Modernize and Scale your Edge Network with Multi-Cloud Networking

Run Arrcus ACE on VMware Telco Cloud Platform™

AT A GLANCE

- Deploy multi-cloud network with hyperscale performance.
- Simple, integrated overlay-underlay approach for distributed data center and cloud regions.
- Secure cloud connectivity across all regions and sites over any transport, including the internet.
- Flexible consumption model, scalable solution, unified orchestration, and a low total cost of ownership.
- Unifies and provides seamless connectivity across the data center, the edge, and the multi-cloud.
- Fully programmable network with standards-based APIs
- ArcEdge - a secure data plane element in the MCN platform can be truly deployed anywhere – data center, cloud regions, and the edge.
- Seamless deployment and interconnection of hundreds and thousands of ArcEdges with automated orchestration.
- Orchestrate thousands of on-premise and cloud nodes from a common platform.

Introduction

The era of enterprise data centers (DCs) and public clouds delivering business-critical applications are evolving rapidly to keep up with the explosive access from users and machines from anywhere and anytime. To support this rapid expansion of applications and data in distributed places around the world, a new generation of high-performance and scalable networking architecture is required. The current networking architecture adopted by the major public cloud providers are neither optimized nor aligned with the existing enterprise DCs, which in turn aren't designed to scale and integrate with the public clouds. This disjointed network architecture presents significant barriers to growth and also for the efficient and rapid adoption of distributed applications across the multi-cloud infrastructure.

The Challenge

The challenges in the current solutions are multi-fold. Legacy vendors lack a unified networking architecture that leads to rigid deployment, is limited in both scale and performance and is based on inconsistent operating models. Furthermore, as the adoption of on-prem solutions from cloud providers accelerates, these architectural limitations are leading to siloed IT models with increasing complexity, heightened security vulnerabilities, and unnecessary costs.

The fundamental disconnect in this architecture stems from the lack of integration between the well-adopted DC IP Clos architecture and the high reliance on overlay-based (IPSec, VPN) networks from the cloud providers. In networking terms, this translates to the data center based on the IP Clos "underlay" network lacking integration with the public cloud network based on the - IPSec, VPN - "overlay" network. This lack of integration has led to multiple issues, including tedious workflows, inefficient change management, and complex orchestration models, all of which lead to high-cost solutions. Ideally and also what enterprise organizations are seeking is a simple network and a scalable architecture with a unified data forwarding software, managed with standard orchestration workflows, and integrated into their existing network operating models.

The Solution

Arrcus ACE 2.0 platform makes networking agile, scalable, seamless, and secure. ACE 2.0 provides a single platform that can be deployed from on-prem to edge to multi-cloud. With Arrcus ACE 2.0 running on VMware Telco Cloud Platform, it demonstrates that CSPs can leverage VMware Telco Cloud Platform deployed in the field for segment-based routing services. It enables the CSPs to take a more discreet approach to route optimization for specific data from source to destination, such as routing hyperscaler specific traffic to improve performance, scale, and efficiency of data plane communication.

VMWARE TELCO CLOUD PLATFORM

The VMware Telco Cloud Platform enables CSPs to accelerate 5G rollouts from core to edge to the RAN for both containerized network functions (CNFs) and virtualized network functions (VNFs).

VMWARE TELCO CLOUD PLATFORM RAN

The VMware Telco Cloud Platform RAN is powered by field-proven virtualized compute coupled with VMware Telco Cloud Automation and VMware Tanzu for Telco RAN, a telco-grade Kubernetes distribution.

- Use the same common platform to virtualize the RAN now and migrate to O-RAN in the future.
- Run virtualized baseband functions, virtualized distributed units (VDUs), and virtualized central units (VCUs) following stringent RAN performance and latency requirements.
- Optimize the placement of DUs and CUs through programmable resource provisioning.
- Deploy and operate both RAN and non-RAN workloads on a horizontal platform.
- Transform the RAN into a 5G multi-services hub.
- Reduce time-to-deploy by automating the provisioning of RAN sites.
- Simplify the onboarding of vRAN functions with validated and standards-compliant packages.
- Automate lifecycle management of infrastructure, Kubernetes clusters, vRAN functions, and 5G services.
- Programmatically adjust the underpinning platform availability and resource configuration based on the requirements of vRAN functions at the time of instantiation.
- Automatically discover, register, and create Kubernetes clusters from a centralized location to manage thousands of distributed components with ease.
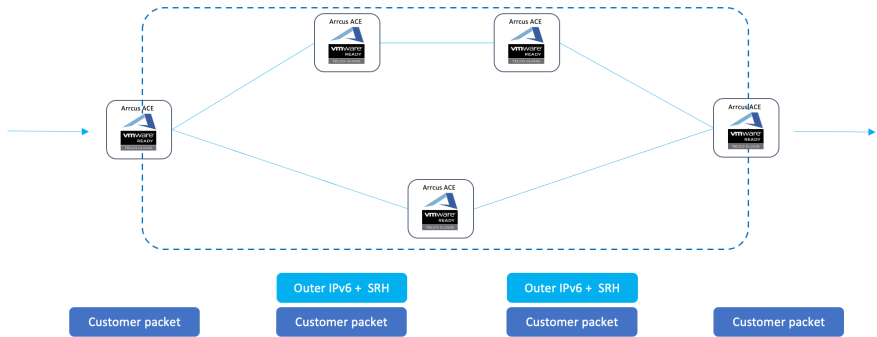

FIGURE 1: SRv6 domain with Arrcus ACE on VMWare TCP

The Arrcus ACE 2.0 multi-cloud networking (MCN) platform delivers the scalable networking solution to securely and seamlessly interconnect enterprise data centers with any cloud region around the world, with hyperscale performance and cloud-native security.

The Arrcus MCN Networking Platform with ArcEdge and ArcOrchestrator

The Arrcus MCN platform consists of ArcEdge, which is a secure data plane element, and ArcOrchestrator, which is the modern orchestrator that dramatically simplifies and secures cloud connectivity with hyperscale performance. Designed for digital-first enterprises, the Arrcus multi-cloud networking platform empowers organizations to tightly integrate their data center network and public cloud infrastructure with a flexible deployment architecture and robust security. Operationally efficient with well-adopted frameworks like HashiCorp Terraform and Ansible playbooks with support for the on-premise YANG data models, OpenConfig, and a complete RestAPI framework. Built with cloud-native principles for public cloud platforms, the Arrcus multi-cloud networking platform is a fully integrated and cloud-native solution.

ARRCUS MCN PLATFORM

Arrcus MCN provides the following core features:

- **Architectural flexibility -** Interconnect distributed applications with hub-spoke, full-mesh, or hybrid connectivity models with multi-cloud network address translation, high availability, and support for overlapping IP addresses needed for cloud migration across the data center across multi-cloud environments

- **Cloud-native security and integration -** Seamlessly deliver access and authentication-based security policies integrated with the always-on AES-256 encryption for all traffic and cloud-native security like IAM, security groups, and NACLs. Flexibly deploy cloud-native application firewalls or 3rd-party firewalls with complete isolation of compute, network and storage resources. Provides the ability to identify, route, and run heterogeneous workloads deployed in virtual machines and containers.

- **Orchestration integration and support -** Deploying, connecting, and securing hundreds and thousands of nodes is made easy as operators manage everything from the ArcOrchestrator. Supports HashiCorp, Terraform, and Ansible playbooks for easy integration into existing deployment frameworks and operational simplicity.

- Eliminates the complexities in traditional networking and enables cloud operations to quickly and securely set up, deploy, and manage their cloud environment.

- Built from cloud-native tenets, ArcEdge in the MCN platform can scale for 500k+ routes per VPC.

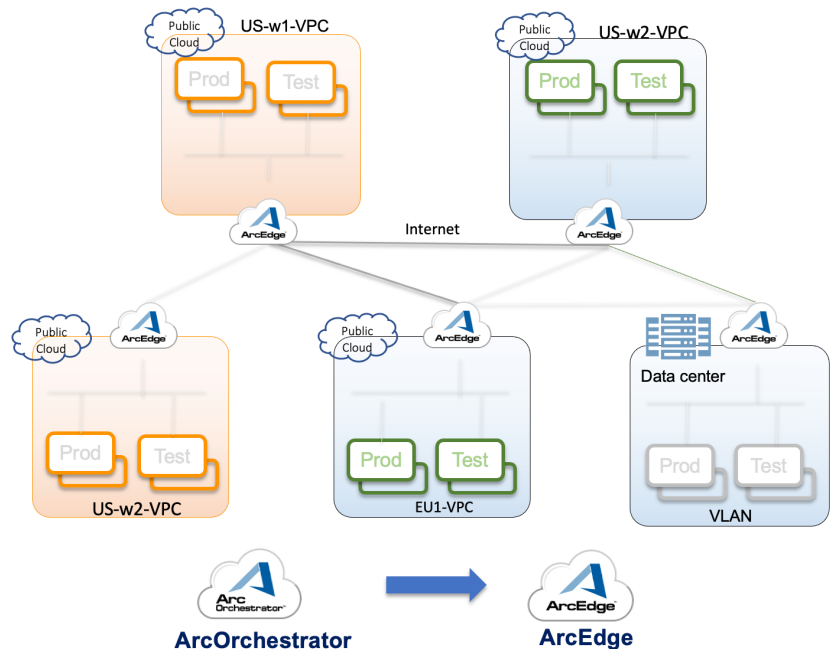- Deploy with seamless cloud-native security integration – security groups, firewalls, and more.

FIGURE 2: Arrcus Multi-Cloud Networking Platform

The Use Cases

Monitoring & Analytics

- Telemetry Architecture: ArcIQ is architected on streaming telemetry for real-time data collection and secure streaming with Kafka or gNMI.

- Control Plane Security: Monitor, validate, and notify – network and security insights like route origin validation (ROV) to detect route leaks and hijacks.

- Open API Infrastructure: Supports an extensive list of APIs for integration with other observability platforms, central processing of critical events, and security analytics.

Edge Routing

- Deployment Flexibility: Deploy the Arrcus Router in a range of roles: Provider (P), Provider Edge (PE), Customer Edge (CE), Peering, or with a combination of technologies: IP, MPLS, Segment Routing (SR-MPLS/SRv6).

- Internet-Scale: Scale the Arrcus Router to internet-scale with state-of-the-art, open hardware-based routing platforms.

- Carrier-Grade Resilience: Deliver Carrier-grade resilient and rapid convergence solutions with first principles-based open networking software.

Routing Security

- Route Validation: Leverages authentication-based routing to validate the origin of routes received, thereby improving the security of business assets.

- Real-Time Visibility: Provides real-time, deep views of networks and resources with actionable insights to enable network operators to execute data-driven policy decisions.

- Network Uptime: Protects routing infrastructure from malicious attacks and secures resource availability and business continuity with no performance impact.

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Key Capabilities and Benefits

ArcEdge is powered by ArcOS – a proven, robust, and microservices-based network operating system built from first principles and leverages industry-leading route scale and convergence times. ArcEdge is architected on cloud-native tenets for seamless integration and auto-scaling in public cloud services and as a border leaf edge in the data center IP Clos network.

ArcOrchestrator is a cloud-native software solution that can be deployed and managed in multi-cloud environments. Along with the support for popular frameworks, ArcOrchestrator integrates with the Kubernetes orchestration platform as a controller to deploy and manage ArcEdge in both the cloud and on-prem. With support for global templates, deployment and connectivity across 1000s of nodes can be orchestrated with a single set of variable constructs and run-time scripts. Enterprise IT and cloud operators can leverage the common templates to provision changes across all layers of the network, from routing updates to network access policy and application connectivity.

Summary

The solution with Arrcus running on VMware Telco Cloud Platform is easily deployed and integrated into CSP's multi-cloud environment. CSPs can now, with Arrcus ACE 2.0 running on VMware Telco Cloud Platform, uniquely sustain the rapid growth of applications and data in distributed locations around the world and leverage a new architecture that delivers hyper-scale multi-cloud networking solutions with reliable scale, predictable performance, and seamless orchestration.

Running Arrcus on the VMware Telco Cloud Platform, CSPs can be equipped with the functionality to modernize their network, making it easier than ever to be dynamic, scalable, and efficient.

For more information on the VMware Telco Cloud Platform, please visit *telco.vmware.com* or contact your VMware representative.