

Waystream 8600 series switch

FTTH switch with 10G ports



Four 25G uplinks

The Waystream 8600 series Ethernet switch is purpose built for FTTH/FTTB access and aggregation to enable easy operation and deployment of services.

The 8600 feature set supports demanding business and residential services such as Internet, TV, wholesale capacity services and private networks at the same time as simplified and automated control of the network lets you reduce operational cost and save time when dealing with network issues.

The 8600 meet network operator needs for long deployment cycles and reliable network operation and it is purpose built with fiber networks in mind to support a wide variety of network architectures and service models.

Extended temperature models enable deployment in outdoor enclosures such as street cabinets.

BENEFITS

- **FTTH Customer and Service VLAN topology support with advanced QoS**
- **24 or 48 10GBASE-X ports with four 25 Gbit/s SFP28 uplinks**
- **Feature set for business and residential services**
- **Service Assurance and streaming telemetry**

Product overview

The 8600 series consist of layer 2 and layer3 access and aggregation switches designed for FTTx networks, network aggregation and traffic classification and prioritization to deliver the ultimate user experience.

The 8600 series has support for 1/10G operation on its downlink ports.

The 8600 series is filled with features to deliver voice, video and data services and to support your network team in daily troubleshooting and network operations, including streaming telemetry and service assurance features.

The Waystream 8600 series can be used in a variety of network topologies such as

- Customer VLAN topology in combination with a Service Router/BNG with efficient multicast distribution and optional RADIUS based control of ingress traffic,
- Service VLAN topology where the MS8600 performs service enforcement and isolates end-users securely using MAC Forced Forwarding.
- Layer3 routed access where the ASR 8600 performs BNG service enforcement
- TR-101 topologies with VLAN translation.
- PPPoE topologies with intermediate agent features for customer identification

Security features such as IP strict clients can be used with both dynamic and statically assigned addresses to prevent spoofing of IP traffic.

Industry standard CLI and SNMP support allows easy management and control of the switch operation.

The 8600 series is available with either with 24 (MS8624, ASR 8624) or 48 SFP (MS8648, ASR 8648) Ethernet downlink ports that operate at 1 or 10Gbit/s link-speed. In addition there are four 10/25 Gbit/s uplink ports.

Benefits

Faster services

The 8600 series can deliver faster services on existing fiber infrastructure using SFP optics that is backwards compatible with existing CPEs - simply replace the existing switch with a Waystream 8600 switch and users can instantly benefit from the higher network speed.

Advanced traffic classification/forwarding

The 8600 provides advanced traffic classification and forwarding capabilities, including MEF-compatible rate-limiters to support wholesale and other complex services.

Automated deployment

The 8600 can be deployed into the network directly out of the box thanks to its Zero Touch Provisioning (ZTP) process. There is no need for pre-configuration of the switch before installation. Using standard protocols such as DHCP and BOOTP the switch can have its firmware upgraded and complete system configuration downloaded when connected to the network. The MS-version of the switch even supports alternating between untagged and tagged VLAN 127 on the uplink during ZTP to enable a variety of network architectures.

Connectors in the front

All connectors for network, administration and power are located in the front of the unit. In addition the 8600 has a small form factor, only 24 cm deep. This simplifies installation and makes the 8600 fit into narrow spaces in apartment buildings as well as dense deployment in central office or wiring-closet sites. An additional 12V DC power input connector is located in the rear enables dual external power sources if needed for maximum redundancy.

Customer and service VLAN topologies with the MS8600

The MS8600 version is especially designed for a wide variety of layer2 network topologies and supports:

- Ethernet wholesale with C-VLAN and S-VLAN, supporting double-tagging for business services or open-access networks.
- Customer VLAN topologies with a central Service Router/BNG
- Service VLAN topologies using DHCP snooping for end-user and network security
- IP strict clients for anti-spoofing
- MAC Forced Forwarding prevents layer 2 interaction between clients in the VLAN, including ARP inspection for increased security

Multicast VLAN support and ability to create channel packages allows optimal bandwidth utilization in the access at the same time as maximum control of TV distribution is obtained.

The MS8600 supports full VLAN range, up to 4,096 vlans, including double-tagging, and 32,000 MAC addresses.

Support for dual stack services

IPv6 deployment is now becoming mandatory in many networks. The 8600 also supports classification on IPv6 including policies for traffic management and QoS.

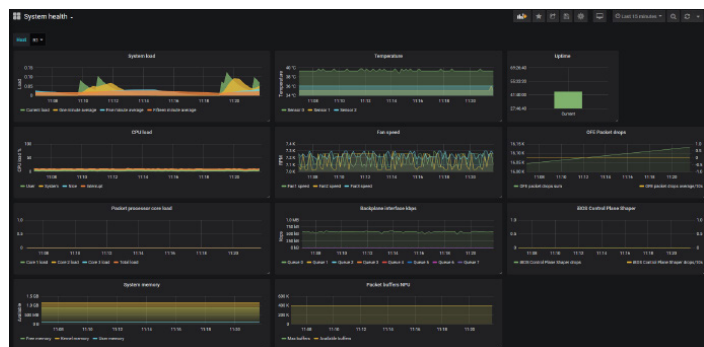
Service Assurance - Quality inspection of TV and connectivity checks

The 8600 series can also inspect multicast MPEG to measure the quality. If an end user reports a problem with the TV service, the switches can provide immediate information if a problem is seen in the network, and if it affected the entire network or only a part of the network. The feature help network engineers to pinpoint the location of the problem in seconds.

In addition the switch can perform continuous connectivity checks to ensure that traffic is working, following the active network path. These checks provides insight into network performance over time and can also immediately notify network operations if service failure occurs.

Streaming telemetry

The 8600 supports streaming telemetry data from thousands of data points to provide indepth information about system health and network performance. Flexible upload options, including JSON format, allow commercial and open-source receivers to collect the telemetry data and visualisation and analysis tools to be applied. The telemetry data can also be requested from the switch using a REST API.



Telemetry data visualized by Grafana

Environmental touch

The Waystream 8600 series has been adapted to meet Swedish legislation to reduce certain hazardous materials commonly used in electronics. The 8600 contains less bromide, phosphorous and chlorine compounds than comparable products which reduces the health risks associated with electronics. In addition, the 8600 series supports Waystream ultra low power SFP:s that uses less electricity than standard SFP:s. This means less heat, a lower electricity bill and less carbon emissions.

Technical Specifications

Physical		
Model	MS8624 / ASR 8624	MS8648 / ASR 8648
Uplink ports	4 1000/10000/25000base-X (SFP28)	4 1000/10000/25000base-X (SFP28)
Downlink ports	24 1000/10000base-X SFP+ connectors 100Mbit downlink requires SGMII-SFP	48 1000/10000base-X SFP+ connectors 100Mbit downlink requires SGMII-SFP
Dimensions	43x441x240 mm (H x W x D)	43x441x240 mm (H x W x D)
Weight	4 kg	4 kg
Indicators	Interface LED indicator for link and speed, dual color Power LED indicator System LED indicator	
Acoustic	Temperature controlled fans. At room temperature (22 degrees C) all units <50 dB MS8624 / ASR 8624 Max: 58 dB MS8648 / ASR 8648 Max: 65 dB MS8624E / ASR 8624E Max: 62 dB MS8648E / ASR 8648E Max: 67 dB	
Cooling	Redundant fan. The 8600 has sufficient cooling capacity even with one fan failing. Commercial temp: Front-to-side airflow Extended temp: Front-to-side and rear airflow	
Environmental		
Operating temperature	Commercial temperature: 0 to 45°C Extended temperature: -20 to 70°C (E-models)	
Operating humidity	10% to 90%, non-condensing	
Storage temperature	-40 to 70°C	
Storage humidity	5% to 95%, non-condensing	
Rack mounting	Standard 19" rack mountable	
Heat dissipation	See power consumption	
Power and Safety		
Power connector	One IEC 60320-1 C14, located on the front panel One 12VDC connector located on the back panel for external power supply DC: One four-pin female JK2EDGR-508-4 with dual power inputs	
Power	AC: Front-panel AC power input 100-240V, 50/60 Hz to internal PSU Rear-panel 12V DC power input to mainboard DC: Front panel DC power input ~48V ~72V to internal PSU	
Power consumption	MS 8624 / ASR 8624 AC: Min: 32 W Max: 60 W MS 8648 / ASR 8648 AC: Min: 34 W Max: 112 W MS 8624E / ASR 8624E DC: Min: 34 W Max: 104 W MS 8648E / ASR 8648E DC: Min: 35 W Max 113 W	
Safety	LVD (2014/35/EU) IEC/EN 60825-1, IEC/EN 60825-2 CE mark: EN 62368-1:2014+A11 CB scheme: IEC/EN 60950-1	
EMC	CE EMC (2014/30/EU) Emission: EN55032:2015 Class B Immunity: EN61000-4-2:2009, EN61000-4-3:2006+A1:2008+A2:2010, EN61000-4-5:2014, EN61000-4-6:2014	
RoHS, WEEE and REACH	RoHS 2017/2102/EU and 2015/863/EU, WEEE 2012/19/EU, SFS2016:1067, REACH	

Performance	
Switch ASIC performance	Forwarding bandwidth: 48-port 1.09 Tbps, max 600 Mpps 24-port 850 Gbps, max 600 Mpps
CPU/NPU Performance	1200-1500Mhz NPU with 4 cores, providing up to 10 Gbps throughput
MAC table	32000 MAC addresses
VLAN table	1000 VLAN:s from full VLAN range 4094 VLAN:s
Multicast S,G entries	2048 L2 multicast, up to 3K (*,G) addresses
Jumbo Frames	Up to 9 Kbyte
Classification	Layer 2 packet classification with filtering 9K x 10 bytes TCAM
Packet queuing	Weighted round robin (WRR) and strict priority (SP)
Policing ingress/egress	2000 policers with packet drop or recolor (64kbps-1000Mbit/s)
Packet Memory	6MB (24K buffers)
IP routing entries	ASR-series: 16K IPv4 / 8K IPv6 (shared memory) MS-series: 64 routes (the management vlan interface is layer3 routed, supporting static routing)
Layer2 and Forwarding	
IEEE standards	IEEE 802.3z – Gigabit Ethernet IEEE 802.3ae – 10Gbit/s over optical fibre IEEE 802.3by – 25Gbit/s operation IEEE 802.1p and 802.1Q with full VLAN range including Q-in-Q IEEE 802.1s Multiple Spanning-tree IEEE 802.1w Rapid spanning-tree IEEE 802.1x Port authentication with RADIUS VLAN/Service template assignment
Link aggregation	Up to 16 groups, 4 interfaces per group
Multicast	IGMPv2 snooping and proxy Static join of multicast groups
Other features	
System boot	BOOTP and DHCP client for address assignment and configuration download (Zero Touch Provisioning) MS-series Alternating untagged and tagged vlan 127
Security	IP spoofing protection Restricted multicast access with IGMP join-filter UNI isolated ports MAC Forced Forwarding DHCPv4 snooping for anti-spoofing Port-security MAC learning priority
Mirroring	Interface mirroring to local interface Interface mirroring over GRE to remote Wireshark or other packet capture tool
Programmable extension	ScriBOS script language for programmable extension

Management	
Command Line Interface	Industry standard CLI with debugging, configuration and management Telnet SSH RADIUS/TACACS AAA for CLI access
Serial interface	RS232 console serial port to access CLI
SNMP	SNMPv1, v2c and v3
PFDP	PacketFront Device protocol exchange system information with other IBOS devices and selected PFNP customer premise equipment
System boot	BOOTP/DHCP client for address assignment and Zero Touch Provisioning
Time	NTP time synchronisation
Remote logging	Syslog
LLDP	Link Layer Discovery Protocol
Telemetry	Streaming telemetry as InfluxDB line-protocol HTTP or JSON and REST API
Stacking	Stacking for network management, up to 8 switches per stack

ASR 8600 series

The Waystream 8600 ASR series is a layer3 switch. It supports BNG-like features and layer2 overlay functionality. The following additional features is available on all ASR models.

Virtual Private Networking	
L3 tunnels	L2TPv3 with transparent Ethernet bridging and port forwarding (proprietary) GRE Up to 200 tunnel interfaces
L2CP	Layer2 Control Protocol Tunneling over VLANs
GRE	IP over GRE

IP Routing and Forwarding	
Interfaces	600 layer 3 interfaces
ECMP	Up to 4 paths
Multicast	4096 S,G IPv4 multicast forwarding entries Per port and per VLAN replication PIM SM / SSM IGMPv2, IGMPv3 Static-join of multicast groups
Unicast	OSPFv2, OSPFv3, BGPv4, IS-IS, policy-routing

BNG features	
RADIUS	RADIUS protocol based service control including Change of Authorization
PPPoE Server	Up to 576 users with PAP/CHAP authentication
IPoE	Up to 576 C-VLANs with services

Purchase your Waystream 8600 series switch

To find out how you can join the growing number of networks using Waystream switches, please contact your local partner or sales@waystream.com.

Article	Description
MS8624-AC	MS8624, 4 x 25G (SFP28), 24 x 1/10G SFP+, AC power, iBOS Standard
MS8648-AC	MS8648, 4 x 25G (SFP28), 48 x 1/10G SFP+, AC power, iBOS Standard
MS8624E-DC	MS8624, 4 x 25G (SFP28), 24 x 1/10G SFP+, DC power, -20C to +70C ext. temperature, iBOS Standard
MS8648E-DC	MS8648, 4 x 25G (SFP28), 48 x 1/10G SFP+, AC power, -20C to +70C ext. temperature, iBOS Standard
ASR8624-AC	ASR 8624, 4 x 25G (SFP28), 24 x 1/10G SFP+, AC power, iBOS Standard Layer 3
ASR8648-AC	ASR 8648, 4 x 25G (SFP28), 48 x 1/10G SFP+, AC power, iBOS Standard Layer 3
ASR8624E-DC	ASR 8624, 4 x 25G (SFP28), 24 x 1/10G SFP+, DC power, -20C to +70C ext. temperature, iBOS Standard Layer 3
ASR8648E-DC	ASR 8648, 4 x 25G (SFP28), 48 x 1/10G SFP+, DC power, -20C to +70C ext. temperature, iBOS Standard Layer 3
CBL-CONSOLE	Serial console cable (RJ-45 to DB9) (Note: MUSB adapter also needed)
CBL-CONSOLE-MUSB	Serial console cable adapter (Micro-USB to RJ-45 female)
PSU-12-180	External AC to DC power supply 12VDC, 15A, 180W

www.waystream.com

ABOUT WAYSTREAM

Waystream provides products fit for FTTH that are reliable, easy to operate and delivers great services. This means that the network can be built faster with better return on investment, more satisfied end-users and a robust solution. We provide switches, routers and related accessories that lets business and residential services be delivered over fiber.

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