

# Huawei Technologies Co., Ltd.

## Quidway Access Routers

### Tolly Verified Certification and Cisco Interoperability Evaluation



## Test Summary

*Premise: Packet-rate performance on today's enterprise-class access routers is but one of several key purchase criteria. Users need to look beyond performance to understand the degree upon which third-party access routers can achieve interoperability with installed Cisco devices. Moreover, users need to look for availability of key features and functions that ensure the access router is capable of supporting Quality of Service, multicasting and other advanced services required today to support business-critical applications.*

Huawei Technologies Co., Ltd., commissioned The Tolly Group to evaluate six members of the Quidway access router line, which is designed to serve the needs of enterprise network users. Tolly Group engineers examined the degree of interoperability they offer with Cisco Systems, Inc. 1751 and 2621 access routers.

Engineers tested the Huawei Quidway AR46-40, an enterprise core WAN access router with two fixed 10/100Base-T ports and four Flexible Interface Card (FIC) slots. Engineers also tested the Quidway AR28-80, a WAN access router with eight Multifunction Interface Module (MIM) slots. The third of the devices

### Test Highlights

- Interoperates with Cisco 1751 during tests of routing protocols including RIP, IPX, OSPF and multicasting (PIM dense and Sparse modes)
- Achieves interoperability with Cisco 1751/2621 when supporting advanced functions such as 802.1p/Q VLAN tag propagation, VRRP and IPSec VPNs
- Interoperates with Cisco 1751 during tests of link-level protocols including PPP, HDLC and frame relay

Huawei-3Com Quidway Access Router Tolly Verified Certifications Earned						
Certification ID	Certification	Access router model				
		AR46-40	AR28-80	AR28-31	AR28-09	AR18-12
10508	10/100 Auto-negotiation	✔	✔	✔	✔	✔
10514	Auto MDI/MDIX	✔	✔	✔	✔	✔
10583	User authentication via Layer 3 (IP) based Access Control List	✔	✔	✔	✔	✔
10584	User authentication via Layer 4 (TCP/UDP) based Access Control List	✔	✔	✔	✔	✔
10534	Rate-limiting per port	✔	✔	✔	✔	✔
10787	Management Access Authentication via Local User Database	✔	✔	✔	✔	✔
10788	System Upgrade via File Transfer Protocol (FTP)	✔	✔	✔	✔	✔
10526	Save/Load Configuration to Text File	✔	✔	✔	✔	✔

Key: = Pass

Source: The Tolly Group, August 2004 Figure 1

Huawei Quidway Access Router Tolly Verified Certifications Earned for Interoperability with Cisco Access Routers							
Certification ID	Certification category	Certification	Access router model				
			AR46-40	AR28-80	AR28-31	AR28-09	AR18-12
10732	Cisco Interop. - Advanced Features	802.1p/Q VLAN Tag Propagation					
10733	Cisco Interop. - Advanced Features	Virtual Router Redundancy Protocol (VRRP)					
10734	Cisco Interop. - Advanced Features	VPN IPSec Interoperability					
10724	Cisco Interop. - Routing Protocols	PIM Dense Mode - IP Multicasting					
10725	Cisco Interop. - Routing Protocols	PIM Sparse Mode - IP Multicasting					
10720	Cisco Interop. - Routing Protocols	IPv4 - RIP v1 - Routing Protocol Support					
10721	Cisco Interop. - Routing Protocols	IPv4 - RIP v2 - Routing Protocol Support					
10723	Cisco Interop. - Routing Protocols	IPv4 - OSPF - Routing Protocol Support					
10789	Cisco Interop. - Routing Protocols	IPv4 - BGP-4 - Routing Protocol Support					
10726	Cisco Interop. - Link Protocols	PPP Basic Operation (No Authentication)					
10727	Cisco Interop. - Link Protocols	PPP Multilink Operation					
10728	Cisco Interop. - Link Protocols	PPP - PAP Authentication					
10729	Cisco Interop. - Link Protocols	PPP - CHAP Authentication					
10730	Cisco Interop. - Link Protocols	HDLC Operation					
10731	Cisco Interop. - Link Protocols	Frame Relay Operation					

Key: = Pass

Source: The Tolly Group, August 2004 Figure 2

tested was the Quidway AR28-31, a WAN access router with two fixed 10/100Base-T ports and three Multifunction Interface Module (MIM) slots. Engineers also tested the Quidway AR28-09, a modular branch access router with one fixed Fast Ethernet port, one fixed serial port, two Smart Interface Card (SIC) slots and one Multifunction Interface Module (MIM) slot. Another branch access router, the Quidway AR18-12, was tested with one fixed 10/100Base-T and two fixed serial ports.

Tests were conducted during July and August 2004 at The

Tolly Group's Boca Raton, FL. facilities.

Test results show that the Huawei access routers were awarded Tolly Verified certifications for all of the feature/function tests in which they participated. (See Figure 1.) Tolly Verified tests also identified a high degree of interoperability with Cisco-class access routers likely to be installed within user networks.

## RESULTS

The number of Tolly Verified certifications awarded to the Quidway access routers cannot

be covered in its entirety in this report. Readers are encouraged to visit The Tolly Group's Web site to learn more about the individual Tolly Verified certifications awarded to the Huawei Quidway access routers. Go to: <http://www.tolly.com/TV/TVVendorDetail.aspx?VendorID=208>.

## CISCO INTEROPERABILITY

Huawei access routers earned more than a dozen Tolly Verified certifications for proving their interoperability with popular Cisco Systems access routers commonly anchored to

installed networks. In the Tolly Verified tests, Huawei access routers demonstrated that they could exchange 802.1p/Q VLAN tags, which are crucial for identifying data packets for Quality of Service purposes. The Huawei devices also demonstrated support for the VRRP protocol and for VPN interoperability using the IPsec encryption standard. (See Figure 2.)

Huawei access routers also earned six Tolly Verified certifications for their interoperability with tested Cisco devices supporting popular multicast protocols (PIM Dense Mode and PIM Sparse Mode), supporting RIP v1 and RIP v2 protocols and for supporting OSPF and BGP protocols.

The Huawei devices tested also earned six Tolly Verified certifications for Cisco interoperability at the link protocol level. Huawei access routers proved they could interoperate with Cisco devices supporting PPP basic and multilink operations, as well as PPP PAP and CHAP authentication routines. The Huawei access routers also demonstrated interoperability with the Cisco equipment when supporting HDLC operations and over Frame Relay connections.

#### VIRTUAL ROUTER REDUNDANCY PROTOCOL (VRRP) TOLLY VERIFIED 10733

This test verified the access router's capability to act as a standby router in the event of failure using VRRP standards in a network including a Cisco

router. Devices earning this certification have demonstrated interoperability using VRRP in both Master and Slave configurations with the Cisco 175x-class router.

#### TEST CONFIGURATION AND METHODOLOGY

The Tolly Group tested Huawei Technologies Quidway AR46-40 Version VRP 3.40.01, Quidway AR28-80 Version VRP 1.74.105, Quidway AR28-31 Version VRP 1.74.105, Quidway AR28-09 Version VRP 1.74.105, and Quidway AR18-12 Version VRP 1.74.105 with a Cisco 1751 Modular Access Router configured running Cisco IOS 12.3(4) T3 and a Cisco 2621XM Multi-service Router running Cisco IOS 12.3(4) T2. Both Cisco devices were only used for interoperability tests conducted by Tolly Group engineers.

For detailed information on the configuration of the Huawei and Cisco switches tested, see Figure 3.

For interoperability tests, engineers paired one of the Huawei Quidway access routers with the Cisco 1751V or Cisco 2621XM to evaluate interoperability with the Cisco routers.

For VPN interoperability tests, engineers configured the IPsec VPN tunnel utilizing 3DES/SHA1 between one of Huawei Quidway access routers and the Cisco 2621XM across the Fast Ethernet link or E1 link.

**Huawei-  
Technologies  
Co., Ltd.**



**Quidway  
Access  
Routers**

**Tolly Verified for Cisco  
Interoperability**

#### Huawei Technologies Co., Ltd. Quidway Access Routers Product Specifications\*

##### Data link protocols supported

- Ethernet, PPP, PPP link quality monitor, PPPoE, SLIP, FR, LAPB, X.25, X.25 PAD, X.25 Hunt Group, XOT, ISDN, HDLC, DDR, MODEM, MP, MP load balancing

##### Network protocols supported

- IP, DLSw, IP Fast Switch, DHCP Server/Relay, IPX, VLAN

##### Routing protocols supported

- Static routing, OSPF, RIPv1/v2, BGP-4, Multicast PIM-DM, PIM-SM

##### Application protocols supported

- Dumb terminal, terminal server, FTP, TFTP, Callback, SNMP, RMON

##### Security

- Firewall, NAT, L2TP, GRE, IPsec, IKE, Encryption card

##### Voice capabilities supported

- VoIP, VoFR, IP Fax, IPHC, GKClient, E1 Voice, T1 Voice

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*\*Vendor-supplied information not verified by  
The Tolly Group*

Access Router Configuration Data				
Vendor	Model	H/W Version	SW Version	Description
Huawei	Quidway AR46-40	MTR 1.0	VRP 3.40 Release 0001	Enterprise core WAN access router with two fixed 10/100Base-T ports and four Flexible Interface Card (FIC) slots
Huawei	Quidway AR28-80	MTR 1.1	VRP 1.74 Release 0105	WAN access router with eight Multifunction Interface Module (MIM) slots
Huawei	Quidway AR28-31	MTR 1.1	VRP 1.74 Release 0105	WAN access router with two fixed 10/100Base-T ports and three Multifunction Interface Module (MIM) slots
Huawei	Quidway AR28-09	MTR 1.0	VRP 1.74 Release 0105	Modular branch access router with one fixed Fast Ethernet, one fixed serial, two Smart Interface Card (SIC) slots and one Multifunction Interface Module (MIM) slot
Huawei	Quidway AR18-12	MTR 1.0	VRP 1.74 Release 0105	Branch access router with one fixed 10/100Base-T and two fixed serial ports
Cisco	1751V		IOS 12.3(4)T3	Modular access router with one fixed 10/100Base-T, two WAN interface card/voice interface card slots and one voice interface card-only slot
Cisco	2621XM		IOS 12.3(4)T2	Multiservice router with two fixed 10/100Base-T slots and two WAN Interface Card (WIC) slots

Source: The Tolly Group, August 2004

Figure 3

### The Tolly Group gratefully acknowledges the providers of test equipment used in this project.

Vendor	Product	Web address
Funk Software	Steel-Belted Radius Server v4.71	<a href="http://www.funk.com">http://www.funk.com</a>
Spirent Communications	SmartBits 6000B	<a href="http://www.spirentcom.com">http://www.spirentcom.com</a>
Spirent Communications	SmartBits LAN-3325A	<a href="http://www.spirentcom.com">http://www.spirentcom.com</a>
Spirent Communications	SmartBits LAN-3101A	<a href="http://www.spirentcom.com">http://www.spirentcom.com</a>
Spirent Communications	SmartWindow 8.0	<a href="http://www.spirentcom.com">http://www.spirentcom.com</a>
Spirent Communications	SmartFlow 4.0.	<a href="http://www.spirentcom.com">http://www.spirentcom.com</a>



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With more than 15 years of testing experience of leading-edge network technologies, The Tolly Group employs time-proven test methodologies and fair testing principles to benchmark products and services with the highest degree of accuracy. Plus, unlike narrowly focused testing shops, The Tolly Group combines its vast technology knowledge with focused marketing services to help clients better position product benchmarks for maximum exposure. The company offers an unparalleled array of reports and services including: Test Summaries, Tolly Verifieds, performance certification programs, educational Webcasts, white paper production, proof-of-concept testing, network planning, industry studies, end-user services, strategic consulting and integrated marketing services. Learn more about The Tolly Group services by calling (561) 391-5610, or send E-mail to [sales@tolly.com](mailto:sales@tolly.com).



For info on the Fair Testing Charter, visit: <http://www.tolly.com/Corporate/FTC.aspx>

## PROJECT PROFILE

**Sponsor:** Huawei Technologies Co., Ltd.

**Document number:** 204154

**Product class:** Enterprise-class access routers

**Products under test:**

- Quidway AR46-40 SW Ver. VRP<sup>®</sup> 3.40 Release 0001SP01
- Quidway AR28-80 SW Ver. VRP<sup>®</sup> 1.74 Release 0105
- Quidway AR28-31 SW Ver. VRP<sup>®</sup> 1.74 Release 0105
- Quidway AR28-09 SW Ver. VRP<sup>®</sup> 1.74 Release 0105
- Quidway AR18-12 SW Ver. VRP<sup>®</sup> 1.74 Release 0105

**Testing window:** July and August 2004

**Software status:**

- Generally available

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