

X2-100G RoCE Test Module



In the process of data packet processing, the traditional TCP/IP technology needs to go through the operating system and other software layers, which requires a large amount of server resources and memory bus bandwidth. Data is copied and moved back and forth between the system memory, processor cache and network controller cache, causing a heavy burden on the server's CPU and memory. In particular, the serious "mismatch" among network bandwidth, processor speed and memory bandwidth has exacerbated the network latency effect.

RDMA (Remote Direct Memory Access), is designed to address the latency of server-side data processing in traditional network transmission. It will support local hosts to access data on remote host memory without the need for CPU involvement, bypassing the traditional system kernel processing and data copying operations of network protocol stacks. Based on network card hardware, it implements kernel bypass and zero copy for data transmission.

RDMA technology was initially implemented based on the IB (Infiniband) network protocol stack, but the IB network protocol stack is not compatible with traditional Ethernet based data center network architectures. RoCEv2 is an Ethernet RDMA transmission technology based on the UDP/IP protocol stack. Its lightweight network protocol stack has strong scalability and low hardware implementation difficulty, making it widely used in data center RDMA network deployment.

The Xinertel X2-100G-12QSFP28-Q test module supports large-scale routing and switch protocols and traffic simulation, benchmark testing of 100GE network equipment (such as RFC2544/RFC2889/RFC3918), functional testing, performance testing, long-term stability and reliability testing, and supports testing and verification of the functionality and performance of RDMA networks and lossless switches.

Key Features

- Native QSFP28 100G interface, support 12 x 100G L2-3 test ports, or support 6 100GRoCE test ports
- Support the generation and transmission of RoCEv2 traffic
- Supports QoS settings for L2(VLAN) and L3(DSCP)
- Support ECN/PFC enabling and priority setting
- Support the selection of traffic endpoints based on QP
- Support the performance test of routing, multicast, access, MPLS, VXLAN, segmented routing(SR) and other protocols
- FPGA based 100% line speed traffic generation, statistics and capture
- Support RFC2544, RFC2889, RFC3918 and other benchmark test suites

Models

Product name	Product description	Product classification
X2-100G-12QSFP28-Q test module	12 port 100G test module(6 ports for RoCE test)	DarYu series test module

Specifications

Hardware and electrical characteristics

Port speed	Native 100G QSFP28(6 ports for RoCE test)
Port density	12
User reservation	Reservation by port
Weight(kg)	8.5
Dimensions (W x H x D)	438mm x 46 mm x 580mm
Temperature	0 ° C to 35 ° C
Humidity	20% to 85%
Max power consumption(W)	380W

Traffic

Max streams per port	16K
Frame length(byte)	64-16383
Frame length controls	Fixed, Increment, Decrement, Random, Auto, and IMIX
Dynamic fields	6 dynamic fields are available for each stream ; Support multiple dynamic controls such as Fixed, increment, Decrement, List, and Random.
Transmit mode	Continuous, Burst, and Time Burst modes based on port; Continuous and Burst modes based on flow
Bandwidth modification	Modify by port or flow
Latency and jitter	LIFO, FIFO, LILO, and FILO
Timestamp resolution	2.5 nanoseconds
Built-in protocol templates	VLAN, ICMP, PPPoE, GRE, DHCP, L2TP, IPv6, MPLS, GTP, GOOSE, VXLAN, OSPF, TCP and UDP, etc.
Customized frame	Support user-defined frame, and the edited frame template can be saved; Supports the checksum check of custom fields
Customized payload	Support importing the 16K bytes customized payload and the first 128K bytes can be adjusted with jumping
Flow control	Full duplex flow control
Packet error generation	CRC error, Oversize frame

Statistics

Single port statistics stream number	16K
Statistical form	Table statistics, chart statistics, and automatic saving of EXCEL files
Statistics item(port)	Number of sent/received frames, send/receive frame rate, receive bandwidth, error frame statistics, filtering statistics, custom statistics, etc., FCS error statistics, TCP/UDP Checksum errors, Pause frame statistics, average delay statistics
Statistical item (stream)	Send/receive frames, send/receive flow rate, receive bandwidth, error frame statistics, real-time packet loss statistics, out of sequence statistics, delay jitter and user-defined statistics;
Statistical operation	Support sorting of statistical results, addition, subtraction, multiplication, division and other mathematical operations, user-defined paging statistics, etc

Capture

Capture buffer(Byte)	2M
Capture pattern	Capture of data and receive frames of the control plane; Capture of transmitted and received frames of the control plane; Capture based on filter templates; Capture filtered error packets; Capture buffer overwriting; Support specifying the number of downloaded capture packets.

Protocol emulation

RoCEv2	QoS: VLAN priority and DSCP priority
	Congestion control: 1. ECN detection, CNP response; 2. CNP interval setting; 3. QoS settings for CNP
	Flow control: PFC and ECN linkage support
	Traffic configuration: 1. Supports up to 8K QP 2. Support QP traffic endpoint selection
	Statistics: Throughput, latency, and packet loss; Statistics for each QP queue.

Routing and MPLS	RIPv1v2, RIPng, OSPFv2, OSPFv3, ISISv4, ISISv6, BGP, BGP4+, LDP, MPLS L3VPN, VPLS, VLL, 6VPE, 6PE
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Access	PPPoE Client/Server, DHCPv4 Client/Server, DHCPv6 Client/Server, DHCPv6 PD Client/Server, L2TPv2, 802.1x
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Multicast	IGMPv1/v2/v3, MLdv1/v2, IGMP/MLD Querier, PIM-SM
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Data center	VXLAN, OpenFlow, OVSDB, EVPN, LACP
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Other	BFD, 802.1ag, 802.1ah, IPv6 automatic configuration
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Test suite	RFC2544, RFC2889, RFC3918, Asymmetric Test, Smart Scripter
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Software platform

Client software	Renix
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API	Tcl, Python3.x, GUIToTcl, GUIToPython
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GUI language	English, Simplified Chinese
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hardware platform

Chassis	DarYu 3000, DarYu 12000
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Chassis operating system	Linux CentOS7. x
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