



XROADS NETWORKS

ExampleGuide: WAN Optimization

Example Guide

EDGE NETWORK APPLIANCE

ExampleGuide

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Edge Configuration Series

WAN Optimization

Use this guide as a step-by-step manual for configuring your Edge appliance WAN Optimization.

The WAN Optimization configuration is designed to enable site-to-site data compression, TCP tuning, and error checking to speed up application responsiveness.



About the “Screen Shots”

The included screen shots were taken from a working example configuration in the XRoads Networks lab. This configuration was running on XOS3.3.x. Some screen shots may be different depending on your version of XOS code.

Step-By-Step Method

Use this guide to assist in configuring your own Edge device. The examples provided herein are designed as a template which can translate to your organizations network environment. The three primary configuration steps are outlined below:

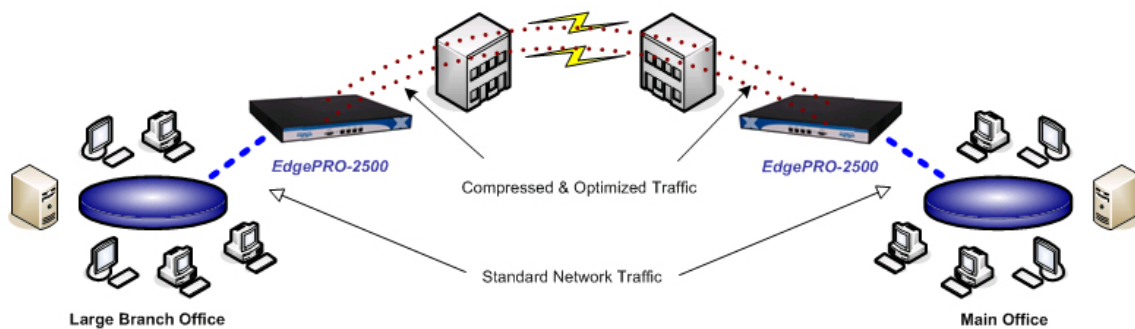
- **Primary Hub Configuration – This is setup of the WAN Optimization tunnel of the Edge device designated as the hub.**
- **Primary Client Configuration – This is setup of the WAN Optimization tunnel of the Edge device designated as the client.**
- **Secondary tunnel for binding at each site – This is the configuration of a secondary tunnel on each Edge device for the purpose of binding the two tunnels together. Tunnel binding automatically provides failover in case one of the tunnels (i.e. WAN connections) should stop working.**

WAN Optimization Overview

Increase site-to-site application responsiveness and download times. This feature is designed to improve the performance of critical applications primarily between a central location and one or more branch offices.

Some of the advantages of the WAN optimization solution include data compression (where data is compressed prior to being sent out the WAN interface), tunnel binding (the ability to bind multiple WAN optimization tunnels through multiple WAN interfaces to increase overall throughput for the network), adaptive TCP tuning (automatic scaling of the TCP window to improve performance), and forward error checking (dynamically resetting a file download when errors occur to minimize the time to resend the file).

The example below shows a highly optimized solution between two sites. This example demonstrates how Edge appliances (one at each location) in combination with multiple WAN connections, can greatly increase the overall performance and throughput of critical applications being access between the sites.



Use the EdgeBPR -> WAN Optimization menu selection to create a new tunnel. When selecting this menu option the tunnel listing first appears. Select the “<< Add Tunnel” button to begin the configuration process.

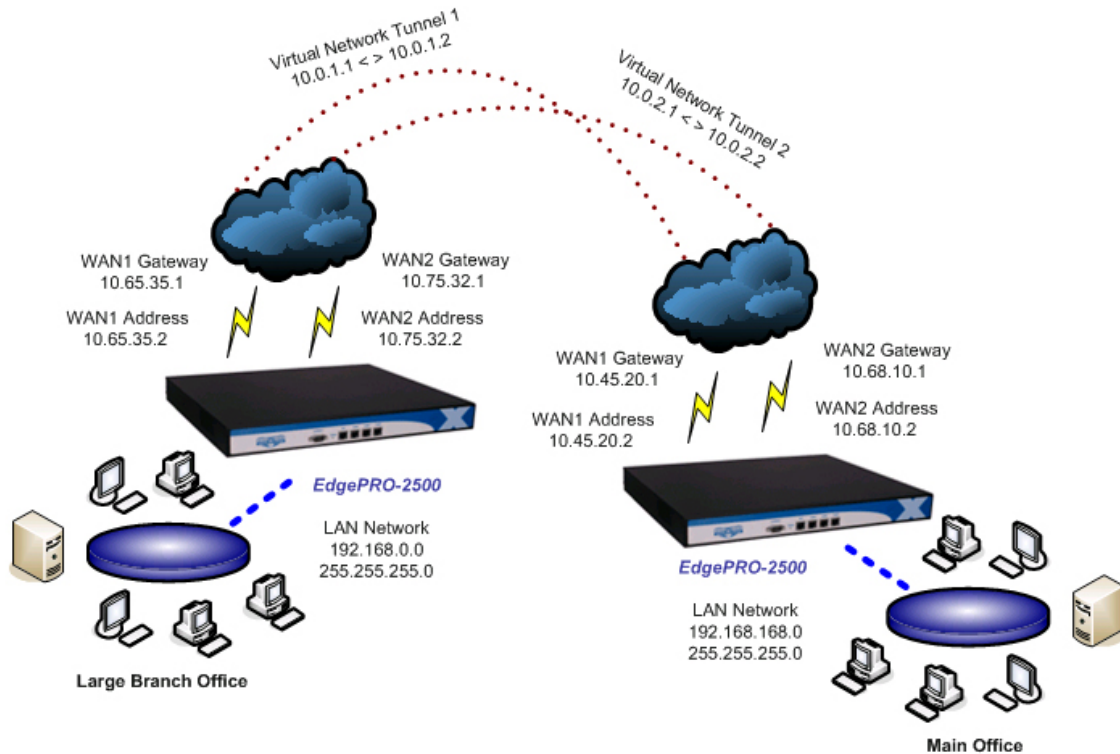
The screenshot shows the XRoads EdgeBPR control panel. The top navigation bar includes 'Home', 'Interfaces', 'EdgeDNS', 'EdgeNAT', 'EdgeWALL', 'EdgeBPR', 'Tools', and 'Reporting'. The 'EdgeBPR' section is active, displaying a message: 'This is the XRoads EdgeBPR (Best Path Routing) control panel, from here you control how critical network destinations (i.e. VPN endpoints, remote VoIP nodes, etc) are routed using real-time metrics obtained from each of the possible WAN connections. This control panel also enables the configuration of critical services, which enable you to determine which WAN interface a particular protocol/service uses. Make sure to Save any changes made in this section or they will be lost upon reboot.'

Under 'Edge Routing', the 'WAN Optimization' menu is selected. Below this, the 'WANOPT Tunnels List' is displayed. The table has columns: Select, Connection, WAN Port, Client/Hub, Remote Device, Remote Addr/Mask, Binding, Session, State, Activated, Status. A red box highlights the '<< Add Tunnel' button.

Select	Connection	WAN Port	Client/Hub	Remote Device	Remote Addr/Mask	Binding	Session	State	Activated	Status
<< Add Tunnel	Select	Delete	OPTLog	Start	Stop	Restart All	Refresh View	Save		

Example Network

This example network is provided as a template which can be used to determine how to best configure your Edge appliance. In the example network environment, each Edge appliance is connected to two WAN interfaces. The WAN interfaces are statically routed in this case, but the method of WAN connection does not matter when configuring the tunnels. The only requirement is that the interfaces being configured are active.



Network Overview

This example network shows two Edge devices connected via two WAN links at each site. The goal is to create two optimization tunnels between the sites and bind them for increase speed via tunnel load balancing with the ability to automatically failover in the event of a WAN outage.

The primary tunnel will be called m2b_tun1 (b2m_tun1), and the secondary tunnel will be called m2b_tun2 (b2m_tun2). The secondary tunnel will be bound to the primary tunnel.

The addressing information that will be used is located in the diagram above. The following steps show how to configure this scenario.

WAN Optimization Step-By-Step

The following pages show a step-by-step example of how to configure the Edge router based on the network environment in the example scenario. The following screen will be displayed whenever changes are made to the tunnel rules.

Make sure to save your settings.

Please wait while the WAN Optimization policies are being updated...

Step One

The following screen demonstrates how TUNNEL 1 on the HUB device is configured.

Edge Routing: ?	WAN Optimization
Tunnel Name: ?	m2b_tun1 (Used to define this site-to-site optimization tunnel)
Tunnel ID: ?	1 (Select a unique tunnel ID)
Tunnel Type: ?	<input checked="" type="radio"/> Primary <input type="radio"/> Backup (Enter the primary tunnel name) <input type="radio"/> Bind To -- none -- (Select an existing tunnel for binding, see '?' for details)
Shared Secret Key: ?	thisismykey12345 (This key must be 16 characters using only numbers and letters)
WAN Interface: ?	WAN1 (Select the outbound interface)
Virtual Address: ?	10 . 0 . 1 . 2 (Local Virtual Address) 10 . 0 . 1 . 1 (Remote Virtual Address)
Remote Edge Device: ?	10 . 65 . 35 . 2 (Enter the WAN address of the remote Edge device)
Remote Network: ?	192 . 168 . 0 . 0 (Enter the network address of the remote network) 255.255.255.0 (Remote network mask)
Client/Hub: ?	<input type="radio"/> Client Side <input checked="" type="radio"/> Hub Side (Select this tunnel type)
On Failure: ?	<input checked="" type="radio"/> Disabled <input type="radio"/> Enabled (Select to enable tunnel only if WAN1 fails)

Step Two

This screen demonstrates how TUNNEL 1 on the CLIENT device is configured.

Edge Routing: ?	WAN Optimization
Tunnel Name: ?	b2m_tun1 (Used to define this site-to-site optimization tunnel)
Tunnel ID: ?	1 (Select a unique tunnel ID)
Tunnel Type: ?	<input checked="" type="radio"/> Primary <input type="radio"/> Backup (Enter the primary tunnel name) <input type="radio"/> Bind To (none) (Select an existing tunnel for binding, see '?' for details)
Shared Secret Key: ?	thisismykey12345 (This key must be 16 characters using only numbers and letters)
WAN Interface: ?	WAN1 (Select the outbound interface)
Virtual Address: ?	10 . 0 . 1 . 1 (Local Virtual Address) 10 . 0 . 1 . 2 (Remote Virtual Address)
Remote Edge Device: ?	10 . 45 . 20 . 2 (Enter the WAN address of the remote Edge device)
Remote Network: ?	192 . 168 . 168 . 0 (Enter the network address of the remote network) 255.255.255.0 (Remote network mask)
Client/Hub: ?	<input checked="" type="radio"/> Client Side <input type="radio"/> Hub Side (Select this tunnel type)
On Failure: ?	<input checked="" type="radio"/> Disabled <input type="radio"/> Enabled (Select to enable tunnel only if WAN1 fails)

Step Three

The following screen demonstrates how TUNNEL 2 on the HUB device is configured.

Edge Routing: ?	WAN Optimization
Tunnel Name: ?	m2b_tun2 (Used to define this site-to-site optimization tunnel)
Tunnel ID: ?	2 (Select a unique tunnel ID)
Tunnel Type: ?	<input type="radio"/> Primary <input type="radio"/> Backup (Enter the primary tunnel name) <input checked="" type="radio"/> Bind To m2b_tun1 (Select an existing tunnel for binding, see '?' for details)
Shared Secret Key: ?	thisismykey12345 (This key must be 16 characters using only numbers and letters)
WAN Interface: ?	WAN2 (Select the outbound interface)
Virtual Address: ?	10 . 0 . 2 . 2 (Local Virtual Address) 10 . 0 . 2 . 1 (Remote Virtual Address)
Remote Edge Device: ?	10 . 75 . 32 . 2 (Enter the WAN address of the remote Edge device)
Remote Network: ?	192 . 168 . 0 . 0 (Enter the network address of the remote network) 255.255.255.0 (Remote network mask)
Client/Hub: ?	<input type="radio"/> Client Side <input checked="" type="radio"/> Hub Side (Select this tunnel type)
On Failure: ?	<input checked="" type="radio"/> Disabled <input type="radio"/> Enabled (Select to enable tunnel only if WAN1 fails)

Step Four

This screen demonstrates how TUNNEL 2 on the CLIENT device is configured.

Edge Routing: ?	WAN Optimization
Tunnel Name: ?	b2m_tun2 (Used to define this site-to-site optimization tunnel)
Tunnel ID: ?	2 (Select a unique tunnel ID)
Tunnel Type: ?	<input type="radio"/> Primary <input type="radio"/> Backup (Enter the primary tunnel name) <input checked="" type="radio"/> Bind To b2m_tun1 (Select an existing tunnel for binding, see '?' for details)
Shared Secret Key: ?	thisismykey12345 (This key must be 16 characters using only numbers and letters)
WAN Interface: ?	WAN1 (Select the outbound interface)
Virtual Address: ?	10 . 0 . 2 . 1 (Local Virtual Address) 10 . 0 . 2 . 2 (Remote Virtual Address)
Remote Edge Device: ?	10 . 68 . 10 . 2 (Enter the WAN address of the remote Edge device)
Remote Network: ?	192 . 168 . 168 . 0 (Enter the network address of the remote network) 255.255.255.0 (Remote network mask)
Client/Hub: ?	<input checked="" type="radio"/> Client Side <input type="radio"/> Hub Side (Select this tunnel type)
On Failure: ?	<input checked="" type="radio"/> Disabled <input type="radio"/> Enabled (Select to enable tunnel only if WAN1 fails)

Step Five

Once the tunnels have been created they must be ENABLED. This is done by selecting a tunnel and clicking the “Start” button. This will change the State of the tunnel to ENABLED and the tunnel will attempt to make a connection to the remote Edge device.

Select	Connection	WAN Port	Client/Hub	Remote Device	Remote Addr/Mask	Binding	Session	State
<input checked="" type="radio"/>	m2b_tun1	wan1	Hub	10.65.35.2	192.168.0.0/24	None	1	Disabled
<input type="radio"/>	m2b_tun2	wan2	Hub	10.75.32.2	192.168.0.0/24	m2b_tun1	2	Disabled

<< Add Tunnel Select Delete OPTLog **Start** Stop Restart All Refresh View Save

The following screen is displayed during the starting or stopping of a tunnel.

Please wait while the Edge attempts to start Wan Optimization Tunnel 'm2b_tun1'...

Both tunnels should be ENABLED to enable tunnel binding.

Select	Connection	WAN Port	Client/Hub	Remote Device	Remote Addr/Mask	Binding	Session	State
<input type="radio"/>	m2b_tun1	wan1	Hub	10.65.35.2	192.168.0.0/24	None	1	Enabled
<input type="radio"/>	m2b_tun2	wan2	Hub	10.75.32.2	192.168.0.0/24	m2b_tun1	2	Enabled

Step Six

The client tunnels must also be started as the hub tunnels were in order to bring the tunnels to an UP and activated mode.

Select	Connection	WAN Port	Client/Hub	Remote Device	Remote Addr/Mask	Binding	Session	State
<input type="radio"/>	b2m_tun1	wan1	Client	10.45.20.2	192.168.168.0/24	None	1	Disabled
<input type="radio"/>	b2m_tun2	wan1	Client	10.68.10.2	192.168.168.0/24	b2m_tun1	2	Disabled

Step Seven

This screen shows the tunnels UP and activated. Both tunnels are now in a load balanced state able to pass traffic between the two sites with full optimization, data compression, error checking, and redundancy.

The screenshot shows the XRoads EdgeBPR control panel. The navigation menu includes Home, Interfaces, EdgeDNS, EdgeNAT, EdgeWALL, EdgeBPR (selected), Tools, and Reporting. The main content area is titled 'EdgeBPR' and contains a description of the control panel's function. Below this, there is a section for 'Edge Routing' with a 'WAN Optimization' dropdown menu. The 'WANOPT Tunnels List' section displays a table of tunnels with columns for Select, Connection, WAN Port, Client/Hub, Remote Device, Remote Addr/Mask, Binding, Session, State, Activated, and Status. Two tunnels are listed, both with 'Enabled' state and 'UP' status.

Select	Connection	WAN Port	Client/Hub	Remote Device	Remote Addr/Mask	Binding	Session	State	Activated	Status
<input type="radio"/>	b2m_tun1	wan1	Client	10.45.20.2	192.168.168.0/24	None	1	Enabled	Yes	UP
<input type="radio"/>	b2m_tun2	wan1	Client	10.68.10.2	192.168.168.0/24	b2m_tun1	2	Enabled	Yes	UP

Activation / Status Definitions

The “Status” column is used to provide information regarding the availability of the tunnel. If the tunnel is in a working state, the “Status” column will show as UP. If the tunnel is not in a working state, due to either a WAN failure, route failure, disabled or stopped tunnel the “Status” column will show the tunnel as DOWN.

The “Activated” column is used to determine whether the tunnel is being actively routed, meaning whether network traffic is actually being routed through that particular tunnel. If the “Activated” column equals -Yes- than traffic is being routed over this tunnel. If the “Activated” column equals -No- than traffic is not being routed over this tunnel.

Activated	Status
Yes	UP
Yes	UP

This state shows both tunnels UP in load balanced mode.

Activated	Status
Yes	UP
No	DOWN

This state shows the primary tunnel UP and the secondary tunnel DOWN, most likely from a WAN failure or if the tunnel was disabled.

Activated	Status
Yes	UP
No	UP

This state show the primary tunnel UP and routing traffic. The secondary tunnel is also UP (meaning available) however it is not routing traffic. This is most likely because the tunnel is in Backup mode.

WAN Optimization FAQ's

Coming soon....