CX600-X3A/X8A/X16A
Metro Services Platform

HUAWEI TECHNOLOGIES CO., LTD.

HUAWEI

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Introduction

The CX600 series Metro Services Platform (MSP) is designed with the routing platform to provide solutions for the carrier-class Metropolitan Area Network (MAN) that features Fixed-Mobile Convergence (FMC). The solutions provided by the CX600 are concerned with access and convergence layers of the carrier-class MAN.

Based on distributed hardware forwarding and non-blocking switching technologies, the CX600 features carrier-class reliability, line speed forwarding capability, a well-designed Quality of Service (QoS) mechanism, strong service-processing capability, and excellent expansibility. In addition to providing competitive Layer 2 services, including Ethernet access and convergence, Ethernet switching, and transmission of Ethernet over Multi-Protocol Label Switching (EoMPLS) services, the CX600 provides diverse Layer 3 (IP) services, such as Internet broadband services, triple play (video, voice, and data) services for individual users as well as IP leased line and IP Virtual Private Network (VPN) services for enterprise users. The CX600 provides Maximum 1T line cards to satisfy the increased demand for bandwidth.

Appearance

The CX600 series includes the CX600-X16A, CX600-X8A and CX600-X3A to satisfy the requirement of various scales network.

CX600-X16A

CX600-X8A

CX600-X3A

Product Highlights

Extremely Large Capacity Line Card

The CX600 can support maximum 1T Line Card, which fulfills with the increased network requirements of customers. And the powerful 480G line card can support both 100GE and 10GE port types, which can provide customer a flexible configuration. Both 1T Line Card and 480G Line Card passed the 100% line-rate tests of Tolly. Excelling by the developed chipset technology and fine design technique, CX600 must provide sustainable high bandwidth capacity in the future.

Future-Oriented IPv6-Compatible Solutions

The CX600 supports a variety of IPv6 features including IPv6 leased line, dual stack, tunneling, and translation. The CX600 supports Next Hop Separation to optimize the IPv6 convergence time and larger IPv6 FIB to improve the scalability. All of them help to provide comprehensive solutions based on the high performance for transition from IPv6 to IPv4. And owing to the variety of technologies and different situations of provider networks, each provider will certainly select a conservative, reposeful, or aggressive transition technology that is the most suitable for its own network.

All-round Reliability Solution

Providing comprehensive reliability protection technologies including the equipment level, network level, and service level, the CX600 can cope with various kinds of bearer network failures and ensure service recovery. Based on these the CX600 provides a hierarchical solution that can meet the requirements of the whole network and completely satisfy carrier-class reliability requirements. The CX600 acts as a foundation on which to build carrier-class services with system availability at 99.999%.

- Equipment-level reliability: The CX600 provides redundancy backup for key components. These components support hot swapping and hot backup. The CX600 also makes use of Non-Stop Routing (NSR), Non-Stop Forwarding (NSF), In-Service Software Upgrade (ISSU) and other technologies to improve services recovery capability and ensure continuous service forwarding.

- Network-level reliability: The CX600 supports IP/Label Distribution Protocol (LDP)/VPN/ TE Fast Reroute (FRR), hot-standby, fast convergence of Interior Gateway

Protocols (IGPs), BGP and multicast routing, Virtual Router Redundancy Protocol (VRRP), trunk link backup, Bidirectional Forwarding Detection (BFD), Ethernet Operation Administration, and Maintenance (OAM), and routing protocol/port/VLAN damping technologies to ensure the stability of the whole network. The CX600 provides an end- to- end network protection solution that can, in the event of a failure, guarantee service recovery within 200 ms.

- Service-level reliability: The VPN FRR, E-VRRP, VLL FRR, Ethernet OAM, Y.1731, PW redundancy, and E-Trunk technologies provided by the CX600 can be applied to L3VPN and L2VPN networking solutions. These provide service-level redundancies to ensure the stable and reliable delivery of services and to ensure continuous service forwarding.

Energy Saving Design

The environmentally friendly design of the CX600 saves energy and reduces emissions. The CX600 has an industry-leading cooling and energy-saving system which includes advanced ventilation and optimal heat dissipation design, intelligent fans, and a design for power supply distribution. By automatically sensing and adjusting temperature, the CX600 improves power supply utilization, making it an outstanding energy saver.

Enhanced Metro Ethernet Features

Based on the mature Versatile Routing Platform (VRP), the CX600 excels in reliability, expansibility, and maintainability. The CX600 is an ideal platform for operators to build up carrier-class MANs. It supports various features to satisfied the multi services carried requirement including Hierarchical Virtual Private LAN Service (HVPLS), Virtual Leased Line (VLL), Layer 2 VPN (L2VPN), Layer 3 VPN (L3VPN), multicast VPN, 802.1Q-in-802.1Q (QinQ), Virtual Local Area Network (VLAN) mapping, Dynamic Host Configuration Protocol (DHCP) relay/snooping, GRE. CX600 supports Protocol Independent Multicast-Source Specific Multicast (PIM-SSM), Internet Group Membership Protocol Version 3 (IGMPv3), and MAC+IP+VLAN user binding. On the carrier-class MANs based on the CX600, operators can provide Internet Protocol Television (IPTV) services, family multi-play services, IP leased line services, enterprise interconnection services, and enterprise VPN services.

In addition, the CX600 supports comprehensive Ethernet clock synchronization, which well satisfies the requirements for carrier-class FMC service development in the MAN.

Efficient OAM features

CX600 support Ethernet OAM fault management including: Ethernet in the First Mile OAM (EFM OAM), conforming to IEEE 802.3ah and Connectivity Fault Management OAM (CFM OAM), conforming to IEEE 802.1ag.

Conforming to ITU-T Y.1731, the CX600 supports performance management to measure the delay, jitter, and packet loss ratio when the messages are transmitted. In this manner, the CX600 can detect the end-to-end performance of traffic in a specified time period and on a specified network segment.

For Mobile Backhaul networks, especially the future oriented LTE network, CX600 adopt advanced Hierarchical L3 solution, deploying HVPN technology, which can guarantee efficiency, security, and reliability. L3 to edge solution makes the OAM more effective, and it can achieve E2E segment by segment fault demarcation and confirm each IP base station status.

Cooperating with performance management tools such as U2000, CX600 can provide SDH like network OAM, service oriented, intelligent warning, and refined positioning. With supporting efficient and precise performance measurement and test technologies such as IP FPM, TWAMP, RFC2544, G.8032, CX600 can help to simplify the OAM and save the OPEX to a great extend. Besides, the ISP can monitor the network status in real time through the NMS. The ISP then check whether the forwarding capacity of the network complies with the Service Level Agreement (SLA) signed with users and locate faults. The ISP does not need to carry out detection on the user side, which greatly decreases maintenance costs.

Specification

Attribute	CX600-X16A	CX600 -X8A	CX600-X3A
Switching Capacity	50.32 Tbps	25.16 Tbps	5.76Tbps
Forwarding Performance	11520Mpps	5760Mpps	900Mpps
Number of Slots	22 slots, including 2 MPUs (1:1 backup), 4 SFUs (3+1 backup), and 16 LPUs	12 slots, including 2 SRUs (1:1 backup), 2 SFUs (3+1 backup), and 8 LPUs	5 slots, including 2 MPUs (1:1 backup), and 3 LPUs
Dimension (W × D × H)	442mm × 650mm × 1778mm (40U)	442mm × 650mm × 934mm (21U)	442mm × 664mm × 264mm (6U)
Typical power consumption in full configuration	12390W	6520W	1120W
Weight in full configuration	395kg	207kg	72kg
Interface type	100GE 40GE 10GE- LAN /WAN GE/FE OC-192c/STM-64c POS OC-48c/STM-16c POS OC-12c/STM-4c POS OC-3c/STM-1c POS Channelized STM-1 E1/T1	100GE 40GE 10GE- LAN /WAN GE/FE OC-192c/STM-64c POS OC-48c/STM-16c POS OC-12c/STM-4c POS OC-3c/STM-1c POS Channelized STM-1 E1/T1	100GE 40GE 10GE- LAN /WAN GE/FE OC-192c/STM-64c POS OC-48c/STM-16c POS OC-12c/STM-4c POS OC-3c/STM-1c POS Channelized STM-1 E1/T1

Attribute	CX600-X16A	CX600 -X8A	CX600-X3A
IPv4	Supports the static routing protocol and IPv4 dynamic routing protocols such as RIP, OSPF, IS-IS, and BGP-4.		
IPv6	Supports various technologies for transition from IPv6 to IPv4: manual tunnel configurations, Generic Routing Encapsulation (GRE) tunneling. Supports IPv6 over IPv4 tunneling and IPv6 Provider Edge Router (6PE). Supports the IPv6 static routing protocol. Supports IPv6 dynamic routing protocols such as RIP Next Generation (RIPng), OSPFv3, IS-ISv6, and BGP4+. Supports IPv6 neighbor discovery and path Maximum Transmission Unit (PMTU) discovery. Supports Transmission Control Protocol Version 6 (TCP6), ping IPv6, traceroute IPv6, socket IPv6, and IPv6 policy-based routing. Supports Internet Control Message Protocol Version 6 (ICMPv6) Management Information Base (MIB), User Datagram Protocol Version 6 (UDP6) MIB, TCP6 MIB, and IPv6 MIB.		
MPLS	Supports LDP over TE, VPLS, H-VPLS, policy-based routing in VPN. Supports MPLS L2VPNs in either Martini mode. Supports VLL/VPLS access L3VPNs. Supports QinQ, MPLS/BGP L3VPN, and inter-AS VPN Option A/B/C. Supports NG-MVPN . Supports P2MP mLDP/TE. Supports EVPN. Supports Remote LFA (Loop Free Alternate).		
Layer 2 feature	Supports IEEE802.1q, IEEE802.1p, IEEE 802.3ad, and IEEE 802.1ab. Supports the Spanning Tree Protocol (STP), Rapid Spanning Tree Protocol (RSTP), Multiple Spanning Tree Protocol (MSTP), VLAN swap. Supports Ethernet Virtual Connection (EVC). Supports Virtual Extensible LAN (VxLAN).		
Reliability	Supports BGP/IS-IS/OSPF/LDP/RSVP-TE/PIM Non-Stop Routing (NSR). Supports VLL/VPLS/L3VPN NSR. Supports BGP GR Helper, IS-IS GR Helper, and OSPF GR Helper. Supports LDP GR Helper, Resource-Reservation Protocol (RSVP) GR Helper Supports In-Service Software Upgrade (ISSU). Supports fast convergence of Interior Gateway Protocols (IGPs), BGP, and multicast routing. Supports IP/LDP/VPN/TE/VLL FRR. Supports IP Auto FRR. Supports BFD for the static routing protocol and protocols such as IS-IS, RSVP, LDP, TE, Label Switched Path (LSP), PW, OSPF, BGP, VRRP, and PIM. Supports Ethernet OAM, Y.1731. Supports backup of service routers, PW redundancy, and PWE3 end-to-end protection. Supports E-Trunk, E-STP.		
QoS	Supports Weighted Random Early Detection (WRED). Supports five-level H-QoS scheduling.		

Attribute	CX600-X16A	CX600 -X8A	CX600-X3A
Multicast	Supports IGMPv1, IGMPv2, IGMPv3, IGMP snooping, multicast VPN, and IPv6 multicast. Supports static multicast routes. Supports multicast routing protocols: PIM-SM, PIM-SSM, Multicast source Discovery Protocol (MSDP), and Multi protocol BGP (MBGP). Supports the deployment of both multicast and TE.		
Security	Supports ACL filtering, URPF, GTSM, DHCP Snooping. Supports anti-ARP attack、anti-DOS attack. Supports MAC address limitation. Supports SSH, SSH v2. Supports NetStream.		
Clock transmission	Supports Ethernet clock synchronization, and IEEE 1588v2. Supports Adaptive Clock Recovery (ACR).		
IP RAN	Supports CSG Plug-and-Play. Supports IP FPM. Supports TWAMP. Supports RFC2544. Supports G.8032.		
Environmental requirements	Long-term ambient temperature: 0°Cto 45°C Short-term ambient temperature: –5°Cto +50°C Temperature change rate: 30℃/hour Long-term relative humidity: 5% to 85%, non-condensing Short-term relative humidity: 5% to 95%, non-condensing Working altitude: lower than 3000 meters		

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