# Multi Domain Operations From the Core to the Edge

## Red Hat Enterprise Linux – the new kid in (Panasonic) town

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# Agenda

- Panasonic & Red Hat - how it all started
- Think Platform - not Operating System
- Secure Software Supply Chain & Automation
- Use Cases, Ideas - your thoughts

NATO Definition:
„Orchestration of military activities, across all domains and environments, synchronized with non-military activities, to enable the Alliance to create converging effects at the speed of relevance”

Planungsamt der Bundeswehr:

… Beschreibungen von MDO fokussieren stark auf die technischen Anteile und gehen oftmals mit Begriffen wie Cloud, Edge, künstlicher Intelligenz und Umgang mit Massendaten einher. … wichtig zu verstehen, dass es sich bei MDO nicht um ein primär technisches Thema handelt.

Red Hat ⇒ Technologie Provider ⇒ Fokus auf die technologischen Grundlagen



Source: Planungsamt der Bundeswehr MULTI-DOMAIN OPERATIONS FÜR DIE BUNDESWEHR

# The Only RHEL Certified Rugged Computers




Red Hat | Panasonic

# Why Does It Matter?



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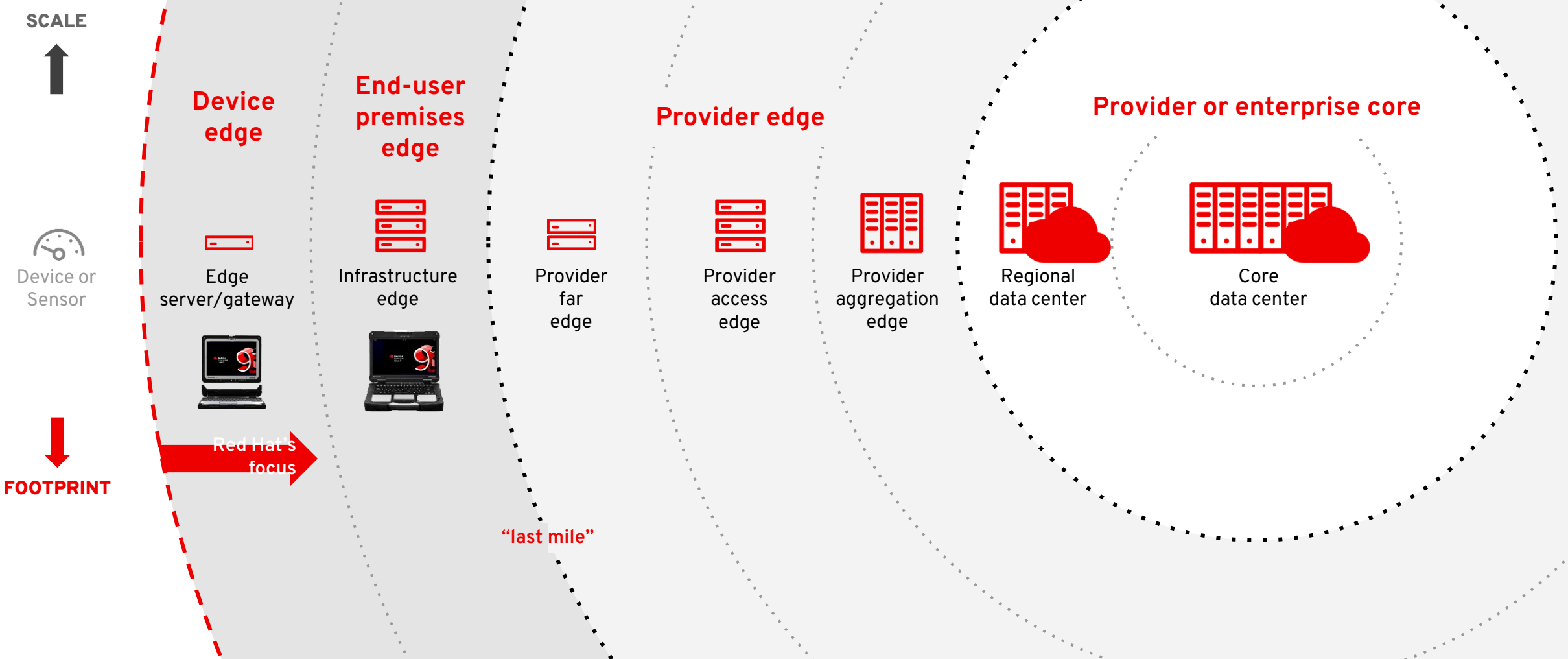
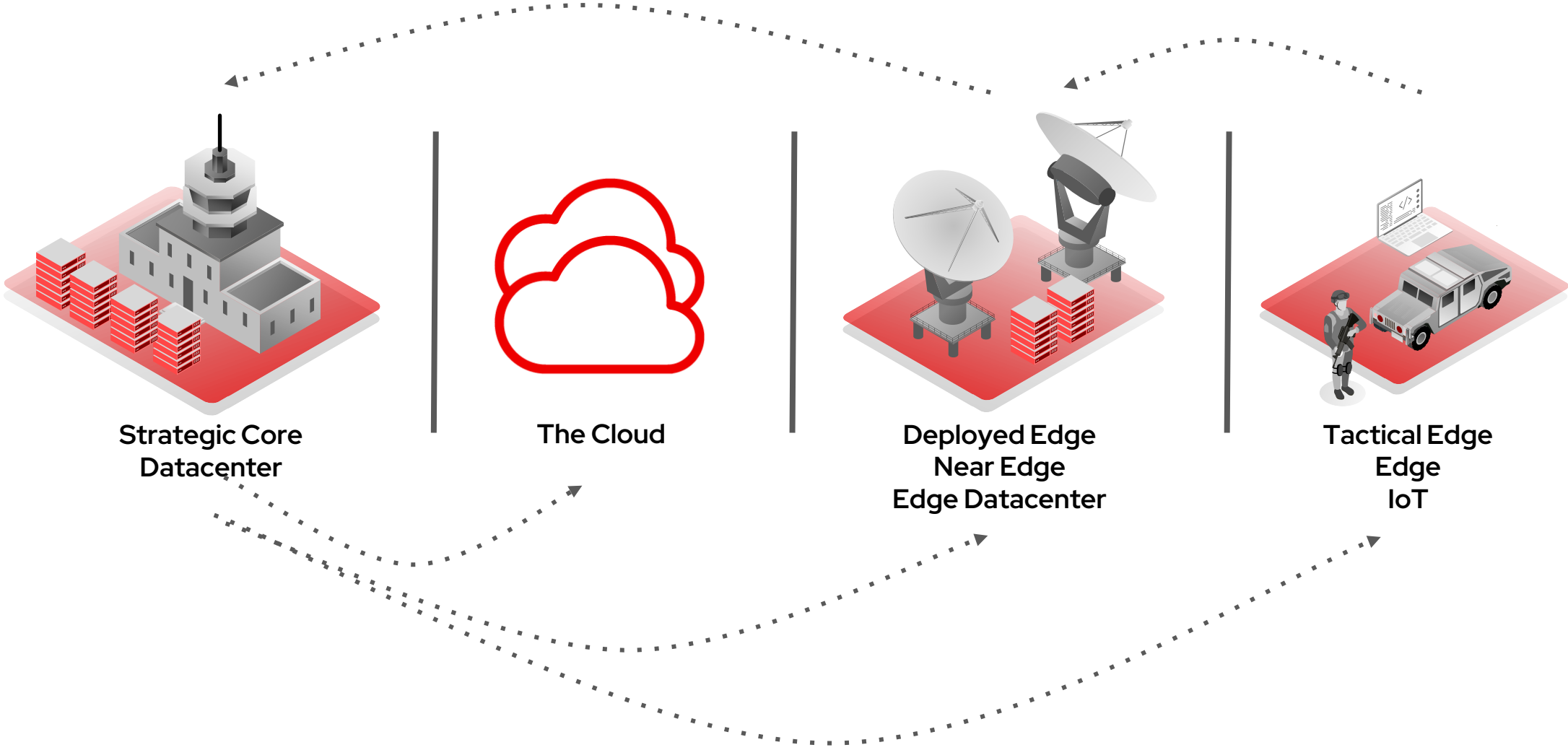
# Red Hat (Edge) Point of View

## Edge Tiers - Think Platform



# Where we are today

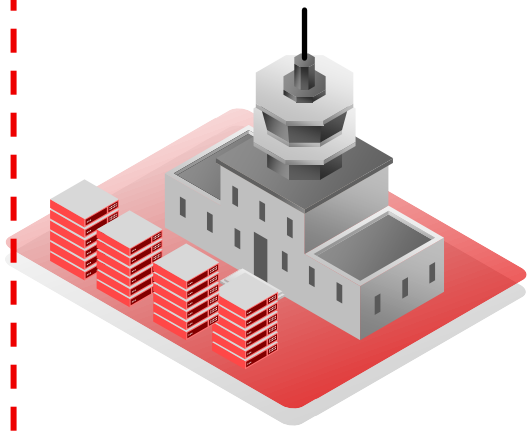




# Where our customers want to be



Distribute Software, Config, ML Models, Control, Commands



Strategic Core
Datacenter

The Cloud

Deployed Edge
Near Edge
Edge Datacenter

Tactical Edge
Edge
IoT

Transfer Operational data, Telemetry, Events

# Challenges to solve



Unified Platform

Secure Software Supply Chain

Reliable and Secure Automation

# Challenges to solve

Think Platform - not Operating System

## Unified Platform

Development, Operations, Security and Data Scientists must work on a single platform regardless it's core, cloud or edge

## Secure Software Supply Chain

## Reliable and Secure Automation

# Simplification with an Unified Platform



CONTAINERS

DATA

FUNCTIONS

Strategic Core

Public/Private Cloud

Deployed Edge

Tactical Edge

Red Hat

AI/ML

VMs

Hybrid Infrastructure



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# Organizational Value

## Processes Simplification

People can operate in any part of the Hybrid Infrastructure with the same skills and tools

## Faster time to mission

People can move solutions quickly in any part of the Hybrid Infrastructure with the same skills and tools

## Industrial Ecosystem available to support

Multiple vendors available to support customers

# Challenges to solve

Think Platform - not Operating System

## Unified Platform

## Secure Software Supply Chain

Applications must include only content coming from trusted sources; build process must be auditable and verifiable

## Reliable and Secure Automation



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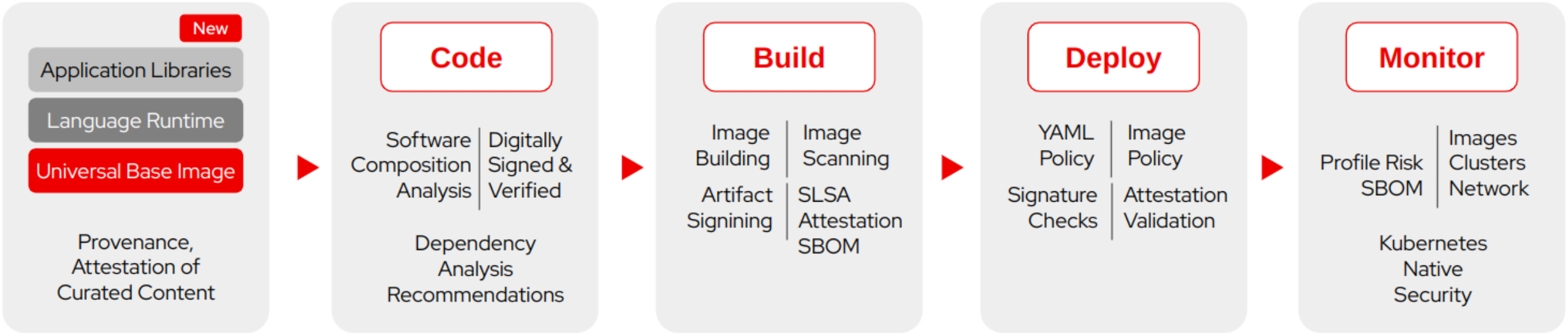
# Trusted Secure Software Supply Chain




**SBOM** = Software Bill of Material | **VEX** = Vulnerability Exploitability Exchange | **SLSA** = Supply-chain Levels for Software Artefacts



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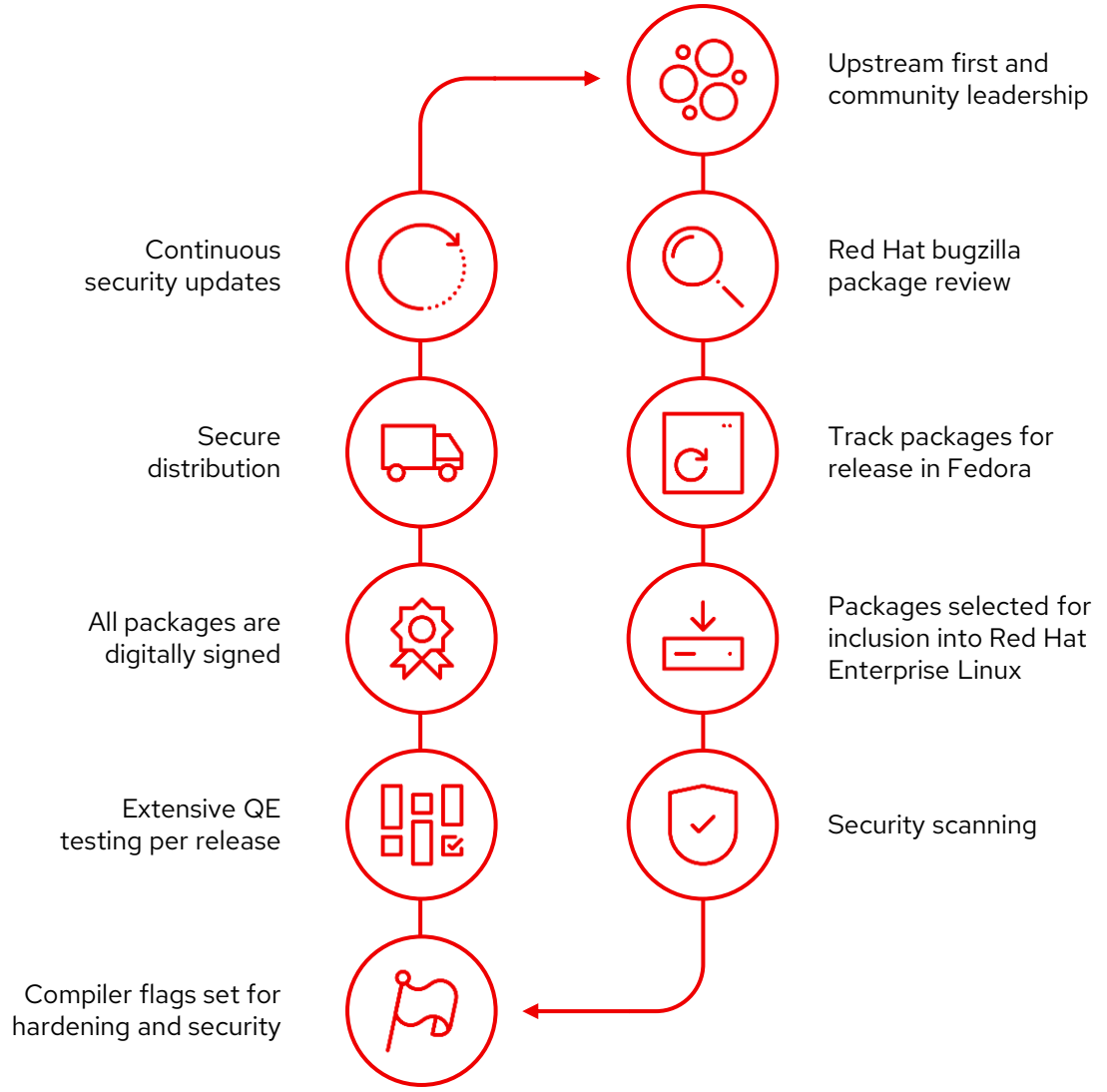
# Trusted supply chain to reduce software life cycle risk, Our daily business

- Perform a static code analysis across code base
- Minimize security flaws before shipping and improve the upstream open source
- Prevent stack smashing and mitigate memory corruption with compiler flags
- Maintain through patching of security flaws



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# Business Value

## Highest Security Standards

A private Software Supply Chain working in your infrastructure that offers security gates and maximum control over your processes

## Improve your security posture

As soon as a vulnerability is discovered, you can know which application is impacted and then which systems are affected and plan a fix as soon as possible

## Seamless integration in multi hybrid digital infrastructure

Managing security across multi hybrid digital infrastructure becomes possible and efficient



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# Challenges to solve

A proposed framework

## Unified Platform

## Secure Software Supply Chain

## Reliable and Secure Automation

Manage devices, applications and data in a secure way with tamper-proof resistance and provenance capability



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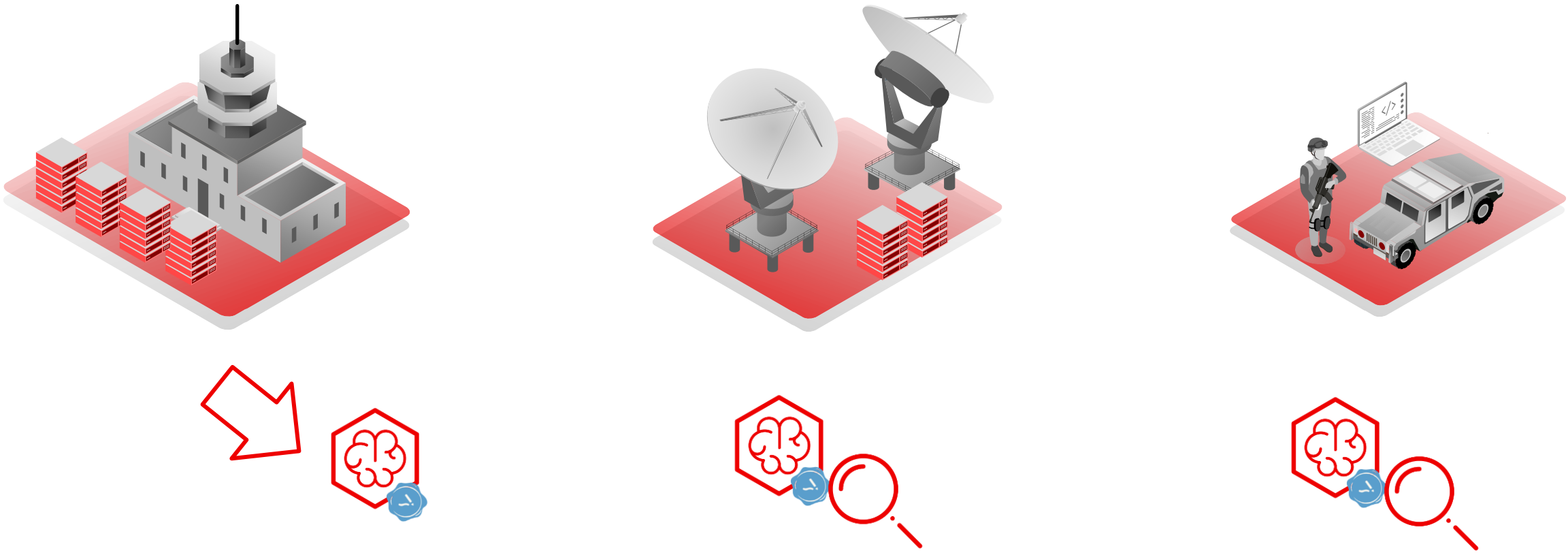
# Reliable and Secure Automation

## High Level Process



Distribute applications, configuration and data securely across all environments



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# Business Values

## Deployment of infrastructure or software simplified

Management of devices, software or data from the core to the edge can be automated and simplified

## Distribution of applications and configuration can fit any requirement

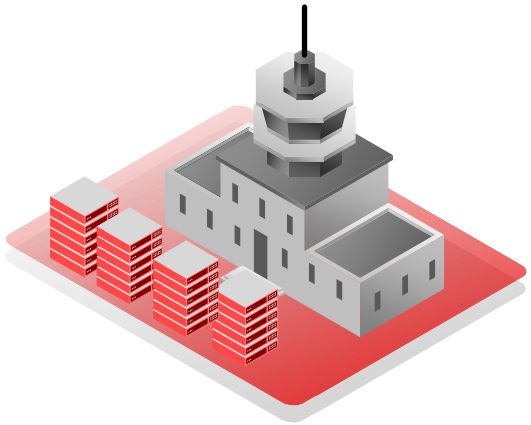
Any custom distribution process can be implemented: copy images on secure laptops, optical discs, DMZ, etc

## Provenance and Tamper-Proof Resistance

When artifact arrives at the destination, it’s possible to verify its provenance and its signature to check that content was not changed in transit and who is the author

# Think Platform not Operating System

## Open, Interoperable and Coherent Platform to solve Customers Challenges



**Strategic Core Datacenter**

**The Cloud**

**Deployed Edge Near Edge / Edge Datacenter**

**Tactical Edge Edge / IoT**

Unified Platform

Secure Software Supply Chain

Reliable and Secure Automation

**The Platform provides the technical capabilities for Multi Domain Operations**

„Orchestration of military activities, across all domains and environments, synchronized with non-military activities, to enable the Alliance to create converging effects at the speed of relevance”



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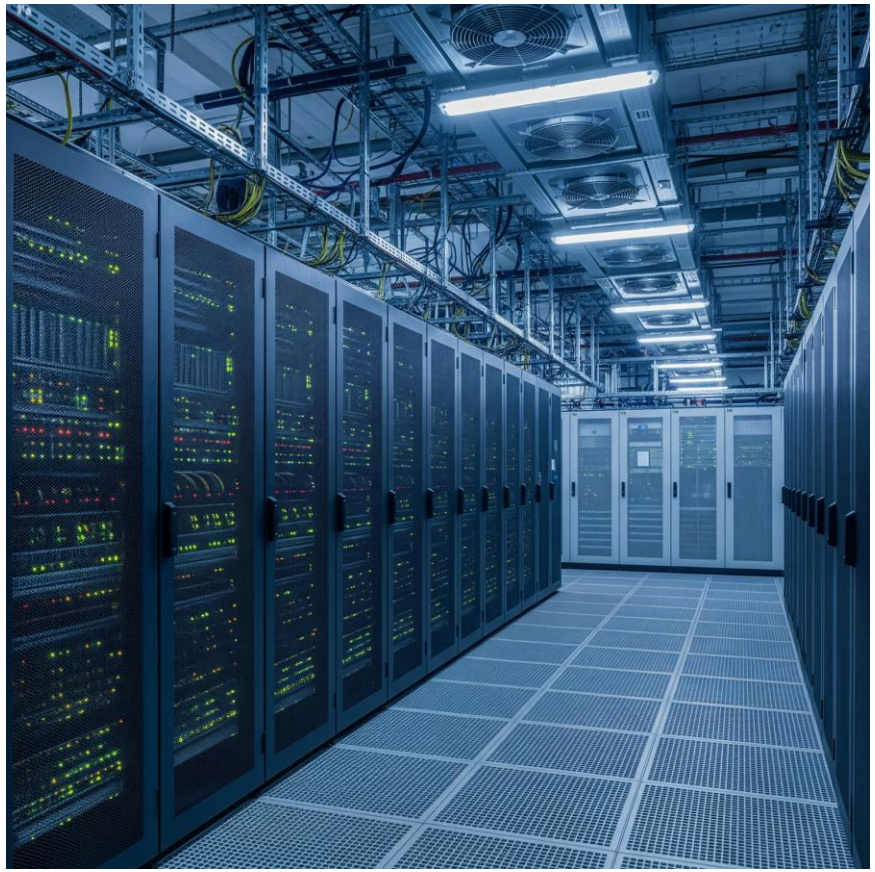
# Red Hat Enterprise Linux Panasonic Toughbooks use cases, ideas, inspirations

# What if ….
# You consider Panasonic Toughbooks as mobile servers

# The Challenges of the Edge for harsh environments





- Traditional data centers are static and secure—they are built to stay in one place.
- Military missions and others, can happen in harsh, remote unpredictable environments
- Moving and operating edge datacenter poses unique challenges that a civilian IT department never faces.

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# Red Hat Approach



## The Power of one unified platform

**What if we consider Panasonic Toughbooks as mobile servers?**

Those devices are easy to carry and can be plugged together to form an edge data center that can guarantee resilience.

They can operate on their own battery power.

They can be easily extended by connecting traditional servers with specialized equipment (e.g. GPUs).

The setup doesn’t require highly trained personnel - can be automated.

The same software stack of the core datacenter can be executed at the edge - real portability and skills reuse.

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# What if ....
# AI workload would run on your Toughbook

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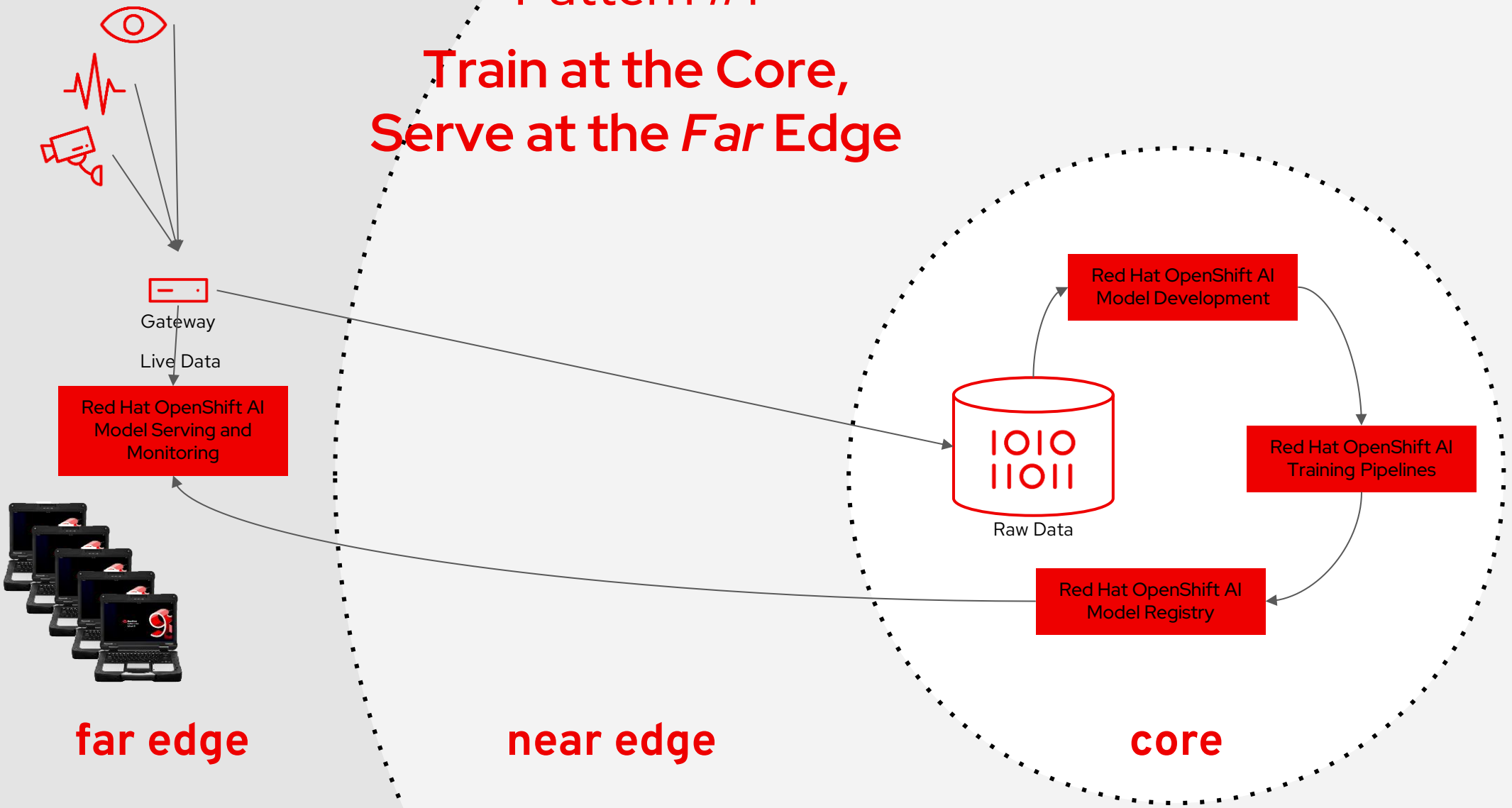
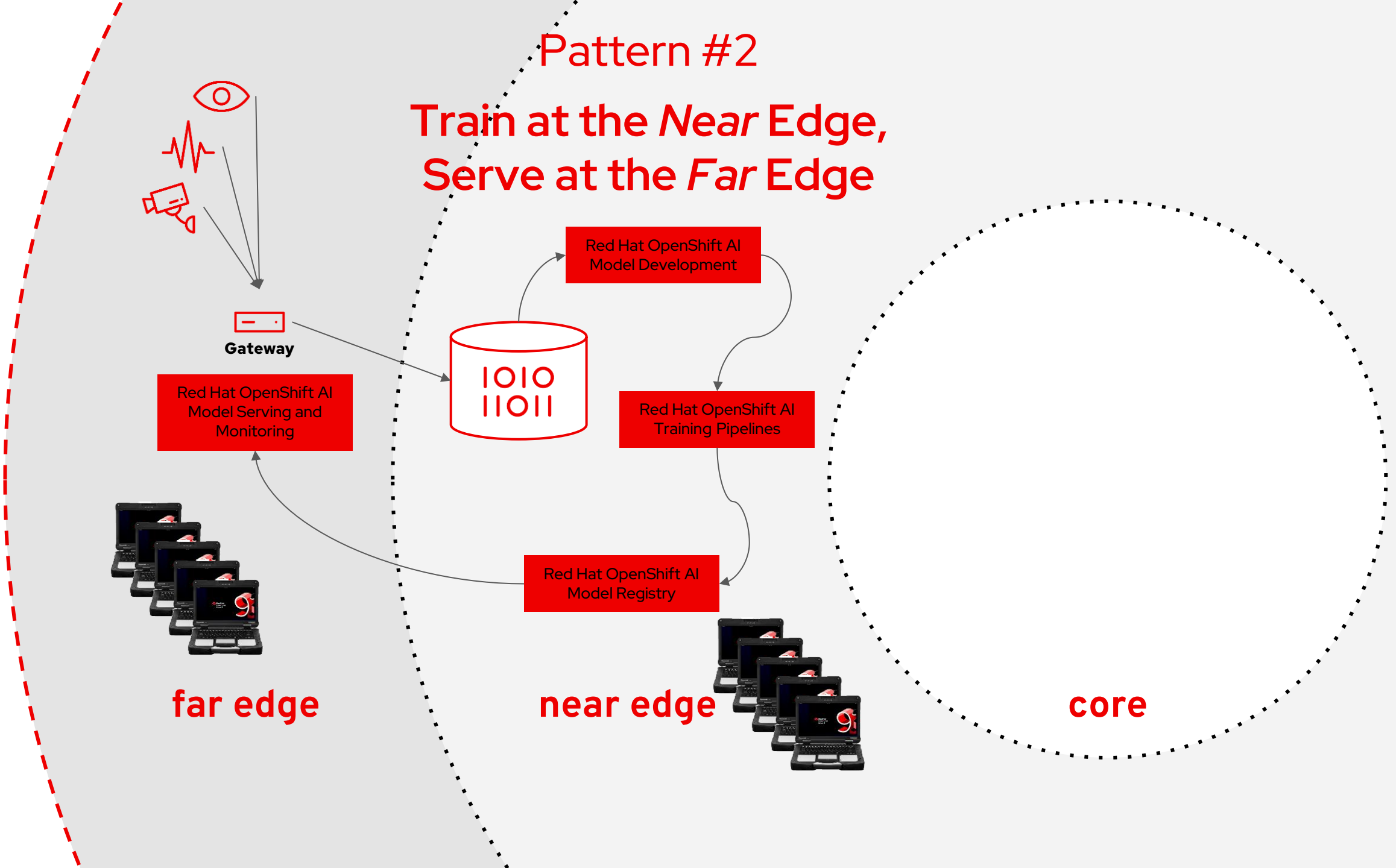
# Pattern #1

## Train at the Core, Serve at the *Far* Edge



# Pattern #2

## Train at the *Near* Edge, Serve at the *Far* Edge



What if ....
AI workload would run on your Toughbook

# War da was???

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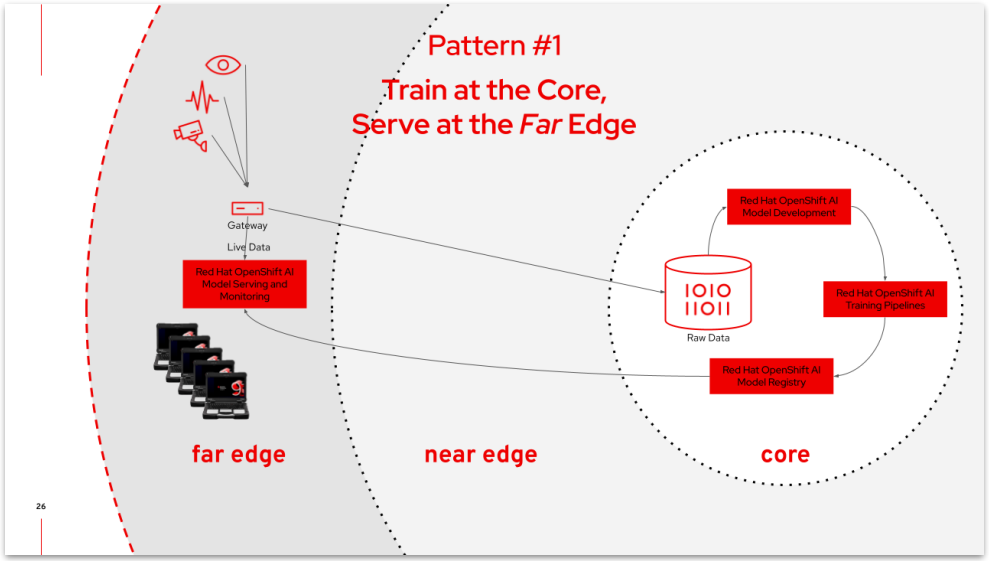
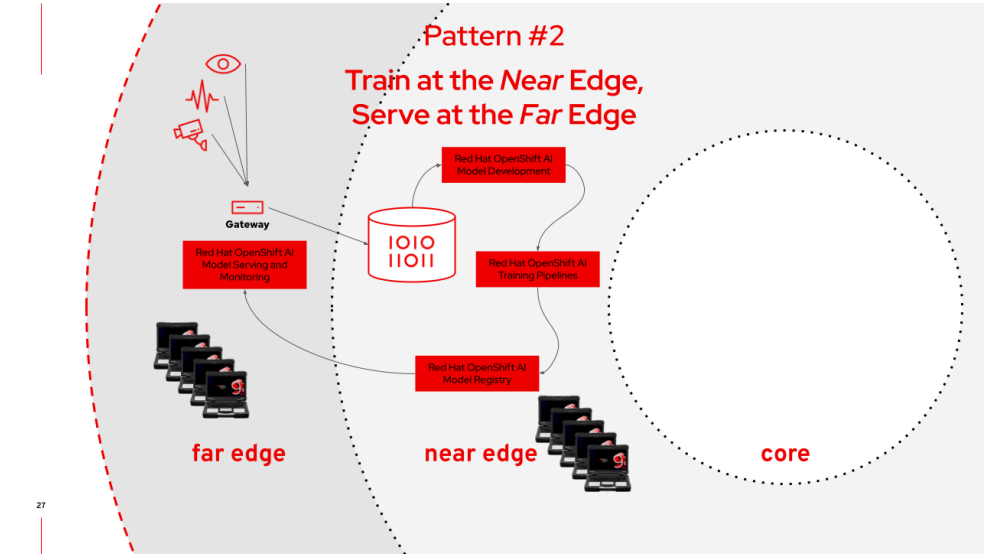


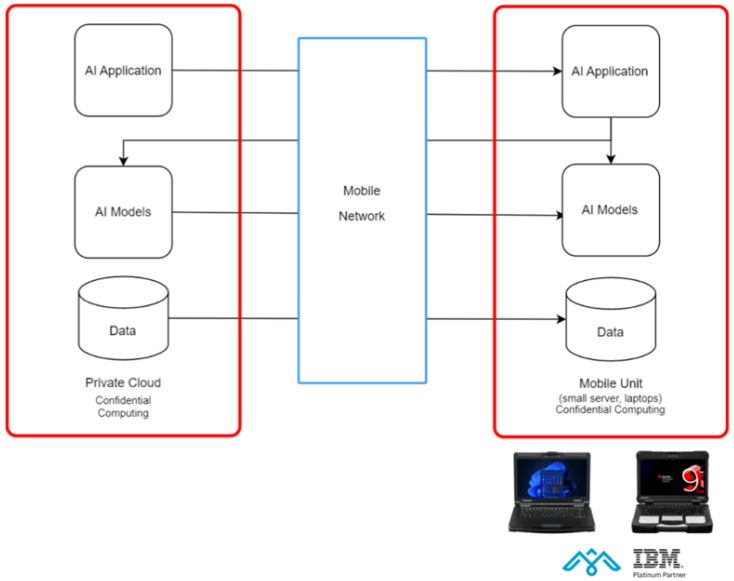

## Resilience solution for field operations

Connecting to private cloud is not always an option

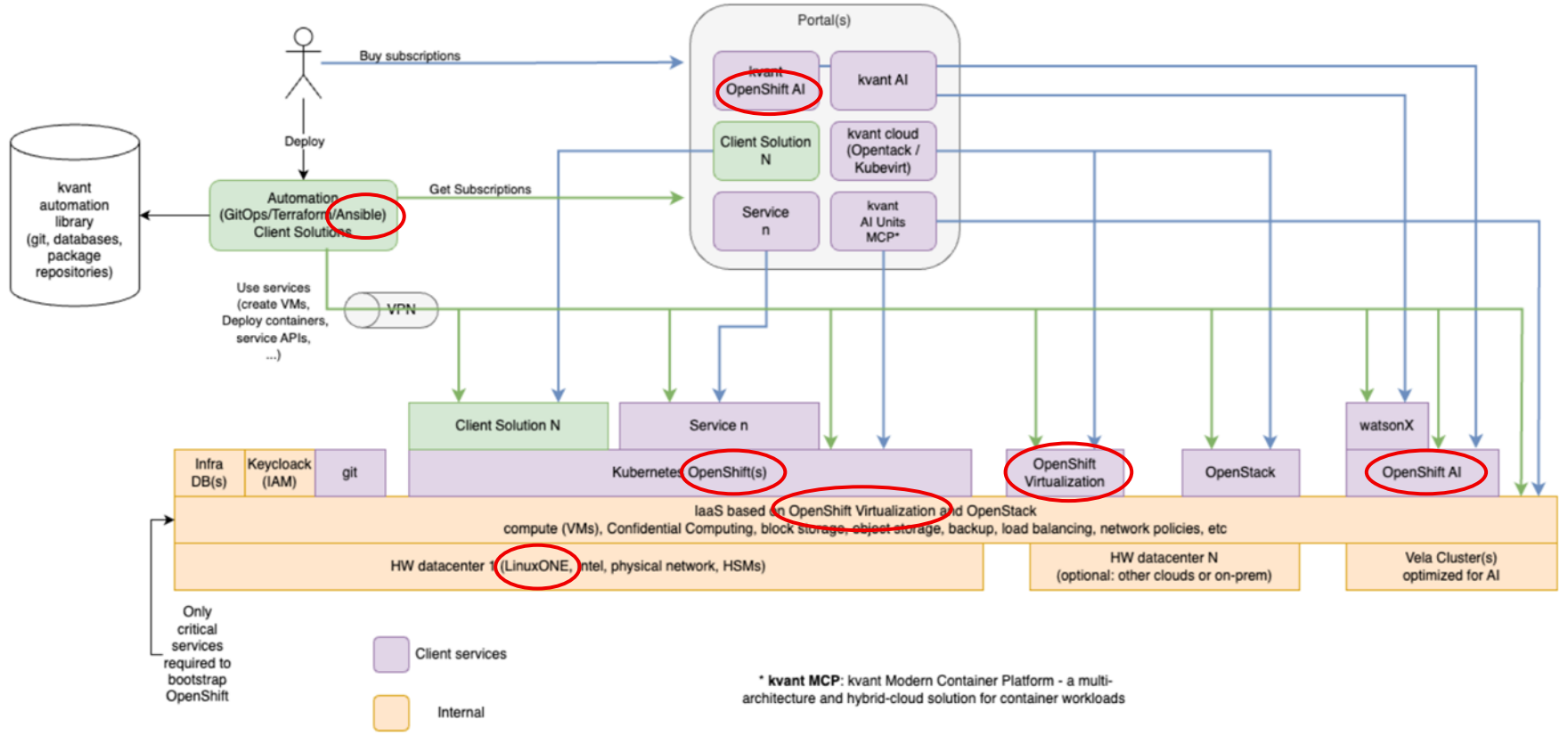
- Connectivity issues
- Disasters
- Data Center down time

How do we solve this?

- Rugged field laptops and car police computers have a lot of power
- AI application can run (slowly) on them – better than no application!
- Subset of the data synced to mobile unit when connected
- Data protected with confidential computing to prevent misuse



# Our Architecture – Leveraging Open-Source Technologies and Standards




Red Hat Technology

at

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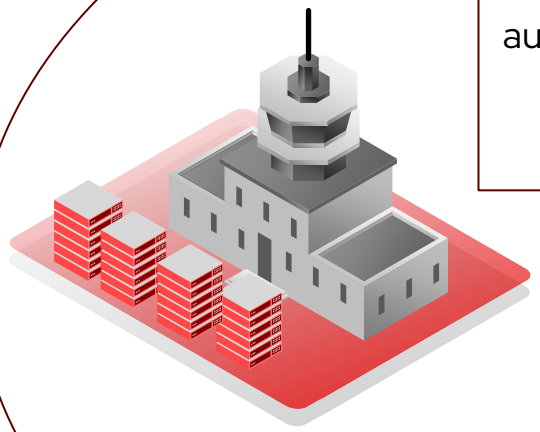
# What if ....
# You adjust the use of the
# immutable
# Toughbook on the fly

Install all the required software, configurations, secrets and playbooks needed in the field to automate any procedure with Ansible

Use Ansible to run the playbooks to bring the edge system in the expected final state



**Strategic Core**

**Deployed Edge**

**Tactical Edge**

Air Gapped

Air Gapped

**Tactical edge**



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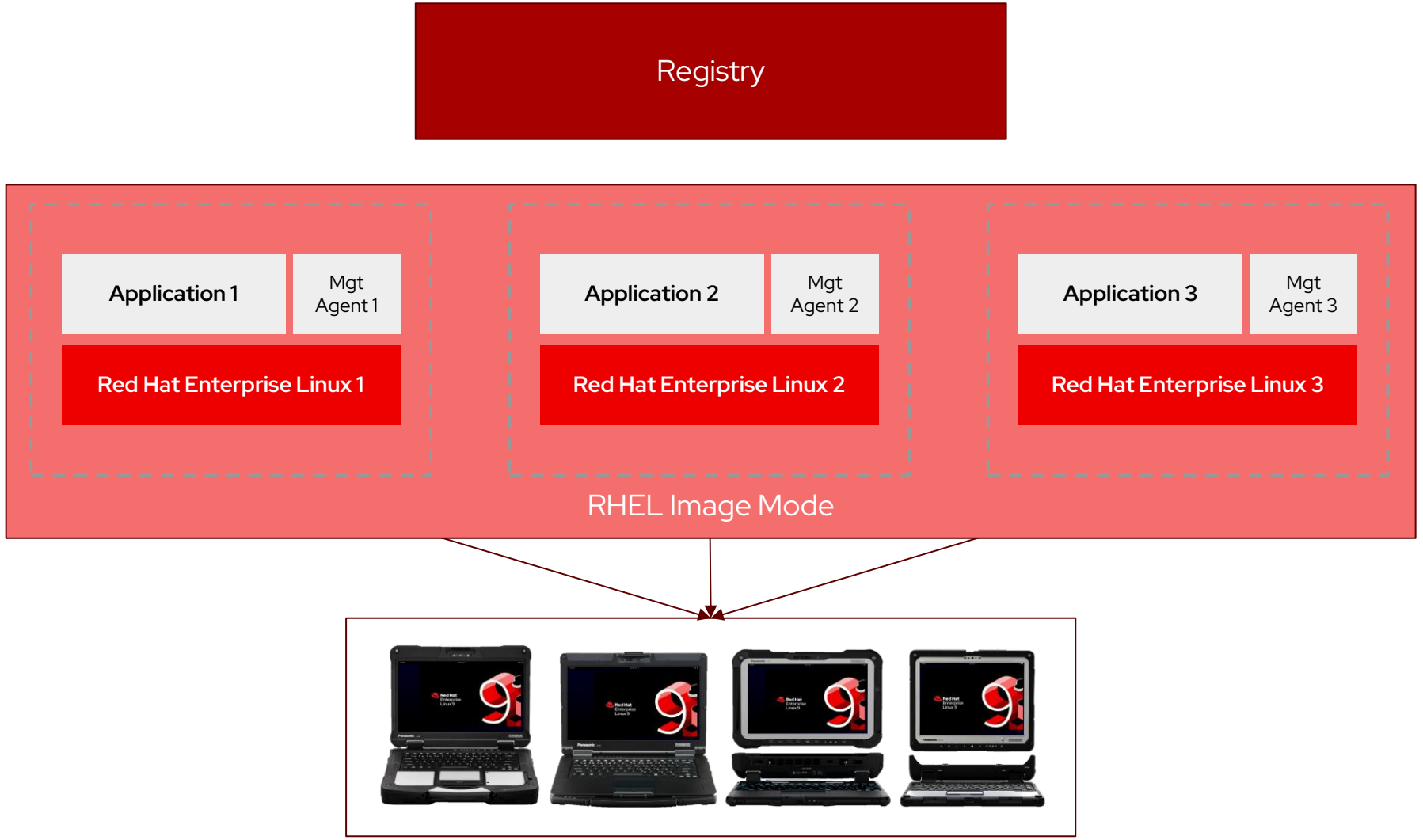


Immutable, customized images

Distribute on the fly

Everybody wants the OS to be completely **customizable**...
until the point that they want it to be **immutable!**



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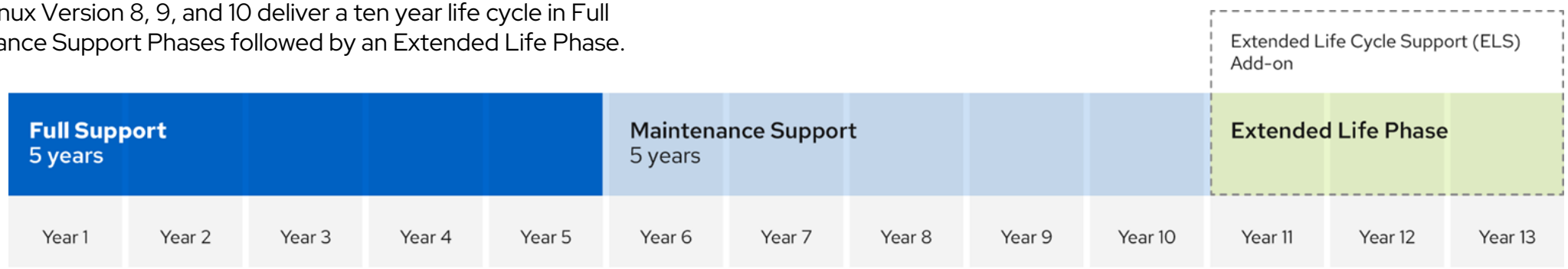
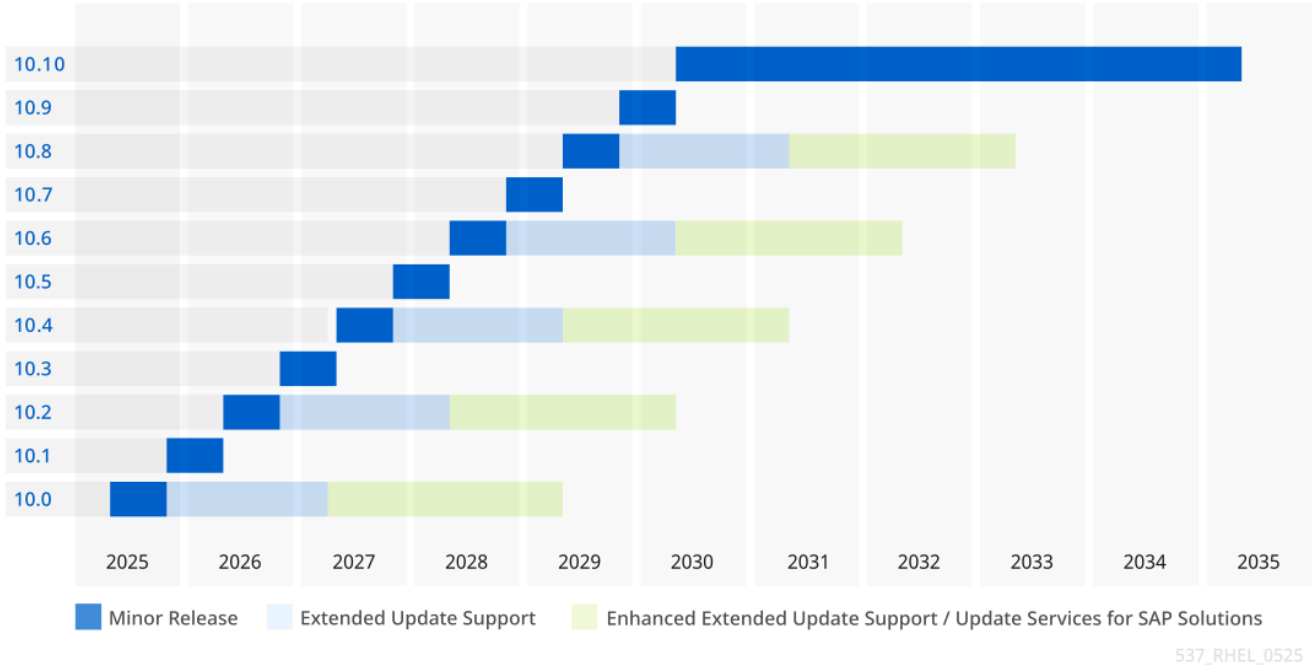
# What if ....
# All this is stable, maintained and secure for +10 years

Red Hat Enterprise Linux Version 8, 9, and 10 deliver a ten year life cycle in Full Support and Maintenance Support Phases followed by an Extended Life Phase.




## RHEL 10 Maintenance Support ⇒ 2035 Extended till 2038

RHEL 9 Maintenance Support 2032 - Extended till 2035



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# Red Hat Enterprise Linux & Panasonic Toughbook - more than a ruggedized Laptop

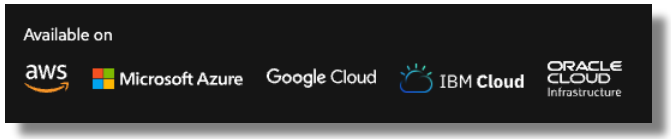
Different workloads, same

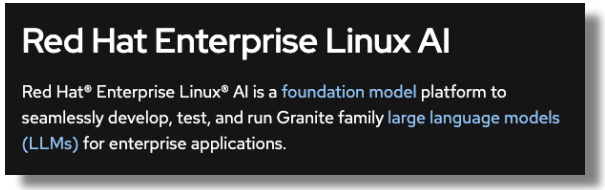
## Standard Operating Environment:

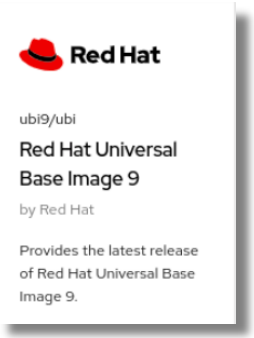
- RHEL for bare metal servers (x64, ARM, Power, IBMz)
- RHEL for virtual machines / cloud

- RHEL for Workstations
- RHEL for Edge (small footprint)
- RHEL for High Performance Computing (HPC)

- RHEL for AI
- RHEL Universal Base Image (certified container images)






https://www.redhat.com/en/technologies/linux-platforms/enterprise-linux

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