

Pearl Cloud

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Virtuozzo

Virtuozzo Hybrid Infrastructure

vs

Various Virtualization Solutions



July 2024

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vmware®

Virtuozzo Hybrid Infrastructure

vs

Broadcom/VMware
Virtualization Solutions

July 2024

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Market positioning:

Virtuozzo is the leading cloud management solution for service providers.

- Enables service providers to sell public, private, or hybrid cloud services (IaaS)
- And extend by selling PaaS, Kubernetes, WordPress-aaS
- Designed for xSPs: more accessible, affordable, easier to use and profitable



Solution characteristics:

- Purposely built for cloud scenarios and service providers: multi-tenant architecture, self-service panel with white labelling and no extra products required or hidden prices
- Kubernetes as a service functionality available out of the box as standard
- Built-in multi-site S3 storage
- Provides an open standard REST API for self-service management of platform resources – OpenStack API. Use the wide range of OpenStack tools/integrations already available
- Includes Virtuozzo ReadyKernel that enables rebootless update of the kernel to apply critical security updates



Pros and Cons:

- Built for Service Providers with native multi-tenancy, secure self-service, flexible metering/pricing/packaging tools and billing integrations built in
- Hardware agnostic; installed on any servers
- Built-in SDN (software defined networking) as standard, and easy to use/integrate with existing networks
- Supports Kubernetes deployment and management as standard
- Greater density for virtual environments on a per node basis than VMware
- Built for the cloud, with in-built cloud management services (such as multi tenancy and live kernel patching etc) included as standard



Market positioning:

VMware delivers an enterprise-class software suite designed to build on-premises private clouds, and in recent years, more diversified cloud enabling solutions added through development and acquisitions.

Key products: VMware ESXi, vSphere, vCenter, vCloud Suite, vRealize Suite, NSX, vSAN



Solution characteristics:

- Strong in server virtualization, has a big market share, but lacks innovations to address growing competition from container-based developments and cloud-native apps
- Translates poorly to the service provider cloud market. To build a hyperconverged cloud platform, you need to install and maintain at least 4 different VMware products. It leads to increased architecture complexity and support efforts, and additional cost
- Extra services, such as Kubernetes, require yet more VMware licensed product add-ons (e.g. VMware Tanzu)
- No S3 as a service from their core virtualization platform. VMware Cloud Foundation now includes S3 support to use external third party S3 compatible storage. This can lead to significant additional OpEx to enable this service



Pros and Cons:

- Arguably the standard for virtualization platforms. Built for enterprises to operate on-premises infrastructure, not designed as a cloud solution for service providers
- Metering and billing is weak for service provider use cases
- vSAN Storage is very restrictive; HCL is restrictive when also using vSAN
- Networking is flexible but much more complex
- Extensive list of OS and other software platforms that it supports
- Virtual environment density is good, but not as finely tuned as in VCP
- VMware vSphere/ESXi is not built for the cloud, they need VMware vCentre and Cloud Director add-ons to deliver multi-tenancy and cloud based management

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NUTANIXTM

Virtuozzo Hybrid Infrastructure
vs
Nutanix Virtualization Solutions

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- Designed for xSPs: more accessible, affordable, easier to use and profitable



Solution characteristics:

- Hardware agnostic; highly optimized and tuned KVM-based hypervisor
- Out-of-the box multi-site S3 storage
- Ability to separate storage nodes from compute, e.g. to build high-capacity cold storage
- Purposely built for cloud scenarios: multi-tenant architecture and self-service panel with white labelling
- Comprehensive tools for self-service users to manage their environment (VM management, network management, LBaaS, K8aaS etc)
- Includes Virtuozzo ReadyKernel - enables rebootless update of the kernel to apply critical security updates
- Provides an open standard REST API for self-service management of platform resources – OpenStack API. Use the wide range of OpenStack tools/integrations already available



Pros and Cons:

- Installed through a Virtuozzo white glove service
- Considerably lower TCO than Nutanix
- Greater density for virtual environments on a per node basis than Nutanix
- Can easily scale with larger cluster sizes
- Built for the cloud, with in-built cloud management services (such as multi-tenancy and live kernel patching) included as standard



Market positioning:

Acropolis software enables enterprises to build an on-premises private cloud, using tightly configured hardware resources. Enterprise private cloud is the primary use case.

- Can be extended into other cloud use cases with Nutanix Xi and Hyperscaler options
- E.g. cloud suites like Prism Pro, Calm or Xi Cloud, which are an additional cost



Solution characteristics:

- Deployed on hardware appliances/servers, it tightly binds CPU, RAM and Storage (SSD & HDD) into a clustered scale-out platform with its own KVM-based hypervisor, AHV
- S3 storage is provided as a separate scalable Nutanix S3 cluster, but it is built upon the Nutanix AHV foundation and therefore is very costly to scale
- Nutanix clusters are built from nodes (servers) - either compute + storage nodes, or storage only nodes. All nodes require CPU, RAM and storage. Scaling Nutanix can be costly
- Focuses on virtual machine management: multi-tenancy and self-service features are weak for VM and user management
- No live kernel patching for critical security updates – has to take nodes offline, patch and reboot them one by one. VMs are moved to other nodes during this process. This takes time, involves moving many VMs, and customers typically do this out-of-hours
- Nutanix uses its own custom API



Pros and Cons:

- Easy to install and scale
- Known to be very expensive. Cost scales linearly as you grow the cluster
- Most customers deploy Nutanix in small clusters (typically 6-8 nodes), thereby increasing the management overhead while scaling, by having multiple clusters to manage
- Offers additional, separately licensed service add-ons to deliver a more cloud-like experience (e.g. Prism Pro, CALM) – this increases cost and complexity

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Virtuozzo Hybrid Infrastructure
vs
Proxmox Virtualization Solutions

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WINNING STATEMENTS AGAINST PROXMOX

Proxmox is a complex virtualization platform, primarily suited for users with significant experience in open-source technologies.

The platform is essentially a wrapper around established tools such as Linux, KVM, and Ceph. To deploy Proxmox in a production environment, you need a team of skilled engineers proficient in these technologies, as well as paid production support from Proxmox.

Furthermore, the user interfaces and documentation provided by Proxmox do not match the ease-of-use from commercial solutions.



CHALLENGES WITH PROXMOX THAT YOU AVOID WITH VIRTUOZZO

Not Production-Ready in Its Free Version

The free version of Proxmox is not designed for production use. Without access to the enterprise repository, Proxmox relies on standard Debian OS packages, which are not tested together for production environments.

Complex Configuration

Proper configuration of Proxmox involves significant command-line interface (CLI) work, requiring deep expertise in Linux, KVM, Ceph, and networking. Since Proxmox is essentially a front-end for open-source tools, CLI configuration is unavoidable for setting it up correctly. It is not feasible to configure Proxmox without using the CLI.

Manual Updates

Updates in Proxmox must be handled manually via the CLI, with no automated maintenance mode for virtual machines (VMs) and storage. Major updates are particularly complex and time-consuming.

VM Creation Limitations

Creating VMs in Proxmox is complex, and the platform does not support the use of qcow2 templates for streamlined VM creation.

No Initial Placement

Proxmox lacks features for automatic placement of VMs across hosts, a critical feature for optimizing resource distribution.

No Integrated Monitoring and Alerting

Proxmox does not come with built-in monitoring and alerting capabilities, requiring users to implement third-party solutions for these essential functions.

Backup Server Costs

The Proxmox Backup Server is not free, with licensing fees ranging from \$500 to \$4,160 per server per year, adding significant overhead to the overall cost.

Not Hyper-Converged

Proxmox is not a hyper-converged solution, meaning it cannot automatically manage the distribution of resources between compute, storage, and networking subsystems. Setting up a hyper-converged infrastructure with Proxmox requires manual resource calculation and management—tasks that are automated by other platforms like VHI.

Complex Storage Integration

Integrating external iSCSI or FC storage with Proxmox requires a complicated, error-prone manual setup. Even after configuration, users cannot take full advantage of storage-native features like snapshots or replication.

Manual SDN Configuration

Software-defined networking (SDN) configuration in Proxmox is entirely manual, requiring user intervention at every step for setup and future changes. There is no automation available for SDN.

Unsuitable for Public Cloud

Proxmox lacks key features required for public cloud environments, such as:

- SDN with automated resource provisioning
- Kubernetes integration
- Load balancers
- A self-service portal
- Object storage support

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Virtuozzo Hybrid Infrastructure
vs
Red Hat Virtualization Solutions

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Red Hat Offering for Virtual Machine Virtualization



TRADITIONAL VIRTUALIZATION APPROACH (VCENTER + ESXI)

OpenShift Virtualization with OpenShift Kubernetes Engine (OKE)

- Minimal footprint (no multitenancy, only admin control plane) by deploying only OpenShift Kubernetes Engine (OKE)
- Kubernetes-based virtualization (Kubevirt) requires knowledge of Kubernetes to work with virtual workloads
- VM Live migration is only possible with RWX based PVCs (read-write-many) shared storage like NFS and limits you from using such storages as ISCSI or FC
- OpenShift Container Platform is required for multitenancy
- Complex to manage workloads, follow manifest / declarative approach for deployment configuration and lifecycle management of the VMs
- 3rd party solutions required for a functional workload backup, restore or disaster recovery

ADVANCED VIRTUALIZATION

OpenShift Virtualization with OpenShift Kubernetes Engine (OKE) + OpenShift Container Platform

- Multitenancy with much larger footprint: 3 x Worker Nodes + 3 x Compute Nodes + N Storage CEPH cluster nodes or External Storage
- Kubernetes-based virtualization (Kubevirt) requires knowledge of Kubernetes to work with virtual workloads
- VM Live migration is only possible with RWX based PVCs (read-write-many) shared storage like NFS and limits you from using such storages as ISCSI or FC
- Complex to manage workloads, follow manifest / declarative approach for deployment configuration and lifecycle management of the VMs
- 3rd party solutions required for a functional workload backup, restore or disaster recovery

Red Hat Virtualization Positioning



RED HAT OPENSTACK AS AN ALTERNATIVE TO VMWARE

Red Hat prefers to offer OpenShift virtualization more than Red Hat OpenStack when discussing VMware opportunities. The reason is that Red Hat chose OpenShift as their core solution to consolidate cloud native approach. Maintaining both solutions is costly. This is also why we see a new deployment option in Red Hat OpenStack version 18 - OpenStack services on OpenShift.

RED HAT OPENSTACK TRADITIONAL DEPLOYMENT

- **Complex Installation.** Red Hat OpenStack installation requires expertise, CLI, only partially automated, and has no UI.
- **Complex Updates.** In RHOS there is complex and error-prone upgrade process, especially for major updates. You need to update all components separately OS, KVM, storage, OpenStack, management. You need to live migrate all VMs manually between hypervisors during node upgrades.
- **Storage Management.** If using CEPH or External storage, the management is performed from different control planes, increasing complexity.
- **No integrated comprehensive backup solution.**
- Metrics and dashboard are parts of a **different tool suite and control planes**, adding more complexity.
- **Not included Kubernetes as a Service:** you'll need to pay for the OpenShift subscription and deploy it separately.

RED HAT OPENSTACK SERVICES ON OPENSIFT

- **More expensive** as you'll pay for both OpenStack and OpenShift subscriptions.
- **More complex to manage and deploy for non-Kubernetes experts/users.** You need to know about Kubernetes architecture and OpenStack, double complexity and price.
- **No clear documentation currently** as this OpenStack services on OpenShift approach is still in Beta phase.
- **Red Hat is pushing towards OpenShift virtualization,** especially for their VMware strategy, and the goal to consolidate and simplify their offering.

Virtuozzo Hybrid Infrastructure Positioning & Benefits

POSITIONING VHI VS RED HAT OPENSTACK

- **Simple installation** as a turnkey product with all components altogether using UI
- **Simple platform updates (minor/major)**, components are updated together even for major updates: OS, KVM, SDS, SDN, orchestration, admin UI, self-service panel, monitoring
- **Automated update process with maintenance**, e.g. automatically migrate workloads during updates
- **Automated security and live kernel patching**
- **Integrated Software Defined Storage**, while CEPH requires expertise to deploy and manage
- **Integrated Backup-as-a-Service** with UI and self-service panel
- **Integrated Object Storage** with self-service panel
- **Integrated Kubernetes-as-a-Service**
- **User-friendly admin UI** (not just "rebranded Horizon")
- **Integrated user-friendly self-service** for public or private cloud end-users
- **Integrated monitoring based on Prometheus and Grafana** with preconfigured alerts, metrics and dashboards

POSITIONING VHI VS OPENSIFT VIRTUALIZATION

- **Simple installation** as a turnkey product with all components altogether using UI. No need for Kubernetes knowledge to manage VMs and deploy cluster
- **Simple platform updates (minor/major)**, components are updated together even for major updates. No need for Kubernetes knowledge to manage the cluster lifecycle
- **Mature KVM-based virtualization approach** vs Kubevirt
- **Automated update process with maintenance**, e.g. automatically migrate workloads during updates
- **Automated security and live kernel patching**
- **Integrated Software Defined Storage**, while CEPH requires expertise to deploy and manage
- **Integrated Backup-as-a-Service** with UI and self-service panel
- **Integrated Object Storage** with self-service panel
- **User-friendly admin UI** (not just "rebranded Horizon")
- **Integrated user-friendly self-service** for public or private cloud end-users
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vs

Open Nebula Virtualization Solutions

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Market positioning

Virtuozzo is the full-stack hyperconverged cloud enablement solutions for service providers, ISVs and enterprises.

- OpenStack-based public, private, or hybrid cloud services: virtualization, storage, network, orchestration
- Ability to extend with built-in application deployment and management solutions: PaaS, Kubernetes, WordPress-aaS



Strong points

- Easy installation and management from the single UI, CLI & API
- Ready to use product with end-to-end component integration
- Based on the industry standard OpenStack software with high adoption rate among large enterprises and service providers
- Fast product development and good quality due to the large community of contributors
- Much easier to find engineering and support resources on the market
- The modern and user-friendly self-service UI
- Advanced software-defined network and storage
- Advanced Managed Kubernetes



Market positioning

Open-source platform for private, hybrid or edge cloud infrastructure.

The two primary uses are:

- Datacenter virtualization
- Cloud deployments based on the KVM hypervisor, LXD/LXC system containers, and AWS Firecracker



Weak points

- Production installation is only partially automated and requires more expertise
- All components like KVM, storage (ceph, local, etc), UI, network, K8s must be installed and configured separately using CLI
- Fewer engineering and support resources are available in the market due to the low product adoption
- Basic implementation of software-defined network
- No official enterprise storage support
- Managed Kubernetes implementation is basic, and based on a 3rd-party solution from SUSE

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XCP-NG

Virtuozzo Hybrid Infrastructure

vs

XPG-NG Virtualization Solutions

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WINNING STATEMENTS AGAINST XCP-NG

XCP-NG is a fork of the XenServer hypervisor, which was previously abandoned by both Citrix and AWS. It is a complex virtualization platform, primarily suited for users with significant experience in open-source technologies.

CHALLENGES WITH XCP-NG THAT YOU AVOID WITH VIRTUOZZO

Outdated Kernel

XCP-NG is still based on the outdated 4.x Linux kernel, while VHI uses the more modern 5.x kernel. This difference means VHI offers better hardware compatibility and support.

Slow Development

Development for XCP-NG has been notably slow — taking four years to release a minor update, and the platform is still stuck on the 4.x kernel. The number of active contributors to the project is very low, and an in-place upgrade to a newer kernel remains highly uncertain.

Legacy Automation Solutions

All automation tools for XCP-NG are developed by a single company, "Vates," and appear very outdated.

Paid Production Support

Production support and management tools for XCP-NG are not free, adding additional costs for businesses seeking to implement the platform at scale.

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Virtuozzo Application Platform
vs
Broadcom/VMware Tanzu

July 2024

Virtuozzo Application Platform

Battlecard with VMware Tanzu for ISVs, enterprises and service providers

WINNING STATEMENTS

An application management platform for **service providers, ISVs and enterprises** that **liberates you from the complexities** of IT infrastructure configuration, speeds up and simplifies **moving traditional applications to the cloud**, automates DevOps processes, and optimizes cost efficiency.

CHALLENGES WITH COMPETITOR

- Configuration of full VMware's stack mandatory for full cycle development – build - test – release flow, requires significant expertise from the IT Ops team
- For proper VMware's Tanzu setup you need at least 3 products, and as a xSP you still will lack extra modules for proper Metering/Billing/User management.
- End-user technical maturity should be significantly higher compared to Virtuozzo Application Platform
- Lack of preconfigured complicated clustered solutions deployment packages, requires a lot of internal R&D efforts

BENEFITS WITH VIRTUOZZO

- Virtuozzo Application Platform is moderately easy to operate from the administration point of view
- Comprehensive solution with all features required for application management available out-of-the-box
- Extremely user-friendly UI/UX provides not too technically savvy users to operate Virtuozzo Application Platform's self-service panel in quite easy way
- Marketplace with a lot of complicated deployments automation such as clustered DBs, clustered WordPress, Kubernetes cluster, Jenkins pack etc.