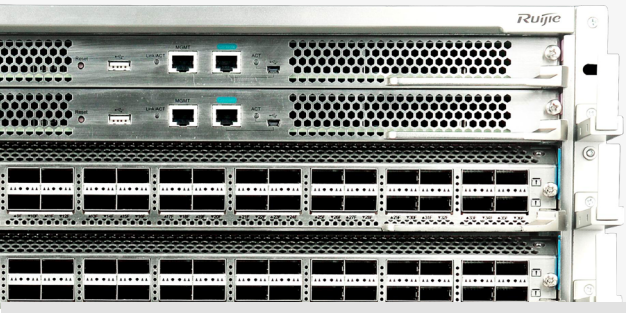

Ruijie RG-N18000-X

Cloud Data Center Core Switch Series

Ruijie Newton 18000-X Switch Series (RG-N18000-X) is the next-generation high-performance core switches designed for cloud network, which tops the class with its zero-backplane design on the 100T switching platform. The RG-N18000-X Switch Series offers high-efficiency and high-stability switching services, and guarantees ten-year smooth network upgrades.

The RG-N18000-X Series deploys an advanced hardware architecture design and is one of the world's leading core switches with the highest specifications. The series adopts the CLOS orthogonal switching architecture and offers a maximum switching capacity of up to 461T per chassis. The RG-N18000-X Series offers forwarding rates of up to 5400Mbps per slot and supports 576 100GE, 576 40GE, 2304 10GE full line rate ports by one chassis.

The RG-N18000-X Series adopts front-to-rear airflow design for heat dissipation which features a much higher heat dissipation efficiency with a much lower revolving speed, lower quantity of fans as well as lower noise level. The RG-N18000-X also makes use of energy-saving technology to minimize power consumption of the chassis.

The RG-N18000-X Series provides 2 models, RG-N18010-X and RG-N18018-X, to meet deployment needs of Internet data center and campus network data center.

Feature Highlights

- Ideal for ultra-large campus and data center networks
- Ideal for high-performance computing with ultra-low latency
- CLOS non-blocking architecture with up to 461T bandwidth per chassis
- Scalable capacity for future expansion: up to 576 100GE, 576 40GE, 2304 10GE ports
- Ready for future: support 100G Ethernet and SDN/ OpenFlow

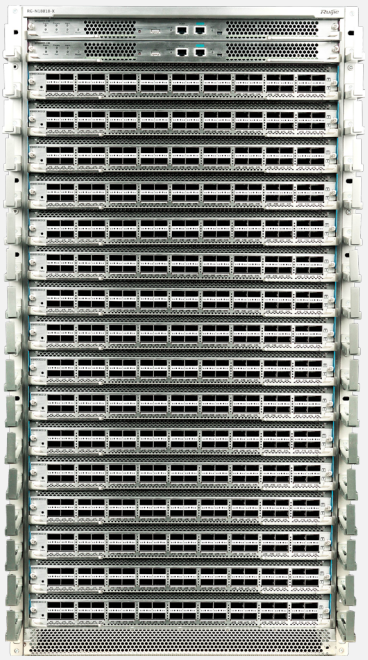

Figure 1: RG-N18018-X

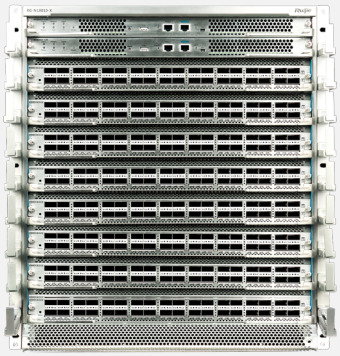

Figure 2: RG-N18010-X

Product Features

Advanced Zero-Backplane Design

The RG-N18000-X Series firstly adopts the zero-backplane design for switches with 100T switching capacity, which supports a direct connection between line cards and fabric engines without any backplane connections. The cross-module data traffic is transmitted to the fabric engines directly with minimized transmission loss. It can also improve internal transmission efficiency of service data traffic, maximizing the performance and switching capacity of the switches. Therefore, users are not required to replace the chassis for future upgrades, bringing a utilization lifespan of more than 10 years to the data center users.

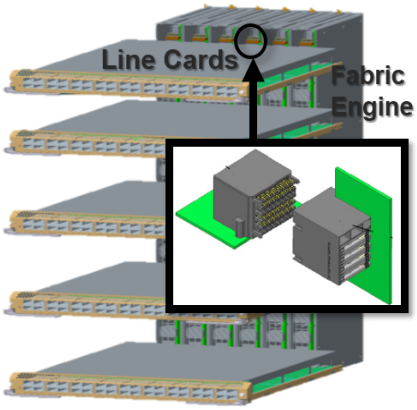

Figure 3: Direct Connection between Line Cards and Fabric Engines

Cell-based CLOS Non-Blocking Architecture

Ruijie RG-N18000-X Series deploys the advanced CLOS multi-plane, multi-stage switching architecture, which achieves complete separation of the forwarding and control planes. With independent fabric engines and control engines, the cell-based switching architecture ensures all ports are running at full line rate in a non-blocking manner. The solution continues to strengthen bandwidth upgrade and business supporting capacities.

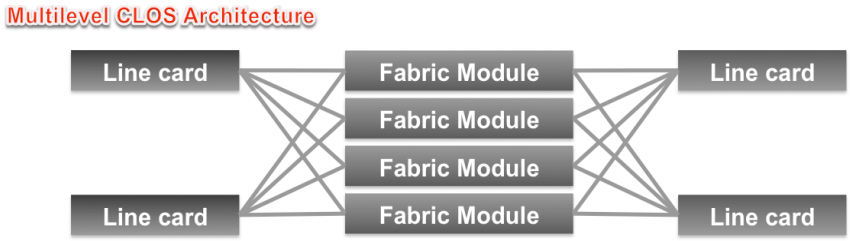

Figure 4: Advanced CLOS Architecture

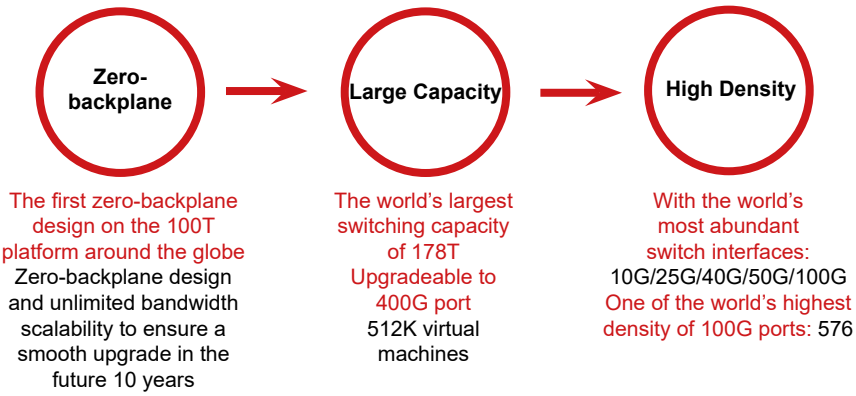

Figure 5: Uplift Performance with Exceptional Design

World's Leading Data Center Core Switch

The Ruijie RG-N18000-X Series supports bandwidth of 11.1Tbps per slot with the zero-backplane design and it is scalable to 21.6Tbps. The series also supports abundant network interfaces to meet the evolving requirements of a wide variety of scenarios, offering 36 100GE ports, 36 40GE ports and 144 10GE ports per line card.

Featuring the world's lowest height of 21U for 18-slot chassis, the RG-N18018-X supports 461T switching capacity at maximum per chassis. The 21U-height switch supports a maximum of 576 100GE, 576 40GE or 2304 10GE line rate ports, with the port density increasing by 20% compared with other similar products in the market.

The RG-N18010-X offers a height of 12U for 10 slots, and provides 89T switching capacity at maximum per chassis. The 12U switch supports up to 288 100GE, 288 40GE and 1152 10GE line rate ports, with port density of 20% higher compared with other similar products in the market. The RG-N18000-X Series, as the network gateway of the large Layer 2 network, can support over 500 thousand virtual machines. Equipped with the latest graphic-card-class GDDR5 SDRAM, the switch can achieve a maximum cache capacity of up to 24 GB per module, and support the distributive cache technology, which increases the cache capacity by 33%. The RG-N18000-X Series supports high-efficiency caching of surge traffic from the large-scale virtual machines of the data center, significantly reducing the packet loss ratio and improving the processing performance of the data center services.

On-Demand Resource Allocation Enabled by Data Center Virtualization

Virtual Switch Unit 3.0 (VSU)

The series supports the industry-leading Virtual Switch Unit 3.0 (VSU). The technology can virtualize multiple physical devices into one logical unit, which largely minimizes the number of network nodes and reduces administrator workload. Superior 50~200ms link failover ensures smooth and uninterrupted transmission of key services. The RG-N18000-X Series supports cross-device link aggregation, providing active/active uplink to server or switch. The network can hence offer effective connectivity and amplify the bandwidth.

Virtual Machine Perception and Policy Auto-migration

The VM perception and automatic migration of policies features enable centralized deployment of VM traffic security policy in a large-scale server virtualization environment. Married with data center network management platform, data center switches, and VM management platform, it realizes simultaneous policy migration as virtual host can migrate smoothly within the network. It totally gets rid of security loopholes and hence lessens network maintenance workload.

Innovative Technology & Energy-saving Design

The RG-N18000-X Switch Series adopts zero-backplane design for heat dissipation straight-through airflow feature, that perfectly complies with the airflow direction in the data center rooms, contributing to unobstructed air flow across the front-to-rear module with a high speed of up to 15m/s (equivalent to the 7th level of wind power). This design has significantly improved the heat dissipation efficiency, allowing much cold air pouring in the chassis for heat dissipation. It effectively reduces device temperature and supports surge protection. The 30°degree inward bending front panel increases the vent ratio by 106% compared with the vertical panel, efficiently elevating the air intake amount.

The RG-N18000-X Switch Series uses the smart counter rotating fans that consists of two different fan blades to satisfy the needs on airflow amount and air pressure. The different quantities of fan blades enable the staggering frequencies in terms of vibration and noise to avoid the problem resonance. Compared with the traditional concatenation of axial fans, the counter rotating fans have more advantages on the amount of wind flow, and also supports the speed adjustment in different zones to reduce the power consumption.

The RG-N18000-X Switch Series adopts the industry-leading titanium-level power supply, offering a power supply switching efficiency of up to 96%. The 100G line card adopts the non-PHY chip design, reducing power consumption per module by more than 5.63%. The low-impedance copper bar design ensures a power loss during power configuration by less than 0.3%.

Technical Specifications

Model	RG-N18018-X	RG-N18010-X
Module Slots	18 (2 for control engines)	10 (2 for control engines)
Modular Power Slots	16	8
Control Engine Slots	2	2
Service Module Slots	16	8
Fabric Engine Slots	6	6
Switching Capacity	461Tbps/1032Tbps	230Tbps/516Tbps
Packet Forwarding Rate	86400Mpps	43200Mpps
Airflow Design	Front-to-rear airflow	
Device Virtualization	VSU3.0 (Virtual Switch Unit)	
Network Virtualization	VXLAN network bridge, VXLAN network gateway	
VXLAN	VXLAN Layer 2 Bridge, VXLAN Layer 3 Bridge, EVPN VXLAN	
L2 Features	Jumbo Frame, 802.1Q, STP, RSTP, MSTP, Super VLAN, GVRP, QinQ or flexible QinQ, LLDP	
IPv4 Features	Static routing, RIP, OSPF, IS-IS, BGP4, VRRP, equal cost routing, strategic routing and GRE tunnel	
IPv6 Features	Static routing, OSPFv3, BGP4+, IS-ISv6, MLDv1/v2, VRRPv3, equal-cost routing, strategic routing, manual tunnel, GRE tunnel	
Multicast	IGMP v1/v2/v3, IGMP Snooping, IGMP Proxy, Multicast routing protocols (PIM-DM, PIM-SM, PIM-SSM), MLD, Multicast static routing	

ACL	Standard/Extended/Expert ACL, IPv6 ACL	
QoS	802.1p, Queue scheduling mechanisms (SP, WRR, DRR, SP+WRR, SP+DRR), RED/WRED, Input/output port-based speed limit, HQoS	
Reliability	Independent fabric engine and independent control engine design to achieve the compete separation of forwarding and control panel	
	Control engine 1+1 redundancy; fabric engine N+1 redundancy, power supply and fan N+M redundancy; zero-backplane design to avoid single point of failure; Hot-swappable components; Hot patch and online patch upgrade; ISSU; NSR; GR for OSPF/IS-IS/BGP, BFD for VRRP/OSPF/BGP4/ISIS/ISISv6/static routing	
Security	NFPP (Network Foundation Protection Policy), CPP (CPU Protection), DAI, Port Security, IP Source Guard, uRPF, Portal authentication, user login authentication, Unknown multicasts are not delivered to CPU and support unknown unicasts suppression, Support SSHv2 to provide a secure and encrypted channel for user login, Support ITU-T Y.1731	
Manageability	Console/AUX Modem/Telnet/SSH2.0 command line configuration; FTP, TFTP, Xmodem, SFTP file upload/download management; SNMP V1/V2c/V3; Netconf, RMON; NTP clock; Fault alarm and auto-recovery; System log; Flow Analysis; Automated Configuration	
Dimensions (W x D x H) (mm)	442*1017*934(21U)	442*1017*534(12U)
Power Supply	RG-PA2700I:	
	100-120VAC 1350W	
	200-240VAC 2700W	
MTBF	>=200K hours	
Safety Standards	IEC 60950-1, EN 60950-1	
Emission Standards	EN 300 386, EN 55032, EN 61000-3-2, EN 61000-3-3, EN 55024, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11	
Temperature	Operating temperature: 0ºC to 45ºC	
	Storage temperature: -40ºC to 70ºC	
Humidity	Operating humidity: 10% to 90% RH (non-condensing)	
	Storage humidity: 5% to 95% RH	
Operating Altitude	-500m to 5,000m	

Typical Applications

Data Center Network Core

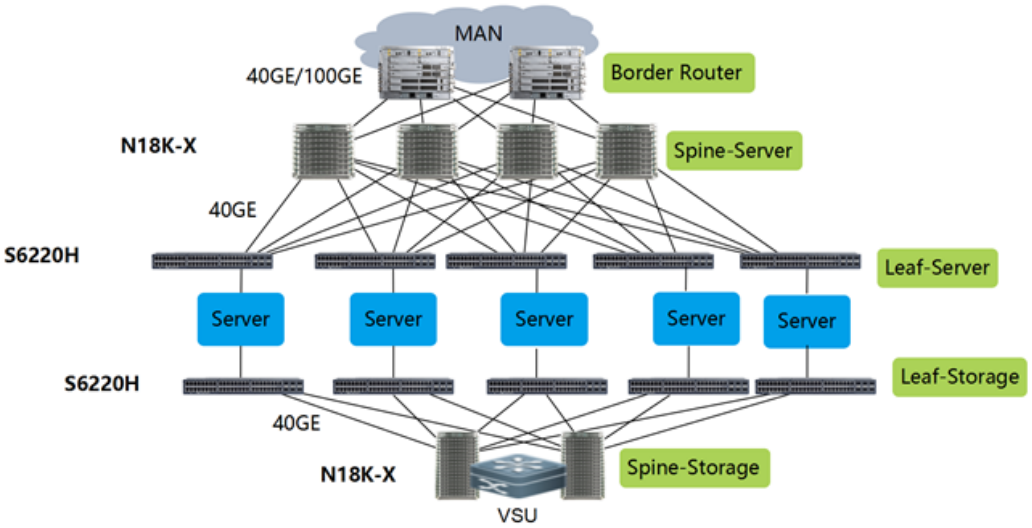

Figure 6: Data Center Network Core

Ruijie Newton 18000-X Switch Series (RG-N18000-X) is the next-generation high-performance core switches designed for cloud network, which tops the class with its zero-backplane design on the 100T switching platform.RG-N18000-X Series data center products mainly focus on large data center scenarios with application of the VXLAN technology.It is mainly used in the core equipment of data center.

Ordering Information

1. Main Chassis & Engine Management

Select the main chassis and control engine in accordance with specific product models.

Model	Description
RG-N18000-X Series Main Chassis & Control Engine	
RG-N18018-X	18-slot chassis with fan (without power supply)
RG-N18010-X	10-slot chassis with fan (without power supply)
M18000X-CM II	N18000-X 2nd generation control engine

2. Power Supply

Select at least 1 power module or up to N+M redundancy according to the power supply requirement of the device.

Model	Description
RG-PA2700I	N18000-X power module (support redundancy, AC, 2700W, 16A)

3. Fabric Engine

Select at least 1 fabric engine. It is recommended to select at least 2 to ensure fabric engine redundancy.

Model	Description
M18018X-FE-C II	N18018-X fabric engine II
M18010X-FE-C I	N18010-X fabric engine I

4. Line Card & Service Module

Select the host line cards and service modules according to your application scenario.

Model	Description
M18000X-6QXS6CQ-CB	6 40GBASE-X ports (QSFP+,MPO), 6 100GBASE-X ports (QSFP28, MPO)
M18000X-36CQ-CB	36 100GBASE-X ports (QSFP28, MPO)
M18000X-12QXS12CQ-CB	12 40GBASE-X ports (QSFP+,MPO), 12 100GBASE-X ports (QSFP28, MPO)
M18000X-48XS2CQ-CB	48 10GBASE-X ports (SFP+, LC), 2 100GBASE-X ports (QSFP28, MPO)
M18000X-18QXS18CQ-CB	18 40GBASE-X ports (QSFP+,MPO), 18 100GBASE-X ports (QSFP28, MPO)
M18000X-48XT2CQ-CB	48 10GBASE-T ports (RJ45), 2 100GBASE-X ports (QSFP28, MPO)

5. Transceiver & Accessories

Model	Description
XG-SFP-SR-MM850	10G SR Fiber Module for SFP+ ports, 300m
XG-SFP-LR-SM1310	10G LR Fiber Module for SFP+ ports, 10km
XG-SFP-ER-SM1550	10G ER Fiber Module for SFP+ ports, 40km
XG-SFP-ZR-SM1550	10G ZR Fiber Module for SFP+ ports, 80km
40G-QSFP-SR-MM850	40GBASE-SR, QSFP+ transceiver (8/12-core, 850nm, 100m with OM3 fiber, 150m with OM4 fiber, MPO)
40G-QSFP-LR4-SM1310	40G LR single-mode fiber module, QSFP+ transceiver, 10km (LC, dual-core, 1310nm)
100G-QSFP-SR-MM850	100GBASE-SR, QSFP28 transceiver (850nm, 100m with OM4 fiber)
100G-QSFP-LR4-SM1310	100G LR single-mode fiber module, QSFP28 transceiver, 10km (LC, dual-core, 1310nm)

Model	Description
100G-QSFP-iLR4-SM1310	100G iLR fiber module, QSFP28 transceiver, 2km (LC, dual-core, 1310nm)
40G-AOC-5M	40G QSFP+ Optical Stack Cable (included both side transceivers), 5 Meters
100G-AOC-5M	100G QSFP28 Optical Stack Cable (included both side transceivers), 5 Meters

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