DATASHEET

Advance 10G /25G Aggregation Switch

Advanced 10GE/25GE Switches Datasheet

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Product overview

WD Advance 10G/25G series switches provide industry-leading high performance and scalable 10GE/25GE access switching solution with modular dual power, fixed uplinks (40GE/100GE) and VSS for resiliency. The series offers OSPF/BGP and multicast, SDN enabled and flexible management.

The 10G/25G switch series contains the following models:

- WD-GS-24G8Q28: 24×1GE/10GE SFP+ Ports, 8×40GE/100GE QSFP28 Ports, 5×fan tray slots, and 2×powermodule slots.
- WD-GS-48G8Q28: 48×1GE/10GE SFP+ Ports, 8×40GE/100GE Ports, 5×fan tray slots, and 2×power module slots.
- WD-GS-28DC: 24×10GE/25GE SFP28 Ports, 8×40GE/100GE QSFP28 Ports, 5×fan tray slots, and 2×power module slots.
- WD-GS-54XC: 48×10GE/25GE SFP28 Ports, 8×40GE/100GE QSFP28 Ports, 5×fan tray slots, and2×power module slots.

WD-GS-24G8Q28

WD-GS-48G8Q28

WD8000-28DC

WD-GS-54XC

Features and benefits

High-density 10GE/25GE forwarding

The switch offers high-density 10GE/25GE forwarding. It provides powerful hardware forwarding capacity and abundant campus features. It provides up to 48/24*1GE/10GE/25GE autosensing SFP28 ports and 8*100G ports. The switch supports modular power modules and fan trays. By using different fan trays, the switch can provide field changeable a VSSlows.

Embedded Access Controller

WD Advance 10G/25G implements the WLAN function by installing an AC feature pack on the main control unit, thereby implementing both the wired function and the WLAN function on a single device. Embedded AC isa low-cost WLAN solution, save overall investment, improve forwarding capacity, realized a true unified wired and wireless solution in Campus. Max 2K AP supported on one single switches.

WatchDog Virtual Switching System (VSS)

WatchDog VSS virtualizes multiple Advance Aggregation switches into one virtual switch and provides the following benefits:

- **Scalability**—VSS allows you to add devices to the VSS 2 system easily. It provides a single point of management, enables switch plug-and-play, and supports software auto-update for software synchronization from the master to the new member devices. It brings business agility with lower total cost of ownership by allowing new switches to be added to the fabric without network topology change as business grows.

- **High availability**—The VSS technology ensures redundancy and backupof all information on the control and data planes and non-stop Layer 3 data forwarding in an VSS fabric.It also eliminates single point of failure and ensures service continuity.

- **Redundancy and load balancing**—The distributed link aggregation technology supports load sharing and mutual backup among multiple uplinks, which enhances the network redundancy and improves link resources usage.

- **Flexibility and resiliency**—The switch uses standard GE ports instead of specialized ports for VSS links between VSS member devices. This allows customers to assign bandwidth as needed between uplink, downlink, and VSS system connections. In addition, an VSS fabric can span a rack, multiple racks,or multiple campuses.

Wide range of advanced features

The switch offers a wide range of features, including:

- **Modular hardware and software design**: The switch uses modular, hot swapping, and redundancy design for hardware, including power modules and fan trays. The switch also uses modular design for software, which enables feature installation and removal on an as-needed basis. Refined physical architecture and optimized software workflows greatly reduce the end-to-end packet processing delay.

- **Software-defined networking (SDN)**: An innovative network architecture that separates the control plane from the forwarding plane, typically by using OpenFlow. SDN significantly simplifies network management, reduces maintenance complexities and costs, enables flexible traffic management, and offers a good platform for network and application innovations.

- **Virtual eXtensible LAN (VXLAN)**: A MAC-in-UDP technology that provides Layer 2 connectivitybetween distant network sites across an IP network. VXLAN enables long-distance virtual machine and data mobility and is typically used in data centers and the access layer of campus networks for multitenant services. The WD implementation of VXLAN supports automatic VXLAN tunnel establishment with EVPN.

- **Ethernet Virtual Private Network (EVPN)** is a Layer 2 VPN technology that provides both Layer 2 and

Layer 3 connectivity between distant network sites across an IP network. EVPN uses MP-BGP in the control plane and VXLAN in the data plane. EVPN provides the following benefits: Configuration automation; Separation of the control plane and the data plane; Integrated routing and bridging (IRB).

- **In-Service Software Upgrade (ISSU)** and Operation, Administration, and Maintenance (OAM)—Ensure business continuity and improve Ethernet management and maintainability.

Comprehensive security control policies

The switch supports AAA authentications (including RADIUS authentication) and dynamic or static binding of user identifiers such as user account, IP address, MAC address, VLAN, and port number. Using the switch in conjunction with WD Management Center, you can manage and monitor online users in real time and take prompt actionon illegitimate behaviors.

The switch offers a large number of inbound and outbound ACLs and VLAN-based ACL assignment. This simplifies configurations and saves ACL resources.

MACsec

MACsec is an ideal hop-by-hop link-layer security protocol for Ethernet networks, which are typically insecure. It provides the following services:

- **Data encryption**: Encrypts data over the Ethernet link to protect data against security issues such as eavesdropping.
- **Anti-replay**: Prevents packets from being intercepted and modified on the route to protect the network against unauthorized access.
- **Tampering protection**: prevents packet tampering to protect data integrity.

MACsec supports the following deployments:

- **Client-oriented**: Protects data transmission over the link between the client and its access device.
- **Device-oriented mode**: Protects data transmission over the link between two peering devices.

High availability

In addition to node and link protection, the switch offers the following hardware high availability features:

- 1+1 power module redundancy and 5 fan tray redundancy.

- Automatic power and fan tray status monitoring and alarming mechanisms.
- Automatic fan speed adjustment based on the change in temperature.
- Self-protection mechanisms that protect power modules against overcurrent, overvoltage, and overtemperature conditions.
- Support hardware-level dual boot, use two FLASH chips to store boot software (system boot program), realize hardware-level boot redundancy backup, and avoid the failure of the switch to start due to FLASH chip failure.

Outstanding management capacity

The switch provides a variety of management features and is easy to manage. It offers the following device management features:

- Provides multiple management interfaces, including the console port, out-of-band management Ethernet port, and USB port.
- Supports configuration and management from CLI.
- Supports multiple access methods, including SNMPv1/v2/v3, Telnet, and more secure SSH 2.0 and SSL.
- Uses OAM to enhance system management capability.
- Supports FTP for system upgrade.

Precision Time Protocol (PTP)

WD Advance Aggregation switch series supports the 1588V2 function to meet the high-precision time synchronization requirements between network devices. Compared with GPS time synchronization with the same precision,it improves security and lowers deployment costs.

Enhanced Media Delivery Index (eMDI)

eMDI is a solution to audio and video service quality monitoring and fault locating. It is intended to solve problems caused by packet loss, packet sequence errors, and jitters.

eMDI monitors and analyzes specific TCP or RTP packets on each node of an IP network in real time, providing data for quickly locating network faults.

Multichassis Link Aggregation Group (M-LAG)

Advance series support M-LAG, which enables links of multiple switches to aggregate into one toimplement device-level link backup. M-LAG is applicable to servers dual-homed to a pair of access devices for node redundancy.

- Streamlined topology: M-LAG simplifies the network topology and spanning tree configuration by virtualizing two physical devices into one logical device.

- Independent upgrading: The DR member devices can be upgraded independently one by one to minimize the impact on traffic forwarding.
- High availability: The DR system uses a keepalive link to detect multi-active collision to ensure that only one member device forwards traffic after a DR system splits.

Visualization ability

WD Advance 10G/25G series switches support Telemetry technology, which can send the switch's real-time resourceinformation and alarm information to the O&M platform through the gRPC protocol.

The platform can realize network quality backtracking, troubleshooting, risk early warning, architecture optimization and other functions to accurately guarantee user experience by analyzing real-time data.

Technical specifications

Item	WD-GS-24G8Q28	WD-GS-48G8Q28	WD8000-28DC	WD-GS-54XC
CPU	Quad core, 2GHz			
Flash/SDRAM	8GB/8GB (Standard) , 16GB/32GB (Premium)			
Packet Buffer	36M			
Box Switching capacity	4.8Tbps			
Port Switching capacity	2.08Tbps	2.56Tbps	2.8Tbps	4Tbps
Packet forwarding rate	1560Mpps	1920Mpps	1800Mpps	2000Mpps
Dimensions (H × W × D)	44 × 440 × 400 mm (1.73 × 17.32 × 15.75 in)			
Weight	≤ 7.3 kg	≤ 7.6 kg	≤ 7.3 kg	≤ 7.6 kg
Console ports	1			
Management Ethernet ports	1			
USB ports	1			
SFP+	24	48	-	-
SFP28	-	-	24	48
QSFP28	8*	8*	8	8
Power supply slots	2			
Fan trays	5 hot swappable fan trays, invertible airflow			
Input voltage range	AC: Rated: 100 VAC to 240 VAC @ 50 Hz/60 Hz Max.: 90 VAC to 264 VAC @ 47 Hz to 63 Hz			
	HVDC: Rated voltage range: 240V DC Max voltage range: 180V ~ 320V DC			
	DC: Rated voltage range: –48 to –60 VDC			

Item	WD-GS-24G8Q28	WD-GS-48G8Q28	WD8000-28DC	WD-GS-54XC
Power consumption	MIN: Single AC: 76W; Dual AC: 83W.	MIN: Single AC: 76W; Dual AC: 83W.	MIN: Single AC: 76W; Dual AC: 83W.	MIN: Single AC: 76W; Dual AC: 83W.
	MAX: Single AC: 186W; Dual AC: 191W.	MAX: Single AC: 217W; Dual AC: 221W.	MAX: Single AC: 188W; Dual AC: 193W.	MAX: Single AC: 223W; Dual AC: 227W.
Operating temperature	-5℃ to 45℃ (23°F to 113°F)			
	-60m-5000m altitude: From 0m, the maximum operating temperature reduce by 0.33℃ for every time 100 the altitude increases by 100m.			
Storage temperature	-40℃ to 70℃(-40°F to 158°F)			
Operating & storage humidity	5% RH to 95% RH, non-condensing			
MTBF(Year)	61.4	58.44	61.4	58.44
MTTR(Hour)	1	1	1	1

Software Specifications

Feature	Advance 10G/25G Aggregation Switch
Virtualization	VSS Distributed device management Distributed link aggregation Distributed resilient routing Stacking through standard Ethernet ports Local device stacking and remote device stacking LACP-, BFD-, and ARP-based multi-active detection (MAD) M-LAG
Link aggregation	10GE/25G/40GE/100GE port aggregation Static aggregation Dynamic aggregation
Jumbo frame	Supported
MAC address table	Static/Dynamic/ Blackhole MAC address MAC automatic learning and aging

Feature	Advance 10G/25G Aggregation Switch
	MAC learning limit MAC filtering
SND/ Openflow	Openflow1.3 Multiple controllers (EQUAL mode, active/standby mode) Multi-table pipeline Group table Meter
VLAN	Port-based VLAN Default VLAN QinQ and flexible QinQ Guest VLAN Voice VLAN VLAN mapping STP/RSTP/MSTPPVST+ and RPVST+ MVRP VLAN division based on IP, MAC, protocol, policy, port
Traffic monitoring	sFLOW
LLDP	LLDP/LLDP-MED
MPLS	Support MPLS MCE Support MPLS L3VPN Support MPLS L2VPN Support MPLS SR
DHCP	DHCPv4/v6 client DHCP snooping, DHCPv6 snooping DHCPv4/v6 relay DHCPv4/v6 server DHCP snooping Option 82/DHCP relay Option 82
ARP	Static entry Gratuitous ARP Common proxy ARP and local proxy ARP Dynamic ARP inspection ARP anti-attack

Feature	Advance 10G/25G Aggregation Switch
	ARP source suppression ARP detection based on DHCP snooping safety entries, 802.1X entries, and IP/MAC static binding entries
Routing	IPv4/IPv6 static routing, Dual stack Dynamic routing such as RIPv1/2 and RIPng Policy routing Equal-cost multi-path routing (ECMP) VRRP/VRRPv3 OSPFv1/v2, OSPFv3 BGP, BGP4+ for Ipv6 IS-IS, IS-IS v6
IPv6	Neighbor Discovery (ND) ND Snooping PMTU ICMP v6, Telnet v6, SFTP v6, SNMP v6, BFD v6, VRRP v3 IPv6 Portal IPv6 tunnel IPV6 SAVI
VxLAN	VXLAN Layer 2 switching VXLAN routing switching VXLAN centralized gateway, distributed Anycast gateway BGP EVPN Centralized VXLAN control through OpenFlow+Netconf
DC feature	802.1Qbb PFC ECN
Multicast	IGMP Snooping v1/v2/v3 MLD Snooping v1/v2 PIM Snooping MLD proxy Multicast VLAN Multicast load sharing of bundled ports Port-based multicast traffic statistics Controllable multicast IGMP v1/v2/v3

Feature	Advance 10G/25G Aggregation Switch
	MLD v1/v2 PIM-DM, PIM-SM and PIM-SSM MSDP and MSDP for IPv6 MBGP and MBGP for IPv6 IGMP Snooping fast-leave IGMP Snooping group-policy
Zero configuration	DHCP auto-config CWMP-TR069
Broadcast/Multicast/Unicast storm suppression	Storm suppression based on port bandwidth percentage Storm suppression based on PPS Storm suppression based on BPS
Loop-free redundant Layer 2 topology	STP/RSTP/MSTP/PVST/PVST+ STP Root Guard BPDU Guard BPDU Blocking and Root Guard RRPP SmartLink Link Detection (UDLD) Digital Diagnostic Monitor (DDM) G.8032 Ethernet ring protection switching (ERPS), Convergence time within 50ms
QoS/ACL	Rate limit for receiving and transmitting packets CAR Eight output queues per port Flexible queue scheduling algorithms based on both port and queue, including SP, WDRR, WRR, WFQ, and SP+WRR 802.1p priority and DSCP priority Layer 2 to Layer 4 packet filtering Traffic classification based on source MAC, destination MAC, source IP, destination IP, port, protocol, and VLAN Time range WRED
Mirroring	Flow mirroring N:4 port mirroring

Feature	Advance 10G/25G Aggregation Switch
	Local port mirroring and remote port mirroring Policy-based Mirroring Traffic Mirroring
Security	Hierarchical user management and password protection MAC-based authentication 802.1X Storm constrain AAA authentication Portal authentication RADIUS authentication WDTACACS SSH, SSH2.0 Port isolation, Port security, Sticky MAC IP/MAC/Port/VLAN binding MFF EAD SAVI, SAVA IP source guard HTTPs SSL Public Key Infrastructure (PKI) CPU protection Anti DOS/APR/ICMP attack Control Plane Protection (CoPP), Wireless Intrusion Prevention System (WIPS) All ports MACsec
Loading and upgrading	Loading and upgrading through XMODEM/FTP/TFTP Loading and upgrading from USB
Management and maintenance	Zero Touch Provisioning Configuration through CLI, Telnet, and console port Embedded AC, maximum support management 2K AP Restful Python NETCONF Telemetry

Feature	Advance 10G/25G Aggregation Switch
	Job scheduler ISSU VCT 802.1ag and 802.3ah Simple Network Management Protocol (SNMPv1/v2c/v3) iMC network management system Embedded SmartMC Graphical network management platform System log Alarming based on severity NTP, PTP Power, fan, and temperature alarming Debugging information output Ping and Tracert Track Telnet-based remote maintenance USB for file upload and download, support USB deployment NQA (Network Quality Analyzer) eMDI (Enhanced Media Delivery Index)
EMC	FCC Part 15 Subpart B CLASS A ICES-003 CLASS A VCCI CLASS A CISPR 32 CLASS A EN 55032 CLASS A CISPR32 EN 55024 EN 61000-3-2 EN 61000-3-3
Safety	IEC 60950-1 EN 60950-1

Performance Specification

Model	Advance 10G/25G Aggregation Switch
MAC address entries(max)	576K
VLAN table	4094
VLAN interface	4094
IPv4 routing entries(max)	768K
IPv4 ARP entries(max)	78K
IPv4 ACL entries	Ingress: 26K Egress: 2K
IPv4 multicast L2 entries	68K
IPv4 multicast L3 entries	48K
IPv6 unicast routing entries(max)	178K
QOS forward queues	8
IPv6 ACL entries	Ingress: 13K Egress: 1K
IPv6 ND entries(max)	48K
IPv6 multicast L2 entries	28K
IPv6 multicast L3 entries	18K
Jumbo frame length	13312
Max Stacking Member	9
Max Stacking Bandwidth	800Gbps

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