Z9512 • Next Generation Datacenter & Cloud Core Platform

16.8 Tbps raw switching capacity delivering highest density, ultra high performance Core / Aggregation platform for next generation DC/Cloud applications

400Gbps per slot with support for 40 x 10 GbE, 8 x 40 GbE, 4 x 100 GbE Line Cards

High performance backplane designed to scale to 1 Tbps per slot

Higher throughput with less power enabling energy efficient and high performance data centers

Standards based industry's highest density 10 GbE/40 GbE/100 GbE line cards

Full suite of Layer 2, Layer 3, Automation and Virtualization features

Designed to support highly scalable control planes for Layer 2, Layer 3 and MPLS traffic

The New Order in Datacenter Core Switching & Routing

ZettaScale is the next generation family of core switching and routing platform from Force10 Networks providing unparallel density and capacity in a reduced footprint that opens a new horizon of possibilities to build massively scalable Data Center Networks and Cloud based Network Infrastructure. ZettaScale family of products outperform the competition in throughput, scalability, density, open standards and future proof design. Switching and routing capabailities at low power consumption and reduced heat dissipation enable the design of large scale high performance datacenters and cloud computing networks in an energy efficient manner. Z9512 is a 12 traffic slots fully redundant chassis platform in the ZettaScale family of products.

Application

- Core/Aggregation platform for High Performance, Virtualized Datacenters and Cloud Clusters
- ZettaScale's 10, 40, and 100 GbE port densities enable non-blocking core architectures for High Performance Computing and Data Center Core Networking
- ZettaScale provides lossless, low latency and highly scalable Open Cloud Switching fabric enabling cloud architectures that scale exponentially.

Key Features

- An aggregation platform that provides the highest 10, 40, and 100 GbE port density with complete non-blocking throughput and low latency
- Provide high degree of virtualization and network automation capability that is required in the Core and Edge to enable a truly virtualized Data Center
- Scalable data plane with high capacity forwarding tables and quality of service enabled
- High scalable control plane protocols for Layer 2, Layer 3 and MPLS deployments
- High availability and resiliency features to minimize network downtime
- Fully redundant, hot-swappable platform providing n+1 redundant switch fabric, 1:1 redundant RPM, n+1 redundant power supply and 1+1 fan redundancy
- Network virtualization and automation to enable a fully virtualized data center.

FORCE10

Specifications: Z9512 Next Generation Datacenter and Cloud Core Switch

Ordering Information

Order Number	Description
CH-Z9512	Z9500 12 Slot Chassis with backplane
CC-Z9500-CFAN	Z9500 Common Fan Tray
CC-Z9500-SFM-FAN	Z9500 SFM Fan Tray
CC-Z9512-SFM1	Z9500 Switch Fabric Module
LC-Z9500-RPM	Z9500 Route Processor Module
CC-Z9500-PWR-3000W-AC	Z9500 3000W AC Power Supply
CC-Z9500-PWR-DC	Z9500 DC Power Entry Module*
CB-Z9500-3000W-AC-US250	Z9500 5-Pack AC Power Cords, US/Canada, N6-20, 250V, (2.5m or 8ft)
SW-Z9500-LATEST	Z9500 Force10 FTOS Operating System
LC-Z9500-10GE-40S	Z9500 40-port 10 GbE line card with pluggable SFP+ optics – Standard (SFP+ optics required)
LC-Z9500-10GE-40S-E	Z9500 40-port 10 GbE line card with pluggable SFP+ optics – Enhanced (SFP+ optics required)
LC-Z9500-40GE-8P	Z9500 8-port 40 GbE line card with pluggable QSFP optics – Standard (QSFP optics required)
LC-Z9500-10GE-8P-E	Z9500 8-port 40 GbE line card with pluggable QSFP optics – Enhanced (QSFP optics required)
LC-Z9500-100GE-4C	Z9500 4-port 100 GbE line card with pluggable CFP optics – Standard (CFP optics required)
LC-Z9500-100GE-4C-E	Z9500 4-port 100 GbE line card with pluggable CFP optics – Enhanced (CFP optics required)
LC-Z9500-GE-90M	Z9500 90-port GbE line card with MRJ21 interface – Standard
LC-Z9500-GE-90M-E	Z9500 90-port GbE line card with MRJ21 interface – Enhanced
CC-Z9500-BLNK-LC	Line Card Blank Panel
CC-Z9500-BLNK-RPM	Route Processor Module Blank Panel
CC-Z9512-BLNK-SFM	Switch Fabric Module Blank Panel
CC-Z9500-BLNK-PWR	12 Slot Chassis Power Module Blank Panel
CC-Z9500-FLTR	Air Filter
CC-Z9500-CMK	Cable Management Kit
CC-Z9500-RAILS	Rails for Rack Mounting
GP-QSFP-40GE-1SR	40 GbE QSFP+ short reach optics
GP-QSFP-40GE-1LR	40 GbE QSFP+ long reach optics
CBL-QSFP-40GE-10M	40 GbE QSFP+ active fiber cable (10m)
CBL-QSFP-40GE-50M	40 GbE QSFP+ active fiber cable (50m)
CBL-QSFP-40GE-PASS-1M	40 GbE QSFP+ passive cable (1m)
CBL-QSFP-40GE-PASS-5M	40 GbE QSFP+ passive cable (5m)
GP-10GSFP-1S	Qualified 10 GbE SFP+ optics module – SR
GP-10GSPF-1L	10 GbE LR Optics
GP-10GSFP-1E	Qualified 10 GbE SFP+ optics module – ER
GP-SFP2-1S	Qualified GbE SFP optics module – SX
GP-SFP2-1T	Qualified GbE SFP module – 1000Base-T
GP-SFP2-1Y	Qualified GbE SFP optics module – LX
GP-SFP2-1Z	Qualified GbE SFP optics module – ZX
CBL-10GSFP-DAC-0.5M	10 GbE SFP+ Direct Attach Copper Cable (0.5m)
CBL-10GSFP-DAC-1M	10 GbE SFP+ Direct Attach Copper Cable (1m)
CBL-10GSFP-DAC-2M	10 GbE SFP+ Direct Attach Copper Cable (2m)
CBL-10GSFP-DAC-5M	10 GbE SFP+ Direct Attach Copper Cable (5m)
CBL-10GSFP-DAC-7M	10 GbE SFP+ Direct Attach Copper Cable (7m)
CBL-10GSFP-DAC-10M	10 GbE SFP+ Direct Attach Copper Cable (10m)

* see above?

Physical
12 Line Card Slots
Size: 19 RU, 33″ h x 17″ w x 30″ d
(83.82 cm h x 43.18 cm w x 76.2 cm d)

AC Power
Nominal input voltage:
200-240 VAC 50/60 Hz
Maximum thermal output:
40160 BTU/h (11770 W) at 200/240 VAC
Maximum input current per module:
16 A at 200 VAC

Maximum system power input:
3.2 KVA at 200/240 VAC

Maximum power consumption:
11770 W at 200/240 VAC

DC Power*
Nominal input voltage: –44 to -60 VDC
Maximum thermal output: 40160 BTU/h (11770 W)
Maximum current draw per DC PEM: 52 A
Maximum power consumption: 11770 W

Maximum Operating Specifications:
Temperature: 32° to 104°F (0° to 40°C)
Altitude: no degradation to 10,000 feet (3,048 m)
Relative humidity: 5 to 85 percent, noncondensing

Maximum Non-operating Specifications:
Temperature: -40° to 158°F (-40° to 70°C)
Maximum altitude: 15,000 feet (4,572 meters)
Relative humidity: 5 to 95 percent, noncondensing

Redundancy
N+1 Power Supply redundancy
1+1 Power Source redundancy
1:1 Redundant RPM modules
N+1 Redundant SFM modules
1+1 redundant module fan trays
1+1 redundant SFM fan trays
Hot swappable power supply
Hot swappable fan trays
Hot swappable line cards
Redundant PCIe based SFM Management
Hot Swappable SFM modules (without cell loss)
Non Stop Forwarding (Graceful Restart)
Stateful RPM Failover
ISSU (Hitless In Service Software Upgrade)*

Performance
MAC addresses: 1M
IPv4 routes: 1M
Switch fabric capacity: 9.6 Tbps (full-duplex)
Queues per port: 8 COS queues
VLANs: 4096
Line-rate Layer 2 switching
Line-rate Layer 3 routing: IPv4 and IPv6
ACLs: 128K ingress, 8K egress
LAGs: 256 with up to 64 members per LAG.
LAG load balancing: based on Layer 2, IPv4 or IPv6 headers
Packet buffer memory: 8GB per LC
CPU memory: 24GB per CPU

IEEE Compliance

802.1AB	LLDP
802.1ag	Connectivity fault Management
802.1D	Bridging, STP
802.1p	L2 Prioritization
802.1Q	VLAN Tagging, Double VLAN Tagging, GVRP
802.1ad	Q-in-Q
802.1s	MSTP
802.1w	RSTP
802.1X	Network Access Control
802.3ab	Gigabit Ethernet (1000BASE-T)
802.3ac	Frame Extensions for VLAN Tagging
802.3ad	Link Aggregation with LACP
802.3ae	10 Gigabit Ethernet (User configurable LAN/WAN PHY) 10GBASE-X/-W
802.3ba	40 Gigabit Ethernet on optical ports 40GBase-SR4/-CR4/-LR4
802.3ba	100 Gigabit Ethernet on optical ports 100 GBase-LR4/-SR4
802.3u	Fast Ethernet (100BASE-TX) on mgmt ports
802.3x	Flow Control
802.3z	Gigabit Ethernet (1000BASE-X)

ANSI/TIA-1057 LLDP-MED
Force10 PVST+
MTU 12,000 bytes

Data Center Protocols
TRILL*

RFC and I-D Compliance

General Internet Protocols

768	UDP
793	TCP
854	Telnet
959	FTP
1321	MD5
1350	TFTP
2474	Differentiated Services
2698	Two Rate Three Color Marker
3164	Syslog

SSHv2

General IPv4 Protocols

791	IPv4
792	ICMP
826	ARP
1027	Proxy ARP
1035	DNS (client)
1042	Ethernet Transmission
1191	Path MTU Discovery
1305	NTPv3
1519	CIDR
1542	BOOTP (relay)
1812	IPv4 Routers
1858	Security considerations for IP Fragment Filtering
2131	DHCP Server and Relay
2338	VRRP
3021	31-bit prefixes on point-to-point IPv4 links
3046	DHCP Option 82
3069	Private VLAN
3128	Tiny Fragment Attack Protection

IPv4 Routing Protocols

RIP

1058	RIPv1
2453	RIPv2

OSPF

1587	NSSA
1745	OSPF/BGP interaction
1765	OSPF Database overflow
2154	MD5
2328	OSPFv2
2370	Opaque LSA
3101	OSPF NSSA
3623	OSPF Graceful Restart
4222	Prioritization and congestion avoidance with OSPFv2

Specifications: Z9512 Next Generation Datacenter and Cloud Core Switch

IS-IS

1142 IS-IS
1195 IPv4 Routing
2763 Dynamic Hostname
2966 Domain-Wide Prefixes
3373 Three-way Handshake
3567 MD5
3784 Wide Metrics
5301 Dynamic Hostname Exchange.
5302 Dynamic Wide Prefixes
5303 Three-way Handshake
5304 MD5
5305 TE Extensions to ISIS
5306 Restart Signaling for IS-IS
5308 IS-IS for IPv6
5120 Multi Topology Routing in IS-IS
draft-ietf-isis-igp-p2p-over-lan-06
Point-to-Point Operation
draft-ietf-isis-ipv6-06
IPv6 Routing
draft-kaplan-isis-ext-eth-02
Extended Frame Size

BGP

1997 Communities
2385 MD5
2439 Route Flap Damping
2545 Multiprotocol Extension for IPv6
2796 Route Reflection
2842 Capabilities
2858 Multiprotocol Extensions
2918 Route Refresh
3065 Confederations
4271 BGP-4
4360 Extended Communities
4724 BGP Graceful Restart
4760 Multiprotocol Extensions
4893 4-byte ASN
5396 4-byte ASN representations
5492 Capabilities Advertisement
draft-ietf-idr-bgp4-20 BGPv4
draft-ietf-idr-restart-06 Graceful Restart
draft-michaelson-4byte-as-representation-05
4-byte ASN Representation (partial)
draft-ietf-idr-add-paths-04.txt ADD PATH

Multicast

1112 IGMPv1
2236 IGMPv2
2710 MLDv1
3376 IGMPv3
3569 SSM for IPv4/IPv6
3618 MSDP
3810 MLDv2
4541 IGMPv1/v2/v3, MLDv1 Snooping, MLDv2 Snooping
draft-ietf-pim-sm-v2-new-05
PIM-SM for IPv4/IPv6
4601 PIM-SM for IPv4/IPv6

General IPv6 Protocols

1981 Path MTU Discovery (partial)
2460 IPv6
2461 Neighbor Discovery (partial)
2462 Stateless Address Autoconfiguration (partial)
2464 Ethernet Transmission
2675 Jumbo grams
3687 Global Unicast Address Format
4291 IPv6 Addressing
4443 ICMPv6
5798 VRRPv3 for IPv6

IPv6 Routing Protocols

2080 RIPng
5340 OSPFv3
2545 BGP-4 extensions for IPv6
5308 IS-IS for IPv6
draft-ietf-pim-sm-v2-new-05
PIM-SM for IPv4/IPv6
4601 PIM-SM for IPv4/IPv6

Network Management

1155 SMIv1
1156 Internet MIB
1157 SNMPv1
1212 Concise MIB Definitions
1215 SNMP Traps
1493 Bridges MIB
1657 BGP-4
1724 RIPv2 MIB (roadmap?)
1850 OSPFv2 MIB
ISIS MIB
1901 Community-based SNMPv2
2011 IP MIB
2012 TCP MIB
2013 UDP MIB
2024 DLSw MIB
2096 IP Forwarding Table MIB
2570 SNMPv3
2571 Management Frameworks
2572 Message Processing and Dispatching
2574 SNMPv3 USM
2575 SNMPv3 VACM
2576 Coexistence Between SNMPv1/v2/v3
2578 SMIv2
2579 Textual Conventions for SMIv2
2580 Conformance Statements for SMIv2
2618 RADIUS Authentication MIB
2665 Ethernet-like Interfaces MIB
2674 Extended Bridge MIB
2787 VRRP MIB
2819 RMON MIB (groups 1, 2, 3, 9)
2863 Interfaces MIB
2865 RADIUS
2933 IGMP MIB
3273 RMON High Capacity MIB
3416 SNMPv2
3418 SNMP MIB
3434 RMON High Capacity Alarm MIB
3580 802.1X with RADIUS
3815 LDP MIB
4292 IPv6 Forwarding Table MIB
4293 IPv6 MIB
5060 PIM MIB
IPv4 Multicast MIB
ANSI/TIA-1057 LLDP-MED MIB
draft-grant-tacacs-02 TACACS+
draft-ietf-idr-bgp4-mib-06 BGP MIBv1
IEEE 802.1AB LLDP MIB
IEEE 802.1AB LLDP DOT1 MIB
IEEE 802.1AB LLDP DOT3 MIB
ruzin-mstp-mib-02 MSTP MIB (traps)
sFlow.org sFlowv5
sFlow.org sFlowv5 MIB (version 1.3)
FORCE10-BGP4-V2-MIB Force10 BGP MIB
(draft-ietf-idr-bgp4-mibv2-05)
FORCE10-IF-EXTENSION-MIB
FORCE10-LINKAGG-MIB
FORCE10-COPY-CONFIG-MIB
FORCE10-MON-MIB
FORCE10-PRODUCTS-MIB
FORCE10-SS-CHASSIS-MIB
FORCE10-SMI
FORCE10-SYSTEM-COMPONENT-MIB
FORCE10-TC-MIB
FORCE10-TRAP-ALARM-MIB
FORCE10-FORWARDINGPLANE-STATS-MIB

MPLS

2702 Requirements for TE Over MPLS
3031 MPLS Architecture
3032 MPLS Label Stack Encoding
3209 RSVP-TE: Extensions to RSVP for LSP Tunnels
3630 TE Extensions to OSPF Version 2
3784 IS-IS Extensions for TE
3812 MPLS-TE MIB
3813 MPLS LSR MIB
4090 Fast Reroute Extensions to RSVP-TE for LSP Tunnels
4379 Detecting MPLS Data Plane Failures (TE/LDP)
Ping & Traceroute
5036 LDP Specification
5063 Extensions to GMPLS RSVP Graceful Restart

Regulatory Compliance

Safety

AS/NZS 60950
UL/CSA 60950-1, Second Edition
EN 60950-1, Second Edition
IEC 60950-1, Second Edition Including all National Deviations and Group Differences
EN 60825-1 Safety of Laser Products Part 1: Equipment Classification Requirements and User's Guide
EN 60825-2 Safety of Laser Products Part 2: Safety of Optical Fibre Communication Systems
FDA Regulation 21 CFR 1040.10 and 1040.11

Emissions

EMC compliance
Australia/New Zealand: AS/NZS CISPR 22: 2006, Class A
Canada: ICES-003, Issue-4, Class A
Europe: EN 55022: 2006+A1:2007 (CISPR 22: 2006), Class A
Japan: VCCI V3/2009 Class A
USA: FCC CFR 47 Part 15, Subpart B:2009, Class A
VCCI (Japan) Class A
KN22 (Korea) Class A
CNS13438 (Taiwan) Class A
CISPR24
EN55024
EN61000-3-2
EN61000-3-3
EN61000-6-1
EN300 386

Immunity

EN 300 386 V1.4.1:2008 EMC for Network Equipment
EN 55024: 1998 + A1: 2001 + A2: 2003
EN 61000-3-2: Harmonic Current Emissions
EN 61000-3-3: Voltage Fluctuations and Flicker
EN 61000-4-2: ESD
EN 61000-4-3: Radiated Immunity
EN 61000-4-4: EFT
EN 61000-4-5: Surge
EN 61000-4-6: Low Frequency Conducted Immunity

RoHS

All Z-Series components are EU RoHS 6 compliant.
All Z-Series components are China ROHS compliant

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