

Brocade[®] G630 Switch Data Sheet



HIGHLIGHTS

- Adapt to storage growth and demanding workloads with the industry's highest-density 128-port 32 Gbps Gen 6 Fibre Channel switch
- Optimize performance and ensure reliability with enhanced monitoring for NVMe
- Integrate NVMe-ready solutions without a rip-and-replace
- Accelerate operations with simple and open automation that increases productivity
- Simplify end-to-end management of large-scale environments by automating repetitive administrative tasks
- Provide proactive, real-time monitoring and alerting of storage IO health and performance with integrated network sensors
- Enable Virtual Machine (VM) visibility in a storage fabric in order to monitor VM performance, identify VM anomalies, and optimize VM performance

Accelerate Business Operations with NVMe and Automation

Data centers are under pressure to deliver maximum performance, business intelligence, and operational efficiency to address exponential data growth and dynamic business demands. To gain the performance required, organizations are transitioning to the all-flash data center, which requires a modern storage network that can keep pace with innovations in compute and storage resources. By modernizing the SAN, organizations will be able to maximize productivity and increase the efficiency of their storage investments, even as they rapidly scale their environments. Moreover, the addition of automation technology to Gen 6 Fibre Channel will transform SAN management by simplifying operations and freeing up resources to focus on business optimization and revenue opportunities.

The Brocade G630 Switch provides the tools to optimize NVMe storage and automate SAN management tasks. It is a high port density building block with a management platform designed to support application, data, and storage growth. As an NVMe-ready switch, the Brocade G630 allows organizations to seamlessly integrate Brocade Gen 6 Fibre Channel networks with the next generation of flash storage, without a disruptive rip-and-replace. In addition, the Brocade G630 features integrated network sensors for advanced monitoring of NVMe workloads, helping to ensure optimal performance.

The Brocade G630 Switch also delivers new automation capabilities that enable DevOps resources to automate and

orchestrate SAN resources through open APIs and the Ansible automation engine. With Brocade automation, organizations can quickly and reliably perform resource-intensive tasks, such as provisioning, and operationalize the continuous monitoring of the network, so that tasks can be completed in a fraction of the time. By combining Brocade's robust set of data collecting capabilities with automation, organizations can automate repetitive daily tasks and deliver consistent performance by eliminating human error.

With the Brocade G630, organizations can seamlessly transition to an all-flash data center and build a foundation to support future innovation and operational efficiency.

GEN 6 FIBRE CHANNEL

Brocade Gen 6 Fibre Channel is the purpose-built network infrastructure for mission-critical storage, delivering NVMe-ready performance, advanced automation, and comprehensive management to accelerate application performance and drive always-on business operations. The Brocade G630 Switch with Gen 6 Fibre Channel and Brocade Fabric Vision technology delivers unmatched 32 Gbps performance, industry-leading port density, and automated operations to support storage growth, demanding workloads, and data center consolidation.

Simple and Elegant Scalability with Industry-Leading Port Density

The Brocade G630 enterprise-class switch delivers industry-leading port density with 128 Fibre Channel ports in an elegant 2U form factor. Organizations can both increase scalability and optimize space utilization. With 96 32 Gbps SFP+ ports and 8 4x32 Gbps Q-Flex ports, the compact design of the switch enables data centers to scale efficiently and deliver more connectivity with fewer switches. Built to support maximum flexibility and dense Fibre Channel fabrics, the Brocade G630 Switch offers cost-effective pay-as-you-grow scalability, expanding from 48 to 128 ports with Ports on Demand (PoD).

Each Q-Flex port can support 4x32 Gbps Fibre Channel for device or ISL connectivity with MTP/MPO cables, MTP/MPO to LC breakout cables, or patch panels, enabling administrators to consolidate and simplify cabling infrastructure. Each Q-Flex port is capable of 4x32 Gbps, 4x16 Gbps, 4x8 Gbps, or 4x4 Gbps Fibre Channel speeds. Q-Flex ports can be used to aggregate

edge switches into a core to form a high-density fabric with high-performance ISLs between the Brocade FC32-64 Port Blade in a Brocade X6 Director and Brocade G620 or G630 Switches. The switch also provides ISL trunking for up to 8 ports between a pair of switches to form a single logical ISL.

In addition to offering 128 32 Gbps ports, the Brocade G630 delivers Gen 6 Fibre Channel performance to support growing and dynamic workloads. It achieves this level of performance through a combination of market-leading low latency and up to 566 million frames switched per second—shattering application performance barriers with up to 200 million IOPS. At the same time, port-to-port latency is minimized to < 780 ns (including FEC) through the use of cut-through switching. As a result, the Brocade G630 provides both elegant scalability and powerful performance to stay ahead of the demands of flash storage workloads.

To support higher data volumes over long distance, the Brocade G630 Switch delivers in-flight encryption and data compression to optimize bandwidth and minimize the risk of unauthorized access. It delivers up to 384 Gbps of combined in-flight encryption and 192 Gbps of in-flight compression. Moreover, internal fault-tolerant and enterprise-class RAS features help minimize downtime to support growing mission-critical environments.

SIMPLIFY AND CONSOLIDATE CABLING WITH FLEXIBLE Q-FLEX PORTS

Q-Flex ports are available for flexible ISL and device connectivity with industry-leading 32 Gbps speeds. These ports are designed to support single QSFP connections or fan out to four standard SFP+ connections, enabling administrators to simplify cabling infrastructure. The Ports on Demand (PoD) feature of the Brocade G630 gives organizations the flexibility to mix and add Q-Flex ports at any time.

Increase Productivity with Simple and Open Automation

IT organizations spend nearly half of their time performing repetitive daily management tasks, such as zoning, inventory reporting, and operational validation checks. By automating these repetitive tasks, IT organizations can significantly improve their efficiency and dramatically decrease the risk of operational mistakes. Automation in large-scale IT environments integrates diverse infrastructure components with consistency and predictability to deliver greater operational efficiency and agility. With more than 20 years of storage networking experience, Brocade, A Broadcom Inc. Company, understands the nuances that go into infrastructure management and what tasks can benefit from automation. By introducing REST APIs directly into its switch and management products, Brocade offers a broad range of choices to enable any SAN management solution. IT organizations that couple Brocade's robust data collecting capabilities with automation and orchestration tools (such as Ansible) gain the ability to automate configuration tasks and the visibility to monitor and detect any performance or health changes.

Brocade automation solutions are based

on these pillars:

- Make standard REST APIs available directly from the switch in order to automate repetitive daily tasks, such as fabric inventory, provisioning, and operational state monitoring.
- Quickly integrate systems with open source PyFOS, a Python language, to simplify common SAN management practices.
- Leverage Ansible to easily scale automation and orchestration across the entire infrastructure.

Enhanced Operational Stability for Always-on Business Operations

The Brocade G630 with Brocade Fabric Vision® technology delivers a breakthrough hardware and software solution that helps simplify monitoring, increase operational stability, and dramatically reduce costs. Fabric Vision technology includes IO Insight and VM Insight, which provides organizations with deeper visibility into both SCSI and NVMe traffic. This enhanced visibility enables administrators to quickly identify the problem and accelerate root-cause analysis for faster time to resolution. The Brocade G630 also optimizes the performance of NVMe over Fibre Channel by leveraging integrated, non-intrusive, real-time network monitoring and alerts. This proactive monitoring of NVMe traffic provides administrators with key insights for maintaining optimal network health and performance.

IO Insight proactively monitors IO performance and behavior through integrated network sensors, providing deep insight into problems and helping to ensure service levels. This capability non-disruptively and non-intrusively gathers IO statistics from any device port, then feeds them to a monitoring policy that sets thresholds and generates alerts. VM Insight applies IO Insight visibility for

each VM. Integrated VM, application-, and device-level IO latency and IOPS monitoring enables administrators to set the baseline for application performance and identify the VM or physical layer responsible for the degraded performance.

Innovative Fabric Vision monitoring, management, and diagnostic capabilities enable administrators to avoid problems before they impact operations. Additional Fabric Vision capabilities include:

- **Monitoring and Alerting Policy Suite (MAPS):** Simplifies fabric-wide threshold configuration, monitoring, and alerting with pre-built, rule- or policy-based templates. Administrators can configure the entire fabric (or multiple fabrics) at one time using common rules and policies, or customize policies for specific ports or switch elements. In addition, administrators can use IO Insight metrics to set thresholds in MAPS policies in order to be notified of application, VM, and storage IO performance degradation.
- **Fabric Performance Impact (FPI) Monitoring:** Leverages predefined MAPS policies to automatically detect and alert administrators to different latency severity levels, and to identify slow drain devices that could impact network performance. This feature identifies various latency severity levels, pinpointing exactly which devices are causing or are impacted by a bottlenecked port, and quarantines slow drain devices automatically to prevent buffer credit starvation.
- **Dashboards:** Provides integrated dashboards that display an overall SAN health view, along with details on out-of-range conditions, to help administrators easily identify trends and quickly pinpoint issues occurring on a switch or in a fabric.

BROCADE FABRIC VISION TECHNOLOGY

Brocade Fabric Vision technology with IO Insight and VM Insight provides unprecedented insight and visibility across the storage network. Its powerful, integrated monitoring, management, and diagnostic tools enable organizations to:

Simplify monitoring:

- *Deploy more than 20 years of storage networking best practices with a single click*
- *Take advantage of non-intrusive, real-time monitoring and alerting of SCSI and NVMe storage IO health and performance with key latency and performance metrics*
- *Gain comprehensive visibility into the fabric using browser-accessible dashboards with drill-down capabilities*

Increase operational stability:

- *Avoid 50 percent of common network problems with proactive monitoring*
- *Identify hot spots and automatically mitigate network problems—before they impact application performance*
- *Monitor and set baselines on IO performance for each VM, and identify performance anomalies to facilitate fault isolation and troubleshooting*

Dramatically reduce costs:

- *Eliminate nearly 50 percent of maintenance costs through automated testing and diagnostic tools*
 - *Save up to millions of dollars on CapEx costs by eliminating the need for expensive third-party tools through integrated network sensors, monitoring, and diagnostics*
 - *Tune device configurations with integrated IO metrics to optimize storage performance and increase ROI*
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- **Configuration and Operational Monitoring Policy Automation Services Suite (COMPASS):** Simplifies deployment, safeguards consistency, and increases operational efficiencies of larger environments with automated switch and fabric configuration services. Administrators can configure a template or adopt an existing configuration to seamlessly deploy a configuration across the fabric. In addition, they can ensure that settings do not drift over time with COMPASS configuration and policy violation monitoring within Brocade Network Advisor dashboards.
- **Brocade ClearLink® Diagnostics:** Ensures optical and signal integrity for Fibre Channel optics and cables, simplifying deployment and support of high-performance fabrics. ClearLink Diagnostic Port (D_Port) is an advanced capability of Fibre Channel platforms.
- **Flow Vision:** Enables administrators to identify, monitor, and analyze specific application flows in order to simplify troubleshooting, maximize performance, avoid congestion, and optimize resources. Flow Vision includes:
 - **Flow Monitor:** Provides comprehensive visibility, automatic learning, and non-disruptive monitoring of a flow's performance. Administrators can monitor all flows from a specific host to multiple targets or volumes, from multiple hosts to a specific target/volume, or across a specific ISL. Additionally, they can perform volume-level monitoring of specific frame types to identify resource contention or congestion that is impacting application performance. With the IO Insight capability, administrators can monitor first IO response time, IO completion time,

the number of pending IOs, and IOPS metrics for a flow from a specific host to a target or volume running SCSI or NVMe over Fibre Channel traffic. With VM Insight, administrators can monitor network throughput and IO statistics for each VM.

- **Flow Learning:** Enables administrators to non-disruptively discover all flows that go to or come from a specific host port or a storage port, or traverse ISLs/IFLs or FCIP tunnels, to monitor fabric-wide application performance. In addition, administrators can discover top and bottom bandwidth-consuming devices and manage capacity planning.
- **Flow Generator:** Provides a built-in traffic generator for pretesting and validating the data center infrastructure for robustness—including route verification and integrity of optics, cables, ports, back-end connections, and ISLs—before deploying applications.
- **Flow Mirroring:** Enables administrators to non-disruptively create copies of specific application and data flows or frame types that can be captured for in-depth analysis.
- **Forward Error Correction (FEC):** Enables recovery from bit errors in a data stream, enhancing transmission reliability and performance. FEC is mandatory in Gen 6 links with more robust error recovery to support 32 Gbps performance.
- **Credit Loss Recovery:** Automatically detects and recovers buffer credit loss at the Virtual Channel (VC) level, providing protection against performance degradation and enhancing application availability.

Brocade Network Advisor

Brocade Network Advisor simplifies Gen 6 Fibre Channel management and helps organizations proactively diagnose and resolve issues to maximize uptime, increase operational efficiency, and reduce costs. The wizard-driven interface dramatically reduces deployment and configuration times by allowing fabrics, switches, and ports to be managed as groups. Customizable dashboards graphically display performance and health indicators out of the box, including all data captured using Brocade Fabric Vision technology. To accelerate troubleshooting, administrators can use dashboard playback to quickly review past events and identify problems in the fabric. Dashboards and reports can be configured to show only the most relevant data, enabling administrators to more efficiently prioritize their actions and maintain network performance.

Global Support

Global Support has the expertise to help organizations build resilient, efficient SAN infrastructures. Leveraging 20+ years of expertise in storage networking, Global Support delivers world-class technical support, implementation, and migration services to enable organizations to maximize their hardware and software investments, accelerate new technology deployments, and optimize the performance of their overall network.

Maximizing Investments

To help optimize technology investments, Brocade, A Broadcom Inc. Company, 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.broadcom.com/brocade.

Brocade G630 Switch Specifications

System Architecture

Fibre Channel ports	96 SFP+ ports capable of operating at 4/8/10/16/32 Gbps Fibre Channel auto-sensing speeds; 8 QSFP ports capable of operating at 4×32/4×16/4×8/4×4 Gbps Fibre Channel speeds. Offers a base configuration of 48 ports, two 24-port SFP+ PoD (Ports on Demand), and one 32-port QSFP PoD. The switch has a total of eight 32 Gbps QSPF ports. This allows users to grow from 48 ports to 128 ports. Supports F/E/EX_Port and D_Port types on the SFP+ ports and only F/E/EX_Port and D_Port types on the QSFP ports with Brocade Fabric OS® (FOS) v8.2.0.
Scalability	Full-fabric architecture with a maximum of 239 switches
Certified maximum	Single fabric: 56 domains, 7 hops MPR fabric: 19 hops
Performance	Fibre Channel: 4.25 Gbps line speed, full duplex; 8.5 Gbps line speed, full duplex; 14.025 Gbps line speed, full duplex; 28.05 Gbps line speed, full duplex; auto-sensing of 4, 8, 16, and 32 Gbps port speeds. Auto-sensing of 4×32, 4×16, 4×8, and 4×4 Gbps speeds on the QSFP ports with Brocade FOS v8.2.0.
ISL trunking	Frame-based trunking with up to eight 32 Gbps connections between a pair of switches combined to form a single logical ISL with a speed of up to 256 Gbps (512 Gbps full duplex) per ISL trunk. Exchange-based load balancing across ISLs with DPS included in Brocade FOS. On the QSFP ports 256 Gbps trunks are supported by trunking 2× (4×32 Gbps) QSFP ports.
Aggregate bandwidth	4 Tbps
Maximum fabric latency	Latency for locally switched ports is < 780 ns; latency between port groups is 2.6 µs, cut-through routing at 32 Gbps between locally switched groups. Encryption/compression is 1 µs per node.
Maximum frame size	2,112-byte payload
Frame buffers	15K frame buffers with dynamic buffer sharing capability across ports
Classes of service	Class 2, Class 3, Class F (inter-switch frames)
Port types	D_Port (ClearLink Diagnostic Port), E_Port, EX_Port, F_Port, AE_Port, optional port-type control
Data traffic types	Fabric switches supporting unicast
Media types	Hot-pluggable, industry-standard Small Form-Factor Pluggable Plus (SFP+), LC connector; Short-Wave Laser (SWL), Long-Wave Laser (LWL); Extended Long-Wave Laser (ELWL); distance depends on fiber optic cable and port speed. Supports SFP+ (32/16/8 Gbps), SFP+ (16/8/4 Gbps), SFP+ 10 Gbps optical transceivers, 4×32 Gbps QSFP SWL and 4×16 Gbps QSFP SWL optical transceivers. Note: 32 Gbps ELWL is currently not supported with Brocade FOS v8.2.0 but is planned for future support.
USB	One USB port for system log file downloads or firmware upgrades
Fabric services	Monitoring and Alerting Policy Suite (MAPS); Flow Vision; Brocade Adaptive Networking (Ingress Rate Limiting, Traffic Isolation, QoS); Fabric Performance Impact (FPI) Monitoring; Slow Drain Device Quarantine (SDDQ); Brocade Advanced Zoning (default zoning, port/WWN zoning, broadcast zoning, peer zoning, target-driven zoning); Dynamic Path Selection (DPS); Brocade Extended Fabrics; Enhanced BB Credit Recovery; FDMI; Frame Redirection; Frame-based Trunking; FSPF; Integrated Routing; Brocade ISL Trunking; Management Server; NPIV; Time Server; Registered State Change Notification (RSCN); Reliable Commit Service (RCS); Simple Name Server (SNS); Virtual Fabrics (Logical Switch, Logical Fabric); Read Diagnostics Parameter (RDP)

Brocade G630 Switch Specifications *(continued)*

Extension	Fibre Channel, in-flight compression (Brocade LZO) and encryption (AES-GCM-256); integrated optional 10 Gbps Fibre Channel for DWDM MAN connectivity
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Management

Supported management software	HTTP, SNMP v1/v3 (FE MIB, FC Management MIB), SSH; Auditing, Syslog; Brocade Advanced Web Tools; Brocade Network Advisor SAN Enterprise or Brocade Network Advisor SAN Professional/Professional Plus; Command Line Interface (CLI); SMI-S compliant; trial licenses for add-on capabilities
Security	DH-CHAP (between switches and end devices), FCAP switch authentication; HTTPS, IPsec, IP filtering, LDAP with IPv6, OpenLDAP, Port Binding, RADIUS, TACACS+, user-defined Role-Based Access Control (RBAC), Secure Copy (SCP), Secure RPC, Secure Syslog, SFTP, SSH v2, SSL, Switch Binding, Trusted Switch. The Brocade G630 Switch provides up to 12 in-flight encryption and compression ports.
Management access	10/100/1000 Mbps Ethernet (RJ-45), serial port (RJ-45), and one USB port
Diagnostics	ClearLink optics and cable diagnostics, including electrical/optical loopback, link traffic/latency/distance; flow mirroring; built-in flow generator; POST and embedded online/offline diagnostics, including environmental monitoring, FCping and Pathinfo (FC traceroute), frame viewer, non-disruptive daemon restart, optics health monitoring, power monitoring, RAStrace logging, and Rolling Reboot Detection (RRD)

Mechanical

Enclosure	Front-to-back airflow; non-port-side exhaust; port-side intake; 2U Back-to-front airflow; non-port-side intake; port-side exhaust; 2U
Size	Width: 440.0 mm (17.32 in.) Height: 86.70 mm (3.41 in.) Depth: 609.60 mm (24 in.)
System weight	21.31 kg (47.00 lb) with two power supply FRUs, and three fan FRUs without transceivers

Environment

Operating environment	Temperature: 0°C to 40°C/32°F to 104°F Humidity: 10% to 85% (non-condensing)
Non-operating environment	Temperature: -25°C to 70°C/-13°F to 158°F Humidity: 10% to 90% (non-condensing)
Operating altitude	Up to 3,000 m (9,842 ft)
Storage altitude	Up to 12 km (39,370 ft)
Shock	Operating: Up to 20 G, 6 ms half-sine Non-operating: Half-sine, 33 G 11 ms, 3/eg axis

Brocade G630 Switch Specifications *(continued)*

Vibration	Operating: 0.5 g sine, 0.4 grms random, 5 to 500 Hz Non-operating: 2.0 g sine, 1.1 grms random, 5 to 500 Hz
Heat dissipation	128 ports at 3,512 BTU/hr
Power	
Power supply	Two power supply FRUs with integrated power module, voltage range of 90 V to 264 V AC (for AC units)
Fans	Three fan FRUs with two fans each
AC input (PSU)	100 V to 240 V nominal, 90 V to 264 V range, 12 A
AC input line frequency (PSU)	50 Hz to 60 Hz nominal, 47 Hz to 63 Hz range
AC power consumption	Maximum 942 W with all 128 ports operating at 32 Gbps (96 ports populated with 32 Gbps SWL optics and 8 QSFP ports populated with 4×32 Gbps SWL optics) Maximum of 495 W for empty chassis with no optics in idle configuration

For information about supported SAN standards, visit www.broadcom.com/support/fibre-channel-networking/san-standards.

For information about hardware regulatory compliance, visit www.broadcom.com/support/fibre-channel-networking/san-standards/regulatory-compliance.

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