

Intelligent Operations for New 5G and Edge Ecosystems: A Game Changer?

Running virtual RAN (vRAN) and open RAN (O-RAN) cloud-native workloads on a virtualized environment rather than on bare metal can help you grow, change, expand and monetize your network at the speed of 5G and beyond. The truth is bare metal is a static, short-term solution for a dynamic, long-term need as protocols continually evolve. VMware® virtualization increases efficiency, flexibility, security and ultimately CapEx and OpEx savings in the short term but is also agile enough to adapt to meet future telco needs rapidly.

Virtualization is the better decision for today and tomorrow, yet there remains some uncertainty about its immediate and long-term benefits. Below, we outline 10 different points of comparison between bare metal and VMware virtual environments when running containerized workloads.

10 points of comparison

between bare metal and VMware virtual environments when running containerized workloads



Performance



Ease of lifecycle management



Hardware optimization



Operational complexity



Trapped capacity



Visualization



Security



Multitenancy



Time to market



Resiliency



1. Performance: RAN workload performance is the same on hypervisors as on bare metal.

Performance is king, and resistance to virtualization often rests on the misconception that running O-RAN or vRAN containerized workloads on a hypervisor increases latency and hinders performance. This is simply not the case. Indeed, industry-standard cyclic tests and OSlat performance tests show no performance penalty when using a VMware ESXi™ hypervisor, and VMware vSphere® 7 Update 3 is easily within RAN workload latency requirements.



2. Hardware optimization: Virtualization saves incredible amounts of hardware, CPU processing power, cooling resources and physical space.

Hardware optimization has become increasingly important for cell sites where space is limited and innovative apps are being developed. The need to use hardware resources wisely is especially acute amidst a global chip shortage that makes new hardware increasingly challenging to achieve. Virtualization allows you to mix and match workloads on the same server, conserving resources and offering significant CapEx and OpEx savings.



3. Trapped capacity: Virtualization achieves maximum asset efficiency by allowing you to share a pool of resources.

Bare metal requires separate resources dedicated to separate functions, often meaning excess processing and memory capacity is being underutilized in off-peak times. Virtualization achieves maximum asset efficiency by allowing you instead to share a pool of resources, easily scaling up and down, distributing workloads and cost-efficiently planning for peak traffic times.



4. Security: Hypervisors and virtual machines (VMs) give you additional layers of security.

When it comes to security, bare-metal servers have limited mechanisms to restrict, secure and isolate network traffic at the hardware level, and containers alone are inadequate security boundaries. vSphere logically isolates workloads and prevents one workload from infringing on another without requiring additional software that increases costs and strains resources.



5. Time to market: Virtualization decreases service delivery from days and weeks to mere hours.

VMware Telco Cloud Automation automates significant aspects of service delivery, including provisioning infrastructure software and designing and managing network functions and services. It automatically customizes the virtual infrastructure and Kubernetes nodes to avoid manual configuration, rollbacks and disparate operational processes between infrastructure and management.



6. Ease of lifecycle management: Hypervisors simplify operating system (OS) upgrades.

In this era of constant and complex software updates, agility is paramount. Yet bare metal forces complex and expensive scale-up and scale-down processes, including disruptions in service for rollbacks and upgrades and hardware replacement for software upgrades. On the other hand, hypervisors decouple OSs from the underlying hardware, enabling operators to change it without risk to applications and services and without taking assets offline.



7. Operational complexity: Virtualization reduces costs and simplifies operations by using the same tools for data center, core network, RAN and edge.

Particularly with RAN deployments reaching tens of thousands of sites, operational simplicity is vital, as is the consistency to support these environments at scale. VMware virtualization utilizes consistent management, tools and orchestration across multiple clouds and provides a vendor-agnostic ecosystem, [lowering costs and complexities](#) of Day 2 operations.



8. Visualization: Bare metal cannot achieve the same level of telemetry visualization.

VMware provides rich visualization, telemetry analytics, capacity planning and control with tools designed to work with VMware and other ecosystem partners. To build something close to this level of telemetry visualization on bare metal would increase costs and strain resources, requiring integrations with multiple open source components and environment-specific customization.



9. Multitenancy: Virtualization reduces capital expenditures by running multiple tenant workloads on the same hardware.

Virtualization through VMware allows for logically isolating workloads, preventing one workload from encroaching on another while restricting access among different VMs.



10. Resiliency: vSphere clusters have a long track record of protecting applications.

vSphere clusters offer faster failover and recovery that bring application services back online quickly. When vSphere detects a problem with a workload on a VM, it can move the VM before it and the workload fail. If the host goes down, vSphere automatically restarts the affected VM (nodes) within two to three minutes. Kubernetes alone takes more time to notice a node has gone down (typically five minutes), cannot automatically restart the node/host, and will not recover the node/host.

There really is no comparing bare metal to VMware virtualization

The VMware platform offers agility, flexibility, efficiency and security that bare metal simply cannot match. Building your next-gen RAN on bare metal will ultimately require painful transitions and upgrades as new protocols and requirements are placed on your network. At the same time, the VMware Telco Cloud Platform gives you the agility and flexibility you need for the next wave of innovation. With no significant difference in performance and lower overhead cost owing to the [vastly increased pod/container density](#) virtualization achieves, there really is no comparing virtualization to bare metal for today's needs and certainly not tomorrow's.

Learn more at telco.vmware.com.