Modernize Edge Infrastructure with VMware Cloud Foundation Edge

Key Drivers for edge computing

- Intermittent networks
- Local data processing
- Scalability
- Real time data processing
- Compliance and data sovereignty

Edge computing is a critical component for most enterprises' digital transformation initiatives due to its ability to bring computing resources closer to the data source (edge site) rather than relying solely on centralized data center or cloud infrastructure. Edge infrastructure allows customers to extend their modern data center/cloud infrastructure to new locations so that applications can use the data locally for quicker, more accurate decision making. And then, by leveraging the power of AI at the edge, organizations can build intelligent applications that will unlock new use cases, improve efficiency, and deliver innovative services that meet the demands of today's connected world.

But edge infrastructure deployment has its own challenges

1. **Limited network connectivity:** Intermittent connectivity risks extended outages, leaving edge sites vulnerable to downtime. In addition, the edge sites typically implement strict firewall policies, blocking inbound connections from the internet to mitigate security risks.
2. **Lack of local skilled IT personnel:** Edge site management is often hindered by the challenge of having on-the-ground personnel to handle the installation, configuration, hardware refreshes, and updates, upgrades, patches and other day 2 operations.
3. **Massive Scale:** The massive scale of edge infrastructure, with thousands of sites distributed globally, presents a significant challenge when it comes to maintaining and securing the environment.
4. **Security and Privacy:** Edge infrastructure faces significant security and privacy challenges due to its distributed nature and limited physical security at remote edge sites. Additionally, edge sites must adhere to stringent compliance requirements set by regulatory bodies.

Edge Infrastructure Investments Are Growing Exponentially

of large enterprises will have a documented strategy for edge computing by end of 2026.[1]

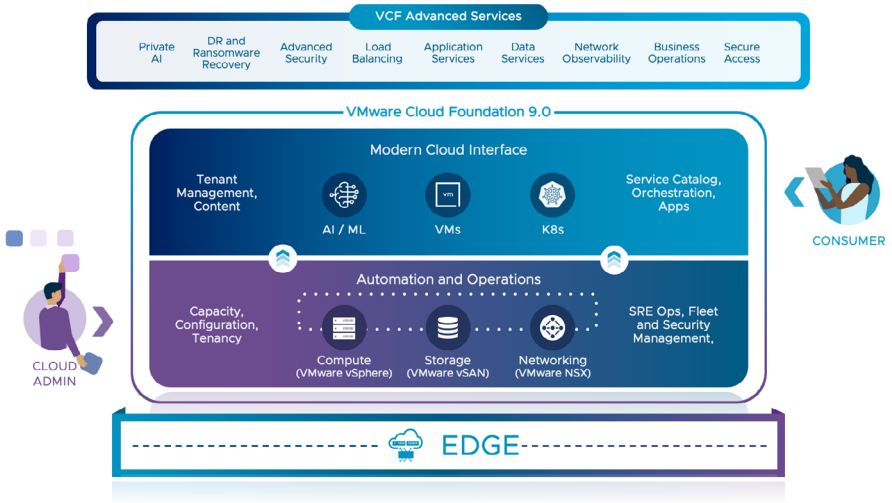
$380B

The expected worldwide spending on edge solutions by 2028.[2]

"By 2027, more than 50% of enterprise-managed data will be created and processed outside the data center or cloud, which is a major increase from 20% in 2023."[3]

Solution: VMware Cloud Foundation Edge

VMware Cloud Foundation Edge is an optimized configuration of VMware Cloud Foundation tailored for edge use cases that provides industry's first private cloud infrastructure-as-a-service solution for edge with autonomous operations at the edge sites. It delivers scalable edge infrastructure with zero-touch infrastructure deployment, automated lifecycle management, centralized operations and built-in security and resiliency at the edge. It provides a unified platform with consistent infrastructure and operations across data center, public cloud and edge locations.



Key components of VCF Edge

- **An integrated private cloud platform:** VCF Edge delivers a comprehensive, integrated enterprise-class compute, networking, storage, management, and security packaged together that can be deployed within hours instead of months and years.
  - **Compute:** At its core, VMware Cloud Foundation leverages vSphere to create and manage virtual machines and containers, providing a flexible, secure, and scalable compute platform. With support for up to 256 cores per edge site, VCF Edge provides ample compute power at the edge for local data processing needs.
  - **Storage:** By integrating vSAN or external storage into the platform, VMware Cloud Foundation offers integrated, secure, scalable storage solutions that enhance resource efficiency and reduce operational complexity
  - **Networking:** VCF provides a secure, software-defined networking layer with advanced security capabilities that enables network connectivity, operations, and scale to handle dynamic needs of modern workloads. Advanced networking features such as micro-segmentation and load balancing for managing the data traffic generated by edge devices and ensuring efficient data movement across the infrastructure.

  - **Automation:** VCF provides comprehensive management, automation and orchestration capabilities like self-service infrastructure provisioning, automated lifecycle management, self-service portal to access/manage IaaS resources
  - **Operations:** VCF delivers comprehensive operational capabilities such as performance optimization, capacity management, cost efficiency management, visibility and observability of infrastructure and operations, configuration management, compliance, monitoring, troubleshooting, and log analytics etc.
  - **Argo CD Integration:** Git repository holds the desired state of application-defined as code in YAML manifests . A CI/CD tool like Argo CD (deployed as an operator in the VKS cluster) continuously monitors that git repo and automatically syncs changes to edge locations — eliminating the need for manual updates or onsite configuration.
- **Advanced Add-Ons:** Support for a portfolio of advanced services in different areas
  - Application and Network Security
  - VMware Live Recovery
  - VMware Private AI Foundation

1. Gartner, Inc."Building an Edge Computing Strategy." G00787332.
2. IDC. "IDC Worldwide Edge Spending Guide—Mar 2025."
3. Gartner, Inc. "Market Guide for Hybrid Cloud Storage." March 6, 2024.

Key Benefits

- Reduced Operational Overhead
- Improved staff efficiency and productivity
- Lower TCO
- Strengthened security posture
- Ultimate flexibility and scalability

Why VMware Cloud Foundation Edge	
Scalable Workload Management	• With Automated Lifecycle Management, it allows IT staff to change focus from routine infrastructure lifecycle management tasks to strategic priorities and business innovation and eliminates the need for having technical personnel on site at the edge location. • With automated low-touch deployment, it enables faster infrastructure setup at new edge sites without the need of skilled IT person onsite • Allows for independent scaling of the management plane to support even the largest deployments consisting of thousands of edge locations. Ability to send updates to 1000s of edge sites at a time
Architectural Flexibility	• Ability to choose either full stack or individual infrastructure components as per the business needs. Flexibility to deploy SDDC Manager or simply use vCenter for lifecycle management • Ability to start small with single host deployment and seamlessly scale up or down later as needed
Consistent and Familiar Platform	• Consistent Infrastructure across central data center and edge locations minimizes risks and complexities while integrating edge sites with central data center VCF instance • Consistent operations across edge, data center and cloud minimizes the learning curve for the staff and allows them to use same tools, skill-sets and processes across entire IT infrastructure landscape • VCF Edge allows customers to extend their modern data center/cloud infrastructure to edge sites so that applications can use the data locally for quicker, more accurate decision making
Centralized Operations and Management	• A unified operations layer to streamline operations across all edge sites • Ability to monitor, troubleshoot and run diagnostics for edge sites from the central console with the help of Edge Orchestrator. No need to connect to individual edge sites separately through SSH. • Option to use either VMware vCenter or VCF Operations to manage workload domains across different edge sites

"VMware Cloud Foundation enables us to centralize these systems and move away from a distributed approach towards a more centralized mindset and processes. By focusing on the 'golden image,' we can install once and then roll out to the hundreds of stations we operate in production."

Christopher Kolb
Domain Architect for the EC4P Project
Audi

Why VMware Cloud Foundation Edge	
Built-in Security and Resiliency	• Built-in security at every layer of an infrastructure – hardware security, network security, data encryption, security updates, built-in micro-segmentation • Distributed firewall protection and threat detection and prevention with VMware vDefend advanced service • Resilient to network connectivity so that edge sites run autonomously in case of intermittent or no network connectivity ensuring that applications remain fully functional regardless of connectivity challenges. • VCF Operations provides end to end network monitoring, visibility into network traffic and user behavior to help detect anomalous activity and threats leveraging ML (Machine Learning) models, and then provides recommendations
Support for Diverse Edge Systems	• Supports diverse set of edge-specific hardware platform as used by different industries • Supports OT networking protocols like Profinet • Support for OEM Partners certified on ESX • Native support for both VMs as well as containers

Key Use Cases	
Use Case Name	**Example Scenarios**
Infrastructure Extension	• Remote Office Branch Office/Fulfillment Centers • Hospitals/Clinics • Retail stores
Artificial Intelligence	• Augmented Quality Control • Preventive Maintenance • CV aided Patient Diagnosis
Real Time Analytics	• Fraud Detection in Automated Checkout Counters • Plant Security and Worker Safety • Threat Identification • Protection Relay in power distribution
Industrial IoT	• Automated Inspection • Process Automation and Control • Inventory Management • Virtual Programmable Logic Controllers (vPLCs)
Content Delivery	• Data Thining • Data Security • AR and VR Content Delivery
Offline Locations	• Oil rigs • Military/Defense Apps • Remote healthcare/agriculture

Resources

VMware Cloud Foundation Edge Website

VCF Edge Detailed Design

VMware Cloud Foundation: Technical Documentation

VMware Cloud Foundation: Getting Started Hands on Lab, HoL Catalog

VMware Cloud Foundation Blogs

Follow us on X

Follow us on LinkedIn

Watch latest videos on YouTube

Summary

Modernize Your Edge Infrastructure at Scale with VMware Cloud Foundation Edge

VMware Cloud Foundation Edge is an optimized configuration of VMware Cloud Foundation tailored for edge use cases that provides industry's first private cloud infrastructure-as-a-service solution for edge with autonomous operations at the edge sites. It offers integrated enterprise class compute, storage, networking, management and security capabilities along with low-touch deployment , automated lifecycle management, centralized operations and built-in security and resiliency at the edge sites. It delivers scalable and flexible infrastructure for edge sites with the ability to choose and deploy infrastructure components as needed and scale infrastructure seamlessly as per the business needs. With consistent infrastructure, it enables smooth integration of the edge sites with data center and cloud and with a unified and consistent operations layer across an entire IT infrastructure landscape, it simplifies the management and orchestration of the edge deployments across multiple sites.

vmware® by Broadcom