



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 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 10 GbE ports with pluggable XFP modules
- Suite of security, access control and wiring closet edge features for enterprise networks

- VirtualView™ real-time network and application traffic monitoring for virtualized data centers
- 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

# Specifications: C-Series Resilient Switches

## Ordering Information

| Order Number     | Description  |
|------------------|--|
| CH-C150          | C150 4-slot switch with backplane  |
| CH-C300          | C300 8-slot chassis with backplane   |
| CC-C150-FAN2     | C150 enhanced fan subsystem  |
| CC-C300-FAN2     | C300 enhanced fan subsystem  |
| GP-CF-1G         | 1G compact flash memory card   |
| LC-CB-RPM        | Switch Fabric and Route Processor Module (series CB)   |
| LC-CB-10GE-4P    | 4-port 10 Gigabit Ethernet line card, XFP modules required (series CB)   |
| LC-CB-10GE-8P    | 8-port 10 Gigabit Ethernet line card, XFP modules required (series CB)   |
| LC-CB-GE-48P     | 48-port Gigabit Ethernet line card, SFP modules required (series CB)   |
| LC-CB-GE-48T     | 48-port 10/100/1000Base-T line card with RJ45 interfaces (series CB)   |
| LC-CB-GE-48V     | 48-port 10/100/1000Base-T line card with RJ45 interfaces and PoE (series CB)   |
| LC-CB-10G-1G-36T | FlexMedia line card with 36 10/100/1000Base-T RJ45 interfaces, eight GbE interfaces – SFP modules required, and two 10 GbE interfaces – SFP+ modules required (series CB)          |
| LC-CB-10G-1G-36V | FlexMedia line card with 36 10/100/1000Base-T RJ45 interfaces with PoE, eight GbE interfaces – SFP modules required, and two 10 GbE interfaces – SFP+ modules required (series CB) |
| CC-C-1200W-AC    | 1200 W AC Power Supply Module  |
| CC-C-PWR-DC      | 1400 W DC Power Entry Module   |
| SW-CB-LATEST     | FTOS software  |

## Chassis

### 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

DC power  
 Nominal input voltage: –44 to –55 VDC  
 Maximum thermal output: 4,231 BTU/h (1,240 W)  
 Maximum current draw per DC PEM: 32 A  
 Maximum power consumption: 1,460 W

### 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

DC power  
 Nominal input voltage: –44 to –55 VDC  
 Maximum thermal output: 2,457 BTU/h (720 W)  
 Maximum current draw per DC PEM: 32 A  
 Maximum power consumption: 800 W

## Common

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  
 1+1 redundant system DC Power Entry 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  
 1+1 redundant system DC Power Entry 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: 8 links per group, 128 groups per chassis  
 Queues per port: 4 queues  
 VLANs: 1024 VLANs with 4096 tag value support  
 Line-rate Layer 2 switching: all protocols, including IPv4 and IPv6  
 Line-rate Layer 3 routing: IPv4 and IPv6  
 LAG load balancing: based on Layer 2, IPv4 or IPv6 headers  
 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)  
 802.3z Flow Control  
 802.3x 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 MD5

### 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 Protection  
 1542 CIDR  
 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 Format  
 2462 Stateless Address Autoconfiguration 4291 Addressing  
 2463 ICMPv6

## RIP

1058 RIPv1 2453 RIPv2

## OSPF

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

## BGP

1997 Communities 2842 Capabilities  
 2385 MD5 2858 Multiprotocol Extensions  
 2439 Route Flap Damping 2918 Route Refresh  
 2545 Multiprotocol Extensions 3065 Confederations  
 for IPv6 4360 Extended Communities  
 2796 Route Reflection 4893 4-byte ASN  
 draft-ietf-idr-bgp4-20 BGPv4 5396 4-byte ASN  
 draft-ietf-idr-bgp4-20 Graceful Restart Representation

## 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 SMIPv1 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  
 1493 Bridges MIB Alarm MIB  
 1850 OSPFv2 MIB 3580 802.1X with RADIUS  
 1901 Community-based 5060 PIM MIB  
 SNMPv2 ANS/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 1GB MIBv1  
 2570 SNMPv3 IEEE 802.1AB  
 2571 Management Frameworks LLDP MIB, LLDP DOT1  
 Message Processing and Dispatching MIB, LLDP DOT3 MIB  
 2572 ruzin-mstp-mib-02  
 2574 SNMPv3 USM MSTP MIB (traps)  
 2575 SNMPv3 VACM sFlow.org sFlowv5  
 2576 Coexistence Between sFlow.org sFlowv5 MIB  
 SNMPv1/v2/v3 (version 1.3)  
 2578 SMIPv2 FORCE10-BGP4-V2-MIB  
 2579 Textual Conventions for SMIPv2 FORCE10-CS-CHASSIS-MIB  
 FORCE10-IF-EXTENSION-MIB  
 2580 Conformance Statements for SMIPv2 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-LINKAGG-MIB  
 2787 VRRP MIB FORCE10-SYSTEM-COMPONENT-MIB  
 2819 RMON MIB (groups 1, 2, 3, 9) FORCE10-TC-MIB  
 2863 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.

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