H3C CR19000

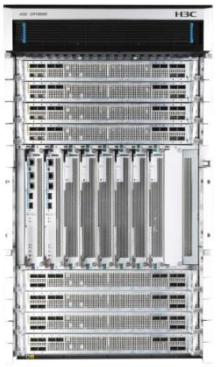
Core Routers

Release Date: May, 2021

Product Overview

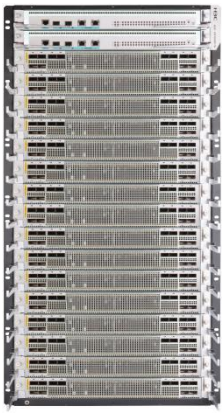
The CR19000 core router series (hereinafter referred to as the CR19000) is a set of new-generation core routers developed for service provider-level applications. It can be deployed as service providers' backbone nodes and MAN core nodes, or data centers backbone interconnection nodes. The CLOS architecture, cutting-edge optical connection technology, and Comware V7 operating system enables the CR19000 to deliver extraordinary availability and compatibility, making it an ideal choice for service providers.

The CR19000 router series includes the following models: CR19000-8, CR19000-16, CR19000-20, and CR19000-MC. The CR19000-8, CR19000-16, and CR19000-20 provide 8, 16, and 20 service line-card slots, respectively. The CR19000-MC is a fabric card chassis (FCC) that provides interconnection and unified control of multiple CR19000-20 routers. The CR19000-8 can operate in single-chassis mode or the back-to-back cluster mode. The CR19000-16 can operate in single-chassis mode. The CR19000-20 can operate in single-chassis mode, back-to-back cluster mode, or multi-chassis cluster mode.

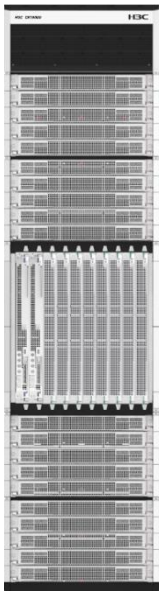


CR19000-8

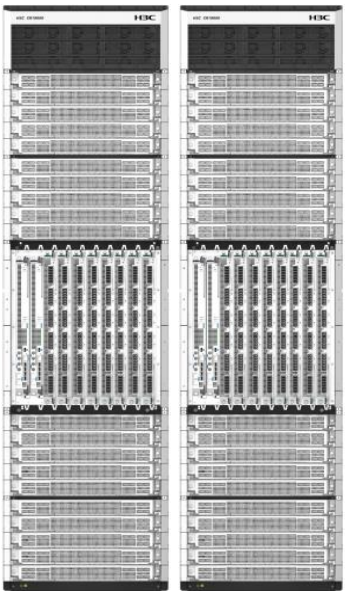
CR19000-8 back-to-back cluster



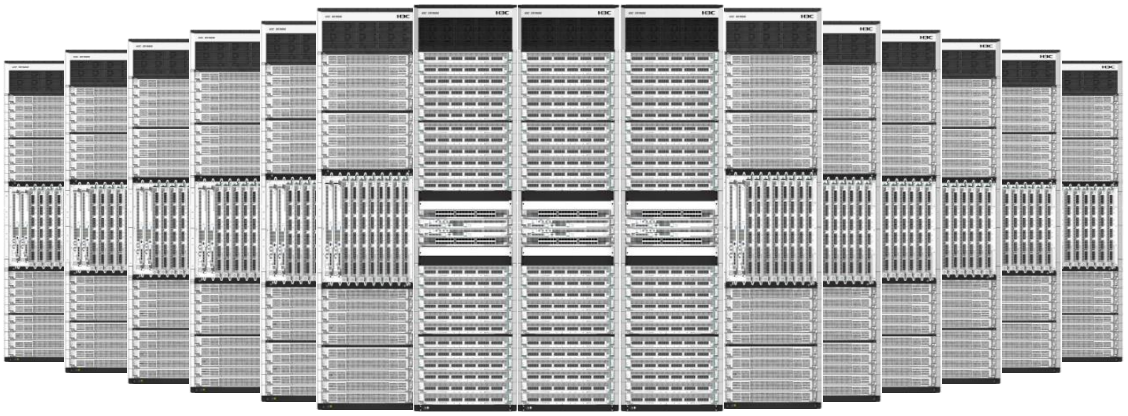
CR19000-16



CR19000-20



CR19000-20 back-to-back cluster



CR19000-20 3+12 cluster

Features and benefits

Ultra-large capacity and unlimited expansion

- The CR19000 router adopts the most advanced fourth-generation non-blocking CLOS switching architecture, which enables data to be transmitted at a super high speed with low latency. Support for variable-length cell switching significantly improves operation efficiency of the overall cluster.
- On a single CR19000 with 1800G capacity on each slot, each port can provide a capacity as high as 400Gbps. The router supports a maximum of 360 100G ports and this number will be continuously increased.
- The CR19000 supports multiple cluster modes, such as back-to-back, 2+6, and 3+12, and supports cascade of up to 12 chassis. Smooth expansion from a single chassis to a cluster protects users' investment

Open architecture and SDN-oriented design

With full support for SDN, the CR19000 provides various protocol interfaces for collaboration with external systems and can communicate comprehensively with SDN controllers. This enables users to precisely control network resources on demand and greatly improves network operation efficiency.

High availability and enhanced security

The CR19000 provides comprehensive high availability performance by using the following methods:

- Advanced distributed architecture—With separated routing, service, and switching engines, the failure of a single hardware component does not affect the operation of the whole system. The separation of control plane and service plane prevents service processing and system control from affecting each other and ensures service continuity during active/standby switchover. Support for N+M redundancy of switching fabric modules guarantees line-speed traffic forwarding during switching fabric module replacement.
- Comware 7-based operating system — The control plane of the OS adopts multi cores and the Symmetrical Multi-Processing (SMP) technology to provide separate processing and running space for each software module, enabling dynamic loading and independent upgrade. Support for running specific processes on the dedicated CPU set, together with preemptive scheduling and priority settings, guarantees resources for critical services when the CPU usage is high. Distributed computing and refined management further improves system stability.
- Abundant availability features—The CR19000 supports abundant availability features, including hot patching, link detection protocols NSR, GR, BFD, and NQA, fast convergence protocols IP FRR and LDP FRR, and Embedded Automation Architecture (EAA). With all these features, the CR19000 is able to provide ultra-large service capacity and ultra-fast service convergence as required by service providers in large-scale deployment.

Green design

- The industry-leading environment-friendly and sustainable design greatly increases the energy efficiency and ensures smooth upgrade.
- The router uses cut-through ventilation aisles, which brings much higher cooling efficiency than the traditional U-shaped, Z-shaped, or C-shaped air isles. This design enables the air to flow through the router with almost no loss in air volume and speed and can fully satisfy the cooling requirements of core network devices with continuously increasing capacity.
- With the smart micro-module heat dissipation system, the router perfectly balances ventilation and power consumption. The cluster system can intelligently adjust the fan speed based on the hotspot

information to meet the overall ventilation requirements.

Technical specifications

Item	CR19000-8	CR19000-8 back-to-back cluster	CR19000-16	CR19000-20	CR19000-20 3+12 cluster
MPU slots	2	N/A	2	2	N/A
Switching fabric slots	6	N/A	6	8	N/A
line-card slots	8	16	16	20	240
System aggregated throughput	14.4 Tbps	28.8 Tbps	28.8 Tbps	36 Tbps	432 Tbps
Power module	8 power modules per chassis support for redundancy and smart power management		16 power modules support for redundancy and smart power management	24 power modules per chassis support for redundancy and smart power management	
Fan trays	6 fan trays per chassis support for redundancy and smart heat dissipation		2 fan trays support for redundancy and smart heat dissipation	33 fan trays per chassis support for redundancy and smart heat dissipation	
Dimensions (H × W × D)	843 × 440 × 743 mm (33.19 × 17.32 × 29.25 in), 19 RU		931 × 440 × 857 mm (36.65 × 17.32 × 33.74 in), 21 RU	1820 × 440 × 850 mm (71.65 × 17.32 × 33.46 in), 41 RU	
Operating temperature	0°C to 45°C (32°F to 113°F)				
Operating humidity	5% to 95%, non-condensing				
Operating altitude	–60 m (–196.85 ft) to +5000 m (+16404.20 ft)				
Ports	1000BASE-X-SFP fiber ports 10GBASE-R/W-SFP+ fiber ports 40GBASE-R-QSFP+ fiber ports 100GBASE-R-QSFP28 fiber ports 400GBASE-R-QSFPDD fiber ports				
EMC standards	FCC Part 15 (CFR 47) CLASS A ICES-003 CLASS A VCCI-3 CLASS A VCCI-4 CLASS A CISPR 22 CLASS A EN 55022 CLASS A AS/NZS CISPR22 CLASS A CISPR 24 EN 55024 EN 61000-3-2 EN 61000-3-3				

	EN 61000-6-1 ETSI EN 300 386 EN 301 489-1 EN 301 489-17
Safety standards	UL 60950-1 CAN/CSA C22.2 No 60950-1 IEC 60950-1 EN 60950-1/A11 AS/NZS 60950 EN 60825-1 EN 60825-2 FDA 21 CFR Subchapter J GB 4943
Interfaces	GE, 10GE, 40GE, 100GE and 400GE interfaces
QinQ	VLAN termination
Traffic statistics	Traffic statistics on both the incoming and outgoing traffic
QoS	Priority marking/remarking CAR (Ingress/Egress) CBQ Congestion management Queue scheduling QoS policy (applied on an interface, globally, and on the control plane) Dynamic modification of QoS policies QPPB
ACL	Ingress/Egress ACL Basic ACLs, advanced ACLs Applying an ACL to an interface or globally
IPv4 protocol	TCP, UDP, RawIP, Ping, Traceroute Telnet, FTP, TFTP ICMPv4 DNS DHCP NTP ARP, ARP Proxy
IPv6 protocol	Dual IPv4 and IPv6 protocol stacks TCP6, UDP6, RawIP6, Pingv6, Traceroute6 Telnetv6, FTPv6, TFTPv6 DNS6 ICMPv6 VRRPv3 DHCPv6

	ND PMTUD (IPv6) 6PE
IPv4 routing protocol	RIPv1/v2 OSPFv2 IS-IS BGPv4 IPv4 static routing/routing policy/route recursion/policy-based routing
IPv6 routing protocol	RIPng OSPFv3 IS-IS6 BGPv4+ IPv6 static routing/routing policy/route recursion/policy-based routing
Layer 3 multicast	Static multicast routes IPv4 intra-AS multicast routes IPv4 inter-AS multicast routes IPv4 multicast group management IPv6 intra-AS multicast routes IPv6 multicast group management Multicast VPN
Interconnect	VXLAN
MPLS	Basic MPLS MPLS L3VPN VPWS/VPLS 6VPE MPLS TE P2MP
SDN	BGP-LS BMP Flowspec OpenFlow PCEP
Segment Routing	SR BE、SR TE、SR TE Policy SR OAM L3VPN、EVPN L3VPN HoVPN VPNv4/VPNv6 over SR BE/SR-TE/SR TE Policy
SRv6	SRv6 BE、SRv6 TE Policy SRv6 OAM TI-LFA L3VPN、EVPN L3VPN HoVPN VPNv4/VPNv6 over SRv6 BE/SRv6 TE Policy
Device security	Protection against data packet-based attacks Protection against protocol packet-based attacks

	Attack detection Protection of protocol packets Diagnosis on packet transmitting and receiving
Network security	Packet validity check uRPF Packet filtering ARP attack protection Protocol-based traffic limiting NetStream
User security	Device management security AAA SSH
Device management	CLI management by accessing the device through console port, Telnet, or sTelnet (SSH)
File management	Uploading/downloading files through FTP/TFTP Formatting files Creating, copying, deleting, saving files and directories
Network maintenance	Ping TraceRoute LSP Ping/Tracert Loop detection on a port
Network management and monitoring	SNMPv3 IMC LLDP/LLDP-MED MIB PTP
High availability	Hot swapping of cards Redundancy of switching fabric modules Active/standby switchover Hot patching GR NSR VRRP, VRRPE BFD for VRRP/BGP/IS-IS/RIP/OSPF/static routing IP FRR

Ordering guide

PID	Description
CR19000-8	H3C CR19000-8 router chassis
CR19000-16	H3C CR19000-16 router chassis

CR19000-20	H3C CR19000-20 router chassis
Power frame module	
CR-PEM-DC2000	DC 2000W power frame
CR-PEM-AC3000	AC 3000W power frame
CR-PEM-HVDC3000	HVDC 3000W power frame
Power module	
PSR2400-54D	DC 2400W power module
PSR3000-54A	AC 3000W power module
PSR3000-54AHD	AC 3000W &240V-380V HVDC power module
PSR2000B-54D	DC 2000W power module
PSR3000B-54AHD	AC 3000W power module (support for HVDC)
MPU module	
CR-19K-MPU-08B	H3C CR19000-8 main processing unit B
CR-19K-MPU-16A	H3C CR19000-16 main processing unit A
CR-19K-MPU-16B	H3C CR19000-16 main processing unit B
CR-19K-MPU-20C	H3C CR19000-20 main processing unit C
Switching fabric module	
CR-19K-SFU-08C	H3C CR19000-8 fabric module for single-chassis (Class C)
CR-19K-SFU-16C	H3C CR19000-16 fabric module for single-chassis (Class C)
CR-19K-SFU-20C	H3C CR19000-20 fabric module for single-chassis (Class C)
IO Module	
CR-19K-LPU-CQ18	H3C CR 18-port 100G Ethernet optical interface module (QSFP28)
CR-19K-LPU-CQ12B	H3C CR 12-port 100G Ethernet optical interface module B (QSFP28)
CR-19K-LPU-CQ02	H3C CR 2-port 400G Ethernet optical interface module (QSFPDD)
Service Engine Module	
CR-19K-LPU-8004	H3C CR flexible interface module (LPU-8004)
CR-19K-LPU-4004	H3C CR flexible interface module (LPU-4004)
Subcard module	
CR-HIC-CQ01	H3C CR 1-port 100G Ethernet optical interface card (QSFP28)
CR-HIC-CQ02	H3C CR 2-port 100G Ethernet optical interface card (QSFP28)
CR-HIC-QQ03	H3C CR 3-port 40G Ethernet optical interface card (QSFP+)
CR-HIC-XP12B	H3C CR 12-port 10G Ethernet optical interface card B (SFP+)
CR-HIC-XP10	H3C CR 10-port 1G/10G Ethernet optical interface card (SFP+)

The Leader in Digital Solutions

New H3C Technologies Co., Limited

Beijing Headquarters

Tower 1, LSH Center, 8 Guangshun South Street, Chaoyang District, Beijing, China

Zip: 100102Hangzhou Headquarters

No.466 Changhe Road, Binjiang District, Hangzhou, Zhejiang, China

Zip: 310052

Tel: +86-571-86760000