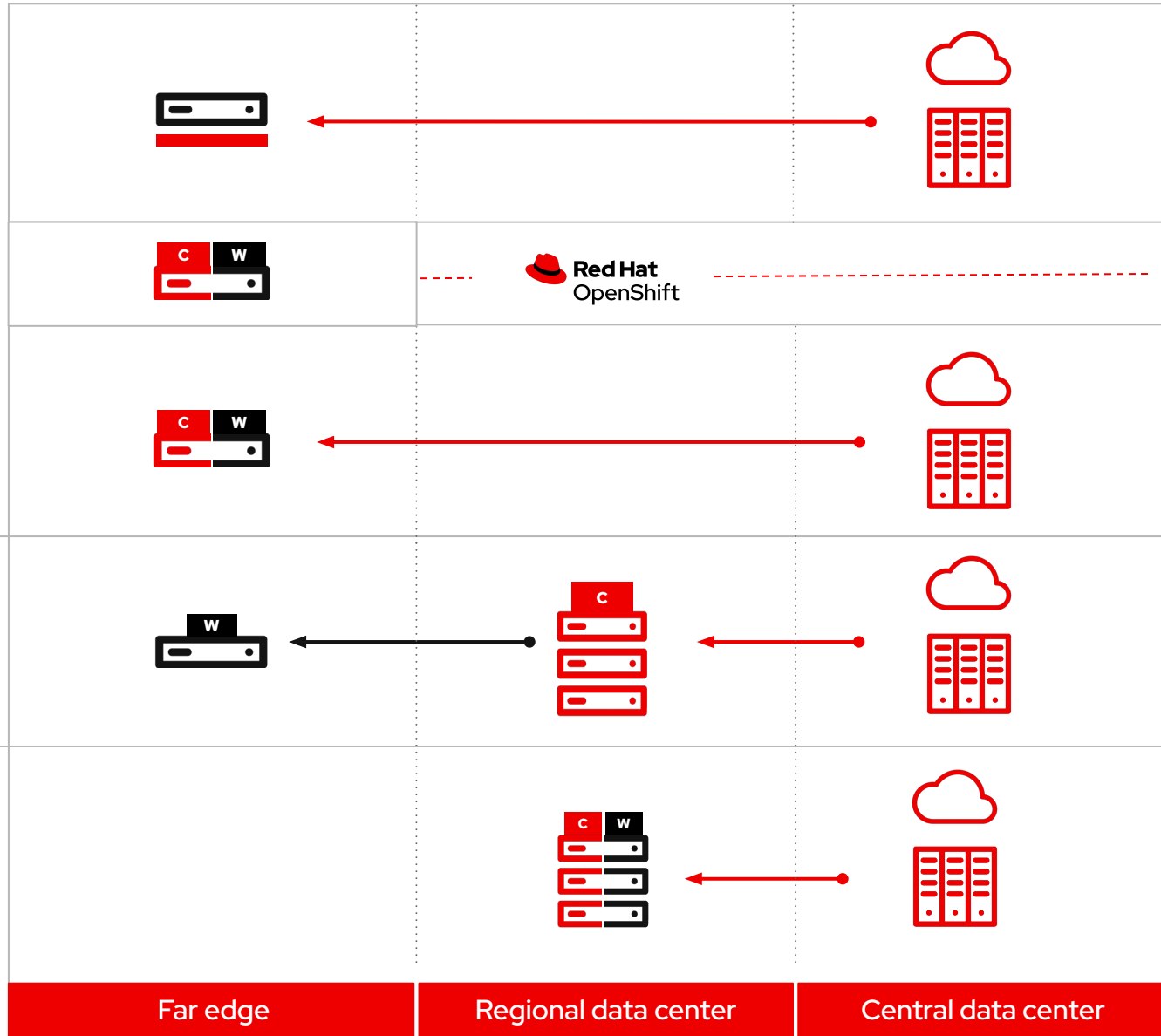
Single-node edge servers
Low bandwidth or disconnected sites

Red Hat
Management

Remote worker nodes
Space-constrained environments

3 node Clusters
Small footprint with high availability

Far edge | Regional data center | Central data center

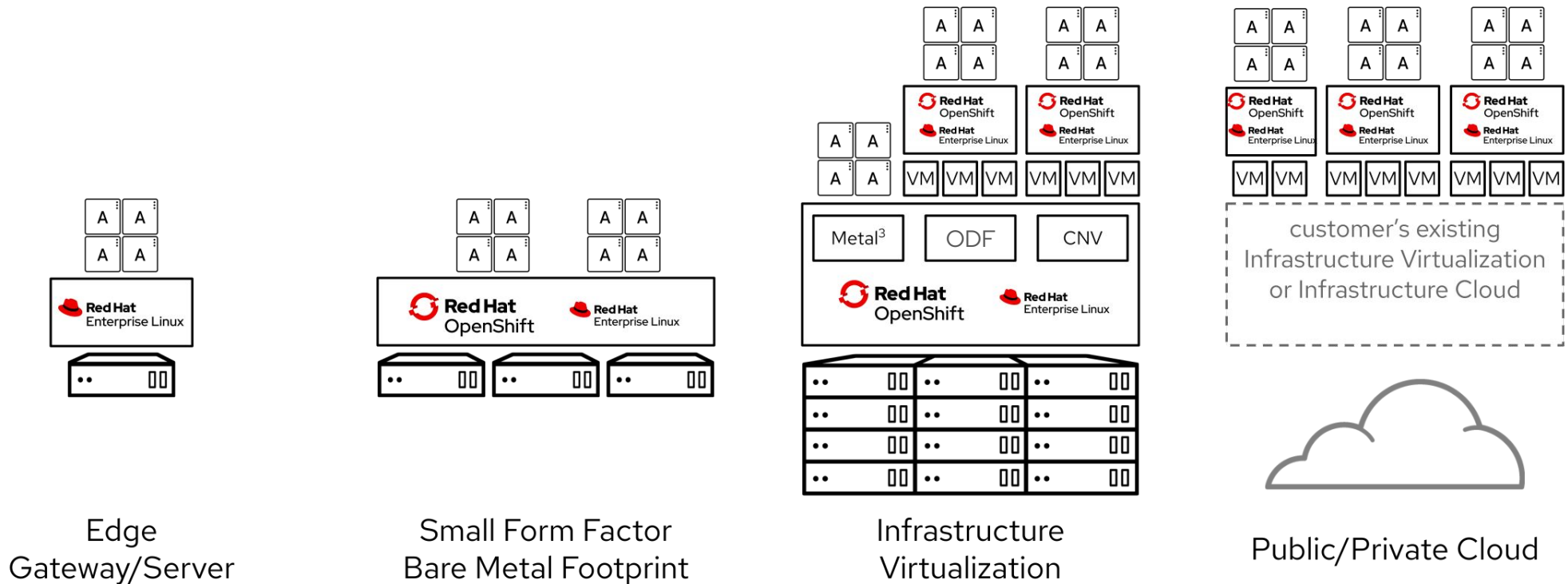Cluster management and application deployment

Kubernetes node control

C Control node

W Worker node

Red Hat

Common platform, many deployment footprints.

With consistent tools to deploy, manage, and use these edge resources

Edge
Gateway/Server

Small Form Factor
Bare Metal Footprint

Infrastructure
Virtualization

Public/Private Cloud

Red Hat Advanced Cluster Management for Kubernetes

Red Hat Advanced Cluster Security

Ansible

Red Hat is maybe the only company that can give you a solid reference architecture for edge infrastructure. I ask every "edge" vendor to draw the edge on a whiteboard. Vast majority can't do it, and in fact, they're surprised anyone would ask.

Paul Delory

Research Director on the Data Center and Cloud Operations

Gartner for Technical Professionals research group

Twitter Thread: https://twitter.com/pacdelory/status/1412893711814610956

Red Hat

Actual Tactical Edge Implementations

Unnamed customers

3+ node OpenShift on existing Dell R640 blades for stationary edge cluster compute running containers and virtual machines.

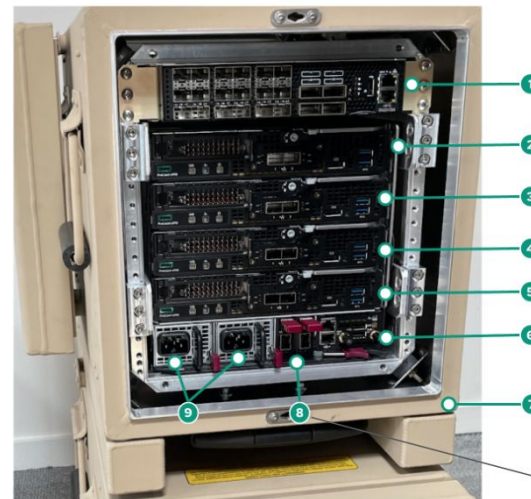4 node OpenShift on HPE EL8000 with half-width e910 blades afloat edge cluster running containers and

Item	Description
1.	HPE StoreFabric Switch (optional)
2.	ProLiant e910 1U Server Blade
3.	ProLiant e910 1U Server Blade
4.	ProLiant e910 1U Server Blade
5.	ProLiant e910 1U Server Blade
6.	Edgeline Chassis Manager (ECM) Module
7.	EL8000-MCS Edgeline series of rugged cases
8.	Two (2) EL8000 Switch Module Bays with 10GbE SFP+ Switches -OR- One (1) SFP+ to Rj45 (8a. 10GbE SFP+ Switch)
9.	Two (2) Edgeline EL8000 Power Supplies

Table: Unracked / Uncabled HPE Edgeline EL8000 5U Components List from Figure 2.

Figure: HPE Edgeline EL8000 5U Front Cabling Chassis View in Ruggedized case

Figure: EL8000 Unmanaged 10G SFP+ Switch

Edge Hardware Types

Traditional Servers
- Standard Racked or standalone enclosures
- Standard 120-220 volts ~1000 watts
- Dual power supplies
- Multiple expansion slots and storage bays for upgrades

Compact Compute Solutions
- Small physical footprint
- Limited or no expandability
- Typical power consumption
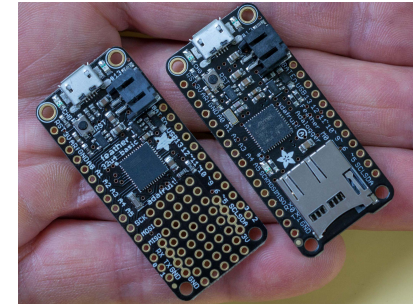- Comparable compute power
- Customized configuration tools

Micro Computing
- Very small physical footprint
- Lower power requirements 120v 50~100w
- Limited or no expandability
- Lower compute capabilities

IoT enabled solutions
- Custom manufactured
- Embedded OS
- Embedded or custom connected sensors
- Low power ~5v

Thank you

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support, training, and consulting services make
Red Hat a trusted adviser to the Fortune 500.

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