

# NE20E-S Universal Service Router



## Product Overview

NetEngine20E-S Universal Service Router (NE20E-S) series are high-end network products developed by Huawei for transportation, finance, electricity, government, education, and enterprise networks. They mainly serve as aggregation nodes on IP backbone networks, core nodes on small and medium enterprise networks, edge nodes on campus networks, and access nodes on small and medium education networks.

The NE20E-S runs on the Versatile Routing Platform (VRP) operating system and uses Huawei-developed NP chips and hardware-based forwarding and non-blocking switching technologies. The NE20E-S has the following features:

- Line-rate forwarding capabilities, carrier-class reliability, excellent scalability, a well-designed quality of service (QoS) mechanism, and strong service processing capabilities

Powerful service access and aggregation capabilities and various features, such as Layer 2 virtual private network (L2VPN), L3VPN, multicast, multicast VPN (MVPN), Multiprotocol Label Switching (MPLS) Traffic Engineering (TE), and QoS, to ensure carrier-class service transmission reliability

Various service features, such as Generic Routing Encapsulation (GRE), IP security (IPsec), Network Address Translation (NAT), and NetStream

Support for IPv6 and smooth transition from IPv4 to IPv6

The NE20E-S can be flexibly deployed at the access and aggregation layer of IP/MPLS networks and work with other NE routers to provide an all-around network solution for enterprise users, satisfying diversified service requirements in the future.

## Appearance

The NE20E-S series include the NE20E-S2E, NE20E-S2F, NE20E-S4, NE20E-S8, and NE20E-S16.

### NE20E-S2E



### NE20E-S2F



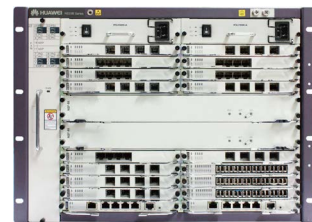
### NE20E-S4



### NE20E-S8



### NE20E-S16



## Product Features

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NE20E-S Universal Service Router

### Advanced VRP Platform

The NE20E-S uses the latest VRP8 platform, which is also used by the NE5000E core router. The VRP uses the Resilient Distributed Framework (RDF), with separated management plane, service plane, data plane, and monitoring module, greatly increasing the system flexibility, reliability, manageability, and expansibility. The VRP has grown mature and stable over the years. So far, more than 4 million sets are running on live networks. Its rich features and stability have proven themselves through wide applications.

### Huawei-developed Chips, Service on Demand

The NE20E-S uses in-built Huawei developed NP chips that allow the NE20E-S to have a flexible programmable architecture. Microcode programming can be used for new service deployment, without the need to replace hardware, which saves investments. In addition, this architecture drastically shortens the technological innovation cycle and accelerates new service launch speed, helping customers build flexible and scalable networks.

### Leading Industrial Design, Energy-conserving

The NE20E-S uses a leading industrial design, with low power consumption, energy conservation, and environmental protection. The NE20E-S is only 220 mm deep and has a lowest height of 2 U, reducing the required installation space. It can be used when the ambient temperature is between  $-40^{\circ}\text{C}$  and  $+65^{\circ}\text{C}$ , applicable to outdoor deployment.

### Comprehensive Access and Aggregation Capabilities

The NE20E-S supports various interface types (E1/CE1, POS, CPOS, GE, 10GE, and 40GE) and high-density fixed ports to provide access and aggregation WAN services as well as Ethernet multi-service transmission platform (MSTP) aggregation services, satisfying various service requirements.





## Powerful Service Support

The NE20E-S provides powerful service processing capabilities.

### Powerful routing capabilities

The NE20E-S supports various routing protocols, such as Routing Information Protocol (RIP), Open Shortest Path First (OSPF), Intermediate System-to-Intermediate System (IS-IS), Border Gateway Protocol version 4 (BGP4), and multicast routing protocols. The NE20E-S supports plaintext and ciphertext authentication as well as fast convergence. These features ensure network stability and security in complex routing environments.

### Strong service bearer capabilities

The NE20E-S can have L2VPN, L3VPN, and MVPN deployed at the same time, as networks require. The NE20E-S also supports TE, selective 802.1Q-in-802.1Q (QinQ), Dynamic Host Configuration Protocol (DHCP), and NetStream. The NE20E-S can provide access for both traditional and newly emerging services, satisfying the needs of multiple service environments.

### Powerful and expansible multicast capabilities

The NE20E-S supports IPv4/IPv6 multicast protocols, such as Protocol Independent Multicast - Sparse Mode (PIM-SM), PIM - Source Specific Multicast (PIM-SSM), Multicast Listener Discovery Version 1 (MLDv1), MLDv2, Internet Group Membership Protocol Version 3 (IGMPv3), and IGMP snooping. The NE20E-S has the flexibility to carry video services, such as Internet Protocol Television (IPTV), and satisfy multicast service requirements on networks of any scale.

## All-Round Reliability Solution

The NE20E-S provides reliability protection at different levels, including the equipment level, network level, and service level. The NE20E-S can provide a multi-level reliability solution that completely meets carrier-class reliability. The NE20E-S lays the foundation for carrier-class services with a system availability of 99.999%. The following describes the reliability protection levels that the NE20E-S provides:

### Equipment-level reliability

The NE20E-S provides redundancy backup for key components. These key components support hot swap and hot backup. The NE20E-S also uses technologies, such as non-stop routing (NSR), non-stop forwarding (NSF), and in-service software upgrade (ISSU), to ensure uninterrupted service forwarding.

### Network-level reliability

The NE20E-S uses the following technologies to provide network-level reliability: IP fast reroute (FRR), Label Distribution Protocol (LDP) FRR, VPN FRR, TE FRR, hot standby, fast convergence of Interior Gateway Protocols (IGP), BGP, and multicast routes, Virtual Router Redundancy Protocol (VRRP), trunk load balancing and backup, hardware-based Bidirectional Forwarding Detection (BFD) of 3.3 ms, MPLS OAM, and Ethernet OAM. The NE20E-S provides an end-to-end protection switching speed of 200 ms with no service interruption.

### Service-level reliability

The NE20E-S uses the following technologies to provide service-level reliability for L2VPNs and L3VPNs: VPN FRR, E-VRRP, VLL FRR, Ethernet OAM, and PW redundancy. These technologies ensure stable and reliable service operation with no service interruption.

### Flexible VS Technologies

The NE20E-S supports flexible virtual system (VS) technologies. A physical router can be divided into multiple logical routers between which resources are separated. Services can be deployed on different VSs to form a multi-service network with service separation. The use of VSs enhances security and reliability.

### Innovative IP Hard Pipe Solution

IP hard pipe is an IP network-based access technology newly developed by Huawei. It works with MPLS TE and HQoS and reserves hardware resources to implement dedicated use of bandwidth for leased line services, ensuring low delay and high reliability.

The NE20E-S supports IP hard pipe, providing a high-quality IP leased line solution for enterprises. IP hard pipe strictly isolates soft and hard pipes by hardware so that soft and hard pipe bandwidths are isolated and cannot be preempted. A hard pipe is similar to a synchronous digital hierarchy (SDH) rigid pipe. IP hard pipe uses IP Flow Performance Measurement (FPM) to measure service quality of flows and uses the NMS and uTraffic to display the measurement result and real-time service operating

status, making IP leased line services controllable, manageable, and visible.

### Complete OAM Technologies, Easy to Deploy and Maintain

The NE20E-S supports complete OAM technologies. Detection packets can be sent periodically or manually to detect network connectivity for network fault locating and diagnosis. P2P Ethernet in the First Mile (EFM), E2E Connectivity Fault Management (CFM), E2E Y.1731, and their combinations are used to provide a complete Ethernet OAM solution.

The NE20E supports a generalflow test methodology in compliance with RFC 2544 for offline performance monitoring. RFC 2544 defines a set of standard methods for evaluating network performance, which can be used in various networking scenarios that have different packet formats. The RFC 2544 tests are performed before service provisioning. During a test, a device simulates network packets and sends them to itself so that it can measure network performance. No tester is needed during this process. RFC 2544 tests can be used before service cutover for customers to evaluate whether the network performance indicators are ready.

The NE20E-S supports IP FPM developed by Huawei to measure IP network performance. IP FPM directly measures IP service packets and monitors service changes online for fast fault locating. IP FPM provides highly-accurate measurements. It can be flexibly deployed and has no impact on services.



## Product Specifications

Item	NE20E-S2E	NE20E-S2F	NE20E-S4	NE20E-S8	NE20E-S16
Switching capacity	160 Gbps	320 Gbps	480 Gbps	480 Gbps	480 Gbps
Forwarding performance	70 Mpps	150 Mpps	180 Mpps	360 Mpps	360 Mpps
Fixed port	2*10GE(SFP+) and 24*GE(SFP)	4*10GE(SFP+) and 40*GE(SFP)	—	—	—
Number of slots	2 PICs	2 PICs	2 MPUs 1 NSP 4 PICs	2 MPUs 2 NSPs 8 PICs	2 MPUs 2 NSPs 16 PICs
Dimensions (H x W x D)	89 mm x 442 mm x 220 mm (2 U)	89 mm x 442 mm x 220 mm (2 U)	132 mm x 442 mm x 220 mm (DC, 3 U) 175 mm x 442 mm x 220 mm (AC, 4 U)	222 mm x 442 mm x 220 mm (DC, 5 U) 264 mm x 442 mm x 220 mm (AC, 6 U)	353 mm x 442 mm x 220 mm (8 U)
Typical power consumption	175 W (DC) 199 W (AC)	259 W (DC) 285 W (AC)	398 W (DC) 456 W (AC)	645 W (DC) 703 W (AC)	696 W (DC) 740 W (AC)
Weight (in full configuration)	9.3kg (DC) 10.3kg (AC)	9.4kg (DC) 10.4kg (AC)	13.7kg (DC) 18.1kg (AC)	22.3kg (DC) 27.0kg (AC)	34.0kg (DC) 36.0kg (AC)
Interface type	40GE 10GE GE/FE OC-3c/STM-1c POS OC-12c/STM-4c POS Channelized OC-3/STM-1 POS E1/CE1				
Clock synchronization	Synchronous Ethernet and IEEE 1588v2				
Layer 2 features	IEEE 802.1q, IEEE 802.1p, IEEE 802.3ad, IEEE 802.1ab, and STP/RSTP/MSTP				

Item	NE20E-S2E	NE20E-S2F	NE20E-S4	NE20E-S8	NE20E-S16
IPv4/IPv6 routing protocols	IPv4 static routes and dynamic routing protocols, such as RIP, OSPF, IS-IS, and BGP IPv4/IPv6 dual stack Various IPv4-to-IPv6 transition technologies: manual tunnel, 6to4 tunnel, and 6PE IPv6 static routes and dynamic routing protocols, such as BGP4+, RIPng, OSPFv3, and IS-ISv6 IPv6 neighbor discovery, PMTU discovery, TCP6, ping IPv6, tracer IPv6, socket IPv6, and IPv6 policy-based routing				
L2/L3 VPN	LDP over TE, VPLS, H-VPLS, and VPN policy-based routing Martini MPLS L2VPN VLL/VPLS accessing L3VPN MPLS/BGP L3VPN and inter-AS VPN				
Multicast	IGMPv1/v2/v3, IGMP snooping, IPv6 multicast, static multicast routing, PIM-SM, PIM-SSM, MBGP, and NG MVPN				
QoS	WRED, five-level HQoS, and VLL/PWE3 QoS				
Reliability	NSR for OSPF/RIP/LDP/RSVP-TE/PIM/MSDP/IGMP/ARP/L3VPN/ISIS/BGP/LL/RRP GR for BGP/OSPF/ISIS/LDP/VLL/VPLS/RSVP/L3VPN/PIM BFD for static route/fast reroute/RRP/ISIS/OSPF/BGP/PIM/LSP/IPv6 Fast convergence of BGP/IGP/multicast routes IP/LDP FRR, TE FRR, VPN FRR, and VLL FRR Ethernet OAM, Y.1731, and PWE3 E2E protection ISSU and in-service patching for smooth software upgrades				
Security	ACL-based packet filtering, AAA, SNMPv3 encryption and authentication, URPF, GTSM, DHCP snooping, ARP attack defense, and SSHv2				
Value-added services	NAT, IPSec, GRE, NetStream				
OAM	Y.1731, IP FPM, MPLS OAM, 802.1ag, and 802.3ah				
Operating temperature	-5°C to +65°C	-5°C to +65°C	-40°C to +65°C	-40°C to +65°C	0°C to 45°C
Operating humidity	5% RH to 85% RH, non-condensing				
Operating altitude	≤ 3000 meters				

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