
Security for OSI-Based TMN Interfaces

Contents

List of Figures0.....	xv
List of Tables.....0.....	* xvii
Preface.....*	Preface-1
Bellcore's Interactive GR Process.....	Preface-1
FA-TA-TR to GR.....0.000.0.....0.000.....	Preface-1
Transition Phase.....	Preface-1
Comments and Issues List Report Mechanism.....	Preface-2
GR-1469 Current Maturity Level, Status and Plans.....	Preface-2
Formatting Comments.....	Preface-3
Where and When to Submit Comments.....	Preface-4
1. Introduction.....	1-1
1.1 <i>scope</i>	1-1
1.2 Layered security architecture.....	1-3
1.3 Other security considerations.....	1-5
1.4 Requirements Terminology.....	1-6
1.5 Requirement Labeling Conventions.....	1-6
1.5.1 Numbering of Requirement and Related Objects.....	1-6
1.5.2 Requirement , Conditional Requirement, and Objective Object Identification	1-7
2. Background.....	2-1
2.1 Operational Environment.....	2-1
2.2 Communications Environment.....**.....*.....*	2-3
3. Threats to TMN Interfaces.....	3-1
3.1 Threats to the Integrity and Confidentiality of Information.....	3-1
3.2 Unauthorized Access to Resources through the Interfaces.....	3-2
3.3 Repudiation.....*	3-3
4. <i>security Services</i>	4-1
4.1 Security Semites and Security Mechanisms.....	4-2
4.2 Authentication Service.....	4-3
4.3 Access Control Service.....	4-3
4.4 Confidentiality Service*	4-4
4.5 Data Integrity Service.....	4-5
4.6 Non-Repudiation Service.....	4-5
4.7 Other Security Concerns.....*	4-6
4.7.1 OSI Security Management.....	4-6

4.7.2	Security Alarm.....*	4-7
4.7.3	Security Audit Log.....*	4-7
4.8	Security Requirements of Specific Applications	4-8
5.	Security Mechanisms	5-1
5.1	One-way Hashing.....0.....	5-2
5.2	Encryption	5-3
5.2.1	Symmetric Encryption.....*	5-3
5.2.2	Asymmetric Encryption	5-3
5*3	Authentication Mechanisms	5-3
5.3.1	Association Request.....	5-4
5.3.1.1	Simple Authentication Seal	5-4
5.3.1.2	Strong Authentication Seal.....	5-5
5.3.1.3	Digital Signature.....	5-5
5.3.2	Association Response.....	5-6
5.3.3	Connectionless Authentication.....	5-6
5.4	Integrity Mechanisms	5-6
5.5	Access Control Mechanisms	5-7
5.6	External Information	5-8
5.6.1	Security Paths.....	5-8
5.6.2	Directory Linking.....	5-9
5.7	Key Management and Distribution	5-9
5.7.1	X.500 Directory.....	5-10
5.7.2	Kerberos	5-10
5.7.3	Distribution of Security Information.....	5-10
5.7.3.1	Distribution of symmetric encryption keys	5-11
5.7.3.2	Distribution of public key certificates	5-12
5.8	Authentication Server	5-12
6.	OSI Security Work.....	6-1
6.1	OSI Security Architecture	6-1
6.2	Upper Layers Security.....	6-2
6.2.1	Upper Layers Security Model.....	6-2
6.2.2	Infrastructure/Support Security.....	6-2
6.2.2.1	Association Control Service Element.....	6-2
6.2.2.2	Generic Upper Layer Security	6-3
6.2.3	Application-Specific Security.....	6-4
6.2.3.1	Common Management Information Semite Element	6-4
6.2.3.2	File Transfer, Access, and Management.....	6-5
6.2.3.3	X.500 Directory	6-5
6.3	Lower Layer Security Services	6-6
6.3.1	Link Layer Security Services	6-6
6.3.2	Network Layer Security Services	6-7
6.3.3	Transport Layer Security Services	6-8
7.	Security Requirements for the OSI-Based TMN Interfaces	7-1

7.1	Baseline Requirements	7-1
7.2	Requirements for Encryption	7-2
7.2.1	Requirements for DES	7-2
7.2.2	Requirements for PKCS	7-3
7.3	Requirements for Identification	7-4
7.4	Requirements for Authentication	7-5
7.5	Requirements for Data Integrity	7-7
7.6	Requirements for Access Control	7-8
7.7	Confidentiality	7-10
7.8	Non-Repudiation	7-11
7.8.1	Non-Repudiation of Origin	7-11
7.8.2	Non-Repudiation of Delivery	7-11
7.9	Key Distribution	7-12
7.10	General Security Mechanisms	7-13
7.11	security Alarm	7-13
7.12	Security Audit	7-13
Appendix A:	Requirement-Object List	A-1
Appendix B:	Encoding of Authentication and Digital Signature Information	B-1
Appendix C:	Interoperability	C-1
References	References-1
Glossary	Glossary-1
Requirement-Object Index	Index-1

List of Figures

Figure 2-1.	TMN Physical Architecture*	2-1
Figure 2-2.	Communication Environment of GR-828-CORE	2-5
Figure 6-1.	Location of TLSP in the OSI Model.....	6-8

List of Tables

Table 1-1.	Security Features of ISO Standards	1-4
Table 4-1.	Security Services vs. Security Threats.....	4-1
Table 4-2.	Severity of Threats to TMN Applications	4-8
Table 5-1.	Security Services vs. Security Mechanisms	* 5-1
Table 5-2.	Digital Signature Algorithms.....	5-5