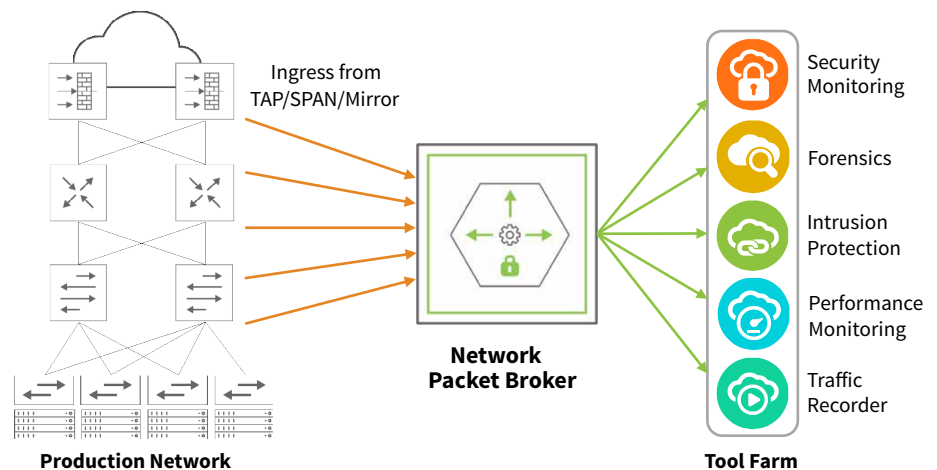


Pluribus Network Packet Broker

Highlights

- Industry's first SDN-enabled virtualized packet broker
- Easily scale port capacity, add switches and sites to match demand and minimize operational complexity
- Simplify multi-site operations to lower opex, and enable easier tool sharing across sites to lower capex
- Ensure continuous monitoring and visibility
- Use network capacity efficiently to drive lower capex

The Pluribus Network Packet Broker (NPB) is the industry's most flexible and scalable solution for network and security monitoring and visibility. The scale-out fabric architecture grows seamlessly from simple single-switch applications to multi-site, geographically distributed monitoring and visibility fabrics while preserving a virtual chassis operational model with a single point of management.



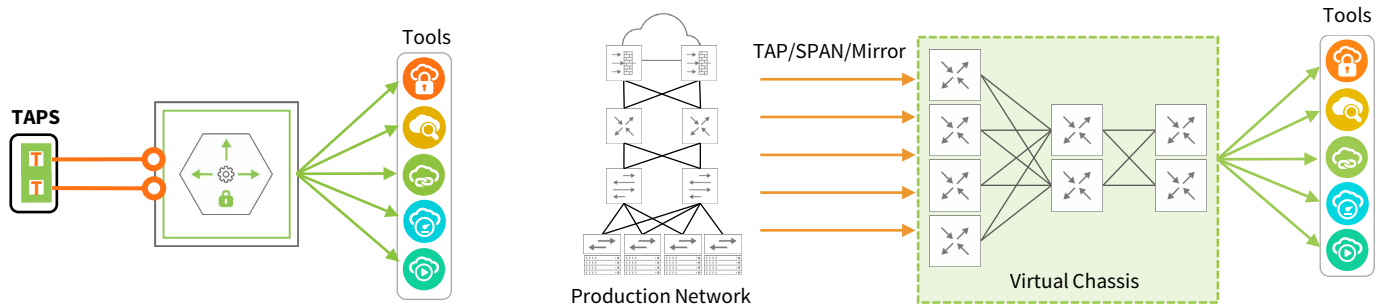
Pluribus NPB solutions are built on a foundation of the Pluribus Adaptive Cloud Fabric and open networking Ethernet switches and provide a comprehensive feature set for a wide range of use cases:

- High-scale, non-blocking, wire-speed filtering, replication, conditioning and grooming
- Support for diverse hardware platforms with varying port capacities and interface speeds, enabling high- to low-speed traffic delivery
- Any feature, any service, any port: Configure any port as ingress or egress
- Any TAP, any tool, any location: Flexible aggregation and replication, 1-to-1, 1-to-many, many-to-1, many-to-many
- Granular multi-stage filtering on ingress and egress
- Pluribus UNUM GUI-based management and virtual chassis operations model to simplify and automate packet broker policy configuration
- REST API for integration with any external orchestration system

The Pluribus Networks Packet Broker solution can be deployed on a wide range of compact, high-density 1U or 2U Ethernet open networking switches supported by the Pluribus Netvisor ONE Network Operating System. Netvisor ONE compatible switches come in a variety of wire speed, non-blocking configurations with a broad range of interface options ranging from RJ45 native copper to SFP, SFP+, QSFP+ and QSFP28. Depending on the hardware of choice port densities range from 12-ports RJ45/SFP/SFP+/SFP28 all the way to 64-ports QSFP28. Breakout cables are also supported for a maximum capacity per 1U of 128x10G/25G ports.

Network Packet Broker Modes of Operation: Standalone and Fabric Modes

When the port density of a single switch is sufficient, the NPB service is configured in a Standalone mode, also known as L1 VirtualWire mode. When two or more switches are required, the NPB service is delivered over the Adaptive Cloud Fabric and operates in Fabric Mode with a virtual chassis operations model.



Standalone L1 Virtual Wire Mode: single switch from 12 ports to 128 x 10G/25G

Fabric Mode: Two or more switches in a virtual chassis configuration, scalable to thousands of ports

Network Packet Broker Features

The following table refers to features available natively in switching systems of a Pluribus NPB, whether deployed in Standalone or Fabric mode:

| | |
|---|---|
| Filtering | <ul style="list-style-type: none"> • Wirespeed Filtering supported for: <ul style="list-style-type: none"> • Layer 2: MAC, VLAN, VXLAN, Ethertype, CoS, inner QinQ tag • Layer 3: Source and Destination IPv4/IPv6 sessions, DSCP, TTL, IP Protocol • Layer 4: Port Number, TCP Control • Deep Packet Matching (DPM) with masking (up to 128 bytes in packet) • Egress filtering on destination ports connected to Tools • Overlapping filtering rules • Multi-stage filtering on ingress switch and optionally on egress switches connected to the Tool Farm |
| Replication | <ul style="list-style-type: none"> • Replication on a standalone device or across the Fabric (multiple switches): <ul style="list-style-type: none"> • One-to-One • One-to-Many • Many-to-One • Many-to-Many |
| TAP, Tool, Service Node Connections | <ul style="list-style-type: none"> • Unidirectional connections • Bidirectional connections (e.g. PacketEngine service node) • LAG connections • Multi-chassis LAG connections • Port splitting with transceiver RX and TX split to TAP and Tool |
| Load Balancing and High-Availability | <ul style="list-style-type: none"> • Flow-based load balancing to maintain session integrity • Load balancing across fabric links • Multi-chassis LAG (M-LAG) connections to the tools • LAG connections to the tools |
| Monitor Traffic Port Tagging | <ul style="list-style-type: none"> • VLAN tagging to identify traffic sources • Destination MAC re-write to mark traffic for specific Tools ** Both actions available in standalone mode or with a dedicated filter on the egress Leaf switch connected to Tools** |
| Management and Diagnostic Telemetry | <ul style="list-style-type: none"> • Centralized management for the entire monitoring fabric (like a "distributed virtual chassis") • CLI (SSH) and RESTful API • Fabric-wide single global command for packet broker filtering and replication distributed rules • IPv6 and Dual stack IPv4/IPv6 for management • SNMP v1, v2, v3 • Syslog • Configurable alerts via UNUM for link traffic utilization, packet errors, and port congestion notifications • Granular per-policy hardware counters • Granular per port traffic counters including drops, bad packets etc. • sFlow • Netvisor ONE TCP Flow Telemetry • Netvisor ONE Flow Tracker for HW assisted flow Telemetry. (Only selected hardware models. See tables below.) |
| Security | <ul style="list-style-type: none"> • TACACS+ • Full AAA switch control via CLI and Linux shell • Management ACL |

The Pluribus NPB solution also supports connection of third-party advanced packet processing devices that can deliver additional features such as deduplication, packet slicing, header stripping and timestamping.

Supported Hardware Platforms

| | 1G/10G platforms with multi-speed interfaces | 10G/25G platforms with multi-speed interfaces | 40G/100G platforms with multi-speed interfaces |
|----------------------|--|--|---|
| Pluribus Freedom | F9372-X F9372-T F9460-X F9460-T | F9572L-V F9476-V | F9532L-V F9432-C |
| Dell EMC PowerSwitch | S4112F-ON S4112T-ON S4128F-ON S4128T-ON S4148F-ON S4148T-ON | S5224F-ON S5248F-ON | S5232F-ON Z9264F-ON |
| Edge-Core | AS5812-54X AS5812-54T AS5835-54X AS5835-54T | AS7312-54X AS7326-56X | AS7712-32X AS7816-64X |