



OpenNebula vs VMware: Cost, Operational Complexity, and Modern Cloud Readiness

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Scope

This report evaluates OpenNebula as an alternative to VMware-based infrastructure platforms, with a focus on enterprise and service provider environments.

Following VMware's transition under Broadcom, the portfolio has shifted toward subscription-based models such as VMware Cloud Foundation (VCF) and vSphere Foundation, introducing changes in licensing structure, cost predictability, and operational approach. At the same time, evolving infrastructure requirements—such as support for AI and GPU workloads, hybrid and multi-site deployments, edge computing, and data sovereignty—are increasing both cost and architectural complexity in VMware-based environments.

The purpose of this report is to assess OpenNebula not only from a cost perspective, but also in terms of operational simplicity, flexibility, and alignment with modern cloud use cases. The analysis highlights key differences in architecture, deployment, lifecycle management, and scalability, as well as the ability to support emerging workloads such as AI/ML platforms and GPU-accelerated services.

This is not intended to be a feature-by-feature comparison. Rather, this document is intended for organizations currently operating VMware environments, evaluating alternatives to proprietary virtualization platforms, or designing sovereign and future-ready cloud infrastructures. Its purpose is to provide a strategic and practical perspective on how different virtualization and cloud infrastructure approaches can support modernization, operational independence, scalability, and long-term infrastructure resilience, instead of reducing the discussion to a simple checklist of individual product features. This is not intended to be a feature-by-feature comparison. Rather, this document is intended for or designing sovereign and future-ready cloud infrastructures

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Glossary

AD	Active Directory
ACL	Access Control List
COW	Copy on Write
DB	Database
DC	Data Center
HA	High Availability
NFS	Network File System
NIC	Network Interface Card
VDC	Virtual Data Center
VM	Virtual Machine
KVM	Kernel-based Virtual Machine

1. What is VMware?

Following its integration into Broadcom, VMware has consolidated its portfolio into subscription-based offerings centered around VMware Cloud Foundation (VCF) and VMware vSphere Foundation (VVF).

VMware Cloud Foundation delivers a full-stack infrastructure platform that integrates compute (vSphere), storage (vSAN), networking (NSX), and management (Aria). VMware vSphere Foundation targets traditional virtualization environments, combining vSphere with integrated operations and Kubernetes capabilities.

Following the transition to Broadcom, VMware has fundamentally changed its licensing and product strategy. Perpetual licenses have been discontinued and replaced by subscription-only models, with pricing based on CPU cores rather than sockets.

In addition, VMware has consolidated its portfolio into bundled offerings such as VMware Cloud Foundation and vSphere Foundation. These bundles integrate multiple infrastructure components—compute, storage, networking, and management—into a single licensing model, limiting modular adoption and increasing dependency on a full-stack architecture.

Licensing is now directly tied to CPU core counts, with minimum core requirements per CPU and, in many cases, cluster-wide licensing policies. As organizations adopt modern processors with higher core density, licensing costs increase proportionally, even when workload requirements remain unchanged.

Traditional editions such as vSphere Standard and Enterprise Plus are no longer the primary delivery model for new capabilities. vSphere 9.x features are delivered through vSphere Foundation and VMware Cloud Foundation, and customers are encouraged or required to transition to these bundled subscription offerings for continued support and access to new functionality.

Existing customers may continue using legacy licenses until expiration, but long-term access to updates and support requires migration to the new subscription-based model.

As a result, VMware environments now represent tightly coupled platforms where infrastructure, licensing, and operations are strongly interdependent. Managing these environments requires coordination across multiple components, increasing operational complexity and dependency on specialized expertise.

While VMware remains a mature and feature-rich platform, adapting it to modern requirements—such as AI workloads, hybrid multi-site deployments, and sovereign cloud architectures—often introduces additional cost and operational overhead.

2. What is OpenNebula?

OpenNebula is an open cloud and virtualization management platform designed to simplify the deployment and operation of private, hybrid, and edge cloud infrastructures. It provides a unified control layer to manage compute, storage, and networking resources across distributed environments, with a strong focus on operational efficiency, flexibility, and independence from proprietary platforms.

Unlike complex multi-component cloud frameworks, OpenNebula delivers a streamlined architecture that integrates infrastructure management, orchestration, and automation within a single platform. This approach significantly reduces operational overhead and eliminates the need for tightly coupled services and external dependencies typically required in traditional cloud stacks.

The platform supports a wide range of workload execution models, including virtual machines, containerized applications, and Kubernetes-based environments, enabling organizations to select the most appropriate model based on workload requirements without introducing additional management complexity.

OpenNebula is designed to operate across on-premises data centers, edge locations, and distributed multi-site environments. Built-in federation and hybrid cloud capabilities allow geographically dispersed infrastructure to be

managed as a single logical cloud, supporting use cases such as disaster recovery, workload mobility, and low-latency edge processing.

In addition to traditional enterprise workloads, OpenNebula provides a strong foundation for modern infrastructure requirements, particularly in the area of AI and GPU-accelerated computing. It enables the creation of multi-tenant AI environments with strict isolation, resource segmentation, and lifecycle management, supporting use cases such as GPU-as-a-Service, LLM inference platforms, and large-scale AI training environments .

The platform integrates with modern AI ecosystems and supports flexible execution models, allowing workloads to run directly on GPU-enabled virtual machines or within Kubernetes clusters, while maintaining consistent governance, performance, and operational control across the environment .

OpenNebula is also designed with a strong focus on sovereignty, openness, and vendor neutrality. It enables full control over data, infrastructure, and lifecycle management, supporting on-premises and air-gapped deployments, as well as compliance with strict regulatory and data residency requirements. Organizations retain full ownership of their data, encryption keys, and operational processes, reducing dependency on external vendors and proprietary ecosystems .

By combining simplicity, flexibility, support for AI-driven workloads, and alignment with sovereign cloud principles, OpenNebula enables organizations to build and operate modern cloud infrastructures that are easier to manage, more cost-efficient, and better aligned with future technological and regulatory requirements.

In contrast to multi-layered cloud stacks, OpenNebula delivers these capabilities within a single, unified platform, reducing architectural complexity while maintaining flexibility and performance.

3. Cost and Subscription Model

The cost of a cloud platform extends beyond software licensing. It includes infrastructure management, operational complexity, lifecycle management, and the human resources required to operate and maintain the environment. For this reason, total cost of ownership (TCO) is the most relevant metric when evaluating cloud platforms.

OpenNebula delivers a transparent and predictable subscription model based on the number of managed infrastructure nodes and the selected level of enterprise support. The pricing model is independent of CPU count, allowing organizations to scale hardware capacity without increasing licensing costs.

According to the [OpenNebula Subscription Guide](#), annual pricing is structured as follows:

- \$875 per host (Standard support)
- \$1,375 per host (Premium support)
- Front-end (management layer): \$8,750–\$13,750 per deployment

In contrast, VMware's current licensing model (following recent changes under Broadcom) is based on **CPU cores rather than sockets**, with minimum core requirements per CPU and subscription-only licensing.

This introduces a direct dependency between hardware configuration and software cost. As organizations adopt modern processors with higher core density, licensing costs increase proportionally, even when workload requirements remain unchanged.

In addition, VMware licensing policies include minimum core thresholds per CPU and often require full coverage of all physical hosts within a cluster. Combined with bundled platform subscriptions—including compute, storage, networking, and management—this results in a cost structure that is tightly coupled to hardware decisions and less flexible over time.

As a result, infrastructure scaling, hardware upgrades, and feature adoption directly impact licensing costs in VMware environments.

VMware offerings are delivered through bundled platforms such as:

- VMware vSphere Foundation (VVF)
- VMware Cloud Foundation (VCF)

These bundles integrate compute virtualization, storage (vSAN), networking (NSX), and management (Aria), resulting in a tightly coupled architecture where infrastructure components and licensing are closely interdependent.

In real-world deployments, the total cost per host in VMware environments is significantly higher than in OpenNebula-based infrastructures, particularly in high-core-density servers or large-scale environments.

Operational cost is also a key differentiator. VMware environments require ongoing management of multiple integrated components, increasing operational overhead and dependency on specialized expertise.

OpenNebula, by contrast, reduces both licensing and operational costs through its unified architecture, enabling organizations to operate cloud environments with greater efficiency and lower total cost of ownership.

In most scenarios, operational costs exceed licensing costs, making architectural simplicity the primary driver of overall cost efficiency.

4. Simple Case Pricing Review

As a representative scenario, this section compares the annual cost of building a private cloud infrastructure consisting of 10 servers, each equipped with 2 CPUs and 48 cores per CPU, over a one-year period.

Category	VMware (VVF)	VMware (VCF)	OpenNebula
Cost per Host	~\$13,000	~\$33,600	~\$1,100
10 Hosts	~\$130,000	~\$336,000	~\$11,000
Front-end	Included	Included	~\$13,750
TOTAL	~\$130,000	~\$336,000	~\$24,750

Cost Analysis

VMware's licensing model is directly tied to CPU core counts. As infrastructure evolves toward higher-density processors, licensing costs increase proportionally. This creates a structural cost escalation over time, particularly in modern environments where core density continues to grow.

In addition, VMware typically requires licensing coverage across all hosts within a cluster, further increasing total cost as infrastructure scales.

OpenNebula, by contrast, follows a per-host subscription model that is independent of hardware characteristics. This allows organizations to adopt higher-performance CPUs and increase infrastructure density without impacting licensing costs.

Key Takeaways

In this scenario, OpenNebula delivers:

- approximately **5× lower cost compared to VMware vSphere Foundation (VVF)**
- up to **10× lower cost compared to VMware Cloud Foundation (VCF)**

The cost difference becomes more pronounced in environments with high-core-density CPUs or GPU-accelerated workloads, where VMware licensing scales with hardware capacity, while OpenNebula remains constant.

compared to VMware-based platforms.

5. Consulting Services

OpenNebula is designed to enable rapid deployment of production-ready cloud environments with minimal architectural overhead. Its unified platform approach significantly reduces the complexity typically associated with infrastructure design, integration, and validation.

As a result, consulting engagements are typically shorter, more predictable, and focused on delivering immediate value. Organizations can move from design to production in a streamlined manner, reducing time-to-market and minimizing project risk. Deployment processes are aligned with validated reference architectures, enabling consistent and repeatable outcomes across environments.

In contrast, VMware environments typically require more extensive planning and integration due to their multi-component and tightly coupled architecture.

Deployments often involve coordinating multiple layers, including:

- compute (vSphere)
- storage (vSAN or external storage systems)
- networking (NSX or traditional networking)
- management and automation components

Each layer introduces its own configuration, dependencies, and lifecycle requirements. As a result, implementation projects tend to involve more coordination, validation, and alignment across components.

Lifecycle and Extension Considerations

In VMware environments, extending infrastructure—such as adding clusters, integrating additional services, or enabling advanced platform features—often requires additional planning and validation cycles. This can increase project duration and introduce operational dependencies.

OpenNebula enables a more flexible approach, where infrastructure components can be extended or integrated without requiring complex reconfiguration across multiple tightly coupled systems.

6. Key Differentiators

Cost Efficiency

OpenNebula delivers a significantly lower total cost of ownership by combining a simple and predictable pricing model with reduced operational overhead. Costs scale linearly with infrastructure growth and are not tied to hardware characteristics such as CPU core counts.

In contrast, VMware's licensing model introduces cost escalation linked directly to hardware evolution and feature adoption. Combined with bundled platform subscriptions, this results in higher and less predictable long-term costs.

Licensing Flexibility

OpenNebula provides a flexible subscription model based on managed hosts, independent of CPU cores or hardware configuration. This allows organizations to scale infrastructure or adopt new hardware technologies without increasing licensing complexity.

VMware's core-based licensing model ties software cost directly to hardware capacity. Minimum core requirements, cluster-wide licensing policies, and bundled platform offerings reduce flexibility and often require organizations to license resources beyond actual usage requirements.

Operational Simplicity

OpenNebula's unified architecture integrates infrastructure management, orchestration, and automation within a single platform. This simplifies deployment, upgrades, and day-to-day operations, enabling efficient management with smaller teams.

VMware environments require managing multiple tightly integrated components across compute, storage, networking, and management layers. This increases operational complexity, requires specialized expertise, and introduces additional dependencies during lifecycle management.

Vendor Independence

OpenNebula is designed with a strong focus on openness and vendor neutrality. It supports heterogeneous environments and integrates with a wide range of storage, networking, and compute technologies.

VMware environments are typically built around a proprietary ecosystem, where infrastructure components and management tools are tightly integrated. This can increase dependency on a single vendor and limit flexibility in infrastructure evolution.

Hybrid, Multi-Site, and Edge

OpenNebula provides native support for hybrid cloud, multi-site federation, and edge computing, allowing distributed infrastructure to be managed as a single logical environment.

VMware supports hybrid and multi-cloud strategies through additional solutions and integrations, which may introduce additional complexity and cost.

7. Summary

This report has presented a comparison between OpenNebula and VMware-based infrastructure platforms, with a focus on architecture, licensing models, cost structure, and operational impact in the context of the Broadcom-era VMware portfolio.

The analysis highlights a fundamental shift in VMware's strategy toward subscription-only, core-based licensing and tightly bundled platform offerings such as VMware Cloud Foundation and vSphere Foundation. While these platforms deliver a comprehensive and integrated feature set, they introduce increased cost dependency on hardware evolution, reduced licensing flexibility, and greater operational complexity due to their multi-component architecture.

As infrastructure requirements continue to evolve—particularly with the rise of AI-driven workloads, GPU-accelerated computing, hybrid multi-site deployments, and sovereign cloud initiatives—these constraints can become a limiting factor for organizations seeking efficiency, scalability, and long-term cost control.

OpenNebula offers a different approach, based on a unified and streamlined architecture that integrates infrastructure management, orchestration, and automation within a single platform. Its per-host subscription model decouples software licensing from hardware characteristics, enabling predictable costs and more efficient infrastructure scaling.

In addition to cost efficiency, OpenNebula provides native support for modern workload models, including virtual machines, containers, Kubernetes environments, and AI-driven use cases, without requiring additional licensing layers or tightly coupled platform dependencies. Its built-in capabilities for hybrid, multi-site, and edge deployments further support distributed and sovereign cloud architectures.

By reducing architectural complexity and operational overhead, OpenNebula enables organizations to deploy and operate cloud environments more efficiently, with faster time-to-value and lower long-term risk.

Organizations evaluating alternatives to VMware or seeking to modernize their infrastructure can benefit from adopting a platform that prioritizes simplicity, flexibility, and independence, while maintaining full control over their cloud environment.

8. Ready for a Test Drive?

OpenNebula can be evaluated and deployed quickly using a set of purpose-built tools designed to minimize setup complexity and accelerate time-to-value.

For quick testing and initial validation, **miniONE** provides a lightweight deployment method that installs a fully functional OpenNebula environment on a single virtual machine or physical host within minutes. This environment can then be extended by attaching additional resources or remote clusters, enabling users to explore core platform capabilities with minimal effort.

In addition, the **OpenNebula ISO Community Edition** delivers a ready-to-use appliance that includes a preconfigured operating system and OpenNebula stack. This option is particularly suited for rapid evaluations, proof-of-concept environments, and standardized deployments.

For production-grade deployments, **OneDeploy** offers an automated and scalable installation framework that simplifies the rollout of OpenNebula across multi-node environments. It provides a consistent and repeatable deployment process aligned with recommended architectures, reducing setup time and operational complexity.

Together, these tools enable organizations to move from evaluation to production efficiently, reducing deployment time and allowing teams to quickly validate OpenNebula in real-world scenarios.

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