Technical Brief

Helping Remote Users with Inbound Load Balancing

ELFIQ
By Adaptiv Networks

Introduction

With so many employees working remotely, the pressure on corporate networks has moved from inside the office and going out to the Internet, to the home offices remotely connecting to local corporate resources.

This increased pressure is a complex challenge to tackle, as organizations rarely have control over the sessions' origin: the home office. ELFIQ by Adaptiv Networks can help by distributing the inbound traffic and improve the quality of experience for remote users with simple solutions like Intelligent DNS (iDNS) and Intelligent Service Verification (ISV).

This document is intended to communicate the technology and use cases associated with these solutions. iDNS and ISV are offered as part of Adaptiv Networks' ELFIQ Link Balancing and SD WAN products.

Technology Overview

Inbound load balancing allows organizations to distribute traffic to make the best use of bandwidth and avoid network congestion. The result is your infrastructure investment becomes fully optimized because ELFIQ understands how to manage each connection request based on current available resources and network conditions, whether outgoing, or incoming.

When Internet or remote users reach local resources (often by using VPN), they're typically directed to a single IP address, whether it's available or not. ELFIQ delivers a better user experience by intelligently managing the way remote users get connected to the services they needacceleration, and on cloud infrastructure for download acceleration.

ELFIQ Link Balancers have the following features that make it possible to manage inbound traffic:

1. **Intelligent DNS (IDNS)** The Link Balancer intercepts the request and answers on behalf of the DNS server. It replies with the IP address of the best link, based on the link metrics and the algorithms configured for the resources.
2. **Intelligent Service Verification (ISV)** The Link Balancer verifies the resources for basic connectivity before responding the DNS requests.

Use Case

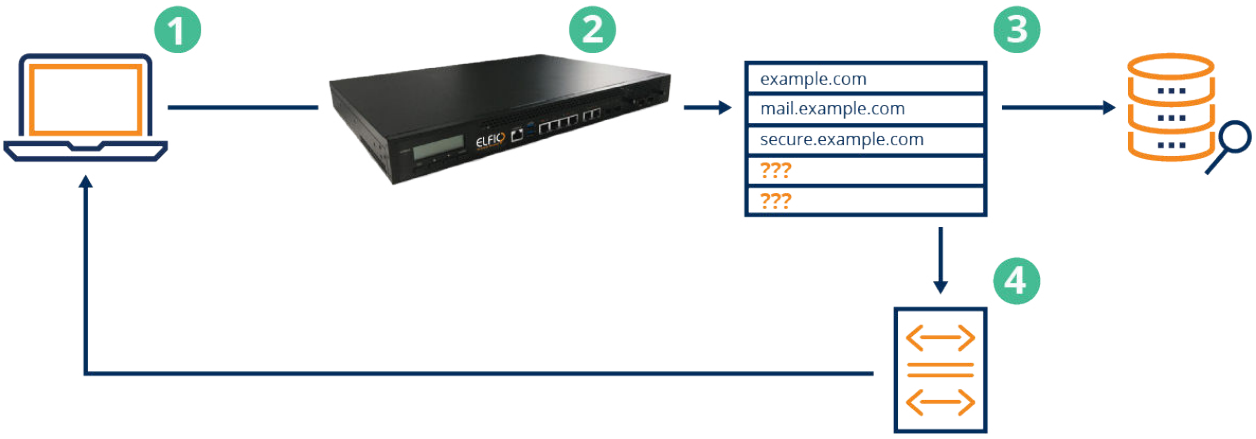
Todd works in the accounting department of a law firm. Due to the sensitive nature of the company's data, its IT department decided to host files and records locally at the headquarters. Now that he works from home, Todd uses his home Internet to access the files he would usually access instantly via the LAN or WAN. Now, Todd's download competes against all the other requests from other home workers, which risks overloading the HQ's network.

Lucky for Todd and his colleagues, their IT deployment recently deployed a Link Load Balancer from ELFIQ by Adaptiv, so they could deploy a secondary Internet connection. The ELFIQ solution recognizes that the first ISP is becoming saturated before sending Todd's request, and instead of dowloading his report over Link 1, which would take 15 minutes, Todd's request is sent over Link 2 and he gets his file in under 1 minute.

Intelligent DNS

The Link Balancer can dynamically intercept and answer Domain Name Server (DNS) queries according to the balancing algorithms configured for each of your internal resources. It monitors incoming DNS requests on UDP port 53. If the DNS request has a matching entry in its DNS resource record table, the Link Balancer intercepts the request and answers on behalf of the DNS server.

Intelligent DNS (IDNS) intercepts the DNS requests only for resources that you configure. If there are requests for resources that are not configured, the request passes to your DNS server, which answers the query. The diagram below provides an overview of the process. IDNS interceptions can also apply to outgoing DNS requests.



1 **An external user sends a DNS request.**

2 **The Link Balancer intercepts the request.**

3 **It checks whether the address is in its DNS resource records. If not, the DNS request passes to the DNS server.**

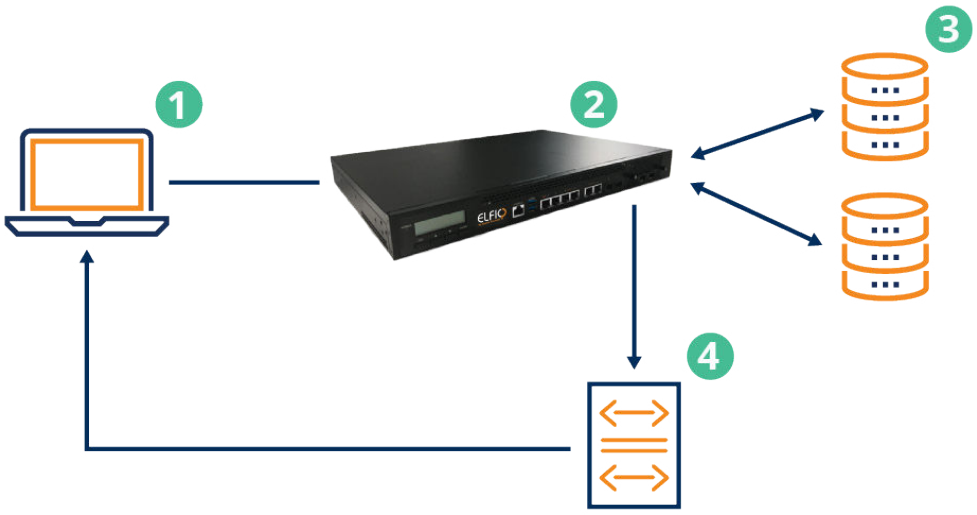
4 **If it has a resource record for the address, the Link Balancer verifies the configured algorithm and responds to the request.**

Intelligent Service Verification

Intelligent Service Verification (ISV) is a feature that actively monitors the following services: TCP, HTTP, HTTPS, FTP, API.

You can use ISV in conjunction with IDNS to ensure that the Link Balancer responds to DNS requests with the IP address of a server that is operational. In some infrastructures, there are two or more servers for the same service. For example, a network may have two web servers that host the same content in order to provide redundancy in case of server failure.

When you configure Intelligent Service Verification together with IDNS, the Link Balancer verifies the servers for basic connectivity and takes the link metrics into account when it intercepts DNS requests and responds to them.



1 An external user sends a DNS request.

2 The Link Balancer opens test sessions with the requested servers.

3 The services respond to the Link Balancer.

4 Using the information from the test, as well as current link metrics, the Link Balancer calculates the best link to use when answering the DNS request.

CASE STUDY

Société de transport de Montréal

ELFIQ By Adaptiv Networks

Société de transport de Montréal (STM) offers train and bus service to passengers throughout Montreal, Canada. Their mobile app provides real time updates on train and bus schedules to ensure passengers are informed of any delays the transit system experiences.

With daily ridership of over 2 million people and 68 stations, there is a lot of potential for spikes in traffic through the app when there is an interruption in the transit system.

STM has been using ELFIQ by Adaptiv Networks since 2016 and has seen great value from ISP redundancy. Using two ISPs instead of just one, ensures business continuity, even when traffic peaks. Should one link go down, the backup link kicks in, and the end user accessing the app remains connected.

With the solid network foundation put in place with ELFIQ, STM is also prepared to have employees work remotely should it become necessary.

Whether they need their employees to access resources at home, or they introduce new applications that require more bandwidth resources, STM can feel confident about the network infrastructure they have in place and that it is both flexible and scalable for future needs.

With the ability to have ISP redundancy of up to 32 carriers for incoming and outgoing traffic, STM is confident in the resiliency and scalability of their network.

"To create a platform for remote work, you need a solid network infrastructure with available and scalable bandwidth. ELFIQ by Adaptiv Networks creates this foundation, so that new applications and services can be deployed without bandwidth limitations."

- Richard Crevier
Network Analyst, STM

NETWORK PERFORMANCE

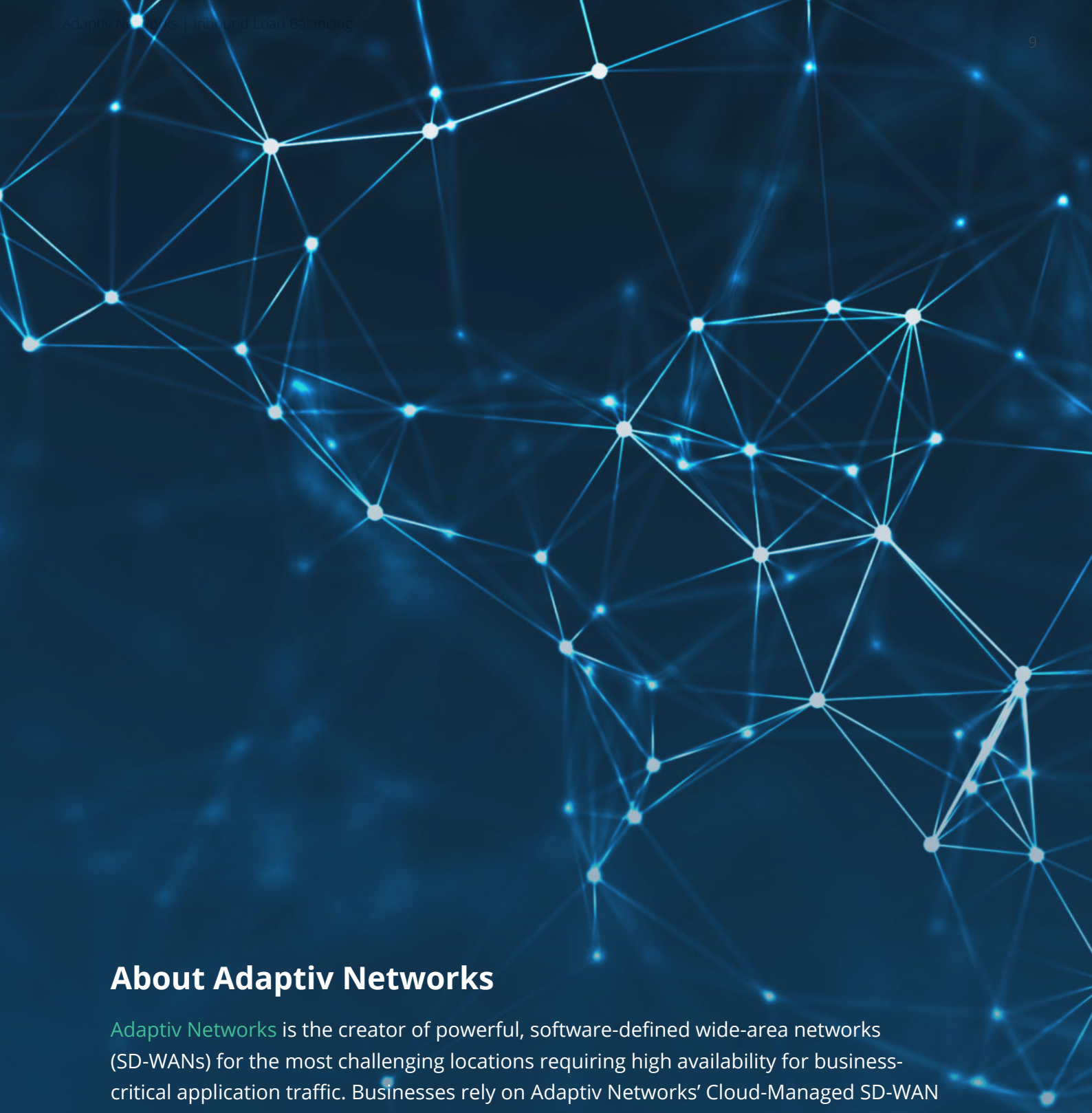
More ELFIQ Solutions by Adaptiv Networks

ELFIQ By Adaptiv Networks

ELFIQ by Adaptiv Networks is a networking toolbox which can help build a flexible and resilient infrastructure that fits your needs. From adding bandwidth to building a disaster recovery plan, ELFIQ has you covered.

Contact sales@adaptiv networks.com to learn more.

Link Failover & Traffic Segmentation	Deep Packet Inspection & App Steering	Bandwidth Aggregation	Fail-to-Wire LAN Failsafe
Site-to-Site Encryption	LTE/4G/3G Failover	Geographic & Cloud Failover	Inbound Load Balancing
Quality of Service Rules	Application Usage Reporting	Hybrid WAN & MPLS support	Conditional and Time-of-Day Verification



About Adaptiv Networks

Adaptiv Networks is the creator of powerful, software-defined wide-area networks (SD-WANs) for the most challenging locations requiring high availability for business-critical application traffic. Businesses rely on Adaptiv Networks' Cloud-Managed SD-WAN to provide secure, high-performance, and highly reliable networking for their voice, data, and video communications needs. Adaptiv Networks serves more than 250 customers, with more than 2,500 sites deployed through 30 partners.

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