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# ITU-T Q.2765

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SERIES Q: SWITCHING AND SIGNALLING

Broadband ISDN – B-ISDN application protocols for the network signalling

# Signalling System No. 7 B-ISDN User Part (B-ISUP) – Application Transport Mechanism (APM)

ITU-T Recommendation Q.2765

(Formerly CCITT Recommendation)

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**ITU-T Recommendation Q.2765**

# Signalling System No. 7 B-ISDN User Part (B-ISUP) – Application Transport Mechanism (APM)


## Summary

This ITU-T Recommendation, Application Transport Mechanism (APM), is an addition to the B-ISDN User Part (B-ISUP) that provides a transport mechanism for its applications requiring a bearer and, in conjunction, support the application's signalling information flow. This transport mechanism provides the same capabilities as that which the Transaction Capabilities Application Part (TCAP) provides its user.

The basic function of the Application Transport Mechanism is to create signalling associations between the APM-user application logic located at a public initiating node (PIN) and its per APM-user application located at the public address node.



## Source

ITU-T Recommendation Q.2765 was prepared by ITU-T Study Group 11 (1997-2000) and approved under the WTSC Resolution 1 procedure on 3 December 1999.

## FOREWORD

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The World Telecommunication Standardization Conference (WTSC), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSC Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

## NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

CONTENTS

**ITU-T Recommendation Q.2765**

# Signalling System No. 7 B-ISDN User Part (B-ISUP) – Application Transport Mechanism (APM)

## 1 Scope

This ITU-T Recommendation specifies the exceptions to the Q.765 recommendation to support Application Transport Mechanism in the broadband network. The information contained in this ITU-T Recommendation should be read in conjunction with Q.765.

## 2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; all users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.


[1] ITU-T Recommendation Q.765 (2000), *Signalling System No. 7 – Application transport mechanism*.

[2] ITU-T Recommendation Q.2761 (1999), *Functional description of the B-ISDN user part (B-ISUP) of Signalling System No. 7*.

[3] ITU-T Recommendation Q.2762 (1999), *General functions of messages and signals of the B-ISDN user part (B-ISUP) of Signalling System No. 7*.

[4] ITU-T Recommendation Q.2763 (1999), *Signalling System No. 7 B-ISDN user part (B-ISUP) – Formats and codes*.

[5] ITU-T Recommendation Q.2764 (1999), *Signalling System No. 7 ISDN user part (B-ISUP) – Basic call procedures*.

[6] ITU-T Recommendation Q.2730 (1999), *Signalling System No. 7 B-ISDN user part (B-ISUP) – Supplementary services*.

[7] ITU-T Recommendation Q.2660 (1999), *Interworking between Signalling System No. 7 broadband ISDN user part (B-ISUP) and narrow-band ISDN user part (N-ISUP)*.

[8] ITU-T Recommendation Q.2650 (1999), *Interworking between Signalling System No. 7 broadband ISDN user part (B-ISUP) and digital subscriber signalling system No. 2 (DSS2)*.

[9] ITU-T Recommendation Q.2610 (1999), *Usage of cause and location in B-ISDN user part and DSS2*.


## 3 Additional Abbreviations

prep-APM ASE Preparing APM ASE

## 4 Exceptions and clarification for Application Transport Mechanism in ITU-T Recommendation Q.765

Table 4-1 contains three columns as follows:

- relevant reference in ITU-T Recommendation Q.765;
- the title of the referenced clause;
- remarks.

All subclasses are the same as in ITU-T Recommendation Q.765 unless indicated otherwise in Table 4-1.

The remark "not applicable" in the table means that a procedure described in ITU-T Recommendation Q.765 is not available in the broadband signalling references.

**Table 4-1/Q.2765 – Exceptions and clarification against ITU-T Recommendation Q.765**

| Q.765 | Title | Remarks |
|---|---|---|
| 1 | Scope | |
| 2 | References | Throughout the Recommendation replace the following references:<br>– ITU-T Rec. Q.761 by ITU-T Rec. Q.2761 [2];<br>– ITU-T Rec. Q.762 by ITU-T Rec. Q.2762 [3];<br>– ITU-T Rec. Q.763 by ITU-T Rec. Q.2763 [4];<br>– ITU-T Rec. Q.764 by ITU-T Rec. Q.2764 [5]. |
| 3 | Definitions | |
| 4 | Abbreviations | |
| 5 | Recommendation structure | Replace "ISUP ASE" by "prep-APM ASE".<br>The prep-APM ASE contains the additional coordination functionality for handling all APM related information. |
| 6 | Modelling | |
| 6.1 | Network model | Addressing and routing methods as described in ITU-T Recommendation Q.2764 may be possible. |
| 6.2 | Specification model | |
| 6.2.1 | Introduction | |

**Table 4-1/Q.2765 – Exceptions and clarification against ITU-T Recommendation Q.765 *(continued)***

| Q.765 | Title | Remarks |
|---|---|---|
| 6.2.2 | General model | Replace "ISUP ASE" by "prep-APM ASE".<br>Special explanation and references to ISUP ASE are not applicable. The corresponding part of B-ISUP is the combination of CC, BC, UI, MC ASE.<br>References to MTP-3 means MTP-3b as well.<br>For this modelling, refer to ITU-T Recommendation Q.2761.<br>Explanations to ISUP APE are not applicable; therefore, the following shall be added:<br>"The prep-APM ASE is defined in this ITU-T Recommendation to take over the additional protocol procedures for APM. The prep-APM ASE acts as a server for the APM ASE for APM related information. The basic call protocol procedures remain in the CC, BC, MC, UI ASE as it is."<br>The following messages in B-ISUP may contain the APP parameters: IAM, CPG, ANM, ACM, PRI, APM. |
| 6.2.3 | Dynamic primitive flows | Replace "ISUP ASE" by "prep-APM ASE". |
| 7 | Application Process functions | |
| 7.1 | General | ISUP basic call means the basic call procedures as defined in ITU-T Recommendation Q.2764. |
| 7.2 | APM Application Process (AP) functions | For additional procedures, see 5.4. |
| 7.2.1 | Introduction | CON is not applicable to B-ISUP. |
| 7.2.2 | Primitive interface (AP-SACF) | The additions as defined in 5.4.1 applies. |
| 7.2.3 | Procedures | |
| 7.2.4 | Primitive contents | |
| 8 | Single Association Control Function (SACF) – SACF | |
| 8.1 | Introduction | Replace "ISUP ASE" by "prep-APM ASE". |
| 8.2 | Information flows related to messages sent by the node | Replace "ISUP ASE" by "prep-APM ASE".<br>In the right column of Table 8/Q.765, replace "Transfer" by "Transfer_APM"<br>For additions, refer to 5.4.2.1. |
| 8.3 | Information flows related to messages received by the node | Replace "ISUP ASE" by "prep-APM ASE".<br>In the right column of Table 13/Q.765, replace "Transfer" by "Transfer_APM" |
| 9 | ISDN User Part ASE (ISUP ASE) | Replace "ISUP ASE" by "prep-APM ASE".<br>The basic call protocol procedures and handling of protocol errors and unrecognized information handling will be done by CC, BC, MC, UI as it is described in ITU-T Recommendation Q.2764. |
| 9.1 | Primitive interface | Replace "ISUP ASE" by "prep-APM ASE". |

**Table 4-1/Q.2765 – Exceptions and clarification against ITU-T Recommendation Q.765 *(continued)***

| Q.765 | Title | Remarks |
|---|---|---|
| 9.2 | Procedures | Replace "ISUP ASE" by "prep-APM ASE".<br>The basic call procedures are defined in ITU-T Recommendation Q.2764. The pre-APM ASE is responsible for all APM specific protocol procedures of described ISUP ASE (see 5.4.3).<br>For format definition of APM message refer to ITU-T Recommendation Q.2763. |
| 9.3 | Primitive contents | |
| 10 | Application Transport Mechanism ASE (APM ASE) | See 5.4.2 for additional procedures. |
| 10.1 | Primitive interface | |
| 10.2 | Procedures | |
| 10.2.1 | Normal procedures – Sending | CON is not applicable to B-ISUP.<br>The segmentation and re-assembly procedures are extended to support variable segments up to 2048 octets with a maximum of 10 segments, provided the maximum APM information transfer per APM-user never exceeds 2048 octets.<br>The 272-octet MTP limit is not applicable if MTP-3b is used. |
| 10.2.2 | Normal procedures – Receiving | |
| 10.2.3 | Sending of acknowledgement | |
| 10.2.4 | Segmentation | CON is not applicable to B-ISUP. |
| 10.3 | Primitive contents | |
| 11 | Application Transport Mechanism User ASE (APM-user ASE) | |
| 11.1 | Primitive interface | |
| 11.2 | Procedures | |
| 11.2.1 | General | |
| 11.2.2 | Signalling congestion | |
| 11.2.3 | Handling of unrecognized signalling information | |
| 11.3 | Primitive contents | |
| 12 | Network Interface function | For the entire section, refer to clause 5/Q.2764. |
| 13 | Unidentified Context and Error Handling ASE (UCEH ASE) | |
| 13.1 | Introduction of Unidentified Context Handling Mechanism | |
| 13.1.1 | Unidentified Context Handling – PAN | Replace "ISUP ASE" by "prep-APM ASE". |
| 13.1.2 | Unidentified Context Handling – PIN | Replace "ISUP ASE" by "prep-APM ASE". |

**Table 4-1/Q.2765 – Exceptions and clarification against ITU-T Recommendation Q.765 *(concluded)***

| Q.765 | Title | Remarks |
|---|---|---|
| 13.2 | Re-assembly Error Handling | |
| 13.3 | Primitive interface | |
| 13.4 | Procedures | |
| 13.4.1 | Normal procedures – Remote error handling | |
| 13.4.2 | Normal procedures – Local error handling | |
| 13.4.3 | Exceptional procedures – Context identifier error | |
| 13.4.4 | Exceptional procedures – Unrecognized Reason value | |
| 13.5 | Primitive contents | |
| 14 | Application Transport Notification Information | |
| 15 | Timers | |

# 5 Additional description to ITU-T Q.276x-series Recommendations

## 5.1 Additional description to ITU-T Recommendation Q.2761

No changes. The APM definitions, formats and codes are included.

## 5.2 Additional description to ITU-T Recommendation Q.2762

No changes. The APM definitions, formats and codes are included.

## 5.3 Additional description to ITU-T Recommendation Q.2763

No changes. The APM definitions, formats and codes are included.

## 5.4 Additional description to ITU-T Recommendation Q.2764

It is the responsibility of the AP to secure the ordering of the initial IAM, ACM, CPG, ANM or PRI message, and of the subsequent SGM and APM messages. Therefore the AP must be informed by the APM ASE about the segmentation status to initiate the sending of further APM messages or other suitable messages. On receipt of an APM_Segmentation_Status indication (More-APP data available) primitive, the AP shall generate an Application_Transport request primitive. Other call/connection control messages shall be queued until the receipt of an APM_Segmentation_Status indication (All APP information sent) primitive.

### 5.4.1 SACF

The following text should be considered with ITU-T Recommendation Q.2764:

Clause 6/Q.2764 – SACF

The following behaviour will be assumed by the SACF:

The SACF uses always a primitive of an ASE even though optional parameters of the related primitive are not present.

Subclause 6.1/Q.2764 – Introduction

Subclause 6.2/Q.2764 – Outgoing messages

Table 6-1/Q.2764 "Mapping between AP and ASE primitives":

**Table 5-1/Q.2765 – Additional mapping between AP and prep-APM ASE primitives**

| Interface d, from AP | Interface to prep-APM ASE |
|---|---|
| Set_Up.req | prep-APM Set_Up req. |
| Address_Complete.req | prep-APM_Address_Complete req. |
| Answer.req | prep-APM_Answer req. |
| Progress.req | prep-APM Call_Progress req. |
| Application_Transport.req | prep-APM_Transport.req |
| Pre_Release_Info.req | prep-APM_Pre_Release_Info.req |

Table 6-2/Q.2764 "Mapping from BCC CC and MC ASE primitives to B-ISUP messages":

**Table 5-2/Q.2765 – Additional mapping between prep-APM ASE primitives to B-ISUP messages**

| Interface to prep-APM ASE | Message type |
|---|---|
| prep-APM Set_Up.req | Initial Address |
| prep-APM_Address_Complete.req | Address Complete |
| prep-APM_Answer.req | Answer |
| prep-APM Call_Progress.req | Call Progress |
| prep-APM_Transport.req | Application Transport |
| prep-APM_Pre_Release_Info.req | Pre-Release Information |

Subclause 6.3/Q.2764 – Incoming messages

Subclause 6.3.1/Q.2764 – Message and parameter distribution

Table 6-5/Q.2764 "Distribution of received B-ISUP messages to BCC ASE, CC ASE and MC ASE":

**Table 5-3/Q.2765 – Distribution of received B-ISUP messages to prep-APM ASE**

| Received message | Primitive to prep-APM ASE |
|---|---|
| Address Complete | Yes |
| Answer | Yes |
| Initial Address | Yes |
| Call Progress | Yes |
| Pre-Release Information | Yes |
| Application Transport | Yes |

Table 6-6/Q.2764 "Mapping between BCC, CC and MC ASE primitives and AP primitives":

**Table 5-4/Q.2765 – Additional mapping between AP and prep-APM ASE primitives**

| Interface from prep-APM ASE | Interface d, to AP |
|---|---|
| APM_Segmentation_Status.ind | APM_Segmentation_Status.ind |

### 5.4.2 Additions to APM-ASE

In B-ISUP the AP initiates the Simple Segmentation. Additional APM messages have to be initiated by the AP which is also responsible to secure the ordering of ACM, CPG, ANM, PRI with SGM and APM messages. Therefore the APM_Segmentation_Status primitive is needed to inform the AP for initiating the sending of further APM messages or other suitable messages.

#### 5.4.2.1 Segmentation

The APM_Segmentation_Status.indication is used to inform the AP whether segmentation procedure is invoked. A APM_Segmentation_Status.indication (More APP data available) informs the AP, that not all APP information could been sent with the last message. It is the responsibility of the AP to generate the next suitable message until the APM ASE informs the AP with the APM_Segmentation_Status.indication (All APP information sent) that all APP information has been sent.

#### 5.4.2.2 Indication of segmentation status

**Table 5-5/Q.2765 – Primitives between APM ASE and SACF**

| Primitive name | Types | Direction (Notes 1 and 2) |
|---|---|---|
| APM_Segmentation_Status | Indication | ➔ |
| NOTE 1 – Primitive flow from APM ASE to SACF: ➔<br>NOTE 2 – Primitive flow from SACF to APM ASE: ➔ | | |

**Table 5-6/Q.2765 – Contents of the APM_Segmentation_Status**

| Parameter | Mandatory/Optional |
|---|---|
| Segmentation Status | M |
| NOTE – Segmentation Status Parameter contains two values namely "More APP data available" or "All APP information sent". | |

### 5.4.3 prep-APM ASE

This subclause specifies all procedures relating to prep-APM ASE.

When the prep-APM ASE receives a Transfer_APM indication primitive containing any of the messages listed in Table 5-3, then a APP parameter is passed on in an APM_Transfer indication primitive.

When the prep-APM ASE receives any prep-APM request primitive listed in Table 5-6, it is passed on as the corresponding B-ISUP message in a Transfer_APM request primitive.

**Table 5-7/Q.2765 – Primitives between SACF and prep-APM ASE**

| Primitive name | Types | Corresponding B-ISUP message |
|---|---|---|
| APM_Transfer | Request/Indication | |
| prep-APM Set_Up | Request | IAM |
| prep-APM_Address_Complete | Request | ACM |
| prep-APM_Answer | Request | ANM |
| prep-APM Call_Progress | Request | CPG |
| prep-APM_Transport | Request | APM |

**Table 5-8/Q.2765 – Parameters for prep-APM_Set_Up/prep-APM_Address_Complete/ prep-APM_Answer/prep-APM Call_Progress/prep-APM_Transport**

| Parameter | Mandatory/Optional |
|---|---|
| No parameter | – |
| NOTE – Used to inform the prep-APM ASE about the message type. | |

## 6 Other services and capabilities

### 6.1 Point-to-multipoint

APM for point-to-multipoint connections is for further study.

## 7 Interworking

### 7.1 Interworking with N-ISUP

For interworking with narrow-band ISDN, segmentation procedure in the transit node is required. The transport of application data in the release phase of the call using the Pre-Release mechanism (PRI message) shall be supported.

### 7.2 Interworking with broadband nodes not supporting the APM

Nodes not supporting the Application Transport Mechanism treat the APM related information as unrecognized signalling information. The instruction indicators shall have the same settings as the ATII. In case the message contains more than one APP, then the ATII settings will be according to the needs of each APM-user application; however, the instruction indicator settings must be according to the most stringent case with regards to the APM-users.

ANNEX A

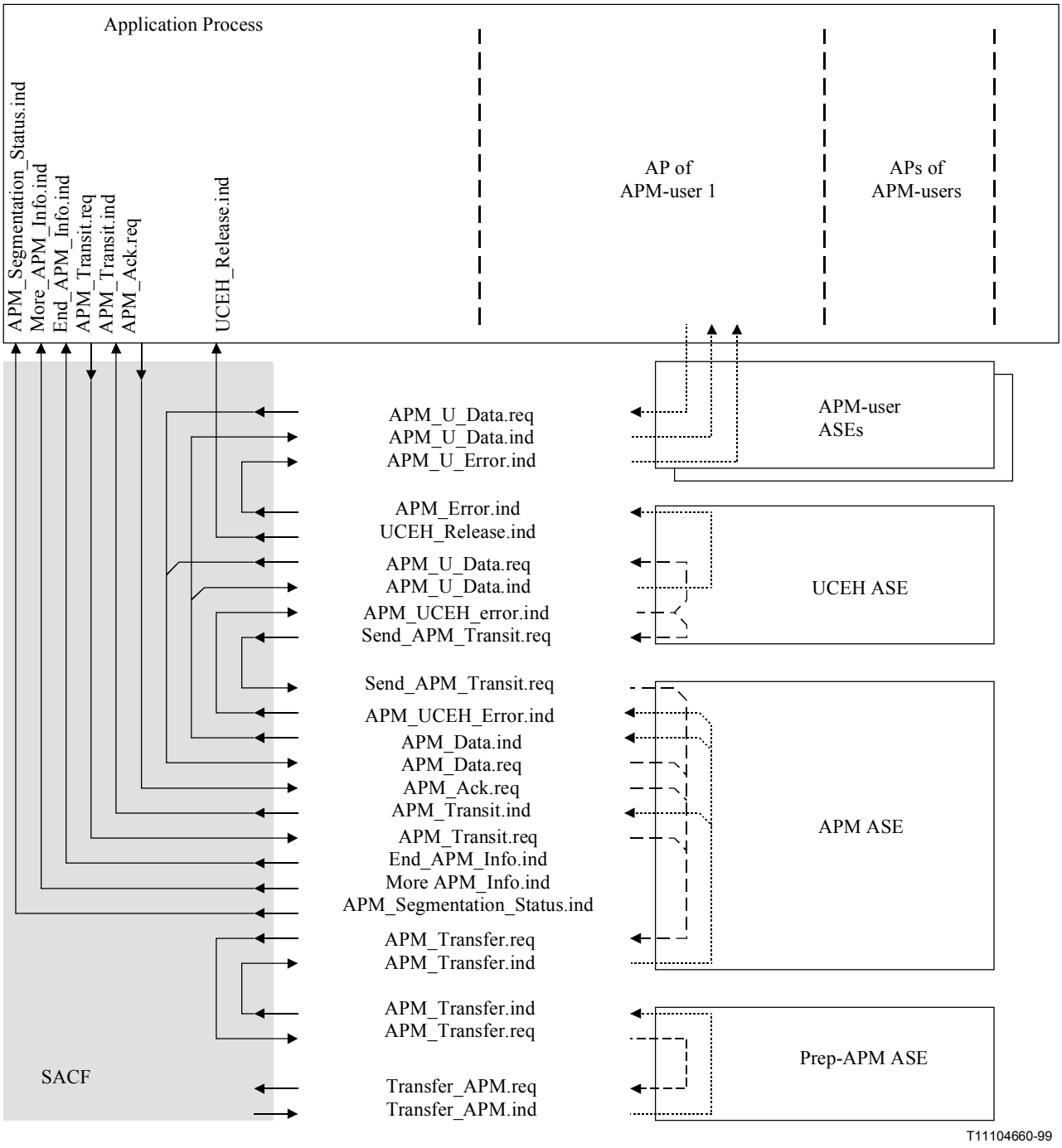
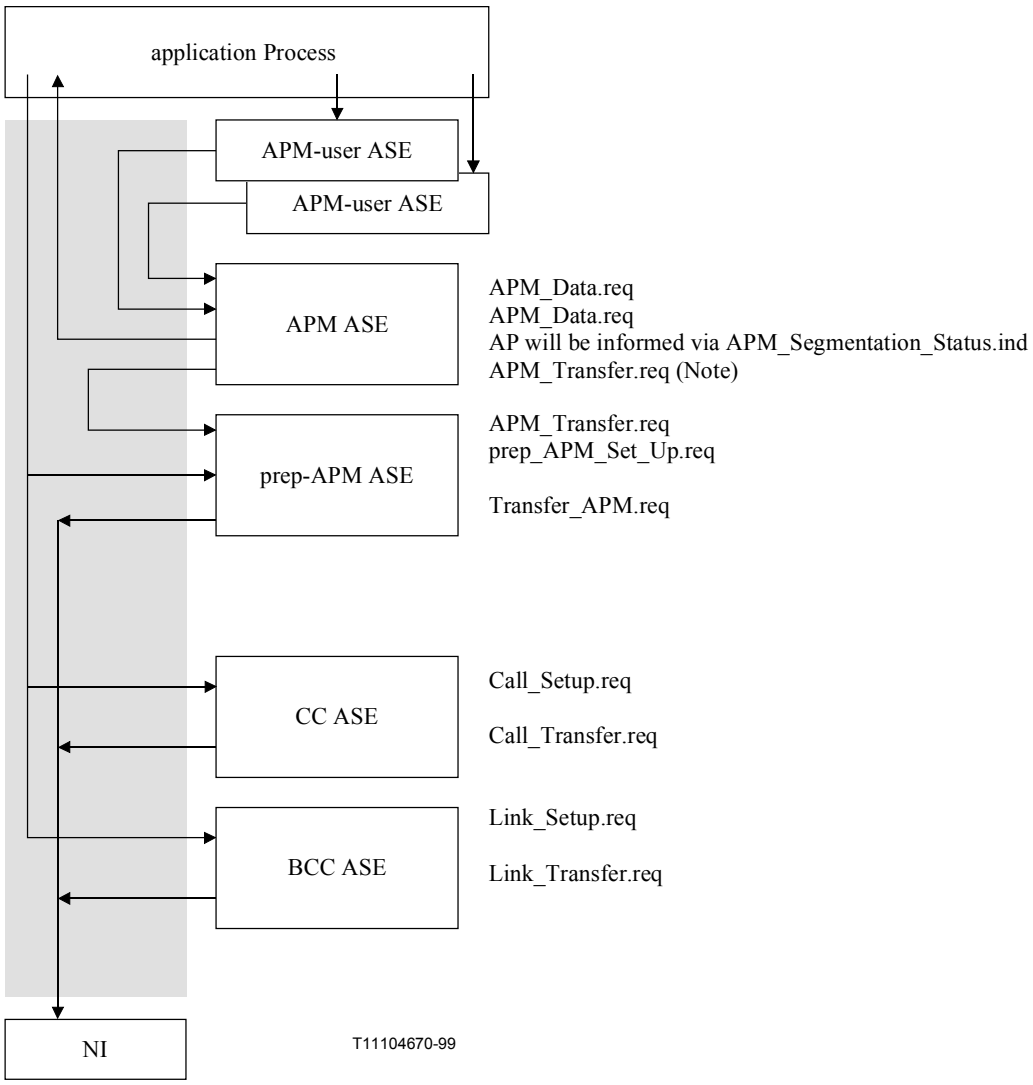
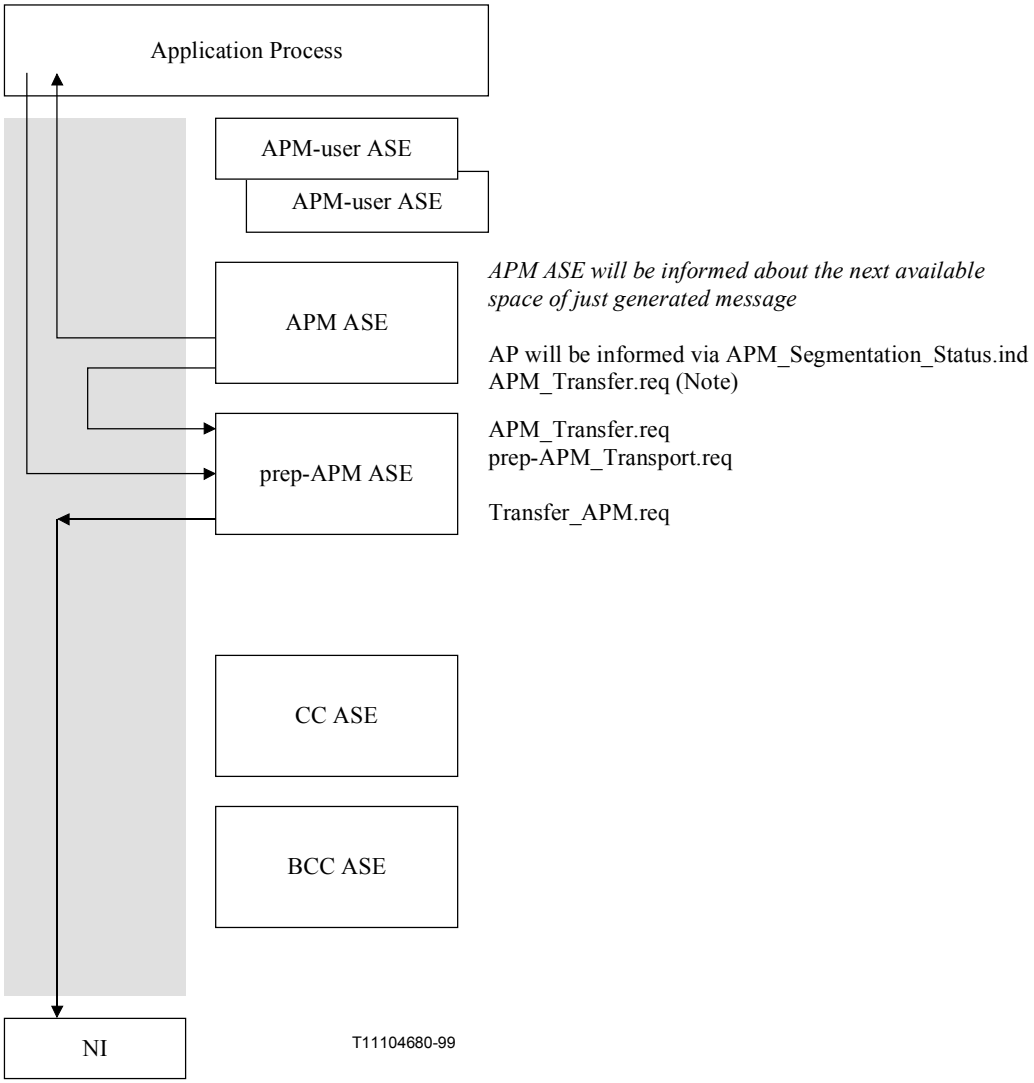



**Figure A.1/Q.2765 – Primitives related to prep-APM/APM/UCEH and APM-user ASEs**




NOTE – The APM ASE has to know via internal function the available space for APM information within the just generated message. If not enough space is available, the segmentation procedure for APM applies. After each sending of APM information, the AP shall be informed whether all APM information could be sent with this message.

**Figure A.2/Q.2765 – Sending APM information during call setup**




NOTE – The APM ASE has to know via internal function the available space for APM information within the just generated message. If not enough space is available, the segmentation procedure for APM applies. After each sending of APM information, the AP shall be informed whether all APM information could be sent with this message.

**Figure A.3/Q.2765 – Sending further APM messages in case of segmentation**

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