

Brocade Vyatta Network OS Product Guide, 5.2R1

Supporting Brocade 5600 vRouter, VNF Platform, and Distributed
Services Platforms

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Overview

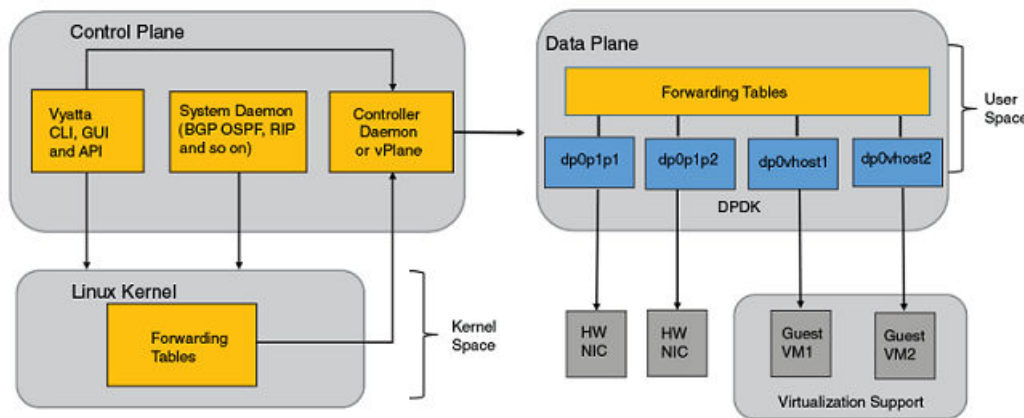
The Brocade Vyatta Network OS lays the foundation for a flexible, easy-to-use, and high-performance network services architecture capable of meeting current and future network demands. The Brocade Vyatta Network OS can be deployed across a wide variety of use cases. For example, it can be deployed as a Brocade 5600 vRouter, VNF platform, or distributed services platform to integrate into cloud, virtual, physical, or on-premises environments. It also can be deployed as a co-resident on the hardware that houses the data planes, or centralized to manage a number of distributed data planes, depending on the requirements of an organization.

With the Brocade Vyatta Network OS, organizations can bridge the gap between traditional and new architectures, leverage existing investments, and maximize operational efficiencies when enabling new services. The Brocade vPlane technology comprises these main components:

- Control plane—Carries signaling traffic and manages configuration and protocol operations; it also serves the data plane. The control plane consists of the following components:
 - Vyatta CLI, API, and GUI—Provide the user interfaces to the router
 - System daemons—Provide control plane services, such as BGP, OSPF, RIP, and SNMP
 - Controller daemon—Provides the data plane interface to the Linux kernel and CLI and manages the data plane
- Data plane—Forwards traffic between ports and passes local traffic to the controller. The data plane consists of the following components:
 - Data plane daemon—Provides packet forwarding, QoS, and firewall services
 - User space I/O drivers—Provide the network interface
- Linux kernel—Hosts the data plane and other processes for the user space.

Figure 2 on page 7 illustrates the Brocade Vyatta Network OS Architecture diagram

FIGURE 1 Brocade Vyatta Network OS Architecture



Brocade Vyatta Network OS Use Cases

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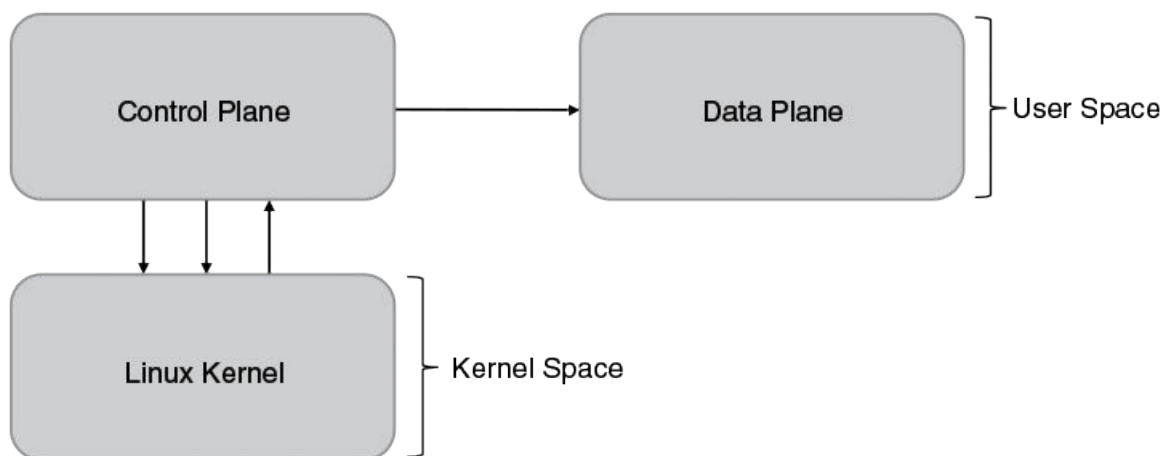
Brocade 5600 vRouter

The Brocade 5600 vRouter employs the innovative Brocade vPlane technology, which enables hardware-like routing performance in a software-based network appliance. The Brocade vPlane technology comprises these main components:

- Control plane: Carries signaling traffic and manages configuration and protocol operations; it also serves the data plane.
- Data plane—Forwards traffic between ports and passes local traffic to the controller.
- Linux kernel—Hosts the data plane and other processes for the user space.

Figure 2 illustrates the Brocade 5600 vRouter in a single node instantiation.

FIGURE 2 Architecture of Brocade Vyatta Network OS as a 5600 vRouter deployment



Customarily, packet processing in Linux runs in the kernel space. However, with the vPlane architecture, packet processing runs in the Linux user space. By using the vPlane architecture and leveraging the Intel Data Plane Development Kit (Intel DPDK), the Brocade vRouter delivers breakthrough levels of performance. Depending on the configuration, one or two cores are dedicated to each interface. The core or cores are able to run at 100-percent efficiency when processing packets and support performance scaling.

Brocade Vyatta Network OS as a VNF platform

The Brocade Vyatta Network OS as a VNF platform supports foundation networking services and can eliminate the need for at least one virtual network function (VNF) in a multiservice design. This platform also eliminates manual provisioning by supporting zero-touch deployment for the on-premise VNF platform, which automates configuration and software updates and allows service providers to scale services as needed. NETCONF supports the VNF life cycle, service chains, and further configuration.

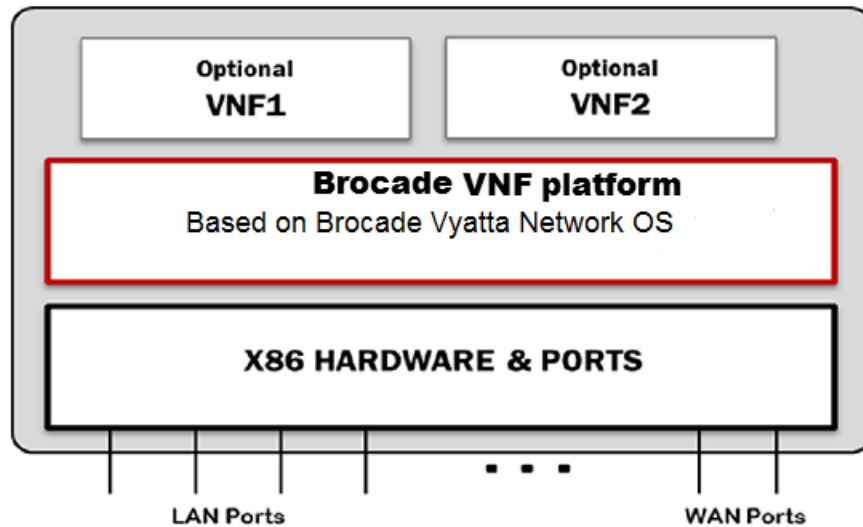
The Brocade Vyatta Network OS as a VNF platform is based on the Brocade Vyatta Network OS of the Brocade 5600 vRouter.

The VNF platform allows the virtualization of the hardware that is required to run your business and provides a set of value-added services, including network connectivity.

You can use the VNF platform to run various VNF devices.

The following figure illustrates the VNF platform architecture. The VNF platform is a use case of the Vyatta Network OS. You install the hypervisor image and then create guests for various VNF roles.

FIGURE 3 Architecture of Brocade Vyatta Network OS as a VNF platform deployment



Brocade Vyatta Network OS as a Distributed Services platform

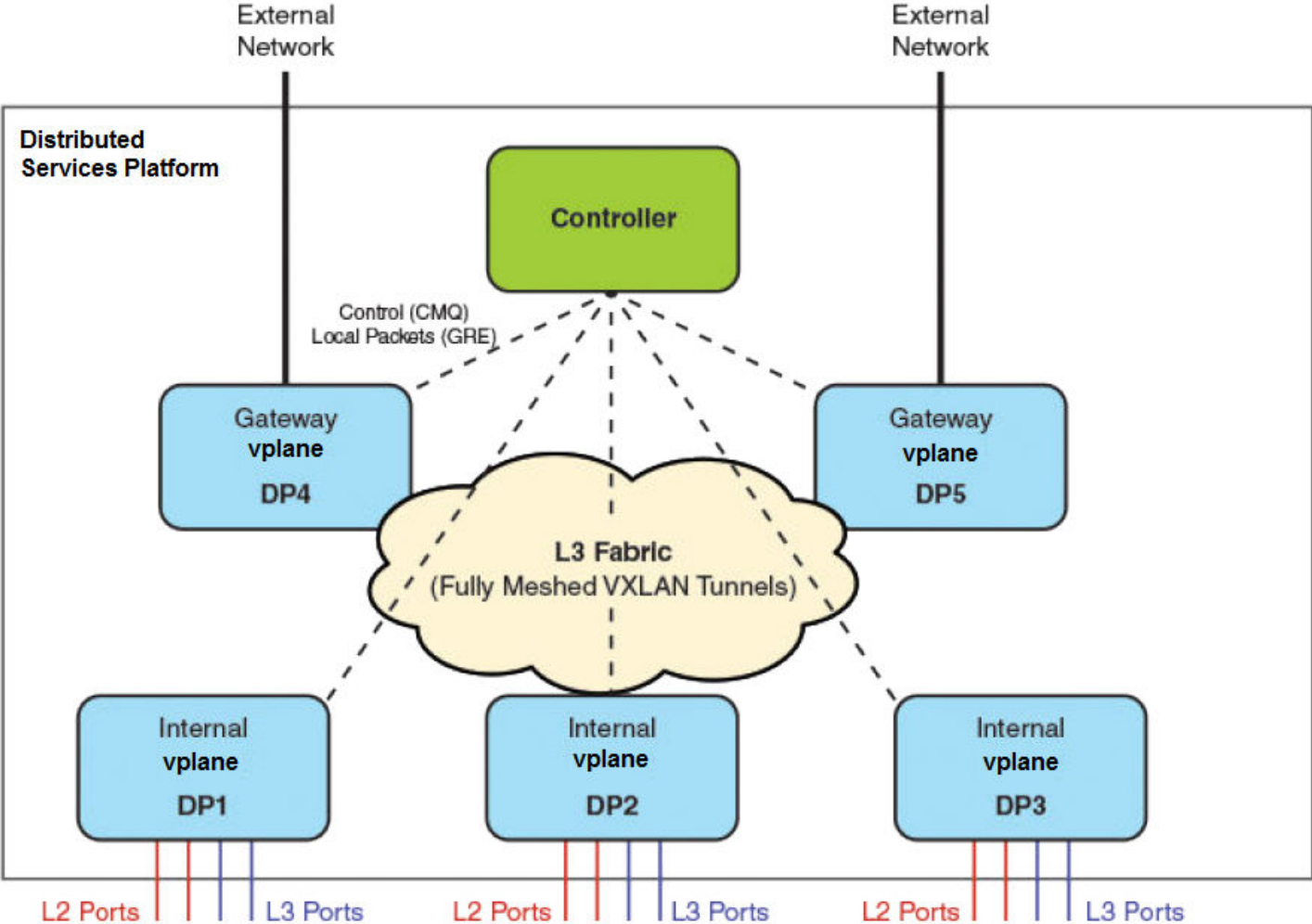
The Brocade Vyatta Network OS as a Distributed Services platform is a large-scale distributed router consisting of a single Distributed Services platform controller and multiple virtual data planes (vPlanes) that operate together as a large distributed system across many hypervisors. The Distributed Services Platform provides the following:

- Horizontal scaling of VNFs, with numerous tenant-facing interfaces that are distributed across multiple vPlanes for Internet service providers.
- A Layer 2 virtual overlay network for cloud service providers.

The following figure provides a high-level view of the Distributed Services platform architecture, which is based on the following elements:

- Controller—Virtual machine (VM) that provides control and management functions for the Distributed Services platform infrastructure.
- vPlane—VM that forwards data as an instance of the data-forwarding plane. A single Distributed Services platform can include up to 32 vPlanes. Internal vPlanes connect to tenant servers, and gateway vPlanes connect to the external network.
- Control network—Network that provides control plane and status communications between the Distributed Services Platform controller and vPlanes.
- Fabric network—Full mesh of VXLAN-GPE tunnels between all the vPlanes that is used to forward packets between vPlanes.

FIGURE 4 Architecture of Brocade Vyatta Network OS as a Distributed Services platform deployment



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