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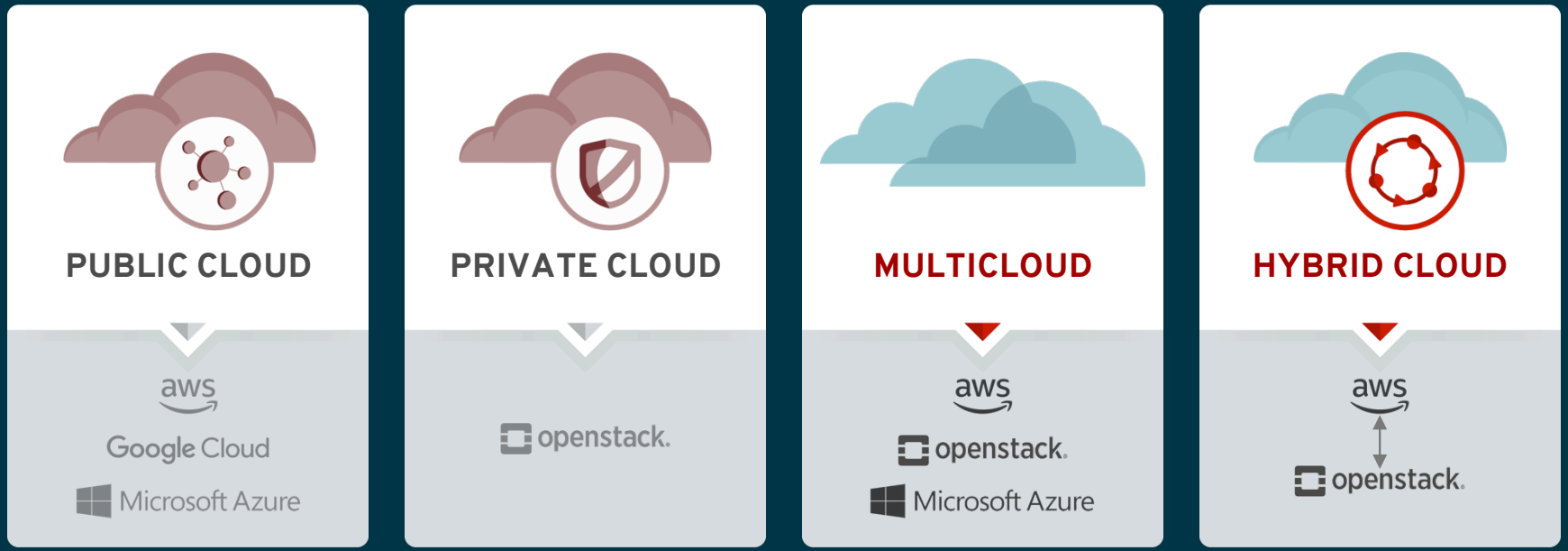
RED HAT HYBRID CLOUD STRATEGY

Hervé LEMAITRE
Field CTO & Business Strategist
Red Hat

CLOUD TYPES



WHAT IS MULTICLOUD?

A Red Hat perspective

MULTICLOUD

*noun · \ muhl-tee \ klaud *

Using **multiple clouds** from multiple private or public providers, for multiple workloads/tasks, **without interconnectivity** between clouds.

HYBRID CLOUD

*noun · \ hī-bred \ klaud *

A combination of **public** and **private** clouds, with some degree of workload portability, **integration**, orchestration, and unified management across said clouds.

INTERCONNECTIVITY IS THE KEY

MULTICLOUD

aws | openstack. | Microsoft Azure

VS

HYBRID CLOUD

aws ⇄ openstack.

KEY CHARACTERISTICS OF HYBRID

- Orchestration
- Monitoring & management
- Policy & governance
- Architecture
- Security
- APIs

True hybrid cloud should allow you to achieve consistency across these areas

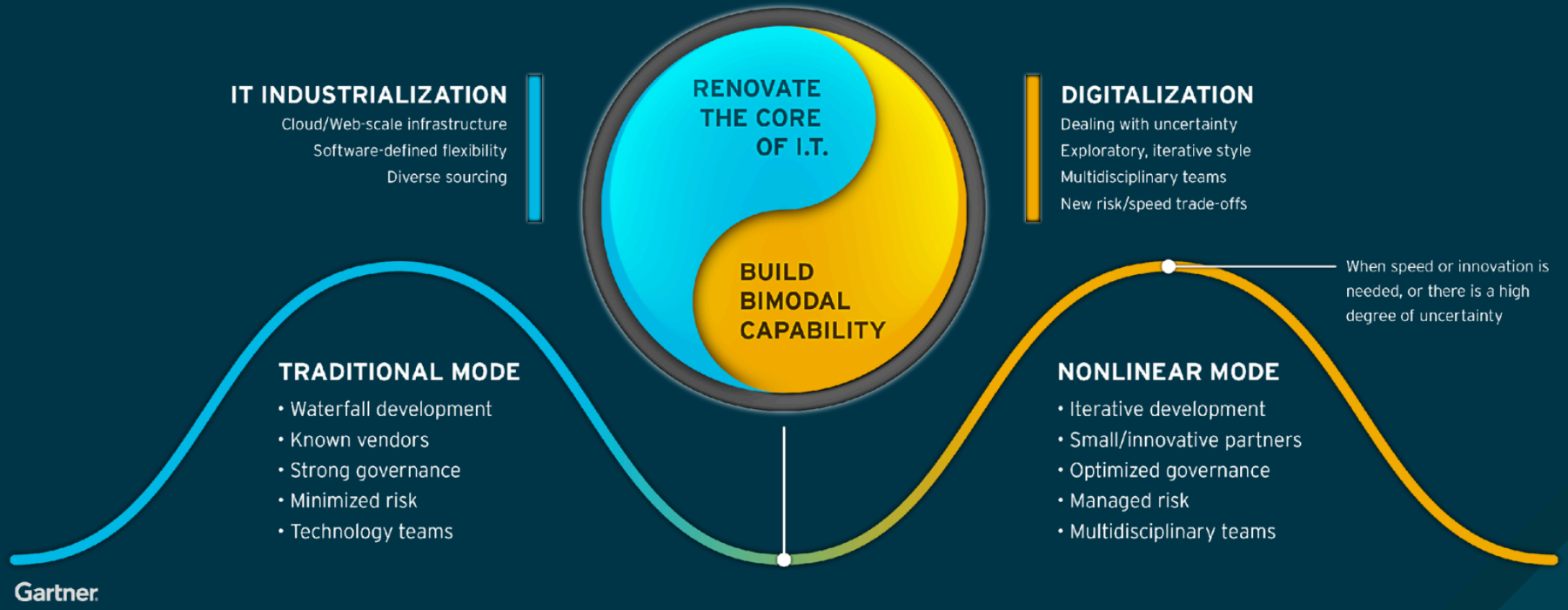
Hybrid cloud is a composition of two or more clouds (private, community, hosted, or public) that remain distinct entities, but are bound together, offering the benefits of multiple deployment models. Hybrid cloud can also mean the ability to connect colocation, managed and/or dedicated services with cloud resources.

HYBRID CAN BRIDGE OLD AND NEW

Choose best infrastructure for workload
Optimize existing investments
Share data
Enable consistent processes and business rules
Deliver new business services

With Hybrid, workloads may span different types of infrastructure at the same time, such as a back-end database on existing infrastructure and new types of services on modern cloud platforms.

“MODE 1” IS NOT GOING AWAY



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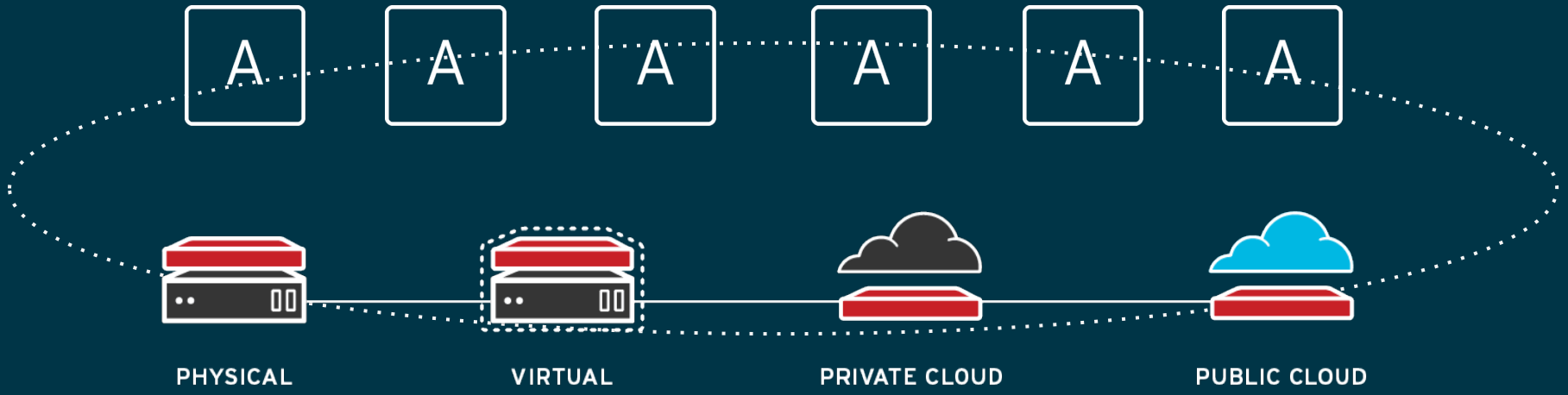
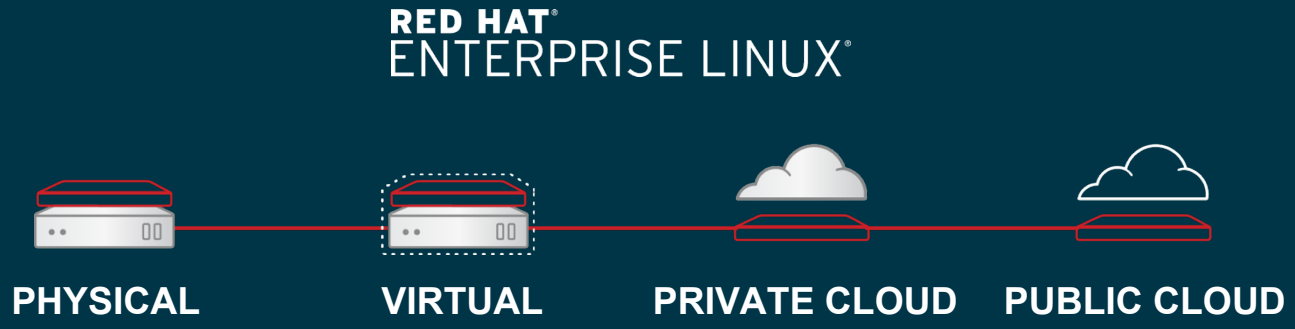
SO IT'S REALLY ABOUT HYBRID "IT"



MAKE THE 4 IT PILLARS **IMMATERIAL** TO CONSUMER/CUSTOMER

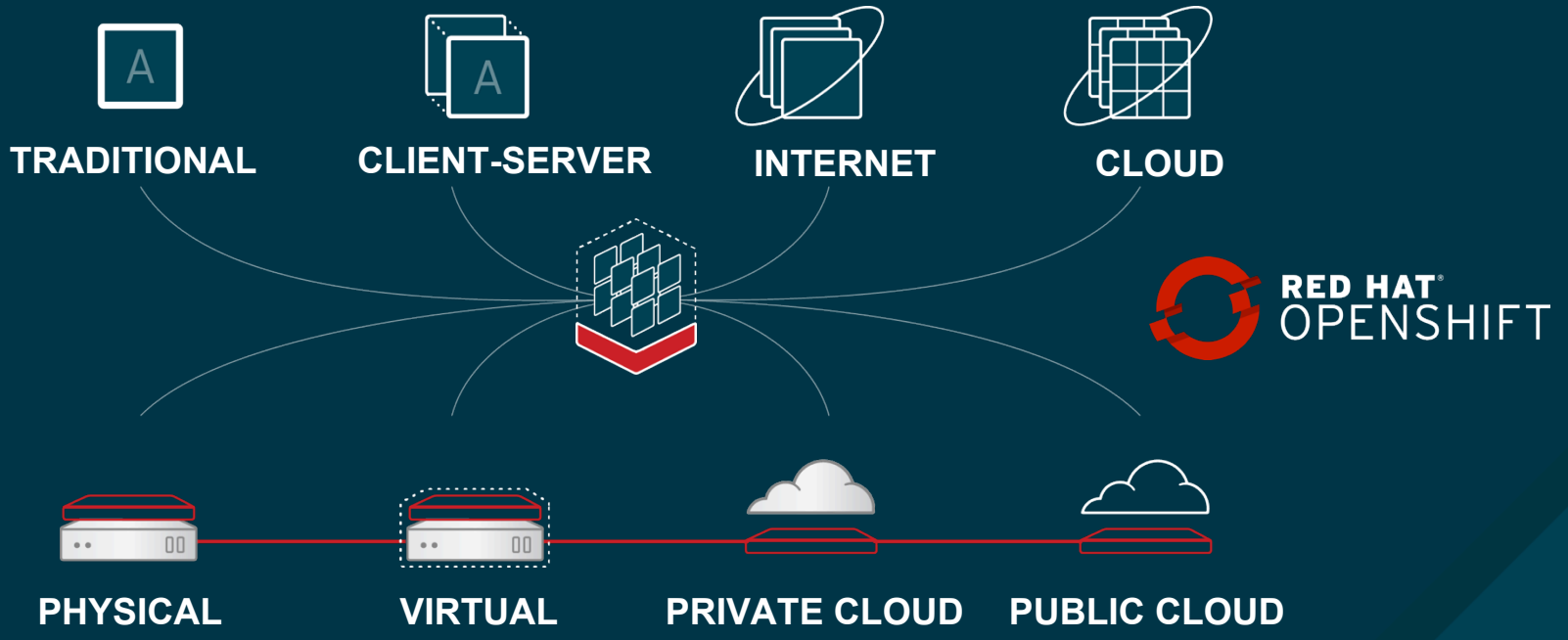
RED HAT'S VISION: OPEN HYBRID CLOUD

EFFICIENT, STABLE TECHNOLOGY FOUNDATION ACROSS ALL 4 FOOTPRINTS



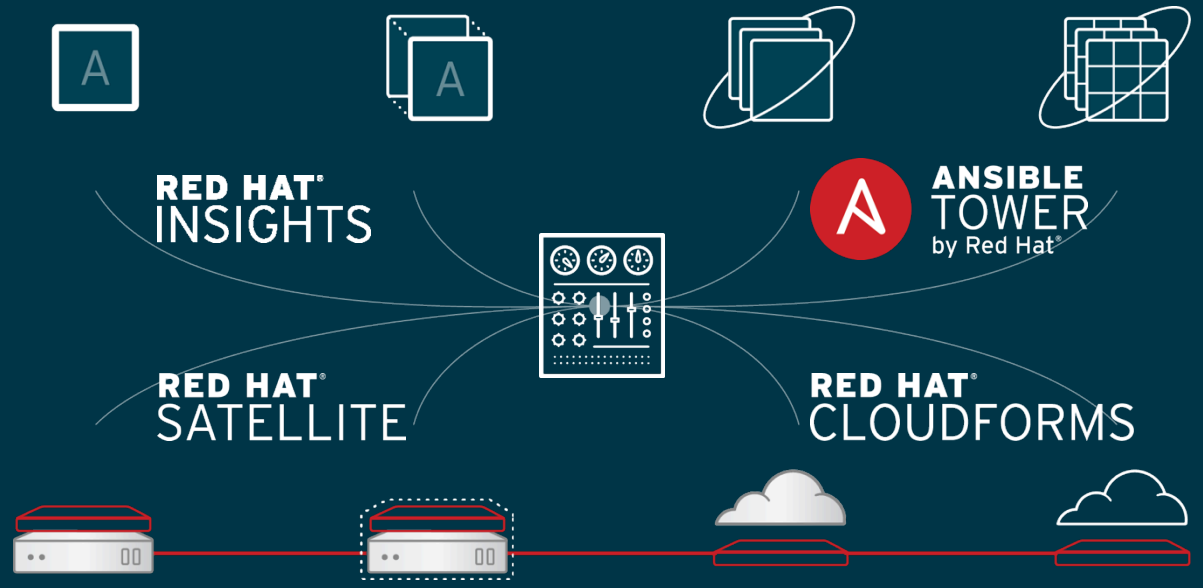
RED HAT'S VISION: OPEN HYBRID CLOUD

ALL KINDS OF APPS AND ENVIRONMENTS, INCLUDING CONTAINERS



RED HAT'S VISION: OPEN HYBRID CLOUD

COMMON MANAGEMENT, INTEGRATION, & AUTOMATION TO KEEP IT ALL GOING



THE 3 PILLARS OF OUR BUSINESS

OPEN HYBRID CLOUD

HYBRID CLOUD INFRASTRUCTURE

Infrastructure software across the 4 footprints, with RHEL at the very core.

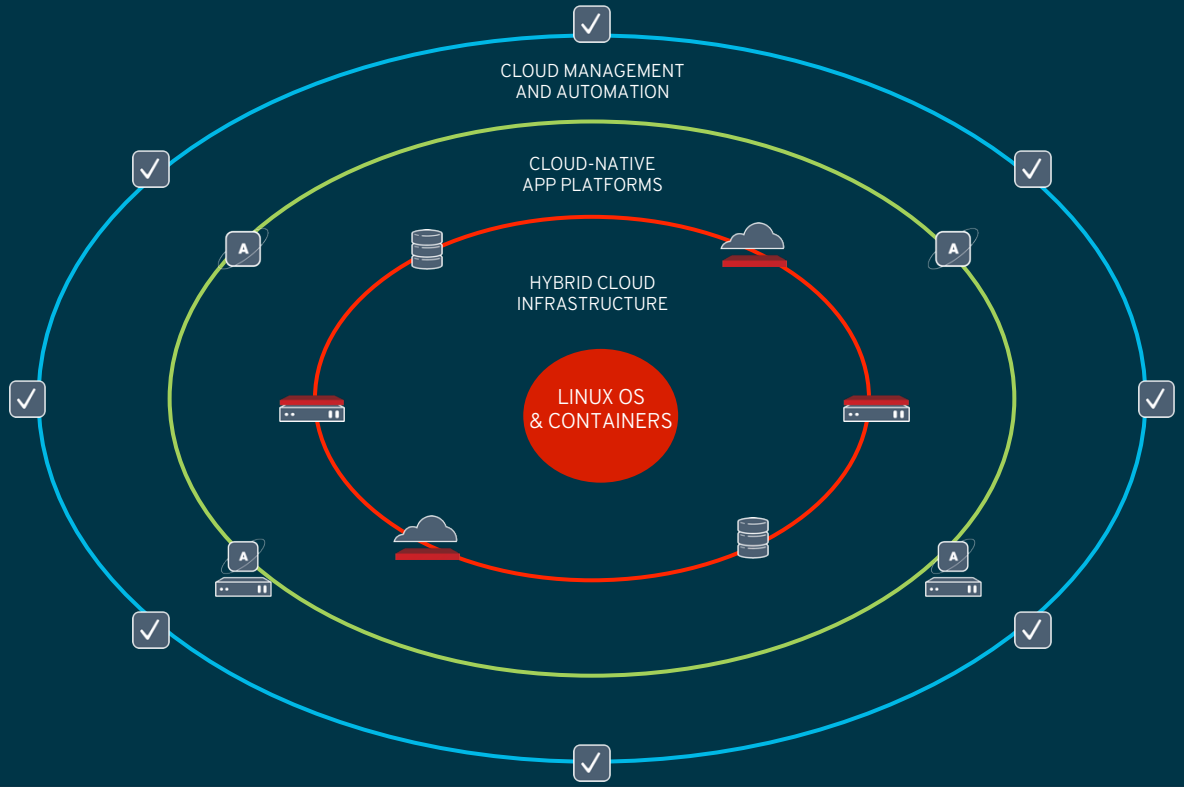
CLOUD-NATIVE APP PLATFORMS

Software to rapidly & efficiently develop & deploy apps across hybrid cloud.

MANAGEMENT & AUTOMATION

Software can simplify management & automation of hybrid cloud environments.

THE PILLARS ARE INTERCONNECTED WITH RHEL AT THE CORE



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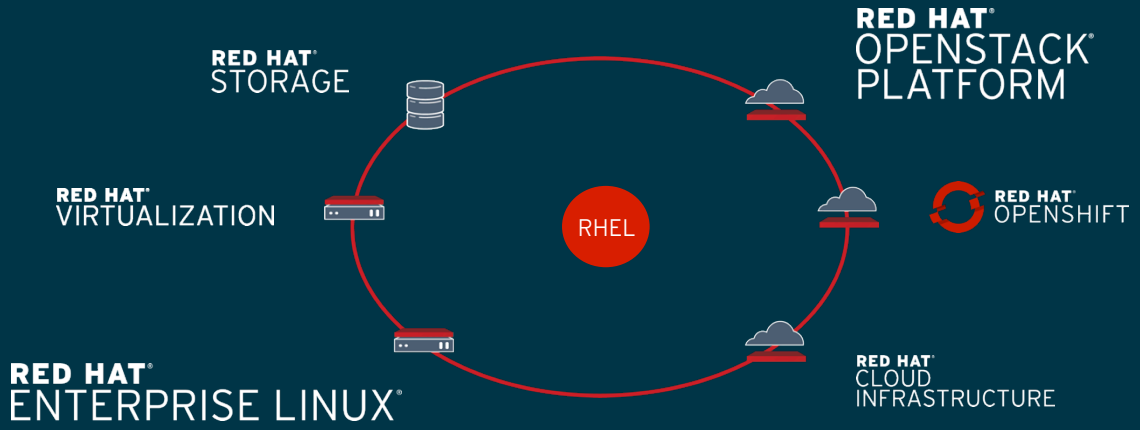

1. Rhel is the TECHNOLOGY enabler
2. Rhel makes infras transparent
3. Openstack is our Private cloud side of Hybrid cloud.
4. Be the **platform of choice on public cloud (RHEL + OpenShift).**
5. Provide hybrid cloud storage.

CLOUD-NATIVE APP PLATFORMS

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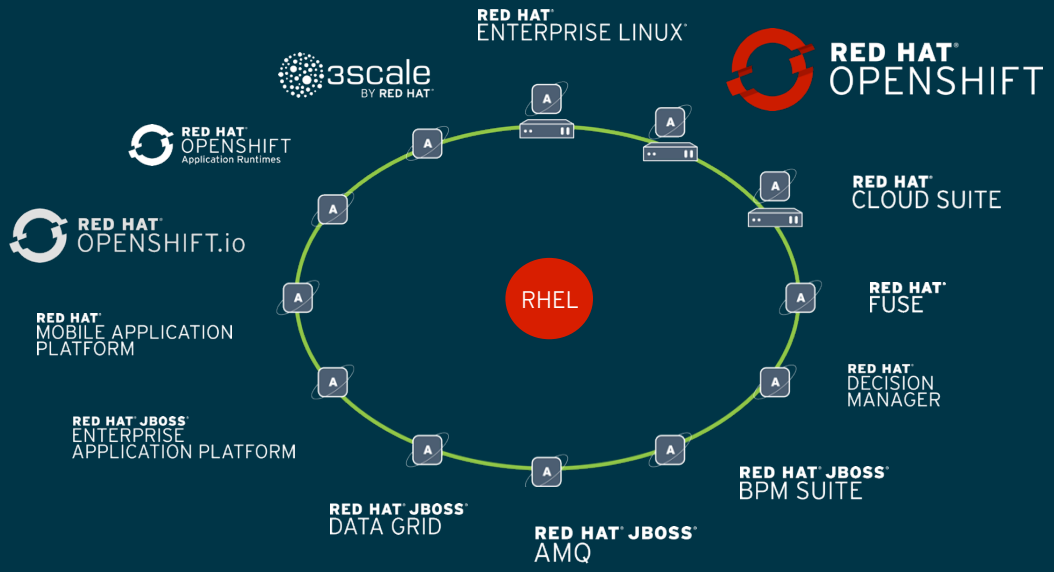
CLOUD-NATIVE APPLICATION PLATFORM



- RHEL foundation for hybrid cloud
- RHEL enabler for container and OpenShift
- Traditional middleware services coupled with Openshift help modernize and migrate legacy application
- New middleware services on OpenShift for new modern workloads
- Openshift as Open Innovation Labs support tooling
- Provide developers easier access to OpenShift

MANAGEMENT & AUTOMATION

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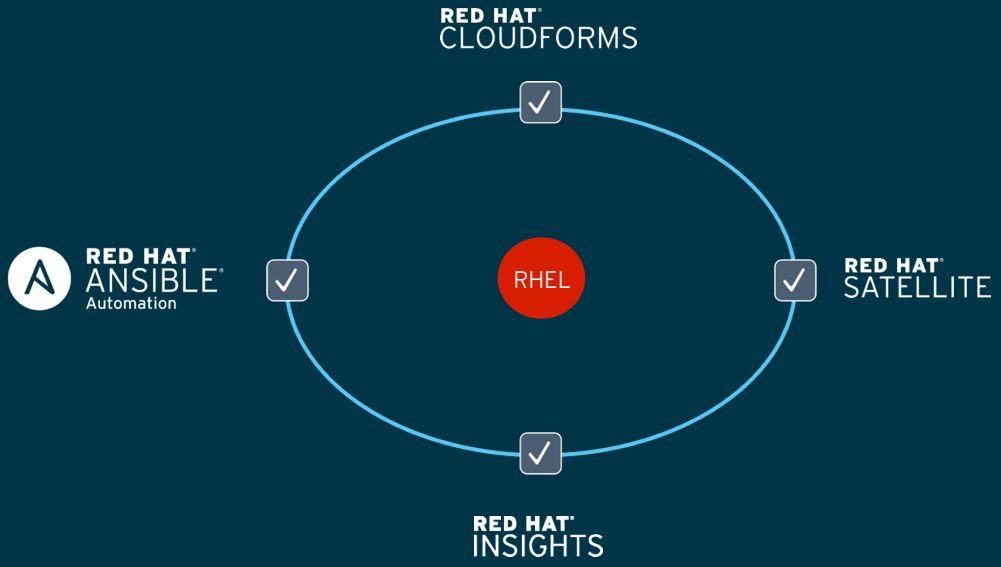
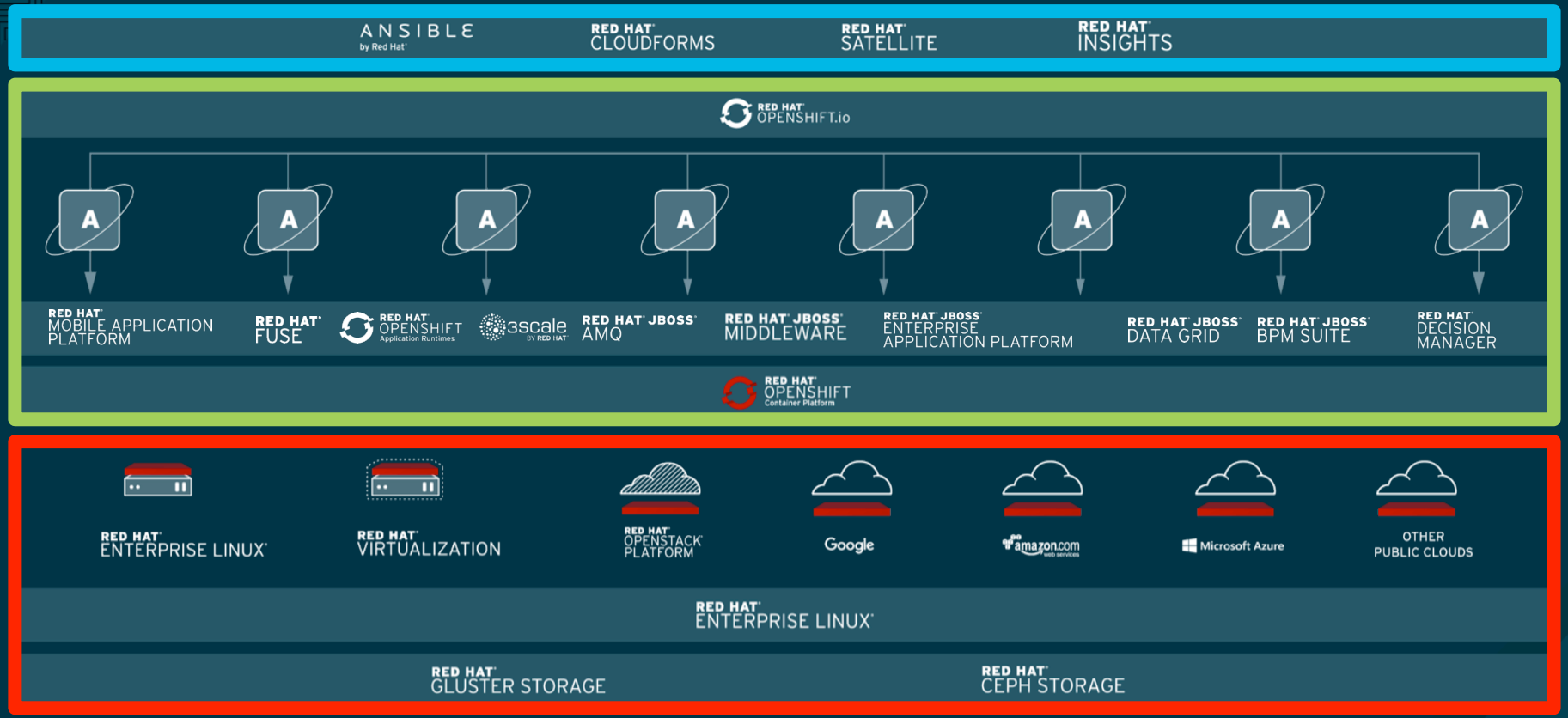
CLOUD MANAGEMENT AND AUTOMATION



1. Automation is required **hybrid cloud management.**
2. Use automation across our product portfolio.
3. **Deliver innovative** fast paced SeeS services (insights)
4. **Leverage Insights** to better understand and automate customer's environment.

THE PORTFOLIO IS CONSISTENT



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OUR BUSINESS

Red Hat is an enterprise-class software company with an open source development model.

VISION

TO BE THE DEFINING TECHNOLOGY COMPANY OF THE 21ST CENTURY

MISSION

TO BE THE CATALYST IN COMMUNITIES OF CUSTOMERS, CONTRIBUTORS AND PARTNERS CREATING BETTER TECHNOLOGY THE OPEN SOURCE WAY

WHY

OPEN UNLOCKS THE WORLD'S POTENTIAL

FROM COMMUNITY TO ENTERPRISE

100% OPENSOURCE

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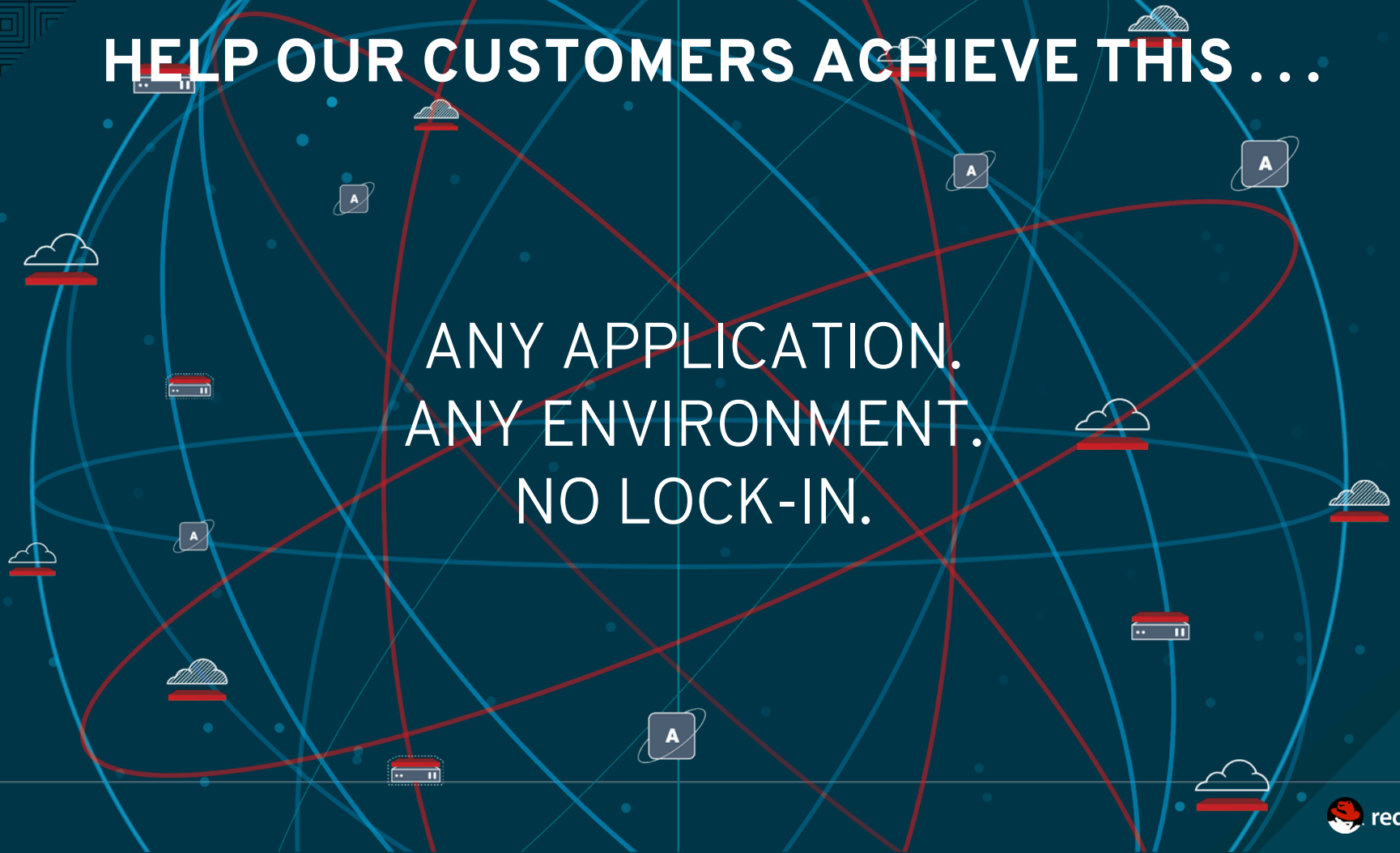
HELP OUR CUSTOMERS ACHIEVE THIS . . .



ANY APPLICATION.
ANY ENVIRONMENT.
NO LOCK-IN.

SOME OF OUR LATEST CONTRIBUTIONS
4 examples

#1

OPENSHIFT : HIGH PERFORMANCE OPTIMIZATION

https://blog.openshift.com/the-path-to-cloud-native-trading-platforms/

Possible to run low latency apps in containers ?

- Use STAC-N1 benchmark (finance services)
- Work with partners (SolarFlare)
- Kub8 community Resource Management Working Group (+SIGs)
- Develop new technology (kub8, kernel…)

STAC-N1: Bare Metal

- Solarflare XtremeScale X2522 Adapters
- Supermicro SYS-1029UX-LL1-S16 Servers
- Red Hat Enterprise Linux 7.5

STAC-N1: Containerized/Kubernetes

- Solarflare XtremeScale X2522 Adapters
- Supermicro SYS-1029UX-LL1-S16 Servers
- Red Hat Enterprise Linux 7.5
- Red Hat OpenShift 3.10 (pre-release)

#1

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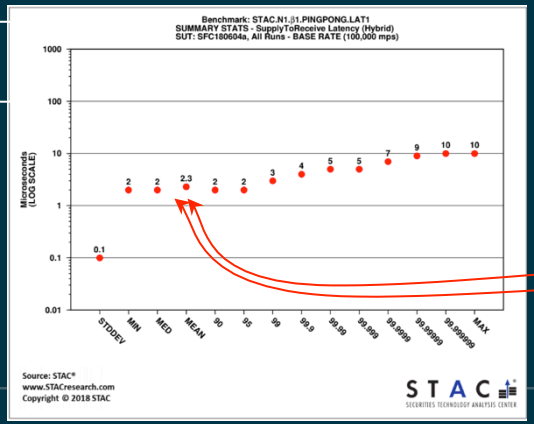
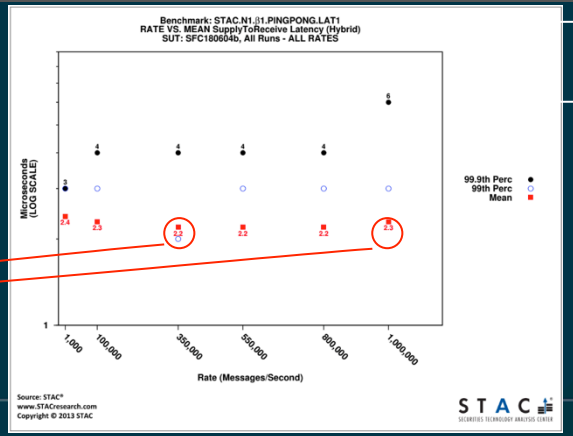
SAME LATENCY / PERFORMANCE BETWEEN BARE METAL AND OPENSHIFT 3.10/KUBERNETES (pre)

(Mean and 99th percentile 100K m/s and 1M m/s)

Bare Metal



vs



Openshift

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#2

OPENSHIFT : CONTAINER NATIVE VIRTUALIZATION

Making VM run in a containerized environment

https://www.youtube.com/watch?v=r8e4bT0-zhU&feature=youtu.be&t=3232

Possible to run a VM in a container ?

Leverage our experience (KVM / oVirt-RHV)

Work in many projects (KubeVirt, oVirt virt-v2v, CDI, Orgin WEbUI…)

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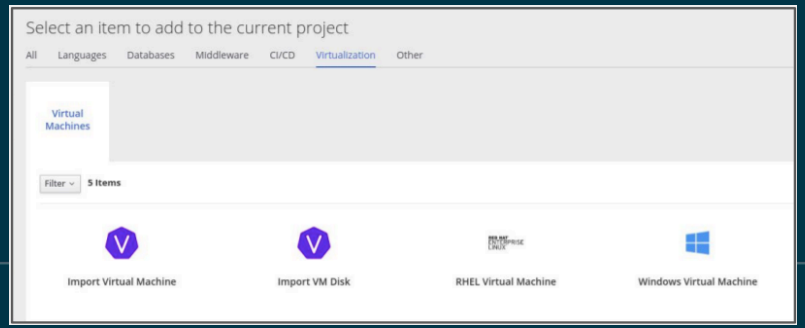
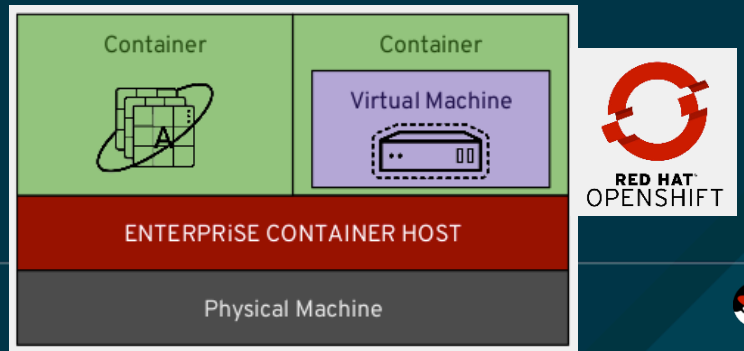
VM image => KVM VM => Service Catalog (template/Ansible) => containerized (including storage and networks)





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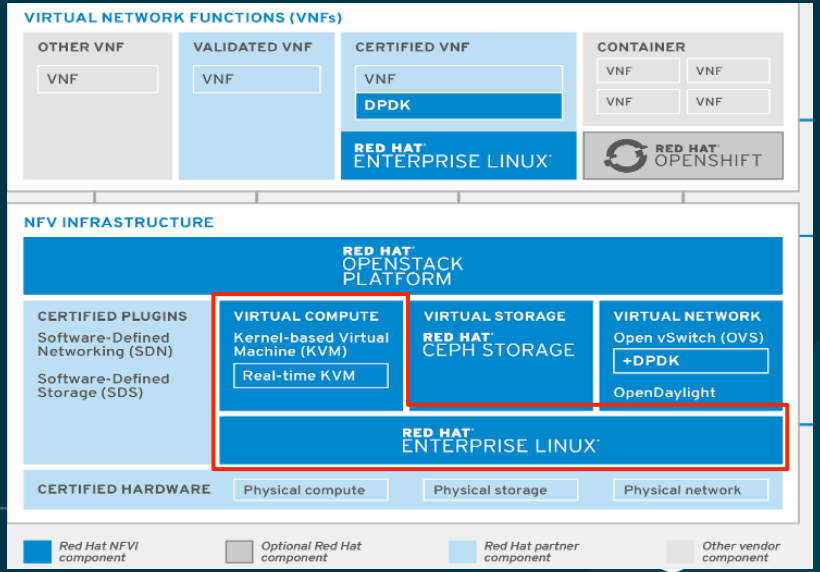
#3

OPENSTACK : REALTIME ENVIRONMENT

Targeting Telco use cases only

- Digital Transformation @ Telco : NFV (Network Function virtualization)
  - From physical nodes running function to virtual (and soon cloud/container) network functions
- OpenStack (Red Hat OSP) is the infrastructure of choice
- **Strong latency requirements** (5G, vRAN…) + transpose hardware assist into virtual SDDC modes
- **Specific technology** : *DPDK, OVS-DPDK / SR-IOV, OVS Hw offload, RT-KVM, …. , QoS, corresponding OSP roles*
  - *rt-cpus (isolated), rt-kernel + rt-kvm, rt VM*

=> Openstack (RHOSP 13) with Realtime compute node : RT Kernel + RT KVM module + tuned profiles



#4

OPENSTACK : HARDWARE ACCELERATION

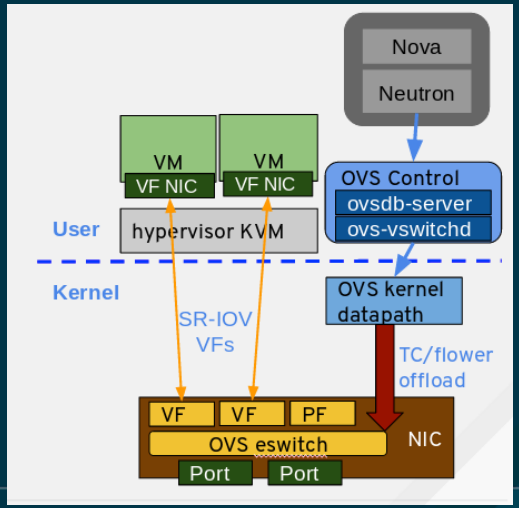
Enabler for ML/AI

- Hardware is still becoming more and more powerful, and dedicated (GPU, FPGAs, smartNICs)
- Compute intensive workloads are becoming usual : HPC, ML/AI (usual frameworks like Tensorflow)

- **Provide hardware assistance** to virtual components

=> Openstack (RHOSP) with hardware acceleration

- GPU passthrough
- FPGA passthrough
- NVidia vGPU (driver sharing)
- OVS offload



MERCI !