

4A.2 ONU-specific PICS

4A.2.1 Implementation identification

ONU Supplier ¹	
Contact point for enquiries about the PICS ¹	
Implementation Name(s) and Version(s) ^{1,3}	
Other information necessary for full identification, e.g., name(s) and version(s) for machines and/or operating systems; System Name(s) ²	
NOTE 1—Required for all implementations.	
NOTE 2—May be completed as appropriate in meeting the requirements for the identification.	
NOTE 3—The terms <i>Name</i> and <i>Version</i> should be interpreted appropriately to correspond with a supplier's terminology (e.g., Type, Series, Model).	

4A.2.2 Protocol summary

Identification	per Table 5-1, ONU-specific requirements
Identification of amendments and corrigenda to this PICS proforma that have been completed as part of this PICS	
Have any Exception items been required?	<input type="checkbox"/> <input type="checkbox"/> No <input type="checkbox"/> <input type="checkbox"/> Yes
(See 3.7; the answer Yes means that the implementation of the given EPON ONU does not conform to IEEE Std 1904.4 requirements.)	

Date of Statement	
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4A.2.3 ~~REPORT MPCP format~~

Item	Description	Subclause	Value/Comment	Status	Support
U-RF0a	Implements REPORT MPCP format	Table 5-1	ONU implements REPORT MPCP format per [REDACTED]	M	<input type="checkbox"/> <input type="checkbox"/> Yes
U-RF0b	REPORT MPCP format	[REDACTED]	REPORT MPCPDU conforms to the structure shown in Figure 8-5.	M	<input type="checkbox"/> <input type="checkbox"/> Yes

Item	Description	Subclause	Value/Comment	Status	Support
U-RF1	Queue-Set count (ONU)		REPORT MPCPDU contains between 1 and 4 Queue-Sets.	M	[] [] Yes
U-RF2a	Queue-count per Queue-Set		Single queue per Queue-Set. Report-bitmap field contains 0x01.	M	[] [] Yes
U-RF2b	Queue-#n-Report field count		All Queue-Sets contain a single Queue-#n-Report field.	M	[] [] Yes
U-RF3	Ordering Queue-#n-Reports		Reported-queue-length values for Queue-#n is cumulative.	M	[] [] Yes
U-RF5	Threshold T_i crossing		When there is not enough data to cross the next threshold T_i , then the reported values r_{i+1} through r_n are not included in the REPORT MPCPDU.	\emptyset	[] [] Yes [] [] No

4A.2.4 Report queue length calculation

Item	Description	Subclause	Value/Comment	Status	Support
U-RLC0	Implements report queue length calculation	Table 5-1	ONU implements report queue length calculation per [REDACTED]	M	[] [] Yes

4A.2.5 Queue service discipline

Item	Description	Subclause	Value/Comment	Status	Support
U-QSD0	Implements queue service discipline	Table 5-1	ONU implements queue service discipline per [REDACTED]	M	[] [] Yes

Item	Description	Subclause	Value/Comment	Status	Support
U-GLID3a	Reporting GLID queue length	8.5.3	For the GLID, the ONU reports the sum of upstream queue lengths of all LLIDs that are members of the given GLID at the moment of REPORT MPCPDU generation.	U-GLID0:M	[] Yes
U-GLID3b	Reporting GLID queue length in excess of maximum reportable value	8.5.3	If the sum of queue lengths exceeds the maximum reportable value of 2^{24} EQ (approximately, 134 Mbytes), the ONU reports the value of 2^{24} EQs.	U-GLID0:M	[] Yes
U-GLID4	Time of generation of envelope descriptors	8.5.3.1	The MPCP client generates the envelope descriptors not earlier than the grant cut-off time, as defined in 8.4.1.6.	U-GLID0:M	[] Yes
U-GLID5a	Priority scheduling, number of fragments when Fragmentation flag is set to one	8.5.4.1	If the Fragmentation flag in the corresponding GLID EnvAlloc is set to one, the GLID grant contains at most one new fragment, which would be in the last frame in the GLID grant.	U-GLID0:M	[] Yes
U-GLID5b	Priority scheduling, number of fragments when Fragmentation flag is set to zero	8.5.4.1	If the Fragmentation flag is set to zero, no new frames are fragmented.	U-GLID0:M	[] Yes
U-GLID6	Strict priority scheduling, frame in progress when Fragmentation flag is set to zero	8.5.4.2	If the Fragmentation flag is set to 0, the current frame is allowed to complete its transmission before the higher priority frame starts its transmission.	U-GLID0:M	[] Yes
U-GLID7	EQ-based proportional (weighted) sharing, work conservation	8.5.4.3	The ONU does not leave any portions of the GLID grant unutilized if there is any data (frames or frame fragments) available in any of the upstream queues belonging to member LLIDs.	U-GLID0:M	[] Yes

4A.2.22 Upstream Transmission

<u>Item</u>	<u>Description</u>	<u>Subclause</u>	<u>Value/Comment</u>	<u>Status</u>	<u>Support</u>
<u>U-USTC0</u>	<u>Support upstream transmission</u>	<u>5.3</u>	<u>ONU implements upstream transmission per 8.4.</u>	<u>M</u>	<u>[] Yes</u>
<u>U-USTC1a</u>	<u>REPORT MPCPDU generation</u>	<u>8.4.1.5.1</u>	<u>ONU does not generate more REPORT MPCPDUs than it is able to transmit in a given PLID envelope</u>	<u>M</u>	<u>[] Yes</u>

<u>Item</u>	<u>Description</u>	<u>Subclause</u>	<u>Value/Comment</u>	<u>Status</u>	<u>Support</u>
<u>U-USTC1b</u>	<u>Generate at least one REPORT MPCPDU</u>	<u>8.4.1.5.3</u>	<u>If ForceReport flag is asserted, the ONU generates at least a single REPORT MPCPDU in the corresponding PLID envelope</u>	<u>M</u>	<u>[] Yes</u>
<u>U-USTC2</u>	<u>GATE MPCPDU sequence</u>	<u>8.4.1.6</u>	<u>ONU MPCP client uses criteria per 8.4.1.6 to determine that the sequence of GATE MPCPDUs pertaining to a given grant has concluded and that it should generate a set of envelope descriptors for the given grant</u>	<u>M</u>	<u>[] Yes</u>
<u>U-USTC3a</u>	<u>Queue state reporting</u>	<u>8.4.2</u>	<u>For each LLID, the ONU reports a single value that represents the total queue length, including the associated framing overhead, i.e., the minimum IPG and frame preambles</u>	<u>M</u>	<u>[] Yes</u>
<u>U-USTC3b</u>	<u>Reporting real-time queue lengths</u>	<u>8.4.2.2</u>	<u>ONU reports real-time queue length for all LLIDs at the moment when the REPORT MPCPDUs are generated</u>	<u>M</u>	<u>[] Yes</u>
<u>U-USTC3c</u>	<u>Multi-PDU reporting</u>	<u>8.4.2.3</u>	<u>ONU generates multiple REPORT MPCPDUs when it is necessary to report the queue lengths of more than seven LLIDs and if the corresponding PLID envelope length allows it</u>	<u>M</u>	<u>[] Yes</u>
<u>U-USTC3d</u>	<u>LLID reporting priorities, use of remaining slots in REPORT MPCPDUs</u>	<u>8.4.2.5</u>	<u>ONU uses the remaining slots in the REPORT MPCPDUs for gratuitous LlidStatus reports after generating the mandatory LlidStatus reports</u>	<u>M</u>	<u>[] Yes</u>
<u>U-USTC3e</u>	<u>LLID reporting priorities</u>	<u>8.4.2.5</u>	<u>ONU generates the gratuitous reports according to the reporting priority shown in Table 8-1</u>	<u>M</u>	<u>[] Yes</u>
<u>U-USTC4a</u>	<u>Order of envelopes in a burst</u>	<u>8.4.3.1</u>	<u>ONU generates the upstream envelopes following the order of EnvAlloc[i] fields in each GATE MPCPDU</u>	<u>M</u>	<u>[] Yes</u>
<u>U-USTC4b</u>	<u>Frame fragmentation in upstream direction</u>	<u>8.4.3.2</u>	<u>ONU implements a segmentation function</u>	<u>M</u>	<u>[] Yes</u>
<u>U-USTC4c</u>	<u>Envelope fill</u>	<u>8.4.3.2.2</u>	<u>If the Fragmentation flag is set to 1 and the upstream queue contains sufficient amount of data, the ONU fills the allocated envelope completely</u>	<u>M</u>	<u>[] Yes</u>
<u>U-USTC4d</u>	<u>No ECH transmission</u>	<u>8.4.3.2.2</u>	<u>ONU does not send the Envelope Continuation Header (ECH) in the last EQ in the envelope</u>	<u>M</u>	<u>[] Yes</u>
<u>U-USTC4e</u>	<u>ECH deferral</u>	<u>8.4.3.2.2</u>	<u>ONU defers the ECH to the next envelope for the same LLID, and fill the last EQ with the idle code</u>	<u>M</u>	<u>[] Yes</u>
<u>U-USTC4f</u>	<u>Do not fragment new frames</u>	<u>8.4.3.2.2</u>	<u>ONU does not fragment new frames when the Fragmentation flag for the given envelope is set to zero</u>	<u>M</u>	<u>[] Yes</u>

<u>Item</u>	<u>Description</u>	<u>Subclause</u>	<u>Value/Comment</u>	<u>Status</u>	<u>Support</u>
<u>U-USTC4g</u>	<u>Do not fragment MPCPDUs</u>	<u>8.4.3.2.2</u>	<u>ONU does not fragment MPCPDU frames, regardless of the value of the <code>Fragmentation</code> flag in the <code>EnvAlloc</code> structure that allocates a PLID envelope</u>	<u>M</u>	<u>[] Yes</u>
<u>U-USTC4h</u>	<u>Frame fragment transmission priority</u>	<u>8.4.3.3</u>	<u>Frame fragment is transmitted at the earliest opportunity and ahead of any later-arriving frame</u>	<u>M</u>	<u>[] Yes</u>
<u>U-USTC5a</u>	<u>REPORT MPCPDU suppression</u>	<u>8.4.4.1</u>	<u>ONU does not generate and transmit any REPORT MPCPDUs if all of the conditions per 8.4.4.1 are true</u>	<u>M</u>	<u>[] Yes</u>
<u>U-USTC5b</u>	<u>PLID envelope suppression</u>	<u>8.4.4.1</u>	<u>ONU does not transmit the PLID envelope in the upstream burst if the REPORT MPCPDUs are suppressed</u>	<u>M</u>	<u>[] Yes</u>
<u>U-USTC5c</u>	<u>Upstream burst suppression</u>	<u>8.4.4.2</u>	<u>ONU suppresses the entire upstream burst if the conditions are met for the REPORT MPCPDU suppression per 8.4.4.1 and all other LLIDs (if there are any) allocated within the same grant have no data to transmit</u>	<u>M</u>	<u>[] Yes</u>

4A.3 OLT-specific PICS

4A.3.1 Implementation identification

OLT Supplier ¹	
Contact point for enquiries about the PICS ¹	
Implementation Name(s) and Version(s) ^{1,3}	
Other information necessary for full identification, e.g., name(s) and version(s) for machines and/or operating systems; System Name(s) ²	
NOTE 1—Required for all implementations.	
NOTE 2—May be completed as appropriate in meeting the requirements for the identification.	
NOTE 3—The terms <i>Name</i> and <i>Version</i> should be interpreted appropriately to correspond with a supplier's terminology (e.g., Type, Series, Model).	

4A.3.2 Protocol summary

Identification	per Table 5-1, OLT-specific requirements
Identification of amendments and corrigenda to this PICS proforma that have been completed as part of this PICS	
Have any Exception items been required?	<input type="checkbox"/> No
	<input type="checkbox"/> Yes
(See 3.7; the answer Yes means that the implementation of the given EPON ONU does not conform to IEEE Std 1904.4 requirements.)	

Date of Statement	
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4A.3.3 ~~REPORT MPCP format~~

Item	Description	Subclause	Value/Comment	Status	Support
T-RF0	Implements <i>REPORT MPCPDU</i> format	Table 5-1	OLT implements <i>REPORT MPCPDU</i> format per [REDACTED]	M	[] Yes
T-RF1	Queue Set count (OLT)	[REDACTED]	OLT accepts a <i>REPORT MPCPDU</i> with the number of Queue Sets between 1 and 4.	M	[] Yes

Item	Description	Subclause	Value/Comment	Status	Support
T-RF2	Queue count per Queue Set (OLT)		OLT accepts <i>REPORT</i> MPCPDUs with a single queue per Queue Set.	M	[] Yes
T-RF3	Minimum size of a queue threshold		Minimum size of a queue threshold is not less than the maximum frame size that may be encountered in the given queue.	M	[] Yes

4A.3.44A.3.3 OLT transceiver status monitoring

Item	Description	Subclause	Value/Comment	Status	Support
T-TSM0a	Implements OLT transceiver status monitoring	Table 5-1	OLT implements OLT transceiver status monitoring per 9.1.3.	M	[] Yes
T-TSM0b	Implementation of OLT transceiver status monitoring	9.1.3	Via SFF-8472- and SFF-8077i-compliant interfaces.	M	[] Yes
T-TSM1	Management and measurement methodology	9.1.3	Management, threshold crossing events, fault diagnostics, and performance prediction functions per DPoE-SP-OAM.	M	[] Yes
T-TSM2	Optical transceiver temperature monitoring	9.1.3.1	OLT supports the measurement of temperature of the optical transceiver, with the measured value represented in the format of a 16-bit signed two's-complement value, with the LSB equal to 1/256 °C, covering the range of -40 °C to +125 °C.	M	[] Yes
T-TSM3	Optical transceiver supply voltage monitoring	9.1.3.2	OLT supports the measurement of supply voltage of the optical transceiver, with the measured value represented in the format of a 16-bit signed two's-complement value, with the LSB equal to 100 μV, covering the range of 0 to +6.55 V.	M	[] Yes
T-TSM4	Optical transmitter bias current monitoring	9.1.3.3	OLT supports the measurement of the bias current of the optical transmitter, with the measured value represented in the format of a 16-bit signed two's-complement value, with the LSB equal to 2 μA, covering the range of 0 to +131 mA.	M	[] Yes
T-TSM5	Optical transmitter output power monitoring	9.1.3.4	OLT supports the measurement of the output power of the optical transmitter, with the measured value is represented in the format of a 16-bit signed two's-complement value, with the LSB equal to 0. μW, covering the range of 0 to +6.5535 mW (~-40 to +8.2 dBm).	M	[] Yes

Item	Description	Subclause	Value/Comment	Status	Support
T-LPTE7	Link monitoring	9.3.4.3.1	Monitor the status of the optical line (i.e., working LLIDs)	T-LPTE0:M	[] Yes
T-LPTE8	NMS notification	9.3.4.3.1	Notify the NMS about the detected line failure condition(s) and the line switch event for a particular ONU	T-LPTE0:M	[] Yes
T-LPTE9a	OLT state diagram instantiation, primary ONU PON port	9.3.4.5	An instance of the state diagram defined in Figure 9-16.a is associated with the primary PON port of each connected ONU	T-LPTE0:M	[] Yes
T-LPTE9b	OLT state diagram instantiation, backup ONU PON port	9.3.4.5	An instance of the state diagram defined in Figure 9-16.b is associated with the backup PON port of each connected ONU	T-LPTE0:M	[] Yes

4A.2.23 Downstream Transmission

<u>Item</u>	<u>Description</u>	<u>Subclause</u>	<u>Value/Comment</u>	<u>Status</u>	<u>Support</u>
<u>T-DSTC0</u>	<u>Support downstream transmission</u>	<u>5.3</u>	<u>OLT implements downstream transmission per 8.3.</u>	<u>M</u>	<u>[] Yes</u>
<u>T-DSTC1</u>	<u>Frame fragmentation in downstream direction</u>	<u>8.3.2</u>	<u>OLT does not fragment any data frames transmitted in the downstream direction</u>	<u>M</u>	<u>[] Yes</u>

4A.2.24 Upstream Transmission

<u>Item</u>	<u>Description</u>	<u>Subclause</u>	<u>Value/Comment</u>	<u>Status</u>	<u>Support</u>
<u>T-USTC0</u>	<u>Support upstream transmission</u>	<u>5.3</u>	<u>OLT implements upstream transmission per 8.4.</u>	<u>M</u>	<u>[] Yes</u>
<u>T-USTC1a</u>	<u>PLID EnvLength value</u>	<u>8.4.1.5.1</u>	<u>OLT sets the length of PLID envelope to $10 \times N_R + 1$ (EQs), where N_R is the desired number of the REPORT MPCPDUs</u>	<u>Q</u>	<u>[] Yes</u> <u>[] No</u>
<u>T-USTC1b</u>	<u>Missing REPORT MPCPDUs</u>	<u>8.4.1.5.3</u>	<u>The OLT does not count a REPORT MPCPDU as missing and does not increment the MissedReportCount variable if it did not receive a REPORT MPCPDU in a PLID envelope and the corresponding envelope allocation had ForceReport flag set to 0</u>	<u>M</u>	<u>[] Yes</u>

<u>Item</u>	<u>Description</u>	<u>Subclause</u>	<u>Value/Comment</u>	<u>Status</u>	<u>Support</u>
<u>T-USTC1c</u>	<u>Multi-PDU grant</u>	<u>8.4.1.6</u>	<u>OLT sends GATE MPCPDUs that allocate envelopes for the same grant with the same StartTime value, which is the time at which the ONU is expected to transmit the first envelope header in a burst (i.e., the ESH immediately following the SBD)</u>	<u>M</u>	<u>[] Yes</u>
<u>T-USTC2a</u>	<u>Frame reassembly</u>	<u>8.4.3.2</u>	<u>OLT implements a frame reassembly function</u>	<u>M</u>	<u>[] Yes</u>
<u>T-USTC2b</u>	<u>Reassembly buffer depth</u>	<u>8.4.3.2.1</u>	<u>Reassembly buffer is able to accommodate at least one maximum-size frame that may be encountered on the given LLID</u>	<u>M</u>	<u>[] Yes</u>
<u>T-USTC2c</u>	<u>Fragmentation flag clear</u>	<u>8.4.3.2.1</u>	<u>OLT clears the Fragmentation flags with enough headroom remaining in the reassembly buffers to accommodate the frame fragments that still may be pending in the ONUs or are in-flight</u>	<u>M</u>	<u>[] Yes</u>
<u>T-USTC2d</u>	<u>Frame loss</u>	<u>8.4.3.2.1</u>	<u>OLT does not sustain frame loss due to overflow of the reassembly buffers</u>	<u>M</u>	<u>[] Yes</u>
<u>T-USTC3a</u>	<u>Overlapping polling grants</u>	<u>8.4.4.3</u>	<u>Overlapping polling grants have the PLID ForceReport flag set to 0</u>	<u>M</u>	<u>[] Yes</u>
<u>T-USTC3b</u>	<u>Upstream collision handling</u>	<u>8.4.4.3</u>	<u>When the OLT detects a collision, it stops issuing the overlapping polling grants and instead polls all idle ONUs individually</u>	<u>M</u>	<u>[] Yes</u>
<u>T-USTC3c</u>	<u>Shared GATE MPCPDUs generation</u>	<u>8.4.4.4</u>	<u>A shared GATE includes envelope allocation only for the multicast PLID that has been provisioned into each ONU in a given multicast group</u>	<u>M</u>	<u>[] Yes</u>
<u>T-USTC3d</u>	<u>Shared GATE MPCPDUs suppression</u>	<u>8.4.4.4</u>	<u>If the OLT detects a collision in a polling grant, it stops issuing the shared GATE MPCPDUs and it handles the collision as described in 8.4.4.3.</u>	<u>M</u>	<u>[] Yes</u>