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AERONAUTICAL TELECOMMUNICATION NETWORK PANEL
Working Group 3

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ATNP/WG3/SG3 CNS/ATM-2 SARPs Planning

(Presented by ATNP/WG3/SG3 Chairman)

Summary
ATNP/WG3/SG3 presents its work items for inclusion in CNS/ATM-2 Upper Layer Architecture (ULA). WG3 is invited to comment on and approve the work items.

1. Introduction

The paper offers an indication of the direction of the CNS/ATM-2 Upper Layer Architecture (ULA) Standards and Recommended Practices (SARPs).

2. Work Items

ATNP/WG3/SG3 presents the following work items in rough order of significance. Many of the items are internal to the ULA, and are recommended for efficiency and performance benefits.

2.1 Association Control Service Element (ACSE), edition 3

As agreed at the WG3 meeting in Toulouse in March 1995, the goal ULA is ACSE, edition 3, over the Upper Layer (UL) efficiency enhancements.

The Association Control Service Element (ACSE), edition 3, is the ACSE work designed to support the extended application layer structure (XALS). The ACSE, edition 3, supports extensions for Application Service Object (ASO) naming and ASO associations. The chief benefit of the work is a reduction in communications costs, as multiple associations may be multiplexed over a single transport connection.

The ACSE, edition 3 texts have been forwarded to ISO for DIS registration and ballot.

The ATN community provides the editor for this effort.

2.2 ISO UL Efficiency Enhancements

The Upper Layer (UL) Efficiency Enhancements are being progressed in ISO. The UL Efficiency Enhancements offer the capability of negotiating out capabilities in the session and presentation layers. The UL efficiency enhancements also allow more efficient encoding in present implementations and use of proactive means in association establishment. The ISO UL Efficiency Enhancements build on the first-generation work standardized in the International Telecommunication Union - Telecommunication Standardization Sector (ITU-T) 'fast byte' recommendations used in CNS/ATM-1.

The work has been submitted to ISO for DAM registration and ballot.

The ATN community provides the editor for this effort.

2.3 ASO Template

ATNP/WG3/SG3 submitted an applications development template (the ASO template) to the meeting in Banff. The ASO template promised increased automation in applications development, by guiding the applications designer in specification of the application-specific aspects of the ULA control function (CF). The work was deferred in Banff as the CNS/ATM-1 applications had been constructed before the template; and the template required refinement in the D-START and D-END capabilities. The work has been used in the development of the ICC SARPs.

2.4 Connectionless Upper Layer Architecture

Certain of the CNS/ATM-1 applications could benefit from a connectionless ULA. All relevant OSI standards are in place. Minor modifications to the dialogue service would be required. A final draft of the Connectionless ULA is attached to this paper.

2.5 System Management

SG3 has an action to profile Remote Operations Service Element (ROSE) and Common Management Information Protocol (CMIP) over the CNS/ATM-1 ULA. SG3 also has the ISO/SC21/WG4 action to submit a corrigendum to CMIP to upgrade CMIP to ASN.1:1994.

The ATN community has contributed significantly to the current CD draft of ISO 10164-8 Managed Objects for Upper Layers. The work should be followed, and incorporated in CNS/ATM-2 system management activity. A copy is available on request.

3.0 General Principles in Design of CNS/ATM-2 Package

3.1 CNS/ATM-1 Application Compatibility

All versions of future applications must coexist with CNS/ATM-1 applications. This implies that CNS/ATM-1 applications must be able to exist in any CNS/ATM-2 ULA.

3.2 CNS/ATM-1 ULA Compatibility

All CNS/ATM-2 ULA elements must interoperate with CNS/ATM-1 ULA elements. Thus, the ACSE, edition 3, is designed to interoperate with the ACSE, edition 2.

4.0 Recommendation

WG3 is invited to comment on the proposals and approve the further work of SG3 towards a further SG3 meeting..

APPENDIX A CNS/ATM-2 Action List

The following topics are still under the purview of the CNS/ATN-2 ULA, but have not been progressed during the reporting period.

A.1 Application Mobility

ATNP/WG3/SG3 has been studying ULA handling of application mobility requirements. SG3 has been pursuing making application transition from center to center transparent to the application. The Canberra Brachiating[1] paper discusses this approach. The application association would be preserved while supported across different transport connections, maintained in a transport connections pool.

A.2 Construction of Useful Application Service Elements (ASEs)

The ULA accrues a significant gain in its identification of common ASEs which can be reused as new applications are constructed. The use of reusable components has advantages in the certification process. Applications designers have made various requests to SG3 for common ASEs. Analysis of CNS/ATM-1 applications for common functionality and user requirements lead to the following suggested ASEs.

A.2.1 CMA as ASE

The Context Management Application (CMA) provides initial logon and limited directory for the ATN. OSI provides a logon service in the form of the ACSE currently incorporated in the ULA. It is noted that CMA does not provide the AP-title, so that all names provided are of the form 'local'.ADS. Thus, ULA extensions to naming for mobility could be confined to the name-address table described in the ULA GM.

A.2.2 Time

A time ASE is an effective candidate for ATN standardization. A time ASE would provide performance measures necessary for CNS/ATM-2 applications.

A.2.3 Message Reference Numbers

A message reference number ASE would greatly simplify the construction of message applications. Such an ASE would provide correlation between message reference numbers to allow multiple responses to a single message, as well as tracking of outstanding messages.

[1] As the monkey moves from tree to tree

A.2.4 Confirmed Data Service Element

A confirmed data service element (CDSE) would provide for confirmation of protocol data unit (PDU) delivery to the corresponding AE-User rather than to the corresponding transport entity.

A.3 Session ASOs

Certain proposed applications such as CCR require the use of Session FUs beyond kernel and full-duplex. Recasting session FUs as ASOs is consistent with the ATN ULA. The work involves reproducing the session FU protocol for the data-transfer phase.

In line with the recasting of Session FUs as ASOs, the specification of a new RTSE (Fast Byte Checkpoint ASE) is suggested.

A requirement has been raised in the ADSP for a two-phase commit capability. The Commitment, Concurrency, and Recovery (CCR) is the OSI standard for this activity. Its implementation is considered for CNS/ATM-2. It requires the use of session Functional Units (FUs) beyond kernel and full-duplex.

An advantage of ASO standardization is that it is entirely a matter for the ATN community -- no ISO activity is involved.

A.4 Security

On user request, security requirements will be incorporated in the ATN ULA. It is noted that ACSE, edition 2, currently supports the authentication FU. SG3 can also study the Generic Upper Layer Security (GULS) work, as required. This work should lead to a common ATN security ASE.

A.5 Pools

An extremely useful feature would be the creation of transport pools, such that a transport connection would not have to be set up in real time, but could exist before the application association actually had need of it.

A.6 X.500

During the TULIP era, it had been generally accepted that CMA was an air-ground ASE which might usefully be interfaced to a ubiquitous ground-ground X.500 directory service. X.500 could be investigated as priorities permit.

A.7 Multicast

Use of ground-ground applications has indicated that multicast of messages is a useful feature. As the OSI work on multicast is well under way, simple ATN extensions for multicast could be investigated.

CONNECTIONLESS UPPER LAYER ARCHITECTURE

Add to list of references:

ITU-T Rec. X.235:1994 | ISO/IEC 9548-1:1995, Information Technology - Open Systems Interconnection - Connectionless Session Protocol - Part 1: Protocol Specification

ITU-T Rec. X.236:1994 | ISO/IEC 9576-1:1995, Information Technology - Open Systems Interconnection - CL Presentation Protocol Specification, Edition 2

ITU-T Rec. X.237:1994 | ISO/IEC 10035-1:1995, Information Technology - Open Systems Interconnection - Connectionless Protocol for the Association Control Service Element (ACSE), Part 1: Protocol Specification

ISO/IEC ISP 11188-4:1996, Information Technology -- International Standardized Profile -- Common Upper Layer Requirements -- Part 4: Connectionless OSI upper layer facilities

Modifications to Dialogue Service to support CL ULA

A. Connectionless Dialogue Service

The D-UNITDATA service

D-UNITDATA is a confirmed service which is invoked by a DS-User (the dialogue-initiator) to start a dialogue with a peer DS-User. D-START request and indication primitives are defined, as illustrated in Figure UD-1

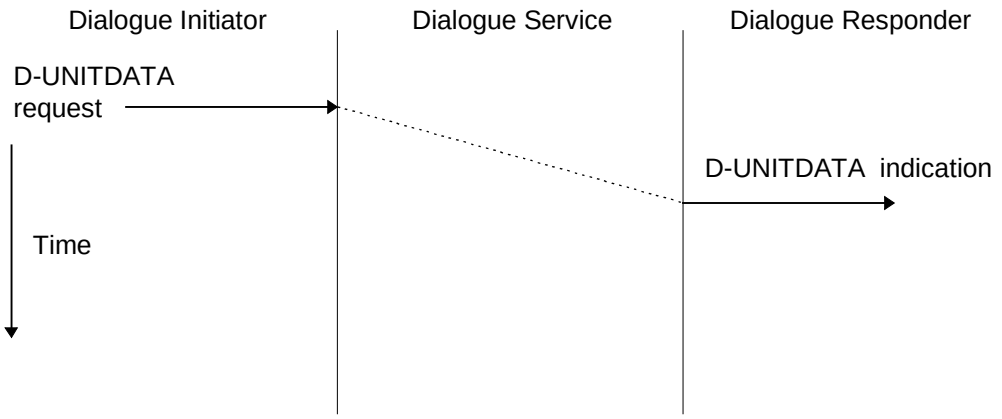

Figure 4.**Error! No text of specified style in document.**-1. D-UNITDATA sequence diagram

The initiating DS-User issues a D-UNITDATA request primitive. The parameters of the D-UNITDATA primitives are specified in Table UD-1

Table UD-1. D-UNITDATA parameters

Parameter Name	Req	Ind
Called Peer ID	M	
Calling Peer ID	U	C(=)
DS-User Version Number	U	C(=)
Security Requirements	U	C(=)
Quality Of Service	M	M
Result		
Reject Source		
User Data	U	C(=)

Called Peer ID

The Called Peer ID parameter is used in the D-UNITDATA service to specify the name of the intended peer DS-User, and shall take an abstract value corresponding to either a 24-bit ICAO aircraft-id or an ICAO facility designator.

Calling Peer ID

The Calling Peer Id parameter is optionally used in the D-UNITDATA service to specify the name of the initiating DS-User, and shall either be absent or take an abstract value corresponding to either a 24-bit ICAO aircraft-id or an ICAO facility designator. Its

presence in the indication primitive is conditional upon it being specified by the DS-User in the request primitive.

DS-User Version Number

This parameter allows peer DS-Users to exchange version information. The parameter is optional in the request and response primitives. Its presence in the indication primitive is conditional upon it being specified by the DS-User in the request primitive, and its presence in the confirmation primitive is conditional upon it being specified by the DS-User in the response primitive. If present, it may take any abstract value in the range 1 to 255.

Security Requirements

This parameter allows the DS-Users to exchange requirements for security. The parameter is optional in the request and response primitives. Its presence in the indication primitive is conditional upon it being specified by the DS-User in the request primitive, and its presence in the confirmation primitive is conditional upon it being specified by the DS-User in the response primitive.

Quality Of Service

This parameter allows the initiating DS-User to specify in the request primitive its requirements for the quality of service (QOS) to be provided for the dialogue. The parameter may be modified by the DS-provider according to what QOS can actually be supported, so that the value in the indication primitive may reflect a reduced QOS compared with the value in the request. If specified by the DS-User in the response primitive, the QOS must be equal to or lower than that received in the indication primitive.

The following QOS parameters may be specified:

Routing Class
Priority
Residual Error Rate.

Routing Class

The following abstract values shall be supported for the Routing Class parameter:

Note. — These values are derived from Table 5.6-1 of Sub-Volume 5. Refer to Sub-Volume 5 for the significance of these Routing Class values and their relationship to Traffic Type and Category.

a) for Air Traffic Service Communications (ATSC):
ATSC: No Traffic Type Policy Preference
Traffic only follows Class A ATSC route(s)
Traffic only follows Class B ATSC route(s)
Traffic only follows Class C ATSC route(s)
Traffic only follows Class D ATSC route(s)

Traffic only follows Class E ATSC route(s)
Traffic only follows Class F ATSC route(s)
Traffic only follows Class G ATSC route(s)
Traffic only follows Class H ATSC route(s)

b) for Aeronautical Operational Control (AOC):

AOC: No Traffic Type Policy Preference
Route Traffic only via Gatelink
Route Traffic only via VHF Data Link
Route Traffic only via Satellite Data Link
Route Traffic only via HF Data Link
Route Traffic only via Mode S Data Link
Route Traffic using an ordered preference of Gatelink first, then VHF Data Link
Route Traffic using an ordered preference of Gatelink first, then VHF Data Link, then Satellite Data Link
Route Traffic using an ordered preference of Gatelink first, then VHF Data Link, then HF Data Link, then Satellite Data Link

If the Routing Class parameter is not provided by the DS-User in the D-UNITDATA Request primitive, then the default value “ATSC: No Traffic Type Policy Preference” shall be assumed.

Priority

The following abstract values shall be supported for the Priority parameter, in order of decreasing priority:

network/systems management (highest priority)
distress communications
urgent communications
high priority flight safety messages
normal priority flight safety messages
meteorological communications
flight regularity communications
aeronautical information service messages
network/systems administration (default)
aeronautical administrative messages
urgent priority administrative/UN Charter communications
high priority administrative and state/government communications
normal priority administrative
low priority administrative (lowest priority).

If a Priority value is not provided by the DS-User in the D-UNITDATA Request primitive, then the default value “network/systems administration” shall be assumed.

Residual Error Rate (RER)

The following abstract values shall be supported for the RER parameter:

low
high

Note. — "low" means a low error rate, i.e. a high quality connection. "high" means a higher error rate, i.e. a lower quality connection. The high RER allows non-use of the transport checksum in the ATN. Refer to Sub-Volume 1 for further details.

User Data

This parameter allows the peer DS-Users to exchange data during the D-UNITDATA service invocation. Its presence in the indication primitive is conditional upon it being specified by the DS-User in the request primitive, and its presence in the confirmation primitive is conditional upon it being specified by the DS-User in the response primitive.

D-UNITDATA

The D-UNITDATA is the entire repertoire of the ATN CL ULA.
cf

D-UNITDATA Request primitive

When Invoked

The D-UNITDATA Request primitive may be validly invoked by the ATN-App ASE when the CF is in any state

Action Upon Invocation

When the D-START Request is validly invoked, the CF shall :

a) Retrieve the AE-qualifier as defined for the ATN-App AE,

b) Construct the Application Context name, with the value of the final arc set equal to the DS-User Version Number parameter if provided, and set to zero otherwise.

c) Retrieve the calling Presentation address

d) Look up the called Presentation address from the Called Peer Id parameter.

e) If the Calling Peer Id parameter is present, retrieve the Calling AP Title and Calling AE-qualifier. If it is not present, then do not use these parameters in the A-ASSOCIATE request (they will not then be included in the resulting AARQ APDU).

f) If the Security Requirements parameter is not present, make no use of the A-ASSOCIATE parameter "ACSE Requirements"shall. If the Security Requirements parameter is present, shallset the ACSE Requirements parameter to the symbolic value "authentication"; and map the Security Requirements value to the A-ASSOCIATE Authentication-value parameter.

g) Construct an A-ASSOCIATE Request primitive with the following parameters:

Table UD-1

A-ASSOCIATE Request parameter	ISO Status	ATN value
Version	O	Not used (default value)
Application Context Name	M	As derived in b) above
Calling AP Title	U	As derived in e) above
Calling AE Qualifier	U	As derived in e) above
Calling AP Invocation-identifier	U	Not used
Calling AE Invocation-identifier	U	Not used
Called AP Title	U	Not used
Called AE Qualifier	U	Not used
Called AP Invocation-identifier	U	Not used
Called AE Invocation-identifier	U	Not used
Implementation Information	U	Not used

Authentication-mechanism Name	U	Not used
Authentication-value	U	As derived in f) above
User Information	U	D-START User Data parameter

h) Invoke the A-UNITDATA Request primitive

Quality of Service parameter mappings

The Quality of Service parameters in D-UNITDATA Request primitiveshall be conveyed to the ATN Internet as specified in this subsection.

Routing Class shall be conveyed by local means, using the values for Security Tag Value specified in Table 5.6-1 of Sub-Volume 5 of these SARPs. If no value for Routing Class is specified in the D-UNITDATA Request primitive, then the value corresponding to "ATSC: No Traffic Type Policy Preference" shall be conveyed. If no value for Routing Class is specified in the D-START Response primitive, then the value shall be taken to be the same as that which was passed to the DS-User in the D-START Indication primitive.

Note. — Sub-Volume 5 states, in section 5.2.7.3.1, "The mechanism by which the connection initiator determines the appropriate ATN Security Label is a local matter. For example, it may be identified by an extension to the transport service interface, be implicit in the choice of a given TSAP, or be identified using a Systems Management function."

Priority shall map to the network priority component by local using the values for Transport Layer Priority specified in Table 1.2-2 of Sub-Volume 1 of these SARPs. If no value for Priority is specified in the D-UNITDATA Request primitive, then the value corresponding to "Network/systems administration" shall be conveyed.

Note. — Although transport priority and network priority are semantically independent of each other, Sub-Volume 5 requires, in section 5.5.1.2, that the TS-user specifies the Application Service Priority, which in turn is mapped into the resulting CLNP PDUs according to Table 1.2-2 of Sub-Volume 1, which defines the fixed relationship between transport priority and the network priority.

Note. — Sub-Volume 5 requires, in section 5.5.1.2, that the TS-user specifies the required residual error rate to determine whether or not the transport checksum is required.

APRL for Connectionless ACSE Protocol
In the text below, M means P2CL:M

B.1 Support for UD PPDU

ISO Note *-- This clause is used to declare if the system is capable of initiating a UD APDU or reacting to a UD APDU or both. No association connection exists and there is no response to a UD PPDU.*

		ISO Status	**ATN Support**	**Mnemonic**
1	**Sender**	**O.1**	**O**	**ACNLS-UD-Sdr**
2	**Receiver**	**O.1**	**M**	**ACLNS-UD-Rcv**

ISO Note: **O.1 a conforming implementation shall support at least one of the roles**

B.2 Supported parameters

B.2.1 UD APDU sender

Prerequisite: ACNLS-UD-Sdr

	ACSE PDU parameter	ISO Status	ATN Support	Mnemonic
1	Protocol version	O	X	
2	Application Context Name	M	M	
3	Called AP title	O	X	
4	Called AE title	O	X	
5	Called AP invocation-identifier	O	X	
6	Called AE invocation-identifier	O	X	
7	Calling AP title	O	M	
8	Calling AE title	O	M	
9	Calling AP invocation-identifier	O	O	
10	Calling AE invocation-identifier	O	O	
11	Implentation information	O	X	
12	User information	M	M	
13	Authentication Mechanism Name	O	O	
14	Authentication value	O	O	

B.2.2 UD APDU receiver

Prerequisite: ACNLS-UD-Rcv

	ACSE PDU parameter	ISO Status	ATN Support	Mnemonic
1	Protocol version	M	M	
2	Application Context Name	M	M	
3	Called AP title	O	M	
4	Called AE title	O	M	
5	Called AP invocation-identifier	O	X	
6	Called AE invocation-identifier	O	X	
7	Calling AP title	O	M	
8	Calling AE title	O	M	
9	Calling AP	O	M	

	invocation-identifier			
10	**Calling AE invocation-identifier**	**O**	**M**	
11	**Implentation information**	**O**	**X**	
12	**User information**	**M**	**M**	
13	**Authentication mechanism name**	**O**	**O**	
14	**Authentication value**	**O**	**O**	

APRL for Connectionless Presentation Protocol

C.1 Support for UD PPDU

ISO Note *-- This clause is used to declare if the system is capable of initiating a UD PPDU or reacting to a UD PPDU or both. No presentation connection exists and there is no response to a UD PPDU.*

		ISO Status	ATN Support	Mnemonic
1	Sender	O.1	O	PCNLS-UD-Sdr
2	Receiver	O.1	M	PCLNS-UD-Rcv

ISO Note: **O.1 a conforming implementation shall support at least one of the roles**

C.2 Supported parameters

C.2.1 UD PPDU sender

Prerequisite: PCNLS-UD-Sdr

	Presentation PDU parameter	ISO Status	ATN Support	Mnemonic
1	Protocol version	O	X	
2	Calling presentation selector	O	X	
3	Called presentation selector	O	X	
4	Presentation context definition list	M	X	
5	User data	M	M	

	Session service parameter	ISO Status	ATN Support	Mnemonic
6	Calling session address	M	M	
7	Called session address	M	M	
8	Quality of Service	M	M	

C.2.2 UD PPDU receiver

Prerequisite: PCNLS-UD-Rcv

	Presentation PDU parameter	ISO Status	ATN Support	Mnemonic
1	Protocol version	M	O	
2	Calling presentation selector	O	X	
3	Called presentation selector	O	X	
4	Presentation context definition list	M	O	
5	User data	M	M	

	Session service parameter	ISO Status	ATN Support	Mnemonic
6	Calling session address	M	M	
7	Called session address	M	M	

8	**Quality of Service**	**M**	**M**	

C.3 Support of syntaxes

C.3.1 Transfer syntaxes supported

ISO Note -- *This sub-clause shall be used to indicate which transfer syntaxes the implementation supports. For each transfer syntax supported a references to the definition of the transfer syntax shall be given. Implementation restrictions with respect to the encoding variations as offered by the transfer syntax shall be stated separately and referenced in the following table where applicable. If the number of transfer syntaxes supported by the implementation exceeds the space available in the table, then details of support shall be given in an appendix to the PICS using a table with the equivalent layout.*

[ISO] NOTE - The definition of the ASN.1 basic encoding rules are [is] given in ITU-T Rec. X.209 | ISO/IEC 8825 [ISO/IEC 8825-1]. To complete the specification of a transfer syntax it is necessary to indicate the abstract syntax specification to which the encoding rules should be applied.

	Type	Detail	ATN Support	Reference to definition	Reference to restriction
1	Object Identifier	{joint-iso-ccitt asn1(1) basic-encoding (1)}	O		
2	Object Identifier	{joint-iso-itu-t asn1(1) packed-encoding (3) basic (0) unaligned (1)}	M	N/A	N/A

C.3.2 Abstract syntaxes supported

ISO Note -- *This sub-clause shall be used to indicate which abstract syntaxes the implementation supports. If the number of abstract syntaxes supported by the implementation exceeds the space available in the table, then details of support shall be given in an appendix to the PICS using a table with the equivalent layout.*

[ISO] NOTE - From the Presentation standard point of view, an implementation is required to support and standardised abstract syntax. However, for technical and economic reasons an

implementation may only support a limited number of abstract syntaxes..

	Type	Detail	ATN Support
1	**Object identifier**	**{joint-iso-itut-t association control(2) abstract-syntax(1) clapdu(1) version1(1)}**	**M**

C.3.3 Use of ASN.1 basic encoding

Note -- *Not applicable to CNS/ATM-2.*

C.3.4 PDV structure of User Data parameters

Note -- *Not applicable to CNS/ATM-2.*

D.1 Support for UD SPDU

ISO Note -- *This clause is used to declare if the system is capable of initiating a UD SPDU or reacting to a UD SPDU or both. No session connection exists and there is no reponse to a UD SPDU.*

	Role	ISO Status	ATN Support	Mnemonic
1	Sender	O.1	M	SCNLS-UD-Sdr
2	Receiver	O.1	M	SCNLS-UD-Rcv

ISO Note - *O.1: a conforming implementation shall support at least one of the roles.*

D.2 Supported parameters

D.2.1 UD SPDU sender

Prerequisite: SCNLS-UD-Sdr

	Parameter	ISO Status	ATN Support	Mnemonic
1	Version number	O	X	
2	Calling session selector	O	X	
3	Called session selector	O	X	
4	User information field	M	M	

D.2.2 UD SPDU receiver

Prerequisite: SCNLS-UD-Rcv

	Parameter	ISO Status	ATN Support	Mnemonic
1	Protocol version	M	O	
2	Calling session selector	O	X	
3	Called session selector	O	X	
4	User information field	M	M	

E. Mapping of Connectionless ULA to Connectionless Transport Protocol

The use of the connectionless mode transport service provided by the ATN Internet, and specified in Sub-volume 5, clause 5.3 of the CNS/ATM-1 SARPs, shall be as specified in Clause 7.3 of ISO/IEC 9548-1, except as stated in this section.

The called and calling TSAP address shall be provided to the TS-Provider on a per Transport Connection basis, using the called and calling PSAP addresses as provided to ACSE in the A-unitdata request, with null presentation and session selectors.

The required residual error rate shall be provided to the TS-Provider on a per Transport Connection basis, using the residual error rate quality of service parameters. If the required residual error rate is set to the value zero, then the TS-provider shall use best endeavours to obtain the lowest available residual error rate, including the use of the transport checksum in all TPDUs. If the required residual error rate is set to the value 1, then the TS-provider shall select non-use of the transport checksum.

Note: Subvolume 5 requires, in section 5.1.2, that the TS-user specifies the required residual error rate to determine whether or not the transport checksum is required. In the ATN, the Quality of Service provided to applications Is maintained using capacity planning techniques that are outside of the scope of this specification. Network administrators are responsible for designing and implementing a network that will meet the QOS requirements of the CNS/ATM applications that use it.

The ATN Security Label shall be provided to the TS-Provider on a per Transport Connection basis. The required ATN Security Label shall be conveyed by local means, using the encoding specified in Subvolume 5, section 6.2.2.1. The QOS parameter "Routing Class" shall be conveyed as the Security Tag field of the security tag set for Traffic Type and Associated Routing Policies within the ATN Security Label.

Note 1: Subvolume 5 states, in section 2.7.3.1, "The mechanism by which the [transport] connection initiator determines the appropriate ATN Security Label is a local matter. For example, it may be identified by an extension to the transport service interface, be implicit in the choice of a given TSAP, or be identified using a Systems Management function."

Note 2: Subvolume 5 requires, in section 5.1.2, that the TS-User provides the complete ATN Security Label, although only security tag value is of relevance. The encoding of the ATN Security Label is summarised below. It consists of all fields under the heading "Security Label" (i.e. 12 octets). The QOS parameter "Routing Class" maps to the field labelled "Security Tag".

Security Parameter encoding	*Value*	*Length*
Parameter Code	*1101 0101*	*1*
Parameter Length	*0000 1101*	*1*
Parameter Value:		
Security Format	*1100 0000*	*1*
Security Label:		
Security Registration ID Length	*0000 0110*	*1*
Security Registration ID:		
OID, Length, [1.3.27.0.0]	*06, 04,43,27,00,00*	*6*
Security Information Length	*0000 0100*	*1*
Security Information:		
Tag Set Name Length	*0000 0011*	*1*
Tag Set Name:		
Traffic Type & Associated Routing Policies	*0000 1111*	*1*
Tag Set Length	*0000 0001*	*1*
Security Tag:		
Traffic Type & category (from Sub-volume 5 Table 6-1)	*0000 0011*	*1*
	Total:	*15 Octets*

No Transport Service quality of service parameters other than those specified in the preceding subsections shall be specified when establishing a transport connection.