1POS Modules of H3C Series Routers

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I.　Preface

POS (Packet Over SONET/SDH) is a technology used in WAN and MAN, with packet data supported , such as IP packet.
POS directly maps the variable length packets to SONET synchronous load. With SONET physical layer transport standards, it provides a high speed, reliable and point-to-point data connection.
PPP, Frame Relay and HDLC protocols can be used at the data link layer and IP protocol can be used at the network layer.

II.　Introduction

Today medium/lower end routers only provide 1POS module, which can reside at MIM or FIC slot.

The POS interface rate provided by 1POS module is STM-1/OC-3 (155.52Mbit/s).

The POS interface provided by VRP can use PPP, Frame Relay and HDLC protocol at the data link layer and IP protocol at the network layer. The interface transport rate varies by different devices.

POS interface is primarily used to enable the direct transport of packets over SDH. The following presents the transport procedure of PPP protocol packets in this board: in transmitting direction, packets are first encapsulated into IP packet then to PPP packet depending on PPP protocol. The interface chipset at the physical layer encapsulates PPP packets in HDLC frame format and fills in SDH frame and then send out via optical interface; in receiving direction, optical interface first converts optical signal into electrical signal. The interface chipset at the physical layer extracts HDLC frame from SDH frame , then PPP packet from HDLC frame and finally IP packet form PPP packet for system process.

1POS board supports the data receiving/sending function of full duplex POS interface: on one hand, the board reads data to be sending from system memory via PCI bus, and control sending the data out from POS interface. On the other hand, the board receives data from POS interface, and input the data into system memory via PCI bus for system process.
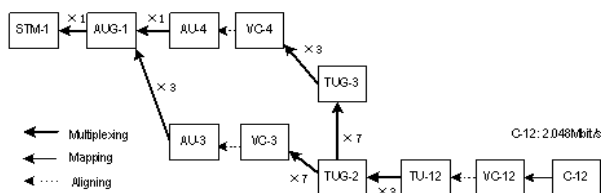
In the case of that CPU interface is PCI, PCI interface complies with PCIV2.1 standards.
STM-1 standard optical interface is provided for outside.

III.　Module Interface Indicator

The front panel of 1POS module is shown as follows:
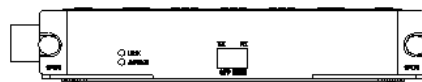
1POS interface module front panel (MIM card)


1POS interface module front panel (FIC card)

The following table provides the implications of various indicators:

Implication of 1POS module indicator

LINK	Extinguished: represents the link is not connected. Lighting: represents the link is connected.
ACT	Flashing: represents that some data have been received/sent. Extinguished: represents that no data has been received/sent.

1POS should attach to a fiber with LC fiber connector, so user is required to employ a fiber with LC type fiber connector.
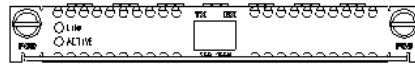
Appearance of LC type fiber connector

Note:
Fiber connector (also called as live connector): International Telecom Union (ITU) recommends to define it as "an inactive component used to stably but not permanently connect two or more fibers." As the indispensable inactive component in optical communication system, the use of fiber connector makes it possible to enable a removable connection among optical channels.

There are a great deal of fiber connectors, for example:
(1) FC: cycle fiber connector with screw thread
(2) ST: cycle fiber connector with plug-in
(3) LC: square fiber connector
(4) MT-RJ: square transceiver fiber connector

Warning:
The optical interface may have invisible radials emitting from it when none of fiber connectors is connected or dustproof cover has been opened, so please do not directly see the optical interface.
Closing the dustproof cover is desirable if the optical interface does not install an opticla connector.

V. Module Interface Attributes

1POS Module Interface Attributes

Attributes	Description			
Interface standard	SONET OC-3/SDH STM-1			
Interface number	1			
Type of connector	SFP socket (it is required to select additional SFP optical module, including multi-mode/single-mode/single-mode long haul/single-mode ultra long haul			
Maximum transmission distance	2km (multi-mode)/15km (single-mode)/40km (single-mode long haul) /80km (single-mode ultra long haul)			
Type of cable	LC fiber			
Interface rate	155M			
Transmitting optical power		Short haul multi-mode	Medium haul single mode	Long haul	Ultra long haul
	Minimum	-19.0 dBm	-15.0 dBm	-5.0 dBm	-5.0 dBm
	Maximum	-14.0 dBm	-8.0 dBm	0. dBm	0. dBm
Receiving sensitivity		-30.0 dBm	-28.0 dBm	-34.0 dBm	-34.0 dBm
Overload optical power		-14.0 dBm	-7.0 dBm	-9.0 dBm	-10.0 dBm
Central wavelength		1310nm	1310nm	1310nm	1550nm
Supported link protocol		PPP Frame HDLC			

VI. Module Networking Description

The configuration of POS interface includes:
l   **Set the clock mode of POS interface**
Master clock mode: using internal clock signal
Slave clock mode: using clock signal provided by a line
Like synchronous serial port with DTE and DCE two operational modes, POS also needs to select a clock mode. When POS interfaces of two routers are connected directly each other, one side should be set employing master clock mode, the other employing slave clock mode; when the POS interfaces

of routers are attached to the switching equipment, the switching equipment functions as DCE employing internal clock signal, and the POS interface functions as DTE employing slave clock mode.

l   **Set the CRC check word length of POS interface**

POS interface supports two kinds of CRC check word lengths: 16bit and 32bit.

l   **Set the loopback mode of POS interface**

l   **Set the overhead byte of POS interface**

Signal label byte C2 is subject to Higher-Order Path Overhead byte, used to indicate the multiplexing structure of virtual container (VC) frame and the characteristics of information payload.

Regenerator section trace byte J0 is subject to Section Overhead byte, used to examine the section-level continuity of connections between two ports

The configuration of C2 and J0 of receiving/sending side should be identical, or it will generate an alarm.

When it comes to POS interface, by default **c2** is 16 (hexadecimal) and **j0** is 0 (hexadecimal).

l   **Set the frame format of POS interface**

POS interface supports two frame formats:

SDH

SONET

l   **Set the interference adding function of POS interface**

POS interface supports the interference adding function to load data, avoiding more continuous 1 or 0 for the receiving side to extract line clock signals.

l   **Set the type of link protocol of POS interface**

l   **Set MTU of POS interface**