FEATURE GUIDE

Ruckus ICX 7750 Breakout Ports

Supporting Ruckus ICX 7750 Campus Switch

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Preface

The scope of this document is to define the breakout capability of the 40 gigabit interfaces on the ICX 7750 into 4x10gig ports, using the supported breakout cables and optics.

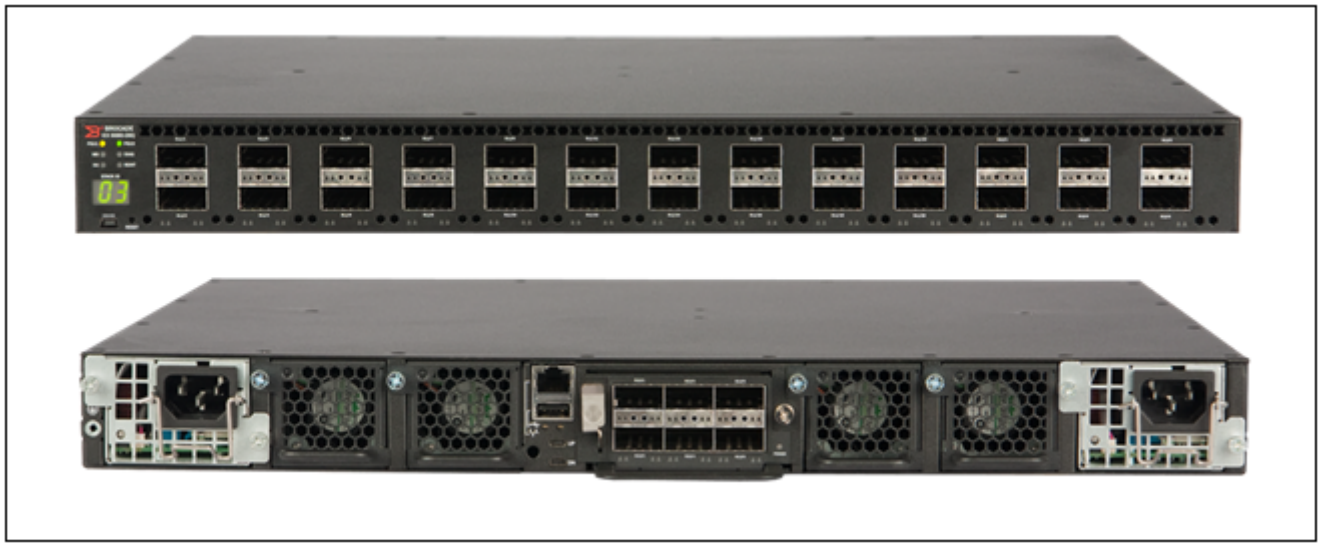
Overview

The Ruckus ICX 7750 is a 1RU high-performance, high-availability, and market-leading-density 10/40 GbE solution that meets the needs of business-sensitive campus deployments and demanding data center Top-of-Rack (ToR) environments. With industry-leading price/performance and a low-latency, non-blocking architecture, the Ruckus ICX 7750 provides. It is part of the Ruckus ICX family of Ethernet switches for campus LAN and classic Ethernet data center environments and runs on Ruckus FastIron software operating system. The product comes in three form factors. The details are captured below.

Ruckus ICX 7750-26Q

The Ruckus ICX 7750-26Q is a 1RU fixed form factor 40 GbE Ethernet switch delivering a chassis experience for campus LAN aggregation and core. It offers unprecedented port density, availability, and scalability and its true hybrid-port mode OpenFlow provides a migration path to SDN. The Ruckus ICX 7750-26Q has 26x40 GbE Quad Small Form-Factor Pluggable (QSFP+) ports on the front panel plus the rear panel can take an optional 6 X40 GbE QSFP+ port pluggable module to support up to 32 40G QSFP+ ports in a 1RU Switch. The optional 6 X 40GbE QSFP+ pluggable module can be added to the rear panel to increase port density. Up to 24 of the total 32 ports can be broken out into 4x10G for a total of 96 10GE ports with up to 8 40GE ports remaining. The Ruckus ICX 7750-26Q supports QSFP-to-SFP breakout cables and LR4 optics on uplink ports.

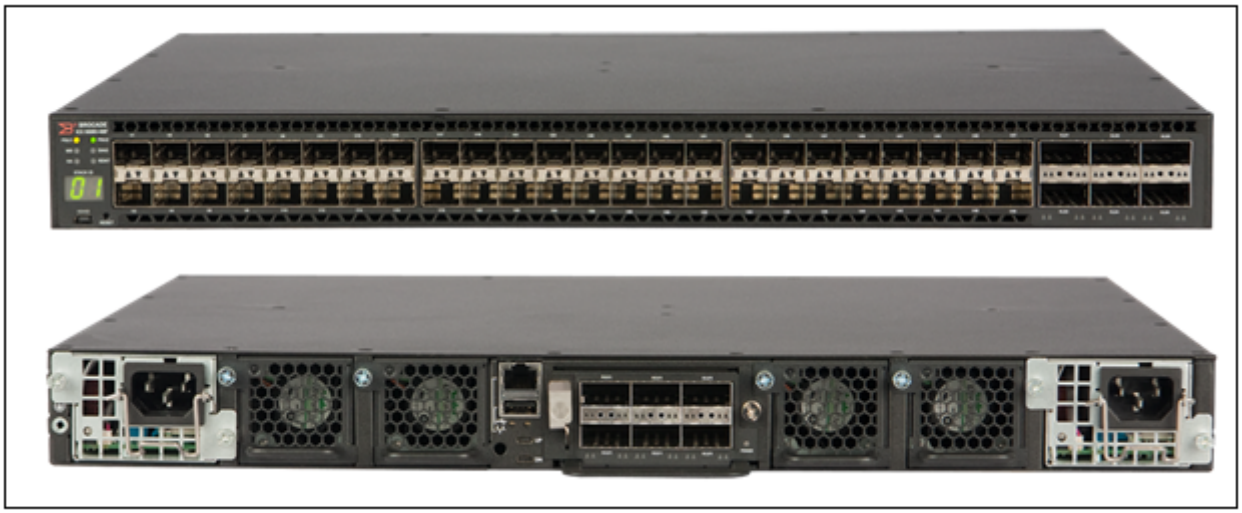
FIGURE 1 Ruckus ICX 7750-26Q Front and Rear Panel



Ruckus ICX 7750-48F

The Ruckus ICX 7750-48F is a 1RU fixed form factor 10/40 GbE Ethernet switch delivering a chassis experience for campus LAN aggregation and core. It offers unprecedented port density, availability, and scalability and its true hybrid-port mode OpenFlow** provides a migration path to SDN. The Ruckus ICX 7750-48F has 48 10 GbE SFP+ Small Form-Factor Pluggable (SFP+) ports and 6 40 GbE QSFP+ ports on the front panel plus the rear panel can take an optional 6x40 GbE QSFP+ port pluggable module to support up to 96 X 10G SFP+ ports in a 1RU Switch. All of the QSFP+ ports on the switch can operate as a native 40 Gbps port or as 4 X 10 Gbps ports. The Ruckus ICX 7750-48F supports QSFP-to-SFP breakout cables and SR4/LR4 optics on uplink ports.

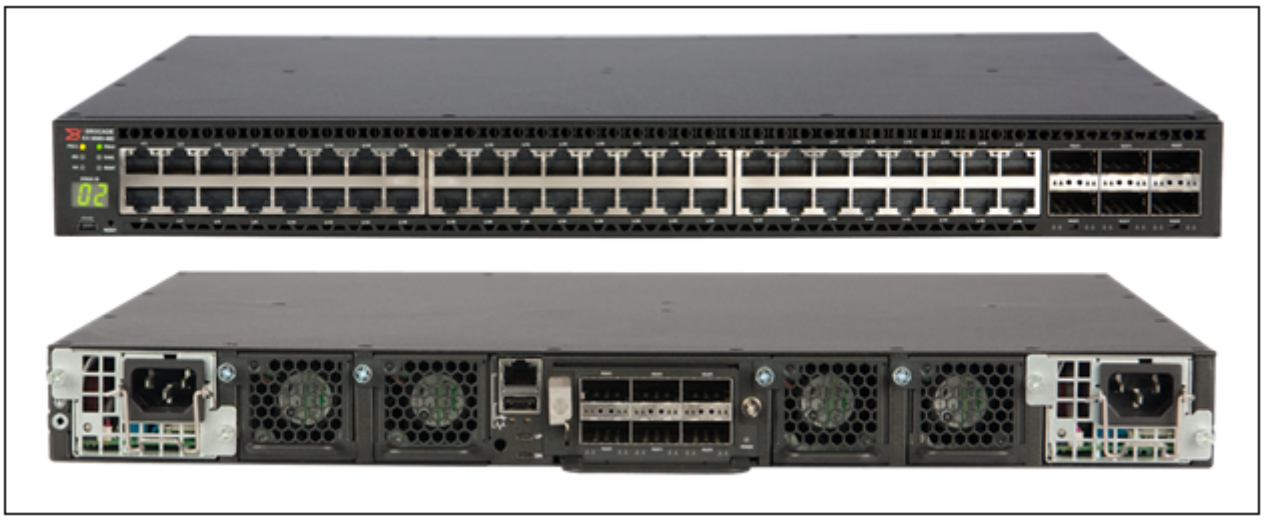
FIGURE 2 Ruckus ICX 7750-48F Front and Rear Panel



Ruckus ICX 7750-48C

The Ruckus ICX 7750-48C is a 1RU fixed form factor 40 GbE Ethernet switch delivering a chassis experience for campus LAN aggregation and core. It offers unprecedented port density, availability, and scalability and its true hybrid-port mode OpenFlow provides a migration path to SDN. The Ruckus ICX 7750-48C has 48 RJ45 10G-Base-T and 6x40 GbE Quad Small Form-Factor Pluggable (QSFP+) ports on the front panel plus the rear panel can take an optional 6 40 GbE QSFP+ port pluggable. All of the QSFP+ ports on the switch can operate as a native 40 Gbps port or as 4x10 Gbps ports. The Ruckus ICX 7750-48C supports QSFP-to-SFP breakout cables* and SR4/LR4 optics on uplink ports.

FIGURE 3 Ruckus ICX 7750-48C Front and Rear Panel



The scope of the feature guide is to explain the breakout capability of each 40 GbE port into 4x10 Gbe port using the breakout cables/Optics. ICX 7750-48F and ICX7750-48C has 12x40 Gbe port (including 6x40Gbe flexible module). The 12x40 Gbe ports can be broken into 12x4x10Gbe ports giving a total of 96x0 Gbe ((12x4x10) + 48x10) in a 1 RU switch. Additionally an ICX 7750-26Q can support 32x40 Gbe ports. We can breakout the 24 X 40 Gbe ports into 96 X 10 Gbe ((12x4x10) + 48x10) ports, giving a total of 96x10 Gbe + 8x40 Gbe ports in a 1 RU switch.

The breakout feature would be beneficial in the Campus aggregation and core environments where a high 10 Gbe density is a major requirement with full line rate support. The same density is a requirement on a Data center TOR environment where a high density traffic is aggregated to be forwarded to the WAN/Internet network. The switch can provide a full line rate of 960 Gbps of forwarding bandwidth with full throughput

Audience

The document is required to understand the feature specifics of breakout port support in ICX 7750. It should be used by system engineers and TMEs to explain the feature specifics and help deploy in the customer environments.

Related documentation

The following documents are related to this feature guide.

- Platform configuration guide

ICX 7750 Hardware Installation Guide

https://support.ruckuswireless.com/documents/1225-ruckus-icx-7750-campus-switch-hw-installation-guide

- ICX 7750 Architectural Brief

  https://www.gosavo.com/brocade/Document/Document.aspx?id=33410008&view=

Document history

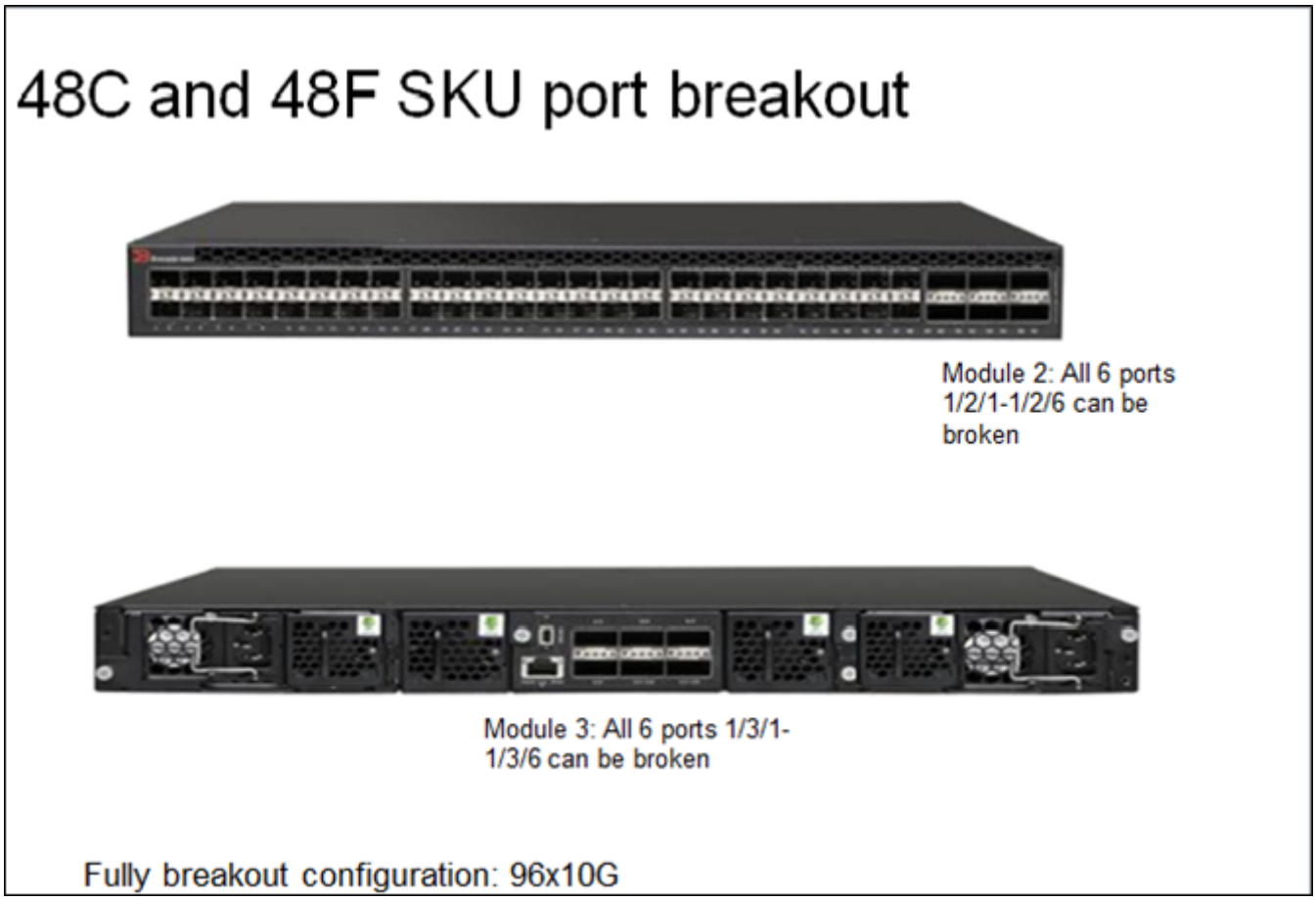
Date	Version	Description
April 2015	53-1003767-01	Initial version
January 2017	53-1003767-02	• Updated the ICX7750-26Q overview section to include the breakout ports information. • Replaced ICX7750-32Q with ICX7750-26Q.
November 2018	53-1003767-03	Minor edit and updates made to document including updated Table 3 on page 11 ICX7750-26Q table.

How to configure breakout ports - use cases

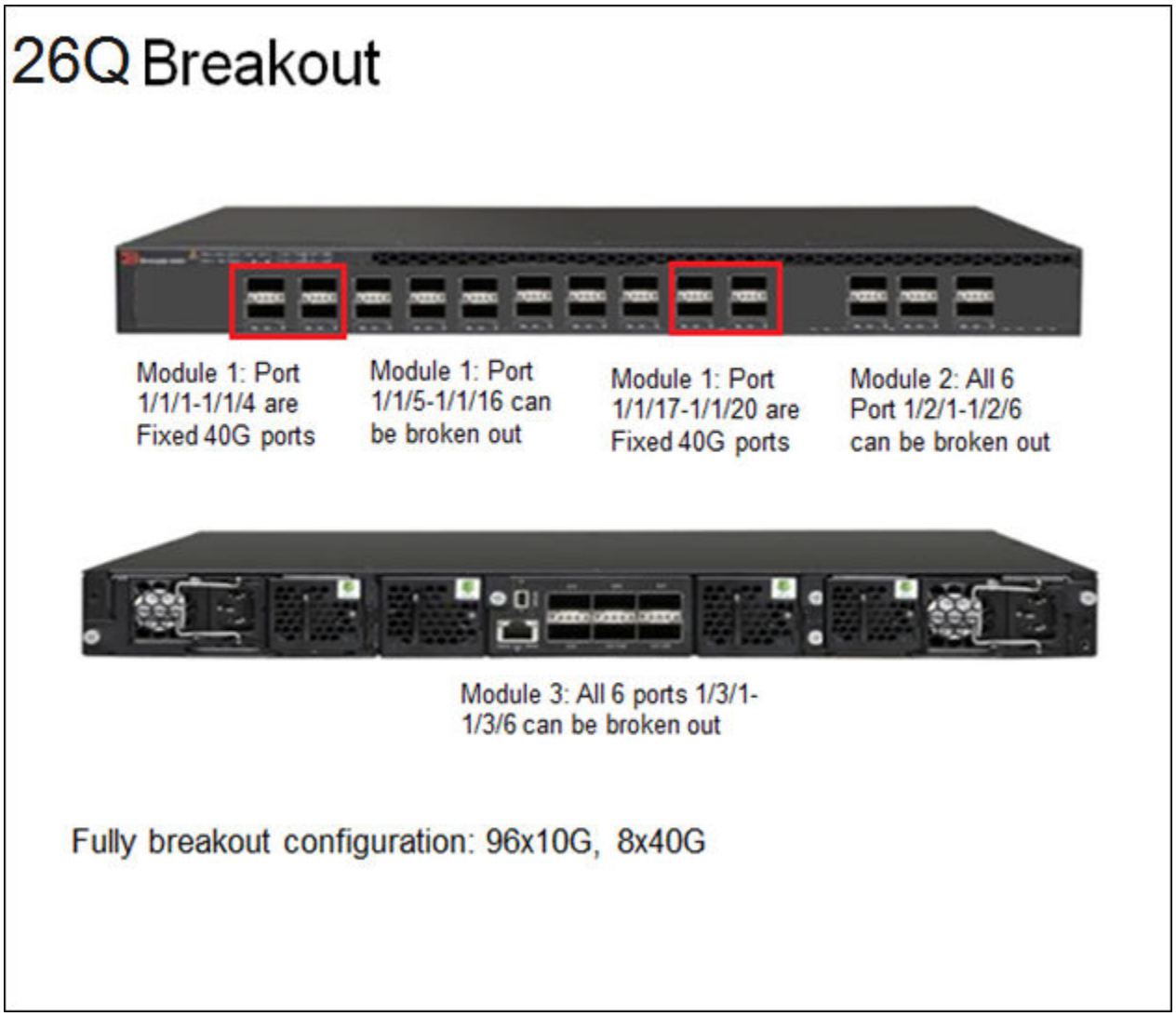
ICX 7750 has 40G interfaces that can be broken into 4x10G ports by applying the breakout CLI command on the interface. The user need to physically connect the supported breakout optics and cables along with the CLI to break the interface into 4x10G ports. The User will be prompted to remove all the configuration on the port before accepting the breakout CLI. Once the CLI is applied the user will be required to reload the unit to apply the configuration.

The ICX 7750 needs to be configured in the store and forward mode before applying the breakout command on the interfaces. The user will be prompted with an error message if the system is configured in cut-through mode. A system reload is required for the breakout port configuration to be applied on the ports. The system does not support dynamic breakout configuration.

ICX 7750 comes in three SKU formats—ICX 7750-48F, ICX 7750-48C, and ICX 7750-26Q. The ICX 7750-48F and ICX 7750-48C comes with a fixed ^ X 40G front module and a flexible 6x40G on the back. All the 12x40G interfaces on the 48F and 48C can be broken into 12x4x10G interfaces giving a total of 96x0G (48x10G + 12x4x10G) ports in a 1 RU switch. Please see the diagram below.



On an ICX 7750-26Q, the unit has 32x40G interfaces. 24x40G ports can be broken out into 24x4x10G, providing a configuration of 96x10G + 8x40G ports in a 1 RU switch. The unit has three modules. The first four and last four ports in Module 1 will be fixed 40G interfaces. The rest 24 Ports including 6x40G ports in the module 2 and 6x40G ports in Module 3 can be broken out into 4x10G interfaces. Refer to the diagram below.



In release 8.0.30, the breakout support on the 40G interfaces will be supported on a standalone mode only. Breakout ports will not be supported with stacking configuration.

Refer to the tables below for the breakout supported ports on each SKU.

TABLE 1 ICX 7750-48F

MODULE	PORTS	Native-SPEED	BREAKOUT-Support
1	1/1/1 to 1/1/48	10G	N/A
2	1/2/1 to 1/2/6	40G	YES
3	1/3/1 to 1/3/6	40G	YES

TABLE 2 ICX 7750-48C

MODULE	PORTS	Native-SPEED	BREAKOUT-Support
1	1/1/1 to 1/1/48	10G	N/A
2	1/2/1 to 1/2/6	40G	YES

TABLE 2 ICX 7750-48C (continued)

MODULE	PORTS	Native-SPEED	BREAKOUT-Support
3	1/3/1 to 1/3/6	40G	YES

TABLE 3 ICX 7750-26Q

MODULE	PORTS	Native-SPEED	BREAKOUT-Support
1	1/1/1 to 1/1/20	40G	YES only on Ports 1/1/5 to 1/1/16
2	1/2/1 to 1/2/6	40G	YES
3	1/3/1 to 1/3/6	40G	YES

After breakout, the port configuration on ports will be same with an added port number for each 10G breakout port. Each 40 G interface has a port format of stack ID/Module ID/Port number. With breakout ports the format will be stack ID/Module ID/Port number: 10G port number. See the below table for more information.

Port	Speed	Comment
1/2/1/	40G	No Breakout
1/2/1:1	10G	After Breakout
1/2/1:2	10G	
1/2/1:3	10G	
1/2/1:4	10G	

Optics and cables supported on ICX 7750 breakout ports

Each 40G interface needs to be equipped with a supported breakout optic and a cable with the port configuration for the port to operate as a breakout port.

Summary

The Ruckus ICX 7750 is a 1RU high-performance, high-availability, and market-leading-density 10/40 GbE solution that meets the needs of business-sensitive campus deployments and demanding data center Top-of-Rack (ToR) environments. With the Breakout ports support on the switch the user can achieve up to 96x10G ports in a 1 RU switch. With such a high density of 10G interface support in a small form factor and the low latency full throughput support the switch will be a cost effective solution for many demanding deployments.