



Free WEBINAR
BY GSE BELUX

**Discover & experience
the new world of containers**

Thursday January 14, 2021
16:00-17:30

Free WEBINAR

Dynamic Schedule ☺

DevOps, Containers

Demonstration - Containerization

Kubernetes

Red Hat OpenShift

Demonstration - Kubernetes and Containers on LinuxONE

Quarkus Introduction

Demonstration - Quarkus on LinuxONE

Why LinuxONE?

Demonstration Red Hat OpenShift on LinuxONE

Why Red Hat OpenShift on LinuxONE?

LinuxONE Community Cloud, Final O&A

“Innovation that makes the Difference” requires DevOps

Traditional way of working

- ▶ Perception of the Developer

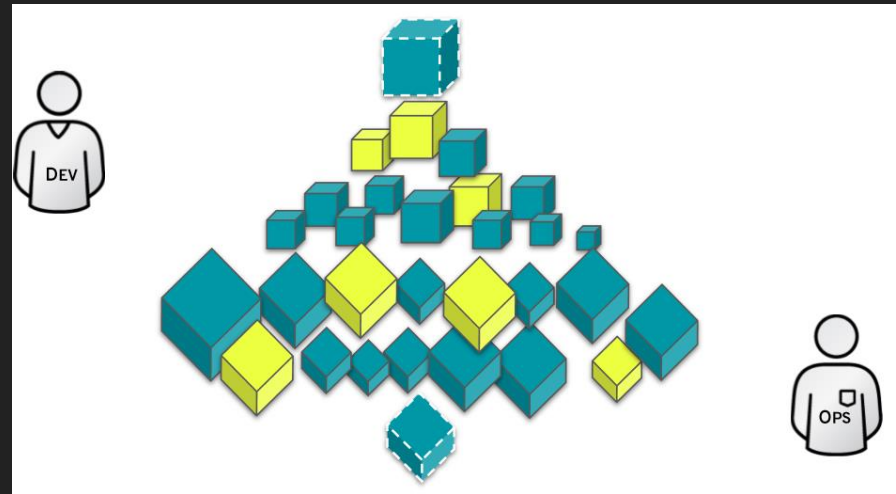


- ▶ Perception of Operations



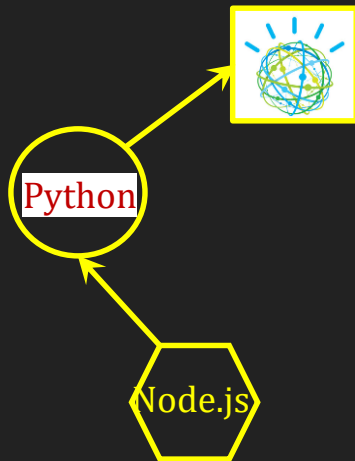
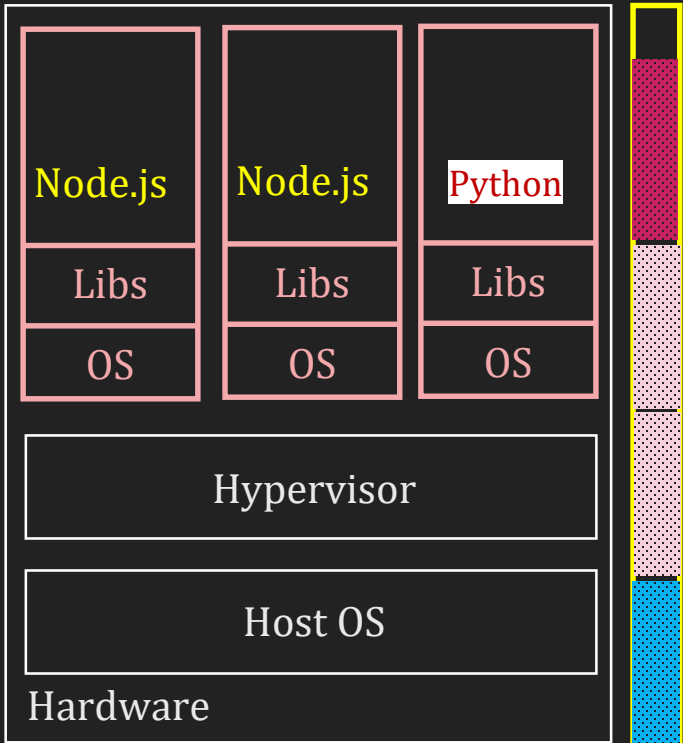
DevOps: Containers as a Glue and a Bridge

No “hand over moment” any more

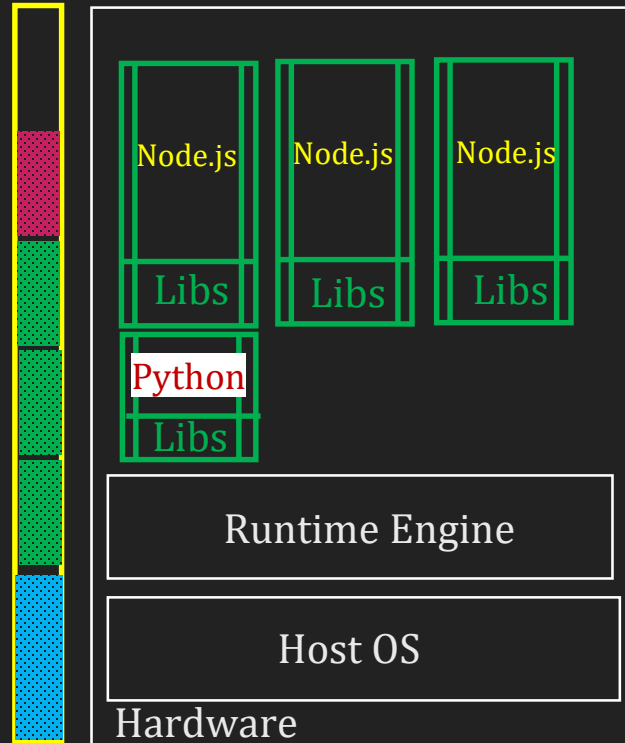


What are Containers?

VMs



Containers



What are Containers about?

VMs are ISOLATED

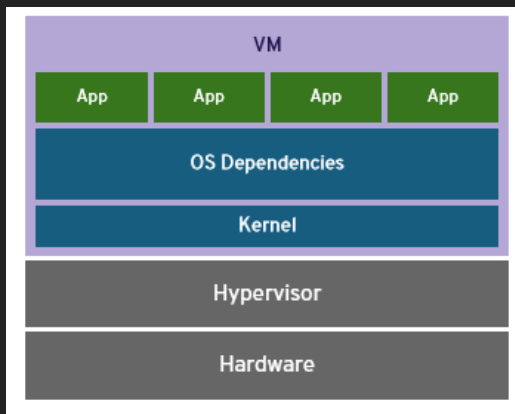
Apps are NOT

Complete OS

Static Compute

Static Memory

High Resource Usage



Containers are ISOLATED

So are the Apps

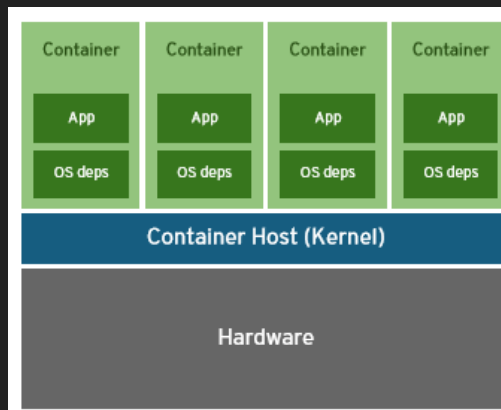
Shared Kernel

Burstable Compute

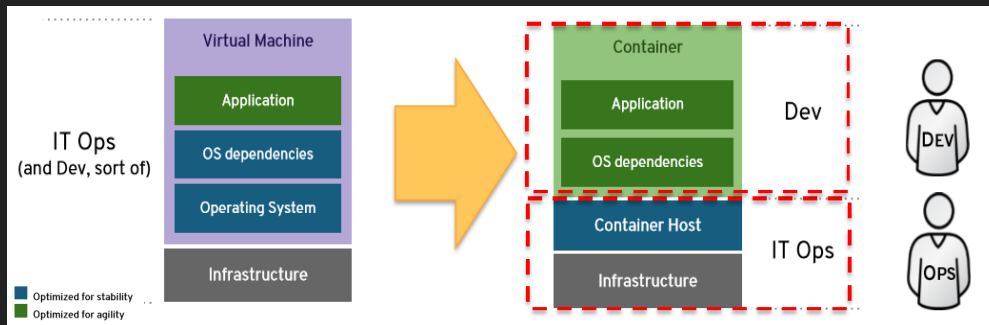
Burstable Memory

Low Resource Usage

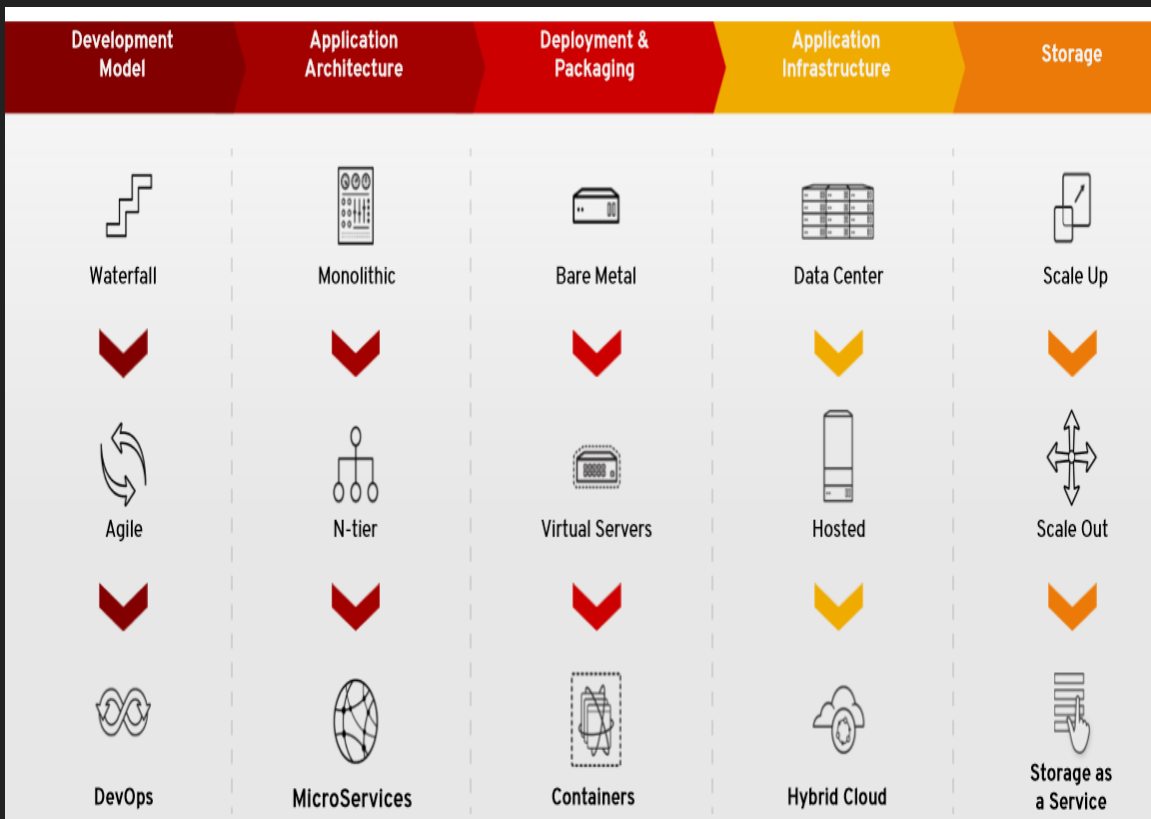
Flexible and Portable



Clear ownership boundary between Dev and IT Ops drives DevOps adoption and fosters agility



Containers are part of an Holistic Evolution



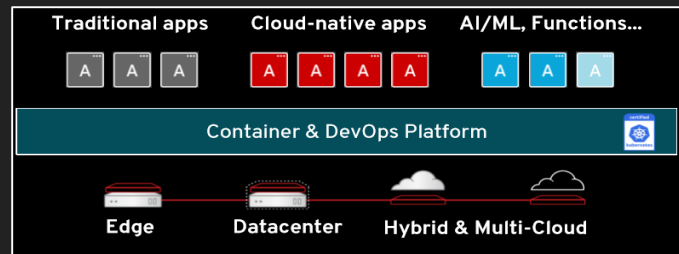
What is a Container?

For Operations ...

- ▶ Sandboxed application processes on a **shared Operating System**
- ▶ **Simpler, lighter**, and denser than virtual machines
- ▶ **Portable** across different environments

For a Developer ...

- ▶ **Package** “my application” and all its dependencies
- ▶ Deploy in seconds to any environment and enable **CI/CD**
- ▶ Easily access and **share containerized components**





DEMO

Containers

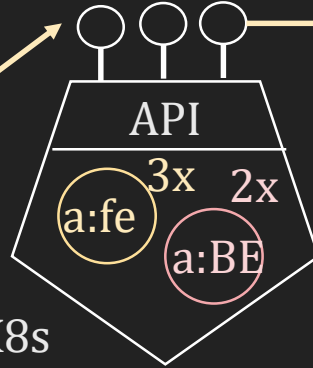
What is Kubernetes?

```
kind: deployment      manifest.yml
selector: {a:fe}
replicas: 3
template:
  kind: Pod
  image: EricMichiels/fe: v1
  labels:
    a: fe
kind: service
selector: {a:fe}
type: Load Balancer
```

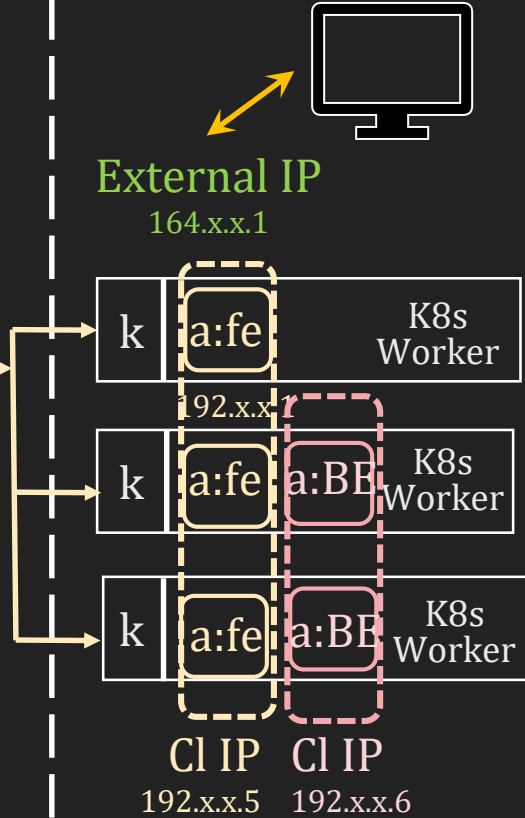


kubectl

K8s Master



Cloud | Customer



Why Kubernetes, a.k.a. “K8s” ?

<https://kubernetes.io/>

K8s, is an open-source system for automating the deployment, the scaling, and the management of **Containerized applications**

Groups Containers, that make up an Application, into logical units for easy management and discovery

Horizontal Scaling, with a Command, the GUI and based on CPU Usage

Automated Rollouts and Rollbacks of application changes while monitoring application health

Deploy and update Secrets and Application Configurations without rebuilding images and exposing secrets

Batch Executions and Workloads, replacing failing containers if desired

Service Discovery and Load Balancing across Pods

Service Topology awareness, to route service traffic based upon cluster topology

Storage Orchestration, Local or in public cloud our Network Storage

Automatic bin packing based on the resource requirements of the Containers

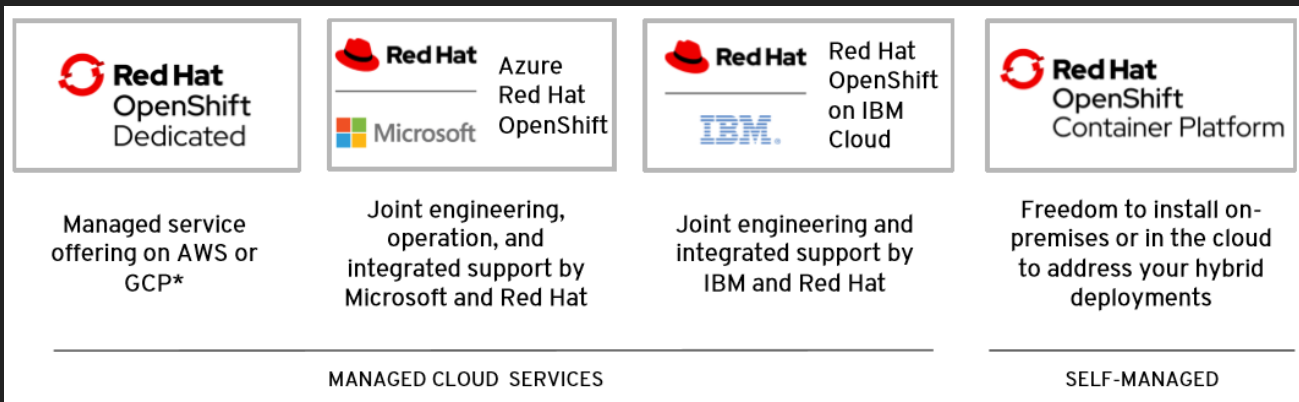
Self-Healing, restarting failing containers, killing not-responding containers

OK great, but what if I want ...

- Professional **support**
- To manage **public, private and virtual** infrastructure
- Apply **security policies** before running containers
- Easy set-up of **Authentication and Authorization** processes as well as **RBAC**
- A ready-to-use **Dashboard** Interface for administration of Clusters, Projects, Servers and Roles
- **Deployment Versions** and **Automated Deployments**, based on triggers
- Easily build **CI/CD pipelines** using an integrated CI/CD solution
- An integrated **Image Registry**
- To use my **RHEL package management** system for updates to the Container Orchestration Platform
- An **easy installation** process of the Container Orchestration Platform
- Automated Container **Operations** (“Operators”)
- A complete Container **Storage Technology** Stack
- A complete **Developer Console** and easily build a **Container Image from Source Code** (Source2Image)



OpenShift Consumption Models (Cont.)



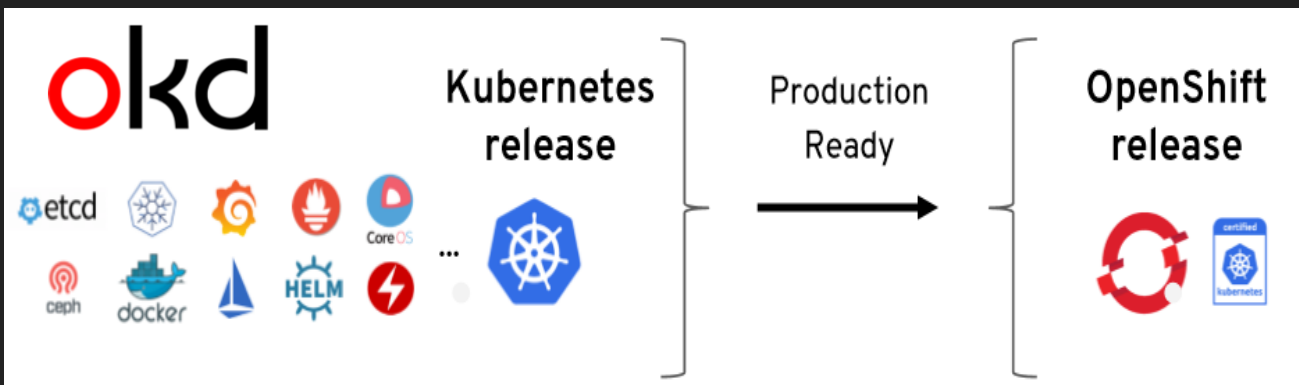
► In all of these scenarios is OpenShift your trusted **Enterprise Kubernetes**

► 200+ **validated** integrations

► **Certified** container ecosystem

► **9-year** enterprise life-cycle management

► Red Hat is a leading Kubernetes contributor since day 1



Red Hat OpenShift 4.6 is available on IBM LinuxONE

LinuxONE Community Cloud

IBM LinuxONE Community Cloud

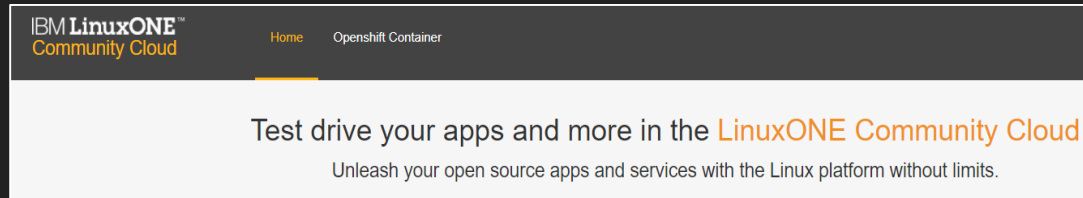
The IBM LinuxONE Community Cloud is a no-charge, 24 x 7, enterprise-grade, open access, shared public cloud environment on IBM's LinuxONE III platform

Login or register

Get started with IBM LinuxONE

Unleash the power to innovate with IBM LinuxONE Community Cloud

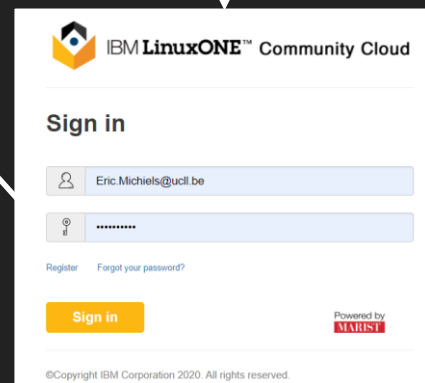
<https://developer.ibm.com/components/ibm-linuxone/gettingstarted/>



IBM LinuxONE™ Community Cloud

Home Openshift Container

Test drive your apps and more in the **LinuxONE Community Cloud**
Unleash your open source apps and services with the Linux platform without limits.



IBM LinuxONE™ Community Cloud

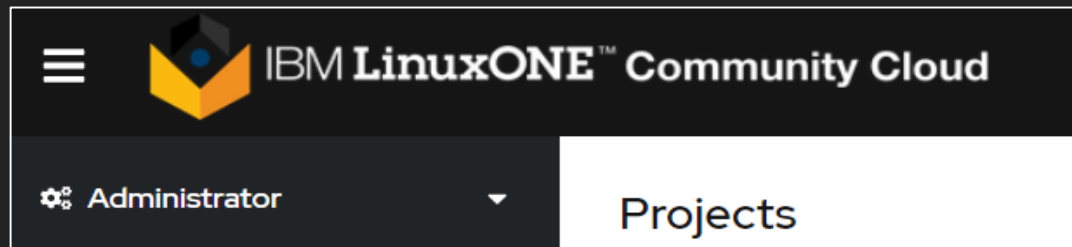
Sign in

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IBM LinuxONE™ Community Cloud

Administrator ▾

Projects

A LinuxONE for Everyone !

The IBM LinuxONE Generation III family

LT2 Mono-Frame



LT1 Single-Frame



LT1 Dual-Frame



LT1 Triple-Frame



LT1 Quad-Frame



From 65 cores @ 4.5 GHz to 190 cores at 5.2 GHz

From 65 GB Memory to 40 TB Memory

From 40 LPARs to 85 LPARs

Consolidate from 11 to 17 cores running Red Hat OpenShift Clusters

Right-sized to fit your
business needs

Designed for highly secure
data and cloud serving

Lower total cost of
ownership than x86

Engineered for
performance and scale



DEMO

Kubernetes and Containers on LinuxONE



DEMO

Quarkus on LinuxONE

LinuxONE is designed for cache-intensive workloads

LinuxONE has over **8x more lower-level cache** and over **15 times more mid-level cache** than x86

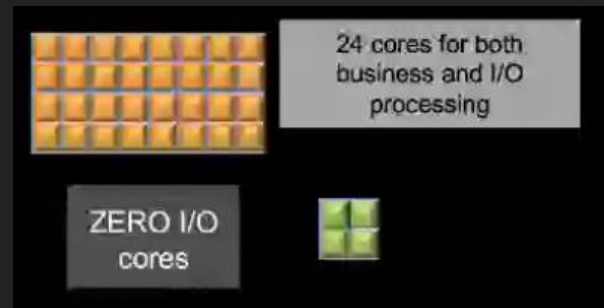
LinuxONE - Four Levels of Cache

- L1: 128 KB (I) and 128 KB (D) per core
- L2: 4 MB (I) and 4 MB (D) per core
- L3: 256 MB – shared by all active cores on the chip
- L4: 960 MB – on separate chip, shared by all active cores

x86 - Three Levels of Cache (Skylake-SP)

- L1: 32 KB (I) + 32 KB (D) per core
- L2: 1 MB (I)
- L3: 1,375 MB per core

LinuxONE- high I/O Bandwidth Business Workloads

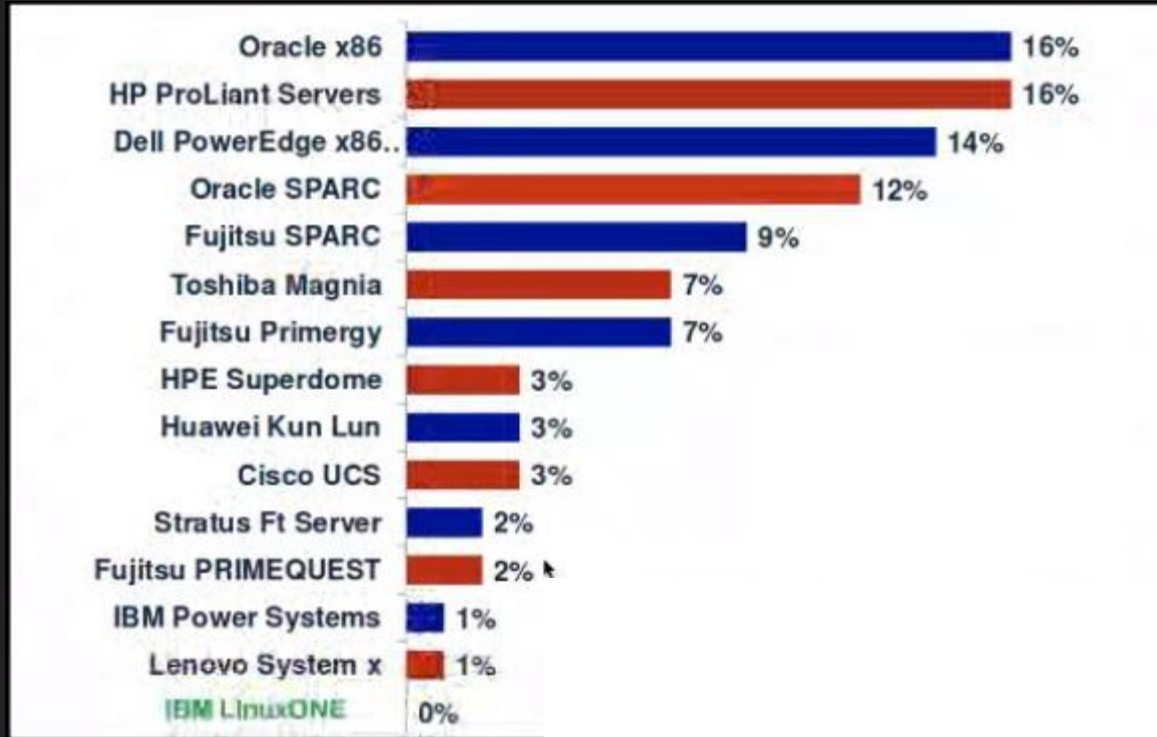


10 to 40 % of typical applications procession is estimated to be I/O processing

Only LinuxONE has specialty cores dedicated to I/O Processing

LinuxONE has about 80x more I/O channel processors that typical scale-out serves

Resilience, Uptime, Availability is “2nd to NONE”



ITIC surveys show IBM LinuxONE had no unplanned system downtime due to inherent flaws in hardware

Unplanned Downtime of > 4 hours on each server platform

(Source: ITIC 2017-2018 Global Server Hardware, Server OS Reliability Survey)

Encrypt and Protect More Data with Less Hassle

nearly **4 million records** stolen per day – that's **2,623** per minute



of the **9 Billion** records breached since 2013. **only 4%** were encrypted

1 in 4 companies are likely to experience a **breach**



the greatest security mistake organizations make is failing to protect their networks and data from **internal threats**



45% more security incidents due to **unauthorized access**



1/3 of companies have **no process for tracking or fixing vulnerabilities** in the open-source code they use

a business will fall victim to a ransomware attack **every 14 seconds**

cyber attacks can put **60%** of their victims out of business



DEMO

Red Hat OpenShift on LinuxONE

PoCs with Red Hat OpenShift on LinuxONE (IBM Cloud Paks incl.)

Government

Digital Transformation with Cloud Native Apps on IBM Z

Education

Containerize applications on IBM S for student tracing

Financial Services

Co-Locate Containerized Workloads with z/OS Data to achieve lower response times

IT Services

Containerizing applications on IBMZ

Manufacturing

Accelerate Application Development and Deployment with Containers

Financial Services

Migration of COBOL applications to Red Hat OpenShift running on IBM Z

Financial Services

Accelerate Application Development and Deployment on IBM Z

Financial Services

Develop and Deploy Cloud Native Applications on IBM Z

Financial Services

Adopt Cloud Native on Z to achieve consistency and grow containerized workloads on IBM Z

Financial Services

Reduce latency of applications by moving close to data on IBM Z

Government

Faster Application Development and Consistent Management

Financial Services

Java applications connected to IBM z/OS Data

- *15 Client PoCs going on*
- *Tens of PoCs planned*
- *100^{rds} of engagements*

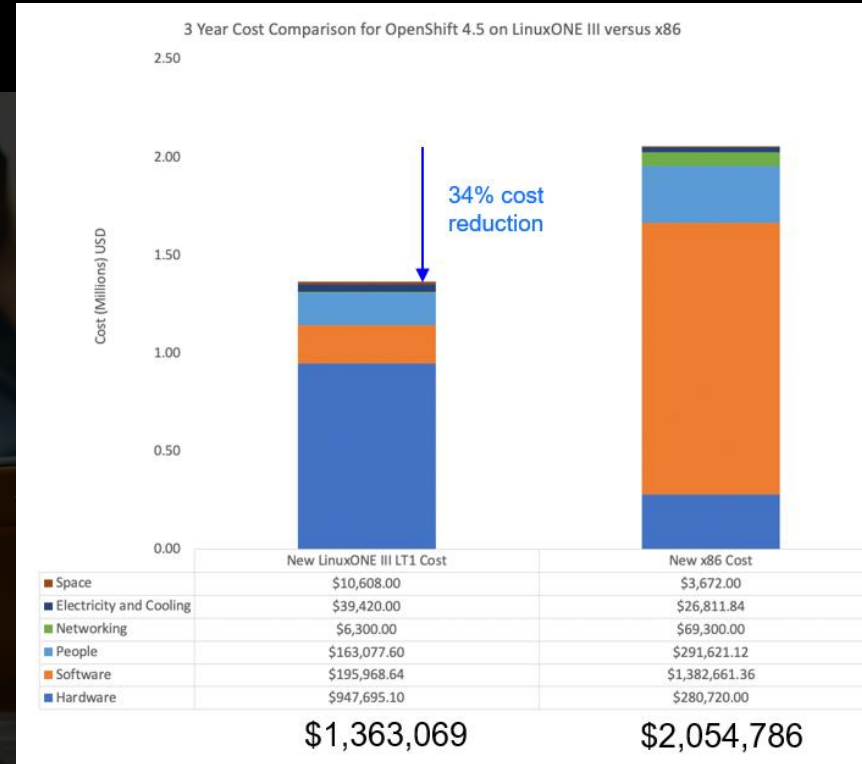
Why **Red Hat OpenShift** on **LinuxONE**?

Unrivaled Economics through Engineering

Consolidate
“priced per core”
data serving
infrastructures

Consolidate 100s, and possibly **more than a 1,000 x86 cores** onto a **single LinuxONE III LT1 server**

Reduce costs by up to 40% over a 3-year period compared to x86



Why **Red Hat OpenShift** on **LinuxONE**?

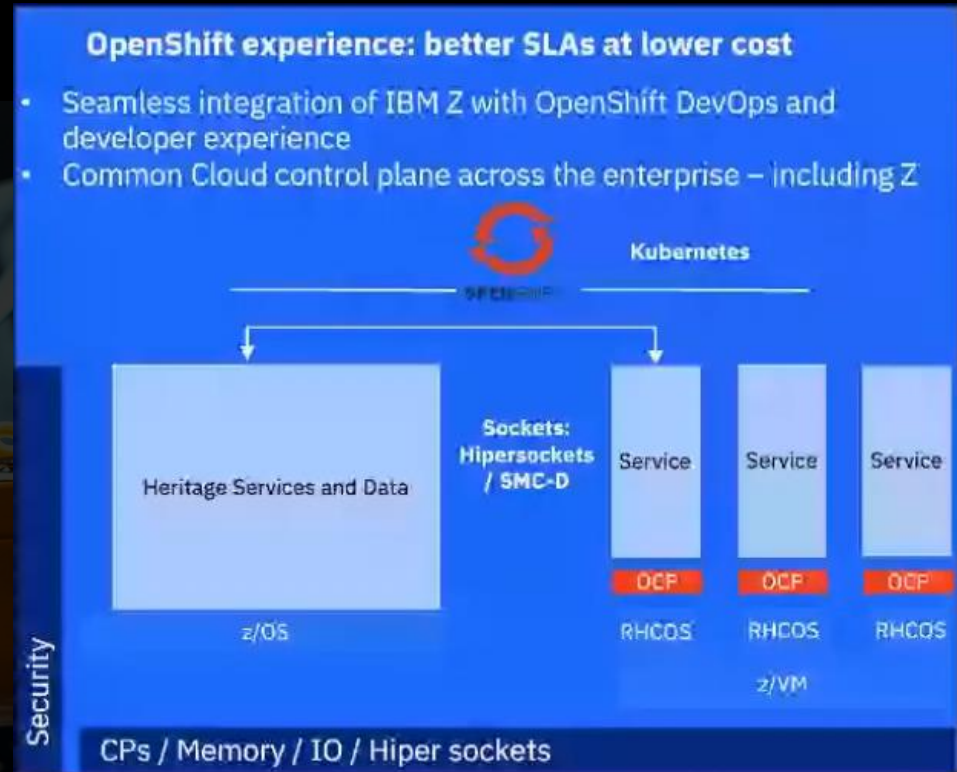
Performance – Co-Locate with Heritage Services and data

Accelerate digital transformation

- Containerized services running in Linux on Z are co-located on the same hardware with Db2 for z/OS Data and CICS for low latency, high volume transaction processing
- Achieve up to **7.3x lower latency** by **co-locating** applications on IBM Z compared to connecting to an x86 Server

Modernize and digitally transform

- **Modernize and extend** mission-critical legacy assets incrementally while **maintaining enterprise SLAs** and keeping **risk and cost low**

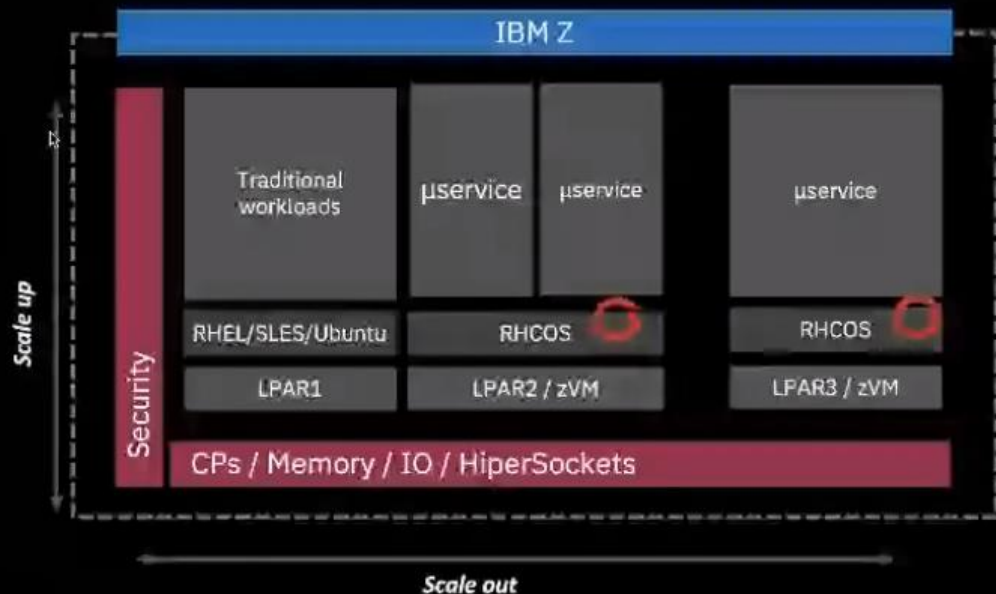


Why **Red Hat OpenShift** on **LinuxONE**? “Private Cloud in a Box”

Super elastic system

- Combine **horizontal** and **vertical** scaling
- **Non-disruptively** add or remove resources from Linux guests
- Non-disruptively add or remove Linux Guests
- Digital transformation – Develop new applications using **Microservices**
- Elastic diagonal scale for cloud (scale-up and scale-out in a single footprint)
- **Consolidation** – save software licensing, power and space

Typically offered as an alternative to moving to public cloud within client organizations



Scalable, elastic and highly available “cloud in a box”

*Thank you
for your
attention !*

IBM LinuxONE Community Cloud

The IBM LinuxONE Community Cloud is a no-charge, 24 x 7, enterprise-grade, open access, shared public cloud environment on IBM's LinuxONE III platform

Let us dream and suppose you find some spare time...

LinuxONE Community Cloud

<https://www.ibm.com/community/z/linuxone-cc/faststart/>

Containers

<https://www.youtube.com/watch?v=0qotVMX-I5s>

Kubernetes

<https://www.youtube.com/watch?v=aSrqRSk43IY>

Red Hap OpenShift:

https://www.youtube.com/watch?v=KTN_QBuDplo

IBM Cloud Paks

<https://www.youtube.com/watch?v=78wvDIK5Hys>

LinuxONE

<https://www.youtube.com/watch?v=CTpWg7P0COE>

RedHat OpenShift on LinuxONE

<https://www.youtube.com/watch?v=0iswIY8T2lg>

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