



Force10



Dell Force10 C-Series

C150 and C300 Aggregation / Core Chassis Switches

High-density line-rate, non-blocking GbE and 10 GbE switches; affordable PoE enabled GbE ports; modular Dell™ Force10 Operating System (FTOS) software delivers inherent stability; in-service diagnostics and traffic visibility tools increase control of network.

C-Series Resilient Switches

The Dell Force10 Networks C-Series are resilient chassis-based switches that deliver reliability, network control and scalability. The C-series is designed to support GbE and 10GbE switch aggregation for enterprise campus and business wiring closets, while also supporting GbE server aggregation for data centers. Comprehensive management capabilities make the C-Series a cost-effective and flexible deployment option.

Key applications

- Low cost 100/1000 Mbps server aggregation for small-to medium-sized data centers (100s to 1,000s of servers)
- Scalable GbE aggregation and 10 Gigabit Ethernet transport in a carrier's Middle Mile network to enable the deployment of triple play services
- High density GbE aggregation into a multiple Gbps or 10 GbE backbone
- Cost-effective, scalable PoE-enabled wiring closet aggregation of VoIP phones, wireless access points, or other IEEE 802.3af-compliant devices

Key features

The Dell Force10 C-Series is designed to provide inherent reliability, network control, and scalability for high performance Ethernet environments.

- Up to 384 line-rate 10/100/1000Base-T ports with full 15.4 W Class 3 PoE support in a 13-RU chassis
- Up to 64 line-rate, non-blocking 10 GbE ports with plug-gable XFP modules
- Suite of security, access control and wiring closet edge features for enterprise networks

- PowerSmart™ intelligent power management features provide automatic sensing, provisioning and management of PoE power
- Full complement of standards-based Layer 2, IPv4 and IPv6 features for unicast and multicast applications
- 5 microsecond switching latency under full load for 64 byte frames
- Switch fabric capacity of up to 1.536 Tbps and up to 952 Mpps L2/L3 packet forwarding capacity
- High availability architecture
 - 1+1 Route Processor Module (RPM) design
 - Continuous runtime data plane monitoring and advanced in-service CLI diagnostic functions
 - Power supply redundancy with load sharing power bus enabling uninterrupted VoIP calls during a power supply failure

Scalable, cost-effective aggregation chassis for data center networks and enterprise campus.

Specifications: C-Series Resilient Enterprise Switches

Dell SKU Description

C-Series chassis

C150 4-slot chassis* with 3 AC power supplies
 C150 4-slot chassis* with 1 AC power supply
 C150 4-slot chassis* with 3 AC power supplies, & variable speed fan
 C150 4-slot chassis* with 1 AC power supply, & variable speed fan
 C300 8-slot chassis* with 4 AC power supplies
 C300 8-slot chassis* with 2 AC power supplies
 C300 8-slot chassis* with 4 AC power supplies, & variable speed fan
 C300 8-slot chassis* with 2 AC power supply, & variable speed fan
 *Chassis includes backplane, switch and route processor module and fan subsystem.

Fans

C150 enhanced fan subsystem
 C300 enhanced fan subsystem

Line cards

Switch Fabric and Route Processor Module
 4-port 10 Gigabit Ethernet line card, XFP modules required
 8-port 10 Gigabit Ethernet line card, XFP modules required
 48-port Gigabit Ethernet line card, SFP modules required
 48-port 10/100/1000Base-T line card with RJ45 interfaces
 48-port 10/100/1000Base-T line card with RJ45 interfaces & PoE
 FlexMedia line card - 36 10/100/1000Base-T RJ45 interfaces, and eight GbE interfaces
 - SFP modules required, and two 10 GbE interfaces
 - SFP+ modules required
 FlexMedia line card with PoE - 36 10/100/1000Base-T RJ45 interfaces, and eight GbE interfaces
 - SFP modules required, and two 10 GbE interfaces
 - SFP+ modules required

Redundant power supply

1200 W AC Power Supply Module

Optics/Transceivers

XFP, 10GbE, CX4, 15m Reach
 XFP, 10GbE, SR/SW, 850nm Wavelength, 300M Reach
 XFP, 10GbE, LR/LW, 1310nm Wavelength, 10km Reach
 XFP, 10GbE, ER/EW, 1550nm Wavelength, 40km Reach
 SFP, 100BASE-FX, 1310nm Wavelength, 2km Reach
 SFP, 1000BASE-T
 SFP, 1000BASE-SX, 850nm Wavelength, 550m Reach
 SFP, 1000BASE-LX, 1310nm Wavelength, 10km Reach
 SFP, 1GbE, ZX, 1550nm Wavelength, 80km Reach typical on 9/125um SMF
 SFP+, 10GbE, SR, 850nm Wavelength, 300m Reach
 SFP+, 10GbE, LR, 1310nm Wavelength, 10km Reach
 SFP+, 10GbE, ER, 1310nm Wavelength, 40km Reach

Cables

10GBASE-CX4, 1 Meter
 10GBASE-CX4, 3 Meters
 10GBASE-CX4, 5 Meters
 10GBASE-CX4, 10 Meters
 10GBASE-CX4, 15 Meters

Chassis models

C300 - 8 line card slots

2 Route processor module with integrated switch fabric slots
 8 Power supply module slots and 1 fan tray slot
 Size: 13 RU, 22.7 h x 17.4 w x 14.4" d (57.66 h x 44.2 w x 37.58 cm d)
 Weight with factory-installed components: 55 lbs (24.95 kg)
 Weight fully loaded: 152.27 lbs (69.07 kg)
 ISO 7779 A-weighted sound pressure level: 73.8 dBA at 73.4°F (23°C)
 AC power
 Nominal input voltage: 100-240 VAC 50/60 Hz
 Maximum thermal output: 4,978 BTU/h (1,498 W) at 100/120 VAC
 4,864 BTU/h (1,459 W) at 200/220 VAC
 Maximum input current per module:
 14 A at 100 VAC, 12 A at 120 VAC, 7 A at 200 VAC, 6 A at 240 VAC
 Maximum system power input:
 8.7 KVA at 100/120 VAC, 8.5 KVA at 200/240 VAC
 Maximum power consumption:
 8,675 W at 100/120 VAC, 8,476 W at 200/240 VAC

C150 - 4 line card slots

2 Route processor module with integrated switch fabric slots
 6 Power supply module slots and 1 fan tray slot
 Size: 9 RU, 15.7 h x 17.5 w x 15.3" d (39.88 h x 44.45 w x 38.86 cm d)
 Weight with factory-installed components: 38 lbs (17.24 kg)
 Weight fully loaded: 86.63 lbs (39.29 kg)
 ISO 7779 A-weighted sound pressure level: 69.3 dBA at 73.4°F (23°C)
 AC power
 Nominal input voltage: 100-240 VAC 50/60 Hz
 Maximum thermal output: 2,891 BTU/h (862 W) at 100/120 VAC
 2,824 BTU/h (840 W) at 200/220 VAC
 Maximum input current per module:
 14 A at 100 VAC, 12 A at 120 VAC, 7 A at 200 VAC, 6 A at 240 VAC
 Maximum system power input:
 4.5 KVA at 100/120 VAC, 4.4 KVA at 200/240 VAC
 Maximum power consumption:
 4,420 W at 100/120 VAC, 4,319 W at 200/240 VAC

Common attributes to both chassis

19" front rack mountable
 Maximum operating specifications:
 Temperature: 32° to 104°F (0° to 40°C)
 Altitude: no performance degradation to 10,000 feet (3,048 meters)
 Relative humidity: 5 to 85% (RH), non-condensing
 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% (RH), non-condensing

Redundancy/Availability

1+1 redundant Switch Fabric & Route Processor Modules (RPM)
 C300: 2+1 redundant system AC Power Supply Modules
 4+1 redundant PoE Power Supply Modules supporting up to 384 PoE ports at 15.4 W with deterministic failure mode
 C150: 1+1 redundant system AC Power Supply Modules
 2+2 redundant PoE Power Supply Modules supporting up to 192 PoE ports at 15.4 W with deterministic failure mode
 Online insertion and removal of all components
 Environmental self-monitoring

Performance

MAC addresses: C150: 256K, C300: 512K
 IPv4 routes: 12K
 IPv6 routes: 6K
 Switching fabric capacity:
 C150: 768 Gbps (476 Mpps)
 C300: 1,536 Tbps (952 Mpps)
 Link aggregation:
 Queues per port: 4 queues
 VLANs: 1024 VLANs with 4096 tag value support all protocols, including IPv4 and IPv6
 Line-rate Layer 2 switching: IPv4 and IPv6
 Line-rate Layer 3 routing: based on Layer 2, IPv4 or IPv6 headers
 LAG load balancing:
 Switching latency: <5 µs for 64 byte frames

IEEE Compliance

802.1AB LLDp
 802.1D Bridging, STP
 802.1p L2 Prioritization
 802.1Q VLAN Tagging, Double VLAN Tagging, GVRP
 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 (10GBASE-X)
 802.3af Power over Ethernet
 802.3ak 10 Gigabit Ethernet (10GBASE-CX4)
 802.3i Ethernet (10BASE-T)
 802.3u Fast Ethernet (100BASE-FX, 100BASE-TX)
 802.3x Flow Control
 802.3z Gigabit Ethernet (1000BASE-X)
 ANSI/TIA-1057 LLDp-MED
 Force10 FRRP (Force10 Redundant Ring Protocol)
 Force10 PVST+
 MTU 9,252 bytes

RFC and I-D Compliance

General Internet Protocols

768 UDP 1350 TFTP
 793 TCP 2474 Differentiated Services
 854 Telnet 3164 Syslog
 959 FTP draft-ietf-bfd-base-03 BFD
 1321 MDS

General IPv4 Protocols

791 IPv4 1812 Routers
 792 ICMP 1858 IP Fragment Filtering
 826 ARP 2131 DHCP (server and relay)
 1027 Proxy ARP 2338 VRRP
 1035 DNS (client) 3021 31-bit Prefixes
 1042 Ethernet Transmission 3046 DHCP Option 82
 1191 Path MTU Discovery 3069 Private VLAN
 1519 NTPv3 3128 Tiny Fragment Attack
 1542 CIDR Protection
 1542 BOOTP (relay)

General IPv6 Protocols

1981 Path MTU Discovery (partial) 2464 Ethernet Transmission
 2460 IPv6 2675 Jumbograms
 2461 Neighbor Discovery (partial) 3587 Global Unicast Address
 2462 Stateless Address Format
 Autoconfiguration Addressing
 2463 ICMPv6

RIP

1058 RIPv1 2453 RIPv2

OSPF

1587 1587 2740 OSPFv3
 2154 MD5 3623 Graceful Restart
 2328 OSPFv2 4222 Prioritization and
 2370 Opaque LSA Congestion Avoidance

BGP

1997 Communities 2842 Capabilities
 2385 MD5 2858 Multiprotocol Extensions
 2439 Route Flap Damping 2918 Route Refresh
 2545 Multiprotocol Extensions for IPv6 3065 Confederations
 3065 Extended Communities
 4893 4-byte ASN
 5396 4-byte ASN Representation
 2796 Route Reflection
 draft-ietf-idr-bgp4-20 BGPv4
 draft-ietf-idr-bgp4-20 Graceful Restart

Multicast

1112 IGMPv1 4541 IGMPv1/v2 Snooping
 2236 IGMPv2 draft-ietf-pim-sm-v2-new-05
 3376 IGMPv3 PIM-SM for IPv4
 3569 SSM for IPv4

Network Management

1155 SMIv1 2865 RADIUS
 2385 MD5 3273 RMON High Capacity MIB
 1156 Internet MIB 3376 IGMPv3
 1157 SNMPv1 3416 SNMPv2
 1212 Concise MIB Definitions 3418 SNMP MIB
 1215 SNMP Traps 3434 RMON High Capacity Alarm MIB
 1493 Bridges MIB
 1850 OSPFv2 MIB 3580 802.1X with RADIUS
 1901 Community-based BGP MIBv1 5060 PIM MIB
 SNMPv2 ANSI/TIA-1057
 2011 IP MIB LLDp-MED MIB
 2012 TCP MIB draft-grant-tacacs-02
 2013 UDP MIB TACACS+
 2024 DLsw MIB draft-ietf-idr-bgp4-mib-06
 2096 IP Forwarding Table MIB BGP MIBv1
 2570 SNMPv3 IEEE 802.1AB
 2571 Management Frameworks LLDp MIB, LLDp DOT1
 2572 Message Processing and Dispatching MIB, LLDp DOT3 MIB
 2574 SNMPv3 USM ruzin-mstp-mib-02
 2575 SNMPv3 VACM MSTP MIB (traps)
 2576 Coexistence Between sFlow.org sFlowv5
 SNMPv1/v2/v3 (version 1.3) sFlowv5 MIB
 2578 SMIv2 FORCE10-BGP4-V2-MIB
 2579 Textual Conventions for FORCE10-CS-CHASSIS-MIB
 SMIv2 FORCE10-IF-EXTENSION-MIB
 2580 Conformance Statements for SMIv2 FORCE10-LINKAGG-MIB
 FORCE10-COPY-CONFIG-MIB
 2618 RADIUS Authentication MIB FORCE10-MON-MIB
 2665 Ethernet-like Interfaces MIB FORCE10-PRODUCTS-MIB
 2674 Extended Bridge MIB FORCE10-SMI
 2787 VRRP MIB FORCE10-SYSTEM-COMPONENT-MIB
 2819 RMON MIB (groups 1, 2, 3, 9) FORCE10-TC-MIB
 Interfaces MIB FORCE10-TRAP-ALARM-MIB

Regulatory Compliance

Safety

UL/CSA 60950-1, 1st Edition
 EN 60950-1, 1st Edition
 IEC 60950-1, 1st 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

Australia/New Zealand: AS/NZS CISPR 22: 2006, Class A
 Canada: ICES-003, Issue-4, Class A
 Europe: EN 55022: 2006 (CISPR 22: 2006), Class A
 Japan: VCCI V3/2007.04 Class A
 USA: FCC CFR 47 Part 15, Subpart B, Class A

Immunity

EN 300 386 V1.3.3: 2005 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 C-Series components are EU RoHS compliant.

Certifications

TAA (Trade Agreement Act) compliant models also available

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