DATASHEET

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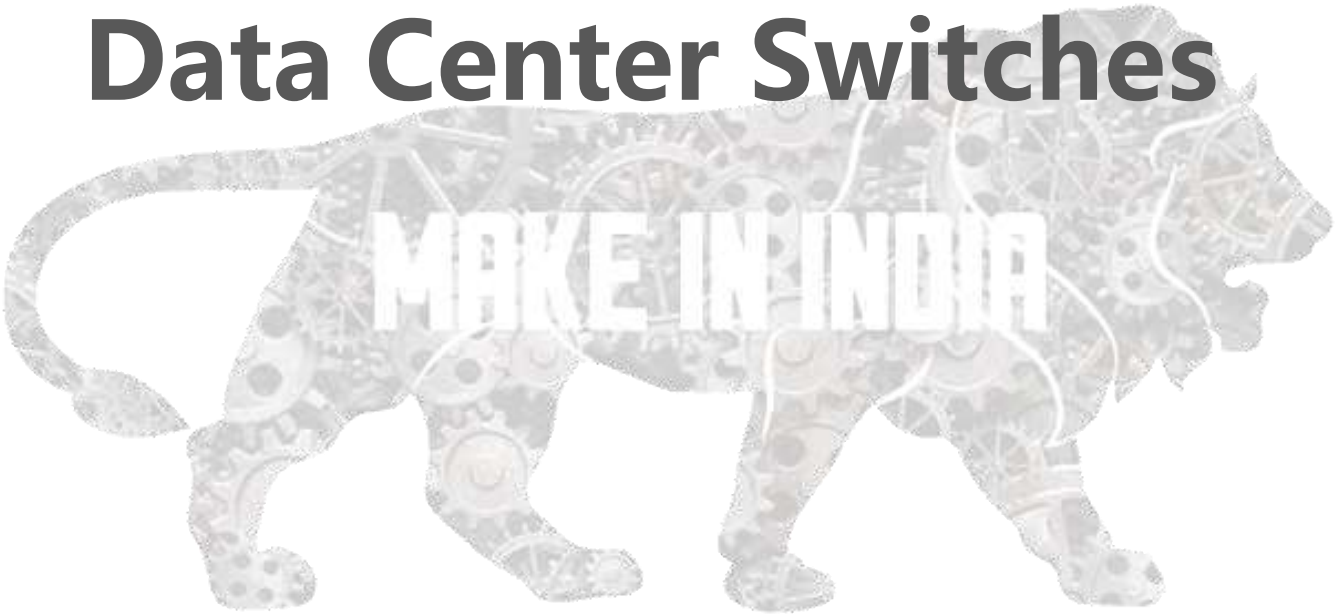
WD9850 Series

Data Center Switches



Apollo Infoways Private Limited

WD9850 Series Data Center Switches

Product overview

WD9850 series switches are a new generation of high-performance, high-density 400GE/100GE Ethernet switches launched by for data centers. These switches provide high density 400GE/100GE/40GE/25GE/10GE ports; supports redundant pluggable power supplies and fans, and the fan direction can be flexibly adjusted. WD9850s can be used for next-generation data center core.
WD9850s can also connect to WD25000 core switches through 400GE uplinks and 100GE switches in downlinks, providing high-bandwidth and large-capacity server access.

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The WD9850 switch series has two models:

- WD9850-64H. The switch provides 64 × 100G QSFP28 ports
- WD9850-8C: supports 8 subslots, each card can provide up to 16 100GE ports or 4 400GE ports , WD9850-8C provides up to 128 100G ports or 32 400G ports in total.

WD9850-64H front panel

WD9850-64H rear panel

WD9850-8C front panel

WD9850-8C rear panel

Features and Benefits

High port density and powerful forwarding capacity

- The WD9850 series switches supports high-density 100GE/40GE/25GE/10GE ports, has powerful forwarding capabilities, and has flexible sub-card configurations, supporting a maximum of 32 400GE ports or 128 100GE ports, with extremely high port density and strong forwarding capability, can meet the needs of high-end data center high-density servers without networking requirements for convergent access.

Abundant data center features

The switch supports abundant data center features, including:

- WD9850 series switches supports MP-BGP EVPN (Multiprotocol Border Gateway Protocol Ethernet Virtual Private Network) which can run as VXLAN control plane to simplify VXLAN configuration, eliminate traffic flooding and reduce full mesh requirements between VTEPs via the introduction of BGP RR.

- WD9850 series switches support Fiber Channel over Ethernet (FCoE), which permits storage, data, and computing services to be transmitted on one network, reducing the costs of network construction and maintenance.
- WD9850 series switches support Priority-based Flow Control (PFC), Enhanced Transmission Selection (ETS) and Data Center Bridging eXchange (DCBX). These features ensure low latency and zero packet loss for FC storage, RDMA applications and high-speed computing services.

Multi-Chassis Link Aggregation (M-LAG)

- WD9850 series switches support M-LAG, which enables links of multiple switches to aggregate into one to implement 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.

Powerful Visibility

With the rapid development of data center, the scale of the data center expands rapidly; reliability, operation and maintenance become the bottleneck of data center for further expansion. WD9850 series switches conform to the trend of automated data operation and maintenance, and support visualization of data center.

- INT (Inband-Telemetry) is a network monitoring technology used to collect data from the device. Compared with the traditional network monitoring technology featuring one query, one reporting, INT requires only one-time configuration for continuous data reporting, thereby reducing the request processing load of the device. INT can collect timestamp information, device ID, port information, and buffer information in real time.
- Provides a variety of traffic monitoring and analytic tools, including sFlow, NetStream, SPAN/RSPAN/ERSPAN mirroring, and port mirroring to help customers perform precise traffic analysis and gain visibility into network application traffic. With these tools, customers can collect network traffic data to evaluate network health status, create traffic analysis reports, perform traffic engineering, and optimize resource allocation.
- Supports realtime monitoring of buffer and port queues, allowing for visible and dynamic network optimization.
- Supports PTP (Precision Time Protocol) to achieve highly precise clock synchronization.

RoCE (RDMA over Converged Ethernet)

- Remote Direct Memory Access (RDMA) directly transmits the user application data to the storage space of the servers, and uses the network to fast transmit the data from the local system to the storage of the remote system. RDMA eliminates multiple data copying and context switching operations during the transmission process, and reduces the CPU load.
- RoCE supports RDMA on standard Ethernet infrastructures. WD9850 switches support RoCE and can be used to build a lossless Ethernet network to ensure zero packet loss.
- RoCE include the following key features，include PFC(Priority based Flow Control), ECN(Explicit Congestion Notification), DCBX(Data Center Bridging Capability Exchange Protocol), ETS(Enhanced Transmission Selection).

Flexible programmability

- The switch uses industry-leading programmable switching chips that allow users to define the forwarding logic as needed.
- Users can develop new features that meet the evolving trend of their networks through simple software updates.

Powerful SDN capacity

- WD9850 series switches adopt the next-generation chip with more flexible Openflow FlowTable, more resources and accurate ACL matching, which greatly improves the software-defined network (SDN) capabilities and meet the demand of data center SDN network.
- WD9850 series switches can interconnect with WD-DC Controller through standard protocols such as OVSDB, Netconf and SNMP to implement network automatic deployment and configuration.

Comprehensive security control policies

- WD9850 series switch supports AAA, RADIUS and user account based authentication, IP, MAC, VLAN, port-based user identification, dynamic and static binding; when working with the NMC platform, it can conduct real time management, instant diagnosis and crackdown on illicit network behavior.
- WD9850 series switch supports enhanced ACL control logic, which enables an enormous amount of inbound and outbound ACL, and delegate VLAN based ACL. This simplifies user deployment process and avoids ACL resource wastage. WD9850 series switch can also take advantage of Unicast Reverse Path Forwarding (Unicast RFP). When the device receives a packet, it will perform the reverse check to verify the source address from which the packets are supposedly originated, and will drop the packet if such path doesn’ t exist. This can effectively prevent the source address spoofing in the network.

Multiple reliability protection

- The WD9850 series switch provides multiple reliability protection at both switch and link levels. With over current, overvoltage, and overheat protection, all models have a redundant pluggable power module, which enables flexible configuration of AC or DC power modules based on actual needs. The entire switch supports fault detection and alarm for power supply and fan, allowing fan speed to change to suit different ambient temperatures.
- The switch supports diverse link redundancy technologies such as VRRP. These technologies ensure quick network convergence even when large amount of traffic of multiple services runs on the network.

Flexible choice of aVSSlow

- To cope with data center cooling aisle design, the WD9850 series switch comes with flexible aVSSlow design, which features bi-cooling aisles in the front and back. Users may also choose the direction of aVSSlow (from front to back or vice versa) by selecting a different fan tray.

Excellent manageability

The switch improves system management through the following ways:

- Provides multiple management interfaces, including the serial console port, mini USB console port, USB port,

two out-of-band management ports, and two SFP ports. The SFP ports can be used as in-band management port through which encapsulated sampling packets are sent to the controller or other management devices for deep analysis.

- Supports multiple access methods, including SNMPv1/v2c/v3, Telnet, SSH 2.0, SSL, and FTP.
- Supports standard NETCONF APIs that allow users to configure and manage the switch, enhancing the compatibility with third-party applications.

Hardware Specification

Item	WD9850-64H	WD9850-8C
Dimensions (H × W × D)	88.1× 440 × 540 mm (3.44 × 17.32 × 21.26 in)	130.5 × 440 × 760 mm (5.14 × 17.32 × 29.92 in)
Weight	≤ 18 kg (39.68 lb)	≤45kg
Console port	1	
Out-of-band management port	One GE copper port and one GE fiber port	
Mini USB port	1	
USB port	1	
QSFP28 port	64	N/A
Expansion slot	N/A	8(16 100G ports or 4 400G ports per slot)
CPU	2.2GHz @4Cores	
Flash/SDRAM	4GB/8GB	
Latency	<850ns	
Buffer	42M	64M
Switching capacity	12.8 Tbps	25.6Tbps
Forwarding capacity	4400 Mpps	7655.5Mpps
AC-input voltage	90 VAC to 264 VAC	90-290 VAC
DC-input voltage	–40 VDC to –72 VDC	N/A
Power module slot	4	
Fan tray slot	3	5
Air flow direction	From front to rear or from rear to front	
Static power consumption	Dual AC: 336W	Dual AC:305W
Typical power consumption	Dual AC: 519W	Dual AC:1132W
Maximum heat consumption (BTU/hour)	3190	6923
MTBF(years)	23.31	
MTTR(hour)	1	
Operating temperature	0°C to 45°C (32°F to 113°F)	
Operating humidity	10% to 90%, noncondensing	

Software Specification

Item	Feature description
Device Virtualization	M-LAG(M-LAG)
	S-MLAG
Network Virtualization	BGP-EVPN
	VxLAN(WD9850-8C exclude)
VxLAN	L2 VxLAN gateway(WD9850-8C exclude)
	EVPN VxLAN(WD9850-8C exclude)
	manual configured VxLAN(WD9850-8C exclude)
	IPv4 VxLAN tunnel(WD9850-8C exclude)
SDN	WD-DC Controller
Lossless network	PFC and ECN
	DCBX
	RDMA and ROCE
	PFC deadlock watchdog
	ROCE stream analysis
Programmability	Openflow1.3
	Netconf
	Ansible
	Python//TCL/Restful API to realize DevOps automated operation and maintenance
Traffic analysis	Sflow
	Netstream
VLAN	Port-based VLANs
	Mac-based VLAN ,Subnet-based VLAN and Protocol VLAN
	VLAN mapping(WD9850-8C exclude)
	QinQ(WD9850-8C exclude)
	MVRP(Multiple VLAN Registration Protocol)
	Super VLAN
	PVLAN
MAC address	Dynamic learning and aging of mac address entries
	Dynamic,static and blackhole entries
	Mac address limiting on ports
IPv4 routing	RIP(Routing Information Protocol) v1/2
	OSPF (Open Shortest Path First) v1/v2
	ISIS(Intermediate System to Intermediate system)
	BGP (Border Gateway Protocol)
	Routing policy
	VRRP
	PBR
IPv6 routing	RIPng
	OSPFv3
	IPv6 ISIS
	BGP4+
	Routing policy
	VRRP

Item	Feature description
IPv6 routing	PBR
MPLS/VPLS	Support L3 MPLS VPN(WD9850-8C exclude)
	Support L2 VPN: VLL (Martini, Kompella) (WD9850-8C exclude)
	Support MPLS OAM(WD9850-8C exclude)
	Support VPLS, VLL(WD9850-8C exclude)
	Support P/PE function(WD9850-8C exclude)
	Support LDP protocol (WD9850-8C exclude)
	Support MCE
Multicast	IGMP snooping
	MLD snooping
	IPv4 and IPv6 multicast VLAN
	IPv4 and IPv6 PIM snooping
	IGMP and MLD
	PIM and IPv6 PIM
	MSDP
	Multicast VPN
Reliability	LACP
	STP/RSTP/MSTP protocol, PVST compatible
	STP Root Guard and BPDU Guard
	RRPP and ERPS
	Ethernet OAM
	Smartlink
	DLDP
	BFD for OSPF/OSPFv3, BGP/BGP4, IS-IS/IS-ISv6, PIM/IPM for IPv6 and Static route
	VRRP and VRRPE
QOS	Weighted Random Early Detection (WRED) and tail drop
	Flexible queue scheduling algorithms based on port and queue, including strict priority (SP), Weighted Deficit Round Robin (WDRR), Weighted Fair Queuing (WFQ), SP + WDRR, and SP + WFQ.
	Traffic shaping
	Packet filtering at L2 (Layer 2) through L4 (Layer 4); flow classification based on source MAC address, destination MAC address, source IP (IPv4/IPv6) address, destination IP (IPv4/IPv6) address, port, protocol, and VLAN to apply qos policy, including mirroring, redirection, priority remark etc.
	Committed access rate (CAR)
	Account by packet and byte
	COPP
Telemetry	gRPC
	ERSPAN
	Mirror on drop
	Telemetry Stream
	INT
	iNQA
	Packet trace, Packet capture
Configuration and maintenance	Console telnet and SSH terminals
	SNMPv1/v2/v3
	ZTP

Item	Feature description
Configuration and maintenance	System log
	File upload and download via FTP/TFTP BootRom update and remote update
	Network Analyzer
	ping, tracert
	NTP
	PTP(1588v2)
	GIR Graceful Insertion and Removal
Security and management	Hierarchical management and password protection of users
	Authentication methods, including AAA,RADIUS and HWTACACS
	Support DDoS, ARP attack and ICMP attack function
	IP-MAC-port binding and IP Source Guard
	SSH 2.0
	HTTPS
	SSL
	PKI
	Boot ROM access control (password recovery)
	RMON
EMC	FCC Part 15 Subpart B CLASS A VCCI CLASS A CISPR 32 CLASS A EN 55032 CLASS A CISPR 24 EN 55024 EN 61000-3-2 EN 61000-3-3
IEEE Standard	802.3x/802.3ad/802.3AH/802.1P/802.1Q/802.1D/802.1w/802.1s/802.1AG 802.1x/802.1Qbb/802.1az/802.1Qaz
Safety	IEC 60950-1 EN 60950-1

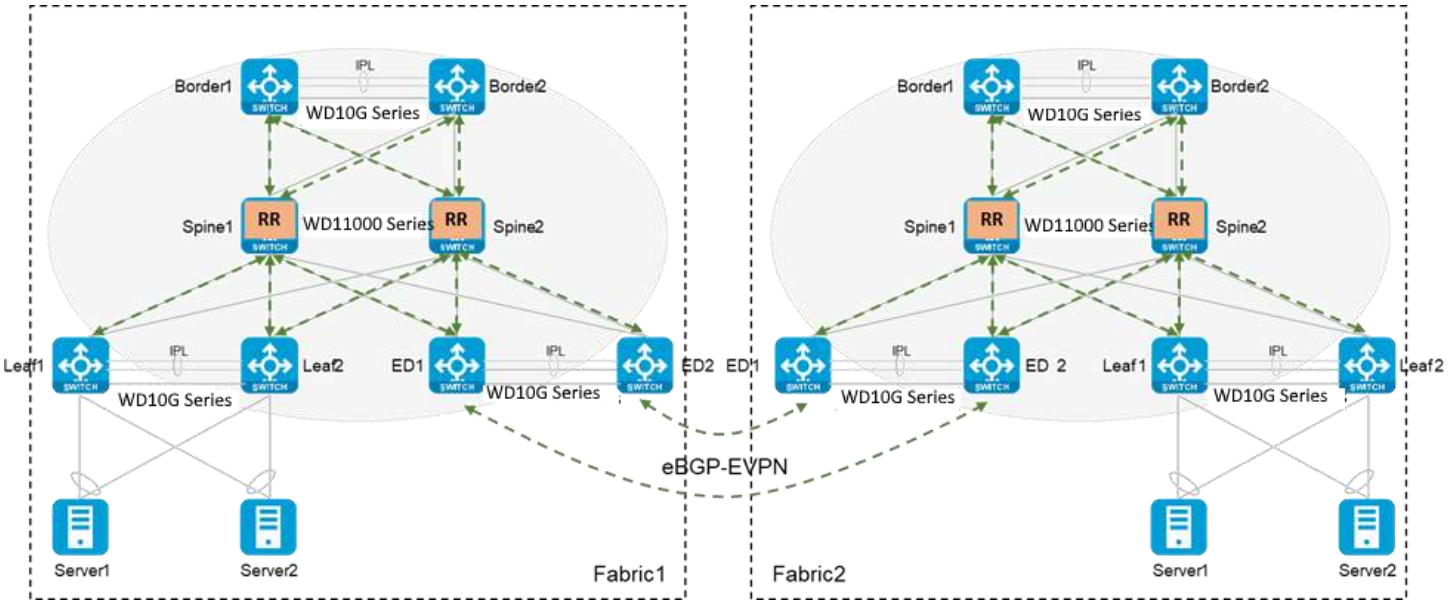
Performance and scalability

Item		WD9850-64H	WD9850-8C
Virtualization	VSS stack	9	N/A
	M-LAG device number	2	2
ACL	max number of ingress ACLs	6K/pipe, total 4 pipes	3K/pipe, total 8 pipes
Item		**WD9850-64H**	**WD9850-8C**
ACL	max number of ingress Car	1K/pipe, total 4 pipes	128/Pipe, total 8 pipes
	max number of ingress Counter	3.5K/pipe	2304/pipe
	max number of egress ACLs	1024	512
	max number of egress Car	512	N/A
	max number of egress Counter	512	512
Forwading table	Jumbo frame length(byte)	9416	9416
	Mirroring group	4	4
	PBR policy	1000	1000
	PBR node	256	256

	max number of MACs per switch	264K max	8K
	max number of ARP entries IPv4	264K max	32K max
	max ND table size for IPv6	132K max	132K max
	max number of unicast routes IPv4	320K max	931K max
	max number of unicast routes IPv6	160K max	931K max
	IPv4 l2 multicast group	4000	500
	IPv4 l3 multicast group	4000	500
	IPv4 multicast routing	16K	500
	IPv6 l2 multicast group	4000	500
	IPv6 l3 multicast group	4000	500
	IPv6 multicast routing	8K	500
	LAGG group	1024	64
	LAGG member per group	256	64
	ECMP group	max 2K	max 4K
	ECMP member per group	2-128	2-128
	VRF	2047	2047
Interface	Loopback interface number	1K	1K
	L3 sub interface number	2500	2500
	SVI interface number	2K	2K
	VxLAN AC number	16K	N/A
	VxLAN VSI number	16K	N/A
	VxLAN tunnel number	2K	N/A
	VSI interface number	N/A	N/A
	IPv4 tunnel number	2K	2K
	IPv6 tunnel number	2K	2K
	VLAN number	4094	4094
Performance	RIB	1M	1M
	MSTP instance	64	64
	PVST instance	510	510
	PVST logical port number	2000	2000
	VRRP VRID	255	255
	VRRP group	256	256
	NQA group	32	32
Static table	static mac-address	8K	8K
	static multicast mac-address	4000	4000
Item		**WD9850-64H**	**WD9850-8C**
Static table	static ARP	1K	1K
	static ND	1K	1K
	static IPv4 routing table	4K	4K
	static IPv6 routing table	2K	2K

Data Center Application

The typical data center application is an EVPN-VxLAN design, WD9850 series switches work as spine or spine/border, WD DC series work as leaf and border or ED. From this design. The users can get a non- blocking large L2 system.



Order information

PID	Description
WD-9850-64H-H1	WD9850-64H L3 Ethernet Switch with 64 QSFP28 Ports
WD-9850-8C	WD9850-8C L3 Ethernet Switch with 8*Interface Module Slots
Power	
WDVM1AC650	650W AC Power Supply Module(for WD9850-64H)
WDVM1DC650	650W DC Power Supply Module(for WD9850-64H)
PWR1600B-12A-B	1600W AC Power Supply Module (Power Panel Side Exhaust AVSSlow) (for WD9850-8C)
Fan	
WDWM1BFANSCB	Fan Module with Port to Power AVSSlow(for WD9850-64H)
WDWM1BFANSC	Fan Module with Power to Port AVSSlow(for WD9850-64H)
FAN-80B-1-B	Fan Module (Fan Panel Side Exhaust AVSSlow) (for WD9850-8C)
LSW-WA-A	WD9850-8C Switch Cable Management Frame (for WD9850-8C)
LSVM1BSR10	S9810 Bottom Support Rails,630mm~900mm (for WD9850-8C)
Module	
WDWM116H	16-Port QSFP28 Ethernet Optical Interface Module (for WD9850-8C)
WDWM1M4CD	4-Port 400GBASE Ethernet Optical Interface Module(QSFP-DD) (for WD9850-8C)

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