Google Cloud VMware Engine

Migrate, scale and innovate at speed.

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Executive summary

Every enterprise is striving to adopt a cloud-first strategy - but making that happen is easier said than done. Until now, moving, scaling, building and deploying on clouds has caused a lot of roadblocks and detours for IT teams.

Google Cloud VMware Engine bypasses the challenges of moving and modernizing critical workloads to the cloud - enabling business agility without risk, app refactoring or having to reskill your teams. The service enables customers to seamlessly migrate their VMware workloads from on-premises data centers directly into Google Cloud too.

This paper will show you how you can deploy VMware infrastructure to Google Cloud natively and securely, giving you access to cloud scalability and cost savings as well as development and management services from both providers - helping you build the future, faster than ever.

What is hybrid cloud?

Hybrid cloud is a cloud computing architecture consisting of one or more on-premises environments connected to a public cloud with orchestration between the two platforms.

Why is getting to the cloud so tough for enterprise?

Cloud adoption is driven by a desire for agility. Organizations want an infrastructure they can shape fluidly as their needs change, without being locked into a fixed, costly and complex on-site environment. They also want access to unique public cloud services that allow for faster and more far-reaching innovation, and leverages artificial intelligence, machine learning and automation. But if your enterprise wasn't born in the cloud, getting there can be a challenge.
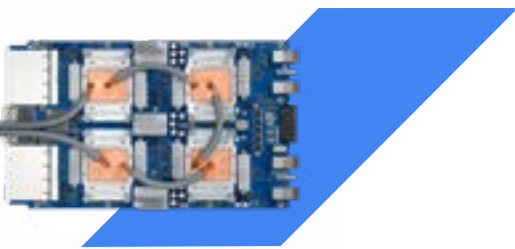
Compatibility

The cloud is a natural fit for new apps, but rewriting and refactoring existing apps to make them cloud-compatible is far more complex. It can be costly, error-prone and more time-consuming than most enterprises have the patience for. Today, only a few virtual machines (VMs) exist in the top three clouds.

The complexities of inconsistent infrastructure, policies and tools also make it difficult to monitor, troubleshoot, network, secure, backup, audit, and establish compliance and do many other typical enterprise IT support operations from on-premises to the cloud.

Unsurprisingly many enterprise apps have remained locked into their fixed, on-premises infrastructures, slowing the path to growth, innovation, and new service delivery.

Operations

It's not enough to just move a workload to the cloud. Once you migrate, things can get difficult for IT teams as they contend with the challenges of operating across multiple environments.

Many providers only deliver the bare minimum when it comes to hosting VMware SDDC services. They install VMware on public cloud hardware and leave the job of configuring, managing, and operating the infrastructure to the enterprise. Inconsistencies between environments mean organizations often struggle to manage workload, policy and compliance compatibility, as well as training training staff in the use of new and unfamiliar tools.

As IT operators extend their remit beyond the data center their responsibilities compound. Without automated capabilities these already stretched-thin teams can become mired in operational complexity.

Innovation

When it comes to delivering innovation, not all public clouds are created equal. Modern IT teams are being pushed to deliver the latest capabilities to developers, so that they can build new and better services at the speed customers and competition demands.

Access to Google Cloud provides developers with leading artificial intelligence, machine learning (ML), big data analytics solutions they can use to drive innovation. However, without consistency between environments, developers often get caught in operational bottlenecks, unable to access the services they need, when they need them.

What you need to succeed in the cloud

Enterprises need a specific set of capabilities that removes operational complexity and provides speed and fluidity to developers so that they can build the future.

You need a solution that delivers:

Operational continuity

The same operation, support, monitoring and processing tools to manage both on-premises and cloud environments, with seamless API management - to migrate without refactoring or reskilling.

Unified networking and security configurations

The same network configurations, and security, compliance, monitoring and chargeback policies across environments, to ensure data is safe and compliant, whether at rest or in transit.

Access to innovative services

Once running in the cloud you need the ability to adopt the latest AI, ML, automation and analytics services to query your data and derive new insights.

Introducing Google Cloud VMware Engine

VMware Engine is fully managed, integrated offering that delivers the consistency and innovation enterprises need, with a simple and seamless way to migrate to the cloud and unlock big data insights. With this service, you can deploy VMware workloads natively on isolated and dedicated bare metal infrastructure, delivering the business agility you need while unlocking native access to cloud services.

Because you run VMware vSphere, vCenter, vSAN and NSX natively in Google Cloud - compatibility is a given. This allows you to migrate, manage and scale workloads from your data center to the cloud, without refactoring or causing disruption to your network or security policies.

Google Cloud's API lifecycle management enables your teams can easily manage their policy configurations and workloads, using the same tools and skills they use on-premises. IT operations workloads are also unburdened from infrastructure management with the help of VMware Engine's OS orchestration and automation capabilities, sidestepping the complexity of managing an expanding architecture.

The result is fast migration and scalability, without downtime or management headaches - allowing you to shift workloads to Google Cloud in minutes and bypassing planning, procurement, rack-n-stack network design and configuration. You also lower your total cost of ownership with on-demand provisioning, paying only for what you use as you shrink and grow usage based on your needs.

With seamless connectivity to Google Cloud, your application developers have direct access to services for Kubernetes, data analytics (BigQuery), Cloud AI and machine learning. Consistency between environments allows them to spend less time worrying about infrastructure, and more time harnessing big data to deliver the innovative services customers demand.
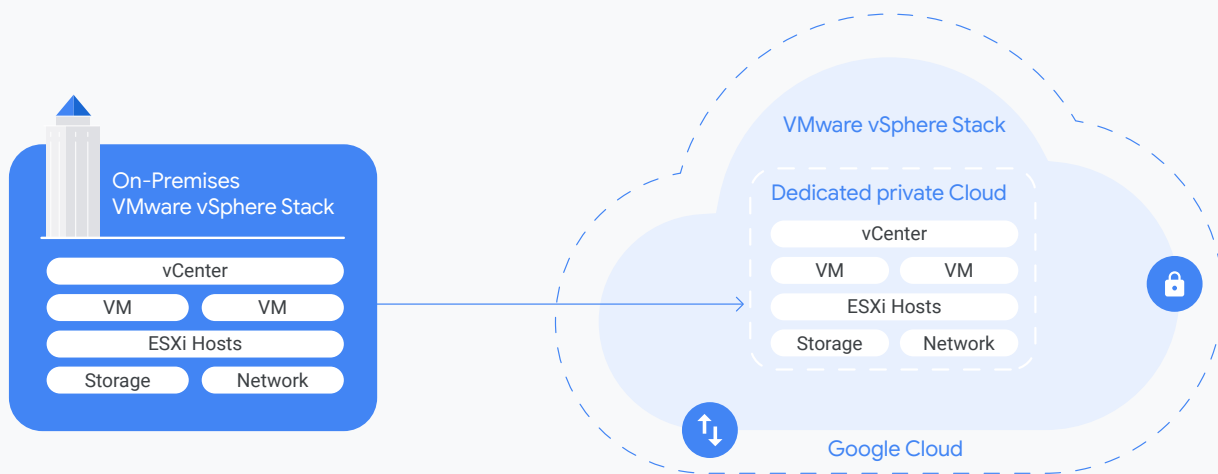

Figure 1: VMware Engine Integrates an On-Premises VMware vSphere Stack, natively with dedicated, private cloud.

Benefits

The service gives you the secure and flexible infrastructure you need to power your business ahead of the competition.

Flexibility and speed
Dedicated, isolated private cloud with full access to Google Cloud, enabled by Google Cloud's API management.

Unified management
Single portal to view your VMware and Google Cloud environments, providing visibility for both cloud admins and app developers.

Consistent operations
Leverage familiar VMware or Google Cloud tools depending on preference and without disruption to established network, security, data protection, or audit policies.

Elevated privilege
Easily configure ISV apps (like DR and backup) on your VMs with elevated privileges, allowing users to make changes for limited periods of time.

Complete security
Move fast with confidence, with security built into every layer and a dedicated isolated environment that maintains compatibility and mobility.

Intuitive elasticity
Scale elastically into the cloud as and when needed, provisioning in as little as 30 minutes and paying only for what you use.

Hassle-free infrastructure
Unburden IT from infrastructure management with automation and orchestration, creating more time for innovation.

On-call support
We're always ready to lend a hand with on-demand support.

Big data insights
Turn data into actionable insights with a comprehensive and serverless data analytics and machine learning platform. Accelerate time to insights and leave the complexities of data analytics behind.

Three key components for a smarter, more innovative cloud

Google Cloud VMware Engine consists of three key components:

Hybrid cloud infrastructure

Dedicated, isolated, private cloud deployed on a hyperconverged infrastructure stack. This enables you to run VMware natively within Google Cloud, along with back-end operations and support for the entire solution, and separated via a data plane for additional security.

Operating System

The hybrid cloud management platform that orchestrates, automates, and maintains availability across the VMware bare metal and Google Cloud infrastructures. This is managed through a single management portal, through which you can view both VMware and Google Cloud environments.

Network edge services

Enable communication between your hybrid architecture and the public internet with advanced networking and security capabilities provided by Google Cloud.
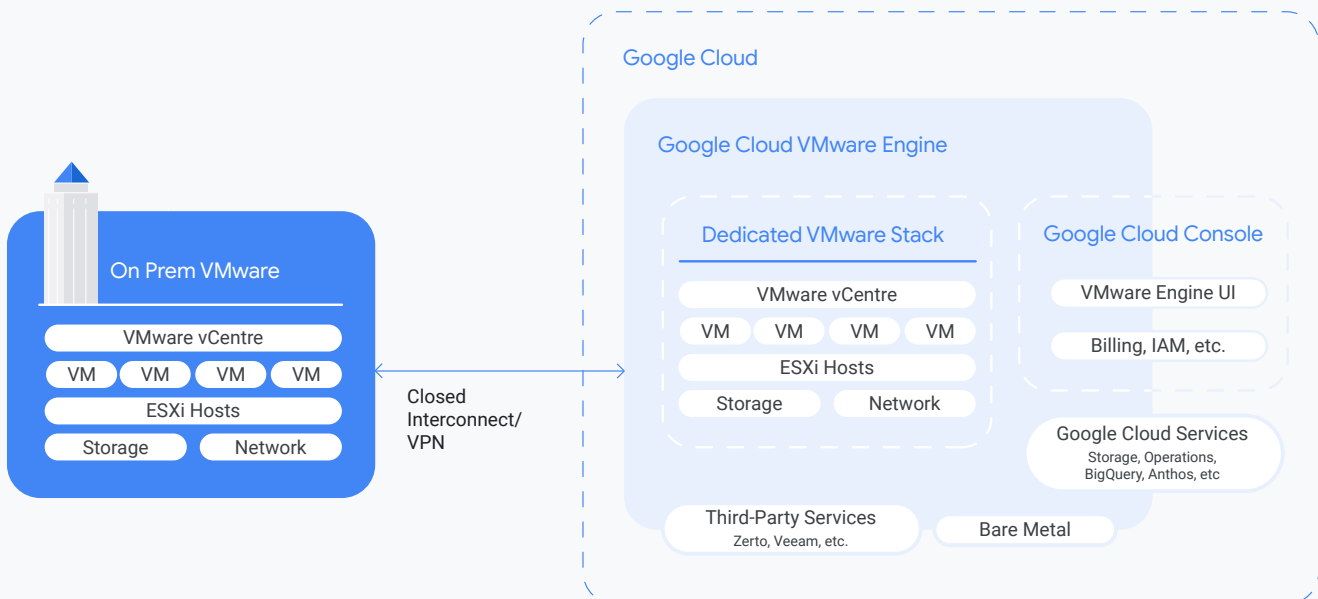

Figure 2: Key components of VMware Engine.

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Hybrid cloud infrastructure

The dedicated, isolated, and private cloud abilities of VMware Engine, means that it offers a broad set of capabilities to drive business success and modernization.

Hot, cold and bulk migrations

Complete compatibility between the environments enables organizations to move on-premises workloads to the cloud with standard VMware tools. In a hot migration, you can use vMotion to transfer a live, powered-on virtual machine between data centers, clusters, or hosts without downtime. You can achieve the same function with a cold migration, moving the virtual machine in a powered-off state. These two methods work best for serial migrations.

You can also use VMware HCX (included in the service), to schedule migration of workloads en masse using replication. After you replicate your workloads to a new environment, HCX will automatically power-off data center workloads and power-on the workloads in your cloud.

VMware partner ecosystem services

The dedicated, isolated, private environment enables access to the entire vSphere ecosystem of third-party IT management tools, as well as the complete core vSphere platform and its default interface, vCenter. This allows you to access provisioning, monitoring, support, inventory management, backup and disaster recovery, security, network and IP address management, identity management, and ticketing capabilities - all managed through a single pane of glass.

Google cloud innovation

A dedicated VMware SDDC in Google Cloud means you have high speed VLAN connectivity to innovative services. This is ideal for developing next generation apps that take advantage of Google Cloud's services that harness the power of Google's big data. For example you can build and run AI and ML apps in the public cloud, while leveraging your database that resides on your dedicated cloud.

With a single portal to both VMware and Google Cloud environments, application developers can build, manage and deploy their workloads directly in a self-service manner using tools they are already familiar with. They can perform power operations and configure them with the appropriate amount of disks and network interfaces.

They can also create additional VMs within the limits of resources allocated to them by administrators. For example: developers may wish to deploy their web-facing app layers in Google Cloud where they have configured a load balancer, auto scale, and public IP addresses. This layer then has the ability to talk to databases deployed in VMware's SDDC, establishing the appropriate security rules between layers.

![Google Cloud](Google Cloud logo)

Google Cloud VMware Engine OS

The service provides a cloud operating system and OS that integrates services and innovations that optimize VMware administration tasks. Key to this is provisioning a portal for self-service consumption, control and ownership for Private Cloud resources. In addition, it serves to integrate Private Cloud and Public consumption in the same interface, thus fostering hybrid application development. Finally, this integration provides direct access to backup services, event logging, and for monitoring the health, performance, availability, and capacity of clusters.

For example, developers can use VMware Engine Hybrid Templates to repeatedly deploy their application during every stage of the application lifecycle: Dev, Test or Production.

Rather than relying on a lower cost "secondary" store for backup and archival data, VMware Engine targets cloud object storage directly, so customers can choose redundancy and availability levels as appropriate, or configure their own automated tiering. You can also enable backup strategies for environments in the VMware Engine portal, integrated into Google Cloud and then configure these with a plugin to the vSphere UI. VMware Engine also supports the most common backup tools used in VMware vSphere environments.

The service establishes the level of probes and error logs best-suited for you, and enables continuous collection of performance data so that issues can be detected and resolved quickly. The OS also schedules custom maintenance times for VMware upgrades and patches based on customer convenience. Critical security or stability patches are performed with full customer awareness and approval, and minimal disruption to workloads.

These capabilities ensure organizations can maintain and manage environments on an ongoing basis, with role-based levels of access control configured between user and administrators. The solution establishes the right access control levels for each of the 350+ operations supported by the vSphere platform.

Google Cloud Edge Network

Edge Network enables communication between the internet and your hybrid environment. It runs on Google Cloud, leverages cloud edge security, and simplifies network setup and direct access to vCenter for managing VMs.

Edge Networking Services establishes access to the public internet using Google Cloud connectivity, and allows public IP addresses for virtual machines to be published with the right level of network isolation without having to configure many different systems and devices. Google Dedicated Interconnect provides secure, high-speed connections to the public cloud from on-premises environments.

Edge Network also protects the traffic between workloads and application layers flowing to/from VPN (supporting site-to-site or point-to-site), public internet and public IPs, and across all subnets and environments. This allows organizations to take advantage of Google Cloud's edge network security and advanced level of DDOS protection.

The solution also allows you to maintain compatibility with existing vSphere network designs, including NSX-T, Port Groups and Distributed Virtual Switches, enabling easier migration with minimal re-architecture.

Bringing it all together

Many enterprise cloud strategies involve both exiting expensive on-premises data centers as well as digitally transforming their processes. Taking advantage of these at scale means moving or redeploying to a public cloud.

VMware Engine offers the only platform that provides a managed, dedicated cloud in Google Cloud for VMware workloads. By providing a complete platform that incorporates management, networking, isolation, and high speed connections to Google Cloud resources, VMware Engine gives enterprises a fast and secure way to meet their digital transformation goals on time.