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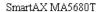
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SmartAX MA5680T

—First Aggregation OLT in the World

The SmartAX MA5680T series are developed based on Huawei's third generation unified platform and are the first aggregation OLTs in the world. The MA5680T series integrate the aggregation and switching functions, provide the high-density xPON, Ethernet P2P, and GE/10GE ports, and provide the TDM and Ethernet private line services with high clock precision to support smooth Internet access service, video service, voice service, and high-reliability service access. This series improve the network reliability, reduce the investment in network construction, and reduce the O&M costs.

The MA5680T series include the large-capacity SmartAX MA5680T and the medium-capacity SmartAX MA5683T. The hardware and software of these two models are fully compatible with each other to reduce the costs of goods preparation for the network. In these two models, the SmartAX MA5680T provides 16 service slots and the SmartAX MA5683T provides 6 service slots.
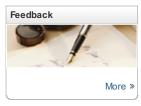

SmartAX MA5680T   SmartAX MA5683T

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Key Features

- **Large-capacity shared platform**

  The MA5680T series provide the large-capacity shared platform that supports a high-speed switching capacity.

  Developed based on the iMAP hardware platform and the IAS software platform of Huawei, the MA5680T series adopt advanced architecture and design.

  The switching capacity of the backplane is up to 3.2 Tbit/s.

  The bidirectional switching capacity of the control board is up to 480 Gbit/s.

  The GPBD board supports eight GPON ports and the entire subrack supports up to 8K ONTs.

  The EPBD board supports eight EPON ports. Based on the 1:64 split ratio, the entire subrack supports up to 8K ONTs.

  Sharing the development platform with Huawei's broadband access devices, the MA5680T series support the Layer 2 and Layer 3 features of the broadband access devices to provide user-oriented and future-oriented functions.

- **Powerful integrated GPON/EPON access capability**

  1. EPON access capability

  The point to multi-point (P2MP) architecture is used to support the passive optical transmission over Ethernet. Symmetrical upstream and downstream rates of 1.25 Gbit/s are supported to provide the high-speed broadband services, meeting the bandwidth requirements of access users.

  In the downstream direction, the bandwidth is shared by different users in the encrypted broadcast mode. In the upstream direction, time division multiplex (TDM) is used to share the bandwidth.

  The MA5680T series support dynamic bandwidth allocation (DBA) with the granularity of 64 kbit/s. Therefore, the bandwidth of ONT terminal users can be dynamically allocated based on the user requirements.

  The EPON system uses the passive optical transmission technology, and the optical splitter uses the P2MP mode and supports a split ratio of 1:64.

  The supported transmission distance is up to 20 km.

  The ranging technology can be scheduled ranging, automatic ranging, or initial ranging.

  2. GPON access capability

High rate is supported. The downstream rate is up to 2.488 Gbit/s and the upstream rate is up to 1.244 Gbit/s.

Long distance is supported. The maximum physical transmission distance of the ONT is 60 km. The physical distance between the farthest ONT and the nearest ONT can be up to 20 km.

High split ratio is supported. The 8-port GPON access board supports a split ratio of 1:128, which increases the capacity and saves the optical fiber resources.

High density is supported. The MA5680T series provide the 8-port or 4-port GPON access board to increase the system capacity.

The H-QoS (hierarchical quality of service) function is supported to meet the SLA requirements of various commercial customers.

- **Powerful QoS capability**

The MA5680T series provide the following powerful QoS solutions to facilitate the management of various services:

Supports priority control (based on the port, MAC address, IP address, TCP port ID, or UDP port ID), priority mapping and modification based on the ToS field and 802.1p, and DSCP differentiated services.

Supports bandwidth control (based on the port, MAC address, IP address, TCP port ID, or UDP port ID) with a control granularity of 64 kbit/s.

Supports three queue scheduling modes: priority queue (PQ), weighted round robin (WRR), and PQ+WRR.

Supports HQoS, which assures the multi-service bandwidth for multiple users: The first level assures the user bandwidth, and the second level assures the bandwidth for each service of each user. This ensures that the assured bandwidth is allocated absolutely and the burst bandwidth is allocated fairly.

- **Comprehensive security assurance measures**

The MA5680T series meet the security requirements of the telecommunication services, fully use the security protocols, and fully ensure the security of the system and the user.

1. System security measure

Protection against the DoS (denial of service) attack

MAC (media access control) address filtering

Anti-ICMP/IP packet attack

Source address routing filtering

Blacklist

2. User security measure

DHCP (Dynamic Host Configuration Protocol) Option 82 to enhance the DHCP security

Binding between MAC/IP addresses and ports

Anti-MAC spoofing and anti-IP spoofing

Authentication based on the serial number (SN) and password of the ONU/ONT

Triple churning encryption

Encrypted broadcast transmission in the GPON downstream direction for different users, such as AES (advanced encryption standard) 128-bit encryption

GPON type B OLT dual homing

Smart link and monitor link for the network with dual upstream channels

- **Flexible network topology**

As a multi-service access platform, the MA5680T series support multiple access modes and multiple network topologies to meet users' network topology requirements on different environment and services.
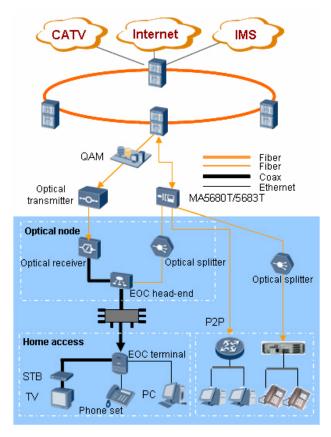
Figure 1-1 Network topology application for triple play in the broadcast and television industry
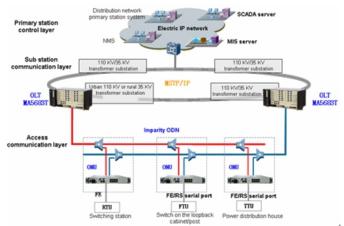
Figure 1-2 Network topology application for automatic power distribution in the electric power industry

- **Carrier-class reliability design**

  The system reliability of the MA5680T series is taken into consideration in the system, hardware, and software designs to ensure that the device runs in the normal state. The MA5680T series:

  Provides the lightning-proof and anti-interference functions.

  Supports fault pre-warning on the exhaustive (consumed) units and parts, such as the fan, power supply, and battery.

  The 1+1 (type B) protection for the PON port and the 50 ms level service protection switchover for the backbone optical fiber are supported.

  Supports in-service upgrade.

  Supports high temperature detection to ensure the system safety.

  The functions of querying the board temperature, setting the temperature threshold, and high temperature shutdown are supported.

  Adopts 1+1 redundancy backup for the control board and the upstream interface board.

Supports hot swappable for all service boards and the control boards.

Provides soft-start circuit, protective circuit, current-limit protection, and short circuit protection for the input power of the boards in the subrack to protect the boards against lightning strikes and surges.

Supports GPON type B/type C OLT dual homing.

Supports smart link and monitor link for the network with dual upstream channels.

Technical Specifications

- **System performance**

  Backplane capacity: 3.2 Tbit/s; switching capacity: 960 Gbit/s; MAC address capacity: 512 K

  Layer 2/Layer 3 line rate forwarding

  BITS/E1/STM-1/Ethernet clock synchronization mode and IEEE 1588v2 clock synchronization mode

- **EPON access board**

  Adopts the design of 4-port or 8-port high-density board.

  Supports the SFP pluggable optical module (PX20/PX20+ power module is preferred).

  Supports a maximum split ratio of 1:64.

  Provides the capability of processing 8 k streams.

  Supports optical power detection.

  Adopts the unique traffic processing technology to meet the requirement of processing various VLANs.

- **GPON access board**

  Adopts the design of 8-port high-density GPON board.

  Supports the SFP pluggable optical module (class B/class B+/class C+ power module is preferred).

  Supports 4 k GEM ports and 1 k T-CONTs.

  Supports a maximum split ratio of 1:128.

  Supports the detection and isolation of the ONT that works in the continuous mode.

  Supports the flexible DBA working mode, and the low-delay or high-bandwidth efficiency mode.

- **100M Ethernet P2P access board**

  Supports 48 FE ports and the SFP pluggable optical module on each board.

  Supports the single-fiber bidirectional optical module.

  Supports the DHCP option 82 relay agent and the PPPoE relay agent.

  Supports Ethernet OAM.

- **Subrack dimensions (Width x Depth x Height)**

  MA5680T subrack: 490 mm x 275.8 mm x 447.2 mm

  MA5683T subrack: 442 mm x 283.2 mm x 263.9 mm

- **Running environment**

  Operating ambient temperature: –25°C to +55°C

- **Power input**

  –48 VDC and dual power input ports (supported)

  Operating voltage range: –38.4 V to –72 V