

# Sun™ Datacenter Switch 3456

Massive scalability, reduced complexity,  
and breakthrough economics



## Highlights

- Reduces the cost and complexity of delivering large-scale HPC solutions
- Replaces up to 300 discrete switching elements — and thousands of cables — with a single standards-based, fully nonblocking, monolithic core switch
- 3,456 DDR 4x ports realized with 1,152 12x connectors in a single double-wide chassis
- Ultrahigh-density InfiniBand core switch with unrivaled capacity for up to 3,456 InfiniBand-attached servers and storage systems with 110 terabits or cross-sectional bandwidth
- Total supercomputing solution — offers extremely low latency using industry-standard InfiniBand (IB) transport and commodity AMD Opteron™, Intel® Xeon®, and SPARC® processors
- Supports IB next-generation, fabric-wide, congestion management with FECN and BECN congestion control mechanisms
- Integrated cable management designed to efficiently direct up to 1,152 cables either under the floor or up to the ceiling



The Sun™ Datacenter Switch 3456 minimizes the cost and complexity of delivering large-scale HPC solutions by replacing up to 300 discrete switching elements — and thousands of cables — with a single standards-based, fully nonblocking, monolithic core switch. The switch represents a breakthrough in industry-standard petascale supercomputing fabrics, combining three major innovations: ultrahigh density with 24 hot-swappable line cards, each with the capacity to connect 144 DDR 4x end nodes; a new connector and cabling system that consolidates three 4x connections into a single connector and 12x passive cable; and leveraging Sun's embedded leaf switch with integrated HCAs to deliver unprecedented congestion control across a fabric of up to four Sun Datacenter Switch 3456 components using forward explicit congestion notification (FECN) and backward explicit congestion notification (BECN) — eliminating hot spots in the fabric and driving maximum throughput at the lowest possible latencies.

## Fabric consolidation, power efficiency, and scalability

The Sun Datacenter Switch 3456 eliminates up to 10 tons of racks, switches, and copper cabling endemic to alternative Clos fabric offerings. It also minimizes power demands — a fully populated Sun Datacenter Switch 3456 consumes less than 40 kW under load. The switch is also designed to seamlessly integrate with the Sun Blade™ 6048 InfiniBand Switched Network Express Module, extending the fabric to include up to four Sun Datacenter Switch 3456s, for a total of 13,824 end nodes. The

resilient design and management of the switch provides up to 720 industry-standard InfiniBand switching elements connected in a full Clos or Fat-Tree topology. Sun also provides valuable services that can support the switch — and your infrastructure — throughout its complete lifecycle. This includes the Sun Customer Ready program, which can help with design validation, integration, and testing of Sun and third-party components — offering integrated systems that leave the Sun factory built to your specifications and ready to deploy.

# Sun Datacenter Switch 3456 Specifications

## Switch architecture

- 3,456 ports based upon five-stage Clos fabric
- Custom double-wide rack chassis
- 24 horizontally installed line cards, each providing 144 DDR 4x ports
- 18 vertically installed fabric line cards, each with eight modular high-performance fans
- Passive orthogonal midplane provides direct connection between line cards and fabric cards
- Integrated cable management designed to route a maximum of 1,152 cables to either floor or ceiling

## Sun Datacenter Switch 3456 line card

- 38 in. W x 12.5 in. D line card supports 144 DDR 4x ports with 48 high-density 12x connectors
- LED indication of physical and logical link status
- Weight: 39.7 lbs.
- Hot-swappable

## Interconnect system

- Passive 12x cables and custom-tooled miniature 12x connectors support three times the density of conventional CX4 cables
- 3,456 total 4x ports require only 1,152 12x connectors
- Active cable circuitry in line card and Sun Blade 6048 Switched InfiniBand NEM, effectively doubling the supported cable length for DDR to 15 meters
- Hybrid passive 12x splitter cable supports connectivity to three conventional CX4 end nodes with active circuitry embedded in the CX4 connector
- Cable serial number in NVRAM readable by the Chassis Management Module
- Local and remote cable insertion detection
- Remote node power-up detection through cable

## Switch specifications

- Data throughput: 110 Tb/sec.
- Port-to-port latency: 700 nanoseconds
- Congestion control with FECN and BECN

- Data virtual lanes: Eight
- Management virtual lanes: One
- MTU: 2,048 bytes
- Combined with Sun Blade 6048 Switched InfiniBand NEM, it supports scalability up to 13,824 end nodes in seven-stage Clos fabric

## Management capabilities

- Fully redundant Chassis Management Modules
- Monitors all critical chassis functions: power, cooling, line card, fan modules, and fabric cards
- Automatic connectivity verification
- InfiniBand 1.2-compliant managers and agents
- Supported management protocols: IPMI for chassis environmentals, SNMPv2, Telnet, SSH, HTTP, SunMC, Sun Fabric Director
- Connectors: two RS-232 (RJ45), dual 10/100 Base-T (RJ45)
- Solaris™ Subnet Manager designed for maximum scalability

## Recommended services

- HPC Quick Start Services
- Sun<sup>SM</sup> Managed Operations
- SunSpectrum<sup>SM</sup> Support

## Power requirements

- Six to 16 2,600 W power supplies, depending on line card population
- Two discrete power domains, each with N+1 power protection
- Line card power (cables copper/optical): 1,100 W/1,200 W
- Fabric card power: 360 W
- Fan module: 18 W
- Chassis management controller: 10 W
- Fully populated chassis: 36 kW

## Thermal management

- Airflow: front to rear — line card to fabric card
- Total airflow: 3,600 CFM

## Learn More

To learn more about the Sun Datacenter Switch 3456, go to: [sun.com/ds3456](http://sun.com/ds3456), [sun.com/6048chassis](http://sun.com/6048chassis), [sun.com/sunconstellationsystem](http://sun.com/sunconstellationsystem).

## Dimensions

	Without cable management	With cable management
Height	62 in.	62 in.
Width	48 in.	71.6 in.
Depth	28.5 in.	44.4 in.
Weight	2,561.27 lbs.	2,908.8 lbs.

## Serviceability

- FRUs: LC, FC, and CMC
- CRUs: Power supply unit and fan module
- Warranty: One year
- Enclosure hardware support: Three years
- Call response: Eight hours

## Environmental

- AC power: 200–240 V AC, 47–63 Hz, 2,078 VA
- Operating temperature: 5° to 32° C (41° to 89.6° F) 5–90% relative humidity, noncondensing, 27° C max. wet bulb

## Regulatory

- Safety: UL/CSA 60950-1, EN60950-1, IEC 60950 CB Scheme with all country deviations, IEC825-1, 2, and CFR 21 part 1040
- Ergonomics: EK1 - ITB – 2000
- RFI/EMC: EN55022/CISPR 22, Class A, FCC CFR47 Part 15 Class A, EN61000 -3 -2, EN61000 -3 -3
- Immunity: EN55024/CISPR 24
- Telecommunication: EN300 – 386
- Regulatory marks: CE, FCC, ICES-003, C-tick, VCCI, GOST-R, BSMI, MIC, UL/cUL, TUV-GS, TUV/S-mark



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