



# WD4500 Series Router

Branch Router



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## Product overview

As SDN, cloud computing, and AI technologies bring revolutionized changes to the networking landscape, a growing number of enterprises are driving digital business transformation, which requires enterprise WANs to provide the following capabilities:

- SDN-WAN capacity—Provides visibility into link quality and business traffic on the WAN, and allows management, control, and scheduling of business traffic, and enables good use experience with enterprise businesses.
- Higher network performance—Increased complexity of traffic models driven by development of enterprise businesses requires more converged and diversified network services. Network devices must provide higher forwarding capacity to align with the growing needs.
- Simple, automated network management—Simplifies network device management and maintenance, improves efficiency, and reduces management costs.

To embrace these opportunities and challenges, WD has developed new-generation WD4500 router series based on ten years of experience in enterprise and carrier network construction and profound technology accumulation. The router delivers the following features:

- Uses the industry-leading high-performance multi-core processor, which offers outstanding concurrent service processing capability in combination with WD's advanced software and hardware architecture.
- Supports a full range of SD-WAN features including OpenFlow, telemetry, segment routing, NETCONF, and zero-touch provisioning (ZTP) and can work in conjunction with WD SD-WAN controllers to deliver extraordinary SD-WAN management and use experience.
- Integrated with WD IMC, the router provides centralized management and monitoring of devices, bulk software upgrade, automated configuration deployment, configuration rollback, and fault alarming, improving O & M efficiency and reducing the TCO significantly.
- Employs rich VPN interconnect technologies, including IPSec, L2TP, and ADVPN and robust encryption algorithms to provide secure VPN access in various scenarios.

WD4500 routers include the following models: WD4510-X1, WD4510E-X1, WD4520-DP, WD4520-X1, WD4540-X1 and WD4540-X1-HI.



WD4510-X1 router



WD4510E-X1



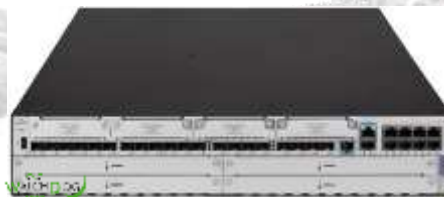
WD4520-DP router



WD4520-X1 router



WD4540-X1 router



WD4540-X1-HI router

## Features and benefits

### Advanced technologies

- WD's state-of-the-art network operating system—Provides intelligent service scheduling and management mechanism, supports loose coupling of service modules, and enables dynamic loading of processes and patches.
- Industry-leading multicore processor—Improves concurrent service processing capability remarkably with non-blocking switching architecture.
- Routing matrix architecture—Separates the routing plane from the switching plane and enables high-speed data transmission.
- Variety of acceleration engines—Accelerates service processing significantly by engines such as data encryption engine and voice DSP processing engine.

## Full support for SDN

The router supports a full range of SDN features, including:

- Flexible management—Supports management and control protocols such as OpenFlow, Telemetry, and NETCONF and allows management from WD SD-WAN or third-party controllers.
- Powerful forwarding capability—Supports advanced forwarding and routing technologies such as segment routing, VXLAN, and EVPN and allows customization of multiple forwarding models to adapt to different business requirements.
- ZTP—Supports ZTP through URL, USB drive, and DHCP to enable fast, bulk, and low-cost deployment.
- DPI—Provides precise traffic identification and enables traffic visibility, customization, and flexible orchestration.
- SR/SRv6—Supports the EVPN L2VPN over SRv6 policy/BE and EVPN L3VPN over SRv6 policy/BE networking solutions.

## High security

The router employs the following advanced features to ensure high security:

- Rich security rules—Supports filtering rules based on 5-tuple, ASPF state, MAC address and URL, domain-based firewall rules, and IPS rules.
- Diversified VPN technologies—Supports IPsec, L2TP, GRE, ADVPN, MPLS VPN, and combination of multiple VPN technologies.
- Endpoint access security—Provides strict access control for endpoints through 802.1X/portal authentication, endpoint admission defense (EAD) solution, and endpoint MAC address authentication.
- DDoS attack protection—Guards against SYN, ACK, RST, and UDP flood attacks.
- Secure device management—Provides flexible and secure control of permissions by managing permissions based on roles, assigning resources based on roles, and mapping users to roles.
- Traffic control on the control plane—Allows customization of protocol messages for traffic control and filtering.

## Granular control

- Uses granular identification and control to rate limit and filter application layer services and ensure bandwidth and provides detailed network statistics for network optimization.
- Supports equal cost multiple path (ECMP) and unequal cost multiple path (UCMP) load balancing. UCMP allows the device to perform bandwidth-based load balancing.

## Intelligent network management

- The router Supports multiple network management methods, including Telnet/SSH, SNMP, TR069, and NETCONF.
- With EAA, the router allows you to define monitor policies with Tcl and Python scripts to monitor the

internal events and status of the system's software and hardware components and execute the pre-defined actions in response to specific events automatically.

## High availability

The device provides the following high availability features:

- Bidirectional forwarding detection (BFD), which can collaborate with static routing, RIP/OSPF/BGP/ISIS dynamic routing, VRRP, and interface backup through the track module.
- Network quality analyzer (NQA), which can collaborate with static routing, VRRP, and interface backup through the track module.
- Multi-device redundancy and load balancing (VRRP/VRRPE).

## Network virtualization

- The router takes the lead in employing Virtual Switching System (VSS), an advanced technology for virtualizing two devices into one logical device, which significantly decreases networking complexity, reduces the operation and maintenance cost, enhances bandwidth and equipment utilization, and improves management efficiency.
- With multi-chassis link aggregation, the router enables load balancing and backup among multiple uplinks, enhancing reliability of the overall network architecture and improving link resources efficiency.

## Environment friendly

- Compliant with the RoHS standard.
- Improved space efficiency with an advanced air aisle design.
- Minimized fan tray noises and power consumption with the automated multi-level fan speed regulation solution.

## Technical specifications

### Hardware specifications

Item	WD4520-X1	WD4540-X1	WD4540-X1-HI
IP Forwarding Performance (IMIX)	25 Gbps	35 Gbps	58 Gbps
Forwarding Performance with ACL+NAT+QOS (IMIX)	11 Gbps	22 Gbps	27 Gbps

## WD4500 Router Series

Item	WD4520-X1	WD4540-X1	WD4540-X1-HI
IPSec Forwarding Performance (1400byte)	10 Gbps	16 Gbps	24 Gbps
CPU	1.8GHz	1.8GHz	1.8GHz
Memory /Flash (default/maximu m)	4 GB/4 GB ( Expandable upto 8GB/8GB	4 GB/4 GB ( Expandable upto 8GB/8GB	8 GB/8 GB ( Expandable upto 16GB/32GB
USB 2.0 port	1	1	1
Console port	1	1	1
WAN port	6*10GE (SFP+) ports 8*GE copper ports	5*10GE (SFP+) ports 1*GE combo port 8*GE copper ports	4*25GE (SFP28) ports 16*10GE (SFP+) ports 10*GE copper ports
LAN port	8*GE copper ports	N/A	N/A
SIC slot	4	4	4
HMIM slot	2	4	4
Maximum power consumption	150 W	300 W	300 W
Power redundancy	AC/DC	AC/DC	AC/DC
Power input	AC: 100 to 240 VAC @ 50/60 Hz DC: -48 to -60 VDC	AC: 100 to 240 VAC @ 50/60 Hz DC: -48 to -60 VDC	AC: 100 to 240 VAC @ 50/60 Hz DC: -48 to -60 VDC
Rack height	1 RU	2 RU	2 RU
Dimensions (H × W × D)	44.2 × 440 × 470 mm (1.74 × 17.32 × 18.50 in)	88.1 × 440 × 480 mm (3.47 × 17.32 × 18.90 in)	88.1 × 440 × 480 mm (3.47 × 17.32 × 18.90 in)
Ambient temperature	0°C to 45°C (32°F to 113°F)		
Ambient relative temperature	5 % to 95%, non-condensing		
EMC	FCC Part 15 (CFR 47) CLASS A CISPR 22 CLASS A		

## WD4500 Router Series



Item	WD4520-X1	WD4540-X1	WD4540-X1-HI
EMC	EN 55022 CLASS A		
	CISPR22 CLASS A		
	CISPR 24		
	EN 55024		
	EN 61000-3-2		
	EN 61000-3-3		
	EN 61000-6-1		
	EN 301 489-1		
	EN 301 489-17		
	IEC 60950-1		
	EN 60950-1/A11		
	EN 60825-1		
	EN 60825-2		

Item	WD4510-X1	WD4510E-X1	WD4520-DP
IP Forwarding Performance (IMIX)	5.8 Gbps	10 Gbps	6 Gbps
Forwarding Performance with ACL+NAT+QOS (IMIX)	2.5 Gbps	5.5 Gbps	5 Gbps
IPSec Forwarding Performance (1400byte)	1.8 Gbps	5 Gbps	4.4 Gbps
CPU	1.2GHz	2.2GHz	1.2GHz
Memory	2 GB	4 GB	2 GB
Flash (default/maximum)	512 MB/32GB	4GB	512 MB/32GB
External Flash	Micro SD card	N/A	Micro SD card

## WD4500 Router Series



Item	WD4510-X1	WD4510E-X1	WD4520-DP
HDD slot	1*2.5" SATA HDD/SSD	N/A	1*mSATA SSD
USB port	1	1	1
Console port	1	1	1
WAN port	2 x GE copper ports 2 x GE combo ports 2 x SFP ports	3*10GE (SFP+) ports 2*GE combo port	4 x GE combo ports 2 x SFP ports
LAN port	N/A	8*GE copper ports	N/A
SIC slot	4	4	4
HMIM slot	N/A	N/A	2
Max power consumption	54 W	54 W	150 W
Power redundancy	N/A	N/A	AC/DC
Power voltage	AC: 100 VAC to 240 VAC @ 50 Hz/60 Hz	AC: 100 VAC to 240 VAC @ 50 Hz/60 Hz	AC: 100 VAC to 240 VAC @ 50 Hz/60 Hz DC: -48 to -60V
Rack height	1 RU	1 RU	1 RU
Dimensions (H x W x D)	43.6 x 440 x 360 mm (1.72 x 17.32 x 14.17 in)	44.2 x 440 x 320 mm (1.74 x 17.32 x 12.60 in)	44.2 x 440 x 470 mm (1.74 x 17.32 x 18.50 in)
Operating temperature	0°C to 45°C (32°F to 113°F)	0°C to 45°C (32°F to 113°F)	0°C to 45°C (32°F to 113°F)
Operating humidity	5% RH to 95% RH, non- condensing	5% RH to 95% RH, non- condensing	5% RH to 95% RH, non- condensing
EMC	FCC PaWDRT 15 (CFR 47) CISPR 22 CLASS A EN 55022 CLASS A CISPR 24 EN 55024 EN 61000-3-2 EN 61000-3-3 EN 61000-6-1		

Item	WD4510-X1	WD4510E-X1	WD4520-DP
	EN 301 489-1		
	EN 301 489-17		
	IEC 60950-1		
	EN 60950-1/A11		
Security	EN 60825-1		
	EN 60825-2		

## Software specifications

Item	Specifications
Layer 2 switching	Ethernet, Ethernet II, VLAN, 802.3x, 802.1p, 802.1q, 802.1X, STP (802.1D), RSTP (802.1w), MSTP (802.1s), PPP, PPPoE client, PPPoE server, HDLC, FR, DDR, modem, ISDN
IP services	TCP, UDP, IP option, IP unnumbered Policy-based routing, NetStream, sFlowECMP UCMP
IP applications	Ping, Tracert, ICMP, DHCP server, DHCP relay, DHCP client, DHCP snooping, DNS client, DNS proxy, DDNS, UDP Helper, NTP, SNTP
IPv4 routing	Static routing Dynamic routing: RIPv1/v2, OSPFv2, BGP, IS-IS Route iteration Routing policy Multicast routing protocols: IGMPv1/v2/v3, PIM-DM, PIM-SM, MBGP, MSDP
IPv6	IPv6 ND, IPv6 PMTU, IPv6 FIB, IPv6 ACL, NAT-PT, 6PE, DS-LITE IPv6 tunnel: manually configured IPv6 tunnel, automatic IPv6 tunnel, GRE tunnel, 6to4 tunnel, ISATAP tunnel

Item	Specifications
	Static routing Dynamic routing protocols: RIPng, OSPFv3, IS-ISv6, BGP4+ IPv6 multicast protocols: MLDv1/v2, PIM-DM, PIM-SM
QoS	LR, port-based mirroring, priority trust mode on a port, and port priority Committed access rate (CAR) FIFO, WFQ, CBQ Generic Traffic Shaping (GTS) Traffic classification
Access controller (AC)	AP management: AP access, AP pre-provisioning, AP version upgrade, AP reboot, AP display WLAN access, WLAN security, WLAN authentication, WLAN roaming
Voice	FXS, FXO, E&M, VE1, VT1 interfaces R2, DSS1, Q.sig, digital E&M G.711, G.723, G.726, G.729AB, AMR-NB, GSM-FR, iLBC, WDRT-Audio Rich voice services, voice backup, DTMF signaling (RFC2833), intelligent calling router, FXS and FXO 1:1 binding, PSTN backup, SIP server SRST, IVR
3G/4G/5G	3G/4G/5G access 5G NR NSA/SA TDD/FDD LTE, TD-SCDMA, CDMA2000/EVDO, WCDMA/HSPA+
Security	Portal, 802.1X Local authentication, RBAC authentication, RADIUS authentication, TACACS+ authentication ASPF, ACL, filter, firewall rule based on domain names, connection limit, IPS IKE/IPsec VPN, ADVPN, GDVPN, L2TP VPN, GRE VPN NAT/NAPT, PKI, RSA, URPF DDoS attack prevention, ARP attack prevention, URL filtering, EAD DPI Firewall Sessions (512,000) SM1, SM2, SM3, SM4 encryption algorithms
SDN	NETCONF, OpenFlow, telemetry VXLAN, EVPN Segment routing ZTP through USB drive, URL, and DHCP SRv6:



Item	Specifications																												
	OSPFv3 for SRv6IS-IS for SRv6 SRv6 policy SRv6 policy-based traffic steeringEVPN L3VPN over SRv6 EVPN L3VPN over SRv6 policy SRv6 policy-based traffic statisticsSRv6 OAM BFD for SRv6 SRv6 TI-LFA																												
MPLS	LDP, Static LSP L3VPN: Inter-domain MPLS VPN (Option1/2/3), nested MPLS VPN, Hierarchy PE (HoPE), CE dual homing, MCE, and multi-role host L2VPN: MaWDRTini, Kompella, CCC and SVC MPLS TE, RSVP TE																												
High availability	IRF2 VRRP, VRRPv3 Multi-link load balancing and backup Network quality analyzer (NQA), supporting collaboration with routing, VRRP, and interface backup BFD GR/NSR																												
Management and maintenance	SNMP v1/v2c/v3, TR069, syslog, RMONTelnet, SSHv1.5/2.0, FTP EAA CLI management, file system management, dual image NQA DHCP test, NQA FTP test, NQA HTTP test, NQA ICMP test, NQA UDP publictest, NQA UDP private test, NQA TCP public test, NQA TCP private test, and NQA SNMP test																												
Forwarding Table Capacity	<table border="1"> <thead> <tr> <th data-bbox="421 1749 619 1839">Parameter</th> <th data-bbox="619 1749 746 1839">WD4510-X1</th> <th data-bbox="746 1749 874 1839">WD4510E-X1</th> <th data-bbox="874 1749 1002 1839">WD4520-DP</th> <th data-bbox="1002 1749 1129 1839">WD4520-X1</th> <th data-bbox="1129 1749 1257 1839">WD4540-X1</th> <th data-bbox="1257 1749 1506 1839">WD4540-X1-HI</th> </tr> </thead> <tbody> <tr> <td data-bbox="421 1839 619 1928"><b>IPv4 Public Entries</b></td> <td data-bbox="619 1839 746 1928">300,000</td> <td data-bbox="746 1839 874 1928">500,000</td> <td data-bbox="874 1839 1002 1928">300,000</td> <td data-bbox="1002 1839 1129 1928">500,000</td> <td data-bbox="1129 1839 1257 1928">500,000</td> <td data-bbox="1257 1839 1506 1928">2,000,000</td> </tr> <tr> <td data-bbox="421 1928 619 2018"><b>IPv4 Private Entries</b></td> <td data-bbox="619 1928 746 2018">100,000</td> <td data-bbox="746 1928 874 2018">50,000</td> <td data-bbox="874 1928 1002 2018">100,000</td> <td data-bbox="1002 1928 1129 2018">100,000</td> <td data-bbox="1129 1928 1257 2018">100,000</td> <td data-bbox="1257 1928 1506 2018">400,000</td> </tr> <tr> <td data-bbox="421 2018 619 2092"><b>IPv4 FIB</b></td> <td data-bbox="619 2018 746 2092">1,000,000</td> <td data-bbox="746 2018 874 2092">500,000</td> <td data-bbox="874 2018 1002 2092">1,000,000</td> <td data-bbox="1002 2018 1129 2092">1,000,000</td> <td data-bbox="1129 2018 1257 2092">1,000,000</td> <td data-bbox="1257 2018 1506 2092">4,000,000</td> </tr> </tbody> </table>	Parameter	WD4510-X1	WD4510E-X1	WD4520-DP	WD4520-X1	WD4540-X1	WD4540-X1-HI	<b>IPv4 Public Entries</b>	300,000	500,000	300,000	500,000	500,000	2,000,000	<b>IPv4 Private Entries</b>	100,000	50,000	100,000	100,000	100,000	400,000	<b>IPv4 FIB</b>	1,000,000	500,000	1,000,000	1,000,000	1,000,000	4,000,000
Parameter	WD4510-X1	WD4510E-X1	WD4520-DP	WD4520-X1	WD4540-X1	WD4540-X1-HI																							
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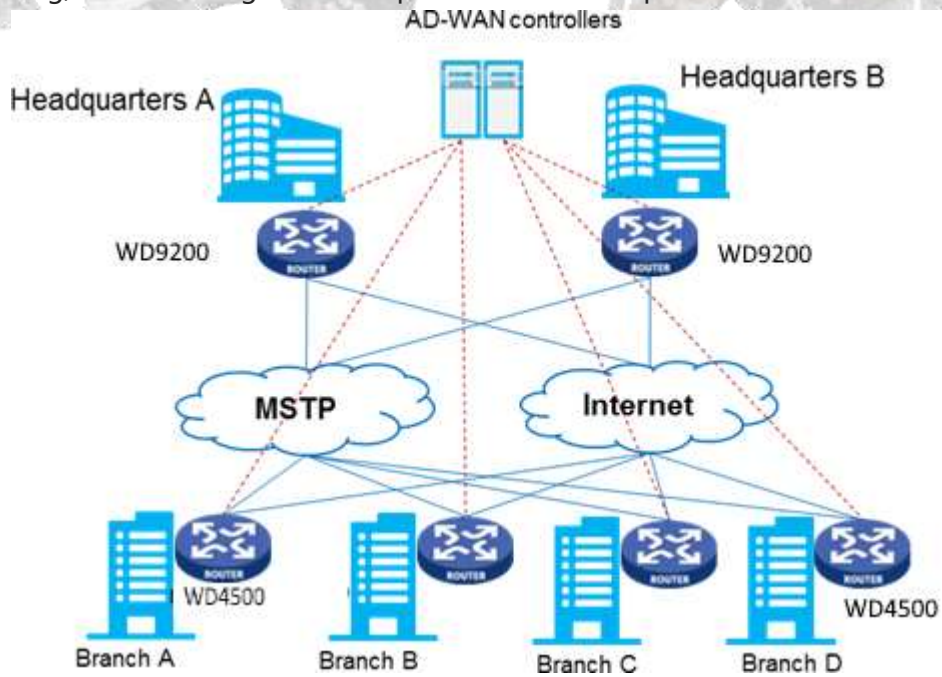


<b>IPv6 Public Entries</b>	300,000	500,000	300,000	500,000	500,000	2,000,000
<b>IPv6 Private Entries</b>	100,000	50,000	100,000	100,000	100,000	400,000
<b>IPv6 FIB</b>	1,000,000	500,000	1,000,000	1,000,000	1,000,000	4,000,000

## Application scenarios

### Deployment in an SD-WAN headquarters-branch network

WD9200 and WD4500 routers support management from WD SD-WAN controllers. In an SD-WAN headquarters-branch network, you can deploy WD9200 routers as aggregation devices at the headquarters or access devices at medium and large branches and WD4500 routers as access devices at branches. This deployment enables unified device management, enables link quality and traffic visibility and intelligent traffic scheduling, and delivers good use experience with enterprise businesses.



SD-WAN headquarters-branch network

### Deployment in E-government extranets



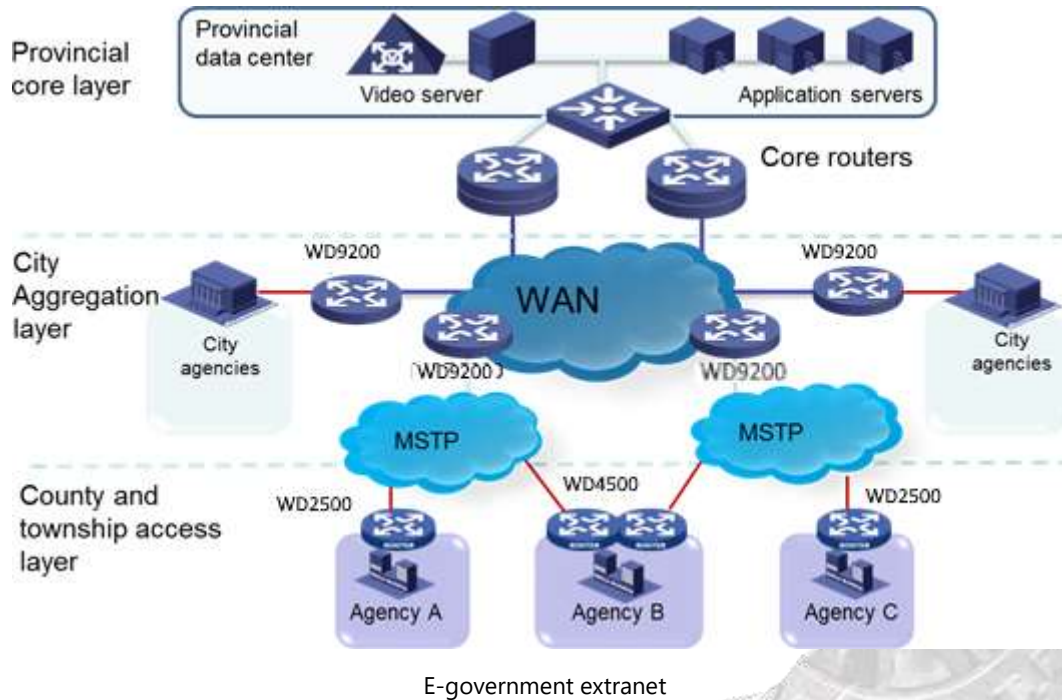
## WD4500 Router Series



WD routers can ensure WAN reliability and security with firewall, QoS, IRF, and EAD features, suitable for the E-government extranet scenarios.

- WD9200 can be deployed as aggregation devices at city-level government bodies to connect downlink devices or used as access devices at city government agencies.
- WD2800 or WD4500 routers can be used as access devices at county and township agencies such as social security, street administration, industry and commerce, and taxation departments.





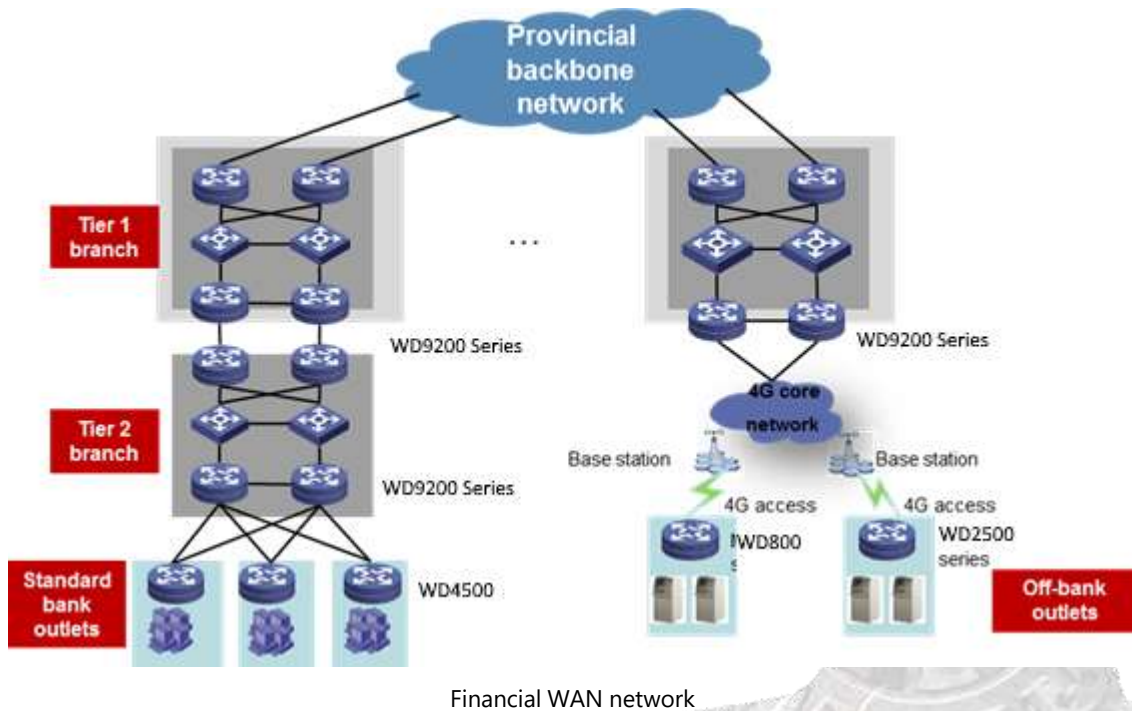
## Deployment in a financial WAN

WD routers are ideal for the financial industry. With outstanding concurrent service processing capability and high availability solutions such as IRF, BFD, and link aggregation, they ensure stable and smooth services at the financial outlets. Support of remote secure access technologies such as ADVPN, IPsec VPN, and L2TP VPN in combination with robust encryption algorithms ensures security of sensitive financial businesses.

In a financial WAN, you can deploy WD routers as follows:

- Deploy WD9200 routers at tier-2 branches as aggregation devices or devices to uplink.
- Deploy WD2800 or WD4500 routers as access devices at standard financial outlets.
- Deploy WD2800 and WD810 routers as access devices at off-bank outlets.





## Ordering information

Product ID	Description
WDRT-WD4510-X1	WD4510-X1 Gigabit Ethernet Integrated Services Gateway with 4GE (2Combo) + 2SFP Ports, HD Supported WDR
WDRT-WD4510E-X1	WD4510E-X1 Router (3*10GE(SFP+),2*GE(Combo),8*GE(RJ45))
WDRT-WD4520-DP	WD4520 Gigabit Ethernet Integrated Services Gateway(4GE Combo+2SFP,Support Dual Power Supplies,1U)
WDRT-WD4520-X1	WD4520-X1 Router (6*10GE(SFP+),16*GE(RJ45))
WDRT-WD4540-X1	WD4540-X1 Router (5*10GE(SFP+),1*GE(Combo),8*GE(RJ45))
WDRT-WD4540-X1-HI	WD4540-X1-HI Router (4*25GE(SFP28),16*10GE(SFP+),10*GE(RJ45))
Power module	
AC-PSR150-A1	150W AC power module
DC-PSR150-D1	150W DC power module
AC-PSR300-12A2	300W AC Power Supply Module
DC-PSR300-12D2	300W DC Power Supply Module
Disk	
HDD-500G-SATA-3G-5.4K-SFF	500GB 2.5inch SATA HDD HardDisk Module



## WD4500 Router Series



HDD-2T-SATA-6G-5.4K-SFF	2TB 2.5inch SATA HDD HardDisk Module
SSD-512G-SATA-6G-MSATA	512GB mSATA SSD HardDisk Module
HMIM module	
WDRT-HMIM-4GEE	4-port Gig-T HMIM module (RJ-45)
WDRT-HMIM-4GEF	4-port 1000BASE-X HMIM module
WDRT-HMIM-8GEE	8-port Gig-T HMIM module (RJ-45)
WDRT-HMIM-8GSWF	8-port 100M/1000M Ethernet (4SFP + 4SFP/RJ-45 combo) L2/L3 HMIM module
WDRT-HMIM-4XP	4-Port 10GBASE-R HMIM Module
SIC module	
WDRT-SIC-4GSWF	4-port 100/1000BASE-X L2/L3 SIC module
WDRT-SIC-4GSW	4-port 10/100/1000BASE-T L2 switch SIC module
WDRT-SIC-2SAE	2-port Enhanced Sync/Async Serial SIC Module
WDRT-SIC-4SAE	4-port Enhanced Sync/Async Serial SIC Module
WDRT-SIC-1EPRI-V3	1-port E1/CE1/PRI SIC module
WDRT-SIC-1E1-F-V3-H3	1-Port Fractional E1 Interface SIC Module
WDRT-SIC-2E1-F-H3	2-Port Fractional E1 Interface SIC Module
WDRT-SIC-4G-CAT6	4G LTE CAT6 SIC module

For More Information  
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