

AERONAUTICAL TELECOMMUNICATIONS NETWORK PANEL

WG2/14

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**Elements of management information
related to the ATN Transport Layer**

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SUMMARY

This document is the first draft of specification of management information related to the transport layer within an ATN system.

The ATN Transport Layer Management Information is defined by specifying:

- the managed object class definition of ATN Transport Layer MOs following the MO template that has been proposed for use in ATN SARPs.
- the action type operations on the attributes of ATN Transport Layer MOs that are available to ATN System Management

DOCUMENT CONTROL LOG

SECTION	DATE	REV. NO.	REASON FOR CHANGE OR REFERENCE TO CHANGE
	16/02/98	Issue 1.0	First Issue presented at the WG1/SG3 meeting in Gatwick
	10/03/98	Issue 2.0	Update of introductory sections for presentation to WG2

TABLE OF CONTENTS

1. Introduction.....	1
1.1 Scope.....	1
1.2 History of the document	1
1.3 Status.....	2
1.3.1 General.....	2
1.3.2 Level of convergence with the projects	2
1.3.3 Open Issues.....	2
1.4 Recommendation	2
2. Elements of ATN transport layer management information	3
2.1 Summary of managed objects.....	3
2.2 Containment hierarchy	3
2.3 Symbols, abbreviations and terms	3
2.4 The aTNtransportSubsystem managed object.....	5
2.4.1 MO Class Support.....	5
2.4.2 Attributes	5
2.4.3 Actions	5
2.4.4 Notifications.....	5
2.5 The aTNtransportEntity managed object.....	6
2.5.1 MO Class Support.....	6
2.5.2 Attributes	6
2.5.3 Actions	7
2.5.4 Notifications.....	7
2.6 The aTNclmodeTPM managed object	8
2.6.1 MO Class Support.....	8
2.6.2 Attributes	8
2.6.3 Actions	9
2.6.4 Notifications.....	9
2.7 The aTNcomodeTPM managed object	11
2.7.1 MO Class Support.....	11
2.7.2 Attributes	11
2.7.3 Actions	13
2.7.4 Notifications.....	13
2.8 The aTNtransportConnection managed object.....	15
2.8.1 MO Class Support.....	15
2.8.2 Attributes	15
2.8.3 Actions	19
2.8.4 Notifications.....	19

1. Introduction

1.1 Scope

This document is the first draft of specification of management information related to the Transport layer within an ATN system.

The ATN Transport Layer Management Information is defined by specifying:

- the managed object class definition of ATN Transport Layer MOs following the MO template that has been proposed for use in ATN SARPs.
- the action type operations on the attributes of ATN Transport Layer MOs that are available to ATN System Management

1.2 History of the document

Under the initiative of Eurocontrol, a first System Management co-ordination meeting was held in October 97, before the ATNP WG meeting at Redondo, with representatives of the ProATN and ACI consortia (Thomson, Vertel, Sofreavia) and with participants of the ATNP Working Groups (Eurocontrol, STNA).

One of the subject of the meeting was the definition of a plan for the alignment of the MIB of the ProATN and ATNSI projects, and the injection of the resulting harmonised material into ATNP WG meeting. At this time, no MIB had yet been defined for the ATNSI project, but this was planned to be completed by the end 97 (the ACI NMA FRS document). It was agreed that this ACI MIB would be defined taking into account input from ATN experts currently operating experimental systems, and input from the ProATN project. It was then agreed that this MIB would be considered as input material for injection into ICAO ATNP meetings in March 98.

This plan was presented to ATNP WG2 at the Redondo meeting and accepted. Stephane Tamalet was tasked to produce a first proposal for the ICS MIB, to be presented at the Rio WG2 meeting in March 98.

A second System Management co-ordination meeting was held in January 98, one week after the ACI NMA FRS document was made available. One of the result of this meeting was the creation of a Task Team for the production of an harmonised MIB for the projects and a proposal for a minimum subset of MOs for the ATN SARPs. The task team consisted of representatives of ProATN and ACI consortia (Thomson, Sita and Vertel) representing the views and the constraints of the projects and of participants to the ATNP WGs (STNA and Eurocontrol) representing the views and the requirements from an ATNP perspective.

The MIB convergence activity undertook by the team resulted in the production of 3 documents:

- A document presenting the proposed elements, for the ATN SARPs, of management information related to the ATN Network Layer (WG2-14/WP 440)
- A document presenting the proposed elements, for the ATN SARPs, of management information related to the ATN Transport Layer. Layer (i.e. this document (WG2-14/WP 441))
- A document defining a convergent MIB for the ACI and ProATN consortia. (WG2-14/IP 439)

1.3 Status

1.3.1 General

This document is the first draft of specification of management information related to the Transport layer within an ATN system. In its current version, it only addresses system management aspects pertaining to fault and performance management.

Accounting and Security management for the ATN Transport Layer will be considered in a future version of this document.

Configuration management is a system management functional area that has been considered to be out of the scope of the SARPs.

This issue of the document is an annotated version. Every description of attribute, action, and notification is annotated with a paragraph providing some level of rationale explaining why the attribute, notification or action is proposed to be standardised in the ATN SARPs. These annotations will be removed at a later stage.

1.3.2 Level of convergence with the projects

Note: Convergence with the projects means that what is proposed to be standardised in the SARPs, is acceptable for implementation by the projects.

With respect to the Transport Layer MOs, convergence of views between the representatives of the ProATN and ACI consortia and the team members participant to ATNP was completed at 100 %. Agreement was reached on all attributes, actions and notifications for Transport Layer MOs.

Note: the project will not implement the proposed aTNclmodeTPM MO. But the reason is that the projects do not plan to implement the ConnectionLess Transport Protocol.

In parallel, the projects have converged on a number of additional (projects specific) attributes in each MO class, and on a limited number of additional Managed Object Classes. These additional MOCs and attributes pertain for the most to configuration management (e.g. Initial Value MO (IVMO), tSAP MO, etc...).

1.3.3 Open Issues

There is a question on whether it is required to keep the values of both the Transport and Network priorities in the aTNtransportConnection MO.

1.4 Recommendation

WG2 is invited to review this material and to provide comments.

2. Elements of ATN transport layer management information

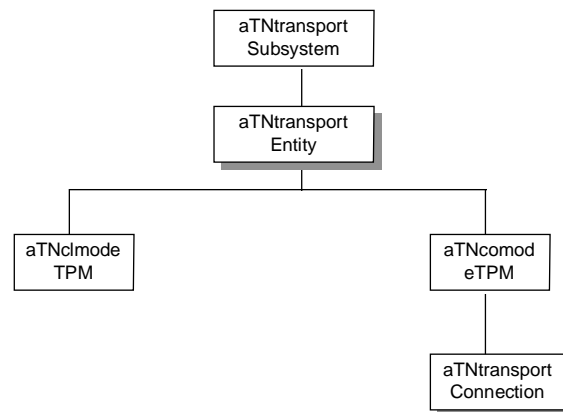
2.1 Summary of managed objects

The following set of managed object classes are defined for the ATN Transport layer:

- aTNtransportSubsystem
- aTNtransportEntity
- aTNcomodeTPM
- aTNtransportConnection
- aTNclmodeTPM

2.2 Containment hierarchy

The containment hierarchy is illustrated in figure 1. Managed Objects which can have multiple instances are illustrated by shadowed boxes. These objects are defined in detail in the following sections.



2.3 Symbols, abbreviations and terms

In each table, the "ISO Status" column indicates the conformance requirement as specified in the ISO/IEC base standard that defines the MO. A hierarchy exists, so that the conformance requirements of a dependent feature only apply if the "parent" feature is supported (e.g. if an MO class is not supported, then none of the attributes will be supported, even if classified as "M"). Possible values for ISO Status are:

M - Mandatory to implement

O - Optional to implement

C - Dependent upon some Condition explained in a footnote to the table

A - Feature is ATN-specific, i.e. not present in base standard.

The "ATN Status" column indicates the conformance requirement as specified in the ATN SARPs. Notes may be used to expand on the support requirement, e.g. to differentiate between different types of ATN system. Possible values for ATN Status are:

M - Mandatory to implement (equivalent to a "shall" statement)

R - Recommended to implement (equivalent to a "should" statement)

O - Optional to implement (i.e. an implementation is free to implement the feature or not)

X - Prohibited to implement.

2.4 The aTNtransportSubsystem managed object

2.4.1 MO Class Support

Index	Property	Description	ISO Status	ATN Status
1.	Managed Object Class	aTNtransportSubsystem There shall be one such MO within an ATN system. It exists to provide a container for all Transport Layer specific MOs. The aTNtransportSubsystem MO can not be created or deleted explicitly by management operation. It exists inherently in an ATN system; created and deleted as part of system operation.	ISO/IEC 10737 transportSubsystem MO: M	M
2.	Naming attribute	subsystemId	M	M
3.	Superior in Naming Tree	aTNsystem		

2.4.2 Attributes

Index	Attribute Name (Description)	Syntax	Operations	ISO Status	ATN Status
1.	subsystemId naming attribute	GraphicString Initial Value = « aTNtransportSubsystem »	GET	M	M

2.4.3 Actions

None

2.4.4 Notifications

None

2.5 The aTNtransportEntity managed object

2.5.1 MO Class Support

Index	Property	Description	ISO Status	ATN Status
1.	Managed Object Class	<p>aTNtransportEntity There shall be one such MO within an ATN system for each transport Entity, that is, for each Transport Layer user of the Network Service (associated with an NSAP or a set of NSAPs).</p> <p>Its definition permits it to be created or deleted explicitly by management operation, but in some systems it will exist inherently and neither creation nor deletion by management operation will be possible</p>	ISO/IEC 10737 transportSubsystem MO: M	M
2.	Naming attribute	communicationsEntityId		
3.	Superior in Naming Tree	aTNtransportSubsystem		

2.5.2 Attributes

Index	Attribute Name (Description) Syntax	Operations	ISO Status	ATN Status
1.	communicationsEntityId naming attribute GraphicString Initial Value = « aTNtransportEntity »	GET	M	M
2.	operationalState Operational state as defined in ISO/IEC 10164-2 ENUMERATED { disabled(0), enabled(1) }	GET	M	M
3.	checksumErrorsDetected The number of PDUs received with an incorrect checksum INTEGER <i>rational: interesting for the diagnostic of troubles (e.g. retransmitted TPDU's) and to get statistics on the integrity of the data received. Allow to see whether checksum is useful.</i>	GET	M	M
4.	protocolErrors Number of protocol errors counted INTEGER <i>rational: interesting for the diagnostic of troubles (e.g. retransmitted TPDU's)</i>	GET	M	M

5.	undecodedNSDUs Number of NSDUs that cannot be attributed to any protocol machines INTEGER <i>rational: interesting for the diagnostic of troubles (e.g. retransmitted TPDU)</i>	GET	M	M
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Note: A number of ISO/IEC 10737 standard attributes are not proposed to be retained for standardisation in the ATN SARPs; the rational is provided below:

- actualNSAP:* *its a configuration management related attribute*
- targetNSAP:* *its a configuration management related attribute*

2.5.3 Actions

None

2.5.4 Notifications

Index	Notification Name (Description)	ISO Status	ATN Status
1.	stateChange stateChange notification as defined in ISO/IEC 10165-2. used to report the changes to the operationalState attribute. A single parameter set is included in the State change definition field. Only the (mandatory) attributeld and (optional) newAttributeValue parameters are used <i>rational: it is a basic requirement for the manager to know whether a protocol entity is operational or not. Monitoring the operationalState may not be sufficient, since the polling period may not allow to detect problem quickly enough</i>	A	M

Note: A number of ISO/IEC 10733 standard notification are not proposed to be retained for standardisation in the ATN SARPs; the rational is provided below:

- objectCreation* *This notification allows the manager to dynamically discover that the managed system implements the MO, or to confirm a create operation, and allows to report initial MO attribute values. ATN systems are required to support one such MO. Manager are therefore assumed to a-priori know that one instance of this MO will exist. The stateChange notification will allow to know when the MO is operational. No requirement for the logging of initial attribute values is identified for this MO*
- objectDeletion:* *This notification allows the manager to dynamically discover that the managed system does not implements the MO anymore, or to confirm a delete operation, and allows to report final MO attribute values. ATN systems are required to support one such MO. It is therefore not assumed to be deleted. The stateChange notification will allow to know when the MO is not operational anymore. No requirement for the logging of final attribute values is identified for this MO*
- (communicationAlarm)protocolErrorNotification* *no requirement identified (these are very rare events, with no severe consequence (the corrupted PDU will be retransmitted). Anyway the associated counters are implemented; the manager will therefore have information on the occurrence of such events*

2.6 The aTNclmodeTPM managed object

2.6.1 MO Class Support

Index	Property	Description	ISO Status	ATN Status
1.	Managed Object Class	<p>aTNclmodeTPM This MO represents an implementation of the ISO/IEC 8602 protocol.</p> <p>There shall be no more than one of these MOs per Transport Entity.</p> <p>Its definition permits it to be created or deleted explicitly by management operation, but in some systems it will exist inherently and neither creation nor deletion by management operation will be possible</p>	ISO/IEC 10737 clmodeTPM MO: M if CLTP	M
2.	Naming attribute	clProtocolMachinelid		
3.	Superior in Naming Tree	aTNtransportEntity		

2.6.2 Attributes

Index	Attribute Name (Description)	Operations	ISO Status	ATN Status
1.	<p>clProtocolMachinelid</p> <p>Naming attribute</p> <p style="text-align: right;">Syntax</p> <p style="text-align: right;">GraphicString</p> <p style="text-align: right;">Initial Value = « CLTPM»</p>	GET	M	M
2.	<p>operationalState</p> <p>Operational state as defined in ISO/IEC 10164-2</p> <p style="text-align: right;">ENUMERATED { disabled(0), enabled(1) }</p> <p><i>rational: it is a basic requirement for the manager to know whether a protocol entity is operational or not.</i></p>	GET	M	M

3.	<p>undeliverablePDUsCounter</p> <p>The number of times the ConnectionLess Transport Entity was unable to deliver a received Data Unit to a Transport Service User.</p> <p>Note: This counter is associated with the undeliverablePDU event which generates a communication alarm notification.</p> <p style="text-align: right;">INTEGER</p> <p><i>rational: ISO/IEC 10165-4 recommends to maintain a counter for managed resource events that result in the issuing of a notification (arguing that CMIS M-EVENT-REPORT may be suppressed by the event forwarding discriminators). See also rational for the notification.</i></p>	GET	M	M
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Note: A number of ISO/IEC 10737 standard attributes are not proposed to be retained for standardisation in the ATN SARPs; the rational is provided below:

octetsSentCounter, *no requirement identified*
pdusSentCounter,
pdusReceivedCounter:

administrativeState, *configuration management related attributes*
clChecksumOption:

2.6.3 Actions

None

Note: A number of ISO/IEC 10737 standard actions are not proposed to be retained for standardisation in the ATN SARPs; the rational is provided below:

activate: *it is an action used for local administration of the systems*
deactivate: *it is an action used for local administration of the systems*

2.6.4 Notifications

Index	Notification Name (Description)	ISO Status	ATN Status
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<p>1.</p>	<p>communicationsAlarm</p> <p>Used to report a communication alarm condition in the operation of the clmodeTPM managed object. It is used to report the following events:</p> <ul style="list-style-type: none"> undeliverablePDU: generated when the ConnectionLess Transport Entity is unable to deliver a received Data Unit to a Transport Service User. The significance sub-parameter of each item of additionalInformation shall be set to the value 'False' (i.e. not significant) so that a managing system receiving the event report will be less likely to reject it. The PDU header and the PDU source address shall be reported as parameters in the additionalInformation field. The probableCause shall be set to TLM.communicationsProtocolError. The perceived severity shall be set to 'Minor'. A subsequent communicationsAlarm with a perceived severity value of 'Cleared' shall not be generated. No other fields or parameters shall be used, with the exception of further parameters in additionalInformation the field. <p><i>rational: this events occurs when a remote TSU attempts to send data to an unknown or deactivated local TSU. The error requires investigation.</i></p>	<p>M</p>	<p>M</p>
<p>2.</p>	<p>stateChange</p> <p>stateChange notification as defined in ISO/IEC 10165-2. used to report the changes to the operationalState attribute. A single parameter set is included in the State change definition field. Only the (mandatory) attributeld and (optional) newAttributeValue parameters are used</p> <p><i>rational: it is a basic requirement for the manager to know whether a protocol entity is operational or not. Monitoring the operationalState may not be sufficient, since the polling period may not allow to detect problem quickly enough</i></p>	<p>A</p>	<p>M</p>
<p>3.</p>	<p>objectDeletion</p> <p>Generated whenever an instance of the managed object class is deleted. Implementations may optionally include the sourceIndicator parameter in the notification. If deletion occurred as a result of internal operation of the resource, the value 'resourceOperation' is used. If deletion occurred in response to a management operation, the value 'managementOperation' is used A value 'unknown' may be returned if it is not possible to determine the source of the operation. The attributeList parameter shall be used to report the values of the MO attributes. None of the other optional parameters are used.</p> <p><i>rational: needed for the logging of the actual value of the MO attributest</i></p>	<p>M</p>	<p>M</p>

Note: A number of ISO/IEC 10733 standard notification are not proposed to be retained for standardisation in the ATN SARPs; the rational is provided below:

objectCreation

This notification allows the manager to dynamically discover that the managed system implements the MO, or to confirm a create operation, and allows to report initial MO attribute values. The manager is assumed to a-priori know that one instance of this MO exists. The stateChange notification will allow to know when the MO is operational. No requirement for the logging of initial attribute values is identified for this MO

2.7 The aTNcomodeTPM managed object

2.7.1 MO Class Support

Index	Property	Description	ISO Status	ATN Status
1.	Managed Object Class	<p>aTNcomodeTPM This MO represents an implementation of the ISO/IEC 8073 class 4 over CLNS protocol.</p> <p>There shall be no more than one of these MOs per Transport Entity.</p> <p>Its definition permits it to be created or deleted explicitly by management operation, but in some systems it will exist inherently and neither creation nor deletion by management operation will be possible</p>	ISO/IEC 10737 comodeTPM MO: M if COTP	M
2.	Naming attribute	coProtocolMachineld		
3.	Superior in Naming Tree	aTNtransportEntity		

2.7.2 Attributes

Index	Attribute Name (Description)	Syntax	Operations	ISO Status	ATN Status
1.	coProtocolMachineld Naming attribute	GraphicString Initial Value = « COTPM»	GET	M	M
2.	operationalState Operational state as defined in ISO/IEC 10164-2	ENUMERATED { disabled(0), enabled(1) }	GET	M	M
	<i>rational: it is a basic requirement for the manager to know whether a protocol entity is operational or not.</i>				
3.	localErrorsDisconnects The number of transport disconnects initiated by the local entity upon issuing a DR TPDU with an error code other than « Normal disconnect initiated by Service User », or upon issuing an ER TPDU.	INTEGER	GET	M	M
	<i>rational: interesting for the off-line diagnostic of troubles and to get statistics on the ratio of connection failures.</i>				

4.	<p>localSuccessfulConnections</p> <p>Number of transport connections initiated by the local entity which have reached the Open state</p> <p style="text-align: right;">INTEGER</p> <p><i>rational: interesting to monitor the activity of the system: number and frequency of connection establishment</i></p>	GET	M	M
5.	<p>localUnsuccessfulConnections</p> <p>Number of local unsuccessful transport connections initiated by the local Transport Entity which failed to reach the Open state (Retransmission of CR TPDU is not included in this counter)</p> <p style="text-align: right;">INTEGER</p> <p><i>rational: interesting for the off-line diagnostic of troubles and to get statistics on the ratio of connection failures.</i></p>	GET	M	M
6.	<p>maxOpenConnections</p> <p>The highest number of simultaneously open Transport connections which has occurred since the last REPLACE-WITH-DEFAULT operation.</p> <p style="text-align: right;">INTEGER</p> <p><i>rational: this parameter is needed for a correct tuning of the system configuration (to check that the current configuration foresees enough margins to absorb peaks condition on the number of concurrent TCs).</i></p>	GET SET DEFAULT	M M	M M
7.	<p>openConnections</p> <p>The number of transport connections which are in the open state as defined in the state tables for ISO/IEC 8073. Updated upon each connection establishment and release.</p> <p style="text-align: right;">INTEGER</p> <p><i>rational: this attribute is one parameter of the current load of a the system. It will allow to monitor the evolution of the system load</i></p>	GET	M	M
8.	<p>remoteErrorDisconnects</p> <p>Number of disconnects initiated by a peer Transport entity upon issuing a DR TPDU with an error code other than « Normal disconnect initiated by Service User » or upon issuing an ER TPDU</p> <p style="text-align: right;">INTEGER</p> <p><i>rational: interesting for the off-line diagnostic of troubles and to get statistics on the ratio of connection failures.</i></p>	GET	M	M
9.	<p>remoteSuccessfulConnections</p> <p>Number of transport connections initiated by a remote entity which have reached the Open state</p> <p style="text-align: right;">INTEGER</p> <p><i>rational: interesting to monitor the activity of the system: number and frequency of connection establishment</i></p>	GET	M	M

10.	<p>remoteUnsuccessfulConnections</p> <p>Number of (remote) transport connections initiated by a remote Transport entity which failed to reach the Open state</p> <p>Note: This counter is associated with the incomingConnectionRejected event which generates a communication alarm notification.</p> <p style="text-align: right;">INTEGER</p> <p><i>rational: ISO/IEC 10165-4 recommends to maintain a counter for managed resource events that result in the issuing of a notification (arguing that CMIS M-EVENT-REPORT may be suppressed by the event forwarding discriminators). See also rational for the notification.</i></p>	GET	M	M
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Note: A number of ISO/IEC 10737 standard attributes are not proposed to be retained for standardisation in the ATN SARPs; the rational is provided below:

- octetsSentCounter,*
- octetsReceivedCounter:* *no requirement identified*
- unassociatedTPDUs* *attribute used when COTP runs over CONS*
- administrativeState:* *configuration management related attributes*

2.7.3 Actions

None

Note: A number of ISO/IEC 10737 standard actions are not proposed to be retained for standardisation in the ATN SARPs; the rational is provided below:

- activate:* *it is an action used for local administration of the systems*
- deactivate:* *it is an action used for local administration of the systems*

2.7.4 Notifications

Index	Notification Name (Description)	ISO Status	ATN Status
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<p>1.</p>	<p>communicationsAlarm</p> <p>Used to report a communication alarm condition in the operation of the clmodeTPM managed object. It is used to report the following events:</p> <ul style="list-style-type: none"> incomingConnectionRejected: generated when an incoming connection is rejected. The significance sub-parameter of each item of additionalInformation shall be set to the value 'False' (i.e. not significant) so that a managing system receiving the event report will be less likely to reject it. The rejection cause, calling NSAP Address, Called NSAP address, calling Tselector and called Tselector shall be reported as parameters in the additionalInformation field. The probableCause shall be set to TLM.communicationsProtocolError. The perceived severity shall be set to 'Minor'. A subsequent communicationsAlarm with a perceived severity value of 'Cleared' shall not be generated. No other fields or parameters shall be used, with the exception of further parameters in additionalInformation the field. <p><i>rational: The error may prevent the establishment of an association between critical applications. Contrarily to abnormal disconnection failures, no local application will receive an indication on the occurrence of the problem. The only entity which is in a position to notify the problem is therefore COTP.</i></p>	<p>M</p>	<p>M</p>
<p>2.</p>	<p>stateChange</p> <p>stateChange notification as defined in ISO/IEC 10165-2. used to report the changes to the operationalState attribute. A single parameter set is included in the State change definition field. Only the (mandatory) attributeld and (optional) newAttributeValue parameters are used</p> <p><i>rational: it is a basic requirement for the manager to know whether a protocol entity is operational or not. Monitoring the operationalState may not be sufficient, since the polling period may not allow to detect problem quickly enough</i></p>	<p>A</p>	<p>M</p>
<p>3.</p>	<p>objectDeletion</p> <p>Generated whenever an instance of the managed object class is deleted. Implementations may optionally include the sourceIndicator parameter in the notification. If deletion occurred as a result of internal operation of the resource, the value 'resourceOperation' is used. If deletion occurred in response to a management operation, the value 'managementOperation' is used A value 'unknown' may be returned if it is not possible to determine the source of the operation. The attributeList parameter shall be used to report the values of the MO attributes. None of the other optional parameters are used.</p> <p><i>rational: needed for the logging of the actual value of the MO attributest</i></p>	<p>M</p>	<p>M</p>

Note: A number of ISO/IEC 10733 standard notification are not proposed to be retained for standardisation in the ATN SARPs; the rational is provided below:

objectCreation

This notification allows the manager to dynamically discover that the managed system implements the MO, or to confirm a create operation, and allows to report initial MO attribute values. The manager is assumed to a-priori know that one instance of this MO exists. The stateChange notification will allow to know when the MO is operational. No requirement for the logging of initial attribute values is identified for this MO

2.8 The aTNtransportConnection managed object

2.8.1 MO Class Support

Index	Property	Description	ISO Status	ATN Status
1.	Managed Object Class	aTNtransportConnection There may be multiple instances of these MOs within a connection-oriented protocol machine. Each corresponds to a Transport Connection. A transportConnection is created automatically as part of system operation. A transport connection may be deleted automatically as part of system operation or may be deleted as a result of the deactivate management operation	ISO/IEC 10737 transportConnection MO: M if COTP	M
2.	Naming attribute	connectionId		
3.	Superior in Naming Tree	aTNcomodeTPM		

2.8.2 Attributes

Index	Attribute Name (Description)	Operations	ISO Status	ATN Status
	Syntax			
1.	connectionId The namingAttribute GraphicString	GET	M	M
2.	octetsReceivedCounter Total number of user data octets received. Only user data in valid data TPDU's shall be counted. User data octets in data TPDU's which are rejected for any reason, or user data octets in non-data TPDU's shall not be counted INTEGER <i>rational: accounting on the service provided by a local application</i>	GET	M	M
3.	octetsSentCounter Total number of user data octets sent. Only user data in valid data TPDU's shall be counted. User data octets in retransmitted data TPDU's, or user data octets in non-data TPDU's shall not be counted INTEGER <i>rational: accounting on the service provided by a local application</i>	GET	M	M

4.	<p>pdusRetransmittedErrorCounter</p> <p>Total number of PDUs retransmitted on this connection</p> <p style="text-align: right;">INTEGER</p> <p><i>rational: needed for detecting potential incorrect configuration value of the COTP protocol parameters.</i></p>	GET	M	M
5.	<p>calledNSAPAddress</p> <p>The called NSAP address received at the network service interface with the N-Unitdata indication that conveyed the CR TPDU</p> <p style="text-align: right;">OCTET STRING</p> <p><i>Note: the calledNSAPAddress is the remote NSAP address for outgoing calls and the local NSAP address for incoming calls</i></p> <p><i>rational: to keep a trace of the identity of the remote ES. Needed for accounting, and for investigation of any potential problem</i></p>	GET	M	M
6.	<p>calledTSelector</p> <p>The called TSAP identifier specified at connection establishment</p> <p style="text-align: right;">OCTET STRING</p> <p><i>Note: the calledTSelector is the remote TSEL for outgoing calls and the local TSEL for incoming calls</i></p> <p><i>rational: to keep a trace of the identity of the remote ES. Needed for accounting, and for investigation of any potential problem</i></p>	GET	M	M
7.	<p>callingNSAPAddress</p> <p>The calling NSAP address specified at the network service interface for each N-Unitdata-request</p> <p style="text-align: right;">OCTET STRING</p> <p><i>Note: the callingNSAPAddress is the remote NSAP address for incoming calls and the local NSAP address for outgoing calls</i></p> <p><i>rational: to keep a trace of the identity of the remote ES. Needed for accounting, and for investigation of any potential problem</i></p>	GET	M	M
8.	<p>callingTSelector</p> <p>The calling TSAP identifier specified at connection establishment</p> <p style="text-align: right;">OCTET STRING</p> <p><i>Note: the callingTSelector is the remote TSEL for incoming calls and the local TSEL for outgoing calls</i></p> <p><i>rational: to keep a trace of the identity of the remote ES. Needed for accounting, and for investigation of any potential problem</i></p>	GET	M	M

9.	<p>connectionDirection</p> <p>Indicates the direction of the connection. The value Incoming means that it was initiated by the remote Transport Entity. The value Outgoing means that it was initiated by the local Transport Entity.</p> <p style="text-align: center;">ENUMERATED {outgoing(0), incoming(1)}</p> <p><i>rational: needed for the identification of the remote ES. Depending on the connection direction, the remote identity will be either indicated in the callingNSAPAddress and callingTSelector attributes or in the calledNSAPAddress and calledTSelector attributes</i></p>	GET	M	M
10.	<p>localReference</p> <p>Local reference number (as defined in ISO/IEC 8073) in use for the connection</p> <p style="text-align: center;">INTEGER</p> <p><i>rational: might be needed for distinguishing a transport connection amongst others in the logs. Might help in the diagnostic of troubles</i></p>	GET	M	M
11.	<p>maxTPDUSize</p> <p>The maximum TPDU size negotiated for the connection</p> <p style="text-align: center;">INTEGER</p> <p><i>rational: it is of interest to keep trace of all negotiated transport parameters. It might help in the diagnostic of troubles</i></p>	GET	M	M
12.	<p>protocolErrors</p> <p>The number of protocol errors that occurred on the connection</p> <p style="text-align: center;">INTEGER</p> <p><i>rational: might help for the off-line diagnostic of troubles</i></p>	GET	M	M
13.	<p>remoteReference</p> <p>The remote reference number (as defined in ISO/IEC 8073) in use for the connection</p> <p style="text-align: center;">INTEGER</p> <p><i>rational: might be needed for distinguishing a transport connection amongst others in the logs. Might help in the diagnostic of troubles</i></p>	GET	M	M
14.	<p>acknowledgmentTime</p> <p>Value of the local acknowledgment time in use for this connection</p> <p style="text-align: center;">INTEGER</p> <p><i>rational: this parameter is configurable on a TC basis. It is therefore of interest to keep trace of its value for possible off-line diagnostic of troubles</i></p>	GET	M	M
15.	<p>checksumNonuse</p> <p>Indicates whether checksum non-use has been selected for the connection (TRUE) or not (FALSE)</p> <p style="text-align: center;">BOOLEAN</p> <p><i>rational: it is of interest to keep trace of all negotiated transport parameters. It might help in the diagnostic of troubles</i></p>	GET	M	M

16.	<p>extendedFormat</p> <p>Indicates whether extended TPDU format is in use for the connection (TRUE) or not (FALSE)</p> <p style="text-align: right;">BOOLEAN</p> <p><i>rational: it is of interest to keep trace of all negotiated transport parameters. It might help in the diagnostic of troubles</i></p>	GET	M	M
17.	<p>inactivityTime</p> <p>Value of inactivity time (as defined in ISO/IEC 8073) in use for the connection</p> <p style="text-align: right;">INTEGER</p> <p><i>rational: this parameter is configurable on a TC basis. It is therefore of interest to keep trace of its value for possible off-line diagnostic of troubles</i></p>	GET	M	M
18.	<p>maxTransmissions</p> <p>Max number of transmissions as defined as the parameter 'N' in ISO/IEC 8073</p> <p style="text-align: right;">INTEGER</p> <p><i>rational: this parameter is configurable on a TC basis. It is therefore of interest to keep trace of its value for possible off-line diagnostic of troubles</i></p>	GET	M	M
19.	<p>retransmissionTime</p> <p>Current value for the Local retransmission time as defined in ISO/IEC 8073.</p> <p style="text-align: right;">INTEGER</p> <p><i>rational: this parameter is configurable on a TC basis. It is therefore of interest to keep trace of its value for possible off-line diagnostic of troubles</i></p>	GET	M	M
20.	<p>transportExpeditedService</p> <p>Indicates whether the transport expedited service has been selected (TRUE) or not (FALSE)</p> <p style="text-align: right;">BOOLEAN</p> <p><i>rational: it is of interest to keep trace of all negotiated transport parameters. It might help in the diagnostic of troubles</i></p>	GET	M	M
21.	<p>windowTimer</p> <p>Value of the window timer(as defined in ISO/IEC 8073) in use for the connection</p> <p style="text-align: right;">INTEGER</p> <p><i>rational: this parameter is configurable on a TC basis. It is therefore of interest to keep trace of its value for possible off-line diagnostic of troubles</i></p>	GET	M	M
22.	<p>priority</p> <p>Value of the transport priority in use for this connection</p> <p style="text-align: right;">INTEGER</p> <p><i>rational: it is of interest to keep trace of all negotiated transport parameters. It might help in the diagnostic of troubles</i></p>	GET	A	M

23.	<p>networkPriority</p> <p>Value of the network priority in use for this connection</p> <p style="text-align: right;">INTEGER</p> <p><i>rational: it is of interest to keep trace of all negotiated transport parameters. It might help in the diagnostic of troubles</i></p>	GET	A	M
24.	<p>aTNSecurityLabel</p> <p>The value of the Traffic type security tag in use for this connection</p> <p style="text-align: right;">BIT STRING</p> <p><i>rational: it is of interest to keep trace of all negotiated transport parameters. It might help in the diagnostic of troubles</i></p>	GET	A	M

Note: A number of ISO/IEC 10737 standard attributes are not proposed to be retained for standardisation in the ATN SARPs; the rational is provided below:

- ,pdusSentCounter,*
pdusSentCounter: *no requirement identified*
- unassociatedTPDUs:* *meaningful only when COTP runs over CONS*
- administrativeState:* *configuration management related attribute*
- protocolClass:* *it is useless to read that class 4 is configured. This is a priori known for an ATN system.*

2.8.3 Actions

None

2.8.4 Notifications

Index	Notification Name (Description)	ISO Status	ATN Status
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<p>1.</p>	<p>objectCreation</p> <p>Generated whenever an instance of the managed object class is created. The sourceIndicator parameter shall be set to the value 'resourceOperation'. None of the other optional parameters are used, with the exception of the additionalInformation field which contains the following parameters:</p> <ul style="list-style-type: none"> • connectionId • calledNSAPAddress • calledTSelector • callingNSAPAddress • callingTSelector • connectionDirection • priority • aTNsecurityLabel <p><i>rational: needed for the logging of every mobile connection establishment</i></p>	<p>M</p>	<p>M</p>
<p>2.</p>	<p>objectDeletion</p> <p>Generated whenever an instance of the managed object class is deleted. If deletion occurred as a result of internal operation of the resource, the value 'resourceOperation' is used. If deletion occurred in response to a management operation, the value 'managementOperation' is used. The attributeList parameter shall be used to report the values of the MO attributes. None of the other optional parameters are used, with the exception of the additionalInformation field which contains the following parameters:</p> <ul style="list-style-type: none"> • objectDeletionCause: reason why the Transport Connection Object is being deleted <p><i>rational: needed for the logging of every mobile connection attribute (for further analysis)</i></p>	<p>M</p>	<p>M</p>

Note: A number of ISO/IEC 10733 standard notification are not proposed to be retained for standardisation in the ATN SARPs; the rational is provided below:

*(communicationInformation) No requirement identified
successfulConnectionEstablishment*