Q-Balancer®

Your trusted SD-WAN partner

Solution Brief: *Multi-WAN Load Balancing for Enterprises*

*Unbreakable continuity via intelligent network failover
and load balancing*

Highlights

> Increased network performance through WAN bonding

> Minimal network downtime with network redundancy

> Augmented VPN connectivity with VPN resiliency

> Increased speed for site-to-site connectivity via VPN bonding

> Improved reliability and response for corporate-hosted applications

> Maximized uplink utilization without complex configuration

> Improved productivity through granular bandwidth control

> Improved quality for latency-sensitive or critical applications via service priority

> Cost saving by leveraging low-cost broadband technologies

> Increased WAN scalability

> Service provider independence

Overview

Internet plays an important role in today's business operation, and the number of businesses relying on Internet has been growing quickly. Businesses enjoy the convenience and advantage of harnessing internet today. However, poor Internet connectivity can cause less productivity and loss of business opportunity, and even damage the business reputation.

A multi-WAN strategy, using two or more WAN services, is getting applicable and common to enterprises. Initially, many organizations pursued a multi-WAN strategy because they were uncertain about WAN reliability. Multi-WAN was, and still is, seen as a way to prevent downtime due to a single point of failure on WAN. Multi-WAN deployments were being driven by redundancy, but now they are also driven by the growing demand for high speed Internet.

As an intelligent multi-WAN load balancing solution for enterprise, Q-Balancer is incorporated with enterprise-grade features such as WAN failover and restoration, WAN load balancing, Inbound Load Balancing, VPN bonding & failover. The solution is designed to help customers take full advantage of WANs at corporate networks, data centers, and branch offices. In this solution brief we'll take a look at the WAN challenges and solutions with some of the key features of the Q-Balancer solution.

Challenges

Downtime caused by WAN outages

A network with single WAN link or multiple WAN links from a single service provider will limit the WAN reliability and performance due to single source. Some businesses may apply a secondary WAN link from the other provider to achieve WAN redundancy with manual intervention when/if primary link goes down, yet this cannot be easily managed as the network disruption is so unpredictable.

Some firewalls offer an all-or-nothing failover mechanism, in which when/if primary WAN link goes down, and then all traffic is automatically routed down the remaining active paths. This is great for redundancy. However, there are always live links only for backup.

Corporate-hosted applications

In a typical DNS deployment, a DNS server hosts and serves data for single or multiple domains; when DNS server receives a DNS requests for domain name resolution, it then resolves and returns an IP address to the request. However, DNS does not check the possible outages or the status on WAN when replying DNS requests. It always returns a same IP set for a domain to DNS requests despite the primary WAN is already inaccessible or slow.

Corporate-hosted applications like Mail or Web serve numerous incoming requests via the DNS mechanism. These internal servers are often important to enterprises operations, yet they can be sometimes unavailable to external requests due to either link failure or slow response, which can cause major issues to enterprises.

Not enough bandwidth

Business-critical applications are sometimes negatively impacted by the limited bandwidth. Adding a WAN connection, which comes with high performance and reliability at a reasonable price, is always welcomed and needed by enterprises. Yet, adding more WANs brings another issue, that is, how to increase bandwidth utilization efficiency and maximize the bandwidth investment.

Inefficient bandwidth utilization

A stable and high-speed IP network can be a foundation of any successful enterprise as most business is done through the Internet. The WAN solutions for enterprise today must be able to efficiently utilize bandwidth resources; voice, video, and critical applications may be granted priority so that the quality of these applications will be assured, while the bandwidth for non-business related applications will be limited in order to prevent them from over consuming the bandwidth resource.

Unpredictable application performance

Business may experience unreliable application performance when using broadband links due to congestion and changing network conditions, causing disruption and low productivity. Today, the WAN solutions for enterprise must be able to monitor WAN link status, dynamically direct critical applications to the best route, and divert

traffic from the slow or faulty paths.

Lack of business-oriented WAN scalability

As business grows, more bandwidth and branch offices will be added to meet the increasing demand. While planning on WAN infrastructure, enterprise needs a WAN solution that enables them to flexibly add WAN links without limiting the future growth or over provisioning for the short term.

Site-to-site connectivity

Large files and applications such as VoIP and Video Conferencing are frequently transmitted in site-to-site VPN networks, which are usually connected via leased line or MPLS or VPN. Enough bandwidth and stable connectivity for mission-critical applications in a site-to-site networks becomes a major task for IT department.

Site-to-site connections are traditionally established based on a single Internet circuit. Should the circuit fails, there is no way to keep the connectivity for the organization. In addition, if more bandwidth is required to accommodate growing demand, this is possibly difficult to achieve through simply adding more WAN links and applying traditional WAN load balancing. The possible solution could be expensive upgrades or change for legacy WAN infrastructure.

Remote offices, pop-up store, and temporary sites

Remote offices, pop-up store, and temporary sites have the need to stay connected to the cloud. Broadband or MPLS service might be limited or not available for those deployments, not to mention network redundancy.

Imagine what would happen if Internet connection at a retail store fails during peak business hours and you don't have backup line? Thanks to the proliferation of 4G LTE networks, Internet connectivity for those deployments is achievable today without long waiting or paying extra, and yet providing a secure and reliable WAN connectivity for them still remain challenges due to unpredictable wireless connectivity or harsh environment.

Solutions

WAN Load Balancing & Failover

The Q-Balancer WAN Load Balancing helps business cost-effectively build a reliable and fast Internet connectivity by utilizing multiple Internet links in some cases. The solution is WAN agnostic and can combine Internet lines including DSL, T1, Wireless, 4G, Fiber, Metro-Ethernet rings and more. By leveraging multiple low-cost broadband lines, businesses enjoy enterprise-grade bandwidth capacity without spending lots of budget on it.

The solution intelligently aggregates multiple Internet connections to increase the WAN speed for all users. Greater application performance can be achieved as best performing and least-loaded links are always selected when requests come up. The solution enables business to incrementally add WAN links as many as needed on a single appliance when the bandwidth demand grows. This helps customers minimize the upfront investment on WAN and flexibly scale up their networks when the requirements grow.
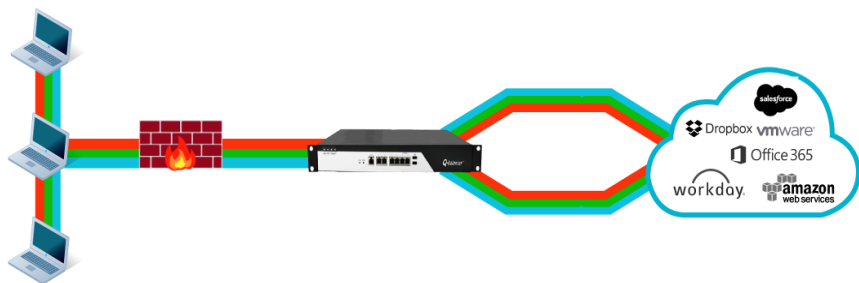

Figure 1: Multi-WAN Load Balancing

Inbound Load Balancing
Q-Balancer ensures the corporate-hosted services for customers through handling DNS services for them, and it provides a range of sophisticated load-balancing algorithms that are much more effective and accurate than basic DNS load balancing. The solution is able to monitor link status to divert the incoming requests the active paths when WAN outage occurs; also, it is able to distribute incoming traffic load on all available paths by directing external requests to internal hosts via multiple available WAN links. This accelerates the server response to incoming requests for enterprises.
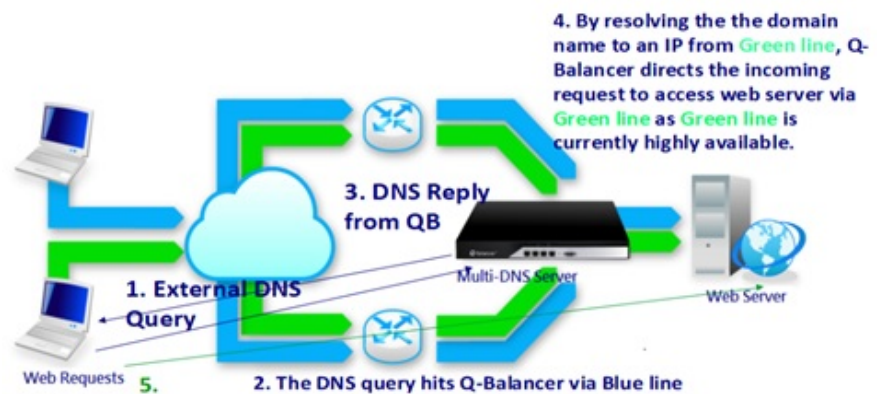
Figure 2: Inbound Load Balancing

Q-Balancer is the best-in-class inbound load balancing solutions used by high-traffic enterprises to deliver their content quickly and reliably. It provides their customers with better user experience as the hosted services will be always accessible and responsive to them.

Multi-Path QoS

When the delivery of mission-critical applications becomes slow, businesses would consider to invest more in bandwidth. However, more bandwidth means bigger bills month after month.
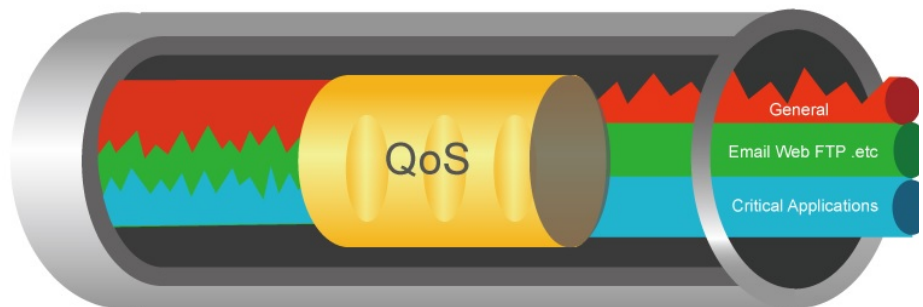

Figure 3: Quality of Service

The Q-Balancer gives you granular control over the network to prevent bandwidth abuse; as a result, it helps you control WAN costs. The solution enables enterprises to mitigate bandwidth abuse and bottleneck issues by allocating enough bandwidth to business-critical applications and limiting bandwidth resource to business-unrelated traffic. The Q-Balancer QoS allows you to control traffic flows, and so traffic does not exceed network capacity. With the solution, you can enforce bandwidth control for traffic on a narrow or a broad scale. Other than bandwidth allocation, the solution can prioritize traffic for business-critical applications. These applications get the bandwidth

they need to cross the network unhindered by the business unrelated traffic.

VPN Bonding & Failover

Once the Q-Balancer solution is in place, the devices will keep VPN connectivity up and running by diverting VPN traffic down to the remaining active paths in the event of the primary circuit fails. Moreover, the Q-Balancer solution maximizes site-to-site VPN speed through efficiently utilizing multiple paths at the same time.
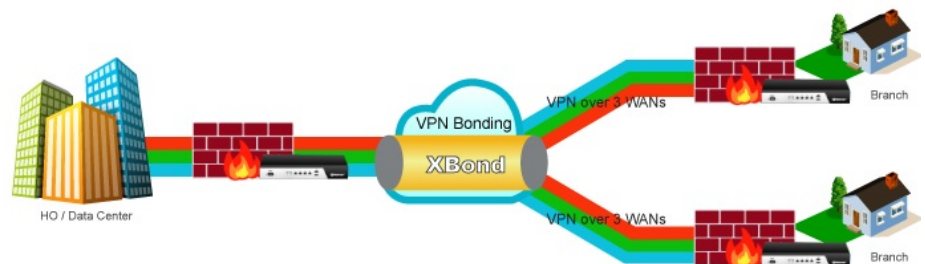

Figure 4: VPN Bonding

The Q-Balancer XBond is an inbuilt bandwidth bonding technology using Zero Touch Provisioning (ZTP), and its mechanism of auto-provision enables the configuration of VPN bonding to be provisioned automatically in an effort to reduce operational costs. All Internet circuits in this type of deployment are set active, and so the branches are able to access corporate network at a fully aggregated speed at all times.

The Q-Balancer VPN bonding is able to work on static IP, dynamic IP, and even private IP, and can be integrated into existing VPN networks with minimal impact.

Solid Connectivity for Remote offices, pop-up store, and temporary sites

Q-Balancer is designed to address connectivity issues for these sectors. Through deploying Q-Balancer appliance and connecting multiple 4G LTE lines, IT departments now are able to instantly deploy Internet connectivity when a branch network is about to set. By taking on multiple WAN transport services from multiple providers, the solution ensures retail stores to keep on taking payments even if one of Internet line went down. The customer service will not suffer during WAN outage. For Construction sector, IT department will never have issues with finding Internet access for their construction sites
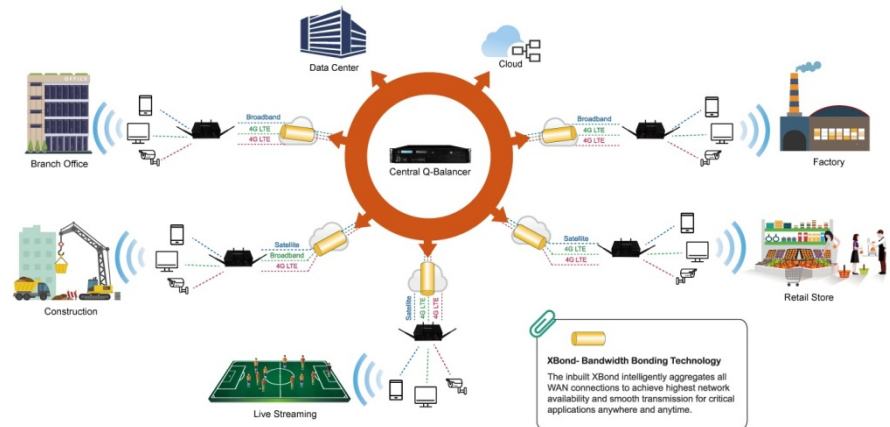
when a new project starts.

Figure 5: Building a scalable and resilient network with 4G LTE

The Q-Balancer central management system (CMS) is browser-accessed software that enables IT department to manage and monitor network status for site-to-HQ and branch-to-branch connectivity from a single console. The Q-Balancer CMS minimizes administrative effort and operational cost associated with managing a Q-Balancer appliance. Rather than access to manage each site individually, the Q-Balancer CMS lets you manage the distributed network as a whole, which saves time, and dramatically reduces errors for these sectors.

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About Q-BALANCER

Q-BALANCER Company is dedicated to developing the highly innovative Multi-WAN and Hybrid-WAN solutions. Since inception we aim to build a WAN solution for enterprises that is able to deliver higher WAN reliability at lower cost. Through cooperation with our partners, Q-Balancer has been successfully deployed across thousands of enterprises in over 20 countries.