



# OpenTourn

Plataformas con posibilidades ilimitadas

## A Coruña

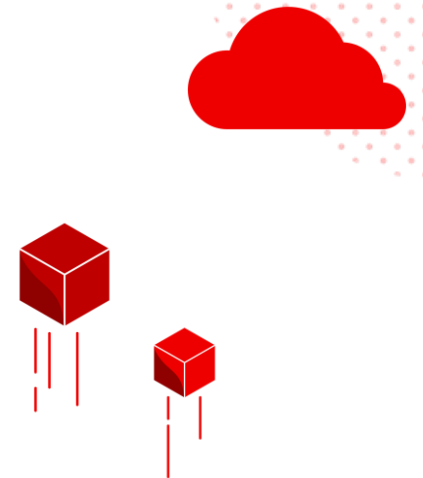
28 de Mayo de 2024



# Red Hat OpenShift Virtualization

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## What we'll discuss today

### OpenShift



#### Application Platform

Modern Platform for Application Development and Deployment across the hybrid cloud.

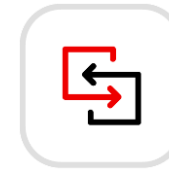
### Virtualization



#### Containers and VMs

Single pane of glass.  
VMs can benefit from kubernetes.  
Lower barriers for modernization.

### MTV

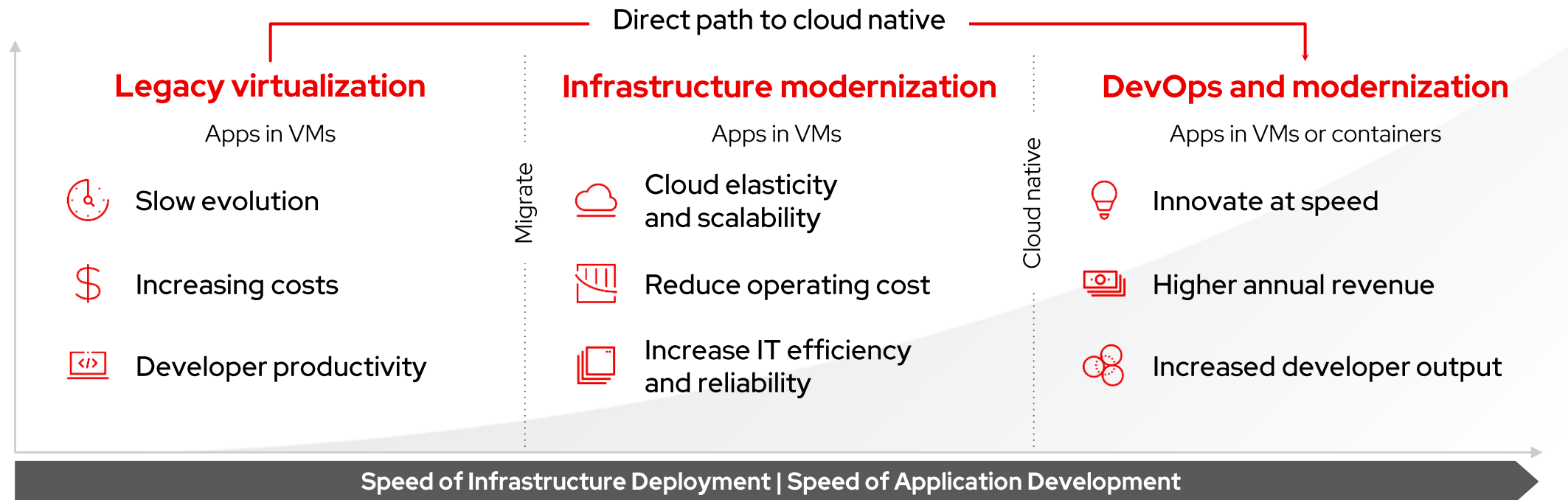


#### Migration Toolkit

Warm migration of VMs at scale.  
Network and Storage mapping.  
From vSphere, RHV or OpenStack.

# Modernize at your own pace

(and only as much as you want)



### Path #4: Retire & Replace

A ground-up rebuild, keeping the legacy application up-and-running, whilst a new version of the application is developed, leveraging a Cloud Native development approach



### Path #2: Containerize - Replatform to Containers/Kubernetes

"Lift, tinker, and shift" workloads from WebSphere/EAP to OpenShift containers



### Path #1: Virtualize - Rehost Application Server to OpenShift

"Lift, and shift" Java application on App Server to JBoss or WebSphere on OpenShift

### Path #3+: Refactor Plus

Staged approach: individually replace/develop application's services as microservices, incorporating more advanced capabilities into applications, such as AI/ML and event driven approaches

### Path #3: Refactor

Staged approach: individually replace/develop application's services as microservices

# The paths to Application Modernization

# Platform for Application Development and Deployment

**Red Hat**  
Advanced Cluster Management  
for Kubernetes

**Red Hat**  
Advanced Cluster Security  
for Kubernetes

**Red Hat**  
Quay

**Red Hat**  
OpenShift  
Data Foundation

## Multicluster management

Observability | Discovery | Policy | Compliance |  
Configuration | Workloads

## Cluster security

Declarative security | Container vulnerability  
management | Network segmentation |  
Threat detection and response

## Global registry

Image management | Security scanning | Geo-  
replication Mirroring | Image builds

## Cluster data management

RWO, RWX, Object | Efficiency |  
Performance | Security | Backup |  
DR Multicloud gateway

## Manage workloads

### Platform services

- Service mesh | Serverless
- Builds | CI/CD pipelines
- GitOps | Distributed Tracing
- Log management
- Cost management

## Build cloud-native apps

### Application services\*

- Languages and runtimes
- API management
- Integration
- Messaging
- Process automation

## Data-driven insights

### Data services\*

- Databases | Cache
- Data ingest and preparation
- Data analytics
- AI/ML

## Developer productivity

### Developer services

- Developer CLI | IDE
- Plugins and extensions
- CodeReady workspaces
- CodeReady containers

## Kubernetes cluster services

Install | Over-the-air updates | Networking | Ingress | Storage | Monitoring | Log forwarding | Registry | Authorization | Containers | VMs | Operators | Helm

## Kubernetes (orchestration)

**Red Hat**  
Enterprise Linux

## Linux (container host operating system)

**Red Hat**  
Enterprise Linux  
CoreOS



Physical



Virtual



Private cloud



Public cloud



Edge

\* Red Hat OpenShift® includes supported runtimes for popular languages/frameworks/databases. Additional capabilities listed are from the Red Hat Application Services and Red Hat Data Services portfolios.

\*\* Disaster recovery, volume and multicloud encryption, key management service, and support for multiple clusters and off-cluster workloads requires OpenShift Data Foundation Advanced



# Data Protection, Compliance & Sovereignty with Confidential Computing

# Growing Customer Challenges



Projects blocked  
due to data privacy or  
compliance concerns

Cloud migration stalled  
due to data control and  
sovereignty concerns

Security worries  
due to sophisticated,  
persistent threats to data  
and software IP

Confidential Computing is a pathway to help overcome these challenges



# The Need for Confidential Computing

## Closes a Major Gap in the Data Protection Continuum

Data at Rest



Storage Encryption

Data in Transit



Network Encryption

Data in Use

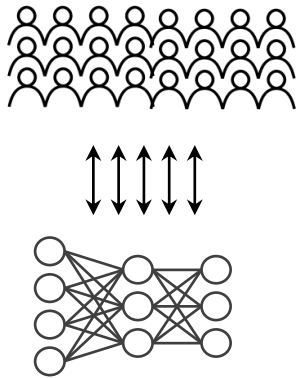


Confidential Computing

# Evolving AI Landscape Fuels Need for Confidentiality & Security

## Growing AI Ubiquity

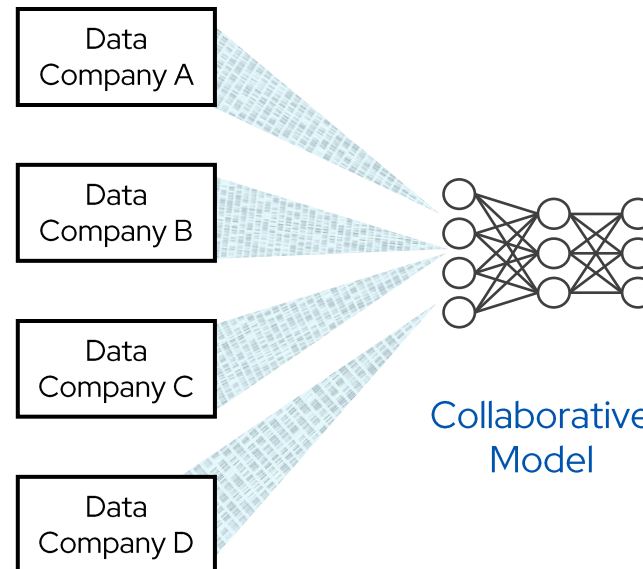
Use expanding from experts to general population, exposing new risks



Large Language Models & Generative AI

## Collaborative AI

Multiple entities contribute to achieve large, more diverse data set



## AI Regulations

Deployment mandate expected to be widely-applicable across industries



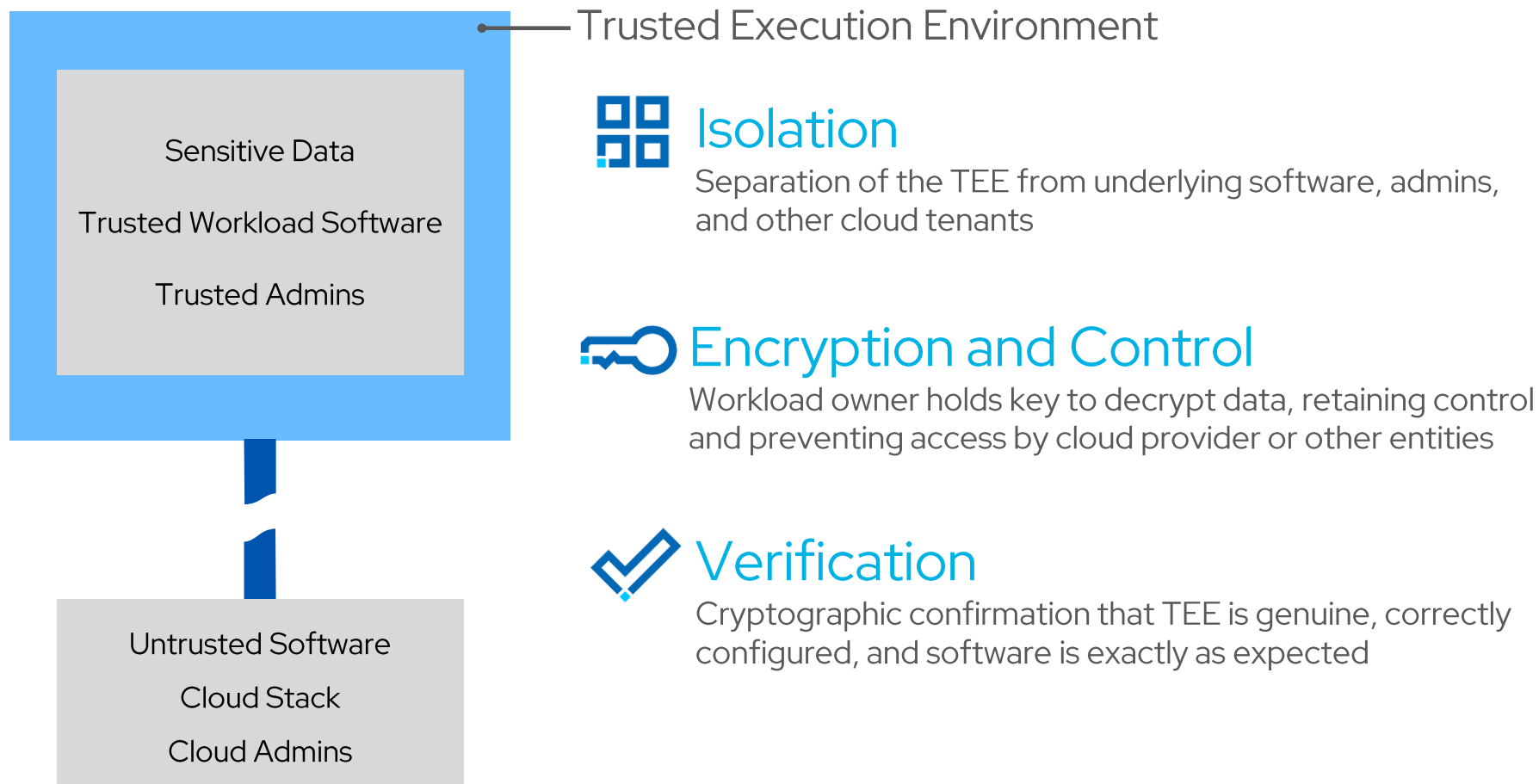
EUROPEAN UNION  
ARTIFICIAL INTELLIGENCE ACT\*

*"High-risk AI systems shall be resilient as regards attempts by unauthorized third parties to alter their use or performance by exploiting the system vulnerabilities."*

Additive to GDPR privacy protections

# Confidential Computing

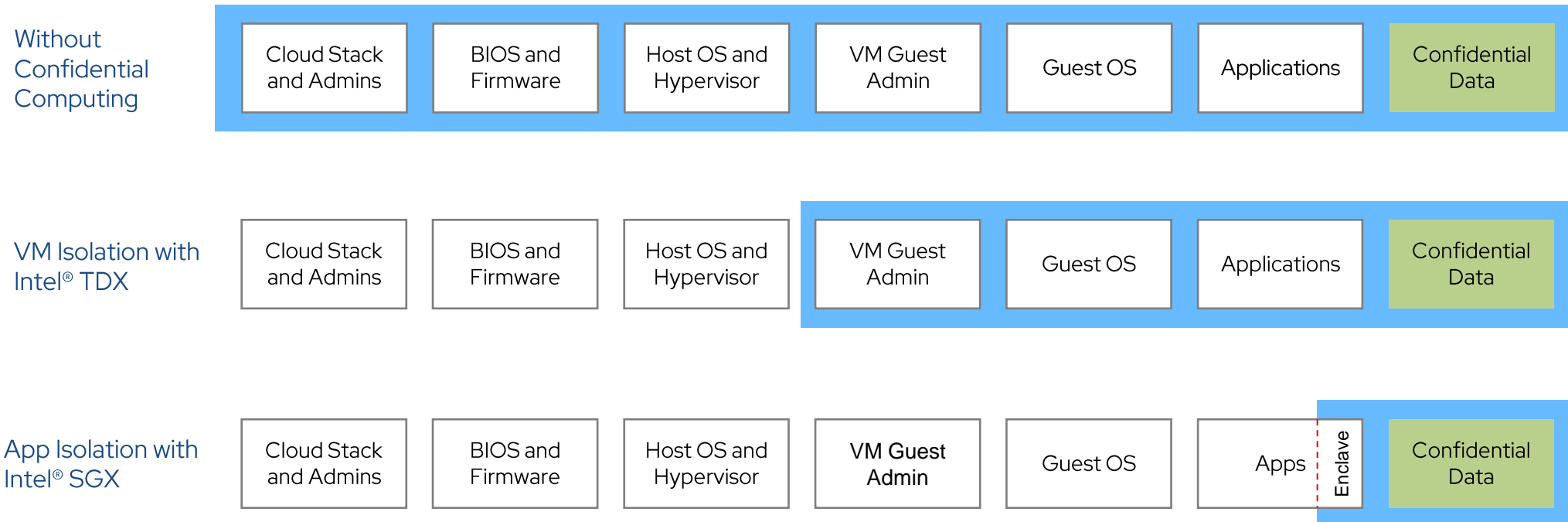
## Essential Functions



# Intel Trusted Execution Environments

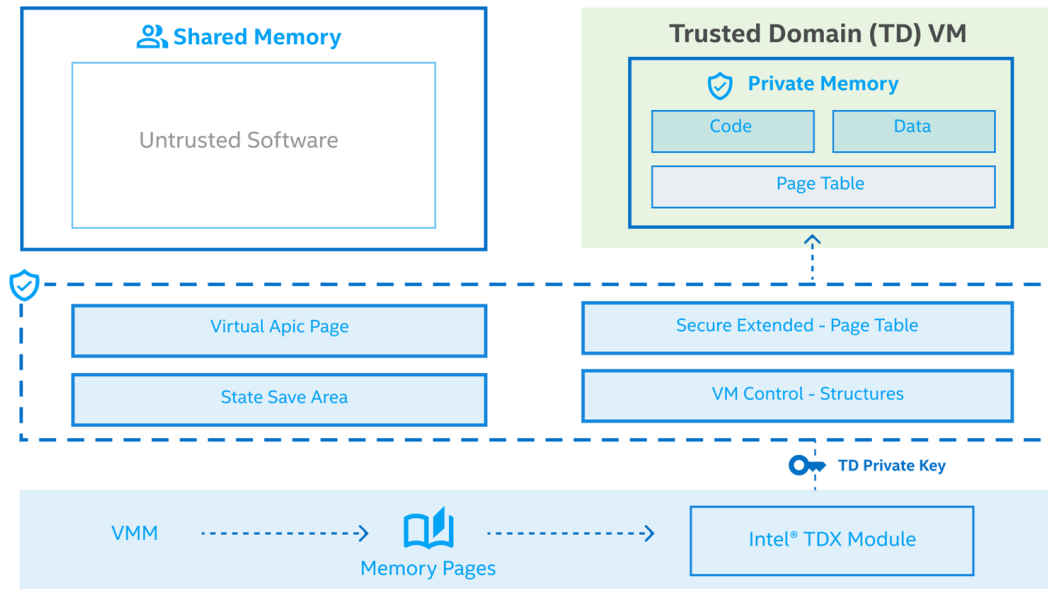
## Trust Boundaries Compared

■ Trust Boundary: Elements with potential to access confidential data



# Confidential Containers for AI workload security in the public cloud

With Intel Trusted Domain Extensions (TDX)



- ▶ High value IP such as machine learning models require additional security
- ▶ Confidential Containers for AI workloads allow to safely process sensitive data in the cloud
- ▶ Intel TDX providing hardware-isolated VMs to protect containers from unauthorized access
- ▶ On Azure DCesv5 and ECesv5-series Confidential VMs with Intel TDX

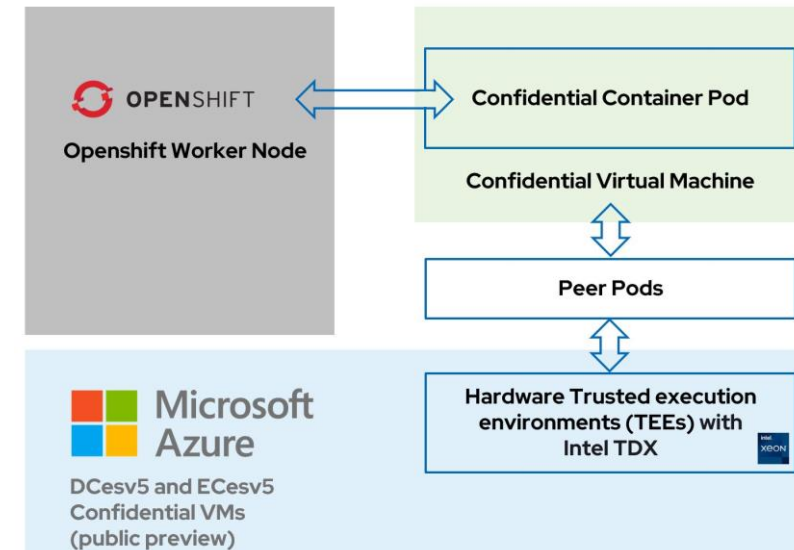


# Kubecon Paris 2024 Demo: Fraud detection in public cloud

- ▶ **Public Cloud Advantages for FSI:** Leverage geo-resilience and cost savings of public clouds while meeting strict security and resiliency regulations.
- ▶ **CoCo and Confidential Computing:** Utilize Confidential Containers (CoCo) to protect financial workloads in the cloud, enabling secure migration with data integrity.
- ▶ **Demo overview:** Walkthrough of deploying a fraud detection workload in Azure using CoCo, showcasing the use of confidential VMs and Intel® TDX for trusted processing.

This demo is a cooperation between Azure, Intel and Red Hat

Watch demo video [here](#)



# Intel TDX Availability with 5th Gen Intel Xeon Scalable



Intel TDX will be available on select 4<sup>th</sup> Gen Intel Xeon Scalable instances through four leading cloud providers

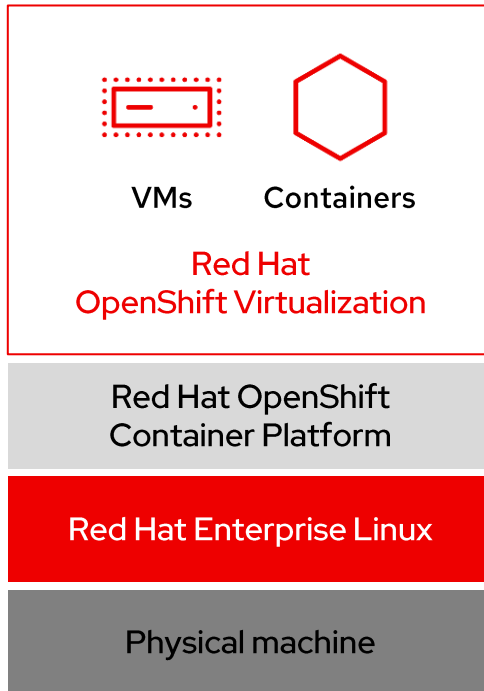
Previews underway now; Check with your provider for details

Intel TDX will generally be available in all **5<sup>th</sup> Gen Intel Xeon Scalable Processors** (code-named Emerald Rapids)



# Red Hat OpenShift Virtualization

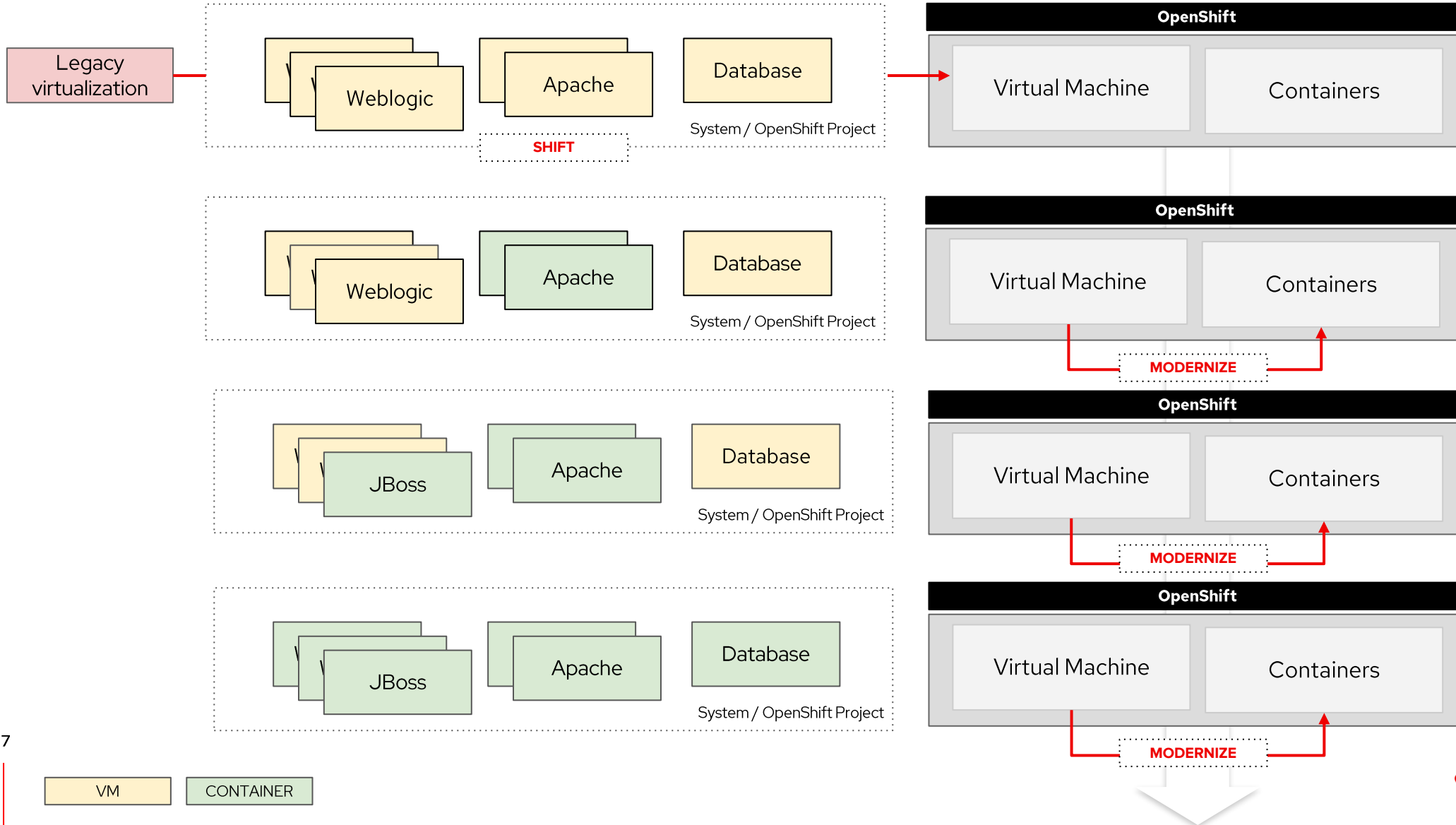
The modern option for virtualization



- ▶ **Unified platform**  
for running virtual machines and containers
- ▶ **Included feature**  
of the Red Hat OpenShift Container platform
- ▶ **Consistent management**  
toolings, interface, and ecosystem
- ▶ **Diverse Ecosystem**  
of the Red Hat OpenShift Container platform
- ▶ **Performance and stability**  
of Kernel-based Virtual Machine (KVM),  
the Linux kernel-based hypervisor
- ▶ **Includes Red Hat Enterprise Linux**  
guest entitlements
- ▶ **Built on KubeVirt**  
Rapid innovation through Open Source  
community. Top 10 CNCF active project with  
190+ contributing companies
- ▶ **Supports Microsoft Windows**  
guests through Microsoft Server Virtualization  
Validation Program (SVVP)



# Modernize Applications Iteratively

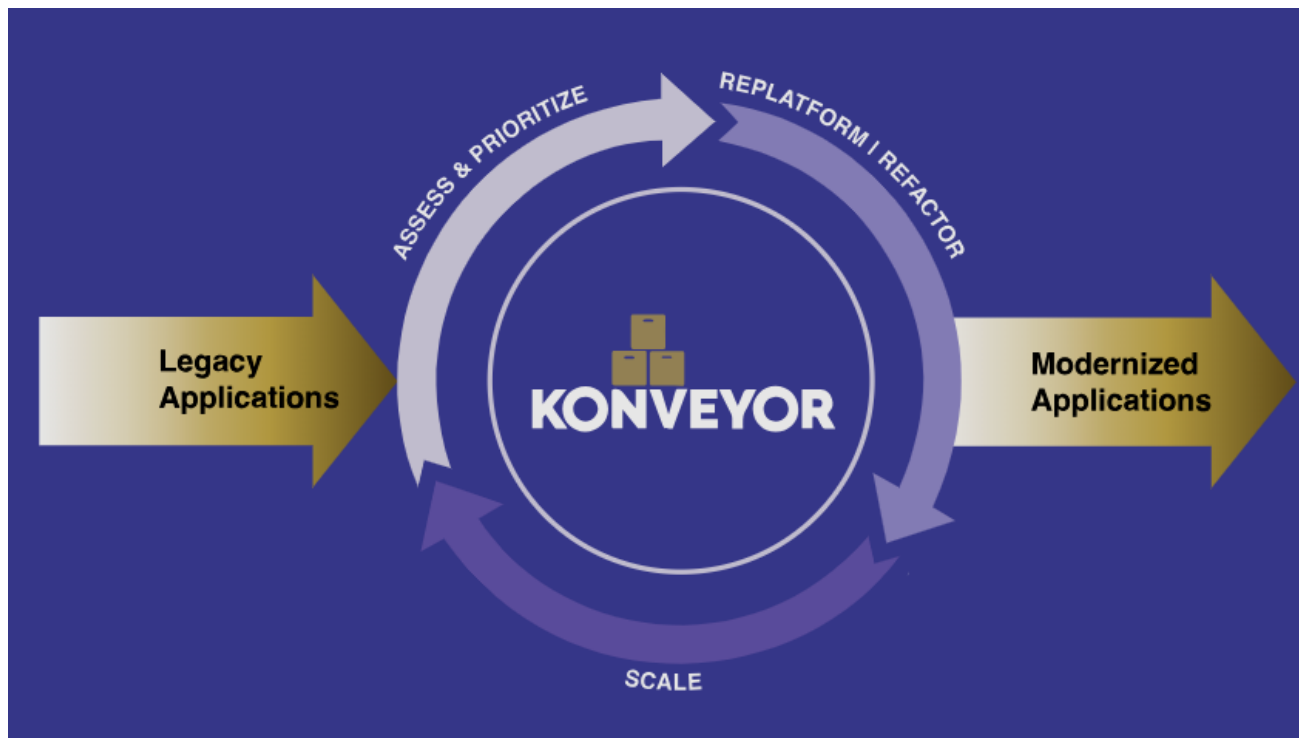


# Konveyor Projects and Migration Toolkits by Red Hat

A community of **people** passionate about **helping others modernize** and migrate their **applications** to Kubernetes by **building tools and discovering patterns** of how to **break down monoliths, adopt containers, and embrace Kubernetes**.



Konveyor is a CNCF Sandbox project



## Red Hat Supported Operators

- Migration Toolkit for Applications
- Migration Toolkit for Containers
- Migration Toolkit for Virtualization

# Migration Toolkit for Virtualization

Bringing traditional virtual machines into OpenShift



## Migration tooling

- ▶ **Migration Toolkit for Virtualization (MTV)**
- ▶ Warm and parallel migration of VMs at scale
- ▶ VM Validation
- ▶ Network and Storage mapping
- ▶ Comes free with OpenShift Virtualization

### Create Migration Plan

- 1 General
- 2 VM selection
- Filter VMs
- Select VMs
- 3 Storage mapping
- 4 Network mapping
- 5 Hooks
- 6 Review

#### Select VMs

Select VMs for migration. The Migration analysis column shows the risk associated with migrating a VM as determined by Red Hat's Migration Analytic service. The Flags indicate the reason for that risk assessment.

	Name	Filter by name...	Name	↓	1	of 1		
▶	<input type="checkbox"/>	<b>Migration analysis</b>	<b>VM name</b>	<b>Datacenter</b>	<b>Cluster</b>	<b>Host</b>	<b>Folder path</b>	
▶	<input type="checkbox"/>	⚠	VM1	datacenter1	cluster1	host1	folder1/folder2	
▶	<input type="checkbox"/>	✔	VM2	datacenter1	cluster1	host1	folder1/folder2	
▶	<input type="checkbox"/>	i	VM3	datacenter1	cluster1	host1	folder1/folder2	
▶	<input type="checkbox"/>	✔	VM4	datacenter1	cluster1	host1	folder1/folder2	
▼	<input type="checkbox"/>	!	VM5	datacenter1	cluster1	host1	folder1/folder2	

This VM is a **high risk** for migration because it violates the following rules:

- VM shares a disk with other VMs
- VM uses remote device management
- VM was harvested during a month without an "r" in it

# OpenShift Virtualization - Services Journey

Strategy

Foundation

Expand

Evolve

**Training & Certs** - Discounted training bundle: [Managing Virtual Machines with Red Hat OpenShift Virtualization + Exam \(DO317\)](#)

**Phase 1 - Virtualization Migration Assessment**

- **Analyze** current VM Architecture
- **Identify** VM workloads
- **Define** integrations
- **Understand** Day 2 Ops
- **Propose** high-level design and roadmap
- Build **lightweight business case**

**Phase 2 - Migrate: OpenShift Virtualization Production Build + Migration Factory**

- **Deploy** OpenShift cluster with optional container storage integration
- **Enable & validate** virtualization features
- **Migration** of initial VM workloads
- **Validate** strategy for scale
- **Automate** Day 2 Operations

**(Optional Phase 1.5) - OpenShift Virtualization Proof of Value**

- **Proof of Value** of the virtualization platform, with meaningful workloads migrated

- **Automated migration** of VM batches with Ansible Automation Platform
- **Automated configuration** of components like networking and storage with Ansible Automation Platform
- **Repeat** migration patterns
- **Validate** migration
- **Retire** legacy platform
- Measure **value realized**

**App Modernization Accelerator (Optional)**

- Optional solution for customers that want to modernize apps to containers
- Onboard initial app teams to platform functionality provided by OpenShift

**Ansible Automation Acceleration (Optional)**

- Optional Services Map to accelerate Ansible Automation for the Enterprise

**Technical Account Management** - Operational guidance & advisory services from an OpenShift TAM

# Summary

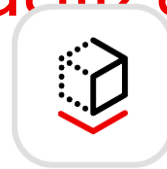
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# Muchas gracias


Red Hat es el principal proveedor mundial de soluciones empresariales de código abierto con un enfoque impulsado por la comunidad que permite ofrecer tecnologías de alto rendimiento de Linux, nube, contenedor y Kubernetes. Le ayudamos a estandarizar en todos los entornos, a desarrollar aplicaciones nativas de la nube, a integrar, automatizar, asegurar y gestionar entornos complejos gracias al soporte, training y servicios de consultoría galardonados.

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