AX3650S Series

Compact gigabit layer 3 switches that achieve reliable, wide-area virtual networks with multiple sites

The AX3650S is the series of compact gigabit layer 3 switches supporting ***Network Partition***, a feature that enables network integration /separation through network virtualization. The AX3650S supports key features such as VRF (Virtual Routing and Forwarding), which plays an important role in network partition, and ***Stack*** for realizing network redundancy with a combination of multiple switches. Having enough entry capacity for virtualization of large-scale networks, the AX3650S switches are ranked as an upper-class flagship model with increased 10G uplink ports.

AX3650S-24T6XW

AX3650S-20S6XW

AX3650S-48T4XW

Stack

■ Easy buildup of fault tolerant network
◎ ***Fast failover*** in the event of master failure
◎ Software update without communication interruption

■ Simple redundant enterprise networks
◎ SFP+ interface, which enables switches distanced from each other to form a stack configuration (possible to use either a direct attach cable or a 10GBASE-SR/LR/ER cable according to the distance between the switches)
◎ Combination of Stack and Network Partition realizes network virtualization with ***protocol-free redundancy***.

Network virtualization (network partition)

■ Simple, low-cost network virtualization
◎ Enables VPN (Virtual Private Network) by logically dividing a network configured of VRF (Virtual Routing and Forwarding) and VLAN (Virtual LAN), helping achieve network integration/separation without sacrificing network security/independence.

■ Wide-area, multi-site network virtualization
◎ Enables network integration using wide-area Ethernet by distributing resources to multiple sites.

10Gbps uplink

■ Increased 10Gbps uplink ports
◎ A model with ***six 10Gbps uplink ports*** (highest 10Gbps uplink port density among the 1U-sized switches of the AX series) is available.

■ SFP+ interface
◎ SFP+ (10Base-R) same size as SFP (1000Base-X) is supported. Compared with XFP (10GBase-R), SFP+ (10Base-R) enables more effective use of optical transceiver ports (shared by SFP/SFP+).
◎ Direct attach cables (not require expensive optical transceivers) can be used to reduce the total cost for switch setup.

Green IT with power saving features

■ ***Dynamic power saving*** to cut unnecessary power use
◎ Schedule Sleep for automatic power-off (at night/holidays)
◎ Unused-port power saving for cutting power to unused ports

■ Low power consumption
◎ Higher energy efficiency (W/Gbps) than the conventional models

Stable, high-functionality routing (IPv4/IPv6)

■ ***Field-proven routing functionality*** same as that of core routers
◎ Routing software equivalent to that of the AX7800R, which has always been well received by many ISPs/providers
◎ Load balancing based on high-reliability routing (e.g., multipath) with OSPF/BGP for site-to-site connection using wide-area Ethernet/IP-VPN
◎ Policy-based routing (IPv4) to choose the best route based on each traffic amount (supports tracking function to detect communication faults and achieve automatic route switchover)

■ Large entry capacity
◎ Helps configure large-scale virtual networks with many terminals: compared to AX3640S, entry capacity is 1.3 times larger for unicast routes (IPv4/IPv6), and is doubled for ARP(IPv4)/NDP(IPv6).

■ IPv6/multicast
◎ ***Hardware-based IPv6/IPv4 routing***
◎ Supports various protocols (Static, RIPng, OSPFv3, BGP4+, multicast, etc.) responding to the diversity of IPv6 networks.

High reliability and high availability

■ High-reliability features
◎ Improves line and route reliability with link aggregation, STPs, Graceful Restart (helper), VRRP, as well as ALAXALA's proprietary functions such as GSRP (Gigabit Switch Redundancy Protocol), VRRP Polling, Static Polling, Uplink Redundancy, L2 loop detection, and EtherOAM.

■ L2 Ring protocol
◎ Realizes a ***ring network without STP***, which enables stable, high-reliability L2 redundancy capable of fast switchover. Supports a flexible network topology configured of multiple rings using a multi-ring feature.

■ Hot-swappable power supply unit
◎ Equipped with a built-in redundant power supply that enables hot swapping without communication interruption.

Advanced security

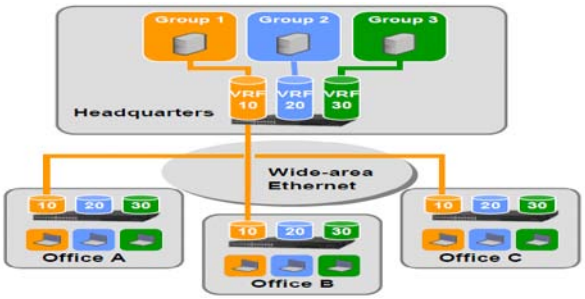
■ Authentication/quarantine solution
◎ ***Triple authentication*** (IEEE802.1X, Web authentication, MAC authentication) enables user authentication of various types (one switch can authenticate up to 1024 terminals).
◎ Combinations of authentication servers and quarantine servers enable quarantine-authentication cooperation that gives access rights to only PCs successfully quarantined.

■ Packet filtering
◎ With outbound / inbound filters, unauthorized traffic can be prevented from flowing into servers/terminals.

AX3650S Application Examples

(1) Virtualization of a wide-area, multi-site network

Network integration using wide-area Ethernet with multiple VRF (network partition) – supporting switches (AX3650S) at different sites



[Point 1] Large entry capacity

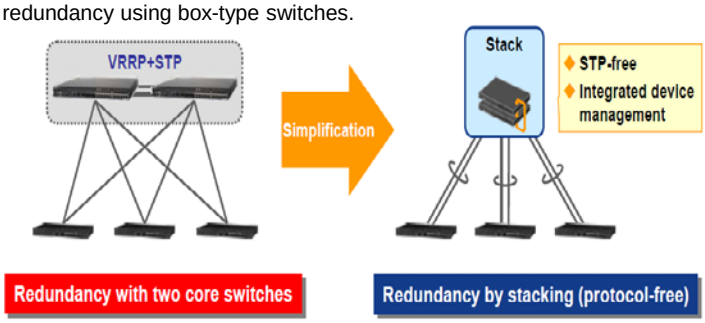
Enough entry capacity for virtualization of large-scale networks (possible to configure up to 31 virtual networks)

[Point 2] Using various protocols/redundancy features

Possible to configure a virtual network using IPv6, multicast, OSPF/BGP, GSRP, ring protocols, etc. at the same time.

(2) Stack for simple small/medium scale network core

Stack functionality helps configure a fault tolerant network with simple redundancy using box-type switches.



[Point 1] Simple redundancy, improved stability

Uses stack / link aggregation for simple redundancy, and STP-free topology for loop-free, stable network.

[Point 2] Low price, small installation space

Device redundancy / integrated device management using low-price box type switches requiring less space/power

AX3650S Series Product Specifications

Model			AX3650S-24T6XW	AX3650S-20S6XW	AX3650S-48T4XW
Performance	Max. switching capacity		168Gbps	168Gbps	176Gbps
	Max. packet forwarding performance		125.0Mpps	125.0Mpps	131.0Mpps
Port count	10GBASE-SR / LR / ER (SFP+)		6 #1	6 #1	4 #1
	10GBASE-CU (SFP+)				
	1000BASE-SX / SX2 #4 / LX / LH / BX / LHB (SFP)		6 #2	26 #3 #5	4 #2
	10 / 100 / 1000BASE-T (SFP)		-	20 #6	-
	100BASE-FX (SFP)				
	10 / 100 / 1000BASE-T		24	4	48
Routing protocols	IPv4	Unicast	Static, RIP, RIP2, OSPF, BGP4, IS-IS #7, Stub Router (OSPF), Policy-based Routing		
		Multicast	PIM-SM, PIM-SSM, IGMPv2/v3		
	IPv6	Unicast	Static, RIPng, OSPFv3, BGP4+, IS-IS #7, Stub Router (OSPFv3)		
		Multicast	PIM-SM, PIM-SSM, MLDv1/v2		
Layer 2 functions	Max. MAC address entries		32k		
	VLAN		Port VLAN, Tag-VLAN (IEEE802.1Q), Protocol VLAN, MAC VLAN, Tag Conversion		
	Spanning tree protocol		STP (IEEE802.1D), RSTP (IEEE802.1w), PVST+, MSTP (IEEE802.1s), BPDU Filter, Root Guard, Loop Guard		
	Layer 3 interoperation		IGMPv1/v2/v3 snooping, MLDv1/v2 snooping		
	Ring protocol		Autonomous Extensible Ring Protocol		
Network functions	Security		IEEE802.1X (per-port authentication, per-VLAN authentication (static/dynamic)), Authentication VLAN, Web Authentication, Filter (L2/IPv4/IPv6/L4), Inter-port relay blocking, URL Redirect (Dynamic VLAN mode/Fixed VLAN mode), MAC Authentication (Dynamic VLAN mode/Fixed VLAN mode)		
	QoS		Flow detection (L2/IPv4/IPv6/L4), Bandwidth monitoring (rate limitation), Marking (DSCP / user prioritization), Priority control (flow base, user priority mapping), Discard control (tail drop), Shaping (8 classes, port bandwidth control, scheduling (PQ, WRR, PQ+DRR, WFQ)), Diff-serv, IEEE802.1p		
	L2-VPN		VLAN Tunneling		
	High reliability and high operability functions		Stack functionality, Load balance (IPv4/IPv6), VRRP (IPv4/IPv6), Static Polling (IPv4/IPv6), VRRP Polling (IPv4/IPv6), Link Aggregation (IEEE802.3ad), GSRP, Uplink Redundancy, Graceful Restart #8, Storm Control, IEEE802.3ah/UDLD, Local ProxyARP, GSRP aware extension, L2 loop detection, EtherOAM		
	Virtualization		VRF (Virtual Routing and Forwarding), Network Partition		
Operation management functions	Network management		SNMPv1/v2/v3, MIB-II, IPv6 MIB, IPv6 VRRP MIB, RMON, Port Mirroring, IPv4 DHCP Server/Relay, Prefix Delegation, LLDP, OADP, sFlow		
	Operation / maintenance		syslog, ping, traceroute, telnet, SSH, ftp, tftp, NTP, RADIUS, TACACS+, Temperature log, Fan control		
Power saving functions			Dynamic Power Saving (unused-port power saving #9, Device Sleep, power saving for link-down ports, LED brightness control)		
Redundancy			Built-in power supply (AC, DC)		
Equipment conditions	Input voltage		AC100 to 120V / 200 to 240V	AC100 to 120V / 200 to 240V	AC100 to 120V / 200 to 240V
			DC -48V	DC -48V	DC -48V
	Max. input current (A)		1.1 @AC100V / 0.6 @AC200V	1.2 @AC100V / 0.6 @AC200V	1.2 @AC100V / 0.6 @AC200V
			2.2 @DC-48V	2.5 @DC-48V	2.4 @DC-48V
	Max. power consumption (W)		105	120	115
	Max. heat output (kJ/h)		378	432	414
	Outer dimensions (W x D x H (mm)) (height [U])		445 x 500 x 43 (1U)		
	Weight (kg) (with full installation)		9.0 or less		
Environmrnt conditions	Permissible operation temperature range		- 10°C to 50°C #10 #11		
	Temperature when not operating (when not applying		- 10°C to 50°C		
	Temperature at storage and transport		- 25°C to 65°C		
	Permissible operation humidity range		10% to 90% (no condensation) #12		
	Humidity when not operating (when not applying current)		8% to 90% (no condensation)		
	Humidity at storage and transport		5% to 90% (no condensation)		
	Floating dust		Floating dust of about 10 microns or smaller : 0.15mg/m3		

#1: The values given here are the maximum numbers of ports (SFP+/SFP shared) available for SFP+ interface. If some of them are used for SFP interface, these values must be reduced by the number of such ports. #2: The values given here are the maximum numbers of ports (SFP+/SFP shared) available for SFP interface. If some of them are used for 10GBASE-R (SFP+), these values must be reduced by the number of such ports. #3: Six of these ports are SFP+/SFP shared ports. If some or all of them are used for 10GBASE-R (SFP+), the number of ports available for SFP interface must be reduced by the number of such ports. #4: Supports AX3650S-20S6XW only. #5: Up to 20 ports are available when using SFP-SX2. #6: Available only for 1000BASE-X (SFP). #7: IS-IS will be supported in the future. #8: Supports both the Helper function (OSPF/OSPFv3) and the Receive Router function (BGP4/BGP4+). #9: Supported only by 10/100/1000BASE-T (UTP) ports. #10: The temperature range is 0°C to 50°C when the device has started up. #11: The temperature range for SFP-BX1U/1D and SFP-BX4U/4D is 0°C to 50°C. #12: The humidity range for SFP/SFP+ is 10% to 85%.

⚠ Caution | For your safety, please be sure to read the *Hardware Instruction Manual* and the *Safety Guide* well in advance.

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