

BROCADE VYATTA vROUTER FOR CLOUD COMPUTING

NETWORK FUNCTIONS VIRTUALIZATION

THE BROCADE VYATTA vROUTER

The Brocade Vyatta vRouter is a scalable, integrated, enterprise-class networking solution that delivers advanced routing and network security functionality for physical, virtual, and cloud networking environments. This software-based networking and security solution includes dynamic routing, stateful firewall, VPN, threat protection, traffic management and more in a package that is optimized to take advantage of multicore x86 processing power, common hypervisor platforms, and emerging cloud architectures. All features are configured through a familiar, networking-centric CLI, web-based GUI or third party management systems using the REST-based Remote Access API.

Control Security, Connectivity, and Compliance in the Cloud

The Brocade® Vyatta® vRouter delivers advanced network security and connectivity functionality in a cloud-ready, virtualization optimized, software appliance. This on-demand software approach to cloud security offers cloud providers and enterprises the unique ability to easily provision, deploy, secure and manage flat networks as well as complex n-tier networks. Much more than a simple gateway or firewall solution, the Brocade Vyatta vRouter offers enterprise-class stateful firewall, IPsec VPN, SSL-based OpenVPN, secure web filtering, dynamic routing, and more to simply enable per customer or per server security and connectivity.

As cloud moves from vision to reality, networking quickly moves to the front as a major impediment to meeting the core requirements. The reason is simple: traditional edge networking has not been modernized the way server and storage infrastructure has been over the past decade. In order to deliver on the business benefits of cloud computing, the networking function must evolve to enable best practices in effective cloud design (see Table 1).

Table 1.
Network Virtualization Applications.

Requirement	Brocade Vyatta vRouter	Hardware-based Networking
Multifunction Layer 3+ (Routing, Firewall, VPN and more)	Yes	Vendor Dependent
Elasticity / Scalability	Seamless addition of underlying processor cores	Platform Limited
Multitenancy	Platform independent virtual machine	Hardware bound
Hypervisor Agnosticism/Awareness	VMware, Hyper-V, Xen/XenServer, KVM	None
Open Management API	Yes	No
On-Demand Provisioning	Yes	No
Utility Pricing	Yes; Brocade - VSPL License	No

KEY BENEFITS

- **Platform Independence:** The Brocade Vyatta vRouter allows for a single virtualized routing and security package to be installed on VMware, Microsoft Hyper-V, Citrix Xen/XenServer and Red Hat KVM virtualization hypervisors.
- **Elasticity/Scalability:** The Brocade Vyatta vRouter removes the limitations of box-bound network devices by offering the ability to scale performance, add users, or add instances in seconds and minutes, not hours, days or weeks.
- **Physical-to-Virtual Migration:** Using the Brocade Vyatta vRouter enables simple, straightforward migration from physical networks to the virtual environment without network redesign or compromising existing security policies and compliance.
- **Auto-Provisioning:** Brocade enables simple button-click deployment and auto-configuration of complete network connectivity and security.
- **Remote Management:** The Brocade Vyatta vRouter is easily integrated with any third party management, orchestration or provisioning system to enable instant-on infrastructure deployment, license and billing management, as well as monitoring and reporting.
- **Utility Licensing:** VSPL licensing offers pay-per-use billing options that map to common cloud computing consumption models.

SECURE MULTITENANT XaaS CLOUD

A successful multitenant service delivery model is defined by a number of factors, including: customer isolation, data protection, automated provisioning, high utilization of the underlying infrastructure, minimal investment risk, and fast ROI. The Brocade Vyatta vRouter provides the industry's only cloud-ready virtual machine that bundles enterprise-class firewall, VPN, dynamic routing, Policy-Based Routing, cloud bridging, web filtering and more to simplify isolation, data protection and traffic management. Brocade Vyatta vRouters can be provisioned on demand with pre-defined security profiles, plus users can inject configuration data remotely, using third-party management tools or via the RESTful API. As a cloud-ready virtual machine, the Brocade Vyatta vRouter removes the need for hardware-based solutions allowing cloud providers to maximize utilization of underlying server hardware. Brocade also offers usage-based pricing options requiring virtually no CAPEX investment risk.

VIRTUAL FIREWALLING

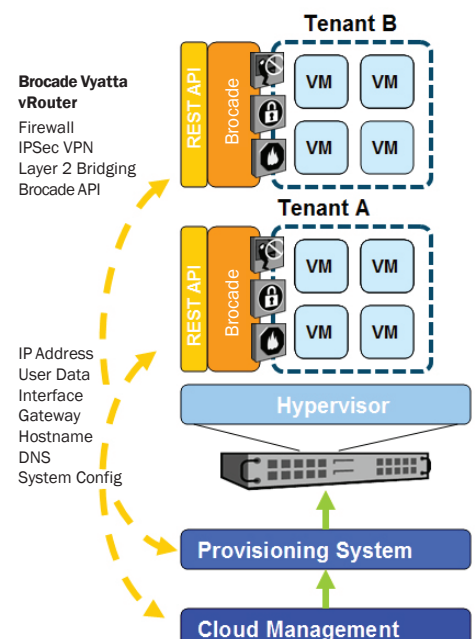
Within the data center, physical firewall devices are typically deployed to ensure security and segmentation between departments, application servers, databases, transaction systems, and other IT resources. These firewalls address internal security needs (HR databases, financial systems) and compliance (PCI, HIPAA). In the cloud, however, tenants share underlying infrastructure (including server hardware, hypervisors and virtual switches, and other shared services). Thus, firewalls must not only enable compliance and internally segment sensitive business resources, but they must ensure multitenant security within a shared environment. Traditional networking requires physical firewall gear; this means high cost, slow deployment, and inflexibility in the cloud. On-demand networking from Brocade enables the instant, flexible deployment of firewall virtual instances, anywhere in the cloud and with no capital investment.

SECURE REMOTE ACCESS

Cloud users access their applications and data over the Internet, requiring every user's connection to be encrypted for security. Brocade Vyatta vRouters are an exceptionally clean solution for this requirement. Within the cloud a new VPN virtual machine can be started in moments, using a small fraction of an existing server's resources. The high cost associated with acquiring and installing a unique physical device is completely eliminated, as is the requirement for more space, power, and cooling. Organizations can deploy the same software of virtual machine at any network entry point, rapidly and with minimal expense as a "secure cloud connector."

CLOUD ON-BOARDING— SECURE L2 BRIDGING

An often overlooked requirement in cloud computing is the need to enable organizations to securely migrate data to the cloud from the enterprise data center. The Brocade Vyatta vRouter combines Layer 2 bridging and VPN Tunneling functionality to deliver a cloud bridging solution which allows physically separate networks to securely communicate with each other over the Internet as if they were on a single Ethernet network. This capability extends cloud service and data center reach, simplifies the migration of applications and physical



servers between data centers, ensures continuity during a phased migration, and enables the moving of virtual machines between physical servers on physically separate networks.

ADVANCED N-TIER VIRTUAL INFRASTRUCTURE

Cloud networking infrastructure must allow for cloud users to completely migrate security, traffic management and compliance policies from their physical topologies into the virtualized cloud environment. Brocade's deep roots in delivering a complete Layer 3+ network OS offers organizations a single solution that can route and secure traffic in a single flat network or create multi-tier environments complete with separate security policies.

NETWORK CONNECTIVITY

At the core of the Brocade Vyatta vRouter is a routing engine with full support of IPv4 and IPv6 dynamic routing protocols (BGP Multipath, OSPF, RIP, PBR). Brocade includes support for 802.11 wireless, Serial WAN Interfaces and a wide variety of 10/100 through 10 Gb Ethernet NICs.

FIREWALL PROTECTION

The Brocade Vyatta vRouter firewall features IPv4/IPv6 stateful packet inspection to intercept and inspect network activity and protect your critical data. Advanced firewall capabilities include stateful failover, zone and time-based firewalling, P2P filtering and more.

ADDITIONAL PROTECTION

Brocade offers an additional level of proactive threat protection with integrated secure web filtering rules available as subscription services.

SECURE CONNECTIVITY

Organizations can establish secure site-to-site VPN tunnels with standards-based IPsec VPN between two or more Brocade instances or any IPsec VPN device. Or they can provide secure network access to remote users via the SSL-based OpenVPN functionality.

TRAFFIC MANAGEMENT

Brocade provides a wide variety of QoS queuing mechanisms that can be applied to inbound traffic and outbound traffic for identifying and prioritizing applications and traffic flows.

HIGH AVAILABILITY

Mission critical networks can deploy Brocade Vyatta vRouters with the confidence that high availability and system redundancy can be achieved through a number of industry standard failover and configuration synchronization mechanisms.

IPv6 COMPATIBILITY

Brocade Vyatta Subscription Edition is the only software-based routing and security solution with proven IPv6 functionality and interoperability, ensuring a future-proof investment in a solution that offers a simplified migration path from IPv4 to IPv6.

ADMINISTRATION AND AUTHENTICATION

Organizations can manage the Brocade Vyatta vRouter through a familiar network-centric command line interface (CLI), web-based GUI or through external management systems using the Remote Access API. All network management sessions can be securely managed using SSHv2, RADIUS or TACACS+.

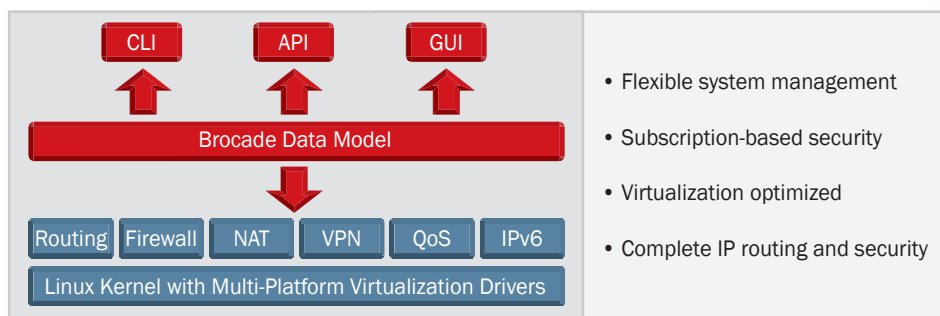
HIGHLIGHTS

- Performance Optimized VMs
- Complete Layer 3+ OS
- Stateful Firewall
- IPsec & SSL-based OpenVPN
- Secure Web Filtering
- VMware, XenServer/Xen, Microsoft Hyper-V, Red Hat KVM Ready
- Remote Access API

RELIABLE SUPPORT OPTIONS

Essential Support

- 24x7 access to Brocade Technical Support expertise, reducing time to resolution
- Provides unmatched expertise in data center networking to optimize network performance
- Simplifies management through online technical support tools



- Flexible system management
- Subscription-based security
- Virtualization optimized
- Complete IP routing and security

ABOUT BROCADE

Brocade networking solutions help organizations transition smoothly to a world where applications and information reside anywhere. Innovative Ethernet and storage networking solutions for data center, campus, and service provider networks help reduce complexity and cost while enabling virtualization and cloud computing to increase business agility. Learn more at www.brocade.com.

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