Ruijie Newton RG-N18000
Cloud Network Core Switch Series Datasheet

Ruijie Newton 18000 Switch Series (RG-N18000) is industry leading in supporting cloud data center with a broad spectrum of specialized campus network features. Ruijie RG-N18000 core switches achieve cloud network integration, virtualization, and flexible deployment to fulfill the evolving next-gen cloud architecture requirements.

Ruijie brings you an innovative "Network Cloud Mode" featuring strong cloud and light access: Building a strong core (unified gateway, authentication, multiservice) for light access. All service channels including the cloud data center and cloud campus network can move to the cloud, building a true channel connecting the services and end users. The feature achieves network resources pooling, requirement-based distribution and flexible expansion.

HIGHLIGHTS

- Ideal for ultra-large campus and data center networks with up to 512K MAC and 170K ARP table

- Ideal for high-performance computing with ultra-low latency of up to 0.5μs

- CLOS non-blocking architecture with up to 2T bandwidth per slot

- Scalable capacity for future expansion: up to 1152 10GE and 288 40GE ports

- Ready for future: support 100G Ethernet and SDN/ OpenFlow

Ruijie RG-N18000 Series deploys an advanced software architecture design and is one of the world's leading core switches with the highest specifications. The series supports CLOS switching architecture and offers sustaining bandwidth upgrade and service support capacities. Single slot offers forwarding rates of up to 1.28Tbps and single chassis can support 96 100GE, 288 40GE or 1152 10GE full line rate interfaces.

RG-N18014   RG-N18010   RG-N18007

Ruijie Newton 18000 Series has 3 models - RG-N18014, RG-N18010 and RG-18007 - to meet various port density and performance requirements. The switches deliver excellent investment protection and are suitable for deployment in a wide range of settings such as data center, MAN, campus network or integrated network of data center and campus network.

Newton 18000

Innovative Feature Highlights of Ruijie Newton 18000 Series

PRODUCT FEATURES

Ultra-Simplified Solution for Campus and Data Center Networks

To meet new challenges from evolving application environments, the market-leading Ruijie RG-N18000 Series delivers an innovative heterogeneous solution to power both campus and data center networks.

The RG-N18000 operates as the core of unified authentication and gateway in the ultra-simplified network solution. The switch achieves centralized authentication of wired and wireless networks on the core device via the built-in/external 802.1X/ Portal authentication system. It can eliminate all the differences between access layer device performance and access mode. The RG-N18000 supports ≥170K ARP capacity, concurrent ≥90K IPv4/IPv6 dual stack devices with centralized authentication and authentication speed of 1200 devices per second. The web noise reduction feature can prevent illegal authentication packets to protect users' Internet authentication experience. With Ruijie SAM, the RG-N18000 can also achieve refined management such as traffic billing and traffic control.

Moreover, RG-N18000 can further achieve network simplicity through the consolidation of SAN Storage Network into a unified Ethernet-based Storage Network via FCoE support.

Feature highlights supported by the respective sub-solution are illustrated in the figure below and described in the following sections.

	Campus Network	Data Center
N18000 Series Ultra-Simplified Solution	• L2/L3, QinQ, IPv6 • MPLS, Multicast • Tunnel, ACL • QoS, BFD • IPFIX, sFlow • Hot Backup, ISSU • Unified authentication • Large table size • Unified management mode (One Switch One Network) • SDN and more...	• FCoE • DCB • TRILL • Security policy migration • VSU (4 to 1) • VSD (1 to 12) • High density/High bandwidth • Low latency • Ultra-large buffering • L2-GRE and more...

Platform Features	**Hardware**: CLOS architecture, 1.28Tbps per slot (unidirectional) **Software**: Multi-processing modular OS, ISSU and process backup

N18000 Series Handles Both Networks with Ease

Ruijie RG-N18000 Series can act as the core of unified authentication and gateway of the campus network to offer simplified network experience for users. As the centralized authentication gateway, the core device can achieve unified assignment of security policies. The access layer and aggregation layer is only responsible for Layer 2 forwarding. As the device maintenance is simpler, the performance capacity is no longer a bottleneck. The core layer device provides rich features, high performance and high reliability. The centralized management of network management policies facilitates security monitoring,

network expansion and new service development. The Ruijie RG-N18000 Series supports multiple authentication modes such as Portal/ 802.1X. MAC. Different management modes and technologies will be deployed in different scenarios according to different user requirements of the campus network so as to provide targeted and high-availability technologies and solutions.
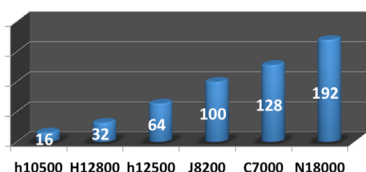
Ruijie Newton N18K Series supports up to 170K ARP entries and 90K IPv4/IPv6 terminals.

Authenticate **1000 clients/second**

Speed surpasses traditional authentication device
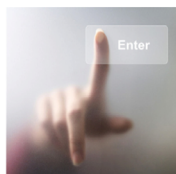
Superior Authentication Performance

Cloud Data Center Network

Ruijie RG-N18000 Series can also act as the core of the Cloud Data Center Network Solution, and provide a robust and comprehensive set of features that meets the demanding requirements of virtualization and automation in present and future data center environments. A variety of features are embedded in the Ruijie RG-N18000 Series such as Transparent Interconnection of Lots of Links (TRILL), Policy Auto-migration, Layer 2 Generic Routing Encapsulation (GRE), Virtual Ethernet Port Aggregator (VEPA), Fibre Channel over Ethernet (FCoE) and Data Center Bridging (DCB).
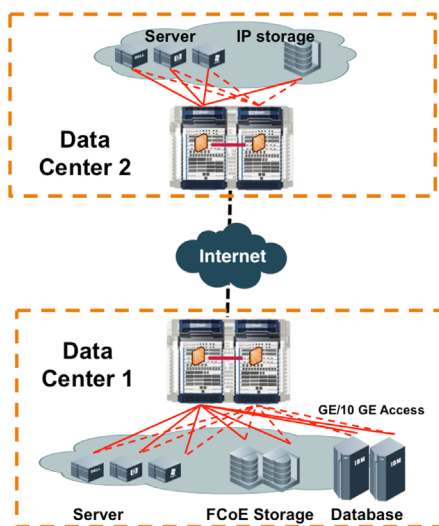
N18000 Supports Data Center Solution

World's Leading Cloud Network Core

CLOS Non-blocking Architecture[1]

Ruijie RG-N18000 Series deploys the advanced CLOS multi-plane, multi-stage architecture, which achieves complete

separation of the forwarding and control planes. With independent fabric engines and control engines, it 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
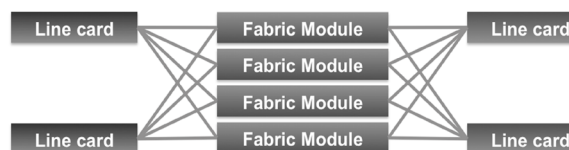
Advanced CLOS Architecture

Using an orthogonal design for service modules and fabric engines, the cross-board traffic is transmitted to the fabric engines through the orthogonal connector. Ruijie RG-N18000 Series achieves zero wiring for backplane with minimized transmission loss and signal degradation. It can also improve internal transmission efficiency of the switch.

Scalable Performance for Future Development

Ruijie RG-N18000 Series single slot supports bandwidth of 2Tbps and it is scalable to 4Tbps. The series also supports high-density 40GE and 100GE Ethernet ports to meet the evolving requirements of cloud computing data center in the coming decade.

The RG-N18000 Series is market leading in supporting line-rate packet forwarding. All boards including the one with the highest density support 64-byte packet forwarding at line rate. The switches thereby ensure high-speed forwarding with zero packet loss in large-scale data center.

The RG-N18000 Switches offer ultra-low latency up to 0.5µs to support high-speed transmission.

The series sustains a huge distributed cache design to achieve 200ms caching capacity. This feature fulfills spontaneous traffic requirements for data centers, high-performance network and so on.

The line card provides the highest density:
· 2T bandwidth per slot
· 24 x 40G ports per slot
· 24 x 40G ports per chassis
All ports support Line-Speed Forwarding

2T

Only 0.57us Low Forwarding Delay to satisfy high-performance computing, computing center, data equipment interconnection, financial transactions, etc.

0.5us

Super Large Distributing Cache 200ms to ensure zero packet loss

200ms

Market-leading Performance in Line Card Density, Forwarding and Cache

Note:

[1] The RG-N18007 does not support the CLOS Non-blocking Architecture.

Next-Generation Cloud Infrastructure

Delivering high-quality cloud-based experiences to clients efficiently requires an intelligent next-generation cloud infrastructure that Ruijie offers. Ruijie RG-N18000 Cloud Network Core Switch Series can operate as the core of the Cloud Data Center Network, and provide a robust and comprehensive set of features that meets the demanding requirements of virtualization and automation in present and future data center environments. A variety of features are embedded in the Ruijie RG-N18000 Series such as Transparent Interconnection of Lots of Links (TRILL), Policy Auto-migration, Layer 2 Generic Routing Encapsulation (GRE), Virtual Ethernet Port Aggregator (VEPA), Fibre Channel over Ethernet (FCoE) and Data Center Bridging (DCB). Full details will be discussed in the coming sections.
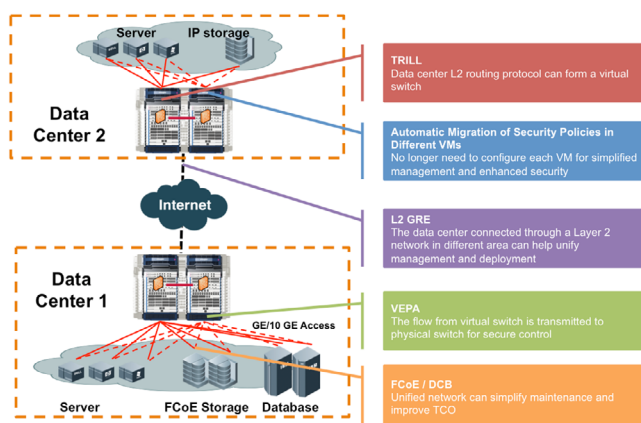
Summary of Data Center Features Supported by N18000

Virtual Switch Unit 3.0 (VSU)

The series supports the 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 reduce administrator workload. Superior 50~200ms link failover ensures smooth and uninterrupted transmission of key services. The RG-N18000 Series supports cross-device link aggregation for easy double uplink to server/switch. The network can effectively maximize bandwidth investment return.
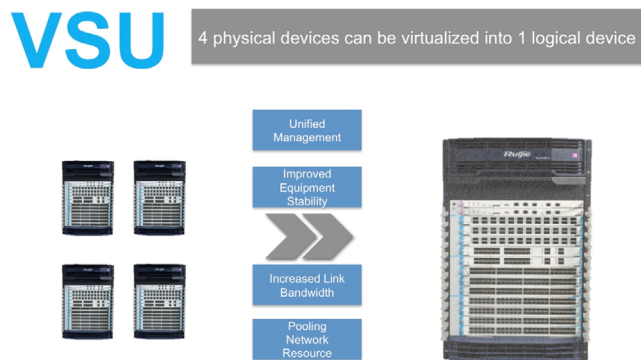
Benefits of 4-to-1 Virtualization

Virtual Switch Device (VSD)

Ruijie RG-N18000 Series delivers industry's first 1:12 virtualization. One device can be virtualized into multiple virtual units. Hence, every virtual unit has a unique configuration management interface, independent hardware 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.

Benefits of 1-to-12 Virtualization

Transparent Interconnection of Lots of Links (TRILL)

Ruijie RG-N18000 Series supports Transparent Interconnection of Lots of Links (TRILL) of the IETF standard, allowing deployment of super 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.

Layer 2 Generic Routing Encapsulation (L2-GRE)

With the international L2-GRE standard, the RG-N18000 switches break the geographical boundaries to achieve data center L2 communication. Data center resources at different locations can be centrally managed and allocated.

Virtual Ethernet Port Aggregator (VEPA)

The Ruijie RG-N18000 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

Ruijie RG-N18000 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 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.

Software-Defined Network (SDN) & OpenFlow

Software Defined Networking is an emerging network architecture where network control is decoupled from forwarding and is directly programmable.

Core Concepts

- Decoupling of control plane and forwarding plane-> hardware / network unified abstraction & virtualization, ease of independent development
- Centralized control & distributed forwarding-> convert the distributed protocol problem into algorithm problem
- Open programming interface-> softwarization of hardware, programmable devices, scalable network features & higher flexibility

Solution Components

- Hardware Switching Devices:
  Ruijie Newton 18000 and S6000 series platforms will fully support OpenFlow 1.0/1.3 modular hardware switching
- SDN Controller RG-IONC
  Ruijie Intelligent OpenFlow Network System is a X86 hardware platform, which fully supports OpenFlow 1.0/1.3 and SNMP2.0, providing the SDN control service modules below:
  • Switch/host/topology management, L2/L3 communication
  • Traffic editing/path calculation/static routing/DHCP
  • MPLS L3 VPN service
  • Virtual tenant network service

Ruijie products fully support SDN solution

Load Balancing
Centralized Authentication
Intelligent Route Selection
....
APP N

OpenFlow Switch   Controller   Supervisory Control Platform

Simplify maintenance and operation Control resources flexibly
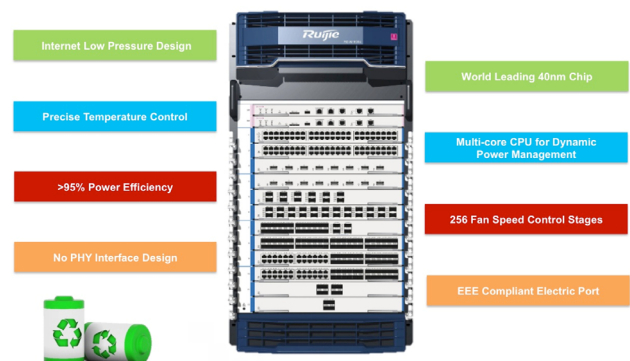
N18000 Offers a Comprehensive SDN Solution

High Reliability & Energy-saving Design

Redundant design of the RG-N18000 Series key components delivers excellent protection: control engine 1+1 redundancy, fabric engine N+1 redundancy, fan N+M redundancy and power module N+M redundancy. All redundant components are hot-swappable to enhance the reliability and availability of the device to the maximum extent. Hot patch and ISSU technology are also supported to enable online upgrade of devices.

Support GR for OSPF/IS-IS/BGP and BFD for VRRP/OSPF/BGP4/ISIS/ISISv6/MPLS/static routing to enable the fast fault detection mechanism of different protocols, which minimized the fault detection time to less than 50ms.

The RG-N18000 Series adopts 40nm chip technology, more energy efficient than the traditional 90nm and 65nm. Multi-core CPU supports dynamic power management with all fiber ports adopting non-PHY design to reduce power consumption. All Ethernet ports support the Energy-Efficient Ethernet (EEE) standard to save power under light load.

The internal system is designed for low voltage power supply with high-efficiency modular power to form a more efficient power supply system. The smart fan supports 256 speed modulations with precise temperature control, energy saving and noise control. The device can function at high temperature for a long period of time or in harsh environment for significant savings on energy consumption by air conditioning.

Internet Low Pressure Design
Precise Temperature Control
>95% Power Efficiency
No PHY Interface Design

World Leading 40nm Chip
Multi-core CPU for Dynamic Power Management
256 Fan Speed Control Stages
EEE Compliant Electric Port

Abundant Energy Conservation Features

Multi-processing Modular Operating System

Since 1998, Ruijie has been investing on the R&D of modular operating system. The RG-N18000 software platform is designed based on the next-generation RGOS 11.X multi-processing modular operating system to integrate the service features such as loosely coupled firewall, wireless, IPFIX and authentication into a unified cloud network operating system. The RG-N18000 software platform also supports full virtualization and offers rich data center and campus network features. The key availability indicators such as multi-processing modules, process backup and hot patch have reached the industry-leading level.
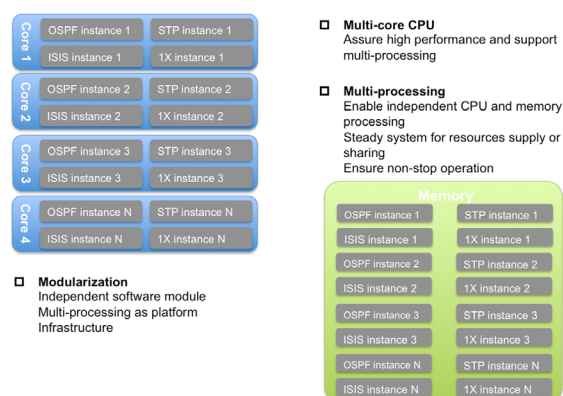
Architecture and Benefits of Multi-process Modular Operating System
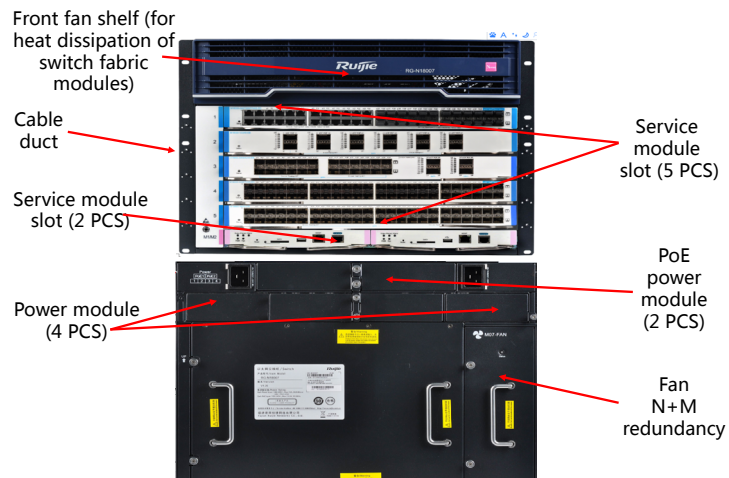
PLATFORM COMPONENTS

The Ruijie Newton 18000 platform provides high forwarding performance, high-density 10GE/100GE ports, and FCoE/IP integrated networking to meet application requirements of integrated data center networks and campus networks. Below is a quick hardware overview of the Newton 18000 platform:

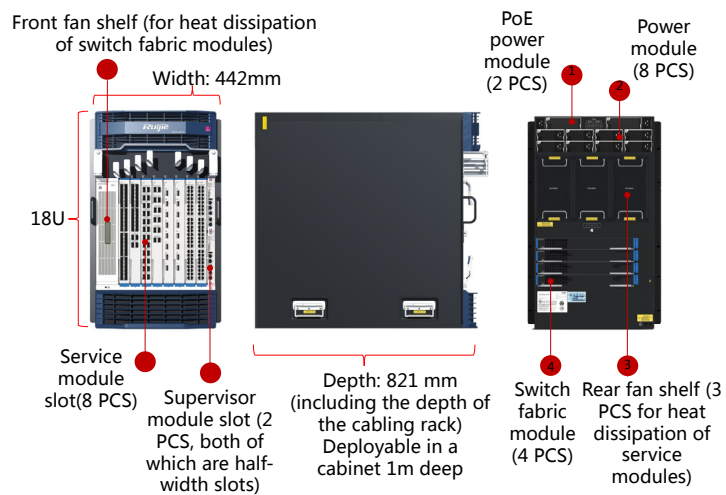| Specifications	RG-N18007	RG-N18010	RG-N18014
Dimensions (W x D x H) (mm)	442 x 598 x 352.8 (8U)	442 x 821 x 797.3 (18U)	442 x 811 x 886.2 (20U)
Number of Control Engine Slots	2	2	2
Number of Service Module Slots	5	8	12
Number of Fabric Engine Slots	N/A	4	4
Max. Number of 10GE Ports	240 (DB module, 10GE ports) 240 (DB module, 40GE ports for 1-to-4 splitting)	384 (DB module, 10GE ports) 768 (DB module, 40GE ports for 1-to-4 splitting) 320 (CB module, 10GE ports) 768 (CB module, 40GE ports for 1-to-4 splitting)	576 (DB module, 10GE ports) 1152 (DB module, 40GE ports for 1-to-4 splitting) 480 (CB module, 10GE ports) 1152 (CB module, 40GE ports for 1-to-4 splitting)
Max. Number of 40GE Ports	60	192	288

Ruijie Newton 18000 Platform Components

The Ruijie Newton 18000 platform is built using the components summarized in figure below followed by full details in latter sections.
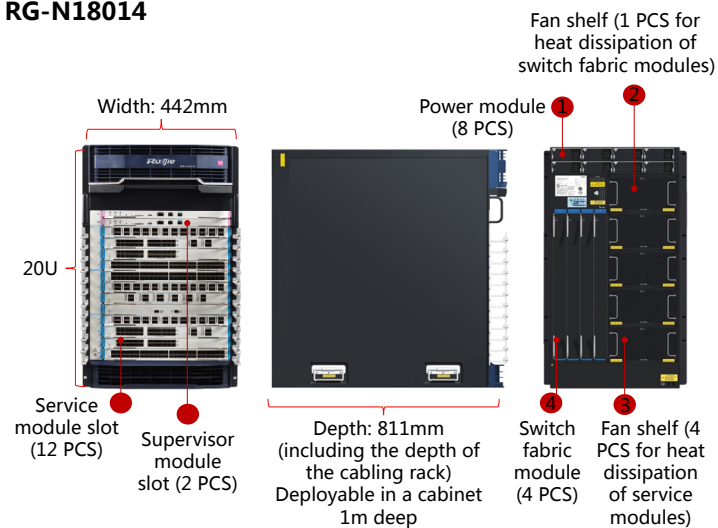
RG-N18007

Front fan shelf (for heat dissipation of switch fabric modules)

Cable duct

Service module slot (2 PCS)

Power module (4 PCS)

Service module slot (5 PCS)

PoE power module (2 PCS)

Fan N+M redundancy

Ruijie RG-N18007 Platform Components

RG-N18010

Front fan shelf (for heat dissipation of switch fabric modules)

Width: 442mm

18U

Service module slot(8 PCS)

Supervisor module slot (2 PCS, both of which are half-width slots)

Depth: 821 mm (including the depth of the cabling rack) Deployable in a cabinet 1m deep

PoE power module (2 PCS)

Power module (8 PCS)

Switch fabric module (4 PCS)

Rear fan shelf (3 PCS for heat dissipation of service modules)

Ruijie RG-N18010 Platform Components

RG-N18014

Width: 442mm

20U

Service module slot (12 PCS)

Supervisor module slot (2 PCS)

Depth: 811mm (including the depth of the cabling rack) Deployable in a cabinet 1m deep

Fan shelf (1 PCS for heat dissipation of switch fabric modules)

Power module (8 PCS)

Switch fabric module (4 PCS)

Fan shelf (4 PCS for heat dissipation of service modules)

Ruijie RG-N18014 Platform Components

Ruijie Newton 18000 Platform Line Cards

The Ruijie Newton 18000 platform supports a variety of line cards, all of which can be configured in any combination as shown in the table below.[2]

Line Cards	Description
Enterprise Line Cards (ED)	• Designed for Campus Network • Support for Large-Scale MAC (up to 512K) and ARP Table (up to 170K) • Support distributed IPv4, IPv6, MPLS and IPIFX • Support Next-Gen Data Center features such as VSD, VSU, FCoE, DCB, VEPA, VM Discovery and Security Policy Migration
Enterprise Line Cards (EF)	• Designed for Campus Network • Support for Large MAC (up to 512K) and ARP Table (up to 170K) • Support for Large IP Routing Table (up to 512K) and ACL entries (up to 6K) • Support distributed IPv4, IPv6, MPLS and IPIFX • Support Next-Gen Data Center features such as VSD, VSU, FCoE, DCB, VEPA, VM Discovery and Security Policy Migration
Data Center Line Cards (DB)	• Designed for Data Center Network • Support for 40G/100G Ethernet • Support Ultra-Low Latency (i.e. <1μs) • Support distributed IPv4, IPv6, MPLS and IPIFX • Support Next-Gen Data Center features such as VSD, VSU, FCoE, DCB, VEPA, VM Discovery and Security Policy Migration
Carrier Line Cards (CB)	• Designed for Data Center Network • Support for 40G/100G Ethernet • Support Large Caching (up to 6GB) • Support distributed IPv4, IPv6, MPLS and IPIFX • Support Next-Gen Data Center features such as VSD, VSU, FCoE, DCB, VEPA, VM Discovery and Security Policy Migration

TECHNICAL SPECIFICATIONS

Model	RG-N18007	RG-N18010	RG-N18014
Module Slots	7 (2 for control engines)	10 (2 for control engines)	14 (2 for control engines)
Modular Power Slots	6 (2 for PoE power modules) System power: 4 PoE Power: 2	10 (2 for PoE power modules) System power: 8 PoE power: 2	8 System power: 8 PoE power: N/A
Fan Slots	1	4	5
Control Engine Slots	2	2	2
Service Module Slots	5	8	12
Fabric Engine Slots	N/A	4	4

Note:

[2] N18007 does not support EF, CB module and M18000-24QXS-DB

Model	RG-N18007	RG-N18010	RG-N18014
Backplane Bandwidth (per slot)	Up to 640Gbps (DB module)[3] Up to 160Gbps (ED module)[4]	Up to 320Gbps (FE-D I Fabric Engine) Up to 1.28Tbps (FE-D III Fabric Engine) Up to 550Gbps (FE-C I Fabric Engine)	Up to 320Gbps (FE-D I Fabric Engine) Up to 960Gbps (FE-D III Fabric Engine) Up to 340Gbps (FE-C I Fabric Engine) Up to 620Gbps (FE-C II Fabric Engine)
Switching Capacity	20Tbps/85Tbps	32Tbps/136Tbps	48Tbps/204Tbps
Packet Forwarding Rate	3,600Mpps/18,000Mpps	11,520Mpps/28,800Mpps	17,280Mpps/43,200Mpps
Max. Number of 10GE Ports	240 (DB module, 10GE ports) 240 (DB module, 40GE ports for 1-to-4 splitting)	384 (DB module, 10GE ports) 768 (DB module, 40GE ports for 1-to-4 splitting) 320 (CB module, 10GE ports) 320 (CB module, 40GE ports for 1-to-4 splitting)	576 (DB module, 10GE ports) 1,152 (DB module, 40GE ports for 1-to-4 splitting) 480 (CB module, 10GE ports) 480 (CB module, 40GE ports for 1-to-4 splitting)
Max. Number of 40GE Ports	60	192	288
PoE	Support	Support	N/A
Port Buffer	5MB (ED module) 12MB (DB module)	3GB (CB module) 5MB (ED/EF module) 12MB (DB module) CB: 3GB M18000-10QXS-CB, M18000-40XS-CB and M18000-44SFP4XS-CB: 3GB*2=6GB M18000-24QXS-DB: 12MB*2=24MB	3GB (CB module) 5MB (ED/EF module) 12MB (DB module) CB: 3GB M18000-10QXS-CB, M18000-40XS-CB and M18000-44SFP4XS-CB: 3GB*2=6GB M18000-24QXS-DB: 12MB*2=24MB
ARP Table	170K (ED module) 75K (DB module)	170K (ED module) 85K (EF module) 75K (DB module) 26K (CB module)	170K (ED module) 85K (EF module) 90K (DB module) 26K (CB module)
MAC Address	512K (ED module) 288K (DB module)	512K (ED module) 512K (EF module) 288K (DB module) 128K (CB module)	512K (ED module) 512K (EF module) 288K (DB module) 128K (CB module)
Routing Entries	12K(ED module) 384K(EF module) 12K(DB module) 12K(CB module)	12K(ED module) 384K(EF module) 12K(DB module) 12K(CB module)	12K(ED module) 384K(EF module) 12K(DB module) 12K(CB module)

Note:

[3] DB modules for N18007 include: M18000-48XS-DB, M18000-12QXS-DB, M18000-24XS4QXS-DB

[4] ED modules for N18007 include: M18000-24GT20SFP4XS-ED, M18000-48GT-ED, M18000-48GT-P-ED, M18000-44SFP4XS-ED, M18000-08XS-ED, M18000-WS-ED (M18000-WS), RG-WALL 1600-B-ED

Model	RG-N18007	RG-N18010	RG-N18014
IP Host Entries (IPv4/IPv6)	12K/6K (ED module) 12K/6K (DB module)	12K/6K (ED module) 384K/128K (EF module) 12K/6K (DB module) 12K/6K (CB module)	12K/6K (ED module) 384K/128K (EF module) 12K/6K (DB module) 12K/6K (CB module)
Multicast Entries (IPv4/IPv6)	16K/8K (ED module) 8K/4K (DB module)	16K/8K (ED module) 16K/8K (EF module) 8K/4K (DB module) 8K/4K (CB module)	16K/8K (ED module) 16K/8K (EF module) 8K/4K (DB module) 8K/4K (CB module)
ACL Entries	7K (ED module) 2K (DB module)	7K (ED module) 7K (EF module) 2K (DB module) 8K (CB module)	7K (ED module) 7K (EF module) 2K (DB module) 8K (CB module)
VLAN	4K		
QinQ	Basic QinQ, Flexible QinQ		
Link Aggregation	Support		
Port Mirroring	Support		
Spanning Tree Protocols	STP, RSTP and MSTP		
DHCP	DHCP relay v4&v6, DHCP snooping v4&v6, DHCP server v4&v6, DHCP client v4&v6		
Multiple Spanning Tree (MST) Instances	64 (not include default 0)		
Maximum Aggregation Port (AP)	256 (ED, DB module)	256 (ED, EF, DB module) 128 (CB module)	256 (ED, EF, DB module) 128 (CB module)
Virtual Routing and Forwarding (VRF) Instances	60 (ED module) 1K (DB module)	60 (ED module) 2K (EF module) 1K (DB module) 500 (CB module)	60 (ED module) 2K (EF module) 1K (DB module) 500 (CB module)
Data Center Unified Network Features	Enhanced Ethernet features (DCB): 802.1Qbb: Priority-based Flow Control (PFC) 802.1Qaz: Enhanced Transmission Selection (ETS and DCBX) 802.1Qau: Congestion Notification (CN/QCN) FCoE (Fibre Channel over Ethernet) Large distributed cache design, each port supports 200ms caching to ensure no packet loss during traffic burst		
SDN	OpenFlow v1.3		
VSU (Virtual Switch Unit)	Up to 4 stack members (Recommended: 2)		
VSD (Virtual Switch Device)	Up to 12 VSD units		
Network Virtualization	TRILL (Transparent Interconnection of Lots of Links), L2-GRE, VXLAN		
Edge Virtual Switching	VEPA (Virtual Ethernet Port Aggregator), Virtual machine policy auto migration		
L2 Features	Jumbo Frame, 802.1Q, STP, RSTP, MSTP, Super VLAN, GVRP, QinQ, flexible QinQ, QinQ termination, LLDP		
Layer 2 Protocols	IEEE802.3 (10BASE-T), IEEE802.3u (100BASE-T), IEEE802.3z (1000BASE-X), IEEE802.3ab (1000BASE-T), IEEE802.3ae (10GBASE-T), IEEE802.3an (10GBASE-T), IEEE802.3ba (40GBASE), IEEE802.3ak, IEEE802.3an, IEEE802.3x, IEEE802.3ad (link aggregation), IEEE802.1p, IEEE802.1x, IEEE802.1Q, IEEE802.1D (STP), IEEE802.1w (RSTP), IEEE802.1s (MSTP), IGMP Snooping, Jumbo Frame (9Kbytes), IEEE802.1ad (QinQ and flexible QinQ), GVRP		

Model	RG-N18007	RG-N18010	RG-N18014
Layer 3 Features	Static routing, Equal-Cost Multi-Path Routing (ECMP), OSPF, OSPF v3, BGP, BGP4+, RIP, RIPng, IS-IS, IS-IS v6, MCE		
Layer 3 Protocols (IPv4)	BGP4, OSPFv2, RIPv1, RIPv2, MBGP, LPM Routing, Policy-based Routing, Route-policy, ECMP, WCMP,VRRP, IGMP v1/v2/v3, DVMRP, PIM-SSM/SM/DM, MSDP, Any-RP		
Centralized Authentication (With RG-SAM+ Integration)	100K concurrent users for 802.1x authentication, 90K IPv4 and IPv6 dual-stack concurrent users, 1200 devices per second authentication speed Authentication modes including 802.1x/ Portal/ Mac Portal authentication, RADIUS and TACACS+ user authentication Layer 2 portal, Layer 3 portal authentication Traffic billing, traffic control, refined management Gateway authentication URL audit User positioning		
IPv4 Features	Static routing, RIP, OSPF, IS-IS, BGP4, VRRP, Equal-cost routing, Policy-based routing, GRE Tunnel		
IPv6 Features	Static routing OSPFv3, BGP4+, IS-ISv6, MLDv1/v2, VRRPv3, Equal-cost routing, Policy-based routing, Manual tunnel, Auto tunnel, ISATAP tunnel, GRE tunnel		
Basic IPv6 Protocols	Neighbor Discovery (ND), ICMPv6, Path MTU Discovery, DNSv6, DHCPv6, ICMPv6, ICMPv6 redirection, ACLv6, TCP/UDP for IPv6, SNMP v6, Ping/Traceroute v6, IPv6 RADIUS, Telnet/SSH v6, FTP/TFTP v6, NTP v6, IPv6 MIB support for SNMP, VRRP for IPv6, IPv6 QoS		
IPv6 Routing Protocols	Static routing, Equal-cost routing, Policy routing, OSPFv3, RIPng, BGP4+, ISISv6,MLDv1/v2, PIM-SMv6, Manual tunnels, Automatic tunnels, IPv4 over IPv6 tunnels, ISATAP tunnels		
IPv6 Tunnel Features	6over4 Manual Tunnel, 6to4 Auto Tunnel, Manual Tunnel, Auto Tunnel, ISATAP Tunnel, IPv4 over IPv6 Tunnel, IPv6 over IPv4 Tunnel, GRE Tunnel(4 over 6), GRE Tunnel(6 over 4)		
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		
G.8032	Support		
ACE Capacity	7,000 (ED module) 2,000 (DB module)	7,000 (ED module) 7,000 (EF module) 2,000 (DB module) 8,000 (CB module)	7,000 (ED module) 7,000 (EF module) 2,000 (DB module) 8,000 (CB module)
ACL	Standard, Extended, Expert ACL, ACL 80, IPv6 ACL		
QoS	802.1p, Queue scheduling mechanisms (SP, WRR, DRR, SP+WRR, SP+DRR), RED/WRED, Ingress/egress port-based speed limit		
IPv6 ACL	Support		
Reliability	Independent fabric engine and control engine design which allows separation of forwarding and control plane; Control engine supports 1+1 redundancy; Fabric engine supports N+1 redundancy; Power supply and fan support N+M redundancy; Passive backplane design to avoid single point of failure; Hot-swappable components; Support hot patch and online patch upgrade; ISSU; GR for OSPF/IS-IS/BGP;		

Model	RG-N18007	RG-N18010	RG-N18014
Reliability	BFD for VRRP/OSPF/BGP4/ISIS/ISISv6/MPLS/static routing; Independent PoE slot, ensures that PoE will not affect the stability of other modules		
EEE Format	Support EEE (802.3az)		
Security	NFPP (Network Foundation Protection Policy) CPP (CPU Protection) DAI, Port Security, IP Source Guard uRPF Login authentication and password security policy Storm Suppression and Broadcast Control Support SSHv2 to provide a secure and encrypted channel for user login ITU-T Y.1731 EEE (802.3az)		
Manageability	Console/AUX Modem/Telnet/SSH2.0 command line configuration FTP, TFTP, Xmodem, SFTP file upload / download management SNMP V1/V2c/V3 RMON NTP clock Fault alarm and self-recovery System log IPFIX flow analysis DCMI (Data Center Management Interface with International Standard) for remote device operation such as power on/off, reset and status monitoring		
OAM	802.1AG		
Hot Patch	Support		
CWMP	Support		
Smart Temperature Control	Fan speed auto-adjustment; Fan malfunction alerts; Fan status check		
Smart Power Supply	Power management, Power monitoring		
Other Protocols	DHCP Client, DHCP Relay, DHCP Server, DNS Client, UDP helper, ARP Proxy, Syslog		
Dimensions (W x D x H) (mm)	442 x 598 x 352.8	442 x 836 x 797.3	442 x 814 x 886.2
Rack Height	8RU	18RU	20RU
Weight	30.2kg (total weight of empty chassis and fans)	78.66kg (total weight of empty chassis and fans)	77.86kg (total weight of empty chassis and fans)
MTBF	>200K hours		
Power Supply	RG-PA1600I: 90-180V~1200W; 180-264V~ 1600W RG-PA600I: 90-180V~ 600W; 180-264V~ 600W RG-PD1600I: -40.5VDC-75VDC ~1600W RG-PD600I: -40.5VDC-75VDC ~600W RG-PA1600I-PL: 90-180V~1000W;	RG-PA1600I: 90-180V~1200W; 180-264V~ 1600W RG-PA600I: 90-180V~ 600W; 180-264V~ 600W RG-PD1600I: -40.5VDC-75VDC ~1400W RG-PD600I: -40.5VDC-75VDC ~600W RG-PA1600I-P: 90-180V~1200W;	RG-PA1600I: 90-180V~1200W; 180-264V~ 1600W RG-PA600I: 90-180V~ 600W; 180-264V~ 600W RG-PD1600I: -40.5VDC-75VDC ~1400W RG-PD600I: -40.5VDC-75VDC ~600W

Model	RG-N18007	RG-N18010	RG-N18014
Power Supply	180-264V~1600W RG-PA3000I-PL: 90-180V~ 1200W; 210-264V~ Power: 3000W	180-264V~1600W	
Power Consumption	<432W	<730W	<860W
PoE Power	<6,000W	<3,200W	N/A
Temperature	Operating temperature: 0ºC to 50ºC		
	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		

Weight and Typical Power

Below table lists the weight and maximum power consumption of the Newton 18000 switch platform.

Component	Weight	Maximum Power
Main Chassis		
• Ruijie RG-N18007 chassis with fan	30.2kg	432W
• Ruijie RG-N18010 chassis with fan	78.66kg	730W
• Ruijie RG-N18014 chassis with fan	77.86kg	860W
Control Engine		
• M18007-CM II	2.0kg	102W
• M18007-CM II Lite	2.0kg	102W
• M18010-CM	1.68kg	40W
• M18010-CM II	2.04kg	100W
• M18014-CM	3.22kg	40W
• M18014-CM II	3.58kg	95W
Fabric Engine		
• M18010-FE-C I	2.72kg	90W
• M18010-FE-D I	2.8kg	107W
• M18010-FE-D III	3.36kg	313W
• M18014-FE-C I	3.54kg	90W
• M18014-FE-C II	4.22kg	150W
• M18014-FE-D I	3.76kg	158W
• M18014-FE-D III	4.56kg	425W
Power Supply		
• RG-PA1600I	2.04kg	N/A
• RG-PA600I	1.64kg	
• RG-PA1600I-P	1.6kg	

Component	Weight	Maximum Power
• RG-PA3000I-PL	1.6kg	N/A
• RG-PD1600I	1.6kg	
• RG-PD600I	1.3kg	
Line Card & Service Module		
• M18000-44SFP4XS-ED	3.76kg	135W
• M18000-44SFP4XS-EF	3.86kg	175W
• M18000-44SFP4XS-CB	5.06kg	267W
• M18000-48GT-ED	3.7kg	95W
• M18000-48GT-EF	3.8kg	175W
• M18000-48GT-P-ED	4.04kg	95W
• M18000-24GT20SFP4XS-ED	3.76kg	100W
• M18000-08XS-ED	3.42kg	85W
• M18000-08XS-EF	3.52kg	120W
• M18000-16XS-CB	4.20kg	156W
• M18000-16XT-CB	4.50kg	250W
• M18000-40XS-CB	5.20kg	296W
• M18000-48XS-DB	4.25kg	232W
• M18000-24XS4QXS-DB	4.0kg	208W
• M18000-10QXS-CB	4.82kg	257W
• M18000-12QXS-DB	3.92kg	200W
• M18000-24QXS-DB	4.95kg	374W
Multiservice Module		
• RG-WALL 1600-B-ED	4.58kg	190W
• RG-M18000-WS-ED	4.58kg	190W
• M18000-MSC-ED	4.58kg	190W

TYPICAL APPLICATION

The Ruijie Newton 18000 platform is applicable to a wide range of deployment scenarios. The series can act as the core for large campus network, data center network, integrated network of data center and campus network, and large MAN. Respective illustrations are shown below.
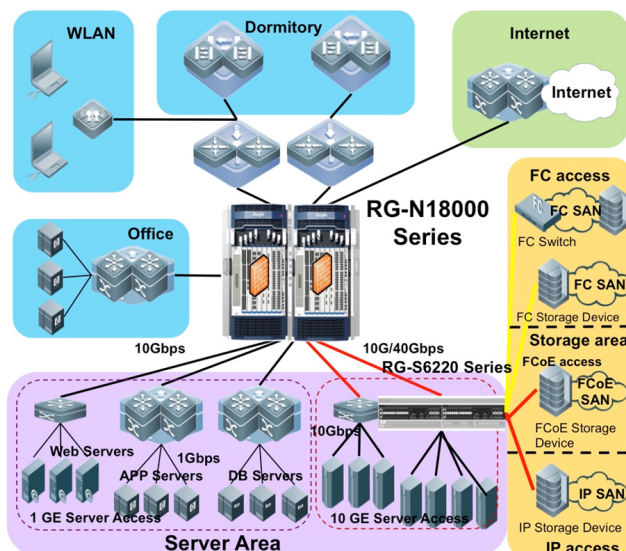
Large Campus Network Core
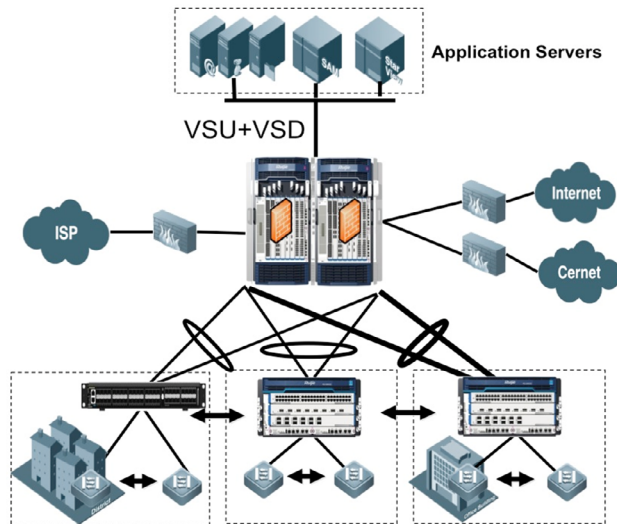
RG-N18000 switches are connected through 40GE ports to build a core network, implementing non-blocking switching.
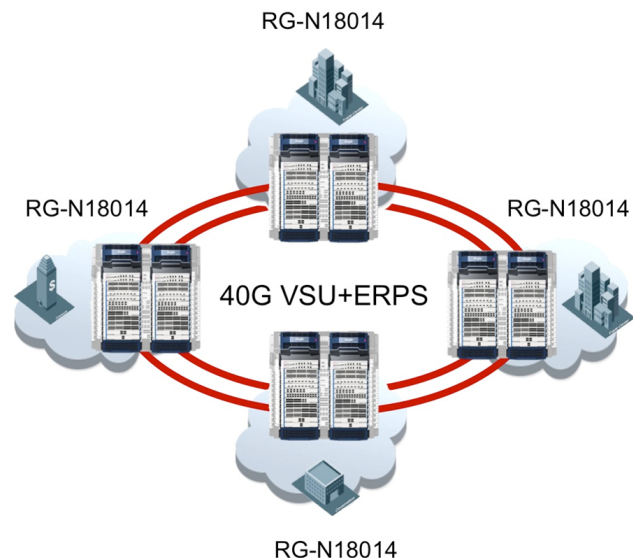
Data Center Network Core
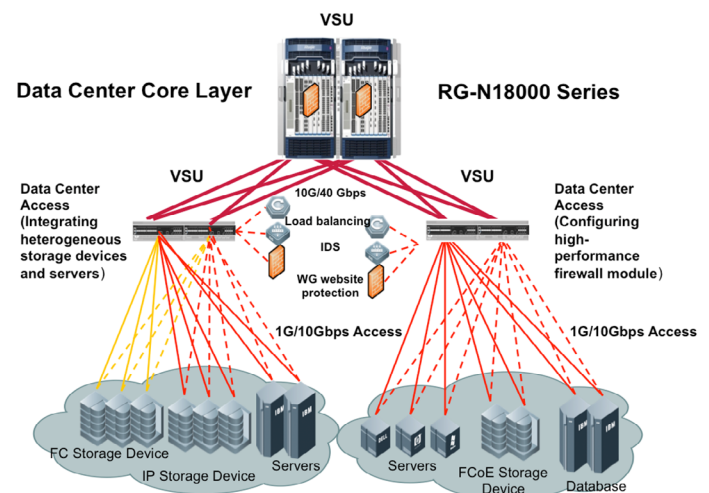
Campus Network & Data Center Network Core

Large MAN Core

ORDERING INFORMATION

1.   Main Chassis & Engine Management

Select the main chassis and control engine according to specific product model.

Model	Description
RG-N18000 Series Main Chassis & Control Engine	
RG-N18014	14-slot Chassis with fan (without power supply)
RG-N18010	10-slot Chassis with fan (without power supply)
RG-N18007	7-slot Chassis with fan (without power supply)
M18014-CM II	N18014 2nd Generation Control Engine
M18014-CM	N18014 Control Engine
M18010-CM II	N18010 2nd Generation Control Engine
M18010-CM	N18010 Control Engine
M18007-CM II	N18007 2nd Generation Control Engine
M18007-CM II Lite	N18007 2nd Generation Lite 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-PA600I	N18000 Power Module (support redundancy, AC, 600W, 10A)
RG-PD600I	N18000 Power Module (support redundancy, DC, 600W)
RG-PA1600I	N18000 Power Module (support redundancy, AC, 1600W, 16A)
RG-PD1600I	N18000 Power Module (support redundancy, DC, 1400W)
RG-PA1600I-PL	N18000 PoE Power Module (support redundancy, AC, 1600W, 16A)
RG-PA3000I-PL	N18000 PoE Power Module (support redundancy, AC, 3000W, 16A)

3.   Fabric Engine

Please select at least 1 or up to 4 fabric engines. It is recommended to select at least 2 to ensure fabric engine redundancy.

Model	Description
M18014-FE-D III	N18014 D series 3rd-generation Fabric Engine (For ED and DB series Line Card and Service Module)
M18014-FE-D I	N18014 D series 1st-generation Fabric Engine (For ED and DB series Line Card and Service Module)
M18010-FE-D III	N18010 D series 3rd-generation Fabric Engine (For ED and DB series Line Card and Service Module)
M18010-FE-D I	N18010 D series 1st-generation Fabric Engine (For ED and DB series Line Card and Service Module)
M18014-FE-C II	N18014 C series 2nd-generation Fabric Engine (For CB series Line Card and Service Module)
M18014-FE-C I	N18014 C series 1st-generation Fabric Engine (For CB series Line Card and Service Module)
M18010-FE-C I	N18010 C series 1st-generation Fabric Engine (For CB series Line Card and Service Module)

4.   Line Card & Service Module[5]

Select the host line cards according to your application scenario.

Model	Description
M18000-44SFP4XS-ED	44 Gigabit Ethernet fiber ports (SFP, LC), 4-port 10GE Ethernet optical interface board (SFP+, LC)
M18000-44SFP4XS-EF	44 Gigabit Ethernet fiber ports (SFP, LC), 4-port 10GE Ethernet optical interface board (SFP+, LC)
M18000-44SFP4XS-CB	44 Gigabit Ethernet fiber ports (SFP, LC), 4-port 10GE Ethernet optical interface board (SFP+, LC)
M18000-48GT-ED	48-port Gigabit Ethernet electrical interface board (RJ45)
M18000-48GT-EF	48-port Gigabit Ethernet electrical interface board (RJ45)
M18000-48GT-P-ED	48-port Gigabit PoE Ethernet electrical interface board (RJ45)
M18000-24GT20SFP4XS-ED	24-port Gigabit Ethernet electrical interface board (RJ45), 20 Gigabit Ethernet fiber ports (SFP, LC), 4 10GE Ethernet fiber ports (SFP+, LC)
M18000-08XS-ED	8 10GE fiber ports (SFP+, LC)
M18000-08XS-EF	8 10GE fiber ports (SFP+, LC)
M18000-16XS-CB	16 10GE fiber ports (SFP+, LC)
M18000-16XT-CB	16 10GE copper ports (RJ45)
M18000-40XS-CB	40 10GE fiber ports (SFP+, LC)
M18000-48XS-DB	48 10GE fiber ports (SFP+, LC)
M18000-24XS4QXS-DB	24 10GE fiber ports (SFP+, LC) + 4 40GE fiber module (QSFP+, MPO)
M18000-10QXS-CB	10 40GE fiber ports (QSFP+, MPO)
M18000-12QXS-DB	12 40GE fiber ports (QSFP+, MPO)
M18000-24QXS-DB	24 40GE fiber ports (QSFP+, MPO)
Multiservice Module	
RG-WALL 1600-B-ED	Firewall module, support RG-N18000 Series, deploy with ED and DB line cards
RG-M18000-WS-ED	Wireless control module

5.   Transceiver and Cable

Model	Description
Mini-GBIC-SX	1000BASE-SX, SFP Transceiver, MM (850nm, 550m, LC)
Mini-GBIC-LX	1000BASE-LX, SFP Transceiver, SM (1310nm, 10km, LC)
Mini-GBIC-GT	1000BASE-TX, SFP Transceiver (100m)
Mini-GBIC-LH40	1000BASE-LH, SFP Transceiver, SM (1310nm, 40km, LC)
Mini-GBIC-ZX50	1000BASE-ZX, SFP Transceiver, SM (1550nm, 50km, LC)
Mini-GBIC-ZX80	1000BASE-ZX, SFP Transceiver, SM (1550nm, 80km, LC)
Mini-GBIC-ZX100	1000BASE-ZX, SFP Transceiver, SM (1550nm, 100km, LC)
XG-SFP-CU1M	10GBASE-CU SFP+ Cable 1 Meter
XG-SFP-CU3M	10GBASE-CU SFP+ Cable 3 Meter

Note:

[5] N18007 does not support EF, CB module and M18000-24QXS-DB

Model	Description
XG-SFP-SR-MM850	10GBASE-SR, SFP+ Transceiver, MM (850nm, 300m, LC)
XG-SFP-LR-SM1310	10GBASE-LR, SFP+ Transceiver, SM (1310nm, 10km, LC)
XG-SFP-ER-SM1550	10GBASE-ER, SFP+ Transceiver, SM (1550nm, 40km, LC)
XG-SFP-ZR-SM1550	10GBASE-LC, SFP+ Transceiver, SM (1550nm, 80km, LC)
40G-QSFP-STACK3M	40G Copper Cable for QSFP+, 3M
40G-QSFP-SR-MM850	40GBASE-SR, QSFP+ Transceiver, MM (850nm, 100m with OM3 fiber, 150m with OM4 fiber, MPO)
40G-QSFP-LR4-SM1310	40G LR Single-mode Fiber Module, QSFP+ Transceiver, LC (1310nm)

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