CNS/ATM-1 Package Standards and Recommended Practices (SARPs)

Sub-Volume 1

Introduction and System-Level Requirements

Version 0.4

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1.0 Sub-Volume 1: Introduction and System-Level Requirements

1.1 Introduction

The International Civil Aviation Organization (ICAO) is developing Standards and Recommended Practices (SARPs) to advance the Communication, Navigation, Surveillance/Air Traffic Management (CNS/ATM) concepts. These advanced CNS/ATM concepts include the use of distributed data applications and supporting data communication services to:

a) Deliver air traffic services (ATS) to aircraft;

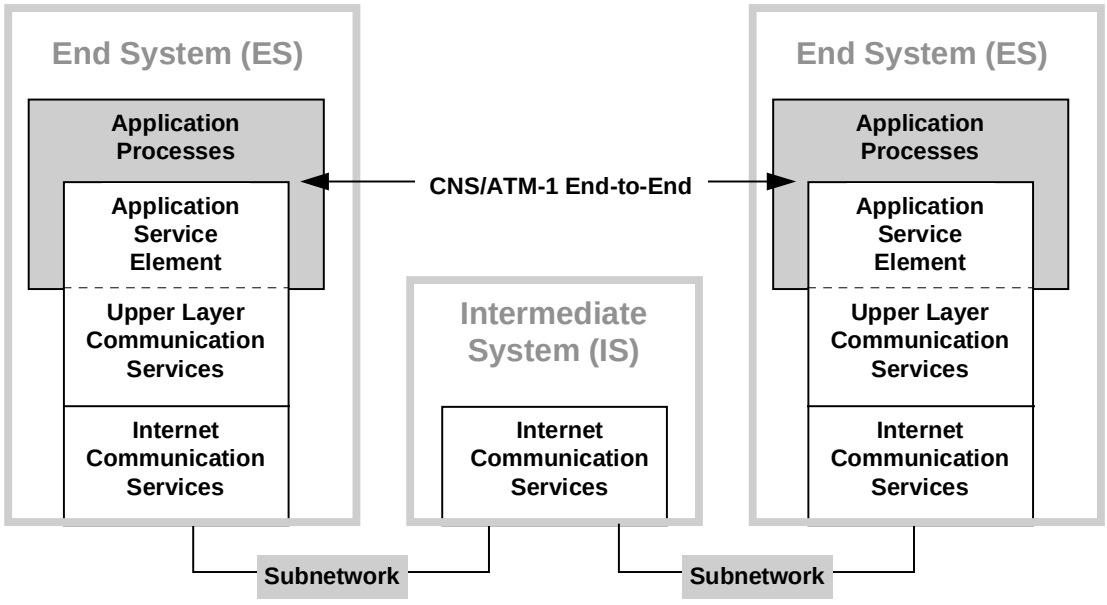
b) Exchange air traffic management (ATM) information between fixed-based ATS facilities on the ground; and

c) Control the movements of aircraft and vehicles operating on airport surfaces.

The CNS/ATM SARPs are expected to be structured into several successive and incremental packages, the first of them being named the CNS/ATM-1 Package, hereafter referred to as CNS/ATM-1. The CNS/ATM-1 provides the initial data communication services to be standardized by ICAO.

1.1.1 Scope.

Figure 1.1-1 shows an overview of CNS/ATM-1 and its operational environment.



Note: Shading indicates elements outside the scope of these SARPs.

Figure 1.1-1: Overview of CNS/ATM-1 Package.

The CNS/ATM-1 SARPs define:

a) Context Management (CM), (Data link initiation capability)

b) Controller/Pilot Data Communications (Controller Pilot Data Link Communications (CPDLC), includes (Pre)Departure Clearance)

c) Automatic Dependent Surveillance (ADS)

d) Automatic Terminal Information Services (ATIS) as an Flight Information Services (FIS) application

e) Inter-Centre Co-ordination (ICC) as an Air traffic services (ATS) Interfacility Data Communications (AIDC) application

f) ATS Message Handling Services (AMHS)

g) Upper Layers Communication Services

h) Internet Communication Services

1.1.2 Overview

Figure 1.1-2 shows an overview of these SARPs and their relationships with each other.

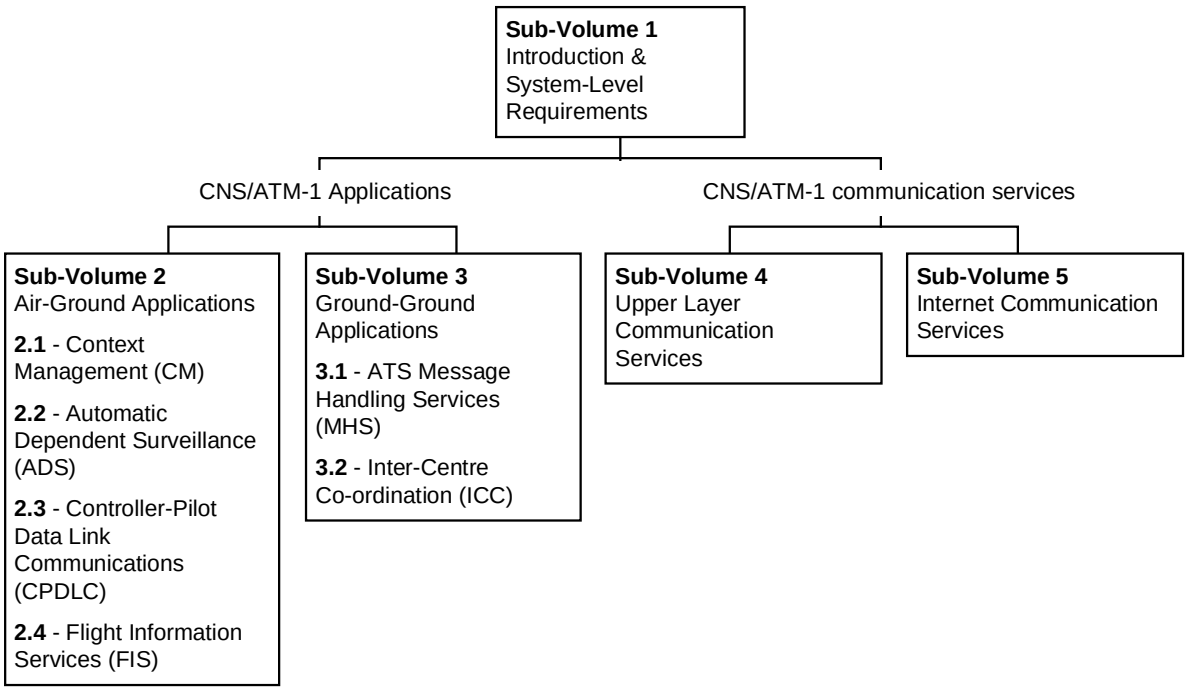


Figure 1.1-2: CNS/ATM-1 Sub-Volumes and Relationships.

1.2 System Level Requirements

Note.— The system level requirements are high-level technical requirements that have been derived from operational needs, technological constraints, safety objectives and regulatory constraints (administrative and institutional). These system-level requirements are the basis for the lower level technical and derived requirements. Figure 1.2-1 is a conceptual overview of the relationship between high-level requirements, low-level requirements and external constraints

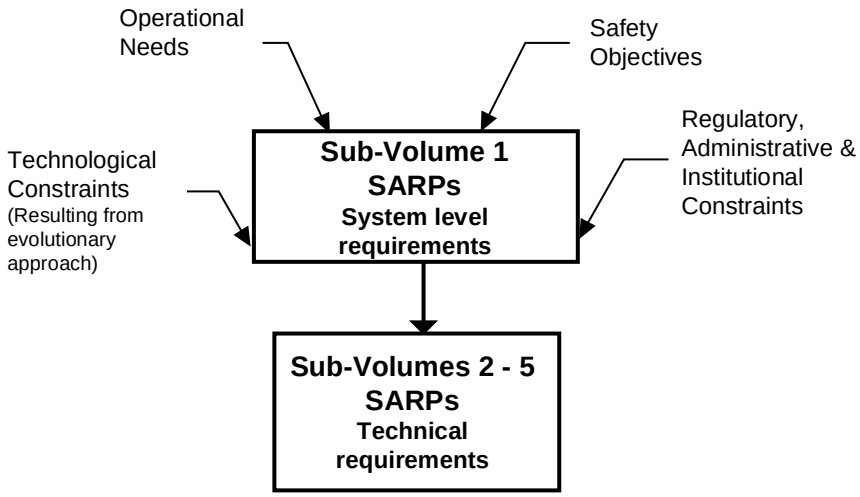


Figure 1.2-1: System Level Requirement Concept Diagram

1.2.1 CNS/ATM-1 Package System Level Requirements

1.2.1.1 The ATN shall be based on International Organization for Standardization (ISO) Open Systems Interconnection (OSI) standards to enable evolutionary introduction of services.

1.2.1.2 CNS/ATM-1 shall enable the transition of existing AFTN users and systems into the ATN architecture.

1.2.1.3 CNS/ATM-1 shall enable only the authorized ATC authority to provide ATC instructions to aircraft operating in its airspace.

1.2.1.4 CNS/ATM-1 shall enable data communications to be carried only over authorized paths for the type of traffic specified by the user.

1.2.1.5 CNS/ATM-1 shall employ ATS traffic types in accordance with the criteria in Table 1.2-1.

One way End-to-End Transit Delay at 95% probability (seconds)	ATS Traffic Types
0.7	A
1.5	B
2.5	C
5	D
8	E
15	F
20	G
30	H
55	I
110	J
No value specified	No preference

Table 1.2-1:Traffic Types

1.2.1.6 CNS/ATM-1 shall enable peer to peer application exchange of information when an authorized path exists.

1.2.1.7 CNS/ATM-1 shall notify the appropriate application processes when no authorized path exists.

1.2.1.8 CNS/ATM-1 shall provide a means to unambiguously address all ATS & non ATS end and intermediate systems.

1.2.1.9 CNS/ATM-1 addressing plan shall permit States and organisations to assign addresses within their own administrative domains.

1.2.1.10 CNS/ATM-1 shall provide a means to facilitate migration to future versions.

1.2.1.11 CNS/ATM-1 shall support fixed and mobile systems.

1.2.1.12 CNS/ATM-1 shall accommodate ICAO standardized mobile subnetworks.

1.2.1.13 CNS/ATM-1 shall enable an aircraft Intermediate System to be connected to a ground Intermediate System via multiple mobile subnetworks.

1.2.1.14 CNS/ATM-1 shall enable an aircraft Intermediate System to be connected to multiple ground Intermediate Systems.

1.2.1.15 CNS/ATM-1 shall enable exchange of application address information.

1.2.1.16 CNS/ATM-1 shall establish, maintain, release, forward and abort peer to peer application associations for Automatic Dependent Surveillance (ADS).

1.2.1.17 CNS/ATM-1 shall establish, maintain, release, forward and abort peer to peer application associations for Controller Pilot Data Link Communications (CPDLC).

1.2.1.18 CNS/ATM-1 shall establish, maintain, release, forward and abort peer to peer application associations for Context Management (CM).

1.2.1.19 CNS/ATM-1 shall establish, maintain, release and abort peer to peer application associations for Flight Information Services/Automatic Terminal Information System (FIS/ATIS).

1.2.1.20 CNS/ATM-1 shall establish, maintain, release and abort peer to peer application associations for ATS Message Handling Services over the ATN (AMHS).

1.2.1.21 CNS/ATM-1 shall establish, maintain, release and abort peer to peer application associations for Inter-Centre Co-ordination/ATS Interfacility Data Communications Application (ICC/AIDC).

1.2.1.22 CNS/ATM-1 shall enable communication priorities to ensure safety communications are given preference over non-safety communications.

1.2.1.23 CNS/ATM-1 shall reference time based on Co-ordinated Universal Time (UTC).

1.3 References

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ISO ISP 10607-1:1995~~0~~	Information technology – International Standardized Profiles AFTnn – File Transfer, Access and Management – Part 1: Specification of ACSE, Presentation and Session protocols for the use by FTAM
ISO ISP 10607-2:1995~~0~~	Information technology – International Standardized Profiles AFTnn – File Transfer, Access and Management – Part 2: Definition of document types, constraint sets and syntaxes
~~ISO ISP 10607-2:1990/AM1:1991~~	~~Information Technology -International Standardized Profile AFTnn - File Transfer Access and Management - Part 2: Definition of Document Types Constraint Sets and Syntaxes Amendment 1: Additional Definitions~~

ISO ISP 10607-3:1995~~0~~	Information technology – International Standardized Profiles AFTnn – File Transfer, Access and Management – Part 3: AFT11 – Simple File Transfer Service (unstructured)
ISO ISP 10607-4:1995~~1~~	Information technology – International Standardized Profiles AFTnn – File Transfer, Access and Management – Part 4: AFT12 – Positional File Transfer Service (flat)
ISO ISP 10607-5:1995~~1~~	Information technology – International Standardized Profiles AFTnn – File Transfer, Access and Management – Part 5: AFT22 – Positional File Access Service (flat)
ISO ISP 10607-6:1995~~1~~	Information technology – International Standardized Profiles AFTnn – File Transfer, Access and Management – Part 6: AFT3 – File Management Service
ISO DISP 10608-1	Information technology – International Standardized Profile TAnnnn – Connection-mode Transport Service over Connectionless-mode Network Service – Part 1: General overview and subnetwork-independent requirements
ISO/IEC ISP 10611-1 : 1994	Information technology – International Standardized Profiles AMH1n – Message Handling Systems – Common Messaging – Part 1: MHS Service Support
ISO/IEC ISP 10611-2 : 1994	Information technology – International Standardized Profiles AMH1n – Message Handling Systems – Common Messaging – Part 2: Specification of ROSE, RTSE, ACSE, Presentation and Session Protocols for use by MHS
ISO/IEC ISP 10611-3 : 1994	Information technology – International Standardized Profiles AMH1n – Message Handling Systems – Common Messaging – Part 3: AMH11-Message Transfer (P1)
ISO/IEC ISP 10611-4 : 1994	Information technology – International Standardized Profiles AMH1n – Message Handling Systems – Common Messaging – Part 4: AMH12-MTS Access (P3)
ISO/IEC ISP 10611-5 : 1994	Information technology – International Standardized Profiles AMH1n – Message Handling Systems – Common Messaging – Part 5: AMH13-MS Access (P7)
ISO TR 10730:1993	Information technology - Open systems Interconnection - Tutorial on naming and addressing
ISO/IEC 10731:1994 ITU-T Rec. X.210 (1993)	Information technology– Open Systems Interconnection –Conventions for the definition of OSI services
ISO/IEC 10733:1993	Information technology – Telecommunications and information exchange between systems – Elements of management information relating to OSI Network Layer standards
ISO/IEC 10733:1993/PDAM	Information technology – Telecommunications and information exchange between systems – Elements of management information relating to OSI Network Layer

1	standards Amendment 1: Managed Object Conformance Statement Proforma
ISO/IEC 10736:1995~~3~~	Information technology – Telecommunications and information exchange between systems – Transport layer security protocol
~~ISO/IEC 10736:1993/DAM1~~	~~Information Technology - Telecommunications and Information Exchange between Systems -Transport Layer Security Protocol - Amendment 1: Security Association Establishment~~
ISO/IEC 10737:1994~~3~~	Information technology – Telecommunications and information exchange between systems – Elements of Management Information Related to OSI Transport Layer Standards
ISO/IEC 10737:1994~~3~~/PDAM2	Information technology – Telecommunications and information exchange between systems – Elements of Management Information Related to OSI Transport Layer Standards – Amendment 2: Managed Object Conformance Statement Proforma
ISO/IEC ~~DIS~~ 10745:1995	Information technology – Open Systems Interconnection – Upper layers security model
ISO/IEC 10747:1994~~3~~	Information technology – Telecommunications and information exchange between systems – Protocol for exchange of inter-domain routeing information among intermediate systems to support forwarding of ISO 8473 PDUs
ISO/IEC ISP 11183-1:1992	Information technology – International Standardized Profiles AOM1n OSI Management – Management Communications – Part 1: Specification of ACSE, presentation and session protocols for the use by ROSE and CMISE
ISO/IEC ISP 11183-2:1992	Information technology – International Standardized Profiles AOM1n OSI Management – Management Communications – Part 2: CMISE/ROSE for AOM12 – Enhanced Management Communications
ISO/IEC ISP 11183-3:1992	Information technology – International Standardized Profiles AOM1n OSI Management – Management Communications – Part 3: CMISE/ROSE for AOM11 – Basic Management Communications
ISO/IEC 11570:1992	Information technology – Telecommunications and information exchange between systems – Open Systems Interconnection – Transport protocol identification mechanism
ISO/IEC 11577:1995~~ISO DIS 11577~~	Information technology – Open Systems Interconnection – Network layer security protocol
ISO/IEC DIS 11586-1	Information technology – Open Systems Interconnection – Generic Upper Layers Security – Part 1: Overview, Models and Notation
ISO/IEC DIS	Information technology – Open Systems Interconnection – Generic Upper Layers

11586-2	Security – Part 2: Security Exchange Service Element (SESE) Service Specification
ISO/IEC DIS 11586-3	Information technology – Open Systems Interconnection – Generic Upper Layers Security – Part 3: Security Exchange Service Element (SESE) Protocol Specification
ISO/IEC DIS 11586-4	Information technology – Open Systems Interconnection – Generic Upper Layers Security – Part 4: Protecting Transfer Syntax Specification
ISO/IEC ISP 12059-0:1995~~ISO DISP 12059-0~~	Information technology – International Standardized Profiles – OSI Management – Common information for management functions – Part 0: Common definitions for management function profiles
ISO/IEC ISP 12059-1:1995~~ISO DISP 12059-1~~	Information technology – International Standardized Profiles – OSI Management – Common information for management functions – Part 1: Object management
ISO/IEC ISP 12059-2:1995~~ISO DISP 12059-2~~	Information technology – International Standardized Profiles – OSI Management – Common information for management functions – Part 2: State management
ISO/IEC ISP 12059-3:1995~~ISO DISP 12059-3~~	Information technology – International Standardized Profiles – OSO Management – Common information for management functions – Part 3: Attributes for representing relationships
ISO/IEC ISP 12059-4:1995~~ISO DISP 12059-4~~	Information technology – International Standardized Profiles – OSI Management – Common information for management functions – Part 4: Alarm reporting
ISO/IEC ISP 12059-5:1995~~ISO DISP 12059-5~~	Information technology – International Standardized Profiles – OSI Management – Common information for management functions – Part 5: Event report management
ISO/IEC ISP 12059-6:1995~~ISO DISP 12059-6~~	Information technology – International Standardized Profiles – OSI Management – Common information for management functions – Part 6: Log control
ISO/IEC ISP 12060-1:1995~~ISO DISP 12060-1~~	Information technology – International Standardized Profiles – OSI Management – Management functions – Part 1: AOM211 – General management capability
ISO/IEC ISP 12060-2:1995~~ISO DISP 12060-2~~	Information technology – International Standardized Profiles – OSI Management – Management functions – Part 2: AOM212 – Alarm reporting and state management capabilities
ISO/IEC ISP 12060-3:1995~~ISO~~	Information technology – International Standardized Profiles – OSI Management – Management functions – Part 3: AOM213 – Alarm reporting capabilities

~~DISP 12060-3~~

ISO/IEC ISP 12060-4:1995~~ISO DISP 12060-4~~	Information technology – International Standardized Profiles – OSI Management – Management functions – Part 4: AOM221 – General event report management
ISO/IEC ISP 12060-5:1995~~ISO DISP 12060-5~~	Information technology – International Standardized Profiles – OSI Management – Management functions – Part 5: AOM231 – General log control
ISO/IEC ISP 12062-1 : 199~~5~~4	Information technology – International Standardized Profiles AMH2n – Message Handling Systems – Interpersonal Messaging – Part 1: IPM MHS Service Support
ISO/IEC ISP 12062-2 : 199~~5~~4	Information technology – International Standardized Profiles AMH2n – Message Handling Systems – Interpersonal Messaging – Part 2: AMH21 – IPM Content
ISO/IEC ISP 12062-3 : 199~~5~~4	Information technology – International Standardized Profiles AMH2n – Message Handling Systems – Interpersonal Messaging – Part 3: AMH22 – IPM Requirements for Message Transfer (P1)
ISO/IEC ISP 12062-4 : 199~~5~~4	Information technology – International Standardized Profiles AMH2n – Message Handling Systems – Interpersonal Messaging – Part 4: AMH23 – IPM Requirements for MTS Access (P3)
ISO/IEC ISP 12062-5 : 199~~5~~4	Information technology – International Standardized Profiles AMH2n – Message Handling Systems – Interpersonal Messaging – Part 5: AMH24 – IPM Requirements for Enhanced MS Access (P7)
ITU-T Rec. X.215 Addendum 1 (1995)	Information processing systems – Open Systems Interconnection – Service Definition for Session Layer Efficiency Enhancements
ITU-T Rec. X.216 Addendum 1 (1995)	Information processing systems – Open Systems Interconnection –Service Definition for Presentation Layer Efficiency Enhancements
ITU-T Rec. X.225 Addendum 1 (1995)	Information processing systems – Open Systems Interconnection –Protocol Specification for Session Layer Efficiency Enhancements
ITU-T Rec. X.226 Addendum 1 (1995)	Information processing systems – Open Systems Interconnection – Protocol Specification for Presentation Layer Efficiency Enhancements

1.4 Glossary

Accounting Management	Accounting management enables charges to be established for the use of resources, and for costs to be identified for the use of those resources. Accounting management includes functions to inform users of costs incurred or resources consumed, enable accounting limits to be set and tariff schedules to be associated with the use of resources, and enable costs to be combined where multiple resources are invoked to achieve a given communications objective.
ACSE.	The Association Control Service Element is the common mechanism in the ALS for establishing and releasing ASO-associations
Active User	A user that is currently in an applications dialogue, such as for CM or CPDLC.
~~Active user~~	~~a user which is currently involved in an ADS dialogue~~
~~Active User~~	~~a user which is currently involved in a CM dialogue.~~
~~Active user~~	~~the user is currently involved in a CPDLC dialogue.~~
~~Active User~~	~~the FIS-AE-user is currently involved in a FIS Contract.~~
Actual TSAP	The actual TSAP is composed of the IDP and the long TSAP.
Address Domain	An Address Domain is a set of address formats and values administered by a single address authority. Under the ISO plan, any address authority may define subdomains within its own domain, and delegate authority within those subdomains.
Addressing (logical)	Logical addressing means that the address defined in the addressing plan and used to locate the addressed object is a virtual address which is a substitute of the actual (physical) address of an object. Address mapping functions have to fulfil this substitution, carefully maintaining unambiguity of identification of objects.
Addressing (physical)	Physical addressing means that the address defined in the addressing plan and used to locate the addressed object is the physical, i.e. hardwired, hard-coded, or configured address of the object. An example of a physical address is the ICAO 24-bit Aircraft Address used for the SSR Mode S Transponder.
Addressing Authority	An Addressing Authority defines formats and/or values of NSAP addresses within its jurisdiction.
Administrative Domain	A collection of end systems, intermediate systems, and subnetworks operated by a single organisation or administrative authority. An administrative domain may be internally divided into one or more routing domains.

ADS abstract service interface	The abstract interface between the ADS-air-ASE and the ADS-air-user or between the ADS-ground-ASE and the ADS-ground-user
ADS emergency report	An ADS report provided as part of an emergency contract
ADS report	A report provided by the ADS-air-user and sent to the ADS-ground-user concerning conditions on the aircraft, notably its location and FOM
ADS service primitive	See *Service Primitive*.~~A function of an ADS-AE that is not broken down further into subfunctions, and is presented as part of the ADS-AE abstract service interface (i.e. request, indication, response, or confirmation).~~
ADS service provider	See *Service Provider*. ~~The ADS service provider is composed of the ground and airborne ADS-AEs, all underlying data communication protocol entities and the physical media. As a consequence, it encompasses everything between the ADS-AE service interfaces of the end-users of the ADS application.~~
ADS-AE Abstract Service Interface	The abstract interface between the ADS-users and the ADS-service-provider.
ADS-air-ASE	That abstract part of the aircraft system that~~which~~ performs the communications related functions of ADS
ADS-air-user	That abstract part of the aircraft system that~~which~~ performs the non communications related functions of ADS
ADS-ASE Abstract Service Interface	The abstract interface through which the ADS-ASE services are accessed. *Note 1.— In version 1 of the ADS application, this interface coincides with the ADS-AE abstract service interface.*
ADS-CF	That abstract part of the AE that~~which~~ performs the mapping between the ADS-ASE service primitives and other elements within the ADS application
ADS-ground-ASE	That abstract part of the ground system that~~which~~ performs the communications related functions of ADS
ADS-ground-user	That abstract part of the ground system that~~which~~ performs the non communications related functions of ADS
AE Qualifier	That part of the AE title that unambiguously identifies the particular application entity.
AE Title	An unambiguous name for an application entityTh
Aeronautical Administrative	Communications used by aeronautical operating agencies related to the business aspects of operating their flights and transport services. These communications

Communications (AAC)	are used for a variety of purposes, such as flight and ground transportation bookings, deployment of crew and aircraft,, or any other logistic purposes thatwhich maintains or enhances the efficiency of overall flight operation.
Aeronautical Administrative Messages	Messages regarding the operation or maintenance of facilities provided for the safety or regularity of aircraft operation, messages concerning the functioning of the aeronautical telecommunication services, and messages exchanged between government civil aviation authorities relating to aeronautical services.
Aeronautical Industry Service Communication (AINSC)	AINSC comprises aeronautical industry communications between airlines, aeronautical industry service providers, general aviation operators, and any other industry stakeholders. This term is used for purposes of address administration.
Aeronautical Information Service Messages.	Messages concerning NOTAMS and messages concerning SNOWTAMS.
Aeronautical Mobile Satellite Service (AMSS)	AMSS provides packet-mode data and circuit-mode data and voice service to aircraft and ground users provided by a satellite subnetwork whichthat comprises satellites, Aircraft Earth Stations (AESs), Ground Earth Stations (GESs), and associated ground facilities such as a network coordination center.
Aeronautical Operational Control (AOC)	Communications required for the exercise of authority over the initiation, continuation, diversion, or termination of a flight in the interest of the safety of the aircraft and the regularity and efficiency of flight.
Aeronautical Passenger Communications (APC)	Communications relating to the non-safety voice and data services to passengers and crew members for personal communications.
Aeronautical stakeholder	Definition tbd
Aeronautical Telecommunication Network (ATN)	The Aeronautical Telecommunication Network is an internetwork architecture whichthat allows ground, air-to-ground, and avionics data subnetworks to interoperate by adopting common interface services and protocols based on the International Organization for Standardization (ISO) Open Systems Interconnection (OSI) reference model.
AINSC Administrative Domain	An AINSC Administrative Domain is an ATN Administrative Domain owned and/or administered by an aeronautical industry service organisation.
AINSC RDC	The ATN AINSC RDC consists of all AINSC RDs in the ATN.
AINSC Routing	An AINSC Routing Area is a routing subdomain comprising one or more ISs, and

Areas	optionally, one or more ESs owned and/or administered by an aeronautical industry service organisation. For example, an AINSC Routing Area may correspond to a physical location such as an airline's systems located at an airport.
AINSC Routing Domains	An AINSC Routing Domain comprises ESs and ISs that are part of an AINSC Administrative Domain.
Air Traffic Control(ATC)	ATC is a service operated by an appropriate authority to promote the safe, orderly, and expeditious flow of air traffic.
Air Traffic Management (ATM)	ATM consists of a ground and air part, both needed to ensure the safe and efficient movement of aircraft during all phases of operation.
Air Traffic Services (ATS)	Services provided by governmental civil aviation authorities.
Air Traffic Services Communications (ATSC)	Communications related to air traffic services including air traffic control, aeronautical and meteorological information, position reporting, and services related to safety and regularity of flight. This communication must involve one or more air traffic service administrations. This term is used for purposes of address administration.
Airframe-Id	The ICAO 24 bit aircraft identifier.
ALS	The Application Layer Structure (ALS) refers to the internal architecture of the OSI Application Layer as described in ISO/IEC 9545, Edition 2.
~~APDU~~	~~Basic unit of information exchanged between the airborne ADS-AE and the ground ADS-AE.~~
APDU	An Application Protocol Data Unit (APDU) is an (N)-PDU where N refers to the Application Layer. An APDU is the basic unit of information exchanged between the airborne application and the ground application.
Application	Software providing services to its users, in the guise of a consistent set of functionality; example given, the ATC related functions implemented in the server(s) and/or controller work position host computers.(from EATCHIP Glossary of Terms / COPS/CWP Report)
Application Control Service Element (ACSE)	The association control service element (ACSE) establishes, maintains and releases associations between application entities.
~~Application Entity~~	~~A model of those aspects of an application process that are significant from the viewpoint of accessing OSI capabilities~~
Application Entity	Part of an application process thatwhich is concerned with communications within

(AE)	the OSI environment. The aspects of an application process thatwhich need to be taken into account for the purposes of OSI are represented by one or more AEs. .
Application identifier	An abstract identifier whichthat distinguishes one application from another.
Application Layer	The layer of the OSI reference model that controls application user access to the communication system.
~~Application process~~	~~An element within an open system which performs information processing tasks for a particular application~~
Application process (AP)	A set of resources, including processing resources, within a real open system whichthat may be used to perform a particular information processing activity.
Application service	The abstract interface between the (N)-service and the (N)-service user, where N refers to the Application layer; thus it is the boundary between the ATN-App-AE and the Application-user.
Application Service Element (ASE)	A set of functions whichthat provide OSI communications capabilities for the interworking of AEs for a specific purpose. An AE may be composed of one ASE or several ASEs of different types.
Application Service Element (ASE)	A set of application functions whichthat provide a capability for the interworking of application-entity-invocations for a specific purpose; ASEs are a component of application service objects. An ASE can be considered to be a protocol module that is combined with others to form a complete protocol.
Application Service Object (ASO)	An active element within (or equivalent to the whole of) the application-entity embodying a set of capabilities defined for the Application Layer that corresponds to a specific ASO-type (without any extra capabilities being used). An ASO is a combination of ASEs and ASOs that perform a specific function. An ASO that provides the functions of the establishment and data transfer phases is considered a complete protocol.
Application-user	That abstract part of the aircraft or ground system thatwhich performs the non-communications related functions of the Application
~~ASE~~	~~an abstract module of a system providing a service to other parts of the system~~
ATM/ATS Applications	These are applications supporting ATM or other ATS functions and do not necessarily correspond to ATN applications. The term is usually used to distinguish between ATM functions and other non-ATM functions using the same communication service.
ATN App	A generic name for an ATN application.
ATN Applications	Refers to applications thatwhich support ATM or aeronautical industry functions

	and thatwhich are designed to operate across an OSI communications system. ATN applications are always distributed applications, i.e. peer processes are hosted by different end systems which are interconnected.
ATN Environment	The term ATN environment relates to functional and operational aspects around the ATN as a complete end-to-end communication system.
ATN host computer	An ATN host computer is a civil aeronautical computer system whichthat contains one or more end user applications and thatwhich communicates using the ATN internet. In OSI terms, it denotes an End System. An ATN Host Computer may also implement the upper layers necessary to support the Systems Management Agent and Systems Management Manager and upper layer protocols as specified for the supported end-user applications.
ATN Internet (ATNI)	An implementation of the ISO OSI network layer services and protocols for support of interprocess data communication between aeronautical host computers. It is defined to be the collection of the connected internetwork routers and subnetworks that conform to ATN internetwork requirements.
ATN Island Backbone RDC	An ATN backbone is an RDC comprising a subset of Transit Routing Domains within an ATN Island whichthat provide general connectivity.
ATN Island Bridge	A bridge between two ATN Islands is a communications link between backbones over a suitable subnetwork.
ATN Island RDC	An ATN Island is an RDC comprising CAA-operated ATN RDs within a geographical region, and may include associated ATN service providers, or an RDC comprising Aeronautical Industry members which are users of communications services of a single Aeronautical Industry Service Provider, or more than one such provider providing services in combination with each other.
~~ATN Manual Edition 2~~	~~The second edition of the ATN Manual is the ICAO document 9578-AN/935 expected to be published by ICAO during 1995. The ATN Manual Edition 2 is derived from the material developed by the SICASP in the form of the ATN Manual (Version 2) and recommended for publication at the fifth meeting of this panel.~~
ATN Network Operating Concept	An ATN Network Operating Concept will address the administrative, operational, institutional, and policy issues and additional (non-SARPs relevant) technical aspects to enable the efficient and correct operation of the ATN.
ATN Presentation Address	In the ATN, presentation addresses must, as a minimum, include an NSAP Address and a TSAP Selector and may include a PSAP Selector and SSAP Selector based on the addressing structure adopted within the ES and whether the application requires the OSI session or presentation protocol.
ATN Profile Requirement List	APRLs contained in the Draft ATN SARPs identify, in a tabular form, requirements together with the options and parameters for protocols used in the

(APRL)	ATN. The supplier of an ATN protocol implementation claiming to conform to the ATN SARPs must indicate conformance to those requirements by preparing a Protocol Implementation Conformance Statement (PICS) based on the set of APRLs presented in the SARPs.
ATN Router	The communication element that manages the relaying and routing of data while in transit from an originating ATN host computer to a destination ATN host computer. In ISO terms, an ATN router comprises an OSI intermediate system and an end system supporting a systems management agent.
ATN Routing Domain Confederation	The ATN RDC is the set of interconnected RDs that together form the ATN.
ATN Services	The ATN services are provided to ATN users that require ground-ground or air-ground data communication. The ATN internet service is provided at the transport layer (service access point). The ATN accommodates different grades of services which can be expressed by Quality of Service parameters.
ATN System Applications	System Applications support the operation of the ATN communication services and are either not directly or not at all used by ATN users but rather by the service providers or operators. Typical examples of ATN system applications are the ATN directory service, ATN context management or ATN systems management.
ATN Systems Management	The ATN Systems Management provides mechanisms for monitoring, control and co-ordination of resources necessary to provide ATN services. ATN Systems Management is based on OSI System Management principles and may be distributed, centralised, or local.
ATN-App ASE	That abstract part of the ATN end system that~~which~~ performs the communications related functions of the ATN application. Examples of the ATN-App ASE for the CNS/ATM-1 Package include: the ADS-Air ASE and the CM-Air ASE.
ATS Message	A unit of user-data, coded in binary form, which is conveyed from an originator of the data to one or more recipients of the data. It is possible to associate a unique message identifier and a priority with each ATS message.
ATS Message Handling Service	Procedures used to exchange ATS Messages over the ATN such that the conveyance of an ATS Message is in general not correlated with the conveyance of another ATS Message by the service provider. Two ATS Message Handling Services are defined in this Part of Sub-Volume III. They are the ATS Message Service and the ATN Pass-Through Service.
ATSC Administrative Domain	An ATSC Administrative Domain is an ATN Administrative Domain owned and/or administered by an air traffic services organisation.
ATSC RDC	The ATN ATSC RDC consists of all ATSC RDs in the ATN.

ATSC Routing Areas	An AINSC Routing Area is a routing subdomain comprising one or more ISs, and optionally, one or more ESs owned and/or administered by an ATS organisation. For example, an ATSC Routing Area may correspond to a physical location such as an airport.
ATSC Routing Domain	An ATSC Routing Domain comprises ESs and ISs that are part of an ATSC Administrative Domain.
Authentication information	Information used to authenticate the identity of an application or user.
Automatic Dependent Surveillance (ADS)	A technique for aircraft surveillance that is based upon the reporting of aircraft-derived position via a communication system.
Boundary Intermediate System (BIS)	An intermediate system that~~which~~ is able to relay data between two separate routing or administrative domains.
Broadcast Subnetwork	Broadcast subnetworks (e.g. LANs) are often used to connect ISs and ESs within a small geographical area with media offering relatively high data throughput with relatively low delays.
CF	That abstract part of the AE that~~which~~ performs the mapping between the ATN-App ASE service primitives, the ACSE service primitives, and other elements within the Application Entity.
CM AE abstract service interface	The abstract interface between the CM-users and the CM-service provider.
CM service primitive	See *Service Primitive*. ~~A function of a CM-AE that is not broken down further into sub-functions, and is presented as part of the CM-AE abstract service interface (i.e., request, indication, response, or confirmation).~~
CM service provider	See *Service Provider*. ~~The CM-service provider is composed of the ground and airborne CM AEs, all underlying data communication protocol entities and the physical media. As a consequence, it encompasses everything between the CM-AE service interfaces of the end-users of the CM application.~~
CM-air-ASE	An abstract part of the aircraft system that~~which~~ performs the communication related functions of CM.
CM-air-user	The abstract part of the aircraft system that~~which~~ performs the non communication related functions of CM.
CM-ASE abstract service interface	The abstract interface through which the CM-ASE service are accessed. *Note— In version 1 of the CM application, this interface coincides with the CM-AE abstract service interface.*

CM-CF	That abstract part of the application entity thatwhich performs the mapping between the CM-ASE service primitives and other elements within the CM application.
CM-ground-ASE	An abstract part of the ground system thatwhich performs the communication related functions of CM.
CM-ground-user	The abstract part of the ground system thatwhich performs the non communication related functions of CM.
CNS/ATM-1 Package Internet SARPs (Draft Version n.m)	Each Version of Draft Internet SARPs and Guidance Material is explicitly referenced as "n.m". In this usage, "n" represents the major revision level associated with agreements reached during a meeting of ATNP Working Group 2, and where "m" represents revisions applied between WG2 meetings based on interim agreements by appropriate experts, subject to WG2 approval. Therefore, draft SARPs approved by WG2 carry the version number "n.0".
CNS/ATM-1 Package	The term CNS/ATM-1 Package describes the set of ATN internet and upper layer functions and protocol features as well as the early ATN applications thatwhich will be recommended by the ATNP for the first operational use of the ATN. The purpose of this package is the availability of early operational implementations and trials in the 1997 time frame. The applications comprising CNS/ATM-1 Package are ADS, Controller-Pilot Communication, Context Management, Flight Information Services, Message handling Services, and Inter-Centre Coordination. In line with the incremental development and validation strategy of the ATN, CNS/ATM-1 Package will be followed by subsequent packages containing a more complete set of ATN functions and applications.
Configuration Management	Configuration management identifies, exercises control over, collects data from and provides data to open systems for the purpose of preparing for, initialising, starting, providing for the continuous operation of, and terminating interconnection services.
Congestion	In the ATN Internet sense, congestion describes the state where the network is overloaded. Typical effects of congestion are extended transit delays, drastically reduced throughput, and the loss of data packets.
Congestion Avoidance	Techniques whichthat continuously control the data flow into the network in order to prevent the network from getting overloaded. These encompass both open-loop techniques which ensure that a traffic contract specified by the source is respected, and closed-loop techniques which monitor signals generated by the network and adapt the traffic generated by the sources accordingly.
Congestion Management	This term refers to a set of rules and techniques thatwhich prevent congestion , e.g. by monitoring actual network load. Co-operative interaction of all end systems is required in order to prevent individual end-systems taking up the throughput saved by well-behaving systems.

Congestion Recovery / Congestion Control	This term refers to a mechanism thatwhich reacts to congestion after it has occurred in order to remove the overload condition. Congestion Recovery can be initiated only after congestion has been experienced, and is not able to safely prevent congestion in the network.
Connection mode Service (CO)	The communication service technique thatwhich transfers data between peer layers using a prior connection to logically associate the sequence of protocol data units (PDUs).
Connectionless mode Service (CL)	The communication service technique transfers data between peer layers without prior coordination. All protocol data units (PDUs) are transferred with no explicit association between them.
Context Management	In the ATN environment, the term "Context Management (CM)" refers to an ATN application. This application implements an ATN logon service allowing initial aircraft introduction into the ATN. The logon service also allows indication of all other data link applications on the aircraft. CM also includes functionality to forward addresses between ATC centres. Thus, CM is a logon and simple directory service. Note: "Context Management" is a recognised OSI presentation layer term. The OSI use and the ATN use have nothing in common.
~~Context Management~~	~~an independent service that meets ATSC addressing requirements. It provides the mechanism for aircraft and ATC ground system peers to indicate availability to other ATN users and to convey the addresses to be employed.~~
~~Context Management~~	~~an independent service that meets ATSC addressing requirements. It provides the mechanism for aircraft and ATC ground systems to indicate availability to other ATN users and to convey the addresses to be employed. The aircraft CM application interfaces with aircraft equipment to provide ATC ground system the addresses needed to establish communication with the aircraft.~~
contract	An agreement between the ADS-ground-user and the ADS-air-user that the latter will provide reports to the former under the conditions specified in the contract.
CPDLC AE abstract service interface	The abstract interface between the CPDLC-users and the CPDLC-service provider.
CPDLC ASE abstract service interface	The abstract interface through which the CM-ASE service are accessed. Note: — In version 1 of the CPDLC application, this interface coincide with the CPDLC-AE abstract service interface.
CPDLC service primitive	See *Service Provider*. ~~A function of a CPDLC-AE that is not broken down further into sub-functions, and is presented as part of the CPDLC-AE abstract service interface (i.e., request, indication, response,, or confirmation).~~
CPDLC service provider	See *Service Provider*. ~~The CPDLC-service provider is composed of the ground and airborne CPDLC AEs, all underlying data communication protocol entities and the physical media. As a consequence, it encompasses everything between the~~

	~~CPDLC-AE service interfaces of the end-users of the CPDLC application.~~
CPDLC-air-ASE	An abstract part of the aircraft system that~~which~~ performs the communication related functions of CPDLC.
CPDLC-air-user	The abstract part of the aircraft system that~~which~~ performs the non-communication related functions of CPDLC.
CPDLC-CF	That abstract part of the application entity that~~which~~ performs the mapping between the CPDLC-ASE service primitives and other elements within the CPDLC application.
CPDLC-ground-ASE	An abstract part of the ground system that~~which~~ performs the communication related functions of CPDLC.
CPDLC-ground-user	The abstract part of the ground system that~~which~~ performs the non-communication related functions of CPDLC.
Current Data Authority	The ground system that~~which~~ is technically permitted to conduct a CPDLC dialogue with an aircraft.
Data Communications Equipment (DCE)	An interface between data terminal equipment and the transmission mechanism.
Data Link Applications	This term refers to applications using either a specific data link (air/ground subnetwork) or air-ground communications in general. It should be regarded as an outdated term and be replaced by the term ATN Air/Ground Applications.
Data Link Layer	The layer of the OSI reference model that manages the operations of the physical layer and may utilise special error detection or retransmission techniques to achieve acceptable error rates.
Data Terminal Equipment (DTE)	A digital data transmitter/receiver device that includes terminals and computers.
Datagram service	A service providing the transmission and reception of packets of data as discrete messages.
Demand Contract	A “contract” between a requestor and a provider of information service, such as ADS or FIS, to provide a single report to the requestor (vs. Continual reports to one request).
~~demand contract~~	~~A contract to provide a single ADS report~~
~~Demand Contract~~	~~A contract to provide a single piece of FIS information.~~
Dialogue	A co-operative relationship between elements which enables communication and

	joint operation.
Dialogue service	A term for the lower service boundary of an ATN-App ASE; the service allows two ATN-App ASEs to communicate, such as a CM-ground-ASE to communicate with a CM-air-ASE.
Directory	The ATN Directory is a facility that supports on request the retrieval of ATN address information or the resolution of application names.
Directory Service	The ATN Directory Service provides the ATN user with the addressing information thatwhich is associated with the application process title or application entity title used as input to the directory. The addressing information provided by the directory service includes the network address as well as further technical addresses on the layers above, as required or applicable. Furthermore, the ATN Directory Service resolves generic application process titles or application entity titles, i.e. names which may be incomplete or contain "don't care" elements, into the corresponding (list of) non-generic application process titles or application entity titles.
Distinguishing Path Attribute (DPA)	In ISO/IEC 10747 a DPA is used to discriminate among multiple routes to a destination, based on differences in the quality of service between the routes (for example, expense, transit delay or residual error probability.)
Domain	A set of end systems and intermediate systems thatwhich operate according to the same routing procedures and thatwhich is wholly contained within a single Administrative domain.
Domain Specific Part (DSP)	An Addressing Authority is responsible for its own Addressing Subdomain, and NSAP Addresses within that addressing domain are distinguished, where necessary, by the value of the DSP.
Downstream Data Authority	The ground system thatwhich is technically permitted to conduct a DSC dialogue with an aircraft.
emergency contract	A contract to provide ADS reports at regular intervals during an emergency situation
emergency contract	A contract to provide ADS reports at regular intervals during an emergency situation
emergency mode	A mode of operation of the aircraft when a ***Active User:*** a user thatwhich is currently involved in a CM dialogue.
End Routing Domain (ERD)	A RD that only routes PDUs from/to its own RD.
End System (ES)	A system that contains the seven OSI layers and contains one or more end user application processes.

end user	The human who is using the user interface to the system
Engineering Trials	In contrast to operational trials, engineering trials may be based on pre-operational, prototype, or experimental equipment. Aim is to demonstrate the technical feasibility and correctness of applied techniques, concepts, and specifications.
Entity	An active element in any layer which can either be a software entity (such as a process) or a hardware entity (such as an intelligent I/O chip).
Ethernet	Ethernet is based on a local area network standard ISO 8802-3 Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method, and Physical Layer Specifications using broadcast technology which may connect as an ATN subnetwork.
event contract	A contract to provide ADS reports when certain events occur.
Expected Quality of Service (QoS)	Expected QoS is based on a combination of a priori knowledge and analysis of performance information received from the operation of routing protocols.
Expected Transit Delay	Expected Transit Delay is defined as the time elapsed between the invocation of CLNS by the source ATN NS user and the arrival of an NSDU at the destination ATN NS user, based on an NPDU size of 512 octets. Transit Delay values are typically expressed in increments of 500 milliseconds.
Expense	Expense is the cost to perform some task. In the context of internetworking, expense is defined in terms of the incremental expense incurred for transfer of a single NSDU of 512 octets in size.
extended projected profile	A projected profile extended up to a number of way points.
Fast Byte	definition tbd.
Fault Management	Fault management encompasses fault detection, isolation, and the correction of abnormal operation, and includes functions to maintain and examine error logs, accept and act upon error detection notifications, trace and identify faults, carry out sequences of diagnostic tests, and correct faults.
FIS Abstract Service Interface	The abstract interface between the FIS-air-AE and the FIS-air-user or between the FIS-ground-AE and the FIS-ground-user. In CNS/ATM-1 Package, this interface identifies both the FIS AE abstract service interface and the FIS-ASE abstract service interface.
FIS service-primitive	A function of an FIS AE that is not broken down further into subfunctions, and is presented as part of the abstract service interface (i.e. request, indication, response, or confirmation).

FIS service-provider	The FIS service-provider is composed of the ground and airborne FIS AEs, all underlying data communication protocol entities and the physical media. As a consequence, it encompasses everything between the FIS-AE service interfaces of the end-users of the FIS application.
FIS-AE Abstract Service Interface	The abstract interface between the FIS-users and the FIS-service-provider.
FIS-air-ASE	The abstract part of the aircraft system thatwhich performs the communications related functions of FIS.
FIS-air-user	The abstract part of the aircraft system thatwhich performs the non communication related functions of FIS.
FIS-ASE	The FIS-air-ASE and the FIS-ground-ASE.
FIS-ASE Abstract Service Interface	The abstract interface through which the FIS-ASE services are accessed. Note 1.— In version 1 of the FIS Application, this interface coincides with the FIS-AE abstract service interface
FIS-CF	The abstract part of the AE thatwhich performs the mapping between the FIS-ASE service primitives and others elements within the FIS Application.
FIS-ground-ASE	The abstract part of the ground system thatwhich performs the communications related functions of FIS.
FIS-ground-user	The abstract part of the ground system thatwhich performs the non communication related functions of FIS.
FIS-user	The FIS-air-user or the FIS-ground-user.
Fixed ATN RDC	The Fixed ATN RDC consists of all ground-based RDs that form the ATN.
flight id	An identifier, to an ICAO approved format, for a particular flight.
Flight plan	
Flow control	A function thatwhich controls the flow of data to perform buffer management within a layer or between adjacent layers.
FOM	The figure of merit is an indication of the level of accuracy of positional information given in an ADS report.
forward contract	A contract to provide a ground ADS system with ADS reports.
Forwarding Information Base (FIB)	The information base that is maintained by each ATN router and contains the set of forwarding paths reflecting the various policy and QoS rankings available to reach each known destination.

Four-D profile

Function	A function is a coherent set of activities which fulfils, by itself or together with other functionality, a concept. Examples of functions: conflict free planning; electronic representation of the flight.
Functional Requirements	Operational requirements that determine what function a system should perform. They can usually be expressed by a verb applying to a type of data, e.g. display aircraft position.
Gateway	A system used to interconnect dissimilar networks. A gateway may contain all seven layers of the OSI reference model.
General Communications	A category of communications whichthat includes APC, public correspondence, and other non-operational and non-administrative communications.
General Topology Subnetwork	General topology subnetworks (e.g. WANs) are often used to connect geographically dispersed ISs and ESs.
Global Network Addressing	An internetwork addressing plan covering worldwide aeronautical operations which enables all participating subnetworks to function in a single integrated global network.
Global Network Addressing Domain	An addressing domain consisting of all the NSAP addresses in the OSI environment.
Indicated QoS	Indicated QoS is determined by the QoS parameters passed in protocol control information, and may reflect varying accuracy with respect to actual characteristics.
Initial Domain Part (IDP)	The IDP identifies the Addressing Authority responsible for an Addressing Subdomain thatwhich assigned the NSAP Address, and thatwhich specified the abstract syntax and structure of the remainder of the NSAP Address.
Institutional Issues	Issues related to ownership, control, and responsibility for correct implementation and operation of systems thatwhich involve more than one state or organisation.
Integrated Services Digital Network (ISDN)	A public telecommunications network that supports the transmission of digitised voice and data traffic on the same transmission links.
Intermediate System (IS)	A system comprising the lower three layers of the OSI reference model and performing relaying and routing functions.
Internetwork	A set of interconnected, logically independent heterogeneous subnetworks. The constituent subnetworks are usually administrated separately and may employ different transmission media.

Internetwork Protocol	A protocol thatwhich performs the basic end-to-end mechanism for the transfer of data packets between network entities. In the ATN Internet, the ISO 8473 internetwork protocol is used.
Interoperable	Describes the ability of the ATN to provide, as a minimum, a transparent data transfer service between end systems even though the ATN comprises various ground, air-to-ground, and avionics subnetworks. The ability to interoperate between end systems can be extended to include commonality of upper layer protocols.
Intra-domain routing information exchange protocol	In the ATN, the ISO 10589 IS-IS intra-domain routing information exchange protocol may be used to exchange connectivity and topology information between ATN routers within a routing domain.
Level 1 subdomain	A routing subdomain of end systems and intermediate systems thatwhich maintains detailed routing information about its own internal composition and routing information which allows it to reach other routing areas. A level 1 subdomain area is also denoted a routing area.
Level 2 subdomain	The subset of all level 2 intermediate systems within a routing domain.
Local Area Network (LAN)	A network connecting various data communication devices in a localised geographical area such as a single aircraft, office building, or a group of buildings.
Long TSAP	The long TSAP is composed of the RDP and the short TSAP.
Lower layers	A term pertaining to the physical, data link, network and transport layers of the OSI reference model.
Managed Object	Managed objects refer to those data processing and data communication resources that may be managed through the use of the OSI Management protocol.
Management Administrative Domain	A management administrative domain is a management domain where the managed objects in the domain are all under the responsibility of one and only one administrative authority.
Management Agent	The Management Agent performs management operations on managed objects within its local environment as a consequence of management operations communicated from a manager. An Agent may also forward notifications emitted by managed objects to a manager.
Management Domain	Management domains are resources thatwhich for systems management purposes are represented by managed objects. A management domain possesses at least the following quantities: a name thatwhich uniquely identifies that management domain, identification of a collection of managed objects thatwhich are members of the domain, and identification of any inter-domain relationships between this

	domain and other domains.
Management Information Base (MIB)	The management information base is a conceptual composite of management information within an open system.
Management Information System (MIS)-User	An MIS-User is a management application. For the purposes of network management, an MIS-User is allowed to take on one of two possible roles — either an agent role or a manager role.
Manager	A manager is the term given to a system thatwhich requests or otherwise receives information about managed objects.
Mean Transit Delay	The average time it takes to transfer a standard packet size from source to destination.
Message	Basic unit of user information exchanged between an airborne application and its ground counterpart, or between two ground applications. Messages are passed in one or more data blocks from one end user to another through different subnetworks.
~~***Message***~~	~~basic unit of information exchanged between the airborne CM Application and the ground CM Application.~~
~~Message~~	~~information exchanged between the CPDLC air-user and the CPDLC-ground-user.~~
~~Message~~	~~Information which is passed in one or more data blocks from one end user to another through different subnetworks.~~
Message Element	A component of a message used to define the context of the information exchanged.
Message Element Identifier	The ASN.1 tag of the ATCUplinkMsgElementID or the ATCDownlinkMsgElementId.
Message Header (air/ground)	The control information used to maintain synchronisation between the aircraft and the ground ATC system.
Message Header (ground/ground)	Control information used to maintain synchronisation between the two ground ATC systems.
Message Identification Number	A unique number assigned to each air/ground message. This number is used to differentiate messages and is conveyed in an air/ground message header.
Message Reference Number	Used to uniquely associate a response with a previously received message. The Message Identification Number of a previously received message becomes the Message reference number of the response message. The Message Reference

	number is conveyed in the message header.
Mobile Routing Domains	A mobile routing domain is formed from ATSC and AINSC systems onboard an aircraft (or any other mobile platform), within the aircraft operator's Administrative Domain. A mobile RD is characterised as an End Routing Domain (ERD).
Mobile Subnetwork	A subnetwork connecting a mobile system with another system not resident in the same mobile platform. These subnetworks tend to use free-radiating media (e.g. VHF/UHF radio, D-band satellite or D-band secondary surveillance radar) rather than "contained" media (e.g. wire or coaxial cable); thus they exhibit broadcast capabilities in the truest sense.
Mode Select (Mode S)	An enhanced mode of secondary surveillance radar (SSR) which~~that~~ permits the selective interrogation of Mode S transponders, the two-way exchange of digital data between Mode S interrogators and transponders, and also the interrogation of Mode A or Mode C transponders.
Multi-homed End Routing Domain	An ERD that is in communication with more than one RD.
navigational intent	The intended path of the aircraft for a period of time in the future.
Network Addressing Domain	A subset of the global addressing domain consisting of all the NSAP addresses allocated by one or more addressing authorities.
Network Entity	A functional portion of an internetwork router or host computer that is responsible for the operation of internetwork data transfer, routing information exchange, and network layer management protocols.
Network Entity Title (NET)	The global address of a network entity.
Network Layer	The ISO network layer is responsible for providing a uniform service interface for the transfer of data among end systems and intermediate systems (ISs) utilising the ISO protocol architecture.
Network Management	Network Management is the set of functions related to the management of various OSI resources and their status across the Network Layer of the OSI architecture.
Network Service Access Point (NSAP)	Point within the ISO protocol architecture at which global end users may be uniquely addressed on an end-to-end basis.
Network Service Access Point (NSAP) Address	The NSAP Address is a hierarchically organised global address, supporting international, geographical, and telephony-oriented formats by way of an address format identifier located within the protocol header. Although the top level of the NSAP address hierarchy is internationally administered by ISO, subordinate address domains are administered by appropriate local organisations.

Network Topology Map	Network topology maps provide an overall view of the global network connectivity, and are used in path computations by the operative routing algorithm.
Next Data Authority	The ground system so designated by the Current Data Authority.
NSAP address prefix	NSAP Address prefixes are used to identify groups of systems that reside in a given routing domain or confederation. An NSAP prefix may have a length that is either smaller than, or the same size as, the base NSAP address.
Open Systems Interconnection (OSI) Protocol Architecture	A set of protocols used to implement the OSI reference model.
Open Systems Interconnection (OSI) reference model	A model providing a standard approach to network design introducing modularity by dividing the complex set of functions into seven more manageable, self-contained, functional layers. By convention these are usually depicted as a vertical stack.
Operating Concept	The Operating Concept describes the technical functionality of a system and its inherent capabilities regarded from the system operator's point of view. This includes the interaction between user and system, the services provided by the system as well as the internal operation of the system.
Operational Concept (1)	The Operational Concept describes from the user's point of view the operational requirements, constraints, and prerequisites within which a technical system is supposed to work as well as the inherent capabilities of the system. Furthermore it describes the interaction between the user and the system as well as the services the user may expect from the system.
Operational Concept (2)	Broad outline of an operational structure able to meet a given set of high level user requirements. It comprises a consistent airspace organisation, general operational procedures, and associated operational requirements for system support.
Operational Requirements	This term refers to a set of requirements that~~which~~ define the operational needs and constraints within which a technical system has to operate in order to fulfil its anticipated role. The ATN operational requirements relate to ATN communications as seen from the user point of view. Operational requirements are composed of functional and non-functional requirements.
Operational Trials	Operational trials are based on operational environment. This includes operational systems and operational equipment, e.g. routinely scheduled flights in an operational ATS environment. Aim is to demonstrate the operational acceptance and correctness of applied mechanisms, applications, and concepts.
Packet	The basic unit of data transfer among communications devices within the network layer.

PDU, Protocol Data Unit	A unit of data specified in an (N)-protocol and consisting of (N)-protocol-control-information and possibly (N)-user-data, where N indicates the layer.
PDV, Presentation Data Value	the unit of information specified in an abstract syntax, which is transferred by the OSI presentation-service (ISO/IEC 8822).
Performance Management:	Performance management enables the behaviour of resources and the effectiveness of communication activities to be evaluated. Performance management includes functions to gather statistical information, maintain and examine logs of system state histories, determine system performance under natural and artificial conditions, and alter system modes of operation for the purpose of conducting performance management activities.
Performance Requirements	Performance Requirements are requirements with respect to the performance of a system (e.g. reliability, availability, response time, processing delay, etc.) and are derived from Operational Requirements. In general, they describe the minimum performance figures thatwhich a system must provide in order to fulfil the operationally required functions.
periodic contract	A contract to provide ADS reports at regular intervals.
Physical Layer	The layer of the OSI reference model that controls access to the transmission medium whichthat forms the basis for the communication system.
Policy Information Base (PIB)	The PIB is contained with a BIS, and consists of a set of policy statements specified by the Systems Manager which together describe the applicable Routing Policy.
Presentation Layer	The layer of the OSI reference model that controls the coding, format, and appearance of the data transferred to and from the application layer.
Presentation Service Selector (PSAP Selector)	The element of the presentation address thatwhich identifies the user of the presentation protocol entity.
Priority	Priority is defined as the relative importance of a particular PDU relative to other PDUs in transit, and is used to allocate resources which become scarce during the transfer process.
Profile	A profile defines implementation conformance constraints on a set of reference specifications.
projected profile	An indication of where and when the aircraft anticipates it will be at the following two way points.
Protocol	A set of rules and formats (semantic and syntactic) which determines the communication behaviour between peer entities in the performance of functions at

	that layer.
Protocol Control Information (PCI)	Information included in a layer header which contains service primitives specific to that layer.
Protocol Data Unit(PDU)	A unit of data transferred between peer entities within a protocol layer consisting of protocol control information and higher layer user data (i.e. service data units).
Quality of Service (QoS)	Information relating to data transfer characteristics (for example, requested throughput and priority) used by a router to perform relaying and routing operations across the subnetworks which make up a network.
Relaying	The process of transferring packets across subnetworks including any necessary packet conversion.
Requested QoS	Requested QoS reflects the service characteristics desired by the service user.
Reserved Value	Reserved values constitute legal values for the respective fields but have not yet been assigned specific meanings by ICAO. These values should be processed normally in order to allow future assignment. Meanings may be assigned in the future and are not available for local use. The allocation of these values requires no change in the version identifier.
Residual Error Probability	Residual Error Probability indicates the likelihood that an PDU will be lost, duplicated, or corrupted. This probability is defined as the ratio of lost, duplicated, or corrupted NSDUs to the total number of NSDUs transmitted by an ATN NS provider, normalised for an NSDU size of 512 octets.
~~***Residual Error Rate***~~	~~is defined as the ratio of messages mis-delivered, non-delivered, or delivered with an error undetected by the system, over the total number of messages delivered to the system.~~
~~residual error rate~~	~~the ratio of message misdelivered, non-delivered, or delivered with an error undetected by the system, over the total number of messages delivered to the system~~
~~Residual Error Rate~~	~~the ratio of messages mis-delivered, non-delivered, or delivered with an error undetected by the system, over the total number of messages delivered to the system.~~
~~Residual Error Rate~~	~~the ratio of messages mis-delivered, non-delivered, or delivered with an error undetected by the system, over the total number of messages delivered to the system.~~
residual error rate (RER)	is defined as the ratio of messages misdelivered, non-delivered, or delivered with an error undetected by the system, to the total number of messages delivered to the system during a measurement period (adapted from ISO/IEC 8072). Note that for ATN, ICAO is considering not counting non-delivered messages in the total.

Route	A route consists of the set of addresses thatwhich identifies the destinations reachable over the router, and information about the route's path including the QoS and security available over the route.
Router	A router is the communication element that manages the relaying and routing of data while in transit from an originating end system to a destination end system. An ATN router comprises an OSI intermediate system and end system supporting a systems management agent.
Routing	A function within a layer thatwhich uses the address to which an entity is attached in order to define a path by which that entity can be reached.
Routing Area (RA)	A routing area is a routing subdomain comprising one or more ISs, and optionally one or more ESs.
Routing Domain	A set of end systems and intermediate systems thatwhich operate the same routing protocols and procedures and thatwhich are wholly contained within a single administrative domain. A routing domain may be divided into multiple routing subdomains.
Routing Domain Confederation (RDC)	A Routing Domain Confederation (RDC) is a set of Routing Domains and/or RDCs thatwhich have agreed to join together and form a Routing Domain Confederation. The formation of a RDC is done by private arrangement between its members without any need for global coordination.
Routing Domain Identifier (RDI)	An RDI is a generic NET as described in ISO 7498, and is assigned statically in accordance with ISO 8348. An RDI is not an address, and cannot be used as a valid destination of an ISO 8473 PDU. However, RDIs are, like ordinary NETs, assigned from the same Addressing Domain as NSAP Addresses.
Routing Information Base(RIB)	A data base thatwhich is maintained by each router and comprises the information regarding the connectivity and topology of the ESs and ISs within a particular Routing Domain and path information pertinent to paths interconnecting Routing Domains. It is maintained by way of the information received by a routing information exchange protocol. Each Routing Information Exchange Protocol has its own RIB specification.
Routing information exchange protocol	The protocol used to exchange subnetwork connectivity information between end systems and intermediate systems and between intermediate systems and intermediate systems.
Routing Policy	Routing policy is a set of rules that control the selection of routes and the distribution of routing information by ATN Boundary Intermediate Systems (BISs). These rules are based on policy criteria rather than on performance metrics such as hop count, capacity, transit delay, cost, etc. which are usually applied for routing. There are two groups of routing policy in the ATN: (1) general routing policy specified in the Draft ATN Internet SARPs in order to ensure necessary connectivity in the ATN at a reasonable routing information

	update rate and (2) user specified routing policy, i.e. individual policy rules which may be additionally implemented in ATN BISs by administrations and organisations to meet their specific operational and policy needs.
Routing Policy	The set of rules in a BIS that~~which~~ determines the advertisement and use of routes is known as a Routing Policy. Each organisational user of the ATN must determine and apply their own Routing Policy.
Safety Case	A safety case is an analysis presenting an overall justification for the declaration that a particular systems satisfies its safety requirements.
Security Label	A Security Label may indicate requirements for protection of a PDU and provide information used by network layer access control functions.
Security Management	The purpose of security management is to support the application of security policies by means of functions which include the creation, deletion and control of security services and mechanisms, the distribution of security-relevant information, and the reporting of security-related events.
Service Data Unit	A unit of data transferred between adjacent layer entities, which is encapsulated within a PDU for transfer to a peer layer.
Service primitive	A function of an ASE that is not broken down further into subfunctions, and is presented as part of the abstract service interface (i.e. request, indication, response, or confirmation).
Service Provider	An application service provider is composed of the ground and airborne AEs for the application, all underlying data communication protocol entities and the physical media. As a consequence, it encompasses everything between the Application-AE service interfaces of the peer end-users of the application.
Session layer	The layer of the OSI reference model that establishes the rules of dialogue between two end-user entities.
Session Service Selector (SSAP Selector)	The element of the session address that~~which~~ identifies the user of the session protocol entity.
Short TSAP	The short TSAP is composed of the ARS, the LOC, the SYS, and the SEL.
Single Homed ERD	An ERD that is in communication with one other RD only.
Spare Value	A Spare value is a value for which no meaning is currently defined. These values are available by the administering authority for local use, and may be assigned in the future.
Stack (or protocol stack)	A set of co-operating OSI protocols selected from different layers of the basic reference model. Hence, “upper layer stack” refers to session, presentation, and

	application protocols, while "lower layer stack" refers to physical, data link, network, and transport protocols.
Subnetwork	An actual implementation of a data network thatwhich employs a homogeneous protocol and addressing plan, and is under control of a single authority.
Subnetwork Access Facility (SNAcF)	The subset of the OSI network layer thatwhich provides the interface with the data link layer and is specific to a particular subnetwork.
Subnetwork Access Protocol (SNAcP)	The actual protocol used to receive services form a particular subnetwork. For example, the subnetwork access protocol to many public data networks is X.25.
Subnetwork Dependent Convergence Function (SNDCF)	The set of rules and procedures needed to convert the data transfer needs of the subnetwork independent convergence protocol to the actual services provided by a subnetwork.
Subnetwork Domain	The set of end systems and intermediate systems connected to the same physical network.
Subnetwork Independent Convergence Function (SNICF)	The subnetwork independent convergence protocol is the common protocol for all ATN host computers and routers that is used for the transfer of data. In the ATN internet, the SNICF is the connectionless network protocol defined by ISO 8473.
Subnetwork Point of Attachment (SNPA)	The SNPA is the point at which a real end system, interworking unit, or real subnetwork is attached to a real subnetwork, and is a conceptual point within an end or intermediate system at which the subnetwork service is offered.
Subnetwork Point of Attachment (SNPA) Address.	The SNPA address provides information used in the context of a particular real subnetwork to identify a SNPA. An SNPA address is a subnetwork address such as X.25 DTE Addresses, Ethernet MAC Addresses, etc.
Subnetwork sublayer	A component of the OSI reference model that provides the protocol mechanism for data transfer between peer entities within the same subnetwork. This sublayer is an implementation of the OSI subnetwork access facility (SNAcF).
Systems Management	The set of functions related to the management of various OSI resources and their status across all layers of the OSI architecture.
Systems Management Application Entity (SMAE)	An application entity for the purpose of systems management communications.
Systems Management Function	Systems Management Functions encompass the monitoring, controlling, operating, supervising, co-ordination, and administration of a communications network.
Traffic Type	The data conveyed by the ATN is divided into four traffic types: ATN Operational

	Communications representing safety and regularity of flight communications, ATN Administrative Communications representing non-safety and regularity of flight communications sent by aircraft operating agencies and ATS administrations, General Communications representing APC, public correspondence, and other non-operational and non administrative communications, and ATN Systems Management Communications representing systems management information thatwhich is critical for support of network operations. The differentiation of traffic types is required because different data traffic may have different access to subnetworks. The traffic type is conveyed in the ATN Security Label of ISO 8473 (CLNP) and ISO 10747 (IDRP) PDUs. It is used to qualify (CLNP) data packets and (inter-domain) routes according to the class of traffic thatwhich they carry. Based on this qualification, access of subnetworks is controlled at the ATN Internet level.
Transit Routing Domain (TRD)	A Transit Routing Domain is a domain whose policies permit its BISs to provide relaying for PDUS whose source is located in either the local routing domain or in a different routing domain.
Transport layer	The layer of the OSI reference model that assures reliable end-to-end transfer between transport service users.
Transport service (TS) user	The entity thatwhich uses transport layer services.
Transport Service Access Point (TSAP)	The Transport Service Access Point is the logical access point to the transport layer.
Transport Service Access Point (TSAP) address	The complete communications address which unambiguously defines a transport service user. The TSAP address comprises the NSAP address and a TSAP-selector.
Transport Service Access Point Selector (TSAP Selector).	The element of the transport address thatwhich identifies the user of the transport protocol entity.
Update Contract	A contract to provide a piece of FIS information and any update of this information.
Upper layers	A term pertaining to the session, presentation, and application layers of the OSI reference model.
User Requirements	User requirements describe what users expect to obtain from the system (not how the system should do it). User requirements are usually expressed on a high level and do not care about technical details. Technically, the direct user of the ATN is an application within an end system supporting Air Traffic Management or Aeronautical Industry functions. The Air Traffic Controller, other ground staff, or the Pilot are the human beings using directly or indirectly the ATN. The user may also be seen more on the abstract level as an organisation, e.g. airline or air

	navigation service provider.
Validation	In the ICAO context, validation is a process thatwhich ensures that systems meet user requirements to an agreed level of confidence and can be produced from written SARPs and Guidance material. Therefore, one has to distinguish between performance based and functional validation. Single subsystems of the ATN, like routers, may be validated on a functional basis. In contrast, validation of the ATN's suitability with respect to network performance etc. requires definition of performance requirements. Both, performance based and functional validation is necessary for the ATN.
Very High Frequency (VHF)	VHF is a frequency band from 30 to 300 megahertz.
VHF Data Link (VDL)	VDL provides packet data communications to aircraft and ground users provided by a VDL subnetwork whichthat comprises airborne VHF data radios (VDRs), VHF ground stations, and connectivity to routers on the aircraft and the ground.
Virtual circuit priority	The priority associated with a connection (virtual circuit) which is established between two systems prior to the transmission of data.
Wide Area Network (WAN)	Wide Area Networks are used to interconnect geographically dispersed routers and host computers. These subnetworks may be internally complex packet switching entities of their own, or they may be as simple as point-to-point dedicated lines.
X.25 Packet Switched Data Network (PSDN)	An X.25 PSDN is a communications network that provides a network access service in compliance with CCITT Recommendation X.25.

1.5 Acronyms

-	N/A
^	Not
84IW	84 Interworking
A/G	Air-ground
AAC	Aeronautical Administrative Communications
AARE	ACSE Associate Response APDU
AARQ	ACSE Associate Request APDU
ABRT	ACSE Abort APDU
ACA	Address compression algorithm
ACAS	Airborne Collision Avoidance System
ACSE	Association control service element
AD	Administrative domain
AD	Addendum (of an ISO/IEC standard)
ADJBISMO	Adjacent BIS MO
ADJRIBMO	Adjacent RIB MO
ADM	Administrative identifier
ADMD	Administration management domain
ADMF	ADM Flag
ADS	Automatic Dependent Surveillance
ADS-ATC	ADS-based Air Traffic Control system
ADSP	Automatic Dependent Surveillance Panel
AE	Application Entity
AES	Aircraft earth station

AF-Address	AFTN-form address
AFI	Authority and format identifier
AFS	Aeronautical fixed service
AFTN	Aeronautical fixed telecommunication network
A-FU	Authentication Functional Unit
AC	Accept
ACSE	Association Control Service Element
ACT	Activity Management
ADS	Automatic Dependent Surveillance
ADSP	ADS Panel
AE	Application Entity
AINSC	Aeronautical Industry Service Communication
AK	Data acknowledgement
ALS	Application Layer Structure
AMHS	ATS message handling system
AMSS	Aeronautical mobile satellite service
ANC	Air Navigation Commission
AOC	Aeronautical Operational Communications
AOC	Aeronautical Operational Control
AOM	Systems Management Upper Layer profile
AP	Application process
APC	Aeronautical Passenger Communications
APDU	Application Protocol Data Unit
API	Application Program Interface

App	Application
APRL	ATN profile requirements list
ARPA	Advanced Research Projects Agency
ARPANET	ARPA network
ARS	Administrative Region Selector
ARSD	ARS Default [Flag]
ASE	Application Service Element
ASI	Abstract Service Interface
ASN.1	Abstract Syntax Notation One
ASO	Application Service Object
ATC	Air Traffic Control
ATFM	Air traffic flow management
ATIS	Automatic Terminal Information Service
ATM	Air Traffic Management
ATN	Aeronautical Telecommunication Network
ATNI	ATN internet
ATNP	ATN Panel
ATNP	ATN Panel
ATNPA	ATN protocol architecture
ATNSM	ATN systems management
ATS	Air Traffic Services
ATSC	Air Traffic Services Communications
ATSU	Air Traffic Services Unit
AU	Access unit

BCD	Binary Coded Decimal
BER	Basic Encoding Rules (of ASN.1)
BIS	Boundary intermediate system
BISPDU	BIS PDU
BPS	Bits per second
BSI	British Standards Institute
~~C~~	~~Conditional~~
C	Counter
CAA	Civil aviation administration
CAN	Cancellation
CC	Connection confirm
CCITT	International Telegraph and Telephone Consultative Committee
CDSE	Confirmed Data Service Element
CDT	Credit
CE	Congestion experienced flag
CF	Control Function
CIDIN	Common ICAO data interchange network
CL	Connectionless mode
CLNP	CL network protocol
CLNPMMO	CL network protocol machine MO
CLNS	CL network service
CLTP	CL transport protocol
CLTPMMO	CL transport protocol machine MO
CLTS	CL transport service

CM	Context Management (CNS/ATM-1 Package Application)
CMIP	Common management information protocol
CMIS	Common management information service
CMISE	CMIS element
CN	Connect
CNS	Communications, Navigation, and Surveillance
CNS/ATM	Communications Navigation Surveillance / Air Traffic Management
CO	Connection mode
COMSEC	Communications security
COTP	CO transport protocol
COTP	Connection-oriented transport protocol
COTPMMO	COTP protocol machine MO
COTS	CO transport service
CP	Connect PPDU
CPA	Connect Accept PPDU
CPC	Controller-Pilot Communications (CNS/ATM-1 Package Application)
CPDLC	Controller-Pilot Data Link Communications (ATNP preferred term = “CPC”)
CPR	Connect Reject PPDU
CR	Connection request
CR	Context Restoration
CVER	Compressed VER
DC	Demand Contract
DC	Disconnect confirm
DCC	Data country code

DCE	Data circuit terminating equipment
DCPC	Direct Controller-Pilot Communications (ATNP preferred term = “CPC”)
DFDAU	Digital flight data acquisition unit
DL	Distribution List
DN	Disconnect
DOD	Department of Defense
DPA	Distinguishing path attribute
DR	Disconnect request
DS	Dialogue Service
DSP	Data link service provider
DSP	Domain specific part
DST-REF	Destination reference
DT	Data
DT	Data Transfer SPDU
DTE	Data terminal equipment
E/C	Error probability over cost flag
E/R	Error report requested
E/T	Error probability over transit delay flag
EA	ED acknowledge
ED	Expedited data
EGP	Exterior gateway protocol
EoS	Element of Service
EOT	End of TSDU
ER	Error [TPDU]

ER	Error report [NPDU]
ER	Error report requested flag
ERD	End routing domain
ERP	Echo Response [NPDU]
ERQ	Echo Request [NPDU]
ES	End System
ESCT	ES configuration timer
ESH	ES hello
EX	Expedited Data SPDU
EXCEP	Exceptions
EXP	LOCREF extension flag
F/M	Fixed/Mobile
FANS	Future Air Navigation Systems
FD	Functional Description
FD	Full Duplex
FDPS	Flight Data Processing System
FG	Functional Group
FIB	Forwarding information base
FIBMO	FIB MO
FIFO	First in first out
FIS	Flight Information Services (CNS/ATM-1 Package Application)
FMS	Flight management system
FN	Finish SPDU
FOM	Figure Of Merit

FP	Full/Prefix
FSM	Finite state machine
FTAM	File transfer, access and management
FU	Functional Unit
G	Gauge
GA	General Aviation
GDMO	Guideline for definition of MOs
GES	Ground earth station
GT	Give Tokens SPDU
HD	Half Duplex
HF	High Frequency
HI	High Interface
~~I~~	~~Out of scope~~
IA5	International Alphabet Number 5
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
ICC	Inter-Centre Coordination (CNS/ATM-1 Package Application)
ICC	Inter-Centre Communications
ICD	International code designator
ICS	Implementation conformance statement
ID	Identification
ID	Identifier
IDI	Initial domain identifier
IDP	Initial Domain Part

IDRP	Interdomain routing protocol
IDRPCFGMO	IDRP configuration MO
IEC	International Electrotechnical Commission
IIH	IS-IS hello
IMF	International Monetary Fund
IOC	Internet operations centre
IP	Internetwork protocol
IPI	Initial protocol identifier
IPM	Interpersonal message
IPMS	Interpersonal Messaging System
IPN	Interpersonal notification
IPRL	ISP Protocol RL
IS	International Standard
IS	Intermediate system
ISDN	Integrated Services Digital Network
IS-SME	IS SME
ISH	IS hello
ISN	Initial sequence number
ISO	International Organization for Standardization
ISOPA	ISO protocol architecture
ISORM	ISO reference model
ISP	International standardized profile
ISPICS	ISP Implementation Conformance Statement
ITA-2	International Telegraph Alphabet No. 2

ITU	International Telecommunication Union
ITU-T	ITU Telecommunication Standardization Sector
IUT	Implementation under test
IVMO	Initial value MO
K	Kilo
L1R	Level 1 Router
L2R	Level 2 Router
LAN	Local area network
LI	Low Interface
LI	Length indicator
LINKMO	Linkage MO
LOC	Location Identifier
LOCD	LOC Default [Flag]
LOCREF	Local reference
LOCRIBMO	Local RIB MO
LSP	Link state PDU
~~M~~	~~Mandatory~~
M	More [bit] (X.25)
MA	Major Synchronisation
MAC	Medium Access Control
MAD	Management administrative domain
MD	Management Domain
MET	Meteorological
MF-Address	MHS-form address

MHS	Message Handling Services (CNS/ATM-1 Package Application)
MHS	Message handling system
MIB	Management information base
MIDS	Management information definition statement
MIS	Management information service
MO	Managed object
MOA	MO attribute
MOCS	MO conformance statement
MOD	Modulus
Mode S	Mode Select
MORTS	MO requirement template specification
MOTIS	Message-oriented text interchange system
MS	More segments flag
MS	Message store
MTA	Message transfer agent
MTS	Message Transfer System
MTSE	Message transfer service element
N/A	Not applicable
NATO	North Atlantic Treaty Organization
NE	Network entity
NEMO	NE MO
NET	NE title
NL	Network layer
NLE	NL entity

NLM	NL management
NLPI	NL protocol information
NLRI	NL reachability information
NLSP	NL security protocol
NM	Network management
NOR	No orderly release
NOTAM	Notice to Airmen
NPAI	Network protocol address information
NPDU	Network protocol data unit
NR	Negotiated Release
NRN	Non-Receipt Notification
NS	Network service
NSAP	Network Service Access Point
NSAPMO	NSAP MO
NSDU	NS data unit
NSMO	Network subsystem MO
~~O~~	~~Optional~~
O/R	Originator/recipient
OA	Overflow Accept
OCA	Object class attributes
OCN	Object class notifications
OCNB	Object class name bindings
OHI	Optional Heading Information
OID	Object Identifier

OOC	Operations on object classes
OR	Operational Requirement
OSI	Open Systems Interconnection
OSIE	OSI environment
OSIM	OSI management
OSISME	OSI SM environment
P	Priority
PC	Personal Computer
PCI	Protocol control information
PDAI	Predetermined address indicator
PDAM	Proposed Draft Addendum
PDN	Public data network
PDU	Protocol Data Unit
PDV	Presentation Data Value
PER	Packed Encoding Rules (of ASN.1)
PIB	Policy information base
PIBMO	PIB MO
PICS	Protocol implementation conformance statement
PIREP	Pilot Report
PPDU	Presentation PDU
PR	Prepare
PRL	Profile Requirements List
PRMD	Private management domain
PSAP	Presentation service access point

PSDN	Packet switched data network
PT	Please Tokens
PTT	Post, telephone, and telegraph
Q	QOS Maintenance
QoS	Quality of Service
~~R~~	~~Recommended~~
~~R~~	~~Read-only~~
R&R	Requirements and Recommendations
R/W	Read/write
RA	Routing area
RCP	Required Communication Performance
RD	Routing domain
RD PDU	Redirect PDU
RDC	Routing domain confederation
RDF	Routing domain format
RDFD	RDF Domain [Flag]
RDI	Routing domain identifier
RDP	Router Domain Part
REL	Release
RER	Residual Error Rate
RESYNC	Resynchronisation
RF	Radio frequency
RF	Refuse
RIB	Routing information base

RJ	Reject
RL	Requirements list
RLRE	ACSE Release Response APDU
RLRQ	ACSE Release Request APDU
RLS	Release
RN	Receipt Notification
ROA	Request of Acknowledgement
ROSE	Remote operation service element
RP	Routing information exchange protocol
RPF	Reference publication format
RPOA	Recognised private operating agency
RTE	Receiving TE
RTSE	Reliable transfer service element
~~S~~	~~W (creation), R (lifetime)~~
S/T	Segmentation over transit delay flag
SAC	Short Accept
SARPs	Standards and Recommended Practices
SCN	Short Connect
SDU	Service data unit
SEL	(Transport) Selector
SHORT-CP	Short Connect PPDU
SHORT-CPA	Short Connect Accept PPDU
SHORT-CPR	Short Connect Reject PPDU
SICASP	SSR Improvements and Collision Avoidance Systems Panel

SM	Systems management
SMA	SM application
SMAE	SM AE
SME	SM entity
SMF	SM function
SMFA	SM functional area
SN	Subnetwork
SNAcF	SN access function
SNAcP	SN access protocol
SNCR	SN connection reference
SNDCF	SN dependent convergence function
SNDCP	SN dependent convergence protocol
SNICF	SN independent convergence function
SNICP	SN independent convergence protocol
SNSDU	SN SDU
SN-SME	SN SME
SNL	SN layer
SNOWTAM	Snow NOTAM
SNP	Sequence number PDU
SNPA	SN point of attachment
SNQOS	SN QoS
SNS	SN service
SP	SN Processor
SP	Segmentation permitted flag

SPDU	Session PDU
SPI	Subsequent protocol identifier
SPM	Session Protocol Machine
SRC-REF	Source reference
SRF	Short Refuse
SS	Symmetric Synchronise
SS	Session Service
SSR	Secondary surveillance radar
ST/SYS	Storage and transfer system
STE	Sending TE
SY	Minor Synchronise
SYS	System Identifier
SYS4	SYS 4th Octet [Flag]
SYS5	SYS 5th Octet [Flag]
SYS6	SYS 6th Octet [Flag]
T	Tidemark
T/C	Transit delay over cost flag
T/SYS	Transfer system
TC	Transport connection
TCIVMO	TC IVMO
TCMO	TC MO
TCP	Transmission control protocol
TCQIVMO	TC QoS IVMO
TD	Typed Data

TE	Transport entity
TEMO	TE MO
TI	Transmission identification
TLE	Transport layer entity
TP4	Transport protocol class 4
TPDU	Transport protocol data unit
TPDU-NR	TPDU send sequence number
TR	Technical report
TRD	Transit routing domain
TS	Transport service
TSAP	Transport Service Access Point
TSAPMO	TSAP MO
TSDU	TS data unit
TSMO	Transport subsystem MO
TSN	Tag set name
TWDL	Two-Way Data Link (ATNP preferred term = “CPC”)
TWS	Terminal Weather Service
U	User option
UA	User agent
UC	Update Contract
UD	Unit data
UHF	Ultra high frequency
UTC	Co-ordinated Universal Time
VC	Virtual circuit

VDL	VHF data link
VER	Version
VHF	Very high frequency
WAN	Wide area network
WR	Receive window value
WS	Send window value
WX	Weather
~~X~~	~~Excluded~~
X	Hexadecimal
YR-EDTU-NR	Expected ED TPDU sequence number in EA (‘your ED TPDU number')
YR-TU-NR	Expected TPDU sequence number (‘your TPDU number')