

# Intelligent Flow Management

## HIGHLIGHTS

- Increase the speed of large data transfers by 20x
- Open, modular, software driven
- Commercially-supported, production-ready software-defined networking application

## The Transfer of Large Data Sets Takes Too Long

Like most companies, higher education and research institute IT organizations have a subset of internal customers that they consider “power users.” These customers utilize a heavier share of IT resources than others. Whether they are compute, storage, network or personnel resources, satisfying the power user base can often be difficult. With the advent of cloud computing, these power users want to acquire these resources outside of usual IT processes, marginalizing the value of the IT organization.

When these power users are researchers of various disciplines (biotech, physics, climatic, astronomic, and so on) an even greater challenge is presented to the IT department. The research performed is rarely solely done in-house, but rather in collaboration with outside research organizations, across town or across the globe. Because the data sets the researchers are transferring to and from the network are massive, IT organizations often hear the question from researchers: “Why does it take more than a week to download my data?”

### The Brocade Solution

The Intelligent Flow Management (IFM) solution from Brocade is a modular, open, software-driven design that increases the speed of transfer of large, trusted data sets by 20 times. True to the new IP era, the IFM solution puts control of network resources in the hands of many stakeholders (not just IT administrators). The technology is flexible and adaptable by the community that utilizes the network, not just the vendors providing the equipment. It is open and modular, not requiring equipment or software coming from a single vendor to reap the benefits.

### Process

Users create a custom policy definition within the Brocade Flow Optimizer application that identifies which flows should be trusted. This information can include source and/or destination Layer 2, Layer 3, and Layer 4 information about the flow. (See Figure 1.)

As traffic normally flows to the border router and is routed to the firewall for inspection, sFlow samples of the traffic are sent to the Brocade Flow Optimizer application sFlow database, which resides on the Brocade Vyatta Controller. Using

## COMPONENTS

- **OpenFlow and sFlow-capable**

- **Brocade® MLXe® Series of Routers:**

Most research institutions have very large pipes to the outside world, 100 gigabit Ethernet (GbE) becoming the most predominant connection rate to upstream research and education networks (for example, Internet2, GEANT, RedCLARA, and so on). The border router utilized by many research institutions is the Brocade MLXe. The features required of the border router for the IFM solution are the following: OpenFlow v1.3 with hybrid-port mode support and sFlow support for traffic visibility.

- **Firewall:** There is no requirement for a specific vendor or feature set for the Intelligent Flow Management solution.
- **Brocade Vyatta® Controller or OpenDaylight Controller:** The Brocade Vyatta Controller is a commercially supported edition of the OpenDaylight Controller. With the Brocade Vyatta Controller, Brocade contributes code back to the community and leverages contributions from the community, while providing commercial support to users that desire that option. The IFM solution can be deployed with the Brocade Vyatta Controller or the open source based free OpenDaylight Controller.
- **Brocade Flow Optimizer application:** The Brocade Flow Optimizer application runs on the Brocade Vyatta Controller or the open source OpenDaylight Controller. The application contains a custom policy definition area to program which actions to take if certain data flows are seen on the border router. Utilizing an on-board sFlow database, the application signals to the controller to make a change on the border router via OpenFlow that affects the data flow path.

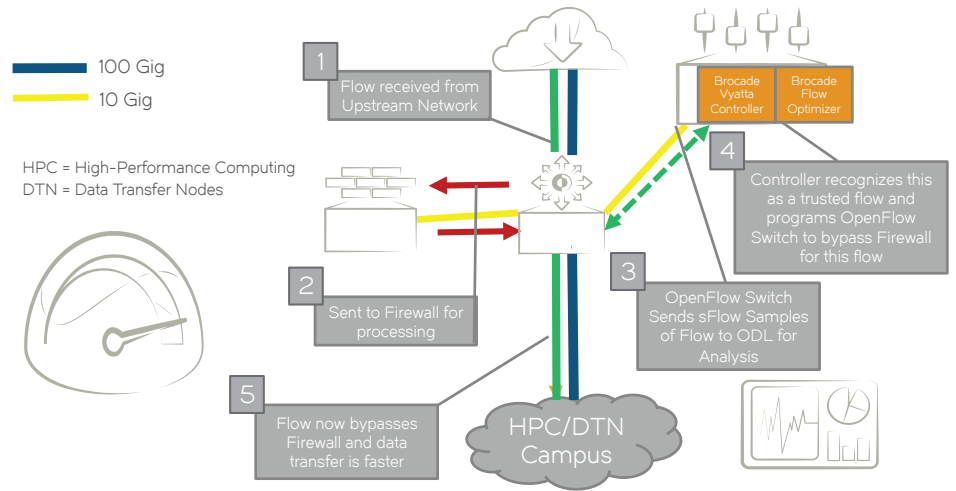


Figure 1. Intelligent Flow Management Solution Process.

the sFlow database, the Brocade Flow Optimizer application identifies when these trusted, long-lived data flows are traversing the border router and signals to the Brocade Vyatta Controller to issue a preprogrammed action as part of the policy definition. That action can include sending an OpenFlow-based rule to the border router. The rule can redirect the route of the trusted data flow to steer the traffic directly to its destination instead of traversing the firewall, greatly increasing the transfer rate of the flow.

### Benefits of the Solution

The U.S. Department of Energy, Energy Sciences Network (ESNet) says that when these elephant data flows have to traverse a firewall, they are 20 times slower.<sup>1</sup> By utilizing the IFM solution, trusted flows can be identified and rerouted directly to the destination path in less than 15 seconds, vastly increasing the transfer speed. Now researchers can reduce their data transfer times from days to minutes.

Besides speeding large data transfers, the IFM solution from Brocade brings additional value to research institutions.

- The Brocade Flow Optimizer application brings extra benefits for network administrators, including: network traffic visibility, historical trending information, and identification and remediation of certain high-volume traffic attacks.
- The open and software-driven solution is an excellent launching point for enabling the Software Defined Network. By enabling OpenFlow-capable infrastructure—an SDN controller based on OpenDaylight and utilizing the Brocade Flow Optimizer application in a high-value production environment—the IFM solution takes SDN from theory to practice for research institutions.

The IFM solution provides a solid infrastructure on which to build additional SDN application capabilities and components.

<sup>1</sup> US Department of Energy, ESNet™  
<http://fasterdata.es.net/science-dmz/more-references/esnet-helpful-talks-and-tutorials/science-dmz-architecture-and-security/>

### Learn More

Brocade partners with companies of all sizes to deliver innovative solutions that help organizations maximize the value of their most critical information. To learn more, visit [www.brocade.com](http://www.brocade.com).

### About Brocade

Brocade networking solutions help organizations achieve their critical business initiatives as they transition to a world where applications and information reside anywhere. Today, Brocade is extending its proven data center expertise across the entire network with open, virtual, and efficient solutions built for consolidation, virtualization, and cloud computing. Learn more at [www.brocade.com](http://www.brocade.com).

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