Q-BALANCER SD-WAN

Building an Intelligent and Agile WAN

MPLS is a reliable and secure technology for building a fixed-path VPN over an IP network between branch offices and data centers. However, enterprise networks are facing the challenges such as the connectivity with lower cost, the capability for quicker deployment, the agility to steer traffic to a variety of cloud-based and SaaS sites outside this traditional VPN, etc.

Software-defined WAN (SD-WAN) technology is the solution to the challenges. SD-WAN offers augmented connectivity, better cloud application delivery, simplified WAN operations, and reduced operational costs for those managing public and private WAN connections.

Q-Balancer SD-WAN delivers a business-class, secure, simple, and cloud-enabled WAN connection with as much open and software-based technology as possible through augmenting or even replacing traditional MPLS with affordable Internet bandwidth.

Branch Gateway

All Q-Balancer Branch Gateway devices support multiple WAN transports across broadband, MPLS, and LTE cellular links. Software features include the ability to route and prioritize traffic being sent to the data center, public cloud infrastructure or the Internet. Each device also supports High Availability (HA) requirements (e.g. active/active and active/standby), making it ideal for sites that need full redundancy.

Headend Gateway

Q-Balancer Headend Gateway devices deployed in headquarters or data centers work as VPN concentrator (VPNC) to terminate traffic from edge devices. The Headend gateways enable seamless and secure connectivity for all branch and headquarters locations connecting to the headend gateway. Q-Balancer Headend Gateway devices can be either physically or virtually deployed in public or private cloud infrastructures.

Centralized Management System

QB-MANAGER is a centralized management system that works for enterprise networks through monitoring traffic, applying policy rules, configuration management, and simplifying deployment. QB-MANAGER can be virtually deployed in public or private cloud infrastructures.

Intelligent WAN Management

Q-Balancer gateways enable the simultaneous use of multiple WAN links and automatically fail over to the secondary connection in the event of WAN outage or brownout. The gateways also have the ability to direct traffic to the optimal path or distributes traffic across the selected paths.

The centralized management system, QB-MANAGER, deployed in public or private cloud infrastructures, make all gateway devices easy to configure and provision and see traffic from branch gateways and headend gateways from anywhere.

MPLS Augmentation & Replacement

Q-Balancer delivers a business-class, secure, and simple cloud-enabled WAN connection with as much open and software-based technology as possible. Q-Balancer enables enterprises to flexibly expand network scale, delivers optimal access for both site-to-site and cloud applications.

Flexible Bandwidth Licensing

Q-Balancer offers scalable bandwidth throughput based on license upgrade. This means you have access to full hardware performance capabilities without the need to purchase new hardware. Also, you may upgrade the bandwidth throughput as the business grows.

Highlights

- Improving reliability and performance for underlay and overlay networks
- Optimal application delivery
- Augmenting MPLS reliability and performance
- Flexible scalability for WANs
- Ensuring accessibility to internal server for external requests
- Lowering WAN OpEx and CapEx
- Mitigating potential security threats
- Enhancing dynamic routing capability
- Minimizing effort for installation with ZTP
- Simplifying branch network infrastructure
- Improving WAN visibility

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Key Features

Overlay and Underlay WAN Management

Q-Balancer introduces a new architecture that provides a network overlay for WAN connections to improve performance and control across private and public connections. This builds a truly reliable and agile business network combining multiple WAN transports.

VPN Bonding

In a site-to-site VPN network, VPN Bonding has the ability to chop a single VPN session into packets and send them across multiple paths. This provides a fast, reliable and secure connection for all online activities, browsing, video streaming, large file transfers, etc. The configuration for VPN Bonding is auto-provisioned, and therefore can be done in minimal human effort.

Inbound Load Balancing

Through its intelligent algorithms, the incoming requests will be directed to best-performing or least-loaded path, or efficiently distributed across the available paths. This avoids faulty or congested path(s) when directing incoming requests to the hosted servers, and furthermore highly increases the availability and efficiency of the hosted service to incoming requests.

Network Security

Q-Balancer delivers advanced security as a layer of protection to branch networks, while protecting business continuity against WAN outages. Through proper configuration for its inbuilt security mechanisms, Q-Balancer can be a primary firewall, or simply work nicely with the security solution that is already in place beforehand.

Multi-Path Routing

In terms of route entries learned from the underlay network through supported routing protocols such as OSPF and BGP, overlay paths are can be added manually on the appliance. Thus, in the event of an interface outage, traffic for the route will be directed to the defined virtual path.

Forward Error Correction (FEC)

FEC adds error correction data to the outbound traffic, allowing the receiving end to recover from packet loss and other errors that occur during transmission, improving the quality of real-time applications.

Local Internet Breakout

Local internet breakout eliminates the possible bottlenecks on MPLS backhaul as web and general traffic will be directly sent out via broadband WAN connections, rather than MPLS network. It saves bandwidth resource for critical applications by locally directing internet-bound traffic via broadband WAN to their correct destinations.

Intelligent Traffic Steering

The ability of intelligent traffic steering directs traffic to the path(s) that provides desired performance for applications, and works in conjunction with application-aware routing, dynamic path selection, and path monitoring. It tracks network characteristics of the data plane tunnels between Q-Balancer appliances and uses the collected information to compute optimal paths for data transmission. WAN traffic can be automatically routed over the best available uplink based on characteristics, such as WAN throughput, latency, jitter and packet loss.

Multi-Path QoS

Even though bandwidth is plentiful and cheaper today, businesses today may still need to enforce QoS rules to make doubly sure that VoIP, video, and other critical applications work properly without being affected by the possible bandwidth issue. Q-Balancer mitigates abuse of bandwidth resources and prevents enterprises from mindless bandwidth upgrades or over-provisioning, and the possible waste on bandwidth cost is thus reduced. Besides, its multi-path QoS results in an improved overall network performance and increased productivity.

Zero Touch Provisioning (ZTP)

Using Zero Touch Provisioning, the hardware gateways can be factory-shipped and deployed onsite. Settings can be applied based on configuration and other network-specific requirements.

Branch Network Simplification

Q-Balancer reduces the reliance on expensive certified specialists as its configuration is simple and fast through the intuitive and user-friendly user interface. The solution also reduces the reliance on hardware appliances like routers, DHCP server, firewall, etc. With its consolidated features, WAN cost and complexity are lowered for branch networks.

Software Specifications

Hybrid Multi-WAN Load Balancing
Policy-based Routing
By Packet, MAC, IP, Connection, Port, Geo-Location, Domain Name, Application, & Schedule & Schedule
Real-Time Statistics by Volume & Sessions for Individual Rule
Load Balancing Modes:
- Weighted Round-Robin, Downlink, Uplink Total Traffic, Persistent, Response, Jitter Optimum Routing Path, Redirect, Priority, & Failover

VPN Bonding & Failover
Seamless Failover & Fallback
Private & Dynamic IP Support
Tunnel Encryption (DES, 3DES, AES)
Auto-Provision Tunneling & Policy
Forward Error Correction
DHCP Broadcast through Tunnel

Road Warrior VPN
PPTP & L2TP over IPSec
- Local Authentication
- External Authentication via Radius

IPSec
- IKE V1 & V2, Preshared key, Digital Certificates
- External Authentication via Radius

Site-to-Site VPN
- Layer 2 & 3 Tunnel Termination
- IPSec Tunnel
- Tunnel Encryption (Null, DES, 3DES, AES)
- Hash Algorithms (MD5/ SHA-1)
- Authentication Methods (Pre-shared key)
- Tunnel Status
- Dead Peer Detection
- Perfect Forward Secrecy (D-H Group 1, 2, 5)
- Domain Name Support for Tunnel End Points
- Hub & Spoke VPN
- Compatible with Major 3rd Party VPN
- Compatible with Cloud VPN
- Private & Dynamic IP Support
- Support RIP, OSPF, BGP
- Automated Tunnel Failover
- Session-Based Load Balancing

MPLS Augmentation & Replacement
WAN Virtualization
Granular Local Internet Breakout
Intelligent Traffic Steering
Multi-Path Routing (Static & Dynamic)
Virtual Appliance
Centralized Management System

Inbound Load Balancing
Multi-Domains
Multi-Records
IPv4/ IPv6
DNSSEC
Load Balancing Modes:
- Response Time
- Available Bandwidth
- Weighted Round-Robin by Connection
- Priority
- Failover

Path Monitoring
Ping, Trace Route, Connection to Specified Port
Packet loss, Latency, Jitter, Interval Adjustment

Multi-Path Bandwidth Management
Policy-Based QoS:
- By MAC, IP, Port, Domain Names, Geo-Location, Application, Priority, Minimum & Maximum, Individual/Shared, Schedule, Real-Time Statistics

Service Priority

Networking
NAT
IPSec NAT Traversal
Server Mapping
Static Route
RIP, OSPF, BGP
Multiple DHCP Server & Relay
DNS Server & Relay
LACP NIC Bonding
IEEE 802.1q VLAN
WAN IP Address Assignment:
- Static, PPPoE, DHCP, DDNS

Inbuilt Wireless WAN & LAN Support
Multiple Public IP Pass-Through
ARP Proxy
Bridge Mode
- Multiple Bridges in a LAN Bypass Pair

IPv4/IPv6 Dual Stack
SIP & H.323 NAT Traversal
Bandwidth Reduction
L4 Server High Availability & Load Balancing
Global Server Failover & Load Balancing
Domain Name Routing
Application-Aware Routing

Security
Stateful Inspection Firewall
Domain Name Filtering
DDoS Prevention
Connection Limit
ARP Spoofing Prevention

Flexible Licensing
Stackable Bandwidth Upgrade by License
Upgradeable Number of Tunnels by License

Status
Links (Link Status, Download/Upload Usage, Latency, Packet Loss, and Sessions)
Current Flow (Path, IP, Port, Protocol, Applications, and Suspicious Flow)
Individual Load Balancing Rule
Traffic Status for QoS Rule
Traffic Status for Policy Rule
LAN Hosts
Admin Events

Logging & Reporting
System Logs
Bandwidth Usage
Local, External, & Central

Device Management
Web-based UI (HTTP & HTTPs)
Command Line (Serial Console & SSH)
Multiple Admin Levels
Centralized Management System
Handheld Devices Compatible
Firmware Upgrades via Web UI
Automated Configuration Backup
Automated Firmware Upgrades
System Auto Recovery
NTP Server Support
SNMP
Email Alert
Events Notification Center
Built-in Diagnostic Tools
VRRP High Availability:
- Configuration Synchronization
- Firmware Version Synchronization

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HARDWARE APPLIANCES

MODELS	QB-MESH	QB-150	QB-300	QB-500	QB-2000
Deployment Modes	Small	Small	Small and Medium	Medium to Large	Large / Data Center
Recommended Users [1]	50 - 150	50 - 150	100 - 500	300 - 2000	1500 - 20000+
SYSTEM					
Throughput (bps)	500 M	150 - 300 M	300 -1500 M	500 - 3000 M	2 - 20 G
WAN Links	4 - 7	3 - 10	5 - 25	7 - 52	7 - 52
Max. Concurrent Connections	50K	50K	800K	2M	8M
Connections per Second	5K	3K	40K	150K	550K
HARDWARE					
Network Interfaces (GbE)	4	4	6	8	8- 24 [6]
Hardware LAN Bypass (Pairs)	○	1	1	2	2 [6]
User-defined Port	●	●	●	●	●
Embedded 4G LTE Modems [2]	1 - 4	○	○	○	○
USB 4G Modems [3]	1	1	1	1	1
Wi-Fi Support [4]	●	●	○	○	○
GPS Interface with Female Antenna Connector	●	○	○	○	○
Inbuilt Storage [5]	●	●	●	●	●
DIMENSIONS					
Form Factor	Desktop	Desktop	1U/Desktop[7]	1U	1U
W x D x H (mm)	195 × 138 × 70	230 × 152 × 30	430 × 248 × 44	430 × 394 × 44	430 × 450 × 44
Net Weight (Kg)	2	2.2	7	8.2	8.5

[1] Recommendation for sizing purposes only. No software restrictions applied. [2] Up to three 4G LTE modules can be added. [3] USB 4G Modem only works as failover mode. [4] Wi-Fi Module is an option to the supported models. [5] Inbuilt storage is an option. [6] LAN modules with 10GbE/25GbE/40GbE/LAN Bypass are optionally supported. [7] Desktop model of QB-300 is QB-300D.

VIRTUAL APPLIANCES

MODELS	QB-VHUB	QB-V2000	QB-MANAGER
Deployment Mode	VPN Concentrator (VPNC)	Large / VPNC	Centralized Management System
Throughput (Gbps)	Unlimited	2- 20	Unlimited
Hypervisor Supported	VMware ESXi 6.5 or above	VMware ESXi 6.5 or above	VMware ESXi / ESX 5.0 or above
Minimum Number of interfaces	2	2	2
Minimum vCPU Required	2	2	2
Minimum Memory (GB)	4	4	4
Minimum Storage (GB)	2	2	1000

*The capacity of QB-V2000 is same as QB-2000.
**For complete hardware specifications, please see the data sheets for each model.

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