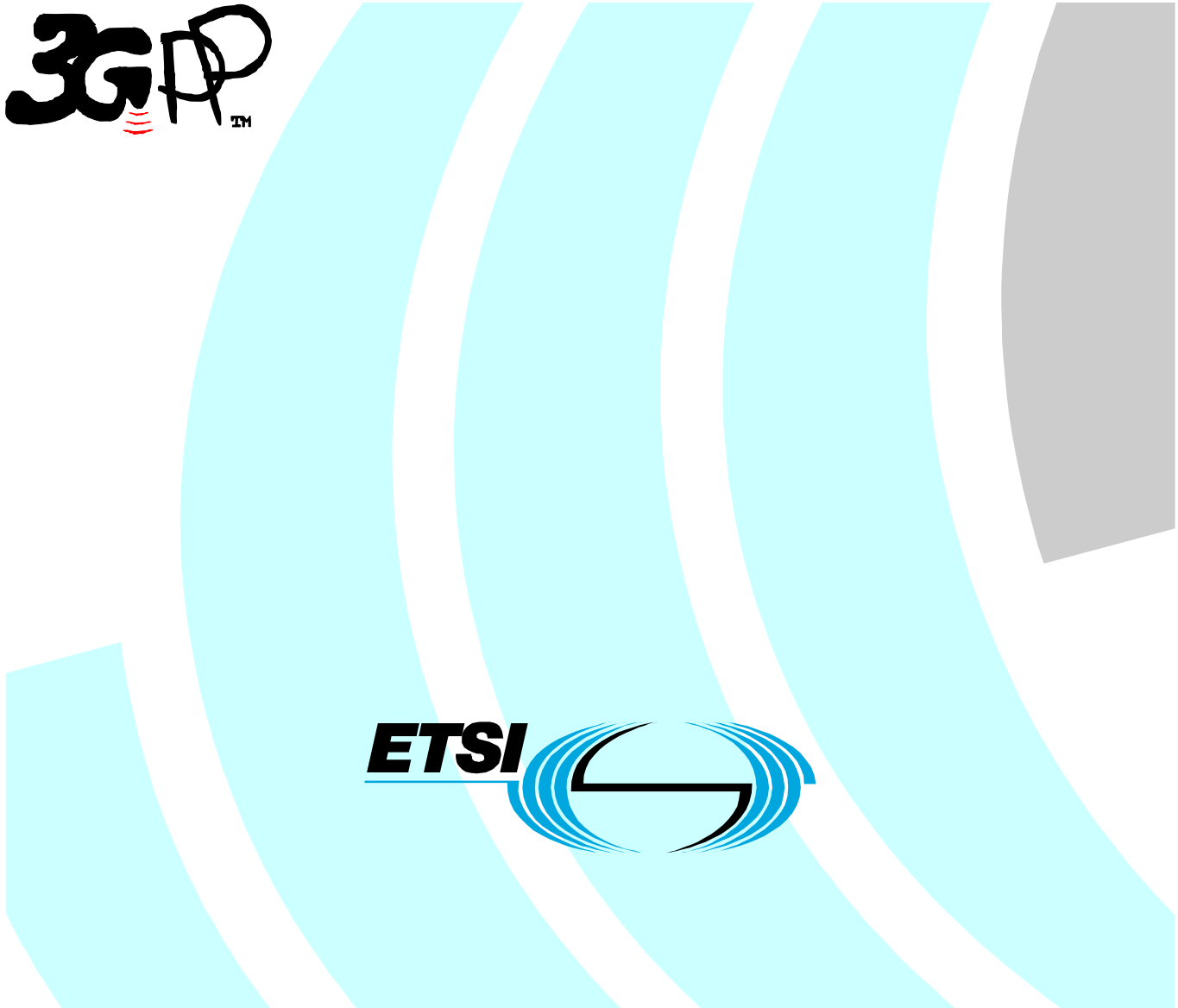
ETSI TS 129 202 V6.0.0 (2004-12)

Technical Specification

Universal Mobile Telecommunications System (UMTS);
Signalling System No. 7 (SS7)
signalling transport in core network;
Stage 3
(3GPP TS 29.202 version 6.0.0 Release 6)



Reference
RTS/TSGN-0429202v600

Keywords
UMTS

ETSI

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Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
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Foreword

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Contents

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

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- z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

The present document defines the possible protocol architectures for transport of SS7 signalling protocols in Core Network.

2 References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

2.1 Normative references

[1] 3GPP TR 21.905: "3G Vocabulary"

[2] ITU-T Recommendation Q.701: "Functional description of the message transfer part (MTP) of signalling system No. 7"

[3] ITU-T Recommendation Q.702: "Signalling data link"

[4] ITU-T Recommendation Q.703: "Signalling link"

[5] ITU-T Recommendation Q.704: "Signalling network functions and messages"

[6] ITU-T Recommendation Q.705: "Signalling network structure"

[7] ITU-T Recommendation Q.706: "Message transfer part signalling performance"

[8] RFC 2960: "Stream Control Transmission Protocol"

[9] ITU-T Recommendation G.804: "ATM cell mapping into Plesiochronous Digital Hierarchy (PDH)"

[10] ITU-T Recommendation I.112: "Vocabulary of terms for ISDNs"

[11] ITU-T Recommendation I.361: "B-ISDN ATM layer specification"

[12] ITU-T Recommendation I.363.5: "B-ISDN ATM Adaptation Layer specification: Type 5 AAL"

[13] ITU-T Recommendation Q.2110: "B-ISDN ATM adaptation layer - Service specific connection oriented protocol (SSCOP)"

[14] ITU-T Recommendation Q.2140: "B-ISDN ATM adaptation layer - Service specific coordination function for signalling at the network node interface (SSCF at NNI)"

[15] ITU-T Recommendation Q.2210: "Message transfer part level 3 functions and messages using the services of ITU-T Recommendation Q.2140"

[17] RFC 3309: "SCTP Checksum Change"

[18] RFC 3332:Signaling System 7 (SS7) Message Transfer Part 3 (MTP3) - User Adaptation Layer (M3UA)"

2.2 Informative references

[16] RFC 2719: "Framework Architecture for Signalling Transport"

3 Definitions and abbreviations

3.1 Definitions

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

3.2 Abbreviations

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

AAL5	ATM Adaptation Layer type 5
ATM	Asynchronous Transfer Mode
IP	Internet Protocol
MTP	Message Transfer Part
MTP1	Message Transfer Part layer 1
MTP2	Message Transfer Part layer 2
MTP3	Message Transfer Part layer 3
M3UA	MTP3-User Adaptation
PDH	Plesiochronous Digital Hierarchy
SSCF	Service Specific Coordination Function
SSCOP	Service Specific Connection Oriented Protocol
SCCP	Signalling Connection Control Part
SCTP	Stream Control Transmission Protocol
SDH	Synchronous Digital Hierarchy
TCAP	Transaction Capabilities Application Part

4 Introduction

The Core Network enables the transport of SS7 signalling protocols between two entities by means of different underlying networks (e.g. MTP-based, IP-based or ATM-based).

The transport of SS7 signalling protocol messages of any protocol layer that is identified by the MTP level 3 layer, in SS7 terms, as a user part (MTP3-user) shall be accomplished in accordance with the protocol architecture defined in the following sub-clauses. The list of these protocol layers includes, but is not limited to, Signalling Connection Control Part (SCCP).

The transport of protocols which can be identified as SCCP-users, like for example TCAP, and in turn the transport of TCAP-users like MAP and CAP, shall also be accomplished in accordance with the defined protocol architectures, since their protocol messages are transferred as SCCP payload.

5 Protocol Architectures

5.1 Protocol architecture in the case of MTP-based SS7 signalling transport network

The transport of an MTP3-user signalling messages shall be accomplished in accordance with the relevant ITU-T Recommendations [2], [3], [4], [5], [6], [7].

The protocol architecture applicable in the case of MTP-based SS7 signalling transport network is shown in Figure 5.1/1

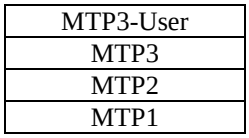


Figure 5.1/1: Protocol architecture in the case of MTP-based SS7 signalling transport network

5.2 Protocol architecture in the case of IP-based SS7 signalling transport network

The transport of an MTP3-user signalling messages shall be accomplished in accordance with the architecture defined by the "Framework Architecture for Signalling Transport" [16], by "Stream Control Transmission Protocol"[8] and by the IETF document available in Annex A. An implementation of SCTP to this document shall use the checksum method specified in RFC 3309 [17] instead of the method specified in RFC 2960 [8].

The protocol architecture applicable in the case of IP-based SS7 signalling transport network is shown in Figure 5.2/1

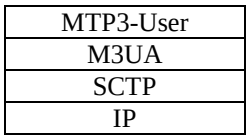


Figure 5.2/1: Protocol architecture in the case of IP-based SS7 signalling transport network

The definition of the use of M3UA in 3GPP core network is provided in Annex A to this specification.

5.3 Protocol architecture in the case of ATM-based SS7 signalling transport network

The transport of an MTP3-user signalling messages shall be accomplished in accordance with the relevant ITU-T Recommendations [9], [10], [11], [12], [13], [14], [15]

The protocol architectures applicable in the case of ATM-based SS7 signalling transport network are shown in Figure 5.3/1.

ATM over SDH

MTP3-User
MTP3 B
SSCF
SSCOP
AAL5
ATM

ATM over PDH

MTP3-User
MTP3 B
SSCF
SSCOP
AAL5
G.804

Figure 5.3/1: Protocol architectures in the case of ATM-based SS7 signalling transport network

Annex A (Normative): The use of M3UA in 3GGP networks

1 Scope

This annex defines the application of M3UA in 3GPP core networks. The purpose of the Annex is to ensure the interoperability of different implementations of M3UAs used by different operators and vendors. This is achieved by

- Clarifying certain concepts which are used in RFC 3332;
- Defining those features in RFC 3332 for which support is mandatory;
- Defining those features in the RFC 3332 for which support is optional;
- Defining those features in RFC 3332 which shall not be used;

The specification is intended for interfaces between network domains. However, it can also be used inside one network domain, and constitutes in that case minimum M3UA to be supported between IP nodes and between IP nodes and SGW nodes in 3GPP network.

2 Introduction

M3UA may be used in a number of interfaces in a 3GPP core network. The annex is intended for the interface called A and C in figure 1. A is the Interface between two IP nodes that are equipped with SCTP, M3UA and a M3UA user. Examples of M3UA user are BICC, H.248, SCCP and ISUP. The interface can be used inside one network domain but also to interconnect network domains. Interface B can be used between network domains and inside network domains. Interface B is using - Q.701-Q.705 or Q.2210, and therefore is already standardised and not in the scope for this annex. Interface C is the interface between a node including SCTP, M3UA and a M3UA user and a node including SCTP, M3UA and M3UAsignalling gateway functions.. This interface is inside one network domain.

Interfaces A and C are similar. The main difference is that interface C shall also allow for interworking with the SS 7 network and therefore provides functions for the interworking.

The signalling gateways in this picture are pure MTP3/3B-M3UA signaling gateways. They do not include any M3UA users. Still there could be a node including an M3UA user (eg SCCP functions) and a M3UA signalling gateway functions. In that case the node will support all the interfaces A, B and C.

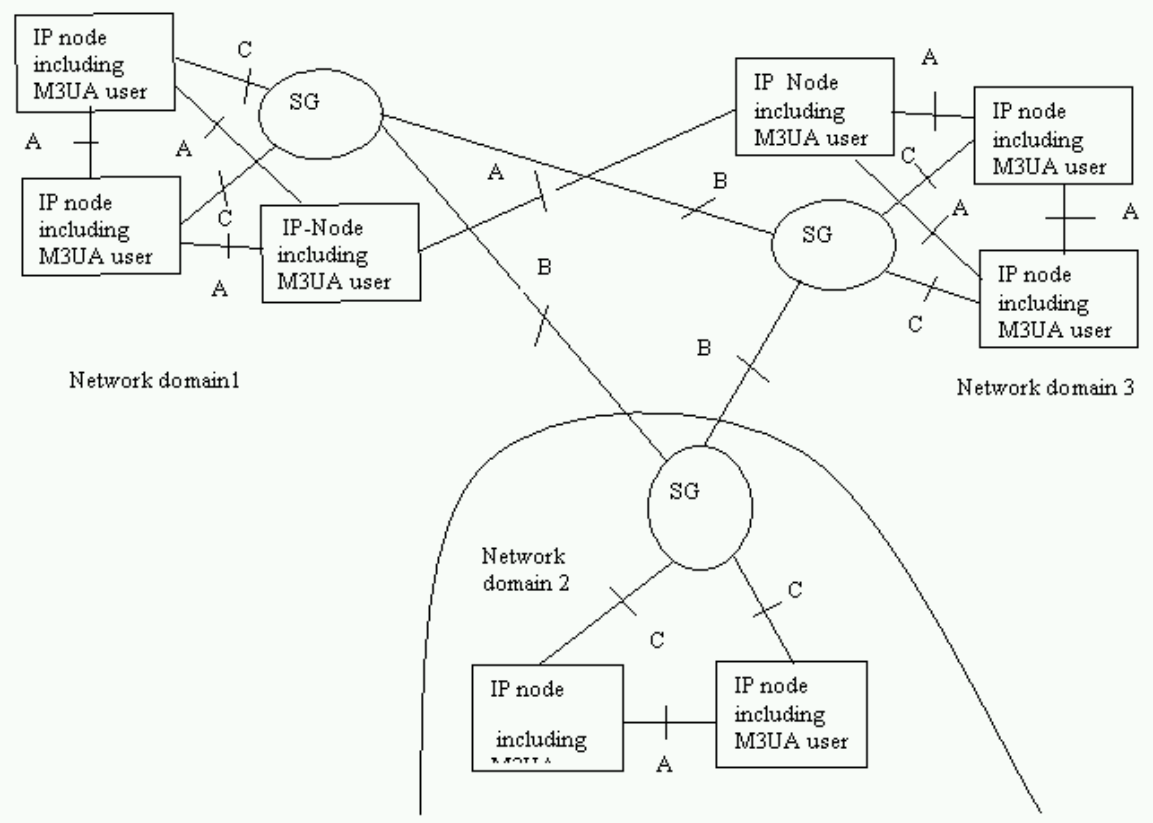


Figure 1 Use of M3UA in 3GPP core network

3 Protocol conformance to RFC 3332

A minimum implementation shall support sections marked mandatory in the table below. It shall be possible to configure all implementations to interoperate (no error messages returned) with the minimum set.

The table below makes comment to the sections in RFC 3332. In the comment column the following terms are used:

- Mandatory: When support of text in a section is marked mandatory:
  - On an information element, message or message class, it means that a receiver shall understand the information element, message or message class and carry out the requested action.
  - For a procedure, it means that the procedure is mandatory to be carried out by the involved network elements.
- Optional: When support of the text in a section is marked optional the feature involved is only guaranteed to work between peer entities which are subject to a bilateral agreement between operators of those entities. If one end uses an optional message or information element and the other does not support it, then either a silent discard takes place of an information element as a part of the message or the message is discarded and an error message is returned. This is described as part of the handling of the optionality in the table.
- Excluded: This means that the feature shall not be used in a 3GPP environment

Descriptive text means that the section does not include any requirements for this specification.

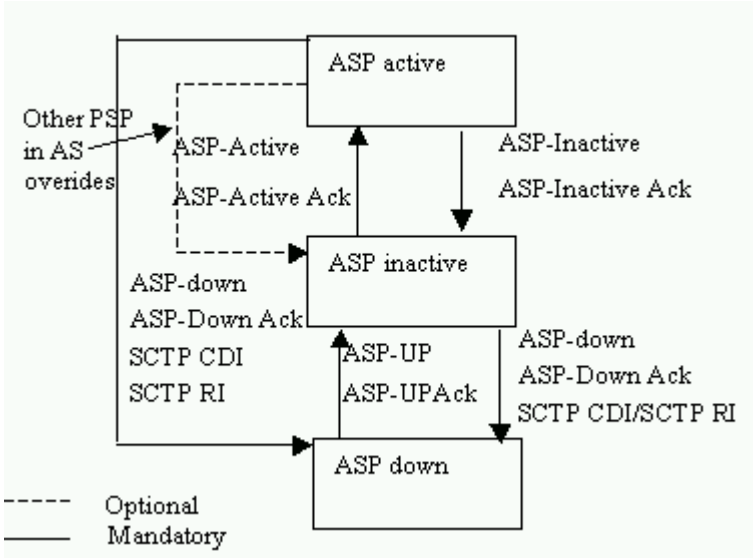
Note: The word 'heading' means that the section consists only of subordinate sections.

The comments column also defines the behaviour of a minimum implementation if it does not support a message or an information element in a mandatory message.

Section number in M3UA RFC	Comments
Abstract	Descriptive text
1.Introduction	Descriptive text
1.1 Scope	Descriptive text
1.2 Terminology	Descriptive text.
1.3 M3UA overview	Descriptive text.
1.4 Functional area	Descriptive text.
1.5 Sample Configurations	Descriptive text
1.6 Definition of M3UA Boundaries	Descriptive text
2 Conventions	Descriptive text
3. M3UA Protocol Elements	Mandatory
3.1 Common message header	Mandatory
3.1.1 M3UA Protocol Version:	The version number field shall be set to 1
3.1.2 Message classes	The values are classified as follow 0-4 Mandatory 5-8 Excluded 9 Optional (Routing Key Management (RKM) Messages) 10 to 255 Excluded
3.1.2 (Management (MGMT) message)	The values are classified as follow 0 Mandatory 1 Optional (Notify). When received and not supported the message maybe silently discarded. 2-255 Excluded
3.1.2 (Transfer messages)	The values are classified as follow 0 Excluded 1 Mandatory 2 to 255 Excluded
3.1.2 (Signalling network management (SSNM) messages)	The values are classified as follow 0 Excluded 1-6 Mandatory 7- 255 Excluded.
3.1.2 (ASP State Maintenance (ASPSM) Messages)	The values are classified as follow 0 Excluded 1-6 Mandatory 7-255 Excluded
3.1.2 (ASP Traffic Maintenance (ASPTM) Messages)	The values are classified as follow 0 Excluded 1-4 Mandatory 5 to 255 Excluded
3.1.2 (Routing key management (RKM)) messages	Optional If any of these messages is received and not supported an error message with the error code 0x04 (Unsupported message type) shall be sent
3.1.3 Reserved	Mandatory

Section number in M3UA RFC	Comments
3.1.4 Message length	Mandatory
3.2 Variable Length Parameter Format Common Parameters:	The values are classified as follows 0x0000-- 0x0003, 0x0005, 0x0008, 0x000a, 0x000e, 0x000f, 0x0010 0x0014—0x01ff Excluded 0x0007, 0x0009, 0x000c and 0x0012 Mandatory 0x0004 optional (INFO String) if received and not supported the message is processed but the optional information element is silently discarded, 0x0006 optional (Routing Context if received and not supported the message is processed but the optional information element is silently discarded, 0x000b optional (Traffic Mode Type) if received and not supported the message is processed but the optional information element is silently discarded, 0x0011 (ASP Identifier) if received and not supported the message is processed but the optional information element is silently discarded, 0x0012 Affected point code is mandatory. The support of value 0 in the mask field is mandatory. All other values is outside the scope of this annex. 0x0013 (Correlation ID) if received and not supported the message is processed but the optional information element is silently discarded,
3.2 Variable Length Parameter Format M3UA Specific Parameters	The values are classified as follows 0x0201, 0x0202, 0x0203, 0x0211, 0x020d and 0x0214 to 0xffff Excluded 0x0204--0x0205, 0x0210 Mandatory 0x0200 optional (Network Appearance) if received and not supported the message is processed but the optional information element is silently discarded, 0x0206 Optinal (Concerned Destination). If received and not supported the message is processed but the optional information element is silently discarded. 0x0207 (Routing Key), 0x0208 (Registration Result), 0x0209 (Deregistration Result) 0x020a (Local Routing Key Identifier), 0x020b (Destination Point Code), 0x020c (Service Indicators) 0x020d (Subsystem Numbers), 0x020e (Originating Point Code List), 0x020f (Circuit Range), 0x0212 (Registration Status), 0x0213 (Deregistration Status) are parameters in optional message, and therefore no action is specified.
3.3 Transfer messages	These messages are mandatory at the interfaces A and C.
3.3.1 Payload message	The parameters Network Appearance, Routing Context, Correlation ID are optional The parameter Protocol data is mandatory.
3.4 SS7 signalling network management messages	Heading
3.4.1 Destination Unavailable (DUNA)	The message is mandatory at the interface C. The parameters Network Appearance, Routing Context, and INFO String are optional The parameter Affected Point Code is mandatory

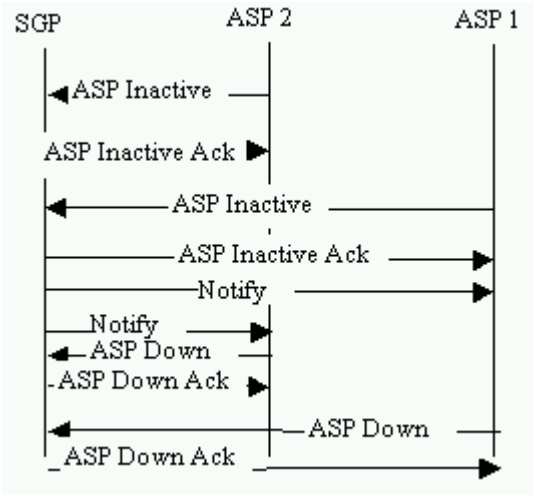
Section number in M3UA RFC	Comments
3.4.2 Destination Available (DAVA)	The message is mandatory at the interface C The parameters Network Appearance, Routing Context, and INFO String are optional. The parameter Affected Point Code is mandatory
3.4.3 Destination State Audit (DAUD)	The message is mandatory at the interface C The parameters Network Appearance, Routing Context, and INFO String are optional. The parameter Affected Point Code is mandatory
3.4.4 Signalling Congestion (SCON)	The message is mandatory at the interface C The parameters Network Appearance, Routing Context, Congestion Indications and INFO String are optional The parameter Affected point code is mandatory.
3.4.5 Destination User Part Unavailable (DUPU)	The message is mandatory at the interfaces A and C. The parameters Network Appearance, Routing Context, and INFO String are optional. The parameters Affected point code and User/Cause are mandatory
3.4.6 Destination Restricted (DRST) message	This message is mandatory.
3.5 ASP State Maintenance (ASPSM) Messages	These messages are mandatory at the interfaces A and C.
3.5.1 ASP Up message	The ASP Identifier and Info String parameters are optional
3.5.2 ASP Up Acknowledgement Message	The Info String parameter is optional.
3.5.3 ASP Down message	The Info String parameter is optional.
3.5.4 ASP Down Acknowledgement message	The Info String parameter is optional.
3.5.5 Heartbeat message	The message is mandatory.
3.5.6 Heartbeat Acknowledgement message	The message is mandatory
3.6 Routing Key Management messages	These messages are optional at the interfaces A and C.
3.7 ASP Traffic Maintenance (ASPTM) Messages	These messages are mandatory at the interfaces A and C.
3.7.1 ASP Active message	The parameters Traffic Mode Type, Routing Context and INFO String are optional.
3.7.2 ASP Active Acknowledgement message	The Traffic Mode Type, Routing Context and INFO String are optional.
3.7.3 ASP inactive message	The parameters Routing Context and INFO String are optional.
3.7.4 ASP Inactive Acknowledgement	The parameters Routing Context INFO String are optional.

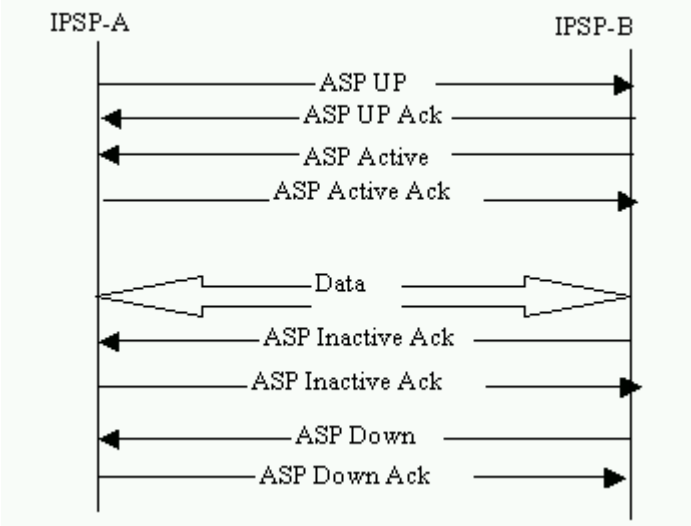
Section number in M3UA RFC	Comments
3.8 Management (MGMT) Messages	Heading
3.8.1 Error message	The message is mandatory at the interfaces A and C
3.8.2 Notify message	The message is optional at the interfaces A and C
4 Procedure	The application of a particular procedure at a certain interface is detailed in the following sections
4.1 Procedures to Support the M3UA-User	Heading
4.1.1 Receipt of Primitives from the M3UA-User	The procedure is mandatory at the interfaces A and C.
4.1.2 Receipt of Primitives from the Layer Management	This section is outside the scope of this annex.
4.2 Procedures to Support the Management of SCTP Associations	The procedures are mandatory at the interfaces A and C
4.2.1 Receipt of M3UA Peer Management Messages	The two first paragraphs are outside the scope of this annex. Last paragraph is mandatory.
4.3 AS and ASP State Maintenance	The procedure is mandatory at the interfaces A and C.
4.3.1 ASP States	Replace figure in section 4.3.1 in 'RFC 3332' with the one below, which is based on figure 4 in draft-ietf-sigtran-m3ua-implementors-guide-01 
4.3.2 AS States	Mandatory
4.3.3 M3UA Management Procedures for Primitives	This section is outside the scope of this annex.

Section number in M3UA RFC	Comments
4.3.4 ASPM Procedures for Peer-to-Peer Messages	Heading
4.3.4.1 ASP Up Procedure	This procedure is mandatory at the interface C and is a subset of the procedure used at interface A. See also 4.3.4.1.2. Note: The registration procedure is optional. A received ASP Up must be acknowledged by an ASP Up Ack message, if no restriction applies e.g. maintenance.
4.3.4.1.1 M3UA Version Control	This procedure is mandatory at the interfaces A and C.
4.3.4.1.2 IPSP Considerations (Asp Up)	This procedure is mandatory at the interface A. The present section 4.3.4.1.2 in RFC 3332 is replaced by: 'An IPSP may be considered in the ASP-INACTIVE state after an ASP Up or ASP Up Ack has been received from it. An IPSP can be considered in the ASP-DOWN state after an ASP Down or ASP Down Ack has been received from it'. The IPSP may inform Layer Management of the change in state of the remote IPSP using M-ASP_UP or M-ASP_DN indication or confirmation primitives. If for any local reason (e.g., management lockout) an IPSP cannot respond to an ASP Up message with an ASP Up Ack message, it responds to an ASP Up message with an Error message with reason "Refused - Management Blocking" and leaves the remote IPSP in the ASP-DOWN state.' The paragraphs above are in accordance with changes included in Draft-ietf-sigtran-m3ua-implementors-guide-01 All comments applicable for section 4.3.4.1 and 4.3.4.2 are also applicable for this section.
4.3.4.2 ASP-Down Procedure	This procedure is mandatory at the interface C and is a subset of the procedure used at interface A. See also 4.3.4.1.2. A received ASP Down message must be acknowledged by an ASP Down Ack message, if no restriction applies eg maintenance reason.
4.3.4.3 ASP Active Procedure	This procedure is mandatory at interface C and is a subset of the procedure used at interface A. See also 4.3.4.3.1. Configuration data define which AS an ASP is a member of. The ASP Active message does not contain a Routing Context parameter. Consequently, the ASP Active Ack message does not include any Routing Context(s) parameter. The traffic state an ASP has, is configured within the associated Application Server. If more than one physical entity (ASPs, SGPs or IPSPs) implements a logical entity (SG, AS) then loadshare with 1+k is the mandatory traffic mode. A received ASP Active must be acknowledged by an ASP Active Ack message, if no restriction applies e.g. maintenance reason. If a Routing Context parameter is included in the ASP Active message it is not needed to include the Routing Context parameter in the ASP Active Ack message. Note: This is a deviation to RFC 3332.

Section number in M3UA RFC	Comments
4.3.4.3.1 IPSP Considerations (ASP Active)	This procedure is mandatory at the interface A. Section 4.3.4.3.1 in RFC 3332 is replaced by: 'Either of the IPSPs can initiate communication. When an IPSP receives an ASP Active, it should mark the peer as ASP-ACTIVE and return an ASP Active Ack message. An ASP receiving an ASP Active Ack message may mark the peer as ASP-Active, if it is not already in the ASP-ACTIVE state.' The paragraph above is in accordance with changes included in Draft-ietf-sigtran-m3ua-implementors-guide-01 All comments applicable for section 4.3.4.3 are also applicable for this section.
4.3.4.4 ASP Inactive Procedures	This procedure is mandatory at the interface C and is a subset of the procedure used at interface A. See also 4.3.4.4.1. Configuration data defines which AS an ASP is a member of. It is optional to send several ASP Active Ack messages in response to a single ASP Active message. A received ASP Inactive must be acknowledged by an ASP Inactive Ack message, if no restriction applies e.g. maintenance. The sending of Notify message is mandatory if the As state is changed.
4.3.4.4.1 IPSP Considerations (ASP Inactive)	This procedure is mandatory at the interface A. Section 4.3.4.4.1in RFC 3332 is replaced by: 'An IPSP may be considered in the ASP-INACTIVE state by a remote IPSP after an ASP Inactive or ASP Inactive Ack message has been received from it.' The paragraph above is in accordance with changes included in Draft-ietf-sigtran-m3ua-implementors-guide-01 All comments applicable for section 4.3.4.4 are also applicable for this section.
4.3.4.5 Notify Procedures	The procedure is mandatory at the interfaces A and C to reflect an AS state change.
4.3.4.6 Heartbeat Procedures	The procedure is optional.
4.4 Routing Key management procedure	The procedure is optional.
4.5 Procedures to Support the Availability or Congestion Status of SS7 Destination	Heading
4.5.1 At an SGP	Note: The use of Transfer restricted message is a national option and is about the scope of this specification. If the SG knows that the ASP support s DRST, then SG shall Send a DRST message, if the SG does not know whether the ASP supports the DRST message the SGW shall send a DAVA message if the destination earlier was unavailable. If the destination was available then no action is required.
4.5.2 At an ASP	Heading
4.5.2.1 Single SG Configurations	It is mandatory for an ASP to interoperate with one Signaling Gateway.

Section number in M3UA RFC	Comments
4.5.2.2 Multiple SG Configurations	It shall be possible to configure an ASP to handle at least a configuration consisting of two Signalling Gateways.
4.5.3 ASP Auditing	Only the part related to international use in Q.704 is inside the scope of this annex. Add the following paragraph to the corresponding section in RFC 3332 'Where the SGP does not maintain the congestion status of the SS7 destination (ITU international networks), the response to a DAUD message should always be only a DAVA, or DUNA message as appropriate.' The paragraph above is an extract from 'draft-ietf-sigtran-m3ua-implementors-guide-01'.
4.6 MTP 3 restart	The procedure is mandatory.
5. Examples of M3UA Procedures	Descriptive text
5.1. Establishment of Association and Traffic between SGPs and ASPs	Note The procedures defined in the sub-sections to 5.1 are a subset of the procedures defined in section 5.5.
5.1.1 Single ASP in an Application Server ("1+0" sparing	Descriptive text
5.1.1.1 Single ASP in an Application Server ("1+0" sparing), No Registration	The use of RCn is optional.
5.1.1.2 Single ASP in Application Server ("1+0" sparing), Dynamic Registration	The use of dynamic registration is optional.
5.1.1.3 Single ASP in Multiple Application Servers (each with "1+0" sparing), Dynamic Registration (Case 1 - Multiple Registration Requests)	The use of dynamic registration is optional.
5.1.1.4 Single ASP in Multiple Application Servers (each with "1+0" sparing), Dynamic Registration (Case 2 - Single Registration Request)	The use of dynamic registration is optional.
5.1.2 Two ASPs in Application Server ("1+1" sparing)	This procedure is optional.
5.1.3 Two ASPs in an Application Server ("1+1" sparing, loadsharing case).	The traffic mode parameter is optional in ASP-Active message

Section number in M3UA RFC	Comments
5.1.4 Three ASPs in an Application Server ("n+k" sparing, loadsharing case)	The procedure is optional.
5.2 ASP Traffic Failover Examples	Heading
5.2.1 (1+1 Sparing, Withdrawal of ASP, Backup Override)	The use of the procedure 'backup override' is optional.
5.2.2 (1+1 Sparing, Backup Override)	The use of the procedure 'backup override' is optional.
5.2.3 (n+k Sparing, Loadsharing case, Withdrawal of ASP)	The procedure is optional
5.3 Normal Withdrawal of an ASP from an Application Server and Teardown of an Association	The registration procedure is optional. Routing Contexts (RC) is optional.
5.3.X Normal Withdrawal of the ASP from an Application Server (1+1 sparing) loadsharing and Teardown of Association	 **The figure is added for clarification.**
5.4 M3UA/MTP3-User Boundary Examples	Heading
5.4.1 At an ASP	Heading
5.4.1.1 Support for MTP-TRANSFER Primitives at the ASP	Heading
5.4.1.1.1 Support for MTP-TRANSFER Request Primitive	The procedure is mandatory at the interface A and C. This description is also applicable for an IPSP, so replace the abbreviation ASP with ASP/IPSP and SGP with SGP/IPSP
5.4.1.1.2 Support for the MTP-TRANSFER Indication Primitive	The support is mandatory at the interface A and C. This description is also applicable for an IPSP, so replace the abbreviation ASP with ASP/IPSP and SGP with SGP/IPSP.

Section number in M3UA RFC	Comments
5.4.1.1.3 Support for ASP Querying of SS7 Destination States	This procedure is mandatory at the interface C. The quering of congestion states is an optional national procedure and outside the scope of this annex.
5.4.2 At an SGP	Heading
5.4.2.1 Support for MTP-TRANSFER Request Primitive at the SGP	The procedure is mandatory at the interface C. Network Appearance is optional.
5.4.2.2 Support for MTP-TRANSFER Indication Primitive at the SGP	The procedure is mandatory at the interface C
5.4.2.3 Support for MTP-PAUSE, MTP-RESUME, MTP-STATUS Indication Primitives	Heading
5.4.2.3.1 Destination Unavailable	The procedure is mandatory at the interface C
5.4.2.3.2 Destination Available	The procedure is mandatory at the interface C
5.4.2.3.3 SS7 Network Congestion	The procedure is mandatory at the interface C
5.4.2.3.4 Destination User Part Unavailable	The procedure is mandatory at the interface C and optional at the interface A.
5.5 Examples for IPSP communication.	Replace the section in RFC 3332 with the paragraph below This scenario shows a basic example for IPSP communication for the three phases of the connection (establishment, data exchange, disconnection). It is assumed that the SCTP association is already set up.  **The paragraph above is in accordance with changes included in Draft-ietf-sigtran-m3ua-implementors-guide-01**

Annex B (informative): Change history

Change history							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
February 2001					Initial draft	0.0.1	0.0.2
February 2001					Second draft	0.0.2	0.1.0
February 2001					Contributions and comments from TSG-CN WG4#6.1 Madrid Ad Hoc incorporated	0.1.0	0.2.0
February 2001					Contributions and comments from TSG-CN WG4#6.1 Madrid Ad Hoc incorporated and draft further elaborated	0.2.0	2.0.0
March 2001					Comments from TSG-CN WG4#7 incorporated.	2.0.0	2.1.0
March 2001	CN#11	NP-010079			Annex A: M3UA updated to the latest available version 6 Approved in CN#11	2.1.0	4.0.0
May 2001					Foreword added	4.0.0	4.0.1
Sep 2001	CN#13	NP-010452	001		Change of M 3UA version	4.0.1	4.1.0
Sep 2001	CN#13				Editorial clean up	4.0.1	4.1.0
Jun 2002	CN#16				Corrupted Figure 5.3/1 fixed	4.1.0	4.1.1
Jun 2002	CN#16				Rel-5 created after CN#16	4.1.1	5.0.0
Sep 2002	CN#17	NP-020445	003	1	Add reference to new IETF RFC on SCTP Checksum	5.0.0	5.1.0
Dec 2002	CN#18	NP-020585	007	2	M3UA for 3GPP networks	5.1.0	5.2.0
Dec 2002	CN#18	NP-020585	009		IETF RFC reference for M3UA	5.1.0	5.2.0
Dec 2004	CN#26				Rel-6 created after CN#26	5.2.0	6.0.0

History

Document history		
V6.0.0	December 2004	Publication