FAQ

Brocade ICX 7450 Switch Frequently Asked Questions

Introduction

The Brocade® ICX® 7450 Switch redefines the economics of enterprise networking by providing unprecedented capabilities, flexibility, data security, and performance in a stackable form factor. It delivers the capabilities of a chassis with the flexibility and cost-effectiveness of a stackable switch.

The Brocade ICX 7450 delivers high-performance switching across all ports to support high-bandwidth and latency-sensitive applications such as voice/video streaming and Virtual Desktop Infrastructure (VDI). Up to 12 Brocade ICX 7450 switches can be stacked using standards-based full-duplex 40 Gbps or 10 Gbps stacking ports, providing 960 Gbps of aggregated stacking bandwidth with full redundancy, eliminating inter-switch bottlenecks. Additionally, each switch can provide up to 12 10 Gigabit Ethernet (GbE) ports for high-speed connectivity to the aggregation or core layers.

The Brocade ICX 7450 Switch supports PoE, PoE+, and Power over HDbaseT (PoH) to provide up to 95 watts of power to connected powered devices. This high-powered solution simplifies wiring for next-generation conferencing devices such HD flat screen, VDI clients, pan/tilt surveillance cameras, and 802.11ac wireless access points. With a 1,500-watt PoE power budget per switch (with two AC power supplies), the Brocade ICX 7450 24-port and 48-port PoE models can supply full Class 3 (15.4 watts) or full Class 4 PoE+ (30 watts) power to every port.

The Brocade ICX 7450 Switch with the IPsec VPN service module is the industry's first stackable switching solution to deliver encryption from the wiring closet, providing unprecedented VPN deployment flexibility and cost savings to meet stringent compliance and data security requirements. By initiating an IPsec tunnel from the Brocade ICX 7450 for transporting selected traffic, organizations save the time and costs from having to install and manage encryption software on individual computers or deploy dedicated encryption products. This provides a valuable extra layer of protection for organizations that need pervasive encryption security as they transition to a world where information and applications reside anywhere.

For more information, visit: www.brocade.com/icx7450.

General Questions and Answers

Q. How many models are available in the Brocade ICX 7450 Switch family?

A. Six models are available in the Brocade ICX 7450 family. Each model is orderable with either power supply side intake (-I) or power supply side exhaust (-E) airflow:

- **Brocade ICX 7450-24** with 24 10/100/1000 Mbps RJ-45 fixed ports
- **Brocade ICX 7450-24P** with 24 10/100/1000 Mbps RJ-45 PoE+ fixed ports
- **Brocade ICX 7450-32ZP** with 24 10/100/1000 Mbps RJ-45 PoE+ and 8 100/1000 Mbps/2.5 Gbps RJ-45 PoE+ ports
- **Brocade ICX 7450-48** with 48 10/100/1000 Mbps RJ-45 fixed ports
- **Brocade ICX 7450-48P** with 48 10/100/1000 Mbps RJ-45 PoE+ fixed ports
- **Brocade ICX 7450-48F** with 48 100/1000 Mbps Small Form-Factor Pluggable (SFP) fixed ports

All Brocade ICX 7450 models have three modular slots that can be populated with interchangeable interface modules:

- **Brocade ICX7400-4X1GF:** 4-port 100 Mbps/1 GbE SFP module
- **Brocade ICX7400-4X10GF:** 4-port 1/10 GbE SFP/SFP+ module
- **Brocade ICX7400-4X10GC:** 4-port 1/10 GbE 10GBASE-T copper module
- **Brocade ICX7400-1X40GQ:** 1-port 40 GbE QSFP+ module

All Brocade ICX 7450 models, except for the ICX 7450-24 and 7450-24P, provide a maximum of 12 10 GbE or two 40 GbE modular ports per switch. The Brocade ICX 7450-24 and 7450-24P models provide a maximum of 12 10 GbE or three 40 GbE modular ports per switch.

Q. Are the optional modules fully interchangeable?

A. In most cases, the Brocade ICX 7450 Switch can accept any module in any of its three modular slots with some exceptions. The Brocade ICX 7450-48, 7450-48P, 7450- 48F, and 7450-32ZP models will not accept a Brocade ICX7400-1X40GQ module in the modular slot located on the front panel.

		Brocade ICX 7450-24 Brocade ICX7450-24P			Brocade ICX 7450-32ZP Brocade ICX 7450-48 Brocade ICX 7450-48P Brocade ICX 7450-48F		
Part Number	Ports	Front	Rear Slot A	Rear Slot B	Front	Rear Slot A	Rear Slot B
ICX7400-4X1GF	4-port 100M/1G SFP	Uplink	No	No	Uplink*	No	No
ICX7400-4X10GF	4-port 1/10G SFP+	Uplink or Stacking	Uplink	Uplink	Uplink or Stacking	Uplink	Uplink
ICX7400-4X10GC	4-port 1/10G 10GBaseT Copper	Uplink	Uplink	Uplink	Uplink	Uplink	Uplink
ICX7400-1X40GQ	4-port 40G QSFP+	Uplink	Uplink or Stacking	Uplink or Stacking	No	Uplink or Stacking	Uplink or Stacking

* The Brocade ICX 7450-32ZP does not support the Brocade ICX7400-4X1GF module or the Brocade ICX 7450 Service Module.

Q. What environment is the Brocade ICX 7450 primarily designed for?

A. Brocade ICX 7450 Switches are designed to be deployed at the access layer of an enterprise campus LAN network and as Top-of-Rack (ToR) switches in the data center. As a high-performance campus access solution, the Brocade ICX 7450 can be deployed in wiring closets, providing Ethernet connectivity to workstations, phones, wireless APs, security cameras, and other network devices within close proximity.

Its class-leading 10 GbE port count makes the Brocade ICX 7450 a great solution as a ToR switch in a mixed 1 /10 GbE server connectivity environment. It is designed to fit in server racks, consuming only one rack unit and offering dual integrated power supplies and fan assemblies with front-to-back/back-to-front airflow for flexible cooling options. In data center environments where most servers have 1 GbE and some 10 GbE network interfaces, the Brocade ICX 7450 provides a compact and cost-effective 1/10 GbE ToR stackable switch.

The Brocade ICX 7450-48F also provides 48 SFP ports, making it very well suited as an aggregation solution for small to medium-size campus networks. For example, thanks to high stacking bandwidth (960 Gbps of aggregated stacking bandwidth) and uplink bandwidth (four 10 Gbps ports per stacked switch), four Brocade ICX 7450-48F switches stacked together can deliver the performance required for an aggregation solution with 192 1 GbE SFP fiber ports and 16 10 GbE SFP+ fiber ports.

The Brocade ICX 7450-32ZP is designed to handle next-generation 802.11ac Wave 2 wireless access points. It offers eight 2.5 GbE ports to connect multigigabit wireless access points.

The Brocade ICX 7450 Service Module for IPsec VPN is designed for organizations that require the flexibility and performance to meet increasing compliance and data security requirements without impacting network performance. For example, this allows customers who employ contractors on site to provide their contractors with secure access to their respective corporate networks without installing or managing encryption software on the contractors' devices. Interoperability with the Brocade MLXe and the Brocade vRouter IPsec solutions enables scalable, pervasive network encryption from the campus to the corporate network and cloud deployments.

Q. Does the Brocade ICX 7450 have Layer 3 capabilities?

A. All Brocade ICX 7450 models have IPv4 and IPv6 Layer 3 capabilities:

- **Base Layer 3 routing:** Available in all Brocade ICX 7450 models with no license required and includes IPv4 and IPv6 static routes and routing between directly connected subnets.
- **Premium Layer 3 routing (with license):** Adds IPv4/IPv6 static and dynamic routes with RIPv1/v2/RIPng announce, VRRP, and OSPFv2/v3. It also includes multicast routing protocols, such as PIM, and rich Layer 3 features, such as Policy-Based Routing (PBR), VRRP, and VRRP-E. Additionally, BGP, VRF capabilities, and IPv4 over IPv6 tunnels features are included.

Q. Can Brocade ICX 7450 Switches be upgraded to support Layer 3 features in the field?

A. Yes. Brocade ICX 7450 Switches can be upgraded to the Premium feature set at any time. Customers can purchase a software upgrade license to upgrade any Brocade ICX 7450 Switch to support Layer 3 capabilities.

Q. What type of license can be installed on the Brocade ICX 7450?

A. The Brocade ICX 7450 supports "non-node-locked" licenses. The non-node-locked license files are not tied to a particular switch serial number and can be transferred between Brocade ICX 7450 Switches. However, a given license file should only be activated on one switch at a time. Using the same license file concurrently on multiple switches is prohibited.

Q. Does the Brocade ICX 7450 support 40 GbE connectivity?

A. Yes. The Brocade ICX7400-1X40GQ module supports a 40 GbE QSFP+ interface that can be used for stacking or uplink connectivity.

Q. Do Brocade ICX 7450-32ZP 2.5 GbE ports interoperate with other vendors' 2.5 GbE solutions?

A. As with all vendors offering 2.5/5 GbE products, Brocade relies on pre-standard specifications. Therefore, interoperability cannot be guaranteed with future standards.

Brocade, however, is fully committed to open standards and is actively working to define the IEEE 802.3bz standard in order to ensure cross-vendor interoperability. This standard is expected to be ratified in late 2016. The Brocade ICX7450-32ZP is recommended for organizations that want to acquire access points with pre-standard IEEE 802.3bz ports and need a pre-standard IEEE 802.3bz switch in order to connect them to the network.

Q. How does the Brocade ICX 7450 expand when more than 24 or 48 ports are needed?

A. All Brocade ICX 7450 Switches support stacking to facilitate port expansion while minimizing management overhead. Up to 12 switches can be included in a stack, scaling the logical switch up to 576 1 GbE ports and 48 10 GbE ports. The aggregated stacking bandwidth is 960 Gbps.

Q. Do the switches need to be physically stacked in order to grow the logical switch?

A. No. When using the 40 Gbps stacking ports, the switches can be either situated on top of each other in a rack in a "daisy-chained ring" configuration, or stacked horizontally in a "braided ring" configuration, in which alternating switches are connected to each other. The latter configuration allows switches in the ring to be situated farther apart from each other.

Q. What cabling options are available for stacking switches?

A. Standard QSFP+ or SFP+ copper cables are used for short-distance stacking. Cables are not included and will need to be ordered separately. QSFP+ and SFP+ optics can also be used for distance stacking. Visit www.brocade.com/optics to download the Brocade Ethernet Optics Family data sheet and support matrix for the latest information on Brocade ICX 7450 optics and cable support for stacking.

Q. What is the maximum distance between two Brocade ICX 7450 Switches in a stack?

A. The maximum distance between two stacked switches depends on the type of QSFP+ or SFP+ link used to stack the units together. To date, the maximum distance is 10 km. New optics are certified on an ongoing basis. For the latest information about supported optics, visit www.brocade.com/optics.

Q. Can PoE and non-PoE Brocade ICX 7450 Switches be mixed in a stack?

A. Yes. Brocade stacking technology provides the flexibility to mix and match PoE and non-PoE Brocade ICX 7450 Switches in a single stack.

Q. Can fiber and copper versions of the Brocade ICX 7450 Switches be mixed in a stack?

A. Yes. Brocade stacking technology provides the flexibility to mix and match the Brocade ICX 7450-48F fiber with other Brocade ICX 7450 models. This provides a convenient way to add fiber ports to a Brocade ICX 7450 stack for distance extension and for deploying fiber to the desktop.

Q. Can Brocade ICX 7450 Switches be stacked with Brocade ICX 6610 or 6450 Switches?

A. No. This stacking configuration is not supported.

Q. Can Brocade ICX 7450 Switches be stacked with Brocade ICX 7750 Switches?

A. No. This stacking configuration is not supported.

Q. Is PoE+ backward-compatible with PoE?

A. Yes. 801.3at PoE+ is fully backward-compatible with 802.3af PoE. Leveraging LLDPMED, the Brocade ICX 7450 auto-negotiates 802.3af Class 1, Class 2, and Class 3 power.

Q. Is PoH standards-based?

A. Power over HDBase-T (PoH) is a standard defined by the HDBase-T alliance that enables the delivery of up 100 W of power through standard (Cat5e and above) copper twisted pair cables with a reach of up to 100 m.

Q. Is PoH supported on all ports?

A. No. Power over HDBase-T (PoH) is supported only for the first eight ports (ports 1 through 8) of the Brocade ICX 7450 Switch.

Q. How many PoE and PoE+ ports can the Brocade ICX 7450 deliver?

A. The Brocade ICX 7450 can deliver all 24, 32, or 48 ports with full Class 3 power. The following chart shows how many ports can be driven with PoE power, based on the number of power supplies that are installed:

Brocade ICX 7450 Model	PoE Class 3 Ports	PoE+ Ports
24-port model, single 1,000 W power supply	24	24
24-port model, dual 1,000 W power supply	24 fully redundant	24 fully redundant
32-port model, single 1,000 W power supply	32	24
32-port model, dual 1,000 W power supply	32 fully redundant	32
48-port model, single 1,000 W power supply	48	24
48-port model, dual 1,000 W power supply	48 fully redundant	48

Q. What is the Brocade ICX 7450 PoE power budget?

A. The total PoE power budget with two AC power supplies is 1,500 W. The Brocade ICX 7450 PoE models support two internal hot-swappable, load-sharing 1,000 W AC power supplies. Each power supply delivers 750 W of PoE power and has 250 W reserved for system power.

Q. Can the Brocade ICX 7450 be field-upgraded to support PoE?

A. No. Non-PoE Brocade ICX 7450 models cannot be upgraded to support PoE. The PoE design of the Brocade ICX 7450 requires different power supplies and a different circuit board.

Q. Can the Brocade ICX 7450 configure PoE power via a Cisco CDP packet?

A. Yes. The Brocade ICX 7450 has the capability to configure the individual port power based on the content of a CDP packet sent from a Cisco phone. This is a useful feature to control power on a more granular basis than the class definitions allow.

Q. Does the Brocade ICX 7450 offer both AC and DC power supplies?

A. Yes. The Brocade ICX 7450 supports both AC and DC power supplies. A DC power supply option can be installed on any of the Brocade ICX 7450 models (24/48 copper port models, 24/32/48 PoE port models, and the 24 SFP port model) and is available with portside exhaust and port-side intake airflow as the following SKUs:

- **RPS15-E:** 250 W AC power supply, exhaust airflow
- **RPS15-I:** 250 W AC power supply, intake airflow
- **RPS16-E:** 1,000 W AC power supply, exhaust airflow
- **RPS16-I:** 1,000 W AC power supply, intake airflow
- **RPS16DC-E:** 510 W DC power supply, exhaust airflow
- **RPS16DC-I:** 510 W DC power supply, intake airflow

Q. Brocade ICX 7450 switches have two removable fan trays. Can the fan tray be replaced while the unit is running?

A. Yes. The fan unit can be hot-swapped while the unit is running.

Q. Does the Brocade ICX 7450 have the option for a redundant power supply?

A. Yes. All Brocade ICX 7450 Switches allow for an optional second redundant AC or DC power supply to be installed internally. These power supplies are hot-swappable and load-sharing.

Q. How is the Brocade ICX 7450 managed?

A. The Brocade ICX 7450 supports a wide range of management standards and features an industry-standard CLI and a Web-based interface. Additionally, it can be managed—along with the rest of the Brocade Ethernet network—by Brocade Network Advisor management software. The Brocade ICX 7450 offers a dedicated out-of-band 10/100/1000 Mbps management port so edge ports are not consumed by management traffic.

Q. What does “hitless failover” mean?

A. Hitless stacking failover is a critical high-availability feature provided by Brocade stacking technology. Hitless failover enables the standby stack controller to instantaneously take over in the event of a failure of the master stack controller, without any interruption of traffic forwarding.

In addition, if a stack controller (one of the switches in the stack) fails, it can be replaced while the stack is operating—without interrupting traffic forwarding—through hot insertion and removal of stacked units. This is another high-availability feature of Brocade stacking technology.

Q. How is the cooling airflow in the Brocade ICX 7450 directed?

A. Airflow in all Brocade ICX 7450 Switches flows from either port side to power supply side, or power supply side to port side. Airflow can be specified at the time of order and can be reversed in the field by swapping the power supplies and fan assembly.

Q. Is a lifetime warranty offered for Brocade ICX 7450 Switches?

A. Yes. Brocade ICX 7450 Switches are covered by the Brocade Assurance® Limited Lifetime Warranty. For details, visit www.brocade.com/warranty.

Q. How do I order the Brocade ICX 7450 Switch?

A. Customers have two options when ordering a Brocade ICX 7450 Switch. Either select one of the six pre-built units from the "Switch Bundle" list, or build a custom unit by selecting a "Bare Switch" and adding a choice of power supplies, fans, and port modules. Refer to the Brocade ICX 7450 product page for a complete list of available SKUs.

Q. What comes in the box with the Brocade ICX 7450 Switches?

A. Pre-built units ordered from the "Switch Bundle" list include a power cord, two-post rack mounting brackets, and a USB serial console cable.

Units ordered from the "Bare Switch" list include two-post rack mounting brackets and a USB serial console cable. AC power supplies ordered separately include a power cord.

Stacking cables must be ordered separately.

Q. What is the ICX7450-48P-STK-E part number intended for?

A. Customers ordering a stack of switches from the "Switch Bundle" list might not need to have uplinks on every member of the stack. The ICX7450-48P-STK-E is a 48-port PoE "Switch Bundle" that includes two 40 GbE QSFP+ stacking ports, one 1,000 W AC power supply, and one fan. No uplink module is included.

Q. Why is Brocade adding IPsec VPN service within the Brocade ICX 7450 Switch?

A. As organizations move to a hybrid cloud architecture with geographically dispersed business partners, their exposure to vulnerabilities is increasing. Many organizations seek to better meet compliance and protect their data in transit—whether across the Internet or the enterprise network. The Brocade ICX 7450 Service Module for IPsec VPN consolidates network switching and encryption to provide a cost-effective and scalable way to meet compliance and data security requirements without purchasing dedicated encryption appliances.

The service module provides hardware-based acceleration for IPsec VPNs using Advanced Encryption Standards (AES). It leverages programmable hardware technology to future-proof data protection, enabling more features to be added to IPsec VPN deployments as business needs evolves. The service module accelerates IPsec traffic performance by offloading the mathematically intensive part of the overall process while relying on the switch processor to identify traffic for encryption, negotiate the security associations, and forward encrypted traffic. Thus, the Brocade switch processor extends traditional Layer 3 routing capabilities to include encryption with Suite B algorithms and support for 128-bit and 256-bit AES. With 10 Gbps throughput per service module, a single Brocade ICX 7450 switch or stack helps ensure that service levels are not impacted as compliance requirements and security needs increase.

Q. In which slot can the Brocade ICX 7450 Service Module be inserted?

A. The IPsec service module can be inserted in any of the three modular slots within the Brocade ICX 7450.

Q. In which switch within the stack can the Brocade ICX 7450 Service Module be inserted?

A. Customers have the flexibility to insert the service module into any switch within the stack, regardless of the ports selected for encryption.

Q. How many Brocade ICX 7450 Service Modules can a Brocade ICX 7450 stack support?

A. A Brocade ICX 7450 stack supports one Brocade ICX 7450 Service Module.

Q. How many Brocade ICX 7450 Service Modules can the Brocade ICX 7450 Switch support?

A. The Brocade ICX 7450 Switch supports one Brocade ICX 7450 Service Module.

Q. What is the performance throughput of the Brocade ICX 7450 Service Module?

A. The Brocade ICX 7450 Service Module supports up to 10 Gbps full duplex, encryption and decryption. The IPsec performance depends on the packet size. With 1500-byte packets, the Brocade ICX 7450 Service Module delivers 96 percent of maximum throughput.

Q. Is a separate software license required for the service module?

A. No.

Q. What images support the Brocade ICX 7450 Service Module?

A. The base router image supports the Brocade ICX 7450 Service Module. The PREM license is required for the premium features. The base switch image does not support the Brocade ICX 7450 Service Module.

Q. Is the Brocade ICX 7450 Service Module Suite B-compliant?

A. Yes. CSFC–FIPS/CC certification will be completed in a future release.

Q. Which Brocade products does the Brocade ICX 7450 Service Module interoperate with?

A. The Brocade ICX 7450 Service Module interoperates with the Brocade 4-Port 10 GbE IPsec service module (BR-MLX-10GX4-IPSEC-M) and the IPsec functionality of the Brocade vRouter to provide end-to-end network encryption.

Q. What encryption types does the Brocade ICX 7450 Service Module support?

A. The Brocade ICX 7450 Service Module supports AES-GCM-256 and AES-GCM-128.

Q. Does the Brocade ICX 7450 Service Module work with third-party encryption products?

A. Yes, if the third-party encryption products follow the IPsec RFC standards, and support IKEv2 and AES-GCM-256 and AES-GCM-128 standards.

Q. What is the maximum bandwidth on a single IPsec tunnel?

A. The bandwidth on a single IPsec tunnel depends on the port speed and the VPN policy. Customers have the capability to direct selected traffic from multiple ports through a single tunnel.

Q. How many tunnels does the Brocade ICX 7450 Service Module support?

A. The Brocade ICX 7450 Service Module supports up to 20 tunnels.

Q. How does the customer select which traffic to encrypt using the Brocade ICX 7450 Service Module?

A. Customers have the ability to direct selected traffic into an IPsec tunnel using static routes, or with VRF or ACL selection using policy-based routing.

Q. Can customers update the firmware running on the Brocade ICX 7450 Service Module FPGA?

A. Yes. Customers can download the firmware from www.brocade.com and reflash the FPGA in the field with the latest firmware image.

Q. What features are supported on the IPsec tunnel of the Brocade ICX 7450 Service Module?

A. Some of the supported features include:

- IPv4 unicast traffic
- VRF
- OSPF
- QoS
- Jumbo frames

Learn More

Q. How do I find more information about the Brocade ICX 7450?

A. Navigate to the Brocade ICX 7450 product page on www.brocade.com for the latest data sheets, white papers, and solution briefs. Or contact your Brocade sales representative or Brocade OEM Partner for more details.

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