

# Pluribus Netvisor<sup>®</sup> Fabric Automation

## Network Simplification and Agility

### Traditional Network Infrastructure is Inflexible

In the effort of supporting business continuity and regulatory compliance, IT organizations face the constant challenge of inefficient and time consuming network related tasks, resulting in high operational cost and lack of agility.

Many IT managers are restrained by their legacy network infrastructures, which are complex, onerous to manage and automate and often based on single vendor fabrics, up to the point that their networks can no longer meet current business requests, nor be expanded to add new capacity or new technological innovations to support business growth.

Pluribus Netvisor<sup>®</sup> Fabric Automation removes all these hindrances by simplifying key administrative phases: network deployment, network maintenance and updates, network reporting and troubleshooting, and network capacity expansion.

### Pluribus Netvisor<sup>®</sup> Operating System

Pluribus Networks advances virtual and software-defined networking (SDN) through Netvisor, the industry's most programmable, open source-based network operating system. Netvisor is based upon the Pluribus Virtualization-Centric Fabric (VCF<sup>™</sup>) architecture, a proven approach to understanding flow, rapidly responding to business needs and securing your data.

Netvisor combines the benefits of server clustering for networking with a distributed controller fabric. The traditional CLI (Command Line Interface) is paired with fabric-wide programmability (C, RESTful API), and DevOps tools (e.g. Ansible) for agility and automation via a single point of management.

In combination with our switch hardware, Netvisor provides best-in-class switching economics. The deployment flexibility is guaranteed by Pluribus Netvisor full L2/L3 stack providing complete interoperability with the legacy networking infrastructure, allowing for easy insertion into third party deployments.

### Virtualization-Centric Fabric

The Pluribus Netvisor is based on the Pluribus Virtualization-Centric Fabric (VCF<sup>™</sup>) which can be constituted by a collection of Pluribus switches running Netvisor that, by sharing network configuration and state information, can be managed as a single switch. The control fabric that interconnects Netvisor switches is realized over TCP/IP transport and can scale to a number of nodes and server ports much larger than any existing fabric technology without imposing any restriction on the network topology, in-band or out-of-band connectivity and topological distance between nodes. As Netvisor switches support full standard L2 and L3 data plane and protocols, the Pluribus Netvisor Virtualization-Centric Fabric works well in a multi-vendor environment by interoperating with existing infrastructure and allows easy insertion of third-party network elements.

Without the necessity of electing master node roles or introducing external controllers or NMS tools, remote control of the entire fabric is possible by connecting to any switch, thus eliminating single points of failure.

### Netvisor Fabric Automation – Capabilities

- One CLI/API to automate the fabric from any switch:
  - Create application policies (VLAN, QoS, switch port buffer, Security, vLB, vRouter Service chaining)
  - Automate assignment of Application Policies when a new VM/host connects to the fabric or migrates
- Distributed controller architecture using server-clustering technology
- Multi-threaded (1,000s of concurrent calls), server-style APIs (no southbound protocols)
- Highly scalable: scale across pods and datacenters
- L2 broadcast (ARP) free
- STP-free L2 fabric
- Hit-less, automated fabric software upgrade and configuration snapshot rollback
- L3 fabric w/ "L2 everywhere": fabric based VXLAN overlay automation
- Fabric-wide configurations are atomic transactions guaranteed to succeed or fail across the fabric

## Pluribus Netvisor Fabric Automation Benefits

Network Operations Function	Challenge	Pluribus solution
Network Fabric Deployment	Fabric provisioning requires connecting to the remote console of each individual fabric node	Single-Point Centralized Management Console for the entire fabric is available by connecting to any fabric node
	Network policy creation for a group of nodes requires entering commands for each individual target node	Centralized management with fabric wide scope CLI allows the creation of network objects with a single command that is automatically executed across the whole fabric
	Configuring two adjacent nodes to operate as virtual chassis redundant pairs requires individual Network Node and Physical Port Configuration	Once defined the virtual chassis relationship, high-availability functions are configurable with a single command. Physical ports are automatically bundled without the need to configure LAG/MLAG
	Features and Configuration Consistency across network is a manual, error prone process, with potential conflicts due to concurrent management sessions or uncontrolled transaction rollback	Configuration changes that need to be propagated across the fabric are updated in parallel using a three-phase commit protocol to provide consistency
Network Fabric Maintenance and Updates	Software updates need to be performed manually and are service disrupting	The Pluribus Virtualization-Centric Fabric will offer In Service Software Update that when performed on high available topologies cause negligible service disruption
	Network Node addition or replacement requires Individual Network Node Configuration	The node is automatically provisioned by simply joining the existing Netvisor fabric
Network Fabric Monitoring and Troubleshooting	Consolidated View of Fabric Topology and State requires external NMS tool or external SDN controller	Aggregated view of the fabric topology with each node state is provided by connecting to any fabric node
Automating the Whole Network Operations Lifecycle	Limited Network Programmability with local node scope	Fabric-wide programmability (C, RESTful APIs) and DevOps tools (e.g. Ansible) for agility and automation via a single point of management
Expanding Data Center Capacity and Functionality	Incompatibility with existing technology and network design force a complete rip and replace of the network. Proprietary or non-native data plane creates hardware lock-ins and prevents inline service insertion and traffic visibility	The Pluribus Netvisor fabric is based on Open Layer-2 and Layer-3 data plane and protocols (standard Ethernet, LACP, MLAG, active-active VRRP, ECMP with OSPF and BGP) and as such it works with existing spine, aggregation or core infrastructure and allows easy service insertion
	As traditional fabrics are based on topological proximity, administering geographically distant networks mandates the introduction of a separated administrative domain	The Netvisor architecture is designed to support over 100ms Round Trip Time between portions of the same fabric
	Scaling the number of fabric nodes is limited by the management plane or fabric control plane on master network nodes or centralized controllers	The Pluribus Netvisor fabric is based on modern server clustering technology and can scale to a number of nodes much higher than traditional networking protocols
	Endpoint scalability limit is dictated by Master node hardware capacity or control plane protocols	Distributed hardware cache on peer nodes and software based global tables allow scaling to 1M+ endpoints

## About Pluribus Networks

Pluribus Networks provides data center solutions that allow your business to run unconstrained. Our software-defined, open networking, fabric-based solutions transform existing network infrastructures into flexible and strategic assets fully aligned with today's digital business needs. Our Virtualization-Centric Fabric (VCF™) architecture provides unprecedented insight, agility and security to customers seeking to simplify operations, run more cost effectively and bring new applications online faster.

Learn more at [www.pluribusnetworks.com](http://www.pluribusnetworks.com) and [@pluribusnet](https://twitter.com/pluribusnet).