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IBM Ethernet Switch J48E

The IBM J48E Ethernet Switches with Virtual Chassis technology combine the high availability (HA) and carrier-class reliability of modular systems with the economics and flexibility of stackable platforms, delivering a high-performance, scalable solution for data center, campus, and branch office environments.

Figure 1. The IBM J48E Ethernet Switch

Highlights

The highlights of the IBM J48E Ethernet Switch are:

- Delivers high availability, high performance, and single point of management in a compact, power-efficient one-rack-unit form factor.

- Virtual Chassis technology enables up to 10 switches to be interconnected as a single logical device supporting up to 480 server access ports, lowering management and administrative overhead.

- Combines the cabling simplicity and modular rack-level efficiency of top-of-rack solutions with the operational ease, configuration flexibility, and high availability of end-of-row deployments.

- Optional redundant power supplies and the carrier-class Juniper Networks JUNOS Software operating system increase mean time between failures (MTBF) and reduce mean time to repair (MTTR).

- Optional Modular GbE and 10 GbE uplink ports can be installed in the field when needed, providing built-in upgradeability without requiring forklift upgrades.

- A common Juniper Networks JUNOS Software operating system across the entire IBM Ethernet j-type infrastructure delivers a consistent feature set and shortens the learning curve, lowering operational expenses.

- Includes eight class of service (CoS) queues per port, enabling separate prioritization of virtual machines.

- Scalable design allows an entire row of server switches to be managed as a single device.

Featuring complete enterprise Layer 2 and Layer 3 switching capabilities, the IBM J48E Ethernet Switches satisfy the high-density access and Gigabit Ethernet (GbE) aggregation requirements of today's high-performance businesses. A single J48E Ethernet switch can be deployed initially. As requirements grow, Virtual Chassis technology enables up to 10 switches to be interconnected and managed as a

single device, delivering a scalable, pay-as-you grow solution for expanding network environments. Optional GbE and 10GbE uplink modules enable high-speed connectivity to aggregation-layer or core-layer switches.

High-availability features such as optional internal redundant, hot-swappable power supplies and a field-replaceable fan tray with redundant blowers ensure maximum uptime. The switches also support full and partial PoE options, delivering a full 15.4 watts of Class 3 PoE to support IP-enabled telephones, video cameras, and wireless LAN (WLAN) access points in converged network environments.

The IBM J48E Ethernet Switches include an integrated routing engine (RE) that runs the same modular Junos operating system as other Juniper switches, routers, and security devices, ensuring a consistent implementation of control plane features across an entire Juniper infrastructure. When two or more IBM J48E Ethernet Switches are interconnected, the Junos software leverages the multiple REs to deliver Graceful Route Engine Switchover (GRES) and Layer 2 non-stop forwarding in the event of an RE failure, delivering the reliability of a chassis-based switch. Table 1 lists part number information.

Table 1. Part number information

Description	Part number
IBM J48E	427348E
0.6 m Blue Cat5e Cable	40K5679
1.5 m Blue Cat5e Cable	40K8785
3 m Blue Cat5e Cable	40K5581
10 m Blue Cat5e Cable	40K8927
25 m Blue Cat5e Cable	40K8930
SFP+ Transceiver (Juniper)	45W4743
1GE Copper RJ-45 100 m SFP	45W4475
Exx Uplink Module 2x 10 G / 4x 1 G	45W4453
J48E Power Supply	45W4437
4 Post Rack Mount Kit	45W5960
VC Cable 1 Meter	45W5961
VC Cable 3 Meter	45W5962
VC Cable 5 Meter	45W5963
E48 Switch Adv Features	45W4573
Exx Power Cable, Australia	45W4599
Exx Power Cable, China	45W4600
Exx Power Cable, Europe	45W4601
Exx Power Cable, Italy	45W4602
Exx Power Cable, UK	45W4603
Exx Power Cable, US/Japan	45W4604

The IBM J48E Ethernet Switches with Virtual Chassis technology delivers a high-performance, scalable, and highly reliable solution for data center, branch, and campus environments (Figure 2).
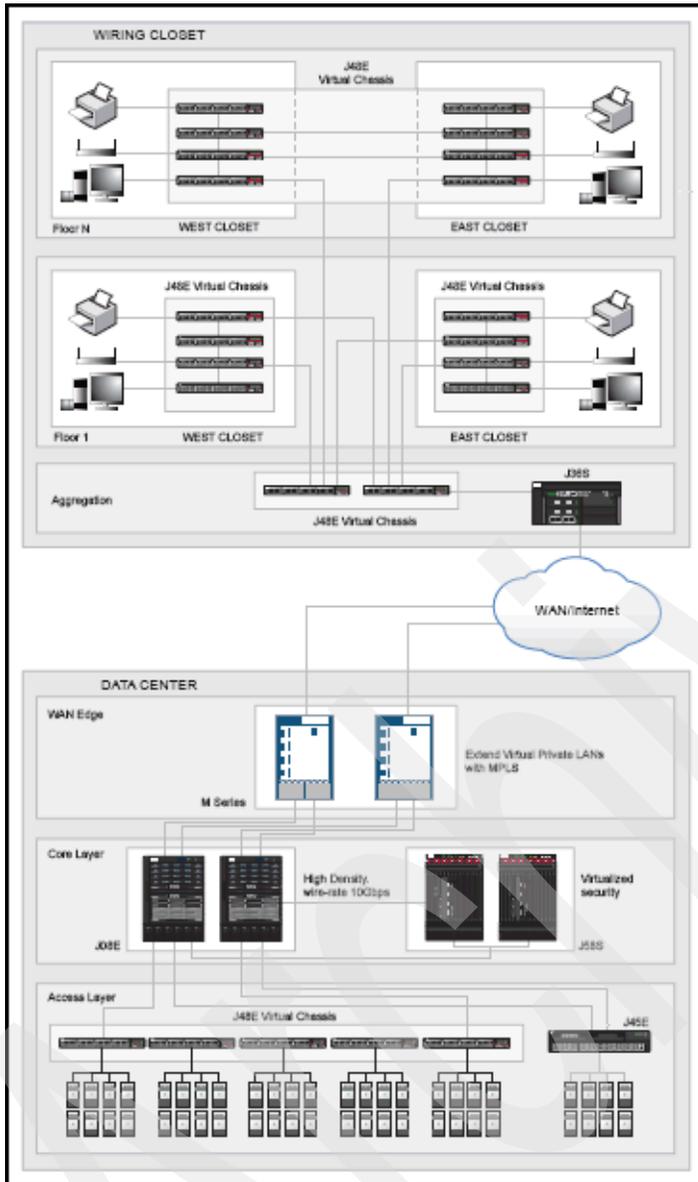

Figure 2. IBM J48E Ethernet Switches with Virtual Chassis technology

Virtual Chassis technology

With Virtual Chassis technology, up to 10 IBM J48E switches can be interconnected to create a single logical device supporting up to 480 10/100/1000BASE-T ports or 240 100/1000BASE-X ports, plus an additional 4 GbE or two 10 GbE uplink ports. Different models can be mixed in a Virtual Chassis configuration to provide a variety of port and density options.

In a Virtual Chassis configuration, all switches are monitored and managed as a single device, enabling enterprises to separate physical topology from logical groupings of endpoints and allowing more efficient resource utilization. Highly resilient topologies can also be created using the GbE or 10 GbE uplink ports to extend the Virtual Chassis configuration across long distances spanning multiple wiring closets, floors, and even buildings.

Using Virtual Chassis technology, up to 10 IBM J48E Ethernet Switches can be interconnected to create a single logical device spanning multiple wiring closets, floors, and even buildings (Figure 3).
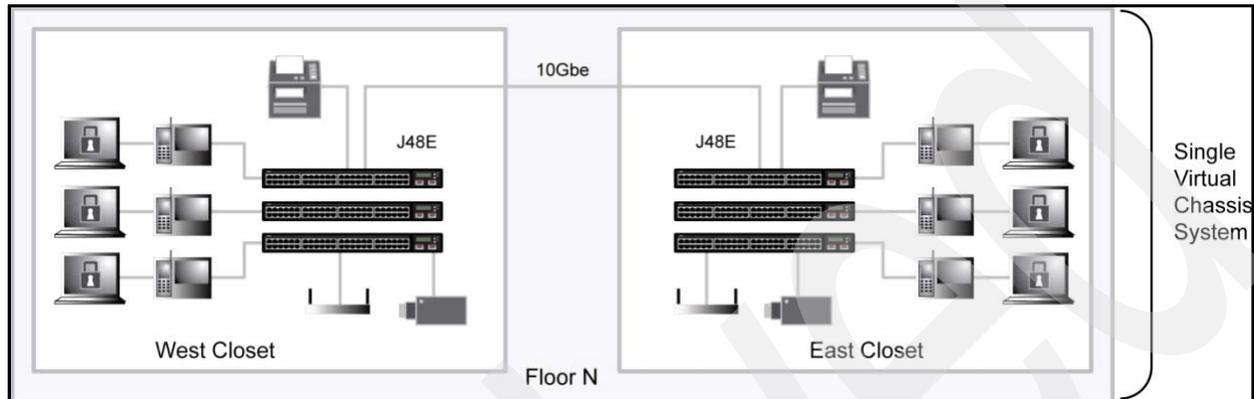

Figure 3. Single Virtual Chassis System

Features and benefits

The IBM J48E line of Ethernet switches delivers the same HA functionality and supports many of the same failover capabilities as other Juniper chassis-based systems.

Each IBM J48E switch is capable of functioning as a Route Engine. When two or more IBM J48E switches are interconnected in a Virtual Chassis configuration, they share a single control plane among all Virtual Chassis member switches. When two IBM J48E switches are interconnected, the Junos operating system automatically initiates an election process to assign a master (active) and backup (hot-standby) Route Engine. An integrated Layer 2 and Layer 3 Graceful Route Engine Switchover (GRES) feature maintains uninterrupted access to applications, services, and IP communications in the unlikely event of a primary RE failure.

When more than two switches are interconnected in a Virtual Chassis configuration, the remaining switch elements act as line cards and are available to assume the backup RE position should the designated master fail. Master, backup, and line card priority status can be assigned by the network operations team to dictate the order of ascension. This N+1 RE redundancy, coupled with the GRES and, in the future, the nonstop routing (NSR) and nonstop bridging (NSB) capabilities of the Junos OS, ensures a smooth transfer of control plane functions following unexpected failures.

Support for GRES ensures a smooth and seamless transfer of control plane functions following a master route engine failure (Figure 4).
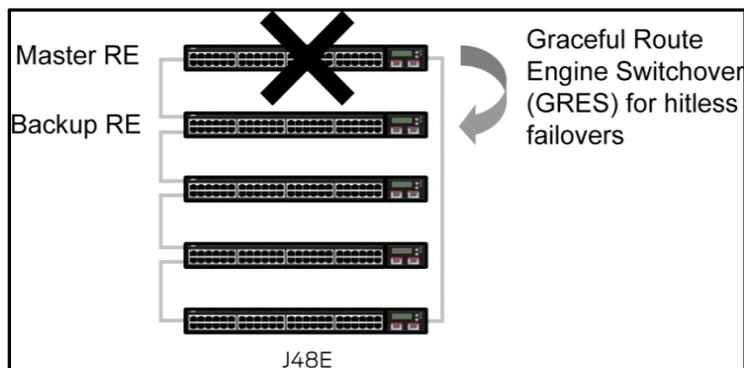

Figure 4. Graceful Route Engine Switchover

By utilizing a consistent operating system and a single configuration file, all switches in a Virtual Chassis configuration are treated as a single device, simplifying overall system maintenance and management.

Individually, the IBM J48E Ethernet switches offer a number of HA features that are typically associated with modular chassis-based switches. When combined with the field-proven Junos operating system and L2/L3 failover capabilities, these features provide the IBM J48E with true carrier-class reliability.

The HA feature highlights are:

● Optional redundant power supplies: The IBM J48E Ethernet switches support optional internal redundant, load-sharing, hot-swappable, and field-replaceable AC and DC power supplies to maintain uninterrupted operations. Thanks to its compact footprint, the IBM J48E requires significantly less power than chassis-based switches delivering equivalent port densities.

● Hot-swappable fan tray with multiple blowers: The IBM J48E Ethernet switches include a hot-swappable, field-replaceable fan tray with three blowers, providing sufficient cooling even if one of the blowers were to fail.

● Redundant trunk group (RTG): To avoid the complexities of the Spanning Tree Protocol (STP) without sacrificing network resiliency, the IBM J48E Ethernet switches employ redundant trunk groups to provide the necessary port redundancy and simplify switch configuration.

● Cross-member link aggregation: Cross-member link aggregation allows redundant link aggregation connections between devices in a single Virtual Chassis configuration, providing an additional level of reliability and availability.

● Carrier-class hardware: The IBM J48E Ethernet switches leverage a purpose-built packet forwarding engine ASIC, the PFE that helps the IBM J48E Ethernet switches deliver the same predictable, scalable functionality found in the world's largest networks.

Features and specifications

In this section we list the features and density specifications of the IBM Ethernet Switch J48E (427348E):

● Form Factor Fixed platform (single switch)
● Virtual Chassis configuration consists of up to 10 switches
● Dimensions (W x H x D): 17.4 x 1.7 x 16.4 in (44.21 x 4.32 x 41.73 cm)
● One rack unit (single switch)
● Backplane speed: 128 Gbps (Virtual Chassis)

- Data rate: 136 Gbps
- Aggregate switching capacity: 264 Gbps
- 10/100/1000BASE-T Port Densities 101 Mpps (wire speed)
- 100BASE-FX/1000BASE-X (SFP) Port, four per platform (via optional four-port GbE uplink module)
- Up to 40 in. Virtual Chassis configuration
- 10GBASE-X Port Densities: Two per switch (via optional two-port 10 GbE uplink module)
- Up to 20 in Virtual Chassis configuration
- Resiliency: Internal, hot-swappable redundant power supply; field-replaceable fan tray with three fans; GRES in Virtual Chassis configuration
- Power options AC: 320 W, 600 W, and 930 W autosensing; 100 – 120 V/200 – 240 V; dual load-sharing hot-swappable internal redundant power supplies
- Operating System Juniper Networks JUNOS® Software QoS Queues/Port 8
- MAC addresses: 24,000
- Jumbo frames: 9216 bytes
- IPv4 Unicast/Multicast Routes: 10,000/2,000
- Number of VLANs: 4,096
- ARP Entries: 16,000

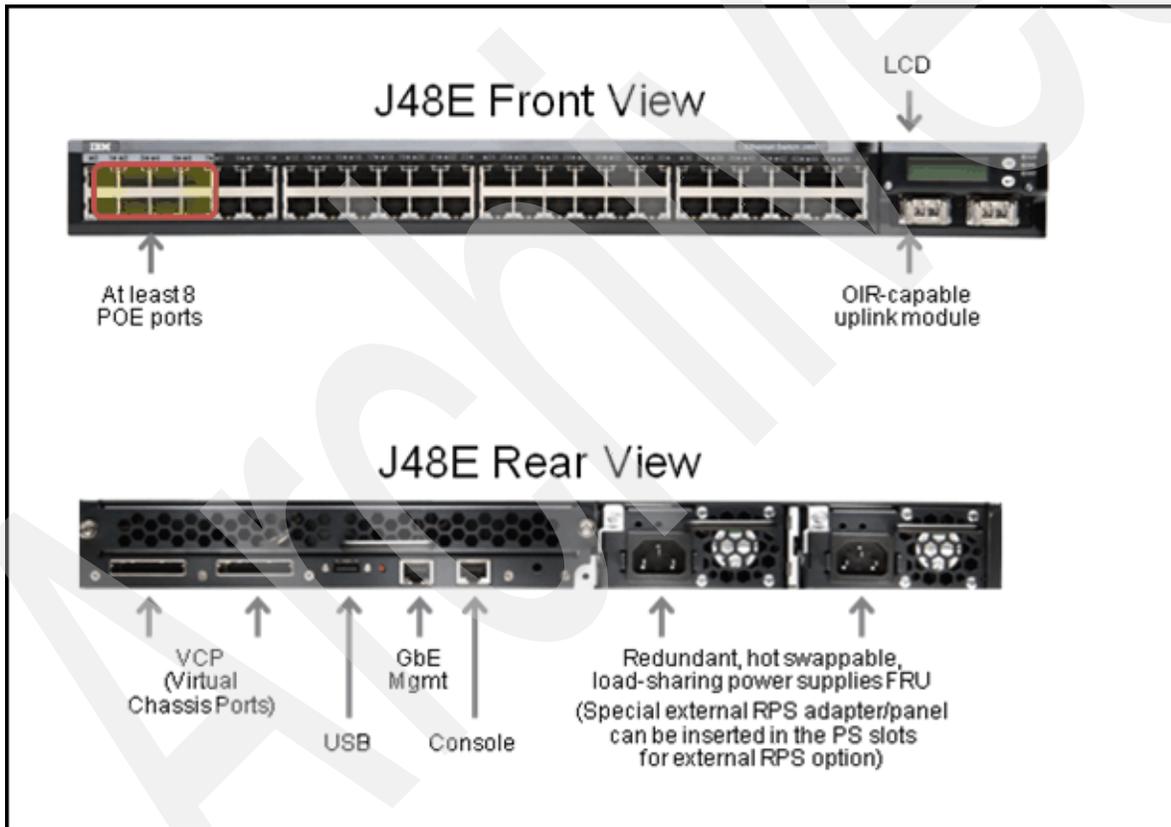Figure 5 shows the front and rear views of the J48E.

Figure 5. J48E front and rear views

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