

Brocade vRouter for Cloud Computing

HIGHLIGHTS

- Provides advanced routing and network security functionality for physical, virtual, and cloud networking environments
- Is optimized for multicore x86 processing power, common hypervisor platforms, and emerging cloud architectures
- Delivers the industry's only cloud-ready, performance-optimized VMs, bundling enterprise-class firewall, VPN, dynamic routing, Policy-Based Routing (PBR), and cloud bridging for secure multitenant cloud service delivery
- Provides a complete Layer 3+ OS to route and secure traffic in a single flat network or create multi-tier environments with separate security policies
- Simplifies network management with the Brocade Remote Access API

Control Security, Connectivity, and Compliance in the Cloud

As the cloud moves from vision to reality, organizations are finding that their networking infrastructure is preventing them from making this transition. The reason is simple: Traditional edge networking, unlike server and storage infrastructure, has changed little over the past decade. To deliver on the business benefits of cloud computing, the networking function must evolve to enable best practices in cloud design.

The Brocade® vRouter helps organizations meet the core requirements for a cloud-optimized network infrastructure (see Table 1). It delivers advanced network security and connectivity functionality in a cloud-ready and 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. More than a simple gateway or firewall solution, the Brocade vRouter offers enterprise-class stateful firewall, IPsec VPN, SSL-based OpenVPN, dynamic routing, and other advanced features to simply enable per-customer or per-server security and connectivity.

Table 1: Network Virtualization Applications.

Requirement	Brocade 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 (VM)	Hardware-bound
Hypervisor agnosticism/awareness	VMware, Hyper-V, Open Xen/Xen/XenServer, KVM	None
Open management API	Yes	No
On-demand provisioning	Yes	No

KEY BENEFITS

- **Platform independence:** Allows for a single virtualized routing and security solution to be installed on VMware, Microsoft Hyper-V, Citrix Open Xen/Xen/XenServer, and Red Hat KVM virtualization hypervisors.
- **Elasticity/scalability:** Removes the limitations of box-bound network devices by offering the ability to scale performance, add users, or add instances in only seconds or minutes.
- **Physical-to-virtual migration:** Enables simple, straightforward migration from physical networks to the virtual environment without network redesign or compromising existing security policies and compliance.
- **Auto-provisioning:** Enables simple button-click deployment and auto-configuration of complete network connectivity and security.
- **Remote management:** Integrates easily with any third-party management, orchestration, or provisioning system to enable instant-on infrastructure deployment, entitlement, and billing management, as well as monitoring and reporting.

Secure Multitenant XaaS Cloud

A successful multitenant service delivery model is defined by several factors, including customer isolation, data protection, automated provisioning, high utilization of the underlying infrastructure, minimal investment risk, and fast ROI. The Brocade vRouter provides the industry's only cloud-ready Virtual Machine (VM) that bundles enterprise-class firewall, VPN, dynamic routing, Policy-Based Routing (PBR), cloud bridging, and other advanced features to simplify isolation, data protection, and traffic management. Brocade vRouters can be provisioned on-demand with pre-defined security profiles. In addition, organizations can inject configuration data remotely, using third-party management tools or via the RESTful API. As a cloud-ready VM, the Brocade 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 capital 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 also ensure multitenant security within a shared environment. Traditional networking requires physical firewall gear, which means high costs, slow deployment, and inflexibility in the cloud. On-demand networking from Brocade enables the

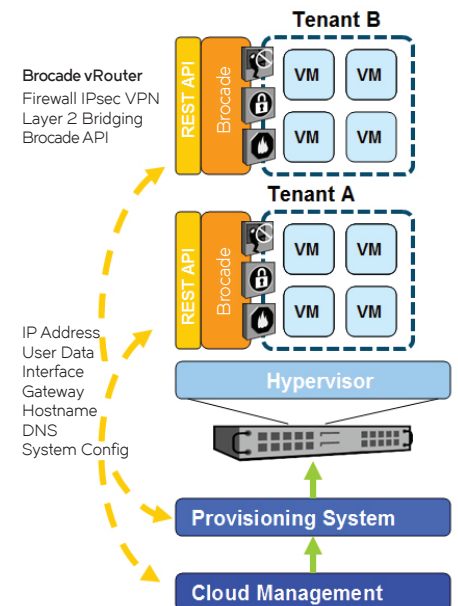
instant, flexible deployment of firewall virtual instances, anywhere in the cloud—and with no capital investment.

Secure Remote Access

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

Moving to the Cloud Secure Layer 2 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 vRouter combines Layer 2 bridging and VPN Tunneling



functionality to deliver a cloud bridging solution that 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 VMs 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 offers a robust Layer 3+ network OS, providing organizations with a flexible solution that can route and secure traffic in flat networks or multi-tiered environments leveraging separate security policies.

Network Connectivity

At the core of the Brocade 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 Mbps through 10 Gbps Ethernet NICs.

Firewall Protection

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

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. Dynamic Multipoint VPN (DMVPN) is now available.

Traffic Management

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

High Availability

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

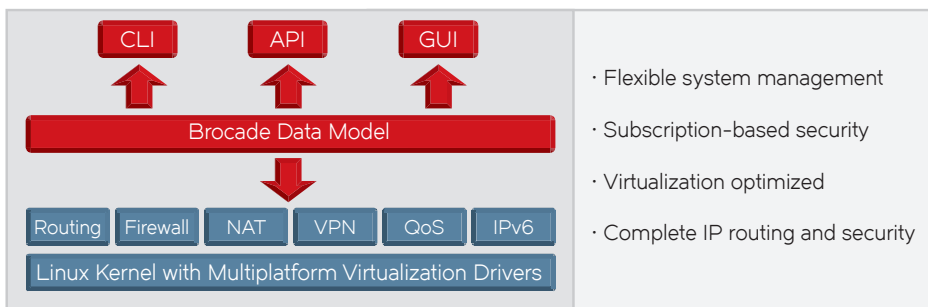
KEY FEATURES

- Performance-optimized VMs
- Complete Layer 3+ OS
- Stateful firewall
- IPsec and SSL-based OpenVPN
- Secure Web filtering
- VMware-, XenServer/Xen/Open Xen-, Microsoft Hyper-V-, Red Hat KVM-ready Brocade Remote Access API

RELIABLE SUPPORT OPTIONS

Brocade Essential Support

- Provides 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



IPv6 Compatibility

The Brocade vRouter 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 vRouter through a familiar network-centric Command Line Interface (CLI), a Web-based GUI, or external management systems using the Brocade Remote Access API. All network management sessions can be securely managed using SSHv2, RADIUS, or TACACS+.

Brocade Global Services

Brocade Global Services has the expertise to help organizations build scalable, efficient cloud infrastructures. Leveraging 20 years of expertise in storage, networking, and virtualization, Brocade Global Services delivers world-class professional services, technical support, network monitoring services, and education, enabling organizations to maximize their Brocade investments, accelerate new technology deployments, and optimize the performance of networking infrastructures.

Maximizing Investments

To help optimize technology investments, Brocade and its partners offer complete solutions that include professional services, technical support, and education. For more information, contact a Brocade sales partner or visit www.brocade.com.

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