

Red Hat Partner Enablement on Edge/IoT

Red Hat Edge/IoT value proposition

PART I

About Edge Computing

PART II

Why Open Source
The root of Red Hat

PART III

Red Hat Edge value
proposition

Back-up

Selected Use Cases

- Enabling E2E IoT
- Distributed Systems
- ML meets Human Expertise

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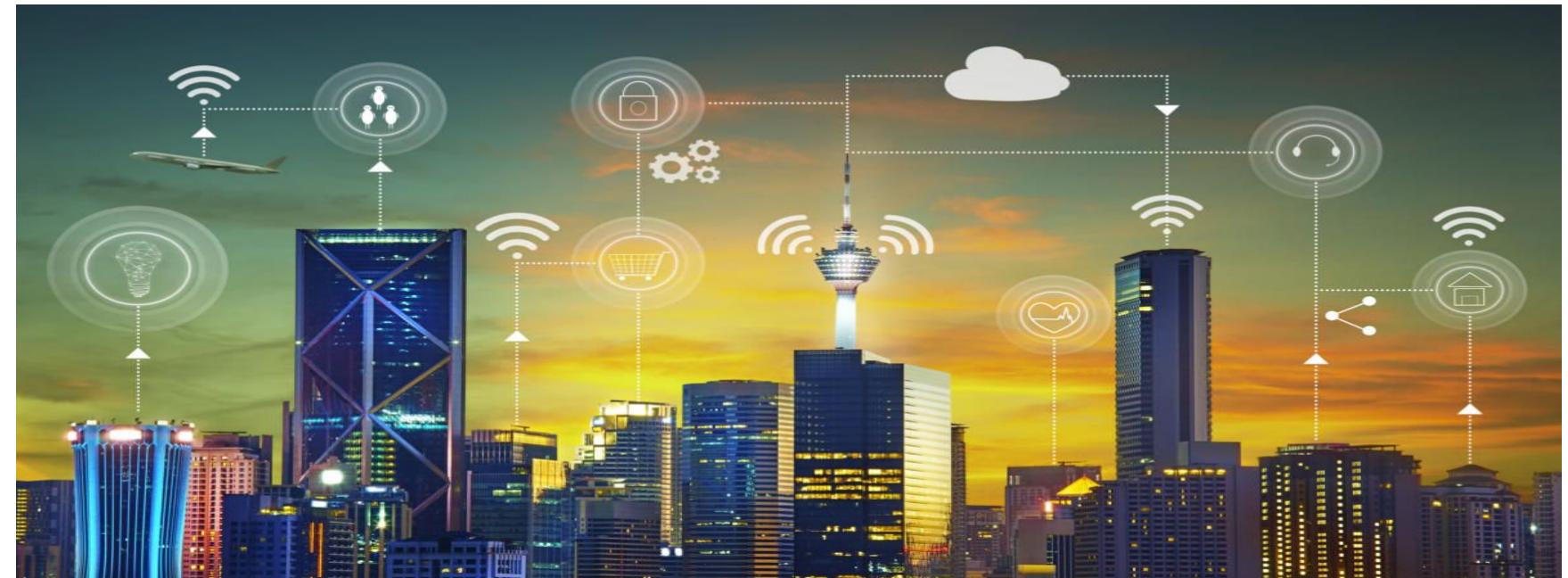
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What is Edge computing?

Edge computing is a distributed computing paradigm which brings **computation and data storage** closer to the **location where it is needed**

This is done so that data, especially real-time data, does not suffer latency issues that can affect an application's performance.



Intelligence is needed everywhere at the right time

GARTNER top 10 strategic trends for 2019



Sources: GARTNER top 10 strategic trends for 2019
<https://www.gartner.com/smarterwithgartner/gartner-top-10-strategic-technology-trends-for-2019/>

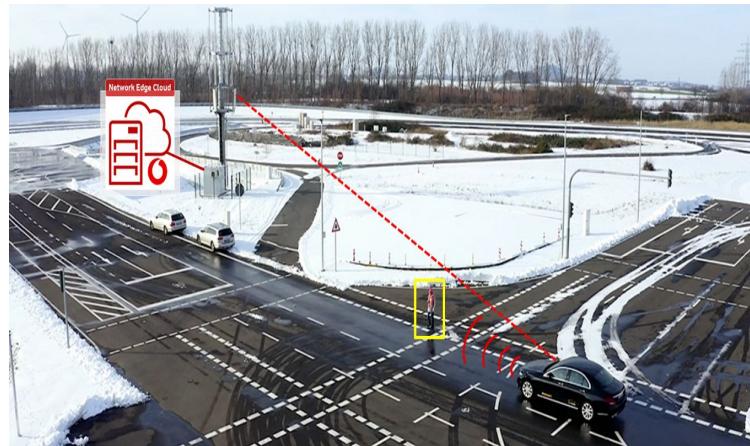
Abstract of few IDC predictions for the EDGE

- Digital Transformation is driving almost half of company digital investments
- By 2021, consumer-facing industries will spend more on the network, computing, and storage resources in edge locations than on upgrades in core data-centers
- By 2022, local cloud offerings will account for a quarter of all hosted private cloud spending
- IoT, AR/VR, Robotics and machine learning are the main drivers behind this trend and generally speaking in most of the Digital Transformation initiatives

Sources: IDC
 IDC Prediction #9 <https://www.idc.com/getdoc.jsp?containerId=AP42219717>
 IDC Directions 2018, Rick Villars: Creating the Data Space: When Edge Is at the Core of the Business

Why Edge Computing?

Telco 5G network



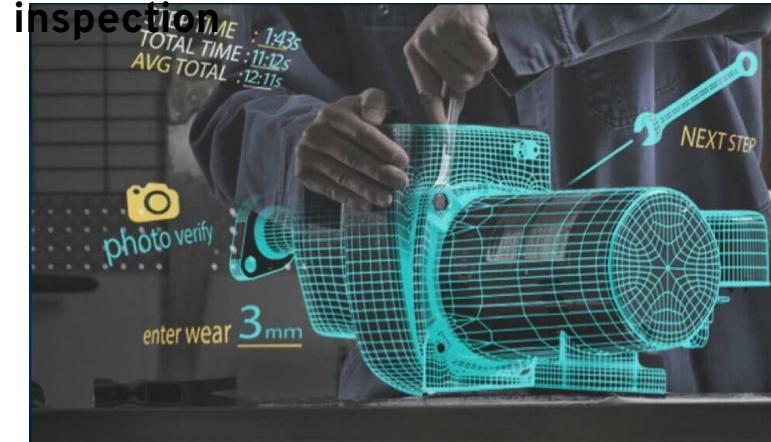
Predictive Maintenance for production

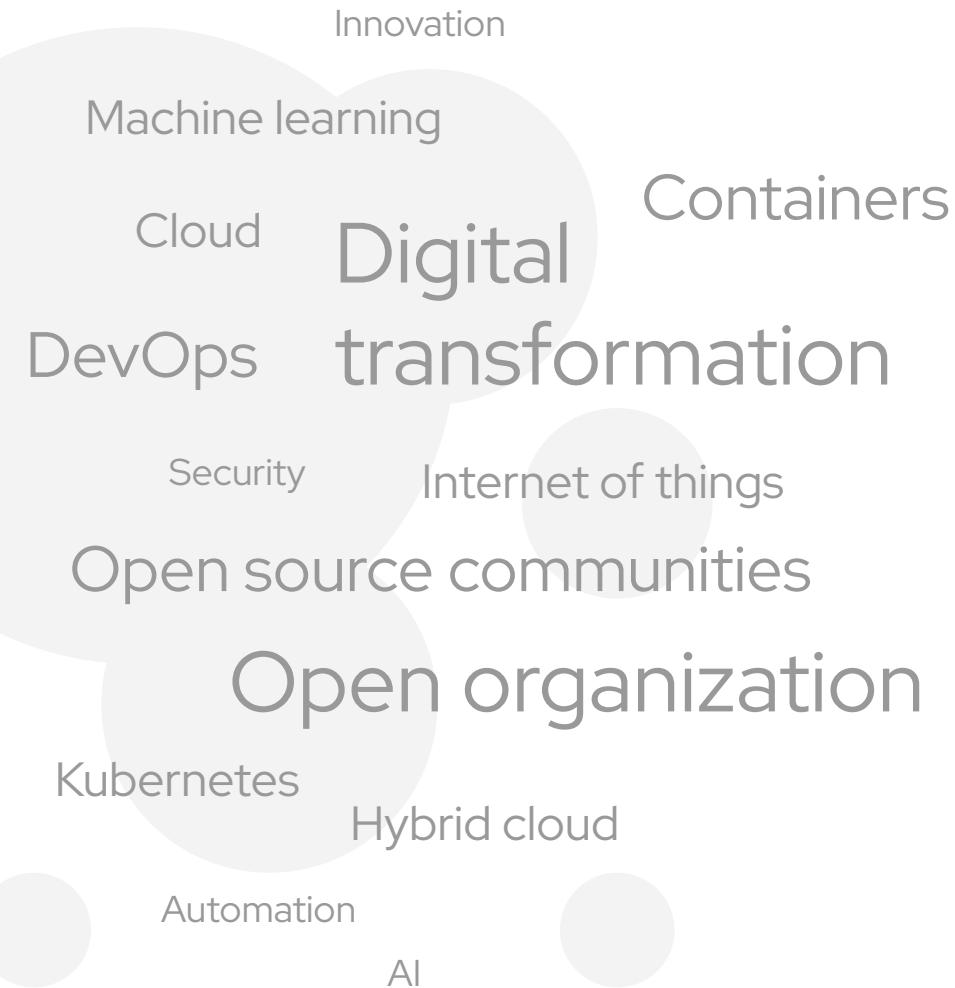


Worker Safety



Augmented reality for on site inspection





Business goals

.....

Innovation velocity
Operational agility

Motivation



The edge computing opportunity in several industries

Telecommunications



Manufacturing



Energy



Use cases

V/C-RAN
Multi-access edge computing

Predictive maintenance
Factory automation
AR + remote export

Product optimization
Process control
Environment monitoring

Benefits

Better user experience
Scale to meet demand
Greater network flexibility
Improved resilience

Reduced downtime
Increased productivity
Longer asset lifetime
Improved factory safety

Reduced downtime
Lower OpEx and CapEx
Lower workforce risk
Less environmental impact

Edge computing

ADVANTAGES

LATENCY

BANDWIDTH

RESILIENCE

SECURITY

SOVEREIGNTY

CONNECTIVITY

COST

CHALLENGES

TECHNOLOGY

SCALE

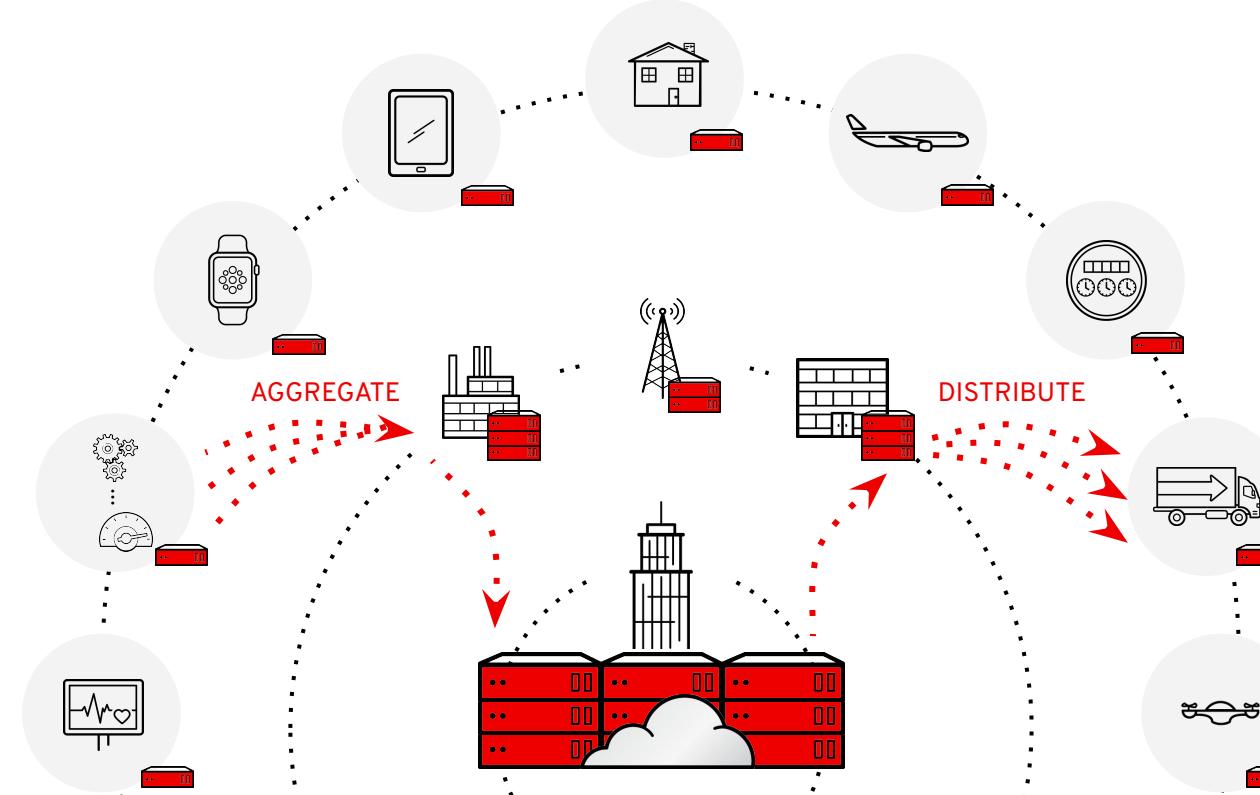
PEOPLE & EXPERTISE

PROCESSES & DATA

ENVIRONMENTAL

SECURITY

COST



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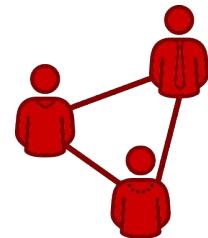
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PART IV

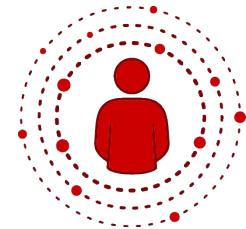
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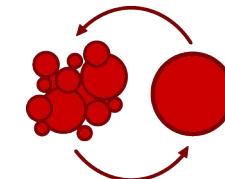
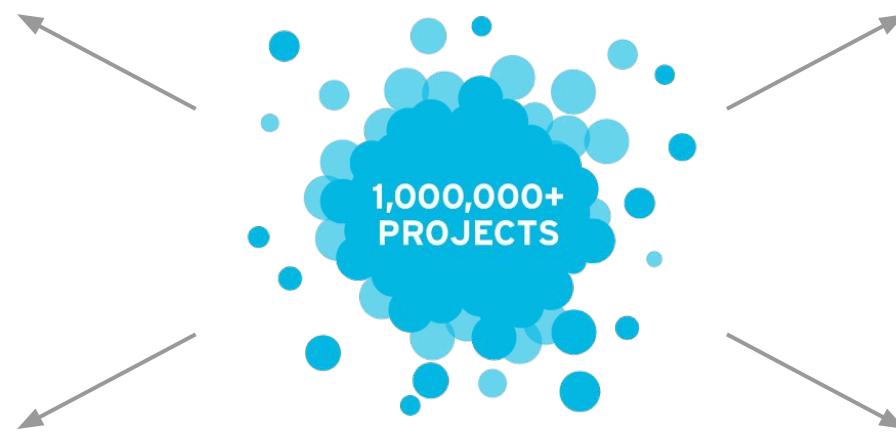
Open source culture



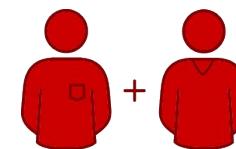
Collaboration



Transparency
(both access and the ability to act)

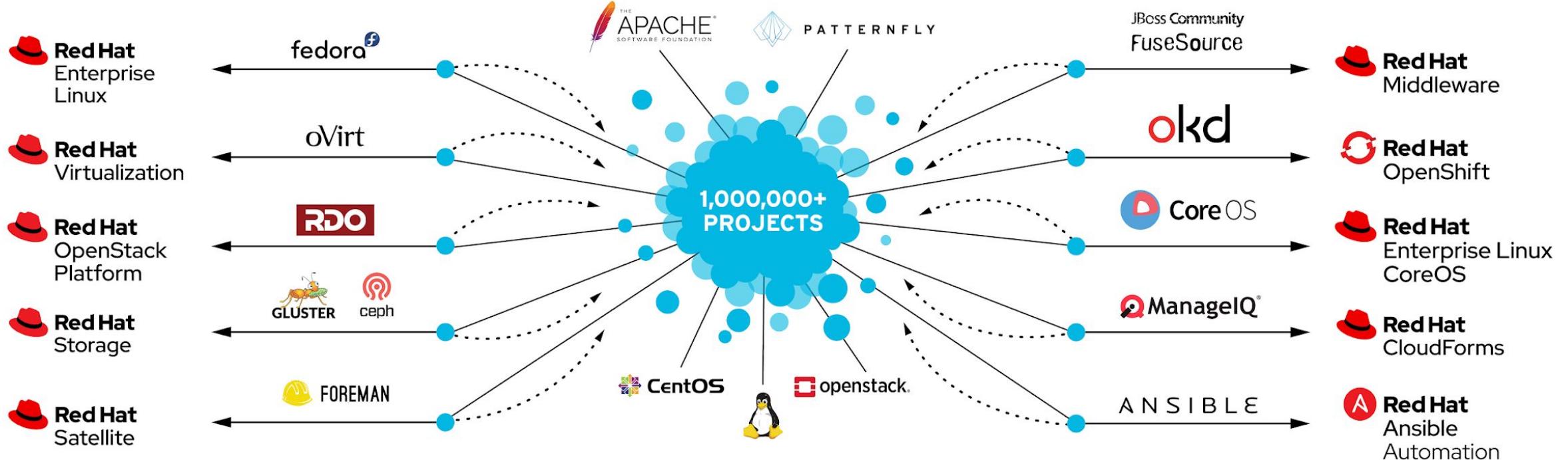


Shared problems are solved faster



Working together creates standardization

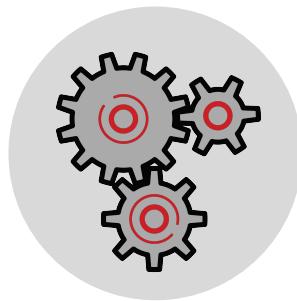
From communities to enterprise



At Red Hat we make Open Source Software **consumable for Enterprise** Customers by
preserving the advantages of Open Source and **eliminating the disadvantages** of Open
Source through our Subscription Business Model

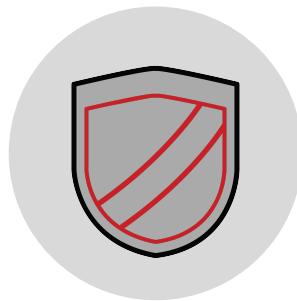
communities-to-enterprise-full-201906rm

What we bring to your business



Technology

Security, stability, reliability



Assurance

Enterprise-grade certainty



Expertise

Experience you can trust

The world's leading provider of open source enterprise IT solutions

MORE THAN
90%
of the
FORTUNE
500
use
RED HAT
PRODUCTS &
SOLUTIONS*

~13,815
EMPLOYEES

105+ OFFICES 40+ COUNTRIES

THE FIRST
\$3
BILLION
OPEN
SOURCE
COMPANY
IN THE WORLD

Red Hat and Open Source for EDGE



Our **open source** solutions

- Free you from **proprietary lock-in and cost escalation**
- Capture **community innovation**
- Provide the enterprise-level **security, reliability, scalability and support** required by the IoT
- Bring the internet of things to life **quickly, cost-effectively, and with lower risk**.

We are involved in a rich set of communities and organization to position
Red Hat in the heart of the edge revolution



Eclipse IoT community

CONFIDENTIAL designator

"We believe the best way to support this complex environment is to base our commercial IoT platform, the Bosch IoT Suite, on open source components and open standards. These projects establish a horizontal open technology for IoT and provide the technical breeding grounds for successful business ecosystems."

- Dr. Stefan Ferber, VP of Engineering, Bosch Software Innovations



Steering Committee Members



39 Participating members such as



cloudera



Google

SIEMENS



itemis



NOKIA

2.4

million
lines of code

30*

projects

250+

developers

130K

monthly
visitors

Red Hat contribute on:

- **Kura** at gateway level is an OT middleware (RH & Eurotech; based on ESF source code donated to community by Eurotech)
- **Kapua** project at cloud platform (RH & Eurotech, based on Everyware Cloud source code donated to community by Eurotech)
- **Hono** will enable connecting large numbers of IoT devices to a platform, based on EnMasse (the coming Messaging as a Service on OpenShift) (RH & Bosch)



Why open source for Edge & IoT solutions

- **Open source & open standards = interoperability**
- **Take advantage of community & accelerate innovation**
- Iterate more quickly with less risk
- Speed time to market to deliver solutions
- Maintain control of your IoT technology and licensing
- **Wider integration selection with platforms and devices**
- Lay the foundation for future system and requirements scaling

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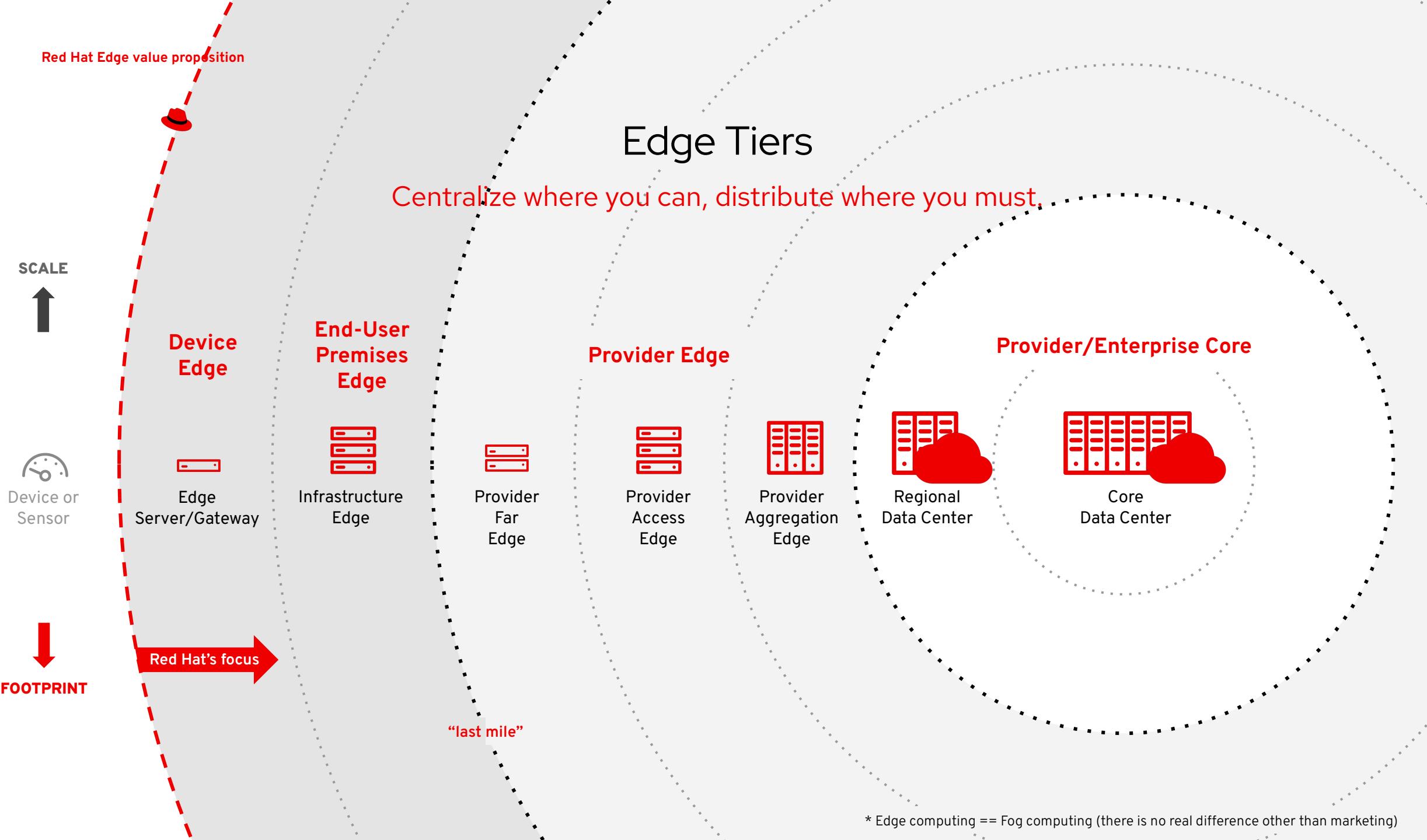
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Red Hat's approach to

Edge computing

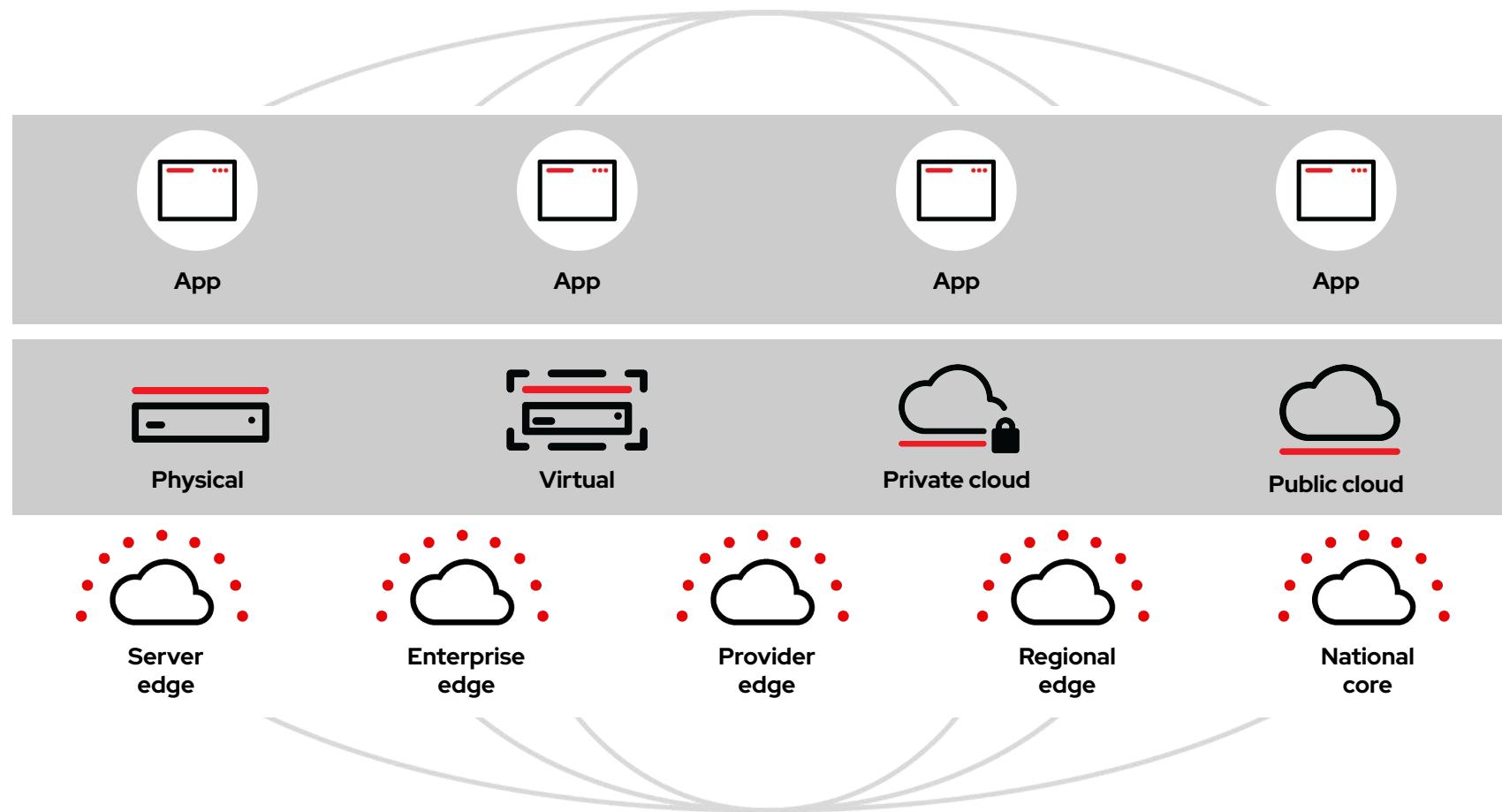
Feb 26 2020 | 8-minute read





The Open Hybrid Cloud now extends to the Edge

Any workload, any footprint, **any location**.

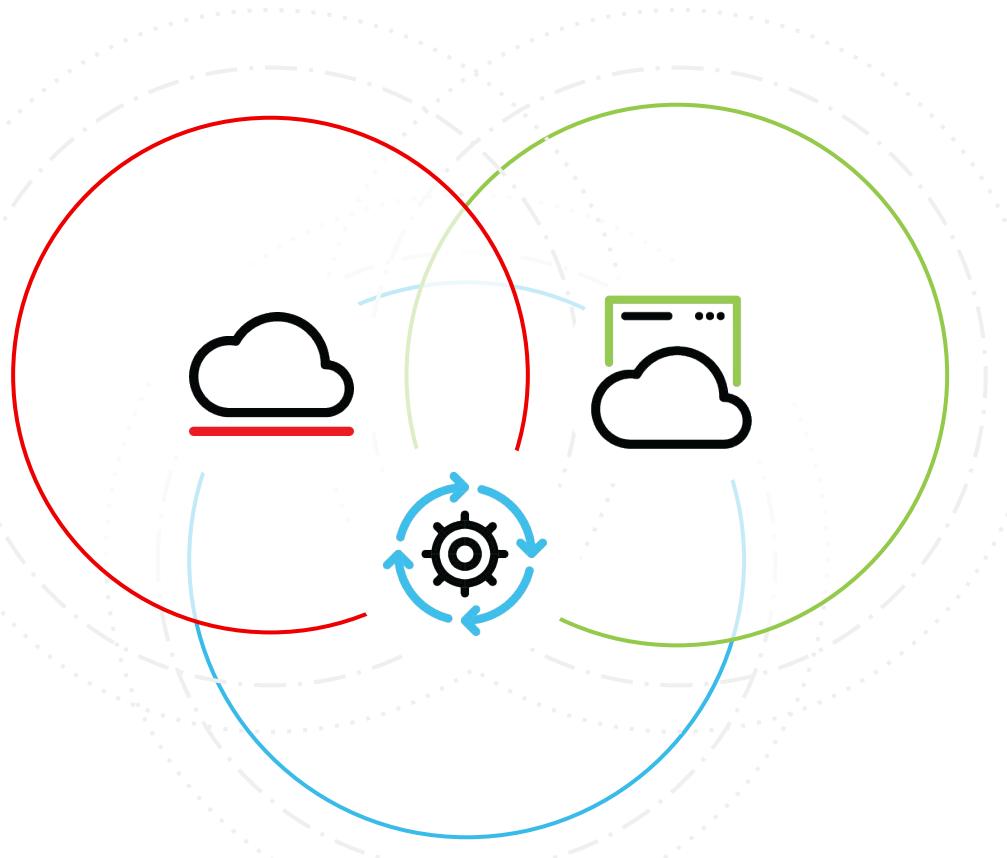


The three pillars of our portfolio

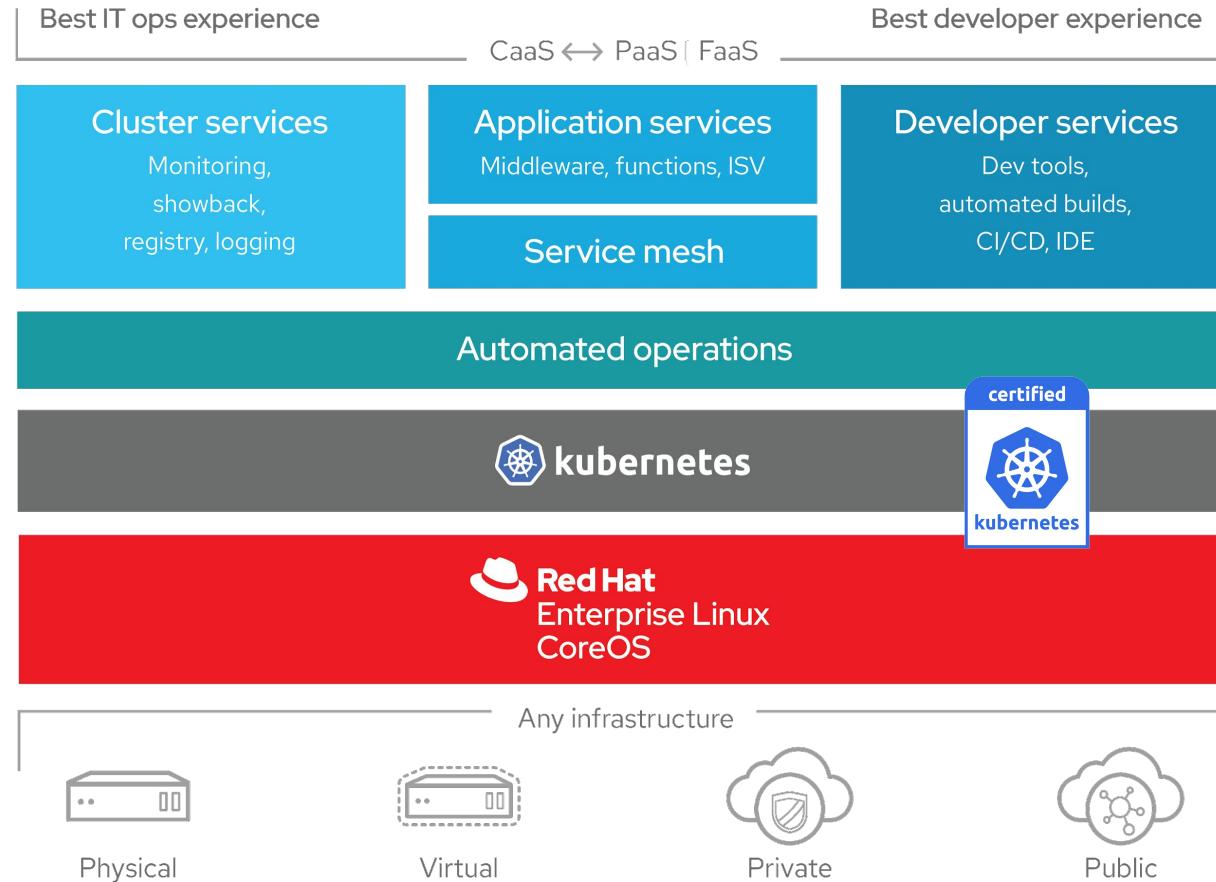
Open hybrid cloud

**Hybrid cloud
infrastructure**

**Cloud-native
development**



Management and automation

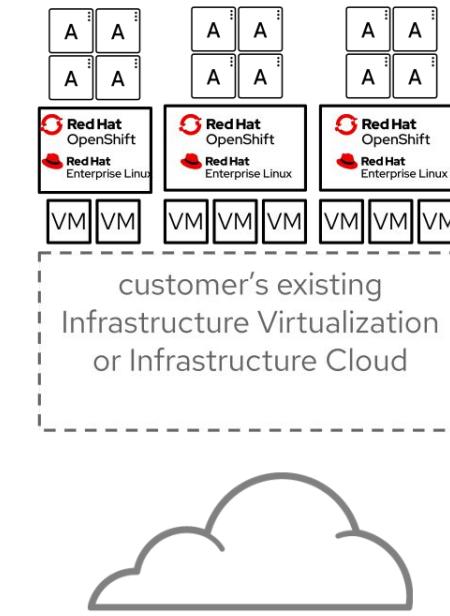
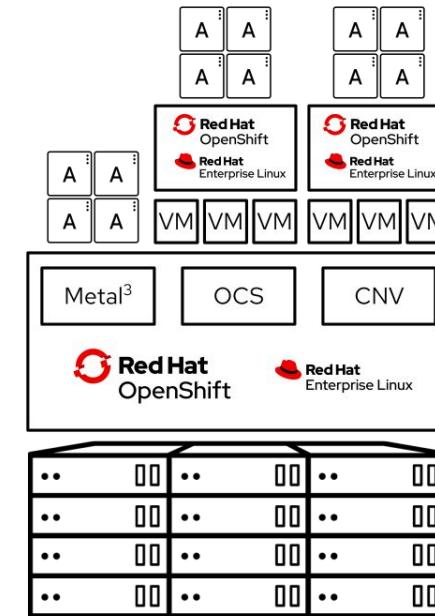
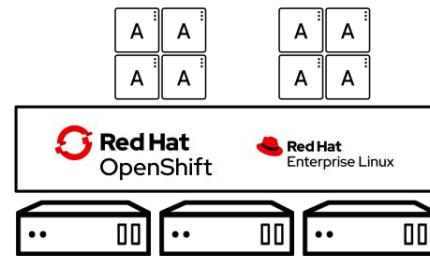
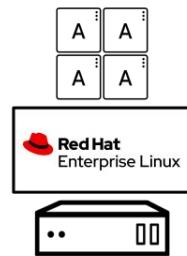


OpenShift 4 Platform

- Fully integrated and automated
- Seamless Kubernetes deployment
- Fully automated installation
- 1-click platform updates
- Autoscaling of cloud resources

Common platform, many deployment footprints

Some examples.



Red Hat Advanced Cluster Management for Kubernetes

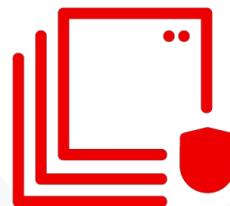
Robust, Proven, Award Winning



Multi-cluster Lifecycle Management

- Create, update and destroy

Kubernetes clusters reliably, consistently and at scale



Policy Driven Governance

Risk and Compliance

Leverage policies to automatically configure and maintain consistency of security controls by industry corporate standards.

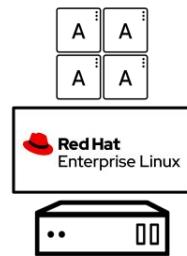


Advanced Application Lifecycle Management

Use open standards and deploy applications using placement policies that are integrated into existing CI/CD pipelines and governance controls.

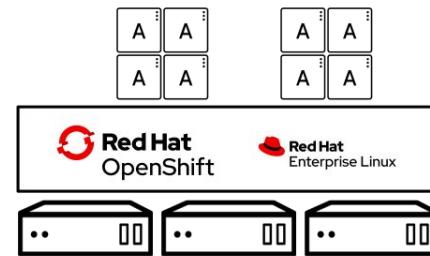
Common platform, many deployment footprints.

Some examples.

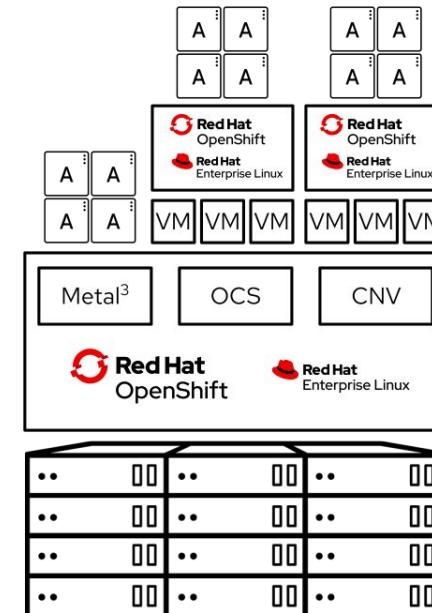


Edge
Gateway/Server

Ansible

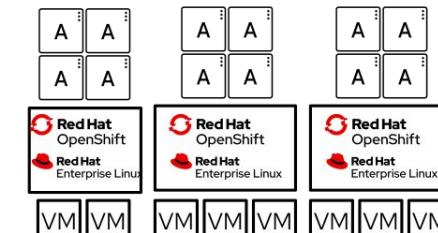


Small Form Factor
Bare Metal Footprint



Infrastructure
Virtualization

Red Hat Advanced Cluster Management for Kubernetes



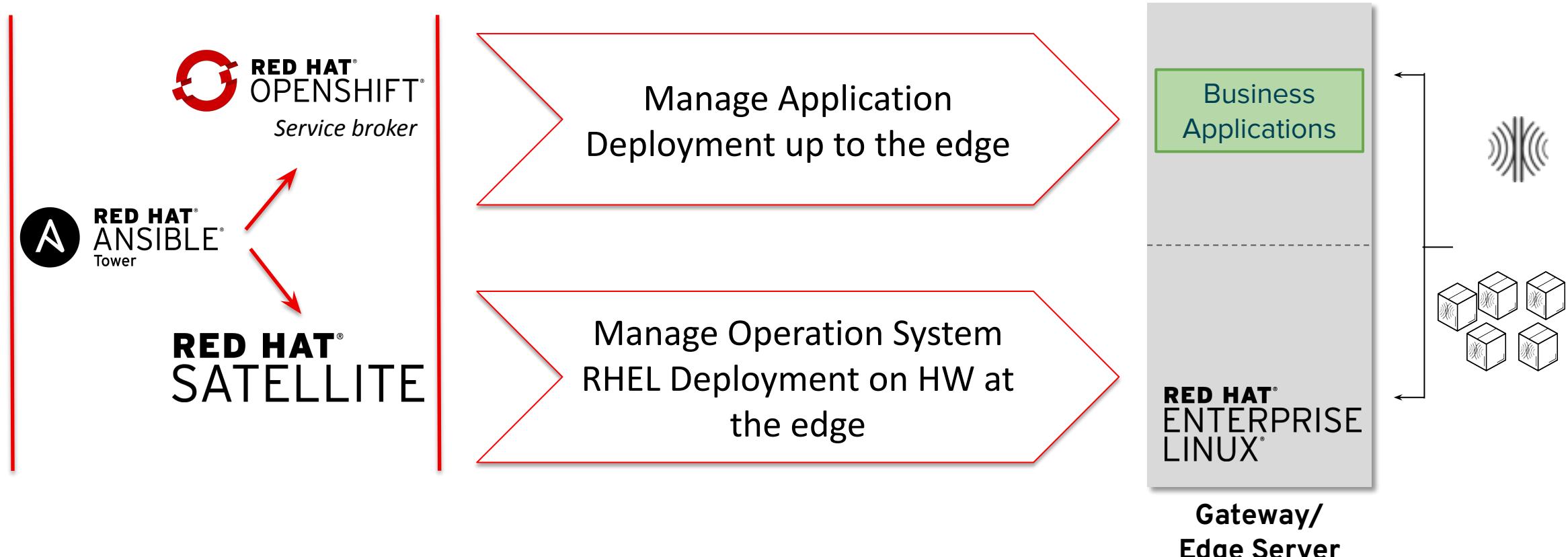
customer's existing
Infrastructure Virtualization
or Infrastructure Cloud



Public/Private Cloud

Scale Edge solutions through centralized automation processes

Centralized Management for... ...Automatized processes to the edge



Red Hat Middleware to build or run modern services

APPLICATION RUNTIMES



OpenJDK™

RED HAT® AMQ BROKER

INTEGRATION

RED HAT® FUSE

RED HAT® AMQ

RED HAT® 3SCALE® API MANAGEMENT

PROCESS AUTOMATION

RED HAT® PROCESS AUTOMATION MANAGER

RED HAT® DECISION MANAGER

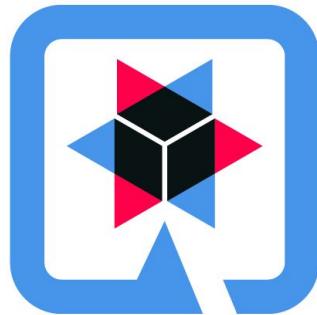
CORE TOOLS TO BUILD
& MIGRATE APPS

COMPOSE AND INTEGRATE
MICROSERVICES ACROSS AN
ENTERPRISE SERVICE NETWORK

AUTOMATE AND OPTIMIZE
BUSINESS PROCESSES

Develop, Deploy and Manage Across Cloud and On Premise

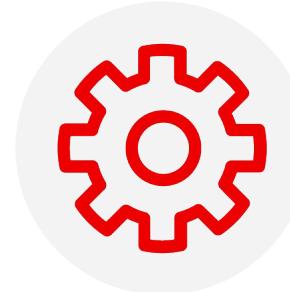
Quarkus - Supersonic Subatomic Java



Quarkus enables Java developers to easily use the most popular frameworks and standards directly on SubstrateVM without any hassle.

A Kubernetes Native Java stack tailored for GraalVM & OpenJDK HotSpot, crafted from the best of breed Java libraries and standards

Quarkus Business Value



Cost Savings

Low memory, fast startup, cloud efficiency, low learning curve, serverless, high density on K8s & cloud



Faster time to value/market

Developer productivity, extensions ecosystem, low learning curve, keep competitive edge



Reliability

Trusted technology, active community, trusted sponsor, fast release cadence, unnoticed failovers

A consistent edge platform to meet your needs

Develop once,
deploy anywhere

Meet diverse
use cases

Consistent
operations



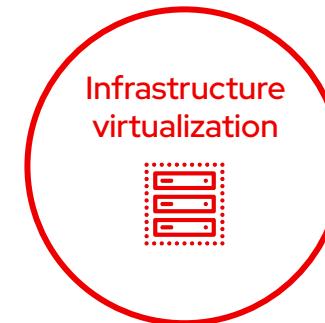
Red Hat



Edge gateway/
edge server



Small
bare metal
footprint



Infrastructure
virtualization



Public/private
cloud

What about competition?

Competition is fierce with players investing billions dollars (ex.Microsoft (\$5bn), AWS(\$3bn), Huawei (\$1bn), Bosch, Siemens, Dell (\$1bn),...) in Edge Computing/IoT offering

Public Cloud



IT Players



Network Equipment Providers

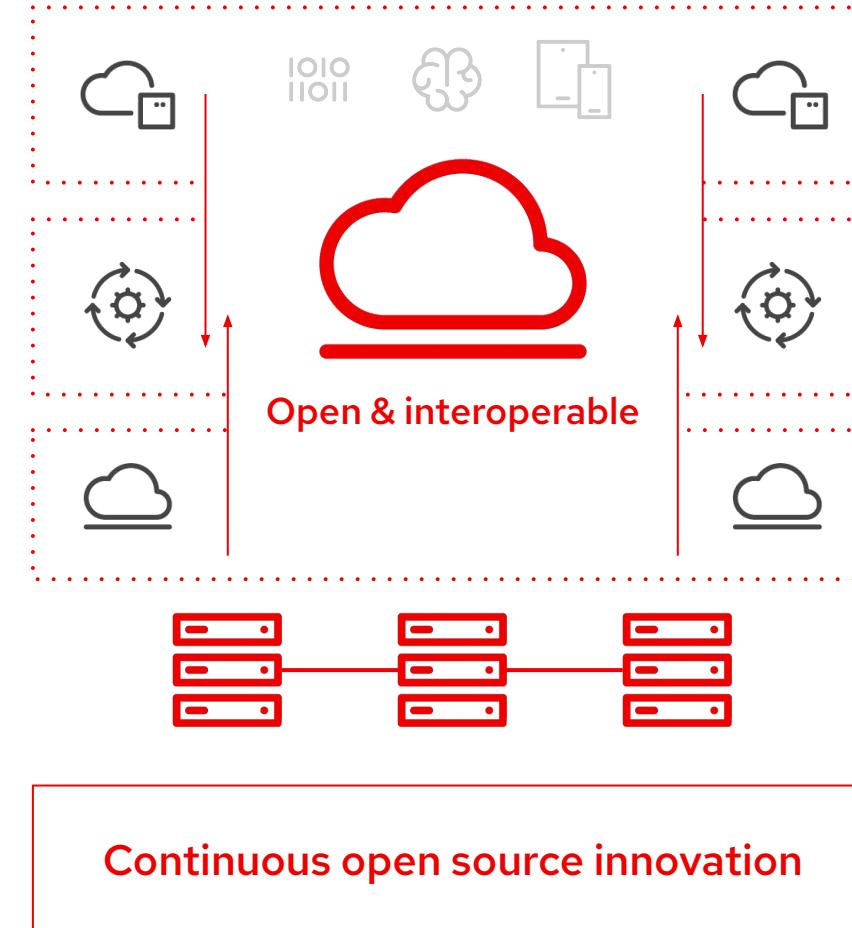
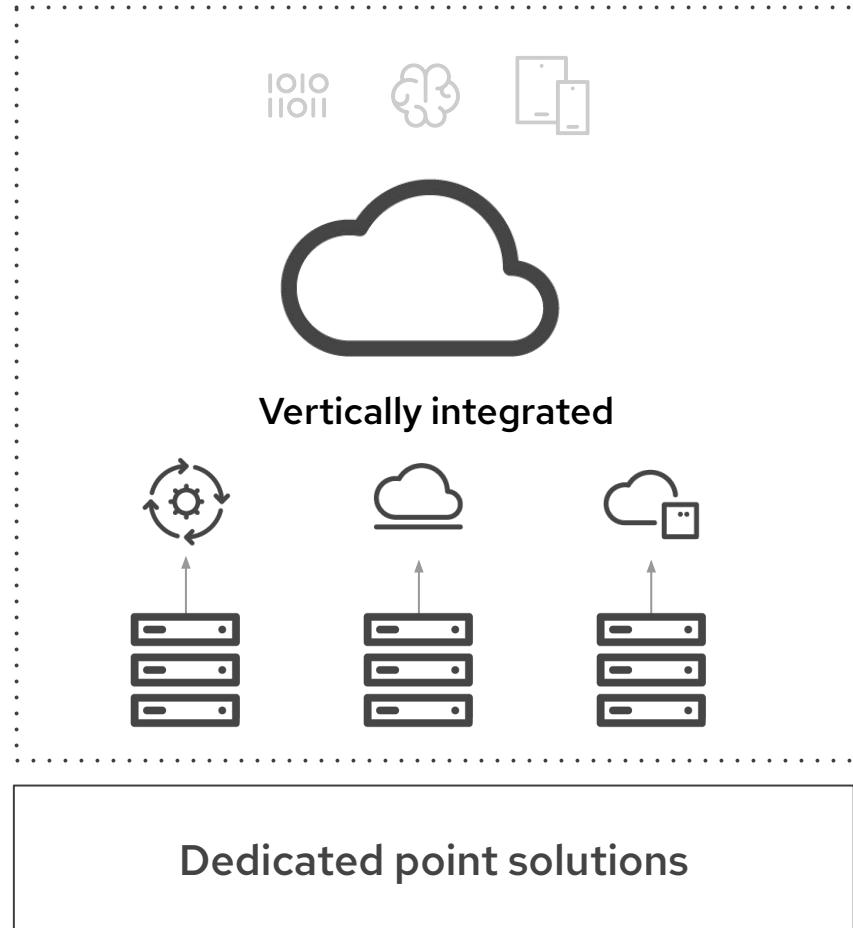


ERICSSON

OpenSource

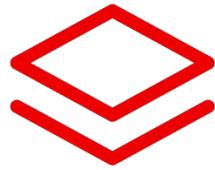


Every organization faces a decision about their future, Red Hat can help the one willing to compete through their digital journey



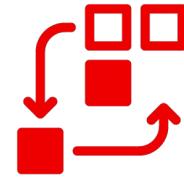
Why Red Hat for Edge Computing

Our Differentiation



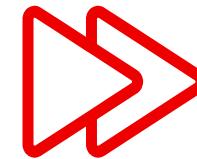
Platforms

With Red Hat OpenShift and Red Hat Enterprise Linux at the heart of our strategy



Portfolio

Powerful building blocks including middleware, runtimes, and services



Open

Driving development of open standards while providing hardened, fully supported enterprise-grade platforms

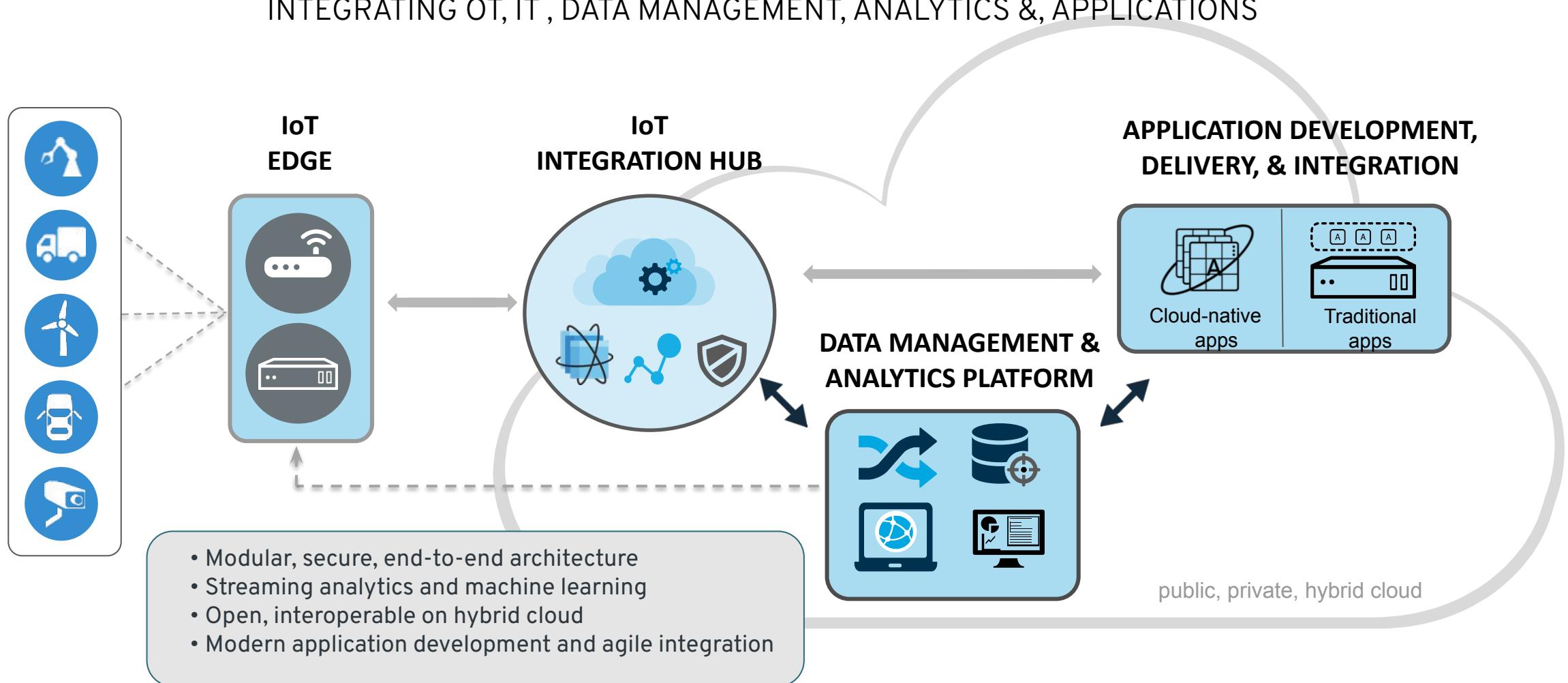


Ecosystem

Partnering with HW and SW vendors to provide solutions to meet customer needs

Open End-to-End IoT Architecture

INTEGRATING OT, IT , DATA MANAGEMENT, ANALYTICS &, APPLICATIONS

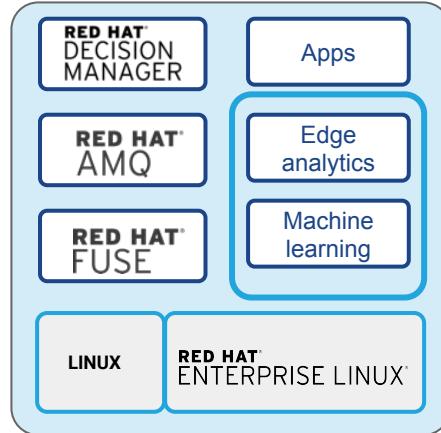


How Red Hat Portfolio can help

CONNECTED “THINGS”



IoT EDGE



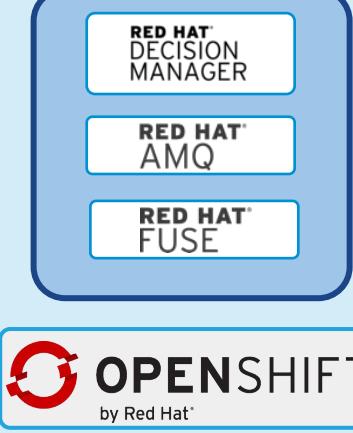
Telemetry

Telemetry
Management

Management

RED HAT®
ANSIBLE®
Automation

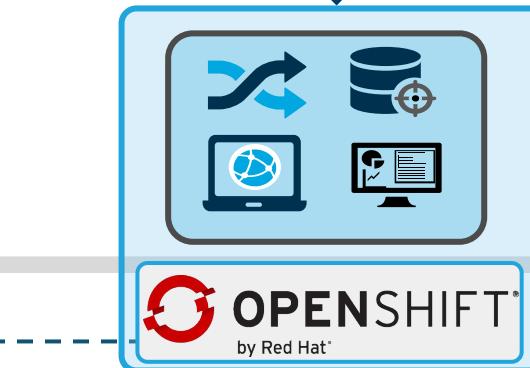
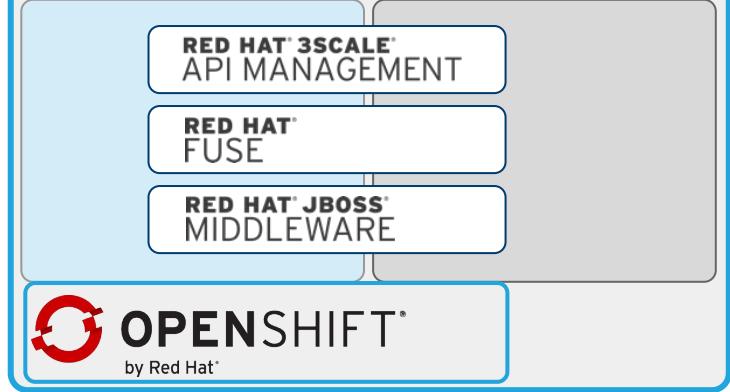
IoT INTEGRATION HUB



App integration
Management

RED HAT®
ANSIBLE®
Automation

APPLICATION DEVELOPMENT, DELIVERY, & INTEGRATION



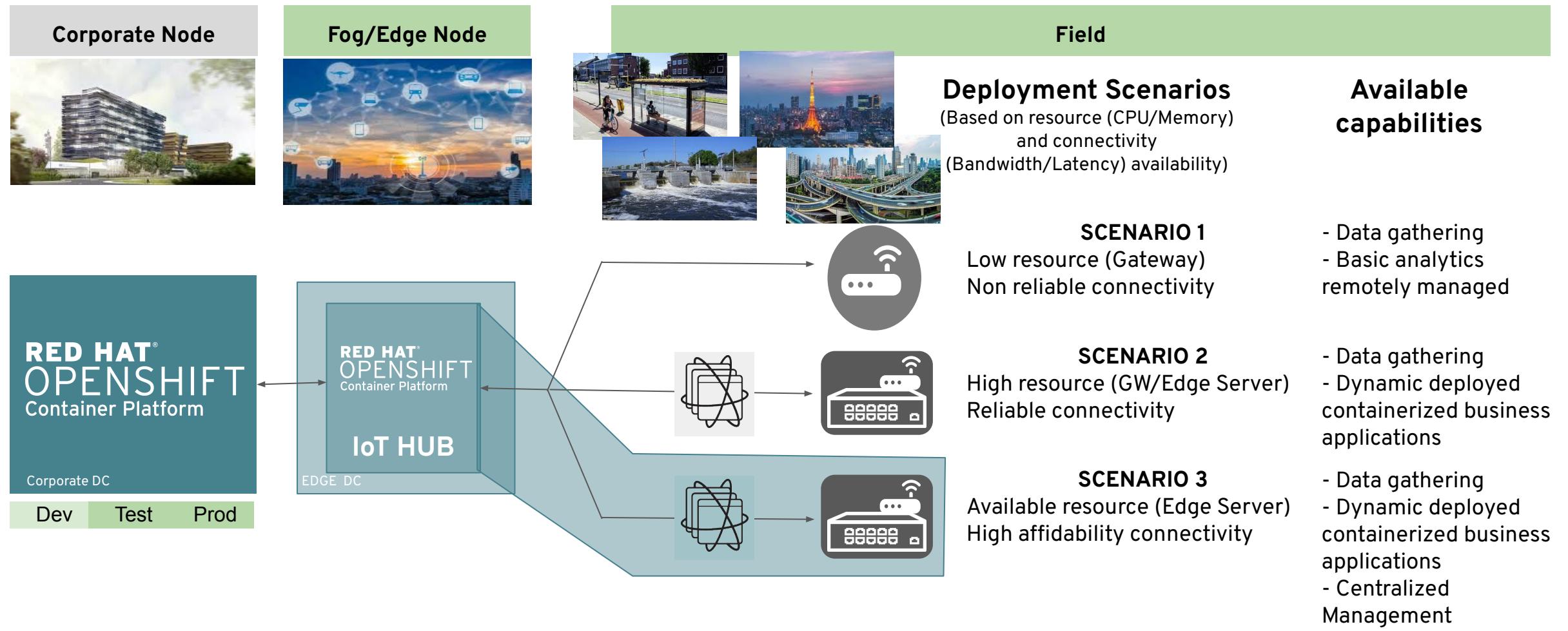
DATA MANAGEMENT & ANALYTICS

V0000000

Red Hat

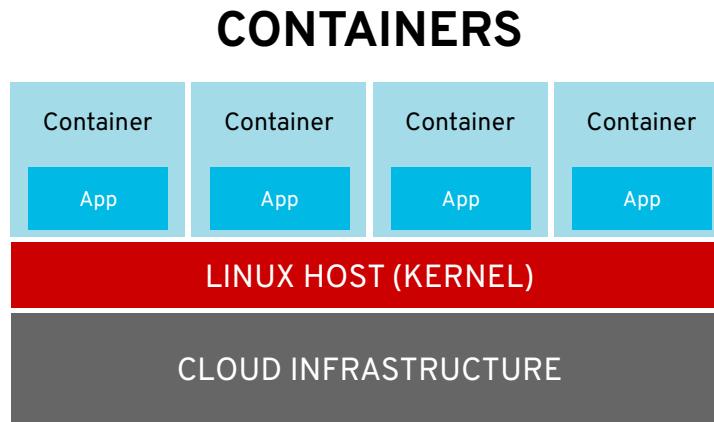
Multiple EDGEs

Multiple Deployment Scenarios



What are containers?

CONTAINER BENEFITS FOR MULTIPLE TEAMS

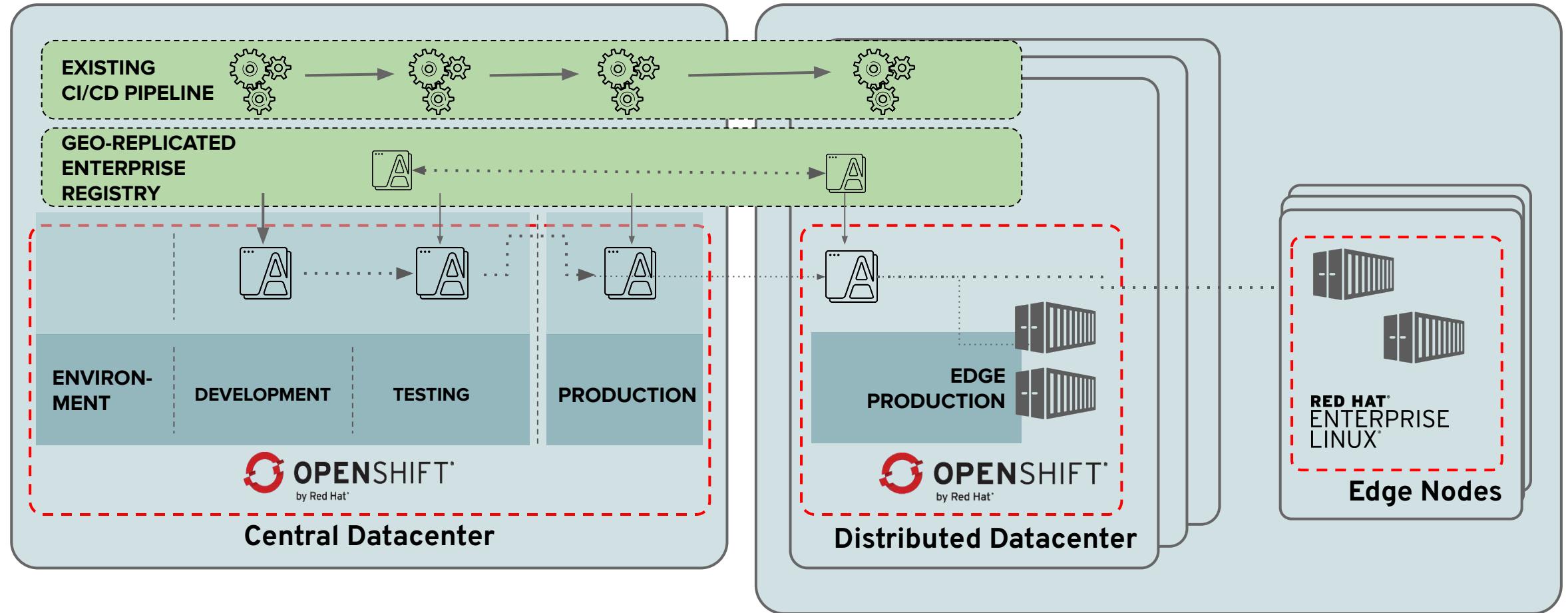


Package all app dependencies
Integrated in Linux OS
Fully Open Source
Secure Isolation of Applications
Eliminates need for VM Hypervisor
Runs on Any Cloud Platform

- Enable efficiency and automation for microservices, but also support traditional applications
- Enable faster and more consistent deployments from Development to Production
- Enable application portability across 4 infrastructure footprints: Physical, Virtual, Private & Public Cloud



Hybrid container deployment up to the Edge - CI/CD through datacenter and their distributed systems



Thank you

Red Hat is the world's leading provider of enterprise open source software solutions. Award-winning support, training, and consulting services make Red Hat a trusted adviser to the Fortune 500.

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