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International Videotex Interworking between a terminal
and a host

ETSI

Contents

Foreword

This European Telecommunication Standard (ETS) has been prepared by the Terminal Equipment (TE) Technical Committee of the European Telecommunications Standards Institute (ETSI).

This ETS has been produced in the light of:

a)   Videotex services being implemented in different countries using different data syntax profiles (as described in ETS 300 072 [1]);

b)   the International Radio Consultative Committee (CCIR) expressing the view that terminal equipment compatibility should exist between broadcast Teletext [1] systems for general reception and public network-based database systems;

c)   the right of different countries to use their existing systems;

d)   the possible requirement for transcoding and/or conversion to permit interworking between Videotex services in different countries;

e)   interworking between Videotex services may be provided by using different types of networks such as the Public Switched Telephone Network (PSTN), Packet Switched Public Data Network (PSPDN), Circuit Switched Public Data Network (CSPDN), Integrated Services Digital Network (ISDN), etc;

f)   the need for Videotex interworking protocols to offer a large degree of compatibility with those protocols used in other telematic services.

This ETS provides additional technical information concerning the different configurations of terminal to host interworking as described in ETS 300 105 [3]. It is closely related to ETS 300 072 [1].

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[1]   The term "Teletex" has not yet been definitively adopted by the CCIR.

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1 Scope

This ETS describes, where necessary, detailed information on specific points of the different configurations of Terminal to Host interworking especially in the case of a Videotex Interface Unit (VIU) and a Videotex Service Unit (VSU).

2 Normative references

This ETS incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to, or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1]   ETS 300 072 (1990): "Terminal equipment (TE); Videotex Presentation Layer protocol, Videotex presentation layer data syntax (T/TE 06-01)".

[2]   ETS 300 076 (1990): "Terminal Equipment (TE); Videotex : Terminal Facility Identifier (TFI) (T/TE 06-05).

[3]   ETS 300 105 (1991): "Terminal equipment (TE); International Videotex interworking".

[4]   CEPT Recommendation T/SF 59: "Videotex Service".

[5]   CCITT Recommendation F.300 (1988): "Videotex Service".

[6]   CCITT Recommendation X.3 (1988): "Packet assembly/disassembly facility (PAD) in a public data network".

[7]   CCITT Recommendation X.29 (1988): "Procedures for the exchange of control information and user data between a packet assembly/disassembly (PAD) facility and a packet mode DTE or another PAD".

[8]   CCITT Recommendation X.200 (1988): "Reference model of open systems interconnection for CCITT applications".

[9]   CCITT Recommendation T.541 (1988): "Operational application profile for videotex interworking".

[10]   ISO 639: "Language, country and authority indicatifs".

3 Definitions and abbreviations

The following abbreviations apply:

ASN.1   Abstract Syntax Notation One

CCITT   International Telegraph and Telephone Consultative Committee

CCIR   International Radiocommunication Consultative Committee

CEPT   Conférence Européenne des Postes et Télécommunications

CSPDN   Circuit Switched Public Data Network

ETS   European Telecommunication Standard

ETSI   European Telecommunications Standards Institute

ISDN   Integrated Services Digital Network

PAD	Packet Assembly Disassembly
PDN	Public Data Network
PSPDN	Packet Switched Public Data Network
PSTN	Public Switched Telephone Network
TBC	Time Based Charging
VIU	Videotex Interface Unit
VSU	Videotex Service Unit

4 Access via PSTN or ISDN bearer service

This configuration is described in ETS 300 105 [3], subclause 7.1.

5 Access via PSPDN or ISDN bearer service

This configuration is described in ETS 300 105 [3], subclause 7.2.

6 Access via PSPDN through a PAD

This configuration is described in ETS 300 105 [3], subclause 7.3.

In this configuration it may be necessary to set up the CCITT Recommendation X.3 [6] parameters of the PAD. This can be done either by the terminal or the host.

7 Access via PSPDN through a VIU [2]

This configuration is described in ETS 300 105 [3], subclause 7.4.

Cases of CCITT Recommendations X.29 [7] and X.3 [6]:

It may be necessary to set up the CCITT Recommendation X.3 [6] parameters of the VIU. This can be done either by the terminal or the host.

The data syntax conversion should conform to the one defined in CEPT Recommendation T/SF-59 [4], section 4.4.

The case of CCITT Recommendation X.200 [8] based protocols is for further study.

8 Access via PSPDN through a VSU

This configuration is described in ETS 300 105 [3], subclause 7.5.

When the connection between the VSU and the host is established a basic communication cost becomes active.

8.1 Administrative functions

The commands defined in this ETS have been identified in order to allow the exchange of information for charging and accounting and eventually for identification.

> NOTE: The list may not be exhaustive.

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2) Some other networks (CSPDN, ISDN, etc...) may be used between the Terminal and the Host.

The following table describes the command, the direction of the command and whether the command shall be implemented or not in the VSU and/or the host.

Table 1: Terminal to host administrative commands

Command	Direction		Implementation at	
	VSU to Host	Host to VSU	VSU	Host
Charging-Modify-Request		X	M	O
Charging-Modify-Response	X		M	C
Application-Connection-Report		X	M	O
Application-Disconnection-Report		X	M	O
Cost-Limit-Information-Request	X		O	O
Cost-Limit-Information-Response		X	C	C
Item-Over-Limit		X	C1	C2
Item-Over-Limit-Response	X		C1	C2
Identification-Request		X	O	O
Identification-Response	X		O	C
Language-to-Use-Request	X		O	O
Language-to-Use-Response		X	C	O
Data-Syntax-or-Profile-Switching-Request		X	O	O
Data-Syntax-or-Profile-Switching-Response	X		O	C
Error-Message	X	X	M	M

Key to table 1:

M: mandatory
O: optional
C: mandatory when the related request is implemented
C1: mandatory when Cost-Limit-Information-Request is implemented
C2: mandatory when handling of limits is supported.

8.1.1 Charging

The user in country A who accesses, through a VSU, a host machine in country B shall be charged for the session according to a bilateral agreed charging level (initial charging level). The host in country B may adjust the charging level by changing TBC-rate (Time-Based-Charging-rate) and/or Volume-rate. In addition, the host may charge the user for items accessed (frame price) and transactions performed (transaction price).

TBC-rate is specified in terms of period and price per period. Volume-rate is specified in terms of volume size and price per volume. All data sent and received by the VSU on the host side shall be taken into account.

All costs shall be expressed in the currency of the country of the host.

As state tables can be seen as a way of describing the interaction of protocol events, the state table for the charging commands received by the VSU is given in Annex B.

8.1.1.1   Charging level

For negotiation of charging level the commands Charging-Modify-Request and Charging-Modify-Response shall be used.

Application-Connection-Report is used to indicate the moment in time that the negotiated charging level becomes active.

The host may announce an Application-Connection-Report by a parameter in the Charging-Modify-Request. If such a parameter announces start at connection report, the VSU shall delay the use of the new charging level until it has received the Application-Connection-Report. When the host has not announced the Application-Connection-Report, the VSU shall activate the new charging level upon receipt of an Application-Connection-Report command or any data packet with the Q bit set to zero.

Application-Disconnection-Report is used to reset the charging level either to the still running charging level or to the bilateral agreed charging level (initial charging level).

8.1.1.2   Description of charging commands

8.1.1.2.1   Charging-Modify-Request

This command is sent by the host to the VSU. It contains information about modifications in communication costs (TBC-rate and volume-rate) and/or application costs (TBC-rate, volume-rate, frame-price and transaction-price).

At least one modification shall be present when the command is used.

This command shall be sent whenever the charging changes and shall always be sent before a frame or a transaction with a cost not equal to zero.

The host shall not initiate any other charging or limit handling command until the Charging-Modify-Response has been received. The VSU shall respond either accepting or refusing the indicated charging modifications before any other protocol elements are exchanged.

8.1.1.2.2   Charging-Modify-Response

This command is sent by the VSU to the host to accept or to refuse the charging modification requested by the host.

When the VSU refuses the charging modifications, charging shall be according to the previous charging level. It is up to the host to decide whether to disconnect the session or to continue.

When the VSU accepts the charging modifications frame the new charging level shall become active upon receipt by the VSU of an Application-Connection-Report (default situation) or any data packet with the Q bit set to zero.

8.1.1.2.3   Application-Connection-Report

This command is sent by the host to the VSU when a successful connection to the selected application is established. It implicitly means that the previous accepted Charging-Modify-Request command becomes active, and it also implies an implicit Application-Disconnection-Report from the previous application if any.

This command carries one parameter which indicates the connected application.

8.1.1.2.4   Application-Disconnection-Report

This command is sent by the host to the VSU when the association with the selected application is finished or not possible. The Application-Disconnection-Report command implicitly carries a Charging-Modify-Request command setting the communication costs either to the initial value (basic tariff) or to the still running charging level.

This command carries two parameters, the first one indicating the disconnected application and the second one indicating which tariff to apply (basic or still running tariff).

8.1.2 Limit handling

The VSU in country A can inform the host in country B about the charging limits of the user of the session.

The host may accept or refuse the limit-handling or issue an error. When accepted, the host is obliged to issue an Item-Over-Limit command whenever the charges exceed the indicated limits.

All costs shall be expressed in the currency of the country of the host.

8.1.2.1 Description of limit handling commands

8.1.2.1.1 Cost-Limit-Information-Request

This command may be sent only at connection time by the VSU to the host. This command shall be used to request the host to handle the cost limit facility. The host shall accept or refuse the cost limit announced or send an Error-Message command.

This command may contain information about item-cost-limit and/or session-cost-limit and/or time-based-charging-limit.

>   NOTE: The usage of the session-cost-limit needs further clarification.

8.1.2.1.2 Cost-Limit-Information-Response

This command is sent by the host to the VSU in response to a Cost-Limit-Information-Request command to indicate whether the host accepts the cost limit announced or not.

This command carries one parameter which can take the value "Accept" or "Refuse".

If the value of the parameter is "Accept", it shall be up to the host not to deliver more information than the limit allows. If the host continues to send information which exceeds the Cost-Limit, it shall be the responsibility of the VSU not to charge the user for the access of the information.

8.1.2.1.3 Item-Over-Limit

This command is sent by the host to the VSU when the cost limit facility is handled by the host and when the price of frame, transaction or time-based-charging exceeds the limit fixed at connection time. This command shall be used only for transaction, frame or time-based-charging.

The host shall not initiate any other limit handling or charging command until the Item-Over-Limit-Response or Error-Message has been received. The VSU shall respond immediately either accepting or refusing the indicated costs.

8.1.2.1.4 Item-Over-Limit-Response

This command is sent by the VSU to the host in response to an Item-Over-Limit command to indicate whether the VSU accepts the Over-Limit price or not.

This command carries one parameter which can take the value "Accept" or "Refuse".

When the VSU accepts the costs indicated in the Item-Over-Limit command, the host shall issue a Charging-Modify-Request command in order to get the charges modified according to the accepted Item-Over-Limit command.

8.1.3 Identification

The host in country B may ask the VSU in country A to give an identification of the user of the session.

8.1.3.1   Description of Identification commands

8.1.3.1.1   Identification-Request

This command may be sent by the host to the VSU if the host needs an identification.

This request may apply to user identification, terminal identification or line identification as described in CCITT Recommendation F.300 [5].

8.1.3.1.2   Identification-Response

This command may be sent by the VSU to the host in response to an Identification-Request command.

Identification parameters asked for by the host but not supported by the VSU shall either be absent or empty in the Identification-Response.

8.1.4   Language-Management

8.1.4.1   Language-to-Use-Request

This command may be sent by the VSU to the host at any time to indicate a list of languages in preferred order. It is used to allow a host that supports different languages for an information item to choose the instance that corresponds to the user's preference.

8.1.4.2   Language-to-Use-Response

This command may be sent by the host to the VSU in response to a Language-to-Use-Request. It indicates the language used to deliver the information item or items to follow.

8.1.5   Data-Syntax-or-Profile-Management

If possible the host should not perform by itself the switching of the terminal. The host should use the Data-Syntax-or-Profile-Switching-Request command.

8.1.5.1   Data-Syntax-or-Profile-Switching-Request

This command may be sent by the host to the VSU at any time during the session. It contains information about the data syntax and/or the profile the application will use. The VSU can accept or refuse to handle the data syntax and/or the profile announced by the host or send an Error-Message command.

8.1.5.2   Data-Syntax-or-Profile-Switching-Response

This command may be sent by the VSU to the host in response to the Data-Syntax-or-Profile-Switching-Request. This command carries one parameter which may take one of the following values:

-          the requested data-syntax and/or profile is not supported;

-          the requested data-syntax and/or profile is supported with transcoding in the VSU;

-          the terminal is in the requested data-syntax and/or profile.

8.1.6   Error-Message

This command shall be sent by the VSU or the host in reply to either a not supported/unrecognised command or an unrecognized parameter of a command.

Receipt of an Error-Message by the host when it is waiting for a response (Charging-Modify-Response, Item-Over-Limit-Response, Profile-Switching-Response   or Identification-Response) shall finish the waiting state. It is up to the host to decide whether the session shall be continued or disconnected.

Receipt of an Error-Message by the VSU when it is waiting for a response (Cost-Limit Information-Response or Language-to-Use-Response) shall finish the waiting state.

8.2   Coding

The coding of the Administrative commands shall be in line with the Telematic service message as defined in CCITT Recommendation X.29 [7], paragraphs 4.4.1, 4.4.2 and 4.4.11 and is illustrated in figure 1.

octet 1

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Command
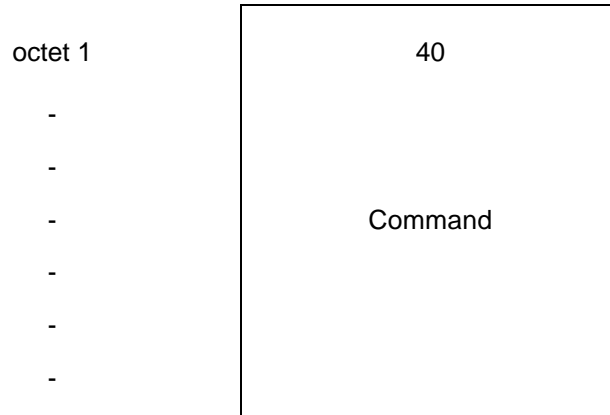
Figure 1: Terminal to host administrative command format

All protocol elements are carried via a qualified packet. Each command shall appear as one single data packet sequence with Q bit set to 1.

The coding of the commands is defined in Annex A.

Annex A (normative): ASN.1 encoding of the administrative commands of terminal to host interworking

This annex is an integral part of the Recommendation.

Terminal-to-Host-interworking-commands DEFINITIONS ::= BEGIN


```
terminalToHostCommand          ::=             CHOICE
{
 chargingModifyRequest         [0]                                ChargingModifyRequest,
 chargingModifyResponse        [1]     IMPLICIT  ChargingModifyResponse,
 appliConnectReport            [2]     IMPLICIT  AppliConnectReport,
 appliDisconnectReport         [3]     IMPLICIT  AppliDisconnectReport,
 costLimitInformationRequest   [4]     IMPLICIT  CostLimitInformationRequest,
 costLimitInformationResponse  [5]     IMPLICIT  CostLimitInformationResponse,
 itemOverLimit                 [6]     IMPLICIT  ItemOverLimit,
 itemOverLimitResponse         [7]     IMPLICIT  ItemOverLimitResponse,
 identificationRequest         [8]     IMPLICIT  IdentificationRequest,
 identificationResponse        [9]     IMPLICIT  IdentificationResponse,
 errorMessage                  [10]    IMPLICIT  ErrorMessage
 languagetoUseRequest          [11]    IMPLICIT  SEQUENCE OF Language,
 languagetoUseResponse         [12]    IMPLICIT  Language,
 dataSyntaxOrProfileSwitchingRequest
                               [13]    IMPLICIT  DataSyntaxOrProfileRequest,

 dataSyntaxOrProfileSwitchingResponse
                               [14]    IMPLICIT  DataSyntaxOrProfileSwitchingResponse
 syntaxBasedVideotex           [30]    -- reserved for Syntax-Based-Videotex
}


ChargingModifyRequest          ::=             CHOICE
{
 predefinedTariff              [0]     IMPLICIT          INTEGER,

                                       -- to be used for bilateral agreed predefined tariffs

 nonpredefinedTariff           [1]     IMPLICIT          NonpredefinedTariff,
 cCITTpredefinedTariff         [2]     IMPLICIT          CCITTpredefinedTariff

                                       -- CCITTpredefinedTariff is for further study

}


NonpredefinedTariff            ::=             SEQUENCE
{
 tBCPrice                      [0]     IMPLICIT  TBCPrice        OPTIONAL,
 framePrice                    [1]     IMPLICIT  RealNumber      OPTIONAL,
 transactionPrice              [2]     IMPLICIT  RealNumber      OPTIONAL,
 volumePrice                   [3]     IMPLICIT  VolumePrice     OPTIONAL

-- at least one of the types should appear
}


TBCPrice                       ::=             SEQUENCE
{
 period                        [0]     IMPLICIT INTEGER,

                                       -- period in seconds

 price                         [1]     IMPLICIT RealNumber,
```

```
    startAtConnectReport        [2]         IMPLICIT BOOLEAN OPTIONAL
                                            -- default is TRUE
                                            -- TRUE means wait for receipt
                                            -- of Application-Connection-Report
                                            -- FALSE means start on any data
}


VolumePrice                     ::=         SEQUENCE
{
 volume                         [0]         IMPLICIT INTEGER{
                                            1Byte(0),
                                            16Bytes(1),
                                            32Bytes(2),
                                            64Bytes(3),
                                            128Bytes(4),
                                            256Bytes(5),
                                            512bytes(6),
                                            1024Bytes(7),
                                            2048Bytes(8)
                                            4096Bytes(9)},
 price                          [1]         IMPLICIT RealNumber,
 startAtConnectReport           [2]         IMPLICIT BOOLEAN OPTIONAL
                                            -- default is TRUE
                                            -- TRUE means wait for receipt
                                            -- of Application-Connection-Report
                                            -- FALSE means start on any data

}


ChargingModifyResponse          ::=         BOOLEAN          -- "Accept"=TRUE
                                                             -- "Refuse"=FALSE


AppliConnectReport              ::=         SEQUENCE
{
 applicationConnectionId        [0]         IMPLICIT OCTETSTRING
}


AppliDisconnectReport           ::=         SEQUENCE
{
  applicationDisconnectionId    [0]         IMPLICIT OCTETSTRING
  tariffToBeApplied             [1]         IMPLICIT BOOLEAN OPTIONAL
                                            -- default is TRUE
                                            -- TRUE means apply the basic tariff
                                            -- FALSE means apply the skill running
                                            -- tariff
}
```

```
CostLimitInformationRequest    ::=           SEQUENCE
{
 itemCostLimit                 [0]    IMPLICIT    RealNumber        OPTIONAL,
 sessionCostLimit              [1]    IMPLICIT    RealNumber        OPTIONAL,
 tBCPriceLimit                 [2]    IMPLICIT    TBCPrice          OPTIONAL,

-- at least one of the types should appear
}


CostLimitInformationResponse ::=         BOOLEAN    -- "supported"=TRUE
                                                    -- "not supported"=FALSE

ItemOverLimit                  ::=           SEQUENCE
{
 framePrice                    [0]    IMPLICIT    RealNumber        OPTIONAL,
 transactionPrice              [1]    IMPLICIT    RealNumber        OPTIONAL,
 proposedTBCPrice              [2]    IMPLICIT    TBCPrice          OPTIONAL

-- at least one of the types should appear
}


ItemOverLimitResponse          ::=       BOOLEAN    -- "Accept"=TRUE
                                                    -- "Refuse"=FALSE


IdentificationRequest          ::=           SEQUENCE
{
 identificationCode            [0]    IMPLICIT    IdentificationCode

  -- at least one identificationCode should appear
}

IdentificationResponse         ::=       SEQUENCE OF Identification

Identification                 ::=       SEQUENCE
{
identificationCode             [0]    IMPLICIT    IdentificationCode,
identificationContents         [1]    IMPLICIT    OCTETSTRING
}

IdentificationCode             ::=       INTEGER
{
                                         userIdentification(15),
                                         lineIdentification(16),
                                         terminalIdentification(17)
                                         -- other identification codes may be used on
                                         -- a bilateral base; it is suggested that,
                                         -- when applicable, values corresponding
                                         -- to field-type of Annex B of T.541 [9] shall be used.
}

Language                       ::=       IMPLICIT OCTETSTRING
                                         -- value as defined in ISO 639 [10],
                                         -- Annex B, alphabetical list of letter symbols for
                                         -- languages.
                                         -- For example, Dutch language is represented by "Nl".

DataSyntaxOrProfileRequest     ::=       CHOICE
{
dataSyntaxIIProfileSwitching   [2]       IMPLICIT OCTETSTRING
                                         -- value as defined in ETS 300076 [2]
```

```
}

DataSyntaxOrProfileSwitchingResponse ::=    INTEGER

{
                                            requestedProfileNotSupported(0),
                                            requestedProfileSupportedTranscodingDoneByVSU(1),
                                            terminalInRequestedProfile(2)
}

ErrorMessage                  ::=           INTEGER
{
                                            unrecognisedCommand(0),
                                            unrecognisedParameter(1)
}

RealNumber                    ::=           SEQUENCE
{
integerPart                   [0]           IMPLICIT INTEGER DEFAULT 0,
decimalExponent               [1]           IMPLICIT INTEGER DEFAULT 2

-- the encoded real number is obtained by dividing the
-- integerPart by 10**decimalExponent
}

END
```

Annex B (informative):   State table for charging events received at VSU side

B.1   Used abbreviations

B.1.1   States

ST_RAA: Basic charging level running, other charging levels absent.

ST_RPA: Basic charging level running, first charging level proposed, second charging level absent.

ST_SRA: Basic charging level sleeping, first charging level running, second charging level absent.

ST_SRP: Basic charging level sleeping, first charging level running, second charging level proposed.

ST_SSR: Basic charging level sleeping, first charging level sleeping, second charging level running.

B.1.2   Actions

[1]   Add frame-price and/or transaction-price to user account.

[2]   Finish charging time period; install proposed charging level and start new time period.

[3]   Finish charging time period; reinstall first charging level and start new time period.

[4]   Finish charging time period; reinstall basic charging level and start new time period.

[5]   Store proposed charging level according to the received values, set V_activate_on_ACR according to the received value.

    NOTE: - when transaction or frame price is absent then value 0 is assumed;

                - when volume or TBC-rate is absent then the running values are assumed.

[6]   Copy second charging level to first charging level.

B.1.3   Incoming events

CMreq: Charging-Modify-Request

ACR: Application-Connection-Report

ADR: Application-Disconnection-Report

Data0:   any data with Q bit = 0;

Data1:   any other data with Q bit = 1.

B.1.4 Outgoing events

CMrsp+: Charging-Modify-Response "Accepted"

CMrsp-: Charging-Modify-Response "Refused"

B.1.5 Predicates

P0: charging modifications can be accepted

P1: V_activate_on_ACR

P2: Basic tariff required

B.1.6 Variables

V_activate_on_ACR: TRUE when charging level is only to become active on receipt of an Application-connection-Report.
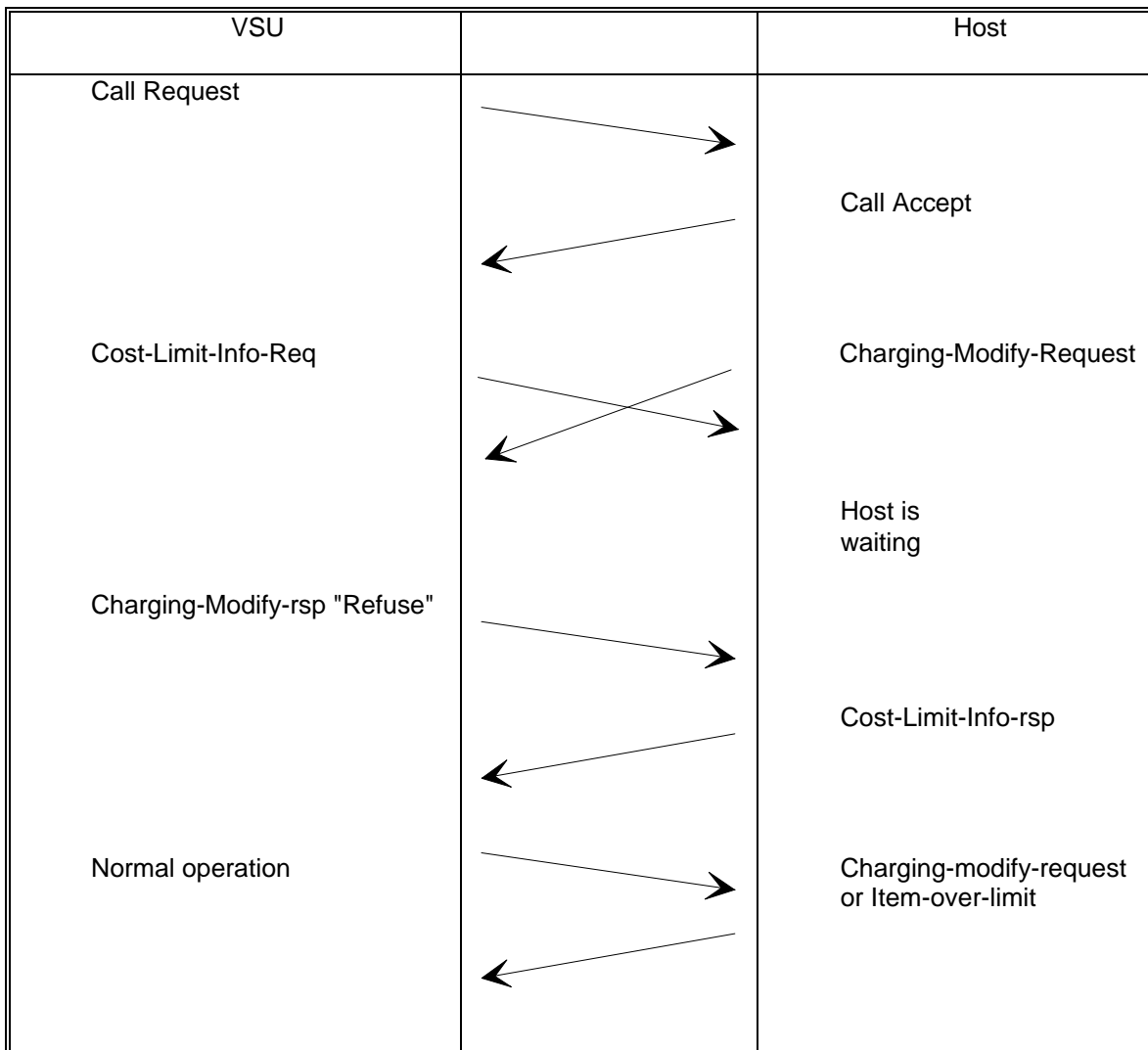
B.2 State table

Table B.1

State Stack: second first basic Event	ST_RAA absent absent running	ST_RPA absent proposed running	ST-SRA absent running sleeping	ST_SRP proposed running sleeping	[ST_SSR running sleeping sleeping
CMreq	P0: CMrsp+ [5] ST_RPA ^P0: CMrsp- ST_RAA	P0: CMrsp+ [5] ST_RPA ^P0: CMrsp- ST_RPA	P0: CMrsp+ [5] ST_SRP ^P0: CMrsp- ST_SRA	P0: CMrsp+ [5] ST_SRP ^P0: CMrsp- ST_SRP	P0: CMrsp+ [6][5] ST_SRP ^P0: CMrsp- ST_SSR
ACR	ST_RAA	[1][2] ST_SRA	ST_SRA	[1][2] ST_SSR	ST_SSR
ADR	ST_RAA	ST_RAA	P2: [4] ST_RAA ^P2: ST_SRA	P2: [4] ST_RAA ^P2: ST_SRA	P2: [4] ST_RAA ^P2: [3] ST_SRA
Data0	ST_RAA	P1: ST_RPA ^P1: [1][2] ST_SRA	ST_SRA	P1: ST_SRP ^P1: [1][2] ST_SSR	ST_SSR
Data1	ST_RAA	ST_RPA	ST_SRA	ST_SRP	ST_SSR

B.3   Collision

When sending of Limit Cost Information clashes with receipt of a Charging-Modify-Request and the costs being modified exceed the user limits the following sequence is exchanged:

Table B.2

VSU		Host
Call Request		
		Call Accept
Cost-Limit-Info-Req		Charging-Modify-Request
		Host is waiting
Charging-Modify-rsp "Refuse"		
		Cost-Limit-Info-rsp
Normal operation		Charging-modify-request or Item-over-limit

History

Document history	
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