

# **XRoads Networks, Inc.**

**Network Load Balancing Overview**

**Revision 3.5.0**

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## What Is Network Load Balancing?

- Network load balancing (aka multi-homing, or dual-wan routing) is the ability to aggregate two or more wide-area network (WAN) connections in order to achieve greater reliability and overall throughput.



- ◆ Increased Reliability
- ◆ Increased Bandwidth
- ◆ Increased Responsiveness

## Why Network Load Balancing?

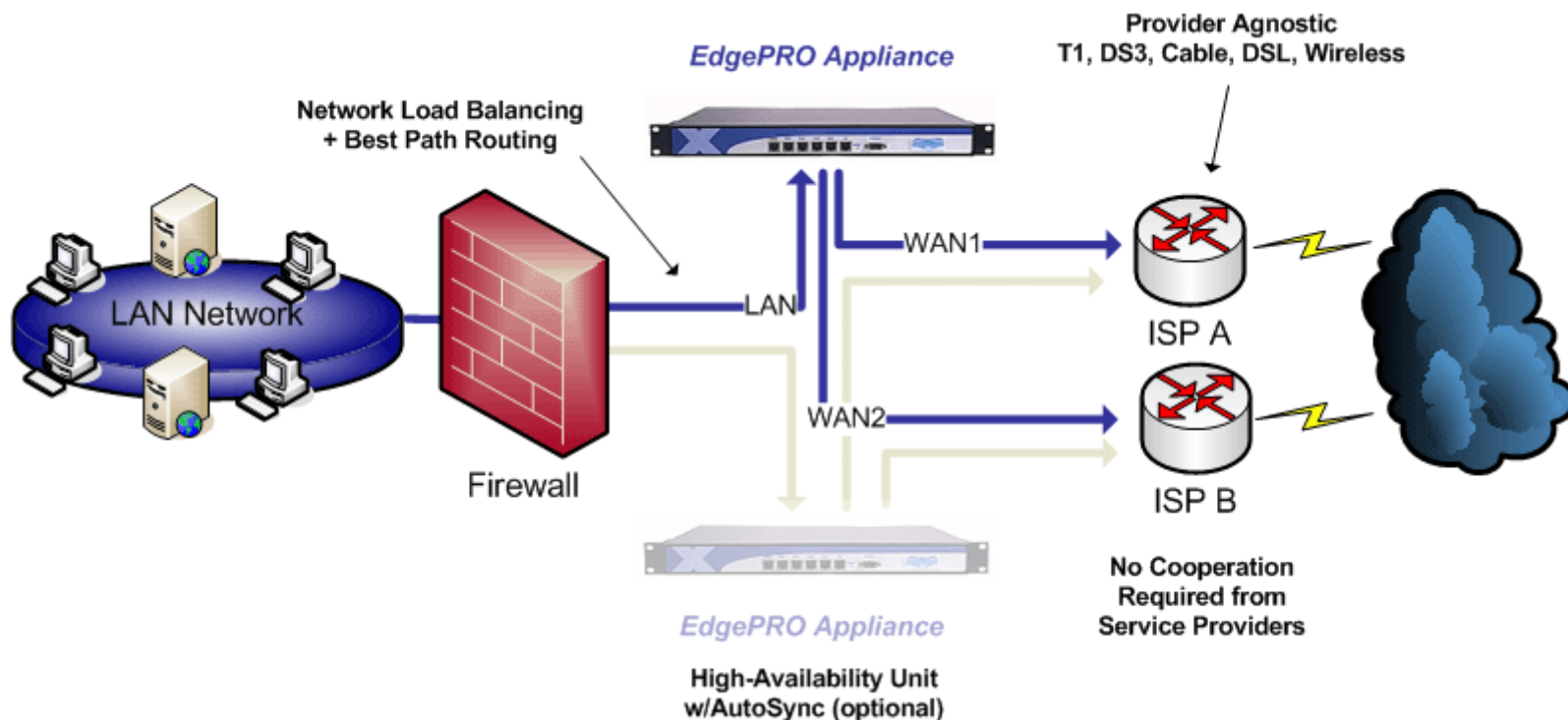
- ◆ **The easiest answer to this question is that it depends on how important your network connection is to your organization.**
- ◆ **On average, for every hour of downtime, a business loses \$100 per employee in lost productivity and sales.**
- ◆ **That easily translates to thousands of dollars per hour in losses for the average business, not to mention the headaches caused by user complaints and the attempt to troubleshoot the root of the problem, which generally takes at least several hours.**
- ◆ **One in four businesses have experienced an outage of eight (8) hours or more. With the average ISP link suffering over seven (7) hours of degraded service EVERY month.**

## What about BGP?

- ◆ **The old method for providing network redundancy was BGP (Border Gateway Protocol), however this technology has many problems associated with its deployment.**
  - ◆ BGP does not natively support load balancing, only redundancy, so there is no way to fully utilize the increased bandwidth obtained from secondary links which increases the overall costs of this solution.
  - ◆ BGP is very difficult to install with complex requirements that must be met prior to installation. Configuring BGP with a single provider is difficult (most broadband providers do not even offer it), however when multiple providers are involved BGP is generally too costly to justify.
  - ◆ BGP is only as good as the provider that offers it, and in fact 60% of all network outages are caused by the providers themselves, either directly or via one of their partners.

## How Does It Work?

- ◆ The Edge is a complete inbound/outbound network load balancing appliance with built-in hardware redundancy for 99.999% uptime.

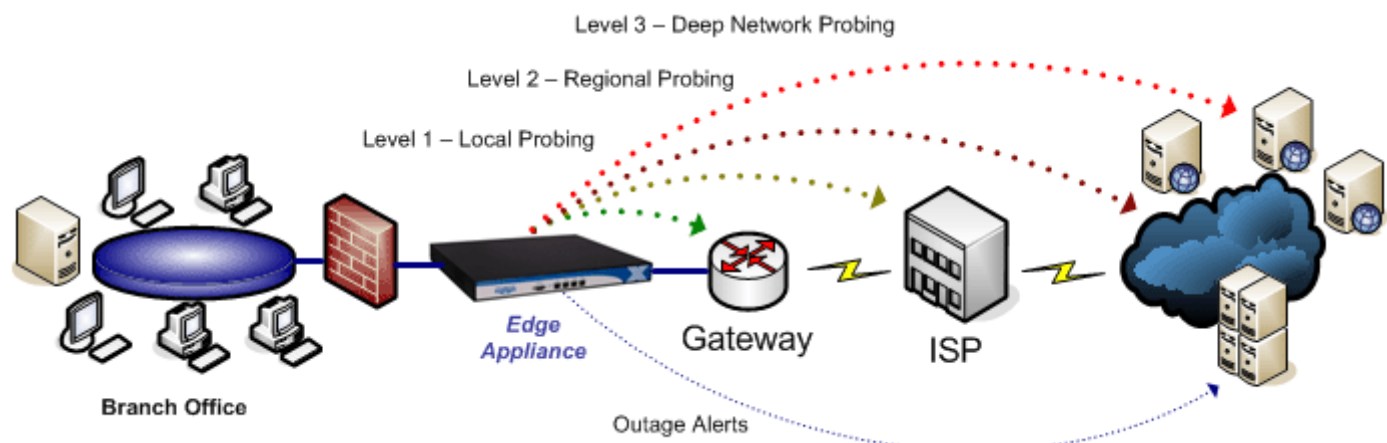


# Edge Appliance Advantages

- ◆ **XRoads Networks is the holder of multiple pending patents in the areas of network load balancing and redundancy. The following technologies are just a few that make the Edge appliance a leader in this area:**
  - ◆ **Vector Routing** – A routing algorithm which takes into account connection speed, link utilization, latency and other factors to determine how a link is balanced.
  - ◆ **Best Path Routing** – A process used to determine the best method for routing critically defined traffic when multiple paths are available (includes SLA reporting).
  - ◆ **MOD (Multi-Level Outage Detection)** – The most sophisticated network outage detection system available, ensures against false outages; provides auto-failover.
  - ◆ **ActiveDNS** – A method by which inbound network requests are routed to the appropriate WAN interface based on an algorithm associated with Vector Routing.
  - ◆ **Virtual Technician** – This unique feature enables the Edge appliance to automatically test, troubleshoot, and analyze what caused a WAN outage.

## Increased Reliability

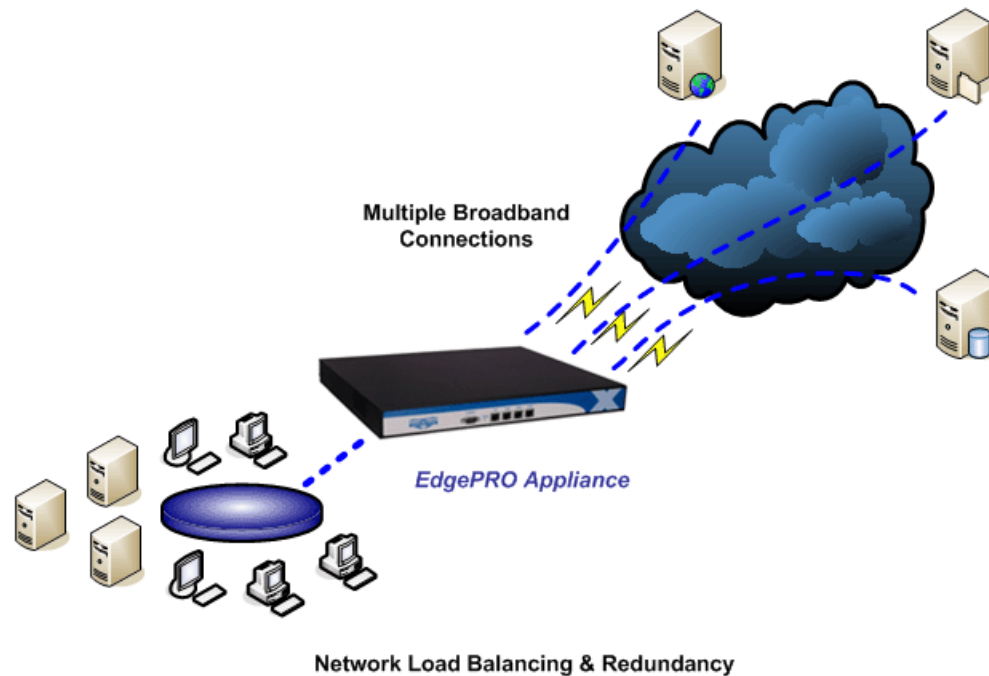
- ◆ **How does the failover process work? What about failing back once the link is back up?**
  - ◆ The MOD (Multi-Level Outage Detection) module, continuously monitors each WAN connection. If a problem is detected, secondary testing is performed to confirm the outage. When the outage is confirmed the WAN link is immediately taken out of the balancing algorithm (this occurs within seconds).
  - ◆ The testing continues during an outage in order to determine when the link has been restored. Upon link restoration the WAN link is placed back into the balancing algorithm with its change to an “up” status.



## Increase Bandwidth

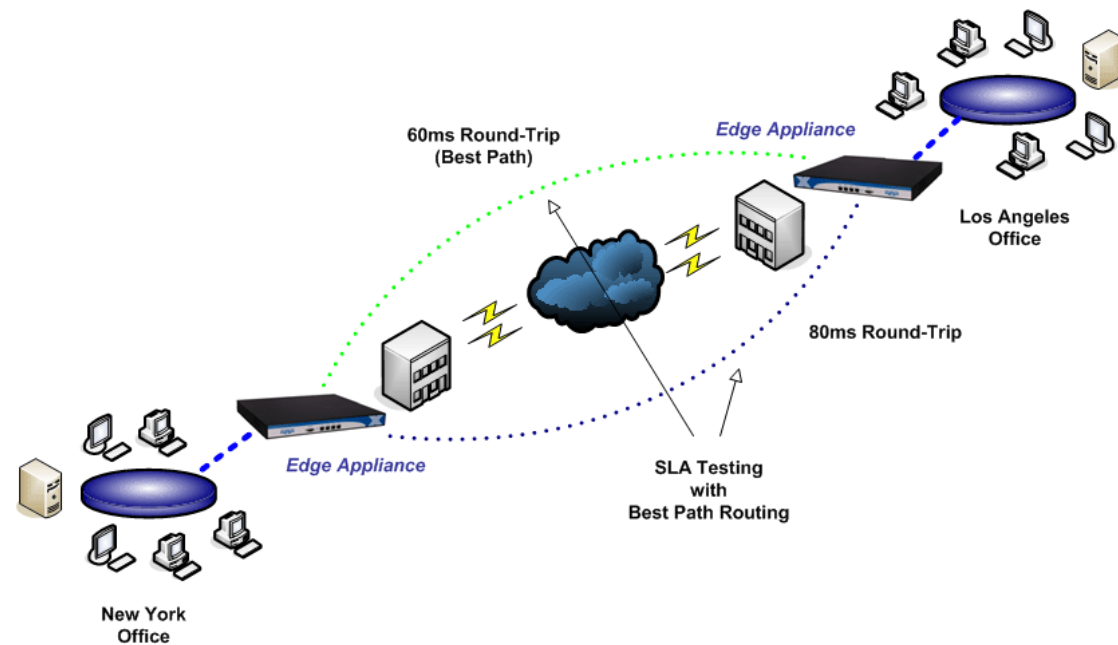
### ◆ Need more bandwidth?

- ◆ The Edge product line can handle up to five (5) WAN interfaces on a single device and load balance across each connection. The Edge appliances can also be stacked, so that one is tied into the next, which allows for an unlimited number of WAN connections.



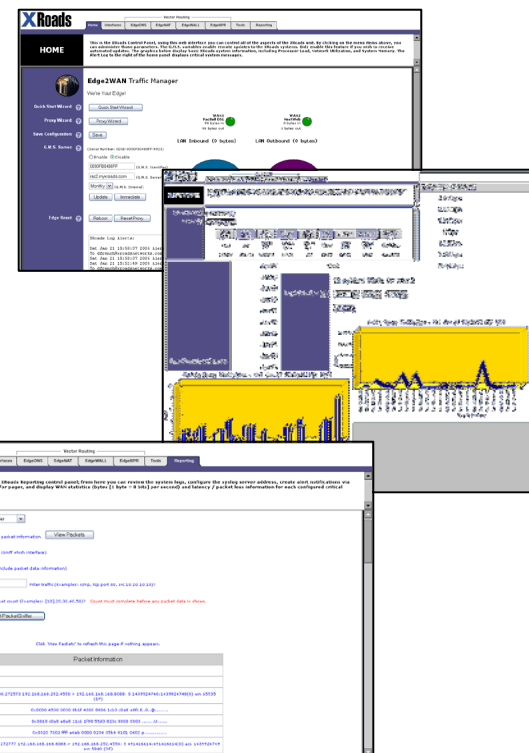
## Increased Responsiveness

- ◆ Improved responsiveness through our Best Path Routing™ technology!
  - ◆ Only the Edge appliances provide this type of Best Path Routing capability, where critical application traffic is always routed via the best possible path to ensure low latency and high responsiveness.



## Designed with simplicity in mind!

- Easy to configure and navigate
  - ◆ Web based interface HTTP/HTTPS
  - ◆ Remote CLI via SSH
- Graphical reporting
  - ◆ WAN usage reporting
  - ◆ Detailed traffic and policy reporting
- Additional features
  - ◆ Network packet sniffer
  - ◆ Syslog server
  - ◆ Server monitoring



## Summary / ROI

- ROI (Return On Investment) – The average organization can lose \$50-100 per hour per employee based on loss of productivity due to a WAN outage or simply high latency across the WAN network.
- ◆ Based on that statistic, an average 25 person office can lose between \$3,000 and \$10,000 per quarter.
- ◆ By implementing an Edge network balancing solution cost savings could be realized within a single quarter.
- ◆ Lower the potential for outage related costs, and immediately increase productivity through higher application responsiveness across the WAN.



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