

Simplify Your Edge

Deliver on the promise of 5G with speed and simplicity as you transition from a centralized to a multi-cloud, multi-vendor, multi-tenant and distributed network architecture.



KEY BENEFITS

Reduces complexity

A virtualized abstraction layer that spans the entire network reduces the need to manually configure each toolset.

Cost savings

Provides a Software as a service (SaaS)-based solution that can be deployed on any Infrastructure as a service (IaaS) platform, reducing CapEx and OpEx with a consolidated platform.

Delivers scale, visibility and flexibility

Provides “stitching” and scaling of multiple environments, enabling consistency and visibility.

Increases security

Reducing the attack surface and increasing observability thwarts the impact of bad actors.

Optimizes operations

Build a consistent infrastructure from the core data center to the radio access network (RAN), all the way to the edge.

Convergence of telco and IT cloud

SaaS-based solution provides lifecycle management, including zero-touch provisioning, scaling, and simplified upgrades along with site reliability engineers (SRE) as a service.

Expanding Your 5G Networks to the Edge

5G Edge computing will provide tremendous opportunities in every industry. Having compute, storage, and processing power close to the end user is fundamental for reaching the near real-time latency performance and high bandwidth that 5G promises. Processing data close to where it originates improves privacy and security since the data doesn't need to travel to the data center and back. Having artificial intelligence/machine learning (AI/ML) algorithms process data at the edge opens the opportunity for a wealth of applications.

As service providers, you are positioned to play a prominent role in edge computing by transitioning to the edge and building virtual, hybrid, and multi-cloud networking infrastructures, allowing you to deploy applications anywhere across your edge infrastructure. Around 10% of enterprise-generated data is created and processed outside a traditional centralized data center or cloud. By 2025, Gartner predicts this figure will reach 75%.¹

5G is fundamentally designed with a decentralized architecture that incorporates a distributed cloud environment. The distributed cloud enables you to deploy and run applications and functions in a mix of different cloud locations and environments (private and/or public cloud) that meet the specific requirements for those applications. This is reshaping cloud computing and enables you to centrally manage more complex deployments of private and public cloud environments from multiple different vendors and support modern applications from multiple different industries.

KEY FEATURES

Multi-cloud networking

Connect, secure, and observe applications deployed across multiple cloud and edge sites.

Unparalleled speed and agility

Reduce complexity of managing and operating multiple services.

Distributed app management

Deploy and operate applications across distributed and heterogeneous infrastructure such as private/public, network, and edge clouds.

Simplified operation

Automate application deployment, scaling, security, and operations as a unified cloud.

Unified security

Provide security with a distributed proxy-based and zero-trust architecture.

Visibility and control

Provide a single pane of glass view for distributed apps and infrastructure.

UNDERGOING DIGITAL TRANSFORMATION - CONVERGENCE OF IT AND TELCO CLOUD

Service providers are continuously undergoing a digital transformation as you migrate to 5G. In preparing for 5G and edge computing deployments, you need to redesign your mobile network and IT architectures from the ground up—moving away from monolithic, appliance-based network architectures and leveraging horizontal IT architectures.

Cloud computing resources can now be deployed in distributed data centers at the edge of the network, which provides a platform for modern applications and services. This has led service providers on a critical journey to implement a cloud-native infrastructure while transitioning their existing network to a hybrid, multi-cloud and distributed network that is designed for agility. However, these edge cloud services need to be run at tremendous scale.

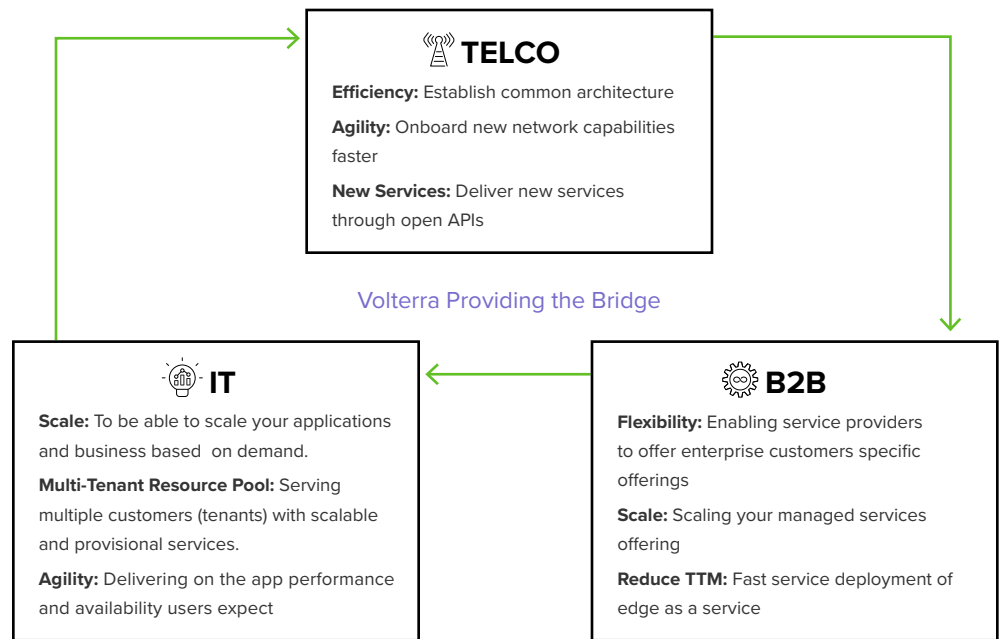


Figure 1: Convergence of telco, IT, and B2B systems creates differentiated business services in a hybrid multi-cloud distributed ecosystem.

With the introduction of 5G also comes the convergence of telco, IT and B2B systems, which creates transformative business services for industry verticals in a hybrid multi-cloud distributed ecosystem. Critical drivers for enterprise applications are 5G and edge computing. With the convergence of IT and telco cloud we now have the telco cloud expanding into the enterprise edge. Therefore, the combination of 5G, edge computing and hybrid multi-cloud represents a new computing model capable of transforming a wide range of industries.

CHALLENGES THAT ARISE WITH TRANSITIONING TO 5G

With 5G's distributed architecture comes the need to reduce the complexity of deploying, managing, and maintaining the lifecycle management of tens of thousands of Kubernetes clusters.

With the transition from 4G to 5G, service providers must now support both virtual network functions (VNFs) together with cloud-native functions (CNFs). Having multiple VNF and CNF cloud stacks to support makes managing networks increasingly more difficult. For instance, how do you manage KPIs and upgrades, monitor capacity, and move workloads or instantiate workloads at the edge?

As you continue on your migration path, some existing network implementations will have siloed Kubernetes environments, which are based on specific virtualized vertical stack implementations. Vertical stack implementation occurs when each vendor introduces their own infrastructure, thereby increasing vendor lock-in and complexity. The vertical stack approach also makes it increasingly difficult to implement multiple digital services and workloads that can be easily instantiated and managed (for instance, gaming, manufacturing, IoT, and fintech to name a few). Having a network predicated on vertical stack implementations also reduces your network security since you now need to entrust that individual vendors are enabling their own Kubernetes encryption.

Operating your network has now become much more complicated with multiple vendors bringing with them multiple operational systems, causing network operations costs to rise with each vendor. Proper lifecycle management is also a prerequisite due to the complexity surrounding 5G distributed multi-cloud networks. Most importantly, it is vital to maintain visibility into your network with the proper toolset needed to manage and maintain the entire end-to-end network.

The crucial part of a 5G network is the capability to scale-in and scale-out as needed to re-allocate capacity from one application that doesn't need it to another one that does, along with the ability to scale to accommodate enterprise edge use cases or applications. Scaling can only be successfully carried out if a common platform exists.

Supporting more applications and more devices in a hybrid multi-cloud environment increases the following risk factors.

- **Cost increases**, due to fragmented cloud skills, application/cloud dependencies, and increased OpEx.
- **Slow deployments**, due to additional automation and Infrastructure as a service (IaaS) dependencies.
- **Limited scalability** from limited-service stitching.
- **Decreased visibility**, due to multiple operating systems.
- **Reduced security**, because vertical stack implementation requires the service provider to ensure proper Kubernetes encryption.
- **Interoperability issues**, because multi-vendor and multi-tenant environments are conducive to interoperability challenges.

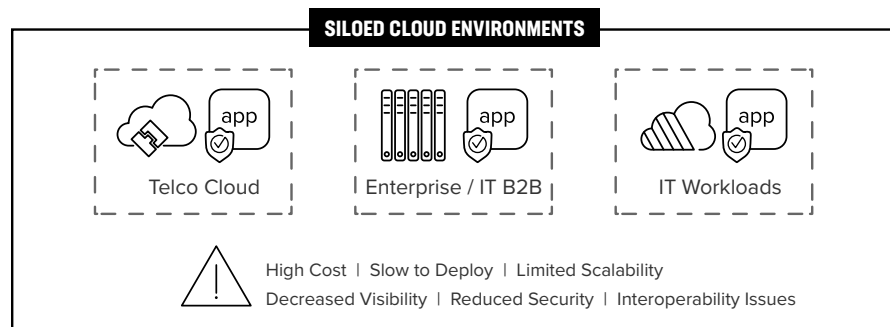


Figure 2: Digital transformation means more devices, more apps, and more clouds, and requires supporting new edge applications, microservices, and multi-cloud deployments.

A Single Platform to Build, Stitch, Secure, and Scale Your Network

IT MAY SEEM THAT
MIGRATING TO 5G WILL
BE A DAUNTING TASK,
BUT A COMMON SAAS-BASED
PLATFORM CAN SOLVE ALL
THESE ISSUES FOR YOU.

Volterra is a SaaS-based solution that offers service providers a single platform to connect, secure and observe applications deployed across multiple clouds. The Volterra solution provides connectivity, networking, deployment and management ease as you begin to build out your 5G network. Having a centralized control plane with a full scale-out data plane enables you to implement enterprise applications with the click of a button.

Volterra provides a single platform to manage all your distributed applications from the core data center to the edge, far-edge and enterprise edge. Volterra delivers multi-cloud confidence. This means that Volterra provides the ability to seamlessly connect and share workloads across distributed environments from multiple public and private cloud providers and the edge.

Enabling management ease with operational visibility and control is vital in multi-cloud environments with multiple vendors and tenants. With Volterra's SaaS solution, you can deploy, manage, and upgrade tens of thousands of Kubernetes clusters while managing consistent identity access, policy, and security across all the cluster. Offering the ease of scaling while supporting complete life-cycle management is crucial as network complexity increases. Volterra powers OpEx, decreases your time to market, and reduces network complexity by consolidating services and offering a single pane of glass to manage and control your network.

Volterra enables deployment ease and provides added security by delivering a SaaS-based operation with common tooling across the entire network. This enables a faster time to market for service providers to start monetizing their investments while maintaining the promise of 5G.

AROUND 10% OF ENTERPRISE-GENERATED DATA IS CREATED AND PROCESSED OUTSIDE A TRADITIONAL CENTRALIZED DATA CENTER OR CLOUD. BY 2025, GARTNER PREDICTS THIS FIGURE WILL REACH 75%.

Volterra can create an IaaS or Containers-as-a-service (CaaS) or can work on top of an existing IaaS. There is no need to rip and replace existing infrastructure, as Volterra implements an abstraction layer that enables integration with ease.

Some key features offered by implementing the Volterra solution include:

- Enabling network **simplification**.
- Providing an **IaaS** for VNFs (KubeVirt) and a **CaaS** for CNFs.
- **Scaling** to accommodate all the network functions from the 5G standalone core and edge, and to the RAN.
- Providing additional **security, control** and **visibility** of your network.
- Providing **centralized** control plane management.
- Supporting **full scale-out** capability of the data plane.
 - A single VoltMesh instance can support a single CNF or scale across the entire network.
- Deploying software rollouts and **lifecycle management** with ease—without any data plane downtime.

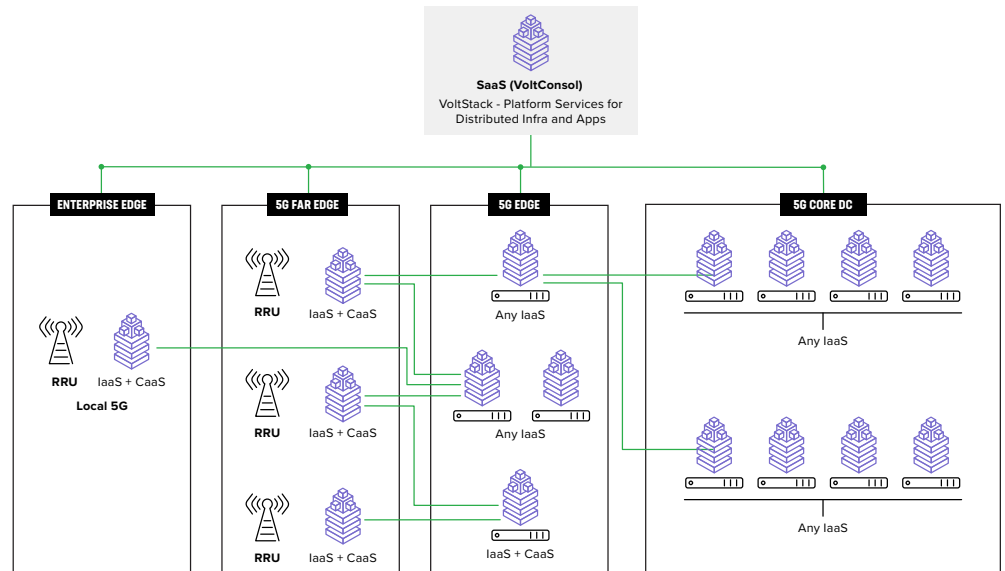


Figure 3: Mobile edge network consolidation with Volterra

VOLTERRA PROVIDES
MULTI-CLOUD CONFIDENCE
BY PROVIDING
THE ABILITY TO
SEAMLESSLY CONNECT
AND SHARE WORKLOADS
ACROSS DISTRIBUTED
ENVIRONMENTS FROM
MULTIPLE PUBLIC AND
PRIVATE CLOUD PROVIDERS
TO THE EDGE.

The Volterra solution consists of three products: VoltMesh, VoltStack and VoltConsole.

VoltMesh:

- Provides **distributed network and security services**.
- **Connects, secures, and observes** applications deployed across multiple cloud and edge sites.
- **Improves security** with its distributed proxy-based and zero-trust architecture.
- Delivers **deterministic, reliable, and secure** connectivity across multiple clouds.
- **Reduces complexity** of managing and operating multiple services deployed within a single cloud, multiple clouds or edge sites.
- Provides **lifecycle management** of the infrastructure and services running on it.

VoltStack:

- Provides a **virtual Kubernetes platform** service for distributed applications.
- **Deploys, secures, and operates** a fleet of applications across heterogeneous infrastructures in private, public, telco, and edge clouds.
- **Offers high scalability** with **centralized** orchestration, observability and operation to **reduce complexity** of managing distributed clusters.
- Delivers a **logically centralized** cloud that can be managed by Kubernetes APIs.
- **Automates application deployment, scaling, security, and operations** as a **unified cloud**.

VoltConsole:

- Offers a **centralized SaaS console** for app deployment and services.
- Provides a **single pane of glass** for distributed apps and infrastructure.
- **Eases operational complexity** by enabling infrastructure and apps management across multi-cloud and edge.
- **Provides intelligence** by providing early warnings and AI/ML-driven business insights.
- **Delivers observability** by monitoring health and providing lifecycle management.
- **Enhances security** by providing visibility into multi-layer security systems.

86% OF SERVICE
PROVIDERS CONSIDER
INTEGRATING AN EDGE
COMPUTING SOLUTION
EXTREMELY CHALLENGING.

Conclusion

Implementation of 5G and edge computing needs to be simplified in terms of deployments and operations. In an IDG report,² 86% of service providers consider integrating an edge computing solution extremely challenging. With Volterra, however, implementing edge as a service does not need to be challenging or complex. Volterra provides end-to-end networking and application security services across distributed cloud environments, simplifying the deployment and operations of distributed apps. The ease of building, stitching, securing and scaling your network with Volterra enables you to seamlessly adapt to telco and IT cloud convergence, extending your telco cloud to your enterprise edge to support broader industries and drive greater innovations.

About Volterra

Volterra provides a comprehensive SaaS platform to deploy, connect, secure and operate distributed applications and data across multi-cloud and edge sites.

Learn more about Volterra Edge Cloud solutions

Visit: volterra.io

Contact Technical Sales: sales@volterra.io

Endnotes

¹ Gartner: [What Edge Computing Means for Infrastructure and Operational Leaders](#)

² IDG Report: [Protect Your 4G Investments with Your 5G Deployment Strategy](#)

