

IEEE Standard for Flexible Optical Service Unit for Optical Networks

IEEE Communications Society

Developed by the
Access and Core Networks Standards Committee

IEEE Std 1953.1™-2025

STANDARDS

IEEE Standard for Flexible Optical Service Unit for Optical Networks

Developed by the

Access and Core Networks Standards Committee
of the
IEEE Communications Society

Approved 10 September 2025

IEEE SA Standards Board

Abstract: A flexible optical service unit (OSU) path layer is specified by this standard for optical networks, providing services ranging from 2 Mb/s to 100 Gb/s. The main features of the OSU path layer are being offered in the form of massive OSU connections that carry packet and constant bit rate (CBR) services with guaranteed performance, enabling the flexible hitless bandwidth adjustment (e.g., $n \times 10$ Mb/s) for each OSU connection, along with capabilities such as high-bandwidth efficiency, large capacity, and low latency. The OSU path layer can be carried on different server layers, for instance, optical transport network (OTN), passive optical network (PON), among others. High-quality leased line services and video services, with guaranteed performance, that are utilized in telecom operators' optical networks and other industry transport networks are supported by this standard.

Keywords: Ethernet, IEEE 802.3, IEEE 1953.1, optical service unit, optical transport network, OSU, OTN, passive optical network, PON, SDH, synchronous digital hierarchy

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Introduction

This introduction is not part of IEEE Std 1953.1-2025, IEEE Standard for Flexible Optical Service Unit for Optical Networks.

With the end of sale and support of synchronous digital hierarchy (SDH) equipment from vendors, optical transport network (OTN) is quickly replacing SDH networks. Currently, OTN is also gradually applying to various specific networks for vertical industry applications. OTN will be used to carry a variety of services, including high-quality leased lines and video services. This standard specifies a flexible optical service unit (OSU) path layer for optical networks to provide 2 Mb/s to 100 Gb/s services. The main features of the OSU path layer are providing massive OSU connections to carry packet and constant bit rate (CBR) services with guaranteed performance. The OSU path layer can be carried on different server layers, e.g., OTN, passive optical network (PON).

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IEEE Standard for Flexible Optical Service Unit for Optical Networks

1. Overview

1.1 Scope

This standard specifies a flexible optical service unit (OSU) path layer for optical networks to provide 2 Mb/s to 100 Gb/s services. The main features of the OSU path layer are providing massive OSU connections to carry packet and constant bit rate (CBR) services with guaranteed performance, enabling the flexible hitless bandwidth adjustment (e.g., $n \times 10$ Mb/s) for each OSU connection, with the capabilities of high-bandwidth efficiency, large capacity, and low latency. The OSU path layer can be carried on different server layers (optical transport network [OTN], passive optical network [PON], etc.).

1.2 Purpose

The standard supports high-quality leased line services and video services with guaranteed performance that are used in telecom operators' optical networks and other industry transport networks. The standard defines technical specifications that meet the requirements of these services, such as low latency, massive connections, and agile hitless bandwidth adjustment.

1.3 Word usage

The word *shall* indicates mandatory requirements strictly to be followed in order to conform to the standard and from which no deviation is permitted (*shall* equals *is required to*).^{6, 7}

The word *should* indicates that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required (*should* equals *is recommended that*).

The word *may* is used to indicate a course of action permissible within the limits of the standard (*may* equals *is permitted to*).

The word *can* is used for statements of possibility and capability, whether material, physical, or causal (*can* equals *is able to*).

⁶ The use of the word *must* is deprecated and cannot be used when stating mandatory requirements; *must* is used only to describe unavoidable situations.

⁷ The use of *will* is deprecated and cannot be used when stating mandatory requirements; *will* is only used in statements of fact.

2. Normative references

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IEEE Std 802.3™-2022, IEEE Standard for Ethernet.^{8, 9}

ITU-T G.707, Network node interface for the synchronous digital hierarchy (SDH).¹⁰

ITU-T G.709, Interface for the optical transport network (OTN).

ITU-T G.806, Characteristics of transport equipment—Description methodology and generic functionality.

ITU-T G.823, The control of jitter and wander within digital networks which are based on the 2048 kbit/s hierarchy.

ITU-T G.825, The control of jitter and wander within digital networks which are based on the synchronous digital hierarchy (SDH).

ITU-T G.873.1, Optical transport network: Linear protection.

ITU-T G.7712, Architecture and specification of data communication network.

ITU-T G.8260, Definitions and terminology for synchronization in packet networks.

ITU-T G.8261, Timing and synchronization aspects in packet networks.

ITU-T G.8275.1, Precision time protocol telecom profile for phase/time synchronization with full timing support from the network.

3. Definitions, acronyms, and abbreviations

3.1 Definitions

For the purposes of this document, the following terms and definitions apply. The *IEEE Standards Dictionary Online* should be consulted for terms not defined in this clause.¹¹

multi-frame mode (MFM): Indicates that the optical service unit (OSU) maps services based on a multi-frame consisting of one basic frame and one or more extension frames with the specific pattern of path monitoring (PM), tandem connection monitoring (TCM), and mapping overheads.

single-frame mode (SFM): Indicates that the optical service unit (OSU) maps services based on a single frame with the specific pattern of path monitoring (PM), tandem connection monitoring (TCM), and mapping overheads.

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¹¹ *IEEE Standards Dictionary Online* is available at: <http://dictionary.ieee.org>. An IEEE Account is required for access to the dictionary, and one can be created at no charge on the dictionary sign-in page.

3.2 Acronyms and abbreviations

256b_PTR	256b pointer
257b_IND	257b indication
1PPS	1 pulse per second
AcBW	accepted bandwidth
ACK_IND	acknowledge indication
AIS	alarm indication signal
AMP	asynchronous mapping procedure
APS	automatic protection switching
AU	administrative unit
BDEG	backward degraded defect
BDI	backward defect indication
BEI	backward error indication
BER	bit error rate
BIP	bit interleaved parity
BIP8	bit interleaved parity-8
BMP	bit-synchronous mapping procedure
BW	bandwidth
BWM	bandwidth mismatch
BW_ADJ_ACK	bandwidth adjustment acknowledge
BW_ADJ_REQ	bandwidth adjustment request
BW_DEC_ACK	bandwidth decrease acknowledge
BW_DEC_REQ	bandwidth decrease request
BW_INC_ACK	bandwidth increase acknowledge
BW_INC_CONFIRM	bandwidth increase confirm
BW_INC_CONFIRM_ACK	bandwidth increase confirm acknowledge
BW_INC_NACK	bandwidth increase negative acknowledge
BW_INC_REQ	bandwidth increase request

BW_ROLLBACK_ACK	bandwidth rollback acknowledge
BW_ROLLBACK_REQ	bandwidth rollback request
CBR	constant bit rate
CFI	client fault indication
CRC	cyclic redundancy check
CSF	client signal fail
CV	connectivity verification
DA	destination address
DAPI	destination access point identifier
DEG	degraded defect
DEGM	degraded defect consecutive one-second monitoring intervals
DM	delay measurement
FDI	forward defect indication
FT	frame type
FTM	frame type mismatch
GCC	general communication channel
GMP	generic mapping procedure
GMP-OSU	generic mapping procedure—optical service unit
IM	in multiframe
IMP-OSU	idle mapping procedure—optical service unit
IPG	interpacket gap
LCK	locked
LF	local fault
LN_P	loss number of 256b pointer
LN_SQ	loss number of sequence
LOF	loss of frame
LOFLOM	loss of frame and multiframe
LOM	loss of multiframe

LOM_P	loss of multiframe path
LOM_T	loss of multiframe tandem connection monitoring (TCM)
LOPB	loss of payload block
LOS	loss of signal
LSB	least significant bit
LSS	loss of pseudo-random binary sequence lock
LTC	loss of tandem connection
M8	8 multiframe
M32	32 multiframe
M32/256	32/256 multiframe
M512	512 multiframe
MAC	media access control
MFM	multi-frame mode
MOD	mode configuration
MON	monitoring
MSB	most significant bit
NNI	network node interface
OAM	operation, administration, and maintenance
OCh	optical channel with full functionality
OCI	open connection indication
ODU	optical channel data unit
ODUCn	optical data unit-Cn
ODUj	optical channel data unit-j
ODUk	optical data unit-k
ODTUjk	optical channel data tributary unit j into k
ODTUG	optical channel data tributary unit group
ODUk-Xv	X virtually concatenated optical data unit-ks (ODUs)
OEC	optical transport network (OTN) equipment clock

OH	overhead
OMS	optical multiplex section
OMS-OH	optical multiplex section overhead
OOM	out of multiframe
OPU	optical channel payload unit
OPUk	optical channel payload unit-k
OPUk-Xv	X virtually concatenated optical data unit-ks (OPUks)
OSC	optical supervisory channel
OSTU	optical service tributary unit
OSTUG	optical service tributary unit group
OSU	optical service unit
OSUP	optical service unit path
OSUT	optical service unit tandem connection monitoring (TCM)
OT	operation, administration, and maintenance (OAM) frame type
OTN	optical transport network
OTS	optical transmission section
OTU	optical channel transport unit
OTUk	completely standardized optical channel transport unit-k
OTUkV	functionally standardized optical channel transport unit-k
PB	payload block
PBP	payload block pointer
PKT	packet
PLM	payload mismatch
PLn	payload length-n
PM	path monitoring
PRBS	pseudo-random binary sequence
PRC	primary reference clock
preLOF	previous loss of frame

PSI	payload structure identifier
PT	payload type
RDI	remote defect indication
REQ_IND	request indication
RES	reserved for future international standardization
RF	remote fault
SA	source address
SAPI	source access point identifier
SDH	synchronous digital hierarchy
SEC	synchronous digital hierarchy (SDH) equipment clock
SFD	start-of-frame delimiter
SFM	single-frame mode
SNCP	subnetwork connection protection
SNC/I	subnetwork connection protection with inherent monitoring
SNC/N	subnetwork connection protection with non-intrusive monitoring
SNC/S	subnetwork connection protection with sub-layer monitoring
SOH	section overhead
SQ	sequence
STAT_P	state path
STAT_T	state tandem connection monitoring (TCM)
STM-N	synchronous transport module level N
TCM	tandem connection monitoring
TPN	tributary port number
TPNM	tributary port number mismatch
TS	timestamp
TSE	test sequence error
TS-FH	timestamp frame header
TU	tributary unit

TU-AIS	tributary unit-alarm indication signal
TUG	tributary unit group
VC-n	virtual container-n
VC_PTR	virtual container pointer

4. OSU layer network architecture

4.1 OSU layer network overview

Optical service unit (OSU) is used in the optical transport network (OTN) to support client services with rates at 2 Mb/s to 100 Gb/s. This OSU layer network is located above the optical data unit (ODU) layer. The OSU frame length is 192 bytes, and the frame structure includes overhead and payload areas. The layer network functions provided by OSU specifically include OSU service adaptation, OSU overhead management and monitoring, OSU cross-connection functionality, OSU multiplexing to optical payload unit (OPU), OSU hitless bandwidth adjustment, and OSU protection functions. The OSU layer network is an extension of the existing OTN to support fine-granularity client services. OSU can be mapped and multiplexed to optical data unit-k (ODU_k), or first mapped to ODU_j and then multiplexed to ODU_k/optical data unit-Cn (ODUC_n).

4.2 Information structure

Figure 1 illustrates the information containment relationship of OSU. Client services are first mapped into the payload area of the OSU frame. The overhead area of the OSU frame provides functions for path monitoring (PM) overhead, tandem connection monitoring (TCM) overhead, and section overhead (SOH). Subsequently, the OSU frame is further mapped into the OPU payload blocks (PB).

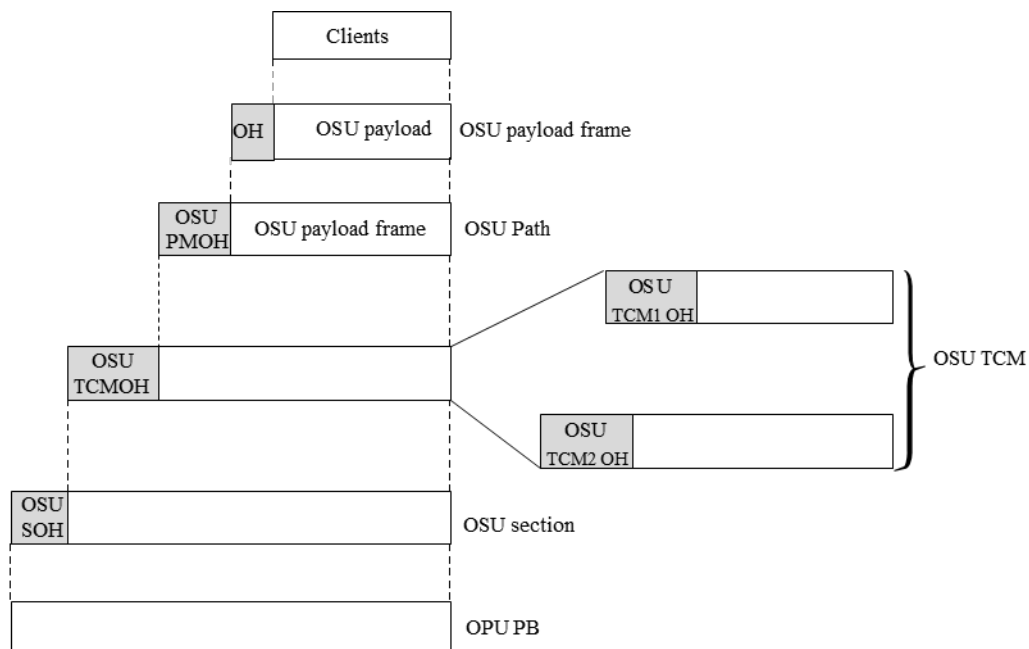


Figure 1—OSU information containment relationship

4.3 Multiplexing structure

Figure 2 describes the layer network structure where OSU is multiplexed to OPU through the optical service tributary unit (OSTU) and the optical service tributary unit group (OSTUG).

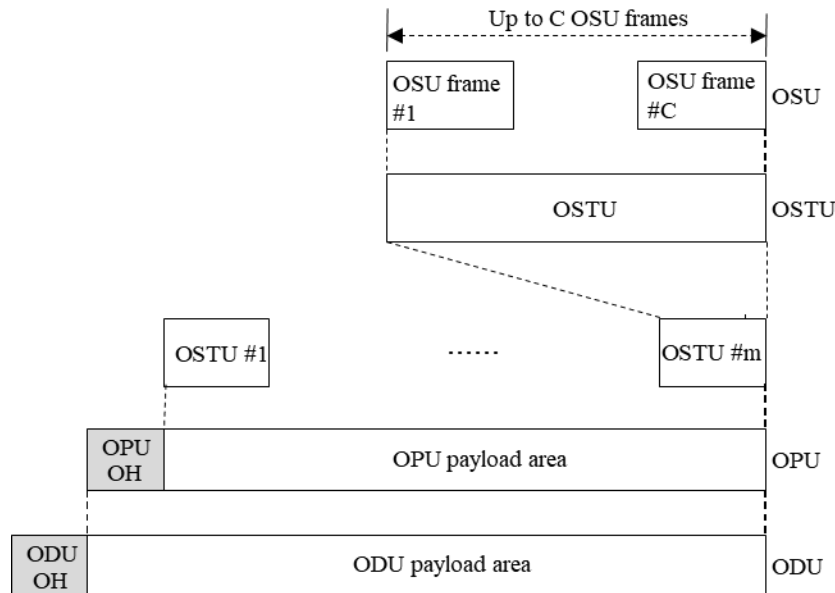


Figure 2—OSU to ODU multiplexing structure

Figure 3 illustrates the specific mapping and multiplexing path from OSU to ODUk/Cn. Multiple OSTUs from different ports are multiplexed to form an OSTUG (payload type [PT] = 0x88), which is then mapped into OPU. After adding the corresponding overhead, it forms an ODU, or it can be further multiplexed into a higher-rate ODU.

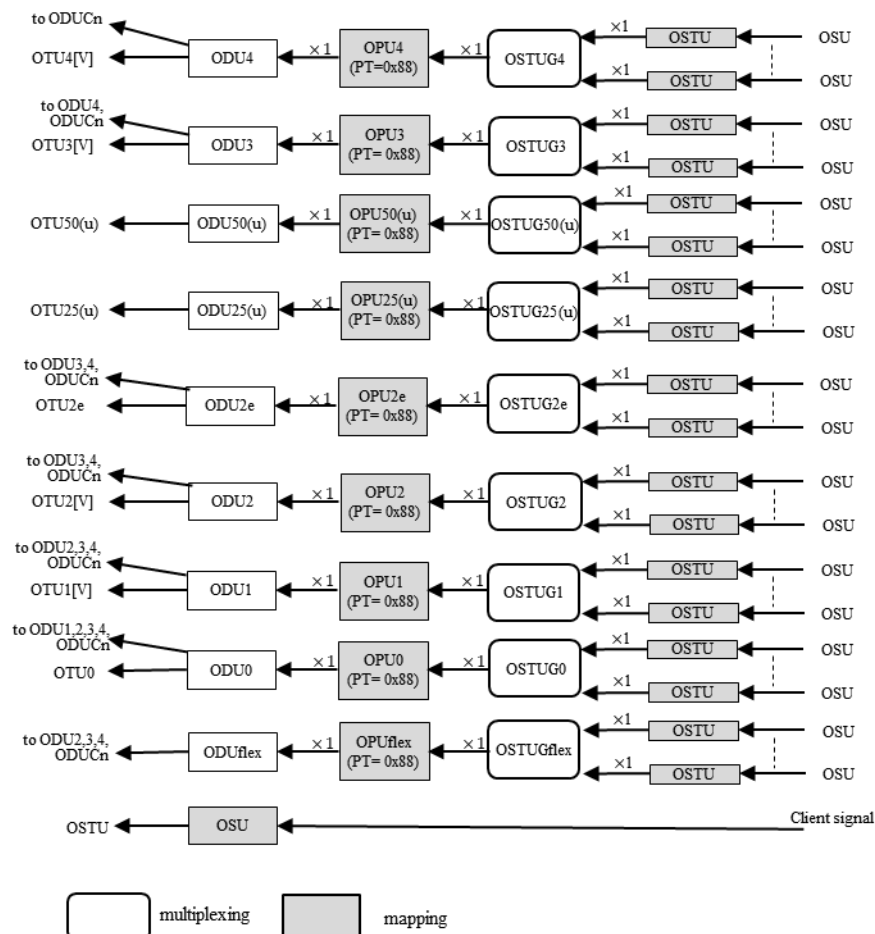


Figure 3—OSU to OPU mapping and multiplexing path

4.4 Functional requirements

OSU should support the following functions:

- a) OSU client adaptation, including IEEE 802.3™ (Ethernet) client services with bit rate ranging from 2 Mbit/s to 100 Gbit/s, and constant bit rate (CBR) client services like synchronous transport module level 1 (STM-1)/synchronous transport module level 4 (STM-4)/virtual container-n (VC-n) (including E1)
- b) Clock synchronization of CBR client services, and support for network clock synchronization of VC-n client services
- c) OSU to ODU multiplexing functionality
- d) OSU cross-connection functionality, which should include the following types of cross-connections: unidirectional, bidirectional, loopback, and broadcast
- e) OSU PM/TCM monitoring functions and the insertion of alarm indication signal (AIS)/open connection indication (OCI)/locked (LCK) maintenance signals
- f) OSU pseudo-random binary sequence (PRBS) testing functionality
- g) OSU delay measurement functionality
- h) OSU subnetwork connection protection (SNCP) 1+1 protection switching

- i) OSU hitless bandwidth adjustment functionality
- j) OSU general communication channel (GCC) functionality, used to provide a common communication path between network elements
- k) Mixed multiplexing of OSU and ODU to high-order OPU (for further study)

5. OSU frame format and overhead

5.1 OSU frame format

The frame format of the OSU is shown in Figure 4. The length of the frame is 192 bytes. Bytes 1 to 7 are the overhead area, and bytes 8 to 192 are the payload area. OSU overheads include OSU general overheads and OSU mapping overheads.

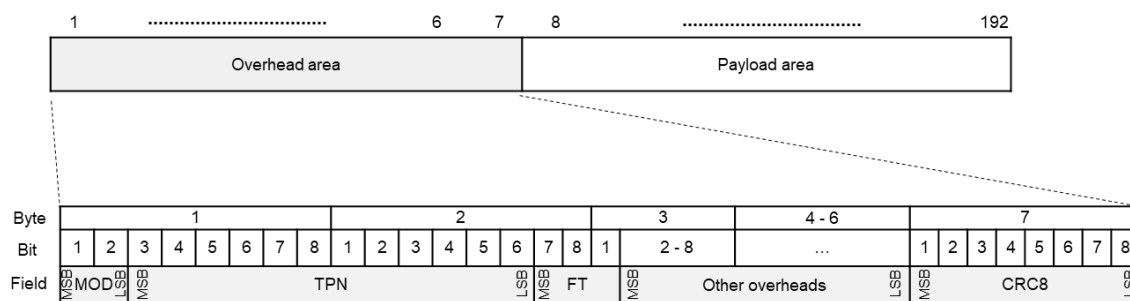


Figure 4—OSU frame format

In this standard, the transmission order of the OSU frames and overheads is from left to right, from the most significant bit (MSB) to the least significant bit (LSB). For each overhead field, the leftmost bit is the MSB, and the rightmost bit is the LSB. For the overhead fields identified by multi-frame number (for example, M32), the bit in the frame with the minimum multi-frame number is the MSB, and the bit in the frame with the maximum multi-frame number is the LSB.

5.2 OSU general overhead

5.2.1 General

There are three types of OSU general overheads: OSU section overhead (SOH), OSU tandem connection monitoring (TCM) overhead, and OSU path overhead. The SOH consists of the following three overhead fields:

- Tributary port number (TPN) overhead
- Connectivity verification (CV) overhead
- CRC8 check overhead

5.2.2 OSU section overhead (SOH)

5.2.2.1 General

The TPN, CV, and CRC8 are generated at the source end of the OSU section and terminated at the sink end of the OSU section. SOH shall be regenerated and terminated in each section that the OSU passes through.

5.2.2.2 Tributary port number (TPN)

The 12-bit TPN is located in bits 3 to 8 of byte 1 and bits 1 to 6 of byte 2. It is used to identify the relationship between the tributary port and the OSU frame.

The TPN is unique in every server layer that directly carries every OSU section. It is used to distinguish each tributary port. The value of TPN is defined in Table 1.

On the end-to-end path, TPN shall be regenerated and terminated in each section that the OSU path passes through, as shown in Figure 5.

The value of the TPN overhead field is recommended to be 0 by default before multiplexing the OSU frame into the ODU server layer. A specific TPN value shall be assigned to identify the port number when multiplexing the OSU into the ODU server layer.

Table 1—TPN value definition

Byte 1						Byte 2						Port number/function
3	4	5	6	7	8	1	2	3	4	5	6	
000000000000												Reserved
000000000001												Port 1
000000000010												Port 2
000000000011												Port 3
.....												
111110100000												Port 4000
111110100001 to 111111111110												Reserved
111111111111												Reserved for idle frame

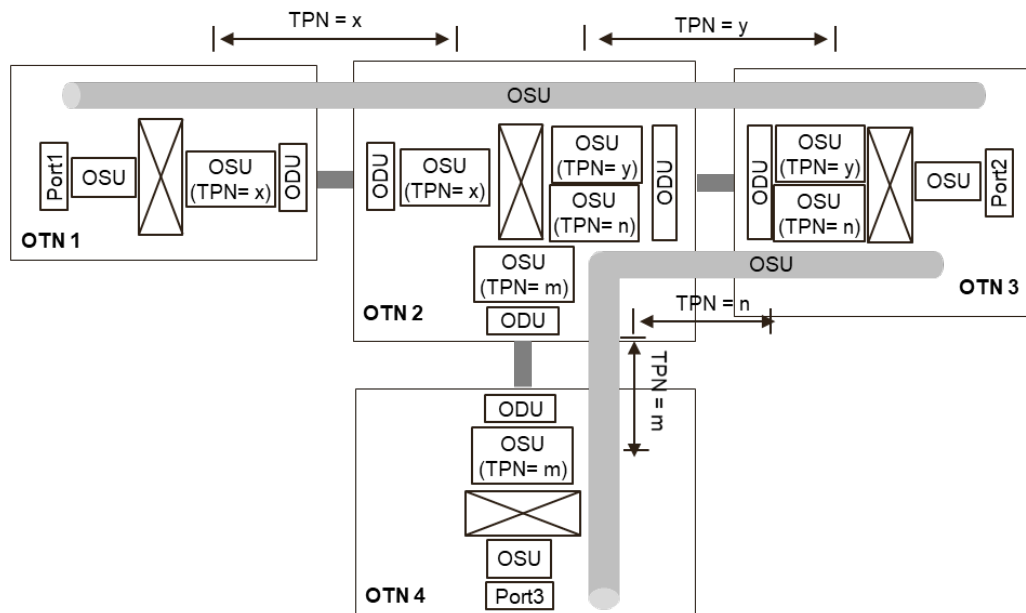


Figure 5—TPN processing example

5.2.2.3 Connectivity verification (CV)

The CV overhead is used to verify the connectivity of OSU frames in the section layer. It shall be regenerated and terminated in each section that the OSU passes through. The format is described in 5.2.5.

5.2.2.4 CRC8 overhead

The CRC8 overhead is located in bits 1 to 8 of byte 7 and is used to perform cyclic redundancy checks on the OSU frame overhead (48 bits in bytes 1 to 6). The CRC8 polynomial is $G(x) = x^8 + x^2 + x + 1$, and it shall be regenerated and terminated in each section that the OSU passes through. The details of the processing procedure are as follows:

- At the source end of each section, a CRC8 check is performed based on overhead (48 bits from bytes 1 to 6). The initial values of the 8-bit CRC8 check code are all 1s, and the CRC8 operation is performed based on the polynomial. The 8-bit check result will be generated after the CRC8 calculation is complete, and the result will be sent to the sink end of the section.
- At each sink end of the section, a CRC8 check will be performed by using the same calculation process at the source end of the section. That is, the CRC8 check will be performed based on 48-bit overhead (the bytes 1 to 6). The initial values of the 8-bit CRC8 check code are all 1s, and a CRC8 operation is performed based on the polynomial $G(x) = x^8 + x^2 + x + 1$. The 8-bit check result will be generated by performing the CRC8 calculation. The result will be compared with the received CRC8 check result. If two results are equal, it indicates that the data is correct. Otherwise, it indicates that a CRC8 error occurs in the frame, and the incorrect OSU frame will be discarded.

5.2.3 OSU tandem connection monitoring (TCM) overhead

5.2.3.1 General

TCM is used to monitor the tandem connection between the OSU nodes. The OSU can support up to two levels of TCM sections. TCM overhead fields consist of bit interleaved parity-8 (BIP8), backward defect indication (BDI), backward error indication (BEI), backward degraded defect (BDEG), delay measurement (DM), and automatic protection switching (APS). The formats are defined in 5.2.5.

5.2.3.2 Bit interleaved parity-8 (BIP8)

The range checked by BIP8 is from bytes 8 to 192 in the multi-frame payload area of consecutive 32 OSU frames. The source end performs a BIP8 check on each 32-frame multiframe to generate the BIP8 calculation result, and then inserts the BIP8 calculation result into the BIP8 overhead in the next 32-frame multiframe. The sink end performs BIP8 calculation for each 32-frame multiframe according to the same rules. Then, the sink end compares the BIP8 calculation result with the BIP8 calculation result carried in the BIP8 overhead of the next 32-frame multiframe to obtain the check and comparison result for the current 32-frame multiframe, as shown in Figure 6.

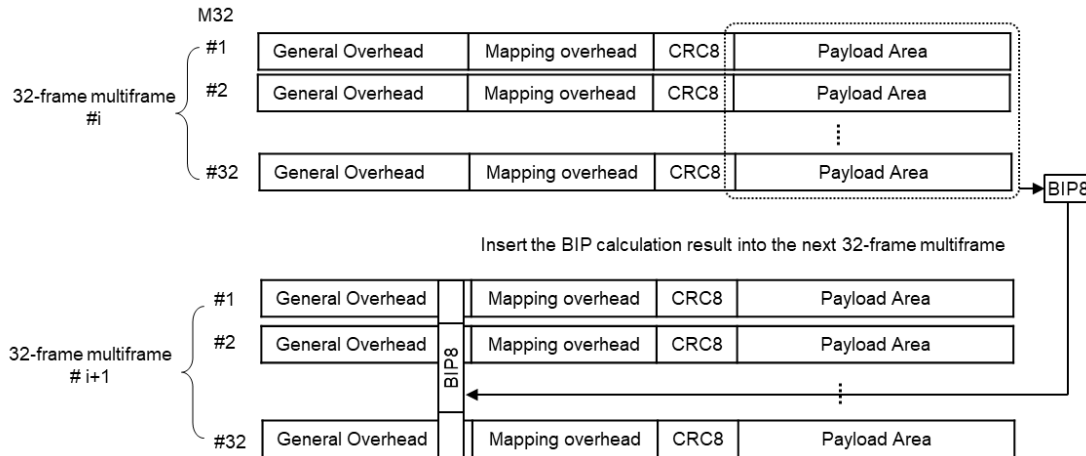


Figure 6—BIP8 calculation

5.2.3.3 Backward defect indication (BDI)

BDI is used to notify the source end of the OSU signal failure status detected in the TCM layer.

5.2.3.4 Backward error indication (BEI)

BEI is used to notify the source end of the count of OSU blocks that have been detected in error by using the BIP8 in the corresponding TCM layer.

If the BIP8 calculation result at the sink end is different from the BIP8 calculation result at the source end, bit errors exist in the current 32-frame multiframe.

If the BIP8 calculation result at the sink end is consistent with the BIP8 calculation result at the source end, the comparison result is 0. It indicates that there is no bit error in the current 32-frame multiframe.

If an incomplete 32-frame multiframe is received, the check result is recorded as 1 and processed in accordance with the presence of bit errors. Then, the check result is accumulated to the block error counter. The block error counter represents the accumulated bit errors of the 32-frame multiframe in the upstream direction. The initial value of the counter is 0.

The sink end returns the error block counter back to the source end as the backward error indication (BEI) overhead information to indicate the bit error situation in the upstream direction, and at the same time resets the error block counter to 0.

When the upstream and downstream bandwidth of the OSU that carries the packet (PKT) service are inconsistent, the block error needs to be accumulated according to the actual deviation between the upstream and downstream bandwidth. For the OSU that carries the CBR service, the upstream and downstream bandwidths of the OSU are consistent, and the block error is accumulated only once.

5.2.3.5 Backward degraded defect (BDEG)

BDEG is generated based on the BIP8 check result at the sink end, and it indicates a backward degraded defect to the source end. The BDEG collects statistics based on error blocks. The consecutive 32 OSU frames form a block. BIP8 value is calculated with the bytes 8 to 192 in the consecutive 32 OSU frames at the sink end, and it is compared with the received BIP8 value in the next period. If a bit error exists in the calculation result, the block formed by the consecutive 32 OSU frames is an errored block. Error block count is used as the basic count for the degraded defect (DEG) defect calculation. When the bit error rate (BER) at the sink

end exceeds the DEG threshold every second, a DEG defect is generated. At the same time, BDEG shall be set to 1 at the sink end to indicate DEG defect in the upstream direction to the source end. When the bit error rate at the sink end per second is lower than the DEG threshold, the sink end resets the DEG defect and returns the BDEG = 0 back to the source end. The details about the DEG threshold configuration are described in Table 7-1 of ITU-T G.806 (2012).¹²

The BDEG overhead is equivalent to the combined function of BDI + BEI. Therefore, the backward indication overhead of each OSU layer just needs to choose one from BDI + BEI and BDEG.

5.2.3.6 Delay measurement (DM)

DM is used for delay measurement in the TCM layer, and it can support one-way and two-way delay measurement.

One-way delay measurement requires time synchronization between the source end and the sink end. For details about the synchronization, please refer to ITU-T G.8275.1 and ITU-T G.709. Measurement is performed by recording the transmitting timestamp (T1) at the source end and the receiving timestamp (T2) at the sink end, as shown in Figure 7.

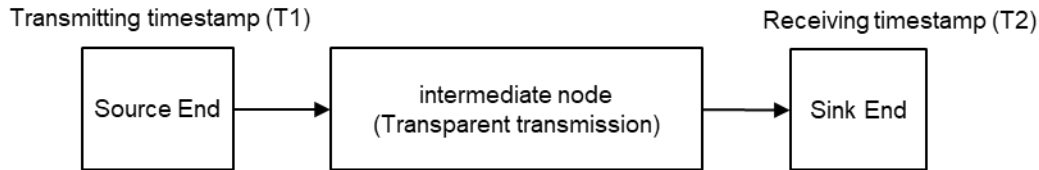


Figure 7—One-way delay measurement

The one-way delay between the source and the sink end is calculated by Equation (1).

$$\text{Delay}_{\text{one-way}} = T2 - T1 \quad (1)$$

where

- $\text{Delay}_{\text{one-way}}$ is the one-way delay between the source and the sink end
- $T1$ is the transmitting timestamp at the source end
- $T2$ is the receiving timestamp at the sink end

Two-way delay measurement does not require time synchronization between the source end and the sink end. The source end sends the request information of DM measurement, and performs measurement by recording the transmitting timestamp (T1) at the source end, the receiving timestamp (T2) at the sink end, the transmitting timestamp (T3) at the sink end, and the receiving timestamp (T4) at the source end. The intermediate node transparently transmits the DM measurement information. After receiving the DM information, the sink end loops back to the source end and inserts the residence time at the sink end, as shown in Figure 8.

¹² Information on references can be found in Clause 2.

Record the transmitting timestamp T1 and the receiving timestamp T4

Loopback DM and insert residence time

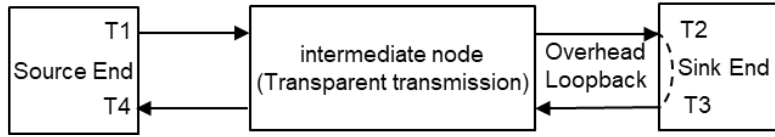


Figure 8—Two-way delay measurement

The residence time is calculated by Equation (2).

$$T_r = T3 - T2 \quad (2)$$

where

- T_r is the residence time at the sink end
- $T2$ is the receiving timestamp at the sink end
- $T3$ is the transmitting timestamp at the sink end

The source end obtains the two-way delay by Equation (3).

$$\text{Delay}_{\text{two-way}} = T4 - T1 - T_r \quad (3)$$

where

- $\text{Delay}_{\text{two-way}}$ is the one-way delay between the source and the sink end
- $T1$ is the transmitting timestamp at the source end
- $T4$ is the receiving timestamp at the source end
- T_r is the residence time at the sink end

5.2.3.7 Automatic protection switching (APS)

APS is used to transmit the automatic protection switching protocol in the TCM layer, including request/status, protection type, request signal, and bridge signal. For details, please refer to ITU-T G.873.1.

5.2.4 OSU path overhead

5.2.4.1 General

OSU path overheads include path monitoring (PM), mode configuration (MOD), and frame type (FT).

5.2.4.2 Path monitoring (PM)

5.2.4.2.1 General

PM is used to monitor the end-to-end path of OSU, including trail trace identifier (TTI), BIP8, BDI, BEI, BDEG, DM, and APS. The formats are defined in 5.2.5. The definitions of these overheads are given in 5.2.4.2.2 and 5.2.4.2.3.

5.2.4.2.2 Trail trace identifier (TTI)

The trail trace identifier (TTI) is defined as a 32-byte string for trail tracing. It consists of the source access point identifier (SAPI) and the destination access point identifier (DAPI), which are consistent with the first 32 bytes of the TTI defined in ITU-T G.709.

5.2.4.2.3 Other overheads

The functions of BIP8, BDI, BEI, BDEG, DM, and APS are consistent with those described in 5.2.3.

5.2.4.3 Mode configuration (MOD)

The OSU mode configuration is located in bits 1 and 2 of byte 1. It can be flexibly configured as the OSU frame mode identifier. Based on the unified 192-byte frame size, unified section overhead processing (TPN processing), and unified mapping and multiplexing procedure, PM and TCM can be extended and customized as required. In this document, two modes are defined: single-frame mode (SFM, set to 01) and multi-frame mode (MFM, set to 00).

NOTE—Deploy the single-frame mode or multi-frame mode in accordance with the requirements of network applications.¹³

5.2.4.4 Frame type (FT)

The FT is located in bits 7 to 8 of byte 2 and bit 1 of byte 3 with a length of 3 bits to identify the frame type. FT types are defined in Table 2. The OSU frame type is defined in 5.4.

Table 2—Frame type (FT) definition

Bit 1	Bit 2	Bit 3	Frame types ^a
000			PKT frame
001			PRBS test frame (for SFM) PKT extension frame (for MFM)
010			CBR data frame
011			VC-n frame (for SFM) CBR extension frame (for MFM)
100			Keep active frame
101			Client fault frame
110			Maintenance status frame
111			OAM frame

^a When OSU data frames, data extension frames, client fault frames, maintenance status frames, keep-active frames, OAM frames, and PRBS test frames are mapped into OSTU at the source end of the section layer, TPN, CV, and CRC8 overheads are generated.

¹³ Notes in text, tables, and figures of a standard are given for information only and do not contain requirements needed to implement this standard.