



Juniper Validated Design for building a Campus Fabric IP Clos

A repeatable design for huge-scale, secure, and flexible campus fabric



Learn how to reduce risk, save time and money, and assure network optimization with JVD.

[Explore the JVD](#)

The number of mobile devices is expected to reach 18.22 billion by 2025

JVDs are comprehensive, end-to-end blueprints for deploying HPE Juniper Networking solutions in your network.

Campus fabric JVD

The challenge

The rising demand for IoT and mobile devices is driving massive transitions in the networks that support these endpoints. As the number of devices grows, so does network complexity with an ever-greater need for scalability, segmentation, and security.

The capabilities you need

JVD differentiators

Supporting these trends for large enterprises requires a robust campus architecture, like IP Clos. But safe and secure implementations require a strict set of guidelines.

- **Repeatability**
Prescriptive designs, where all JVD customers benefit from lessons from worldwide deployments.
- **Reliability**
Integrated, best practice designs tested with real-world traffic and described with measured results.
- **Velocity**
Streamlined deployment with step-by-step guidance, automation, and prebuilt integrations.
- **Consistency**
When JVDs are utilized, resultant networks are far more rigorous, stable, and maintainable.

The answer: JVD

Juniper Validated Designs (JVD)

These modern challenges require networks that are cloud-ready, scalable, and efficient. A [Campus Fabric IP Clos](#) is both simple and scalable, ensuring operational efficiencies with optimal personal experiences for end users. Implementing the solution with [Juniper Wired Assurance](#) ensures flawless operator and user experiences.

How it works

Campus Fabric IP Clos Juniper Validated Design

To handle any amount of endpoint growth, HPE Campus Fabric IP Clos JVD shows how to decouple the underlay (physical) network from the overlay network (virtual topology). This provides a much more flexible, functional, high-performance network in ever-changing IT environments.

The Campus Fabric IP Clos architecture provides consistent, personalized experiences for end users. Operators have an AI- and cloud-native network that easily handles the rising complexity of network endpoints. Enterprises enjoy the flexibility of providing Layer 2 and Layer 3 connectivity for all endpoints across campuses and data centers while maintaining a consistent physical architecture (Figure 1).

The Layer 3 VXLAN gateway resides at the access layer. The flexibility of Layer 3 access is perfect for enterprises who have large “east to west” (between servers in data centers or between clouds) traffic patterns, often including multicast.

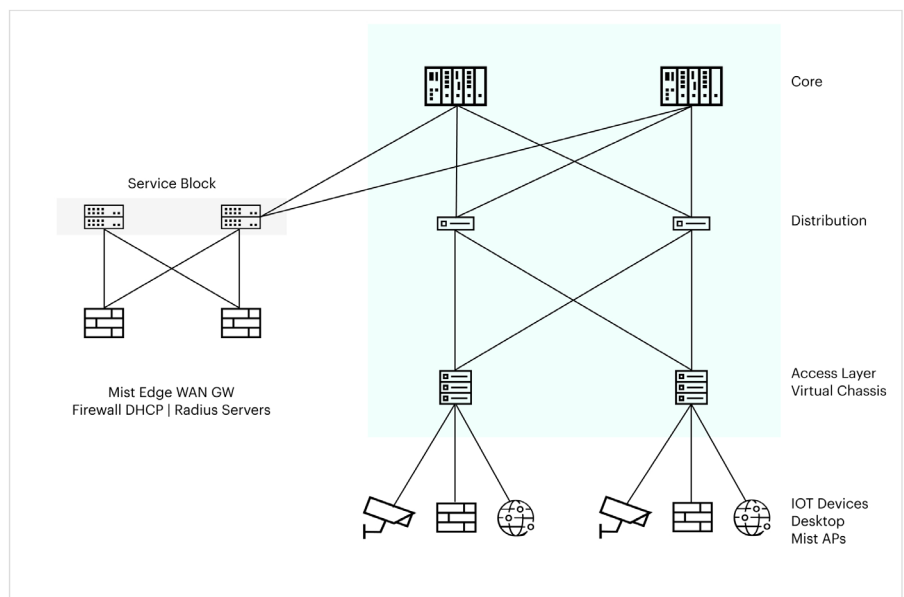


Figure 1. The Campus Fabric IP Clos JVD solution



Core capabilities

JVDs minimize operational costs and reduce the IT burden

Reduced flooding/ learning	Control plane-based Layer 2 and Layer 3 learning reduces the “flood and learn” issues in traditional campus-switched networks. The EVPN control plane handles the exchange and learning of MAC addresses through eBGP routing, rather than a Layer 2 forwarding plane. Not having to learn MAC addresses in the forwarding plan has a huge impact on performance as the number of endpoints grows. With minimal management traffic, nearly all the bandwidth is available for production traffic.
Scalability	Efficient control plane-based address learning at Layers 2 and 3. For example, in a Campus Fabric IP Clos, core switches only need to learn the access layer switch addresses instead of the device endpoint addresses. Thus, the core scales far into the future with predictable growth as branches, users, and devices are added.
Seamless, consistent end-to-end network	The network uses the same EVPN/VXLAN architecture across disparate campus and data center deployments. A VXLAN overlay provides Layer 2 extension across campuses without any changes to the underlay network.
Flexible traffic isolation with simple security policies	Operators can microsegment groups in their network with the flexibility of Group Based Policies (GBP). The power of microsegmentation enables EVPN-VXLAN to provide traffic isolation within and between broadcast domains as well as simplify security policies across a Campus Fabric.
Location-agnostic connectivity	The EVPN-VXLAN campus architecture provides a consistent endpoint experience no matter where the endpoint is located. Some endpoints require Layer 2 reachability, such as legacy building security systems or IoT devices.

How we deliver



The JVD program develops well-characterized, multidimensional solutions that reduce complexity for networking teams



Physical infrastructure supported by a JVD proves solution viability, with results provided in test reports Our advantage

Our advantage

Implementing JVD with HPE Mist Wired Assurance

AI for IT Operations

In addition to the network itself, managing and operating the network is key to keep it running smoothly and efficiently.

[HPE Mist AI](#) delivers unique capabilities for both wired and wireless LAN:

- Wired and [wireless assurance](#): HPE Mist is enabled with wired and wireless assurance. Once configured, [Service Level Expectations \(SLE\)](#) for key wired and wireless performance metrics, such as throughput, capacity, roaming, and uptime, are addressed in the HPE Mist platform.
- The [Marvis AI Assistant](#): An integrated AI engine that provides rapid wired and wireless troubleshooting, trending analysis, anomaly detection, and proactive problem remediation.

HPE Mist also optimizes the deployment of the network. For more information, [see Implementing Branch Networks for AI-Driven Enterprises](#).



Juniper Wired Assurance

[Juniper Wired Assurance](#) is a cloud service that brings automated operations and service levels to the Campus Fabric for switches, IoT devices, access points, servers, and printers. Marvis further simplifies troubleshooting while streamlining help desk operations by monitoring events and recommending actions.

HPE Mist UI Workflow

The HPE Mist UI Workflow makes it easy to create campus fabrics, including the Campus Fabric IP Clos.

HPE Mist provides templates to choose the topology and allocate device roles, define networks of interest and the physical connections, and apply the network fabric's intent.

Supported devices and full details on the workflow are detailed in the Juniper Validated Design for [Campus Fabric IP Clos Using HPE Mist Wired Assurance](#).

Why HPE

The HPE difference

This JVD provides a proven robust BGP/EVPN implementation on all QFX Series and EX Series switches using HPE Mist Wired Assurance.

HPE Juniper Networking is uniquely positioned to bring EVPN technology to its full potential by providing optimized, seamless, and standards-compliant L2 or L3 connectivity, both within and across today's evolving campuses and data centers. HPE campus fabrics, based on a VXLAN overlay with an EVPN control plane, are an efficient and scalable way to build campuses and interconnect multiple campuses, data centers, and public clouds.

The HPE Juniper Networking Campus Fabric IP Clos, coupled with HPE Mist AI's use of AI, machine learning, and data science, optimizes user experiences and simplifies operations across the wireless and wired domains.

HPE Mist Campus Fabric provides a templated, repeatable method to build IP Clos campus fabrics that enable EVPN-VXLAN overlay networks. The advantages of this are in the areas of scale, operator and user experience, microsegmentation, and an overlay to carry security policies across the fabric.

With the HPE Mist UI workflow detailed in [the JVD](#), this is a straightforward deployment with a simple configuration and proven results.

More information

Learn more about Campus Fabric IP Clos

To learn more about Campus Fabric IP Clos using HPE Mist Wired Assurance—JVD, visit our website at juniper.net/documentation/us/en/software/jvd/jvd-campusfabric-ip-clos-wired-assurance/index.html

For technical data sheets, guides and documentation, visit juniper.net/documentation/us/en/software/jvd/testreportbrief-campus-fabric-ip-clos-wiredassurance.pdf



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