

## Why Huawei

- Broad range of products deliver critical applications and voice traffic with QoS
- Innovative, feature-rich products and solutions with superior price-performance ratio bring down total cost of ownership (TCO)
- Outstanding scalability ensures positive return on investment (ROI)
- Specialized expertise to meet installation, implementation and maintenance requirements



## Quidway® AR 46 Series Router

Series Multi-Service  
Enterprise Core  
Router

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Version No. : GE-082130-20050101-BR-1.0

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# Quidway® AR 46 Series Enterprise Core Routers

Quidway AR 46 Series Enterprise Core Routers are high-performance edge routers developed for the service providers and enterprise networks. Depending on the network size, Quidway AR 46 Series Routers can be taken as the edge equipment in the provider's IP networks or the high-performance backbone equipment in the provider's support networks (such as management networks). In addition, these routers can work as the core routers or the high-performance aggregating routers in enterprise networks. Quidway AR 46 Series support hot swapping of interfaces, power supply, and fan modules, and offer two power supply schemes (AC power supply and DC power supply), as well as 1+1 power supply module backup.

Depending on the number of slots provided, the routers fit into three models: Quidway AR 46-80, AR 46-40 and AR 46-20. These three models use the same interface module.

## Key Benefits

### Powerful Forwarding/ Service Processing Capacity

Quidway AR 46 Series Routers adopt unique Dual Bus architecture, high performance Power PC microprocessor, and advanced Huawei IP Turbo Engine technology, greatly improving the forwarding and service processing performance without compromising the flexibility of



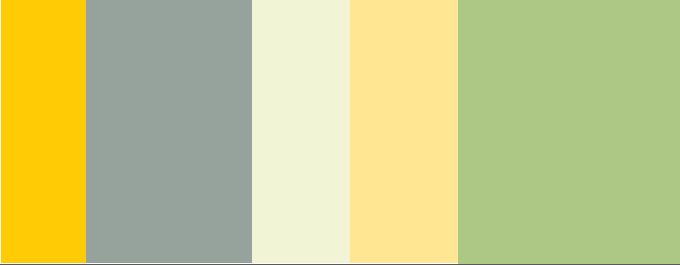
AR 46-80



AR 46-40



AR 46-20



service and protocol processing. Such an approach enormously improves the forwarding and service processing capability of the system and the forwarding rate reaches 300Kpps (155M interface wire-speed forwarding). Besides supporting forwarding on various fast links, like Ethernet, synchronous PPP, FR and HDLC, Quidway AR 46 Series Routers can also support fast forwarding combining QoS and firewall.

### High Reliability

Quidway AR 46 Series Routers adopt the redundancy design technology of carrier-class products on all key components, including bus, fan, BootRom, and power supplying system. All the power/interface/fan modules are designed hot-swappable and can be replaced without affecting the ongoing service, and hence can satisfy the high reliability required by carrier-class networks. The redundant power modules support either AC or DC input.

The back-up center and VRRP technologies applied to the Quidway AR 46 Series Routers provide a back-up scheme that ensures smooth data communications in case communications links or devices fail to work and thereby commit to a robust and reliable network. Unique hot-patch technology also ensures non-stop service non-stopping during software upgrading.

### Prominent Integrated Security

Quidway AR 46 Series incorporate integrated security design into each module, protocol, and service flow: multiple authentications mechanism for routing protocols (including simple text and MD 5 authentication), packet filtering firewall, ISPKeeper DoS protection, Network Address Translation (NAT), Security Shell (SSH), security severity log..... all the technologies integrated effectively protect the security and safety of the enterprise network.

### Flexible Applications

Quidway AR 46 Series Routers inherits the abundant service capabilities of Huawei Versatile Routing Platform (VRP), providing powerful routing, MPLS, VPN, multicast, voice, security, QoS functionalities in one chassis. All services are designed and optimized for critical enterprise core applications. Quidway AR 46 routers integrate functions of such devices as router, firewall, intrusion defense, VPN gateway, voice gateway, broadband access gateway, fully satisfying network integrative networking requirement. They can be flexibly combined with various devices and services according to actual situations.



## Specifications

### Product features

Software Specifications of Quidway AR 46-20/40/80 Series Routers

Network Interconnection Protocol	Ethernet, PPP, PPPoE, SLIP, FR, LAPB, X.25, ISDN, HDLC, DCC, MODEM, MP
Network Layer Protocol and Application	IP, DLSw, IP Fast Switch, DHCP Client / Server / Relay, IPX, MPLS
Routing Protocol	Static Routing, OSPF, RIPv1 / v2, BGP-4, Policy Routing, IGMP, MSDP, PIM-DM, PIM-SM
Transmission layer protocol	TCP, UDP
Application Layer Protocol and Application	Telnet, Dumb Terminal, Terminal Server, FTP, TFTP, Callback, Configuration function, SNMP, RMON, Private MIBs, POS, RTU
Security Characteristics	AAA RADIUS, SSH, Firewall, NAT, L2TP, GRE, IPsec, IKE, Encryption card, Huawei-TACACS
Voice Application	VOIP, VOFR, IP Fax, IPHC, GK Client, E1 Voice, T1 Voice, H.323, SIP
QoS Application	PQ, CQ, WFQ, CBWFQ, CAR, GTS, WRED, LR
Reliability Functions	VRRP, Backup Center

### Hardware

Hardware Specifications of Quidway AR 46-20/40/80 Series Routers

Description	AR 46-80	AR 46-40	AR 46-20
Boot ROM	1024KB		
SDRAM	256MB (maximum 512MB)		
Flash	32MB		
Main Control Slots	1		
Service Slots	8	4	2
Fixed Ports	2 10/100 Mbps Ethernet Ports 1 AUX Port 1 Console Port		
Dimensions (W X H X D)	436.2 mm X 420 mm X 219.5 mm	436.2 mm X 420 mm X 130.5 mm	436.2 mm X 420 mm X 130.5 mm
Weight	28kg		
Input Voltage	AC: 100V to 240V (+/-10%) 50/60Hz		
	DC: -48V to -60V (+/-20%)		
Max. Power Consumption	213W	126W	86W
Max. Attitude	4000m		
Operating Temperature	0 to 40°C		
Operating Humidity	10 to 90%, non-condensing		

High-  
performance  
edge routers

## Modules

Quidway AR 46-20/40/80 Series provide the interface modules below:

1/2 Port 100 Base-TX Module  
(RT-FIC-1/2 FE)

1 Port 100 Base-F Single Mode Module  
(RT-FIC-1 SFX)

1 Port 100 Base-F Multi-Mode Module  
(RT-FIC-1 MFX)

2/4/8-Port Enhanced Synchronous /  
Asynchronous Interface Module  
(RT-FIC-2/4/8 SAE)

8/16-Port Asynchronous Serial Interface  
Module (RJ45) (RT-FIC-8/16 ASE)

1/2/4 Port E1/CE1/PRI Module  
(RT-FIC-1/2/4 E1)

1/2/4 Port T1/CT1/PRI Module  
(RT-FIC-1/2/4 T1)

1/2/4 Port T1 Module Fractional  
(RT-FIC-1/2/4 T1-F)

1/2/4 Port E1 Module-Fractional  
(RT-FIC-1/2/4 E1-F)

1/2 Port ADSL over POTS Module  
(RT-FIC-1/2 ADSL)

4-Channel ISDN-S/T Interface Module  
(RT-FIC-4BS)

1 Port E3/CE3 Compatible Interface  
Module (RT-FIC-E3)

1 Port T3/CT3 Compatible Interface  
Module (RT-FIC-T3)

6/12-Channel Enhanced Analog MODEM  
Interface Module (RT-FIC-6/12 AM)

1 Port OC-3 ATM Multi-mode, SC Optical  
Interface Module (RT-FIC-1ATM-OC3MM)

1 Port OC-3 ATM Single-mode, SC Optical  
Interface 15km Module  
(RT-FIC-1ATM-OC3SM)

1 Port OC-3 Single-mode, SC Optical  
Interface 30km ATM Module  
(RT-FIC-1ATM-OC3SML)

1 Port Gigabit Ethernet Electrical Interface  
Line Process Card(RT-FIC-1 GE)

1 Port OC-3/STM-1 POS Interface  
(RT-FIC-POS)

1 Port OC-3/STM-1 Channellized POS  
to E1/T1 Interface (RT-FIC-CPOS)

1/2-Port ADSL over ISDN Module  
(RT-FIC-1/2 ADSLoISDN)

Port ATM E3 75-ohm Electrical Interface  
Module (RT-FIC-ATM E3)

Port ATM T3 75-ohm Electrical Interface  
Module (RT-FIC-ATM T3)

1/2/4-Port G.SHDSL Module  
(RT-FIC-1/2/4 G.SHDSL)

4/8-Port E1-IMA Module  
(RT-FIC-4/8 E1-IMA)

4/8-Port T1-IMA Module  
(RT-FIC-4/8 T1-IMA)

2/4-Port Loop Trunk Voice Processing  
Interface Module (RT-FIC-2/4 FXO)

2/4-Port Subscribe Circuit Interface  
Voice Processing Module  
(RT-FIC-2/4 FXS)

1 Port E1 IP Voice Module  
(RT-FIC-E1VI)

1 Port T1 IP Voice Module (RT-FIC-T1VI)

2/4-Port E&M Trunk Interface Module  
(RT-FIC-2/4 E&M)

Network Data Encryption Module II  
(RT-FIC-NDEC II)

# Safety and Compliance

## Emissions / Agency Approvals

CISPR 22 Class A

FCC Part 15 Class A

EN 55022 Class A

ICES -003 Class A

VCCI Class A

AS/NZS 3548 Class A

EN 61000-3-2

EN 61000-3-3

## Immunity

Product conforms to:

EN 55024: 1998

EN 61000-4-2

EN 61000-4-3

EN 61000-4-4

EN 61000-4-5

EN 61000-4-6

EN 61000-4-11

## Safety Agency Certifications

UL 60950 3rd ed.

IEC 60950: 1999, corr. Feb.

2000; all national deviations

EN 60950: 2000, ZB and ZC deviations

CSA 22.2 No. 950 3rd ed., 1995

NOM-019 SCFI, Mexico

AS/NZS 60950:2000, Australia

## MTBF

AR 46-20/40/80 Series Router: 39.36 years( 344,793.6 hours)

A robust and reliable network

# Applications

## ■ Quidway® AR 46 Series Routers Applied to Carrier-Class Network

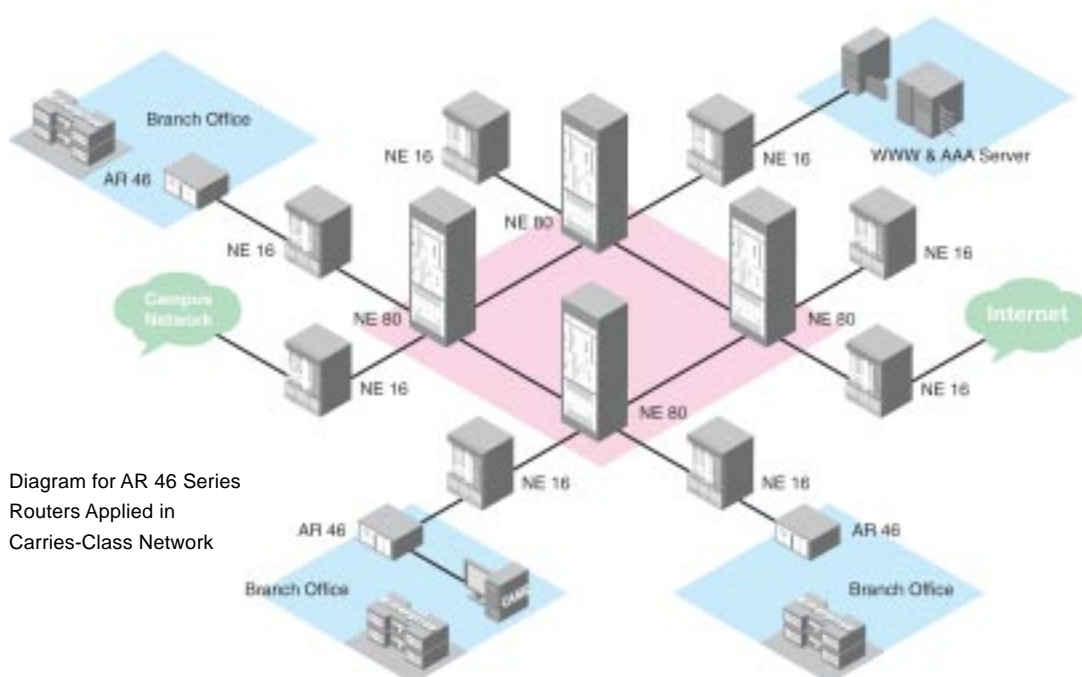


Diagram for AR 46 Series Routers Applied in Carries-Class Network

For the carriers, Quidway AR 46 Series Routers can serve as access routers at the edge of the service networks and provide following features:

- Possessing high-speed forwarding capacity and supporting service features such as QoS, MPLS, VPN, and security;
- Complying with the high-reliability requirements of carrier-class network equipment with applying back-up center, VRRP, redundant power supply and hot-swappable modules.
- Providing multiple high-speed interfaces, including ADSL, E1/T1, E3/T3, and ATM (STM-1/OC-3), and

multiple access approaches such as ISDN / X25 / FR / ATM / DDN, which can accommodate subscribers at different levels.

## ■ Quidway® AR 46 Series Routers Applied to Large and Medium Enterprise Network

Quidway AR 46 Series Routers can serve as convergence layer or core layer equipment on the large and medium enterprise networks. As a convergence layer device, they connect the core layer and access layer to implement hierarchical network



connections. For the enterprises with a smaller-scaled network and less traffic, Quidway AR 46 router serves as a core layer device to connect every internal network branch and function as a gateway connected to the outside network. Integrated with such features as ACL and NAT, the router works as an "inside server" and also provides Internet access. Many enterprise management networks of the carriers apply such solution as well.

### Typical Application as a Convergence Layer Equipment

- On LAN of the headquarters of a company, NE Series Routers serve as core routers and connect each local segment via 100M links and each branch through  $n \times 2M$  (E3/T3) or 55M ATM links.

- Every branch is connected to the up stream headquarter core router through Quidway AR 46 Series Routers. The downlink connects a branch with multiple offices, aggregates traffic and performs proper network management.
- Quidway AR 46 Series Routers support flexible interface modules configuration to achieve expanding flexibility. Low cost solution could include low-speed links such as  $n \times 2M$  or  $n \times 64K$  to reduce the cost. The headquarters can also adopts high-peed interfaces such as ATM and E3/T3 to speed up the forwarding.

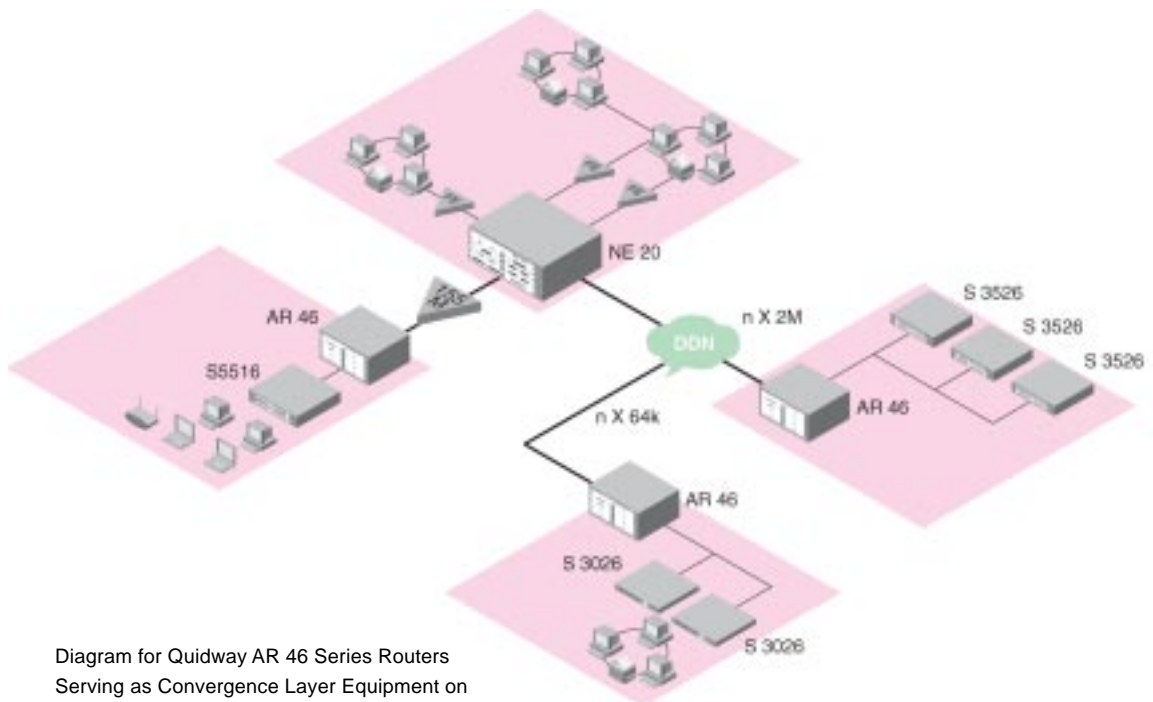


Diagram for Quidway AR 46 Series Routers Serving as Convergence Layer Equipment on Large and Medium Enterprise Networks

## Typical Application as a Core Layer Equipment

- Quidway AR 46 Series Routers, as core routers, connect each headquarter LAN via 100M links and each branch via n\*2M (E3 / T3 / E1 / T1) or synchronous/asynchronous serial ports. The small remote offices and commuting employees are accessing remotely through ISDN/PSTN dial-up connection.
- Quidway AR 46 Series supports flexible interface modules configurations, which provide the enterprises with maximum flexibility of interconnection. 8AS/16AS asynchronous serial port modules with abundant interfaces provide accessibility of remote dial-up subscribers.

# Maximum flexibility and interconnection

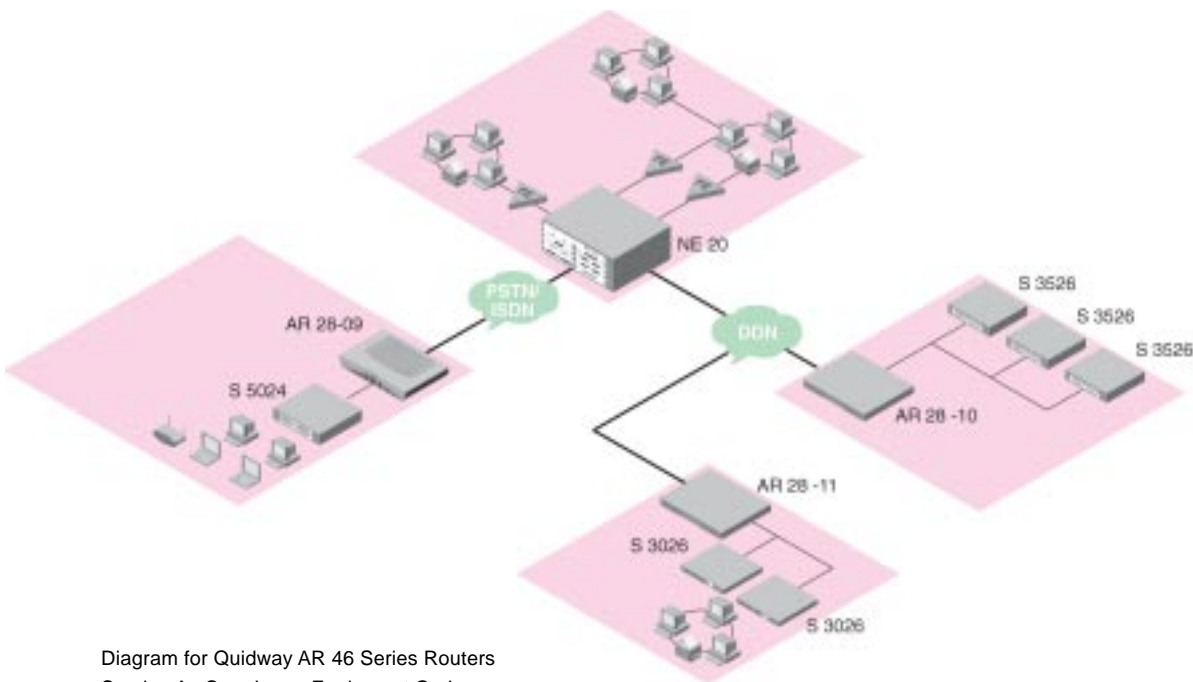


Diagram for Quidway AR 46 Series Routers Serving As Core Layer Equipment On Large and Medium Enterprise Networks

## Multi-service SNA Application

Quidway AR 46 Series Routers function as a gateway between SNA network and IP network. This is becoming a mainstream solution for SNA users to immigrate existing infrastructure to SNA and IP coexistence.

- Quidway AR 46 Series Routers provide DLSw function. The SNA devices (LLC2 frame) in the network center of provincial bank and each branch are interconnected over TCP/IP network. This solution not only expands the SNA network, but also protects the existing investment.
- Quidway AR 46 Router provides terminal access services, which allows TCP multiplexing and transparent transmission function for the system such as bank service system which operates in Host-terminal mode. It

accesses the terminals at service network sites to the mainframe in the central equipment room through IP network and implements the smooth migration from the multiplexer access to IP network access.

- Quidway AR 46 Router provides a terminal access service, POS (Point of Sale), including dial-up and networking access measures. It also adopts the shared POS access service technology to make it possible for transacting different bank cards on the same POS machine. Quidway AR 46 Router provides 8AS/16AS interface modules with abundant asynchronous interfaces for POS access services.
- The business halls, lower-level bank network center and superior bank network center can use Quidway Routers to provide various services, like office automation, VoIP and VPN, which will fully display the advantages of SNA and IP networks.

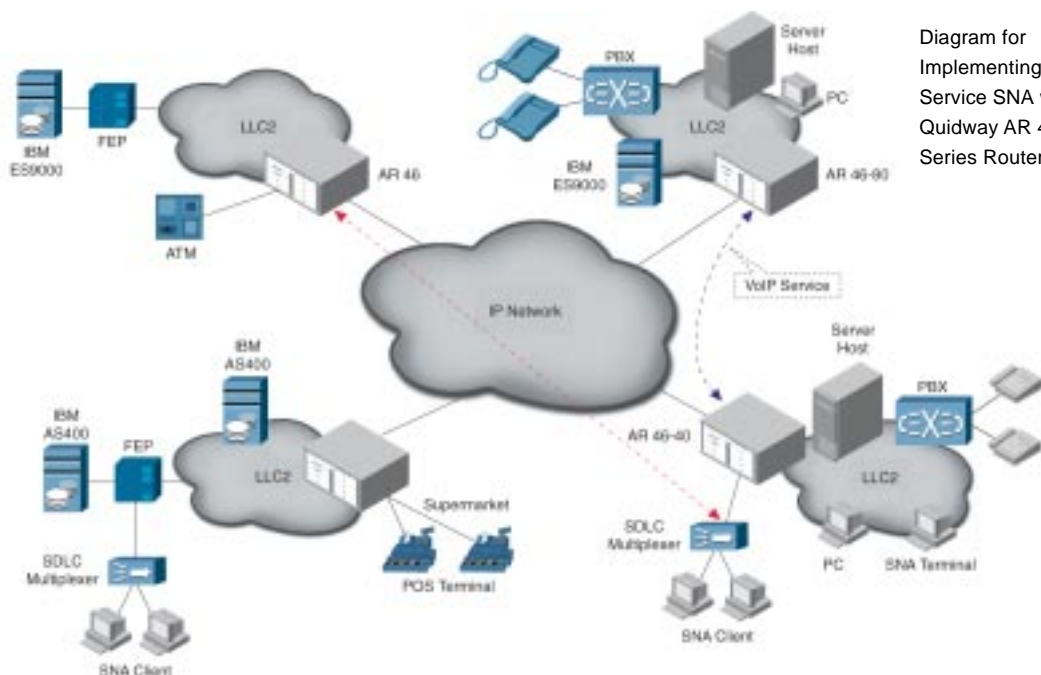


Diagram for Implementing Multi-Service SNA with Quidway AR 46 Series Routers

## Secure VPN Application

Quidway AR 46 Series Routers, serving as VPN gateways, support such tunneling technologies as L2TP and GRE and guarantee quality and security of information transmission on networks, integrated IPSec, NAT, firewall, and QoS technologies.

- Access VPN accesses traveling employees to the network, so they can work on tasks remotely. These people are connected to the VPN server at their headquarters over the private tunnels with the VPN service provided by the local ISP.
- Intranet VPN provides a means for overseas organizations, branches, and offices of a company to access the headquarters. It ensures interconnection

of the network via Internet lines, and security of information on the Intranet VPN with the tunneling and encryption technologies.

- Extranet VPN provides the business partners and clients with a means of accessing the company headquarters without compromising security of the Intranet.

## MPLS VPN Solution

The legacy VPN adopting Permanent Virtual Circuit (PVC) and tunneling technologies has been proved successful. However, as the network grows larger, it is facing more and more problems on scalability, manageability and QoS.

MPLS is the latest achievement in integrated routing/switching solutions. It integrates the flexibility of IP routing

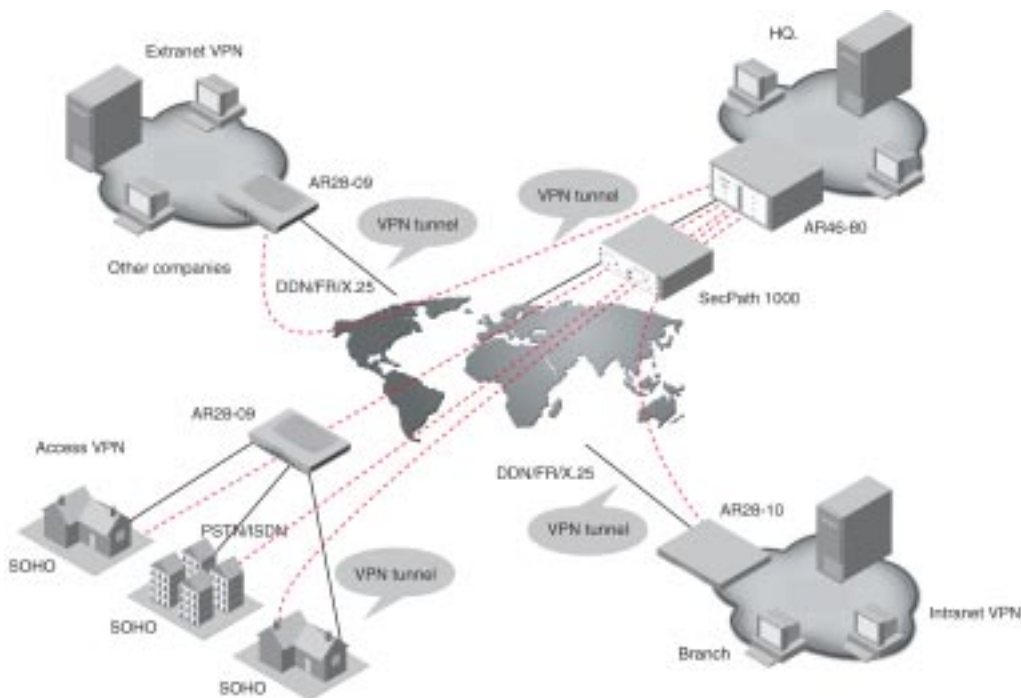


Diagram for Quidway AR 46 Series Routers Applied to Secure VPN



technology and the simplicity of L2 switching. In addition, it has an outstanding advantage on VPN construction. A MPLS network can conveniently implement the IP-based VPN services to satisfy VPN scalability and manageability. Security measures can be taken on the MPLS VPN to isolate the VPNs. MPLS network also provides powerful QoS mechanism to guarantee the quality of VPN services such as bandwidth, transmission, and delay.

#### Typical MPLS VPN networking

- Users are provided with LAN (and even inter-AS) MPLS VPN services.
- A VPN with all its sites belonging to an enterprise is called an Intranet, while a VPN containing sites of different enterprises are called an Extranet. Quidway AR 28 Series Routers provide MPLS VPN access to Intranet and Extranet and Internet egress for the VPN users.
- Quidway AR 28 Series Routers, serving as a Provider Edge (PE) router,

is directly connected with the Customer Edge (CE) router to perform all the VPN-related functionalities. It exchanges routing information with other PEs through IBGP. A PE can be connected with more than one CE.

- MPLS VPN uses edge LSR (PE) to add Label to the IP packets. The LSR (P) at ISP side can judge the destination of the data according to the Label. Additional routing of the data inside a VPN is not required so that MPLS VPN can achieve high speeding forwarding and support large -scaled VPN network.

#### HoPE solution

In BGP MPLS VPN, since a PE device has to aggregate multiple VPN routes, a bottleneck is likely to occur if there are too many subscribers to be accessed by a PE with relatively less capacity. To solve this problem, Huawei Technologies brought forward the Hierarchy of PE (HoPE) solution. HoPE separates the PEs on an MPLS VPN network into different layers to

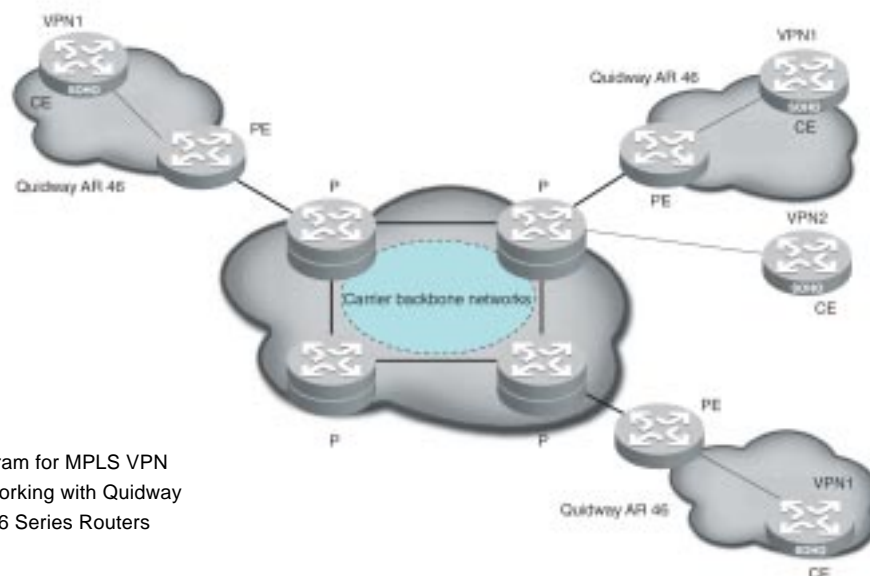


Diagram for MPLS VPN Networking with Quidway AR 46 Series Routers

form a hierarchical BGP MPLS VPN network. The PE at different layer plays a different role. The PE at a higher layer requires more on routing and forwarding capacity and mainly interconnects the backbone network and accesses large VPN subscribers. A PE at a lower layer requires less on routing and forwarding capacity and mainly accesses the VPN subscribers at the edge. Such a network can be infinitely nested; the scalability of BGP / MPLS VPN is also significantly improved.

- PE includes SPE, MPE and UPE. PEs at different levels adopt label switching among each other and can be directly connected via interfaces / sub-interfaces of different forms or through tunnels.

- UPE provides multiple interfaces to maintain the routes to the directly connected VPN Sites, but not maintain the routes to other remote sites. It also allocates internal label for the routes to the directly connected sites and advertises them to SPE;
- SPE maintains all the routes in the VPN containing the direct Sites via UPE. These routes include the routes in local and remote sites. However, it advertises VPN routing / forwarding instance (VRF) default route with label to UPE only.
- When SPE and UPE belong to the same carrier, SPE-UPE protocol adopts MP-iBGP and SPE serves as RR. When SPE and UPE belong to different carriers, SPE-UPE protocol adopts MP-eBGP and UPE normally uses private AS number.

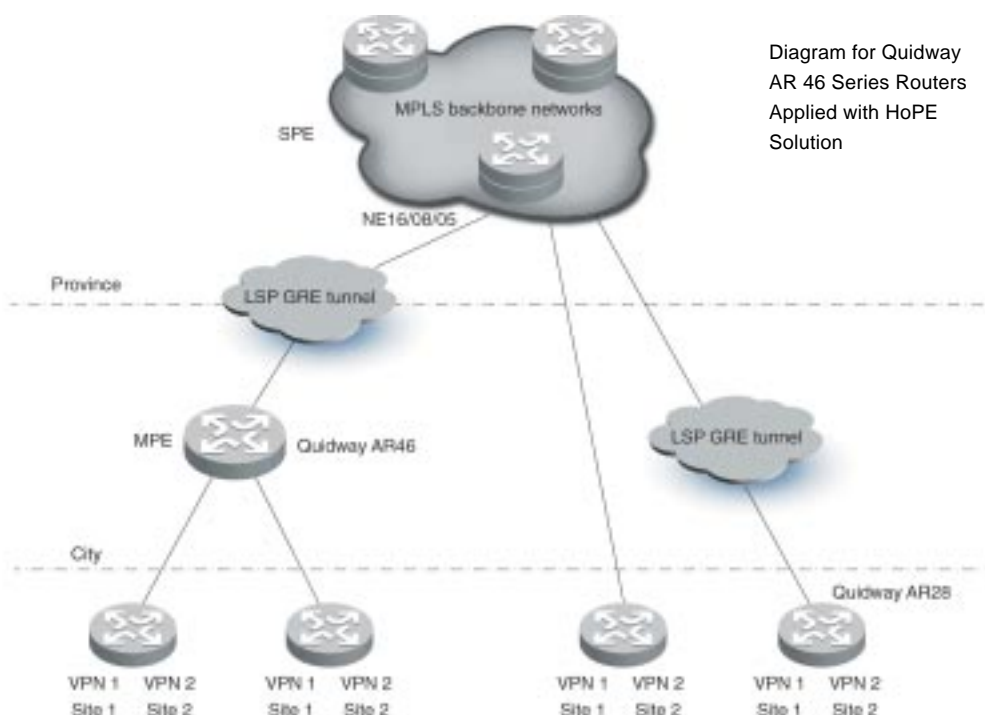


Diagram for Quidway AR 46 Series Routers Applied with HoPE Solution

