

# Brocade Flow Optimizer

## HIGHLIGHTS

- Helps improve business agility by streamlining SDN and existing network operations via policy-driven visibility and automated control of network flows
- Provides threat management by programmatically sensing and clipping DDoS flows at router and switch ports
- Extracts network-wide visibility of Layer 2 through Layer 4 traffic flows collected from network devices through sFlow
- Delivers real-time control of flows (drop, meter, remark, mirror, normal forward) through OpenFlow rules and pushed to entire network for deterministic, policy-driven forwarding
- Automates policy applied via an embedded GUI or through an open API

## Policy-based, Intelligent Flow Management

As organizations continue their digital transformation, the underlying network becomes increasingly critical for supporting end user applications and services. With this increasing reliance on network infrastructure to support growth of complex and dynamic IT workloads, network traffic management, service complexity, and security become more taxing. Network managers face network performance and reliability challenges, including security-related attacks and breaches, resulting in service disruptions that can occur at any moment.

Organizations can use Brocade® Flow Optimizer to proactively help increase network efficiency, improve resource utilization, mitigate network attacks, and significantly reduce network congestion. The Brocade Flow Optimizer is an easily deployable open Software-Defined Networking (SDN) application that detects and manages large Layer 2 through Layer 4 traffic flows in service provider and enterprise networks. By defining policies for proactive monitoring and automated management of large traffic flows and programming those policies into Brocade Flow Optimizer to optimize their network infrastructure, organizations can perform the following:

- **Threat Management:** Detect and mitigate threats in the network quickly and efficiently with:
  - Real-time programmability of the network

- Support for BGP Remote Triggered Black Hole (RTBH) and solutions with BGP Flowspec to manage threats with as much granularity as possible
- Integration with third-party security and analytics platforms, such as Palo Alto Networks firewall

- **Flow Optimization:** Monitor, tune, and map network flows for intelligent Service Level Agreement (SLA) management with profile granularity and enhanced flow reporting:

- OpenFlow statistics
- Logical Port/MPLS LSP and IPsec tunnel selection
- Ease of manageability and visualization via GUI
- Ease of upgradability across Flow Optimizer versions

The Brocade Flow Optimizer application is supported by the Brocade MLX® Routers and Brocade SLX® Routers, as well as the Brocade VDX® Switches and Brocade ICX® Switches.<sup>1</sup> The application comes with a Web-based Graphical User Interface (GUI) that provides simple profile configurations and a detailed view of the dashboard and associated settings. Additionally, REST APIs facilitate customized integration into existing network environments and cloud orchestration systems.

## Key Benefits

### Network attack mitigation

Brocade Flow Optimizer detects large Layer 2 through Layer 4 traffic flows and proactively mitigates against unknown and well-known DDoS attacks. This addresses a critical concern for organizations subscribing to Layer 2 and Layer 3 VPN services who want to ensure that large traffic flows are not high-volume network attacks that could impact and shut down the overall network.

In addition to stopping the DDoS attack at the ingress to the network, Brocade Flow Optimizer also supports BGP Remote Triggered Black Hole (RTBH) and can work with external BGP stacks such as ExaBGP to mark and send BGP Flowspec based on sFlow threats in local network. This well-known standards-based Internet operation enables Brocade Flow Optimizer to trigger the upstream router to drop offending traffic or redirect it to a cleaning site if the upstream link is congested above 50 percent by a DDoS attack. This automation via BGP reduces mitigation time for an attack to a matter of minutes, as opposed to hours.

If advanced DDoS detection is required, Brocade Flow Optimizer also supports integration with third-party devices to assess application flow information through an open application programming

interface (API.) Flow Optimizer mirrors flows to an analytics or IDS appliance for enhanced detection up to Layer 7. Upon detection, an API from the analytics or IDS appliance to the Flow Optimizer API initiates additional discard actions. Brocade Flow Optimizer supports integration with third party devices such as Palo Alto firewalls.

### Traffic flow optimization

Brocade Flow Optimizer can detect traffic flows and proactively remark, redirect, or meter specific flows according to established policies. This helps avoid network congestion, latency and network violations, thus helping ensure customer SLAs.

### Network usage reports

Brocade Flow Optimizer allows network and IT managers to identify and track network usage patterns. These reports can in turn be used to help run the business more efficiently such as to determine appropriate network downtime for planned network upgrades or to monitor end-user usage compared to subscribed service to maximize top line revenue.

## Standards-based, production-ready SDN solution

Brocade Flow Optimizer is a modular, open and non-proprietary, fully tested, quality-assured, and commercially supported application running under any Open Daylight-compliant SDN controller. Organizations can introduce Brocade Flow Optimizer into any Brocade network and easily solve immediate problems through the operational benefits of SDN without the need to develop software or understand SDN protocols. Additionally, leveraging Brocade hybrid port mode innovation, customers can seamlessly deploy this SDN capability alongside existing IP/MPLS services.

## Simple and user-friendly interface with real-time network visibility

Access to Brocade Flow Optimizer is provided via an easy-to-install and intuitive web-based GUI. An application dashboard provides real-time graphical overviews of various traffic types and flows, showing multiple actions and events simultaneously.

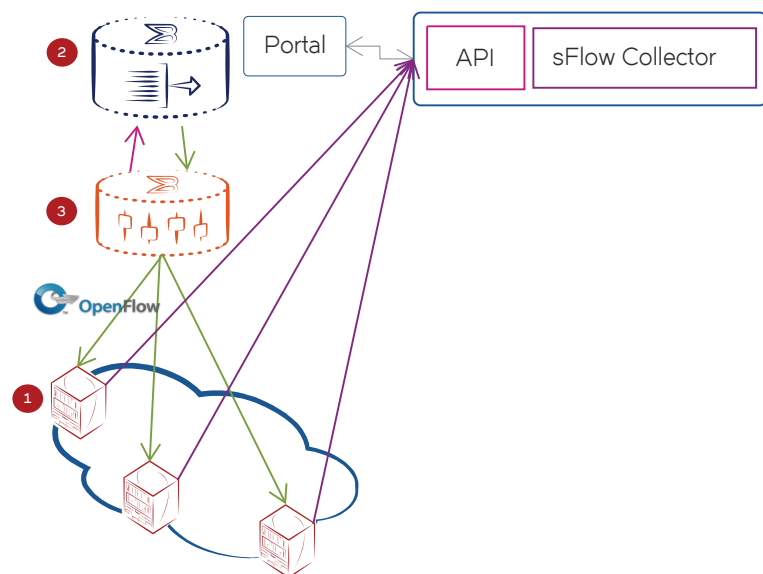


Figure 1. Brocade Flow Optimizer Solution Components.

<sup>1</sup> Note: Support for Brocade SLX routers includes only visibility on the Brocade SLX 9140 and 9240; all actions are supported on the Brocade SLX 9540 and 9850. Support for Brocade VDX switches includes visibility and the ability to drop a flow; the drop action is provided through integration with Brocade Workflow Composer.

## Ease of integration with cloud orchestration systems

Brocade Flow Optimizer supports programmable REST APIs, which allow customers to facilitate configuration, operational and analytical IT DevOps automation, and integration with cloud orchestration systems.

## Real-time events

Brocade Flow Optimizer allows event logging by application and with storage for up to one month. Once this limit is reached, the events are purged to clear space for logging of new events.

## Support for large data center and network connections

Brocade Flow Optimizer handles multiple flows for traffic up to 200 Gbps to support large volumes of data center and network connections.

## Brocade Global Services

Brocade Global Services has the expertise to help organizations build scalable, efficient cloud infrastructures. Leveraging 20 years of expertise in storage, networking, and virtualization, Brocade Global Services delivers world-class professional services, technical support, and education services, enabling organizations to maximize their Brocade investments, accelerate new technology deployments, and optimize the performance of networking infrastructures.

## Acquisition Options That Match Balance Sheet Objectives

Successful network deployments drive business forward, providing technical and financial agility. Brocade offers the broadest financing models, from

traditional leasing to Brocade Network Subscription. Network-as-a-Service allows organizations to subscribe to network assets today then upgrade on demand, scale up or down, or return them with 60-day notification. Brocade Network Subscription plans can be structured to meet IASC guidelines for OpEx or CapEx treatment to align with financial goals. Learn more at [www.nonetworkcapex.com](http://www.nonetworkcapex.com).

## Maximizing Investments

To help optimize technology investments, Brocade and its partners offer complete solutions that include professional services, technical support, and education. For more information, contact a Brocade sales partner or visit [www.brocade.com](http://www.brocade.com).

## Key Features

Features	Details
Flow monitoring and reporting	<ul style="list-style-type: none"><li>• Parse IPsec headers from the sFlow samples</li><li>• Parse VXLAN headers (monitoring) and flow bandwidth estimation</li><li>• Parse-extended VXLAN headers on Brocade SLX devices for VLAN-VXLAN visibility</li><li>• Parse MPLS headers (monitoring) and flow bandwidth estimation</li><li>• View OpenFlow statistics</li><li>• Tag (flow naming) Learned Flows and User-defined Flows</li><li>• Support manual user-defined actions</li></ul>
Flow aggregation and regeneration	<ul style="list-style-type: none"><li>• Ingress port (in-port) for DROP and REDIRECT actions</li><li>• OpenFlow Logical Interface</li><li>• Ether type as a Layer 2 match criteria</li><li>• MAC address mask for Layer 2 source and destination</li><li>• VLAN modify and VLAN POP for redirect action</li><li>• Wild cards in network attributes of profile</li><li>• Wire tapping; local flow mirroring</li><li>• SDN-based Flow TAP; configure multi-flows/multi-actions</li></ul>
Security and profiles	<ul style="list-style-type: none"><li>• Profiles of well-known network threats: NTP Reflection, UDP Flooding, DNS Reflection, ICMP Ping Flooding, Simple Service Delivery Protocol (SSDP), Character General (CharGEN), and Quote of the Day. Support up to 50 user-defined profiles</li><li>• Automated BGP Remote Triggered Black Hole (RTBH) and BGP Flowspec</li><li>• IP blacklisting for addresses to be mitigated immediately on detection</li><li>• Support for IPv6 arbitrary bitmasks</li><li>• Layer 7 integration with Bro and Palo Alto Networks firewall</li><li>• sFlow registration and device management</li></ul>

## Key Features *(continued)*

Features	Details
Manageability	<ul style="list-style-type: none"><li>• HTTPS communication between Brocade Flow Optimizer and the Brocade SDN Controller</li><li>• Advanced historical charts and graphs</li><li>• Application infrastructure (Logging, Help, Support Save)</li><li>• E-mail notifications</li><li>• REST API support for third-party integration</li><li>• Ease of upgrade from release 1.4 to release 2.0</li></ul>

## Brocade Flow Optimizer Specifications

Feature	Description
Server	<ul style="list-style-type: none"><li>• Linux<ul style="list-style-type: none"><li>- Ubuntu 14.0.4 (64 Bit), CentOS 7</li><li>- Server must have in-band connectivity to Brocade MLXe Routers or Brocade ICX Switches to receive sFlow packets</li></ul></li></ul>
Server CPU	<ul style="list-style-type: none"><li>• Intel Core: Four cores or equivalent</li></ul>
Server memory and storage	<ul style="list-style-type: none"><li>• 16 GB RAM</li><li>• 256 GB of free hard disk drive space</li></ul>
Brocade SDN Controller	<ul style="list-style-type: none"><li>• Brocade SDN Controller version 4.1</li><li>• OpenDaylight Controller Boron SR2</li></ul>
Switch/Router firmware	<ul style="list-style-type: none"><li>• Brocade MLX NetIron firmware, version NI 6.0, 6.1.0 (IPSEC Logical port and Group table feature need NI 6.1.0)</li><li>• Brocade ICX 7250, 7450, 7750 FI firmware version FI 8.0.4a</li><li>• Brocade VDX 6740, 6940, NOS 7.1.0</li><li>• Brocade SLX 9850, 9540, 9240, 9140; Firmware: Brocade SLX-OS 17r.1.00, 17s.1.00</li></ul>
Browser client	<ul style="list-style-type: none"><li>• Google Chrome</li></ul>

## Brocade Flow Optimizer Ordering Information

Part Number	Description
BR-BFO-SML	Brocade Flow Optimizer Application: Perpetual license for up to 20 Gbps traffic flows capability
BR-BFO-LRG	Brocade Flow Optimizer Application: Perpetual license for up to 200 Gbps traffic flows capability

## Brocade Flow Optimizer License Ordering Options

Additionally customers can order 24x7 support with each license option. The support options are listed in the table below.

Please refer to the Brocade Flow Optimizer User Guide and the Brocade Flow Optimizer Release Notes for the latest software version.

Part Number	Description
BFOSML-SVL-SW-1	ESSENTIAL APP SUPPORT 24x7, Brocade Flow Optimizer Small SKU: 1 year
BFOSML-SVL-SW-2	ESSENTIAL APP SUPPORT 24x7, Brocade Flow Optimizer Small SKU: 2 years
BFOSML-SVL-SW-3	ESSENTIAL APP SUPPORT 24x7, Brocade Flow Optimizer Small SKU: 3 years
BFOSML-SVL-SW-4	ESSENTIAL APP SUPPORT 24x7, Brocade Flow Optimizer Small SKU: 4 years
BFOSML-SVL-SW-5	ESSENTIAL APP SUPPORT 24x7, Brocade Flow Optimizer Small SKU: 5 years
BFOLRG-SVL-SW-1	ESSENTIAL APP SUPPORT 24x7, Brocade Flow Optimizer Large SKU: 1 year
BFOLRG-SVL-SW-2	ESSENTIAL APP SUPPORT 24x7, Brocade Flow Optimizer Large SKU: 2 years
BFOLRG-SVL-SW-3	ESSENTIAL APP SUPPORT 24x7, Brocade Flow Optimizer Large SKU: 3 years
BFOLRG-SVL-SW-4	ESSENTIAL APP SUPPORT 24x7, Brocade Flow Optimizer Large SKU: 4 years
BFOLRG-SVL-SW-5	ESSENTIAL APP SUPPORT 24x7, Brocade Flow Optimizer Large SKU: 5 years

### Corporate Headquarters

San Jose, CA USA  
T: +1-408-333-8000  
info@brocade.com

### European Headquarters

Geneva, Switzerland  
T: +41-22-799-56-40  
emea-info@brocade.com

### Asia Pacific Headquarters

Singapore  
T: +65-6538-4700  
apac-info@brocade.com



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