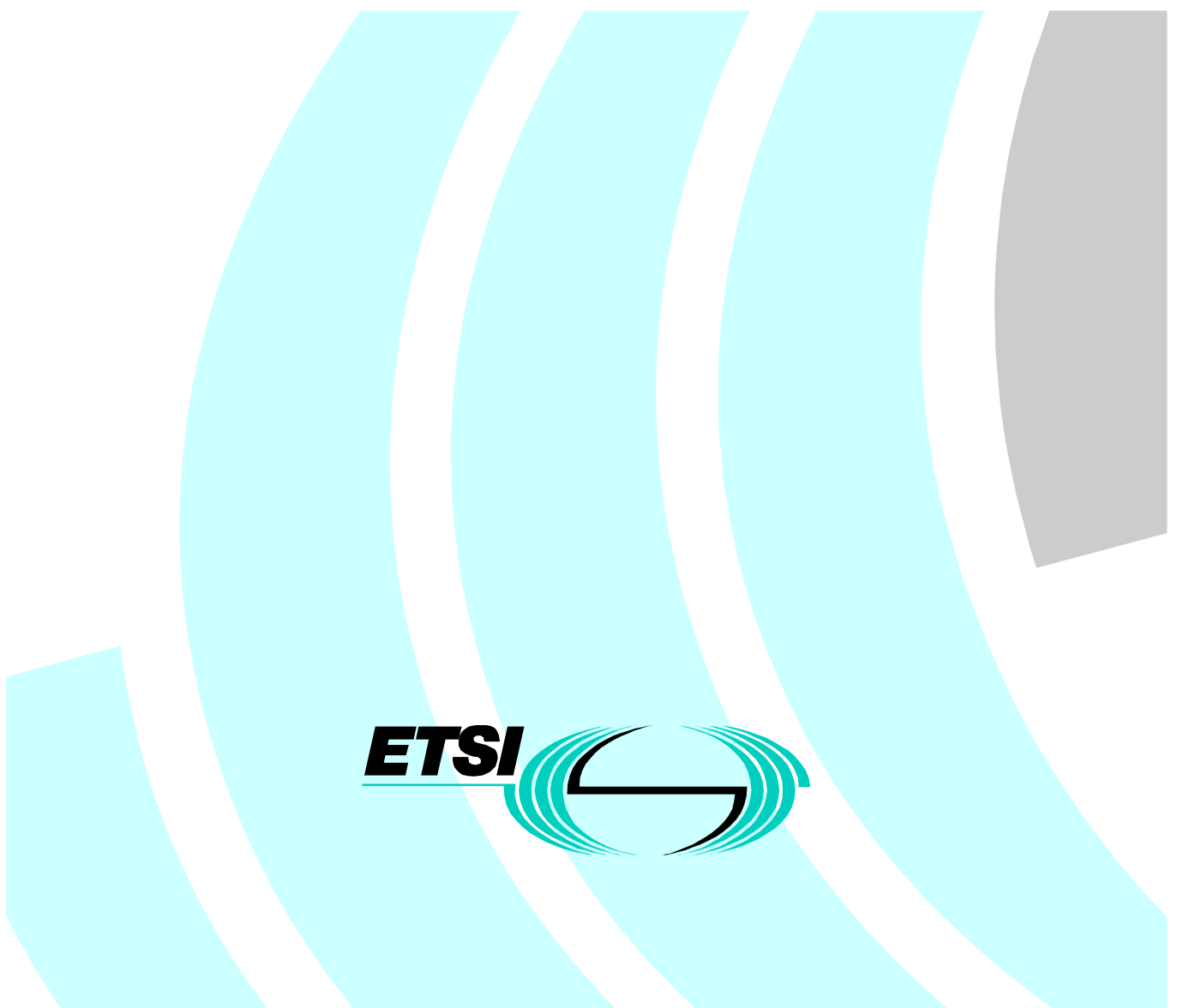


## **Technical Framework for the Provision of Interoperable ATM Services Overview**



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**Reference**

DTR/EASI-000001 (fho00ics.PDF)

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**Keywords**

ATM, interface, interoperability, NNI

**ETSI**

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## Foreword

This Technical Report (TR) has been produced by ETSI Project ATM Services Interoperability (EASI).

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# 1 Scope

The present document is an overview of a set of specifications [1] to [5] defining the network-network interface to enable service interoperability between ATM networks. This will be achieved through adequate specification of network-network interfaces in the following planes:

- the Network User and Control Planes;
- the Network Management Plane.

NOTE: The Network User, Control and Management planes are in accordance with the ITU-T Recommendation I.321 [6] defining the B-ISDN Protocol Reference Model.

In particular the aims of the project are:

- to focus on interoperable interfaces between networks, for the transport of User plane information, network control and network management information;
- to allow for the interoperability of ATM networks by means of gateway functions, so that these networks can be developed independently;
- to identify minimum technical standards to ensure secure interoperability;
- to set up pragmatic phases to allow the systematic introduction of network and management capabilities.

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# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

- [1] TS 101 674-1: "Technical Framework for the Provision of Interoperable ATM Services; Network-Network Interface (NNI) User and Control plane specification (including Network Functions and Service Aspects) Phase 1".
- [2] TS 101 674-2: "Technical Framework for the Provision of Interoperable ATM Services; Network Management (X-interface) Specification for Phase 1 Implementation".
- [3] TS 101 675-1: "Technical Framework for the Provision of Interoperable ATM Services; Network-Network Interface (NNI) User and Control plane specification (including Network Functions and Service Aspects) Phase 2".
- [4] TS 101 675-2: "Technical Framework for the Provision of Interoperable ATM Services; Network Management (X-interface) Specification for Phase 2 Implementation".
- [5] EG 201 676: "Technical Framework for the Provision of Interoperable ATM Services; Guide to the provision of service interoperability".

NOTE: Not yet published.

- [6] ITU-T Recommendation I.321 (1991): "B-ISDN Protocol Reference Model and its application".

## 3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

ATM	Asynchronous Transfer Mode
EASI	ETSI project, ATM Services Interoperability
ETSI	European Telecommunications Standards Institute
NNI	Network-Network Interface
VC	Virtual Channel
VCC	Virtual Channel Connection
VP	Virtual Path
VPC	Virtual Path Connection

## 4 Phases

The ATM Specifications initially define two distinct phases. The first (Phase 1) provides an interoperability specification covering a limited set of features and capabilities, while the second (Phase 2) covers aspects which are enhancements to Phase 1. Additional functionality may be defined in further phases.

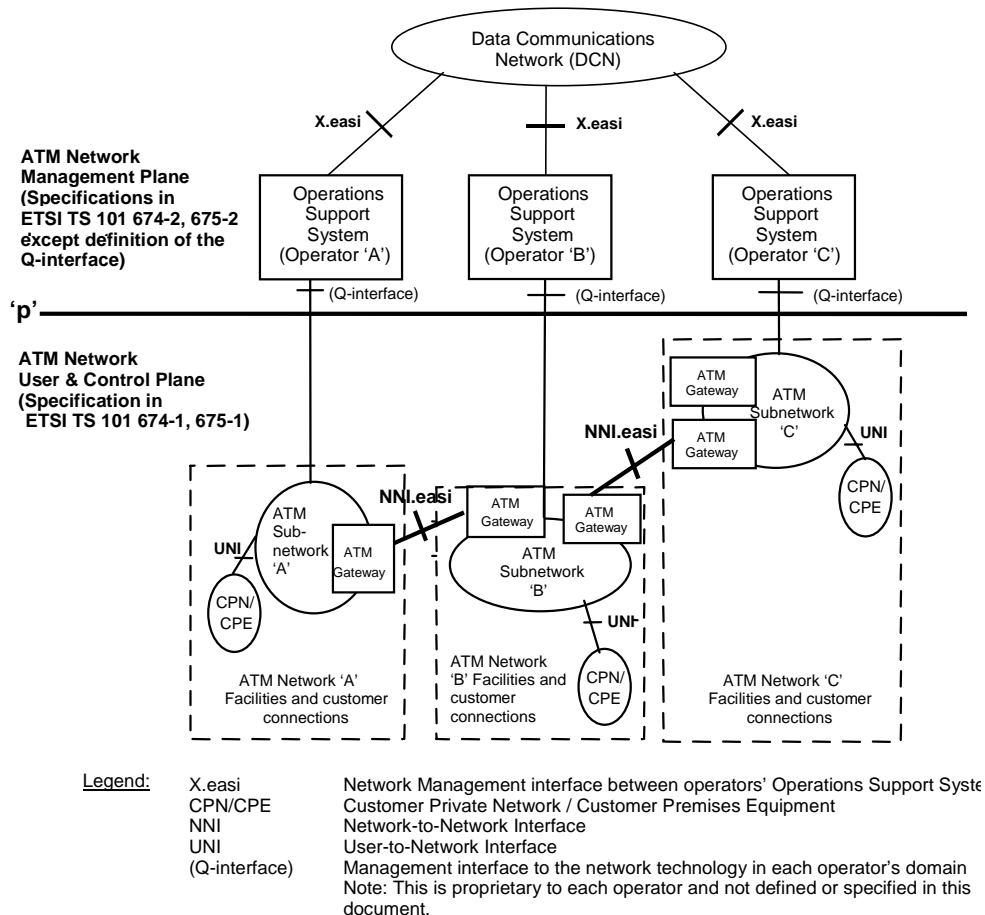
The main functionalities for Phases 1 and 2 are shown in table 1 below.

**Table 1: Main functionalities for Phases 1 and 2**

Phases	Main functionalities
Phase 1	NNI Interface: <ul style="list-style-type: none"> <li>- Permanent/ semi-permanent VP &amp; VC connections</li> <li>- Switched VC connections</li> <li>- Basic ATM transfer capabilities</li> <li>- Basic signalling capabilities</li> </ul> Network Management interface: <ul style="list-style-type: none"> <li>- FM and CM procedures for SVC, PVP, PVC</li> <li>- Automated interface specifications for FM and CM for SVC, PVP and PVC</li> <li>- Basic access control, access control with authentication</li> <li>- Usage measurement parameters defined for SVC, PVP, PVC</li> <li>- Procedures for Administration of Management Systems</li> <li>- Consistent management identifier scheme</li> </ul>
Phase 2 (additions to Phase 1)	NNI Interface: <ul style="list-style-type: none"> <li>- Switched VPs connection</li> <li>- Additional ATM transfer capabilities</li> <li>- Additional signalling capabilities</li> <li>- Interworking capabilities (e.g. with 64 kbit/s ISDN)</li> </ul> Network Management Interface: <ul style="list-style-type: none"> <li>- Processes and interface specifications of PM of SVC, PVC, PVP</li> <li>- Automated usage metering interface specification</li> <li>- Additional FM and CM functions</li> <li>- Enhanced NM Security Mechanisms</li> <li>- Enhancements to procedures for Administration of - Management Systems</li> </ul>

## 5 Network Architecture

The network architecture forming the basis for the present document is described in figure 1, which gives an overview of the technical scope and the interfaces to be provided for the interconnection of ATM networks. These interfaces allow for the interoperability of ATM networks and the exchange of information between their Management Planes, in order to provide services based on or supported by ATM across network boundaries. In particular, this specification is founded on the use of 'Gateways' that separate the inter-domain part from the internal part of the ATM networks.



**Figure 1: Technical scope and the interfaces**

Figure 1 gives an overview of the technical scope and the interfaces to be provided for the interconnection of ATM networks. These interfaces allow for the interoperability of ATM networks and the exchange of information between their Management Planes, in order to provide services based on or supported by ATM across network boundaries. In particular, the proposal is founded on the use of 'Gateways' that separate the inter-domain part from the internal part of the ATM networks.

Specifically, the interfaces which are identified to support the ATM interoperability are as follows:

- the term NNI.easi interface covers the User and Control Planes and is used to specify the interface in terms of transfer of user information and connection control for the interconnection of ATM networks;
- the term X.easi interface covers the Management Plane and has been chosen to reference all management interfaces between network operators covering both automated real-time and manual capabilities.

Each network will need at least one X.easi management interface and at least one NNI.easi interface. These interfaces will need to be replicated as necessary to meet individual network operator "Quality of Service" and resilience objectives.

The physical interface supporting any given X.easi interface for the Management Plane may be different to that supporting the physical NNI.easi interfaces for the User and Control Planes.

Transit traffic may enter and leave the transit network via separate gateways.

An interface between any given network operators' operations support system and its associated network is referred to as 'Q.any', which could be a standardized or proprietary interfaces. There is no intention to offer a recommendation for the specification of these interfaces but in some cases requirements for functionality across these interfaces are implied so as to support the X.easi interfaces.

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## 6 Items identified to specify the ATM EASI interfaces

This clause provides a list of topics which are covered by the specifications of the NNI.easi interface and the X.easi. For some topics there are different degrees of specification, depending upon whether it is for Phase 1 or Phase 2. Furthermore, some topics are only relevant for Phase 2.

### 6.1 NNI.easi interface

- Network Architecture:
  - Numbering Plan;
  - Interworking with non-ATM networks;
- Generic requirements and capabilities of the NNI.easi interface:
  - User Plane:
    - Physical Layer;
    - ATM Layer;
  - Control Plane:
    - Protocol stack at the NNI.easi interface;
    - ATM transfer capability of signalling channels;
    - Support of supplementary services;
- Network requirements:
  - Multiplexing of VCCs;
  - Technical capabilities to support services;
  - Security of the user and control planes;
- Resilience requirements;
- Service usage metering functionalities;
- Testing.



## 6.2 X.easi interface

- Business model for inter-connected ATM Services provision:
  - Policy issues;
- ATM Interconnect services and process model;
- Pre-Service Interconnect Services and Processes:
  - Interconnect Service Definition Processes;
  - Interconnect Service Establishment Processes;
  - Interconnect Service Administration Processes;
- In-Service Interconnect Service Operations Processes including the X.easi management interface:
  - Ordering Processes;
  - Maintenance and Repair Processes;
  - Performance and QoS Processes;
  - Accounting and Billing Processes;
  - Security Processes.

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## History

<b>Document history</b>		
V1.1.1	October 1999	Publication