Usage of the *additionalInfo* Field of MTNM Managed Objects

The *additionalInfo* field is common to all MTNM managed objects as are *name*, *userLabel*, *nativeEMSName*, and *owner*. It consists of a list of name/value pairs that are called *additional info parameters*. These parameters allow the communication from the EMS to the NMS, and vice versa, of additional information that is not explicitly modelled at the MTNM interface, except that some parameter names and values may be predefined (i.e., standardized). For example, there exist predefined values for state information defined in ITU-T standards X.731 and M.3100 which SHOULD be used if supported by the EMS (see SD1-8).

Any information encoded in the *additionalInfo* field is optional. The EMS need not make this information available to the NMS and the NMS need not interpret it. However, when the EMS wants to implement a feature that is predefined by one or more *additionalInfo* parameters it MUST use the predefined names and values to achieve multi-vendor interoperability, and when the EMS implements vendor-specific *additionalInfo* parameters subject to bilateral agreements with NMS vendors the NMSes SHOULD interpret the parameters.

This supporting document specifies the standardized *additionalInfo* parameters that can be used for MTNM managed object classes (i.e., AID, ASAP, CTP, EMS, EPGP, EQT, EQTH, FTP, GTP, ME, MLSN, PGP, PMP, PTP, SNC, TCAPP, TD, TL, TMD, TPPool), for other interface structures (e.g., CrossConnect, SwitchData, input structures for object creations and modifications), and for operation parameters. The **first table** provides an overview of the MTNM interface structures and operation parameters that contain an *additionalInfo* field:

MTNM Structure or Operation Parameter	Abbreviation	CORBA IDL Reference
acknowledgeAlarms(): in *additionalInfo*	-	emsMgr::*acknowledgeAlarms()*
Alarm notification (deprecated)	-	CosNotification::StructuredEvent
Alarm Severity Assignment Profile	ASAP	aSAP::ASAP_T
ASAP create or modify data	-	aSAP::ASAPCreateModifyData_T
assignASAP(): inout *additionalInfo*	-	emsMgr::*assignASAP()*
Call		callSNC::Call_T
Connection Termination Point	CTP	terminationPoint::TerminationPoint_T of type TPT_CTP
createASAP(): out *additionalInfo*	-	emsMgr::*createASAP()*
createGTP(): in *additionalCreationInfo*	-	managedElementManager::*createGTP()*
Cross-Connect(ion) (being part of a route of an SNC)	XC	subnetworkConnection::CrossConnect_T
deassignASAP(): inout *additionalInfo*	-	emsMgr::*deassignASAP()*
deleteASAP(): inout *additionalInfo*	-	emsMgr::*deleteASAP()*
Element Management System object	EMS	emsMgr::EMS_T
Equipment Protection Group	EPGP	protection::EprotectionGroup_T
equipment protection switch data	-	protection::EswitchData_T
equipment create data	-	equipment::EQTCreateData_T
Equipment Holder	EQTH	equipment::EquipmentHolder_T
Equipment object	EQT	equipment::Equipment_T
Floating Termination Point	FTP	terminationPoint::TerminationPoint_T of type TPT_PTP with TP name component “FTP”
Flow Domain	FD	flowDomain::FlowDomain_T
FD Create Data (note)	-	flowDomain::FDCreateData_T
FD Modify Data (note)	-	flowDomain::FDModifyData_T
Flow Domain Fragment	FDFr	flowDomainFragment::FlowDomainFragment_T
FDFr Create Data (note)	-	flowDomainFragment::FDFrCreateData_T
FDFr Modify Data (note)	-	flowDomainFragment::FDFrModifyData_T
getBackupRoutes(): in *additionalInfo*	-	multiLayerSubnetwork::*getBackupRoutes()*
Group Termination Point	GTP	terminationPoint::GTP_T
GUI Cut-Through launch data	-	guiCutThrough::GuiCutThroughData_T
launchGCT(): in *additionalInputInfo*	-	guiCutThrough::*launchGCT()*
launchGCT(): out *additionalOutputInfo*	-	
maintenance operation	-	maintenanceOps::CurrentMaintenanceOperation_T
Managed Element	ME	managedElement::ManagedElement_T

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MTNM Structure or Operation Parameter	Abbreviation	CORBA IDL Reference
Matrix Flow Domain	MFD	flowDomain::MatrixFlowDomain_T
MFD Create Data (note)	-	flowDomain::MFDCreateData_T
MFD Modify Data (note)	-	flowDomain::MFDModifyData_T
Matrix Flow Domain Fragment (being part of a route of an FDFr)	MFDFr	flowDomainFragment::MatrixFlowDomainFragment_T
modifyASAP(): out *additionalInfo*	-	emsMgr::*modifyASAP()*
Multilayer Subnetwork	MLSN	multiLayerSubnetwork::MultiLayerSubnetwork_T
MultiLayerSNPP		multiLayerSNPP::MultiLayerSNPP_T
MultiLayerSNPPLink		multiLayerSNPPLink::MultiLayerSNPPLink_T
Performance Monitoring Point	PMP	performance::PMP_T
Physical Termination Point	PTP	terminationPoint::TerminationPoint_T of type TPT_PTP with TP name component "PTP"
Protection Group	PGP	protection::ProtectionGroup_T
protection switch data	-	protection::SwitchData_T
removeRoute(): in *additionalInfo*	-	multiLayerSubnetwork::*removeRoute()*
route create data	-	subnetworkConnection::RouteCreateData_T
route descriptor	-	subnetworkConnection::RouteDescriptor_T
route lock and unlock data	-	subnetworkConnection::RouteNameAndAdminState_T
setIntendedRoute(): in *additionalInfo*	-	multiLayerSubnetwork::*setIntendedRoute()*
SNC create data	-	subnetworkConnection::SNCCreateData_T
SNC modify data	-	subnetworkConnection::SNCModifyData_T
Subnetwork Connection	SNC	subnetworkConnection::SubnetworkConnection_T
switchRoutes(): in *additionalInfo*	-	multiLayerSubnetwork::*switchRoutes()*
TCA Parameter Profile	TCAPP	performance::TCAParameterProfile_T
TD create data	-	trafficDescriptor::TDCreateData_T
Termination Point Pool	TPPool	terminationPoint::TerminationPoint_T of type TPT_TPPool
TL create data	-	topologicalLink::TLCreateData_T
TMD create data	-	transmissionDescriptor::TMDCreateData_T
Topological Link	TL	topologicalLink::TopologicalLink_T
TC Profile Create Data (note)	-	trafficConditioningProfile::TCProfileCreateData_T
Traffic Descriptor	TD	trafficDescriptor::TrafficDescriptor_T
Transmission Descriptor (includes *additionalTPInfo* and *additionalInfo*)	TMD	transmissionDescriptor::TransmissionDescriptor_T
unacknowledgeAlarms(): in *additionalInfo*	-	emsMgr::*unacknowledgeAlarms()*
verifyTMDAssignment(): out *additionalTPInfo*	-	managedElementManager::*verifyTMDAssignment()*

The NMS can retrieve the current *additionalInfo* parameters of a given MTNM managed object with the *getXYZ()* operation of the object manager for the respective object class (e.g., *getTP()* of *ManagedElementMgr* in case of TPs, *getSNC()* of *MultiLayerSubnetworkMgr* in case of SNCs, *getTopLevelTopologicalLink()* of *EMSMgr* and *getTopologicalLink()* of *MultiLayerSubnetworkMgr* in case of TLs).

The NMS can modify the additional info parameters of a given MTNM managed object with the operation *setAdditionalInfo()* defined in the *Common_I* interface which is inherited by every object manager.

The additional info parameters of a TP (PTP, FTP, CTP) can also be modified by using transmission descriptors. In this case the parameters to be modified are pre-defined in the *additionalTPInfo* field of a TMD and are assigned to the TP by assigning the TMD to the TP with the operation *setTPData()* (which may include further TP parameters to be modified, in particular layered transmission parameters).[1]

Modification of additional info parameters is generally best-effort, i.e. the modification of an individual parameter can fail independently of the modifying operation itself (non-atomicity). However, an additional info parameter may be identified as "not best effort" in the "Potentially settable from" column of the next table. If in the *setAdditionalInfo()* (respectively *setTPData()* operation) at least one of the additional info parameters (respectively additional TP info parameters) although valid can not be set and is of this type the complete operation SHOULD be rejected with exception type UNABLE_TO_COMPLY.

[1] The *setTPData()* mechanism is also used indirectly via the *tpsToModify* parameter of most SNC operations.

An *additionalInfo* parameter may be identified as "only settable via <specific operation>" in the "Potentially settable from" column of the next table. Then the parameter SHOULD be modified with the <specific operation> only and the attempt to modify the parameter (among others) with *setAdditonalInfo()* or *setTPData()* SHOULD result in the rejection of the complete operation with exception type INVALID_INPUT.

In an AVC or SC notification, the *additionalInfo* field's value may not contain the complete value of the field. Rather, it only indicates additional info parameters that have been deleted, changed, or added. A deleted additional info parameter is indicated by a "-" value; a changed or added additional info parameter has its new value specified. All additional info parameters not listed have not changed.

The **second table** provides the list of standardized additional info parameters *sorted by parameter name*:

ParameterName	Applicable MTNM Object Classes or Other Structures	Legal values	AVC notifi-cation raised?	Potentially settable from	Comment / Example
"A<*n*>Role"	SNC, SNCCreateData, not applicable to SNCModifyData	"CMEndPoint", "LCEndPoint"	no	EMS & NMS (read-create)	Indicates the end point role of an aEnd TP of an SNC, where <*n*> refers to the index of the TP within the aEnd list. At a connection matrix (CM) end point the span of the SNC starts at a G.805 CP with a fixed or flexible connection through the ME at the SNC layer, i.e. the connectable layer of the end point. At a link connection (LC) end point connectivity is adapted from a server layer and the span of the SNC starts with a G.805 TCP.
"AEndTNANameOrGroupTNAName"	SNC, SNCCreateData	String, either unstructured or representing a sequence of name-value pairs. The backslash ("\") character is used as separator.	no	NMS (read-create)	Represent the TNA or Group-TNA of the Connection. A TNA Name List may have 3 value pairs. Format: \name=TNAName\value=*TNANameValue*\name=LogicalPortId\value=*LogicalPortIdValue*\name=Index\value=*IndexValue*
"AEndTPList"	SNC, SNCCreateData	String representing a sequence of name-value pairs. The backslash ("\") character is used as separator.	no	NMS (read-create)	Format: \name=EMS\value=*CompanyName/EMSname*\name=ManagedElement\value=*ManagedElementName*\name=PTP\value=*PTPName*\name=CTP\value=*CTPName* E.g.: \name=EMS\value=BigCompany/SmallEMS\name=ManagedElement\value=YellowManagedElement\name=PTP\value=BluePTP\name=CTP\value=RedCTP

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ParameterName	Applicable MTNM Object Classes or Other Structures	Legal values	AVC notifi-cation raised?	Potentially settable from	Comment / Example
"AlarmReporting"	SNC, TL, EQTCreateData, SNCCreateData, SNCModifyData, TLCreateData	"On", "Off"	yes	EMS & NMS	Provides an indication of whether alarm reporting (from ME to the EMS) for the managed object is administratively activated or deactivated. Note that EQT and EQTH have the attribute `alarmReportingIndicator` that serves the same purpose. In case of EQTCreateData this attribute is addressed by "AlarmReporting".
"AllocatedNumber"	TL	String containg an Integer number	yes	EMS & NMS	Used for the provisioning of an IMA virtual link between two peer IMA groups as TL. Indicates the number of IMA links that constitute the TL.
"ASAPpointer"	EMS, ME, GTP, SNC, TL, EQT, EQTH, PGP, EPGP, SNCCreateData, SNCModifyData, TLCreateData, EQTCreateData	"<*value of ASAP name component of ASAP name*>"	yes	EMS & NMS; only settable via *assignASAP()* respectively *deassignASAP()*	Indicates the assignment of an ASAP to the managed object. In case of PTP, CTP, FTP the ASAP assignment is done on a per layer basis only through the transmission parameter "ASAPpointer" (see SD1-16_layeredParameters.pdf).
"BLSRDirection"	SNCCreateData	"EAST", "WEST", "NA"	no	NMS (read-create)	Used in conjunction with "Timeslot" when the EMS cannot use the routing constraints for a BLSR case.
"BundledSNCindicator"	SNC, SNCCreateData	"True", "False"	no	EMS & NMS (read-create)	Indicates whether the SNC constitutes a Bundled SNC service (value "True") or not.
"CallId"	SNC	String	no		This is the control plane identifier. This attribute is the Call Name attribute in G.7713.
"CallName"	SNC	String containing the RDN of the Call	no	EMS & NMS (read-create)	This attribute indicates the Call Name which the connection is supporting in a non control plane case.

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ParameterName	Applicable MTNM Object Classes or Other Structures	Legal values	AVC notifi-cation raised?	Potentially settable from	Comment / Example
		Name. The value in the last name-value pair of name structure			
"ClientConnectivity"	PTP, FTP, CTP	"NotConnectable", "Connected", "NotSet"	yes	EMS	Implements the *client connectivity state* of a TP and should be present on TPs whose direct client TPs can be or are fixed cross-connected. When set to "Connected", the TP is currently multiplexing, i.e. all its client TPs are cross-connected in a fixed way. When set to "NotConnectable", none of the TP's client TPs are involved in fixed cross-connects and none can be cross-connected. When set to "NotSet", the TP is currently in no client connectivity mode, none of its client TPs are cross-connected in a fixed way and nothing prevents this to happen. In case the client TPs of a TP are permanently involved in fixed cross-connects (hard-wired), clientConnectivity will be locked in state "Connected". The EMS should then reject cross-connect creation involving the TP itself or any of its client TPs. If clientConnectivity of a TP is set to "NotSet" and the TP is getting cross-connected, this sets 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 (i.e., clientConnectivity is set to "NotConnectable").

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ParameterName	Applicable MTNM Object Classes or Other Structures	Legal values	AVC notifi-cation raised?	Potentially settable from	Comment / Example
"ConformanceDefinition"	CTP, TMD	"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"	yes	EMS & NMS	Translates the ATM conformance definitions for TDs according to SD1-5_conformanceDefinitions.pdf to CTPs and Transmission Descriptors. Strictly speaking in case of TMDs it is an additional TP info parameter, not an additional info parameter.
"ConnectionId"	SNC, XC	String	no		This is the control plane identifier. This attribute is the Connection Name attribute in G.7713. Note that also the Cross Connection points to its superior Connection.
"ConnectionName"	SNCCreateData	String containing the RDN of the Call Name. The value in the last name-value pair of	no	NMS (read-create)	This attribute allows NMS to provision the name of top level Connection at Call establishment.

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ParameterName	Applicable MTNM Object Classes or Other Structures	Legal values	AVC notifi-cation raised?	Potentially settable from	Comment / Example
		name structure			
"ConnectionSetUpType"	SNC, SNCCreateData	"PC", "SC", "SPC"	no	EMS	This attribute indicates whether the connection has been established by UNI signalling (SC) or NMS (SPC, PC).
"ConnectionState"	SNC	"Complete", "Searching", "N/A"	yes		Indicates that all ("Complete") or not all ("Searching") the resources necessary to support the connection have been successfully allocated yet.
"ContainedMember<*n*>"	TPPool	"<*value of TP or GTP name component of TP or GTP name*>"	yes	EMS & NMS; only settable via modifyTPPool()	Refers to the n^{th} member of the TPPool. It is only used within AVC notifications for the *additionalInfo* attribute. Use *getTPGroupingRelationships()* with *tpName* = TPPool to read the names of the TPPool members. Use *getTPGroupingRelationships()* with *tpName* = PTP/CTP/FTP/GTP to read the TPPool the TP or GTP is a member of. For full name qualification consider "MemberContainingME<n>" and "MemberContainingTP<n>".
"CorrelationId"	SNC	String	yes	EMS	Used to contain information about relationships that this SNC may have to other managed objects.
"DescriptionOfUse"	TPPool	String	yes	EMS & NMS	Indicates the description of use of the TPPool. It is only used within AVC notifications. Use *getTPPool()* to read the parameter.
"EgressTMDstate"	PTP, FTP, CTP	"NotApplicable", "Applied", "Pending", "Mismatch", "TMDmissing"	yes	EMS	Defines the egress TMD state of TPs that can be validated through TMD assignment verification: "NotApplicable" - No TMD is assigned to the TP. "Applied" - A TMD is assigned consistently to the TP. "Pending" - A TMD is assigned and the corresponding TP configuration is in progress.

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ParameterName	Applicable MTNM Object Classes or Other Structures	Legal values	AVC notifi-cation raised?	Potentially settable from	Comment / Example
					"Mismatch" - A TMD is assigned inconsistently and information about all the mismatched TMD parameters is available. "TMDmissing" - A TMD is assigned but the TMD itself cannot be retrieved by the EMS.
"EquipmentProtected"	PTP, CTP	"True", "False"	yes	EMS	Indicates whether or not a TP is supported by protected equipment in case the EMS does not implement the equipment protection model.
"Fixed"	XC, SNC	"True", "False"	no	EMS (read-only)	Takes value "True" when the cross connect is fixed, i.e. cannot be deleted by the NMS, respectively when all cross-connects of the SNC are fixed.
"FragmentServerLayer"	TL	String containing an Integer number	yes	EMS & NMS	Used for the provisioning of an IMA virtual link between two peer IMA groups as TL. Indicates the layer rate of the individual IMA links. The value shall be the standardized integer value for the desired layer (see SD1-17_layerRates.pdf).
"G.774.3::APSfunction"	PGP	"G.783", "Legacy"	no	EMS & NMS	Indicates if the switching function is based on APS standardized protocol or on a proprietary protocol. "G.783" is set in case of K1/K2 based APS, and "Legacy" is set in case of proprietary protocol, as for radio equipment for example.
"IngressTMDstate"	PTP, FTP, CTP	"NotApplicable", "Applied", "Pending", "Mismatch", "TMDmissing"	yes	EMS	Defines the ingress TMD state of TPs that can be validated through TMD assignment verification: see "EgressTMDState"
"LayeredRoutingAreaList"	MLSN playing the	String containing a	no	EMS	The routing areas at each layer.

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ParameterName	Applicable MTNM Object Classes or Other Structures	Legal values	AVC notifi-cation raised?	Potentially settable from	Comment / Example
	role of an MLRA	list delimited by a slash. Each field is composed by the concatenation of layer rate name=value pair, followed by a hyphen, plus the RA identifier name= value pair.			E.g.: /LayerRate=sts3c_au4 RAid=123 /LayerRate=sts12c_vc4_4c -RAid=456 Note that the "object naming string" of layer rates is used.
"M.3100::<*name of M.3100 state or status*>"		"<*value of M.3100 state or status*>"	yes	not best effort	see SD1-8_encodingX731M3100.pdf
"Manufacturer"	EQT, ME, EQTCreateData	String	yes	EMS & NMS (read-create)	Identifies the name of the equipment manufacturer. Must be non-empty. In cases where the NMS provisions equipment with a particular manufacturer name and this name conflicts with the manufacturer name as discovered by the EMS, the manufacturer name discovered by the EMS shall be considered the correct name, and the EMS shall issue an AVC to the NMS indicating a change to "Manufacturer".
"MaximumCost"	SNC, SNCCreateData	String			The maximum link/node cost allowed for routing.
"MemberContainingME<*n*>"	TPPool	"<*value of ME name component of ME name*>"	yes	EMS & NMS; only settable via modifyTPPool()	Refers to the n^{th} member of the TPPool (i.e., a TP or a GTP). It is only used within AVC notifications. Use *getTPGroupingRelationships()* with *tpName* = TPPool to read the names of the TPPool members.
"MemberContainingTP<*n*>"	TPPool	"<*value of PTP/FTP name component of*	yes	EMS & NMS; only settable via	Refers to the n^{th} member of the TPPool when this is a CTP. It is only used within AVC notifications. Use

ParameterName	Applicable MTNM Object Classes or Other Structures	Legal values	AVC notifi-cation raised?	Potentially settable from	Comment / Example
		PTP/FTP name>“		modifyTPPool()	*getTPGroupingRelationships()* with *tpName* = TPPool to read the names of the TPPool members.
“MustRemoveGTPs”	SNC, SNCCreateData, SNCModifyData	“True”, “False”	no	EMS & NMS (read-create)	The parameter is only used for bundled SNCs. If set to “True” the EMS when removing the SNC must make a best-effort attempt to remove the interior GTPs that once belonged to the SNC, and if set to “False” the NMS does not care whether the EMS removes the interior GTPs or not. Any behavior other than best-effort is likely to involve a complicated rollback procedure for the EMS and NEs. In the case that the parameter is set to “True” and the EMS cannot remove all the interior GTPs, the EMS should return a list of the GTPs that could not be removed in the errorReason field of the deactivateAndDeleteSNC() and deleteSNC() operations. The errorReason would be “not all interior GTPs could be deleted”; this would be followed by the names of the GTPs that could not be deleted.
“NetworkAccessDomain”	Call, CTP, FTP, GTP, ME, MLSN, PTP, SNC, TL, additionalCreation Info parameter of createGTP(), SNCCreateData, SNCModifyData, TLCreateData	String	yes	EMS & NMS	Used to associate the resource to an NAD (Network Access Domain) by specifying the implementation-defined NAD name. Depending on bilateral agreements the string could also contain a (somehow) separated list of NAD names.
“NetworkReroute”	SNC, SNCCreateData,	“Yes”, “No”,	yes	EMS & NMS	Indicates if the reroute of an SNC (if allowed) should be computed by the network, by the EMS, or if it does

ParameterName	Applicable MTNM Object Classes or Other Structures	Legal values	AVC notifi-cation raised?	Potentially settable from	Comment / Example
	SNCModifyData	"NotSet"			not matter.
"NumberOfIdleMembers"	TPPool	String containing an Integer number	yes	EMS & NMS; only settable via modifyTPPool()	Indicates the number of idle members of the TPPool. It is only used within AVC notifications. Use *getTPPool()* to read the parameter.
"NumberOfMembers"	TPPool	String containing an Integer number	yes	EMS & NMS; only settable via modifyTPPool()	Indicates the number of members of the TPPool. It is only used within AVC notifications. Use *getTPPool()* to read the parameter.
"PotentialFutureSetupIndicator"	SNCCreateData	"RSU_POINT_TO_POINT", "RSU_BROADCAST", "RSU_ANY_CONFIG"	no	NMS	Refers to the aEnd and is used to convey the likely future (or current) configuration of the SNC (see SD1-16_layeredParameters.pdf).
"ProtectionEffort"	SNC	"EFFORT_WHATEVER" , "EFFORT_SAME_OR_BETTER", "EFFORT_SAME_OR_WORSE", "EFFORT_SAME"	no		Corresponds to subnetworkConnection::ProtectionEffort_T, which is present in SNCCreateData_T and SNCModifyData_T, but was omitted in SNC_T.
"ProtectionRole"	EQT, EQTCreateData	"Primary", "Backup", "NotApplicable"	yes	EMS & NMS	Identifies the role of an EQT in an EPGP. "Primary" refers to the worker EQT while "Backup" refers to the protection EQT. "NotApplicable" applies to unprotected EQT.
"ProtectionSchemeState"	EQT, EQTCreateData	"PSS_UNKNOWN", "PSS_AUTOMATIC", "PSS_FORCED_OR_	yes	EMS & NMS	Identifies the state in which the equipment protection scheme is in. "PSS_FORCED_OR_ LOCKED_OUT" indicates that the entire EPGP is

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ParameterName	Applicable MTNM Object Classes or Other Structures	Legal values	AVC notifi-cation raised?	Potentially settable from	Comment / Example
		LOCKED_OUT"			locked while partial locking is indicated by "PSS_AUTOMATIC". Individual locks can be reported through transmission parameters on the appropriate TPs or additional info parameters on appropriate equipment objects.
"RouteActualState"	XC	"Active", "Inactive", "Partial"	yes	EMS	This parameter is the summary state of the activity states of the route's XCs in the network, regardless the SNC the XCs are currently serving. It can assume the following values: - active: all of the route's XCs are active - inactive: none of the route's XCs is active - partial: one or more but not all of the XCs of the route are active
"RouteAdminState"	XC	"Locked", "Unlocked"	yes	EMS	This state has not any relationship with the actual state. It can assume the following values: - locked: the route is not allowed to be active - unlocked: the route is allowed to be active
"RouteExclusive"	XC	"True", "False"	yes	EMS	"True" if not any routes of other SNCs can share any of the route's XCs or CTPs, even in pending state, "False" otherwise.
"RouteGroupLabel"	SNC, SNCCreateData	String	yes	NMS	This attribute shall represent the route group of the connection.
"RouteId"	XC	String	yes	EMS	This parameter is a unique identifier within the SNC name, with format up to the EMS.
"RouteIntended"	XC	"True", "False"	yes	EMS	The intended route ("True") is defined as preferred, or default route for a given service. The backup route ("False") is partly or totally different from the

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ParameterName	Applicable MTNM Object Classes or Other Structures	Legal values	AVC notifi-cation raised?	Potentially settable from	Comment / Example
					intended route (but with same end points), and is useful for restoration and maintenance purposes.
"RouteInUseBy"	XC	"True", "False"	yes	EMS	"True" if at least one of the route's XCs or CTPs is carrying traffic of another SNC, "False" otherwise.
"RoutingAreaLevel"	MLSN playing the role of an MLRA	"TopLevelRA", "IntermediateRA", "MLRN"	no	EMS	It indicates in the level of the MLRA.
"RoutingConstraintEffort"	SNC, SNCCreateData	"BEST_EFFORT", "EXACT_MATCH"	no	NMS (read-create)	The effort required for routing constraint application.

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ParameterName	Applicable MTNM Object Classes or Other Structures	Legal values	AVC notifi-cation raised?	Potentially settable from	Comment / Example
"ServerConnectivity"	PTP, FTP, CTP	"NotConnectable", "Connected", "NotSet"	yes	EMS	Implements the *server connectivity state* of a TP and should be present on TPs whose direct server TPs can be or are fixed cross-connected. When set to "Connected", the TP is currently inverse multiplexing, i.e. all its server TPs are cross-connected in a fixed way. When set to "NotConnectable", none of the TP's server TPs are involved in fixed cross-connects and none can be cross-connected. When set to "NotSet", the TP is currently in no server connectivity mode, none of its server TPs are cross-connected in a fixed way and nothing prevents this to happen. In case the server TPs of a TP are permanently involved in fixed cross-connects (hard-wired), serverConnectivity will be locked in state "Connected". The EMS should then reject cross-connect creation involving the TP itself or any of its server TPs. If serverConnectivity of a TP is set to "NotSet" and the TP is getting cross-connected, this sets 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 (i.e., serverConnectivity will be set to "NotConnectable").

ParameterName	Applicable MTNM Object Classes or Other Structures	Legal values	AVC notifi-cation raised?	Potentially settable from	Comment / Example
"ServiceCategory"	CTP, TMD	"ATM_CBR", "ATM_VBRRT", "ATM_VBRNRT", "ATM_ABR", "ATM_UBR", "ATM_GFR", "ATM_NA"	yes	EMS & NMS	Translates the ATM service categories for TDs to CTPs and Transmission Descriptors. Strictly speaking in case of TMDs it is an additional TP info parameter, not an additional info parameter.
"SNC_INTENDED_ROUTE_EXCLUSIVE"	SNCCreateData	"True", "False"	no	EMS & NMS (read-create)	Specifies when creating an SNC with multiple routes if the intended route is EXCLUSIVE (value "True") or not; if EXCLUSIVE, then the EMS must find a route that does not conflict or shared XCs or CTPs with any other existing SNC route, in any state (pending/partial/current). Once an EXCLUSIVE (intended) route has been created by the EMS, any further creation operation which conflicts with the exclusive route shall be rejected.
"SNC_PRIORITY"	SNC, SNCCreateData, SNCModifyData	"0", "1", "2", ... where "0" is the highest priority	yes	EMS & NMS	The priority allows to prevent activating routes because of XC or CTP conflicts with equal or higher prior SNCs. An SNC or a Connection in the Control Plane can pre-empt resources of another SNC of lower priority for restoration purposes.

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ParameterName	Applicable MTNM Object Classes or Other Structures	Legal values	AVC notifi-cation raised?	Potentially settable from	Comment / Example
"SNC_REVERTIVE"	SNC, SNCCreateData, SNCModifyData	"True", "False"	yes	EMS & NMS	Takes value "True", i.e. the SNC or Connection is revertive, when the SNC or connection can be switched back to its original route. In case of an SNC with multiple routes when the SNC is revertive, then the restoration or rerouting process will always switch to the intended route if possible, i.e. if there are no failures or if the intended route is not locked.
"SRG"	MLSN, SNC	Complex string, slash is used as separator.			E.g.: /bridge=123,456/duct=12,34 /block=123/room=56,78,99
"SuperiorMLRA"	MLSN playing the role of an MLRA	String	N	EMS	It identifies the name of the superior MLRA. It is an empty string if this is a top level MLRA.
"SupportedConnectionName"	SNC	RDN of Connection Name, i.e., the value in the last name-value pair of name structure			This attribute indicates the Connection Name (i.e. its superior connection) which the connection is supporting in a non control plane case. Note that this superior connection must be defined in a top level MLSN – which allows identifying it with a simple string – RDN value.
"SupportingMEName"	MLSN playing the role of an MLRA	RDN of ME Name, i.e., the value in the last name-value pair of name structure	N		Name of the Managed Element supporting the Routing Node
"SupportingMLSNs"	MLSN playing the role of an MLRA	RDNs of MLSN Names, i,e, a list of the values in the last	N	EMS	Names of the MultiLayer Subnetworks supporting the Routing Node

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ParameterName	Applicable MTNM Object Classes or Other Structures	Legal values	AVC notifi-cation raised?	Potentially settable from	Comment / Example
		name-value pair of name structure, slash is used as separator			
"SupportingSNCs"	SNC	Complex string representing the sequence of name-value pairs, backslash is used as separator.			This attribute shall contain the names of the supporting Subnetwork Connections if any. Note: This attribute is only applicable for top level connections in a non-Control Plane environment if SNCs support indirectly the Call. Format: \name=EMS\value=CompanyName/EMSname\name= MultiLayerSubnetwork\value= SubnetworkName\name= SubnetworkConnection\value=SubnetworkName
"Timeslot"	SNCCreateData	Integer	no	NMS	Used in conjunction with "BLSRDirection".
"UsingHomeRoute"	SNC	T/F			Indicates whether the connection is using the home route or not
"X.721::<*name of X.731 state or status*>"		"<*value of X.731 state or status*>"		not best effort	see SD1-8_encodingX731M3100.pdf
"Z<*n*>Role"	SNC, SNCCreateData, not applicable to SNCModifyData	"CMEndPoint", "LCEndPoint"	no	EMS & NMS (read-create)	Indicates the end point role of a zEnd TP of an SNC, where <*n*> refers to the index of the TP within the zEnd list. At a connection matrix (CM) end point the span of the SNC ends at a G.805 CP with a fixed or flexible connection through the ME at the SNC layer, i.e. the connectable layer of the end point. At a link connection (LC) end point connectivity is adapted from a server layer and the span of the SNC ends with a G.805 TCP.

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ParameterName	Applicable MTNM Object Classes or Other Structures	Legal values	AVC notifi-cation raised?	Potentially settable from	Comment / Example
“ZEndTNANameOrGroupTNAName”	SNC, SNCCreateData	see AEndTNANameOrGroupTNAName			see AEndTNANameOrGroupTNAName
“ZEndTPList”	SNC, SNCCreateData	see AEndTPList			see AEndTPList

ParameterName	Applicable MTNM Object Classes or Other Structures	Legal values	AVC notifi-cation raised?	Potentially settable from	Comment / Example
Note. The route-related parameters defined in the following refer to the distinguishing information **of a route** of a belonging SNC as specified by a route descriptor. They are associated with the first XC of the route, i.e. the XC that involves the first aEnd TP of the belonging SNC.					

The **third table** provides the list of standardized additional info parameters *sorted by MTNM object class or other structure*. Refer to the columns "Legal values", "AVC notification raised?", "Potentially settable from", and "Comment / Example" of the second table for the individual specifications of the ParameterNames.

MTNM Object Class or Other Structure	**Applicable ParameterNames**
Alarm notification (deprecated)	see SD1-9_encodingX733.pdfencodingX733.pdf
Alarm Severity Assignment Profile	-
ASAP create or modify data	-
Connection Termination Point	"ClientConnectivity", "ConformanceDefinition", "EgressTMDstate", "EquipmentProtected", "IngressTMDstate", "NetworkAccessDomain", "ServerConnectivity", "ServiceCategory"
Cross-Connect(ion)	"ConnectionId", "Fixed", "RouteActualState", "RouteAdminState", "RouteExclusive", "RouteId", "RouteIntended", "RouteInUseBy"
Element Management System object	"ASAPpointer"
Equipment Protection Group	"ASAPpointer", "G.774.3::APSfunction",
equipment protection switch data	-
equipment create data	"AlarmReporting", "ASAPpointer", "Manufacturer", "ProtectionRole", "ProtectionSchemeState"
Equipment Holder	"ASAPpointer"
Equipment object	"ASAPpointer", "Manufacturer", "ProtectionRole", "ProtectionSchemeState"
Floating Termination Point	"ClientConnectivity", "EgressTMDstate", "IngressTMDstate", "NetworkAccessDomain", "ServerConnectivity"
Group Termination Point	"ASAPpointer", "NetworkAccessDomain"
GUI Cut-Through launch data	-
maintenance operation	-
Managed Element	"ASAPpointer", "Manufacturer", "NetworkAccessDomain"
Multilayer Subnetwork	"LayeredRoutingAreaList", "NetworkAccessDomain", "RoutingAreaLevel", "SRG", "superiorMLRA", "supportingMEName", "SupportingMLSNs"
Performance Monitoring Point	-
Physical Termination Point	"ClientConnectivity", "EgressTMDstate", "EquipmentProtected", "IngressTMDstate", "NetworkAccessDomain", "ServerConnectivity"
Protection Group	"ASAPpointer", "G.774.3::APSfunction"

MTNM Object Class or Other Structure	**Applicable ParameterNames**
protection switch data	-
route create data	-
route descriptor	-
route lock and unlock data	-
SNC create data	“A<n>Role”, “aEndTPList”, “AEndTNANameOrGroupTNAName”, “AlarmReporting”, “ASAPpointer”, “BLSRDirection”, “BundledSNCindicator”, “ConnectionName”, “MaximumCost” ,”MustRemoveGTPs”, “NetworkAccessDomain”, “NetworkReroute”, “PotentialFutureSetupIndicator“, “RouteGroupLabel”,“RoutingConstraintEffort”, “SNC_INTENDED_ROUTE_EXCLUSIVE”, “SNC_PRIORITY”, “SNC_REVERTIVE”, “Timeslot”, “Z<n>Role”, “ZEndTPList”, “ZEndTNANameOrGroupTNAName”
SNC modify data	“AlarmReporting”, “ASAPpointer”, “MustRemoveGTPs”, “NetworkAccessDomain”, “NetworkReroute”, “SNC_PRIORITY”, “SNC_REVERTIVE”
Subnetwork Connection	“A<n>Role”, “AEndTNANameOrGroupTNAName”, “AEndTPList”, “AlarmReporting”, “ASAPpointer”, “BundledSNCindicator”, “CallId”, “CallName”, “ConnectionId” “ConnectionSetUpType”, “ConnectionState”, “CorrelationId”, “Fixed”, “MaximumCost”, “MustRemoveGTPs”, “NetworkAccessDomain”, “NetworkReroute”, “ProtectionEffort”, “RouteGroupLabel”, “RoutingConstraintEffort”, “SNC_PRIORITY”, “SNC_REVERTIVE”, “SRG”, “SupportedConnectionName”, “SupportingSNCs”, “UsingHomeRoute”, “Z<n>Role”, “ZEndTNANameOrGroupTNAName”, “ZEndTPList”
TCA Parameter Profile	-
TD create data	-
Termination Point Pool	“ContainedMember<*n*>”, “DescriptionOfUse”, “MemberContainingME<*n*>”, “MemberContainingTP<*n*>”, “NumberOfMembers”, “NumberOfIdleMembers”
TL create data	“AlarmReporting”, “ASAPpointer”, “NetworkAccessDomain”
TMD create data	-
Topological Link	“AlarmReporting”, “AllocatedNumber”, “ASAPpointer”, “FragmentServerLayer”, “NetworkAccessDomain”
Traffic Descriptor	-
Transmission Descriptor	“ConformanceDefinition” (in *additionalTPInfo*), “ServiceCategory” (in *additionalTPInfo*)

Revision History

Version	Date	Description of Change
3.0	March 2004	Initial version.
3.1	March 2007	Updated for MTNM Release 3.5.
3.2	April 2008	Added SNCCreateData to applicable data structures for the "ConnectionSetUpType" attribute. Removed EPGP as applicable object from G.774.3::APSfunction.

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How to comment on the document

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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.