



The ATM Forum
Technical Committee

PNNI Version 1.0
Security Signaling
Addendum

AF-CS-116.000

May, 1999

© 1999 by The ATM Forum. This specification/document may be reproduced and distributed in whole, but (except as provided in the next sentence) not in part, for internal and informational use only and not for commercial distribution. Notwithstanding the foregoing sentence, any protocol implementation conformance statements (PICS) or implementation conformance statements (ICS) contained in this specification/document may be separately reproduced and distributed provided that it is reproduced and distributed in whole, but not in part, for uses other than commercial distribution. All other rights reserved. Except as expressly stated in this notice, no part of this specification/document may be reproduced or transmitted in any form or by any means, or stored in any information storage and retrieval system, without the prior written permission of The ATM Forum.

The information in this publication is believed to be accurate as of its publication date. Such information is subject to change without notice and The ATM Forum is not responsible for any errors. The ATM Forum does not assume any responsibility to update or correct any information in this publication. Notwithstanding anything to the contrary, neither The ATM Forum nor the publisher make any representation or warranty, expressed or implied, concerning the completeness, accuracy, or applicability of any information contained in this publication. No liability of any kind shall be assumed by The ATM Forum or the publisher as a result of reliance upon any information contained in this publication.

The receipt or any use of this document or its contents does not in any way create by implication or otherwise:

- Any express or implied license or right to or under any ATM Forum member company's patent, copyright, trademark or trade secret rights which are or may be associated with the ideas, techniques, concepts or expressions contained herein; nor
- Any warranty or representation that any ATM Forum member companies will announce any product(s) and/or service(s) related thereto, or if such announcements are made, that such announced product(s) and/or service(s) embody any or all of the ideas, technologies, or concepts contained herein; nor
- Any form of relationship between any ATM Forum member companies and the recipient or user of this document.

Implementation or use of specific ATM standards or recommendations and ATM Forum specifications will be voluntary, and no company shall agree or be obliged to implement them by virtue of participation in The ATM Forum.

The ATM Forum is a non-profit international organization accelerating industry cooperation on ATM technology. The ATM Forum does not, expressly or otherwise, endorse or promote any specific products or services.

NOTE: The user's attention is called to the possibility that implementation of the ATM interoperability specification contained herein may require use of an invention covered by patent rights held by ATM Forum Member companies or others. By publication of this ATM interoperability specification, no position is taken by The ATM Forum with respect to validity of any patent claims or of any patent rights related thereto or the ability to obtain the license to use such rights. ATM Forum Member companies agree to grant licenses under the relevant patents they own on reasonable and nondiscriminatory terms and conditions to applicants desiring to obtain such a license. For additional information contact:

The ATM Forum
Worldwide Headquarters
2570 West El Camino Real, Suite 304
Mountain View, CA 94040-1313
Tel: +1-650-949-6700
Fax: +1-650-949-6705

Acknowledgments

The editor would like to acknowledge the members of the CS working group and the Security working group who have contributed to this document during the meetings, via email and with written contributions. The following members have made significant contribution to this effort:

Malcolm Wiles (CS WG Chairperson)

Robert B. Dianda

Rob Rennison

Richard F. Graveman (Security WG Chairperson)

Tom Tarman

Brian Rosen

The assistance of these members and all who participated in the ATM UNI Signaling 4.0 Security Addendum is greatly appreciated

Carter Bullard, Editor

Table of Contents

1. INTRODUCTION.....	1
2. REFERENCES.....	1
3. CODING REQUIREMENTS.....	2
3.1. BASIC POINT-TO-POINT CALLS.....	2
3.2. POINT-TO-MULTIPOINT CALLS.....	3
4. SECURITY SERVICES INFORMATION ELEMENT.....	4
5. CALL/CONNECTION CONTROL PROCEDURES IN SUPPORT OF SECURITY.....	4

1. Introduction

This document is the Security Addendum to the ATM Private Network to Network Interface (PNNI) Specification Version 1.0 [PNNI 1.0]. This document defines extensions to messages, an additional information element, and PNNI signaling procedures to support security services.

The ATM Security Specification, Version 1.0 [SEC 1.0], specifies a collection of security services for ATM VC/VPs. The concepts and reference models for ATM security services and their impact on PNNI signaling are described in detail in the [SEC 1.0].

Security services are provided by the ATM Security Agent. An ATM security agent is an abstract object that provides the methods needed to initiate and maintain the collection of ATM security services outlined in the ATM Forum Security Specification [SEC 1.0]. The procedures outlined in this section are a specification for an implementation of the ATM security agent function with respect to PNNI Signaling.

The ATM Forum security agent provides a number of security services and mechanisms that may have either direct or indirect impacts on existing PNNI 1.0 signalling procedures. Section 2.3 of [SEC 1.0] decomposes the functions of the Security Agent into four components. Of these components, SA_{sme} includes the functions of the Security Agent that perform the Security Message Exchange. SA_{sme} functions can be categorized into three basic types; those that should be processed prior to, during, and after the existing set of PNNI 1.0 signalling procedures. The Security Specification Version 1.0 [SEC 1.0] control plane security services and the In-Band security message exchange procedures of the security agent do not require modification to the existing PNNI 1.0 signalling procedures.

2. References

- [PNNI 1.0] ATM Forum Technical Committee, Private Network-Network Interface Specification v1.0, af-pnni-0055.000, March 1996
- [SEC 1.0] ATM Forum Technical Committee, "ATM Security Specification Version 1.0", af-sec-0100.001, February, 1999. (~~Note 1~~)
- [UNI SEC] ATM Forum Technical Committee, UNI 4.0 Signaling Security Addendum, af-cs—0117.000, February 1999 (~~Note 1~~)

~~Note 1 — This document is in course of preparation for publication in 1999.~~

3. Coding Requirements

This section lists the messages and information elements whose contents have been modified to support ATM Security Services capability.

In this specification, subclauses, annexes, appendices, etc. of referenced documents, such as PNNI 1.0, are identified by the actual subclause/annex/appendix number from that document, the document number and the title of the subclause/annex/appendix. For example, an exception to procedures in section 6.3.1.3 of PNNI 1.0 is identified below by a statement titled "6.3.1.3/PNNI 1.0 CONNECT".

6.3.1.3.1. Basic Point-to-Point Calls

Add the following sections:

6.3.1.1/PNNI 1.0 ALERTING:

Add the following to Figure 6-3/PNNI 1.0:

Information Element name	Reference	Type	Length
Security Services information element	4	O	12-512

6.3.1.3/ PNNI 1.0 CONNECT:

Add the following to Figure 6-5/PNNI 1.0:

Information Element name	Reference	Type	Length
Security Services information element	4	O	12-512

6.3.1.5/ PNNI 1.0 RELEASE:

Add the following to Figure 6-6/PNNI 1.0:

Information Element name	Reference	Type	Length
Security Services information element	4	O	12-512

6.3.1.7/ PNNI 1.0 SETUP:

Add the following to Figure 6-8/PNNI 1.0:

Information Element name	Reference	Type	Length
Security Services information element	4	O	12-512

1.2.3.2. Point-to-Multipoint Calls

Add the following sections:

8.1.2.1/ PNNI 1.0 ADD PARTY:

Add the following to Figure 6-19/PNNI 1.0:

Information Element name	Reference	Type	Length
Security Services information element	4	O	12-512

8.1.2.2/ PNNI 1.0 ADD PARTY ACKNOWLEDGE:

Add the following to Figure 6-20/PNNI 1.0:

Information Element name	Reference	Type	Length
Security Services information element	4	O	12-512

8.1.2.3/ PNNI 1.0 PARTY ALERTING:

Add the following to Figure 6-21/PNNI 1.0:

Information Element name	Reference	Type	Length
Security Services information element	4	O	12-512

8.1.2.4/ PNNI 1.0 ADD PARTY REJECT:

Add the following to Figure 6-22/PNNI 1.0:

Information Element name	Reference	Type	Length
Security Services information element	4	O	12-512

8.1.2.5/ PNNI 1.0 DROP PARTY:

Add the following to Figure 6-23/PNNI 1.0:

Information Element name	Reference	Type	Length
Security Services information element	4	O	12-512

8.1.2.6/ PNNI 1.0 DROP PARTY ACKNOWLEDGE:

Add the following to Figure 6-24/PNNI 1.0:

Information Element name	Reference	Type	Length
Security Services information element	4	O	12-512

4. Security Services Information Element (SSIE)

See section 4 of [UNI SEC].

5. Call/connection Control Procedures In Support Of Security

This section describes the call/connection control procedures to support the establishment of ATM security services. The procedures for basic call/connection control as described in section 6 of [PNNI 1.0] shall apply. Only additional procedures to support ATM security services are described in this section.

Upon receipt of a message, if there is a security agent present, the signaling entity shall send the message to the SA_{sme} immediately after entering the appropriate state, eg. NN1 in the case of a SETUP message, and updating appropriate timers, but prior to any other processing of the message. The SA_{sme} shall either return a possibly modified message, or an indication to reject the call together with the cause #21 "Call Rejected", with the rejection reason indicating Security Exception, a diagnostic, and an indication of whether crankback is permissible. If the SA_{sme} does not reject the call, the signaling entity shall progress the message received from the SA_{sme}.

Prior to transporting a message, if there is a security agent present, the signaling entity shall send the message to the SA_{sme}. The SA_{sme} will either return a possibly modified message, or return an indication to reject the call together with the cause #21 "Call Rejected", with the rejection reason indicating Security Exception, a diagnostic and an indication of whether crankback is permissible. If the SA_{sme} does not reject the call, the signaling entity shall transmit unchanged the message received from the SA_{sme} to its peer.

In both of the above cases, when crankback is indicated, the crankback cause code #63 "Service or option not available, unspecified" shall be used.

Implementation Note: The SA_{sme} may not return a message sent to it for an extended period of time. For example, it may hold a CONNECT message while an In-Band Security Message Exchange is completed. Implementation of the sending primitives between the signaling entity and the SA_{sme} may need to be asynchronous.

When there is no security agent present, and a Security Services Information Element (SSIE) is present in a received message, the unmodified SSIE shall be progressed with the message.

When the message contains an SSIE, the signaling entity shall set its pass-along indicator.

If the Security Services information element cannot be transported because of interworking considerations, the call shall progress without the SSIE.