

Keywords

100G

ISC²U

VCC&CCC

Cloud Computing

Reconfiguration Design

With booming deployment of high-bandwidth optical access network and high-definition video service, IP bearer network needs to be changed into a new one which features large capacity, high reliability and strong integration, ZXR10 T8000 redefines the evolution of this new IP bearer network.

Focusing on Internet core node, backbone network super node and egress node in large MAN, ZXR10 T8000 devotes itself to network flatness and long-term development of integrated network. It is operator's optimal choice in building high-quality networks.

Product Features

100G Router and 200T Cluster System build Super-Wide Network

100G Interface Builds High-speed Network Platform

The ZXR10 T8000 has the most powerful switching fabric and packet processing capability in the industry. It provides 120Gbps non-blocking switching capability per slot and supports high-density 10G/40G interfaces, and a smooth upgrade path to 100G high-speed interfaces. It effectively protects operator's investments.

200T Cluster System Eliminates Bottleneck in the Network

ZXR10 T8000 is capable of building cluster system by interconnecting multiple systems together, so that the system capacity can be extended. It supports many multi-chassis models, for example, back to back, 1+2, 1+4, 2+2, 2+4 and 2+8 mode. Maximally, T8000 can support 16+64 multi-chassis system, which enables more than 200Tbps switching capability, seamless network replacement and upgrade.

Sustaining Extension Facilitates Infinite Network Development

ZXR10 T8000 gives complete support to unicast and multicast routing protocols. By supporting super large forwarding table and routing table, ZXR10 T8000 has already been prepared for the rapid development of network traffic. It is the core network element of end-to-end super-wide network.

Table1. Port Density of Cluster System

Port Density	1+4 Mode	2+8 Mode	4+16 Mode	16+64 Mode
100G	64	128	256	1,024
40G	128	256	512	2,048
10G	640	1,280	2,560	10,240

All-distributed Modular and Multi-process Software Architecture ensures a secure and reliable network

Control plane technology based upon cloud computing is the foundation of sustainable

ZXR10 T8000 employs distributed component-based software system which is based on unique technology VCC (Virtual Cluster Controller technology) and CCC (Cloud Computing-based Control plane technology).

The entire software system is composed by multiple software entities. Each entity is actually a software entity attached with an exclusive identifier. Each logical entity which is design in 1+1 backup mode features little coupling, so they are logically independent from each other. The system control unit (SC) and service unit (e.g. MPLS system and routing system) of the software system are actually run on different logical entities respectively.

With VCC technology, the active/standby SC for different load situations of the main processing unit (MPU) is operated on different MPUs of the cluster system. This gives maximum protection to the reliability of the cluster system.

With CCC technology, service modules can be located on different physical CPUs of different chassis. Using state of the art virtualization algorithms, the service modules are evenly deployed on the CPUs of different MPUs, to fully leverage the scalability of multi-chassis cluster system.

T8000 supports non-stop routing, hot patch and In Service Component and Cluster Update (ISC² U). By realizing dynamic upload, it ensures 99.999% reliability.

The distributed architecture of this component module on one hand makes full use of the powerful calculating capability of the multi-chassis system, on the other hand, it features extremely high reliability. By using the active/standby switchover of the logical base between the chassis, T8000 single chassis and multi-chassis cluster system can be smoothly extended without causing any service interruption.

● **Carrier-class reliability enables stable network operation**

With multi-plane architecture and multiple redundant designs in key components, ZXR10 T8000 brings in unparalleled reliability.

- All modules are hot swappable
- The platform uses multi-link binding, load sharing, and TE FRR, VPN FRR and VRRP services to build a very stable platform
- Operations and performance optimization are simplified. It gives support to key industry standard including BFD, Ethernet OAM and MPLS OAM services.

Outstanding Flexibility Customizes Your Network

● **Flexible sub-card and mother card design reduces Operator' s TCO**

With flexible sub-card and mother card design, user can configure different types of interface card as per specific network demands, which maximally saves user's investments.

● **Reconfigurable principle builds almighty network**

Based upon "reconfigurable" principle and highly programmable chip, T8000 restructures bottom-layer resources and services to satisfy the integration of fixed network and mobile network. It means to build almighty network and provide the most flexible services.

● **Multiple intelligent energy-saving technologies creates a green world**

ZXR10 T8000 pays attention to environment protection throughout its operational cycle.

ZXR10 T8000 giving support to independent monitoring plane, diversified power supply report and traffic load report helps operators to implement more accurate power supply monitoring and inspection. The smart power supply management system supports automatic power consumption control, and enables power consumption of each module to be optimized dynamically to satisfy specific traffic situations. The design of fan with infinitely automatic variable speed, intelligent initiation of line card, and intelligent process hibernation reduce power consumption greatly and create a green world.

Product Architecture

ZXR10 T8000 cluster system supports multiple sorts of multi-chassis system, for example, back to back mode, 1+2, 1+4, 2+2, 2+4, 2+8, 4+16 and 16+64 mode. In terms of the existing design, ZXR10 T8000 maximally supports 16 +64 mode cluster system, featuring 200T switching capability. So it is the most powerful cluster router with the largest capacity in the industry, and it is operator's optimal choice in building high-quality network.

● Line Card Chassis (LCC)

With chassis-based architecture which is popular in the industry and all-in-one chassis, ZXR10 T8000 is installed in a standard 19-inch rack. The high density postpositive fast-speed backplane enables maintenance and cabling to be done behind the chassis, which effectively saves power consumption, equipment room and optimizes the price/performance of the platform. The LCD in front of the frame gives conveniences to maintenance staff to check system status. T8000 with air inlet at the bottom of the front panel, outlet on the top of the rear panel, fan module with variable speed and efficient cooling way saves maintenance costs for operators; by giving support AC, DC power input, it adapts to a variety of room conditions.

The key components of ZXR10 T8000 are Main Processing Unit, Switch Fabric Unit, Packet Forwarding Unit and Physical line Interface Unit.

● Central Fabric Chassis (CFC)

Center forwarding chassis (CFC) is the core switching component of ZXR10 T8000. As T8000 cluster system supports smooth upgrade, it can interconnect more LCC and CFC via optical interface and high-speed fiber. This method keeps extending the capacity of the cluster system.

● Main Processing Unit (MPU)

MPU is the main control point of the system, taking care of the management and routing service of the entire system. The embedded high-performance multi-core processor in MPU is responsible for the calculation maintenance of dynamic routing protocol and the control, maintenance, configuration and management of the operating system. MPU in 1+1 redundant design guarantees carrier-class reliability of ZXR10 T8000.

● Switch Fabric Unit(SFU)

SFU the core part of data forwarding implements fast packet switching in the system. Using CROSSBAR framework, SFU enables non-blocking data exchange between slots.

● Packet Forwarding Unit (PFU)

PFU realizes message processing and forwarding.

Table2. PFU Type

PFU Type	Description
T8K-PFU-10	10G Packet Forwarding Unit
T8K-PFU-20	20G Packet Forwarding Unit
T8K-PFU-40	40G Packet Forwarding Unit
T8K-PFU-100	100G Packet Forwarding Unit

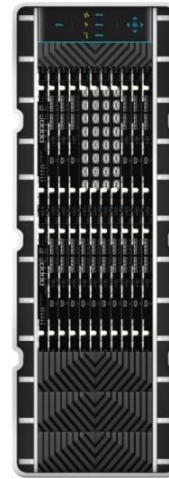


Figure1. LCC

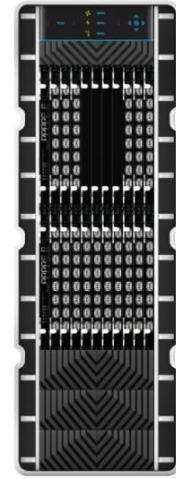


Figure2. CFC

It implements maintenance management of all sorts of protocol and service forwarding table. According to different network capacity, T8000 can provide PFU with different forwarding capability. High-performance network processor chip provides 40G wire-speed data processing capability, and professional traffic management chip provides adequate queue resources and traffic buffer.

● Physical Line Interface Unit (PIU)

PIU is the external interface of router, realizing service access in different speeds and via different types of interface.

Table3. PIU Type

Type	Full Height/ Semi-Height	Description
POS	Full Height	1xOC-768c/STM-256 POS
	Full Height	4xOC-192/STM-64 POS
	Semi-Height	1xOC-192/STM-64 POS
	Semi-Height	4xOC-48/STM-16 POS
	Semi-Height	8xOC-12/STM-4 POS
	Semi-Height	8xOC-3/STM-1 POS
	Semi-Height	8xOC-3c/OC-12c POS
Eth	Full Height	4x10GE WAN
	Full Height	4x10GE LAN
	Semi-Height	2x10GE LAN/WAN
	Semi-Height	1x10GE LAN/WAN
	Semi-Height	1x10GE WAN
	Semi-Height	1x10GE LAN
	Full Height	48x10/100/1000M (UTP)
	Full Height	40x100/1000M (SFP)
	Semi-Height	10x100/1000M (SFP)
	Semi-Height	12x100/1000M (SFP)
	Semi-Height	16x10/100M (UTP)

PIU exchanges signals on physical link with the data frame on link layer. When data frame is received, it will be changed to data message and sent to PFU. Then forwarding engine will find the destination port and implement high-speed message forwarding.

● Multi-stage Switch Fabric Unit(MSFU)

MSFU stands for the multi-stage forwarding unit of T8000 cluster system. Connecting with the center switch via fibers, it realizes the switching between the local chassis and other chassis. After cascading, all chassis form a huge chassis with super large switching capacity, which accordingly increases the quantity of user interface.

● Central Switch Fabric Unit(CSFU)

Locating in the CFC of T8000, CSFU cascading with MSFU forms level-3 CLOS switching fabric. It realizes the non-blocking data switching in the data plane between LCC. Each CSFU is capable of providing 8 cascading interfaces, and each CFC maximally supports 16 CSFUs.

● Central Ethernet Fabric Unit(CESU)

CESU installed on the CFC, is mainly used to realize the control data switching between CFC and LCC. Each CESU offers 4 10GE interfaces for CESU stacking and 20 GE interfaces for control plane MPU cascade. Maximally 4 pieces of CESU can be supported by each CFU.

Product Specifications

Feature	Description
System Specifications	<p>Cluster System</p> <ul style="list-style-type: none">Switching Capability : >200TCluster mode : back-to-back, 1+2, 1+4, 2+2, 2+4, 2+8, 4+16, 16+64CFC Redundancy : Support <p>Single-chassis system and LCC of multi-chassis system</p> <ul style="list-style-type: none">Total Slots : 22Universal service slot : 16Main processing unit slot : 2 (1+1 redundancy)Switch fabric unit/multi-chassis switch fabric unit slot : (M+N redundancy)Throughput per slot : 100G (full duplex)Fan Modul : 2 (stepping speed regulation, 1+1 redundancy) <p>CFC of Multi-chassis system</p> <ul style="list-style-type: none">Total Slots : 22Main processing unit slot : 2CSFU Slots : 16CESU Slots : 4Fan Modul : 2 (stepping speed regulation, 1+1 redundancy)
Major Service	<p>Cluster Feature</p> <ul style="list-style-type: none">smooth capacity extension, system distributed control, protocol distributed processing <p>L2 Feature</p> <ul style="list-style-type: none">MAC management, Vlan, QinQ, SuperVlan, Smartgroup, interface binding <p>L3 Feature</p> <ul style="list-style-type: none">IPv4 unicast, IPv4 multicast, IPv6 unicast, IPv6 multicast <p>MPLS and TE</p> <ul style="list-style-type: none">MPLS L2/L3 VPN, 6vPE, MPLS-TE, DS-TE <p>QoS</p> <ul style="list-style-type: none">Classification, label, traffic policing, congestion control, queue scheduling, shaping, QPPB and H-QoS <p>Reliability</p> <ul style="list-style-type: none">Graceful restart (GR), non-stop route (NSR), ISC2U, FRR, PW redundancy <p>Tunnel</p> <ul style="list-style-type: none">MPLS static tunnel, GRE, IPSec <p>Security</p> <ul style="list-style-type: none">Attack precaution, CPU security protection <p>Operation and Maintenance</p> <ul style="list-style-type: none">CLI, GUI(Netnumen N31NM), MPLS VPN NM, QoS NM and TE NM <p>OAM</p>

Feature	Description
	<ul style="list-style-type: none"> Ethernet OAM, MPLS OAM, SLA tool
Physical Specifications	<p>Single-chassis and LCC of multi-chassis systems</p> <ul style="list-style-type: none"> Physical Dimensions : 442(W)×1686 (H)×740(D)mm, Weight : < 210kg with full load Power supply: DC (-48V, 1 + 1 redundancy) or AC (220V , 4 + 4 redundancy) , Power Supply Division DC Module: rated power consumption 8000W, AC Module: rated power consumption 2000W <p>CFC of Multi-chassis system</p> <ul style="list-style-type: none"> Physical Dimensions : 442 (W) ×1686 (H) ×740 (D) mm, in accord with 19-inch rack Weight : < 180kg with full load Power supply: DC (-48V, 1 + 1 redundancy) or AC (220V , 4 + 4 redundancy) , Power Supply Division DC Module: rated power consumption 8000W AC Module: rated power consumption 2000W
Environmental Specifications	<p>Operating Temperature : -5 ~ 50℃</p> <p>Operating Humidity : 5~95%</p> <p>Operating altitude : <5000m</p>
Electromagnetic Standards	CE, FCC, UL, RoHS, Anti-9magnitude earthquake

There`s distance in the world
But, some strength makes us interconnect each other
easily
and keep us stepping forwarding
T8000
your power connecting the world
eliminates our distance forever



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