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RUCKUS® ICX switches in the data center

HIGHLIGHTS

- RUCKUS ICX technology enables small to mid-sized organization to deploy a modern data center network infrastructure at lower cost without specialized data center networking experience.

- The RUCKUS ICX product portfolio is designed to address a broad range of data center scenarios, catering to different use cases with solutions for L2 or L3 leaf-spine deployments as well as traditional L2/L3 multitier deployments.

- The combination of Stacking and Link Aggregation Groups enables multi-pathing without additional complexity and provides a single point of management, configuration, and monitoring.

- RUCKUS Campus Fabric scales even further and collapses spine and leaf layers into a single logical device, flattening the network and eliminating deployment complexity and arbitrary network segmentation between data center racks.

- CommScope offers a wide range of switching products well suited for data center deployment from the "Top of the Rack" to the spine and core layers supporting non-blocking L2 and L3 switching performance and offering 1, 10, 25, 40 and 100Gbps port speeds.

Simply better data center networks with RUCKUS ICX switches

IT managers overseeing networks at smaller organizations, need solutions that simplify and automate the deployment and management of their networks. These organizations are better served by network products that can be operated without relying on costly network experts.

RUCKUS Scale-out Networking architecture leverages fixed form factor switches and smart software to deliver high performance and ease of management at a lower cost. RUCKUS networking platform is based on cost effective and flexible 1RU switches rather than traditional, rigid chassis switches with higher cost of acquisition, higher power and cooling requirements and more complex management.

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LEAF-SPINE DATA CENTER ARCHITECTURE

The aging three-tier design in the data center is being replaced with what is called the leaf-spine design. The leaf-spine architecture is adaptable to the continuously changing needs of small to large organizations with evolving data centers and is very well suited for small to mid-size data center deployments.

In a traditional leaf-spine architecture, any two servers must be the same number of hops away from each other to ensure the same predictable and consistent latency between any two devices connected to the network. To facilitate this every leaf switch must be connected to every spine switch.

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L3 design: In an L3 leaf-spine deployment (figure 1), connections between leaf and spine switches are L3 links. Equal-Cost Multipathing (ECMP) routing is used to manage multiple paths between them. All ICX switches, from entry level to high-end models, support L3 switching and a wide range of L3 protocol such as RIP, OSPF and BGP making them very well suited for L3 leaf-spine deployment.
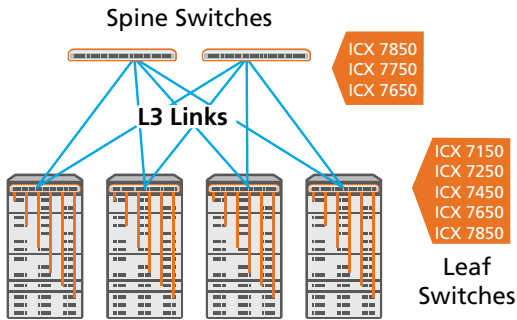

Figure 1: L3 leaf-spine deployment with RUCKUS ICX switches

L2 design: In an L2 leaf-spine deployment, the connections between leaf and spine switches are direct Ethernet links. Because standard Ethernet protocols do not support multipathing natively and the use of STP (Spanning Tree Protocol) to block redundant paths would completely defeat the purpose of the leaf-spine design, a solution must be found to address multipathing with an L2 design. RUCKUS offers multiple options to address this challenge: Stacking or Campus Fabric.

Stacking: In this configuration (figure 2), the spine switches are stacked together forming a single logical switch at the spine level. A LAG (Link Aggregation Group) is created for each group of links connecting each individual leaf switch to the stacked spine. The LAG enables multiple physical links to behave as a single logical link between every spine switch and the stacked spine, a simple way to offer multipathing at the physical link level while working around native Ethernet limitation of a single logical path between switches.
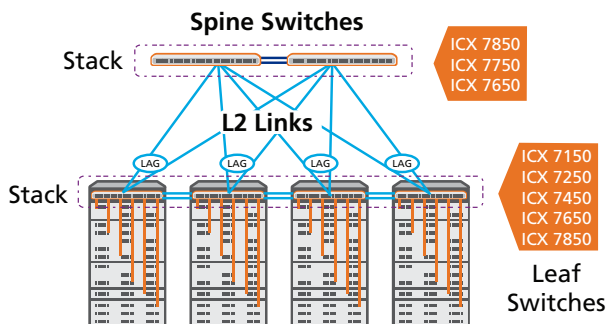

Figure 2: L2 leaf-spine deployment with horizontal stacking

Benefits of Stacking in the Data Center: In addition to offering an elegant and simple solution for multipathing in an L2 leaf-spine design, stacking also considerably simplifies network management and deployment, delivering a single point of management across a stack of up to twelve ICX switches. Furthermore, ICX switches are uniquely capable of stacking using standard Ethernet ports and optics. Unlike proprietary stacking ports and short copper cables offered by competitive switches, ICX switches can be horizontally stacked across racks and even across buildings with a distance of up to 10 km between switches. To further simplify management, in addition to spine switches, leaf switches can also be stacked together offering a single point of management across up to twelve data center top of the rack switches (figure 2).

RUCKUS Campus Fabric: In this configuration, the spine switches are stacked together to form the fabric Control Bridge (CB). The control bridge delivers a unified network control plane which is the central management and traffic forwarding authority for the campus fabric. Leaf switches are Port Extender (PE) devices connected to the CB spine devices using the standard 802.1BR protocol instead of standard Ethernet. The PE devices transparently managed and controlled by the CB, eliminating the need to manually provision and configure individual leaf switches. The entire fabric is managed as one logical device from a single point of management within the CB.
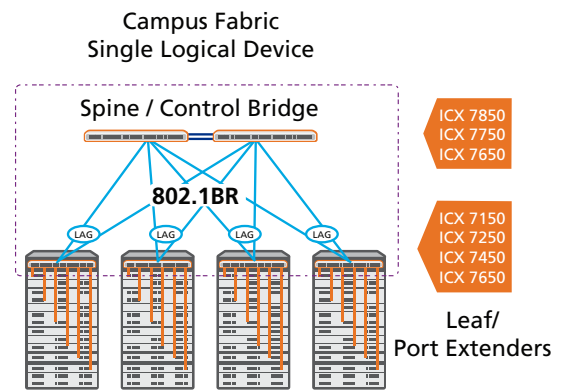

Figure 3: L2 leaf-spine deployment with RUCKUS Campus Fabric

Benefits of RUCKUS Campus Fabric: A Campus Fabric based L2 leaf-spine network will scale well beyond stacking with up to 36 spine switches and offers a single point of management, configuration, and monitoring across leaf and spine switches. It also unifies features, network services, and software images across the data center network. A leaf-spine network based on RUCKUS campus fabric technology delivers all the benefit of a traditional leaf-spine architecture without the management complexity and the additional cost.

THE RUCKUS ICX 7000 PRODUCT LINE IN THE DATA CENTER

Broad range of use cases: The RUCKUS ICX product portfolio is designed to address a broad range of data center use cases, catering to different markets with solutions for L2 or L3 leaf-spine deployments as well as traditional L2/L3 multitier deployments. The RUCKUS ICX product line has been conceived with maximum flexibility in mind and is intended to cover the needs of existing and future customers with the latest Ethernet technologies. RUCKUS Campus Fabric is supported across the line on all RUCKUS ICX 7000 Series switches.

Maximum Flexibility: RUCKUS ICX 7000 switches are flexible enough to operate both as regular Layer 2/Layer 3 switches, as well as running in PE mode (with the RUCKUS ICX 7150, ICX 7250, ICX 7450 and ICX 7650 Switch) or CB mode (with the RUCKUS ICX 7650, ICX 7750 and ICX 7850 Switch). No licensing cost is associated with RUCKUS Campus Fabric technology, and the technology comes with RUCKUS ICX FastIron® software running on RUCKUS ICX 7000 Series switches.

Future-proof with Software Defined Networking: Build a network foundation that's ready for the future whenever you are, RUCKUS ICX switches all support OpenFlow to facilitate Software Defined Networking deployment. The switches can operate in hybrid-port mode, running traditional protocols and OpenFlow-directed flows at the same time, so you can transition to software-defined networking (SDN) at your own pace, without disruption.

COMMSCOPE HELPS SMALLER ORGANIZATIONS DEPLOY STATE OF THE ART DATA CENTERS

CommScope offers a radically different approach that simplifies the deployment of data center networks. RUCKUS ICX technology enables small to mid-sized organization to deploy a modern data center networking infrastructure at a low cost and with the general IT skills already on staff.

	Leaf			Leaf/Spine	Spine	Leaf/Spine
FEATURES	**ICX 7150**	**ICX 7250**	**ICX 7450**	**ICX 7650**	**ICX 7750**	**ICX 7850**
1G Server Connections	●	●	●	●	●	
10G Server Connections	Very Limited	Limited	Limited	High Density	Highest Density	Highest Density
25G Server Connections						●
10G Uplinks	●	●	●	●	●	●
40G Uplinks			●	●	●	●
100G Uplinks				●		●
Reversible Air Flow			●	●	●	●
Redundant PSU		●	●	●	●	●
Hot Swap PSUs and Fans			●	●	●	●
Long Distance Stacking	●	●	●	●	●	●
Stack ISSU	●	●	●	●	●	●
Campus Fabric	PE	PE	PE	PE/CB	CB	CB*
OpenFlow	●	●	●	●	●	●
VXLAN					●	●*
Layer 3 Routing	Static Routes, RIP, OSPF, PBR	Static Routes, RIP, OSPF, PBR, VRF, GRE	Static Routes, RIP, OSPF, PBR, VRF, GRE, BGP	Static Routes, RIP, OSPF, PBR, VRF, GRE, BGP	Static Routes, RIP, OSPF, PBR, VRF, GRE, BGP	Static Routes, RIP, OSPF, PBR, VRF, GRE, BGP

* To be supported in a future software release on the ICX 7850.

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Visit our website or contact your local CommScope representative for more information.