Layered Parameters

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Note:
"All layers" in the **Layers** column means that every layer defined in the SD1-17 supporting document could be used.
"All connectionless layers" in the **Layers** column means that LR_RPR, LR_Ethernet, LR_DVB or LR_IPTV as defined in the SD1-17 supporting document could be used.

Note:
The term "CPTP" is used for CTP, PTP or FTP playing the role of a Connectionless Port.
The term "FP" is used for CTP playing the role of a Flow Point.

Note:
A grouping of parameters (i.e., either all parameters or no parameter in this group exist) is indicated via a specific background colour.

Enhancements and corrections wrt Version 3.0 are identified as blue marked text.

1 Generally Applicable Parameters

ParameterName	Layers	Objects/ Terms	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"AddedForConfigurationOnly"	All layers	TP playing role of CPTP	"true", "false"	no	EMS		This parameter indicates whether this layer (the layer of the containing ConnectionlessParameters) is a regular layer or a layer existing only for configuration purposes. Example: A CPTP can have Ethernet layer parameters although the Ethernet layer is not encapsulated in the CPTP.
"AddedForMonitoringOnly"	All layers		"True", "False"	no	EMS		This parameter will indicate whether this layer (the layer of the containing TransmissionParameters/LayeredParameters) is a regular layer or a layer existing only for monitoring purposes. For an example refer to Figure 2: "Parameters associated to a 2 Mbit/s Port" contained in SD1-19 supporting document.
"AlarmReporting"	All layers		"On", "Off"	yes	EMS & NMS		Identifies if alarm reporting from the ME to the EMS is enabled for the TP at the layer specified. Setting this parameter is best-effort.As for all other parameters, this parameter is settable on a per layer basis.However, if the EMS does not support this granularity, it is acceptable for the EMS to turn on or off alarm reporting for all the layers of the TP regardless of the layer at which the parameter is applied. It is also acceptable for the EMS to turn on or off alarm reporting for the contained CTPs, if the ME does not support finer granularity.
"ASAPPointer"	All layers		String	yes	EMS & NMS **only** via assign / deassignASAP() operations		This parameter contains the names of the assigned ASAPs. No name means no ASAP is attached to the TP for this layer rate.

ParameterName	Layers	Objects/ Terms	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"ClientConnectivity"	All layers		"NotConnectable", "Connected", "NotSet"	yes	EMS		Present on TPs whose direct client TPs can be or are fixed cross-connected. Parameter not present means, the TP do not support fixed multiplexing at all. "Connected" means, the TP is currently multiplexing, i.e. all its client TPs are cross-connected in a fixed way. "NotConnectable" means, none of its client TPs are involved in fixed cross connects and can't be cross-connected. "NotSet" means, the TP is currently in no mode. None of its client TPs are cross-connected in a fixed way and nothing prevents this from happen. In case the client TPs of the TP are permanently involved in fixed cross connect (hard-wired), clientConnectivity will be locked in state "Connected". The EMS should reject cross connect creation involving the TP itself or any of its client TPs. For example, if clientConnectivity of the TP is set to "NotSet" and the TP is getting cross-connected, this may set the clientConnectivity to "Connected". If clientConnectivity is set to "NotSet" and the TP is getting cross-connected at a direct client layer, this sets the TP in a non multiplexing mode (clientConnectivity will be set to "NotConnectable").
"ClientType"	DSR layers and OCH and ODUk layer		"ATM", "IP", "SONET", "SDH", "HYBRID", "BB" (for Broadband), "GBE" (Giga-Bit Ethernet)	yes	EMS & NMS		ClientType indicates the type of client signal being transmitted via the DWDM Optical Channel or via the radio topological link. Broadband client is a client signal capable of transmitting a range either in the High Speed Broadband (HSBB) signals for 100 Mb/s to Gb/s signals; or Low Speed Broadband (LSBB) for 45 to 750 Mbps signals. The actual rate can be set a provisioning time. Note: Parameter is meaningless in case of OTUk client.
"ConnectionlessPort"	All layers	PTP, FTP	"true", "false"	yes	EMS		This parameter identifies the TP as a port at a connectionless matrix which is capable of supporting a connectionless client layer (e.g., external port, internal encapsulation port). Note: The clients of a Connectionless Port, i.e. Flow Points, are connected via the matrix.

ParameterName	Layers	Objects/ Terms	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"InterfaceType"	LR_Ethernet	PTP, FTP	"UNI", "NNI", "E-NNI", "I-NNI", "unconfigured"	yes	EMS		This parameter shall indicate the type of interface which is modelled by this TP. Default value is "unconfigured".
"Location"	All physical layers (PTPs and FTPs)		"[/remote_unit=1..n] [/rack=[1..n]] /shelf=[1..n] [/sub_shelf=[1..n]] /slot=[1..n] /[remote_]sub_slot=[1..n] /port=[1..n]"	no	EMS		Identifies the location of the main port of the PTP (using equipment format). This information may also be available from the PTP or FTP name, depending on the implementation of MTNM naming by the EMS.
"MaxClientRate"	DSR layers and OCH	PTP	"nnn.pp"	yes	EMS		This identifies the maximum rate that the DWDM PTP is capable of receiving. The capability may be different than the actual provisioned state. The unit of these rates are Mbps.

ParameterName	Layers	Objects/ Terms	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"PortTPRoleState"	All connection less layers	PTP, FTP, CTP	"unassigned", "assigned", "fdInternal" "fdEdge"	yes	EMS & NMS		This parameter identifies the kind of role that a Connectionless Port is "playing" for its connectionless client layer. unassigned This is the usual initial role of a Connectionless Port. In this role, the Port cannot carry any traffic. assigned An "unassigned" Connectionless Port becomes an "assigned" Connectionless Port when it is associated to a Matrix Flow Domain (MFD) via a management operation. In this role, the Port cannot carry any traffic because the MFD is not associated to a Flow Domain (FD). fdInternal An "assigned" Connectionless Port TP becomes an "fdInternal" Connectionless Port TP when its MFD is associated to a Flow Domain. An "unassigned" Connectionless Port TP becomes an "fdInternal" Connectionless Port TP when it is assigned to an MFD that is already associated to a Flow Domain. In the fdInternal role, the "potential" client Flow Points of the CPTP can be used as internal points of the route (in case auto-routing is not supported, e.g., in case of Ethernet automatic VLAN-ID registration is not supported) of a Flow Domain Fragment; i.e., can carry traffic. fdEdge An "assigned" Connectionless Port becomes an "fdEdge" Connectionless Port via a management operation. (Note: Precondition is, that the MFD is already associated to the FD). In this role, the "potential" client Flow Points of the Port can be used as edge points of a Flow Domain Fragment; i.e., can carry traffic.

ParameterName	Layers	Objects/ Terms	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"PotentialFutureSetupIndicator"	All connectable layers		"RSU_POINT_TO_POINT", "RSU_BROADCAST", "RSU_ANY_CONFIG"	no	EMS & NMS		Used to convey the likely future (or current) configuration of an SNC. For example, the NMS sets the attribute to the value "RSU_BROADCAST" to inform the EMS that the CTP is likely to participate in a broadcast connection in the future. This allows the EMS/NE to make the necessary resource provisions at the time of crossconnect creation to allow for easy future change to broadcast. For some NEs there will be no need for any particular change of configuration. In response to either "RSU_POINT_TO_POINT" or "RSU_BROADCAST", these NEs will set the value to "RSU_ANY_CONFIG" in the resulting transmission parameters. If however there is a special allocation of resources on the NE to ease the requested future potential move, the EMS should respond with the requested PotentialFutureSetupIndicator state; for example, if "RSU_BROADCAST" is requested and this does indeed cause resources additional to those for point-point to be allocated then the parameter should be set to "RSU_BROADCAST". If the NMS applies an additional SNC to a CTP that is already connected to make it a broadcast point, the EMS should not reject the request on the basis of the current state of the PotentialFutureSetupIndicator parameter of the CTP. However, the EMS may reject the request if the "tolerableImpact" value of the request can not be achieved. For example, if the NMS requests a broadcast connection, with "tolerableImpact" set to GOI_HITLESS where the existing SNC currently has a value in PotentialFutureSetupIndicator of "RSU_POINT_TO_POINT", and if traffic would be impacted to achieve the adjustment, the EMS should reject the change.

ParameterName	Layers	Objects/ Terms	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"ServerConnectivity"	All layers		"NotConnectable", "Connected", "NotSet"	yes	EMS		Present on TPs whose direct server TPs can be or are fixed cross connected. Parameter not present means, the TP do not support fixed multiplexing at all. "Connected" means, the TP is currently inverse multiplexing, i.e. all its server TPs are cross connected in a fixed way. "NotConnectable" means, none of its server TPs are involved in fixed cross connects and can't be cross-connected. "NotSet" means, the TP is currently in no mode. None of its server TPs are cross-connected in a fixed way and nothing prevents this from happen. In case the server TPs of the TP are permanently involved in fixed cross connect (hard-wired), serverConnectivity will be locked in state "Connected". The EMS should reject cross connect creation involving the TP itself or any of its server TPs. For example, if serverConnectivity of the TP is set to "NotSet" and the TP is getting cross-connected, this may set the serverConnectivity to "Connected". If serverConnectivity is set to "NotSet" and the TP is getting cross-connected at a direct server layer, this sets the TP in a non inverse multiplexing mode (serverConnectivity will be set to "NotConnectable").
"ServiceState"	All layers		"IN_SERVICE", "OUT_OF_SERVICE", "OUT_OF_SERVICE_BY_MAINTENANCE", "SERV_NA"	yes	EMS & NMS		See ServiceState_T in equipment.idl or definition of Enums::ServiceState in the IA.
"ResourceFulfillmentState"	All layers		"IN_SERVICE", "OUT_OF_SERVICE", "OUT_OF_SERVICE_BY_MAINTENANCE", "SERV_NA"	yes	EMS & NMS		Used in place of the ServiceState for the MTOSI product.
"SupportsMonitoring"	cross connectable layers		"True", "False"	no	EMS		This parameter identifies that this layer (the layer of the containing TransmissionParameters/LayeredParameters) will support non-intrusive monitoring if the termination point do not terminate the layer. Note: Its value does not change depending on the termination mode of the termination point.

ParameterName	Layers	Objects/ Terms	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"TCAParameterProfilePointer"	All layers		String	yes	EMS & NMS **only** via setTCAParameterProfilePointer() operation		This parameter contains the names of the assigned TCAParameterProfiles. No name means no TCAParameterProfile is attached to the TP at all. Changes in the value are only allowed with respect to the corresponding activity diagram and use case of the setTCAParameterProfilePointer() operation defined in the IA.
"ThisLayerActive" Note: moved from chapter 1.8 WDM specific parameters	All layers	All objects	"ACTIVE", "INACTIVE"	yes	EMS		Some TPs may have several alternative layering presentations, either due to specific configurability or due to the need to represent alternative model compatability. When there are alternative layer choices this transmission parameter is used. The parameter is provided with each of the optional/alternative layers and set to "INACTIVE" when the layer is not involved in the termination of signals and "ACTIVE" when it is involved in the termination of the signal.
"TrailTraceActualRx"	All SDH, SONET, and OTN layers where Trail Trace is specified for, and LR_PHYSICAL_MEDIALESS for radio		String (of up to 64 chars)	no	EMS	SDH : ITU-T G.783 OTN : ITU-T G.798 Microwave Radio: ITU-R F.750-4	
"TrailTraceActualTx"	All SDH, SONET, and OTN layers where Trail Trace is specified for, and LR_PHYSICAL_MEDIALESS for radio		String (of up to 64 chars)	yes	EMS & NMS	SDH : ITU-T G.783 OTN : ITU-T G.798 Microwave Radio: ITU-R F.750-4	

ParameterName	Layers	Objects/ Terms	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
“TrailTraceExpectedRx”	All SDH, SONET, and OTN layers where Trail Trace is specified for, and LR_PHYSICAL_MEDIALESS for radio		String (of up to 64 chars)	yes	EMS & NMS	SDH : ITU-T G.783 OTN : ITU-T G.798 Microwave Radio: ITU-R F.750-4	
“TrailTraceMonitor”	All SDH, SONET, and OTN layers where Trail Trace is specified for, and LR_PHYSICAL_MEDIALESS for radio		“On”, “Off”	yes	EMS & NMS	SDH : ITU-T G.783 OTN : ITU-T G.798 Microwave Radio: ITU-R F.750-4	
“TransmissionDescriptorPointer”	All layers	TP, MFD	String	yes	EMS & NMS see also restriction in comment		Name value of a layer-specific transmission descriptor. For MFD only settable via the setTransmissionDescriptorAssociation () operation. For TP, it is recommended to set the value only via the setTransmissionDescriptorAssociation () operation..
“TransmissionDescriptorState”	All layers	TP, MFD	"TMD_MISSING", "NOT_APPLICABLE", "PENDING", "APPLIED", "MISMATCH"	yes	EMS		Indicates the state of consistency between the layered parameters of the object and its associated Transmission Descriptor (TMD). See also the statechart diagram for TMDState in the UML specification.

2 Connection-oriented Technology Parameters

2.1 Parameters for Inverse Multiplexing

Editor's note: "General parameters for Inverse Multiplexing" (1.2) and "VCAT specific parameters" (1.14) are combined into "Parameters for Inverse Multiplexing".

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"AcceptedSequenceNumber"	LR_Fragment's termination function	CTP	String containing an Integer number	no	EMS	ITU-T G. 806	It indicates the received sequence number (AcSQ) recovered from H4 byte, bits 1-4 in multiframe 14 and 15 and accepted by the fragmented sink CTP. This is a read-only parameter.
"ActiveAllocationNumberRx"	LR_Fragment's and LR_LAG_Fragment's adaptation function	CTP, PTP, FTP	String containing an Integer number	yes	EMS	ITU-T G.806	It indicates the number of server layer CTPs actually carrying traffic in the receiving direction, i.e. – this reflects the current actual rate of the connection. This is a read only parameter. For example, this is the actual number of members of the virtual concatenation group as influenced by autonomous adding or deleting of members by the LCAS protocol in case of individual STS-n or VT-n failures.
"ActiveAllocationNumberTx"	LR_Fragment's and LR_LAG_Fragment's adaptation function	CTP, PTP, FTP	String containing an Integer number	yes	EMS	ITU-T G.806	Same as ActiveAllocationNumberRx but on the transmit direction. This is a read-only parameter.
"AllocatedNumber"	LR_Fragment's and LR_LAG_Fragment's adaptation function	CTP, PTP, FTP	String containing an Integer number	yes	EMS & NMS	ITU-T G.806	It indicates the number of server layer CTPs that is provisioned to carry traffic. For example, this is the number of provisioned members in the virtually concatenated group. This is a read/write parameter. Note: ActiveAllocationNumber parameter is duplicated because LCAS works unidirectional. The provisioned number of member servers (AllocatedNumber) is believed to be common to both directions (asymmetric configuration seen unlikely). If asymmetric configuration is supported by the managed element, parameters "AllocatedNumberRx" and "AllocatedNumberTx" have to be used instead. This parameter is **not** best-effort.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"AllocatedNumberRx"	LR_Fragment's and LR_LAG_Fragment's adaptation function	CTP, PTP, FTP	String containing an Integer number	yes	EMS & NMS	ITU-T G.806	It indicates the provisioned number of server layer CTPs receiving the traffic. For example, this is the number of provisioned receiving members in the virtually concatenated group. This is a read/write parameter. This parameter is **not** best-effort.
"AllocatedNumberTx"	LR_Fragment's and LR_LAG_Fragment's adaptation function	CTP, PTP, FTP	String containing an Integer number	yes	EMS & NMS	ITU-T G.806	It indicates the provisioned number of server layer CTPs transmitting the traffic. For example, this is the number of provisioned transmitting members in the virtually concatenated group. This is a read/write parameter. This parameter is **not** best-effort.
"AllocationMaximum"	LR_Fragment's and LR_LAG_Fragment's adaptation function	CTP, PTP, FTP	String containing an Integer number	no	EMS	ITU-T G.806	It indicates the maximum number of server layer CTPs that can be used to carry traffic. This value is set by the EMS based on hardware limitation, e.g. - for virtual concatenation; it indicates the maximum size of the virtual concatenated group. This is a read-only parameter.
"DynamicAllocation"	LR_Fragment's adaptation function	CTP, PTP, FTP	"LCAS", "LASR"	no	EMS		If this transmission parameter is present, it indicates that it supports dynamic bandwidth adjustments. This is a read-only parameter.
DynamicAllocationEnabled	LR_Fragment's adaptation function	CTP, PTP, FTP	"Enabled", "Disabled"	yes	EMS & NMS	LCAS: G.806	To enable or disable the operation of dynamic allocation e.g. LCAS (Link Capacity Adjustment Scheme). Note: LCAS is only applicable if Virtual Concatenation is used. The parameter is ignored if VCAT is not used. This is a read-write parameter. This parameter is **not** best-effort.
"ExpectedSequenceNumber"	LR_Fragment's termination function	CTP	String containing an Integer number	no	EMS	ITU-T G. 806	It indicates the sequence number expected by the fragmented sink CTP. This is a read-only parameter.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"FragmentServerLayer"	LR_Fragment's and LR_LAG_Fragment's adaptation function	CTP, PTP, FTP	String containing an Integer number	no	EMS		It indicates the TP server layer rate. The value shall be the integer value for the desired layer. This parameter is read-only and is not expected to change if the fragments are currently being used in an SNC.
"LCASHoTime"	LR_Fragment's adaptation function	CTP, PTP, FTP	"0"… "10000"	yes	EMS & NMS	ITU-T G.806 G.808.1	Identifies the time between a Signal Fail (SF) or Signal Degrade (SD) alarm and the start of a restoration action. This is used to account for transient failure without initiating the failure scenario. If LCAS is enabled, this parameter represents the configured hold off (HO) time measured in milliseconds. G.806: The MI_HOTime input controls whether the Hold-Off (HO) timer is enabled or disabled for the sink function and, if enabled, what the value of the timer is. If MI_HOTime = 0, the HO timer shall be disabled, if MI_HOTime ≠ 0 it shall be enabled. G.808.1: A hold-off timer is started when one or more of the SF or SD conditions in the protection group become active, and runs for a non-resettable period which is provisionable from 0 to 10 s in steps of X ms. X is 100 ms (SDH, OTN) and 500 ms (ATM).
"LCASWtrTime"	LR_Fragment's adaptation function	CTP, PTP, FTP	"0", "5"… "12"	yes	EMS & NMS	ITU-T G.806 G.808.1	Identifies the time that LCAS will wait before using a "failed" server again. If LCAS is enabled, this parameter represents the wait to restore (WTR) time measured in minutes. G.806: The MI_WTRTime input controls whether the Wait-To-Restore (WTR) timer is enabled or disabled for the sink function and, if enabled, what the value of the timer is. If MI_WTRTime = 0, the WTR timer shall be disabled, if MI_WTRTime ≠ 0 it shall be enabled. G.808.1: This period, called wait-to-restore (WTR) period, is of the order of 5-12 minutes and should be capable of being set.
"MaximumDifferentialDelay"	LR_Fragment	CTP, TP playing the role of CPTP	String containing an Integer number	no	EMS (NE)		This attribute represents the maximum differential delay (measured in micro-seconds) currently observed between any two pairs of fragment CTPs. Specific values may be used to indicate that actual conditions do not permit valid reporting (e.g., -1), or that the maximum permitted differential delay is exceeded (e.g., -2).
"PayloadCarryingRx"	LR_Fragment's termination function	CTP	"True", "False"	yes	EMS		Indication whether the given fragment is currently active and carrying payload. This is a read-only parameter.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"PayloadCarryingTx"	LR_Fragment's termination function	CTP	"True", "False"	yes	EMS		Indication whether the given fragment is currently active and carrying payload. This is a read-only parameter.
"SentSequenceNumber"	LR_Fragment's termination function	CTP	String containing an Integer number	no	EMS	ITU-T G. 806~~783~~	It indicates the sequence number sent by the fragmented source CTP. This is a read-only parameter.
"VCAT"	LR_Fragment's adaptation function	CTP, PTP, FTP	"enabled", "disabled"	yes	EMS & NMS	G.707 ITU-T G.783	Indicates if Virtual Concatenation (VCAT) is enabled or not. The value disabled can only appear in case there is only one server layer link connection. This parameter is **not** best-effort. Note: The existence of this parameter in a TP identifies that the TP is able to provide VCAT; i.e. in this case the LR_Fragment has to be supported by the TP.

2.2 SDH/SONET/PDH specific parameters

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"CircuitIdentifier"	All SDH, SONET, and PDH layers	PTP	String	no	EMS & NMS	RFC-3895, 3896 (9/2004)	This variable contains the transmission vendor's circuit identifier, for the purpose of facilitating troubleshooting.
"CosetEnabled"	All PDH layers	PTP	"no", "yes"	yes	EMS & NMS	ITU I.432.x	"Yes" signifies that the ATM Forum polynomial (coset polynomial) be added to HEC before the HEC verification of a received cell.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"FDL"	All PDH layers	PTP	"other", "ansiT1403", "att54016", "fdlNone"	yes	EMS & NMS	RFC-3895 (9/2004)	This describes the use of the facilities data link, and is the sum of the capabilities.
"FrameFormat"	All SDH, SONET, PDH and DSL layers	PTP	"other" -- "unframed" many signals "sf" DS1 or E1 superframe "esf" DS1 or E1 extended superframe "d4" DS1 "t1dm" DS1 "zbtsi" DS1 "dlc13" DS1 "dlc16" DS1 "slc96" DS1 "ds2M12" DS2 "m13" DS3 "cbit" DS3 "m23" DS3 "syntran" DS3 "clearChannel" DS3 "e1" E1 "e1CRC" E1 "e1MF" E1 "e1CRCMF" E1 "e1Unframed" E1 "e2" E2 "framed" E3 "plcp" E3 "async" VC11_VT1.5, VC12_VT2 "bytesync" VC11_VT1.5, VC12_VT2	yes	EMS & NMS	DS1, E1, DS2, E2: RFC-3895 (9/2004) DS3, E3: RFC-3896 (9/2004)	Legal values depend on the layer rate. DS1, E1, DS2, E2: This variable indicates the Line implementing this circuit. The type of circuit affects the number of bits per second that the circuit can reasonably carry, as well as the interpretation of the usage and error statistics. DS3 C-bit, E3: This variable indicates the application implementing this interface. The type of interface affects the interpretation of the usage and error statistics. The rate of DS3 is 44.736 Mbps and E3 is 34.368 Mbps. The dsx3ClearChannel value means that the C-bits are not used except for sending/receiving AIS.
"HECCorrectionEnabled"	All PDH layers	PTP	"no", "yes"	yes	EMS & NMS	ITU I.432.x	"Yes" enables correction of cells received with a single-bit error in the HEC.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"LineCode"	All SDH, SONET, and PDH layers		"ami" DS1 "amizcs" DS1 "b8zs" DS1 "b3zs" DS3 "cmi" DS3 "bit7" DS1 "cchan" many "hdb3" E1 "rz" "nrz"	yes	EMS & NMS		
"LineBuildOut"	All PDH layers	PTP	"notApplicable", "neg75dB", "neg15dB", "neg225dB", "zerodB"	yes	EMS & NMS	RFC-3895 (9/2004)	Attenuation setting for T1 framer in long haul (CSU) mode.
"LineLength"	All PDH layers	PTP	"0" … "64000"	yes	EMS & NMS	RFC-3895, 3896 (9/2004)	The length of the DS1/DS3 line in meters. This objects provides information for line build out circuitry. This object is only useful if the interface has configurable line build out circuitry.
"LineStatusChangeTrapEnable"	All PDH layers	PTP	"enabled", "disabled"	yes	EMS & NMS	RFC-3895, 3896 (9/2004)	Indicates whether Line Status Change traps should be generated for this interface.
"Mapping"	All SDH, SONET, and PDH layers		"intact", "async", "ds3_1", "vtfloat"	yes	EMS & NMS		The transmux feature allows the provisioning of a SONET logical TP (STS1 CTP) to carry a DS1 channelized asynchronous DS3 signal.
"PCMMode"	All PDH layers	PTP	"isdn", "clearChannel"	yes	EMS & NMS	ITU I.432.x	Number of active channels in PCM highway: ▪ isdn - use 23 channels to carry the cells ▪ clear channel - use 24 channels to carry the cells.
"RxCellPayloadDescrambleDisabled"	All SDH/SONET layers	PTP	"no", "yes"	yes	EMS & NMS	ANSI T1.105.06	
"RxDescrambleDisabled"	All SDH/SONET layers	PTP	"no", "yes"	yes	EMS & NMS	ANSI T1.105.06	
"ScramblingEnabled"	All PDH layers	PTP	"no", "yes"	yes	EMS & NMS	ITU I.432.x	"yes" enables the descrambling of received cells on the link. The payload of transmitted cells is scrambled.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"SDH_SONET_SS_BITS"	SDH/SONET MS layers		"SDH", "SONET", "HYBRID"	yes	EMS		For Network Elements that can not handle SONET and SDH LRs interchangeably, this parameter indicates the service type that is provisioned.
"SendCode"	All PDH layers	PTP	"sendNoCode", "sendLineCode", "sendPayloadCode", "sendResetCode", "sendQRS", "send511Pattern", "send3in24Pattern", "sendOtherTestPattern", "sendDS1LoopCode", "sendTestPattern"	yes	EMS & NMS	RFC-3895, 3896 (9/2004)	This variable indicates what type of code is being sent across the DS1/DS3/E3 interfaces by the device. (These are optional for E3 interfaces.) Setting this variable causes the interface to send the code requested.
"SignalLabelActualRx"	All SDH/SONET path layers		"0"… "255"	no	EMS		This is in decimal format with values between 0 and 255.
"SignalLabelActualTx"	All SDH/SONET path layers		"0"… "255"	no	EMS		This is in decimal format with values between 0 and 255.
"SignalLabelExpectedRx"	All SDH/SONET path layers		"0"… "255"	yes	EMS & NMS		This is in decimal format with values between 0 and 255.
"SignalMode"	All PDH layers	PTP	"none", "robbedBit", "bitOriented", "messageOriented", "other"	yes	EMS & NMS	RFC-3895 (9/2004)	Type of signaling on this channel.
"TS0monitoring"	LR_E1_2M		"Monitored" "Unmonitored"	yes	EMS & NMS	ITU-T G.704 and G.706	TS0 bits are used to provide/collect performance monitoring statistics for the PDH paths associated with the E1 port
"TxCellPayloadScrambleDisabled"	All SDH/SONET layers	PTP	"no", "yes"	yes	EMS & NMS	ANSI T1.105.06	

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"TxClkSource"	All PDH layers	PTP	"loop", "local", "through", "adaptive"	yes	EMS & NMS	RFC-3895, 3896 (9/2004)	The source of Transmit Clock.
"TxScrambleDisabled"	All SDH/SONET layers	PTP	"no", "yes"	yes	EMS & NMS	ANSI T1.105.06	Enable/disable scrambling and descrambling of the entire transmit and receive stream.

Notes:

Each parameter above is published in their respective standards as mentioned in "Source Standards" column. Also, there can be more parameters present in the given standards, which are not mentioned here but can be recommended by MTNM.

Some more references for DS1/E1 and DS3/E3 are CCITT G.703, G.704, G 804, ANSI T1.102 and T1.107.

Some more references for OC3 and OC12 are ANSI T1.105.06, CCITT G.707, 708, 709, and G.783.

2.3 ATM specific parameters (ATM NI CTP, ATM VP CTP, ATM VC CTP, ATM NI TPPool, ATM VP TPPool

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"ActualMaximumSVCVPI"	LR_ATM_NI (TPPool)		A number n	yes	EMS & NMS		This attribute identifies the maximum VPI value that may be used for SVCs for the associated user.If ILMI is active , this value is calculated by the ILMI functions. See ATM Forum af-ilmi-0065.000, Integrated Local Management Interface (ILMI) Specification Version 4 for information on use of this parameter.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
“ActualMinimumSVCVCI”	LR_ATM_NI (TPPool)		A number n	yes	EMS & NMS		This attribute identifies the minimum VCI value that may be used for SVCs for the associated user.If ILMI is active, this value is calculated by the ILMI functions. See ATM Forum af-ilmi-0065.000 for information on use of this parameter.
“ATMAddress”	LR_ATM_NI (CTP, TPPool)		String	yes	EMS & NMS		The identifier (e.g., E.164 directory number or NSAP address) assigned by a service provider to the end user’s UNI. If the end user UNI has no assigned service provider address, this is an octet string of zero length.
“ATMNIType”	LR_ATM_N (CTP)I		“UNI”, “BICI”, “BISSI”, “PNNI”	yes	EMS & NMS		The type of network interface represented by the TP. “UNI” (User Network Interface), “BICI” (Broadband Inter Carrier Interface- interNNI), “BISSI” (Broadband Inter Switching Systems Interface - intraNNI), “PNNI” (Private Network to Node Interface)
“ATMSignalingType”	LR_ATM_NI (CTP, TPPool)		“UNI3.1”, “UNI4.1”, “PNNI1.0”, “none”	yes	EMS & NMS		Indicates which type of signaling stack (if any) is used to control the end user’s UNI interface.
“Bandwidth”	LR_ATM_NI (CTP)		String containing an Integer number	yes	EMS&NMS		Represented in Kilobits Per Second (KbPS).
“ILMIVCI”	LR_ATM_NI (CTP, TPPool)		String containing an Integer number	yes	EMS & NMS		Represents the VCI value of the VCC supporting the end user’s ILMI at this ATM interface. Note that if both ILMIVPI and ILMIVCI are equal to zero then ILMI is not supported for this end user UNI.
“ILMIVPI”	LR_ATM_NI (CTP, TPPool)		String containing an Integer number	yes	EMS & NMS		Represents the VPI value of the VCC supporting the end user’s ILMI at this ATM interface.
“MaxActualVCIBits”	LR_ATM_NI (CTP, TPPool)		“1”… “16”	yes	EMS & NMS		Represents the actual maximum VCI bit length (after negotiation) for use between the NE and the end user’s UNI.
“MaxActualVPIBits”	LR_ATM_NI (CTP, TPPool)		“1”... “8”, “1”... “12”	yes	EMS & NMS		Represents the actual maximum VPI bit length (after negotiation) for use between the NE and the end user’s UNI. “1”... “8” for UNI “1”... “12” for NNI (BICI or BISSI)

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
“MaxBandwidth”	LR_ATM_VP (TPPool)		String containing an Integer number	yes	EMS & NMS		This parameter indicates the maximum bandwidth which can be allocated to the group of VP CTPs (i.e., the sum of the bandwidth assigned to each individual VP CTP in the group cannot exceed this number).
“MaxVCC”	LR_ATM_NI (CTP, TPPool)		String containing an Integer number	yes	EMS & NMS		Represents the maximum number of VCCs that can actually be supported on the end user’s UNI interface.
“MaxVCIBits”	LR_ATM_NI (CTP)		String containing an Integer number	yes	EMS & NMS		A number representing the maximum VCI bit length (before negotiation).
“MaxVPC”	LR_ATM_NI (CTP, TPPool)		String containing an Integer number	yes	EMS & NMS		Represents the maximum number of VPCs that can actually be supported on the end user’s UNI interface.
“MaxVPI”	LR_ATM_VP (TPPool)		String containing an Integer number	yes	EMS & NMS		Highest VPI allowed for a VP CTP associated to the TPPool
“MaxVPIBits”	LR_ATM_NI (CTP)		String containing an Integer number	yes	EMS & NMS		A number representing the maximum VPI bit length (before negotiation).
“MinVPI”	LR_ATM_VP (TPPool)		String containing an Integer number	yes	EMS & NMS		Lowest VPI allowed for a VP CTP associated to the TPPool
“SignalingChannelVCI”	LR_ATM_NI (TPPool)		String containing an Integer number	yes	EMS & NMS		The VCI for the users signalling channel, if SVCs are supported. Note: This value is usually the same at the users end.
“SignalingChannelVPI”	LR_ATM_NI (TPPool)		String containing an Integer number	yes	EMS & NMS		The VPI for the users signalling channel, if SVCs are supported. Note: This value may be different than the value at the users end.
“SupportedServiceCat”	LR_ATM_VP (CTP)		String	yes	EMS & NMS		Optional parameter relevant to a terminated and mapped VP CTP only (aka, a VP Trail TP). List of Service Categories allowed for the VCs contained (switched) in the VP. See also parameter “ServiceCategory”. Note that this is consistent with the vpTTPBidirectionalR1 managed object class in M4 V2.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"SwitchedVCenabled"	LR_ATM_VP (CTP)		"yes", "no"	yes	EMS & NMS		Parameter significant on a terminated and mapped VP CTP only to indicate if the VP trail can transport switched VCC traffic. "yes" - can support switched VCC traffic "no" - dedicated to permanent VCC traffic

2.4 ATM parameters relevant only to ATM Network Interfaces supporting PNNI (i.e., Soft PVCs and SVCs capable) (ATM NI CTP)

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"PnniAdmWeightAbr"	LR_ATM_NI (CTP)		String containing an Integer number	yes	EMS & NMS		A number indicating the administrative weight of this interface for the ABR service category.
"PnniAdmWeightCbr"	LR_ATM_NI (CTP)		String containing an Integer number	yes	EMS & NMS		A number indicating the administrative weight of this interface for the CBR service category.
"PnniAdmWeightNrtvbr"	LR_ATM_NI (CTP)		String containing an Integer number	yes	EMS & NMS		A number indicating the administrative weight of this interface for the nrtVBR service category.
"PnniAdmWeightRtvbr"	LR_ATM_NI (CTP)		String containing an Integer number	yes	EMS & NMS		A number indicating the administrative weight of this interface for the rtVBR service category.
"PnniAdmWeightUbr"	LR_ATM_NI (CTP)		String containing an Integer number	yes	EMS & NMS		A number indicating the administrative weight of this interface for the UBR service category.

2.5 IMA (Inverse Multiplexing for ATM) specific parameters

Note: Parameters, which are indicated as optional in the source standard or require implementation considerations, are marked as conditional.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"Symmetry"	LR_Fragment (adaptation function, i.e. IMA group)		"SymmetricOp", "AsymmetricOp", "AsymmetricConf"	no	EMS		IMA group symmetry mode, which will only be established or changed at group start-up time.
"MinNumTxLinks"	LR_Fragment (adaptation function, i.e. IMA group)		"1"… "32", "1"… "64", "1"… "128"	yes	EMS & NMS		Minimum number of transmit links required to be in IMA link state "active" for the IMA group to be in the IMA group state "operational". "1"… "32" (or, conditionally, up to "64" or "128")
"MinNumRxLinks"	LR_Fragment (adaptation function, i.e. IMA group)		"1"… "32", "1"… "64", "1"… "128"	yes	EMS & NMS		Minimum number of receive links required to be Active for the IMA group to be in the Operational state. "1"… "32" (or, conditionally, up to "64" or "128")
"NeTxClkMode"	LR_Fragment (adaptation function, i.e. IMA group)		"CTC", "ITC"	yes	EMS & NMS		Transmit clock mode of the near-end IMA group.
"FeTxClkMode"	LR_Fragment (adaptation function, i.e. IMA group)		"CTC", "ITC"	yes	EMS		Transmit clocking mode used by the far-end IMA group.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"NeTxClkSource" (conditional)	LR_Fragment (adaptation function, i.e. IMA group)		"Internal", "Loop", "System"	yes	EMS & NMS		Transmit clock source of the near-end IMA group for CTC mode.
"NeTxClkSourceLink" (conditional)	LR_Fragment (adaptation function, i.e. IMA group)		String	yes	EMS & NMS		Name value of the IMA link CTP used in case of clock source "Loop".
"TxTimingRefLink"	LR_Fragment (adaptation function, i.e. IMA group)		String	yes	EMS		Name value of the transmit timing reference IMA link CTP.
"RxTimingRefLink"	LR_Fragment (adaptation function, i.e. IMA group)		String	yes	EMS		Name value of the receive timing reference IMA link CTP.
"NumTxCfgLinks" (conditional in case of Symmetrical Configuration)	LR_Fragment (adaptation function, i.e. IMA group)		String containing an Integer number	yes	EMS		Number of links configured to transmit in this IMA group; overwrites "NumRxActLinks" when the IMA group is configured in the Symmetrical Configuration group symmetry mode; corresponds to "AllocatedNumber" in this case.
"NumRxCfgLinks" (conditional in case of Symmetrical Configuration)	LR_Fragment (adaptation function, i.e. IMA group)		String containing an Integer number	yes	EMS		Number of links configured to receive in this IMA group; is overwritten by "NumTxActLinks" when the IMA group is configured in the Symmetrical Configuration group symmetry mode; corresponds to "AllocatedNumber" in this case.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"NumTxActLinks" (conditional)	LR_Fragment (adaptation function, i.e. IMA group)		String containing an Integer number	yes	EMS		Number of links configured to transmit and currently in the IMA link state "active" in this IMA group; corresponds to general parameter "ActiveAllocationNumberTx".
"NumRxActLinks" (conditional)	LR_Fragment (adaptation function, i.e. IMA group)		String containing an Integer number	yes	EMS		Number of links which are configured to receive and are currently Active in this IMA group; corresponds to general parameter "ActiveAllocationNumberRx".
"TxImaId"	LR_Fragment (adaptation function, i.e. IMA group)		"0"… "255"	yes	EMS		IMA ID currently in use by the near-end IMA function.
"RxImaId"	LR_Fragment (adaptation function, i.e. IMA group)		"0"… "255", "Unknown"	yes	EMS		IMA ID currently in use by the far-end IMA function.
"TxFrameLength"	LR_Fragment (adaptation function, i.e. IMA group)		"32", "64", "128", "256"	yes	EMS & NMS		Length of the transmit IMA frame.
"RxFrameLength"	LR_Fragment (adaptation function, i.e. IMA group)		"32", "64", "128", "256"	yes	EMS		Length of the receive IMA frame.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
“DiffDelayMax”	LR_Fragment (adaptation function, i.e. IMA group)		String containing an Integer number	yes	EMS		Maximum differential delay (in milliseconds) among the links that will be tolerated on this interface (e.g., “25” for E1/DS1 links).
“LeastDelayLink”	LR_Fragment (adaptation function, i.e. IMA group)		String	no	EMS		Name value of the link configured in the IMA group which has the smallest link propagation delay.
“DiffDelayMaxObs”	LR_Fragment (adaptation function, i.e. IMA group)		String containing an Integer number	no	EMS & NMS		Latest maximum differential delay (in milliseconds) observed between the links having the least and most link propagation delay, among the receive links that are currently configured in the IMA group; NMS may only reset this value.
“AlphaValue”	LR_Fragment (adaptation function, i.e. IMA group)		“1”… “2”	no	EMS & NMS		'alpha' value used to specify the number of consecutive invalid ICP cells to be detected before moving to the Hunt state from the Sync state.
“BetaValue”	LR_Fragment (adaptation function, i.e. IMA group)		“1”… “5”	no	EMS & NMS		'beta' value used to specify the number of consecutive errored ICP cells to be detected before moving to the Hunt state from the Sync state.
“GammaValue”	LR_Fragment (adaptation function, i.e. IMA group)		“1”… “5”	no	EMS & NMS		'gamma' value used to specify the number of consecutive valid ICP cells to be detected before moving to the Hunt state from the PreSync state.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
“RunningSecs”	LR_Fragment (adaptation function, i.e. IMA group)		String containing an Integer number	no	EMS		Amount of time (in seconds) since this IMA group has been in the IMA group state “operational”.
“TxAvailCellRate”	LR_Fragment (adaptation function, i.e. IMA group)		String containing an Integer number	no	EMS		Current cell rate (truncated value in cps) provided by this IMA group in the transmit direction, considering all the Tx links in the Active state.
“RxAvailCellRate”	LR_Fragment (adaptation function, i.e. IMA group)		String containing an Integer number	no	EMS		Current cell rate (truncated value in cps) provided by this IMA group in the receive direction, considering all the receive links in the Active state.
“BandwidthUsage” (conditional)	LR_Fragment (adaptation function, i.e. IMA group)		“0”…”100”	no	EMS		Percentage of use of configured bandwidth (see LR_ATM_NI).
“OverbookingFactor” (conditional)	LR_Fragment (adaptation function, i.e. IMA group)		“NoOverbooking”, “<Integer >= “100>“	yes	EMS		Grade of allowed overbooking of physical line rates; default value is “NoOverbooking”, “100” means overbooking with factor 1, “1000” means 10 times overbooking, etc..
“Allocated SupportingCTPs” (conditional)	LR_Fragment (adaptation function, i.e. IMA group)		String (e.g., “<PTPName1>/e1=1,…,<PTPName8>/e1=1”, in case of 8 E1 links)	no	EMS		Comma list of full name values (concatenation by “/” of all value components) of the supporting CTPs that are connected to the IMA link CTPs (“AllocatedNumber” many).

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"NumTxCACLinks" (conditional)	LR_Fragment (adaptation function, i.e. IMA group)		"1"… "32", "1"… "64", "1"… "128"	yes	EMS & NMS		Number of transmit links that are used for ATM CAC; the remaining links will not fall within CAC limits. "1"… "32" (or, conditionally, up to "64" or "128")
"ImaVersion" (conditional)	LR_Fragment (adaptation function, i.e. IMA group)		"1.0", "1.1"	no	EMS		The IMA standard implemented by this IMA group (AF-PHY-0086.000 or AF-PHY-0086.001).
"LinkInformation" (conditional)	LR_Fragment (adaptation function, i.e. IMA group)		"1.0", "1.1"	no	EMS		Use of the link information fields in the ICP cells by IMA 1.0 group.
"TestLink" (conditional)	LR_Fragment (adaptation function, i.e. IMA group)		String	no	EMS & NMS		Name value of the test link for use in the Test Pattern Procedure, or empty string (EMS to choose the link).
"TestPattern" (conditional)	LR_Fragment (adaptation function, i.e. IMA group)		"-1"… "255"	no	EMS & NMS		"0"…"255" designates a specific Tx Test Pattern to be used in an IMA group loopback operation, "-1" allows the EMS to choose the value.
"TestProcStatus" (conditional)	LR_Fragment (adaptation function, i.e. IMA group)		"disabled", "operating", "linkFailed"	yes	EMS & NMS		Enables or disables the Test Pattern Procedure, and notifies whether at least one link failed the test.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"OperationalStatus" (conditional)	LR_Fragment (adaptation function, i.e. IMA group)		"up", "down", "unknown", "disabled", "linkFailures", "notConfigured"	yes (SCN)	EMS		Eye catcher for the operational state of the IMA group at the near end (see "ServiceState", "NeState", and "FailureStatus" for more details).
"NeState"	LR_Fragment (adaptation function, i.e. IMA group)		"notConfigured", "startUp", "startUpAck", "configAbortUnsupportedM", "configAbortIncompatibleSymmetry", "configAbortUnsupportedImaVersion", "configAbortOther", "insufficientLinks", "blocked", "operational"	yes (SCN)	EMS		State of the near-end IMA group.
"FeState"	LR_Fragment (adaptation function, i.e. IMA group)		"notConfigured", "startUp", "startUpAck", "configAbortUnsupportedM", "configAbortIncompatibleSymmetry", "configAbortUnsupportedImaVersion", "configAbortOther", "insufficientLinks", "blocked", "operational"	yes (SCN)	EMS		State of the far-end IMA group as reported via ICP cells.
"LastChange"	LR_Fragment (adaptation function, i.e. IMA group)		date-time specification "YYYYMoMoDD HHMiMiSS"	no	EMS		Time-of-day the (near-end) IMA group last changed IMA group state (i.e., the last change of "NeState").

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"FailureStatus" (conditional)	LR_Fragment (adaptation function, i.e. IMA group)		"noFailure", startUpNe", "startUpFe", "invalidMValueNe", "invalidMValueFe", "failedAssymetricNe", "failedAssymetricFe", "insufficientLinksNe", "insufficientLinksFe", "blockedNe", "blockedFe", "otherFailure", "invalidImaVersionNe", "invalidImaVersionFe"	yes (SCN)	EMS		Failure reason of the IMA group.
"TxLid"	LR_Fragment (termination function, i.e. IMA link)		"0"… "31"	yes	EMS		Outgoing link ID (LID) used currently on the link by the local end.
"RxLid"	LR_Fragment (termination function, i.e. IMA link)		"0"… "31"	yes	EMS		Incoming link ID (LID) used currently on the link by the remote end, as reported via ICP cells.
"RelDelay" (conditional)	LR_Fragment (termination function, i.e. IMA link)		String containing an Integer number	no	EMS		Latest measured delay on this link (in milliseconds) relative to the link, in the same IMA group, with the least delay (see "LeastDelayLink").
"NeTxState"	LR_Fragment (termination function, i.e. IMA link)		"notInGroup", "unusableNoGivenReason", "unusableFault", "unusableMisconnected", "unusableInhibited", "unusableFailed", "usable", "active"	yes (SCN)	EMS		Current state of the near-end transmit link.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"NeRxState"	LR_Fragment (termination function, i.e. IMA link)		"notInGroup", "unusableNoGivenReason", "unusableFault", "unusableMisconnected", "unusableInhibited", "unusableFailed", "usable", "active"	yes (SCN)	EMS		Current state of the near-end receive link.
"FeTxState"	LR_Fragment (termination function, i.e. IMA link)		"notInGroup", "unusableNoGivenReason", "unusableFault", "unusableMisconnected", "unusableInhibited", "unusableFailed", "usable", "active"	yes (SCN)	EMS		Current state of the far-end Tx link as reported via ICP cells.
"FeRxState"	LR_Fragment (termination function, i.e. IMA link)		"notInGroup", "unusableNoGivenReason", "unusableFault", "unusableMisconnected", "unusableInhibited", "unusableFailed", "usable", "active"	yes (SCN)	EMS		Current state of the far-end receive link as reported via ICP cells.
"NeRxFailureStatus" (conditional)	LR_Fragment (termination function, i.e. IMA link)		"noFailure", "imaLinkFailure", "lifFailure", "lodsFailure", "misConnected", "blocked", "fault", "farEndTxLinkUnusable", "farEndRxLinkUnusable"	yes (SCN)	EMS		Current link failure status of the near-end receive link.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"FeRxFailureStatus" (conditional)	LR_Fragment (termination function, i.e. IMA link)		"noFailure", "imaLinkFailure", "lifFailure", "lodsFailure", "misConnected", "blocked", "fault", "farEndTxLinkUnusable", "farEndRxLinkUnusable"	yes (SCN)	EMS		Current link failure status of the far-end Rx link as reported via ICP cells.
"RxTestPattern" (conditional)	LR_Fragment (termination function, i.e. IMA link)		"0"… "255"	no	EMS		Identifies the Rx Test Pattern received in the ICP cell on the link during the Test Pattern Procedure (to be compared to the Tx "Test Pattern" of the corresponding IMA group).
"TestProcStatus" (conditional)	LR_Fragment (termination function, i.e. IMA link)		"disabled", "operating", "linkFailed"	no	EMS		Notifies the current state of the Test Pattern Procedure, and whether this link failed the test.

2.6 ATM specific traffic descriptor parameters

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"PCR-<qualifier>" <qualifier> is "0" or "0+1"	LR_ATM_VP LR_ATM_VC		String	no	EMS & NMS		The Peak Cell Rate (in cells/second), PCR, is upper bound on the traffic rate that can be sent over a connection.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"SCR-<qualifier>" <qualifier> is "0" or "0+1"	LR_ATM_VP LR_ATM_VC		String	no	EMS & NMS		The Sustainable Cell Rate (in cells/second), SCR, is average traffic rate that can be sent over a connection.
"MCR"	LR_ATM_VP LR_ATM_VC		String	no	EMS & NMS		The Minimum Cell Rate (in cells/second), MCR, is the rate at which the source is always allowed to send.
"MBS-<qualifier>" <qualifier> is "0" or "0+1"	LR_ATM_VP LR_ATM_VC		String	no	EMS & NMS		The Maximum Burst Size (in cells/second), MBS, is the upper bound on the largest number of back-to-back cells that can be sent at PCR.
"CDV"	LR_ATM_VP LR_ATM_VC		String	no	EMS & NMS		The maximum peak-to-peak cell delay variation (in cells/second), CDV; Max Peak-to-Peak CDV is an ATM QoS parameter associated with the CBR and rt-VBR service categories. The Max Peak-to-Peak CDV is the (1-a) quantile of the cell transfer delay minus the fixed cell transfer delay that could be experienced during the entire connection holding time. The parameter "a" is the probability of a cell arriving late or being lost. See CDTV
"CTD"	LR_ATM_VP LR_ATM_VC		String	no	EMS & NMS		The maximum cell transfer delay (in microseconds), CTD; Max CTD is the (1-a) quantile of the cell transfer delay. The parameter "a" is the probability of a cell arriving late or being lost. See CDTV.
"CDVT-<qualifier>" <qualifier> is "0" or "0+1"	LR_ATM_VP LR_ATM_VC		String	no	EMS & NMS		The Cell Delay Variation Tolerance (in microseconds), CDVT, upper bound on the cell delay variability expected on a conforming connection
"CLR"	LR_ATM_VP LR_ATM_VC		String ~~e~~	no	EMS & NMS		The Cell Loss Ratio CLR, is the maximum permissible cell loss ratio. String encoded number n where n is 10^-n.
String encoded number n where n is 10^-n "ICR"	LR_ATM_VP LR_ATM_VC		String	no	EMS & NMS		The Initial Cell Rate (in cells/second), ICR, is the rate at which a source should send initially and after an idle period.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"TBE"	LR_ATM_VP LR_ATM_VC		String	no	EMS & NMS		Transient Buffer Exposure, TBE, is the number of cells that the network would like to limit the source to sending during startup periods, before the first RM cell returns. String encoded number (e.g., "10")
"FRTT"	LR_ATM_VP LR_ATM_VC		"0"… "16700000"	no	EMS & NMS		Fixed Round-Trip Time, FRTT, is the sum of the fixed and propagation delays from the source to the destination and back. String encoded time in microseconds representing values from 0 to 16.7 seconds (i.e., values of "0" to "16700000")
"RIF"	LR_ATM_VP LR_ATM_VC		"0"… "15"(1)	no	EMS & NMS		Rate Increase Factor, RIF, controls the amount by which the cell transmission rate may increase upon receipt of an RM-cell. String encoded Integer, x, ranging from 0 to 15 which represents 1/2x (i.e., represents the values of 1 to 1/32768)
"RDF"	LR_ATM_VP LR_ATM_VC		same as "RIF"	no	EMS & NMS		The Rate Decrease Factor, RDF, controls the decrease in the cell transmission rate.
"NRM"	LR_ATM_VP LR_ATM_VC		"2", "4", "8", "16", "32", "64", "128", "256"	no	EMS & NMS		Number RM, NRM, is the maximum number of cells a source may send for each forward RM-cell.
"TRM"	LR_ATM_VP LR_ATM_VC		"0"… "7" (1)	no	EMS & NMS		Time RM, TRM, is the upper bound on the time between forward RM cells for an active source. String encoded number, k, in the range between 0 and 7 representing values computed as 100 * 2^(-k)
"CDF"	LR_ATM_VP LR_ATM_VC		"0"… "6" (1), "infinity"	no	EMS & NMS		Cutoff Decrease Factor, CDF, controls the rate decrease associated with lost or delayed backward RM cells. String encoded value, x, ranging from 0 to 6 and including "infinity", which represents 1/2x (i.e., represents the values of 1 to 1/64 and 0)
"ADTF"	LR_ATM_VP LR_ATM_VC		"10"… "10230" (10)	no	EMS & NMS		ACR (Allowed Cell Rate) Decrease Time Factor, ADTF, is the time (in milliseconds) permitted between sending RM cells, before the rate is decreased to ICR.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
“BEST”	LR_ATM_VP LR_ATM_VC		“true”, “false”	no	EMS & NMS		Best effort, BEST, indicates whether best effort behaviour is in effect.
“TAG”	LR_ATM_VP LR_ATM_VC		“true”, “false”	no	EMS & NMS		Cell tagging, TAG, is the ability to set the CLP bit to 1.
“FDISCARD”	LR_ATM_VP LR_ATM_VC		“true”, “false”	no	EMS & NMS		Frame Discard. Indicates whether cells are allowed to be treated as part of higher-layer frames.
“MCRSUPPORTED”	LR_ATM_VP LR_ATM_VC		“true”, “false”	no	EMS & NMS		An indicator of whether or not Minimum Cell Rate is to be supported.
“CLRCLP-<qualifier>“ <qualifier> is “0” or “0+1”	LR_ATM_VP LR_ATM_VC		String	no	EMS & NMS		Cell Loss Ratio. String encoded number n where n is 10^-n
“ServiceCategory”	LR_ATM_VP LR_ATM_VC		“ATM_CBR”, “ATM_VBRRT”, “ATM_VBRNRT”, “ATM_ABR”, “ATM_UBR”, “ATM_GFR”, “ATM_NA”	no	EMS		The ATM Service Category relates quality requirements and traffic characteristics to network behavior (procedures and parameters). It is intended to specify a combination of Quality of Service (QoS) commitment and traffic parameters that is suitable for a given set of applications (user interpretation) and that allows for specific multiplexing schemes at the ATM layer (network interpretation).

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"ConformanceDefinition"	LR_ATM_VP LR_ATM_VC		"ATM_CBR.1", "ATM_VBR.1", "ATM_VBR.2", "ATM_VBR.3", "ATM_ABR", "ATM_UBR.1", "ATM_UBR.2", "ATM_GFR.1", "ATM_GFR.2", "ATM_USER", "ATM_CBR.L1", "ATM_VBR.L1", "ATM_VBR.L2", "ATM_VBR.L3" "ATM_ABR.L" "ATM_UBR.L1" "ATM_UBR.L2", "ATM_UBR.L3", "ATM_PCR.L1", "ATM_PCR.L2", "ATM_P&SCR.L1", "ATM_P&SCR.L2"	no	EMS		This attribute specifies the conformance definition which characterizes an ATM Connection. The conformance definitions are from the ATM Forum UNI 4.1, UNI 4.0, and UNI 3.1 standards.

2.7 WDM specific parameters

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"ClientRate"	DSR layers and OCH		"nnnn.ppp"	yes	EMS		This is the actual client rate that the incoming signal is set to (or is provisioned). Decimal notation in megabits per second.
"ClientType"							refer to "ClientType" in chapter Generally Applicable parameters

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"FrequencySpacing"	OMS OCH*		String containing a Real number	yes	EMS		This identifies the frequency spacing between two consecutive OCH CTPs. * In case of variable grid (OTM-n.m), it should be possible to use the "FrequencySpacing" parameter also at OCH layer. Note: With respect to the lambda central frequency, the frequency spacing identifies the minimum allowed spacing, left and right side, with respect to another lambda, at left/right side. In case of fixed grid, then the frequency spacing attribute is fixed per each OCH, so can be represented only at OMS layer. In case of variable grid, then could happen that a given lambda 1 has its frequency spacing (e.g. 100GHz), and the adjacent lambda 2 has e.g. 50GHz. Of course, the distance between lambda 1 and 2 central frequencies must be at least 100GHz. Decimal notation of the frequency spacing in GHz.
"FrequencySpread"	OCH		String containing a Real number	yes	EMS		This identifies the spread of the spectrum on an OCH CTP. Decimal notation of the frequency spread in GHz.
"MaxClientRate"							refer to "MaxClientRate" in chapter Generally Applicable parameters
"MaxNumberOCh"	OMS		String containing an Integer number	no	EMS		This identifies the maximum number of Optical Channels (OCh) that can be carried by the Optical Multiplex Section.
"MinClientRate"	DSR layers and OCH		"nnn.pp"	yes	EMS		This identifies the minimum rate that the DWDM PTP is capable of receiving. The capability may be different than the actual provisioned state. Decimal notation in megabits per second. Note: Parameter is meaningless in case of OTUk client.
"NumberOfTunableFrequencies"	OCH		String containing a Real number	no	EMS		
"OscCentralFrequency"	OTS		"nnn.nn"	no	EMS		Central frequency of Optical Supervisory Channel. Decimal notation of the frequency in THz.
"OscFrequencySpacing"	OTS		String containing a Real number	no	EMS		Identifies the minimum allowed spacing between adjacent channels. Note: With respect to the lambda central frequency, the frequency spacing identifies the minimum allowed spacing, left and right side, with respect to another lambda, at left/right side. In case of fixed grid, then the frequency spacing attribute is fixed per each OCH, so can be represented only at OMS layer. In case of variable grid, then could happen that a given lambda 1 has its frequency spacing (e.g. 100GHz), and the adjacent lambda 2 has e.g. 50GHz. Of course, the distance between lambda 1 and 2 central frequencies must be at least 100GHz. Decimal notation of the frequency spacing in GHz.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"OscFrequencySpread"	OTS		String containing a Real number	no	EMS		Identifies the spread of the spectrum on the Optical Supervisory Channel. Decimal notation of the frequency spread in GHz.
"ThisLayerActive"	All layers		"ACTIVE", "INACTIVE"	yes	EMS		Some PTPs may have several alternative layering presentations, either due to specific configurability or due to the need to represent alternative model compatability. When there are alterative layer choices that transmissionParameter "THIS_LAYER_ACTIVE" is used. The parameter is provided with each of the optional/alternative layers and set to "INACTIVE" when the layer is not involved in the termination of signals and "ACTIVE" when it is involved in the termination of the signal.
"TunableBaseFrequency"	OCH		"nnn.nn"	no	EMS		Decimal notation of the frequency in THz.
"TunableFrequencySpacing"	OCH		"nn"	no	EMS		Decimal notation of the frequency spacing in GHz.
"TunedFrequency"	OCH		"nnn.nn"	yes	EMS & NMS		Applicable to tunable and non-tunable OCHs. Decimal notation of the frequency in THz.
"VendorSpecific"	LR_OCH_ Transport_ Unit_1/2/3 layer rates		"Yes", "No"	no	EMS		

2.8 Protection specific parameters

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"MSLockout"	SDH/SONET MS, RS and DSR layer rates		"locked out", ""	yes	EMS	SDH: ITU-T G.783 Microwave Radio: ITU-R F.750-4, ITU-T G.774-8	This can be changed by the NMS using the performProtectionCommand operation.
"PreEmptionPriority"	SDH/SONET MS, RS and DSR layer rates		"0"… "99"	yes	EMS	SDH: ITU-T G.783 Microwave Radio: ITU-R F.750-4, ITU-T G.774-8	Applicable to 1:N protection group TPs, where 0 is not applicable, and 99 is the highest priority.
"ProtectionRole"	All connectable layers		"Primary", "Backup"	yes	EMS		"Backup" is applicable to the source CTPs, typically in a revertive SNCP
"protectionSchemeState"	All connectable layers (SNCP) and SDH/SONET MS, RS and DSR layer rates (PG)		"PSS_UNKNOWN", "PSS_AUTOMATIC", "PSS_FORCED_OR_LOCKED_OUT"	yes	EMS	SDH: ITU-T G.783 Microwave Radio: ITU-R F.750-4, ITU-T G.774-8	Applies to the reliable CTP(s) of an SNCP or to the PTPs of a protection group.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"SPRINGNodeId"	All SDH/SONET connectable layers		"0"… "15", "Unknown"	yes	EMS & NMS	ITU-T G.841	This is the squelch APS id (SPRINGNodeId of the far end). This parameter implies that incoming and outgoing traffic enter and leave the ring at the same node. It takes precedence over "SPRINGNodeIdIncoming" and "SPRINGNodeIdOutgoing". Values: may be any other String that matches the SPRINGNodeId attribute of PGs. An EMS is allowed not to support this parameter.
"SPRINGNodeIdIncoming"	All SDH/SONET connectable layers		"0"… "15", "Unknown"	yes	EMS & NMS		This is the squelch Node ID for the incoming traffic, i.e. the ID of the node where it enters the ring. This parameter only applies if the "SPRINGNodeId" parameter is absent. Values: may be any other String that matches the SPRINGNodeId attribute of PGs. An EMS is allowed not to support this parameter.
"SPRINGNodeIdOutgoing"	All SDH/SONET connectable layers		"0"… "15", "Unknown"	yes	EMS & NMS		This is the squelch Node ID for the outgoing traffic, i.e. the ID of the node where it leaves the ring. This parameter only applies if the "SPRINGNodeId" parameter is absent. Values: may be any other String that matches the SPRINGNodeId attribute of PGs. An EMS is allowed not to support this parameter.

2.9 TCM related parameters for SDH/SONET

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"TCMSupervision"	SDH/SONET path layer rates		"Monitoring", "Termination", "Off"	yes	EMS & NMS	ITU-T G.783	Identifies if TCM is applied and whether the TCM overhead is terminated at this TP or monitored non-intrusively. This parameter is related to codirectional transmission functions.
"TCMTrailTraceActualRx"	SDH/SONET path layer rates		String	no	EMS	ITU-T G.783	This parameter is related to codirectional transmission functions. String of up to 64 chars.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"TCMTrailTraceActualTx"	SDH/SONET path layer rates		String	yes	EMS & NMS	ITU-T G.783	This parameter is related to codirectional transmission functions. String of up to 64 chars.
"TCMTrailTraceExpectedRx"	SDH/SONET path layer rates		String	yes	EMS & NMS	ITU-T G.783	This parameter is related to codirectional transmission functions only. String of up to 64 chars.
"TCMTrailTraceMonitor"	SDH/SONET path layer rates		"On", "Off"	yes	EMS & NMS	ITU-T G.783	Identifies if TCM Trace is monitored. This parameter is related to codirectional transmission functions.
"TCMContraSupervision"	SDH/SONET path layer rates		"Monitoring", "Termination", "Off"	yes	EMS & NMS	ITU-T G.783	Identifies if TCM is applied and whether the TCM overhead is terminated at this TP or monitored non-intrusively. This parameter is related to contradirectional transmission functions.
"TCMContraTrailTraceActualRx"	SDH/SONET path layer rates		String	no	EMS	ITU-T G.783	This parameter is related to contradirectional transmission functions. String of up to 64 chars.
"TCMContraTrailTraceActualTx"	SDH/SONET path layer rates		String	yes	EMS & NMS	ITU-T G.783	This parameter is related to contradirectional transmission functions. String of up to 64 chars.
"TCMContraTrailTraceExpectedRx"	SDH/SONET path layer rates		String	yes	EMS & NMS	ITU-T G.783	This parameter is related to contradirectional transmission functions. String of up to 64 chars.
"TCMContraTrailTraceMonitor"	SDH/SONET path layer rates		"On", "Off"	yes	EMS & NMS	ITU-T G.783	Identifies if TCM Trace is monitored. This parameter is related to contradirectional transmission functions.

Note:

Codirectional transmission functions mean those which work in the same direction as the direction of the port, i.e.

- sink functions related to information which is mapped from the signal received by the containing PTP
- source functions related to the information which is mapped to the signal transmitted by the containing PTP

Contradirectional transmission functions mean those which work in the opposite direction as the direction of the port, i.e.

- sink functions related to information which is mapped to the signal transmitted by the containing PTP
- source functions related to the information which is mapped from the signal received by the containing PTP

For an example refer to Figure 3: "Parameters associated to a TCM function" contained in the SD1-19 supporting document.

2.10 TCM related parameters for DWDM/OTN

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"TCMLevel<n>Supervision" <n> := 1 | 2 | 3 | 4 | 5 | 6	ODU1, ODU2, ODU3		"Monitoring", "Termination", "Off"	yes	EMS & NMS	ITU-T G.798	Identifies if TCM of level <n> is applied and whether the TCM overhead is terminated or monitored non-intrusively. This parameter is related to codirectional transmission functions.
"TCMLevel<n>TrailTraceActualRx" <n> := 1 | 2 | 3 | 4 | 5 | 6	ODU1, ODU2, ODU3		String	no	EMS	ITU-T G.798	This parameter is related to codirectional transmission functions. String of up to 64 chars.
"TCMLevel<n>TrailTraceActualTx" <n> := 1 | 2 | 3 | 4 | 5 | 6	ODU1, ODU2, ODU3		String	yes	EMS & NMS	ITU-T G.798	This parameter is related to codirectional transmission functions. String of up to 64 chars.
"TCMLevel<n>TrailTraceExpectedDAPIRx" <n> := 1 | 2 | 3 | 4 | 5 | 6	ODU1, ODU2, ODU3		String	yes	EMS & NMS	ITU-T G.798	This is the expected DAPI component of the path trace of TCM level <n>. This parameter is related to codirectional transmission functions only. String of up to 15 chars.
"TCMLevel<n>TrailTraceExpectedSAPIRx" <n> := 1 | 2 | 3 | 4 | 5 | 6	ODU1, ODU2, ODU3		String	yes	EMS & NMS	ITU-T G.798	This is the expected SAPI component of the path trace of TCM level <n>. This parameter is related to codirectional transmission functions only. String of up to 15 chars.
"TCMLevel<n>TrailTraceMonitorDAPI" <n> := 1 | 2 | 3 | 4 | 5 | 6	ODU1, ODU2, ODU3		"On", "Off"	yes	EMS & NMS	ITU-T G.798	Identifies if the DAPI component of the TCM Level <n> Trace is monitored. This parameter is related to codirectional transmission functions.
"TCMLevel<n>TrailTraceMonitorSAPI" <n> := 1 | 2 | 3 | 4 | 5 | 6	ODU1, ODU2, ODU3		"On", "Off"	yes	EMS & NMS	ITU-T G.798	Identifies if the SAPI component of the TCM Level <n> Trace is monitored. This parameter is related to codirectional transmission functions.
"TCMLevel<n>ContraSupervision" <n> := 1 | 2 | 3 | 4 | 5 | 6	ODU1, ODU2, ODU3		"Monitoring", "Termination", "Off"	yes	EMS & NMS	ITU-T G.798	Identifies if TCM of level <n> is applied and whether the TCM overhead is terminated or monitored non-intrusively. This parameter is related to contradirectional transmission functions.
"TCMLevel<n>ContraTrailTraceActualRx" <n> := 1 | 2 | 3 | 4 | 5 | 6	ODU1, ODU2, ODU3		String	no	EMS	ITU-T G.798	This parameter is related to contradirectional transmission functions. String of up to 64 chars.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"TCMLevel<n>ContraTrailTraceActualTx" <n> := 1 | 2 | 3 | 4 | 5 | 6	ODU1, ODU2, ODU3		String	yes	EMS & NMS	ITU-T G.798	This parameter is related to contradirectional transmission functions. String of up to 64 chars.
"TCMLevel<n>ContraTrailTraceExpectedDAPIRx" <n> := 1 | 2 | 3 | 4 | 5 | 6	ODU1, ODU2, ODU3		String	yes	EMS & NMS	ITU-T G.798	This is the expected DAPI component of the path trace of TCM level <n>. This parameter is related to contradirectional transmission functions only. String of up to 15 chars.
"TCMLevel<n>ContraTrailTraceExpectedSAPIRx" <n> := 1 | 2 | 3 | 4 | 5 | 6	ODU1, ODU2, ODU3		String	yes	EMS & NMS	ITU-T G.798	This is the expected SAPI component of the path trace of TCM level <n>. This parameter is related to contradirectional transmission functions only. String of up to 15 chars.
"TCMLevel<n>ContraTrailTraceMonitorDAPI" <n> := 1 | 2 | 3 | 4 | 5 | 6	ODU1, ODU2, ODU3		"On", "Off"	yes	EMS & NMS	ITU-T G.798	Identifies if the DAPI component of the TCM Level <n> Trace is monitored. This parameter is related to contradirectional transmission functions.
"TCMLevel<n>ContraTrailTraceMonitorSAPI" <n> := 1 | 2 | 3 | 4 | 5 | 6	ODU1, ODU2, ODU3		"On", "Off"	yes	EMS & NMS	ITU-T G.798	Identifies if the SAPI component of the TCM Level <n> Trace is monitored. This parameter is related to contradirectional transmission functions.

Notes:

Codirectional transmission functions mean those which work in the same direction as the direction of the port, i.e.

- sink functions related to information which is mapped from the signal received by the containing PTP
- source functions related to the information which is mapped to the signal transmitted by the containing PTP

Contradirectional transmission functions mean those which work in the opposite direction as the direction of the port, i.e.

- sink functions related to information which is mapped to the signal transmitted by the containing PTP
- source functions related to the information which is mapped from the signal received by the containing PTP

For an example refer to Figure 3: "Parameters associated to a TCM function" contained in SD1-19 supporting document

2.11 Radio specific parameters

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"ATPCEnabled"	LR_PHYSICAL_MEDIALESS		"True", "False"	yes	EMS	Microwave Radio: ITU-R F.750-4, ITU-T G.774.08.	This attribute specifies whether the ATPC device is currently allowed to work or not. A value of "True" indicates that the ATPC device is allowed to work and a value of "False" indicates that the device is not allowed to work (i.e. the transmit power has a fixed value).
"ATPCImplemented"	LR_PHYSICAL_MEDIALESS		"True", "False"	no	EMS	Microwave Radio: ITU-R F.750-4, ITU-T G.774.08.	This attribute specifies whether the Automatic Transmitter Power Control capability is present or not. A value of "True" indicates that the ATPC capability is present and a value of "False" indicates that the ATPC capability is not present.
"ClientType"							refer to "ClientType" in chapter Generally Applicable parameters
"MaxClientRate"							refer to "MaxClientRate" in chapter Generally Applicable parameters
"PSMPresent"	SDH MS and VC4 layer rates		"True", "False"	yes	EMS	Microwave Radio: ITU-R F.750-4, ITU-T G.774.08.	This attribute specifies whether the monitoring of protected (radio) section function, including protection switch, is present or not.
"RxPolarization"	LR_PHYSICAL_MEDIALESS		"vertical", "horizontal", "unspecified"	no	EMS	Microwave Radio: ITU-R F.750-4, ITU-T G.774.08.	This attribute is used to specify the related polarization state at receive side.
"RxRadioFrequency"	LR_PHYSICAL_MEDIALESS		This is in a decimal format and in terms of Mhz	no	EMS	Microwave Radio: ITU-R F.750-4, ITU-T G.774.08.	This attribute is used to specify the carrier radio frequencies at receive side.
"TxPolarization"	LR_PHYSICAL_MEDIALESS		"vertical", "horizontal", "unspecified"	no	EMS	Microwave Radio: ITU-R F.750-4, ITU-T G.774.08.	This attribute is used to specify the related polarization state at transmit side.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"TxRadioFrequency"	LR_PHYSICAL_MEDIALESS		String	no	EMS	Microwave Radio: ITU-R F.750-4, ITU-T G.774.08.	This attribute is used to specify the carrier radio frequencies (in Mhz) at transmit side.

2.12 Frame Relay specific parameters

Note 1: The terms Committed Burst Size (CBS) and Excess Burst Size (EBS) are abbreviated as Bc and Be respectively in the Frame Relay Forum specifications (e.g., FRF.2.2) and in RF C2954 . However, in order to make the parameters being generic so that they can be used for all packet switched layers, the generic abbreviations CBS and EBS are used as in RFC 2697.

Note 2: For the transmission direction FRF.2.2 uses the suffix Fwd (forward) and Bwd (backward) but MTNM follows the terminology of RFC 2954, i.e. uses the prefix "In" (ingress to the network) instead of "Fwd" and the prefix "Out" (egress from the network) instead of "Bwd".

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
InCBS	All packet switched layers, in particular LR_FR_PVC		A number n	Yes	EMS & NMS	I.370, RFC2954	Committed Burst Size - Ingress The maximum amount of data (in bits) that the network agrees to transfer in the ingress direction to the network (forward), under normal conditions, during a Committed Rate Measurement Interval (Tc). See complete definition in RFC 2954, and more generic definition for DiffServ in RFC 3289 (appears as CBS).
OutCBS	All packet switched layers, in particular LR_FR_PVC		A number n	Yes	EMS & NMS	I.370, RFC2954	Committed Burst Size - Egress The maximum amount of data (in bits) that the network agrees to transfer in the egress direction from the network (backward), under normal conditions, during a Committed Rate Measurement Interval (Tc).

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
InEBS	All packet switched layers, in particular LR_FR_PVC		String containing an Integer number	Yes	EMS & NMS	I.370, RFC2954	Excess Burst Size - Ingress The maximum amount of uncommitted data (in bits) in excess of Committed Burst Size that a frame relay network can attempt to deliver in the ingress direction into the network (forward) during a Committed Rate Measurement Interval (Tc). This data generally is delivered with a lower probability than CBS. The network treats EBS data as discard eligible.
OutEBS	All packet switched layers, in particular LR_FR_PVC		String containing an Integer number	Yes	EMS & NMS	I.370, RFC2954	Excess Burst Size - Egress The maximum amount of uncommitted data (in bits) in excess of Committed Burst Size that a frame relay network can attempt to deliver in the egress direction from the network (backward) during a Committed Rate Measurement Interval (Tc). This data generally is delivered with a lower probability than CBS. The network treats EBS data as discard eligible.
InCIR	All packet switched layers, in particular LR_FR_PVC		String containing an Integer number	Yes	EMS & NMS	I.370, RFC2954	Committed Information Rate - Ingress The transport speed (in bits/sec) the frame relay network will maintain between service locations when data is presented in the ingress direction into the network (forward).
OutCIR	All packet switched layers, in particular LR_FR_PVC		String containing an Integer number	Yes	EMS & NMS	I.370, RFC2954	Committed Information Rate - Egress The transport speed (in bits/sec) the frame relay network will maintain between service locations when data is presented in the egress direction from the network (backward).

2.13 DSL (Digital Subscriber Line/Loop) specific parameters

Notes:

The applicability of an individual transmission parameter, i.e. a row of the table, to one or more DSL types, is specified in the “Layers” column by adding to the layer rate the applicable DSL types in brackets, e.g. “LR_DSL (ADSL, VDSL)”, and by additionally commenting the “Legal values” and/or “Comment / Example” columns if required. If no brackets and/or comments are added the parameter and/or its values apply to all DSL types.

The xTU-R (xDSL Transceiver Unit at the Remote side) is considered to be an MTNM remote unit (RU) and therefore parameters referring to the xTU-R end point of the xDSL line are prefixed with “RU_”.
So parameters with “RU_” prefix refer to upstream data while parameters without “RU_” prefix refer to downstream data.

Configuration parameters, i.e. transmission parameters that are writeable by the NMS, are in general suffixed by “Cfg”.

Parameters, which are indicated as optional in the source standard(s) or require implementation considerations, are marked as conditional.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
“DSLtype” (mandatory)	LR_DSL	PTP	“ADSL”, “ADSL2”, “ADSL2plus”, “SHDSL”, “HDSL”, “HDSL2”, “IDSL”, “VDSL”, “VDSL2”, “SDSL”, “Unknown”	yes	EMS & NMS		These types are further qualified by type-specific transmission parameters. “Unknown” is used for loop qualification (see the SD1-20 supporting document). “ADSL” refers to G.992.1, G.992.2, G.997.1, RFC 2662, RFC 3440 “ADSL2” refers to G.992.3, G.997.1 “ADSL2plus” refers to G.992.5, G.997.1 “SHDSL” refers to G.991.2, RFC 3276 “HDSL” refers to ANSI TR 28, ETSI ETR 152 (ed. 2) / TS 101 135 “HDSL2” refers to ANSI T1.418 I2, RFC-3276 “IDSL” refers to ANSI T1.601.1999 “VDSL” refers to G.993.1, TR-057, RFC 3728 “VDSL2” refers to G.993.2, G.997.1 “SDSL” refers to ETSI TS 101 524 – 1. Note: Layered parameters of SHDSL can also be used for HDSL2 as they both are defined in the same RFC 3276.
“InitFailureSwitch”	LR_DSL (ADSL, VDSL)		“On”, “Off”	yes	EMS & NMS		Allows to switch on or off the reporting of initialization failure alarms (see parameter “InitStatus” below).
“LineCode”	LR_DIGITAl_SIGNAL_RATE		ADSL: “cap”, “dmt”, “qam”, “other” SHDSL: not used VDSL: “mcm”, “scm”, “other”	yes	EMS		Defines the line coding type used on this xDSL line. Note: “LineCode” is also defined for PDH and SDH/SONET (DSR) layers but with different values.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"LineType"	LR_DSL (ADSL, VDSL)		"noChannel", "fastOnly", "interleavedOnly", "fastOrInterleaved", "fastAndInterleaved"	yes	EMS		Defines the type of xDSL physical line by defining whether and how the line is channelized including dual latency mode, i.e. which latency path or channel type(s) are supported by this xDSL line.
"LatencyCfg" (conditional)	LR_DSL (ADSL, VDSL)		"fast", "interleavedLow", "interleavedHigh"	yes	EMS & NMS		Configured downstream latency with no, low, high interleave delay in case of "interleavedOnly" or "fastOrInterleaved" xDSL line type (see also "[RU_]InterleaveDelay[Cfg]").
"RU_LatencyCfg" (conditional)	LR_DSL (ADSL, VDSL)		"fast", "interleavedLow", "interleavedHigh"	yes	EMS & NMS		Configured upstream latency with no, low, high interleave delay in case of "interleavedOnly" or "fastOrInterleaved" xDSL line type (see also "[RU_]InterleaveDelay[Cfg]").
"VendorTMDpointer" (conditional)	LR_DSL (ADSL)		String	yes	EMS & NMS		Value of TMD name component of TMD name of a vendor-specific transmission descriptor for LR_DSL and LR_DIGITAL_SIGNAL_RATE.
"TransModeCap" (conditional)	LR_DSL (ADSL)		Comma separated list of Integers "0"… "12"	no	EMS	G.997.1 (1999) G.992.1	Transmission modes (G.997.1 (1999) transmission system coding types) the ATU-C is capable of supporting; the values are defined by the bit definitions in RFC 3440, e.g. "5" means "G.992.1 ISDN overlapped".
"TransModeCfg" (conditional)	LR_DSL (ADSL)		See "TransModeCap"	yes	EMS & NMS		Transmission modes currently enabled by the ATU-C.
"TransMode" (conditional)	LR_DSL (ADSL)		"0"… "12", "13", "Unknown"	yes	EMS	G.994.1	Actual transmission mode of the ATU-C; "13" is the handshake mode.
"PowerState" (conditional)	LR_DSL (ADSL)		"L0", "L1", "L3"	yes	EMS	G.997.1 RFC3440	ADSL power state.
"LiteTMDpointer" (conditional)	LR_DSL (ADSL)		String	yes	EMS & NMS	G.992.2	Value of TMD name component of TMD name of an ADSL transmission descriptor for G.992.2 configuration in G.dmt/G.lite dual mode configurations.
"DataRate"	LR_DSL (ADSL, SHDSL, VDSL)		ADSL: "32"… "8192"(32), "invalid" SHDSL: "192"… "2304"(8) in 2-wire mode, "384"… "4608"(16) in 4-wire mode, "invalid" VDSL: "<Integer>", "invalid"	yes	EMS		In case of ADSL and VDSL, aggregate downstream transmit speed (fast and interleaved latency paths), measured in kbps and steps of 32 kbps (ADSL) or individual steps (VDSL); legal values and increments in case of VDSL depend on "ApplicableStandard", on "Bandplan", and possibly on "DeploymentScenario", and may be vendor-specific due to hardware features. In case of SHDSL, actual line rate of the span (transmit and receive speed), measured in kbps and steps of 8 kbps resp. 16 kbps; the EMS may implement a different stepping, e.g. (64) resp. (128). See also Table 1.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"RU_DataRate"	LR_DSL (ADSL, VDSL)		ADSL: "32"… "1024"(32), "invalid" VDSL: "<Integer>", "invalid"	yes	EMS		Aggregate upstream transmit speed, measured in kbps and steps of 32 kbps (ADSL) or individual steps (VDSL); legal values in case of VDSL depend on the legal values of "DataRate" as specified by "ApplicableStandard", by "Bandplan", and by "DeploymentScenario" as well as possibly by vendor-specific documentation; "RU_DataRate" either is equal to "DataRate" (**symmetric VDSL**) or is much smaller than "DataRate" and then depends on it individually (**asymmetric VDSL**).
"DataRateFast" (conditional)	LR_DSL (ADSL, VDSL)		see "DataRate"	yes	EMS		Current downstream transmit speed of fast latency path, measured in kbps and steps of 32 kbps (ADSL) or individual steps (VDSL). See also Table 1.
"RU_DataRateFast" (conditional)	LR_DSL (ADSL, VDSL)		see "RU_DataRate"	yes	EMS		Current upstream transmit speed of fast latency path, measured in kbps and steps of 32 kbps (ADSL) or individual steps (VDSL).
"PrevDataRateFast" (conditional)	LR_DSL (ADSL)		see "DataRate"	no	EMS		Previous downstream transmit speed of fast latency path, measured in kbps and steps of 32 kbps.
"RU_PrevDataRateFast" (conditional)	LR_DSL (ADSL)		see "RUDataRate"	no	EMS		Previous upstream transmit speed of fast latency path, measured in kbps and steps of 32 kbps.
"DataRateSlow" (conditional)	LR_DSL (ADSL, VDSL)		see "DataRate"	yes	EMS		Current downstream transmit speed of interleaved channel, measured in kbps and steps of 32 kbps (ADSL) or individual steps (VDSL).
"RU_DataRateSlow" (conditional)	LR_DSL (ADSL, VDSL)		see "RU_DataRate"	yes	EMS		Current upstream transmit speed of interleaved channel, measured in kbps and steps of 32 kbps (ADSL) or individual steps (VDSL).
"PrevDataRateSlow" (conditional)	LR_DSL (ADSL)		see "DataRate"	no	EMS		Previous downstream transmit speed of interleaved channel, measured in kbps and steps of 32 kbps.
"RU_PrevDataRateSlow" (conditional)	LR_DSL (ADSL)		see "RU_DataRate"	no	EMS		Previous upstream transmit speed of interleaved channel, measured in kbps and steps of 32 kbps.
"InterleaveDelay" (conditional)	LR_DSL (ADSL, VDSL)		"<Integer>", "invalid"	no	EMS		Interleave delay/ interleaving depth (in milliseconds) of downstream interleaved channel (i.e., degree of separation of subsequent input bytes in interleaver bit stream).
"RU_InterleaveDelay" (conditional)	LR_DSL (ADSL, VDSL)		"<Integer>", "invalid"	no	EMS		Interleave delay/ interleaving depth (in milliseconds) of upstream interleaved channel (i.e., degree of separation of subsequent input bytes in interleaver bit stream).
"CrcBlockLengthFast" (conditional)	LR_DSL (ADSL)		Integer	no	EMS		Current length of downstream fast channel data block on which cyclic redundancy check (CRC) is calculated, measured in bytes.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"RU_CrcBlockLengthFast" (conditional)	LR_DSL (ADSL)		String containing an Integer number	no	EMS		Current length of upstream fast channel data block on which cyclic redundancy check (CRC) is calculated, measured in bytes.
"CrcBlockLengthSlow" (conditional)	LR_DSL (ADSL)		String containing an Integer number	no	EMS		Current length of data block of downstream interleaved channel on which the CRC operates, measured in bytes.
"RU_CrcBlockLengthSlow" (conditional)	LR_DSL (ADSL)		String containing an Integer number	no	EMS		Current length of data block of upstream interleaved channel on which the CRC operates, measured in bytes.
"SnrMgn"	LR_DSL (ADSL, SHDSL, VDSL)		ADSL: "-640"… "640", "notApplicable", "invalid" SHDSL: "-127"… "128", "notApplicable", "invalid" VDSL: "-31.75"… "31.75"(0.25), "notApplicable", "invalid"	no	EMS		In case of ADSL or VDSL, current noise margin as seen by the xTU-C/O with respect to its received signal, measured in tenth dB (i.e., centibel) and steps of 1 cB (ADSL) or in dB and steps of 0.25 dB (VDSL); the EMS may implement a different range and stepping, e.g. "-1270".."1280"(10) in case of ADSL and "-127".."128"(1) in case of VDSL. In case of SHDSL, current downstream noise margin for this segment end point, if applicable, measured in dB and steps of 1 dB; the EMS may implement a different range and stepping, e.g. "-64".."63.5"(0.5); in case of SHDSL, "SnrMgn" of a network side PTP is "0".
"RU_SnrMgn"	LR_DSL (ADSL, SHDSL, VDSL)		ADSL: "-640"… "640", "notApplicable", "invalid" SHDSL: "-127"… "128", "notApplicable", "invalid" VDSL: "-31.75"… "31.75"(0.25), "notApplicable", "invalid"	no	EMS		In case of ADSL or VDSL, current SNR margin as seen by the xTU-R with respect to its received signal, measured in tenth dB (i.e., centibel) and steps of 1 cB (ADSL) or in dB and steps of 0.25 dB (VDSL); the EMS may implement a different range and stepping, e.g. "-1270".."1280"(10) in case of ADSL and "-127".."128"(1) in case of VDSL. In case of SHDSL, current upstream noise margin for this segment end point, if applicable, measured in dB and steps of 1 dB; the EMS may implement a different range and stepping, e.g. "-64".."63.5"(0.5); in case of SHDSL, "RU_SnrMgn" of a customer side PTP is "0". See also Table 1.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"Attenuation"	LR_DSL (ADSL, SHDSL, VDSL)		ADSL: "0"… "630", "notApplicable", "invalid" SHDSL: "-127"… "128", "notApplicable", "invalid" VDSL: "0"… "63.75"(0.25), "notApplicable", "invalid"	no	EMS		In case of ADSL or VDSL, measured difference in the total power transmitted by the peer xTU-R and the total power received by this xTU-C/O, measured in tenth dB (i.e., centibel) and steps of 1 cB (ADSL) or in dB and steps of 0.25 dB (VDSL); the EMS may implement a different range and stepping, e.g. "0".."1275"(5) in case of ADSL and "0"…"127.5"(0.5) in case of VDSL. In case of SHDSL, current downstream loop attenuation for this segment end point, measured in dB and steps of 1 dB; the EMS may implement a different range and stepping, e.g. "0"…"127.5"(0.5).
"RU_Attenuation"	LR_DSL (ADSL, SHDSL, VDSL)		ADSL: "0"… "630", "notApplicable", "invalid" SHDSL: "-127"… "128", "notApplicable", invalid" VDSL: "0"… "63.75"(0.25), "notApplicable", "invalid"	no	EMS		In case of ADSL or VDSL, measured difference in the total power transmitted by the peer xTU-C/O and the total power received by this xTU-R, measured in tenth dB (i.e., centibel) and steps of 1 cB (ADSL) or in dB and steps of 0.25 dB (VDSL); the EMS may implement a different range and stepping, e.g. "0"…"1275"(5) in case of ADSL and "0"…"127.5"(0.5) in case of VDSL. In case of SHDSL, current upstream loop attenuation for this segment end point, measured in dB and steps of 1 dB; the EMS may implement a different range and stepping, e.g. "0"…"127.5"(0.5).
"LineStatus"	LR_DSL (ADSL, VDSL)		String containing comma list of single Strings taken from the following list: "noDefect", "lossOfFraming", "lossOfLink", "lossOfPower", "lossOfSignal", "lossOfSignalQuality", "lossOfSyncWord", "dataInitFailure", "configInitFailure", "protocolInitFailure", "noPeerTUPresent", "bitRateThreshold"	yes (SCN)	EMS	RFC2662	The multiple-valued **Line status** reports the current DSL state of the xDSL line as recognized by the xTU-C/O, and further qualifies the Operational state (when it is disabled). As for the Availability status and Control status, the inherent multiplicity of the value of Line status is encoded by use of a comma list.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"RU_LineStatus"	LR_DSL (ADSL, VDSL)		see "LineStatus"	yes (SCN)	EMS		The multiple-valued **RU Line status** reports the current DSL state of the xDSL line as recognized by the xTU-R, if possible, and further qualifies the Operational state (when it is disabled). As for the Availability status and Control status, the inherent multiplicity of the value of RU Line status is encoded by use of a comma list. While trouble shooting the xTU-R, "LineStatus" should be used.
"InitStatus"	LR_DSL (ADSL, VDSL)		"noInitError", "ntNotPresent", "communicationFailed", "fastRetrainProfileError", "rateParameterConfigurationError", "serviceTypeTURRequestRejected", "serviceTypeTUCRequestRejected", "configuredRatesOutOfRange", "configuredMinMaxRelationInvalid", "channelRatesExceedsSystemLimits", "adaptationCombinationInvalid", "configuredDualChannelInvalid", "marginLessThanMinMargin", "adrNotCapableOfDualLatency", "trainingBlockedBySu", "trainingBlockedByCi", "ntNotPresentDetectedOnCi", "gliteModeNotPossibleInPCM", "alarmsDetected", "initStatusUnknown"	yes (SCN)	EMS		The **Initialization status** describes the error in case of an activation problem on the xDSL line during initialization (link activation fault "ACT" on LR_DIGITAL_SIGNAL_RATE). The Operational state is disabled, except in case "noInitError". Therefore the Init status further qualifies the Operational state.
"LinkState" (conditional)	LR_DSL (ADSL, VDSL)		"unknown", "quiet", "idle", "train", "active", "download", "remoteDownload", "sleepMode", "mtaRunning"	yes (SCN)	EMS		The **Link state** describes the current internal state and use of the xDSL line.
"AISonLOS" (conditional)	LR_ATM_NI		"DISABLED", "ENABLED"	yes (SCN)	EMS & NMS		Disables or enables the VP-AIS generation after LOS or RU_LOS defect, for all non-potential ATM VP CTPs contained in the ATM NI CTP.
"AISonACT" (conditional)	LR_ATM_NI		"DISABLED", "ENABLED"	yes (SCN)	EMS & NMS		Disables or enables the VP-AIS generation after link activation fault, for all non-potential ATM VP CTPs contained in the ATM NI CTP.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"OutputPower"	LR_DSL (ADSL, SHDSL, VDSL)		ADSL: "-310"… "310", "invalid" SHDSL: "-310"… "310", "invalid" VDSL: "-5"… "15"(0.5)	no	EMS		Measured total output power transmitted by the xTU-C/O, measured in tenth dBm (i.e., centibel mW) and steps of 1 cBm in case of ADSL and SHDSL, and in dB and steps of 0.5 dBm in case of VDSL; the EMS may implement a different range and stepping, e.g. "-310"…"320"(10) in case of ADSL, "-200"…"200"(1) in case of SHDSL, and"0"…"14.5"(0.25) in case of VDSL.
"RU_OutputPower"	LR_DSL (ADSL, SHDSL, VDSL)		ADSL: "-310"... "310", "invalid" SHDSL: "-310"... "310", "invalid" VDSL: "-25"… "15"(0.5)	no	EMS		Measured total output power transmitted by the xTU-R, measured in tenth dBm (i.e., centibel mW) and steps of 1 cBm in case of ADSL and SHDSL, and in dB and steps of 0.5 dBm in case of VDSL; the EMS may implement a different range and stepping, e.g. "-310"…"320"(10) in case of ADSL, "-200"…"200"(1) in case of SHDSL, and"0"…"14.5"(0.25) in case of VDSL.
"AttainableRate"	LR_DSL (ADSL, SHDSL, VDSL)		see "DataRate"	no	EMS		In case of ADSL and VDSL, maximum currently attainable data rate by the xTU-C/O, measured in kbps and steps of 32 kbps (ADSL) or individual steps (VDSL); in case of SHDSL, maximum attainable line rate of the span, i.e. maximum rate the line is capable of achieving as measured during line probing.
"RU_AttainableRate"	LR_DSL (ADSL, VDSL)		see "RU_DataRate"	no	EMS		Maximum currently attainable upstream data rate, measured in kbps and steps of 32 kbps (ADSL) or individual steps (VDSL).
"FirstUsedSubCarrier" (conditional)	LR_DSL (ADSL)		"0"… "256", "unknown"	yes	EMS		First currently used DMT subcarrier (bin) downstream (if applicable).
"LastUsedSubCarrier" (conditional)	LR_DSL (ADSL)		"0"… "256", "unknown"	yes	EMS		Last currently used DMT subcarrier (bin) downstream (if applicable).
"RU_FirstUsedSubCarrier" (conditional)	LR_DSL (ADSL)		"0"… "64", "unknown"	yes	EMS		First currently used DMT subcarrier (bin) upstream (if applicable).
"RU_LastUsedSubCarrier" (conditional)	LR_DSL (ADSL)		"0"… "64", "unknown"	yes	EMS		Last currently used DMT subcarrier (bin) upstream (if applicable).
"TrellisCoding" (conditional)	LR_DSL (ADSL)		"On", "Off", "Unknown"	yes	EMS		Current use or non-use of trellis coding.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"TrellisCodingCfg" (conditional)	LR_DSL (ADSL)		"On", "Off"	yes	EMS & NMS		Allows to switch trellis coding on or off.
"BandwidthUsage" (conditional)	LR_DSL (ADSL, SHDSL, VDSL)		"0"… "100"	no	EMS		Percentage of current use of guaranteed bandwidth.
"OverbookingFactor" (conditional)	LR_DSL (ADSL, SHDSL, VDSL)		"noOverbooking", "<Integer >= "100>"	yes	EMS		Grade of allowed overbooking of physical line rates; default value is "noOverbooking", "100" means overbooking with factor 1, "1000" means 10 times overbooking, etc..
"MinDataRateCfg"	LR_DSL (ADSL, SHDSL, VDSL)		ADSL: "32"... "8192"(32) SHDSL: "192"… "2304"(8) in 2-wire mode, "384"… "4608"(16) in 4-wire mode VDSL: "<Integer>"	yes	EMS & NMS		In case of ADSL or VDSL, configured minimum aggregate transmit rate at xTU-C/O, measured in kbps and steps of 32 kbps (ADSL) or individual steps (VDSL); legal values and increments in case of VDSL depend on "ApplicableStandard", on "Bandplan", and possibly on "DeploymentScenario", and may be vendor-specific due to hardware features; in case of SHDSL, configured minimum transmit rate of the line, measured in kbps and steps of 8 resp. 16 kbps; the EMS may implement a different stepping, e.g. (64) resp. (128); if "MinRateCfg" equals "MaxRateCfg", the line rate is considered **fixed**, and otherwise it is **rate-adaptive.**
"MaxDataRateCfg"	LR_DSL (ADSL, SHDSL, VDSL)		see "MinDataRateCfg"	yes	EMS & NMS		In case of ADSL or VDSL, configured maximum aggregate transmit rate at xTU-C/O, measured in kbps and steps of 32 kbps (ADSL) or individual steps (VDSL); legal values and increments in case of VDSL depend on "ApplicableStandard", on "Bandplan", and possibly on "DeploymentScenario", and may be vendor-specific due to hardware features; in case of SHDSL, configured maximum transmit rate of the line, measured in kbps and steps of 8 resp. 16 kbps; the EMS may implement a different stepping, e.g. (64) resp. (128); if "MaxRateCfg" equals "MinRateCfg", the line rate is considered **fixed**, and otherwise it is **rate-adaptive.**
"MinDataRateFastCfg" (conditional)	LR_DSL (ADSL, VDSL)		see "MinDataRateCfg"	yes	EMS & NMS		Configured minimum transmit rate for fast channel at xTU-C/O, measured in kbps and steps of 32 kbps (ADSL) or individual steps (VDSL).
"MaxDataRateFastCfg" (conditional)	LR_DSL (ADSL, VDSL)		see "MinDataRateCfg"	yes	EMS & NMS		Configured maximum transmit rate for fast channel at xTU-C/O, measured in kbps and steps of 32 kbps (ADSL) or individual steps (VDSL).

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"MinDataRateSlowCfg" (conditional)	LR_DSL (ADSL, VDSL)		see "MinDataRateCfg"	yes	EMS & NMS		Configured minimum Tx rate for interleaved channel at xTU-C/O, measured in kbps and steps of 32 kbps (ADSL) or individual steps (VDSL).
"MaxDataRateSlowCfg" (conditional)	LR_DSL (ADSL, VDSL)		see "MinDataRateCfg"	yes	EMS & NMS		Configured maximum Tx rate for interleaved channel at xTU-C/O, measured in kbps and steps of 32 kbps (ADSL) or individual steps (VDSL).
"InterleaveDelayCfg" (conditional)	LR_DSL (ADSL, VDSL)		"0"… "255"	yes	EMS & NMS		Configured interleave delay (in milliseconds) of down-stream interleaved channel; larger numbers provide greater separation between consecutive input bytes in the output bit stream allowing for improved impulse noise immunity at the expense of payload latency.
"RateSelectModeCfg" (conditional)	LR_DSL (ADSL, VDSL)		ADSL: "fixedRate", "adaptAtStartup", "adaptAtRuntime" VDSL: "fixedRate", "adaptAtStartup"	yes	EMS & NMS	G.997.1 (1999)	xTU-C/O rate adaptation mode according to G.997.1 (1999), i.e. data rate selection behaviour in the downstream direction, either based on configured maximum channel data rates ("fixedRate") or adapted between configured minimum and maximum channel data rates during start up or (ADSL) continuously adapted during show time; "fixedRate" if not present.
"RateAdaptRatioCfg" (conditional)	LR_DSL (ADSL, VDSL)		ADSL: "0"… "100" VDSL: "0"… "100"(10)	yes	EMS & NMS		Fast channel percentage of configured allocation ratio of excess transmit bandwidth between xTU-C/O fast and interleaved channels; defined as 100 * "MinDataRateFastCfg" / "MinDataRateCfg".
"SnrMgnCfg"	LR_DSL (ADSL, VDSL)		ADSL: "0"… "310" VDSL: "0"… "31.75"(0.25)	yes	EMS & NMS		Configured target SNR margin the xTU-C/O must achieve with a BER of 10^{-7}, or better, to successfully complete (re-)initialization, measured in tenth dB (i.e., centibel) and steps of 1 cB (ADSL) or in dB and steps of 0.25 dB (VDSL); the EMS may implement a different range and stepping, e.g. "0"…"150"(10). See also Table 1.
"MaxSnrMgnCfg"	LR_DSL (ADSL, VDSL)		ADSL: "0"... "310", "auto" VDSL: "0"… "31.75"(0.25), "auto"	yes	EMS & NMS		Configured maximum noise margin the xTU-C/O should try to sustain, measured in tenth dB (i.e., centibel) and steps of 1 cB (ADSL) or in dB and steps of 0.25 dB (VDSL); the EMS may implement a different range and stepping, e.g. "-60"…"120"(10); "auto" configures expert calculation of the threshold value from the target SNR margin "SnrMgnCfg"; if the actual SNR margin is above this level the xTU-C/O should attempt to reduce power output to optimize operation.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"MinSnrMgnCfg"	LR_DSL (ADSL, VDSL)		ADSL: "0"… "310", "auto" VDSL: "0"… "31.75"(0.25), "auto"	yes	EMS & NMS		Configured minimum noise margin the xTU-C/O should tolerate, measured in tenth dB (i.e., centibel) and steps of 1 cB (ADSL) or in dB and steps of 0.25 dB (VDSL); the EMS may implement a different range and stepping, e.g. "-60"…"120"(10); "auto" configures expert calculation of the threshold value from the target SNR margin "SnrMgnCfg"; if the actual SNR margin falls below this level the xTU-C/O should attempt to increase power output, if possible, or re-initialize.
"UpshiftSnrMgnCfg" (conditional)	LR_DSL (ADSL)		see "MaxSnrMgnCfg" and "MinSnrMgnCfg"	yes	EMS & NMS		If the actual noise margin is above this level and stays above for more than "MinUpshiftTimeCfg" seconds, the ATU-C should increase its transmit net data rate.
"DownshiftSnrMgnCfg" (conditional)	LR_DSL (ADSL)		see "MaxSnrMgnCfg" and "MinSnrMgnCfg"	yes	EMS & NMS		If the actual noise margin is below this level and stays below for more than "MinDownshiftTimeCfg" seconds, the ATU-C should decrease its transmit net data rate.
"MinUpshiftTimeCfg" (conditional)	LR_DSL (ADSL)		"0"… "16383"	yes	EMS & NMS		Measured in seconds, see "UpshiftSnrMgnCfg"; the upper value is defined by G.997.1.
"MinDownshiftTimeCfg" (conditional)	LR_DSL (ADSL)		"0"… "16383"	yes	EMS & NMS	G.997.1	Measured in seconds, see "DownshiftSnrMgnCfg"; the upper value is defined by G.997.1.
"RU_MinDataRateCfg"	LR_DSL (ADSL, VDSL)		ADSL: "32"… "1024"(32) VDSL: String containing an Integer number	yes	EMS & NMS		Configured minimum aggregate transmit rate at xTU-R, measured in kbps and steps of 32 kbps (ADSL) or individual steps (VDSL); legal values in case of VDSL depend on the legal values of downstream data rates as specified by "ApplicableStandard", by "Bandplan", and by "DeploymentScenario" as well as possibly by vendor-specific documentation.
"RU_MaxDataRateCfg"	LR_DSL (ADSL, VDSL)		see "RU_MinDataRateCfg"	yes	EMS & NMS		Configured maximum aggregate transmit rate at xTU-R, measured in kbps and steps of 32 kbps (ADSL) or individual steps (VDSL); legal values in case of VDSL depend on the legal values of downstream data rates as specified by "ApplicableStandard", by "Bandplan", and by "DeploymentScenario" as well as possibly by vendor-specific documentation.
"RU_MinDataRateFastCfg" (conditional)	LR_DSL (ADSL, VDSL)		see "RU_MinDataRateCfg"	yes	EMS & NMS		Configured minimum transmit rate for fast channel at xTU-R, measured in kbps and steps of 32 kbps (ADSL) or individual steps (VDSL).
"RU_MaxDataRateFastCfg" (conditional)	LR_DSL (ADSL, VDSL)		see "RU_MinDataRateCfg"	yes	EMS & NMS		Configured maximum transmit rate for fast channel at xTU-R, measured in kbps and steps of 32 kbps (ADSL) or individual steps (VDSL).

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"RU_MinDataRateSlowCfg" (conditional)	LR_DSL (ADSL, VDSL)		see "RU_MinDataRateCfg"	yes	EMS & NMS		Configured minimum Tx rate for interleaved channel at xTU-R, measured in kbps and steps of 32 kbps (ADSL) or individual steps (VDSL).
"RU_MaxDataRateSlowCfg" (conditional)	LR_DSL (ADSL, VDSL)		see "RU_MinDataRateCfg"	yes	EMS & NMS		Configured maximum Tx rate for interleaved channel at xTU-R, measured in kbps and steps of 32 kbps (ADSL) or individual steps (VDSL).
"RU_InterleaveDelayCfg" (conditional)	LR_DSL (ADSL, VDSL)		"0"… "255"	yes	EMS & NMS		Configured interleave delay (in milliseconds) of upstream interleaved channel; larger numbers provide greater separation between consecutive input bytes in the output bit stream allowing for improved impulse noise immunity at the expense of payload latency.
"RU_RateSelectModeCfg"	LR_DSL (ADSL, VDSL)		ADSL: "fixedRate", "adaptAtStartup", "adaptAtRuntime" VDSL: "fixedRate", "adaptAtStartup"	yes	EMS & NMS	G.997.1 (1999)	xTU-R rate adaptation mode according to G.997.1 (1999), i.e. data rate selection behaviour in the downstream direction, either based on configured maximum channel data rates ("fixedRate") or adapted between configured minimum and maximum channel data rates during start up or (ADSL) continuously adapted during show time; "fixedRate" if not present.
"RU_RateAdaptRatioCfg" (conditional)	LR_DSL (ADSL, VDSL)		ADSL: "0"… "100" VDSL: "0"… "100"(10)	yes	EMS & NMS		Ratio (expressed in %) to be taken into account for distributing the xTU-R transmit bit rate considered for rate adaptation amongst the fast and interleaved data streams in case of excess bit rate; defined as 100 * "RU_MinDataRateFastCfg" / "RU_MinDataRateCfg".

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"RU_SnrMgnCfg"	LR_DSL (ADSL, VDSL)		ADSL: "0"… "310" VDSL: "0"… "31.75"(0.25)	yes	EMS & NMS		Configured target SNR margin the xTU-R must achieve with a BER of 10^{-7}, or better, to successfully complete (re-)initialization, measured in tenth dB (i.e., centibel) and steps of 1 cB (ADSL) or in dB and steps of 0.25 dB (VDSL); the EMS may implement a different range and stepping, e.g. "0".."150"(10).
"RU_MaxSnrMgnCfg"	LR_DSL (ADSL, VDSL)		ADSL: "0"… "310", "auto" VDSL: "0"… "31.75"(0.25), "auto"	yes	EMS & NMS		Configured maximum noise margin the xTU-R should try to sustain, measured in tenth dB (i.e., centibel) and steps of 1 cB (ADSL) or in dB and steps of 0.25 dB (VDSL); the EMS may implement a different range and stepping, e.g. "-60".."120"(10); "auto" configures expert calculation of the threshold value from the target SNR margin "SnrMgnCfg"; if the actual SNR margin is above this level the ATU-R should attempt to reduce power output to optimize operation. See also Table 1.
"RU_MinSnrMgnCfg"	LR_DSL (ADSL, VDSL)		ADSL: "0"… "310", "auto" VDSL: "0"… "31.75"(0.25), "auto"	yes	EMS & NMS		Configured minimum noise margin the xTU-R should tolerate, measured in tenth dB (i.e., centibel) and steps of 1 cB (ADSL) or in dB and steps of 0.25 dB (VDSL); the EMS may implement a different range and stepping, e.g. "-60".."120"(10); "auto" configures expert calculation of the threshold value from the target SNR margin "SnrMgnCfg"; if the actual SNR margin falls below this level the xTU-R should attempt to increase power output, if possible, or re-initialize.
"RU_UpshiftSnrMgnCfg" (conditional)	LR_DSL (ADSL)		see "MaxSnrMgnCfg" and "MinSnrMgnCfg"	yes	EMS & NMS		If the actual noise margin is above this level and stays above for more than "MinUpshiftTimeCfg" seconds, the ATU-R should increase its transmit net data rate.
"RU_DownshiftSnrMgnCfg" (conditional)	LR_DSL (ADSL)		see "MaxSnrMgnCfg" and "MinSnrMgnCfg"	yes	EMS & NMS		If the actual noise margin is below this level and stays below for more than "MinDownshiftTimeCfg" seconds, the ATU-R should decrease its transmit net data rate.
"RU_MinUpshiftTimeCfg" (conditional)	LR_DSL (ADSL)		"0"… "16383"	yes	EMS & NMS	G.997.1	Measured in seconds, see "RU_UpshiftSnrMgnCfg"; the upper value is defined by G.997.1.
"RU_MinDownshiftTimeCfg" (conditional)	LR_DSL (ADSL)		"0"… "16383"	yes	EMS & NMS	G.997.1	Measured in seconds, see "RU_DownshiftSnrMgnCfg"; the upper value is defined by G.997.1.
"NumRepeatersCfg"	LR_DSL (SHDSL)		"0"… "8"	yes	EMS & NMS		Configured number of repeaters/ regenerator units of the SHDSL/HDSL2 span.
"NumRepeaters"	LR_DSL (SHDSL)		"0"… "8"	yes	EMS		Actual number of SRUs discovered in the span.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"UnitID"	LR_DSL (SHDSL)		"STU-C", "STU-R", "SRU-1", "SRU-2", "SRU-3", "SRU-4", "SRU-5", "SRU-6", "SRU-7", "SRU-8"	no	EMS		Unique identification of containing span unit for segment end point (SHDSL PTP) having this transmission parameter, or not present.
"UnitSide"	LR_DSL (SHDSL)		"networkSide", "customerSide"	yes	EMS		The side of the unit associated with this segment end point, or not present.
"WirePair"	LR_DSL (SHDSL)		"wirePair1", "wirePair2"	yes	EMS		The UTP of the SHDSL modem (span unit) associated with this segment end point, or not present.
"TransModeCap"	LR_DSL (SHDSL)		String containing comma list of Integers "0"… "3"	no	EMS	G.991.2	Transmission modes (G.991.2 regional requirements) the SHDSL line/ span is capable of supporting, selected from "0" = Annex A, symmetric PSD masks, "1" = Annex A, asymmetric PSD masks, "2" = Annex B, symmetric PSD masks, "3" = Annex B, asymmetric PSD masks.
"TransModeCfg"	LR_DSL (SHDSL)		see "TransModeCap"	yes	EMS & NMS		Desired transmission modes.
"TransMode"	LR_DSL (SHDSL)		"0"… "3", "Unknown"	yes	EMS		Actual transmission mode.
"RemoteMgmtCfg"	LR_DSL (SHDSL)		"DISABLED", "ENABLED"	yes	EMS & NMS		Enabling support of remote management of the span units from STU-C via the EOC.
"LineProbingCfg"	LR_DSL (SHDSL)		"DISABLED", "ENABLED"	yes	EMS & NMS		Enabling line probing of the span units to find the best possible data rate (rate adaptation during set up).
"PowerFeedingCfg" (conditional)	LR_DSL (SHDSL)		"noPower", "powerFeed", "wettingCurrent"	yes	EMS & NMS		Desired support for optional power feeding (remote span powering) or wetting current (loop sealing current) on the SHDSL span.
"PowerFeeding" (conditional)	LR_DSL (SHDSL)		"noPower", "powerFeed", "wettingCurrent", "invalid", "notSupported"	yes	EMS		Actual power feeding of the line resp. span.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"PseudoMacAddress" (conditional)	LR_DSL (SHDSL)		String	yes	EMS		Pseudo MAC address of the STU-R, calculated using an offset from the global MAC address of the ME hosting the STU-C (DSLAM), which has to be configured in advance, and sent to the STU-R via the EOC; it is a hexadezimal string of length 12.
"WireInterfaceCfg"	LR_DSL (SHDSL)		"twoWire", "fourWire"	yes	EMS & NMS		Configuration of two-wire or optional four-wire operation (aka dual port mode) for SHDSL lines.
"PSDMaskCfg"	LR_DSL (SHDSL)		"symmetric", "asymmetric"	yes	EMS & NMS		Configuration of use of symmetric or asymmetric PSD mask for the line; see also "TransModeCfg".
"CurrCondSnrMgnCfg"	LR_DSL (SHDSL)		"-10"… "21"	yes	EMS & NMS		Configuration of downstream current-condition target noise margin, measured in dB and steps of 1 dB; the EMS may implement a different range and stepping.
"WorstCaseSnrMgnCfg"	LR_DSL (SHDSL)		"-10"… "21"	yes	EMS & NMS		Configuration of downstream worst-case target noise margin, measured in dB and steps of 1 dB.
"RU_CurrCondSnrMgnCfg"	LR_DSL (SHDSL)		"-10"… "21"	yes	EMS & NMS		Configuration of upstream current-condition target noise margin.
"RU_WorstCaseSnrMgnCfg"	LR_DSL (SHDSL)		"-10"… "21"	yes	EMS & NMS		Configuration of upstream worst-case target noise margin.
"UsedSnrMgnsCfg"	LR_DSL (SHDSL)		String containing comma list of single Strings taken from the following list: "CurrCondSnrMgn", "WorstCaseSnrMgn", "RU_CurrCondSnrMgn", "RU_WorstCaseSnrMgn"	yes	EMS & NMS		Indicates whether a current-condition or worst-case target noise margin is enabled (inclusion in string value) or disabled (exclusion from string value) for being used during line probing.
"ApplicableStandard"	LR_DSL (VDSL)		"ANSI", "ETSI", "ITU-T", "other"	yes	EMS & NMS	ANSI T1.424, ETSI TS 101 270, ITU-T G.993.x	Applicable VDSL standard (if any) to be used for the line.
"DeploymentScenario"	LR_DSL (VDSL)		"FTTCab", "FTTEx", "other"	yes	EMS & NMS		VDSL line deployment scenario: VTU-O is located in a street cabinet, or in the central office, or elsewhere.
"BandPlan"	LR_DSL (VDSL)		"A/998", "B/997", "C/Fx", "other"	yes	EMS & NMS	G.993.1 T1.424	Four band plan for spectral usage on the VDSL line (DS1/US1/DS2/US2): **A/998** is G.993.1 band plan A which is T1.424 plan 998, **B/997** is G.993.1 band plan B which is T1.424 plan 997, **C/Fx** is G.993.1 band plan C which depends on a variable frequency Fx between the DS2 and US2 bands.

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“BandPlanFx”	LR_DSL (VDSL)		“3750”… “12000”	yes	EMS & NMS		Variable frequency of band plan C/Fx, measured in kHz.
“BandOptUsage” (conditional)	LR_DSL (VDSL)		“unused”, “upstream”, “downstream”	yes	EMS & NMS		Use of the frequency range Opt (25 kHz - 138 kHz) by the VDSL line.
“ADSLpresence” (conditional)	LR_DSL (VDSL)		“none”, “ADSLoverPOTS”, “ADSLoverISDN”	yes	EMS & NMS		Provisioning of the presence of ADSL service in the associated cable bundle/binder.
“PsdTemplate”	LR_DSL (VDSL)		“templateMask1” (notched), “templateMask2” (unnotched)	yes	EMS & NMS		Downstream PSD template mask to be used for the line; the templates depend on “ApplicableStandard” and “DeploymentScenario”.
“RU_PsdTemplate”	LR_DSL (VDSL)		“templateMask1”, “templateMask2”	yes	EMS & NMS		Upstream PSD template mask to be used for the line; the templates depend on “ApplicableStandard” and “DeploymentScenario”; the EMS may impose dependencies on “PsdTemplate” (e.g., require mask-1 resp. mask-2 if the value of “PsdTemplate” is mask-1 resp. mask-2).
“PboControl” (conditional)	LR_DSL (VDSL)		“noPbo”, “manualPbo”, “automaticPbo”	yes	EMS & NMS		Downstream power backoff (PBO) mode (DPBO); automatic DPBO may be based on vendor-specific line measurement methods.
“PboLevel” (conditional)	LR_DSL (VDSL)		“0”… “12.0”(0.25)	yes	EMS & NMS		Downstream PBO level to be used when “PboControl” is set to “manualPbo”, measured in dB and steps of 0.25 dB.
“RU_PboControl”	LR_DSL (VDSL)		“noPbo”, “manualPbo”, “automaticPbo”	yes	EMS & NMS		Upstream power backoff (PBO) mode (UPBO); automatic UPBO is based on line measurements per PBO mask calculation according to “ApplicableStandard”.
“RU_PboLevel”	LR_DSL (VDSL)		“0”… “40.0”(0.25)	yes	EMS & NMS		Upstream PBO level to be used when “RU_PboControl” is set to “manualPbo”, measured in dB and steps of 0.25 dB.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"HamBandMask"	LR_DSL (VDSL)	PTP	String containing comma list of single Strings taken from the following list: "hamBand10m", "hamBand12m", "hamBand15m", "hamBand17m", "hamBand20m", "hamBand30m", "hamBand40m", "hamBand80m", "hamBand160m", "customNotch1", "customNotch2"	yes	EMS & NMS		Configuration of Handheld AMateur radio (HAM) bands that should be notched, namely the four standard HAM bands (up to 10.15 MHz), which are defined in the applicable VDSL spectrum (up to 12 MHz) according to "ApplicableStandard", and one or two custom notches; a notch is enabled by inclusion in the string value and disabled by exclusion from the string value.
"CustomNotch1Start"	LR_DSL (VDSL)		String containing an Integer number	yes	EMS & NMS		Start frequency (in kHz) of the first custom-specific notch.
"CustomNotch1Stop"	LR_DSL (VDSL)		String containing an Integer number	yes	EMS & NMS		Stop frequency (in kHz) of the first custom-specific notch; must be larger than "CustomNotch1Start".
"CustomNotch2Start"	LR_DSL (VDSL)		String containing an Integer number	yes	EMS & NMS		Start frequency (in kHz) of the second custom-specific notch.
"CustomNotch2Stop"	LR_DSL (VDSL)		String containing an Integer number	yes	EMS & NMS		Stop frequency (in kHz) of the second custom-specific notch; must be larger than "CustomNotch2Start".
"TargetSlowBurst"	LR_DSL (VDSL)		String containing an Integer number	yes	EMS & NMS		Downstream target level (in microseconds) of impulse noise (burst) protection for an interleaved (slow) channel.
"RU_TargetSlowBurst"	LR_DSL (VDSL)		String containing an Integer number	yes	EMS & NMS		Upstream target level (in microseconds) of impulse noise (burst) protection for an interleaved (slow) channel.
"MaxFastFEC"	LR_DSL (VDSL)		String containing an Integer number	yes	EMS & NMS		Downstream maximum level (in %) of Forward Error Correction (FEC) redundancy related overhead to be maintained for a fast channel.
"RU_MaxFastFEC"	LR_DSL (VDSL)		String containing an Integer number	yes	EMS & NMS		Upstream maximum level (in %) of Forward Error Correction (FEC) redundancy related overhead to be maintained for a fast channel.
"LoopLengthEstimate"	LR_DSL (VDSL)		String containing an Integer number	yes	EMS		Estimated loop length in feet assuming a 26 AWG loop.
"xTUTransmissionSystemEnabling"	LR_DSL (ADSL, ADSL2, ADSL2+, VDSL2)	PTP	"0", "1" (64 chars long)	yes	EMS & NMS	G.997.1	This parameter (XTSE) defines the transmission system types to be allowed by the near-end xTU (xDSL transceiver unit) on this line. It is coded in a bit map representation (0 if not allowed, 1 if allowed) of 8 Bytes. String of 64 "0"s or "1"s.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"PowerManagementStateForced"	LR_DSL (ADSL2, ADSL2+, VDSL2)	PTP	"0", "2", "3"	yes	EMS & NMS	G.997.1	This parameter (PMSF) defines the line states to be forced by the near-end ATU xTU on this line.
"PowerManagementStateEnabling"	LR_DSL (ADSL2, ADSL2+, VDSL2)	PTP	"0", "1" (2 chars long)	yes	EMS & NMS	G.997.1	This parameter (PMMode) defines the line states the xTU-C or xTU-R may autonomously transition to on this line. It is coded in a bit map representation (0 if not allowed, 1 if allowed).
"MinimumL0TimeIntervalBetweenL2ExitAndNextL2Entry"	LR_DSL (ADSL2, ADSL2+)	PTP	"0"… "255"(1)	yes	EMS & NMS	G.997.1	This parameter (L0 TIME) represents the minimum time (in seconds) between an Exit from the L2 state and the next Entry into the L2 state. It ranges from 0 to 255 seconds.
"MinimumL2TimeIntervalBetweenL2EntryAndFirstL2Trim"	LR_DSL (ADSL2, ADSL2+)	PTP	"0"… "255"(1)	yes	EMS & NMS	G.997.1	This parameter (L2 TIME) represents the minimum time (in seconds) between an Entry into the L2 state and the first Power Trim in the L2 state and between two consecutive Power Trims in the L2 State. It ranges from 0 to 255 seconds.
"MaximumAggregateTransmitPowerReductionPerL2RequestOrL2PowerTrim"	LR_DSL (ADSL2, ADSL2+)	PTP	"0"… "31"(1)	yes	EMS & NMS	G.997.1	This parameter (L2 ATPR) represents the maximum aggregate transmit power reduction (in dB) that can be performed in the L2 Request (i.e., at transition of L0 to L2 state) or through a single Power Trim in the L2 state. It ranges from 0 dB to 31 dB in steps of 1 dB.
"TotalMaximumAggregateTransmitPowerReductionInL2"	LR_DSL (ADSL2, ADSL2+)	PTP	"0"… "31"(1)	yes	EMS & NMS	G.997.1	This parameter (L2 ATPRT) represents the total maximum aggregate transmit power reduction (in dB) that can be performed in an L2 state. It ranges from 0 dB to 31 dB in steps of 1 dB.
"LoopDiagnosticsModeForced"	LR_DSL (ADSL2, ADSL2+, VDSL2)	PTP	"0", "1"	yes	EMS & NMS	G.997.1	This parameter (LDSF) defines whether the line should be forced into the loop diagnostics mode by the near-end ATU xTU on this line. 0 = inhibit; 1 = force.
"AutomodeColdStartForced"	LR_DSL (ADSL2, ADSL2+, VDSL2)	PTP	"0", "1"	yes	EMS & NMS	G.997.1	This parameter is defined in order to improve testing of the performance of xTUs supporting automode when it is enabled. 0 = inhibit; 1 = force.
"DownstreamSubcarrierMasking"	LR_DSL (ADSL2, ADSL2+, VDSL2)	PTP	Structure: "(<sc0>=<0|1>)[, (<sc1>=<0|1>)] …[, (<scNSCds-1>=<0|1>)]"	yes	EMS & NMS	G.997.1	This parameter (CARMASKds) is an array of boolean values sc(i). Each entry sc(i) defines whether subcarrier with index i is masked on this line in the downstream direction, for i ranging from 0 to NSCds-1. It is coded as 1 if the subcarrier is masked and 0 if the subcarrier is not masked. NSCds is the highest subcarrier index that can be transmitted in the downstream direction.

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"UpstreamSubcarrierMasking"	LR_DSL (ADSL2, ADSL2+, VDSL2)	PTP	Structure: "(<sc0>=<0|1>)[, (<sc1>=<0|1>)] …[, (<scNSCus-1>=<0|1>)]"	yes	EMS & NMS	G.997.1	This parameter (CARMASKus) is an array of boolean values sc(i). Each entry sc(i) defines whether transmission of subcarrier with index i is masked on this line in the upstream direction, for i ranging from 0 to NSCus-1. It is coded as 1 if subcarrier is masked and 0 if the subcarrier is not masked. NSCus is the highest subcarrier index that can be transmitted in the upstream direction.
"RFIBands"	LR_DSL (ADSL2+, VDSL2)	PTP	see G.997.1	yes	EMS & NMS	G.997.1	For G.992.5 (ADSL2+), this configuration parameter defines the subset of downstream PSD mask breakpoints, as specified in PSDMASKds, that shall be used to notch an RFI band. This subset consists of couples of consecutive subcarrier indices belonging to breakpoints: [ti; ti + 1], corresponding to the low level of the notch. The specific interpolation around these points is defined in the relevant Recommendations (e.g., G.992.5). For G.993.2 (VDSL2), this configuration parameter defines the bands where the PSD shall be reduced as specified in § 7.2.1.2/G.993.2. Each band shall be represented by a start and stop subcarrier indices with a subcarrier spacing of 4.3125kHz. Up to 16 bands may be specified. This parameter defines the RFI bands for both upstream and downstream directions.
"DownstreamMaximumNominalPowerSpectralDensity"	LR_DSL (ADSL2, ADSL2+, VDSL2)	PTP	"-60.0"… "-30.0"(0.1)	yes	EMS & NMS	G.997.1	This parameter (MAXNOMPSDds) represents the maximum nominal transmit PSD in the downstream direction during initialization and showtime (in dBm/Hz). A single MAXNOMPSDds parameter is defined per mode enabled in the XTSE line configuration parameter. It ranges from –60 to –30 dBm/Hz, with 0.1 dB steps.
"UpstreamMaximumNominalPowerSpectralDensity"	LR_DSL (ADSL2, ADSL2+, VDSL2)	PTP	"-60.0"… "-30.0"(0.1)	yes	EMS & NMS	G.997.1	This parameter (MAXNOMPSDus) represents the maximum nominal transmit PSD in the upstream direction during initialization and showtime (in dBm/Hz). A single MAXNOMPSDus parameter is defined per mode enabled in the XTSE line configuration parameter. It ranges from –60 to –30 dBm/Hz, with 0.1 dB steps.
"DownstreamPSDMask"	LR_DSL (ADSL2+, VDSL2)	PTP	Structure: "(<index1>=<PSD1>)[, (<index2>=<PSD2>)] …[, (<index32>=<PSD32>)]"	yes	EMS & NMS	G.997.1	This parameter (PSDMASKds) defines the downstream PSD mask applicable at the U C2 reference point. PSD ranges from 0 to -95dBm/Hz with 0.5 dBm/Hz steps; i.e., 0.0…-95.0(0.5).
"UpstreamPSDMask"	LR_DSL (ADSL2, ADSL2+, VDSL2)	PTP	Structure: "(<index1>=<PSD1>)[, (<index2>=<PSD2>)] …[, (<index#>=<PSD#>)]"	yes	EMS & NMS	G.997.1	This parameter (PSDMASKus) defines the upstream PSD mask applicable at the U R2 reference point. PSD ranges from 0 to -95dBm/Hz with 0.5 dBm/Hz steps; i.e., 0.0…95.0(0.5). # = 4 for ADSL2 and 16 for VDSL2.
"DownstreamMaximumNominalAggregateTransmitPower"	LR_DSL (ADSL2, ADSL2+, VDSL2)	PTP	"0"… "25.5"(0.1)	yes	EMS & NMS	G.997.1	This parameter (MAXNOMATPds) represents the maximum nominal aggregate transmit power in the downstream direction during initialization and showtime (in dBm). It ranges from 0 to 25.5 dBm, with 0.1 dB steps.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"UpstreamMaximumNominalAggregateTransmitPower"	LR_DSL (ADSL2, ADSL2+, VDSL2)	PTP	"0"… "25.5"(0.1)	yes	EMS & NMS	G.997.1	This parameter (MAXNOMATPus) represents the maximum nominal aggregate transmit power in the upstream direction during initialization and showtime (in dBm). It ranges from 0 to 25.5 dBm, with 0.1 dB steps.
"UpstreamMaximumAggregateReceivePower"	LR_DSL (ADSL2, ADSL2+, VDSL2)	PTP	"null", "-25.5"… "25.5"(0.1)	yes	EMS & NMS	G.997.1	This parameter (MAXRXPWRus) represents the maximum upstream aggregate receive power over a set of subcarriers (in dBm). It ranges from –25.5 to 25.5 dBm, with 0.1 dB steps. The "null" value is used to indicate that no Upstream Maximum Aggregate Receive Power limit is to be applied (i.e., the maximum value is infinite).
"UpstreamPSDMaskSelection"	LR_DSL (ADSL2, ADSL2+)	PTP	"1"… "9"(1)	yes	EMS & NMS	G.997.1	This parameter defines which upstream PSD mask is enabled.
"DownstreamRateAdaptationMode"	LR_DSL (ADSL, ADSL2, ADSL2+, VDSL2)	PTP	"manual", "atInit", "dynamic"	yes	EMS & NMS	G.997.1	This parameter (RA-MODEds) defines the mode of operation of a rate-adaptive xTU-C in the transmit direction.
"UpstreamRateAdaptationMode"	LR_DSL (ADSL, ADSL2, ADSL2+, VDSL2)	PTP	"manual", "atInit", "dynamic"	yes	EMS & NMS	G.997.1	This parameter (RA-MODEus) defines the mode of operation of a rate-adaptive xTU-R in the transmit direction.
"DownstreamTargetNoiseMargin"	LR_DSL (ADSL, ADSL2, ADSL2+, VDSL2)	PTP	"0.0"… "31.0"(0.1)	yes	EMS & NMS	G.997.1	This parameter (TARSNRMds) defines the noise margin which the xTU-R receiver shall achieve, relative to the BER requirement for each of the downstream bearer channels, or better, to successfully complete initialization. It ranges from 0 to 31 dB with 0.1 dB steps.
"UpstreamTargetNoiseMargin"	LR_DSL (ADSL, ADSL2, ADSL2+, VDSL2)	PTP	"0.0"…"31.0"(0.1)	yes	EMS & NMS	G.997.1	This parameter (TARSNRMus) defines the noise margin which the xTU-C receiver shall achieve, relative to the BER requirement for each of the upstream bearer channels, or better, to successfully complete initialization. It ranges from 0 to 31 dB with 0.1 dB steps.
"DownstreamMaximumNoiseMargin"	LR_DSL (ADSL, ADSL2, ADSL2+, VDSL2)	PTP	"null", "0.0"… "31.0"(0.1)	yes	EMS & NMS	G.997.1	This parameter (MAXSNRMds) defines the maximum noise margin the xTU-R receiver shall try to sustain. It ranges from 0 to 31 dB with 0.1 dB steps. The "null" value is used to indicate that no maximum noise margin limit is to be applied (i.e., the maximum value is infinite).

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"UpstreamMaximumNoiseMargin"	LR_DSL (ADSL, ADSL2, ADSL2+, VDSL2)	PTP	"null", "0.0"… "31.0"(0.1)	yes	EMS & NMS	G.997.1	This parameter (MAXSNRMus) defines the maximum noise margin the xTU-C receiver shall try to sustain. It ranges from 0 to 31 dB with 0.1 dB steps. The "null" value is used to indicate that no maximum noise margin limit is to be applied (i.e., the maximum value is infinite).
"DownstreamMinimumNoiseMargin"	LR_DSL (ADSL, ADSL2, ADSL2+, VDSL2)	PTP	"0.0"… "31.0"(0.1)	yes	EMS & NMS	G.997.1	This parameter (MINSNRMds) defines the minimum noise margin the xTU-R receiver shall tolerate. It ranges from 0 to 31 dB with 0.1 dB steps.
"UpstreamMinimumNoiseMargin"	LR_DSL (ADSL, ADSL2, ADSL2+, VDSL2)	PTP	"0.0"… "31.0"(0.1)	yes	EMS & NMS	G.997.1	This parameter (MINSNRMus) defines the minimum noise margin the xTU-C receiver shall tolerate. It ranges from 0 to 31 dB with 0.1 dB steps.
"DownstreamUp-shiftNoiseMargin"	LR_DSL (ADSL2, ADSL2+, VDSL2)	PTP	"0.0"… "31.0"(0.1)	yes	EMS & NMS	G.997.1	This parameter (RA-USNRMds) defines the downstream up-shift noise margin. It ranges from 0 to 31 dB with 0.1 dB steps.
"UpstreamUp-shiftNoiseMargin"	LR_DSL (ADSL2, ADSL2+, VDSL2)	PTP	"0.0"… "31.0"(0.1)	yes	EMS & NMS	G.997.1	This parameter (RA-USNRMus) defines the upstream up-shift noise margin. It ranges from 0 to 31 dB with 0.1 dB steps.
"DownstreamMinimumTimeIntervalForUp-shiftRateAdaptation"	LR_DSL (ADSL2, ADSL2+, VDSL2)	PTP	"0"… "16383"(1)	yes	EMS & NMS	G.997.1	This parameter (RA-UTIMEds) defines the interval of time (in seconds) the downstream noise margin should stay above the downstream up-shift noise margin before the xTU-R shall attempt to increase the downstream net data rate.
"UpstreamMinimumTimeIntervalForUp-shiftRateAdaptation"	LR_DSL (ADSL2, ADSL2+, VDSL2)	PTP	"0"… "16383"(1)	yes	EMS & NMS	G.997.1	This parameter (RA-UTIMEus) defines the interval of time (in seconds) the upstream noise margin should stay above the upstream up-shift noise margin before the xTU-C shall attempt to increase the upstream net data rate.
"DownstreamDown-shiftNoiseMargin"	LR_DSL (ADSL2, ADSL2+, VDSL2)	PTP	"0.0"… "31.0"(0.1)	yes	EMS & NMS	G.997.1	This parameter (RA-DSNRMds) defines the downstream down-shift noise margin. It ranges from 0 to 31 dB with 0.1 dB steps.
"UpstreamDown-shiftNoiseMargin"	LR_DSL (ADSL2, ADSL2+, VDSL2)	PTP	"0.0"… "31.0"(0.1)	yes	EMS & NMS	G.997.1	This parameter (RA-DSNRMus) defines the upstream down-shift noise margin. It ranges from 0 to 31 dB with 0.1 dB steps.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"DownstreamMinimumTimeIntervalForDown-shiftRateAdaptation"	LR_DSL (ADSL2, ADSL2+, VDSL2)	PTP	"0"… "16383"(1)	yes	EMS & NMS	G.997.1	This parameter (RA-DTIMEds) defines the interval of time (in seconds) the downstream noise margin should stay above the downstream down-shift noise margin before the xTU-R shall attempt to decrease the downstream net data rate.
"UpstreamMinimumTimeIntervalForDown-shiftRateAdaptation"	LR_DSL (ADSL2, ADSL2+, VDSL2)	PTP	"0"… "16383"(1)	yes	EMS & NMS	G.997.1	This parameter (RA-DTIMEus) defines the interval of time (in seconds) the upstream noise margin should stay above the upstream down-shift noise margin before the xTU-C shall attempt to decrease the upstream net data rate.
"MinimumOverheadRateUpstream"	LR_DSL (ADSL2, ADSL2+, VDSL2)	PTP	"4000"… "248000"(1000)	yes	EMS & NMS	G.997.1	This parameter (MSGMINus) defines the minimum rate of the message based overhead that shall be maintained by the xTU in the upstream direction. MSGMINus is expressed in bits per second. It ranges from 4000 to 248 000 bit/s with 1000 bit/s steps.
"MinimumOverheadRateDownstream"	LR_DSL (ADSL2, ADSL2+, VDSL2)	PTP	"4000"… "248000"(1000)	yes	EMS & NMS	G.997.1	This parameter (MSGMINds) defines the minimum rate of the message based overhead that shall be maintained by the xTU in the downstream direction. MSGMINus is expressed in bits per second. It ranges from 4000 to 248 000 bit/s with 1000 bit/s steps.
"DownstreamPowerBack-offAssumedExchangePSDMask"	LR_DSL (ADSL2+, VDSL2)	PTP	Structure: "(<index1>=<PSD1>)[, (<index2>=<PSD2>)] …[, (<index16>=<PSD16>)]"	yes	EMS & NMS	G.997.1	This parameter (DPBOEPSD) defines the PSD mask that is assumed to be permitted at the exchange. This parameter shall use the same format as PSDMASKds. The maximum number of breakpoints for DPBOEPSD is 16. PSD ranges from 0 to -95dBm/Hz with 0.5 dBm/Hz steps; i.e., 0.0…-95.0(0.5).
"DownstreamPowerBack-offE-sideElectricalLength"	LR_DSL (ADSL2+, VDSL2)	PTP	"0.0"… "255.5"(0.5)	yes	EMS & NMS	G.997.1	This parameter (DPBOESEL) defines the assumed electrical length of cables (E-side cables) connecting exchange based DSL services to a remote flexibility point (cabinet), that hosts the xTU-C that is subject to spectrally shaped downstream power back-off depending on this length. For this parameter the electrical length is defined as the loss (in dB) of an equivalent length of hypothetical cable at a reference frequency defined by the network operator or in spectrum management regulations. DPBOESEL shall be coded as an unsigned integer representing an electrical length from 0 dB to 255.5 dB in steps of 0.5 dB. All values in the range are valid. If DPBOESEL is set to zero, the DPBO in this section shall be disabled.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"DownstreamPowerBack-offE-sideMinimumElectricalLength"	LR_DSL (ADSL2+, VDSL2)	PTP	"0.0"… "127.5"(0.5)	yes	EMS & NMS		This parameter (DPBOESELMIN) defines the assumed minimum electrical length of cables (E-side cables) connecting exchange based DSL services to a remote flexibility point (cabinet), that hosts the xTU-C that is subject to spectrally shaped downstream power back-off depending on this length. For this parameter the electrical length is defined as the loss (in dB) of an equivalent length of hypothetical cable at a reference frequency of 1 MHz. DPBOESELMIN shall be coded as an unsigned integer representing an electrical length from 0 dB to 127.5 dB in steps of 0.5 dB.
"DownstreamPowerBack-offE-sideCableModelA"	LR_DSL (ADSL2+, VDSL2)	PTP	"-1.00000000"… "1.50000000"(2-8)	yes	EMS & NMS	G.997.1	These parameters (DPBOESCMA, DPBOESCMB, DPBOESCMC) defines a cable model in terms of three scalars DPBOESCMA, DPBOESCMB and DPBOESCMC that shall be used to describe the frequency dependent loss of E-side cables. Parameters DPBOESCMA, DPBOESCMB, DPBOESCMC shall be coded as unsigned integers representing a scalar value from -1 to 1.5 in steps of 2-8. All values in the range are valid.
"DownstreamPowerBack-offE-sideCableModelB"	LR_DSL (ADSL2+, VDSL2)	PTP	"-1.00000000"… "1.50000000"(2-8)	yes	EMS & NMS	G.997.1	
"DownstreamPowerBack-offE-sideCableModelC"	LR_DSL (ADSL2+, VDSL2)	PTP	"-1.00000000"… "1.50000000"(2-8)	yes	EMS & NMS	G.997.1	
"DownstreamPowerBack-offMinimumUsableSignal"	LR_DSL (ADSL2+, VDSL2)	PTP	"0.0"… "-127.5"(0.5)	yes	EMS & NMS	G.997.1	This parameter (DPBOMUS) defines the assumed minimum usable receive PSD mask (in dBm/Hz) for exchange based services, used to modify parameter DPBOFMAX defined below. It shall be coded as an unsigned integer representing a PSD mask level from 0 dBm/Hz to -127.5 dBm/Hz in steps of 0.5 dB. All values in the range are valid.
"DownstreamPowerBack-offSpanMinimumFrequency"	LR_DSL (ADSL2+, VDSL2)	PTP	"0.0000"… "8832.0000"(4.3125)	yes	EMS & NMS	G.997.1	This parameter (DPBOFMIN) defines the minimum frequency from which the DPBO shall be applied. It ranges from 0 kHz to 8832 kHz in steps of 4.3125 kHz.
"DownstreamPowerBack-offSpanMaximumFrequency"	LR_DSL (ADSL2+, VDSL2)	PTP	"138.0000"… "29997.7500"(4.3125)	yes	EMS & NMS	G.997.1	This parameter (DPBOFMAX) defines the maximum frequency at which DPBO may be applied. It ranges from 138 kHz to 29997.75 kHz in steps of 4.3125 kHz.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"UpstreamPowerBack-offReferencePSDPerBand"	LR_DSL (VDSL2)	PTP	Structure: "(<band1>=<a>,<b>)[, (<band2>=<a>,<b>)] …[, (<band#>=<a>,<b>)]"	yes	EMS & NMS	G.997.1	This parameter (UPBOPSD-pb) defines the UPBO reference PSD used to compute the upstream power back-off for each upstream band except US0. A UPBOPSD defined for each band consists of two parameters [a, b]. Parameter a ranges from 40 dBm/Hz to 80.95 dBm/Hz in steps of 0.01 dBm/Hz; and parameter b ranges from 0 to 40.95 dBm/Hz in steps of 0.01 dBm/Hz. The set of parameter values a = 40 dBm/Hz, b = 0 dBm/Hz is a special configuration to disable UPBO in the respective upstream band. a = 40.00…80.95(0.01) b = 0.00…40.95(0.01)
"UpstreamPowerBack-offElectricalLength"	LR_DSL (VDSL2)	PTP	"0.0"… "128.0"(0.1)	no	EMS	G.997.1	This parameter (UPBOKL) defines the electrical length expressed in dB at 1MHz. The value ranges from 0 to 128 dB in steps of 0.1 dB.
"UpstreamPowerBack-offForceElectricalLength"	LR_DSL (VDSL2)	PTP	"0", "1"	yes	EMS & NMS	G.997.1	This parameter (UPBOKLF) is a flag that forces the VTU-R to use the electrical length of theUPBOKL to compute the UPBO. The value shall be forced if the flag is set to 1. Otherwise, the VTUs shall determine the electrical length.
"ProfilesEnabling"	LR_DSL (VDSL2)	PTP	"G.993.2 Profile 8a", "G.993.2 Profile 8b", "G.993.2 Profile 8c", "G.993.2 Profile 8d", "G.993.2 Profile 12a", "G.993.2 Profile 12b", "G.993.2 Profile 17a", "G.993.2 Profile 30a"	no	EMS	G.997.1	This parameter (PROFILES) contains the G.993.2 profiles to be allowed by the near-end xTU on this line.
"PSDMaskClassSelection"	LR_DSL (VDSL2)	PTP	"1"… "5"(1)	no	EMS	G.997.1	This parameter (CLASSMASK) defines the limit Power Spectral Density mask (limit PSD mask).
"LimitPSDMaskAndBandplansEnabling"	LR_DSL (VDSL2)	PTP	"0", "1" (64 chars long)	no	EMS	G.997.1	This parameter (LIMITMASK) contains the G.993.2 limit PSD masks of the selected PSD mask class, enabled by the near-end xTU on this line for each class of profiles.
"US0Disabling"	LR_DSL (VDSL2)	PTP	"0", "1" (64 chars long)	yes	EMS & NMS	G.997.1	This parameter (US0DISABLE) defines if the use of US0 is disabled for each limit PSD mask enabled in the LIMITMASK parameter. For each limit PSD mask enabled in the LIMITMASK parameter, a bit shall indicate if US0 is disabled. The disabling parameter is coded as a bit-map. The bit is set to 1 if US0 is disabled for the associated limit mask.
"US0PSDMasks"	LR_DSL (VDSL2)	PTP	"0", "1" (32 chars long)	no	EMS	G.997.1	This parameter (US0MASK) contains the US0 PSD masks to be allowed by the near-end xTU on the line. It is represented as a bitmap (0 if not allowed and 1 if allowed).

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"SubcarrierMasking"	LR_DSL (VDSL2)	PTP	see G.997.1	no	EMS	G.997.1	This parameter (CARMASK) defines the restrictions, additional to the band plan, to determine the set of subcarriers allowed for transmission in both upstream and downstream directions.
"CyclicExtensionFlag"	LR_DSL (VDSL2)	PTP	"0", "1"	yes	EMS & NMS	G.997.1	This parameter (CEFLAG) is a bit that enables the use of the optional cyclic extension values. If the bit is set to 1, the optional cyclic extension values may be used. Otherwise, the cyclic extension shall be forced to the mandatory length (5N/32).
"DownstreamSignal-to-NoiseRatioMode"	LR_DSL (VDSL2)	PTP	"1", "2"	yes	EMS & NMS	G.997.1	This parameter (SNRMODEds) enables the transmitter referred virtual noise in the downstream direction. If set to 1, the virtual noise is disabled. If set to 2, the virtual noise is enabled.
"UpstreamSignal-to-NoiseRatioMode"	LR_DSL (VDSL2)	PTP	"1", "2"	yes	EMS & NMS	G.997.1	This parameter (SNRMODEus) enables the transmitter referred virtual noise in the upstream direction. If set to 1, the virtual noise is disabled. If set to 2, the virtual noise is enabled.
"DownstreamTransmitterReferred VirtualNoise"	LR_DSL (VDSL2)	PTP	Structure: "(<index1>=<PSD1|null>)[, (<index2>=<PSD2|null>)] …[, (<index32>=<PSD32|null>)]"	yes	EMS & NMS	G.997.1	This parameter (TXREFVNds) defines the downstream transmitter referred virtual noise. index = subcarrier (spacing of 4.3125 kHz), PSD = ranges from -40.0 dBm/Hz to -140.0 dBm/Hz in steps of 0.5 dBm/Hz, null = 0 W/Hz.
"UpstreamTransmitterReferredVirtualNoise"	LR_DSL (VDSL2)	PTP	Structure: "(<index1>=<PSD1|null>)[, (<index2>=<PSD2|null>)] …[, (<index16>=<PSD16|null>)]"	yes	EMS & NMS	G.997.1	This parameter (TXREFVNus) defines the upstream transmitter referred virtual noise. index = subcarrier (spacing of 4.3125 kHz), PSD = ranges from -40.0 dBm/Hz to -140.0 dBm/Hz in steps of 0.5 dBm/Hz, null = 0 W/Hz.
"DownstreamMinimumDataRate-Channel<n>" <n> = 1 | 2 | 3 | 4	LR_DSL (ADSL, ADSL2, ADSL2+, VDSL2)	PTP	String containing an Integer number	yes	EMS & NMS	G.997.1	This parameter defines the minimum net data rate for the bearer channel <n> at xTU-C in the transmit direction. The rate is coded in steps of 1000 bit/s.
"UpstreamMinimumDataRate-Channel<n>" <n> = 1 | 2 | 3 | 4	LR_DSL (ADSL, ADSL2, ADSL2+, VDSL2)	PTP	String containing an Integer number	yes	EMS & NMS	G.997.1	This parameter defines the minimum net data rate for the bearer channel <n> at xTU-R in the transmit direction. The rate is coded in steps of 1000 bit/s.
"DownstreamMinimumReservedDataRate-Channel<n>" <n> = 1 | 2 | 3 | 4	LR_DSL (ADSL2, ADSL2+, VDSL2)	PTP	String containing an Integer number	yes	EMS & NMS	G.997.1	This parameter defines the minimum reserved net data rate for the bearer channel <n> at xTU-C in the transmit direction. The rate is coded in steps of 1000 bit/s.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"UpstreamMinimumReservedDataRate-Channel<n>" <n> = 1 | 2 | 3 | 4	LR_DSL (ADSL2, ADSL2+, VDSL2)	PTP	String containing an Integer number	yes	EMS & NMS	G.997.1	This parameter defines the minimum reserved net data rate for the bearer channel <n> at xTU-R in the transmit direction. The rate is coded in steps of 1000 bit/s.
"DownstreamMaximumDataRate-Channel<n>" <n> = 1 | 2 | 3 | 4	LR_DSL (ADSL, ADSL2, ADSL2+, VDSL2)	PTP	String containing an Integer number	yes	EMS & NMS	G.997.1	This parameter defines the maximum net data rate for the bearer channel <n> at xTU-C in the transmit direction. The data rate is coded in steps of 1000 bit/s.
"UpstreamMaximumDataRate-Channel<n>" <n> = 1 | 2 | 3 | 4	LR_DSL (ADSL, ADSL2, ADSL2+, VDSL2)	PTP	String containing an Integer number	yes	EMS & NMS	G.997.1	This parameter defines the maximum net data rate for the bearer channel <n> at xTU-R in the transmit direction. The data rate is coded in steps of 1000 bit/s.
"DownstreamRateAdaptationRatio-Channel<n>" <n> = 1 | 2 | 3 | 4	LR_DSL (ADSL, ADSL2, ADSL2+, VDSL2)	PTP	"0"… "100"(1)	yes	EMS & NMS	G.997.1	This parameter (expressed in %) defines the ratio that shall be taken into account for the bearer channel <n> at xTU-C in the transmit direction when performing rate adaptation in the transmission direction of the bearer channel. The ratio is defined as a percentage in the 0 to 100 range.
"UpnstreamRateAdaptationRatio-Channel<n>" <n> = 1 | 2 | 3 | 4	LR_DSL (ADSL, ADSL2, ADSL2+, VDSL2)	PTP	"0"… "100"(1)	yes	EMS & NMS	G.997.1	This parameter (expressed in %) defines the ratio that shall be taken into account for the bearer channel <n> at xTU-R in the transmit direction when performing rate adaptation in the transmission direction of the bearer channel. The ratio is defined as a percentage in the 0 to 100 range.
"DownstreamMaximumInterleavingDelay-Channel<n>" <n> = 1 | 2 | 3 | 4	LR_DSL (ADSL, ADSL2, ADSL2+, VDSL2)	PTP	"S0", "S1", "S2", "2"… "63"(1)	yes	EMS & NMS	G.997.1	This parameter defines the maximum one-way interleaving delay introduced by the PMS-TC between the alfa and the beta reference points, in the direction of the bearer channel <n> at xTU-C in the transmit direction. The delay ranges from 2 to 63 ms by steps of 1 ms.
"UpstreamMaximumInterleavingDelay-Channel<n>" <n> = 1 | 2 | 3 | 4	LR_DSL (ADSL, ADSL2, ADSL2+, VDSL2)	PTP	"S0", "S1", "S2", "2"… "63"(1)	yes	EMS & NMS	G.997.1	This parameter defines the maximum one-way interleaving delay introduced by the PMS-TC between the alfa and the beta reference points, in the direction of the bearer channel <n> at xTU-R in the transmit direction. The delay ranges from 2 to 63 ms by steps of 1 ms.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"DownstreamMinimumImpulseNoiseProtection-Channel<n>" <n> = 1 | 2 | 3 | 4	LR_DSL (ADSL2, ADSL2+, VDSL2)	PTP	"0", "0.5", "1"… "16"(1)	yes	EMS & NMS	G.997.1	This parameter (INPMIN) defines the minimum impulse noise protection for the bearer channel <n> at xTU-C in the transmit direction if it is transported over DMT symbols with a subcarrier spacing of 4.3125 kHz. The impulse noise protection is expressed in DMT symbols with a subcarrier spacing of 4.3125 kHz and can take the values ½ and any integer from 0 to 16, inclusive. If the xTU does not support the configured INPMIN value, it shall use the nearest supported impulse noise protection greater than INPMIN.
"UpstreamMinimumImpulseNoiseProtection-Channel<n>" <n> = 1 | 2 | 3 | 4	LR_DSL (ADSL2, ADSL2+, VDSL2)	PTP	"0", "0.5", "1"… "16"(1)	yes	EMS & NMS	G.997.1	This parameter (INPMIN) defines the minimum impulse noise protection for the bearer channel <n> at xTU-R in the transmit direction if it is transported over DMT symbols with a subcarrier spacing of 4.3125 kHz. The impulse noise protection is expressed in DMT symbols with a subcarrier spacing of 4.3125 kHz and can take the values ½ and any integer from 0 to 16, inclusive. If the xTU does not support the configured INPMIN value, it shall use the nearest supported impulse noise protection greater than INPMIN.
"DownstreamMinimumImpulseNoiseProtectionFor8.625kHzSubcarrierSpacing-Channel<n>" <n> = 1 | 2 | 3 | 4	LR_DSL (VDSL2)	PTP	"0"… "16"(1)	yes	EMS & NMS	G.997.1	This parameter (INPMIN8) defines the minimum impulse noise protection for the bearer channel <n> at xTU-C in the transmit direction if it is transported over DMT symbols with a subcarrier spacing of 8.625 kHz. The impulse noise protection is expressed in DMT symbols with a subcarrier spacing of 8.625 kHz and can take any integer value from 0 to 16, inclusive.
"UpstreamMinimumImpulseNoiseProtectionFor8.625kHzSubcarrierSpacing-Channel<n>" <n> = 1 | 2 | 3 | 4	LR_DSL (VDSL2)	PTP	"0"… "16"(1)	yes	EMS & NMS	G.997.1	This parameter (INPMIN8) defines the minimum impulse noise protection for the bearer channel <n> at xTU-R in the transmit direction if it is transported over DMT symbols with a subcarrier spacing of 8.625 kHz. The impulse noise protection is expressed in DMT symbols with a subcarrier spacing of 8.625 kHz and can take any integer value from 0 to 16, inclusive.
"DownstreamForceFramerSettingForImpulseNoiseProtection-Channel<n>" <n> = 1 | 2 | 3 | 4	LR_DSL (VDSL2)	PTP	"0", "1"	yes	EMS & NMS	G.997.1	This parameter (FORCEINP) indicates that the framer settings of the bearer <n> at xTU-C in the transmit direction shall be selected such that the impulse noise protection computed according to the formula specified in the relevant Recommendation is greater than or equal to the minimal impulse noise protection requirement. This flag shall have the same value for all the bearers of one line in the same direction.
"UpstreamForceFramerSettingForImpulseNoiseProtection-Channel<n>" <n> = 1 | 2 | 3 | 4	LR_DSL (VDSL2)	PTP	"0", "1"	yes	EMS & NMS	G.997.1	This parameter (FORCEINP) indicates that the framer settings of the bearer <n> at xTU-R in the transmit direction shall be selected such that the impulse noise protection computed according to the formula specified in the relevant Recommendation is greater than or equal to the minimal impulse noise protection requirement. This flag shall have the same value for all the bearers of one line in the same direction.

G.997.1, TR-057	Q.833.1, TR-028	RFC 2662, draft-ietf-adslmib-vdsl	TR-050	MTNM
ATU-C Target Noise Margin, Target Noise Margin - Downstream	adslConfigurationProfile. targetSnr MarginAtuC	AdslLineConfProfileEntry.adslAtucConf TargetSnrMgn	ADSLConfiguration ProfileValueType. lineConfAtuc. targetSNRMargin	“SnrMgnCfg”
Actual ATU-R SNR Margin	adslLineTTP.current SnrMargin	AdslAturPhysEntry. adslAturCurrSnrMgn	ADSLLineValue Type.lineAturData. currentSNRMargin	“RU_SnrMgn”
Maximum Noise Margin - Upstream	n/a	VdslLineConfProfileEntry.vdslLineConfUpstreamMa xSnrMgn	n/a	“RU_MaxSnrMgn”
ATU-C Current Rate Interleaved + ATU-C Current Rate Fast, Current Line Data Rate - Downstream	adslLineTTP.current LineRate	ifTable.ifSpeed for ifType adsl(94), ifTable.ifSpeed for ifType vdsl(97)	ADSLLineValue Type.lineAtucData. currentLineRate	“DataRate”
ATU-C Current Rate Fast	adslChannel TTP.current ChannelRate	ifTable.ifSpeed for ifType fast(125), or AdslAtucChan Entry.adslAtucChanCurrTxRate	ADSLChannelValue Type.atucData. currentChannelRate	“DataRateFast”

Table 1: Examples of ITU-T/IETF/DSLF Parameter Names and Simple MTNM Names

3 Connectionless Technology Parameters

3.1 Ethernet specific parameters

“For any parameter whose layer rate is Ethernet, or a specific Ethernet rate, and whose object is TP playing the role of CPTP, the LR_LAG_Fragment rate also applies.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"ProtocolIdentifier"	LR_Encapsulation	CTP, TP playing the role of CPTP	"HDLC_PPP", "HDLC_LAPS", "ML_PPP_BAP", "GFP_TRANSPARENT", "GFP_FRAME_MAPPED"	~~no~~yes	EMS& NMS	RFC1990 RFC2125 X.86 G.7041 ~~G.783~~	It indicates the encapsulation method. ~~This is a read-only parameter.~~ It is read/write in the case where the equipment allows changing. Note: "ML_PPP_BAP" identifies LCAS for HDLC encapsulation.
"GFPFrameCheckSequence"	LR_Encapsulation	CTP, TP playing the role of CPTP	"enabled", "disabled"	yes	EMS & NMS	G.7041	Indicates if the GFP Frame Check Sequence capability is enabled or not. Only applies if the "ProtocolIdentifier" is "GFP_FRAME_MAPPED" or "GFP_TRANSPARENT".
"GFPClientSignalFail"	LR_Encapsulation	CTP, TP playing the role of CPTP	"enabled", "disabled"	yes	EMS & NMS	G.7041	Indicates if the GFP Client Signal Fail capability is enabled or not. Only applies if the "ProtocolIdentifier" is "GFP_FRAME_MAPPED" or "GFP_TRANSPARENT".
"AutoNegotiation"	LR_DSR_Fast_Ethernet LR_DSR_Gigabit_Ethernet	PTP, TP playing the role of CPTP	"Enabled", "Disabled"	yes	EMS & NMS	IEEE 802.3	This transmission parameter indicates if the auto-negotiation feature is enabled or disabled. The default value is enabled. This is a read-write parameter.
"AdministrativeSpeedRate"	LR_DSR_Fast_Ethernet LR_DSR_Gigabit_Ethernet LR_DSR_10Gigabit_Ethernet	PTP, TP playing the role of CPTP	"0", "10M", "100M", "1000M", "10G"	yes	EMS & NMS		This parameter indicates the upper bound allowed as a result of a rate negotiation (if auto-negotiation is enabled) or (if auto-negotiation is disabled) the maximum rate the interface is provisioned to support. Note that on a PTP it is at most equal to the rate of the bearing DSR layer. This parameter is read/write and its domain is 0 to 10GB in 1M increments, i.e., "0" to "10000". The special value 0 indicates that the interface is (temporarily) not passing traffic. Note: settable between 10 and 100; read only for 1000 and higher
"ActualSpeedRate"	LR_DSR_Fast_Ethernet LR_DSR_Gigabit_Ethernet LR_DSR_10Gigabit_Ethernet	PTP, TP playing the role of CPTP	"10M", "100M", "1000M", "10G"	yes	EMS & NMS		When AutoNegotiation is disabled this parameter indicates the required operational speed rate and is equal to AdministrativeSpeedRate. When AutoNegotiation is enabled this parameter indicates the negotiated speed rate (which is less or equal to AdministrativeSpeedRate).

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"DuplexMode"	LR_DSR_Fast_Ethernet LR_DSR_Gigabit_Ethernet LR_DSR_10Gigabit_Ethernet	PTP, TP playing the role of CPTP	"Full", "Half"	yes	EMS & NMS		When AutoNegotiation is disabled, and when the Ethernet port is configured to support half or full duplex, this parameter is used to indicate the **desired** Duplex Mode. The parameter is read/write. When AutoNegotiation is enabled, this parameter has no meaning. Note: 1000M and 10G only works in Full duplex mode.
"ActualDuplexMode"	LR_DSR_Fast_Ethernet LR_DSR_Gigabit_Ethernet LR_DSR_10Gigabit_Ethernet	PTP, TP playing the role of CPTP	"Full", "Half"	yes	EMS		This is a read only parameter indicating the **actual** Duplex mode used on the interface. Note: 1000M and 10G only works in Full duplex mode.
"PauseControl"	LR_DSR_Fast_Ethernet LR_DSR_Gigabit_Ethernet LR_DSR_10Gigabit_Ethernet	PTP, TP playing the role of CPTP	"enabled", "disabled"	yes	EMS & NMS	IEEE 802.3	Indicates if the PAUSE command is enabled or not. Note that not all implementations support the PAUSE command.
"AdministrationControl"	LR_DSR_Fast_Ethernet LR_DSR_Gigabit_Ethernet LR_DSR_10Gigabit_Ethernet	PTP, TP playing the role of CPTP	"enabled", "disabled"	yes	EMS & NMS	IEEE 802.3	Indicates if the port is enabled or not.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"CrossoverMode"	LR_DSR_Fast_Ethernet LR_DSR_Gigabit_Ethernet LR_DSR_10Gigabit_Ethernet	PTP, TP playing the role of CPTP	"enabled", "disabled"	yes	EMS & NMS	IEEE 802.3	Indicates if the port is in "crossover" mode or not (to eliminate the need for a crossover cable). Note that not all implementations support crossover mode.
"MaximumFrameSize"	LR_DSR_Fast_Ethernet LR_DSR_Gigabit_Ethernet LR_DSR_10Gigabit_Ethernet	PTP, TP playing the role of CPTP	"64"… "10218"	yes	EMS & NMS	IEEE 802.3 IEEE 802.3as G.7041 for GFP	Specifies the maximum Ethernet frame size: - for untagged frames maximum frame size is 1518 Bytes - for tagged frames maximum frame size is 1522 Bytes - GFP Payload Area provides at least 1600 Bytes - IEEE 802.3as specifies a "maxEnvelopeFrameSize" of 2000 Bytes - not standardised "Jumbo Frames" can have 9114, 9216, or 9600 or 10218 Bytes. Note: The minimum Ethernet frame size is always 64 Bytes.
"BroadcastRateLimit"	LR_DSR_Fast_Ethernet LR_DSR_Gigabit_Ethernet LR_DSR_10Gigabit_Ethernet	PTP, TP playing the role of CPTP	String containing an Integer number	yes	EMS & NMS		Specifies the broadcast and multicast rate limit (in Mbit/s).
"RequirePeerPauseSupport"	LR_DSR_Fast_Ethernet LR_DSR_Gigabit_Ethernet LR_DSR_10Gigabit_Ethernet	PTP/ TP playing the role of CPTP	"yes", "no"	yes	EMS & NMS		To indicate that peer Ethernert ports (i.e., participating in the same FDs) need to also support PAUSE for flow control to work properly.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"NumberOfTrafficClasses"	LR_Ethernet	TP playing the role of CPTP	"1"… "8"		EMS	IEEE 802.1Q, 12.6	The number of Traffic Classes supported on the Port
"PhysAddress"	LR_Ethernet	TP playing the role of CPTP					The IEEE 802.3 address which is placed in the source-address field of any non Flow Domain Fragment specific Ethernet frames that originate at this interface. This address should be the one most likely to be of use to network management. Based on RFC-2665 and RFC-2863 ifPhysAddress.
"InhibitManagementFrames"	LR_Ethernet	TP playing the role of CPTP	"true", "false"	yes	EMS & NMS		This parameter indicates if Management Frames are discarded in egress and ingress direction of the port. Default value is "true".
"Layer2ControlProtocolProcessing List"	LR_Ethernet	TP playing the role of CPTP	String containing comma separated list of: "<controlProtocolName>", "<destMAC>", "discard | peer | pass-to-FDFr/EVC", ["<FDFrID>" - if set to pass]	yes	EMS & NMS	MEF 7	A list of the possible Layer 2 Control protocols processed at this UNI interface. Each entry in this list shall describe the control protocol and provide the corresponding destination MAC address along with the processing alternative (Discard, Peer, Pass-to-FDFr/EVC)) – if pass to FDFr/EVC, FDFr/EVC shall be identified. Layer 2 Control Protocols include: • IEEE 802.3x MAC Control Frames (Pause) • Slow Protocols (e.g., LACP) • IEEE 802.1x Port Authentication • Generic Attribute Registration Protocol (GARP) • Spanning Tree Protocol (STP) • A protocol to multicast to all bridges in a bridged LAN.

3.1.1 Spanning Tree Protocol (STP) related Parameters

"For any parameter whose layer rate is Ethernet, or a specific Ethernet rate, and whose object is CPTP, the LR_LAG_Fragment rate also applies.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"SpanningTreeType"	LR_Ethernet	MFD	"SSTP", "MSTP", "RSTP", "off"	yes	EMS & NMS	IEEE 802.1D	This parameter represents the type of the used spanning tree protocol (STP). The parameter also enables or disables the STP.
"StpOrCistBridgeIdentifier"	LR_Ethernet	MFD	String in hexadecimal format	yes	EMS	IEEE 802.1D, 802.1Q	The unique Bridge Identifier assigned to this Bridge, comprising two components: ▪ the Bridge Identifier Priority, which may be modified by management and is the more significant when Bridge Identifiers are compared, and ▪ a component derived from the Bridge Address, which guarantees uniqueness of the Bridge Identifiers of different Bridges.
"StpOrCistBridgePriority"	LR_Ethernet	MFD	"0"… "61440"(4096)	yes	EMS & NMS	IEEE 802.1D, 802.1Q	The value of the priority part of the Bridge Identifier
"StpTimeSinceTopologyChange"	LR_Ethernet	MFD	String containing an Integer number	no	EMS	IEEE 802.1D, 802.1Q	In an STP Bridge, the count in seconds of the time elapsed since the Topology Change flag parameter for the Bridge was last True, or in an RSTP or MSTP Bridge, the count in seconds since tcWhile timer for any Port was non-zero.
"StpTopologyChangeCount"	LR_Ethernet	MFD	String containing an Integer number	no	EMS	IEEE 802.1D, 802.1Q	In an STP Bridge, the count of the times the Topology Change flag parameter for the Bridge has been set (i.e., transitioned from False to True) since the Bridge was powered on or initialized, or in an RSTP or MSTP Bridge, the count of times that there has been at least one non-zero tcWhile timer.
"StpTopologyChange"	LR_Ethernet	MFD	"true", "false"	no	EMS	IEEE 802.1D, 802.1Q	This parameter is used to propagate the indication of Topology Change in transmitted Configuration Messages, and to determine whether the short (Forward Delay) or long (Ageing Time) timeout value is to be used for dynamic entries in the Filtering Database. In an STP Bridge, the value of the Topology Change parameter, or in an RSTP or MSTP Bridge, asserted if the tcWhile timer for any Port for the CIST is non-zero.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"StpDesignatedRoot"	LR_Ethernet	MFD, TP palying the role of CPTP	String in hexadecimal format	no	EMS	IEEE 802.1D, 802.1Q	In case of MFD: The unique Bridge Identifier of the Bridge assumed to be the Root. In case of CPTP: The Port Identifier of the Root Port.
"StpRootPathCost"	LR_Ethernet	MFD	String in decimal format	no	EMS	IEEE 802.1D, 802.1Q	The cost of the path to the Root from this Bridge. When the Bridge is the Root this parameter has the value zero. Otherwise, it is equal to the sum of the values of the Designated Cost and Path Cost parameters held for the Root Port.
"StpRootPort"	LR_Ethernet	MFD	String in decimal format	no	EMS	IEEE 802.1D, 802.1Q	The Port Identifier of the Port that offers the lowest cost path to the Root, i.e., that Port for which the sum of the values of the Designated Cost and Path Cost parameters held for the Port is the lowest. This parameter is used to identify the Port through which the path to the Root is established. It is not significant when the Bridge is the Root, and is set to zero.
"StpOrCistMaxAge"	LR_Ethernet	MFD	String in decimal format	no	EMS	IEEE 802.1D, 802.1Q	The maximum age of received protocol information before it is discarded.
"StpOrCistBridgeMaxAge"	LR_Ethernet	MFD	"6,0"… "40,0"	yes	EMS & NMS	IEEE 802.1D, 802.1Q	The value of the Max Age parameter when the Bridge is the Root or is attempting to become the Root. Recommended or Default value: 20,0 (seconds)
"StpForwardDelay"	LR_Ethernet	MFD	String containing an Real number	no	EMS	IEEE 802.1D, 802.1Q	The time spent by a Port in the Listening State and the Learning State before moving to the Learning or Forwarding State, respectively. It is also the value used for the ageing time of dynamic entries in the Filtering Database, while received Configuration Messages indicate a topology change.
"StpBridgeForwardDelay"	LR_Ethernet	MFD	"4,0"… "30,0"	yes	EMS & NMS	IEEE 802.1D, 802.1Q	The value of the Forward Delay parameter when the Bridge is the Root or is attempting to become the Root. Recommended or Default value: 15,0 (seconds)

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"StpBridgeHelloTime"	LR_Ethernet	MFD	"1"… "10"	yes	EMS & NMS	IEEE 802.1D, 802.1Q	The value of the Hello Time parameter when the Bridge is the Root or is attempting to become the Root. This parameter is the time interval between transmissions of Topology Change Notification BPDUs towards the Root when the Bridge is attempting to notify the Designated Bridge on the LAN to which its Root Port is attached of a topology change. Recommended or Default value: 2,0; Compatibility Range: 1,0 - 2,0. (seconds).
"StpHoldTime"	LR_Ethernet	MFD	"1"	no	EMS	IEEE 802.1Q	The minimum time period to elapse between the transmission of Configuration BPDUs through a given LAN Port: at most one Configuration BPDU shall be transmitted in any Hold Time period. This parameter is a fixed parameter, with values as specified in Table 8-3.
"TransmitHoldCount	LR_Ethernet	MFD	"1"… "10"	yes	EMS & NMS	IEEE 802.1D	The Transmit Hold Count used by the Port Transmit state machine to limit transmission rate. Recommended or Default value: 6 (seconds).
"ForceVersion"	LR_Ethernet	MFD	"0", "2"	yes	EMS & NMS	IEEE 802.1D, 802.1Q	The Force Protocol Version parameter for the Bridge. This can take the value 0 ("STP Compatibility" mode) or 2 (the default, normal operation). Applies to RSTP and MSTP Bridges only.
"CistRegionalRootIdentifier"	LR_Ethernet	MFD, TP palying the role of CPTP	String in hexadecimal format	no	EMS	IEEE 802.1Q	The Bridge Identifier of the current CIST Regional Root. Applies only to Bridges that support MSTP.
"CistPathCost"	LR_Ethernet	MFD, TP palying the role of CPTP	String in decimal format	no	EMS	IEEE 802.1Q	The CIST path cost from the transmitting Bridge to the CIST Regional Root. Applies only to Bridges that support MSTP.
"CistUptime"	LR_Ethernet	TP palying the role of CPTP	String containing an Integer number	no	EMS	IEEE 802.1Q	Count in seconds of the time elapsed since the Port was last reset or initialized.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
“CistState”	LR_Ethernet	TP palying the role of CPTP	“disabled”, “listening”, “learning”, “forwarding”, “blocking”, “enabled”	no for protocol setting yes for NMS setting	EMS & NMS	IEEE 802.1Q	The current state of the Port. The NMS can only set the value to “Disabled” and “Enabled”.
CistPortIdentifier”	LR_Ethernet	TP palying the role of CPTP	String	yes	EMS & NMS	IEEE 802.1Q	The identifier of the Port, unique among the Ports of this Bridge. The parameter consists of two parts: ▪ one part bears a fixed relationship to the physical or logical support of the Port by real-world equipment; this part assures the uniqueness of the Port Identifier among the Ports of a single Bridge, and is a small integer assigned in the range from one upwards. ▪ the other part of the parameter allows adjustment of the priority of the Port and is taken as the more significant part in priority comparisons. The priority part of this parameter can be updated by management.
“CIST_PortPriority”	LR_Ethernet	TP palying the role of CPTP	String containing an Integer number	yes	EMS & NMS	IEEE 802.1Q	The value of the priority field for the Port Identifier.
“CIST_DesignatedCost”	LR_Ethernet	TP palying the role of CPTP			EMS	IEEE 802.1D, 802.1Q	For a Designated Port, the path cost (equal to the Root Path Cost of the Bridge) offered to the LAN to which the Port is attached. otherwise, the cost of the path to the Root offered by the Designated Port on the LAN to which this Port is attached.
“StpDesignatedBridge”	LR_Ethernet	TP palying the role of CPTP	String in hexadecimal format	no	EMS	IEEE 802.1D, 802.1Q	The unique Bridge Identifier of: ▪ the Bridge to which the Port belongs, in the case of a Designated Port; or otherwise, ▪ the Bridge believed to be the Designated Bridge for the LAN to which this Port is attached.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"CIST_DesignatedPort"	LR_Ethernet	TP palying the role of CPTP		no	EMS	IEEE 802.1Q	The Port Identifier of the Bridge Port, on the Designated Bridge through which the Designated Bridge transmits the Configuration Message information stored by this Port.
"CistTopologyChangeAcknowledge"						IEEE 802.1Q	
"CistPortHelloTime"	LR_Ethernet	TP palying the role of CPTP	"1"… "10"	yes	EMS & NMS	IEEE 802.1Q	In MSTP Bridges, Hello Time is manageable on a per-Port basis, rather than per-Bridge in STP and RSTP. Port Hello Time therefore replaces the Bridge Hello Time parameter found in STP and RSTP. Applies only to Bridges that support MSTP.
"CistAdminEdgePort"						IEEE 802.1Q	
"CistOperEdgePort"						IEEE 802.1Q	
"CistMacEnabled"						IEEE 802.1Q	
"CistMacOperational"						IEEE 802.1Q	
"CistAdminPointToPointMac"						IEEE 802.1Q	
"CistOperPointToPointMac"						IEEE 802.1Q	
"MaxMSTIs"	LR_Ethernet	MFD	String containing an Integer number	no	EMS	IEEE 802.1Q, 12.10	For MST Bridges, the maximum number of MSTIs supported within an MST Region (i.e., the number of Spanning Tree instances that can be supported in addition to the CIST).

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"MSTI_Table_Count"	LR_Ethernet	MFD	"<number of table entries>"	no	EMS		This parameter indicates the number of MST instances in the table. The MSTI table groups MSTI parameters. It is organised in (name, value) pairs, each of which represents a column of the table. For more details, see the individual MSTI parameters below, also section 3.1.8.
"MSTI_Table_ID"	LR_Ethernet	MFD	Structure: "<MSTID #1>, < MSTID #2>, < MSTID #3>, …"	no	EMS	IEEE 802.1Q, 12.8	MST instance identifier. Applies to MSTP Bridges only.
"MSTI_Table_BridgePriority"	LR_Ethernet	MFD	Structure: "<value #1>, <value #2>, <value #3>, …"	yes	EMS & NMS	IEEE 802.1Q, 12.8	The value of the priority part of the Bridge Identifier for the spanning tree instance identified by the MSTID. Applies to MSTP Bridges only.
"MSTI_Table_DesignatedBridge"	LR_Ethernet	TP palying the role of CPTP	Structure: "<value #1>, <value #2>, <value #3>, …"	no	EMS	IEEE 802.1Q, 12.8	Applies only to Bridges that support MSTP.
"MSTI_Table_DesignatedCost"	LR_Ethernet	TP palying the role of CPTP	Structure: "<value #1>, <value #2>, <value #3>, …"	no	EMS	IEEE 802.1Q, 12.8	Applies only to Bridges that support MSTP.
"MSTI_Table_DesignatedPort"	LR_Ethernet	TP palying the role of CPTP	Structure: "<value #1>, <value #2>, <value #3>, …"	no	EMS	IEEE 802.1Q, 12.8	Applies only to Bridges that support MSTP.
"MSTI_Table_DesignatedRoot"	LR_Ethernet	MFD, TP palying the role of CPTP	Structure: "<value #1>, <value #2>, <value #3>, …"	no	EMS	IEEE 802.1Q, 12.8	The Bridge identifier of the Root Bridge for the spanning tree instance identified by the MSTID. Applies to MSTP Bridges only. One occurrence per MSTI.
"MSTI_Table_PathCost"	LR_Ethernet	TP palying the role of CPTP	Structure: "<value #1>, <value #2>, <value #3>, …"	yes	EMS & NMS	IEEE 802.1Q, 12.8	Applies only to Bridges that support MSTP.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"MSTI_Table_PortPriority"	LR_Ethernet	TP palying the role of CPTP	Structure: "<value #1>, <value #2>, <value #3>, …"	yes	EMS & NMS	IEEE 802.1Q, 12.8	The value of the priority field for the Port Identifier for the spanning tree instance identified by the MSTID. Applies only to Bridges that support MSTP.
"MSTI_Table_RootPathCost"	LR_Ethernet	MFD	Structure: "<value #1>, <value #2>, <value #3>, …"	no	EMS	IEEE 802.1Q, 12.8	The path cost from the transmitting Bridge to the Root Bridge for the spanning tree instance identified by the MSTID. Applies to MSTP Bridges only.
"MSTI_Table_RootPort"	LR_Ethernet	MFD	Structure: "<value #1>, <value #2>, <value #3>, …"	no	EMS	IEEE 802.1Q, 12.8	The Root Port for the spanning tree instance identified by the MSTID. Applies to MSTP Bridges only.
"MSTI_Table_State"	LR_Ethernet	TP palying the role of CPTP	Structure: "<value #1>, <value #2>, <value #3>, …"	yes	EMS & NMS	IEEE 802.1Q, 12.8	Applies only to Bridges that support MSTP.
"VID_to_MSTI_Table_Count"	LR_Ethernet	TP palying the role of CPTP	String containing an Integer number	no	EMS		Number of rows in the table. For an example see section 3.1.9.
"VID_to_MSTI_Table_ID"	LR_Ethernet	TP palying the role of CPTP	String containing an Integer number	no	EMS		MST instance number (up to the Count of the MSTI_Table) For an example see section 3.1.9.
"VID_to_MSTI_Table_VID"	LR_Ethernet	CPTP	String	no	EMS		Range of VIDs which are mapped to the MST instance. For an example see section 3.1.9.
"RegistrationProtocol"	LR_Ethernet	MFD	"GARP", "GMRP", "GVRP", "none"	yes	EMS & NMS	IEEE 802.1Q	Parameter used for the configuration of the respective Attribute Registration Protocol.
"RegistrarAdministrativeControl"	LR_Ethernet	MFD	"normalRegistration", "registrationFixed", "registrationForbidden"	yes	EMS & NMS	IEEE 802.1D, 12.8.1	The parameters allow administrative control to be exercised over the registration state of each Attribute value, and hence, via the propagation mechanism provided by GIP, allow control to be exercised over the propagation of declarations.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"ApplicantAdministrativeControl"	LR_Ethernet	TP palying the role of CPTP	"normalParticipant", "nonParticipant"	yes	EMS & NMS	802.1D section 12.8.2	The parameter determines whether or not the Applicant state machine participates in GARP protocol exchanges.

3.1.2 VLAN related Parameters

"For any parameter whose layer rate is Ethernet, or a specific Ethernet rate, and whose object is CPTP, the LR_LAG_Fragment rate also applies.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"802.1QVLANVersion"	LR_Ethernet	MFD	"1", "2"	no	EMS	IEEE 802.1Q, 12.10	Reported as "1" by VLAN Bridges that support only SST operation, and reported as "2" by VLAN Bridges that support MST operation.
"BaseBridgeAddress"	LR_Ethernet	MFD	String containing a Hexadecimal number	no	EMS	IEEE 802.1Q	The MAC Address for the Bridge from which the Bridge Identifier used by the Rapid Spanning Tree Protocol is derived. 6 octets representation of the MAC address
"EnableIngressFiltering"	LR_Ethernet	TP playing the role of CPTP, CTP	"enabled", "disabled"	yes	EMS & NMS	IEEE 802.1Q, 12.10	
"MaxVlans"	LR_Ethernet	MFD, CPTP, CTP	"0"... "4095"	no	EMS	IEEE 802.1Q, 12.10	0 implies no support for VLAN

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"PortAcceptableFrameTypes"	LR_Ethernet	TP playimg the role of CPTP	"all", "vlanTaggedOnly", "untaggedOnly"	Yes	EMS & NMS	IEEE 802.1Q, 12.10 IEEE 802.1ad	This parameter defines if a frame is dropped when it enters the CPTP. If a frame's outermost tag is a priority tag (VID=0), the frame is considered untagged. When only a certain tag type is expected (C tag or S-tag), a frame with the other type should be considered untagged. However, this may be hardware dependent. The value "UntaggedOnly" can be rejected by an EMS if the bridge is of a type which does not recognize it.
"PortDefaultUserPriority"	LR_Ethernet	TP playimg the role of CPTP	"0"... "7"	yes	EMS & NMS	IEEE 802.1D	
"PVID"	LR_Ethernet	TP playimg the role of CPTP	"1"... "<MaxVlanId>"	yes	EMS & NMS	IEEE 802.1Q, 12.10	Default VLAN Id to be assigned by the port to untagged frames or all frames for port based double tagging. The meaning of PVID > 0 is that a tag will be pushed onto the incoming frame. The VID field of the pushed tag will be set to the value of PVID. Note: This is not the S-Tag. This is a tag which is added to act as if the frame had arrived with this tag. Note: A frame with a priority tag (whose VID field contains zero), is treated like an untagged frame. The value of PVID is put into the VID field and the priority of the incoming frame is preserved.
"PVIDFrameTypes"	LR_Ethernet	TP playimg the role of CPTP	"allFrames", "untaggedOnly"	yes	EMS & NMS	IEEE 802.1Q	This parameter indicates if the tag defined by parameter "PVID" (pushed tag when PVID > 0) is pushed onto all frames or only untagged frames. Note: A frame with a priority tag (whose VID field contains zero), is treated like an untagged frame.
"AddSTag"	LR_Ethernet	CTP playimg the role of an FP	"true", "false"	yes	EMS & NMS		This parameter indicates if S-TAGs are to be pushed onto frames coming into the FDFr and popped from frames leaving the FDFr. An EMS can reject an attempt to give different values to the "addSTag" attribute in different FPs associated with the same FDFr.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"IVID"	LR_Ethernet	CTP playimg the role of an FP, FDFr	"0"… "4095", "null"	yes	EMS & NMS		This parameter contains the internal VLAN identifier of the FP and FDFr. The parameter *IVID* at an FP defines the value to be used for VID in S-TAGs pushed onto the frames at entrance to the FD. When the value of *IVID* attached to an FDFr is not "null", the value of the *IVID* parameter on all of the FPs attached to this FDFr has be the same value as the *IVID* on the FDFr. If the FDFr is performing tag swapping inside (as opposed to only at the edges), the *IVID* on the FDFr is not meaningful (and set to "null"). Note: Since the *IVID* of the FP reflects the *IVID* of the FDFr (when the *IVID* of the FDFr is not "null"), it cannot be set to a different value – it is derived from the FDFr. An EMS has to reject an attempt to set an FP's *IVID* to a value different from its FDFr's *IVID* value, if the latter is not "null".
"TPID"	LR_Ethernet	MFD, TP playimg the role of CPTP	"0x0601", "0xFFFF"	yes	EMS & NMS	IEEE 802.1Q	This attribute represents the Tag Protocol ID (TPID) field in the MAC header (Ethernet Type). Some NE's allow the TPID to be exchanged, and so this is the TPID to exchange. However, the exchange mechanism may be different for different equipment and different vendors.
"VIDMappingCapability"	LR_Ethernet	TP playimg the role of CPTP	"translation", "portBasedDoubleTag", "vidBasedDoubleTag", "none"	no	EMS		Reflects the port capability to perform VID mapping of incoming & outgoing Ethernet frames.
"UniCeVlanIdPreservation"	LR_Ethernet	FDFr	"true", "false"	yes	EMS & NMS	MEF 10	If preservation is requested and if VLAN translation is applied, the translation tables on all endpoints of the FDFr have to be symmetric.
"CTagTranslationEnable"	LR_Ethernet	TP playimg the role of CPTP	"enabled", "disabled"	yes	EMS & NMS		This parameter enables and disables C-Tag translation on a CPTP. "Enabled" means that the C-Tag translation table is applied, in both directions. When there is no C-Tag translation table, the value of the parameter is irrelevant.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"CTagTranslation_Table_Count"	LR_Ethernet	TP playimg the role of CPTP	"<number of table entries>"	yes	EMS & NMS		Indicates the number of rows in the C-Tag translation table. For an example see section 3.1.10.
"CTagTranslation_Table_External"	LR_Ethernet	TP playimg the role of CPTP	Structure: "<external VID #1>,<external VID #2>,<external VID #3>,…"	yes	EMS & NMS		An ingressing C-tagged frame, with VID value *external-VID*, will have its VID value changed to *internal-VID*. An egressing C-tagged frame, with VID value *internal-VID*, will have its VID value changed to *external-VID*. Each value can be - single value, - range, - "AllOthers", - "All". Note: In the ingress direction, a C-Tag translation table at a CPTP is applied after the PortAcceptableFrameTypes and before a TrafficMappingTable defined at an FP. Rules: A value should not appear more than once in the "External" column. If replacement value is a range or "AllOthers" or "All", the result is hardware dependent. A many-to-one table can be rejected by an EMS. Note: Translation of multiple VID's to a single VID is not desirable, since it cannot be mapped back. The EMS need not validate the input data and should let the Network Element allow it or reject it. See chapter 3.1.10 for an example of VLAN Translation Table.
"CTagTranslation_Table_Internal"	LR_Ethernet	TP playimg the role of CPTP	Structure: "<internal VID #1>,<internal VID #2>,<internal VID #3>,…"	yes	EMS & NMS		
"STagTranslationEnable"	LR_Ethernet	TP playimg the role of CPTP	"enabled", "disabled"	yes	EMS & NMS		This parameter enables and disables S-Tag translation on a CPTP. "Enabled" means that the S-Tag translation table is applied, in both directions. When there is no S-Tag translation table, the value of the parameter is irrelevant.
"STagTranslation_Table_Count"	LR_Ethernet	TP playimg the role of CPTP	"<number of table entries>"	yes	EMS & NMS		Indicates the number of rows in the S-Tag translation table. For an example see section 3.1.10.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"STagTranslation_Table_External"	LR_Ethernet	TP playimg the role of CPTP	Structure: "<external VID #1>,<external VID #2>,<external VID #3>,…"	yes	EMS & NMS		An ingressing S-tagged frame, with VID value *external-VID*, will have its VID value changed to *internal-VID*. An egressing S-tagged frame, with VID value *internal-VID*, will have its VID value changed to *external-VID*. Each value can be - single value, - range, - "AllOthers", - "All". Note: In the ingress direction, an S-Tag translation table at a CPTP is applied after the PortAcceptableFrameTypes and before a TrafficMappingTable defined at an FP. Rules: A value should not appear more than once in the "External" column. If replacement value is a range or "AllOthers" or "All", the result is hardware dependent. A many-to-one table can be rejected by an EMS. Note: Translation of multiple VID's to a single VID is not desirable, since it cannot be mapped back. The EMS need not validate the input data and should let the Network Element allow it or reject it. See chapter 3.1.10 for an example of VLAN Translation Table.
"STagTranslation_Table_Internal"	LR_Ethernet	TP playimg the role of CPTP	Structure: "<internal VID #1>,<internal VID #2>,<internal VID #3>,…"	yes	EMS & NMS		

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"TrafficMapping_Table_Count"	LR_Ethernet	TP playimg the role of CPTP, CTP playimg the role of an FP	"<number of traffic mappings>"		EMS & NMS		This parameter indicates the number of traffic mappings in the table. This table groups ingress Ethernet frames (classification of traffic) and maps them to conditioning parameters (e.g., class of service, bandwidth). The table is composed of two sets of parameters, each representing a column of the table. The parameters with names of the form *TrafficMappingTableFrom_<column header name>* define the traffic classification. The parameters with name of the form *TrafficMappingTableTo_<column header name>* define the traffic conditioning. All these parameters have a value part of the same form "*<value #1>,<value #2>,<value #3>…*", that is, a list of elementary values separated by commas, which are the values in a column of the table. Just as all columns in a table have the same number of rows, so each value part in the same table must have the same number of elementary values. Some column headers will be acceptable only at the CPTP, some only at the FP, and some at both. If a column, which is acceptable at both CPTP and FP, is specified both at the CPTP and FP, the specification at the FP is used. See chapter 3.1.11 for the list of defined column header names. A description of the use of the *TrafficMappingTable* is contained in supporting document SD1-44.
"TrafficMappingFrom_Table_VID"	LR_Ethernet	TP playimg the role of CPTP, CTP playimg the role of an FP	possible values are defined in Section 3.1.11	yes	EMS & NMS		This parameter identifies the traffic groupings based on VID.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
“TrafficMappingFrom_Table_Priority”	LR_Ethernet	TP playimg the role of CPTP, CTP playimg the role of an FP	possible values are defined in Section 3.1.11	yes	EMS & NMS		This parameter identifies the traffic groupings based on Priority.
“TrafficMappingTo_Table_TrafficClass”	LR_Ethernet	TP playimg the role of CPTP, CTP playimg the role of an FP	possible values are defined in Section 3.1.11	yes	EMS & NMS		This parameter identifies the traffic classes the traffic groupings are assigned to.
“TrafficMappingTo_Table_TcProfile”	LR_Ethernet	TP playimg the role of CPTP, CTP playimg the role of an FP	possible values are defined in Section 3.1.11	yes	EMS & NMS		This parameter identifies the TC Profiles the traffic groupings are assigned to.
“UniCeVlanCosPreservation”	LR_Ethernet	FDFr	“true”, “false”	yes	EMS & NMS	MEF 10	This attribute shall indicate whether the egress Priority in the frame header must be the same as the ingress Priority.
“VLANsForUntaggingOnEgress”	LR_Ethernet	TP playimg the role of CPTP			EMS & NMS	IEEE 802.1Q, 12.10	A list of VLAN IDs for which the Port is a member of the Untagged Set.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"Layer2ControlProtocolDisposition List"	LR_Ethernet	CTP	"<ControlProtocolName: String>"; "<DestinationMACAddress: hex>", "<DestinationUNI>", "<Disposition: Discard | Tunnel>}	yes	EMS & NMS	MEF 7	The layer2ControlProtocolDispositionList attribute provides a list that describes Layer 2 control protocols, along with the frame disposition for each potential destination UNI: ▪ Discard: The Service Frame is discarded. ▪ Tunnel: No matter what the content (assuming correct FCS) of the Service Frame, it is delivered across the other (egress) UNI(s).
"UnicastServiceFrameDelivery"	LR_Ethernet	CTP	"discard", "deliverUnconditionally", "deliverConditionally [<condition>]"	yes	EMS & NMS	MEF 7	Describes the service frame delivery option for Unicast Service Frames (Service Frames with unicast destination MAC addresses) as: Discard, DeliverUnconditionally, or DeliverConditionally.
"MulticastServiceFrameDelivery"	LR_Ethernet	CTP	"discard", "deliverUnconditionally", "deliverConditionally [<condition>]"	yes	EMS & NMS	MEF 7	Describes the service frame delivery option for Unicast Service Frames (Service Frames with unicast destination MAC addresses) as: Discard, DeliverUnconditionally, or DeliverConditionally.
"BroadcastServiceFrameDelivery"	LR_Ethernet	CTP	"discard", "deliverUnconditionally", "deliverConditionally [<condition>]"	yes	EMS & NMS	MEF 7	Describes the service frame delivery option for Unicast Service Frames (Service Frames with unicast destination MAC addresses) as: Discard, DeliverUnconditionally, or DeliverConditionally.
"AvailableCapacity"	LR_Ethernet	TP playimg the role of CPTP	"<ingressCapacity: Integer>", "<egressCapacity: Integer>"	no	EMS	MEF 7	Describes the spare bandwidth capacity of the ETH_FPP (e.g., UNI) in both the ingress and egress direction.
"IngressMaxAssignableBW"	LR_Ethernet	TP playimg the role of CPTP	String containing an Integer number	no	EMS	MEF 7	Identifies the maximum amount of bandwidth assignable on the link in the Ingress direction (inbound or towards the ETH FE). The current operational speed of the interface is in bits per second. Based on RFC-2665 and RFC-2863 ifSpeed.
"EgressMaxAssignableBW"	LR_Ethernet	TP playimg the role of CPTP	String containing an Integer number	no	EMS	MEF 7	Identifies the maximum amount of bandwidth assignable on the link in the Egress direction (outbound or away from the ETH FE). The current operational speed of the interface is in bits per second. Based on RFC-2665 and RFC-2863 ifSpeed.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
“MaxNumFDFrs”	LR_Ethernet	TP playimg the role of CPTP	String containing an Integer number	yes	EMS & NMS	MEF 7	This attribute describes the maximum number of virtual connections (FDFrs/EVCs) that may be supported at the ETH_FPP / CPTP.
“NumConfiguredFDFrs”	LR_Ethernet	TP playimg the role of CPTP	String containing an Integer number	yes	EMS& NMS	MEF 7	Identifies the number of currently configured virtual connections (FDFrs/EVCs) at the ETH_FPP
“LinkUsageCost”	LR_Ethernet	TP playimg the role of CPTP	String containing an Integer number	yes	EMS & NMS	MEF 7	An optional attribute that describes the usage cost allocated to the ETH_Link / Group terminated at the CPTP.
“Layer2ControlProtocolProcessing List”	LR_Ethernet	TP playimg the role of CPTP	“<ControlProtocolName: String>”, “<DestinationMACAddress: hex>”, “<ProcessingAlternative: discard | peer | pass-to-evc>”	yes	EMS & NMS	MEF 7	A list of the possible Layer 2 Control protocols processed at this ETH interface. Each entry in this list shall describe the control protocol and provide the corresponding destination MAC address along with the processing alternative (Discard, Peer, Pass-to-EVC).
“ServiceMuxingIndicator”	LR_Ethernet	TP playimg the role of CPTP	“true”, “false”	yes	EMS & NMS	MEF 7	Describes if service multiplexing is enabled at the ETH UNI. Service multiplexing allows incoming frames to be mapped to multiple FDFrs/EVCs based on CE VLAN ID. Must be set to FALSE if allToOneIndicator is set to true.
“BundlingIndicator”	LR_Ethernet	TP playimg the role of CPTP	“true”, “false”	yes	EMS & NMS	MEF 7	Describes if bundling is enabled at the ETH UNI. Bundling allows incoming frames with multiple CE VLAN IDs to be mapped to a single EVC. Must be set to FALSE if allToOneIndicator is set to TRUE. An EVC with more than one CE-VLAN ID mapping to it MUST have the CE-VLAN ID Preservation Service Attribute and the list of CE-VLAN IDs mapped to the EVC MUST be the same at each UNI in the EVC.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"AllToOneIndicator"	LR_Ethernet	TP playimg the role of CPTP	"true", "false"	yes	EMS & NMS	MEF 7	To support Bundling, all CE VLAN IDs must be mapped to a single EVC (or ETH_FDFr_EVC) at the UNI. When a UNI has the All to One Bundling, all CE-VLAN IDs MUST map to a single EVC at the UNI. The EVC at the UNI MUST have the CE-VLAN ID Preservation Service Attribute and the list of CE-VLAN IDs mapped to the EVC MUST be the same at each UNI in the EVC. If "All-to-One" is used, the allToOneIndicator Boolean attribute in the ETH_FPP_UNI should be set to TRUE, and the ETH_FPP_UNI of the UNI shall support only a single ETH_Flow_Point.

3.1.3 Traffic conditioning parameters

"For any parameter whose layer rate is Ethernet, or a specific Ethernet rate, and whose object is TP playimg the role of CPTP, the LR_LAG_Fragment rate also applies.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"IngressCIR"	LR_Ethernet	TCProfile	String containing an Integer number	yes	EMS or NMS	MEF Services Attributes spec. [1]	This parameter identifies the Committed Information Rate (CIR) in bits per second. CIR MUST be ≥ 0.
"IngressCBS"	LR_Ethernet	TCProfile	String containing an Integer number	yes	EMS or NMS	MEF Services Attributes spec. [1]	This parameter identifies the Committed Burst Size (CBS) in bytes. When CIR > 0, CBS MUST be greater than or equal to the maximum Service Frame size.
"IngressEIR"	LR_Ethernet	TCProfile	String containing an Integer number	yes	EMS or NMS	MEF Services Attributes spec. [1]	This parameter identifies the Excess Information Rate (EIR) in bits per second. EIR MUST be ≥ 0.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"IngressEBS"	LR_Ethernet	TCProfile	String containing an Integer number	yes	EMS or NMS	MEF Services Attributes spec. [1]	This parameter identifies the Excess Burst Size (EBS) in bytes. When EIR > 0, EBS MUST be greater than or equal to the maximum Service Frame size.
"IngressColorMode"	LR_Ethernet	TCProfile	"true", "false"	yes	EMS or NMS	MEF Services Attributes spec. [1]	This parameter describes the color mode (CM) to be applied as "color-blind mode" or "color-aware mode". A value of FALSE will indicate color blind mode is in effect.
"IngressCouplingFlag"	LR_Ethernet	TCProfile	"0", "1"	yes	EMS or NMS	MEF Services Attributes spec. [1]	The optional coupling flag (CF) attribute, describes if yellow frames will be admitted if unused bandwidth is available. When CF is set to 0, the volume of the yellow service frames admitted to the network can not exceed EIR. When CF is set to 1, the volume of the yellow service frames admitted to the network is bounded by CIR + EIR depending on volume of the offered green Frames. In both cases the burst size of the yellow frames admitted to the network is bounded by EBS.

References

[1] MEF TS MEF 10 (November 2004): Ethernet Services Attributes: Phase I.

[2] MEF TS MEF 7 (October 2004): EMS-NMS Information Model.

3.1.4 Resilient Packed Ring (RPR) related parameters

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"StationName"	LR_RPR	TP playimg the role of CPTP	String	yes	EMS	IEEE 802.17 (RPR MIB)	ifName (MIB-II Interface Group)

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"MACAddress"	LR_RPR	TP playimg the role of CPTP	String	yes	EMS	IEEE 802.17	ifPhysAddress (MIB-II Interface Group) (6 octets)
"StationSpeed"	LR_RPR	TP playimg the role of CPTP	String containing an Integer number	yes	EMS	IEEE 802.17	IfSpeed or ifHighSpeed (RFC 2863) Estimate of the interface's current bandwidth in Mbits/s.
"CurrentNumberOfStationsOnRing"	LR_RPR	TP playimg the role of CPTP	"1"… "255"	yes	EMS	IEEE 802.17	rprIfStationsOnRing Total number of RPR stations currently active on the ring.
"ProtectionWaitToRestoreTimer"	LR_RPR	TP playimg the role of CPTP	"0"… "1440"	yes	EMS & NMS	IEEE 802.17 RPR MIB	rprIfProtectionWTR Indicates the length of time in seconds, to remain in the protection state, after the cause of an automatic protection is removed. This mechanism prevents protection switch oscillations. Default value for WTR is 10 seconds."
"ProtectionRevertive"	LR_RPR	TP playimg the role of CPTP	"yes", "no"	yes	EMS & NMS	IEEE 802.17 RPR MIB	rprIfReversionMode The reversion mode of the MAC, False for non-revertive True for revertive. Revertive station will return to idle state after WTR interval expires. Default value for reversion mode is yes.
"ProtectionMechanism"	LR_RPR	TP playimg the role of CPTP	"steering", "wrapping"	yes	EMS & NMS	IEEE 802.17	rprIfWrapConfig Configured protection mode for stations that support both steering and wrapping.

3.1.5 Class of Service parameters

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
“Delay<cos>”	LR_Ethernet	CTP playimg the role of an FP	String containing an Integer number	yes	EMS & NMS	MEF Services Attributes spec. [1]	This parameter identifies the frame delay (FD) bounds in mS that the network must deliver.
“Jitter<cos>”	LR_Ethernet	CTP playimg the role of an FP	String containing an Integer number	yes	EMS & NMS	MEF Services Attributes spec. [1]	This parameter identifies the maximum frame jitter or frame delay variation (FDV) in mS that the network must deliver.
“Loss<cos>”	LR_Ethernet	CTP playimg the role of an FP	String containing an Integer number	yes	EMS & NMS	MEF Services Attributes spec. [1]	This parameter identifies the maximum acceptable number of lost frames over a time period (T) that the network must deliver in terms of a frame loss ration (FLR).

3.1.6 Ethernet MAU parameters

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
“PotentialCapacity”	LR_DSR	PTP	String containing an Integer number	no	EMS	MEF 7	The potentialCapacity attribute describes the bandwidth capacity (in bits per second) that is supported by the TransportPort. This attribute is conditional; it is present if the TransportPort is a rate adaptive technology.
“MauType”	LR_DSR	PTP	“<OBJECT IDENTIFIER>”	no	EMS	MEF 7 RFC-3636	The mauType attribute identifies the MAU type. An initial set of MAU types is defined in RFC-3636. The assignment of OBJECT IDENTIFIERs to new types of MAUs is managed by the IANA. If the MAU type is unknown, the object identifier unknownMauType OBJECT IDENTIFIER ::= { 0 0 } is returned. Based on RFC-3636 IfMauType.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"MauStatus"	LR_DSR	PTP	"other", "unknown", "operational", "standby", "shutdown", "reset"	yes	EMS	MEF 7 RFC-3636	This attribute represents the current state of the MAU. This object MAY be implemented as a read-only object by those agents and MAUs that do not implement software control of the MAU state. Some agents may not support setting the value of this object to some of the enumerated values. The mauStatus may take on the following attributes as described in RFC-3636: other, unknown, operational, standby, shutdown, and reset. Based on RFC-3636 IfMauStatus.
"MauMediaAvailable"	LR_DSR	PTP	"other", "unknown", "available", "notAvailable", "remoteFault", "invalidSignal", "remoteJabber", "remoteLinkLoss", "remoteTest", "offline", "autoNegError", "pmdLinkFault", "wisFrameLoss", "wisSignalLoss", "pcsLinkFault", "excessiveBER", "dxsLinkFault", "pxsLinkFault"	no	EMS	MEF 7 RFC-3636	This attribute represents the link integrity state of the MAU TTP. This attribute may take on the following values as describe in RFC-3636: other, unknown, available, notAvailable, remoteFault, invalidSignal, remoteJabber, remoteLinkLoss, remoteTest, offline, autoNegError, pmdLinkFault, wisFrameLoss, wisSignalLoss, pcsLinkFault, excessiveBER, dxsLinkFault, and pxsLinkFault. Based on RFC-3636 ifMauMediaAvailable.
"MauJabberState"	LR_DSR	PTP	"other", "noJabber", "jabbering"	no	EMS	MEF 7 RFC-3636	The mauJabberState attribute represents the jabbering state of the MAU. This attribute may take on the following values as describe in RFC-3636: other, noJabber, and jabbering. Based on RFC-3636 ifMauJabberState.
"MauDefaultType"	LR_DSR	PTP	"<OBJECT IDENTIFIER>"	no	EMS	MEF 7 RFC-3636	The mauDefaultType attribute identifies the default administrative baseband MAU type, to be used in conjunction with the operational MAU type denoted by mauType. The set of possible values for this object is the same as the set defined for the mauType attribute. Based on RFC-3636 ifMauDefaultType.
"MauTypeList"	LR_DSR	PTP	"<OBJECT IDENTIFIER>"	no	EMS	MEF 7 RFC-3636	This attribute identifies the set of possible IEEE 802.3 types that the MAU could be. Based on RFC-3636 ifMauTypeListBits.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"MauJackTypeList"	LR_DSR	PTP	"other", "rj45", "rj45S", "db9", "bnc", "fAUI", "mAUI", "fiberSC", "fiberMIC", "fiberST", "telco"	no	EMS	MEF 7 RFC-3636	This attribute identifies the set of possible interface jack types that the MAU provides. Based on RFC-3636 ifJackTable.
"MauAutoNegAdminState"	LR_DSR	PTP	"enabled", "disabled"	yes	EMS and NMS	MEF 7 RFC-3636	This attribute allows the auto-negotiation function of the MAU to be enabled or disabled. Setting this attribute to enabled will cause the interface which has the auto-negotiation signaling ability to be enabled. If the value of this object is disabled then the interface will act as it would if it had no auto-negotiation signaling. Under these conditions, an IEEE 802.3 MAU will immediately be forced to the state indicated by the value of mauDefaultType. Based on RFC-3636 ifMauAutoNegAdminStatus.
"MauAutoNegRemoteSignaling"	LR_DSR	PTP	"detected", "notDetected"	no	EMS	MEF 7 RFC-3636	This attribute indicates whether the remote end of the link is using auto-negotiation signaling. It takes the value detected (1) if and only if, during the previous link negotiation, FLP Bursts were received. Based on RFC-3636 ifMauAutoNegRemoteSignaling.
"MauAutoNegConfig"	LR_DSR	PTP	"other", "configuring", "complete", "disabled", "parallelDetectFail"	no	EMS	MEF 7 RFC-3636	This attribute indicates the current status of the auto-negotiation process. This attribute may take on the following values as described in RFC-3636: other, configuring, complete, disabled, or parallelDetectFail. Based on RFC-3636 ifMauAutoNegConfig.
"MauAutoNegCapability"	LR_DSR	PTP	String containing an Integer number	no	EMS	MEF 7 RFC-3636	This attribute identifies the set of capabilities of the local auto-negotiation entity. Based on RFC-3636 ifMauAutoNegCapabilityBits.
"MauAutoNegCapAdvertised"	LR_DSR	PTP	String containing an Integer number	no	EMS	MEF 7 RFC-3636	This attribute identifies the set of capabilities advertised by the local auto-negotiation entity. Based on RFC-3636 ifMauAutoNegCapAdvertisedBits.

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"MauAutoNegCapReceived"	LR_DSR	PTP	String containing an Integer number	no	EMS	MEF 7 RFC-3636	This attribute identifies the set of capabilities received from the remote auto-negotiation entity. Based on RFC-3636 ifMauAutoNegCapReceivedBits.
"MauAutoNegRemoteFaultAdvertised"	LR_DSR	PTP	"noError", "offline", "linkFailure", "autoNegError"	no	EMS	MEF 7 RFC-3636	This attribute identifies any local fault indications that this MAU has detected and will advertise at the next auto-negotiation interaction for 1000Mbps MAUs. This attribute may take on the following values as described in RFC-3636: noError, offline, linkFailure, or autoNegError. Based on RFC-3636 ifMauAutoNegRemoteFaultAdvertised.
"MauAutoNegRemoteFaultReceived"	LR_DSR	PTP	"noError", "offline", "linkFailure", "autoNegError"	no	EMS	MEF 7 RFC-3636	This attribute identifies any fault indications received from the far end of a link by the local auto-negotiation entity for 1000Mbps MAUs. This attribute may take on the following values as described in RFC-3636: noError, offline, linkFailure, or autoNegError. Based on RFC-3636 ifMauAutoNegRemoteFaultReceived.

3.1.7 Link Aggregation Parameters

ParameterName	Layers	Objects	Legal values	AVC (or SC) notification raised if value changes?	Potentially settable from	Source Standard	Comment / Example
"LagMember"	LR_LAG_Fragment's termination function	CTP	String	yes	EMS & NMS		DN of TP associated with LAG member CTP. See explanation of LAG in the SD1-44 supporting document.
"AutoLAG"	LR_LAG_Fragment's adaptation function	TP playimg the role of CPTP	"true", "false"	yes	EMS		Indicates if LACP populates the LAG automatically. See explanation of LAG in the SD1-44 supporting document.

3.1.8 MSTI Table Example

The MSTI Table, below, will be encoded as follows:

MSTI_Table_Count = “3”

MSTI_Table_ID = “1,2,3”

MSTI_Table_BridgePriority = “<Bpriority #1>,< Bpriority #2>,< Bpriority #3>“

MSTI_Table_DesignatedCost = “<Dcost #1>,< Dcost #2>,<Dcost #3>“

MSTI_Table_DesignatedPort = “<Dport #1>,<Dport #2>,<Dport #3>“

MSTI_Table_PathCost = “<Pcost #1>,< Pcost #2>,<Pcost #3>“

MSTI_Table_PortPriority = “<Ppriority #1>,<Ppriority #2>,< Ppriority #3>“

MSTI_Table_DesignatedRoot = “<Droot #1>,<Droot #2>,<Droot #3>“

ID	Bridge Priority	Designated Cost	Designated Port	Path Cost	Port Priority	Designated Root
1	<Bpriority #1>	<Dcost #1>	<Dport #1>	<Pcost #1>	<Ppriority #1>	<Droot #1>
2	<Bpriority #2>	<Dcost #2>	<Dport #2>	<Pcost #2>	<Ppriority #2>	<Droot #2>
3	<Bpriority #3>	<Dcost #3>	<Dport #3>	<Pcost #3>	<Ppriority #3>	<Droot #3>

3.1.9 VID to MSTI Table Example

The VID_to_MSTI Table is a two column table in which the first column is an MSTI ID and the second column is a VLAN ID, or a range of VLAN IDs, or “AllOthers”. If multiple VLAN IDs map to the same MSTI ID, but the list of VLAN IDs cannot be expressed as a single range, each VLAN ID or range will appear in a different row, and each of these rows will have the same value for MSTI ID.

The VID to MSTI Table, below, will be encoded as follows:

VID_to_MSTI_Table_Count = “7”

VID_to_MSTI_Table_ID = “1,2,3,2,5,3,5”

VID_to_MSTI_Table_VID = “1-1000,1001-2000,2001-3000,3001-4000,4001-4150,4151,4152-4094”

MSTI ID	VLAN IDs
1	1-1000
2	1001-2000
3	2001-3000
2	3001-4000
5	4001-4150
3	4151
5	4152-4094

3.1.10 VLAN Translation Table Example

The VLAN Translation Table, below, will be encoded as follows:

<C|S>TagTranslationEnable = “enabled”

<C|S>TagTranslation_Table_Count = “4”

<C|S>TagTranslation_Table_External = “1000,1001,1002,AllOthers”

<C|S>TagTranslation_Table_Internal = “0001,0002,0003,0000”

External VLAN ID	Internal VLAN ID
1000	0001
1001	0002

1002	0003
AllOthers	0000

3.1.11 Traffic Mapping Table

The following table defines the set of column header names which have to be recognized by all MTNM compliant systems, and indicate where they are acceptable (i.e., CPTP, FP). Additional proprietary columns can be used by agreement between the EMS and NMS providers.

	TP playing the role of a CPTP	CTP playing the role of an FP	comments
TrafficMappingFrom_Table column header names			
"VID"	X	X	
"Priority"	X	X	
TrafficMappingTo_Table column headernames			
"TrafficClass"	X	X	
"TcProfile"	X	X	The association of a Traffic Conditioning Profile to an FP or CPTP shall be done in a "cascaded" manner; i.e., a profile associated to *All* CoS of an CPTP is valid for all Ethernet frames within this CPTP except for the frames that are conditioned via a different profile, e.g., valid for a specific CoS in a client FP.
"EgressProfile"			

An EMS which encounters a table with an unrecognized column header (including if a CPTP-only column header is used at the FP, or vice versa) will reject the command in which the offending table is introduced. A description of how to use these tables is contained in supporting document SD1-44

Example TrafficMappingTable at an FP

The following table specifies selection criteria VLAN ID and Priority field, and resulting Traffic Class assignments and Traffic Conditioning Profile assignments:

Parameter "TrafficMappingTable_Count" = "10"

Parameter “TrafficMappingFrom_Table_VID” = “1-1000,1-1000,1-1000,1-1000,1001-2000,1001-2000,2001-3600,2001-3600,2001-3600,AllOthers”

Parameter “TrafficMappingFrom_Table_Priority” = “000-001,010-011,100-101,110-111,000-010,011-111,000,001-110,111,All”

Parameter “TrafficMappingTo_Table_TrafficClass” = “0,1,2,3,0,1,0,2,3,0”

Parameter “TrafficMappingTo_Table_TcProfile” = “name = "EMS"; value = "<CompanyName/EMSname>" name = "TCProfile"; value ="52",
name = "EMS"; value = "<CompanyName/EMSname>" name = "TCProfile"; value ="64",
name = "EMS"; value = "<CompanyName/EMSname>" name = "TCProfile"; value ="17",
name = "EMS"; value = "<CompanyName/EMSname>" name = "TCProfile"; value ="99",
name = "EMS"; value = "<CompanyName/EMSname>" name = "TCProfile"; value ="52",
name = "EMS"; value = "<CompanyName/EMSname>" name = "TCProfile"; value ="127",
name = "EMS"; value = "<CompanyName/EMSname>" name = "TCProfile"; value ="100",
name = "EMS"; value = "<CompanyName/EMSname>" name = "TCProfile"; value ="102",
name = "EMS"; value = "<CompanyName/EMSname>" name = "TCProfile"; value ="103",
name = "EMS"; value = "<CompanyName/EMSname>" name = "TCProfile"; value ="100"

TrafficMappingFrom_Table_...		TrafficMappingTo_Table_...	
VLAN ID	**Priority**	**Traffic Class**	**TC Profile Name**
1-1000	000-001	0	name = "EMS"; value = "<CompanyName/EMSname>"name = "TCProfile"; value ="52"
1-1000	010-011	1	name = "EMS"; value = "<CompanyName/EMSname>"name = "TCProfile"; value ="64"
1-1000	100-101	2	name = "EMS"; value = "<CompanyName/EMSname>"name = "TCProfile"; value ="17"
1-1000	110-111	3	name = "EMS"; value = "<CompanyName/EMSname>"name = "TCProfile"; value ="99"
1001-2000	000-010	0	name = "EMS"; value = "<CompanyName/EMSname>"name = "TCProfile"; value ="52"
1001-2000	011-111	1	name = "EMS"; value = "<CompanyName/EMSname>"name = "TCProfile"; value ="127"
2001-3600	000	0	name = "EMS"; value = "<CompanyName/EMSname>"name = "TCProfile"; value ="100"
2001-3600	001-110	2	name = "EMS"; value = "<CompanyName/EMSname>"name = "TCProfile"; value ="102"
2001-3600	111	3	name = "EMS"; value = "<CompanyName/EMSname>"name = "TCProfile"; value ="103"

TrafficMappingFrom_Table_...		TrafficMappingTo_Table_...	
VLAN ID	**Priority**	**Traffic Class**	**TC Profile Name**
AllOthers	All	0	name = "EMS"; value = "<CompanyName/EMSname>"name = "TCProfile"; value ="100”

Revision History

Version	Date	Description of Change
3.0	April 2005	
3.0	June 2005	References updated
3.1	November 2005	Version in names of referenced supporting documents deleted.
3.2	September 2006	▪ Blue marked text (was new in version 3.0) converted to black. ▪ Additional column “Objects” added to all parameters. ▪ Connectionless technology parameters added. ▪ Parameters for PDH (DS1 / T1 / E1 and DS3 / T3 / E3) and SONET (OC3 and OC12) added. ▪ New structure of document (i.e., divided in - Generally Applicable Parameters - Connection-oriented Technology Parameters - Connectionless Technology Parameters ▪ Parameters for ADSL2, ADSL2+ and VDSL2 added ▪ Description of values moved from “Legal values” to “Comment / Example” ▪
3.2.3	March 2007	▪ LR_Ethernet_VLAN and LR_Ethernet_Flow deleted. ▪ “CPTP” replaced by “TP playing the role of CPTP” Note for CPTP added. ▪ “MaxClientRate” added to section “Genrally Applicable Parameters” ▪ Parameter “TransmissionDescriptorState” added.

		▪ FDFr removed from “TransmissionDescriptorPointer” parameter. ▪ “FP” replaced by “CTP playing the role of an FP” ▪ Note for FP added. ▪ Description of “UnicastServiceFrameDelivery”, “MulticastServiceFrameDelivery” and “BroadcastServiceFrameDelivery” enhanced and removed from FDFr. ▪ Description of “TransmissionDescriptorPointer” and “IVID” enhanced.
3.2.4	March 2007	▪ Editorial cleanup for final release (removed strikethrough items, etc.)
3.3	November 2007	▪ Replaced TCProfile ID by TCProfile name. ▪ “ResourceFulFillmentState” added to section “Generally Applicable Parameters”. ▪ Corrected typo - changed “AdminstrationControl” to “AdministrationControl”

Acknowledgements

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How to comment on the document

Comments and requests for information must be in written form and addressed to the contact identified below:

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Please be specific, since your comments will be dealt with by the team evaluating numerous inputs and trying to produce a single text. Thus we appreciate significant specific input. We are looking for more input than wordsmith" items, however editing and structural help are greatly appreciated where better clarity is the result.