Monetize the Telco Edge Cloud With a Mobile Apps Platform

Run MobiledgeX on VMware to Reduce Costs

VMWARE TELCO CLOUD AT A GLANCE

We help communications service providers build, run, manage, and protect telco cloud infrastructure to transform their networks, accelerate the delivery of modern services, and thrive in a multi-cloud world.

The VMware Telco Cloud puts in place consistent infrastructure for operating all generations of cellular and fixed-line technology while leading the way to 5G adoption with solutions for mobile edge computing (MEC), orchestration, automation, optimization, and intrinsic security.

At the dawn of 5G, the VMware Telco Cloud combines consistent infrastructure and operations with intrinsic security and cloud native technology to give CSPs a strong foundation for digital transformation and rapid innovation.

Introduction

Mobile edge computing opens up a more than $15 billion market for communication services providers rolling out 5G networks, and much of that opportunity stems from applications, services, and enterprise solutions.

As new 5G networks combine higher bandwidth with low latency, however, the chance to generate new sources of revenue at high profit margins hinges on having a platform that can launch new location-based services and solutions on edge-ready infrastructure with a low total cost of ownership.

Edge-ready infrastructure combined with a platform for cloud-native edge applications gives you the flexibility and agility to target emerging use cases and shifting consumer demand in the uncharted territory that lies at the edge. Emerging 5G mobile edge computing use cases include smart retail and enhanced shopping, smart factories and industrial manufacturing, smart glasses, gaming, and better security. To capitalize on these opportunities, you must be able to rapidly deliver enterprise solutions at the edge with minimal complexity and low costs.

Minimizing Cost and Complexity Is Key

Creating a multi-access edge computing environment can be complex and costly. Early use cases can carry high costs as business opportunities are defined and applications are refined. Complexity can snowball, creating its own risks and costs: platform management costs, security expenses, application development costs, and so forth.

Beyond the surface of use cases and new applications, you must be able to process business-critical data securely, efficiently, and cost-effectively. Edge computing should help reduce data management costs by up to 20 percent. The trick is to deliver the right applications for the right use cases at scale and, crucially, on a platform and infrastructure with a low cost of ownership to drive new revenue streams without squeezing profit margins.

Key barriers to MEC include the following:

- Delivering connectivity as an edge location owner
- Deploying an agile edge platform on edge infrastructure with a low total cost of ownership
- Securely and nondisruptively integrating the edge locations with your existing infrastructure at a low total cost of ownership
- Maintaining a focus on rapidly deploying and tuning edge applications for target use cases with ease and flexibility so you can innovate quickly and respond to changing consumer demands

VMWARE TELCO CLOUD INFRASTRUCTURE AT A GLANCE

VMware Telco Cloud Infrastructure™ is a fully integrated, multi-tenant platform for network functions virtualization (NFV). It provides compute, storage, networking, and management to enable operators to deliver virtualized and containerized network functions and services.

The platform lets communications service providers accelerate time to market, increase revenue with new services, streamline operations, reduce network infrastructure costs, and deploy elastic business models. VMware Telco Cloud Infrastructure can isolate multiple tenants within the same infrastructure.

Combining VMware Telco Cloud Infrastructure with MobiledgeX empowers you to rapidly deliver enterprise mobile-edge solutions with minimal complexity and a low total cost of ownership.

EXAMPLE EDGE USE CASES WITH TARGET LATENCIES

- Factory automation at a target latency of 0.5 – 12 ms for machine, process, and production control
- Cooperative motion control at a target latency of 1 ms for autonomous robot operation and interaction
- High-motion augmented reality (20 ms latency) and tactile feedback (5 ms latency)
- Vehicle-to-vehicle communication for awareness and pre-crash sensing at a target latency of 10 – 20 ms
- Virtual reality gaming at a target latency of 10 – 50 ms for adaptive refresh and field-of-view
- Remote presence at a target latency of 10 – 100 ms for remote control with visual and tactile feedback

Use Cases and Opportunities

What use cases and applications might gather early traction at the edge as 5G rolls out in select cities and regions?

Mobile edge computing seeks to support low-latency applications, data-heavy input-output streams, geospatial awareness, hyper-local grouping, and data residency. These capabilities let you address emerging use cases at edge locations, such as the following:

- Industrial manufacturing and smart factories
- Enhanced shopping and smart retail
- Real-time interaction with virtual reality and augmented reality applications
- Location-based services

New Use Cases Open Up New Revenue Streams

According to a MEC market report for 2020 through 2026 *cited by MarketWatch* in October 2020, the global MEC market is projected to reach $258.7 million by 2026. Such projections show that edge computing can contribute to developing new revenue streams in financial services, manufacturing, transportation, health care, and media and entertainment. To turn these revenue opportunities into higher profit margins, however, you must put in place edge infrastructure that carries a low total cost of ownership.

MobiledgeX on VMware Telco Cloud Infrastructure

The combination of MobiledgeX and VMware Telco Cloud Infrastructure establishes an integrated 4G and 5G edge application platform with a pre-validated architecture and a comparatively low total cost of ownership.

MobiledgeX delivers a turnkey virtualized container infrastructure that gives operators and developers a standard method to allocate resources and protect edge applications.

VMware Telco Cloud Infrastructure includes cost-effective, proven abstractions for storage, networking, and compute. VMware Telco Cloud Infrastructure provides the virtual infrastructure manager (VIM).

The MobiledgeX Cloudlet platform provides a service-oriented edge computing model that gives you and your developers on-demand access to a multi-tenant pool of compute, network, and storage resources based on VMware infrastructure.

The MobiledgeX Cloudlet platform consists of several abstraction layers that define the functions to deliver workloads to consumers. At the virtualization layer, MobiledgeX uses VMware vSphere® and VMware vCenter Server® to provide and manage the compute resources, VMware NSX-T™ Data Center to implement virtual networking, and VMware vSAN™ to deliver a distributed storage system.

MobiledgeX is deployed in a two-level architecture that separates management domains for scalability and security. Each management pod services a set of edge sites, and the management pod can be replicated to meet changes in the number of edge sites.

VMware Telco Cloud Infrastructure, which places workloads on edge sites, can be federated to multiple instances. The underlying infrastructure is uniform across all the sites with the same versions of vSphere, NSX, and vSAN at both core data center sites and edge sites—and this shared infrastructure keeps costs low.

To this architecture, you can optionally add VMware vRealize operations management and centralized logging for proactive monitoring and problem resolution.

BUSINESS BENEFITS OF RUNNING MOBILEDGEX ON VMWARE

Combining MobiledgeX with VMware Telco Cloud Infrastructure creates a carrier-grade telco edge platform with a low cost of ownership that empowers you to quickly monetize edge applications with high-performance edge computing and low-latency processing.

- Flexible pricing models for licensing and consumption
- Multi-telco federation across geographies
- Standardized APIs and a telco API abstraction
- Streamlined application onboarding
- Proximity-based app instantiation
- Common marketplace for all apps
- Customized app catalog for telcos
- Replicable to multiple edge sites
- Automated provisioning and operations
- Centralized and hierarchical topology operations
- Fully remote controlled
- Infrastructure lifecycle management

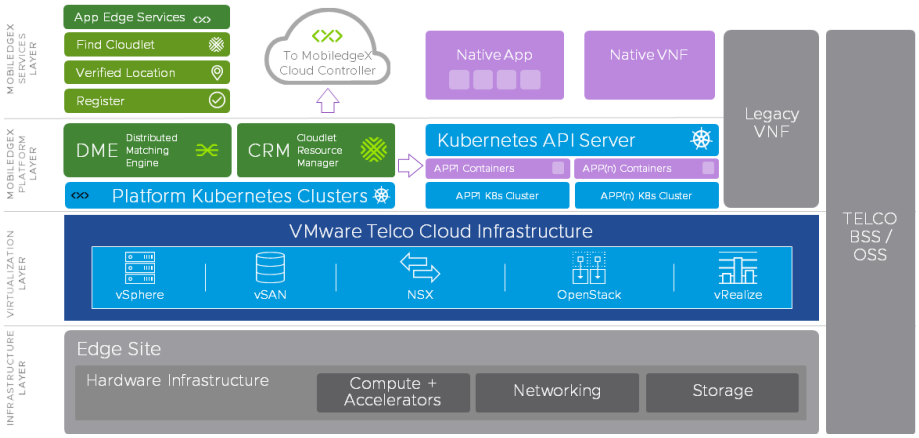

FIGURE 1: The deployment architecture for MobiledgeX with VMware Telco Cloud Infrastructure.

The IaaS layer that is exposed through VMware Telco Cloud Infrastructure establishes a CI/CD environment for workload lifecycle management. The platform also delivers an automation framework to interoperate with external functions for service orchestration and management.

This multi-carrier platform enables you to onboard and continuously deploy MEC applications and manage applications after deployment. Here are some of the platform's key capabilities:

- Edge computing delivered from telco edge sites
- Edge offload for low-latency, real-time 5G applications
- Workload placement and high-availability
- Generic 5G application architecture capable of self-monitoring and scaling
- Open application developer marketplace
- Context-aware application placement
- Centralized management
- Application management for distributed sites and full lifecycle management
- Data residency to help meet the General Data Protection Regulation (GDPR)

VMware Telco Cloud Infrastructure Reduces CapEx by 74 Percent

When MobiledgeX runs on VMware Telco Cloud Infrastructure and uses OpenStack as the VIM, VMware calculates that there is a 66 percent reduction in CapEx tied directly to the number of servers—a VMware deployment for 64 edge sites would require only 131 servers, compared with the 384 servers that would be required by a traditional OpenStack deployment.

VMware Telco Cloud Infrastructure Reduces OpEx by 98 Percent

When MobiledgeX runs on VMware Telco Cloud Infrastructure and uses OpenStack as the VIM, VMware calculates that there is a 98 percent reduction in OpEx for edge data center operations because of the reduction in the number of servers and the operational costs of maintaining them. Maintenance includes patching, upgrades, and troubleshooting. Monitoring fewer servers for security incidents is likely to bring further reductions in OpEx.

TECHNICAL BENEFITS OF RUNNING MOBILEDGEX ON VMWARE

- Common cross-operator platform for 5G-driven MEC applications
- Edge offload for low latency and high throughput applications
- Access to network data such as location, security, identity, and traffic
- Capability- and capacity-based workload placement
- CI/CD framework for application developers
- Application ISV marketplace
- Subscription and perpetual consumption models
- Data residency to help meet GDPR
- Support for multiple clouds, including public clouds
- Pre-validated and certified MEC applications to speed up time to market
- Integrated edge infrastructure that supports VNFs, CNFs, and MEC apps
- Automated application publishing by using DevOps processes

Conclusion

Because of the reduction in the number of servers required for a minimum deployment, a solution that pairs MobiledgeX with VMware Telco Cloud Infrastructure OpenStack Edition carries a significantly lower total cost of ownership over a traditional OpenStack deployment. Both CapEx and OpEX costs are lower with VMware infrastructure.

Additional efficiencies in deploying and operating VMware Telco Cloud Infrastructure stem from its extensive use of automation in provisioning and lifecycle management. Integration with other aspects of the VMware stack, such as those that furnish monitoring and visibility, are likely to further reduce TCO.

Running MobiledgeX on VMware Telco Cloud Infrastructure establishes a cost-effective telco cloud for rapidly launching, managing, and protecting mobile edge applications at a comparatively low TCO.

LEARN MORE

For more information about VMware Telco Cloud Infrastructure, call 1-877-VMWARE (outside North America, dial +1-650-427-5000) or visit *https://telco.vmware.com/*