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Selecting the right RUCKUS switch for hospitality deployments

BUYING GUIDE

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INTRODUCTION

The purpose of this document is to guide CommScope partners and customers to choose the correct RUCKUS ICX switch based on their deployment requirements. There are a variety of factors to consider when choosing which ICX switch to deploy including Power-over-Ethernet (PoE) requirements, number of ports needed and overall throughput.

To help simplify this process, we divided the decision criteria into the two primary areas of a deployment:

1. **Intermediate distribution Frame (IDF)**—Distribution rack for one or more floors. For high-scale buildings there can be two (or more) IDFs per floor. This is the point where all the cables (copper-based) concentrate from a given floor.
2. **Main Distribution frame (MDF)**—Main rack for the building (or group of buildings), where all the cables (fibers usually) coming from IDFs concentrate. This is where servers and/or firewalls are connected.

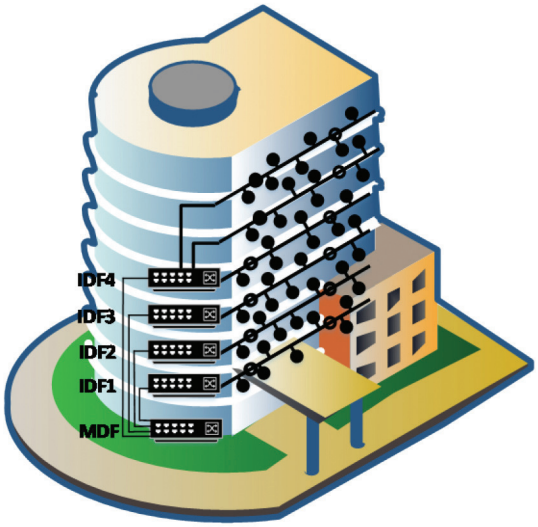

Figure 1. Typical placement of IDFs and MDF

IDF OR ACCESS SWITCH

The ICX 7150-24P ("P" stands for PoE-enabled switch) or ICX 7150-48PF switches are ideal choices for the IDF. There are a few instances, such as if there are R720 access points installed and/or strict requirements for redundant power supplies, in which another ICX switch should be used. However, the ICX 7150 provides the performance and features required at the IDF. Determining which RUCKUS ICX 7150 switch to deploy largely depends on how many ports are needed within the planning horizon:

- **ICX 7150-24P:** 24-port, PoE-enabled switch. Choose this switch if less than 24 ports are needed to connect access points (APs) or other end devices.
- **ICX 7150-48PF:** 48-port switch with a 740-watt PoE budget. This switch is ideal if more than 24 ports will be needed to connect APs or other end devices. Note, if a lower PoE budget is required, the ICX 7150-48P is ideal as it supports up to 48 ports with a low PoE budget.

If more than 48 ports are needed, stacking multiple ICX 7150 switches is the optimal choice. This will be discussed in the stacks and uplinks section.

Part numbers for ICX 7150 switches:

Part number	Description
ICX7150-24P-4X1G	ICX 7150 switch, 24x 10/100/1000 PoE+ ports, 2x 1G RJ45 uplink ports, 4x 1G SFP uplink ports upgradable to up to 4x 10G SFP+ with license, 370W PoE budget, basic L3 (static routing and RIP)
ICX7150-48PF-4X1G	ICX 7150 switch, 48x 10/100/1000 PoE+ ports, 2x 1G RJ45 uplink ports, 4x 1G SFP uplink ports upgradable to up to 4x 10G SFP+ with license, 740W PoE budget, basic L3 (static routing and RIP)

The following ICX 7150 switches may be appropriate in certain situations, as follows:

- **ICX 7150-C12P:** Compact switch that includes 12 PoE ports and four uplink ports (two SFP and two copper). The compact switch has the same features as regular size ICX 7150 (shares the same software) but is fanless and silent (the standard ICX 7150 has a silent mode when the total PoE draw is below 120 watts). Note: the compact switch is the only exception to the rule that every

ICX switch comes with a rack mounting kit.

- **ICX 7150 Z-Series:** Recommended especially in combination with the RUCKUS R720 access point (AP). The ICX 7150 Z-Series includes 16 ports capable of providing both 2.5 GbE and PoH (power over HDbaseT) on each port and 32x1 GbE with PoE+ ports. The multi-gigabit ports allow for the use of popular Category 5e cabling, so there is no need to replace existing cables. PoH is recommended for the R720 AP to run at full speed. Note: the R720 AP can operate on PoE+ (30 watts) and 1 GbE links but not at full speed.

Part number	Description
ICX7150-C12P-2X1G	ICX 7150 compact switch, 12x 10/100/1000 PoE+ ports, 2x 1G RJ45 uplink ports, 2x 1G SFP uplink ports
ICX7150-48P-4X1G	ICX 7150 switch, 48x 10/100/1000 PoE+ ports, 2x 1G RJ45 uplink ports, 4x 1G SFP uplink ports upgradable to up to 4x 10G SFP+ with license, 370W PoE budget, basic L3 (static routing and RIP)
ICX7150-48ZP-E2X10G	ICX 7150-48ZP switch (Z-Series), 16x 100/1000/2.5G PoH ports, 32x 10/100/1000 PoE+ ports, 2x 10G SFP+ and 6x 1G SFP uplink ports upgradable to 8x 10G SFP+ with license. Basic L3 (static routing and RIP). 1 RPS20-E power supply, 1 fan tray.

The ICX 7150 switches include four 1 GbE uplinks (SFP type), with an option for an upgrade of four SFP ports to 10 GbE with no hardware upgrades. The ICX 7150 Z-Series comes with two 10 GbE ports (SFPP) that are enabled by default. The remaining six ports are set to 1 GbE but can be upgraded to 10GbE with a license. The ICX 7150 Z-Series switch includes a single power supply and fan with redundancy as an option.

Each ICX 7150 switch includes rack mount kits (two posts) and a U.S. power cable in the base price. Additional country power cords to match your country standards are available:

Part number	Description
PCEURO	Power cord for RPS2/3/5/9, European version
PCUK	Power cord for RPS2/3/5/9, United Kingdom version
More cables available	PCAUS, PCCHINA2, PCINDIA, PCJAPAN, PCSWISS

ICX SWITCH POE

One advantage of the RUCKUS ICX switching family is the comprehensive PoE support. The standard terms discussed include:

- **PoE** can provide power up to 15.4 watts (802.3af) per port
- **PoE+** can provide power up to 30 watts (802.3at)
- **PoH (power over HDbaseT)** can provide power up to 90 watts (802.3bt)

Learn more about PoE support and design with CommScope's PoE Implementation Guide.

All RUCKUS ICX "P" switches are PoE+ capable (30 watts). In addition, the ICX 7150 Z-Series, ICX 7450 and ICX 7650 are PoH (90 watts), PoE++ (60 watts, UPoE) and PoE/PoE+ capable. Determining power requirements to ensure the switch can provide sufficient power is critical.

Power requirements depend on the devices connected to the switch and can vary significantly. The following table provides information on the maximum PoE budget for each ICX switch. It's imperative that the total power budget not be exceeded. The table also includes information on each RUCKUS AP and the total number of APs each switch can safely support. It is important to

take into consideration cable loss when calculating power requirements.

ICX switch PoE budget and number of supported RUCKUS access points:

Switch	Max PoE budget	H320 15W	H510 15W	R310 15W	R510 15W	R720[3] 30W	R720[4] 45W
ICX 7150-12C	124W	8	8	8	8	4	—
ICX 7150-24P	370W	24	24	24	24	12	—
ICX 7150-48P	370W	24	24	24	24	12	—
ICX 7150-48PF	740W	48	48	48	48	24	—
ICX 7150-48ZP single ps	740W	48	48	48	48	24	16
ICX 7150-48ZP dual ps	1480W	48	48	48	48	48	16
ICX 7250-24P no eps[(1)]	370W	24	24	24	24	12	—
ICX 7250-48P no eps[(1)]	740W	48	48	48	48	24	—
ICX 7450-24P single ps[(2)]	748W	24	24	24	24	24	8
ICX 7450-48P single ps[(2)]	748W	48	48	48	48	24	8
ICX 7650-48P single ps	748W	48	48	48	48	24	8
ICX 7650-48P double ps	1496W	48	48	48	48	48	8
ICX 7650-48ZP single ps	748W	48	48	48	48	24	16
ICX 7650-48ZP double ps	1496W	48	48	48	48	48	24

(1) EPS possible. When installed, will double the amount of PoE budget.
(2) Secondary power supply possible. When installed, will double the amount of PoE budget.
(3) R720 working in PoE+ mode (1 GbE, no secondary 1 GbE port, no USB port).
(4) R720 working in PoE+ Overdrive mode (1 GbE) or PoH (2.5 GbE).

ICX POWER SUPPLIES

The ICX switch family includes switches that utilize the following power supplies:

- Embedded single power supply: ICX 7150 and ICX 7150C
- Dual power supplies: ICX 7150 Z-Series, ICX 7450 and ICX 7650
- External power shelf (EPS) with DC connectors: ICX 7250

Figure 2. EPS4000 connected to ICX 7240-24P

REDUNDANT POWER OPTIONS FOR HIGH AVAILABILITY

The following ICX switches are available for high-availability (HA) environments: ICX 7150 Z-Series, ICX 7250, ICX 7450 and ICX 7650. If you have chosen to install the above switches with only a single power supply unit (PSU), here is the list of parts to add.

ICX 7150 Z-Series:

Part number	Description
RPS20-E	Power supply for ICX7150-48ZP
ICX-FAN11	Fan FRU for ICX7150-48ZP

ICX 7250:

Part number	Description
ICX-EPS4000-SHELF	EPS4000 shelf with four bays for hot-swappable RPS17 power supplies (power supplies not included) and eight connectors for EPS4000 cables (cables not included)
RPS17	1 power supply for EPS4000 shelf; 920W
ICX-EPS4000-CBL-01	EPS4000 cable drect; 1 EPS4000 shelf connector to 1 EPS4000 switch connector
ICX-EPS4000-CBL-02	EPS4000 cable splitter; 1 EPS4000 shelf connector to 2 EPS4000 switch connectors

ICX 7450 and ICX 7650:

Part number	Description
RPS15-E	ICX7450/6610/6650 non-PoE 250W AC PSU, exhaust airflow, front-to-back airflow
RPS15-I	ICX7450/6610/6650 non-PoE 250W AC PSU, intake airflow, back-to-front airflow
RPS16-E	ICX7450/6610 PoE 1000W AC PSU, exhaust airflow, front-to-back airflow
RPS16-I	ICX7450/6610 PoE 1000W AC PSU, intake airflow, back-to-front airflow
ICX-FAN10-E	ICX 7450 exhaust airflow fan, front-to-back airflow
ICX-FAN10-I	ICX 7450 intake airflow fan, back-to-front airflow
ICX-FAN12-E	ICX 7650 exhaust airflow fan, front-to-back airflow
ICX-FAN12-I	ICX 7650 intake airflow fan, back-to-front airflow

* Remember to order redundant fans that match the flow direction of your power supply. Also, be sure to add a fan for each power supply ordered.

STACKS AND UPLINKS

Stacking is the recommended approach when two or more switches need to be connected. Stacking provides the following benefits:

- Single point of management for multiple switches
- No spanning tree issues between switches
- In-Service Software Upgrade (ISSU) for hitless image upgrades

There are a few things to keep in mind when stacking ICX switches:

- 10 GbE links must be used, as stacking will not work over GbE links. This does not apply to uplinks since they will operate at any available speed.
- Trunks from multiple uplinks that are bound together must operate at the same speed.
- 10 GbE ports can be used for stacking, uplinks, and server connectivity since they are universal ports. This is a unique feature of RUCKUS ICX switches. ICX switches do not need dedicated modules or proprietary cables.

- The maximum number of switches in a single stack is 12.
- ICX switches support long-distance stacking up to 10 km over standard Ethernet cables and optics. This allows switches to be stacked together even if they are in different wiring closets or on different floors.

Different switch models can be mixed within one stack (port count, PoE/non-PoE). However, they must be from the same family. For example:

- Stack 1: ICX 7150C-12, 7150-24, 7150-48PF, 7150-48ZP
- Stack 2: ICX 7250-24, 7250-48P
- Stack 3: ICX 7450-24, 7450-48P, 7450-48F
- Stack 4: ICX 7650-48F, 7650-48P, 7650-48ZP
- Stack 5: ICX 7750-26Q, 7750-48F, 7750-48C

Part number of ICX 7150 24-port version without PoE:

Part number	Description
ICX7150-24-4X1G	ICX 7150 switch, 24x 10/100/1000 ports, 2x 1G RJ45 uplink ports, 4x 1G SFP uplink ports upgradable to up to 4x 10G SFP+ with license, basic L3 (static routing and RIP)

Part number of ICX 7150 48-port version without PoE:

Part number	Description
ICX7150-48-4X1G	ICX 7150 switch, 48x 10/100/1000 ports, 2x 1G RJ45 uplink ports, 4x 1G SFP uplink ports upgradable to up to 4x 10G SFP+ with license, basic L3 (static routing and RIP)

CABLES AND OPTICS

The distance between switches depends on distance and the complexity of the design. The following options are available for Twinax cables:

- ICX 7150 and ICX 7250 families: 10 GbE Twinax
- ICX 7450: Either 10 GbE or 40 GbE Twinax cables
- ICX 7750: 40 GbE Twinax cables
- ICX 7650: Either 40 GbE or 100 GbE Twinax cables

Twinax cables are available in lengths of 1, 3, 5, 7, or 10 meters.

Short-range (SR) optics should be used for up to 300 meters and the long-range (LR) optics for distances up to 10 kilometers.

Twinax cables and optics (excerpt only):

Part number	Description
10G-SFPP-TWX-0101	Direct attached SFPP active copper, 1M, 1-pack
10G-SFPP-TWX-0108	Direct attached SFPP active copper, 1M, 8-pack
10G-SFPP-TWX-0301	Direct attached SFPP active copper, 3M, 1-pack
10G-SFPP-SR-S	10GBASE-SR, SFPP MMF LC connector (no TAA)

ICX SWITCH LICENSING

The ICX 7150 and ICX 7250 require 10 GBE links to form a stack. Both come with four or eight SFP ports, which are 1 GBE by default. One 10 GBE port is sufficient for stacking but not recommended. A ring topology is recommended, which requires two (or more) 10 GBE links.

The distance between switches depends on distance and the complexity of the design. The following options are available for Twinax cables:

- ICX 7150: 4x1GBE → license BR-ICX-7150-41U210-P-01 → 2x10GBE + 2x1GBE → license BR-ICX-7150-210U410R-P-01* → 4x10GBE
- 7150: 4x1GBE → license BR-ICX-7150-41U410R-P-01* → 4x10GBE
- 7150C: 2x1GBE → license BR-ICX-7150C-21U210R-P-01* → 2x10GBE
- 7250: 8x1GBE → license ICX7250-2X10G-LIC-POD → 2x10GBE + 6x1GBE → license ICX7250-8X10G-LIC-POD → 8x10GBE
- The base ICX 7150ZP includes two 10GBE ports. The possible upgrade path is: License BR-ICX-7150Z210U810R-P-01* → 8x10GBE

* this license includes Premium features

Following are licensing details:

ICX 7150

The ICX 7150 switch includes four 1 GbE ports. At least one 10 GbE license (two ports) is required for stacking:

Part number	Description
BR-ICX-7150-41U210-P-01	CoE certificate license to upgrade any ICX 7150 24-port or 48-port model from 4x 1G SFP to 2x 1G SFP & 2x 10G SFP+ uplink ports.

The remaining two 1 GbE ports can be used for uplink. If you need faster uplink speeds with 10 GbE, add another license:

Part number	Description
BR-ICX-7150-210U410R-P-01	CoE certificate license to upgrade any ICX 7150 24-port or 48-port model from 2x 1G SFP & 2x 10G SFP+ to 4x 10G SFP+ uplink ports. Also includes L3 features (OSPF, VRRP, PIM, PBR).

* Please note that above license is additive and contains Premium features. There is also a separate license for compact switch (BR-ICX-7150C-21U210R-P-01).

ICX 7150 Z-Series

ICX 7150 Z-Series includes two 10 GbE licensed ports. Additional 10 GbE ports are available up to a maximum of eight:

Part number	Description
BR-ICX-7150Z210U810R-P-01	CoE certificate license to upgrade the ICX 7150-48ZP, Z-Series switch from 8x 1G SFP & 2x 10G SFP+ to 8x 10G SFP+ uplink ports. Also includes L3 features (OSPF, VRRP, PIM, PBR).

ICX 7250

ICX 7250 switches include eight 1 GbE ports licensed by default. Additional 10 GbE ports are available up to a maximum of eight:

Part number	Description
ICX7250-2X10G-LIC-POD	ICX 7250 upgrade from 8x1 GbE uplink ports to 2x1/10 GbE + 6x1 GbE uplink/stacking ports. Only one 2X10G license upgrade can be applied to an ICX7250.
ICX7250-8X10G-LIC-POD	ICX 7250 upgrade from 2X1/10 GbE + 6X1 GbE uplink/stacking ports to 8X1/10 GbE uplink/stacking ports. This can only be applied to an ICX 7250 that already has a 2X10G license applied.

ICX 7450

There are two options for stacking the ICX 7450: 10 GbE front-side port and 40 GbE rear-side port.

CORE SWITCHES

The choice of correct core switch depends on the number of links, including servers, internet provider and uplinks coming from IDF. In most cases, these are fiber connections and the speeds vary from 1 GbE, 10 GbE, 40 GbE and 100 GbE. 1 GbE speeds are the most common, followed by 10 GbE, 40 GbE and 100 GbE which is rare.

Redundancy is provided by doubling power supplies and fans or by doubling appliances (or both).

SMALL MDF SCENARIO

MDF CONNECTING 1-4 IDFs

If the number of IDFs is between one and four, one switch such as the ICX 7150 can be utilized. The ICX 7150 core switch can be the same configuration as the access switch.

ICX 7150 24-port version without PoE with four 1 GbE uplinks and single power supply:

Part number	Description
ICX7150-24-4X1G	ICX 7150 switch, 24x 10/100/1000 ports, 2x 1G RJ45 uplink ports, 4x 1G SFP uplink ports upgradable to up to 4x 10G SFP+ with license, basic L3 (static routing and RIP)

ICX 7150 24-port version without PoE with factory-enabled four 10 GbE uplinks:

Part number	Description
ICX7150-24-4X10GR	ICX 7150 switch, 24x 10/100/1000 ports, 2x 1G RJ45 uplink ports, 4x 10G SFP+ uplink ports, L3 features (OSPF, VRRP, PIM, PBR)

* Please note that the configuration above contains Premium license.

In both examples above, there is no redundancy.

MDF CONNECTING 1-8 IDFs

If the number of IDFs is between one and eight, one switch such as the ICX 7250 or ICX 7150 Z-Series can be utilized.

ICX 7250 24-port version without PoE with eight 1 GbE uplinks and embedded single power supply:

Part number	Description
ICX7250-24	24-port 1 GbE switch with 8x1 GbE SFP+ (upgradeable to 10 GbE) uplink ports

ICX 7250 24-port version without PoE with eight 10 GbE uplinks and embedded single power supply:

Part number	Description
ICX7250-24-2X10G	24-port 1 GbE switch bundle with 2x1 GbE/10 GbE + 6x1 GbE SFP+ (upgradeable to 10 GbE) uplink/stacking ports upgrade
ICX7250-8X10G-LIC-POD	ICX7250 upgrade from 2X1/10 GbE + 6X1 GbE uplink/stacking ports to 8X1/10 GbE uplink/stacking ports. This can only be applied to an ICX7250 that already has a 2X10G license applied.

In both examples above, there is no redundancy. If greater redundancy level is required, the ICX 7150 Z-Series or ICX 7450 with dual power supplies and fans can be used.

ICX 7150 Z-Series 48-port version with PoE, two 1/10 GbE and six 1 GbE uplinks, and dual power supplies and fans:

Part number	Description
ICX7150-48ZP-E2X10G	ICX 7150-48ZP switch Z-Series, 16x 100/1000/2.5G PoH ports, 32x 10/100/1000 PoE+ ports, 2x 10G SFP+ and 6x 1G SFP uplink ports upgradable to 8x 10G SFP+ with license. Basic L3 (static routing and RIP). 1 RPS20-E power supply, 1 fan tray.
ICX-FAN11	Fan FRU for ICX7150-48ZP
RPS20-E	Power supply for ICX7150-48ZP

ICX 7150-48ZP 48-port version with PoE, eight 10 GbE uplinks, and dual power supplies and fans:

Part number	Description
ICX7150-48ZP-E8X10GR	ICX 7150-48ZP Switch Z-Series, 16x 100/1000/2.5G PoH ports, 32x 10/100/1000 PoE+ ports, 8x 10G SFP+, L3 features (OSPF, VRRP, PIM, PBR). 1 RPS20-E power supply, 1 fan tray.
ICX-FAN11	Fan FRU for ICX7150-48ZP
RPS20-E	Power supply for ICX7150-48ZP

(The above is also available as a bundle: ICX7150-48ZP-E8X10GR2-A).

MDF CONNECTING 1-12 IDFs

If the number of IDFs is between one and 12, one switch such as the ICX 7450 can be utilized.

ICX 7450 24-port version without PoE, 12 1 GbE uplinks, and dual power supplies and fans:

Part number	Description
ICX7450-24	24-port 1 GbE switch, three modular slots for optional uplinks/stacking. Power supply, fan & modules need to be ordered separately.
2x RPS15-E	ICX7450/6610/6650 non-POE 250W AC PSU, exhaust airflow, front-to-back airflow.
2x ICX-FAN10-E	ICX 7450 exhaust airflow fan, front-to-back airflow (two fans required when using two power supplies).
3x ICX7400-4X1GF	ICX 7450 four-port 100M/1 GbE SFP module.

ICX 7450 24-port version without PoE, 12 10 GbE uplinks, and dual power supplies and fans:

Part number	Description
ICX7450-24	24-port 1 GbE switch, three modular slots for optional uplinks/stacking. Power supply, fan & modules need to be ordered separately.
2x RPS15-E	ICX7450/6610/6650 non-POE 250W AC PSU, exhaust airflow, front-to-back airflow.
2x ICX-FAN10-E	ICX 7450 exhaust airflow fan, front-to-back airflow (two fans required when using two power supplies).
3x ICX7400-4X1GF	ICX 7450 four-port 100M/1 GbE SFP module.

MDF CONNECTING 12+ IDFs

For deployments in which more than 12 IDFs are connected, a higher uplink count is achieved by stacking. The ICX 7250 or ICX 7150 Z-Series can include eight 1 GbE or 10 GbE ports and 12 1/10 GbE ports on the ICX 7450. In stacked deployments, two ports on each unit are used for the stacking. Therefore, stacking provides an additional six 1/10 GbE ports on the ICX 7250/7150 Z-Series and an additional ten 1/10 GbE ports on the ICX 7450.

HOSPITALITY EXAMPLE

To illustrate above concept, assume the following scenario: a hotel with twelve 48-port IDFs, in which IDF 1 is 96 ports.

Starting with IDF 1: 96 ports require two 48-port switches. Both switches can be connected independently to the MDF, or via single uplink (1 or 10 GbE). There are two options for a single uplink—daisy-chaining or stacking. Stacking requires 10 GbE links between the switches (two licenses), whereas daisy-chaining makes use of 1 GbE only. The drawbacks to this latter approach are lower throughput and less flexible management.

IDF 2-12: 12 uplinks are required. With a dual-core design in which each core provides up to eight ports, that's possible: 16 ports minus 2 x 2 stacking ports yields 12 uplinks. The concept is shown in the diagram below.

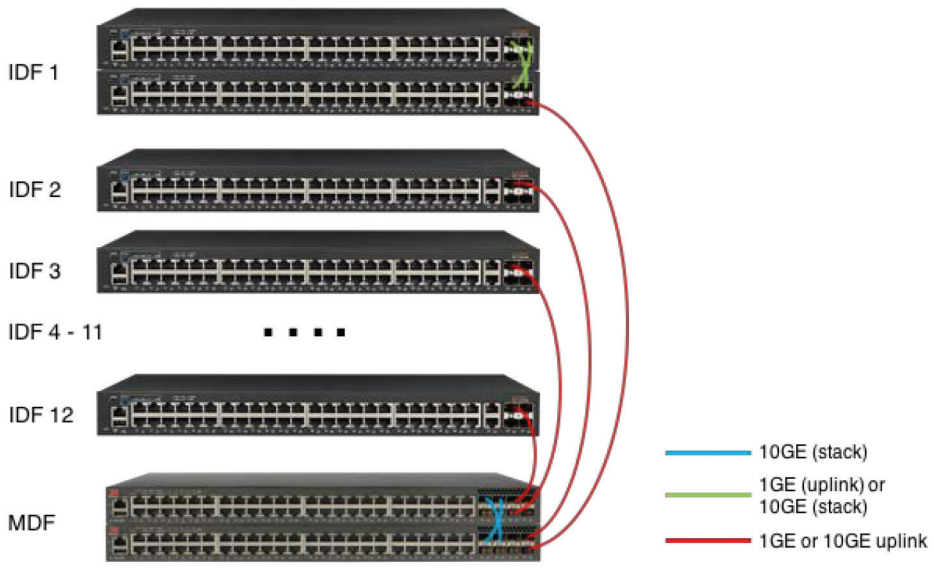

Figure 3. Typical 12-IDF design with dual-core MD

In this scenario, greater redundancy can be provided by dual-homing IDFs. In this case, each IDF would be connected via double links to two different units in the MDF stack.

MEDIUM-SIZED MDF

There is no clear distinction between a small- or medium-sized MDF. Assume a medium-sized MDF connects 24+ IDFs and requires dual power supplies.

MDF CONNECTING 1-48 IDFS

ICX 7450 48 SFP 1 GbE port version with dual power supplies and fans:

Part number	Description
ICX7450-48F	48-port 1 GbE SFP fiber switch, three modular slots for optional uplinks/stacking. Power supply, fan & modules need to be ordered separately.
2x RPS15-E	ICX7450/6610/6650 non-POE 250W AC PSU, exhause airflow, front-to-back airflow.
2x ICX-FAN10-E	ICX 7450 exhaust airflow fan, front-to-back airflow (two fans required when using two power supplies).

ICX 7650 48 SFPP 10 GbE port version with dual power supplies and fans:

Part number	Description
ICX7650-48F-E2	48-PRT(24X1/10G, 24XG) SFP bundle 2PSU

(Optional 4x10 GbE module ICX7650-4X10GF to connect four more IDFs)

MDF connecting 1-48 IDFs with a single 10 GbE link or 1-24 IDFs with double links (ICX 7750 option)

ICX 7750 48 SFPP 10 GbE plus six QSFP 40G port version:

Part number	Description
ICX7750-48F-RMT3	ICX 7750 with 48 10 GbE SFP+ ports, six 10/40 GbE QSFP+ ports, one modular slot. Base layer 3 software feature set. Requires ICX7750-L3-COE to use advanced L3 features. Power supplies, fans, interface modules, optics ordered separately. Three year RMT.
2x RPS9E	500-watt AC power supply with exhaust airflow.
ICX7750-FAN-E	Kit of four ICX7750 fan assemblies port-side air intake.

MDF connecting 24+ IDFs with single/double 10 GbE links (ICX 7750 option)

Stack multiple ICX 7750 switches and use from one to three 40G Twinax cables per switch.

Part number of 40G Twinax cable:

Part number	Description
40G-QSFP-C-00501	40 GbE QSFP direct attached copper cable, 0.5m, 1-pack, passive.

PREMIUM LICENSES

Premium licenses are mandatory for advanced features such as OSPF, VRRP, and PIM.

Features such as static routing, IGMP snooping, DHCP snooping and other Layer 2 features come standard in the base license (no extra cost).

OVERVIEW OF RUCKUS ICX 7000 PRODUCT FAMILY

	ACCESS				ACCESS/AGGREGATION		AGGRE-GATION / CORE
	ICX 7150 Compact	ICX 7150	ICX 7150 Z-Series	ICX 7250	ICX 7450	ICX 7650	ICX 7750
SWITCH CAPACITY							
Switching capacity (max)	68 Gbps	180 Gbps	304 Gbps	256 Gbps	336 Gbps	1.128 Tbps	2.56 Tbps
1 GbE RJ45 ports	12 +2	24 or 48 +2	48	24 or 48	24, 32 or 48	48	48
1 GbE SFP ports	2	4	8	8	48	48	48
1/2.5 GbE RJ45 ports			16		8		
1/2.5/5/10 GbE RJ45 prts						24	
10 GbE SFP+ ports (max)	2	4	8	8	12	24+4	96[2]
10 GbE RJ45 ports (max)					12		48
40 GbE QSFP+ ports (max)					3	2	32
100 GbE QSFP28 ports (max)						2	
PoE power budget (max)	124 W	740 W	1480 W	1480 W[1]	1496 W	1500 W	
Switches per stack (max)	12	12	12	12	12	12	12
Aggregated stack bandwidth	240 Gbps	480 Gbps	480 Gbps	480 Gbps	960 Gbps	2.4 Tbps	5.76 Tbps
KEY FEATURES							
PoE / PoE+	●	●	●	●	●	●	
Stacking	●	●	●	●	●	●	●
sFlow	●	●	●	●	●	●	●
L3: static routing / RIP/ OSPF	●	●	●	●	●	●	●
OpenFlow	●	●	●	●	●	●	●
EEE (energy efficient Ethernet)				●	●	●	
Campus fabric	●	●	●	●	●	●[3]	●
Redundant power option			●	●	●	●	●
Hot-swap PSUs & fans			●		●	●	●
Multigig (IEEE 802.3bz)			●		●	●	
802.3bt ports (90W per port)			●		●	●	
L3: BGP					●	●	●
L3: VRF				●	●	●	●
MACsec					●	●	
IPsec VPN					●		
Reversible airflow option					●	●	●
VXLAN						●[3]	●
MCT						●[3]	●

[1] With external power supply unit.
[2] With QSFP+ splitter cables.
[3] To be supported in a future software release.

WARRANTY

	ICX 7150	ICX 7250	ICX 7450	ICX 7650	ICX 7750
WARRANTY COVERAGE	**RUCKUS Assurance Limited Lifetime Warranty** • Advanced hardware replacement (next business day), Includes power supplies & fans • Lifetime software updates • For the life of the product (initial registered end user only)				
SUPPORT INCLUDED WITH PRODUCT	**90 days 8x5 remote phone support**	**3 years 24x7 remote phone support**	**90 days 8x5 remote phone support**		
PRODUCT + 3 YR. SUPPORT BUNDLES	**ICX 7150 + 3 years 24x7 remote phone support SKUs:** • ICX7150-C12P-2X10GR-RMT3 • ICX7150-24-4X10GR-RMT3 • ICX7150-24P-4X10GR-RMT3 • ICX7150-48-4X10GR-RMT3 • ICX7150-48P-4X10GR-RMT3 • ICX7150-48PF-4X10GR-RMT3 • ICX7150-48ZP-E8X10GRRMT3	**3 years 24x7 remote support included with all ICX 7250 SKUs**	**ICX 7450 + 3 years 24x7 remote phone support SKUs:** • ICX7450-24P-E-RMT3 • ICX7450-48P-E-RMT3 • ICX7450-48F-E-RMT3 • ICX7450-48P-STK-E-RMT3	**ICX 7650 + 3 years 24x7 remote phone support SKUs:** • ICX7650-48ZP-E-RMT3 • ICX7650-48P-E-RMT3 • ICX7650-48F-E-RMT3	**ICX 7750 + 3 years 24x7 remote phone support SKUs:** • ICX7750-48F-RMT3
SUPPORT INCLUDED WITH PRODUCT	**Support options include** • 4 hour parts only support • Next business day parts only support • Remote phone support • Secure uplift support				

QUOTATIONS—TYPICAL INSTALLATIONS

Sample bills of material for very small and medium-sized installations are shown below.

BOM FOR SMALL INSTALLATION

Small hotel with 80 rooms with an ICX 7150 as core switch and no edge switch (one AP per four rooms):

Part number	Description
ICX7150-24P-4X1G	ICX 7150 switch, 24x 10/100/1000 PoE+ ports, 2x 1G RJ45 uplink ports, 4x 1G SFP uplink ports upgradable to up to 4x 10G SFP+ with license, basic L3 (static routing and RIP)
901-R310-XX02	ZoneFlex R310, dual band 802.11ac indoor access point, BeamFlex, 2x2:2, 1-Port, PoE, Does not include power adapter or PoE injector. Limited Lifetime Warranty
901-1205-XX00	ZoneDirector 1200, licensed for up to five ZoneFlex access points. ZD1200 can be upgraded to support up to 75 APs with AP license upgrades if using software release pre ZD10.0. If using software ZD10.0 and above, ZD1200 can be upgraded to support up to 150 APs with license upgrades.
909-0001-ZD12	ZoneDirector 1200 Single AP License Upgrade SKU. Max orderable upgrade license quantity is 70 if using software pre ZD10.0. If using release ZD10.0 and above, max orderable upgrade license quantity is 145.
802-1205-1000	Partner WatchDog Support for ZoneDirector 1205, 1 Year
802-1201-1L00	Partner WatchDog Support for ZoneDirector one AP upgrade, 1 Year

BOM FOR MEDIUM-SIZED INSTALLATION

Assume hotel with six floors, 80 rooms per floor, one AP in every room, one floor with conference rooms. Redundant MDF and the IDF is connected with redundant 1 GbE links.

Part number	Description
ICX7150-48PF-4X1G	ICX 7150 switch, 48x 10/100/1000 PoE+ ports, 2x 1G RJ45 uplink ports, 4x 1G SFP uplink ports upgradable to up to 4x 10G SFP+ with license, basic L3 (static routing and RIP)
ICX7150-48ZP-E2X10G	ICX 7150-48ZP switch Z-Series, 16x 100/1000/2.5G PoH ports, 32x 10/100/1000 PoE+ ports, 2x 10G SFP+ and 6x 1G SFP uplink ports upgradable to 8x 10G SFP+ with license. Basic L3 (static routing and RIP). 1 RPS20-E power supply, 1 fan tray.
ICX-FAN11	Fan FRU for ICX7150-48ZP
RPS20-E	Power supply for ICX7150-48ZP
10G-SFPP-TWX-0101	Direct attached SFPP active copper, 1 M, 1-pack
10G-SFPP-TWX-P-0101	Passive direct attached SFP+copper, 1MTR, 1-pack
E1MG-SX-OM-8	1000Base-SX SFP optic 8-pack, MMF, LC connector, optical monitoring capable
901-H320-XX00	ZoneFlex 802.11ac Wave 2 dual-band concurrent 2.4 GHz (1x1:1) & 5 GHz (2x2:2), wired/wireless wall switch, MU-MIMO, BeamFlex+, 1 10/100/1000 & 2 10/100 Ethernet access ports, POE in. Does not include DC power supply.
901-R720-XX00	ZoneFlex 802.11ac Wave 2
P01-S104-XX00	SmartZone 100 with four GigE ports, 90-day temporary access to licenses.
L09-0001-SG00	AP management license for SZ-100/vSZ 3.X/SCG200/SZ300, 1 RUCKUS AP access point. Order this when you intend to run software version from 3.2 onwards.
S02-S104-1000	Partner WatchDog Support for SmartZone 100 with four GigE ports, 1 Year
S02-0001-1LSG	Partner WatchDog Support per SZ/vSZ AP, 1 Year

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- RUCKUS ICX switches
- RUCKUS cloud management software
- SYSTIMAX® and NETCONNECT: Structured cabling solutions (copper and fiber)
- imVision®: automated infrastructure management
- Era and OneCell: In-building cellular solutions
- Our extensive experience about supporting PoE and IoT

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