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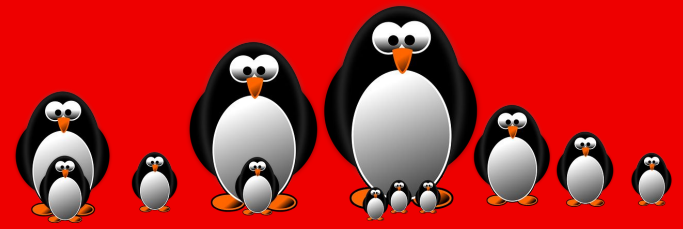
Breda | 13 December, 2022

# Partner Day

Connecting people and solutions
to accelerate your business



# The Red Hat Enterprise Linux Family

Fred van Zwieten
Sr. Portfolio Solution Architect Red Hat



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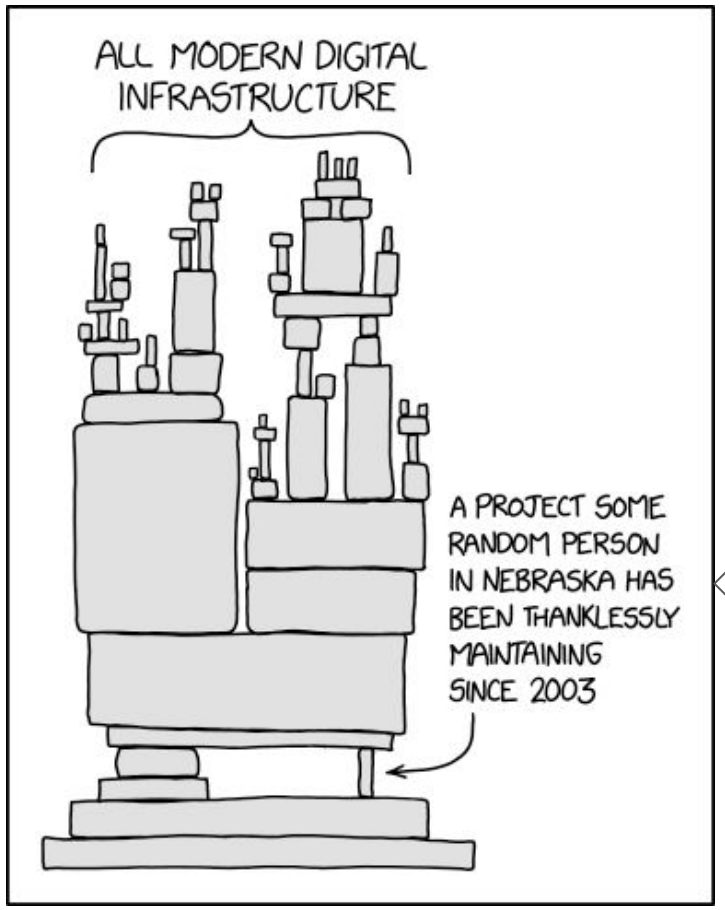
# REBUS

**Red** **Hat** **Enterprise** **Linux**



Source:
https://time.com/3895655/star-trek-enterprise-building/




# "Enterprise"

## What does it take..

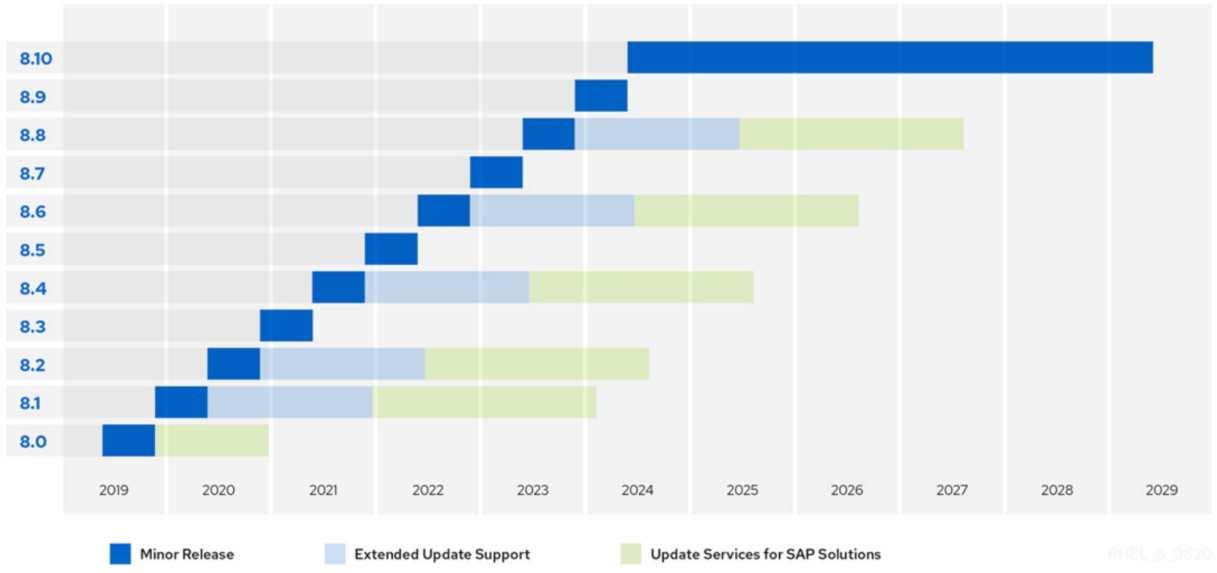
- Stability within a major version (API, ABI)
- Multi platform, Multi Architecture
- Certifications (applications, hardware, industry)
- Security & Hardening
- Support (SLA)
- Documentation
- Knowledge Base
- Being the Catalyst between Customers and Community
- Legal Assurance
- Insights
- Tooling (Satellite, Image Builder, Fleet Management)
- Predictability in lifecycle management

Source:
https://xkcd.com/2347/

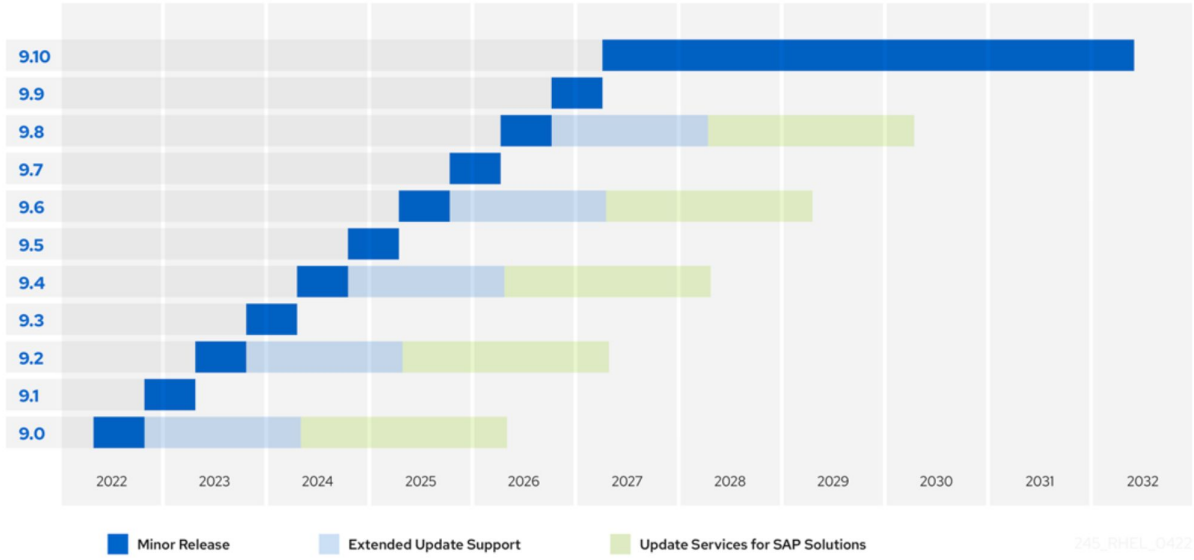
# Predictability

## Can you tell the difference?

RHEL 8 Planning Guide[viii]

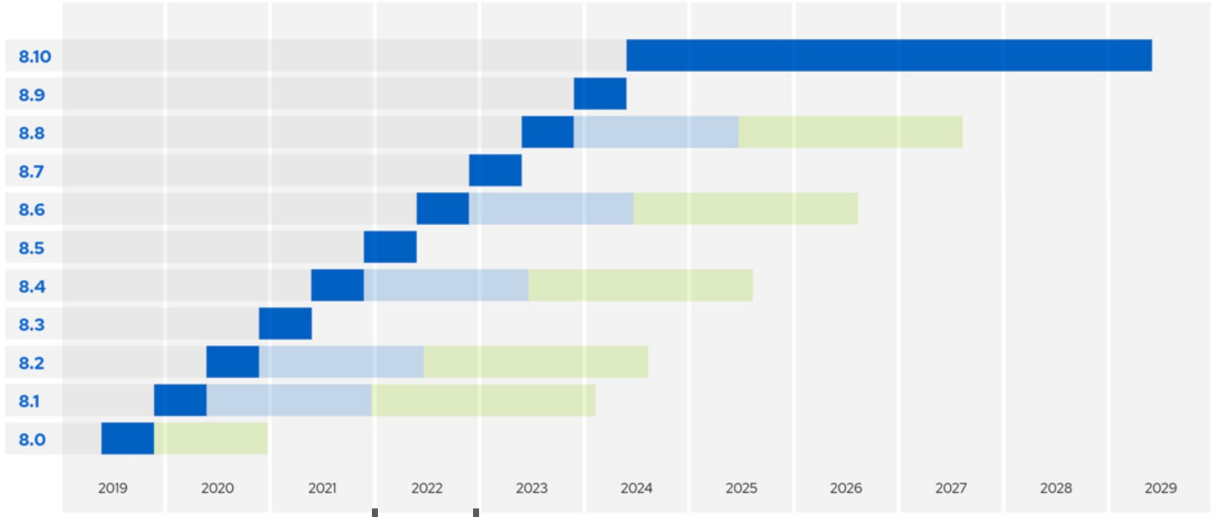


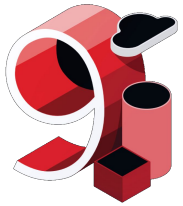

RHEL 9 Planning Guide[viii]

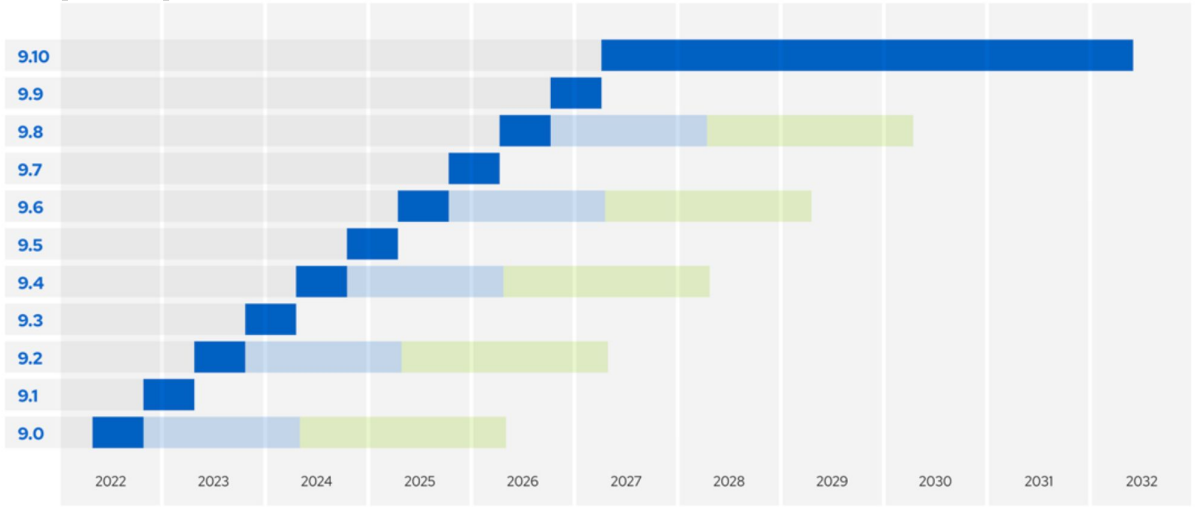





Source:
https://access.redhat.com/support/policy/updates/errata/








Source:
https://access.redhat.com/support/policy/updates/errata/

Enterprise

# Red Hat's pipeline


- Sponsoring
- Participation
- Acquisition & Open Sourcing
- Research & Development


Partners, etc


**Trusted Software Supply Chain**

Red Hat In-Vehicle Operating System

Red Hat Universal Base Image

Red Hat Enterprise Linux

RHEL CoreOS

RHEL for Edge

Red Hat Device Edge

Community

Shared

Private

Upstream

Downstream

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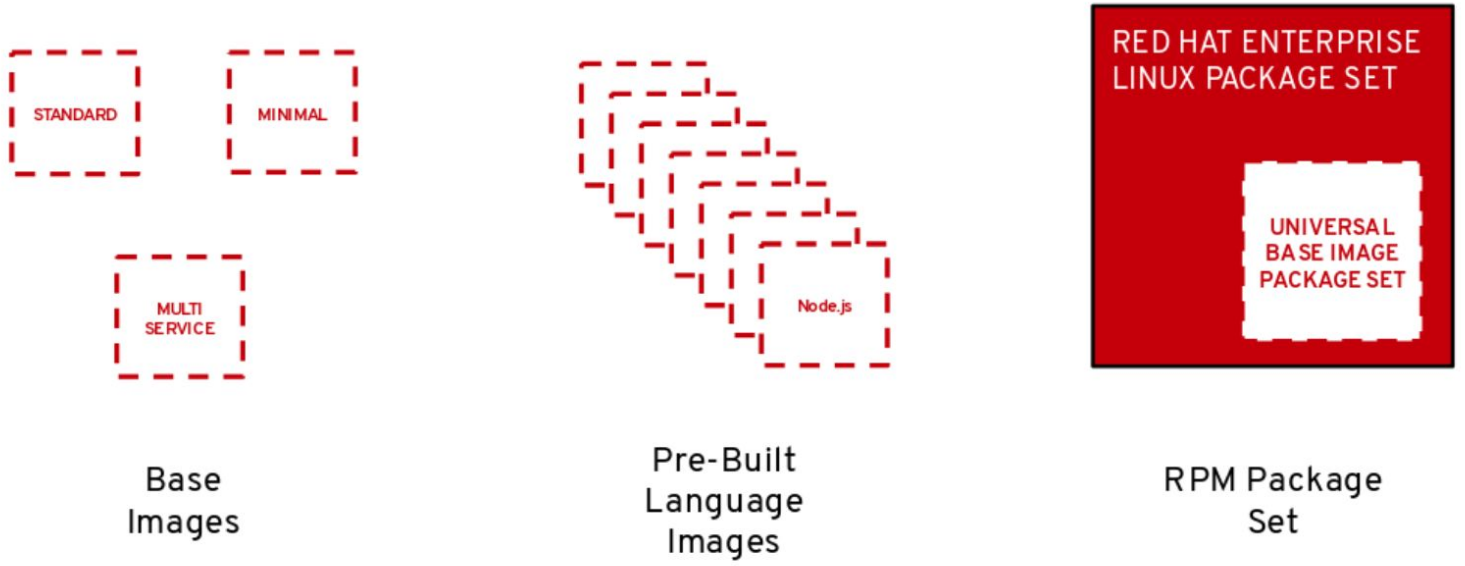
# Red Hat Universal Base Image

# Universal Base Image

## Less than a full operating system, UBI is four things:

- A set of four OCI container base images (ubi, ubi-minimal, ubi-tiny, ubi-init)
- A set of language runtime images (nodejs, ruby, python, php, perl, etc.)
- A set of associated packages in a YUM repository which satisfy common application dependencies
- Image set per major version (UBI-8, UBI-9, etc)






Source:
https://developers.redhat.com/articles/ubi-faq

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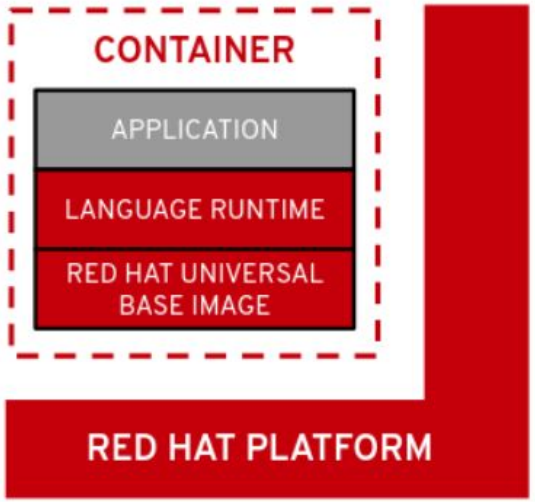
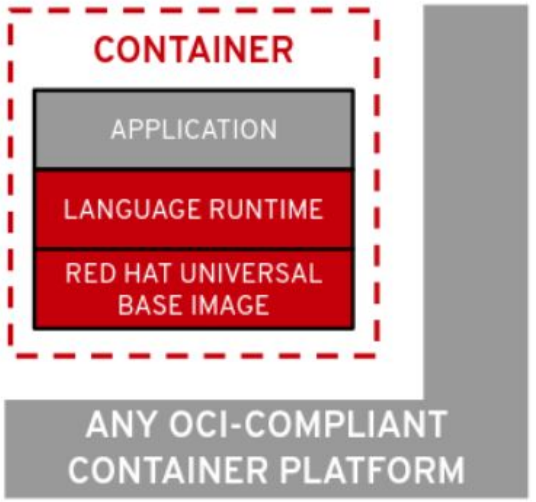
# Universal Base Image

## Universal Base Images are Free

- Free as in Speech and Free as in Beer
- Red Hat provides lifecycle updates on all UBI content within the same terms as RHEL
- Freely redistributable -> ideal for ISV's
- Red Hat Support when running on a Red Hat platform






Source:
https://developers.redhat.com/articles/ubi-faq

# RHEL for Edge

# Edge computing with Red Hat Enterprise Linux

## Ensured stability and deployment flexibility

### image based

Efficiently create purpose-built operating system (OS) images optimized for the architectural challenges inherent at edge locations

### Zero Touch Provisioning

Improve security and scale with the benefits of zero-touch provisioning, fleet health visibility, and quick security remediations throughout the entire life cycle

### Efficient over-the-air updates

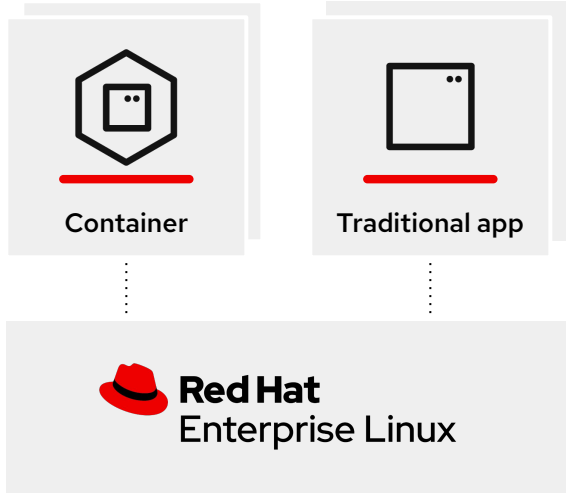
Updates transfer significantly less data and are ideal for remote sites with limited or intermittent connectivity

### Intelligent rollbacks

Application-specific health checks detect conflicts and automatically revert an OS update, preventing downtime

# Traditional and cloud-native workloads

## Have the best of both worlds




### Make the most of existing applications

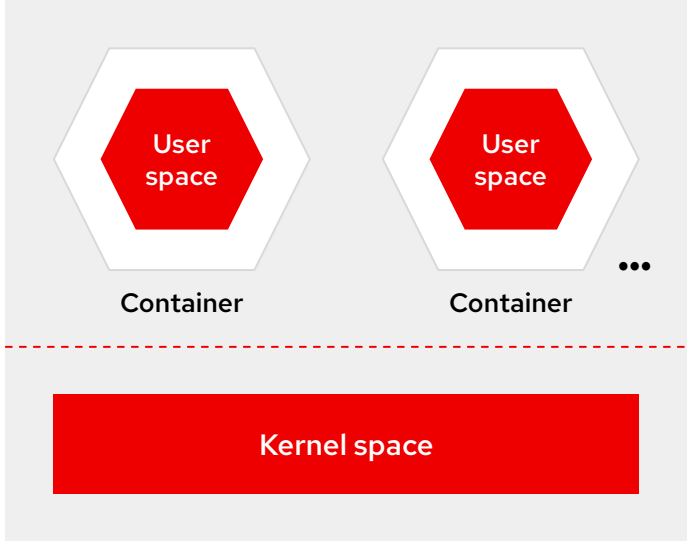
- Traditional applications can be run on both rpm and rpm-ostree Red Hat Enterprise Linux systems.
- SELinux and systemd offer optional sandboxing to increase the security and isolation for traditional applications.

### Move to cloud-native containers any time

- Containers enable better portability, isolation, and workload flexibility on static edge servers and devices.
- Cloud-native containers facilitate life-cycle independence between the application and the underlying operating system.

# Container management: Podman

## Standards compliant: integral to Red Hat Enterprise Linux




### A container implementation without daemons

- Fast and lightweight
- Choice of runtimes*
- Standard container network interface (CNI) networking
- Remote management and cross-container compatibility via v2 API

### Native Red Hat Enterprise Linux technology

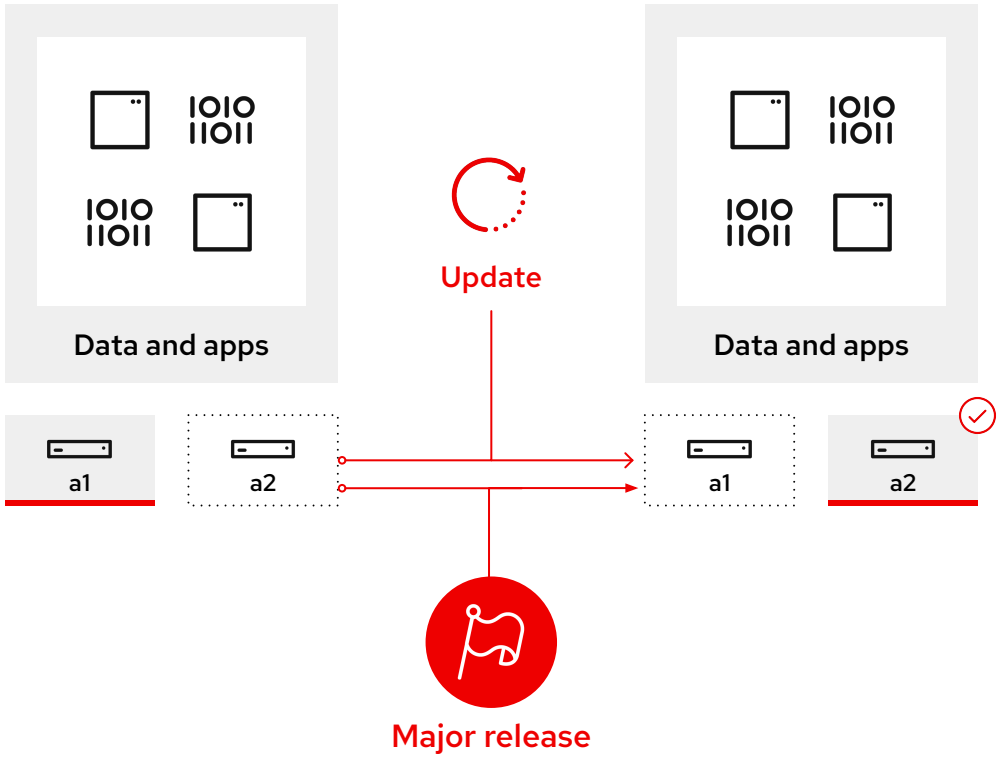
- Additional container security
- Scheduling and process monitoring
- Auto-update based on registry tags, e.g :prod**



* Red Hat supported runtimes are runc and crun
** Feature included in RHEL 8.3 and later

# rpm-ostree

## Immutable OS and stateful config and storage




### Transactional updates (A → B model)

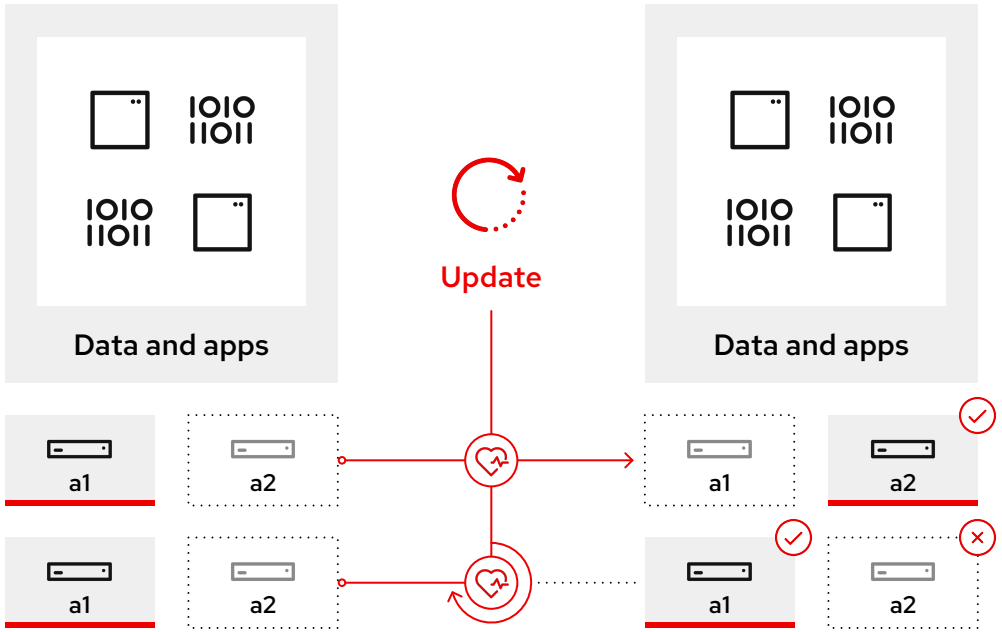
- OS binaries and libraries (/usr*) are immutable and read-only.
- State (r/w) is maintained in /var and /etc.
- No inbetween state during updates.
- Updates are staged in the background and applied upon reboot.
- Reboots can be scheduled with maintenance windows to ensure the highest possible uptime.

### Enables seamless major release upgrades (Red Hat Enterprise Linux 8→ 9)

- Help extend the serviceable life of hardware in the field.

# Intelligent rollbacks: Greenboot

## Additional safeguard for application and OS compatibility

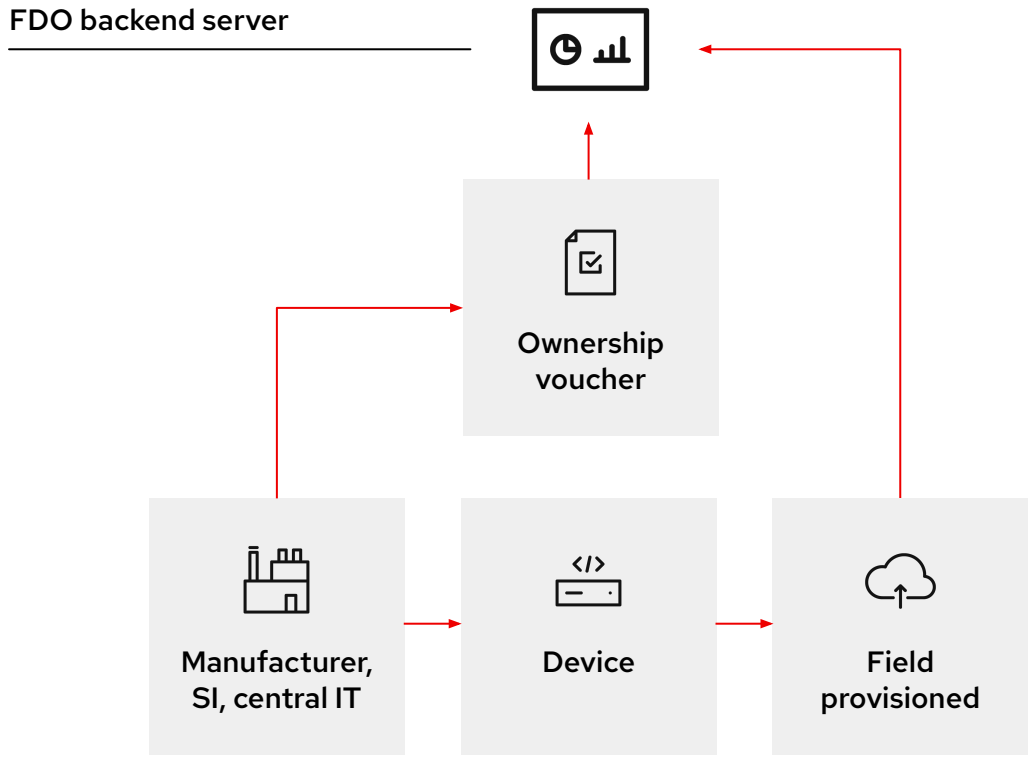



### Custom healthchecks can determine if nodes are functioning properly

- Healthchecks are run during the boot process.
- If checks fail, a counter will track the number of attempts.
- In a failure state, the node will use rpm-ostree to rollback the update.
- Examples can include:
  - Basic name resolution
  - Service or container status or health

# FIDO device onboard (FDO)

## Securing and simplifying device enrollment




Solves the problem of “late binding” devices to a management platform or to load other instruction/ secrets.

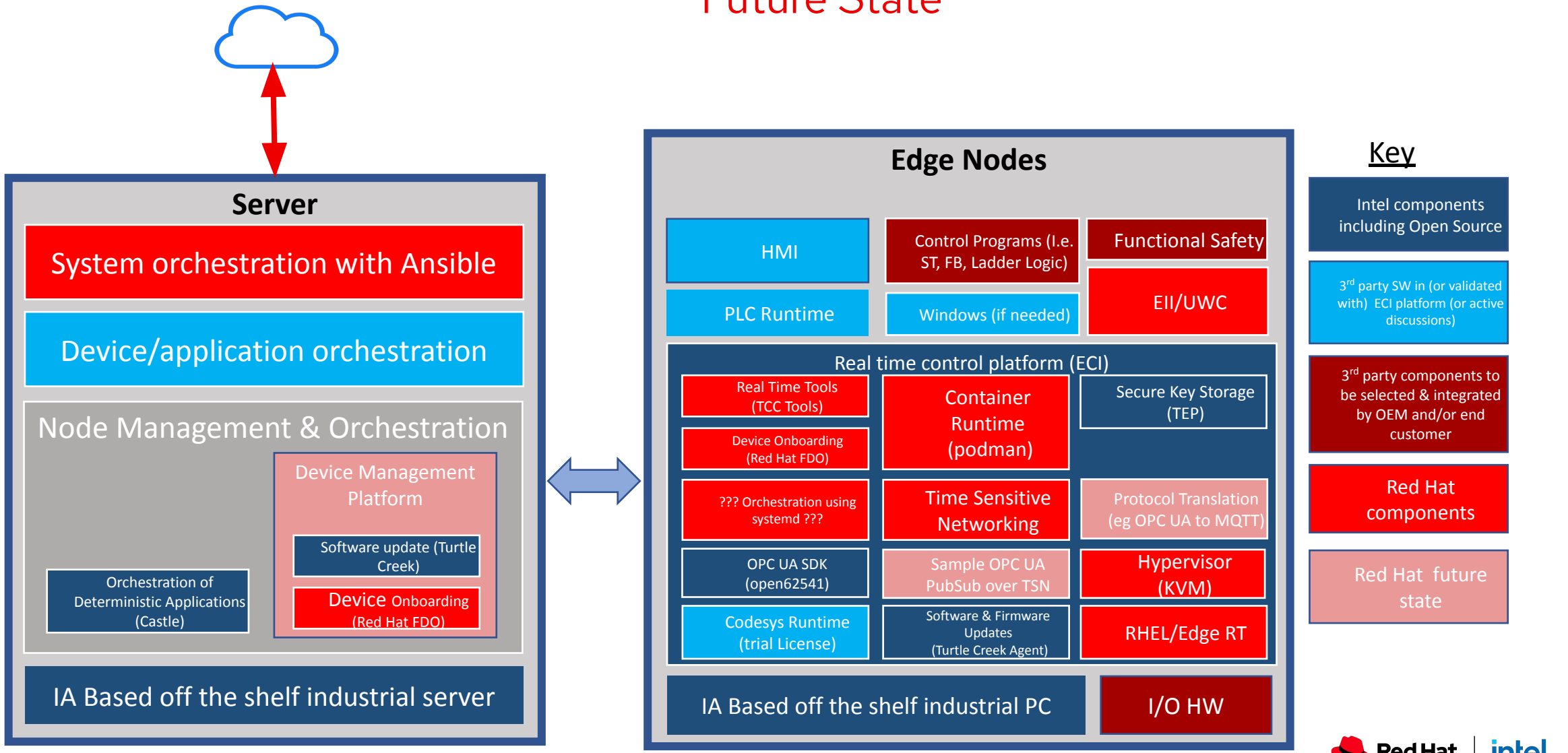
Cryptographically identifies the system identity and ownership before enrolling and passing configuration and other secrets.

Enables non-technical users to power-on the system and walk away.

Available in Red Hat Enterprise Linux 9.0 and 8.6

# High level Intel ECI based Control System - RHEL for Edge

## Future State



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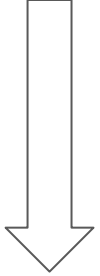

# Red Hat Device Edge

The light-weight Kubernetes solution for resource-constrained devices at the farthest edge



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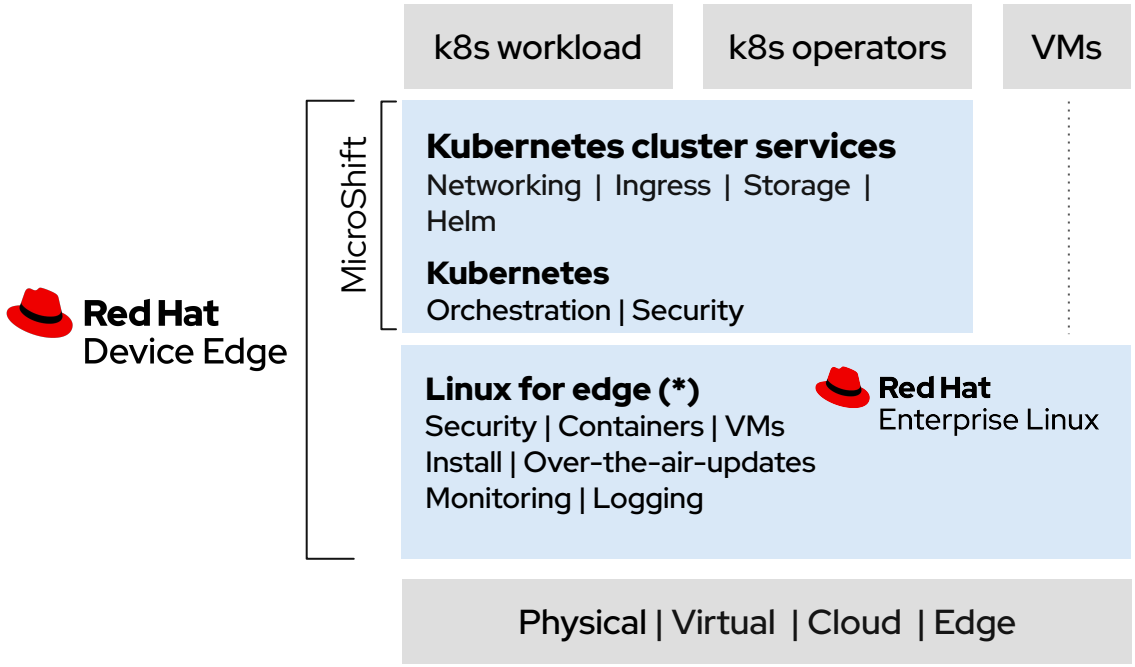
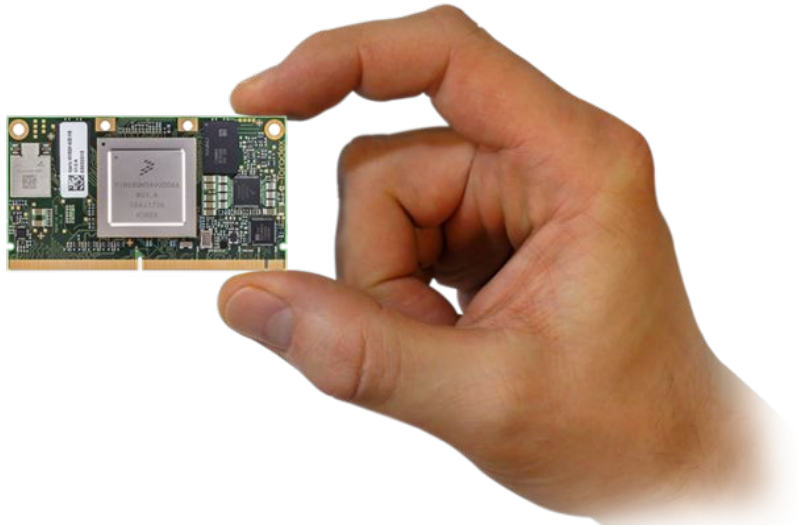
# A small form-factor Kubernetes

## Derived from OpenShift, for field-deployed devices



* recommended for edge deployments: Red Hat Enterprise Linux for Edge Images, rpm-ostree, immutable, atomic upgrade, over the air flavour of Red Hat Enterprise Linux.

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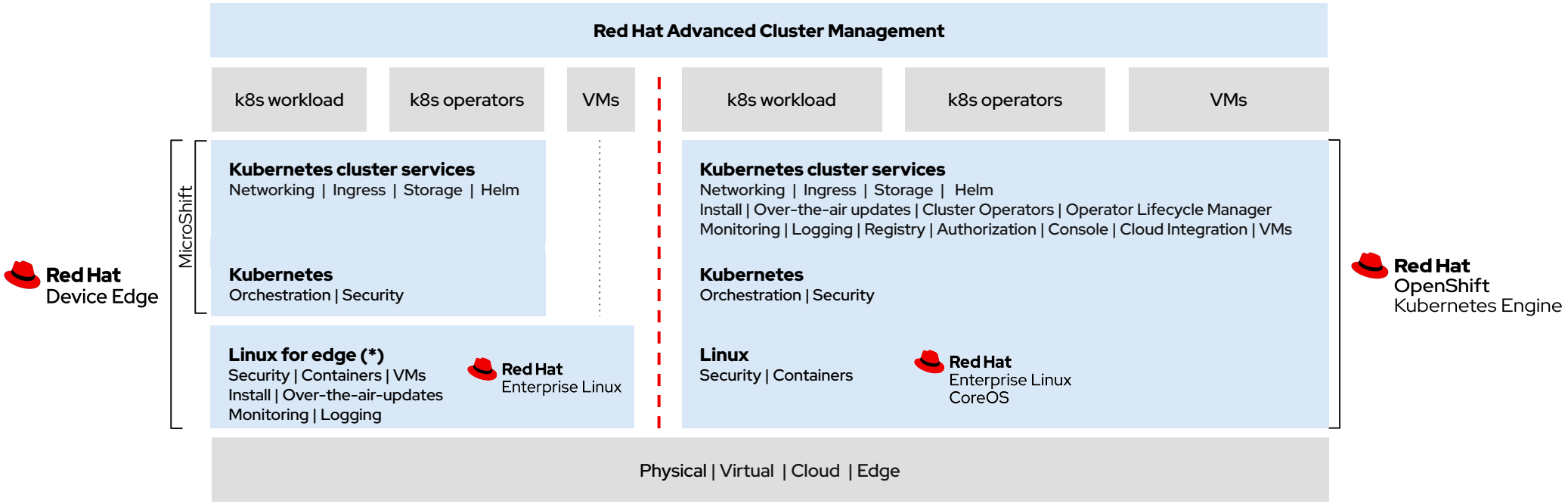
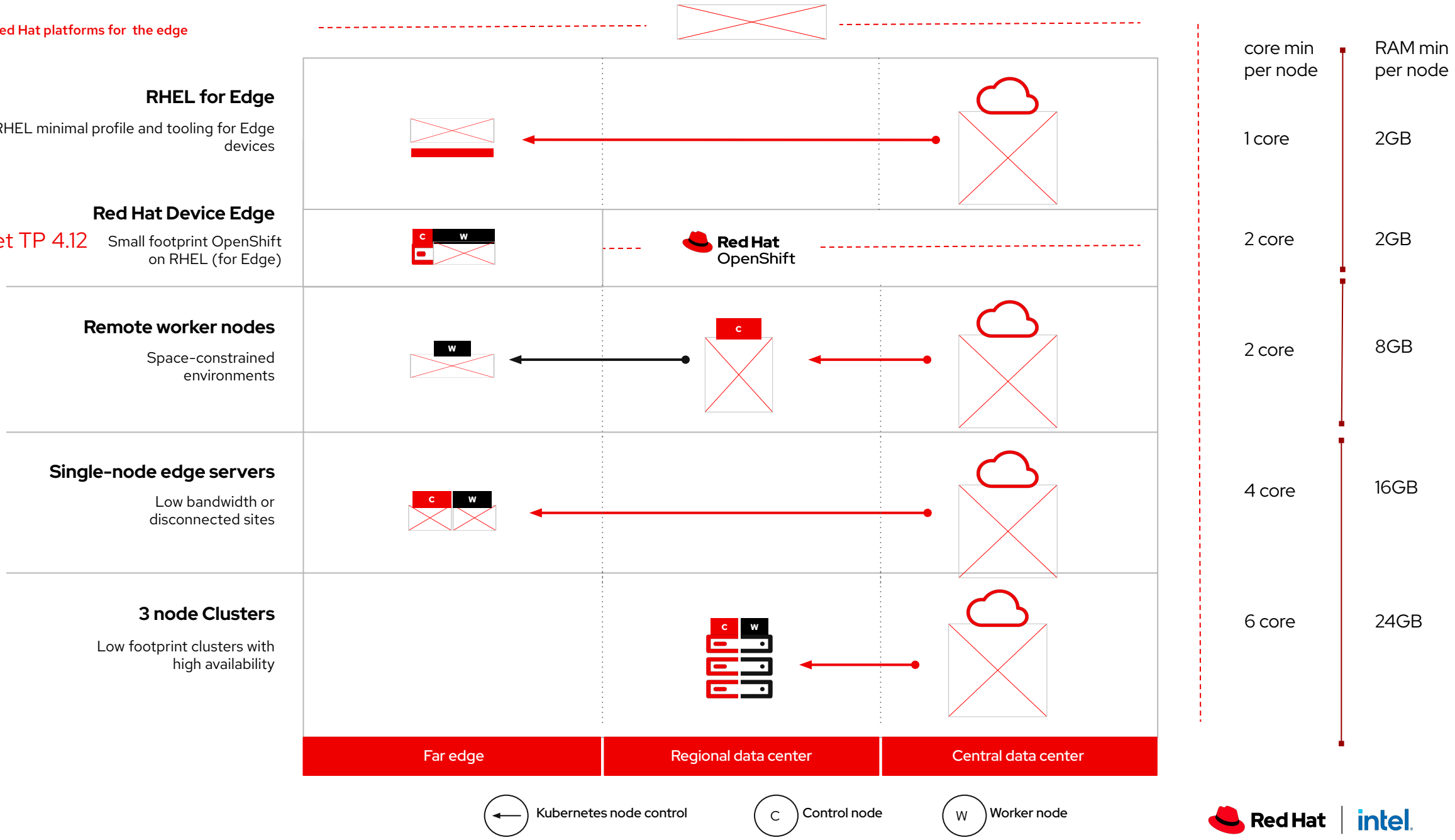
# Red Hat Device Edge compared to Red Hat OpenShift




Red Hat provides and supports

You provide and support

* recommended for edge deployments: Red Hat Enterprise Linux for Edge Images, rpm-ostree, immutable, atomic upgrade, over the air flavour of Red Hat Enterprise Linux.


RHEL for Edge
RHEL minimal profile and tooling for Edge devices
Red Hat Device Edge
Target TP 4.12
Small footprint OpenShift on RHEL (for Edge)
Red Hat OpenShift
Remote worker nodes
Space-constrained environments
Single-node edge servers
Low bandwidth or disconnected sites
3 node Clusters
Low footprint clusters with high availability
core min per node
RAM min per node
1 core
2GB
2 core
2GB
2 core
8GB
4 core
16GB
6 core
24GB
Far edge
Regional data center
Central data center
Kubernetes node control
Control node
Worker node

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# Thank You

Connecting people and solutions
to accelerate your business