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SERIES Q: SWITCHING AND SIGNALLING

Interworking of Signalling Systems – Interworking between Digital Subscriber Signalling System No. 1 and Signalling System No. 7

Interworking between ISDN access and non-ISDN access over ISDN user part of Signalling System No. 7: Support of VPN applications with PSS1 information flows

ITU-T Recommendation Q.699.1

(Previously CCITT Recommendation)

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ITU-T RECOMMENDATION Q.699.1

INTERWORKING BETWEEN ISDN ACCESS AND NON-ISDN ACCESS OVER ISDN USER PART OF SIGNALLING SYSTEM No. 7: SUPPORT OF VPN APPLICATIONS WITH PSS1 INFORMATION FLOWS

Summary

This Recommendation describes the interworking for the support of VPN applications with PSS1 information flows between Signalling System No. 7 (ISDN) and extended DSS1.

Source

ITU-T Recommendation Q.699.1 was prepared by ITU-T Study Group 11 (1997-2000) and was approved under the WTSC Resolution No. 1 procedure on the 15th of May 1998.

Keywords

APM, ASN.1, DSS1, ISUP, PSS1, TCAP

FOREWORD

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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, the 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.

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INTERWORKING BETWEEN ISDN ACCESS AND NON-ISDN ACCESS OVER ISDN USER PART OF SIGNALLING SYSTEM No. 7: SUPPORT OF VPN APPLICATIONS WITH PSS1 INFORMATION FLOWS

(Geneva, 1998)

1 Scope

This Recommendation describes interworking between Signalling System No. 7 (ISDN) and extended DSS1 for the support of VPN applications with PSS1 information flows. For the interworking in this Recommendation related to ISUP, these replace that specified in Recommendation Q.699 whereas all other interworking of PSS1 information flows is according to that specified in Recommendation Q.699.

The interworking described here provides a sub-set of all possible interworking scenarios and is therefore intended to describe the relevant mapping of information flows between the two interfaces being described.

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.699 (1997), *Interworking between ISDN access and non-ISDN access over ISDN User Part of Signalling System No. 7.*

[2] ITU-T Recommendation Q.763 (1997), *Signalling System No. 7 – ISDN User Part formats and codes.*

[3] ITU-T Recommendation Q.764 (1997), *Signalling System No. 7 – ISDN User Part signalling procedures.*

[4] ITU-T Recommendation Q.931 (1998), *ISDN user-network interface layer 3 specification for basic call control. Annex M: Additional basic call signalling requirements for the support of private network interconnection for virtual private network applications.*

[5] ITU-T Recommendation Q.932 (1998), *Digital subscriber Signalling System No. 1 – Generic procedures for the control of ISDN supplementary services. Annex D: Enhancements for virtual private networks.*

[6] ITU-T Recommendation Q.765 (1998), *Signalling System No. 7 – Application transport mechanism.*

[7] ITU-T Recommendation Q.765.1 (1998), *Signalling System No. 7 – Application transport mechanism: Support of VPN applications with PSS1 information flows.*

3 Definitions

Within the scope of this Recommendation "VPN" refers to a Virtual Private Network with the support of PSS1 information flows.

4 Abbreviations

This Recommendation uses the following abbreviations.

ACM Address Complete Message

ANM Answer Message

APM Application Transport Mechanism

APP Application Transport Parameter

CLIP Calling Line Identification Presentation

CLIR Calling Line Identification Restriction

CN Corporate Telecommunications Network

CNID Corporate Telecommunications Network Identifier

COLP Connected Line Identification Presentation

COLR Connected Line Identification Restriction

CON Connect Message

CPG Call Progress Message

DSS1 Digital Subscriber Signalling System No. 1

IAM Initial Address Message

IN Intelligent Network

ISDN Integrated Services Digital Network

ISUP ISDN User Part

PINX Private Integrated Services Network Exchange

PISN Private Integrated Services Network

PRI Pre-Release Information Message

PSS1 Private Network Q Reference Point Signalling System No. 1

REL Release Message

VPN Virtual Private Network

5 Signalling interworking specification for ISDN User Part (ISUP)

5.1 Introduction

The following subclauses specify the interworking between Signalling System No. 7 ISDN User Part (ISUP [2], [3], [6] and [7]) and extended Digital Subscriber Signalling System No. 1 (DSS1 [4] and [5]) for the support of private network interconnection in VPN applications.

This Recommendation describes the ISUP-DSS1 interworking of PSS1 information flows between ISUP [2], [3] and [6] and extended DSS1 [4] and [5]. Where the interworking is defined in this Recommendation, these replace that specified in [1]. All other interworking of PSS1 information flows is according to that specified in [1].

NOTE – The description of the ISUP – extended DSS1 interworking with reference to ISUP'92 interworking document (reference [1]) may not fully cover all interworking aspects since the ISUP'97 specific basic call and supplementary services interworking aspects are not documented in reference [1].

5.2 Methodology

APM-user information segmentation

The actions described in the following subclauses on receipt of Application Transport Parameters (APP) take place only after the completion of the segmentation and reassembly procedure specified in reference [6].

When it is said in the text that an Application Transport (APP) parameter is received in an ISUP message, in case of segmentation it could be received as well in an Application Transport message (APM) containing segmented information linked to that message.

5.3 Outgoing call

5.3.1 Sending of the Initial Address Message (IAM)

If the access has extended DSS1 capability and if the exchange has determined that it is a VPN call requesting support of PSS1 information flows, the Initial Address Message (IAM) sent is coded as described in 2.1.1.1/Q.699 [1] with the following modifications.

Called party number

Add the following sentence:

The called party number parameter is generated by the VPN Application Process.

Application Transport

See Table 1.

Table 1/Q.699.1 – Contents of the Application Transport Parameter

SETUP →	IAM →
Content	**Application Transport parameter**
	Application Context Identifier "PSS1 ASE (VPN)"
	Gateway PINX Transformation capability (Note 1)
	Corporate Telecommunications Network Identifier (CNID) Indicator (Note 2)
	Corporate Telecommunications Network Identifier (CNID) length (Note 2)
	Corporate Telecommunications Network Identifier (CNID) (Note 2)
Non-locking/Locking shift	Non-locking/Locking shift
Transit counter	Transit counter
Calling party number	Calling party number
Called party number	Called party number
Facility with Protocol profile value set to "Networking Extensions"	Facility with Protocol profile value set to "Networking Extensions"
Notification indicator	Notification indicator

NOTE 1 – The "Gateway PINX Transformation capability" indication is optional and is coded as described in clause 14/Q.765.1 [7].

NOTE 2 – The Corporate Telecommunications Network Identifier length and Corporate Telecommunications Network Identifier are only included when the CNID Indicator is coded "Network specific (Network option)" or "Global value". The CNID Indicator, CNID length and CNID are either derived from information received from the calling user in the CN indicator and CN identifier fields of the VPN indicator information element in the SETUP message or have an implicit value tied to the incoming access.

Generic number

This may be required if the network obtains the public called party number from a number translation of the private called party number at an IN node if this IN node is situated at another exchange within the public network.

The mechanism as described here can only be used in the case that a Corporate Telecommunications Network can be uniquely identified.

Replace item about Generic number in 2.1.1.1/Q.699 [1] by:

The calling party number received in the Calling party number information element of the SETUP message is transferred in the generic number parameter with the number qualifier indicator coded "additional calling party number" without taking into account the public CLIR and the CLIP supplementary services.

The called party number received in the Called party number information element of the SETUP message is transferred in the generic number parameter with the number qualifier indicator coded "additional called party number". See Table 2.

Table 2/Q.699.1 – Mapping of values when interworking to the Generic Number parameter

Called/Calling Party Number information element Type of Number indication	Generic Number parameter Nature of address indicator
Unknown	Unknown
Level 0 Regional number	Subscriber number
Level 1 Regional number	National (significant)
Level 2 Regional number	International number
PISN specific number	PISN specific number

5.3.2 VPN call with VPN feature transparency

The originating exchange knows that the VPN call does support PSS1 information flows continuity when the VPN feature transparency indication is received coded "Call with VPN feature transparency capability" in an application transport parameter with the Application Context Identifier coded "PSS1 ASE (VPN)" in the Address Complete Message (ACM) or in a Call Progress Message (CPG) or in the Connect Message (CON) or in the Answer Message (ANM) or in the Pre-Release Information Message (PRI) or in an Application Transport Message (APM).

From the receipt of this explicit information, the originating exchange shall apply the following subclauses.

5.3.2.1 Receipt of the Address Complete Message (ACM)

Upon receipt of an Address Complete Message (ACM), the exchange shall apply the actions described in 2.1.1.3/Q.699 [1] with the following modifications.

Facility/Notification indicator

Add the following Table 3:

Table 3/Q.699.1 – Transfer of the Facility/Notification indicator information element

← Appropriate DSS1 message	← ACM
Content	**Application Transport parameter**
	Application Context Identifier "PSS1 ASE (VPN)"
Facility	Facility
Notification indicator	Notification indicator

5.3.2.2 Receipt of the Call Progress Message (CPG)

Upon receipt of a Call Progress Message (CPG), the exchange shall apply the actions described in 2.1.1.4/Q.699 [1] with the following modifications.

Facility/Notification indicator

Add the following Table 4:

Table 4/Q.699.1 – Transfer of the Facility/Notification indicator information element

← Appropriate DSS1 message	← CPG
Content	**Application Transport parameter**
	Application Context Identifier "PSS1 ASE (VPN)"
Facility	Facility
Notification indicator	Notification indicator

5.3.2.3 Receipt of the Answer Message (ANM)

Upon receipt of an Answer Message (ANM), the exchange shall apply the actions described in 2.1.1.5/Q.699 [1] with the following modifications.

Connected number

Replace item about Connected number in 2.1.1.5/Q.699 [1] by:

The Connected number information element received in the application transport parameter is transferred in the CONNECT message without taking into account the public COLP or COLR supplementary services. See Table 5.

Table 5/Q.699.1 – Transfer of the Connected number information element

← CONNECT	← ANM
Content	**Application Transport parameter**
	Application Context Identifier "PSS1 ASE (VPN)"
Connected number	Connected number

Connected subaddress

Replace item about Connected subaddress in 2.1.1.5/Q.699 [1] by:

The Connected subaddress information element received in the access transport parameter is passed on in the CONNECT message without taking into account public COLP or COLR supplementary services.

Facility/Notification indicator

Add the following Table 6:

Table 6/Q.699.1 – Transfer of the Facility/Notification indicator information element

← CONNECT	← ANM
Content	**Application Transport parameter**
	Application Context Identifier "PSS1 ASE (VPN)"
Facility	Facility
Notification indicator	Notification indicator

5.3.2.4 Receipt of the Connect message (CON)

Upon receipt of a Connect Message (CON), the exchange shall apply the actions described in 2.1.1.6/Q.699 [6] with the following modifications.

Connected number

Replace item about Connected number in 2.1.1.6/Q.699 [1] by:

The Connected number information element received in the application transport parameter is transferred in the CONNECT message without taking into account the public COLP or COLR supplementary services. See Table 7.

Table 7/Q.699.1 – Transfer of the Connected number information element

← CONNECT	← CON
Content	**Application Transport parameter**
	Application Context Identifier "PSS1 ASE (VPN)"
Connected number	Connected number

Connected subaddress

Replace item about Connected subaddress in 2.1.1.6/Q.699 [1] by:

The Connected subaddress information element received in the access transport parameter is passed on in the CONNECT message without taking into account the public COLP or COLR supplementary services.

Facility/Notification indicator

Add the following Table 8:

Table 8/Q.699.1 – Transfer of the Facility/Notification indicator information element

← CONNECT	← CON
Content	**Application Transport parameter**
	Application Context Identifier "PSS1 ASE (VPN)"
Facility	Facility
Notification indicator	Notification indicator

5.3.2.5 Receipt of the Application Transport message

Upon receipt of an Application Transport message with the Application Context Identifier coded "PSS1 ASE (VPN)", the exchange shall transfer the following information in a FACILITY message or in a NOTIFY message. See Table 9.

Table 9/Q.699.1 – Receipt of the Application Transport message

FACILITY/NOTIFY ←	Application Transport ←
Content	**Application Transport parameter**
	Application Context Identifier "PSS1 ASE (VPN)"
Facility	Facility
Notification indicator	Notification indicator

NOTE – The Application Transport message may be received in any state of the call.

5.3.2.6 Sending of the Application Transport message

Upon receipt of a FACILITY message or a NOTIFY message, the exchange shall transfer the following information in an Application Transport message. See Table 10.

Table 10/Q.699.1 – Sending of the Application Transport message

FACILITY/NOTIFY ←	Application Transport ←
Content	**Application Transport parameter**
	Application Context Identifier "PSS1 ASE (VPN)"
Facility with Protocol profile value set to "Networking Extensions"	Facility with Protocol profile value set to "Networking Extensions"
Notification indicator	Notification indicator

5.3.2.7 Receipt of the Release Message (REL)

The actions described in 2.1.1.7/Q.699 [1] shall apply with the following additions:

Upon receipt of a Release Message (REL) subsequent to a Pre-Release Information Message (PRI), the exchange shall transfer the following information in a DISCONNECT message. See Table 11.

Facility/Notification indicator

Table 11/Q.699.1 – Sending of the DISCONNECT message

← DISCONNECT	← REL subsequent to a PRI message
Content	**Application Transport parameter received in the PRI message**
	Application Context Identifier "PSS1 ASE (VPN)"
Facility	Facility
Notification indicator	Notification indicator

5.3.2.8 Sending of the Pre-Release Information Message (PRI)

Upon receipt of a DISCONNECT, RELEASE or RELEASE COMPLETE message, the exchange shall transfer the following information in a Pre-Release Information Message (PRI) before sending the RELEASE message. See Table 12.

Application Transport

Table 12/Q.699.1 – Sending of the Pre-Release Information Message

DISCONNECT, RELEASE RELEASE COMPLETE →	PRI →
Content	**Application Transport parameter**
	Application Context Identifier "PSS1 ASE (VPN)"
Facility with Protocol profile value set to "Networking Extensions"	Facility with Protocol profile value set to "Networking Extensions"
Notification indicator	Notification indicator

5.4 Incoming call

5.4.1 VPN call with VPN feature transparency

If the Initial Address Message (IAM) received contains the Application Transport parameter with the Application Context Identifier coded "PSS1 ASE (VPN)" and if the called access has the extended DSS1 capability, the exchange shall apply the following subclauses.

5.4.1.1 Sending of the SETUP message

The actions described in 3.1.1.1/Q.699 [1] shall apply with the following modifications:

VPN indicator

The VPN indicator information element may optionally include a CN identifier.

The CN indicator and CN identifier values of the VPN indicator information element may be derived from information received in the Corporate Telecommunications Network Identifier (CNID) Indicator, Corporate Telecommunications Network Identifier (CNID) length and Corporate Telecommunications Network Identifier (CNID) fields inside the Application transport parameter.

Calling party number

Replace the item about Calling party number in 3.1.1.1/Q.699 [1] by:

The Calling party number information element received in the application transport parameter is transferred in the SETUP message without taking into account the public CLIP or CLIR supplementary services.

Calling party subaddress

Replace the item about Calling party subaddress in 3.1.1.1/Q.699 [1] by:

The calling party subaddress information element received in the access transport parameter is passed on in the SETUP message without taking into account the public CLIP or CLIR supplementary services.

Called party number

Replace the item about Called party number in 3.1.1.1/Q.699 [1] by (see Table 13):

Table 13/Q.699.1 – Transfer of the Called party number information element

IAM→	SETUP →
Application Transport parameter	**Content**
Application Context Identifier "PSS1 ASE (VPN)"	
Called party number	Called party number

Transit counter

The Locking/Non-locking shift information element followed by the transit counter information element received in the Application Transport parameter are passed on unchanged in the SETUP message.

Facility/Notification indicator

Add the following Table 14:

Table 14/Q.699.1 – Transfer of the Facility/Notification indicator information element

IAM →	SETUP →
Application Transport parameter	**Content**
Application Context Identifier "PSS1 ASE (VPN)"	
Facility	Facility
Notification indicator	Notification indicator

5.4.1.2 Sending of the Address Complete Message (ACM)

The actions described in 3.1.1.3/Q.699 [1] shall apply with the following modifications:

Replace the first paragraph in 3.1.1.3/Q.699 [1] by:

The following cases are possible trigger conditions of sending the Address Complete Message (ACM):

a) the destination exchange has determined independently of access indications that the complete called party number has been received;

b) overlap receiving is used on the DSS1 side and a CALL PROCEEDING is received;

c) *en bloc* receiving is used on the DSS1 side and a Progress indicator information element is received in a CALL PROCEEDING message (except with value No. 8 *In-band information or an appropriate pattern is now available*, No. 3 *originating address is non-ISDN*, or No. 4 *call has returned to the ISDN)* or in a PROGRESS message (except with value No. 3 *originating address is non-ISDN*, or No. 4 *call has returned to the ISDN)*;

d) the first ALERTING message is received;

e) it has been determined, in case of call failure, that a special in-band tone or announcement has to be returned to the calling party from the destination exchange.

Access transport

Replace the first sentence of the item about Access transport in 3.1.1.3/Q.699 [1] by:

This parameter carries the Progress indicator information element possibly received from the called user.

Application Transport

See Table 15.

Table 15/Q.699.1 – Contents of the Application Transport parameter

← ACM	← Message received from the access
Application Transport	**Content**
Application Context Identifier "PSS1 ASE (VPN)"	
VPN feature transparency indication "Call with VPN feature transparency capability" (Note)	
Facility with Protocol profile value set to "Networking Extensions"	Facility with Protocol profile value set to "Networking Extensions"
Notification indicator	Notification indicator
NOTE – Only included if the Address Complete Message (ACM) is the first backwards message sent by the destination exchange.	

5.4.1.3 Sending of the Call Progress Message (CPG)

The actions described in 3.1.1.4/Q.699 [6] shall apply with the following modifications:

Replace the first paragraph in 3.1.1.4/Q.699 [1] by:

If the Address Complete Message (ACM) has already been sent, the following cases are possible trigger conditions of sending the Call Progress Message (CPG):

a) it has been determined that an in-band tone or announcement has to be returned to the calling party from the destination exchange;

b) receipt of a Progress indicator information element in a CALL PROCEEDING message (except with value No. 8 *In-band information or an appropriate pattern is now available*, No. 3 *originating address is non-ISDN*, or No. 4 *call has returned to the ISDN*) or in a PROGRESS message (except with value No. 3 *originating address is non-ISDN*);

c) receipt of the first ALERTING message.

Application Transport

See Table 16.

Table 16/Q.699.1 – Contents of the Application Transport parameter

← CPG	← Message received from the access
Application Transport	**Content**
Application Context Identifier "PSS1 ASE (VPN)"	
Facility with Protocol profile value set to "Networking Extensions"	Facility with Protocol profile value set to "Networking Extensions"
Notification indicator	Notification indicator

5.4.1.4 Sending of the Answer Message (ANM)

The Answer Message (ANM) is coded as described in 3.1.1.5/Q.699 [1] with the following modifications.

Access transport

Add the following line to the Table in 3.1.1.5/Q.699 [1] as follows:

Table 17/Q.699.1 – Contents of the access transport parameter

← ANM	← CONNECT
Access Transport	**Content**
Connected subaddress (Note)	Connected subaddress
NOTE – The Connected subaddress information element is transferred without taking into account the public COLP and COLR supplementary services.	

Application Transport

See Table 18.

Table 18/Q.699.1 – Contents of the Application Transport parameter

← ANM	← CONNECT
Application Transport	**Content**
Application Context Identifier "PSS1 ASE (VPN)"	
Connected number	Connected number
Facility with Protocol profile value set to "Networking Extensions"	Facility with Protocol profile value set to "Networking Extensions"
Notification indicator	Notification indicator

5.4.1.5 Sending of the Connect Message (CON)

The Connect Message (CON) is coded as described in 3.1.1.6/Q.699 [1] with the following modifications.

Access transport

Add the following line to the Table in 3.1.1.6/Q.699 [6] as follows:

Table 19/Q.699.1 – Contents of the access transport parameter

← CON	← CONNECT
Access transport	**Information elements**
Connected subaddress (Note)	Connected subaddress
NOTE – The Connected subaddress information element is transferred without taking into account the public COLP and COLR supplementary services.	

Application Transport

See Table 20.

Table 20/Q.699.1 – Contents of the Application Transport parameter

← ACM	← Message received from the access
Application Transport	**Content**
Application Context Identifier "PSS1 ASE (VPN)"	
VPN feature transparency indication "Call with VPN feature transparency capability" (Note)	
Connected number	Connected number
Facility with Protocol profile value set to "Networking Extensions"	Facility with Protocol profile value set to "Networking Extensions"
Notification indicator	Notification indicator
NOTE – Only included if the Connect Message (CON) is the first backwards message sent by the destination exchange.	

5.4.1.6 Receipt of the Application Transport message

Upon receipt of an Application Transport message with the Application Context Identifier coded "PSS1 ASE (VPN)", the exchange shall transfer the following information in a FACILITY message or in a NOTIFY message. See Table 21.

Table 21/Q.699.1 – Receipt of the Application Transport message

Application Transport →	FACILITY/NOTIFY →
Application Transport parameter	**Content**
Application Context Identifier PSS1 ASE (VPN)"	
Facility	Facility
Notification indicator	Notification indicator

5.4.1.7 Sending of the Application Transport message

Upon receipt of a FACILITY message or a NOTIFY message, the exchange shall transfer the following information in an Application Transport message. See Table 22.

Table 22/Q.699.1 – Sending of the Application Transport message

Application Transport ←	**FACILITY/NOTIFY** ←
Application Transport parameter	**Content**
Application Context Identifier "PSS1 ASE (VPN)"	
VPN feature transparency indication "Call with VPN feature transparency capability" (Note)	
Facility with Protocol profile value set to "Networking Extensions"	Facility with Protocol profile value set to "Networking Extensions"
Notification indicator	Notification indicator
NOTE – Only included if the Application Transport Message (APM) is the first backwards message sent by the destination exchange.	

5.4.1.8 Receipt of the Release Message (REL)

The actions described in 3.1.1.7/Q.699 [1] shall apply with the following additions:

Upon receipt of a Release Message (REL) subsequent to a Pre-Release Information Message (PRI), the exchange shall transfer the following information in a DISCONNECT message. See Table 23.

Facility/Notification indicator

Table 23/Q.699.1 – Receipt of the Release message

REL subsequent to a PRI message →	**DISCONNECT** →
Application Transport parameter received in the PRI message	**Content**
Application Context Identifier "PSS1 ASE (VPN)"	
Facility	Facility
Notification indicator	Notification indicator

5.4.1.9 Sending of the Pre-Release Information Message (PRI)

If the call is released after the sending of the SETUP message, upon receipt of a DISCONNECT, RELEASE or RELEASE COMPLETE message, the exchange shall transfer the following information in a Pre-Release Information Message (PRI) before sending the RELEASE message. See Table 24.

Application Transport

Table 24/Q.699.1 – Sending of the Pre-Release Information Message

← PRI	← DISCONNECT, RELEASE, RELEASE COMPLETE
Application Transport parameter	**Content**
Application Context Identifier "PSS1 ASE (VPN)"	
VPN feature transparency indication "Call with VPN feature transparency capability" (Note)	
Facility with Protocol profile value set to "Networking Extensions"	Facility with Protocol profile value set to "Networking Extensions"
Notification indicator	Notification indicator
NOTE – Only included if the Pre-Release Information Message (PRI) is the first backwards message sent by the destination exchange.	

6 Signalling interworking specification for Transaction Capability User (TC-user)

6.1 Interworking at the Originating local exchange

6.1.1 Sending of the signalling connection establishment request

If a SETUP message coded as described in clause "Connection-oriented bearer independent transport mechanism" (reference [5]) is received from an access with extended DSS1 capability and if the exchange has determined that it is a VPN signalling connection requesting support of PSS1 information flows, a dialogue is established by the exchange sending a TC-BEGIN primitive with Setup invoke component. See Table 25.

Table 25/Q.699. 1 – Contents of the Setup invoke component

SETUP →	**TC-BEGIN →**
Content	**Setup invoke SetUpArg parameter**
	calledPartyNumber parameter (Note 1)
	vpntransport parameter *with contents of VPNTransport as shown below:*
	Corporate Telecommunications Network Identifier (CNID) Indicator (Note 2)
	Corporate Telecommunications Network Identifier (CNID) length (Note 2)
	Corporate Telecommunications Network Identifier (CNID) (Note 2)
Non-locking/Locking shift	Non-locking/Locking shift
Transit counter	Transit counter
Calling party number	Calling party number
Called party number	Called party number
Facility with Protocol profile value set to "Networking Extensions"	Facility with Protocol profile value set to "Networking Extensions"

NOTE l – The CalledPartyNumber parameter is generated by the VPN Application Process. This parameter is the public called party number coded as described in reference [2].

NOTE 2 – The Corporate Telecommunications Network Identifier length and Corporate Telecommunications Network Identifier are only included when the CNID Indicator is coded "Network specific (Network option)" or "Global value". The CNID Indicator, CNID length and CNID are either derived from information received from the calling user in the CN indicator and CN identifier fields of the VPN indicator information element in the SETUP message or have an implicit value tied to the incoming access.

6.1.2 Receipt of the signalling connection establishment confirmation

Upon receipt of a TC-CONTINUE primitive with a Connect invoke component, the exchange shall send a CONNECT message across the user-network interface to the calling user. See Table 26.

Table 26/Q.699.1 – Sending of the CONNECT message

← CONNECT	← TC-CONTINUE
Content	Connect invoke ConnectArg parameter ***with contents of VPNTransport as shown below:***
Connected number	Connected number
Facility	Facility

6.1.3 Sending and receipt of private network specific information after confirmation of the signalling connection establishment

Upon receipt of a TC-CONTINUE primitive with VpnFacility invoke, the exchange shall transfer the following information in a FACILITY message. See Table 27.

Table 27/Q.699. 1 – Sending of the FACILITY message

← FACILITY	← TC-CONTINUE
Content	VpnFacility invoke **VpnFacilityArg parameter** ***with consents of VPNTransport as shown below:***
Facility	Facility

Upon receipt of a FACILITY message, the exchange shall transfer the following information in a TC-CONTINUE primitive with VpnFacility invoke. See Table 28.

Table 28/Q.699.1 – Sending of the VpnFacility invoke component

FACILITY →	TC-CONTINUE →
Content	VpnFacility invoke **VpnFacilityArg parameter** ***with contents of VPNTransport as shown below:***
Facility with Protocol profile value set to "Networking Extensions"	Facility with Protocol profile value set to "Networking Extensions"

6.1.4 Release of the signalling connection

NOTE – The interworking situations where the signalling connection is released are not all described in this subclause.

6.1.4.1 Receipt of the Setup return result component

Upon receipt of a TC-END primitive with setup return result component, the exchange shall transfer the following information in a RELEASE message. See Table 29.

Table 29/Q.699.1 – Sending of the RELEASE message

← **RELEASE**	← **TC-END**
Content	**Setup return result SetUpResultArg parameter**
Cause	**cause parameter**
	vpntransport parameter *with contents of VPNTransport as shown below:*
Facility	Facility

6.1.4.2 Receipt of the Release invoke component

Upon receipt of a TC-END primitive with Release invoke component, the exchange shall transfer the following information in a RELEASE message. See Table 30.

Table 30/Q.699.1 – Sending of the RELEASE message

← **RELEASE**	← **TC-END**
Content	**Release invoke ReleaseArg parameter**
Cause	**cause parameter**
	vpntransport parameter *with contents of VPNTransport as shown below:*
Facility	Facility

6.1.4.3 Sending of the Release invoke component

Upon receipt of a RELEASE or RELEASE COMPLETE message, the exchange shall transfer the following information in a TC-END primitive with Release invoke component. See Table 31.

Table 31/Q.699.1 – Sending of the Release invoke component

RELEASE **RELEASE COMPLETE** →	**TC-END** →
Content	**Release invoke ReleaseArg parameter**
Cause	**cause parameter**
	vpntransport parameter *with contents of VPNTransport as shown below:*
Facility with Protocol profile value set to "Networking Extensions"	Facility with Protocol profile value set to "Networking Extensions"

6.2 Interworking at the Destination local exchange

6.2.1 Sending of the SETUP message

If a TC-BEGIN primitive with Setup invoke component is received and if the called access has the extended DSS1 capability, the exchange shall send a SETUP message coded as described in clause "Connection-oriented bearer independent transport mechanism" (reference [5]) to the called user with the following information. See Table 32.

Table 32/Q.699.1 – Sending of the SETUP message

TC-BEGIN →	**SETUP →**
Setup invoke	**Content**
	VPN indicator (Note)
SetUpArg parameter **vpntransport parameter** *with contents of VPNTransport as shown below:*	
Non-locking/Locking shift	Non-locking/Locking shift
Transit counter	Transit counter
Calling party number	Calling party number
Called party number	Called party number
Facility	Facility
NOTE – The VPN indicator information element may optionally include a CN identifier. The CN indicator and CN identifier values of the VPN indicator information element may be derived from information received in the Corporate Telecommunications Network Identifier (CNID) Indicator, Corporate Telecommunications Network Identifier (CNID) length and Corporate Telecommunications Network Identifier (CNID) fields inside the vpntransport parameter.	

6.2.2 Sending of the signalling connection establishment confirmation

Upon receipt of a CONNECT message, the exchange shall send a TC-CONTINUE primitive with a Connect invoke component. See Table 33.

Table 33/Q.699.1 – Sending of the Connect invoke component

← TC-CONTINUE	**← CONNECT**
Connect invoke **ConnectArg parameter** *with contents of VPNTransport as shown below:*	**Content**
Connected number	Connected number
Facility with Protocol profile value set to "Networking Extensions"	Facility with Protocol profile value set to "Networking Extensions"

6.2.3 Sending and receipt of private network specific information after confirmation of the signalling connection establishment

Upon receipt of a TC-CONTINUE primitive with VpnFacility invoke, the exchange shall transfer the following information in a FACILITY message. See Table 34.

Table 34/Q.699.1 – Receipt of the VpnFacility invoke component

TC-CONTINUE →	**FACILITY →**
VpnFacility invoke **VpnFacilityArg parameter** *with contents of VPNTransport as shown below:*	**Content**
Facility	Facility

Upon receipt of a FACILITY message, the exchange shall transfer the following information in a TC-CONTINUE primitive with VpnFacility invoke. See Table 35.

Table 35/Q.699.1 – Sending of the VpnFacility invoke component

← TC-CONTINUE	**← FACILITY**
VpnFacility invoke **VpnFacilityArg parameter** *with contents of VPNTransport as shown below:*	**Content**
Facility with Protocol profile value set to "Networking Extensions"	Facility with Protocol profile value set to "Networking Extensions"

6.2.4 Release of the signalling connection

NOTE – The interworking situations where the signalling connection is released are not all described in this subclause.

6.2.4.1 Sending of the Release invoke component

Upon receipt of a RELEASE or RELEASE COMPLETE message, the exchange shall transfer the following information in a TC-END primitive with Release invoke component. See Table 36.

Table 36/Q.699.1 – Sending of the Release invoke

← TC- END	RELEASE, ← RELEASE COMPLETE
Release invoke ReleaseArg parameter	**Content**
cause parameter	Cause
vpntransport parameter *with contents of VPNTransport as shown below:*	
Facility with Protocol profile value set to "Networking Extensions"	Facility with Protocol profile value set to "Networking Extensions"

6.2.4.2 Receipt of a Release invoke component

Upon receipt of a TC-END primitive with Release invoke component, the exchange shall transfer the following information in a RELEASE message. See Table 37.

Table 37/Q.699.1 – Sending of the RELEASE message

TC- END →	RELEASE →
Release invoke ReleaseArg parameter	**Content**
cause parameter	Cause
vpntransport parameter *with contents of VPNTransport as shown below:*	
Facility	Facility

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