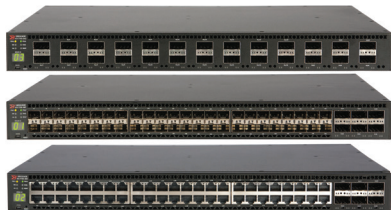


Brocade ICX Packet Brokers



HIGHLIGHTS

- Delivers a scalable network visibility node for edge traffic aggregation and monitoring
- Provides best-in-class investment protection with high 1 GbE, 10 GbE, and 40 GbE wire-speed port density
- Offers robust expandability with up to 12 Brocade ICX Packet Broker nodes stacked into a single logical node for 2.88 Tbps aggregate stacking bandwidth
- Minimizes deployment footprint without compromising capacity and performance through an efficient 1U form factor
- Enables wire-speed traffic aggregation, regeneration, filtering, and load balancing to maximize the productivity of core visibility nodes and monitoring tools

1 GbE, 10 GbE, 40 GbE Network Packet Brokers for Carrier-Grade Edge Aggregation

Pervasive network monitoring requires real-time, on-demand visibility into edge, backhaul, and core networks. But edge networks, unlike backhaul and core networks, are highly distributed and typically comprise a large number of over-provisioned, lower capacity (1 GbE or 10 GbE) links, which makes monitoring the network edge a challenge.

To effectively monitor the network edge, operators need a visibility platform that can aggregate traffic from multiple links at the edge and deliver relevant traffic flows to centralized visibility nodes or monitoring tools.

Brocade® ICX® Packet Brokers are scalable visibility nodes that offer 1 GbE, 10 GbE, and 40 GbE traffic aggregation, filtering, and optimization at the edge. Up to 12 Brocade ICX Packet Brokers can be stacked into a single logical node with up to 2.88 Tbps aggregate stacking bandwidth, providing robust expandability for future growth.

Key Features

Features	Details
Flow aggregation and regeneration	<p>Wire-speed 1 GbE, 10 GbE, and 40 GbE flow filtering and forwarding:</p> <ul style="list-style-type: none"> • Replicate flows from any network port to any tool port on the same or different nodes • Aggregate flows from multiple 1 GbE or 10 GbE network ports to a single 10 GbE or 40 GbE tool port • Distribute flows from one 10 GbE or 40 GbE network port across multiple 1 GbE, 10 GbE, or 40 GbE tool ports • Selectively forward flows from 10 GbE and 40 GbE network ports to lower-speed tool ports • Dual, concurrent IPv4 and IPv6 stack support • Burst protection with buffering on network ports
Flow filtering	<p>Flow selection and filtering configurable on a per-tool basis, based on:</p> <ul style="list-style-type: none"> • Layer 2, 3, and 4 criteria (5-tuple) • VLAN tags
Load balancing	<p>Balance traffic load across multiple egress ports based on:</p> <ul style="list-style-type: none"> • Hash value • IP address range
Stacking	<p>Combine multiple physical nodes into a single logical node:</p> <ul style="list-style-type: none"> • Stack up to 12 Brocade ICX nodes • 2.88 Tbps aggregate stacking bandwidth • Collocate or stack up to 10 km/6 mi between nodes • Simplified management with a single IP address for stacked nodes • Plug-and-play network expansion

Brocade ICX Packet Brokers at a Glance

Features	Brocade ICX 7750-26Q	Brocade ICX 7750-48F	Brocade ICX 7750-48C
Ports	26 40 GbE QSFP+ ports, optional plugin module for additional 6 QSFP+ ports, up to 32 40 GbE or 96 10 GbE ports total	48 1/10 GbE SFP+ ports, 6 40 GbE QSFP+ ports, optional plugin module for additional 6 40 GbE QSFP+ ports, up to 96 10 GbE ports total	48 1/10 GbE RJ-45 ports, 6 40 GbE QSFP ports, optional plugin module for additional 6 ports 40 GbE QSFP, up to 96 10 GbE ports total
Dynamic packet buffer size	12.2 MB	12.2 MB	12.2 MB
Fabric capacity	2.56 Tbps	1.92 Tbps	1.92 Tbps
Packet throughput	1.44 Bpps	1.44 Bpps	1.44 Bpps
Latency	550 ns	550 ns	40 GbE-40 GbE: 550 ns 10 GbE-10 GbE: 2.9 µs

Brocade ICX Packet Brokers Specifications

Features	Brocade ICX 7750-26Q	Brocade ICX 7750-48F	Brocade ICX 7750-48C
Power			
Power consumption (typical)	@100 VAC input: 277 W; 945 BTU/hr @200 VAC input: 274 W; 935 BTU/hr @-48 VDC input: 274 W; 935 BTU/hr	@100 VAC input: 254 W; 867 BTU/hr @200 VAC input: 250 W; 853 BTU/hr @-48 VDC input: 250 W; 853 BTU/hr	@100 VAC input: 510 W; 1,740 BTU/hr @200 VAC input: 511 W; 1,744 BTU/hr @-48 VDC input: 511 W; 1,744 BTU/hr
Power consumption (maximum)	@100 VAC input: 319 W; 1,088 BTU/hr @200 VAC input: 350 W; 1,194 BTU/hr @-48 VDC input: 350 W; 1,194 BTU/hr	@100 VAC input: 290 W; 989 BTU/hr @200 VAC input: 327 W; 1,116 BTU/hr @-48 VDC input: 327 W; 1,116 BTU/hr	@100 VAC input: 558 W; 1,904 BTU/hr @200 VAC input: 586 W; 2,000 BTU/hr @-48 VDC input: 586 W; 2,000 BTU/hr
Input voltage	100 to 240 VAC nominal 40 to 60 VDC nominal	100 to 240 VAC nominal 40 to 60 VDC nominal	100 to 240 VAC nominal 40 to 60 VDC nominal
Input line frequency	50 to 60 Hz	50 to 60 Hz	50 to 60 Hz
Physical			
Dimensions	17.32 in. W × 1.73 in. H × 16.0 in. D (44.0 cm × 4.36 cm × 40.64 cm)	17.32 in. W × 1.73 in. H × 16.0 in. D (44.0 cm × 4.36 cm × 40.64 cm)	17.20 in. W × 8.71 in. H × 23.0 in. D (43.69 cm × 22.12 cm × 58.42 cm)
Weight (with two power supplies, four fans, optional 6-port module, without transceivers)	19.43 lb (8.83 kg)	19.98 lb (9.08 kg)	22.38 lb (10.17 kg)
Enclosure	Reversible airflow; 1U; EIA-compliant	Reversible airflow; 1U; EIA-compliant	Reversible airflow; 1U; EIA-compliant
MTBF	364,061 hours	353,967 hours	259,199 hours
Environmental			
Operating temperature	-5°C to 45°C, 50°C at sea level (0°F to 113°F, 122°F at sea level)	-5°C to 45°C, 50°C at sea level (0°F to 113°F, 122°F at sea level)	-5°C to 40°C, 40°C at sea level (0°F to 96°F, 96°F at sea level)
Non-operating temperature	-40°C to 60°C (-40°F to 140°F)	-40°C to 60°C (-40°F to 140°F)	-40°C to 60°C (-40°F to 140°F)
Humidity	Operating: • 10% to 90% at 50°C (122°F) Non-operating: • 10% to 90% at 60°C (140°F)	Operating: • 10% to 90% at 50°C (122°F) Non-operating: • 10% to 90% at 60°C (140°F)	Operating: • 10% to 90% at 40°C (104°F) Non-operating: • 10% to 90% at 60°C (140°F)
Operating noise	62 dBA average	62 dBA average	62 dBA average
Altitude	Operating: Up to 9,842 feet above sea level (3,000 meters) Storage: Up to 39,370 feet above sea level (12,000 meters)	Operating: Up to 9,842 feet above sea level (3,000 meters) Storage: Up to 39,370 feet above sea level (12,000 meters)	Operating: Up to 9,842 feet above sea level (3,000 meters) Storage: Up to 39,370 feet above sea level (12,000 meters)
Heat dissipation	833 BTU/hr	764 BTU/hr	1,508 BTU/hr

Brocade ICX Packet Brokers Specifications (continued)

System Information

Scalability	<ul style="list-style-type: none">• VLANs: 4,095• ACLs: 4,000/1,000 (ingress/egress)• QoS queues per port: 8• Link aggregation: 8 links per group, 128 groups per switch• Max ECMP: 32
Software-Defined Networking (SDN)	<ul style="list-style-type: none">• Support for OpenFlow v1.0 and v1.3• OpenFlow support with true hybrid port mode• Operates seamlessly under the Brocade SDN Controller
Maximum frame size	10,220-byte Ethernet frame
Data traffic types	Unicast, multicast, and broadcast IP traffic
Media types	<ul style="list-style-type: none">• 1000BASE-TX SFP, RJ45 (Cat5, Cat6, Cat6a/7)• 1000BASE-SX SFP• 1000BASE-LX SFP• SFP+ Direct Attach copper cable• 10 GbE (1/3/5 m Twinax)• 10G SFPP-ER 10GBASE-ER SFP+ optic (LC), for up to 40 km over SMF, 10GBASE-USR SFP+ (MMF Ultra-Short Reach)• 10GBASE-SR SFP+ (MMF Short Reach)• 10GBASE-LR SFP+ (SMF 10 km reach)• 40GBASE-SR4 QSFP+ (MTP 1×8 or 1×12)• MMF 100 m• 40GBASE-SR4-INT QSFP+ (MTP 1×8 or 1×12)• MMF 100 m• 40GBASE-LR4 QSFP+ optic (LC), for up to 10 km over SMF• 40G-QSFP-QSFP-C 40 GbE Direct Attach QSFP+ to QSFP+ active copper cable• 40G-QSFP-4SFP-C direct-attached QSFP+ to 4 SFP+ copper breakout cable• 40GBASE-SR4-INT QSFP+ optic to 4x10GBASE-SR, separate 10 GbE breakout-cable required, not included <p>For the latest information about supported optics, please visit www.brocade.com/optics.</p>

Compliance

IEEE compliance	<p>Layer 1</p> <ul style="list-style-type: none">• IEEE 802.3ad Link Aggregation• IEEE 802.3x Flow Control• IEEE 802.3 10BASE-T• IEEE 802.3u 100BASE-TX• IEEE 802.3z 1000BASE-SX/LX• IEEE 802.3ab 1000BASE-T• 802.3 CSMA/CD Access Method and Physical Layer Specifications• 802.3ae 10 Gigabit Ethernet• 802.3ba 40 Gigabit Ethernet• Jumbo Frame
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Brocade ICX Packet Brokers Specifications (continued)

Compliance (continued)

IEEE compliance (continued)	<p>Layer 2</p> <ul style="list-style-type: none">• IEEE 802.1D MAC Bridging/STP• IEEE 802.1p Mapping to Priority Queue• IEEE 802.1p Marking and DSCP• IEEE 802.1p Honoring QoS• IEEE 802.1Q VLAN Tagging• IEEE 802.1w Rapid Spanning Tree Protocol (RSTP)• IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)• IEEE 802.1x Port Based Network Access Control• IEEE 802.1AB LLDP, 802.1AX Link Aggregation• PVST/RPVST/RPVST+• Port Loop Detection• STP Port Fast• STP Root Guard• 802.1ad Q-in-Q• Uni-Directional Link Detection (UDLD)• MRP-I• MRP-II (Brocade Metro Ring Protocol)• Topology and VLAN Groups
Network management	<p>Supported Management Software</p> <ul style="list-style-type: none">• SSHv2, SNMPv1/v2/v3, Telnet, Brocade Network Advisor, RADIUS, TACACS <p>Management Access</p> <ul style="list-style-type: none">• One 10/100/1000 Mbps (RJ-45) port and one mini-USB serial console port <p>Diagnostics</p> <ul style="list-style-type: none">• POST and embedded online/offline diagnostics
Element security options	<ul style="list-style-type: none">• AES Encryption for SSHv2, SNMPv3, Port Mirroring (MAC-, VLAN-, and ACL-based), sFlow• Authentication, Authorization, and Accounting (AAA)• Username/Password (Challenge and Response)• Bi-Level Access Mode (Standard and EXEC Level)• Secure Copy (SCP)• Secure Shell (SSHv2)• RFC 2865 RADIUS• TACACS/TACACS+
Safety agency approvals	<ul style="list-style-type: none">• CAN/CSA-C22.2 NO. 60950-1-07• UL 60950-1 2nd Edition• IEC 60950-1 2nd Edition• EN 60950-1:2006 Safety of Information Technology Equipment• EN 60825-1 Safety of Laser Products—Part 1: Equipment Classification, Requirements and User's Guide• EN 60825-2 Safety of Laser Products—Part 2: Safety of Optical Fibre Communication Systems

Brocade ICX Packet Brokers Specifications (continued)

Compliance (continued)

Immunity	<ul style="list-style-type: none">• EN 61000-6-1 Generic Immunity and Susceptibility (supersedes EN 50082-1)• EN 55024 Immunity Characteristics (supersedes EN 61000-4-2 ESD)• EN 61000-4-3 Radiated, Radio Frequency, Electromagnetic Field• EN 61000-4-4 Electrical Fast Transient• EN 61000-4-5 Surge• EN 61000-4-6 Conducted Disturbances Induced by Radio-Frequency Fields, EN 61000-4-8 Power Frequency Magnetic Field• EN 61000-4-11 Voltage Dips and Sags
Electromagnetic emission certification	<ul style="list-style-type: none">• FDAS• CC Class A (Part 15)• EN 55022/CISPR-22 Class A• VCCI Class A• ICES-003 Electromagnetic Emission• AS/NZS 55022• EN 61000-3-2 Power Line Harmonics• EN 61000-3-3 Voltage Fluctuation and Flicker• EN 61000-6-3 Emission Standard (supersedes: EN 50081-1)
Environmental regulatory compliance	RoHS compliant (6 of 6), WEEE compliant

Brocade ICX Packet Brokers Ordering Information

Part Number	Description
ICX7750-48F	Brocade ICX 7750 with 48 1/10 GbE SFP+ ports, 6 40 GbE QSFP ports and modular interface slot. No power supplies or fan units (need to be ordered separately). No optics. Requires ICX7750-L3-COE Certificate of Entitlement to use advanced Layer 3 features.
ICX7750-48C	Brocade ICX 7750 with 48 1/10 GbE RJ-45 10GBASE-T ports, 6 40 GbE QSFP ports and modular interface slot. No power supplies or fan units (need to be ordered separately). No optics. Requires ICX7750-L3-COE Certificate of Entitlement to use advanced Layer 3 features.
ICX7750-26Q	Brocade ICX 7750 with 26 40 GbE QSFP ports and modular interface slot. No power supplies or fan units (need to be ordered separately). No optics. Requires ICX7750-L3-COE Certificate of Entitlement to use advanced Layer 3 features.
ICX7750-6Q	Brocade ICX 7750 6 40 GbE QSFP module for use in Brocade ICX7750-48F, 7750-48C, or 7750-26Q
RPS9+I	500 W AC power supply; power-supply-side intake (port-side exhaust) airflow
RPS9+E	500 W AC power supply; power-supply-side exhaust (port-side intake) airflow
RPS9DC+I	500 W DC power supply; power-supply-side intake (port-side exhaust) airflow
RPS9DC+E	500 W DC power supply; power-supply-side exhaust (port-side intake) airflow
ICX7750-FAN-I	Fan kit of 4; fan-side intake (port-side exhaust) airflow
ICX7750-FAN-E	Fan kit of 4; fan-side exhaust (port-side intake) airflow
ICX7750-FAN-I-SINGLE	Fan single unit; fan-side intake (port-side exhaust) airflow
ICX7750-FAN-E-SINGLE	Fan single unit; fan-side exhaust (port-side intake) airflow
10Ge-SFPP-AOC-0701	10 GbE SFP+ Direct Attach active optical cable, 7 m, 1-pack
10Ge-SFPP-AOC-1001	10 GbE SFP+ Direct Attach active optical cable, 10 m, 1-pack
10G-SFPP-USR	10GBASE USR SFP+ optical transceiver, 100 m over MMF LC, 1-pack
10G-SFPP-SR	10GBASE-SR SFP+ optical transceiver, SMF LC
10G-SFPP-LR	10GBASE-LR SFP+ optical transceiver, SMF LC
10G-SFPP-ER	10GBASE-ER SFP+ optic (LC), for up to 40 km over SMF
EIMG-TX	1000BASE-TX SFP copper, RJ-45 connector
EIMG-SX-OM	1000BASE-SX SFP optical transceiver, MMF LC, optical monitoring capable
EIMG-LX-OM	1000BASE-LX SFP optical transceiver, MMF LC, optical monitoring capable
40G-QSFP-LR4	40GBASE-LR4 QSFP+ optic (LC), for up to 10 km over SMF, 1-pack
40G-QSFP-SR4	40GBASE-SR4 QSFP+ optic (MTP 1x8 or 1x12), 100 m over MMF, 1-pack
40G-QSFP-QSFP-C-0101	40 GbE Direct Attach QSFP+ to QSFP+ active copper cable, 1 m, 1-pack
40G-QSFP-QSFP-C-0301	40 GbE Direct Attach QSFP+ to QSFP+ active copper cable, 3 m, 1-pack
40G-QSFP-QSFP-C-0501	40 GbE Direct Attach QSFP+ to QSFP+ active copper cable, 5 m, 1-pack
40G-QSFP-SR4-INT	40GBASE-SR4 QSFP+ optic (MTP 1x8 or 1x12), 100 m over MMF, compatible with 10GBASE-SR, 10 GbE breakout cable, 1-pack
40G-QSFP-4SFP-C-0101	4x10 GbE direct-attached QSFP+ to 4 SFP+ copper breakout cable, 1m, 1-pack
40G-QSFP-4SFP-C-0301	4x10 GbE direct-attached QSFP+ to 4 SFP+ copper breakout cable, 3m, 1-pack
40G-QSFP-4SFP-C-0501	4x10 GbE direct-attached QSFP+ to 4 SFP+ copper breakout cable, 5m, 1-pack

Brocade Global Services

Brocade Global Services has the expertise to help organizations build scalable, efficient cloud infrastructures. Leveraging 15 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.

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