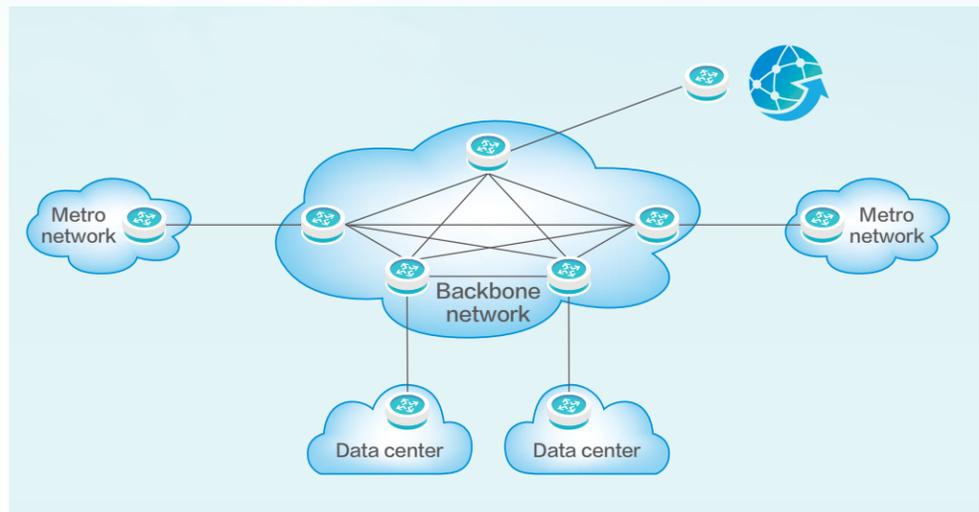


Huawei NetEngine 5000E Core Routers

Intelligent Routers for Ultra-Broadband Backbone Networks

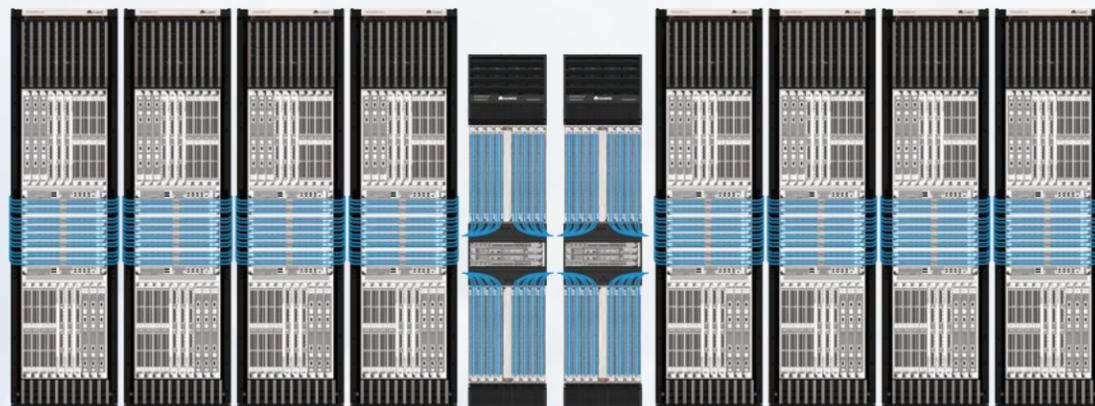
Product Overview

Huawei's NetEngine 5000E core router (NE5000E) is designed to be used as a carrier backbone network node, metro network core node, DCI node, or international gateway. The NE5000E features high capacity, high reliability, intelligence, and energy-saving capabilities. It also supports the single chassis, back-to-back chassis, and multi-chassis cluster modes, allowing on-demand expansion and enabling carriers to handle rapid Internet traffic growth and future service development.



Product Appearance

The NE5000E cluster system consists of two parts: Cluster Central Chassis (CCC) and Cluster Line-Card Chassis (CLC). A CLC is used for high-speed service access and can work in single-chassis or multi-chassis cluster mode. In a multi-chassis cluster, a CCC is connected to the control and data planes of CLCs to implement unified system management and data exchanges.



NE5000E 2+8 cluster system

Product Highlights

256T Cluster Capacity, Elastic Expansion, and Continuous Network Evolution

- **Industry-leading, next-generation, Huawei-developed network processing chipset**

The Solar 5.0 chipset provides higher performance and integration, and lower power consumption, supporting 1.6T line cards of different interface types and on-demand deployment.

- **Advanced high-speed architecture design**

The innovative cable backplane overcomes the bottlenecks of PCB backplanes, supporting a SerDes rate of more than 56 Gbit/s and a device capacity of more than 256T. CCCs and CLCs are connected using the industry's first 12-channel 25G high-density optical fiber band, supporting a 1.6T multi-chassis cluster.

- **Three-level Clos non-blocking switched network architecture**

Three-level switching is deployed on CCCs and CLCs, with switching units that can be flexibly expanded and a switching matrix that is fully meshed. Cells support dynamic routing, and service traffic can be balanced to multiple switched network planes to ensure the switching matrix is non-blocking.

- **Innovative In-Service Hardware Expansion (ISHE) technology**

New CLCs can be introduced without interrupting services, supporting smooth capacity expansion from a 2+2 cluster system to a 2+8 cluster system. The 1.6T platform and 400G/800G platform can constitute a hybrid cluster, protecting customers' existing investments.

All-Round Reliability Design to Build High-Quality Networks

- **Reliable system architecture**

The data plane, control plane, and monitoring plane are separated to ensure no interference between data forwarding, control, and environment monitoring during system operation.

- **Reliable hardware system**

Key components, such as MPUs, SFUs, power modules, and fans, support redundancy. All components support hot swap to ensure stable and reliable system operation.

- **Reliable software system**

The distributed and multi-process Versatile Routing Platform (VRP) virtualizes various compute and storage resources in a cluster system into a resource pool to achieve dynamic load balancing of compute and storage resources on devices.

- **Extensive reliability features**

NSx (NSS, NSR, NSB, or NSF) is supported. Multiple protection mechanisms, including IGP fast convergence, IP/LDP/TE/VLL fast rerouting, BGP/IS-IS automatic fast rerouting, VRRP, BFD, and trunk inter-board link bundling, are supported to ensure reliable service operation.

Green Design for Optimal Energy-Saving Experience

Energy-saving chip design

The high-integrity, Huawei-developed chips with new technologies support independent switch-off of mW-level modules and components, intelligent frequency modulation, intelligent core enabling and disabling, and dynamic link shutdown, greatly reducing power consumption of boards.

Board heat dissipation design

The innovative floating heat sink and carbon nano-tube materials with high thermal conductivity are used to improve the heat dissipation efficiency of boards.

Device heat dissipation design

The efficient I-shaped air duct, with air drawing from the front and exhausting from the back, combined with the air hole design, improve the heat dissipation efficiency of the entire system.

System energy saving design

Intelligent fan speed adjustment balances the system reliability, noise, and power consumption. The system's power consumption can be viewed in real time, providing visibility to users. The 1.6T platform provides the energy efficiency of 0.8 W/Gbit/s, 10% lower than the 1T platform and 47% lower than the 400G platform.

Intelligence and Openness for Building a Programmable Elastic Network

Programmable network processor

The Solar series chipset has extensive programmable resources, making it highly adaptive to future network protocols and service changes in the cloud era. It also supports carriers' service innovation and enables fast go-to-market.

Elastic distributed operating system

VRPv8 supports distributed parallel processing of multiple network protocols and service instances, as well as on-demand elastic expansion of compute resources. VRPv8 supports mainstream SDN standard protocols (such as BGP LS, BGP FlowSpec, EVPN, VXLAN, Segment Routing, and SRv6) and open programmable NETCONF/YANG interfaces, achieving automatic network management and service deployment in the cloud era and improving network flexibility.

Agile and on-demand cloud backbone

The NE5000E works with Huawei's Network Cloud Engine (NCE) to implement centralized control and management, allowing customers to learn about network traffic changes in real time and optimize networks as required. This delivers intelligent traffic optimization, improves network utilization, and helps provide differentiated SLAs based on service requirements.

Product Specifications

Item	Single Chassis	Back-to-Back Chassis	Multi-Chassis Cluster
System capacity	32Tbps	64Tbps	256Tbps
Interface capacity	320 x 100 GE interfaces	640 x 100 GE interfaces	2560 x 100 GE interfaces
	1440 x 10 GE interfaces	2880 x 10 GE interfaces	11520 x 10 GE interfaces
Slots for LPUs	20	40	160
Interface type	Ethernet interfaces: GE, 10 GE, and 100 GE OTN interfaces: 100G OTN		
Routing protocols	OSPF, IS-IS, BGP, PIM, MSDP, MBGP, Segment Routing, and SRv6		
IPv6	Support for IPv4 and IPv6 dual-stack and hardware-based IPv6 line-speed forwarding		
	Support for routing protocols, such as OSPFv3, IS-ISv6, and BGP4+		
	Support for IPv6 neighbor discovery, path MTU discovery, TCP6, ping IPv6, tracer IPv6, socket IPv6, and IPv6 policy-based routing		
	Support for extensive IPv4-to-IPv6 transition technologies		
Reliability	1:1 backup of MPUs		
	7+1 backup of SFUs		
	N+m backup of power modules		
	N+1 backup of fans		
	Support for stateful hot swap and non-stop forwarding		
	Support for NSS, NSR, NSB, and NSF		
	Support for VRRP, BGP, OSPF, IS-IS, RSVP, LDP, LSP, TE, PW, and PIM BFD		
	Support for IGP/BGP/multicast fast route convergence and IP/LDP/TE/VLL fast rerouting		
	Support for BGP/IS-IS automatic fast rerouting		
	Support for link bundling		

Physical Specifications

Item	NE5000E CCC	NE5000E-20 CLC
		
Dimensions (H x W x D)	442 mm x 830 mm x 1955 mm	600 mm x 1000 mm x 2200 mm
Typical power consumption	2+4 1.6T cluster: 8700 W 2+8 1.6T cluster: 16600 W	1.6T single chassis: 25600 W 1.6T cluster: 27900 W

Subscription Information

1.6T Line Card

CR5D00EDNB63	16-Port 100GBase QSFP28 Integrated Line Process Unit CM (NE5000E LPUI-1T6-CM)
CR5S5KNBSL3P	NetEngine5000E 1.6T LPU 100 GE Port Enable RTU (per 100 GE)
CR5P5KHALP6A	NetEngine5000E 16-Port 100GBase QSFP28 Integrated Line Process Unit CM bundle (Including LPUI-1T6-CM, 16*100 GE Port Enable RTU for 1.6T LPU, 16*100G L3VPN Port License)
CR5D00LRXF61	72-Port 10GBase LAN/WAN-SFP+ Integrated Line Process Unit CM (NE5000E LPUI-1T6-CM)
CR5S5KXBSL3P	NetEngine5000E 1.6T LPU 10 GE Port Enable RTU (per 10 GE)
CR5P5KHALP69	NetEngine5000E 72-Port 10GBase LAN/WAN-SFP+ Integrated Line Process Unit CM bundle (Including LPUI-1T6-CM, 72*10 GE Port Enable RTU for 1.6T LPU, 72*10G L3VPN Port License)
CR5D00NDNC61	16-Port 100G OTN/ETH QSFP28 Integrated Line Process Unit (NE5000E LPUI-1T6-CM)
CR5S5KNBSL1P	NetEngine5000E 1.6T LPU 100G OTN Port Enable RTU (per 100G)
CR5P5KHALP6C	NetEngine5000E 16-Port 100G OTN/ETH QSFP28 Integrated Line Process Unit CM bundle (Including LPUI-1T6-CM, 16*100G OTN Port Enable RTU for 1.6T LPU, 16*100G L3VPN Port License)

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HUAWEI TECHNOLOGIES CO., LTD.

Huawei Industrial Base
Bantian Longgang
Shenzhen 518129, P.R. China
Tel: +86-755-28780808

www.huawei.com