

Ruijie Newton RG-N18000-X

Cloud Data Center Core Switch Series Datasheet

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 172T per chassis. The RG-N18000-X Series offers forwarding rates of up to 3.6Tbps per slot and supports 1152 100GE, 576 40GE, 2304 25GE and 2304 10GE full line rate ports per 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.

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 10.8T bandwidth per slot
- Scalable capacity for future expansion: up to 1152 100GE, 576 40GE, 2304 25GE or 2304 10GE ports
- Ready for future: support 100G Ethernet and SDN/ OpenFlow



RG-N18018-X



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.

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.

Multilevel CLOS Architecture



Advanced CLOS Architecture

World's Leading Data Center Core Switch

The Ruijie RG-N18000-X Series supports bandwidth of 10.8Tbps 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 72 100GE ports, 36 40GE ports, 144 25GE 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 172T switching capacity at maximum per chassis. The 21U-height switch supports a maximum of 1152 100GE, 576 40GE, 2304 25GE 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 86T switching capacity at maximum per chassis. The 12U switch supports up to 576 100GE, 288 40GE, 1152 25GE 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 Switch Device (VSD)

The RG-N18000-X Series delivers the industry's first 1:16 virtualization. One device can be virtualized into multiple virtual units. Hence, every virtual unit has a unique configuration management interface, independent hardware resources allocation (e.g. storage, TCAM and hardware forwarding table). All the features support restart with no effects on other virtual machines. Users can realize network resources allocation based on different needs. Resources of the core switch can hence be shared with other domains and users.

Transparent Interconnection of Lots of Links (TRILL)

Ruijie RG-N18000-X Series supports Transparent Interconnection of Lots of Links (TRILL) of the IETF standard, allowing deployment of large Layer 2 network in the data center. The feature enhances deployment flexibility and expands VM migration area. Ruijie data center products, ranging from access to core, all support the TRILL technology. It can simplify the network design and boost network scalability and flexibility, building a firm foundation for a large-scale virtualized cloud-computing network construction in the future.

Virtual Ethernet Port Aggregator (VEPA)

The Ruijie RG-N18000-X Series supports Virtual Ethernet Port Aggregator (VEPA) of the IEEE802.1qbg standard. Data traffic from the server VM can be diverted to the physical network devices for "hard-switching". This completely eliminates problems

such as uncontrollable monitoring of VM traffic, incapability of unified policy deployment and server resources occupation caused by traditional “soft-switching”. All the features together optimize the next-gen data center network solution to fit into the virtual computing environment.

Virtual Machine Perception & 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.

Unified Switching with Integrated Storage & Ethernet

The Ruijie RG-N18000-X Series supports access via Fibre Channel over Ethernet (FCoE) or Ethernet for easy integration of heterogeneous storage and data networks. It greatly reduces the number of network devices.

The RG-N18000-X switches and 10GE data center ToR device RG-S6220 together form a FC/FCoE data center integration solution. It can centrally manage FC SAN, IP SAN, FCoE SAN and IP network. It simplifies network deployment and minimizes cabling cost, hence totally protecting user’s investment.

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 counterrotating 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 counterrotating 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

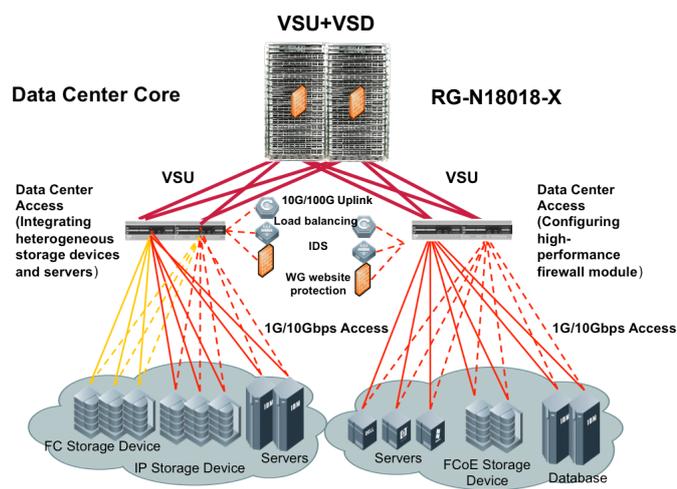
Model	RG-N18018-X	RG-N18010-X
Module Slots	18 (2 for control engines)	10 (2 for control engines)
Modular Power Slots	16	8
Control Engine Slots	2	2
Service Module Slots	16	8
Fabric Engine Slots	6	6
Switching Capacity	172Tbps/356Tbps	86Tbps/178Tbps
Packet Forwarding Rate	172,800Mpps	86,400Mpps
Airflow Design	Front-to-rear airflow	
Device Virtualization	VSU3.0 (Virtual Switch Unit) VSD (Virtual Switch Device)	
Network Virtualization	VXLAN network bridge, VXLAN network gateway	
SDN	OpenFlow 1.3	
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	
MPLS	MPLS forwarding, MPLS VPN/VPLS, VPWS	
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 complete 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/MPLS/ 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	
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	

Model	RG-N18018-X	RG-N18010-X
MTBF	>=200K hours	
Temperature	Operating temperature: 0°C to 45°C	
	Storage temperature: -40°C to 70°C	
Humidity	Operating humidity: 10% to 90% RH (non-condensing)	
	Storage humidity: 5% to 95% RH	
Operating Altitude	-500m to 5,000m	

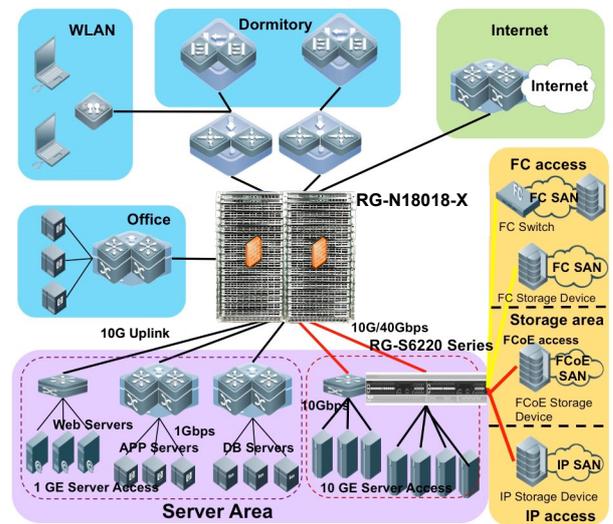
TYPICAL APPLICATION

The Ruijie Newton 18000-X platform is applicable to a wide range of deployment scenarios. The series can act as the core for data center network as well as integrated network of data center and campus network. Respective illustrations are shown below.

Data Center Network Core



Campus Network & Data Center Network Core



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	N18000-X control engine
M18000X-CM II	N18000-X 2nd generation control engine

2. Power Supply

Please 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

Please 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
M18018X-FE-C V	N18018-X fabric engine V
M18010X-FE-C I	N18010-X fabric engine I
M18010X-FE-C II	N18010-X fabric engine II

4. Line Card & Service Module

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

Model	Description
M18000X-36QXS-CB	36 40GBASE-X ports (QSFP+, MPO)
M18000X-36CQ-CB	36 100GBASE-X ports (QSFP28, MPO)
M18000X-18CQ-CB	18 100GBASE-X ports (QSFP28, MPO)
M18000X-48XS2CQ-CB	48 10GBASE-X ports (SFP+, LC), 2 100GBASE-X ports (QSFP28, MPO)
M18000X-72CM-CB	72 100GBASE-X ports (MXP)

5. Transceiver

Model	Description
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)



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