



# Building the Scalable Network Foundation for Hyper-Converged Infrastructure

## Highlights

- Simple, plug and play software-defined network fabric architecture
- Interconnect geographically distributed HCI deployments across data centers
- One-touch provisioning for HCI cluster, compute, storage, and network
- Complete interoperability with existing network, compute and storage infrastructure
- Optimizes performance and availability of synchronization and replication of virtualized workloads
- Interconnects virtualized and bare metal services
- Enhanced security with granular traffic segmentation and multi-tenant services
- Unified analytics dashboard provides visibility for VM, Storage, Compute and Network

With an increasing focus on the migration to digital services, IT organizations must transform the data center to enable cloud-like agility and scale to meet the expectations of the dynamic enterprise. Consequently, this transformation requires a new approach to modernize the network to meet the demands of ever-evolving virtualized services. However, as organizations move to Hyper-Converged Infrastructure (HCI) to realize the value of private cloud and simplify and scale operations, the underlying network has largely been left untouched inhibiting the success of these transformation initiatives.

The challenge is that legacy networks are not aligned to the needs of modern infrastructure, nor are they optimized to support virtualized services. Legacy networks lack programmability and automation, and interconnecting multiple data centers is complex and requires expensive additional equipment. In addition, the lack of end-to-end performance visibility inhibits the ability to manage and optimize performance proactively and to achieve optimal service availability, performance and quality.

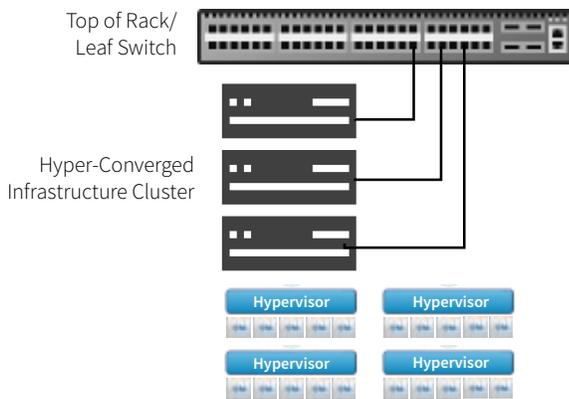
The virtualization of compute and storage have demonstrated what's possible when the right technology is deployed. With the next generation of Software-Defined Network (SDN) technology it is now possible to build a simple, dynamic and secure network that empowers the next generation data center with cloud-like scale, elasticity, and adaptability that makes it easier to deliver, manage, and secure service delivery across the enterprise.

## The Adaptive Cloud Fabric Empowers HCI to Make It Smarter

The Adaptive Cloud Fabric™ from Pluribus Networks empowers organizations to speed their transition to a completely software-defined data center (SDDC) while eliminating network complexity, significantly reducing costs and accelerating time to value for HCI deployments. With its controllerless, distributed architecture and automated plug and play operation, the Adaptive Cloud Fabric delivers a more dynamic, resilient, and elastic network that provides the ideal foundation to optimize HCI architectures, such as Nutanix™, VxRail™, and VMware vSAN.

Powered by the Netvisor® ONE operating system, the Pluribus Adaptive Cloud Fabric enables a powerful software-defined network foundation that adapts to change, improves efficiency, and streamlines operations with complete interoperability with existing network and data center infrastructure.

The simplicity and automation of the Pluribus Adaptive Cloud Fabric makes the network transparent, enabling the IT organization to focus on applications and services. The elastic nature of the fabric supports high volumes of east/west traffic across server and storage nodes with performance predictability, enabling the incremental scale-out of capacity to meet future growth requirements without requiring premature replacements.



Pluribus Netvisor ONE OS Deployed on Open Networking Hardware

### Simple, Scale-Out Flexibility and Extensibility

The Adaptive Cloud Fabric architecture provides resilient, high-performance interconnection across HCI nodes for reliable, distributed, and high-performance resource sharing, data replication, and workload mobility. Capacity is elastic and can scale from several nodes to hundreds of nodes with linear performance, enabling the fabric to be leveraged to support additional service racks, pods, server farms, or the entire data center as required.

The Adaptive Cloud Fabric supports thousands of end-points and millions of concurrent connections with multi-terabit capacity and predictable performance and latency. This scale-out flexibility enables organizations of any size to build a next-generation private cloud that seamlessly interconnects virtualized and bare metal services with fabric-wide workload mobility. The Adaptive Cloud Fabric is optimized to support high-demand and mission-critical services, such as hybrid IT, virtualized applications, Internet of Things (IoT) and Virtual Desktop Infrastructure (VDI) among many.

### Simple, Automated, Plug and Play Management

The Pluribus Adaptive Cloud Fabric is easy to deploy, and provides a centralized single point-of-management to provision and manage all devices across the fabric regardless of their location.

Plug and play operation enables rapid, touchless initialization and upgrades for network devices. Administrators can provision fabric-wide policy and services across all fabric member switches with a single command via RESTful APIs, or Command Line Interface (CLI) with functional parity.

Integrations with VMware vCenter and other automation platforms enable simplified one-touch provisioning for network, compute and storage to administer the network and HCI services in unison. This allows the HCI administrator to provision the network, HCI services, and workloads and from vCenter, without requiring any intervention from the network operations team. Consequently, the HCI administrator can now define services and network resources together to simultaneously scale the network and service layer with a single action, eliminating network complexity and speeding time to deployment. This allows automating multi-team tasks such as:

- Network creation for new VM or virtual services
- Switch configuration based on distributed vSwitch teaming policies of ESXi hosts
- Zero-touch multicast configurations for vSAN traffic

Automated provisioning can be implemented independently of the layer 2 or layer 3 configuration chosen by the network administrator. From the network operations perspective, this means that network creation for new VM or workload is fully automated, and LAG/vLAG formation is automatically provisioned when new hosts or servers are detected.

Automation tools, such as Ansible, or the Pluribus UNUM™ management platform are also available to provision an entire Leaf and Spine fabric for layer 2 or layer 3 operation, reducing network configuration time by up to 95% over traditional box-by-box management. The Pluribus UNUM platform provides a modern point-and-click interface that provides unified provisioning automation, configuration management, and diagnostics capabilities. The Pluribus UNUM platform automatically discovers and visualizes the network topology and peer relationships for switches and server end-points, and maps client/server application flows across the fabric.

### High-Availability and Resiliency

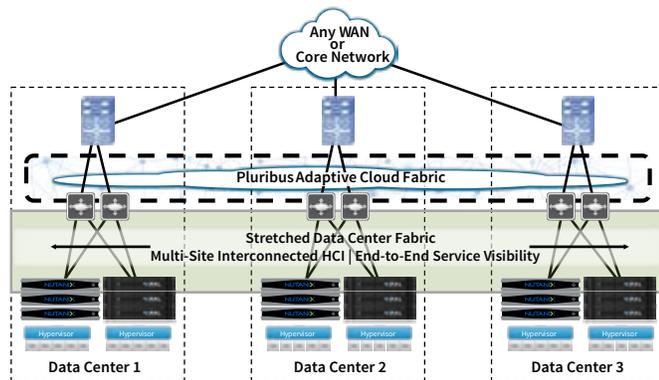
The Pluribus Adaptive Cloud Fabric delivers exceptional resiliency to assure business continuity and meet the availability requirements for HCI service synchronization and replication. In addition to supporting layer 2 and layer 3 protocols and standards-based redundancy strategies, the distributed peer-to-peer fabric architecture enables multi-path optimal distribution to assure connectivity in the event of system/link failures or resource exhaustion.

The distributed fabric architecture delivers unmatched service-level resiliency with sub-second failover and reconvergence, enabling active/active or active/standby configurations to minimize service degradations or outages.

## Stretching HCI Across Multiple Data Centers

The Adaptive Cloud Fabric is a peer-to-peer distributed fabric that federates all switches into a unified operating environment, enabling all member devices to operate and be managed as a single virtualized switch, dramatically simplifying network operations. All switch-to-switch communications, configuration, policies and state information is dynamically updated in real-time across the Fabric.

The Adaptive Cloud Fabric can be implemented in a single data center, or distributed geographically to support Data Center Interconnect (DCI) requirements over any WAN or dark fiber connection without network reengineering or complex protocols. When deployed across distributed locations, the Pluribus Adaptive Cloud Fabric optimizes HCI synchronization, stretches resource sharing, speeds workload mobility, and significantly enhances disaster recovery capabilities.



The Adaptive Cloud Fabric stretches distributed Hyper-Converged Infrastructure deployments across multiple data centers for synchronous replication and active-active HA/DR requirements

## Dynamic Security

Integrated Fabric-wide security services enable granular control and policies to be applied on a per-user, per-application basis. Network virtualization allows highly granular user and traffic segmentation. Application and traffic segmentation enables dynamic controls for north/south and east/west traffic, and flexible multi-tenant services allow administrators to define isolated user groups that span across multiple locations with complete workload mobility.

Segmentation is also ideal for segregating development, test, and production environments across a single HCI cluster. Flexible security insertion and service chaining enables policy-based security services to be applied across the Fabric to efficiently leverage security assets and enable more targeted enforcement capabilities.

## Integrated Visibility and Analytics

The Adaptive Cloud Fabric embeds monitoring telemetry on every port to monitor service and application flows at the speed of the network. The embedded telemetry exposes important service behavior characteristics such as application type, connection state, and end-to-end connection latency. Pluribus vProbe technology extends visibility into VMware servers to expose the performance characteristics of application traffic traversing the hypervisor. The embedded telemetry monitors all application flows, including traffic within VXLAN tunnels. Performance metrics can be viewed through standard RESTful APIs, IPFIX, command line queries, or can be visualized by the Pluribus Insight Analytics™ platform.

Pluribus Insight Analytics provides a comprehensive application-aware Performance Management dashboard that delivers end-to-end visibility across the network, compute, and storage layers. The dashboard provides real-time and historical views into east/west and north/south traffic, as well as virtualized workloads traversing the hypervisor. Visibility can extend from a single location or across a multi-site fabric to identify and triage performance issues to quickly identify problem root cause and assure service availability, performance and quality.

## The Value of Simplicity

The Pluribus Networks approach to next generation data center architectures delivers an open, virtualized and programmable network fabric that ensures the optimum performance and availability of HCI clusters with simplified management and powerful performance analytics. Enabling freedom from legacy network constraints, the Pluribus Adaptive Cloud Fabric is powered by a wide range of Open Networking switches including devices from Dell EMC, D-Link Systems, Edge-core, and the Pluribus Freedom™ series network switches. These next generation data center switches are purpose-built for software-defined and virtualized data centers of all sizes and deliver a cost-effective, high-performance, and highly scalable network foundation for demanding HCI deployments and virtualized workloads.

The combination of Open Networking hardware and the Pluribus Adaptive Cloud Fabric delivers a capability set that is designed to empower any size organization to do more with their next generation data center architectures while eliminating complexities, reducing risk, and speeding the time to value for their HCI investments.