



INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

Q.735.6

(07/96)

SERIES Q: SWITCHING AND SIGNALLING

Specifications of Signalling System No. 7 – ISDN
supplementary services

**Stage 3 description for community of interest
supplementary services using Signalling
System No. 7: Global Virtual Network Service
(GVNS)**

ITU-T Recommendation Q.735.6

(Previously CCITT Recommendation)

ITU-T Q-SERIES RECOMMENDATIONS
SWITCHING AND SIGNALLING

SIGNALLING IN THE INTERNATIONAL MANUAL SERVICE	Q.1–Q.3
INTERNATIONAL AUTOMATIC AND SEMI-AUTOMATIC WORKING	Q.4–Q.59
FUNCTIONS AND INFORMATION FLOWS FOR SERVICES IN THE ISDN	Q.60–Q.99
CLAUSES APPLICABLE TO ITU-T STANDARD SYSTEMS	Q.100–Q.119
SPECIFICATION OF SIGNALLING SYSTEMS No. 4 AND No. 5	Q.120–Q.249
SPECIFICATIONS OF SIGNALLING SYSTEM No. 6	Q.250–Q.309
SPECIFICATIONS OF SIGNALLING SYSTEM R1	Q.310–Q.399
SPECIFICATIONS OF SIGNALLING SYSTEM R2	Q.400–Q.499
DIGITAL EXCHANGES	Q.500–Q.599
INTERWORKING OF SIGNALLING SYSTEMS	Q.600–Q.699
SPECIFICATIONS OF SIGNALLING SYSTEM No. 7	Q.700–Q.849
General	Q.700
Message transfer part	Q.701–Q.709
Signalling connection control part	Q.711–Q.719
Telephone user part	Q.720–Q.729
ISDN supplementary services	Q.730–Q.739
Data user part	Q.740–Q.749
Signalling System No. 7 management	Q.750–Q.759
ISDN user part	Q.760–Q.769
Transaction capabilities application part	Q.770–Q.779
Test specification	Q.780–Q.799
Q3 interface	Q.800–Q.849
DIGITAL SUBSCRIBER SIGNALLING SYSTEM No. 1	Q.850–Q.999
PUBLIC LAND MOBILE NETWORK	Q.1000–Q.1099
INTERWORKING WITH SATELLITE MOBILE SYSTEMS	Q.1100–Q.1199
INTELLIGENT NETWORK	Q.1200–Q.1999
BROADBAND ISDN	Q.2000–Q.2999

For further details, please refer to ITU-T List of Recommendations.

ITU-T RECOMMENDATION Q.735.6

STAGE 3 DESCRIPTION FOR COMMUNITY OF INTEREST SUPPLEMENTARY SERVICES USING SIGNALLING SYSTEM No. 7: GLOBAL VIRTUAL NETWORK SERVICE (GVNS)

Summary

The global virtual network service is a global switched service supported by multiple networks and is offered to customers over PSTN and/or ISDN. While minimizing the need for dedicated network resources, GVNS provides private network functions to users at geographically dispersed international locations.

Source

ITU-T Recommendation Q.735.6 was prepared by ITU-T Study Group 11 (1993-1996) and was approved under the WTSC Resolution No. 1 procedure on the 9th of July 1996.

FOREWORD

ITU (International Telecommunication Union) is the United Nations Specialized Agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the ITU. The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

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

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 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.

INTELLECTUAL PROPERTY RIGHTS

The ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. The ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

As of the date of approval of this Recommendation, the ITU had/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.

© ITU 1997

All rights reserved. No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the ITU.

CONTENTS

	Page
6 Global virtual network service.....	1
6.1 Introduction.....	1
6.1.1 Scope	1
6.1.2 References.....	1
6.1.3 Terms and definitions	1
6.1.4 Abbreviations.....	2
6.2 Description.....	2
6.2.1 General description.....	2
6.2.2 Specific terminology.....	3
6.2.3 Qualification on the applicability to telecommunication services.....	3
6.2.4 State definitions	3
6.3 Operational requirements.....	3
6.3.1 Provision and withdrawal	3
6.3.2 Requirements on the originating network side	3
6.3.3 Requirements in the network.....	3
6.3.4 Requirements on the terminating network side	3
6.4 Coding requirements.....	3
6.4.1 Messages.....	3
6.4.2 Parameters	3
6.5 Signalling procedures.....	7
6.5.1 Activation/deactivation/registration	7
6.5.2 Invocation and operation	8
6.6 Interactions with other supplementary services.....	15
6.6.1 Call Waiting (CW).....	15
6.6.2 Call transfer services.....	15
6.6.3 Connected line identification presentation (COLP)	15
6.6.4 Connected line identification restriction (COLR)	15
6.6.5 Calling Line Identification Presentation (CLIP).....	15
6.6.6 Calling Line Identification Restriction (CLIR).....	15
6.6.7 Closed User Group (CUG)	15
6.6.8 Conference calling (CONF).....	16
6.6.9 Direct-Dialing-In (DDI).....	16
6.6.10 Call diversion services (CDIV)	16
6.6.11 Line Hunting (LH).....	16
6.6.12 Three-Party service (3PTY).....	16
6.6.13 User-to-User Signalling (UUS)	16
6.6.14 Multiple Subscriber Number (MSN).....	16

	Page
6.6.15 Call hold (HOLD).....	16
6.6.16 Advice of Charge (AOC).....	16
6.6.17 Sub-addressing (SUB)	16
6.6.18 Terminal Portability (TP)	17
6.6.19 Completion of Calls to Busy Subscriber (CCBS).....	17
6.6.20 Malicious Call Identification (MCID).....	17
6.6.21 Reverse charging (REV).....	17
6.6.22 Multi-Level Precedence and Preemption (MLPP).....	17
6.6.23 Private Numbering Plan (PNP).....	17
6.6.24 International Telecommunication Charge Card (ITCC).....	17
6.7 Interaction with other networks	17
6.8 Signalling flows	17
6.9 Parameter values (timers)	17
6.10 Dynamic description	17

Recommendation Q.735.6

STAGE 3 DESCRIPTION FOR COMMUNITY OF INTEREST SUPPLEMENTARY SERVICES USING SIGNALLING

SYSTEM No. 7: GLOBAL VIRTUAL NETWORK SERVICE (GVNS)

(Geneva, 1996)

6 Global virtual network service

6.1 Introduction

6.1.1 Scope

The Global Virtual Network Service (GVNS) is a multi-network international service which provides private network functions to users at geographically dispersed international locations while minimizing the need for dedicated network resources. It may be offered to customers over the PSTN or ISDN.

6.1.2 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] CCITT Recommendation I.130 (1988), *Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN*.
- [2] ITU-T Recommendation I.112 (1993), *Vocabulary of terms for ISDNs*.
- [3] ITU-T Recommendation Q.71 (1993), *ISDN circuit mode switched bearer services*.
- [4] ITU-T Recommendation F.16 (1995), *Global virtual network service*.
- [5] ITU-T Recommendation Q.85.6 (1996), *Stage 2 description for community of interest supplementary services: Global Virtual Network Service (GVNS)*.
- [6] CCITT Recommendation E.164 (1991), *Numbering plan for the ISDN era*.
- [7] ITU-T Recommendation Q.763 (1993), *Formats and codes of the ISDN User Part of Signalling System No. 7*.
- [8] ITU-T Recommendation Q.730 (1993), *ISDN supplementary services*.

6.1.3 Terms and definitions

This Recommendation defines the following terms.

6.1.3.1 dialled number: The number which a GVNS user dialled excluding prefix digits.

NOTE – This information, if required by the terminating network, will be included in the terminating network routing number.

6.1.3.2 ISDN number: A number conforming to the numbering plan and the structure specified in Recommendation E.164 [6].

6.1.3.3 terminating access indication: Information used to identify the type of access that the GVNS terminating participating service provider actually used to complete the call.

6.1.3.4 GVNS user group identification: Information that uniquely identifies the GVNS customer. An example for the usage of such information is to locate the address of the database record of a GVNS customer.

6.1.3.5 originating participating service provider identification: Information that uniquely identifies the participating service provider that provides customer access to GVNS to the calling user/interface.

6.1.3.6 routing number: Information used to complete a call to the terminating functional entity. This information is mandatory and is carried by an ISDN number (fully conforming to Recommendation E.164).

NOTE – Whenever adjacent GVNS functional entities are implemented by separate GVNS Participating Service Providers, the Routing Number shall be an ISDN number (fully conforming to Recommendation E.164) unless another prior arrangement exists between the participating service providers.

6.1.3.7 terminating network routing number: Information used by the terminating functional entity to route calls. This information is mandatory and is carried by either an ISDN number (fully conforming to Recommendation E.164) or a network-specific number.

6.1.3.8 terminating participating service provider identification: Information that uniquely identifies the participating service provider that provides customer access to GVNS to the called user/interface.

NOTE – This information is included in the Routing Number.

6.1.4 Abbreviations

This Recommendation uses the following abbreviations.

ISDN Integrated Services Digital Network

NDC National Destination Code

OPSP Originating Participating Service Provider Identification

PSTN Public Switched Telephone Network

TPSP Terminating Participating Service Provider Identification

6.2 Description

This clause is specific to Signalling System No. 7 protocol for the ISDN User Part. Stage 3 identifies the protocol procedures and switching functions needed to support a telecommunication service.

This clause is limited to the type A and B call mechanisms as defined by the GVNS Stage 2 [5]. It does not fully support the type C call mechanism.

6.2.1 General description

GVNS allows service providers to offer subscribing customers a service with the features and functionality similar to that of a private network while minimizing the need for dedicated network resources; however, dedicated network resources may be used to access GVNS or in conjunction with GVNS. A GVNS customer is assigned a unique identifier which identifies the GVNS user group. GVNS user group identification provides a means by which various networks can recognize

the customer. A GVNS customer may choose to group users into one or more subgroups in order to allow subgroup dependent service interactions and operations.

The Stage 1 ITU-T definitions for the GVNS service are given in Recommendation F.16.

The Stage 2 ITU-T descriptions are given in Recommendation Q.85.6.

The Stage 3 description of GVNS service uses the ISDN user part protocol as defined in Recommendations Q.761-764.

6.2.2 Specific terminology

See 6.1.3 terms and definitions.

6.2.3 Qualification on the applicability to telecommunication services

This service is applicable to circuit mode bearer services in the ISDN.

6.2.4 State definitions

No specific state definitions are required.

6.3 Operational requirements

6.3.1 Provision and withdrawal

The GVNS is provided to the customer by subscription. Provision and coordination of GVNS may be required in multiple networks depending on the location of the customer's users.

6.3.2 Requirements on the originating network side

Not applicable.

6.3.3 Requirements in the network

No specific requirements.

6.3.4 Requirements on the terminating network side

Not applicable.

6.4 Coding requirements

6.4.1 Messages

The forward GVNS parameter is an optional part in the initial address message. For the GVNS service, in addition to the messages and parameters defined in the Recommendation Q.763, the initial address message always includes a forward GVNS parameter in order to convey GVNS-specific information between the participating Administrations. Its use is mandatory when the call is a GVNS call. For the GVNS service, in addition to the messages and parameters defined in Recommendation Q.763, the answer and connect messages in the backward direction shall contain a backward GVNS parameter. The forward GVNS parameter is described in 6.4.2.1 and its format is shown in Figure 6-1. The backward GVNS parameter is described in 6.4.2.2 and its format is shown in Figure 6-5.

6.4.2 Parameters

6.4.2.1 Forward GVNS parameter

The format of the forward GVNS parameter is given in Figure 6-1.

	8	7	6	5	4	3	2	1
1	Originating participating service provider OPSP							
2	GVNS user group GUG							
3	Terminating network routing number TNRN							

Figure 6-1/Q.735.6 – Forward GVNS parameter field

The following codes are used in the subfields of the forward GVNS parameter:

- a) *Originating participating service provider*

See Figure 6-2.

	8	7	6	5	4	3	2	1
1	O/E	Spare			OPSP length indicator			
1a	2 nd digit				1 st digit			
...			
1n	Filler (if necessary)				n th digit			

Figure 6-2/Q.735.6 – Originating participating service provider subfield

- 1) *Odd/even indicator (O/E)*

0 even number of digits

1 odd number of digits

- 2) *OPSP length indicator*

Number of octets to follow. The maximum number of octets is 4 allowing for a maximum number of digits to 7.

- 3) *Digit*

Digit string in BCD encoding of flexible length representing the originating participating service provider identification (OPSP).

- 4) *Filler*

In case of an odd number of address signals, the filler code 0000 is inserted after the last address signal.

b) *GVNS user group*

See Figure 6-3.

	8	7	6	5	4	3	2	1
2	O/E	Spare			GUG length indicator			
2a	2 nd digit				1 st digit			
...			
2n	Filler (if necessary)				n th digit			

Figure 6-3/Q.735.6 – GVNS user group subfield

1) *Odd/even indicator (O/E)*

0 even number of digits

1 odd number of digits

2) *GUG length indicator*

Number of octets to follow. The maximum number of octets is 8 allowing for a maximum number of digits to 16.

3) *Digit*

Digit string in BCD encoding of flexible length representing the GVNS User Group Identification (GUG).

4) *Filler*

In case of an odd number of address signals, the filler code 0000 is inserted after the last address signal.

c) *Terminating network routing number*

See Figure 6-4.

	8	7	6	5	4	3	2	1
3	O/E	Numbering plan indicator			TNRN length indicator			
3a	Spare	Nature of address indicator						
3b	2 nd digit				1 st digit			
...			
3n	Filler (if necessary)				n th digit			

Figure 6-4/Q.735.6 – Terminating network routing number subfield

1) *Odd/even indicator (O/E)*

0 even number of digits

1 odd number of digits

2) *Numbering plan indicator*

See 3.9 d)/Q.763.

3) *TNRN length indicator*

Number of octets to follow. The maximum number of octets is 9 allowing for a maximum number of digits to 15.

4) *Nature of address indicator*

00000000	spare
00000001	subscriber number @
00000010	unknown @
00000011	national (significant) number
0000100	international number
0000101	network specific number
0000110	} spare
to	
1101111	
1110000	} reserved for national use
to	
1111110	
1111111	spare

5) *Digit*

See 3.9 e)/Q.763.

The most significant address signal is sent first. Subsequent address signals are sent in successive 4-bit fields.

6) *Filler*

In case of an odd number of address signals, the filler code 0000 is inserted after the last address signal.

6.4.2.2 Backward GVNS parameter

The format of the backward GVNS parameter is given in Figure 6-5.

8	7	6	5	4	3	2	1
H	G	F	E	D	C	B	A

Figure 6-5/Q.735.6 – Backward GVNS parameter field

bits	BA	Terminating access indicator
	00	no information
	01	dedicated Terminating Access
	10	switched Terminating Access
	11	spare
bits	G-C	Spare

bit	H	Extension indicator (EXT)
	0	octet continues through the next octet
	1	last octet

6.4.2.3 Other existing parameter to support GVNS service

6.4.2.3.1 Called party number parameter

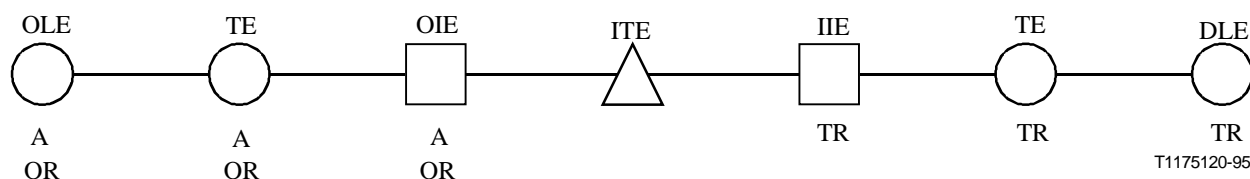
A new coding in the nature of address indicator of the called party number parameter is defined to support a network specific number that is used in the terminating network that provides the GVNS service:

- *Nature of address indicator*
0000101 network-specific number @

6.5 Signalling procedures

This procedure describes only calls from on-net location to another on-net location (see Recommendation F.16).

A possible physical configuration is presented in Figure 6-6.



Exchanges

DLE	Destination Local Exchange
IIE	Incoming International gateway Exchange
ITE	International Transit Exchange
OIE	Outgoing International gateway Exchange
OLE	Originating Local Exchange
TE	Transit Exchange

Functionalities

A	Possible node for the GVNS access function to GVNS service
OR	Possible node for the originating GVNS routing function for GVNS service
TR	Possible node for the terminating GVNS routing function for GVNS service

Figure 6-6/Q.735.6 – Possible physical configuration

6.5.1 Activation/deactivation/registration

Not applicable.

6.5.2 Invocation and operation

6.5.2.1 Actions at the originating local exchange

As an alternative, the GVNS access function and the originating GVNS routing function described in this subclause may be performed at either a transit exchange in the originating network or the outgoing international exchange.

6.5.2.1.1 In case the GVNS access function is performed

6.5.2.1.1.1 Normal operation

Upon receipt of a request for GVNS service, the originating local exchange shall check its GVNS access validity. After the GVNS user group is identified and screening is passed, a GVNS call is set up by sending an initial address message to the succeeding exchange.

GVNS information in the answer or connect message

The procedures to process the information in the received backward GVNS parameter received in the answer or connect messages will be network dependent.

6.5.2.1.1.2 Exceptional procedures

If a GVNS access is not permitted, then the originating local exchange shall release the call, with cause value No. 29.

The absence of the backward GVNS parameter in either an answer or a connect message shall not release the GVNS call. As a network dependent action, the operation and maintenance system may be alerted.

6.5.2.1.2 In case the originating GVNS routing function is performed

As a prerequisite to perform the routing function in the originating local exchange, the originating GVNS access function shall be performed at the originating local exchange, and before the routing function.

6.5.2.1.2.1 Normal operation

When the originating local exchange has determined that the call is to be routed to another GVNS provider and the call is allowed to be set up to the GVNS provider, selection of a suitable, free, inter-exchange circuit takes place and an initial address message is sent to the succeeding exchange.

Appropriate GVNS routing information is either stored at the originating local exchange or at a remote database to which a request may be made.

a) Circuit selection

The selection of the route will depend on the routing number. The routing number is an ISDN number, i.e. a number fully conforming to Recommendation E.164. This selection process may be performed at the exchange or with the assistance of a remote database.

b) GVNS information in the initial address message

The Initial address message shall include all information required to route the GVNS call to the destination exchange and connect the call to the called party.

The following information shall be included in an IAM:

- Originating participating service provider identification, GVNS user group identification and terminating network routing number are included in the forward GVNS parameter.

- The called party number parameter contains the routing number which, at the minimum, identifies the terminating participating service provider.

6.5.2.1.2.2 Exceptional procedures

None identified.

6.5.2.1.3 In case neither the GVNS access function nor the originating GVNS routing function is performed

6.5.2.1.3.1 Normal operation

The procedures to set up a call are the same as the basic procedures.

6.5.2.1.3.2 Exceptional procedures

None identified.

6.5.2.2 Actions at the transit exchange (in the originating network)

As an alternative, the GVNS access function and the originating GVNS routing function described in this subclause may be performed at either the originating local exchange or the outgoing international exchange. In the case when the access function is performed in the originating local exchange, the transit exchange passes the forward GVNS parameter and the backward GVNS parameter received.

6.5.2.2.1 In case the GVNS access function is performed

6.5.2.2.1.1 Normal operation

Upon receipt of a request for GVNS service, a transit exchange shall check its GVNS access validity. After the GVNS user group is identified and screening is passed, a GVNS call is set up by sending an initial address message to the succeeding exchange.

GVNS information in the answer or connect message

The procedures to process the information in the backward GVNS parameter received in the answer or connect messages will be network dependent.

6.5.2.2.1.2 Exceptional procedures

If a GVNS access is not permitted, then a transit exchange shall release the call, with cause value No. 29.

The absence of the backward GVNS parameter in either an answer or a connect message shall not release the GVNS call. As a network dependent action, the operation and maintenance system may be alerted.

6.5.2.2.2 In case the originating GVNS routing function is performed

As a prerequisite to perform the routing function in the transit exchange, the originating GVNS access function shall be performed at the originating local exchange or at the transit exchange. The GVNS access function has to be performed before the GVNS routing function.

6.5.2.2.2.1 Normal operation

When a transit exchange in the originating network has received the complete selection information from the national network and has determined that the call is to be routed to another GVNS provider

and that the call is allowed to be set-up to the GVNS provider, selection of a suitable, free, inter-exchange circuit takes place and an initial address message is sent to the succeeding exchange.

Appropriate GVNS routing information is either stored at the originating local exchange or at a remote database to which a request may be made.

a) *Circuit selection*

The selection of the route will depend on the routing number. The routing number is an ISDN number, i.e. a number fully conforming to Recommendation E.164. This selection process may be performed at the exchange or with the assistance of a remote database.

b) *GVNS information in the initial address message*

The Initial address message shall include all information required to route the GVNS call to the destination exchange and connect the call to the called party.

The following information shall be included in an IAM:

- Originating participating service provider identification, GVNS user group identification and terminating network routing number are included in the forward GVNS parameter.
- The called party number parameter contains the routing number which, at the minimum, identifies the terminating participating service provider.

The procedures to set up a call will be network dependent.

6.5.2.2.2.2 Exceptional procedures

None identified.

6.5.2.2.3 In case neither the GVNS access function nor the originating GVNS routing function is performed

6.5.2.2.3.1 Normal operation

The procedures to set up a call are the same as the basic procedures.

6.5.2.2.3.2 Exceptional procedures

None identified.

6.5.2.3 Actions at the outgoing international exchange

As an alternative, the GVNS access function and the originating GVNS routing function described in this subclause may instead be performed at either the originating local exchange or a transit exchange in the originating network. In those cases, the outgoing international exchange passes the forward GVNS parameter and the backward GVNS parameter received.

6.5.2.3.1 In case the GVNS access function is performed

6.5.2.3.1.1 Normal operation

Upon receipt of a request for GVNS service the outgoing international exchange shall check its GVNS access validity. After the GVNS user group is identified and screening is passed, a GVNS call is set up by sending an initial address message to the succeeding exchange.

GVNS information in the answer or connect message

The procedures to process the information in the backward GVNS parameter received in the answer or connect messages will be network dependent.

6.5.2.3.1.2 Exceptional procedures

If a GVNS access is not permitted, then the outgoing international exchange shall release the call, with cause value No. 29.

The absence of the backward GVNS parameter in either an answer or a connect message shall not release the GVNS call. As a network dependent action, the operation and maintenance system may be alerted.

6.5.2.3.2 In case the originating GVNS routing function is performed

As a prerequisite to perform the routing function in the outgoing international exchange, the originating GVNS access function shall be performed at the originating local exchange, at the transit exchange, or at the outgoing international exchange. The GVNS access function has to be performed before the GVNS routing function.

6.5.2.3.2.1 Normal operation

When the outgoing international exchange has received the complete selection information from the national network and has determined that the call is to be routed to another GVNS provider and that the call is allowed to be set-up to the GVNS provider, selection of a suitable, free, inter-exchange circuit takes place and an initial address message is sent to the succeeding exchange.

Appropriate GVNS routing information is either stored at the outgoing international exchange or at a remote database to which a request may be made.

a) Circuit selection

The selection of the route will depend on the routing number. The routing number is an ISDN number, i.e. a number fully conforming to Recommendation E.164. This selection process may be performed at the exchange or with the assistance of a remote database.

b) GVNS information in the initial address message

The Initial address message shall include all information required to route the GVNS call to the destination exchange and connect the call to the called party.

The following information shall be included in an IAM:

- Originating participating service provider identification, GVNS user group identification and terminating network routing number as contained in the forward GVNS parameter.
- The called party number parameter contains the routing number which, at the minimum, identifies the terminating participating service provider.

The procedures to set up a call will be network dependent.

6.5.2.3.2.2 Exceptional procedures

None identified.

6.5.2.3.3 In case neither the GVNS access function nor the originating GVNS routing function is performed

6.5.2.3.3.1 Normal operation

The procedures to set up a call are the same as the basic procedures.

6.5.2.3.3.2 Exceptional procedures

None identified.

6.5.2.4 Actions at an international transit exchange

6.5.2.4.1 Normal operation

a) *Circuit selection*

The circuit selection process is the same as for a basic call.

b) *Information included in the IAM*

No further action is required than for a basic call.

6.5.2.4.2 Exceptional procedures

None identified.

6.5.2.5 Actions at the incoming international exchange

As an alternative, the terminating GVNS routing function described in this subclause may be performed at either a transit exchange in the terminating network or the destination local exchange. In those cases, the incoming international exchange passes the forward GVNS parameter and the backward GVNS parameter received.

6.5.2.5.1 In case the terminating GVNS routing function is performed

6.5.2.5.1.1 Normal operation

When the incoming international exchange has received the complete selection information from the preceding network and has checked that the call is allowed to be terminated in its VPN, then the following actions occur. The checks can be made either against information stored in the exchange or at a remote database.

a) *Circuit selection*

The selection of the route will depend on the terminating network routing number, received in the forward GVNS parameter. This selection process may be performed at the exchange or with the assistance of a remote database.

b) *GVNS information in the initial address message*

The Initial address message sent to the national network shall contain the called party number parameter that includes a routing number and that is used by the terminating network to complete the call to the destination location. Derivation of this routing number is network dependent.

The Initial address message sent to the national network may also contain the forward GVNS parameter that includes the originating participating service provider identification, GVNS user group identification and terminating network routing number. The Initial address message may also carry the dialled number information.

c) *GVNS information in the answer or connect message*

The backward GVNS parameter shall be included in the answer or connect message.

The terminating access indicator included in the parameter has four values. The setting should be as follows:

- "(10) Switched terminating access" is used when a switched connection from the GVNS network to the terminating user is established via one or more networks on which:
 - i) the particular GVNS is not supported;
 - ii) the circuits from the GVNS participating service provider carry the GVNS traffic of various GVNS user groups and possibly non-GVNS traffic.

- "(01) Dedicated terminating access" is sent when a customer dedicated physical connection is used from the network to a user that supports GVNS.
- "(11) Spare" is reserved for the future use.
- "(00) No information" means that no information is available.

NOTE – This value is discouraged from being used by the terminating participating service provider, since it provides no useful information to the originating participating service provider.

6.5.2.5.1.2 Exceptional procedures

None identified.

6.5.2.5.2 In case the terminating GVNS routing function is not performed

6.5.2.5.2.1 Normal operation

The procedures to set up a call are the same as the basic procedures.

6.5.2.5.2.2 Exceptional procedures

None identified.

6.5.2.6 Actions at a transit exchange (in the terminating network)

As an alternative, the terminating GVNS routing function described in this subclause may be performed at either the incoming international exchange or the destination local exchange. In the case when the terminating GVNS routing function is performed in the destination local exchange, the transit exchange passes the forward GVNS parameter and the backward GVNS parameter received.

6.5.2.6.1 In case the terminating GVNS routing function is performed

6.5.2.6.1.1 Normal operation

When a transit exchange in the terminating network has received the complete selection information from the preceding network and has checked that the call is allowed to be terminated in its VPN, then the following actions occur. The checks can be made either against information stored in the exchange or at a remote database.

a) Circuit selection

The selection of the route will depend on the terminating network routing number. This selection process may be performed at the exchange or with the assistance of a remote database.

b) GVNS information in the initial address message

The Initial address message sent to the destination local exchange shall contain the called party number parameter that includes a routing number and that is used by the terminating network to complete the call to the destination location. Derivation of this routing number is network dependent.

The Initial address message sent to the destination local exchange may also contain the forward GVNS parameter that includes the originating participating service provider identification, GVNS user group identification and terminating network routing number. The Initial address message may also carry the dialled number information.

c) GVNS information in the answer or connect message

The backward GVNS parameter shall be included in the answer or connect message.

The terminating access indicator included in the parameter has four values. The setting should be as follows:

- "(10) Switched terminating access" is used when a switched connection from the GVNS network to the terminating user is established via one or more networks on which:
 - i) the particular GVNS is not supported;
 - ii) the circuits from the GVNS participating service provider carry the GVNS traffic of various GVNS user groups and possibly non-GVNS traffic.
- "(01) Dedicated terminating access" is sent when a customer dedicated physical connection is used from the network to a user that supports GVNS.
- "(11) Spare" is reserved for the future use.
- "(00) No information" means that no information is available.

NOTE – This value is discouraged from being used by the terminating participating service provider, since it provides no useful information to the originating participating service provider.

6.5.2.6.1.2 Exceptional procedures

None identified.

6.5.2.6.2 In case the terminating GVNS routing function is not performed

6.5.2.6.2.1 Normal operation

The procedures to set up a call are the same as the basic procedures.

6.5.2.6.2.2 Exceptional procedures

None identified.

6.5.2.7 Actions at the destination local exchange

As an alternative, the terminating GVNS routing function described in this subclause may be performed at either the incoming international exchange or a transit exchange in the terminating network.

6.5.2.7.1 In case the terminating GVNS routing function is performed

6.5.2.7.1.1 Normal operation

When the destination local exchange has received the complete selection information from the preceding network and has checked that the call is allowed to be terminated in its VPN, then the following actions occur. The checks can be made either against information stored in the exchange or at a remote database.

a) *Circuit selection*

The selection of the user access will depend on the terminating network routing number. This selection process may be performed at the exchange or with the assistance of a remote database.

b) *GVNS information in the answer or connect message*

The backward GVNS parameter shall be included in the answer or connect message.

The terminating access indicator included in the parameter has four values. The setting should be as follows:

- "(10) Switched terminating access" is used when a switched connection from the GVNS network to the terminating user is established via one or more networks on which:
 - i) the particular GVNS is not supported;
 - ii) the circuits from the GVNS participating service provider carry the GVNS traffic of various GVNS user groups and possibly non-GVNS traffic.
- "(01) Dedicated terminating access" is sent when a customer dedicated physical connection is used from the network to a user that supports GVNS.
- "(11) Spare" is reserved for the future use.
- "(00) No information" means that no information is available.

NOTE – This value is discouraged from being used by the terminating participating service provider, since it provides no useful information to the originating participating service provider.

6.5.2.7.1.2 Exceptional procedures

None identified.

6.5.2.7.2 In case the terminating GVNS routing function is not performed

6.5.2.7.2.1 Normal operation

The procedures to set up a call are the same as the basic procedures.

6.5.2.7.2.2 Exceptional procedures

None identified.

6.6 Interactions with other supplementary services

"No applicable interaction at this time" means that the work on the service being interacted with has not finished yet.

6.6.1 Call Waiting (CW)

No impact on ISUP.

6.6.2 Call transfer services

For further study.

6.6.3 Connected line identification presentation (COLP)

For further study.

6.6.4 Connected line identification restriction (COLR)

No impact on ISUP.

6.6.5 Calling Line Identification Presentation (CLIP)

For further study.

6.6.6 Calling Line Identification Restriction (CLIR)

No impact on ISUP.

6.6.7 Closed User Group (CUG)

For further study.

6.6.8 Conference calling (CONF)

No impact on ISUP.

6.6.9 Direct-Dialing-In (DDI)

No impact on ISUP.

6.6.10 Call diversion services (CDIV)

6.6.10.1 Call Forwarding Busy (CFB)

For further study.

6.6.10.2 Call Forwarding no Reply (CFNR)

For further study.

6.6.10.3 Call Forwarding Unconditional (CFU)

For further study.

6.6.10.4 Call Deflection (CD)

For further study.

6.6.11 Line Hunting (LH)

No applicable interaction at this time.

6.6.12 Three-Party service (3PTY)

No impact on ISUP.

6.6.13 User-to-User Signalling (UUS)

6.6.13.1 User-to-User Signalling service 1 (UUS1)

No impact on ISUP.

6.6.13.2 User-to-User Signalling service 2 (UUS2)

No impact on ISUP.

6.6.13.3 User-to-User Signalling service 3 (UUS3)

No impact on ISUP.

6.6.14 Multiple Subscriber Number (MSN)

No impact on ISUP.

6.6.15 Call hold (HOLD)

No impact on ISUP.

6.6.16 Advice of Charge (AOC)

No impact on ISUP.

6.6.17 Sub-addressing (SUB)

For further study.

6.6.18 Terminal Portability (TP)

No impact on ISUP.

6.6.19 Completion of Calls to Busy Subscriber (CCBS)

No applicable interaction at this time.

6.6.20 Malicious Call Identification (MCID)

No applicable interaction at this time.

6.6.21 Reverse charging (REV)

For further study.

6.6.22 Multi-Level Precedence and Preemption (MLPP)

For further study.

6.6.23 Private Numbering Plan (PNP)

No applicable interaction at this time.

6.6.24 International Telecommunication Charge Card (ITCC)

For further study.

6.7 Interaction with other networks

In the case of interworking with Q.767 exchange, all GVNS related information will be discarded. The call will be either released or routed based on the number in the called party number parameter. (but may not be completed successfully to the called party, since the necessary routing information in the terminating network routing number is not available).

6.8 Signalling flows

The signalling flows of the basic call procedures are applicable.

6.9 Parameter values (timers)

None identified.

6.10 Dynamic description

The basic call control SDLs of the ISDN user part (Recommendation Q.764) apply for the GVNS because there is no change in the message sequence.

ITU-T RECOMMENDATIONS SERIES

Series A	Organization of the work of the ITU-T
Series B	Means of expression
Series C	General telecommunication statistics
Series D	General tariff principles
Series E	Telephone network and ISDN
Series F	Non-telephone telecommunication services
Series G	Transmission systems and media
Series H	Transmission of non-telephone signals
Series I	Integrated services digital network
Series J	Transmission of sound-programme and television signals
Series K	Protection against interference
Series L	Construction, installation and protection of cables and other elements of outside plant
Series M	Maintenance: international transmission systems, telephone circuits, telegraphy, facsimile and leased circuits
Series N	Maintenance: international sound-programme and television transmission circuits
Series O	Specifications of measuring equipment
Series P	Telephone transmission quality
Series Q	Switching and signalling
Series R	Telegraph transmission
Series S	Telegraph services terminal equipment
Series T	Terminal equipments and protocols for telematic services
Series U	Telegraph switching
Series V	Data communication over the telephone network
Series X	Data networks and open system communication
Series Z	Programming languages