**EchoLife ONT GPON Terminal HG8245H**

# Product Description

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# About This Document

## Overview

GPON terminal EchoLife ONT is an indoor optical network terminal (ONT) designed for home users. This document provides the appearance, key features, and technical specifications of the ONT, which helps you know the ONT quickly.

## Symbol Conventions

The following symbols may be found in this document. They are defined as follows:

| Symbol | Description |
|---|---|
| ⚠ DANGER | **DANGER** indicates a hazard with a high level or medium level of risk which, if not avoided, could result in death or serious injury. |
| ⚠ WARNING | **WARNING** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury. |
| ⚠ CAUTION | **CAUTION** indicates a potentially hazardous situation that, if not avoided, could result equipment damage, data loss, performance degradation, or unexpected results. |
| ⚲ TIP | Indicates a tip that may help you solve a problem or save your time. |
| 📖 NOTE | Provides additional information to emphasize or supplement important points of the main text. |

# Contents

# 1 About This Document

## Overview

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# 2 Introduction

## 2.1 Product Positioning

EchoLife GPON terminal HG8245H is an indoor optical network terminal (ONT) designed for home users. Its upper shell adopts the natural heat dissipation material, and its optical port adopts the dust-proof design with a rubber plug. The ONT is eye-pleasing and energy-efficient. It can be deployed on a workbench or mounted on a wall, meeting users' deployment requirements in different scenarios.

The ONT provides the more convenient and efficient remote management function. It supports the TR-069 and ONT Management and Control Interface (OMCI) protocols and manages all home terminals in a unified manner, implementing remote fault diagnosis, service provisioning, and performance statistics.

By using the Gigabit-capable Passive Optical Network (GPON) technology, the ONT provides a high-speed data channel through a single optical fiber with an upstream rate of 1.244 Gbit/s and a downstream rate of 2.488 Gbit/s. In this way, you can enjoy the high-speed data service, quality voice service, and superior video service. Apart from that, you can also enjoy the secure and reliable wireless access service and the convenient home network attached storage and file sharing services.

## 2.2 Network Applications

As a network terminal, the ONT is deployed at the GPON access layer and connects the home users users to the Internet through the optical upstream port.

Figure 2-1 shows the position of the ONT on a network.

**Figure 2-1** Network topology of the ONT
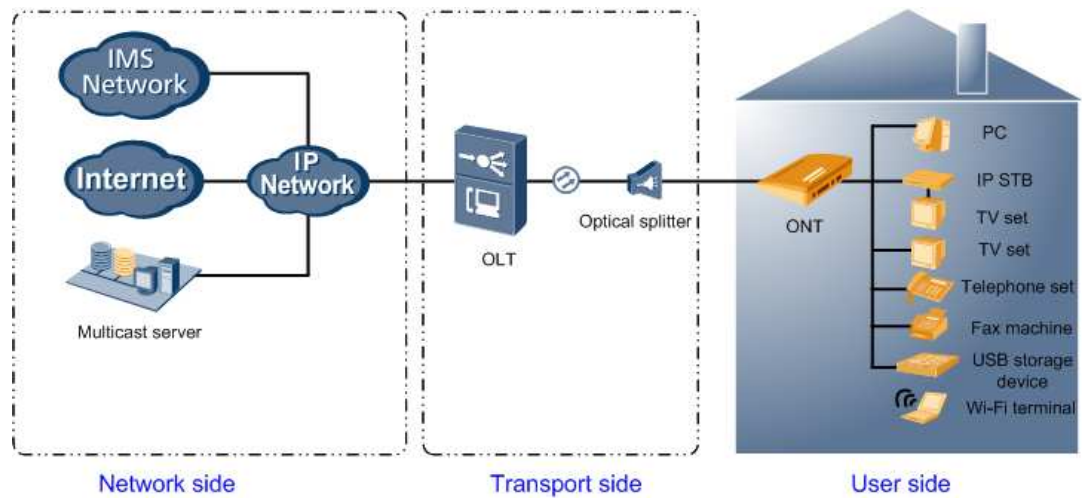


- In the upstream direction, the ONT is connected to the optical splitter and the networkside OLT through the passive optical network (PON) port, namely the OPTICAL port, to provide the integrated access service.

- In the downstream direction, the ONT is connected to various terminals through the abundant LAN-side ports, implementing the triple play service.

  – Ethernet ports, which can be connected to terminals such as the PC, STB, and video phone to provide the high-speed data and video services.

&#x1f4d6; **NOTE**

Each Ethernet port allows only 1 user access.

  – TEL ports, which can be connected to the telephone set or fax machine to provide the superior and cost-effective voice over IP (VoIP), fax over IP (FoIP), and modem over IP (MoIP) services.

&#x1f4d6; **NOTE**

Each TEL port allows only 1 user access.

  – Wi-Fi, which can be connected to a Wi-Fi terminal through wireless connection to provide a secure and reliable high-speed wireless network.

&#x1f4d6; **NOTE**

Each ONT allows up 6 wireless connections.

  – USB port, which can be connected to a USB storage device to provide convenient home network attached storage and file sharing services.

# 2.3 Product Overview

Introduced the appearance, interfaces, LEDs and device parameters of the HG8245H.

## Appearance

**Figure 2-2** Appearance of the HG8245H
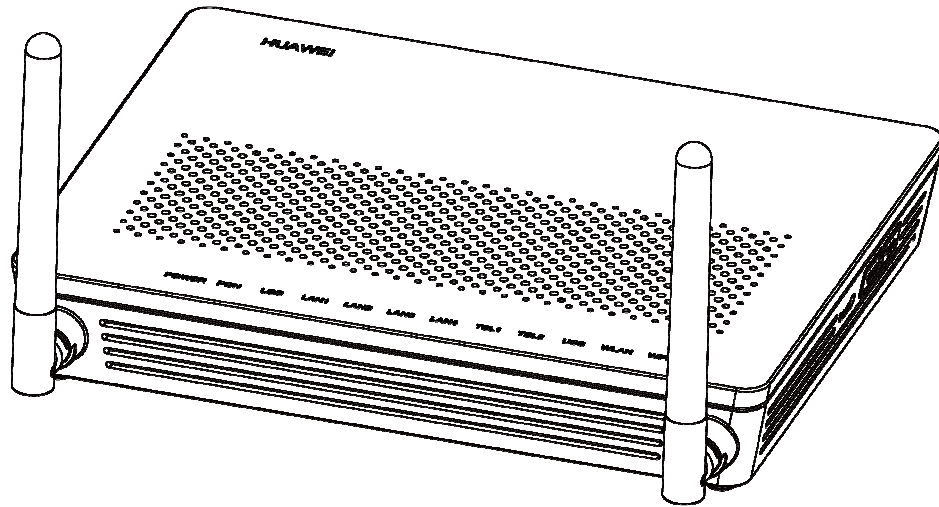


## Port/Button

Figure 2-13 and Figure 2-14 show the ports on the rear panel and side panel of the HG8245H respectively.

**Figure 2-3** Ports and buttons on the rear panel of the HG8245H
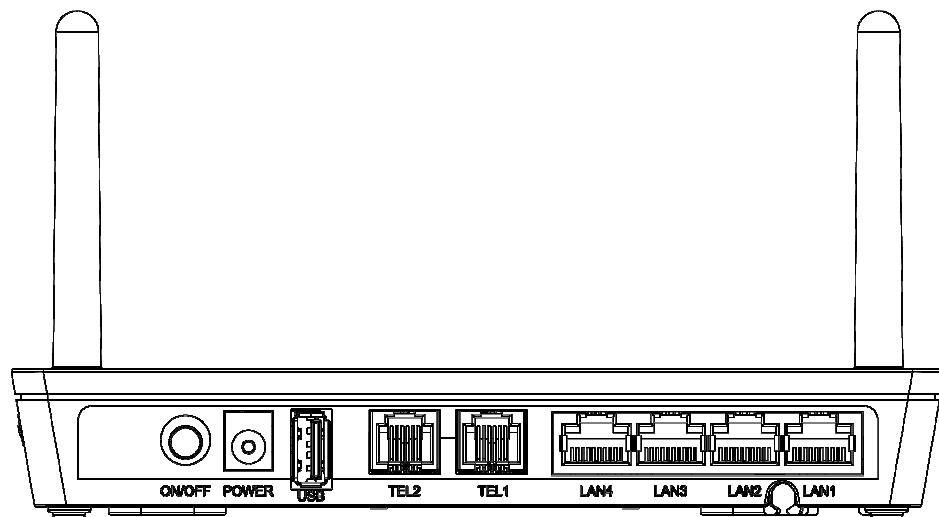


**Table 2-1** Description of ports and buttons on the rear panel of the HG8245H

| Port/Button | Function |
| --- | --- |
| ON/OFF | Indicates the power button. It is used to power on or power off the device. |

| Port/Button | Function |
|---|---|
| POWER | Indicates the power port, used to connect to the power adapter or backup battery unit. |
| USB | Indicate USB host ports, used to connect to USB storage devices. |
| TEL1–TEL2 | Indicate VoIP telephone ports (RJ-11), used for connecting to the ports on telephone sets. |
| LAN1–LAN4 | Indicate auto-sensing 10/100/1000M Base-T Ethernet ports (RJ-45), used to connect to PCs or IP set-top boxes (STBs). |

**Figure 2-4** Ports and buttons on the side cover of the HG8245H
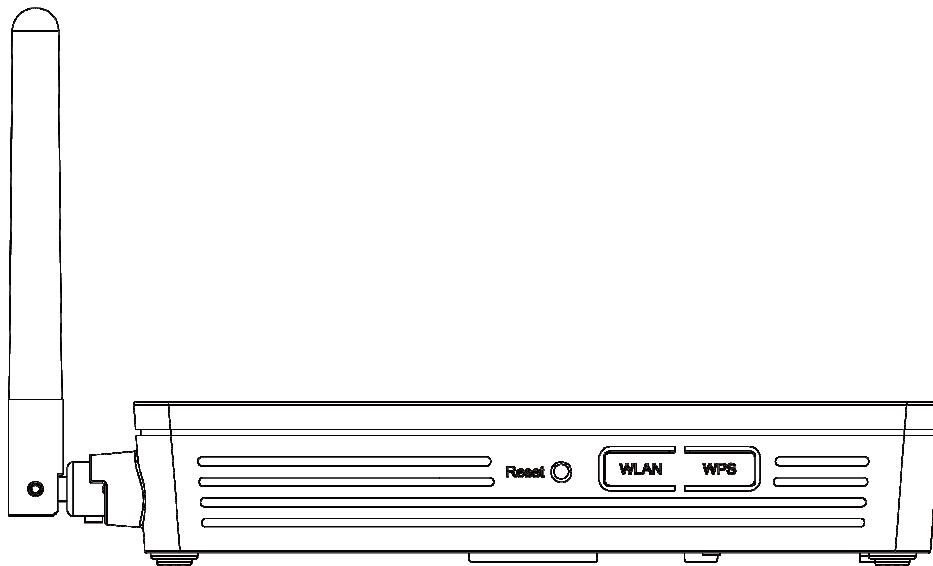


**Table 2-2** Description of ports and buttons on the side cover of the HG8245H

| Port/Button | Function |
|---|---|
| Reset | Indicates the reset button. Press the button for a short time to reset the device; press the button for a long time (longer than 10s) to restore the device to the default settings and reset the device. |
| WLAN | Indicates the WLAN button, used to enable or disable the WLAN function. |
| WPS | Indicates the WLAN data encryption switch. |

Figure 2-15 shows optical ports on the HG8245H.

**Figure 2-5** Optical ports on the HG8245H
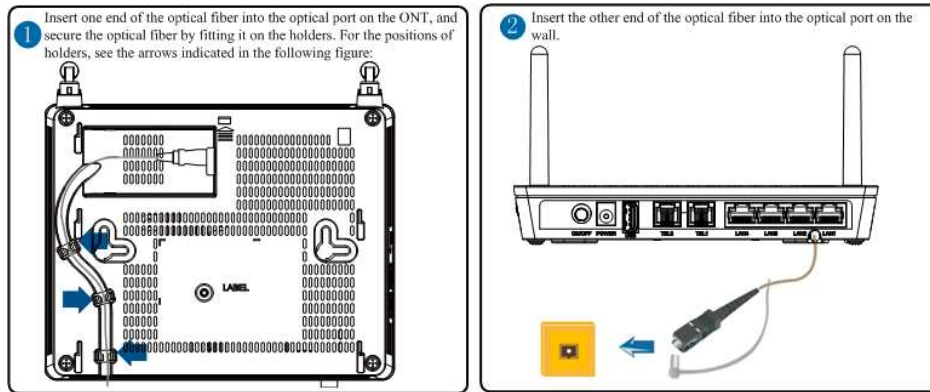


**Table 2-3** Description of optical ports on the HG8245H

| Port/Button | Function |
|---|---|
| OPTICAL | Indicates an optical port. The optical port is equipped with a rubber plug and is connected to an optical fiber for upstream transmission. The type of the optical connector connected to the OPTICAL port is SC/APC. |

## LEDs

**Figure 2-6** LEDs on the HG8245H
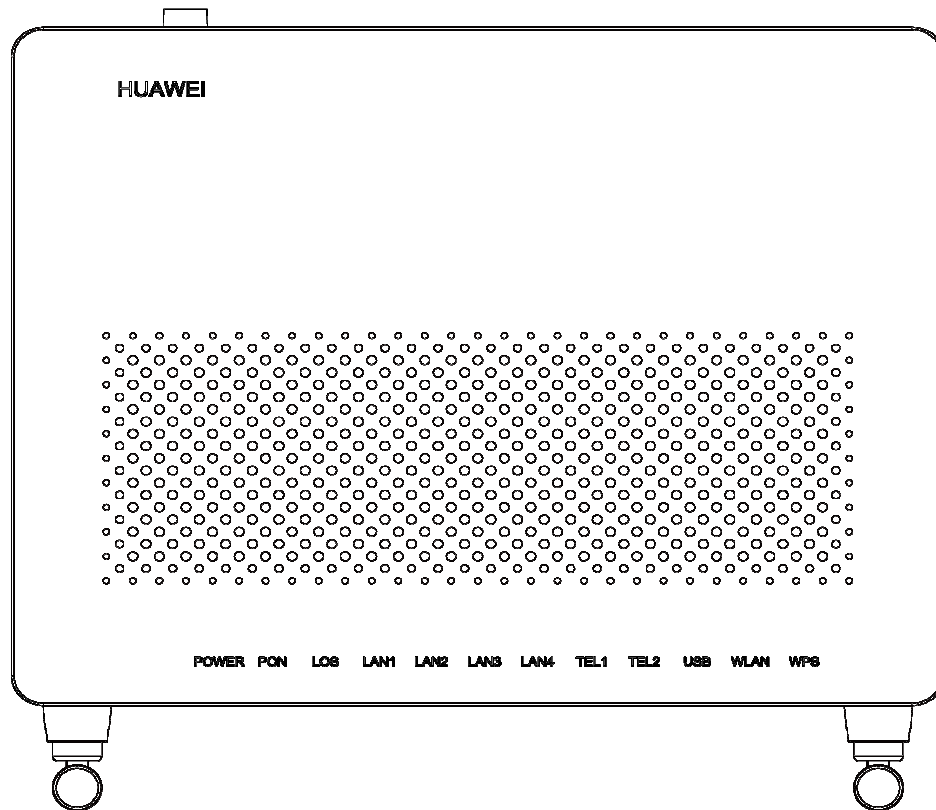


**Table 2-4** Indications of the LEDs on the HG8245H

| LED | Description | Status | Description |
|---|---|---|---|
| POWER | Power supply LED | Always on | The device is powered on. |
| | | Off | The power supply is cut off. |
| PON | Authentication LED | See Table 2-17. | |
| LOS | Connection LED | See Table 2-17. | |
| LAN1–LAN4 | Ethernet port LED | Always on | The Ethernet connection is in the normal state. |
| | | Blinking | Data is being transmitted on the Ethernet port. |
| | | Off | The Ethernet connection is not set up. |
| TEL1–TEL2 | Voice telephone port | Always on | The HG8245H is registered with the softswitch but no service |

| LED | Description | Status | Description |
|---|---|---|---|
| | LED | | flows are transmitted. |
| | | Blinking | Service flows are transmitted. |
| | | Off | The HG8245H is not powered on or fails to be registered to the softswitch. |
| USB | USB port LED | Always on | The USB port is connected and is working in the host mode, but no data is transmitted. |
| | | Blinks quickly (twice per second) | Data is being transmitted on the USB port. |
| | | Off | The system is not powered on or the USB port is not connected. |
| WLAN | WLAN LED | Always on | The WLAN function is enabled. |
| | | Blinking | Data is being transmitted on the WLAN port. |
| | | Off | The WLAN function is disabled. |
| WPS | WPS LED | Always on | The WPS function is enabled. |
| | | Blinking | A Wi-Fi terminal is accessing the system. |
| | | Off | The WPS function is disabled. |

**Table 2-5** Indications of the PON and LOS LEDs

| No. | LED Status | | Description |
|---|---|---|---|
| | PON | LOS | |
| 1 | Off | Off | The ONT is disabled by the OLT. |
| 2 | Blinks quickly (twice per second) | Off | The ONT is attempting to set up a connection to the OLT. |
| 3 | Always on | Off | The connection between the ONT and the OLT is set up. |
| 4 | Off | Blinks slowly (once two seconds) | The Rx optical power of the ONT is lower than the optical receiver sensitivity.The ONT is not connected to optical fibers or does not send optical signals. |
| 5 | Blinks quickly (twice per | Blinks quickly (twice per | The OLT detects that the device |

| No. | LED Status | | Description |
|---|---|---|---|
| | PON | LOS | |
| | second) | second) | is a rogue ONT. |
| 6 | Blinks quickly (twice per second) | Blinks slowly (once two seconds) | The Rx optical power of the ONT does not within the range (–27 dBm to –8 dBm) of the Rx sensitivity. |

## Device parameters

The device parameters include the ONT's size, weight, operating environment, and power parameters and equipment power consumption.

**Table 2-6** HG8245H device parameters

| Parameter | Specifications |
|---|---|
| Dimensions (length x width x height) | 176 mm x 138.5 mm x 28 mm |
| Weight | About 500 g |
| Working environment | Operating temperature: 0℃ to +40℃ |
| | Environment humidity: 5% RH to 95% RH (non-condensing) |
| | Pressure environment: 86 kPa to 106 kPa |
| | Altitude: 2000 m |
| Power specifications | Power adapter input: 100–240 V AC, 50–60 Hz |
| | System power supply: 11–14 V DC, 2 A |
| Power consumption | • Static power: 5 W<br>• Maximum power consumption: 15.5 W |

# 3 Product Functions and Features

This chapter describes the key characteristics of the HG8245H.

| Type | Features |
|---|---|
| GPON features | • Class B+ optical power budget<br>• Authentication modes of SN, password, and SN+password |
| Gateway features | • NAT<br>• Internet, IPTV and VoIP services automatically bound to the ONT port<br>• Virtual Server, Port Trigger<br>• Port trigger and DMZ |
| Broadband features | • Any port any service<br>• Smart pipe<br>• Intelligent hotspot |
| Voice features | • Session Initiation Protocol (SIP), H.248<br>• Voice media streams and signaling streams separation |
| Multicast features | • IGMP V2&V3 Snooping<br>• Dynamically controllable multicast<br>• IGMP Proxy |
| Security features | • MAC address filtering, IP address filtering, URL address filtering<br>• Anti-DoS |
| Device maintenance | • Local service configuration, query, and software upgrade on the Web page<br>• Automatic remote service provisioning, device management, and software upgrade through OMCI<br>• Query of the information about the ONT optical transceiver |

| Type | Features |
|------|----------|
|  | • Loop line test and circuit test<br>• Dual system protection of the software (normal system and mini system)<br>• Intelligent monitoring |
| Reliable features | • Dual system protection of the software (normal system and mini system) |
| Ethernet features | • VLAN filtering, VLAN transparent transmission<br>• VLAN N:1 aggregation and VLAN 1:1 switch |
| Power-saving features | • Dynamic power adjustment |

☐ NOTE

For details about the features, see the *Feature Description*.

# 4 Product Highlights

## 4.1    Comprehensive Triple Play Service

On the LAN side, the ONT provides abundant hardware ports to implement multiple access services, including the home network attached storage, Internet access, voice, and video services, providing users with the comprehensive triple play service.

## 4.2    Secure and Reliable Wi-Fi Access

The ONT helps users build a secure and reliable wireless network based on the 802.11 b/g/n Wi-Fi access.

## 4.3    Convenient Home Network Attached Storage and File Sharing Services

The ONT provides one USB port, which can be used to connect to a USB storage device to provide convenient home network attached storage and file sharing services.

## 4.4    Secure and Powerful Gateway Functions

The ONT can function as a home gateway, which features the secure and powerful gateway functions.

## 4.5    Convenient Automatic Provisioning, Maintenance, and Management of the Remote Service

The ONT applies the TR-069 and OMCI management, manages terminal services without additional IP networks, which facilitates automatic provisioning, maintenance, and management of the remote service.

# 4.1 Comprehensive Triple Play Service

On the LAN side, the ONT provides abundant hardware ports to implement multiple access services, including the home network attached storage, Internet access, voice, and video services, providing users with the comprehensive triple play service.

**Figure 4-1** Comprehensive Triple Play Service
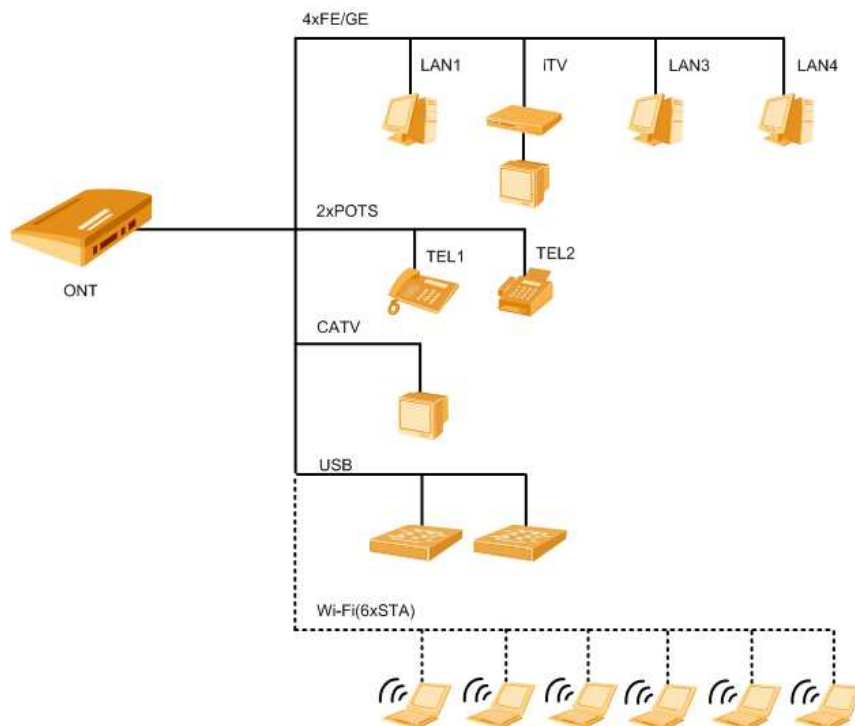


**□ NOTE**

● Each Ethernet port allows only 1 user access.

● Each TEL port allows only 1 user access.

● Each ONT allows up 6 wireless connections.

# 4.2 Secure and Reliable Wi-Fi Access

The ONT helps users build a secure and reliable wireless network based on the 802.11 b/g/n Wi-Fi access.

**Figure 4-2** Wi-Fi Access



The Wi-Fi access of the ONT has the following features:

- Supports four SSIDs. The user can select different wireless networks by setting different SSIDs.

- Compatible with IEEE 802.11b/802.11g/802.11n, passing the authentication of Wireless Fidelity (Wi-Fi) Alliance and featuring good compatibility with other WLAN devices.

- Supports multiple authentication and encryption modes, providing users with the secure and reliable wireless access.

# 4.3 Convenient Home Network Attached Storage and File Sharing Services

The ONT provides one USB port, which can be used to connect to a USB storage device to provide convenient home network attached storage and file sharing services.

The USB storage function of the ONT has the following features:

- The USB port supports Universal Plug and Play (UPnP) and hot plugging.

- The USB function can be configured on the local Web page, which facilitates home network attached file sharing.

- The USB port implements the FTP client for home storage, that is, downloading files from the FTP server in a public network to the USB storage device.

# 4.4 Secure and Powerful Gateway Functions

The ONT can function as a home gateway, which features the secure and powerful gateway functions.

The gateway features of the ONT are as follows:

- Forwarding rate up to 900 Mbit/s, meeting service requirements for a high quality.
- Functioning as a DHCP server or a DHCP client, meeting various requirements in different scenarios.
- Configuration of anti-DoS attack, MAC address filtering, IP address filtering, URL address filtering, firewall, and ONT ACL, making the ONT more secure and reliable when it functions as a gateway.

# 4.5 Convenient Automatic Provisioning, Maintenance, and Management of the Remote Service

The ONT applies the TR-069 and OMCI management, manages terminal services without additional IP networks, which facilitates automatic provisioning, maintenance, and management of the remote service.

The remote service management of the ONT has the following features:

- Supports configuring the global profile and issuing the XML configuration file on the NMS. To provision ONT services in batches and adjust the network, only a few changes are required.
- Supports user-defined upgrade policies configured through the NMS. The device is automatically upgraded after being powered on and no manual operation is required.
- Supports remote performance management of the ONT through the NMS. By collecting the performance data, the network performance exception can be monitored in real time.
- Supports remote fault locating of the ONT through the NMS. Through alarm reporting and remote loopback diagnosis, the fault can be located remotely, which decreases the maintenance cost.

# 5 Port Specifications

Introduced the interface indicators parameter of the ONT.

## 5.1 GPON Port Specifications

Introduced the GPON interfaces indicators of the ONT.

**Table 5-1** GPON port specifications

| Parameter | Specifications |
|---|---|
| Transmission rate | Rx: 2.488 Gbit/s<br>Tx: 1.244 Gbit/s |
| Connector | SC/APC |
| Maximum reach | 20 km |
| Standard compliance | ITU-T G.984.2 CLASS B+ |
| Center wavelength | Tx: 1310 nm |

| Parameter | Specifications |
|---|---|
|  | Rx: 1490 nm |
| Tx optical power | 0.5 dBm to 5.0 dBm |
| Extinction ratio | > 10 dB |
| Minimum receiver sensitivity | -27 dBm |
| Maximum overload optical power | -8 dBm |

# 5.2 GE Port Specifications

This topic describes the specifications and standards compliance of Gigabit Ethernet (GE) ports.

Table 5-2 Specifications of a GE port

| Parameter | Specifications |
|---|---|
| Connector type | RJ45 |
| Port rate | 10 Mbit/s, 100 Mbit/s, or 1000 Mbit/s |
| Maximum transmission distance | 100 m |
| Working mode | Auto-adaptive 10 Mbit/s, 100 Mbit/s or 1000 Mbit/s |
| Cable specifications | Category 5 UTP |
| Compliant standard | IEEE 802.3i<br>IEEE 802.3u<br>IEEE 802.3ab |

# 5.3 POTS port

This section describes the specifications and standards for the plain old telephone service (POTS) port supported by the ONT.

Table 5-3 POTS Port Specifications

| Parameter | Specifications |
|---|---|
| Connector type | RJ11 |
| Transmission rate | 64 kbit/s |
| Cable type | Twisted pair |

| Parameter | Specifications |
|---|---|
| Line coding | Pulse code modulation (PCM) |
| Frame protocol | Time division multiplexing (TDM) |
| Standard compliance | ITU-T Q.551 <br> ITU-T Q.552 |

# 5.4 USB Port

This topic introduces the specifications of the USB port on the ONT.

Table 5-4 Specifications of the USB port

| Parameter | Specification |
|---|---|
| Transmission rate | 480 Mbit/s |
| Support type | USB 2.0 HOST and USB 1.1 |

# 5.5 Wireless Network Access

This topic introduces the wireless network access indicators of the ONT.

Table 5-5 Wireless network access indicators

| Parameter | Indicator |
|---|---|
| Standards compliance | 802.11b/g/n |
| Specification | • 4 SSIDs <br> • 13 working channels <br> • Automatic rate adjustment <br> • Transmit power adjustment |
| Authentication | Open system and shared key |
| Encryption | • 64-bit and 128-bit WEP encryption <br> • WPA-PSK, WPA2-PSK, WPA, WPA2, AES, and TKIP |

# 6 Acronyms and Abbreviations

**A**

**AES**                          Advanced Encryption Standard

**ALG**                          Application Level Gateway

**B**

**BRAS**                         Broadband Remote Access Server

**C**

**CATV**                         Community Antenna Television

**D**

**DBA**                          Dynamic Bandwidth Assignment

**DHCP**                         Dynamic Host Configuration Protocol

**DMZ**                          Demilitarized Zone

**DNS**                          Domain Name Server

**DTMF**                         Dual Tone Multi-Frequency

**DoS**                          Denial of Service

**F**

**FEC**                          Forward Error Correction

**FoIP**                         FAX over IP

**FTTH**                         Fiber To The Home

**G**

**GPON**                         Gigabit-capable Passive Optical Network

**I**

**IGMP**                         Internet Group Management Protocol

**M**

**MoIP**                         Modem over IP

**N**

| | |
|---|---|
| **NAPT** | Network Address and Port Translation |
| **NAT** | Network Address Translation |
| **NMS** | Network Management System |

**O**

| | |
|---|---|
| **OAM** | Operations, Administration, and Maintenance |
| **OLT** | Optical Line Terminal |
| **OMCI** | Optical Network Termination Management and Control Interface |
| **ONT** | Optical Network Terminal |

**P**

| | |
|---|---|
| **PLOAM** | Physical Layer OAM |
| **PON** | Passive Optical Network |
| **PSTN** | Public Switched Telephone Network |

**R**

| | |
|---|---|
| **RTCP** | Real-time Transport Control Protocol |
| **RTP** | Real-time Transport Protocol |

**S**

| | |
|---|---|
| **SIP** | Session Initiation Protocol |
| **SSID** | Service Set Identifier |
| **STB** | Set Top Box |

**T**

| | |
|---|---|
| **TKIP** | Temporal Key Integrity Protocol |

**U**

| | |
|---|---|
| **UPnP** | Universal Plug and Play |

**V**

| | |
|---|---|
| **VLAN** | Virtual Local Area Network |
| **VoIP** | Voice over IP |

**W**

| | |
|---|---|
| **WLAN** | Wireless Local Area Network |
| **WEP** | Wired Equivalent Privacy |
| **WPA** | Wi-Fi Protected Access |
| **WPS** | Wi-Fi Protected Setup |