



## **Electronic Signatures and Infrastructures (ESI); Registered Electronic Mail (REM) Services; Part 4: Interoperability profiles**

**STABLE DRAFT FOR PUBLIC REVIEW UNTIL 29 DECEMBER 2017**

**Download the template for comments:**

[https://docbox.etsi.org/ESI/Open/Latest Drafts/Template-for-comments.doc](https://docbox.etsi.org/ESI/Open/Latest%20Drafts/Template-for-comments.doc)

**Send comments ONLY to [E-SIGNATURES COMMENTS@list.etsi.org](mailto:E-SIGNATURES_COMMENTS@list.etsi.org)**

**CAUTION: This DRAFT document is provided for information and is for future development work within the ETSI Technical Committee ESI only. ETSI and its Members accept no liability for any further use/implementation of this Specification.**

**Approved and published specifications and reports shall be obtained exclusively via the ETSI Documentation Service at**

<http://www.etsi.org/standards-search>

0  
1

## Reference

---

DEN/ESI-0019532-4

## Keywords

---

<keywords>

2

**ETSI**

650 Route des Lucioles  
F-06921 Sophia Antipolis Cedex - FRANCE

---

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C  
Association à but non lucratif enregistrée à la  
Sous-préfecture de Grasse (06) N° 7803/88

---

**Important notice**

---

The present document can be downloaded from:  
<http://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the only prevailing document is the print of the Portable Document Format (PDF) version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at  
<https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

If you find errors in the present document, please send your comment to one of the following services:  
<https://portal.etsi.org/People/CommiteeSupportStaff.aspx>

---

**Copyright Notification**

---

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.  
The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2017.  
All rights reserved.

**DECT™**, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members.  
**3GPP™** and **LTE™** are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.  
**oneM2M** logo is protected for the benefit of its Members.  
**GSM®** and the GSM logo are trademarks registered and owned by the GSM Association.

3  
4  
5  
6

Reproduction is only permitted for the purpose of standardization work undertaken within ETSI.  
The copyright and the foregoing restriction extend to reproduction in all media.

7	<b>Contents</b>		
8	Intellectual Property Rights .....		6
9	Foreword.....		6
10	Modal verbs terminology .....		6
11	Executive summary .....		6
12	Introduction .....		7
13	1 Scope.....		8
14	2 References .....		8
15	2.1 Normative references .....		8
16	2.2 Informative references .....		9
17	3 Definitions, symbols and abbreviations .....		10
18	3.1 Definitions .....		10
19	3.2 Abbreviations.....		10
20	3.3 Terminology .....		11
21	4 Interoperability profile - general concepts .....		11
22	4.1 Introduction.....		11
23	4.2 Compliance requirements .....		11
24	5 SMTP interoperability profile .....		12
25	5.1 Introduction.....		12
26	5.2 Style of operation.....		12
27	5.3 REMS - interfaces constraints .....		13
28	5.3.1 Introduction.....		13
29	5.3.2 ERDS MSI: Message Submission Interface .....		13
30	5.3.3 ERDS MERI: Message and Evidence Retrieval Interface .....		13
31	5.3.4 ERDS RI: Relay Interface .....		13
32	5.3.5 CSI: Common Service Interface.....		13
33	5.4 REMS - whole Headers constraints .....		14
34	5.4.1 REM message - Headers constraints .....		14
35	5.4.2 REMS - signature Headers constraints .....		15
36	5.4.3 REMS - introduction Headers-Body constraints .....		15
37	5.4.3.1 multipart/alternative: free text subsection Header constraints .....		15
38	5.4.3.2 multipart/alternative: HTML subsection Header constraints .....		15
39	5.4.4 REMS - extensions MIME section Headers constraints.....		16
40	5.4.5 ERDS evidence - MIME section Headers constraints .....		16
41	5.5 REMS - user content constraints.....		16
42	5.5.1 original message MIME section Headers constraints.....		16
43	5.6 REMS - evidence set and components constraints .....		17
44	5.6.1 ERDS evidence types constraints.....		17
45	5.6.1.1 Mandatory evidence - all styles of operation.....		17
46	5.6.1.2 Mandatory evidence - S&N style of operation .....		17
47	5.6.1.3 Conditional evidence - all styles of operation.....		17
48	5.6.2 ERDS evidence components constraints .....		18
49	5.6.2.1 SubmissionAcceptance - SubmissionRejection .....		18
50	5.6.2.2 ContentConsignment - ContentConsignmentFailure .....		19
51	5.6.2.3 ContentHandover - ContentHandoverFailure .....		20
52	5.6.2.4 RelayAcceptance - RelayRejection .....		20
53	5.6.2.5 RelayFailure .....		21
54	6 REMS UPU interoperability profile.....		21
55	6.1 Mapping of terms and definitions .....		22
56	6.2 Mapping of boundary roles .....		22
57	6.3 Functional GAP analysis between REM and PReM.....		22
58	6.4 High level definition of the inter-communication flows between REM and PReM .....		30

59	6.4.1	Agreements .....	30
60	6.4.2	Operational scenario.....	32
61	6.5	Mapping of exchanged formats.....	32
62	6.6	Mapping of evidence names and semantics .....	33
63	6.7	Mapping of protocol elements.....	33
64	6.7.1	Enveloping REM Dispatch in PReM Web Service business payload .....	33
65	6.7.2	PReM Designated Operators - relay Web Service Interface .....	35
66	6.7.2.1	SendMessageToDestination .....	36
67	6.7.2.1.1	Mapping of fields during a REM → PReM flow .....	36
68	6.7.2.1.2	Mapping of fields during a PReM → REM flow .....	38
69	6.7.2.2	SubscribeNotification .....	39
70	6.7.2.2.1	Mapping of fields during a REM → PReM flow .....	39
71	6.7.2.2.2	Mapping of fields during a PReM → REM flow .....	40
72	6.7.2.3	UnsubscribeNotification .....	41
73	6.7.2.4	ReceiveNotification .....	41
74	6.7.2.4.1	Mapping of fields during a REM → PReM flow .....	41
75	6.7.2.4.2	Mapping of fields during a PReM → REM flow .....	42
76	6.7.2.5	RejectMessage.....	43
77	6.7.2.5.1	Mapping of evidence during a REM → PReM flow.....	43
78	6.7.2.5.2	Mapping of evidence during a PReM → REM flow.....	43
79	6.8	Definition of mutual recognition system based on ETSI-TSL and UPU-Designated Operator	
80		Trusted List .....	44
81	6.8.1	Scheme information section .....	46
82	6.8.2	List of Trust Service Providers section .....	46
83	6.8.3	Trusted Service information section.....	47
84	6.8.4	Trusted Service approval history section .....	47
85	7	Other interoperability profiles .....	48
86		History .....	48
87			
88			

## 89 Intellectual Property Rights

### 90 Essential patents

91 IPRs essential or potentially essential to the present document may have been declared to ETSI. The information  
 92 pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found  
 93 in ETSI SR 000 314: "*Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in*  
 94 *respect of ETSI standards*", which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web  
 95 server (<https://ipr.etsi.org>).

96 Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee  
 97 can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web  
 98 server) which are, or may be, or may become, essential to the present document.

### 99 Trademarks

100 The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners.  
 101 ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no  
 102 right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does  
 103 not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

## 104 Foreword

105 This draft European Standard (EN) has been produced by ETSI Technical Committee Electronic Signatures and  
 106 Infrastructures (ESI) and is now submitted for public review before approval by TC ESI and submission for the  
 107 combined Public Enquiry and Vote phase of the ETSI standards EN Approval Procedure.

108 The present document is part 4 of a multi-part deliverable covering Registered Electronic Mail (REM) Services, as  
 109 identified below:

110 Part 1: "Framework and architecture";

111 Part 2: "Semantic contents";

112 Part 3: "Formats";

113 **Part 4: "Interoperability profiles";**

Proposed national transposition dates	
Date of latest announcement of this EN (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	6 months after doa

114

## 115 Modal verbs terminology

116 In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and  
 117 "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of  
 118 provisions).

119 "**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

## 120 Executive summary

121 **Editorial Note: this section will be completed in the next developments of the present document.**

122

123

---

## Introduction

124

Editorial Note: this section will be completed in the next developments of the present document.

125

---

# 126 1 Scope

127 The basic purpose of Registered Electronic Mail (REM) is to provide a service for the transmission of information  
128 among parties, counting on an evidence set, related to the communication steps, suitable to uphold proof of acceptance,  
129 of sending, of delivery/non-delivery, receiving/retrieval of the conveyed data. The email standards used as backbone,  
130 including a set of additional security mechanisms, make smooth the interoperability and, at the same time, protect the  
131 integrity, the confidentiality and the loss exposition of the carried information.

132 The present document defines the profiles of ETSI EN 319 532-3 [8] specification, taking in account concepts and  
133 semantic defined in ETSI EN 319 532-1 [6] and ETSI EN 319 532-2 [7], addressing issues relating authentication,  
134 authenticity and integrity of the information, with the purpose to address the achievement of interoperability across  
135 REM service providers, implemented according the aforementioned specifications and using the same or different  
136 formats and/or transport protocols.

137 The present document covers all the options to profile REM services for both styles of operation: S&N and S&F.

138 The mandatory requirements defined in the aforementioned referenced REM services specifications are not normally  
139 repeated here but, when necessary, the present document contains some references to them.

140 More specifically:

- 141 a) Defines generalities on profiling
- 142 b) Defines constraints for SMTP profile.
- 143 c) Defines mapping form SMTP/PReM interoperability profile.

144 The specifications defined in the present document aims to cover the common and worldwide-recognized requirements  
145 to address **electronic delivery** in a secure and reliable way. Particular attention is paid so that the present document  
146 cover the legal provisions of all the articles and requirements of the Regulation (EU) No 910/2014 [i.8]. Anyway, the  
147 legal effects of services implemented according to the present document are outside the scope of the same.

148

149

---

## 150 2 References

### 151 2.1 Normative references

152 References are either specific (identified by date of publication and/or edition number or version number) or  
153 non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the  
154 referenced document (including any amendments) applies.

155 Referenced documents which are not found to be publicly available in the expected location might be found at  
156 <https://docbox.etsi.org/Reference/>.

157 NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee  
158 their long term validity.

159 The following referenced documents are necessary for the application of the present document.

- 160 [1] ETSI EN 319 521: "Electronic Signatures and Infrastructures (ESI); Policy and security  
161 requirements for Electronic Registered Delivery Services Providers".
- 162 [2] ETSI EN 319 531: "Electronic Signatures and Infrastructures (ESI); Policy and security  
163 requirements for Registered Electronic Mail Services Providers".
- 164 [3] ETSI EN 319 522-1: "Electronic Signatures and Infrastructures (ESI); Electronic Registered  
165 Delivery Services; Part 1: Framework and Architecture".
- 166 [4] ETSI EN 319 522-2: "Electronic Signatures and Infrastructures (ESI); Electronic Registered  
167 Delivery Services; Part 2: Semantic Contents".



- 168 [5] ETSI EN 319 522-3: "Electronic Signatures and Infrastructures (ESI); Electronic Registered  
169 Delivery Services; Part 3: Formats".
- 170 [6] ETSI EN 319 532-1: "Electronic Signatures and Infrastructures (ESI); Registered Electronic Mail  
171 (REM) Services; Part 1: Framework and Architecture".
- 172 [7] ETSI EN 319 532-2: "Electronic Signatures and Infrastructures (ESI); Registered Electronic Mail  
173 (REM) Services; Part 2: Semantic Contents".
- 174 [8] ETSI EN 319 532-3: "Electronic Signatures and Infrastructures (ESI); Registered Electronic Mail  
175 (REM) Services; Part 2: Formats".
- 176 [9] IETF RFC 3207 (2002): "SMTP Service Extension for Secure SMTP over Transport Layer  
177 Security".
- 178 [10] ETSI TS 119 612: "Electronic Signatures and Infrastructures (ESI); Trusted Lists".
- 179
- 180 **Editorial Note: the following reference refers to the actual specification of PReM. It should be updated with a new**  
181 **one according to the note at Clause 6.**
- 182 **[11] UPU S52-1: "Functional specification for postal registered electronic mail".**

183

184

185

## 186 2.2 Informative references

187 References are either specific (identified by date of publication and/or edition number or version number) or  
188 non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the  
189 referenced document (including any amendments) applies.

190 NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee  
191 their long term validity.

192 The following referenced documents are not necessary for the application of the present document but they assist the  
193 user with regard to a particular subject area.

- 194 [i.1] ETSI TR 102 605: "Electronic Signatures and Infrastructures (ESI); Registered E-Mail".
- 195 [i.2] ETSI EN 319 522-4-1: "Electronic Signatures and Infrastructures (ESI); Electronic Registered  
196 Delivery Services; Part 4-1: Message delivery bindings".
- 197 [i.3] ETSI EN 319 522-4-2: "Electronic Signatures and Infrastructures (ESI); Electronic Registered  
198 Delivery Services; Part 4-2: Evidence and identification bindings".
- 199 [i.4] ETSI EN 319 522-4-3: "Electronic Signatures and Infrastructures (ESI); Electronic Registered  
200 Delivery Services; Part 4-3: Capability and requirements bindings".
- 201 [i.5] ETSI TS 119 524: "Electronic Signatures and Infrastructures (ESI); Electronic Registered Delivery  
202 Services; Testing Conformance and Interoperability of Electronic Registered Delivery Services".
- 203 [i.6] ETSI TS 119 534: "Electronic Signatures and Infrastructures (ESI); Registered Electronic Mail  
204 (REM) Services; Testing Conformance and Interoperability of Electronic Registered Mail  
205 Services".
- 206 [i.7] ETSI TR 119 500: "Electronic Signatures and Infrastructures (ESI); Business Driven Guidance for  
207 Trust Application Service Providers".
- 208 [i.8] Regulation (EU) No 910/2014 of the European Parliament and of the Council of 23 July 2014 on  
209 electronic identification and trust services for electronic transactions in the internal market and  
210 repealing Directive 1999/93/EC.

- 211 [i.9] ISO/IEC 27001:2005: "Information technology - Security techniques - Information security  
212 management systems - Requirements".
- 213 [i.10] ISO/IEC TR 10000:1998: " Information technology — Framework and taxonomy of International  
214 Standardized Profiles".
- 215 [i.11] IETF RFC 5321: "Simple Mail Transfer Protocol".
- 216 [i.12] IETF RFC 5322: "Internet Message Format".
- 217 [i.13] IETF RFC 5751: "Secure/Multipurpose Internet Mail Extensions (S/MIME) Version 3.2 Message  
218 Specification".
- 219 [i.14] ISO 3166-1: "Codes for the representation of names of countries and their subdivisions -- Part 1:  
220 Country codes".

221

222 **Editorial Note:** the following references will be eliminated/updated from here as the PReM interoperability profile  
223 will be completed, as per the note in Clause 6.

224 [i.15] ETSI TS 102 640-1: "Electronic Signatures and Infrastructures (ESI); Registered Electronic Mail  
225 (REM); Part 1: Architecture".

226 [i.16] ETSI TS 102 640-2: "Electronic Signatures and Infrastructures (ESI); Registered Electronic Mail  
227 (REM); Part 2: Data requirements, Formats and Signatures for REM".

228 [i.17] ETSI TS 102 640-5: "Electronic Signatures and Infrastructures (ESI); Registered Electronic Mail  
229 (REM); Part 5: REM-MD Interoperability Profiles".

230 [i.18] ETSI TS 102 231: "Electronic Signatures and Infrastructures (ESI); Provision of harmonized  
231 Trust-service status information".

232 [i.19] ETSI TS 102 640-3: "Electronic Signatures and Infrastructures (ESI); Registered Electronic Mail  
233 (REM); Part 3: Information Security Policy Requirements for REM Management Domains".

234 [i.20] ETSI TS 102 640-4: "Electronic Signatures and Infrastructures (ESI); Registered Electronic Mail  
235 (REM); Part 4: REM-MD Conformance Profiles".

236

---

## 237 3 Definitions, symbols and abbreviations

### 238 3.1 Definitions

239 For the purposes of the present document, the terms and definitions given in the following document apply.

240 ETSI EN 319 532-1 [6]

241

### 242 3.2 Abbreviations

243 For the purposes of the present document, the abbreviations given in the following document apply:

244 ETSI EN 319 532-1 [6]

245 Furthermore, together with those included in the aforementioned documents, the following abbreviations apply:

246	REMID	REM interoperability domain
247	REMIDR	REM interoperability domain rules
248	UA	User Agent

249

250

## 251 3.3 Terminology

252 Due to the parallelism that there is between Registered Email Services and Electronic Delivery Registered Services, the  
 253 present document uses the terms and definitions coming from ETSI EN 319 521 [1] and ETSI EN 319 522-\* [3][4][5]  
 254 family of documents. To indicate this affinity, when applicable, “ERD” prefix is inherited and used together the terms  
 255 and their meanings coming from ETSI EN 319 532-2 [7] Clauses 3, 4 and - transitively - from its relevant connected  
 256 normative references. When, for the purpose of the present document - due to the REM peculiarity or for clarity - this is  
 257 not possible or opportune, the “REM” prefix is used instead in any definition. The key of interpretation is to consider  
 258 “REM” prefix paired with “RED” and “REMS” (i.e. REM Service) with “ERDS”.

259 NOTE: The prefix REM (without S) is used when the related object is relevant or may be relevant to something  
 260 generated “outside” the REM Service. Conversely, the REMS prefix is used when it refers to an object  
 261 that is produced by the REM Service.

262

263

---

## 264 4 Interoperability profile - general concepts

265

### 266 4.1 Introduction

267 The present document aims to provide a set of profiles in principle as intended in ISO/IEC TR 10000 [i.10], namely  
 268 considering the essence of the profile definition there contained: “the identification of chosen classes, conforming  
 269 subsets, options and parameters of base standards, or International Standardized Profiles necessary to accomplish a  
 270 particular function”. Furthermore, mainly due to the necessity to cover the interoperability profile relevant to REM  
 271 service providers that use different formats and/or transport protocols (in particular SMTP vs. PReM), the concept of  
 272 profile is extended to embrace other type of references (e.g. architectural, protocol detail, semantic and implementation  
 273 aspects, as well as technical standard and service interoperability aspects).

274 And more specifically, other than the present section with generalities on profiling and conformance, two profiles are  
 275 defined in the next sections:

- 276 a) The first for SMTP – it is rather a intra-operability profile acting, theoretically, on a pure and homogeneous  
 277 environment.
- 278 b) The second is on PReM where interoperability between REM/SMTP and PReM/SOAP is addressed.  
 279

280

### 281 4.2 Compliance requirements

282 Requirements are grouped in three different categories, each one having its corresponding identifier. Table 1 defines  
 283 these categories and their identifiers.

284

**Table 1: Requirement categories**

Identifier	Requirement to implement
<b>M</b>	System <b>shall</b> implement the element
<b>R</b>	System <b>should</b> implement the element
<b>O</b>	System <b>may</b> implement the element

285

286 All the requirements will be defined in tabular form.

Table 2: Requirements template

N°	Service/Protocol element	EN reference	Requirement	Implementation guidance	Notes

288

289 Column **N°** will identify a unique number for the requirements. This number will start from 1 in each clause. The  
 290 eventual references to it would also include the clause number to avoid any ambiguity.

291 Column **Service/Protocol element** will identify the service element or protocol element the requirement applies to.

292 Column **EN Reference** will reference the relevant clause of the standard where the element is defined. The reference is  
 293 to ETSI EN 319 522-1 [3], ETSI EN 319 522-2 [4], ETSI EN 319 532-1 [6] or ETSI EN 319 532-3 [8] except where  
 294 explicitly indicated otherwise.

295 Column **Requirement** will contain an identifier, as defined in table 1.

296 Column **Implementation guidance** will contain numbers referencing notes and/or letters referencing explanation of the  
 297 requirement. It is intended either to explain how the requirement is implemented or to include any other information not  
 298 mandatory.

299 Column **Notes** will contain additional notes to the requirement.

300 NOTE: Within one REMID may be in force provision different from the ones specified in the present document,  
 301 if and only if such REMID does not envisage to interoperate with other REMIDs.

302

## 303 5 SMTP interoperability profile

304

### 305 5.1 Introduction

306 This section of the document defines a profile for interoperability among REMSPs based on SMTP relay protocol.  
 307 Under this basis, although many aspects defined here are valid and reusable in other contexts, format and protocols, all  
 308 the sentences of the present part of the document mainly refer to interactions among REM services providers using - as  
 309 transfer protocol for REM messages - SMTP and its related updates, extensions and improvements (e.g. ESMTP or  
 310 SMTP-AUTH, etc.).

311

### 312 5.2 Style of operation

313 From an interoperability standpoint, no impact is expected to occur because of the adopted style of operation by a  
 314 REMS (Store and Forward vs. Store and Notify). Therefore, the present document shall deal with both on the same  
 315 profile..

316 The reason for that lies in the fact that any REM message exchanged between two REMSPs (even REM messages that  
 317 contain a reference to the REM Object in a Store-And-Notify context) is conveyed using the Relay Interface that, within  
 318 the present interoperability profile, is based on the SMTP protocol. Henceforth protocols, message formats and  
 319 evidence formats are the same in the two cases.

320 Then, all the Store-And-Notify systems also need a Store-And-Forward system that represents a common layer between  
 321 the two styles of operations.

322 Differences only arise in the set of mandatory evidence, which is specified within the two styles of operations, as  
 323 described in clause 5.6.

324

## 325 5.3 REMS - interfaces constraints

### 326 5.3.1 Introduction

327 The interfaces defined in ETSI EN 319 522-1 [3] and further detailed in ETSI EN 319 532-1 [6] Clause 5 are profiled as  
328 follows in the next clauses of the present section.

329

### 330 5.3.2 ERDS MSI: Message Submission Interface

Nº	Service/Protocol element	ETSI EN 319 532-1 [6] reference	Requirement	Implementation guidance	Notes
1	Any protocol, provided that it is secured	Clause 5	M	a	

331

332 Implementation guidance:

- 333 a) The Message Submission Interface **shall** be implemented using any protocol securing the communication from  
334 the originating mail User Agent to the SMTP server and paying special attention to identification,  
335 authentication, confidentiality, authenticity and integrity aspects. As an example, SMTP on TLS or SSL plus  
336 check of credential over SMTP-AUTH **may** be used.

337

### 338 5.3.3 ERDS MERI: Message and Evidence Retrieval Interface

Nº	Service/Protocol element	ETSI EN 319 522-1 [3] reference	Requirement	Implementation guidance	Notes
1	Any protocol, provided that it is secured	Clause 5	M	a	

339

340 Implementation guidance:

- 341 a) The Message and Evidence Retrieval Interface **shall** be implemented using any protocol securing the  
342 communication from the sender/recipient mail User Agent to the REMSP server and paying special attention  
343 to identification, authentication, confidentiality, authenticity and integrity aspects. As an example IMAP or  
344 POP or HTTP on TLS or SSL **may** be used.

345

### 346 5.3.4 ERDS RI: Relay Interface

Nº	Service/Protocol element	ETSI EN 319 532-1 [6] reference	Requirement	Implementation guidance	Notes
1	SMTP on TLS	Clause 5	M	a	see note
NOTE: This is a profile for SMTP relay protocol among REMSPs and it is reflected in this requirement.					

347

348 Implementation guidance:

- 349 a) The Relay Interface **shall** be implemented using SMTP protocol securing the communication from the sender  
350 REMSP server to the recipient REMSP server using TLS according to IETF RFC 3207 [9] taking so particular  
351 account on measures preserving confidentiality, authenticity and integrity.

352

### 353 5.3.5 CSI: Common Service Interface

354 The services used throughout this interface are not necessarily provided by a REMSP (see note) and, for the purpose of  
355 the present profile, the following tree main elements shall be considered:

- 356 1. Routing  
 357 2. Trusting  
 358 3. Discovery

359 NOTE: For this reason, the prefix ERDS is omitted before the definition of the interface.

360

Nº	Service/Protocol element	ETSI EN 319 532-3 [8] reference	Requirement	Implementation guidance	Notes
1	DNS	Clause 9	M	a	Routing i/f
2	TL	Clause 9	R	b	Trusting i/f
3	SML/SMP	Clause 9	O	c	Discovery i/f

361

362 Implementation guidance:

- 363 a) The Routing Interface, part of CSI, **shall** be implemented using DNS protocol.  
 364 b) The Trusting Interface, part of CSI, **should** be implemented using TL protocol.  
 365 c) The Discovery Interface, part of CSI, **may** be implemented using SML/SMP protocols.

366 **Editorial Note: The three interfaces above will be further specified more in depth, in the next developments of the**  
 367 **present document.**

368

## 369 5.4 REMS - whole Headers constraints

### 370 5.4.1 REM message - Headers constraints

Nº	Service/Protocol element	ETSI EN 319 532-3 [8] reference	Requirement	Implementation guidance	Notes
1	X-REM-Msg-Type	Clause 6.2.1	R	a	
2	X-REM-<component>	Clause 6.2.1	R	b	

371

372 Implementation guidance:

- 373 a) The headers list **should** contain an "X-REM-Msg-Type:" header specifying the type of the actual message. Its  
 374 value shall be one of those defined in Clause 6.2.1 of ETSI EN 319 532-3 [8].
- 375 b) The headers list **should** contain at least three "X-REM-<component>:" headers specifying the following  
 376 couples components/values:
- 377 - X-REM-EvidenceIdentifier: <value1>: (i.e. *G01 - Evidence identifier* defined in clause 8.2.1 of ETSI  
 378 EN 319 522-2 [4]).
  - 379 - X-REM-EventIdentifier: <value2>: (i.e. *G03 - Event identifier* defined in clause 8.2.3 of  
 380 ETSI EN 319 522-2 [4]).
  - 381 - X-REM-ReasonIdentifier: <value3>: (i.e. *G04 - Reason identifier* defined in clause 8.2.4 of  
 382 ETSI EN 319 522-2 [4]).

383 Where the values **shall** be filled respectively as:

- 384 ▪ <value1> the value of the evidence identifier "Id" defined inside the Evidence root element  
 385 structure in clause 5.2.2.3 of ETSI EN 319 522-2 [4].
- 386 ▪ <value2> one of the values of the significant part of the *ERDSEventId* defined in clause 5.2.2.4  
 387 of ETSI EN 319 522-2 [4] as outlined in the second column "Event Identifier" of Table 3 of the  
 388 same document (e.g. *SubmissionAcceptance*, *SubmissionRejection*, etc.).
- 389 ▪ <value3> the significant part of the "Code" element URI of *EventReason* structure defined in  
 390 clause 5.2.2.6 of ETSI EN 319 522-2 [4] (e.g. *MessageAccepted*, *InvalidMessageFormat*, etc.).

391 NOTE 1: A list of these strings is obtained by the most right part of the URI listed in Table 4 of ETSI EN 319 522-  
392 2 [4].

393 NOTE 2: Items N° 1 and N° 2 in the table, at the top of the present paragraph, facilitate achieving of interoperability  
394 that, however, may also be reached without them.

395

#### 396 5.4.2 REMS - signature Headers constraints

N°	Service/Protocol element	ETSI EN 319 532-3 [8] reference	Requirement	Implementation guidance	Notes
1	Content-Type	Clause 6.2.3	M	a	
2	Content-Disposition	Clause 6.2.3	M	b	

397

398 Implementation guidance:

399 a) The Content-Type header field **shall** be present. The value of the header **shall** be  
400 "**application/pkcs7-signature**". An additional "name" parameter **shall** be provided with value "**smime.p7s**".

401 b) The Content-Disposition field **shall** be present. The value of the header **shall** be "**attachment**". An additional  
402 "filename" parameter **shall** be provided with value "**smime.p7s**".

403 Every REM message generated by a REMSP **shall** include the field Content-Disposition and fill in the  
404 name/filename parameters. To maximize the level of interoperability the REMSPs **shall** be able to correctly  
405 interpret incoming messages without the presence of Content-Disposition and/or name/filename parameters.

#### 406 5.4.3 REMS - introduction Headers-Body constraints

N°	Service/Protocol element	ETSI EN 319 532-3 [8] reference	Requirement	Implementation guidance	Notes
1	X-REM-Section-Type	Clause 6.2.4.1	M	a	

407

408 Implementation guidance:

409 a) An **X-REM-Section-Type** header **shall** be provided with value "**rem\_message/introduction**".

##### 410 5.4.3.1 multipart/alternative: free text subsection Header constraints

N°	Service/Protocol element	ETSI EN 319 532-3 [8] reference	Requirement	Implementation guidance	Notes
1	Content-Type	Clause 6.2.4.2	R	a	

411

412 Implementation guidance:

413 a) The value for this field **shall** be: "text/plain;". It also is recommended that this field assumes also the value  
414 charset="UTF-8".

##### 415 5.4.3.2 multipart/alternative: HTML subsection Header constraints

N°	Service/Protocol element	ETSI EN 319 532-3 [8] reference	Requirement	Implementation guidance	Notes
1	Content-Type	Clause 6.2.4.3	R	a	

416

417 Implementation guidance:

418 a) The value for this field **shall** be: "text/html;". It also is recommended that this field assumes also the value  
419 charset="UTF-8".

420

421 

## 5.4.4 REMS - extensions MIME section Headers constraints

422 The present optional extension of the REM message contains a XML attachment. The following restrictions apply.

Nº	Service/Protocol element	ETSI EN 319 532-3 [8] reference	Requirement	Implementation guidance	Notes
1	X-REM-Section-Type	Clause 6.2.5	M	a	

423

424 Implementation guidance:

425 a) When present, a **X-REM-Section-Type** header **shall** be provided with value "**rem\_message/extension**".

426

427 

## 5.4.5 ERDS evidence - MIME section Headers constraints

Nº	Service/Protocol element	ETSI EN 319 532-3 [8] reference	Requirement	Implementation guidance	Notes
1	X-REM-Section-Type	Clause 6.2.6.2	M	a	

428

429 Implementation guidance:

430 a) An **X-REM-Section-Type** header **shall** be provided with value "**rem\_message/evidence**".

431

Nº	Service/Protocol element	ETSI EN 319 532-3 [8] reference	Requirement	Implementation guidance	Notes
2	Content-Type	Clause 6.2.6.2	M	a	

432

433 Implementation guidance:

434 a) The value for this field **shall** be: "application/xml;" and name/charset fields **shall** assume the values specified  
435 in ETSI EN 319 532-3 [8] Clause 6.2.6.2.436 **The present profile requires that the evidence in XML format (defined in Clause 7.4 of ETSI EN 319 532-3 [8]) is**  
437 **present in all REM messages.**438 Optionally the PDF format, a defined in Clause 6.2.6.3 of ETSI EN 319 532-3 [8], **may** be present.439 NOTE: If the optional evidence in PDF format carries an embedded XML structure, it replicates the data in the  
440 mandatory XML evidence.

441

442 

## 5.5 REMS - user content constraints

443 

### 5.5.1 original message MIME section Headers constraints

Nº	Service/Protocol element	ETSI EN 319 532-3 [8] reference	Requirement	Implementation guidance	Notes
1	X-REM-Section-Type	Clause 6.3.2	M	a	

444

445 Implementation guidance:

446 a) An **X-REM-Section-Type** header **shall** be provided with value "**rem\_message/original**".



447

448 **5.6 REMS - evidence set and components constraints**449 **5.6.1 ERDS evidence types constraints**450 **5.6.1.1 Mandatory evidence - all styles of operation**

451 The following evidence types specified in the indicated clauses of ETSI EN 319 522-1 [3] are always required.

Nº	Service/Protocol element	ETSI EN 319 522-1 [3] reference	Requirement	Implementation guidance	Notes
1	SubmissionAcceptance	Clause 6.2.1 A.1	M	a	see note 1
2	SubmissionRejection	Clause 6.2.1 A.2	M	b	see note 1
3	ContentConsignment	Clause 6.2.4 D.1	M	c	see note 2
4	ContentConsignmentFailure	Clause 6.2.4 D.2	M	c	see note 2
5	ConsignmentNotification	Clause 6.2.4 D.3	M	c	see note 3
6	ConsignmentNotificationFailure	Clause 6.2.4 D.4	M	c	see note 3
NOTE 1: Rationale: The sender <b>shall</b> be aware of the successful/unsuccessful outcome of his/her message submission.					
NOTE 2: Rationale: The sender <b>shall</b> have evidence on whether the recipient was/was not made available (within the boundaries of recipient's REMSP) of the user content he/she sent (where the sender's REMSP style of operation is "S&F").					
NOTE 3: Rationale: The sender <b>shall</b> have evidence on whether the recipient was/was not made available (within the boundaries of recipient's REMSP) of the notification the sender's REMSP generated in relation to the original message (where the sender's REMSP style of operation is "S&N").					

452

453 Implementation guidance:

- 454 a) The sender's REMSP **shall** include the SubmissionAcceptance (obviously related to a successful submission) in  
455 the REM dispatch(es) to be forwarded to the final recipient(s).
- 456 b) The sender's REMSP **shall** include the SubmissionRejection (obviously related to an unsuccessful submission)  
457 in the REMS receipt to be sent back to the sender.
- 458 c) The recipient's REMSP **shall** send back to the sender a REM receipt including the evidence relevant to the  
459 event of delivery of the REM dispatch or REMS notification or REM payload.

460

461 **5.6.1.2 Mandatory evidence - S&N style of operation**

462 The following evidence types specified in the indicated clause of ETSI EN 319 522-1 [3] are always required for  
463 messages conveyed to the recipient by reference.

Nº	Service/Protocol element	ETSI EN 319 522-1 [3] reference	Requirement	Implementation guidance	Notes
1	ContentHandover	Clause 6.2.5 E.1	M	a	see note
2	ContentHandoverFailure				
NOTE: Rationale: The sender needs to have evidence on whether the recipient downloaded/non downloaded within a predefined time period the user content referenced in the notification.					

464

465 Implementation guidance:

- 466 a) The recipient's REMSP **shall** send back to the sender one REMS receipts including the ContentHandover or  
467 the ContentHandoverFailure.

468

469 **5.6.1.3 Conditional evidence - all styles of operation**

470 To the following evidence types, specified in the indicated clauses of ETSI EN 319 522-1 [3], the below specified  
471 conditions apply.

N°	Service/Protocol element	ETSI EN 319 522-1 [3] reference	Requirement	Implementation guidance	Notes
1	RelayAcceptance	Clause 6.2.2 B1	Conditional "M"	a, b, c	see note
2	RelayRejection	Clause 6.2.2 B2	Conditional "M"	a, b, c	see note
3	RelayFailure	Clause 6.2.2 B3	Conditional "M"	d, e	see note
NOTE:	Rationale for both evidence types: the sender needs to know if the sent message did not successfully reach, or was rejected by, the recipient's REMSP, to enact possible backup measures.				

472

473 Implementation guidance for 1. and 2.:

474 a) Mandatory if:

475 - no opposite provision is explicitly specified in the applicable REMID rules;

476 - no previous opposite agreement exists between the involved REMSPs.

477 Such agreement or interoperability provision **should** specify one of the following:478 I) The sender's REMSP will assume that a REM dispatch or payload has been rejected by the recipient's REMSP  
479 if no contrary indication is received within a predefined time period.480 II) The sender's REMSP will assume that a REM dispatch or payload has been accepted by the recipient's  
481 REMSP if no contrary indication is received within a predefined time period.482 Alternative conditions **may** be specified in the above agreement provided that the issue is exhaustively dealt with b) or  
483 c):484 b) If the evidence type under consideration is mandatory, the recipient's REMSP **shall** send back to the sender's  
485 REMSP a REM receipt including the RelayAcceptance or RelayRejection evidence.486 c) In the cases addressed in the previous item I) and item II), the sender's REMSP **shall** build a REM receipt  
487 including respectively the RelayRejection or the RelayAcceptance evidence and **shall** send it to the sender.  
488

489 Implementation guidance for 3.:

490 d) Mandatory if no opposite requirement within REMID exists.

491 Such interoperability requirement **should** specify that, if no contrary indication is received within a predefined  
492 time period, it is to be assumed that it was impossible to deliver a REM dispatch or payload within a given  
493 time period to the recipient's REMSP, due to any kind of problems.494 Alternative conditions **may** be specified in the above interoperability requirement, provided that the issue is  
495 exhaustively dealt with e):496 e) The sender's REMSP **shall** build a REM receipt, including the RelayFailure evidence and **shall** send it back to  
497 the sender.

498

499 

## 5.6.2 ERDS evidence components constraints

500 In the following clauses, details on the Evidence components coming from ETSI EN 319 522-2 [4] Clause 8 are listed  
501 (in the third columns of each table) for each mandatory evidence type indicated in above clauses from 5.6.1.1 through  
502 5.6.1.3. The modelling adopted in the tables defined in the following clauses differs from that used so far. More in  
503 detail, the following clauses list all Evidence components that are required to ensure interoperability, including those  
504 that in in Table 13 ETSI EN 319 522-2 [4] Clause 8.4 are already indicated as mandatory or whose absence implies a  
505 default value.

506 NOTE: This different approach has been adopted to give a more complete and comfortable view to the reader.

507

508 

### 5.6.2.1 SubmissionAcceptance - SubmissionRejection

Nº	Evidence element	ETSI EN 319 522-2 [4] Clause 8 - reference	Requirement	Implementation guidance	Notes
1	Evidence identifier	G01	M		see note 1
2	Event identifier=SubmissionAcceptance or SubmissionRejection	G03	M		see note 1
3	Reason identifier	G04	M		
4	Reason code	G04	M (1..N)	a	
5	Evidence version	G02	M		see note 1
6	Event time	G05	M		see note 1
7	Evidence issuer policy identifier	R01	M (1..N)		see note 1
8	Evidence issuer details	R02	M		see note 1
9	Sender's identifier	I02	M		see note 1
10	Recipient's identifier	I04	M (1..N)		see note 1
11	Sender 's identity assurance details	I08	O	b	see note 1
12	user content information	M02	M		see note 1
13	Reply-to	MD09	M	c	
14	Submission date and time	M03	M	d	
NOTE 1: Readers are reminded that this requirement is present as mandatory in Table 13 ETSI EN 319 522-2 [4] Clause 8.4.					

509

510 Implementation guidance:

- 511 a) At least one Reason code **shall** be present, unless the applicable REMIDs explicitly require that when  
512 submission is regularly accepted no Reason code is necessary. Multiple Reason code **may** be present  
513 depending on the found exceptions.
- 514 b) If this field is not present it means that the class of authentication is Basic. In the other cases it specifies the  
515 class of Authentication according to the semantic of ETSI EN 319 522-2 [4] Clause 5.5.
- 516 c) This field **shall** be present containing the email address of the original sender, unless the applicable REMIDs  
517 explicitly require that no Reply-to is necessary.
- 518 d) This field **shall** be present.

## 519 5.6.2.2 ContentConsignment - ContentConsignmentFailure

Nº	Evidence element	ETSI EN 319 522-2 [4] Clause 8 - reference	Requirement	Implementation guidance	Notes
1	Evidence identifier	G01	M		see note
2	Event identifier=ContentConsignment or ContentConsignmentFailure	G03	M		see note
3	Reason identifier	G04	M		
4	Reason code	G04	M (1..N)	a	
5	Evidence version	G02	M		see note
6	Event time	G05	M		see note
7	Evidence issuer policy identifier	R01	M (1..N)		see note
8	Evidence issuer details	R02	M		see note
9	Sender's identifier	I02	M		see note
10	Recipient's identifier	I04	M (1..N)		see note
11	Recipient referred to by the evidence	I07	M	b	
12	user content information	M02	M		see note
13	Message type	MD13	R	c	
NOTE: Readers are reminded that this requirement is present as mandatory in Table 13 ETSI EN 319 522-2 [4] Clause 8.4.					

520

521 Implementation guidance:

- 522 a) At least one Reason code **shall** be present, unless the applicable REMIDs explicitly require that when  
523 consignment regularly occurred no Reason code is necessary. Multiple Reason code **may** be present depending  
524 on the found exceptions:
- 525 b) This field **shall** be present.
- 526 c) This field **should** be present according to the semantic of ETSI EN 319 522-2 [4] Clause 6.2.13.

527

## 528 5.6.2.3 ContentHandover - ContentHandoverFailure

Nº	Evidence element	ETSI EN 319 522-2 [4] Clause 8 - reference	Requirement	Implementation guidance	Notes
1	Evidence identifier	G01	M		see note
2	Event identifier=ContentHandover or ContentHandoverFailure	G03	M		see note
3	Reason identifier	G04	M		
4	Reason code	G04	M (1..N)	a	
5	Evidence version	G02	M		see note
6	Event time	G05	M		see note
7	Evidence issuer policy identifier	R01	M (1..N)		see note
8	Evidence issuer details	R02	M		see note
9	Sender's identifier	I02	M		see note
10	Recipient's identifier	I04	M (1..N)		see note
11	Recipient referred to by the evidence	I07	M	b	
12	Recipient Authentication details	I05	O	c	
13	user content information	M02	M		see note
NOTE: Readers are reminded that this requirement is present as mandatory in Table 13 ETSI EN 319 522-2 [4] Clause 8.4.					

529

530 Implementation guidance:

- 531 a) At least one Reason code **shall** be present, unless the applicable REMIDs explicitly require that when  
532 download regularly occurred no Reason code is necessary. Multiple Reason code **may** be present depending  
533 on the found exceptions.
- 534 b) This field **shall** be present.
- 535 c) If this field is not present it means that the class of authentication is Basic. In the other cases, it specifies the  
536 class of Authentication.

## 537 5.6.2.4 RelayAcceptance - RelayRejection

Nº	Evidence element	ETSI EN 319 522-2 [4] Clause 8 - reference	Requirement	Implementation guidance	Notes
1	Evidence identifier	G01	M		see note
2	Event identifier=RelayAcceptance or RelayRejection	G03	M		see note
3	Reason identifier	G04	M		
4	Reason code	G04	M (1..N)	a	
5	Evidence version	G02	M		see note
6	Event time	G05	M		see note
7	Evidence issuer policy identifier	R01	M (1..N)		see note
8	Evidence issuer details	R02	M		see note
10	Sender's identifier	I02	M		see note
11	Recipient's identifier	I04	M (1..N)		see note
12	Recipient referred to by the evidence	I07	M		see note
13	user content information	M02	M		see note
14	Message Type	MD13	R	b	
NOTE: Readers are reminded that this requirement is present as mandatory in Table 13 ETSI EN 319 522-2 [4] Clause 8.4.					

538

539 Implementation guidance:

- 540 a) At least one Reason code **shall** be present, unless the applicable REMIDs explicitly require that when the relay  
541 to the recipient's REMSP regularly occurred no Reason code is necessary. Multiple Reason code **may** be  
542 present depending on the found exceptions.
- 543 b) This field **should** be present according to the semantic of ETSI EN 319 522-2 [4] Clause 6.2.13.

544

## 545 5.6.2.5 RelayFailure

N°	Evidence element	ETSI EN 319 522-2 [4] Clause 8 - reference	Requirement	Implementation guidance	Notes
1	Evidence identifier	G01	M		see note
2	Event identifier=RelayFailure	G03	M		see note
3	Reason identifier	G04	M		
4	Reason code	G04	M (1..N)	a	
5	Evidence version	G02	M		see note
6	Event time	G05	M		see note
7	Evidence issuer policy identifier	R01	M (1..N)		see note
8	Evidence issuer details	R02	M		see note
9	Sender's identifier	I02	M		see note
11	Recipient's identifier	I02	M (1..N)		see note
12	Recipient referred to by the evidence	I07	M		see note
13	user content information	M02	M		see note
14	Message Type	MD13	R	b	

NOTE: Readers are reminded that this requirement is present as mandatory in Table 13 ETSI EN 319 522-2 [4] Clause 8.4.

546

547 Implementation guidance:

548 a) At least one Reason code **shall** be present, unless the applicable REMIDs explicitly require that when relay to  
549 the recipient's REMSP failed no Reason code is necessary. Multiple Reason code **may** be present depending on  
550 the found exceptions.

551 b) This field **should** be present according to the semantic of ETSI EN 319 522-2 [4] Clause 6.2.13.

552

553 

## 6 REMS UPU interoperability profile

554 Editorial Note: The text of the present Clause 6 refers to the interoperability profile REM / PReM, and completely  
555 comes from ETSI TS 102 640-6-1: "Registered Electronic Mail (REM); Part 6-1: REM-MD UPU PReM  
556 Interoperability Profiles".

557 A set of first few changes were made to the text below for begin to adapt it to the new ETSI EN REM Specifications  
558 (e.g. use of REMS instead of REM-MD). The original text from ETSI TS 102 640-6-1 defined an interoperability  
559 profile based on UPU S52-1: "Functional specification for postal registered electronic mail (PReM)".

560 Since the UPU S52-1 PReM Technical Specification had the messages and evidence set formats inherited from ETSI  
561 TS 102 640 REM specification, the old interoperability profile was facilitated by this close relationship.

562 Now, in new ETSI EN REM Specification both message and evidence formats have been updated to be adapted to the  
563 new EU regulation requirements. As a consequence, the old aforementioned interoperability profile is no more  
564 applicable as it is to the new ETSI EN REM.

565 The following remains an open item that ESI TB, UPU and CEN TC 331 are discussing:

566 - would an interoperability profile between the new ETSI EN REM and the currently available UPU S52-1 be useful?

567 - or should ESI TB wait for an update of UPU S52-1 before working on a new interoperability profile?

568 It is thus important to understand the direction and schedule of the evolution of UPU S52-1 PReM Technical  
569 Specification to enable ESI TB to complete, in a comprehensive way, the interoperability profile, subject of the present  
570 clause, between the new REM and the old or the new PReM (e.g. know if the new PReM aims to inherit the message  
571 and evidence set formats of the new REM as for the past).

572 For making this process smoother, by increasing the operational and approval flexibility, the ESI TB is considering the  
573 possibility of moving this section from the present EN document to a separate Technical Specification entirely  
574 dedicated to this interoperability profile.

575 For all these evident issues, the content of the present section of the document needs to be further re-harmonized  
576 according to the information that will be available about the PReM evolution and the relevant milestones.

577

## 578 6.1 Mapping of terms and definitions

579 In Table 1 a mapping among the main terms and definitions used in REM Technical specifications ETSI TS 102 640-1  
 580 [i.15], ETSI TS 102 640-2 [i.16], ETSI TS 102 640-3 [i.19], ETSI TS 102 640-4 [i.20], ETSI TS 102 640-5 [i.17] and  
 581 equivalent terms used in PReM UPU [11] specification is provided. An empty cell means that the corresponding  
 582 specification does not define an equivalent term of the one shown in the same row and defined in the other  
 583 specification.

584 **Table 1: Mapping of definitions**

ETSI REM definitions	UPU PReM definitions
certification authority	
information security policy	
Information Security Management System	
long term storage	
message archive	Message Store + Evidence Store
original message	PReM Object
REMS repository	Directory Server+Evidence Store+Message Store
Registered E-Mail	Postal Registered eMail
REM dispatch	PReM Message
REM Service Provider	Designated Operator
REMS envelope	Signed part of PReM Message
REMS evidence	Evidence
REMS Evidence Provider	Designated Operator
REMS Evidence Verifier	Designated Operator
REM message	PReM Message
REMS Message Gateway	Designated Operator
REMS Message Transfer Agent	
REMS Repository Retrieval Interface	
REMS Sender Message Submission Interface	
REMS Third Party Evidence Retrieval Interface	
REM Message Store	Message Store
REM Object	PReM Object or PReM Message or PReM Dispatch
REM Objects Relay Interface	
REM User Agent (REM-UA)	Web-browser/email client software
REM Policy	PReM policy
REM interoperability domain	UPU PReM group
REM interoperability domain Authority	UPU
REM Recipient	Addressee / Mailee
REM Sender	Mailer
REM Third Party	Authorized party
Signature Creation Server	
Time-Stamping Authority	
Time-Stamp Token	
	Notification
	Designated Operator Trust List

585

## 586 6.2 Mapping of boundary roles

587 For the purposes of the present document only the boundary elements of both systems **shall** be considered. In particular,  
 588 as outlined in Figure 1, the main roles involved in the interactions are: REMSPs, Designated Operators, Trusted Lists. A  
 589 new element is needed to cover the gap between the two systems: it is called REM/PReM Gateway.

590 The REM/PReM Gateway **shall** act with double role: it **shall** be considered as a generic REMSP when the  
 591 intercommunication is between REM network  $\leftrightarrow$  REM/PReM Gateway; in a similar way, the REM/PReM Gateway  
 592 **shall** be considered as one of the Designated Operators of the UPU/PReM network when the intercommunication is  
 593 between REM/PReM Gateway  $\leftrightarrow$  PReM network.

## 594 6.3 Functional GAP analysis between REM and PReM

595 The main differences between the functional aspects of ETSI REM and UPU PReM will be identified in this clause by  
 596 comparing, when possible, the similar aspects of the two systems under analysis.

597 The format of the exchanged messages in the REM model to which the present document refers is based on the MIME  
598 standard (RFC 5751 [i.13]) enriched with a set of typical Headers of the SMTP (RFC 5321 [i.11]) messaging protocol.

599 Clause 6.1 of TS 102 640-1 [i.15] and clause 5.1 of TS 102 640-2 [i.16] define the "Events" and the corresponding  
600 "Evidence" produced for each of these events.

601 Sections 5.2 and 7.2 of UPU PReM Technical Specification [11] define a functional description of the PReM service  
602 flow.

603 Each event/evidence is associated to a function and a mapping between functions is identified in the following tables.  
604 The attention is concentrated to the boundary functions that are involved in the gateway among REM and PReM  
605 systems. Anyway, some other remarkable function is inserted in the table to provide a more general view when  
606 significant for the interoperability.

607 The analysis is organized in a table with two columns where the first one **always** contains a list of the events and  
608 relevant evidence of the flows of a **REM system**. The second column **always** contains a similar list with corresponding  
609 functions of a PReM system. The order of the contents (cells of left/right) does not depend on the direction of the flow.  
610 There is a correspondence between the two systems comparing, line by line, the left cell with right cell. When possible  
611 the events/evidence/functions are grouped for analogy of meaning. Events or functions that are not present in one of the  
612 two systems are identified in the comments. Internal events/functions that are not relevant for interoperability are  
613 neglected in this analysis.

614

**Table 2: GAP Analysis - Transmission/Relay/Delivery - REMSP → DO**

Opr.	ETSI REM Events (TS 102 640-1 [i.15], clause 6.2) and Evidence (TS 102 640-2 [i.16], clause 5.1)	UPU PReM functions, events, and descriptions (UPU PReM Technical Specification [11], sections 5.2 and 8.3)
Transmission / Relay / Delivery (Orig. REMSP→Dest. DO)	<p><i>Function:</i></p> <p><b>Relay</b></p> <p>This is the general operation (performed from a REMSP to a destination Designated Operator) to convey a REMS Message containing the Sender's message.</p> <p>To cover the gap among the two systems, the operation requires a gateway.</p>	<p><i>Function/Method:</i></p> <p><b>SendMessageToDestination</b></p> <p>This is the real function invoked from the REM/PReM Gateway that, <b>when executed at DO side</b>, allows PReM Message to be sent to DO of Destination.</p>
	<p><i>Function:</i></p> <p><b>Relay</b></p> <p>This is the general operation (performed from the Recipient's Designated Operator to Sender's REMSP) to convey a REMS Message containing an evidence relevant to a Sender's message.</p> <p>To cover the gap among the two systems, the operation requires a gateway.</p>	<p><i>Function/Method:</i></p> <p><b>SubscribeNotification</b></p> <p>This is the real function that allows the REM/PReM Gateway system to <b>subscribe</b> certain PReM events, and to be <b>notified</b> through a call to the ReceiveNotification function, when these events occur.</p>
	<p><i>Events:</i></p> <p>6.2.2 Event B.1 - R-REMS Acceptance 6.2.2 Event B.2 - R-REMS Rejection</p> <p>This event occurs at Sender's REMSP side in consequence of the <b>result</b> of the relay operation.</p>	<p><i>Events:</i></p> <p>Events 5.1, in the Workflow Process of Figure 3, interpreted as result of the SendMessageToDestination execution (relay operation) for Receive/NotReceive the message conveyed from a Sender's REMSP to a Recipient's DO.</p>

Opr.	ETSI REM Events (TS 102 640-1 [i.15], clause 6.2) and Evidence (TS 102 640-2 [i.16], clause 5.1)	UPU PReM functions, events, and descriptions (UPU PReM Technical Specification [11], sections 5.2 and 8.3)
	<p><i>Evidence:</i></p> <p>5.1.2 Evidence RelayToREMMDAcceptanceRejection</p> <p>The responsible for issuance of this recommended evidence should be the Recipient's DO but it is not present in the workflow of section 5.2.3 of PReM UPU [11] TS. The REM/PReM Gateway <b>shall</b> generate such evidence for the Sender, on behalf of the Recipient's DO, using as input the result of the SendMessageToDestination operation.</p>	<p><i>Evidence:</i></p> <p>EFW-DSP-ACC/REJDOD Evidence of Forward - Acceptance/Rejection - DOD #4 Table 4 section 8.3 of PReM UPU [11] TS.</p> <p>This evidence seems equivalent to the required RelayToREMMDAcceptanceRejection but it is not issued by a DO and it is only logged.</p>
	<p><i>Event:</i></p> <p>6.2.2 Event B.3 - Expiration of time to deliver to R-REMS</p> <p>This event occurs at Sender's REMSP side when the attempts of relay within a fixed interval of time fail completely.</p>	<p><i>Event:</i></p> <p>This event makes sense at Sender's REMSP side, so it is not considered here.</p>
	<p><i>Evidence:</i></p> <p>5.1.3 Evidence RelayToREMMDFailure</p> <p>The responsible for issuance of this evidence is the Sender's REMSP and the recipient of the evidence is the Sender.</p>	<p><i>Evidence:</i></p> <p>In the flow direction under analysis an evidence like that indicated in the left cell makes sense only at Sender's REMSP side and so it is not considered here.</p>
	<p><i>Events:</i></p> <p>6.2.3 Event C.1 - Message Delivery</p>	<p><i>Events:</i></p> <p>Event 5.8 of the Workflow Process of section 5.2.3 of PReM UPU [11] TS (summarized in Figure 3 of the present document) for Acceptance/Non-Acceptance of the message conveyed from the Sender's REMSP to the Recipient's DO.</p>
	<p><i>Evidence:</i></p> <p>5.1.4 Evidence DeliveryNonDeliveryToRecipient</p>	<p><i>Evidence:</i></p> <p>E-DSP-ACC/REJ-DOD Evidence of PReM Dispatch Acceptance/Rejection - DOD #27 Table 4 section 8.3. of PReM UPU [11] TS.</p> <p>The responsible for issuance of this evidence is the Recipient's DO. The 'DeliveryNonDeliveryToRecipient' evidence <b>shall</b> be notified to the Sender's REMSP, via the call-back function subscribed at REM/PReM Gateway level, by means of the ReceiveNotification. The function ReceiveNotification is invoked by the Recipient's DO and executed at REM/PReM Gateway level.</p>
	<p><i>Event:</i></p> <p>6.2.3 Event C.2 - Expiration of time to deliver message</p> <p>This event occurs at Sender's REMSP side when no positive delivery evidence for a sent message is received in a fixed time.</p>	<p><i>Event:</i></p> <p>In this profile, this event makes sense only at Sender's REMSP side, so it is not considered here.</p>



Opr.	ETSI REM Events (TS 102 640-1 [i.15], clause 6.2) and Evidence (TS 102 640-2 [i.16], clause 5.1)	UPU PReM functions, events, and descriptions (UPU PReM Technical Specification [11], sections 5.2 and 8.3)
	<p><i>Evidence:</i></p> <p>5.1.4 Evidence DeliveryNonDeliveryToRecipient</p> <p>The responsible for issuance of this evidence is the Sender's REMSP and the recipient of the evidence is the Sender.</p>	<p><i>Evidence:</i></p> <p>In this profile an evidence like that indicated in the left cell makes sense only at Sender's REMSP side and so it is not considered here.</p>

615

616

Table 3: GAP Analysis - Transmission/Relay/Delivery - DO → REMSP

Opr	ETSI REM Events (TS 102 640-1 [i.15], clause 6.2) and Evidence (TS 102 640-2 [i.16], clause 5.1)	UPU PReM functions, events and descriptions (UPU PReM Technical Specification [11], sections 5.2 and 8.3)
Transmission / Relay / Delivery (Orig. DO → Dest. REMSP)	<p><i>Function:</i></p> <p><b>Relay</b></p> <p>This is the general operation (performed from a Designated Operator to a destination REMSP) to convey a REMS Message containing the Sender's message.</p> <p>To cover the gap among the two systems, the operation requires a gateway.</p>	<p><i>Function/Method:</i></p> <p><b>SendMessageToDestination</b></p> <p>This is the real function invoked from the Sender's DO that, when executed at REM/PReM Gateway side, allows PReM Message to be sent to the REMSP of Destination.</p>
	<p><i>Function:</i></p> <p><b>Relay</b></p> <p>This is the general operation (performed from a REMSP to a Designated Operator) to convey a REMS Message containing an evidence relevant to a Sender's message.</p> <p>To cover the gap among the two systems, the operation requires a gateway.</p>	<p><i>Function/Method:</i></p> <p><b>ReceiveNotification:</b></p> <p>This is the real function subscribed from Sender's DO that, when invoked from Recipient's REM/PReM Gateway, allows REMSP system to notify certain REMS Events when these occur. The execution of the ReceiveNotification function happens at Sender's Designated Operator side.</p>
	<p><i>Events:</i></p> <p>6.2.2 Event B.1 - R-REMS Acceptance 6.2.2 Event B.2 - R-REMS Rejection</p> <p>This event occurs at Recipient's REMSP side in consequence of the <b>execution</b> of the relay operation.</p>	<p><i>Events:</i></p> <p>Events 5.1 in the Workflow Process of section 5.2.3 of PReM UPU [11] TS (summarized in Figure 3 of the present document) interpreted as consequence of the execution of relay operation (at REM/PReM Gateway side) for Receive/NotReceive the message conveyed from the Sender's DO to the Recipient's REMSP. The event is the result of the SendMessageToDestination operation executed at REM/PReM Gateway level.</p>
	<p><i>Evidence:</i></p> <p>5.1.2 Evidence RelayToREMMDAcceptanceRejection</p> <p>In REM network, the responsible for issuance of this recommended evidence is the Recipient's REMSP and the primary intended recipient is the Sender's REMSP (in this particular flow it is a Sender's DO). Since the workflow of section 5.2.3 of PReM UPU [11] TS does not have this evidence at Sender's DO side (this means that it is not expected nor recognized), it may be simply logged at REM/PReM Gateway side, and not sent back to the Sender's DO.</p>	<p><i>Evidence:</i></p> <p>EFW-DSP-ACC/REJDOD Evidence of Forward - Acceptance/Rejection - DOD #4 Table 4 section 8.3 of PReM UPU [11] TS.</p> <p>This evidence is substantial equivalent to the required RelayToREMMDAcceptanceRejection but, in the workflow of section 5.2.3 of PReM UPU [11] TS, it is only logged and not issued. This means that an evidence of this type, coming from a REM network through the REM/PReM Gateway, would not be recognized by the Sender's DO. So, even if it is generated in the REM network, it <b>shall</b> be only logged in the REM/PReM Gateway.</p>

Opr	ETSI REM Events (TS 102 640-1 [i.15], clause 6.2) and Evidence (TS 102 640-2 [i.16], clause 5.1)	UPU PReM functions, events and descriptions (UPU PReM Technical Specification [11], sections 5.2 and 8.3)
	<p><i>Event:</i></p> <p>6.2.2 Event B.3 - Expiration of time to deliver to R-REMS</p> <p>This event makes sense when the Sender's operator is a REMSP.</p>	<p><i>Event</i></p> <p>This event makes sense when the Sender's operator is a REMSP.</p>
	<p><i>Evidence:</i></p> <p>5.1.3 Evidence RelayToREMMDFailure</p> <p>This event makes sense when the Sender's operator is a REMSP.</p>	<p><i>Evidence:</i></p> <p>This evidence makes sense when the Sender's operator is a REMSP.</p>
	<p><i>Events:</i></p> <p>6.2.3 Event C.1 - Message Delivery</p>	<p><i>Events:</i></p> <p>Event 6.1 of the Workflow Process of section 5.2.3 of PReM UPU [11] TS (summarized in Figure 3 of the present document) for Acceptance/Non-Acceptance of the message conveyed from the Sender's DO to the Recipient's REMSP.</p>
	<p><i>Evidence:</i></p> <p>5.1.4 Evidence DeliveryNonDeliveryToRecipient</p> <p>The responsible for issuance of this evidence is the Recipient's REMSP. The 'DeliveryNonDeliveryToRecipient' evidence <b>shall be notified</b> to the Sender's DO, via the call-back function subscribed at Sender's DO level, by means of the ReceiveNotification. The function ReceiveNotification is invoked by the REM/PReM Gateway (when the event C.1 occurs at Recipient's REMSP) and executed at Sender's DO level.</p>	<p><i>Evidence:</i></p> <p>E-DSP-ACC/REJ-DOD Evidence of PReM Dispatch Acceptance/Rejection - DOD #27 Table 4 section 8.3 of PReM UPU [11] TS.</p> <p>The evidence 'DeliveryNonDeliveryToRecipient' <b>shall</b> be received by the Sender's DO executing the ReceiveNotification function invoked by the REM/PReM Gateway, as indicated in the left cell.</p>
	<p><i>Event:</i></p> <p>6.2.3 Event C.2 - Expiration of time to deliver message</p> <p>This event makes sense when the Sender's operator is a REMSP.</p>	<p><i>Event</i></p> <p>In this profile, this event makes sense only at Sender's REMSP side.</p>
	<p><i>Evidence:</i></p> <p>5.1.4 Evidence DeliveryNonDeliveryToRecipient</p> <p>This evidence makes sense when the Sender's operator is a REMSP.</p>	<p><i>Evidence:</i></p> <p>In this profile, this evidence makes sense only at Sender's REMSP side.</p>

Table 4: GAP Analysis - Retrieval - REMSP → DO

Opr	ETSI REM Events (TS 102 640-1 [i.15], clause 6.2) and Evidence (TS 102 640-2 [i.16], clause 5.1)	UPU PReM functions, events and descriptions (UPU PReM Technical Specification [11], sections 5.2 and 8.3)
Retrieval (Orig. REMSP → Dest. DO)	<p><i>Function:</i></p> <p><b>Retrieval</b></p> <p>The retrieval operation (performed at Designated Operator level) generates some evidence relevant to a Sender's message.</p> <p>To cover the gap among the two systems, the operation requires a gateway.</p>	<p><i>Function/Method:</i></p> <p><b>SubscribeNotification</b></p> <p>This is the real function that allows the REM/PReM Gateway system to <b>subscribe</b> certain PReM events, and to be <b>notified</b> through a call to the ReceiveNotification function, when these events occur.</p>
	<p><i>Function:</i></p> <p><b>Retrieval</b></p> <p>The retrieval operation (performed from a Designated Operator level) generates some evidence relevant to a Sender's message.</p> <p>To cover the gap among the two systems, the operation requires a gateway.</p>	<p><i>Function/Method:</i></p> <p><b>RejectMessage</b></p> <p>The Recipient <b>may</b> explicitly <b>Rejects</b> the message with <b>RejectMessage</b> function.</p> <p>This is the real function that allows PReM system to <b>notify</b> REM Senders, through a gateway, the Recipient's rejection of the message.</p>
	<p><i>Events:</i></p> <p>6.2.3 Event F.1 (mailbox) - Retrieval</p>	<p><i>Events:</i></p> <p>Event 9.3 in the Workflow Process of section 5.2.3 of PReM UPU [11] TS for Retrieval of the message conveyed from the Sender's REMSP to the Recipient's DO.</p> <p>The Recipient explicitly <b>Rejects</b> the message with the invocation of the <b>RejectMessage</b> function. The RejectMessage function is translated in the proper evidence (Mailee #31 Table 4 section 8.3 of PReM UPU [11] TS) notified by the Recipient's DO invoking the ReceiveNotification function.</p> <p>This event is mapped with the 'AcceptanceRejectionByRecipient' REMS Evidence.</p> <p>The Recipient <b>Accepts</b> the message and <b>Retrieves</b> it with <b>RetrieveResult</b> function: these two functions are available in REM system and they are related to the event F.1.</p>

Opr	ETSI REM Events (TS 102 640-1 [i.15], clause 6.2) and Evidence (TS 102 640-2 [i.16], clause 5.1)	UPU PRoM functions, events and descriptions (UPU PRoM Technical Specification [11], sections 5.2 and 8.3)
	<p><i>Evidence:</i></p> <p>5.1.6 Evidence RetrievalNonRetrievalByRecipient</p>	<p><i>Evidence:</i></p> <p>E-MSG-ADRDLV/NDL-DOD Evidence of Delivery/Non-delivery - Addressee/Mailee #29 Table 4 section 8.3 of PRoM UPU [11] TS.</p> <p>E-MSG-ADR-REJDOD Evidence of Reject - Addressee/Mailee #31 Table 4 section 8.3 of PRoM UPU [11] TS.</p> <p>The responsible for issuance of "Retrieval" optional evidence is the Recipient's DO. The evidence <b>shall</b> be <b>notified</b> to the Sender's REMSP, via the call-back function subscribed at REM/PRoM Gateway level, by means of the ReceiveNotification function invoked by the Recipient's DO (Event 10.4 in the Workflow Process of section 5.2.3 of PRoM UPU [11] TS).</p> <p>The responsible for issuance of "Reject" optional evidence is the Recipient's DO. It <b>shall</b> be <b>notified</b> to the Sender's REMSP, via the call-back function subscribed at REM/PRoM Gateway level, by means of the ReceiveNotification function invoked by the Recipient's DO (Event 10.4 in the Workflow Process of section 5.2.3 of PRoM UPU [11] TS).</p>
	<p><i>Events:</i></p> <p>6.2.3 Event F.2 (mailbox) - Expiration of time for Retrieval</p>	<p><i>Events:</i></p> <p>Event 9.3 in the Workflow Process of section 5.2.3 of PRoM UPU [11] TS for Retrieval of the message conveyed from the Sender's REMSP to the Recipient's DO.</p> <p>The Recipient <b>ignores</b> the message and it expires: This behaviour is available in REM system and it is related to the event F.2.</p>
	<p><i>Evidence:</i></p> <p>5.1.6 Evidence RetrievalNonRetrievalByRecipient</p>	<p><i>Evidence:</i></p> <p>30 E-MSG-ADR-EXPDOD Evidence of PRoM Message Expiration - Addressee/Mailee.</p> <p>The responsible for issuance of "Expiration" optional evidence is the Recipient's DO. It <b>shall</b> be <b>notified</b> to the Sender's REMSP, via the call-back function subscribed at REM/PRoM Gateway level, by means of the ReceiveNotification function invoked by the Recipient's DO.</p>

Table 5: GAP Analysis - Retrieval - DO → REMSP

Opr	ETSI REM Events (TS 102 640-1 [i.15], clause 6.2) and Evidence (TS 102 640-2 [i.16], clause 5.1)	UPU PReM functions, events and descriptions (UPU PReM Technical Specification [11], sections 5.2 and 8.3)
Retrieval (Orig. DO → Dest. REMSP)	<p><i>Function:</i></p> <p><b>Retrieval</b></p> <p>The retrieval operation (performed at REMSP level) generates some evidence relevant to a Sender's message.</p> <p>To cover the gap among the two systems, the operation requires a gateway.</p>	<p><i>Function/Method:</i></p> <p><b>ReceiveNotification:</b></p> <p>This is the real function subscribed from Sender's DO that, when invoked from Recipient's REM/PReM Gateway, allows REMSP system to notify certain REMS Events when these occur. The execution of the ReceiveNotification function happens at Sender's Designated Operator side.</p>
	<p><i>Events:</i></p> <p>6.2.3 Event F.1 (mailbox) - Retrieval</p> <p>This event occurs at Recipient's REMSP side in consequence of the <b>execution</b> of the retrieval operation.</p>	<p><i>Events:</i></p> <p>Event 11.1 in the Workflow Process of section 5.2.3 of PReM UPU [11] TS (summarized in Figure 3 of the present document) to receive the notification of the message retrieved at Recipient's REMSP side.</p>
	<p><i>Evidence:</i></p> <p>5.1.6 Evidence RetrievalNonRetrievalByRecipient</p> <p>In REM network, the responsible for issuance of this optional evidence is the Recipient's REMSP and the primary intended recipient is the Sender (in this particular flow it is a PReM sender). The RetrievalNonRetrievalByRecipient evidence, when issued, <b>shall be notified</b> to the Sender's DO (that after will notify this evidence to the intended PReM sender), via the call-back function subscribed at Sender's DO level, by means of the ReceiveNotification. The function ReceiveNotification is invoked by the REM/PReM Gateway (when the event F.1 occurs at Recipient's REMSP side) and executed at Sender's DO level.</p>	<p><i>Evidence:</i></p> <p>E-MSG-ADRDLV/NDL-DOD Evidence of Delivery/Non-delivery - Addressee/Mailee #29 Table 4 section 8.3 of PReM UPU [11] TS.</p> <p>E-MSG-ADR-REJDOD Evidence of Reject - Addressee/Mailee #31 Table 4 section 8.3 of PReM UPU [11] TS.</p> <p>The responsible for issuance of "Retrieval" optional evidence is the Recipient's REMSP. The RetrievalNonRetrievalByRecipient <b>shall</b> be mapped, at REM/PReM Gateway level, to one of the above PReM evidence types according to REM Evidence Event Code.</p>
	<p><i>Events:</i></p> <p>6.2.3 Event F.2 (mailbox) - Expiration of time for Retrieval</p>	<p><i>Events:</i></p> <p>Event 9.3 in the Workflow Process of section 5.2.3 of PReM UPU [11] TS for Retrieval of the message conveyed from the Sender's REMSP to the Recipient's DO.</p> <p>The Recipient <b>ignores</b> the message and it expires: This behaviour is available in REM system and it is related to the event F.2.</p>

Opr	ETSI REM Events (TS 102 640-1 [i.15], clause 6.2) and Evidence (TS 102 640-2 [i.16], clause 5.1)	UPU PReM functions, events and descriptions (UPU PReM Technical Specification [11], sections 5.2 and 8.3)
	<p><i>Evidence:</i></p> <p>5.1.6 Evidence RetrievalNonRetrievalByRecipient</p> <p>In REM network, the responsible for issuance of this optional evidence is the Recipient's REMSP and the primary intended recipient is the Sender (in this particular flow it is a PReM sender). The RetrievalNonRetrievalByRecipient evidence, when issued, <b>shall</b> be <b>notified</b> to the Sender's DO (that after will notify this evidence to the intended PReM sender), via the call-back function subscribed at Sender's DO level, by means of the ReceiveNotification. The function ReceiveNotification is invoked by the REM/PReM Gateway (when the event F.2 occurs at Recipient's REMSP side) and executed at Sender's DO level.</p>	<p><i>Evidence:</i></p> <p>30 E-MSG-ADR-EXPDOD Evidence of PReM Message Expiration - Addressee/Mailee.</p> <p>The responsible for issuance of "Expiration" optional evidence is the Recipient's REMSP. It <b>shall</b> be notified to the Sender's DO, via the call-back function subscribed by Sender's DO, by means of the ReceiveNotification function invoked by the REM/PReM Gateway.</p> <p>The responsible for issuance of "Expiration" optional evidence is the Recipient's REMSP. The RetrievalNonRetrievalByRecipient <b>shall</b> be mapped, at REM/PReM Gateway level, to PReM evidence indicated above.</p>

621

## 6.4 High level definition of the inter-communication flows between REM and PReM

622

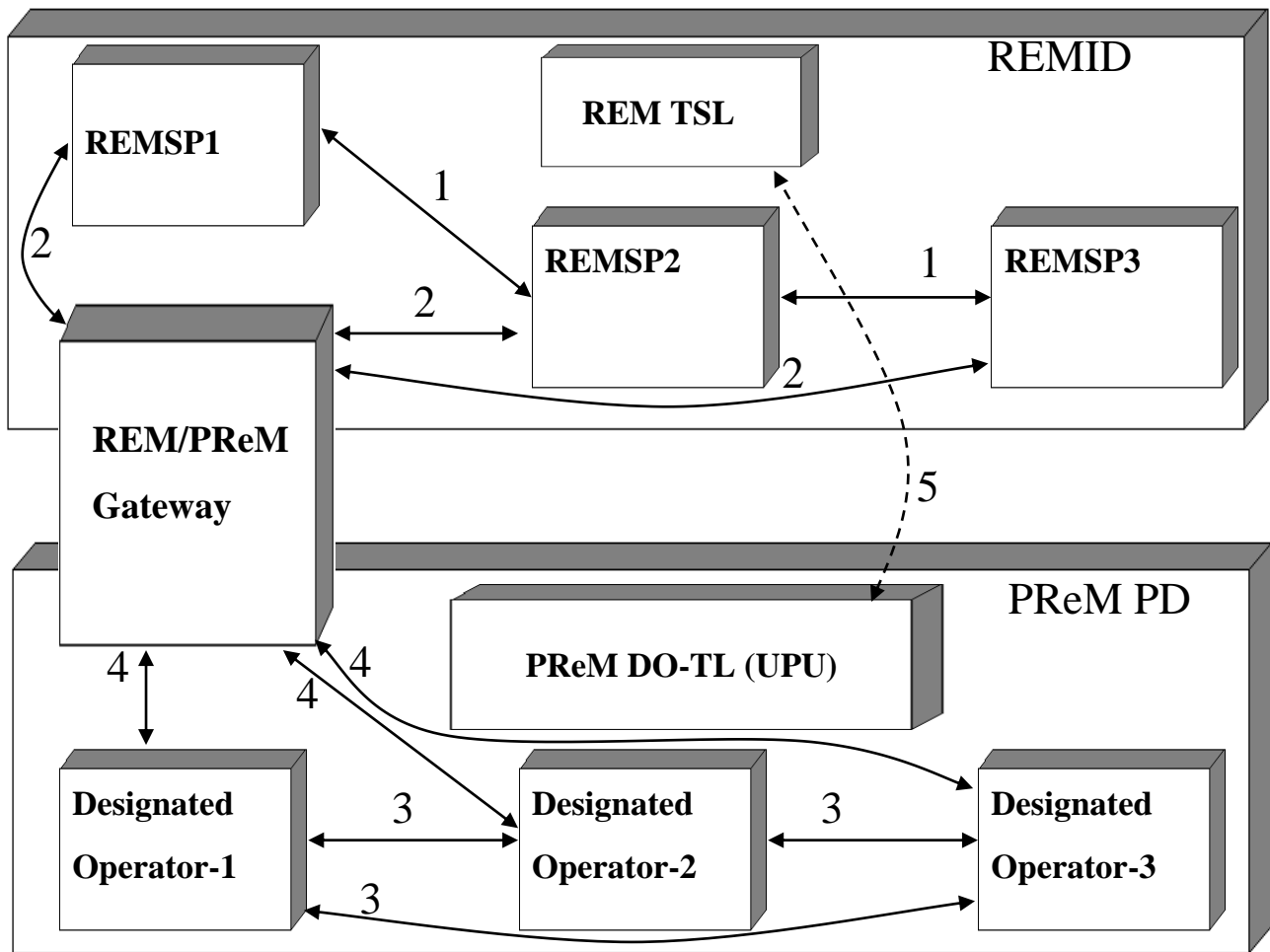
623

### 6.4.1 Agreements

624

625

626 The interchange among a PReM system and a REM system is governed by an agreement among at least one REM  
627 Service Provider and one UPU Designated Operator. This agreement is part of a more high-level agreement among a  
628 UPU PReM Policy Domain and a REM interoperability domain (the REM terms are used in this context but the  
629 designated authorities are present behind these terms). The first Policy Domain, PReM-PD, represents the environment  
630 (common set of rules) of the universe PReM. The second interoperability domain, REMID, defines the space within  
631 which it has life the particular instance of REM to put in communication with the PReM. From the technical point of  
632 view, the agreement among the UPU PReM Policy Domain and a REM interoperability domain requires the application  
633 of the present technical specification that provides the support for the interoperability. Whereas, regarding the  
634 operational level, the agreement among REMSPs and DOs is concretised with a registration inside a special trusted  
635 index. These indexes **shall** be secured and trusted with an implementation like that defined in clause 6.8.



636

637

Figure 1

638 In Figure 1 a description of the main points of contact and interaction is represented.

639 The normal flows among REMSPs are represented with the label "1". In a similar way the normal flow among PReM  
640 Designated Operators is indicated with the label "3".

641 The interaction from REM to PReM, identified by the labels "2" and "4", happens through a REM/PReM Gateway  
642 implemented according to the profile defined in the present technical specification. From the point of view of any single  
643 REMSP, the interaction through the Gateway ("2") is identical to that towards another generic REMSP of the same  
644 system ("1"). The information, instead of arriving to a local REMSP, flows towards a remote Designated Operator of  
645 the PReM system ("2" + "4") through the Gateway. The REM/PReM Gateway **may** be implemented to have a  
646 behaviour like a normal REMSP or it **may** collapse in a particular role of an existing REMSP. In Figure 1 an explicit  
647 separation is outlined for clarity reasons.

648 Conversely, the interaction from PReM to REM happens through a REM/PReM Gateway and it is identified by the  
649 labels "4" + "2". Other than the role in REM network defined above, in the UPU/PReM network the REM/PReM  
650 Gateway **shall** also be considered as one of the Designated Operators or to be collapsed in a particular role of an  
651 existing DO.

652 The addressing bridging between these two systems is effected through a mutual acknowledgment by means of specific  
653 indexes implemented for this purpose. The validation and trusting of these indexes **shall** be implemented through the  
654 REM-TSL and PReM Designated Operators Trust List, identified by the label "5". Indexes implementation details are  
655 out of the scope of the present document.

## 6.4.2 Operational scenario

657 A typical operational scenario when a message flows from a REM system to a PReM system and vice versa is defined  
658 in this clause.

659 The directions of the collateral informative flows on which the two main flows are based are:

- 660 • When a REM User is the initiator of a message for a PReM User:
  - 661 - REM→PReM (REM send a dispatch to PReM),
  - 662 - REM←PReM (REM receive the list of evidence from PReM).
- 663 • When a PReM User is the initiator of a message for a REM User:
  - 664 - PReM→REM (PReM send a dispatch to REM),
  - 665 - PReM←REM (PReM receive the list of evidence from REM).

666 The profile to use between the REM Sender and the REM/PReM Gateway (through the REMSP and the REM-UA)  
667 **shall** be the "REMS Interoperability Profiles" defined in TS 102 640-5 [i.17] REM technical specification. To simplify  
668 the description the terms REM Sender and REM Recipient **shall** be used in the present document without an explicit  
669 mention of the REM-UA role that is always present in the middle to such type of interactions. Similarly REM "Senders"  
670 and "Recipients" are generic terms that **shall** mean any entity like Process Applications, human users without any other  
671 explicit mention.

---

## 6.5 Mapping of exchanged formats

673 The main aspects to consider during the interchanges between two messaging systems are those relevant to the structure  
674 of the messages:

- 675 • attachments
- 676 • signatures
- 677 • evidence

678 An explicit normative reference to the REM ETSI TS [i.16] is reported in sections 2, 8.2, 8.4 and 8.5 of PReM UPU  
679 [11] specification regarding the formats of the messages (and the formats of the types of evidence). So in a normal case,  
680 when a PReM system interacts in a homogeneous way with another PReM system, it already uses the REM  
681 specification for the formats of the PReM Messages and the formats of the evidence.

682 Under this light, in the case of interaction among REM and PReM systems, the format of the messages/evidence  
683 exchanged is exactly the same defined in REM ETSI TS [i.16] specification and other additional requirement **shall not**  
684 be needed. Figure 2 defines some detail of the format. Section 3.9 of UPU PReM Technical Specification [11] also  
685 defines the formatting of attachments using a MIME structure and the signature of the external envelope using S/MIME  
686 specification (as also defined in the normative reference to REM ETSI TS [i.16] specification).

687 Whereas the formats of the evidence are outwardly the same format of the messages, the list of types of evidence is  
688 considered apart in clause 6.6.



---

## 6.6 Mapping of evidence names and semantics

690 For the UPU/PReM network, the types of evidence and their usage are defined in sections 8.2 and 5.2 of the PReM  
691 UPU [11] technical specification. In REM network all the evidence types are defined in TS 102 640-2 [i.16] clause 5.1.

692 According with the aforementioned definitions and with the GAP Analysis of clause 6.3, the list of the types of  
693 evidence **may** be classified in:

- 694 • Evidence internal to REMSP (or internal to the Designated Operator using the PReM UPU [11] terminology):  
695 these are the cases when both Sender and Recipients belong to the same REMSP (or the same Designated  
696 Operator). Even in this case, the evidence is produced, available for the users and logged locally to the  
697 Designated Operator.
- 698 • Evidence between the REMSP and the Sender/Recipient (or between a Designated Operator and a  
699 mailee/addressee using the PReM UPU [11] terminology): this is the direct evidence that flows from a  
700 REMSP (or Designated Operator) and the users registered to it.
- 701 • Evidence among REMSPs (or among the Designated Operators according to the PReM UPU [11]  
702 terminology): this is the evidence that flows between different REMSP (or different Designated Operators).

703 Only the third list of types of evidence is interesting for the purposes of interoperability, object of the present document.  
704 In fact, when two different systems REM/PReM need to interoperate, only the third type of evidence **shall** flow  
705 between the two types of systems and so between REMSP and DO (and vice versa according to the flow direction).

---

## 6.7 Mapping of protocol elements

707 In section 5.2.5 of the PReM UPU [11] specification it is recommended that the interchange of messages (Dispatches)  
708 among two Designated Operators (REMSP in REM terminology) is operated through Web Services.

709 The packages of information conveyed among Designated Operators are fully defined in the PReM UPU [11]  
710 specification as a XML schema and an associated WSDL.

711 A specific "**Data**" element is defined in the XML schema. It is a b64 binary element that **shall** host the REM Dispatch  
712 to be transmitted from a Designated Operator to another one. The same process **shall** be applied also in case of a  
713 REMS Message constituted by an evidence. The REM/PReM Gateway **shall** include the REM Dispatch or the REMS  
714 Message within a PReM WebService structure as specified in sections 7.1.7.2, 8.1 and 8.3 of the PReM UPU [11]  
715 specification.

### 6.7.1 Enveloping REM Dispatch in PReM Web Service business payload

717 Figure 2 illustrates how is implemented this mapping/embodying of REM Dispatch or REMS Messages to PReM  
718 Dispatch structure as WebService business payload.

719

## 720 PReM WebService Structure

721

722

723 .....  
 724 SendMessageToDestinationOptions  
 725 TransactionKey  
 726 OriginalClaimedIdentity  
 727 ClaimedIdentity  
 728 OrganizationID  
 729 ClientApplication  
 730 ContentIdentifier  
 731 Destination

732 **Data**

733 ContentMetadata

734 .....

735

736

737

738

739

740

741

742

743 The envelope on the right part of Figure 2 represents the entire REM Dispatch according to the TS 102 640-1 [i.15],

744 TS 102 640-2 [i.16] and TS 102 640-5 [i.17] (equivalent to the PReM Message, in UPU Terminology).

745 The Sender's payload is the internal enveloped content indicated as "Original Message" in Figure 2.

746 The Recipient **shall** receive the entire content (indicated as "REM Dispatch" in Figure 2) containing the "untouched"  
747 Sender's payload. Some variant to this schema **may** be possible according to the following rules:

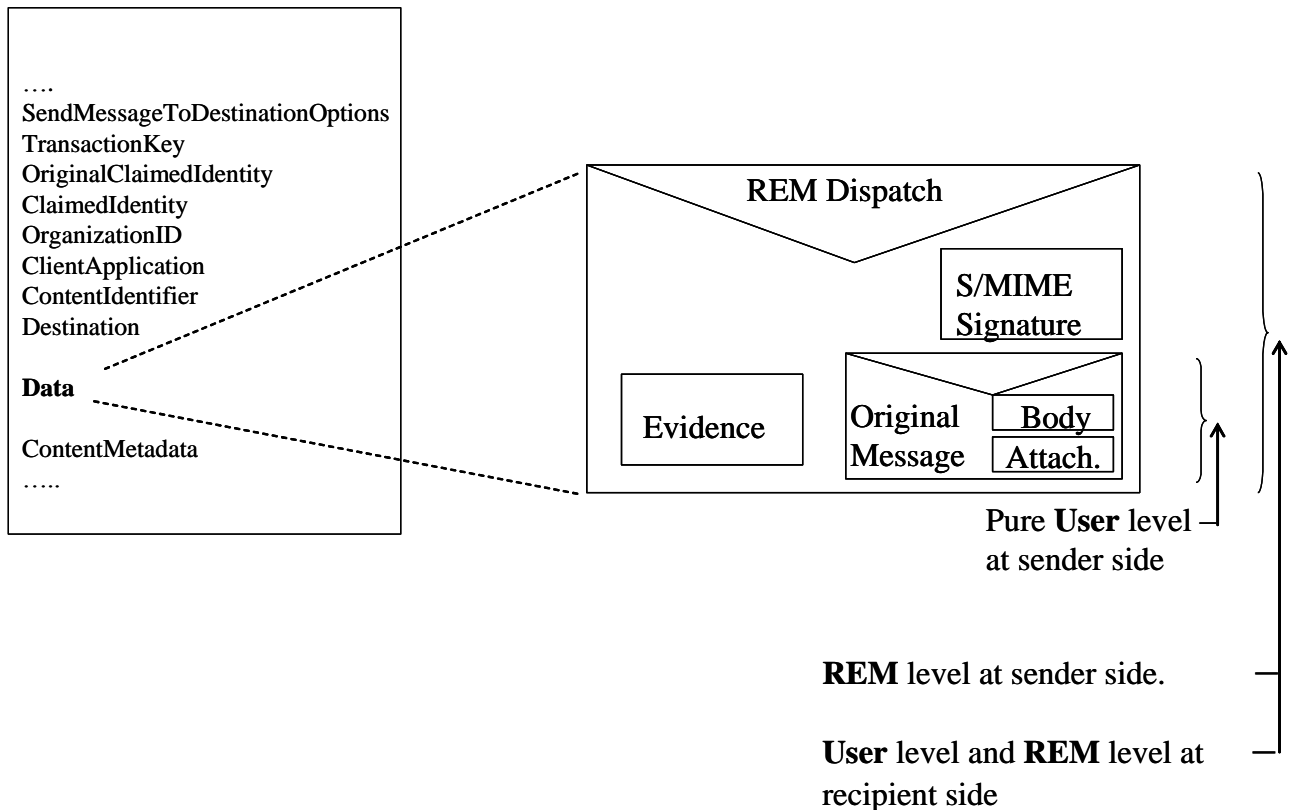
- 748 • The REM Dispatch/REMS Message **may** contain other attachments (for own purposes of UPU/PReM service),  
749 but the basic structure with the mandatory elements defined in the TS 102 640-1 [i.15],  
750 TS 102 640-2 [i.16] and TS 102 640-5 [i.17] **shall** be maintained unchanged.
- 751 • The REMS Message representing an evidence (generally without a Sender's payload) **shall** be enveloped in the  
752 PReM WebService Structure exactly as for the REM Dispatch (that contains the Original Message/Sender's  
753 payload).

754 The mapping described in Figure 2 is implicitly performed when a UPU Designated Operator needs to interoperate with  
755 another UPU Designated Operator according to the specification PReM UPU [11].

756 In consequence, a REM/PReM Gateway:

- 757 1) **shall** build up an appropriate PReM Web Service structure around the normal REM Dispatch, when the  
758 direction is REM → PReM. This PReM Web Service structure **shall** be submitted to the UPU/PReM network  
759 in order to be delivered to the intended PReM recipient;
- 760 2) **shall** extract the REMS Message, containing some evidence, from the "Data" element, when the direction of  
761 the Sender's message is REM → PReM (and so the direction of the evidence messages is PReM → REM).  
762 These evidence messages **shall** be submitted to the REM network in order to be delivered to the intended REM  
763 recipient;

764

736 **Figure 2**

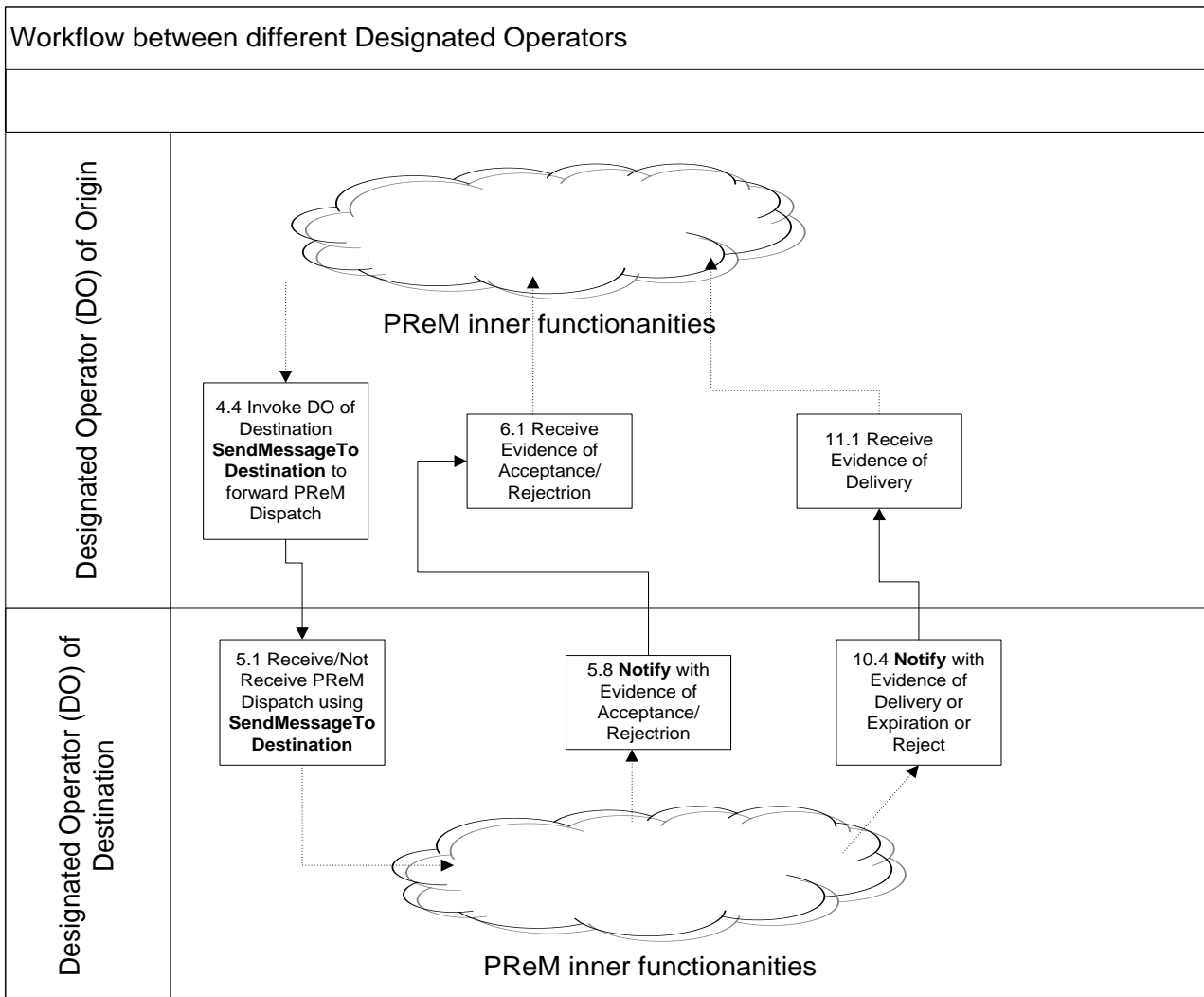
- 758 3) **shall** extract the REM Dispatch contained in the "Data" element, when the direction is PReM → REM. This  
 759 REMS Message containing the Sender's payload **shall** be submitted to the REM network in order to be  
 760 delivered to the intended REM Recipient;
- 761 4) **shall** build up an appropriate PReM Web Service structure around the normal REMS Message that contains an  
 762 evidence, when the direction of the Sender's message is PReM → REM (and so the direction of the evidence  
 763 messages is REM → PReM). These PReM Web Service structure **shall** be submitted to the UPU/PReM  
 764 network in order to be delivered to the intended PReM recipient.

765 Next clauses specify the processing to be implemented by the gateway.

### 766 6.7.2 PReM Designated Operators - relay Web Service Interface

767 The main purpose of the present document is directed to specify the requirements for a REM/PReM Gateway guarantor  
 768 of the interoperability among REMSP and PReM Designated Operators. The attention of this clause is concentrated to  
 769 analyse the Web Service operations (verbs in UPU PReM terminology) defined in PReM UPU [11] specification for the  
 770 interaction among homogenous PReM Designated Operators. The analysis of these verbs allows to define the interface  
 771 needed in the interoperability among REMSP and PReM Designated Operators.

772 The workflow among two general PReM Designated Operators is represented in Figure 3. This workflow is coherent  
 773 with the workflow defined in section 5.2.3 of PReM UPU [11] specification. It is purged of sub-flows not relevant for  
 774 interoperability purposes (that are represented by a cloud) and only the boundary functionalities are mentioned.



775

776

Figure 3: Synthesis of section 5.2.3 of PReM UPU [11] TS

777 The list of PReM verbs relevant for interoperability, that are mainly used in the functions represented in Figure 3, are:

- 778 • SendMessageToDestination;
- 779 • SubscribeNotification;
- 780 • UnsubscribeNotification;
- 781 • ReceiveNotification;
- 782 • RejectMessage.

783 As defined in clause 6 the REM/PReM Gateway **shall** act with double role: "a generic REMSP" plus "a Designated  
784 Operators" according to the direction of the interaction. Under this light the typical usage of the previous functions is  
785 the following:

- 786 • Case of REMSP that needs to relay a REMS Message to a PReM DO: REM→PReM:
  - 787 - The REM/PReM Gateway **shall** register itself to receive notifications/evidence using the method  
788 "**SubscribeNotification**" (this operation is done rarely, typically during the setup of the system).
  - 789 - A REMSP **shall** relay a REM Dispatch or REMS Message and this, through the REM/PReM Gateway,  
790 **shall** be sent to the correct PReM DO of destination by means of the **SendMessageToDestination**  
791 method.
  - 792 - The PReM DO of destination, **shall** deliver the incoming PReM Message to the Recipient  
793 (Addressee/Mailee in PReM terminology) using the **SendMessageToDestination** method.
  - 794 - The REM/PReM Gateway **shall** receive the evidence coming from the remote PReM DO of destination  
795 using the **ReceiveNotification** method. The evidence **shall** be extracted and sent back to the originator  
796 REMSP.
- 797 • Case of PReM DO that needs to relay a PReM Message to a REMSP: PReM→REM:
  - 798 - The PReM DO of origin **shall** register itself to receive notifications/evidence using the method  
799 "**SubscribeNotification**" (this operation is done rarely, typically during the setup of the system).
  - 800 - The PReM DO of origin **shall** send a PReM Message to the REM/PReM Gateway by means of  
801 **SendMessageToDestination** method and this, through the REM/PReM Gateway **shall** be sent to the  
802 correct Recipient's REMSP.
  - 803 - The Recipient's REMSP, **shall** deliver the REMS Message obtained by the incoming PReM Message  
804 (the REM/PReM Gateway shall extract the REMS Message as payload of the PReM Message) to the  
805 Recipient.
  - 806 - The REM/PReM Gateway **shall** receive the evidence messages coming from the Recipient's REMSP and  
807 **shall** notify them to the PReM DO of origin that, using the **ReceiveNotification** method **shall** receive all  
808 the evidence messages.

809 A full description of the mapping for these functions is given in the next clauses.

### 810 6.7.2.1 SendMessageToDestination

811

812 The SendMessageToDestination method is used to send a PReM Message from a Designated Operator to another  
813 Designated Operator. In the context of the present document, the role of one of the Designated Operators (Recipient's  
814 DO or Sender's DO according to the direction of the flow) **shall** be covered by the REM/PReM Gateway.

815 The XML schema of such operation **may** be found in sections 7.1.7.1 and 7.1.7.2 of PReM UPU [11] specification.

#### 816 6.7.2.1.1 Mapping of fields during a REM → PReM flow

817 The following table profiles the SendMessageToDestination operation in the use case of a REMSP sending REM  
818 Dispatch to a PReM DO.

819

Table 6: SendMessageToDestination XML elements

Nº	Service / Protocol element	PRem UPU [11] reference	Requirement	Implementation guidance	Notes
1	EndLifeCycle	Clause 7.1.7.1	M	a	
2	ExtendLifeCycle	Clause 7.1.7.1	M	b	
3	IssuePostMarkedReceipt	Clause 7.1.7.1	M	c	
4	TransactionKey	Clause 7.1.7.1	M	d	
5	OriginalClaimedIdentity	Clause 7.1.7.1	M	e	
6	ClaimedIdentity	Clause 7.1.7.1	M	f	
7	OrganizationID	Clause 7.1.7.1	R	g	
8	ClientApplication	Clause 7.1.7.1	M	h	
9	ContentIdentifier	Clause 7.1.7.1	O	i	
10	Destination	Clause 7.1.7.1	M	l	
11	Timeout	Clause 7.1.7.1	M	m	
12	Data	Clause 7.1.7.1	M	n	
13	ContentMetadata	Clause 7.1.7.1	O	o	

820

821 Implementation guidance:

- 822 a) The SendMessageToDestination **shall** contain 'EndLifeCycle' element indicating if the current operation is at  
823 the "end" of the business transaction lifecycle. Since in REM the concept of business transaction lifecycle is  
824 not present, its value **shall** be set to true, where the meaning is that any interaction is always at the start/end of  
825 the transaction lifecycle.
- 826 b) The SendMessageToDestination **shall** contain 'ExtendLifeCycle' element indicating if the current operation  
827 extends the business transaction lifecycle. Its value **shall** be set to false.
- 828 c) The SendMessageToDestination **shall** contain 'IssuePostMarkedReceipt' element indicating if a specific  
829 "PostMark" receipt (to attest that the REM Dispatch has been successfully received by the remote PRem  
830 Designated Operator) is required. Its value **should** be false unless the Sender's REMSP is able to interpret such  
831 receipt.
- 832 d) The SendMessageToDestination **shall** contain 'TransactionKey' element that is a complex type including a  
833 unique transaction identifier. In order to have a unique identifier important for correlation of the exchanged  
834 REM Dispatch and relevant evidence the value of its significant components **shall** be set as follows:
- 835 i) CountryCode: <two-bytes of the sender country according to the ISO 3166-1 [i.14] country code list>  
836 ii) Version: <"1.0">  
837 iii) Key: <the Message-ID value of the REMS Message envelope>
- 838 e) The SendMessageToDestination **shall** contain 'OriginalClaimedIdentity' element that is a complex type  
839 specifying the original unique identification of the Sender. The value of its significant components **shall** be set  
840 as follows:
- 841 i) NameQualifier: <the Internet Domain address of the Sender's e-mail address (the part on the right of the  
842 '@' in the e-mail address according to the standard RFC 5322 [i.12])>
- 843 ii) Format: <http://tools.ietf.org/html/rfc5322#section-3.4.1>
- 844 iii) UserID: <the user part of Internet e-mail address of the Sender's e-mail address (the part on the left of the  
845 '@' in the e-mail address according to the standard RFC 5322 [i.12])>
- 846 f) The SendMessageToDestination **shall** contain 'ClaimedIdentity' element that is a complex type specifying the  
847 actual identification of the Sender. The value of its significant components **shall** be set to the same value of the  
848 OriginalClaimedIdentity components (implementation guidance e).
- 849 g) The SendMessageToDestination **should** contain 'OrganizationID' element specifying the identifier of the  
850 organization that provides the REM/PRem Gateway service. If present, its value **should** be set to the same  
851 value of the TSP name present in Table 15 of Trusted Service Providers List for this organization.

- 852 h) The SendMessageToDestination **shall** contain 'ClientApplication' element that is a complex type specifying  
 853 the client application requesting the SendMessageToDestination. The value of its significant component **shall**  
 854 be set as follows:
- 855 i) NameAndVersion: "REM/PReM Gateway v1.0"
- 856 i) The SendMessageToDestination **may** contain 'ContentIdentifier' element specifying an identifier of the  
 857 content. If present, its value **shall** be set to "REMS Message".
- 858 j) The SendMessageToDestination **shall** contain 'Destination' element specifying the e-mail destination  
 859 addresses. Its value **shall** be set to a list of e-mail addresses (according to the syntax specified in  
 860 RFC 5322 [i.12]) relevant to a single remote PReM Designated Operator. If the REM Dispatch is directed to  
 861 many e-mail addresses belonging to different remote PReM Designated Operators, the same REM Dispatch  
 862 **shall** be sent many times, one per each remote Designated Operator. In each of these  
 863 SendMessageToDestination invocations the element "destination" **shall** be set to the exact list of addresses  
 864 relevant for each remote PReM Designated Operator. It is out of scope of the present document to specify the  
 865 routing aspects (e.g. how the messages are routed from any REMSP to the remote DO through the  
 866 REM/PReM Gateway).
- 867 k) The SendMessageToDestination **shall** contain 'Timeout' element specifying the period of time (in hours) that  
 868 the Recipient's DO should wait before considering a PReM Message as "not received" by the Recipient (if set  
 869 to 0 means that the timeout value is determined by the Recipient's DO). Its value **should** be set to the same  
 870 time period defined in laws/statutory requirements or local policies of REM network. In case no time period is  
 871 specified at REM level the value 0 **may** be used in Timeout element, indicating to use the Recipient's DO  
 872 default value (that in any case may override any specified value, as indicated in section 7.2.7.2 of PReM  
 873 UPU [11] specification).
- 874 l) The SendMessageToDestination **shall** contain 'Data' element that is a complex type specifying a binary  
 875 element (in b64 form) which embodies the entire REM Dispatch (or the REMS Message) to convey using the  
 876 SendMessageToDestination method. The value of its significant component **shall** be set as follows:
- 877 i) MimeType: "message/rfc822"
- 878 ii) base64Binary: <the base64 encoding of the entire REMS Message in MIME format>
- 879 m) The SendMessageToDestination **may** contain 'ContentMetadata' element that is a complex type specifying a  
 880 sequence of custom details regarding the REMS Message. If present its value **shall** be set as follows:
- 881 i) MetadataName: <name of the metadata>
- 882 ii) MetadataValue: <value of the metadata>

883 The REM/PReM Gateway **may** elaborate the answer of the SendMessageToDestination operation in order to produce  
 884 some new local Evidence to return back to the REM Sender, whenever this is not explicitly expected from the PReM  
 885 system.

#### 886 6.7.2.1.2 Mapping of fields during a PReM → REM flow

887 The REM/PReM Gateway **shall** parse any PReM Dispatch coming from the PReM network and **shall** extract REM  
 888 Dispatch from the XML "Data" element. The REM Dispatch coming from the PReM network **shall** be auto consistent  
 889 in the sense that, according to the aspects considered in clause 6.5 of the present document, it **shall** have all the REM  
 890 fields correctly and coherently compiled to be interpreted by the destination REM system.

891 The REM/PReM Gateway **shall** decode any REM Dispatch (extracted as indicated above) from the base64 format and  
 892 **shall** submit it to the REM network. The submission operation requires to compile the "forward-path" and "reverse-  
 893 path" for the correct addressing to the proper REMSPs and to avoid loops and/or multiple submissions of the same  
 894 message. The two terms "forward" and "reverse" path are used in the present document like their usage in  
 895 RFC 5321 [i.11].

896 Below follows a non-normative example of how the "forward-path" and "reverse-path" are compiled:

897 This operation may be performed as follows:

- 898 i) collect all the "To:" and "Cc:" MIME Headers from the REM Dispatch extracted from the 'Data' element;
- 899 ii) select all the destination addresses that are belonging to the REM system. This may be done by a lookup  
900 to some specific trusted index (see clause 6.8 for trust building);
- 901 iii) insert all the addresses selected in the previous point as "forward-path" for the correct routing of the REMS  
902 Message;
- 903 iv) collect the "Reply-To:" MIME Headers from the REM Dispatch extracted from the 'Data' element and  
904 set it as "reverse-path" for the correct return path to use in case of exceptions.

905 It is out of scope of the present document to specify further these routing aspects.

## 906 6.7.2.2 SubscribeNotification

907 In the context of the present document, the SubscribeNotification method **shall** be used to cover the following  
908 situations:

- 909 • Used by the REM/PReM Gateway for subscribing itself to the event notification service of the PReM system.  
910 In this situation the SubscribeNotification is that usually implemented by any remote PReM DO.
- 911 • Used by any remote PReM Designated Operators to subscribe themselves to be notified on the relevant events  
912 (called evidence in REM terminology) occurring at REM/PReM Gateway side. In this situation the  
913 SubscribeNotification **shall** be implemented by the REM/PReM Gateway.

914 There is a direct correspondence among the PReM notifications and the evidence types in REM. It is required an  
915 invocation of this function for each event type (and so evidence type) that needs to be notified to the REM/PReM  
916 Gateway.

917 The REM/PReM Gateway **shall** subscribe itself, using the SubscribeNotification function, to each Designated Operator  
918 of the PReM system that needs to use the gatewaying function with REM. Conversely, all these Designated Operators  
919 of the PReM system that need to use the gatewaying function with REM **shall** subscribe themselves, using the  
920 SubscribeNotification function to the REM/PReM Gateway.

921 This invocation is a "registration" of information (containing also a call-back URL), so it is performed rarely, and  
922 typically at configuration time. Other means to register the required information **may** be possible under particular  
923 agreements among the REM/PReM Gateway providers and PReM DO providers. Specification of alternative means is  
924 out of scope of the present document.

925 The XML schema of such operation **may** be found in sections 7.1.9.1 and 7.1.9.2 of PReM UPU [11] specification.

### 926 6.7.2.2.1 Mapping of fields during a REM → PReM flow

927 Any DO **shall** implement the function SubscribeNotification. The REM/PReM Gateway **shall** subscribe itself to be  
928 notified on events (evidence in REM terminology) occurring in any remote DO. Any event occurring at DO side means  
929 a specific invocations to the ReceiveNotification (defined in clause 6.7.2.4.1) URL subscribed by the REM/PReM  
930 Gateway with SubscribeNotification method.

931 Table 7 contains the mapping of the elements of SubscribeNotification, function invoked from the REM/PReM  
932 Gateway and implemented in any remote DO.

933 **Table 7: SubscribeNotifications elements - REM → PReM**

Nº	Service / Protocol element	PReM UPU [11] reference	Requirement	Implementation guidance	Notes
1	EventType	Clause 7.1.9.1	M	a	
2	ClientApplication	Clause 7.1.9.1	M	b	
3	CallbackUrl	Clause 7.1.9.1	M	c	

934

935 Implementation guidance:

- 936 a) The SubscribeNotification **shall** contain 'EventType' element specifying the event to subscribe for which a  
 937 notification is required. This function **shall** be invoked, from the REM/PReM Gateway, for each of the  
 938 following events:
- 939 i) "MessageDelivered"
- 940 ii) "MessageUndelivered"
- 941 iii) "MessageReadByAddressee"
- 942 b) The SubscribeNotification **shall** contain 'ClientApplication' element that is a complex type specifying the  
 943 client application requesting the SubscribeNotification. The value of its significant component **shall** be set as  
 944 follows:
- 945 i) NameAndVersion: "REM/PReM Gateway v1.0"
- 946 c) The SubscribeNotification **shall** contain 'CallbackUrl' element specifying the call-back URL function that it is  
 947 required to be invoked by any subscribed DO whenever the event denoted by EventType occurs. This URL  
 948 **shall** implement a function according to the interface defined for the "ReceiveNotification" method, as  
 949 described in clause 6.7.2.4.1 of the present document. The value of this element **shall** be set as follows:
- 950 i) CallbackUrl: <URL of the WebService of the REM/PReM Gateway pointing to the ReceiveNotification  
 951 function>
- 952 Whenever some events occur at DO level, it **shall** invoke the specific ReceiveNotification call-back function  
 953 as defined in clause 6.7.2.4.1 of the present document.

#### 954 6.7.2.2.2 Mapping of fields during a PReM → REM flow

955 The REM/PReM Gateway **shall** implement the function SubscribeNotification. The remote PReM Designated  
 956 Operators **shall** subscribe themselves to be notified on events (evidence in REM terminology) occurring in the  
 957 REM/PReM Gateway. The REMS Messages containing evidence information directed to PReM Designated Operators  
 958 **shall** be converted, by the REM/PReM Gateway, in specific invocations to the ReceiveNotification (defined in clause  
 959 6.7.2.4.2) URLs subscribed by any DO with SubscribeNotification method.

960 Table 8 contains the mapping of the elements of SubscribeNotification, function implemented in the REM/PReM  
 961 Gateway.

962 **Table 8: SubscribeNotifications elements - PReM → REM**

Nº	Service / Protocol element	PReM UPU [11] reference	Requirement	Implementation guidance	Notes
1	EventType	Clause 7.1.9.1	M	a	
2	ClientApplication	Clause 7.1.9.1	M	b	
3	CallbackUrl	Clause 7.1.9.1	M	c	

963

964 Implementation guidance:

- 965 a) The SubscribeNotification **shall** contain 'EventType' element specifying the event to subscribe for which a  
 966 notification is required. This function **shall** be invoked, by any remote DO, for each of the following events:
- 967 i) "MessageDelivered"
- 968 ii) "MessageUndelivered"
- 969 iii) "MessageReadByAddressee"
- 970 b) The SubscribeNotification **shall** contain 'ClientApplication' element that is a complex type specifying the  
 971 client application requesting the SubscribeNotification. The value of its significant component **may** be set as  
 972 follows:
- 973 i) NameAndVersion: "Remote DO v1.0"
- 974 Other values **may** be used by the DOs for this element. It is out of scope of the present document to  
 975 provide further specification on this element since it is considered informative and not critical for the  
 976 interoperability.



- 977 c) The SubscribeNotification **shall** contain 'CallbackUrl' element specifying the call-back URL function that it is  
 978 required to be invoked by the REM/PReM Gateway whenever the event denoted by EventType occurs. This  
 979 URL **shall** implement a function according to the interface defined for the "ReceiveNotification" method, as  
 980 described in clause 6.7.2.4.2 of the present document. The value of this element **shall** be set as follows:
- 981 i) CallbackUrl: <URL of the WebService of the remote DO associated to the ReceiveNotification  
 982 function>

983 The REM/PReM Gateway **shall** maintain a configuration table with the following mapping.

984 **Table 9: SubscribeNotifications - Event mapping - PReM → REM**

PReM EventType	REM Event (TS 102 640-1 [i.15], clause 6.2)
MessageDelivered	6.2.3 Event C.1 - Message Delivery
MessageUndelivered	6.2.3 Event C.2 - Expiration of time to deliver message
MessageReadByAddressee	6.2.3 Event F.1 (mailbox) - Retrieval

985

986 Whenever a REMS Evidence, related to the specified REM Event, arrives to the REM/PReM Gateway, it **shall**  
 987 invoke the specific ReceiveNotification call-back function for all the subscribed PReM Designated Operators  
 988 as defined in clause 6.7.2.4.2 of the present document.

### 989 6.7.2.3 UnsubscribeNotification

990 The UnsubscribeNotification method is useful to cancel a previous registration process performed by a  
 991 SubscribeNotification. It is out of scope of the present document to list all the possible reasons requiring to unsubscribe  
 992 a previous agreement. The full usage description of this method **may** be found in section 7.2.10 of PReM UPU [11]  
 993 specification

994 The REM/PReM Gateway requiring unsubscribing an agreement with some remote DO **shall** queue all the REMS  
 995 Evidence messages directed to such remote DO. The REMS Evidence messages queued, when any subscription  
 996 agreement with a remote DO is defined, **shall** subsequently be delivered as soon as a new subscription agreement will  
 997 be effected. Further details on the subscription agreements are out of scope of the present document.

### 998 6.7.2.4 ReceiveNotification

999 The ReceiveNotification method is used to receive evidence information whenever some event, subscribed with the  
 1000 method SubscribeNotification, occurs.

1001 The XML schema of such operation **may** be found in section 7.1.11.1 of PReM UPU [11] specification.

#### 1002 6.7.2.4.1 Mapping of fields during a REM → PReM flow

1003 In this context the flow REM → PReM means that a REMS Message (or a REM Dispatch) has been sent to a remote  
 1004 PReM Designated Operator and the relevant evidence needs to be received from the REM/PReM Gateway by means of  
 1005 ReceiveNotification. The REM/PReM Gateway **shall** implement the ReceiveNotification function and it **shall** be  
 1006 available at the URL subscribed as indicated in clause 6.7.2.2.1 of the present document. The following table contains  
 1007 the mapping of the relevant elements.

1008 **Table 10: ReceiveNotifications elements - REM → PReM**

Nº	Service / Protocol element	PReM UPU [11] reference	Requirement	Implementation guidance	Notes
1	TransactionKey	Clause 7.1.11.1	M	a	
2	EventType	Clause 7.1.11.1	M	b	
3	EventDateTime	Clause 7.1.11.1	M	c	
4	EventData	Clause 7.1.11.1	M	d	

1009

1010 Implementation guidance:

- 1011 a) The ReceiveNotification **shall** contain 'TransactionKey' element specifying the TransactionKey returned back  
 1012 in the previous SubscribeNotification invocation. Even if the syntax of this element states that it is mandatory,  
 1013 its value **shall** be ignored, at REM/PReM Gateway side, during the implementation of ReceiveNotification.

- 1014 b) The ReceiveNotification **shall** contain 'EventType' element specifying the event that has occurred on the  
 1015 remote PReM Designated Operator, the invoker of ReceiveNotification. The REM/PReM Gateway **shall**  
 1016 extract the evidence from the ReceiveNotification and **shall** submit it in the REM network as described in  
 1017 implementation guidance d) below. The evidence **shall** be fully formatted and enveloped in the EventData  
 1018 element by the remote PReM Designated Operator according to the following mapping table:

1019 **Table 11: ReceiveNotifications - Event mapping - REM → PReM**

PReM EventType	REMS Evidence (TS 102 640-1 [i.15], clause 5.1)
MessageDelivered	5.1.4 DeliveryNonDeliveryToRecipient
MessageUndelivered	5.1.4 DeliveryNonDeliveryToRecipient
MessageReadByAddressee	5.1.6 RetrievalNonRetrievalByRecipient

1020

- 1021 c) The ReceiveNotification **shall** contain 'EventDateTime' element specifying the date/time reference of the event  
 1022 which has just occurred. Even if the syntax of this element states that it is mandatory, its value **shall** be  
 1023 ignored, at REM/PReM Gateway side, during the implementation of ReceiveNotification.

- 1024 d) The ReceiveNotification **shall** contain 'EventData' element that is a complex type specifying a binary element  
 1025 (in b64 form) which embodies the entire REMS Message containing the REMS Evidence to convey using the  
 1026 ReceiveNotification method. The value of its significant component **shall** be set as follows:

1027 i) MimeType: "message/rfc822"

1028 ii) base64Binary: <the base64 encoding of the entire REMS Message containing the evidence>

1029 The REM/PReM Gateway, executing the invocation of ReceiveNotification, **shall** decode the REMS Message  
 1030 containing the evidence, extracted from the element indicated above, from the base64 format and **shall** submit it in the  
 1031 REM network. The submission operation requires to compile the "forward-path" and "reverse-path" for the correct  
 1032 addressing to the proper REMSPs and to avoid loops and/or multiple submissions of the same object. The two terms  
 1033 "forward" and "reverse" path are used in the present document like their usage in RFC 5321 [i.11].

1034 Below follows a non-normative example of how the "forward-path" and "reverse-path" are compiled:

1035 This operation may be performed as follows:

1036 i) collect all the "To:" MIME Headers from the REMS Message extracted from the 'EventData' element  
 1037 and set the "forward-path" with this value;

1038 ii) collect the "From:" MIME Headers from the REMS Message extracted from the 'EventData' element  
 1039 and set it as "reverse-path" (for the correct return path in case of exceptions).

1040 It is out of scope of the present document to specify further these routing aspects.

#### 1041 6.7.2.4.2 Mapping of fields during a PReM → REM flow

1042 In this context the flow PReM → REM means that a PReM Message has been sent from a PReM Designated Operator  
 1043 of origin to a REMSP through the REM/PReM Gateway. The Gateway, receiving back the REMS Evidence from the  
 1044 Recipient's REMSP, **shall** notify this to the PReM Designated Operator of origin by means the invocation of  
 1045 ReceiveNotification. The ReceiveNotification function will be available at the URL subscribed in advance by the PReM  
 1046 Designated Operator as indicated in clause 6.7.2.2.2 of the present document.

1047 The REM/PReM Gateway **shall** invoke the proper URL notifying the correct PReM EventType according to the  
 1048 following table:

1049 **Table 12: ReceiveNotifications - Event mapping - PReM → REM**

REMS Evidence (TS 102 640-1 [i.15], clause 5.1)	PReM EventType
5.1.4 DeliveryNonDeliveryToRecipient - delivery case	MessageDelivered
5.1.4 DeliveryNonDeliveryToRecipient - expiration time to delivery case	MessageUndelivered
5.1.6 RetrievalNonRetrievalByRecipient - retrieval case	MessageReadByAddressee

1050

1051 Table 13 contains the mapping of all the relevant elements of the ReceiveNotification invocation.

Table 13: ReceiveNotifications elements - PReM → REM

Nº	Service / Protocol element	PReM UPU [11] reference	Requirement	Implementation guidance	Notes
1	TransactionKey	Clause 7.1.11.1	M	a	
2	EventType	Clause 7.1.11.1	M	b	
3	EventDateTime	Clause 7.1.11.1	M	c	
4	EventData	Clause 7.1.11.1	M	d	

Implementation guidance:

- a) The ReceiveNotification **shall** contain 'TransactionKey' element specifying the TransactionKey returned back in the previous SubscribeNotification invocation.
- b) The ReceiveNotification **shall** contain 'EventType' element specifying the event to transmit to the Sender's PReM Designated Operator (the initiator of the messaging transaction) according with Table 12. The REM/PReM Gateway **shall** invoke the ReceiveNotification submitting the REMS Message containing an evidence to the Sender's DO as described in implementation guidance d) below.
- c) The ReceiveNotification **shall** contain 'EventDateTime' element specifying the date/time reference of the event which has just occurred. This time **should** be collected from the evidence.
- d) The ReceiveNotification **shall** contain 'EventData' element that is a complex type specifying a binary element (in b64 form) which embodies the entire REMS Message containing the REMS Evidence to be send back to the Sender's DO. The value of its significant component **shall** be set as follows:
- i) MimeType: "message/rfc822"
- ii) base64Binary: <the base64 encoding of the entire REMS Message containing the evidence>
- The REM/PReM Gateway, executing the invocation of ReceiveNotification, **shall** encode the REMS Message containing the evidence in base64 format and **shall** submit it to the Sender's DO.

### 6.7.2.5 RejectMessage

The RejectMessage method is useful to explicitly indicate the will of the Recipient to reject the message. It is out of scope of the present document to list all the possible reasons requiring this method. The full usage description of this method **may** be found in section 7.2.8 of PReM UPU [11] specification.

Since the event associated with rejection is present in both technical specifications REM and UPU/PReM, it **may** be used in both directions.

#### 6.7.2.5.1 Mapping of evidence during a REM → PReM flow

In this context the flow REM → PReM means that a REMS Message (or a REM Dispatch) has been sent to a remote PReM Designated Operator and the final Recipient rejects the incoming message with an explicit declaration. This act is translated in an invocation to the RejectMessage method.

The REM/PReM Gateway **shall** implement the RejectMessage mapping this event to the '**AcceptanceRejectionByRecipient**' REMS Evidence (with EventCode='Rejection'). The new REMS Evidence message composed by the REM/PReM Gateway **shall** be sent back to the REM Sender of the original message. It is out of scope of the present document how the REM/PReM Gateway maintains the correlation among all the sent/received information needed to compose the 'AcceptanceRejectionByRecipient' REMS Evidence.

#### 6.7.2.5.2 Mapping of evidence during a PReM → REM flow

In this context the flow PReM → REM means that a PReM Message has been sent to a REM Recipient and, in case of the optional reject mechanism is provided to the final user, this user rejects the incoming message with an explicit declaration. This declaration is translated, at Recipient's REMSP level, in a generation of a '**AcceptanceRejectionByRecipient**' REMS Evidence (with EventCode='Rejection').

The REM/PReM Gateway **shall** invoke the RejectMessage implemented and executed, as usual in PReM environment, by the Sender's DO. It is out of scope of the present document how the REM/PReM Gateway maintains the correlation among all the sent/received information needed to invoke the RejectMessage method.

---

## 1093 6.8 Definition of mutual recognition system based on ETSI-TSL 1094 and UPU-Designated Operator Trusted List

1095 This clause contains the specifications that **should** be implemented for cross-trusting between ETSI/REM and  
1096 UPU/PReM networks.

1097 A PReM Policy Domain, according to PReM UPU [11] specification, is a collection of PReM enabled Designated  
1098 Operators operating which belong to a group that is managed according to rules and regulations agreed by the group.  
1099 Each PReM Designated Operator grants trust to the PReM End Users abiding by the same Policy Domain rules and  
1100 granting that each PReM Message properly submitted is managed, tracked and delivered under the common Policy  
1101 Domain rules. Digital signatures applied by PReM Designated Operators to PReM Messages and PReM Evidence  
1102 certify the respect of the Policy Domain rules. UPU is responsible for Policy Domain rules establishment and supervises  
1103 Designated Operators operating under Policy Domain rules.

1104 A PReM Trust List is required to support PReM End User or interested party to:

- 1105 • verify that the signing certificate used for PReM Dispatch is valid and belongs to an authorized Designated  
1106 Operator
- 1107 • verify if the PReM Designated Operator belongs to the expected PReM Policy Domain
- 1108 • verify if the PReM Designated Operator current status was in accord with PReM Policy Domain rules when a  
1109 signature envelope was created

1110 TSL defined in TS 102 231 [i.18] addresses those requirements and is the recommended instrument for a seamless  
1111 mutual recognition between a REM and PReM systems evidence. When a TSL is used to implement or complement a  
1112 PReM Trust List, TS 102 640-1 [i.15] **shall** apply.

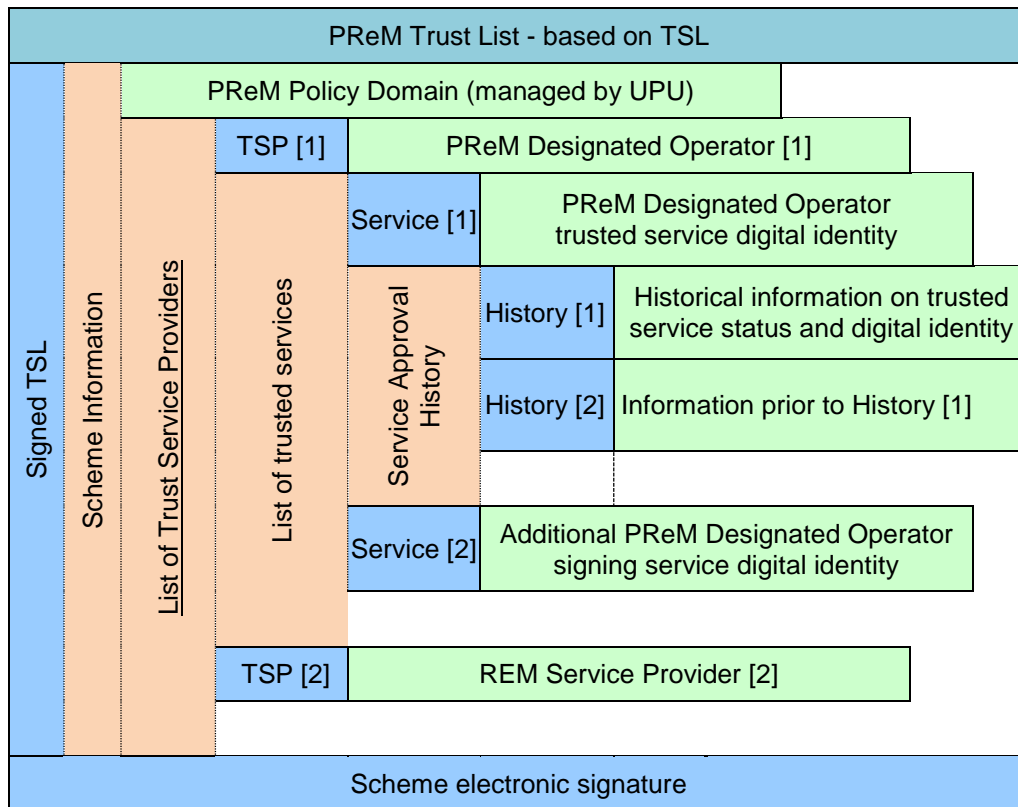
1113 In term of domain trust the following mapping among PReM, REM and TSL defined roles is applied:

- 1114 • entity responsible for Policy Domain rules (i.e. UPU) - REM interoperability domain (REMid) - TSL Schema  
1115 Operator
- 1116 • PReM Designated Operator - REM Service Provider (REMSP) - TSLTrust Service Provider (TSP)
- 1117 • PReM Designated Operator signing service - REMS Evidence Provider - TSL Service

1118 A TSL contains trust information, in a hierarchical format. NOTE: The notations "[1]" and "[2]" above indicate the  
1119 indexes of elements of the list.

1120

1121 Figure 4 shows the information contained in a TSL and how it is mapped to REM/PReM entities.



1122

1123 NOTE: The notations "[1]" and "[2]" above indicate the indexes of elements of the list.

1124

1125

**Figure 4: Mapping UPU Trust List to TSL (based on TS 102 231 [i.18])**

1126 When UPU, as responsible for PReM Policy Domain, issues a TSL, it acts as TSL schema operator and creates, signs  
1127 and publishes the TSL.

1128 A TSL for PReM **shall** be of type Generic and all the Designated Operators **shall** be listed as TSP. Each of these **should**  
1129 contain information related to REMS Evidence provider, current and historical information among which digital  
1130 identity that can be used to verify the service signatures and status.

1131 It is assumed that each party that needs to verify a REMS Evidence **should** trust at least a Schema Operator.

1132 As non normative example, a REM User typically trusts TSLs issued by own REMID.

1133 A TSL issued for PReM **should** contain all the Designated Operators and the related certificated associated to the  
1134 digital keys that they use to:

1135 i) digital sign the PReM Messages

1136 ii) verify integrity and trust of the PReM Messages (including the PReM Objects and Evidence)

1137 If a PReM Designated Operator certificate is no longer used (e.g. when approaching its expiration date) a new  
1138 certificate is generated and associated to the service while the previous certificate is added to the service history. For  
1139 each active signing digital key a Trusted Service element and its history **shall** be updated. No new Trusted Service entry  
1140 **should** be added when a new signing key is generated and associated to a new certificate to renew an expiring one.

1141 **6.8.1 Scheme information section**

1142 The scheme information section of a TSL issued by a PReM Policy Domain **should** be populated in conformance to  
1143 Table 14.

1144 **Table 14: UPU PReM TSL Scheme Information**

TSL field name	Value
TSL type (M)	Set to " <a href="http://uri.etsi.org/TrstSvc/TSLType/generic">http://uri.etsi.org/TrstSvc/TSLType/generic</a> "
Scheme operator name (M)	See TS 102 231 [i.18]
Scheme operator address (M)	
Scheme operator postal address (M)	
Scheme operator electronic address (M)	
Scheme name (M)	
Scheme information URI (M)	
Status determination approach (M)	Set to "Active"
Scheme type/community/rules (O)	Set to "supervision"
Scheme territory (O)	Not present
TSL policy/legal notice (M)	See TS 102 231 [i.18]
Historical information period (M)	
Pointers to other TSLs (O)	
Additional information field (O)	
Attribute of: Pointers to other TSLs	
List issue date and time (M)	
Next update (M)	
Distribution points (O)	
Scheme extensions (O)	Not present
List of Trust Service Providers (O) → sequence of elements in Table 15	List of Trust Service Providers as specified in clause 6.8.2

1145

1146 **6.8.2 List of Trust Service Providers section**

1147 The List of Trust Service Providers section should be compiled according to Table 15.

1148 **Table 15: List of Trust Service Providers**

TSL field	Value
TSP name (M)	Set with the Designated Operator Name
TSP trade name (M)	See TS 102 231 [i.18]
TSP address (M)	
TSP postal address (M)	
TSP electronic address (M)	
TSP information URI (M)	An URI where general information relevant to the users like public certificates, addresses, etc. is published by the Designated Operator
TSP information extensions (O)	Not present
List of services (M)	Sequence of Trusted Service information elements as specified in clause 6.8.3

1149

1150 **6.8.3 Trusted Service information section**

1151 The List of Trust Service information section should be compiled according to Table 16.

1152

**Table 16: Trusted Service information**

<b>TSL field</b>	<b>Value</b>
Service type identifier (M)	The value shall be one of the following. Case of UPU/PReM TSP: <a href="http://www.upu.int/PReMService">http://www.upu.int/PReMService</a>  Case of ETSI/REM TSP: <a href="http://uri.etsi.org/TrstSvc/Svctype/REM">http://uri.etsi.org/TrstSvc/Svctype/REM</a>
Service name (M)	See TS 102 231 <b>[i.18]</b>
Service digital identity (M)	The Designated Operator Certificate X.509 certificate and optionally an X509 SKI element
Service current status (M)	Set to one of "In accord / Suspended / Revoked"
Current status starting date and time (M)	See TS 102 231 <b>[i.18]</b>
Scheme service definition URI (O)	
Service supply points (O)	
TSP service definition URI (O)	Optionally an URI for publishing general information relevant to the users like public certificates, addresses, etc.
Service information extensions (O)	Not present
Service approval history (O)	Sequence of service approval history elements as specified in clause 6.8.4

1153

1154 **6.8.4 Trusted Service approval history section**

1155 The List of Trust Service approval history section should be compiled according to Table 17.

1156

**Table 17: Service approval History**

<b>TSL field</b>	<b>Value</b>
Service type identifier	See Table 16
Service name	See Table 16
Service digital identity	See Table 16
Service previous status	See TS 102 231 <b>[i.18]</b>
Previous status starting date and time	
Service information extensions	Not present

1157

1158

1159  
1160  
1161

---

## 1162 7 Other interoperability profiles

1163 Editorial Note: A “general purpose” mechanism allowing the coverage of other Transport Protocols (e.g already  
1164 existing or more efficient protocols, suitable for REM, which might emerge in a future time) will be specified here, in  
1165 the next developments of the present document. The guideline will consist in the specification of the minimum set of  
1166 requirements, involving the fundamentals of a transport protocol, useful for REM - taking also into account provisions  
1167 & structured formats from EN 319 532 Part-3.

1168  
1169  
1170  
1171  
1172  
1173  
1174  
1175  
1176  
1177  
1178  
1179  
1180  
1181  
1182  
1183  
1184  
1185  
1186

---

## 1187 History

Document history		
V0.0.1	March 2017	Version for ESI comments
V0.0.2	June 2017	Version for ESI comments
V0.0.2	September 2017	Version for ESI comments
V0.0.4	October 2017	Version for public review

1188  
1189  
1190