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SERIES Q: SWITCHING AND SIGNALLING

Specifications of signalling related to Bearer Independent Call Control (BICC)

The Narrowband Signalling Syntax (NSS) – Syntax definition

ITU-T Recommendation Q.1980.1

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

ITU-T Recommendation Q.1980.1

The Narrowband Signalling Syntax (NSS) – Syntax definition

Summary

This Recommendation describes a Narrowband Signalling Syntax (NSS) to provide a normalized set of telephony parameters. NSS enables mapping from multiple telephony protocols in use today into a common parameter set.

Source

ITU-T Recommendation Q.1980.1 was approved on 10 December 2004 by ITU-T Study Group 11 (2005-2008) under the ITU-T Recommendation A.8 procedure.

FOREWORD

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ITU-T Recommendation Q.1980.1

The Narrowband Signalling Syntax (NSS) – Syntax definition

1 Scope

This Recommendation specifies a flexible encoding syntax of narrowband signalling information to be transferred in protocols that cannot inherently transfer such information.

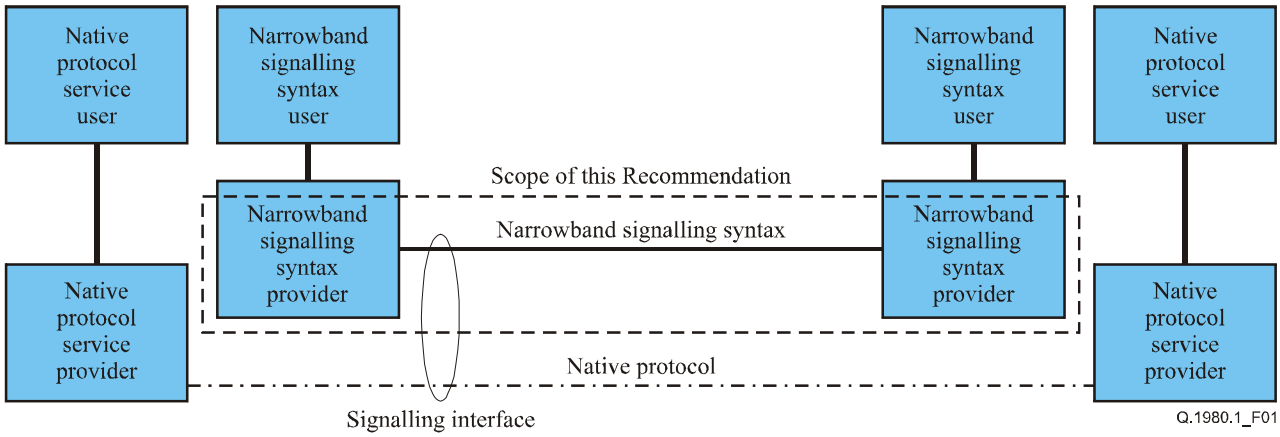

Figure 1/Q.1980.1 – Scope of this Recommendation

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; 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. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

– ITU-T Recommendation H.225.0 (2003), *Call signalling protocols and media stream packetization for packet-based multimedia communication systems*.

– ITU-T Recommendation H.323 (2003), *Packet-based multimedia communication systems*.

– ITU-T Recommendation Q.761 (1999), *Signalling System No. 7 – ISDN User Part functional description*.

– ITU-T Recommendation Q.762 (1999), *Signalling System No. 7 – ISDN User Part general functions of messages and signals*.

– ITU-T Recommendation Q.763 (1999), *Signalling System No. 7 – ISDN User Part formats and codes;* plus Amendment 1 (2001)*, Coding of the application transport parameter;* Corrigendum 1 (2001)*;* plus Amendment 2 (2002)*, Support for the International Emergency Preference Scheme*.

– ITU-T Recommendation Q.765.5 (2004), *Signalling System No. 7 – Application Transport Mechanism: Bearer Independent Call Control (BICC)*.

– ITU-T Recommendation Q.767 (1991), *Application of the ISDN User Part of CCITT Signalling System No. 7 for international ISDN interconnections*; plus Amendment 1 (2002), *Support for the International Emergency Preference Scheme*.

– ITU-T Recommendation Q.850 (1998), *Usage of cause and location in the Digital Subscriber Signalling System No. 1 and the Signalling System No. 7 ISDN User Part*; plus Addendum 1 (2000), plus Amendment 1 (2001).

– ITU-T Recommendation Q.931 (1998), *ISDN user-network interface layer 3 specification for basic call control;* plus Amendment 1 (2002), *Extensions for the support of digital multiplexing equipment;* plus Erratum 1 (2003).

– ITU-T Recommendation Q.1902.3 (2001), *Bearer Independent Call Control protocol (Capability Set 2) and Signalling System No. 7 ISDN user part: Formats and codes*; plus Amendment 1 (2002), *Support for the International Emergency Preference Scheme*.

– ETSI TS 126 103 v 5.5.0 (2004-09), *Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Speech codec list for GSM and UMTS (3GPP TS 26.103 version 5.5.0 Release 5)*.

– IETF RFC 2045 (1996), *Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies*.

– IETF RFC 2046 (1996), *Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types*.

– IETF RFC 2183 (1997), *Communicating Presentation Information in Internet Messages: The Content-Disposition Header Field*.

– IETF RFC 2234 (1997), *Augmented BNF for Syntax Specifications: ABNF*.

– IETF RFC 2327 (1998), *SDP: Session Description Protocol*.

– IETF RFC 3261 (2002), *SIP: Session Initiation Protocol*.

3 Definitions

This Recommendation defines the following terms:

3.1 compatibility parameter: A compatibility parameter is a NSS parameter used to carry unrecognized syntax objects and requiring the PRN parameter for interpretation. The set of compatibility parameters includes FDC, UFC, PCI, and MCI.

NOTE – The ATP parameter also requires the PRN parameter for interpretation.

3.2 mappable parameter: An ISUP/BICC parameter which satisfies the following conditions with respect to the protocol transporting the NSS body:

– every field in the ISUP/BICC parameter is accounted for by a field or combination of fields in the encapsulating protocol;

– every potential value of the ISUP/BICC field is accounted for by a value of the corresponding field(s) in the encapsulating protocol; and

– the original value of every ISUP/BICC field can be recovered when the encapsulating protocol alone (disregarding any encapsulated NSS or ISUP/BICC) is mapped back to the same variant of ISUP/BICC as was mapped into the encapsulating protocol at the NSS-originating node.

3.3 NSS message: A NSS message is a body composed of a contiguous set of text lines as defined in clause 5.

4 Abbreviations

This Recommendation uses the following abbreviations:

ABNF	Augmented Backus-Naur Form (see RFC 2234)
ASCII	American Standard Code for Information Interchange
BICC	Bearer Independent Call Control
COT	Continuity Test (used for TDM circuits)
IA5	International Alphabet No. 5 (same as 7-bit ASCII)
IE	Information Element
IEPS	International Emergency Preference Scheme
ISDN	Integrated Services Digital Network
ISUP	ISDN User Part
ITU-T	International Telecommunication Union – Telecommunication Standardization Sector
MIME	Multipurpose Internet Mail Extensions
NSS	Narrowband Signalling Syntax
PBX	Private Branch eXchange
POTS	Plain Old Telephone Service
PSTN	Public Switched Telephone Network
RAS	Registration, Admission and Status (see ITU-T Rec. H.225.0)
RTP	Real-time Transport Protocol
SDP	Session Description Protocol
SIP	Session Initiation Protocol
SS7	Signalling System No. 7
TDM	Time Division Multiplexing

5 Message and parameter syntax overview

The general rules for NSS message, parameter, and field formats are specified in this clause.

5.1 Character set

NSS messages are composed of printable IA5 (i.e., 7-bit US ASCII) characters plus carriage return (CR = x0D) and line feed (LF = x0A). Alphabetic characters are case sensitive. The case rules are described in this clause and in 5.2.

Values potentially requiring the representation of information lying outside this character set shall be presented as a sequence of one or more binary octets, expressed as a series of one or more pairs of characters ("0"-"9", "A"-"F") without a preceding "x" representing the binary octets as hexadecimal values. The characters "A" through "F" must be upper case. The ordering of the binary octets in a given value is defined by the source protocol. The resulting sequence of character pairs will be placed into an NSS value field with no leading "x" character in that same order. The first character of each pair represents the most significant four bits of the binary octet being expressed. If an octet of the source protocol contains bits which do not belong to the field or sub-field value being encoded, these bits shall be set to zero before applying the hexadecimal encoding.

NOTE – The ordering of bits within individual octets as represented by the hexadecimal encoding is the reverse of their order of transmission in the source protocol. See 1.9/Q.763.

Clauses 7.3 and 7.4 indicate for each field or subfield value whether the direct or ASCII-hexadecimal representation is used.

The CR and LF characters are reserved for use together as line termination. See 5.2.1.

The "," and "=" characters are reserved for use as separators. Parentheses "(" and ")" and braces "{" and "}" are reserved for use as group delimiters. The application of these reserved characters is described in 5.2.

The "\" character is reserved for use as an escape mechanism and must be placed immediately before any "," or "=" or "(" or ")" or "{" or "}" or CR or LF or "\" character found in a field value during parameter construction. During parsing, each first encounter of an "\" character is not used as part of the field value and the character following the "\" is treated as part of the field value.

5.2 Structure

5.2.1 NSS message

A NSS message is composed of a sequence of lines, each beginning with a sequence of three upper-case letters followed by a comma and ending with a carriage return – line feed sequence (x0Dx0A).

Except for the Message Identifier line, the initial sequence of letters on a line identifies a parameter. On the Message Identifier line, the initial sequence of letters identifies a message.

The set of message identifiers defined in this Recommendation is listed in 6.2, "NSS message identifier codes".

The set of parameter identifiers defined in this Recommendation is listed in 7.2, "NSS parameter codes".

A NSS message begins with three mandatory NSS-specific parameters: Version (VER), Protocol Name/Version (PRN), and Message Identifier in that order. These are followed by zero or more other parameters.

This Recommendation does not specify which additional parameters must be present in a NSS message, nor does it specify the order in which those parameter lines must appear. It is recommended that this order be the same as that of the corresponding parameters in the source protocol message.

NOTE – It is expected that NSS messages will not include parameter lines derived from source protocol parameters that have been successfully mapped to the encapsulating protocol. Rules for interworking BICC and ISUP to the combination of SIP (RFC 3261) or ITU-T Rec. H.323 and NSS are not in the scope of this Recommendation.

Multiple parameters of the same type indicate concurrent instances of a parameter within a single NSS message.

5.2.2 NSS parameter line

Each parameter identifier is followed by a sequence of fields. The set of fields that is required to be present for each parameter defined in this Recommendation and the order in which these fields must appear is specified in the applicable sub-clauses of Recommendation 7.3, "Detailed parameter descriptions", and 7.4, "BAT ASE parameters".

Two successive fields are separated by a comma ",".

5.2.3 NSS fields

The type and the actual set of values permitted for each field is specified in the applicable sub-clause of Recommendation 7.3, "Detailed parameter descriptions" and of 7.4, "BAT ASE parameters".

The value may be omitted if the field value is unknown, leaving only the separating comma if there is a following field. This is permitted only if the range of permissible values for the field includes "unknown". The decoding end must correspondingly interpret an empty field value as having the "unknown" value.

Field values defined as literals in 7.3 must be transmitted exactly as defined, e.g., a field value of "0001" must not be transmitted as "1".

For multiple groups of fields and values within some parameters, multiple iterations of the same element type or value may be enclosed by parentheses "(" and ")". Braces "{" and "}" denote a tuple of dissimilar elements. Commas must separate elements within each type of group. From the perspective of higher-level constructs, those groups are viewed as a single field value. Detailed descriptions are provided in those parameters where this applies, e.g., in 7.3.18, "Calling Geodetic Location (CGL)" and in 7.3.23, "Cause indicators (CAI)".

5.3 NSS compact transmission mode

The normal encoding of NSS requires that field values be presented without identifying tags. This is possible because all field values in a parameter have a fixed order.

NOTE – For human display purposes, a "field-name=" construct may be inserted before each field value. Alphabetic characters within field names are always lower case. The field names for fields specified in this Recommendation are shown in 7.3, "Detailed parameter descriptions", to aid in readability, but are not transmitted. The corresponding ABNF for converting from the transmission mode to a display is shown in Appendix II.

For an example of a NSS message in compact transmission mode, see Appendix I.

6 Message definitions

This clause describes the Message Identifiers supported by the NSS. Clause 7 describes all messages, parameters, and fields specifically introduced by the NSS protocol with both structure and intended use. Although this Recommendation provides detailed breakdowns of NSS parameter structure and field values, these must not be considered to be descriptions of the structure and use of existing ISUP messages, parameters, and fields.

NOTE – It is intended that the procedures associated with parameters in NSS will be those applicable to the source protocol parameter from which they were mapped. This topic is not in the scope of this Recommendation.

6.1 Unsupported messages

There are no NSS equivalents for ISUP/BICC messages that do not have end-to-end significance, especially the TDM circuit management messages. Unrecognized NSS Message Handling (see 12.3) procedures can be used in the event that the such messages are required to be transmitted.

6.2 NSS message identifier codes

The following is the list of message names and their associated NSS Message Identifier codes. Parameter codes and Message Identifier codes share the same code space.

Message Name	*Message Identifier Code*	
Address Complete	ACM	
Answer	ANM	
Application Transport	APM	
Call Progress	CPG	
Charge Information	CRG	
Confusion	CFN	
Connect	CON	
Continuity	COT	
Facility	FAC	
Facility Accepted	FAA	
Facility Reject	FRJ	
Facility Request	FAR	
Forward Transfer	FOT	
Generic Parameter List	GPL	NSS-specific
Identification Request	IDR	
Identification Response	IRS	
Information	INF	
Information Request	INR	
Initial Address	IAM	
Loop Prevention	LOP	
Network Resource Management	NRM	
Overload	OLM	
Pass Along	PAM	
Pre-Release Information	PRI	
Release	REL	
Release Complete	RLC	
Resume	RES	
Segmentation	SGM	
Subsequent Address	SAM	
Subsequent Directory Number	SDN	
Suspend	SUS	
Unrecognized Message	UNR	NSS-specific
User-to-user Information	USR	

See 12.1 for explanations of NSS-specific messages.

7 Parameter definitions

This clause describes the syntax, parameters, fields, and field values.

7.1 Unsupported parameter disposition

The parameter "End Of Optional Parameters" is derived from ISUP specifications. It is not supported in NSS because that role is superseded by the encoding rules defined in 5.2.1.

7.2 NSS parameter codes

The following list of parameter names is derived as a superset of ISUP and BICC parameters from the specifications identified in clause 2. The NSS-specific parameters are needed to address transparency issues.

Parameter codes and Message Identifier codes share the same code space.

Parameter name	*NSS code*	
Access Delivery Information	ADI	
Access Transport	ATP	
Action Indicator	ACT	BAT ASE
Application Transport	APP	
Automatic Congestion Level	ACL	
Backward Call Indicators	BCI	
Backward GVNS	BVN	
Backward Network Connection Identifier	BID	BAT ASE
BAT Compatibility Report	BAT	BAT ASE
Bearer Control Information	BCD	BAT ASE
Bearer Control Tunnelling	BCT	BAT ASE
Bearer Control Unit Identifier	BDU	BAT ASE
Bearer Network Connection Characteristics	BNC	BAT ASE
Bearer Redirection Capability	BRC	BAT ASE
Bearer Redirection Indicators	BRI	BAT ASE
Call Completion Service Set-up	CCS	
Call Diversion Information	CDI	
Call Diversion Treatment Indicators	CDT	
Call History Information	CHI	
Call Offering Treatment Indicators	OCT	
Call Reference	CRF	
Call Transfer Number	CTN	
Call Transfer Reference	CTR	
Called Directory Number	CDN	
Called IN Number	CIN	
Called Party Number	CPN	

Calling Geodetic Location	CGL	
Calling Party Geodetic Velocity Information	CGV	
Calling Party Number	CGN	
Calling Party's Category	CPC	
Carrier Selection Information	CSI	
Cause Indicators	CAI	
CCNR Possible Indicator	CCN	
Charged Party Identification	CPI	
Circuit Identification (Call Instance) Code	CIC	
Closed User Group Interlock Code	GIC	
Codec	COD	BAT ASE
Codec List	CDL	BAT ASE
Coding Decoding Processing	CDP	
Collect Call Request	COL	
Conference Treatment Indicator	CNF	
Connected Number	CNN	
Connection Request	CNR	
Continuity Indicators	CTI	
Correlation Identity	COR	
Display Information	DIS	
Echo Control Information	ECI	
Event Information Indicators	EVI	
Facility Indicators	FAI	
Forward Call Indicators	FCI	
Forward GVNS	FVN	
Generic Address (Generic Number)	GEA	
Generic Digits	GED	
Generic Notification Indicator	GNO	
Global Call Identification (Global Call Reference)	GCI	NSS-specific
Hard To Reach	HTR	
Hop Counter	HOC	
Information Indicators	INI	
Information Request Indicators	IRI	
IN Service Compatibility	INC	
Inter-nodal Traffic Group Identifier	ITG	
Interworking Function Address	IWF	BAT ASE
Known Field Compatibility Information	FDC	NSS-specific

Location Number	LON	
Loop Prevention Indicator	LPI	
Mapped Parameter List	MPL	NSS-specific
MCID Request Indicator	MRI	
MCID Response Indicator	MCR	
Message Compatibility Information	MCI	
MLPP Precedence	MLP	
Nature of Connection Indicators	NOC	
Network Management Controls	NMC	
Network Routing Number	NRN	
Network Specific Facilities	NSF	
Number Portability Forward Information	NPF	
Optional Backward Call Indicators	OBI	
Optional Forward Call Indicators	OFI	
Original Called IN Number	OCI	
Original Called Number	OCN	
Originating ISC Point Code	ISC	
Parameter Compatibility Information	PCI	
Pivot Capability	PCA	
Pivot Counter	PCT	
Pivot Routing Backward Information	PBI	
Pivot Routing Forward Information	PFI	
Pivot Routing Indicator	PVR	
Pivot Status	PVS	
Propagation Delay Counter	PDC	
Protocol Name	PRN	NSS-specific
Query On Release Capability	QOR	
Redirect Backward Information	RBI	
Redirect Capability	RDC	
Redirect Counter	RCT	
Redirect Forward Information	RFI	
Redirect Status	RDS	
Redirecting Number	RGN	
Redirection Information	RNI	
Redirection Number	RNN	
Redirection Number Restriction	RNR	
Remote Operations	RMO	

SCF ID	SCF	
Segmentation Indicator	SEG	NSS-specific
Service Activation	SEA	
Signal	SIG	BAT ASE
Signalling Point Code	SPC	
Source Parameter Information	SPI	NSS-specific
Subsequent Number	SUN	
Suspend/Resume Indicators	SRI	
Transaction ID	TID	NSS-specific
Transit Network Selection	TNS	
Transmission Medium Required	TMR	
Transmission Medium Required Prime	TMP	
Transmission Medium Used	TMU	
UID Action Indicators	UID	
UID Capability Indicators	UCI	
Unknown Field Compatibility Information	UFC	NSS-specific
User Service Information	USI	
User Service Information Prime	USP	
User Teleservice Information	UTI	
User-To-User Indicators	UUI	
User-To-User Information	UUS	
Version of NSS	VER	NSS-specific

Telecommunications vendors and operators may wish to use new or private network-specific parameters. In such cases, the parameter must use a three-letter code different from the above list and should encapsulate it within the Parameter Compatibility Information (PCI) parameter so that intermediate nodes are not burdened. Nodes that agree to use that parameter should also agree on PRN values to indicate what parameter set to expect.

The order of the parameters detailed in the remainder of clause 7 follows the order in the above list. The following list is ordered by NSS code to aid in finding the full parameter name.

NSS code	*Parameter name*
ACL	Automatic Congestion Level
ACT	Action Indicator
ADI	Access Delivery Information
APP	Application Transport
ATP	Access Transport
BAT	BAT Compatibility Report
BCD	Bearer Control Information
BCI	Backward Call Indicators

BCT	Bearer Control Tunnelling
BDU	Bearer Control Unit Identifier
BID	Backward Network Connection Identifier
BNC	Bearer Network Connection Characteristics
BRC	Bearer Redirection Capability
BRI	Bearer Redirection Indicators
BVN	Backward GVNS
CAI	Cause Indicators
CCN	CCNR Possible Indicator
CCS	Call Completion Service Set-up
CDI	Call Diversion Information
CDL	Codec List
CDN	Called Directory Number
CDP	Coding Decoding Processing
CDT	Call Diversion Treatment Indicators
CGL	Calling Geodetic Location
CGN	Calling Party Number
CGV	Calling Party Geodetic Velocity Information
CHI	Call History Information
CIC	Circuit Identification (Call Instance) Code
CIN	Called IN Number
CNF	Conference Treatment Indicator
CNN	Connected Number
CNR	Connection Request
COD	Codec
COL	Collect Call Request
COR	Correlation Identity
CPC	Calling Party's Category
CPI	Charged Party Identification
CPN	Called Party Number
CRF	Call Reference
CSI	Carrier Selection Information
CTI	Continuity Indicators
CTN	Call Transfer Number
CTR	Call Transfer Reference
DIS	Display Information
ECI	Echo Control Information

EVI	Event Information Indicators
FAI	Facility Indicators
FCI	Forward Call Indicators
FDC	Known Field Compatibility Information
FVN	Forward GVNS
GCI	Global Call Identification
GEA	Generic Address
GED	Generic Digits
GIC	Closed User Group Interlock Code
GNO	Generic Notification Indicator
HOC	Hop Counter
HTR	Hard To Reach
INC	IN Service Compatibility
INI	Information Indicators
IRI	Information Request Indicators
ISC	Originating ISC Point Code
ITG	Inter-nodal Traffic Group Identifier
IWF	Interworking Function Address
LON	Location Number
LPI	Loop Prevention Indicator
MCI	Message Compatibility Information
MCR	MCID Response Indicator
MLP	MLPP Precedence
MPL	Mapped Parameter List
MRI	MCID Request Indicator
NMC	Network Management Controls
NOC	Nature of Connection Indicators
NPF	Number Portability Forward Information
NRN	Network Routing Number
NSF	Network-Specific Facilities
OBI	Optional Backward Call Indicators
OCI	Original Called IN Number
OCN	Original Called Number
OCT	Call Offering Treatment Indicators
OFI	Optional Forward Call Indicators
PBI	Pivot Backward Information
PCA	Pivot Capability

PCI	Parameter Compatibility Information
PCT	Pivot Counter
PDC	Propagation Delay Counter
PFI	Pivot Forward Information
PRN	Protocol Name
PVR	Pivot Routing Indicator
PVS	Pivot Status
QOR	Query On Release Capability
RBI	Redirect Routing Backward Information
RCT	Redirect Counter
RDC	Redirect Capability
RDS	Redirect Status
RFI	Redirect Routing Forward Information
RGN	Redirecting Number
RMO	Remote Operations
RNI	Redirection Information
RNN	Redirection Number
RNR	Redirection Number Restriction
SCF	SCF ID
SEA	Service Activation
SEG	Segmentation Indicator
SIG	Signal
SPC	Signalling Point Code
SPI	Source Parameter Information
SRI	Suspend/Resume Indicators
SUN	Subsequent Number
TID	Transaction ID
TMP	Transmission Medium Required Prime
TMR	Transmission Medium Required
TMU	Transmission Medium Used
TNS	Transit Network Selection
UCI	UID Capability Indicators
UFC	Unknown Field Compatibility Information
UID	UID Action Indicators
USI	User Service Information
USP	User Service Information Prime
UTI	User Teleservice Information

UUI	User-To-User Indicators
UUS	User-To-User Information
VER	Version of NSS

7.3 Detailed parameter descriptions

The designation "a" means all possible characters allowed in 5.1, unless otherwise constrained by the field description. The designation "d" means only characters 0-9 are used. The designation "h" means that the field or subfield is to be hexadecimal-encoded.

The first field value for most fields will be the "unknown" value. "Unknown" means that the information was absent or unavailable at the source of the NSS encoding.

The left-hand columns in the following clauses are **literal** values to be used as codepoints. The Format lines show "<tag>=" preceding the field values; however, these field names (tags) are not transmitted in the compact encoding used on the wire.

7.3.1 Access Delivery Information (ADI)

```
Format: ADI,adi=a

Fields:

Field-01: adi - access delivery indicator
 a   description
 -   -----------
 u - unknown
 y - set-up message generated
 n - no set-up message generated
```

7.3.2 Access Transport (ATP)

```
Format: ATP,dat=1*(2Hex)

Fields:     (may carry Q.931 IE)

Field-01: dat - access Transport data
 1*(2h)  description
 ------  -----------
 1*(2h) - one or more pairs of characters (0-9, A-F) representing a
          hexadecimal encoding (see clause 5.1).
          (If unknown, parameter is omitted.)
```

7.3.3 Application Transport (APP)

```
Format: APP,aci=a,sni=a,rci=a,si=a,seg=hh,slr=hh,apm=0*(2Hex)

Fields:

Field-01: aci - application context identifier
 a   definition
 -   ----------
 u - unknown
 0 - Unidentified Context and Error Handling (UCEH) ASE
 1 - PSS1 ASE (VPN)
 2 - Charging ASE
 3 - GAT ASE
 4 - BAT ASE
 5 - Enhanced Unidentified Context and Error Handling
     (EUCEH) ASE
```

```
Field-02: sni - send notification indicator
 a   definition
 -   ----------
 u - unknown
 n - do not send notification
 y - send notification

Field-03: rci - release call indicator
 a   definition
 -   ----------
 u - unknown
 n - do not release call
 y - release call

Field-04: si - sequence indicator
 a   definition
 -   ----------
 0 - subsequent segment to first segment
 1 - new sequence

Field-05: seg - segmentation indicator
 dd   definition
 --   ----------
 00
-99 - 2 decimal digits 0-9 - indicates number
      of following segments

Field-06: slr - segmentation local reference
 hh  definition
 --  ----------
 00
-FF - 2 hexadecimal digits 0-9 or A-F

Field-07: apm - APM user information
 0*(2h)   description
 ------   -----------
 0*(2h) - one or more pairs of characters (0-9, A-F) representing a
          hexadecimal encoding (see clause 5.1).

See clause 7.4 for additional NSS parameters that must be used with
the APP Field-01 code point number 4 (BAT ASE) instead of tunnelling
in Field-07. In this case, Field-07 shall be left empty in the encoding of the
APP parameter. When other Field-01 code point values are used, the APM user
information is encoded in Field-07 and not parameters in clause 7.4. When
Field-07 is empty and BAT ASE clause 7.4 parameters are absent from the
message, then the APM user information value is "unknown".
```

7.3.4 Automatic Congestion Level (ACL)

```
Format: ACL,acl=a

Fields:

Field-01: acl - auto congestion level
 a   description
 -   -----------
 u - unknown
 1 - congestion level 1 exceeded
 2 - congestion level 2 exceeded
```

7.3.5 Backward Call Indicators (BCI)

```
Format: BCI,cha=a,sta=a,cpc=dd,e2ei=a,e2em=a,inter=a,iupi=a,h=a,
        acc=a,eco=a,sccpm=d  <NOTE – continuation of same line.>

Fields:

Field-01: cha - charge indicator
 a   description
 -   -----------
 0 - no indication
 y - charge
 n - no charge

Field-02: sta - called party status
 a   description
 -   -----------
 0 - no indication
 f - subscriber free
 c - connect when free

Field-03: cpc - call(ed) party category (reuses clause 7.3.21 cpc=field)
 dd   description
 --   -----------
 00 - unknown/no indication
 09 - ordinary subscriber
 15 - public payphone

Field-04: e2ei - end-to-end information indicator
 a   definition
 -   ---------
 u - unknown (meaning 'No Indication')
 y - end-to-end information is available
 n - end-to-end information is not available

Field-05: e2em - end-to-end method indicator
 a   definition
 -   ----------
 u - unknown
 n - no end-to-end method available
 1 - pass-along method available
 2 - SCCP method available
 3 - pass-along and SCCP methods available

Field-06: inter - interworking Indicator
 a   definition
 -   ----------
 u - unknown
 y - interworking has been encountered
 n - interworking has not been encountered (SS7/BICC all the way)

Field-07: iupi - ISDN user part indicator
 a   definition
 -   ----------
 u - unknown
 y - ISDN user part/BICC is used all the way
 n - ISDN user part/BICC is not used all the way

Field-08: h - hold indicator
 a   definition
 -   ----------
 u - unknown
 y - call hold requested
 n - call hold not requested
```

```
Field-09: acc - ISDN access indicator
 a   definition
 -   ----------
 u - unknown
 y - Terminating access is ISDN
 n - Terminating Access is not ISDN

Field-10: eco - Echo control device indicator
 a   definition
 -   ----------
 u - unknown
 y - incoming half echo device included
 n - incoming half echo device not included

Field-11: sccpm - SCCP Method Indicator
 d   definition
 -   ----------
 0 - no indication
 1 - connectionless method available
 2 - connection-oriented method available
 3 - connectionless and connection-oriented methods available
```

7.3.6 Backward GVNS (BVN)

```
Format: BVN,tai=a

Fields:

Field-01: tai - terminating access indicator
 a   description
 -   -----------
 0 - no information
 d - dedicated terminating access
 s - switched terminating access
```

7.3.7 Call Completion Service Set-up (CCS)

```
Format: CCS,ccss=a

Fields:

Field-01: ccss - CCSS call indicator
 a   description
 -   -----------
 0 - no indication
 y - CCSS call
```

7.3.8 Call Diversion Information (CDI)

```
Format: CDI,nso=a,rr=a

Fields:

Field-01: nso - notification subscription options
 a   description
 -   -----------
 u - unknown
 1 - presentation restricted
 2 - presentation allowed with redirection number
 3 - presentation allowed without redirection number
```

```
Field-02: rr - redirecting reason
 a   description
 -   -----------
 u - unknown
 1 - user busy
 2 - no reply
 3 - unconditional
 4 - deflection during alerting
 5 - deflection immediate response
 6 - mobile subscriber not reachable
```

7.3.9 Call Diversion Treatment Indicators (CDT)

```
Format: CDT,ct=a

Fields:

Field-01: ct - call diversion treatment
 a   definition
 -   ----------
 u - unknown
 y - call diversion allowed
 n - call diversion not allowed
```

7.3.10 Call History Information (CHI)

```
Format: CHI,pd=ddddd

Fields:

Field1 : pd - propagation delay

 ddddd   definition
 -----   ----------
 00000 - delay unknown
-65535 - delay in milliseconds
```

7.3.11 Call Offering Treatment Indicators (OCT)

```
Format: OCT,coi=a

Fields:

Field-01: coi - call offering treatment indicator

 a   description
 -   -----------
 u - unknown
 n - call offering not allowed
 y - call offering allowed
```

7.3.12 Call Reference (CRF)

```
Format: CRF,cid=hhhhhh,pc=aaaaaaaaaa

Fields:

Field-01: cid - call identity
 hhhhhh   description
 ------   -----------
 000000 - 6 characters 0-9, A-F representing hexadacimal values
-FFFFFF

Field-02: pc - Point Code
```

```
 aaaaaaaaaaa   description
 -----------   -----------
 nnn.ccc.mmm - nine characters separated by two periods, where
               nnn is for network/zone (most significant 3 or 8 bits),
               ccc is for cluster/area (middle 8 bits),
               mmm is for member (least significant 3 or 8 bits).
               The nnn, ccc, and mmm are 3-digit numbers from 000 to 255
               representing the decimal equivalent of the subfield viewed
               as a binary number. [NOTE – ITU format is 3.8.3 bit.]
```

7.3.13 Call Transfer Number (CTN)

```
Format: CTN,noa=dd,npi=a,pi=a,si=a,#=1*h

Fields:

Field-01: noa - nature of address
 dd   description
 --   -----------
 00 - unknown, number present
 02 - unique subscriber number
 04 - unique national (significant) number
 06 - unique international number
 08 - network-specific number
 30 - network routing number in national (significant) format
 31 - network routing number in network-specific format
 32 - network routing number concatenated with Called Directory
      Number
 35 - PISN specific number

[NOTE – noa= appears in the following additional parameters:
 CDN, CPN, CIN, CGN, CNN, FVN, GEA, HTR, LON, OCI, OCN, RGN, RNN.
 Those parameters refer back to the above list because of its
 size. The NRN parameters use alternative lists.]

Field-02: npi - numbering plan indicator
 a   description
 -   -----------
 u - unknown
 1 - ISDN numbering plan (ITU-T Rec. E.164)
 2 - Data numbering plan (ITU-T Rec. X.121)
 3 - Telex numbering plan (ITU-T Rec. F.69)
 4 - Private numbering plan
 5 - national

Field-03: pi - presentation indicator
 a   description
 -   -----------
 u - unknown
 y - presentation allowed
 n - presentation restricted
 0 - address not available

Field-04: si - screening indicator
 a   description
 -   -----------
 u - unknown
 1 - user provided not screened
 2 - user provided screening passed
 3 - user provided screening failed
 4 - network provided

Field-05: # - address
 1*h   description
```

```
 ---   -----------
 1*h - one or more telephony digits: 0-9, A-F
       (see formal grammar)
```

7.3.14 Call Transfer Reference (CTR)

```
Format: CTR,ref=ddd

Fields:

Field-01: ref - call transfer reference
 ddd   description
 ---   -----------
 000 - positive integer number 0-9 (omit if parameter unknown)
-255
```

7.3.15 Called Directory Number (CDN)

```
Format: CDN,noa=dd,inn=a,npi=a,#=1*h

Fields:

Field-01: noa - nature of address
 dd  description
 --  -----------
     See definition of "noa=" in clause 7.3.13,
     Call Transfer Number (CTN).

Field-02: inn - internal network number indicator
 a   description
 -   -----------
 u - unknown
 n - routing to internal network number not allowed
 y - routing to internal network number allowed

Field-03: npi - numbering plan indicator
 a   description
 -   -----------
 u - unknown
 1 - ISDN numbering plan (ITU-T Rec. E.164)
 2 - Data numbering plan (ITU-T Rec. X.121)
 3 - Telex numbering plan (ITU-T Rec. F.69)
 4 - Private numbering plan
 5 - national

Field-04: # - address
 1*h   description
 ---   -----------
 1*h - one or more telephony digits: 0-9, A-F
       (see formal grammar)
```

7.3.16 Called IN Number (CIN)

```
Format: CIN,noa=dd,npi=a,pi=a,#=1*h

Fields:

Field-01: noa - nature of address
 dd  description
 --  -----------
     See definition of "noa=" in clause 7.3.13,
     Call Transfer Number (CTN).
```

```
Field-02: npi - numbering plan indicator
 a   description
 -   -----------
 u - unknown
 1 - ISDN numbering plan (ITU-T Rec. E.164)
 2 - Data numbering plan (ITU-T Rec. X.121)
 3 - Telex numbering plan (ITU-T Rec. F.69)
 4 - Private numbering plan
 5 - national

Field-03: pi - presentation indicator
 a   description
 -   -----------
 u - unknown
 y - presentation allowed
 n - presentation restricted
 0 - address not available

Field-04: # - address
 1*h   description
 ---   -----------
 1*h - one or more telephony digits: 0-9, A-F
       (see formal grammar)
```

7.3.17 Called Party Number (CPN)

```
Format: CPN,noa=dd,inn=a,npi=a,#=1*h

Fields:

Field-01: noa - nature of address
 dd   description
 --   -----------
      See definition of "noa=" in clause 7.3.13,
      Call Transfer Number (CTN).

Field-02: inn - Internal network number indicator
 a   description
 -   -----------
 u - unknown
 n - routing to internal network number not allowed
 y - routing to internal network number allowed

Field-03: npi - numbering plan indicator
 a   description
 -   -----------
 u - unknown
 1 - ISDN numbering plan (ITU-T Rec. E.164)
 2 - Data numbering plan (ITU-T Rec. X.121)
 3 - Telex numbering plan (ITU-T Rec. F.69)
 4 - Private numbering plan
 5 - national

Field-04: # - address
 1*h   description
 ---   -----------
 1*h - one or more telephony digits: 0-9, A-F
       (see formal grammar)
```

7.3.18 Calling Geodetic Location (CGL)

```
Format: CGL,pi=a,si=a,type=d,[Field Container]

Fields:

Field-01: pi - presentation indicator
 a   description
 -   -----------
 u - unknown
 y - presentation allowed
 n - presentation restricted
 0 - location not available

Field-02: si - screening indicator
 a   description
 -   -----------
 u - unknown
 1 - user provided not screened
 2 - user provided screening passed
 3 - user provided screening failed
 4 - network provided

Field-03: type - type of shape
 d   definition
 -   ----------
 u - unknown
 0 - ellipsoid point                       field container 1
 1 - ellipsoid point with uncertainty      field container 2
 2 - ellipsoid point with altitude and
     uncertainty                           field container 3
 3 - ellipse on ellipsoid                  field container 4
 4 - ellipsoid circle sector               field container 5
 5 - polygon                               field container 6
 6 - ellipsoid point with altitude         field container 7
 7 - ellipsoid point with altitude and
     uncertainty ellipsoid                 field container 8
 8 - ellipsoid arc                         field container 9

Field containers:

Field container 1 - ellipsoid point

 Format: ns=d,lat=1*d,lon=1*d

 Field-04: ns - north/south
   d   description
   -   -----------
   0 - north
   1 - south

 Field-05: lat - degrees of latitude
   1*d   description
   -     -----------
   1*d - This field value is the decimal equivalent of the
         23-bit binary value N, that when multiplied by 90 and
         divided by 2^23 produces degrees and fraction of degrees
         to multiple decimal places of precision. This note
         applies to all latitude fields in this parameter.
         Example: 111 0000 0000 0000 0000 0000 = 7,340,032
           x 90 = 660,602,880 / 2^23 = 78.75 degrees.
         In other words, N/(2^23) produces a fraction 0≤X<1 of
         the total 90 degrees.
```

```
 Field-06: lon - degrees of longitude
   1*d   description
   -     -----------
   1*d - This field value is the decimal equivalent of the
         24-bit binary value N, that when multiplied by 360 and
         divided by 2^24 produces degrees and fraction of degrees
         to multiple decimal places of precision. For conversion
         to negative degrees West, when resulting degrees exceed
         180, subtract 360. This note applies to all longitude
         fields in this parameter.
         Example: N/(2^24)x360 is similar to that above. A value
         of 275 degrees converts to: 275 - 360 = -85 degrees West.

Field container 2 - ellipsoid point with uncertainty

 Format: ns=d,lat=1*d,lon=1*d,unc=d,con=d

 Field-04: ns - north/south
   d   description
   -   -----------
   0 - north
   1 - south

 Field-05: lat - degrees of latitude
   1*d   description
   ---   -----------
   1*d - same as in field container 1

 Field-06: lon - degrees of longitude
   1*d   description
   ---   -----------
   1*d - same as in field container 1

 Field-07: unc - uncertainty
   1*d   description
   ---   -----------
   1*d - This field value is the decimal equivalent of the
         7-bit binary value K used in the formula:
         uncertainty = 10 x [ (1.1)^K - 1] that produces
         uncertainty values in the range of 0 to 1800 metres.
         This applies to all Latitude/Longitude uncertainty
         fields in this parameter.

 Field-08: con - confidence
   1*d   description
   ---   -----------
   1*d - This field value is the decimal equivalent of the
         7-bit binary value 0≤K≤100 expressed as a percentage,
         and where K=0 means "no information".
         This applies to any confidence field in this parameter.

Field container 3 - ellipsoid point with altitude and uncertainty

 Format: ns=d,lat=1*d,lon=1*d,unc=1*d,as=d,alt=1*d,
         auc=1*d,con=1*d  [NOTE - continued on same line.]

 Field-04: ns - north/south
   d   description
   -   -----------
   0 - north
   1 - south
```

```
Field-05: lat - degrees of latitude
  1*d   description
  -     -----------
  1*d - same as in field container 1

Field-06: lon - degrees of longitude
  1*d   description
  -     -----------
  1*d - same as in field container 1

Field-07: unc - uncertainty
  1*d   description
  -     -----------
  1*d - same as in field container 2

Field-08: as - altitude sign
  d   description
  -   -----------
  0 - above ellipsoid
  1 - below ellipsoid

Field-09: alt - altitude
  1*d   description
  ---   -----------
  1*d - This field value is the decimal equivalent of the
        15-bit binary value indicating 0≤a≤32767 metres. This
        applies to any altitude field in this parameter.

Field-10: auc - altitude uncertainty code
  1*d   description
  ---   -----------
  1*d - This field value is the decimal equivalent of the
        7-bit binary value K used in the formula:
        uncertainty = 45 x [ (1.025)^K – 1] that produces
        uncertainty values in the range of 0 to 1000 metres.
        This note applies to all altitude uncertainty fields
        in this parameter.

Field-11: con - confidence
  1*d   description
  ---   -----------
  1*d - same as in field container 2

Field container 4 - ellipse on ellipsoid

Format: ns=d,lat=1*d,lon=1*d,maj=1*d,min=1*d,ori=1*d,
        con=1*d

Field-04: ns - latitude sign
  d   description
  -   -----------
  0 - north
  1 - south

Field-05: lat - degrees of latitude
  1*d   description
  ---   -----------
  1*d - same as in field container 1

Field-06: lon - degrees of longitude
  1*d   description
  ---   -----------
  1*d - same as in field container 1
```

```
 Field-07: maj - major radius
   1*d   description
   ---   -----------
   1*d - This field value is the decimal equivalent of the
         7-bit binary value K used in the formula:
         radius = 10 x [ (1.1)^K - 1] that produces radius
         values in the range of 0 to 1800 metres. This
         note applies to most Radius fields in this parameter.

 Field-08: min - minor radius
   1*d   description
   ---   -----------
   1*d - same as major radius above

 Field-09: ori - orientation
   1*d   description
   ---   -----------
   1*d - This field value is the decimal equivalent of the
         8-bit binary value 0≤K≤180 degrees. This applies to
         any orientation field in this parameter.

 Field-10: con - confidence
   1*d   description
   ---   -----------
   1*d - same as in field container 2

Field container 5 - ellipsoid circle sector

 Format: ns=d,lat=1*d,lon=1*d,rad=1*d,off=1*d,ang=1*d,
         con=1*d

 Field-04: ns - north/south
   d   description
   -   -----------
   0 - north
   1 - south

 Field-05: lat - degrees of latitude
   1*d   description
   ---   -----------
   1*d - same as in field container 1

 Field-06: lon - degrees of longitude
   1*d   description
   ---   -----------
   1*d - same as in field container 1

 Field-07: rad - radius
   1*d   description
   ---   -----------
   1*d - same as major radius in container 4

 Field-08: off - offset angle
   1*d   description
   ---   -----------
   1*d - This field value is the decimal equivalent of the
         8-bit binary value 0≤K≤180 with degrees=2*K, where
         0 degrees is North and 90 degrees is East. This
         applies to any offset or included angle field in this
         parameter.
```

```
   Field-09: ang - included angle
     1*d   description
     ---   -----------
     1*d - same as offset angle above

   Field-10: con - confidence
     1*d   description
     ---   -----------
     1*d - same as in field container 2

  Field container 6 - polygon

   Format: num=dd,(3*15{ns=d,lat=1*d,lon=1*d}),con=1*d

   Field-04: num - number of points
     dd   description
     --   -----------
     03 - the number of points in the polygon
    -15

   For each point in the polygon, a tuple of three fields is needed
   to describe that point. The number of tuples is indicated by
   Field-04 above. Each tuple must begin with an open brace
   "{", end with a close brace "}", with tuples comma-delimited.
   A comma separates subfields within the tuple. Example:
   Triangle: ({ns=0,lat=33,lon=89},
             {ns=0,lat=34,lon=90},
             {ns=0,lat=34,lon=89})

   In the following fields, T1, T2, and T3 compose the tuple:

   Field-T1: ns - north/south
     d   description
     -   -----------
     0 - north
     1 - south

   Field-T2: lat - degrees of latitude
     1*d   description
     -     -----------
     1*d - same as in field container 1

   Field-T3: lon - degrees of longitude
     1*d   description
     -     -----------
     1*d - same as in field container 1

   A single occurrence of confidence ends the parameter:

   Field-NN: con - confidence
     1*d   description
     ---   -----------
     1*d - same as in field container 2

Field container 7 - ellipsoid point with altitude

   Format: ns=d,lat=1*d,lon=1*d,as=d,alt=1*d

   Field-04: ns - north/south
     d   description
     -   -----------
     0 - north
     1 - south
```

```
 Field-05: lat - degrees of latitude
   1*d   description
   -     -----------
   1*d - same as in field container 1

 Field-06: lon - degrees of longitude
   1*d   description
   -     -----------
   1*d - same as in field container 1

 Field-07: as - altitude sign
   d   description
   -   -----------
   0 - above ellipsoid
   1 - below ellipsoid

 Field-08: alt - altitude
   1*d   description
   ---   -----------
   1*d - same as in field container 3

Field container 8 - ellipsoid point with altitude and
                    uncertainty ellipsoid

 Format: ns=d,lat=1*d,lon=1*d,as=d,alt=1*d,maj=1*d,min=1*d,
         ori=1*d,auc=1*d,con=1*d

 Field-04: ns - latitude sign
   d   description
   -   -----------
   0 - north
   1 - south

 Field-05: lat - degrees of latitude
   1*d   description
   ---   -----------
   1*d - same as in field container 1

 Field-06: lon - degrees of longitude
   1*d   description
   ---   -----------
   1*d - same as in field container 1

 Field-07: as - altitude sign
   d   description
   -   -----------
   0 - above ellipsoid
   1 - below ellipsoid

 Field-08: alt - altitude
   1*d   description
   ---   -----------
   1*d - same as in field container 3

 Field-09: maj - major radius
   1*d   description
   ---   -----------
   1*d - same as in field container 4

 Field-10: min - minor radius
   1*d   description
   ---   -----------
   1*d - see ITU-T Recs Q.763/Q.1902.3 for encoding
```

```
 Field-11: ori - orientation
   1*d   description
   ---   -----------
   1*d - same as in field container 4

 Field-12: auc - altitude uncertainty code
   1*d   description
   ---   -----------
   1*d - same as in field container 3

 Field-13: con - confidence
   1*d   description
   ---   -----------
   1*d - same as in field container 2

Field container 9 - ellipsoid arc

 Format: ns=d,lat=1*d,lon=1*d,inr=1*d,unc=1*d,off=1*d,ang=1*d,
         con=1*d

 Field-04: ns - latitude sign
   d   description
   -   -----------
   0 - north
   1 - south

 Field-05: lat - degrees of latitude
   1*d   description
   ---   -----------
   1*d - same as in field container 1

 Field-06: lon - degrees of longitude
   1*d   description
   ---   -----------
   1*d - same as in field container 1

 Field-07: inr - inner radius
   1*d   description
   ---   -----------
   1*d - This field value is the decimal equivalent of the
         16-bit binary value N used in the standard formula. This
         note applies to most Radius fields in this parameter.

 Field-08: unc - uncertainty radius (identical to uncertainty)
   1*d   description
   ---   -----------
   1*d - same as in field container 2

 Field-09: off - offset angle
   1*d   description
   ---   -----------
   1*d - same as in field container 5

 Field-10: ang - included angle
   1*d   description
   ---   -----------
   1*d - same as offset angle in container 5

 Field-11: con - confidence
   1*d   description
   ---   -----------
   1*d - same as in field container 2
```

7.3.19 Calling Party Geodetic Velocity Information (CGV)

```
Format: CGV,pi=a,si=a,type=d,[field container]

Based on the value of "type", none or one of the following field
containers will follow. This parameter can appear multiple times,
indicating different types of information within the same message.

Fields:

Field-01: pi - presentation indicator
 a   description
 -   -----------
 u - unknown
 y - presentation allowed
 n - presentation restricted
 0 - location not available

Field-02: si - screening indicator
 a   description
 -   -----------
 u - unknown
 1 - user provided not screened
 2 - user provided screening passed
 3 - user provided screening failed
 4 - network provided

Field-03: type - type of geodetic velocity information
 d   definition
 -   ----------
 0 - unknown
 1 - Horizontal velocity                  field container 1
 2 - Horizontal with Vertical velocity    field container 2
 3 - Horizontal velocity with Uncertainty field container 3
 4 - Horizontal with Vertical velocity
     and Uncertainty                      field container 4

Field Containers:

Field Container 1 (type=1)

 Format: bear=ddd,hvel=ddddd

 Fields:

 Field-04: bear - bearing
   ddd   definition
   ---   ----------
   000 - degrees clockwise from North
  -360   (maximum)

 Field-05: hvel - horizontal speed
   ddddd   definition
   -----   ----------
   00000 - rounded up to nearest kilometer per hour
  -65535   (e.g., X.5 rounds to X+1)

Field Container 2 (type=2)

 Format: bear=ddd,hvel=ddddd,dir=d,vvel=ddd
```

```
 Fields:

 Field-04: bear - bearing
   ddd   definition
   ---   ----------
   000 - degrees clockwise from North
  -360   (maximum)

 Field-05: hvel - horizontal speed
   ddddd   definition
   -----   ----------
   00000 – rounded up to nearest kilometer per hour
  -65535   (e.g., X.5 rounds to X+1)

 Field-06: dir - direction of vertical speed
   d   definition
   -   ----------
   0 - upward
   1 - downward

 Field-07: vvel - vertical speed
   ddd   definition
   ---   ----------
   000 - rounded up to nearest kilometer per hour
  -255   (e.g., X.5 rounds to X+1)

Field Container 3 (type=3)

 Format: bear=ddd,hvel=ddddd,hu=ddd

 Fields:

 Field-04: bear - bearing
   ddd   definition
   ---   ----------
   000 - degrees clockwise from North
  -360   (maximum)

 Field-05: hvel - horizontal speed
   ddddd   definition
   -----   ----------
   00000 - rounded up to nearest kilometer per hour
  -65535   (e.g., X.5 rounds to X+1)

 Field-06: hu - horizontal uncertainty speed
   ddd   definition
   ---   ----------
   000 - increments of one kilometer per hour
  -254
   255 - indicates that uncertainty is not specified

Field Container 4 (type=4)

 Format: bear=ddd,hvel=ddddd,hu=ddd,dir=d,vvel=ddd,vu=ddd

 Fields:

 Field-04: bear - bearing
   ddd   definition
   ---   ----------
   000 - degrees clockwise from North
  -360   (maximum)
```

```
Field-05: hvel - horizontal speed
  ddddd   definition
  -----   ----------
  00000 - rounded up to nearest kilometer per hour
 -65535   (e.g., X.5 rounds to X+1)

Field-06: hu - horizontal uncertainty speed
  ddd   definition
  ---   ----------
  000 - increments of one kilometer per hour
 -254
  255 - indicates that uncertainty is not specified

Field-07: dir – direction of vertical speed
  d   definition
  -   ----------
  0 – upward
  1 - downward

Field-08: vvel - vertical speed
  ddd   definition
  ---   ----------
  000 - rounded up to nearest kilometer per hour
 -255   (e.g., X.5 rounds to X+1)

Field-09: vu - vertical uncertainty speed
  ddd   definition
  ---   ----------
  000 - increments of one kilometer per hour
 -254
  255 - indicates that uncertainty is not specified
```

7.3.20 Calling Party Number (CGN)

```
Format: CGN,noa=dd,cni=a,npi=a,pi=a,si=a,#=1*h

Fields:

Field-01: noa - nature of address
 dd  description
 --  -----------
     See definition of "noa=" in clause 7.3.13,
     Call Transfer Number (CTN).

Field-02: cni - complete number indicator
 a   description
 -   -----------
 u - unknown
 y - number complete
 n - number incomplete

Field-03: npi - numbering plan indicator
 a   description
 -   -----------
 u - unknown
 1 - ISDN numbering plan (ITU-T Rec. E.164)
 2 - Data numbering plan (ITU-T Rec. X.121)
 3 - Telex numbering plan (ITU-T Rec. F.69)
 4 - Private numbering plan
 5 - national
```

```
Field-04: pi - presentation indicator
 a   description
 -   -----------
 u - unknown
 y - presentation allowed
 n - presentation restricted
 0 - address not available
 1 - restricted by network

Field-05: si - screening indicator
 a   description
 -   -----------
 u - unknown
 1 - user provided not screened
 2 - user provided screening passed
 3 - user provided screening failed
 4 - network provided

Field-06: # - address
 1*h   description
 ---   -----------
 1*h - one or more telephony digits: 0-9, A-F
       (see formal grammar)
```

7.3.21 Calling Party's Category (CPC)

```
Format: CPC,cpc=dd

Fields:

Field-01: cpc - Call(ing) Party Category
     (Calling or called derived from parameter context)
 dd   description
 --   -----------
 00 - unknown
 01 - operator, Language French
 02 - operator, Language English
 03 - operator, Language German
 04 - operator, Language Russian
 05 - operator, Language Spanish
 06 - admin1
 07 - admin2
 08 - admin3
 09 - ordinary calling subscriber
 11 - calling subscriber with priority
 12 - data call (voiceband data)
 13 - test call
 15 - public  payphone
 19 - IEPS call marking for preferential call set-up
```

7.3.22 Carrier Selection Information (CSI)

```
Format: CSI,csi=dd

Fields:

Field-01: csi - carrier selection information (omit parm if unknown)
dd   description
--   -----------
00 - no indication
01 - selected carrier identification pre-subscribed and no
     input by calling party
02 - selected carrier identification pre-subscribed and
     input by calling party
```

```
03 - selected carrier identification pre-subscribed and
     input by calling party undetermined
04 - selected carrier identification not pre-subscribed and
     input by calling party
05 - primary preferred carrier of the charged party
06 - alternate preferred carrier of the charged party
07 - selected carrier identification presubscription unknown (verbal)
     instructions from the calling party
08 - selected carrier identification presubscription unknown (verbal)
     instructions from the charged party
09 - emergency call handling
10 - carier selected by input from the calling party
11 - carrier selected by a network operator
```

7.3.23 Cause Indicators (CAI)

```
Format: CAI,cs=a,loc=aaa,rec=a,cau=ddd,
            di={condition_coding,tni_coding,ccbs_ind,
               call_rejected_ind,cdpn_coding,fac_id_reject,
               attribute_ids,chan_type,incompat_param,
               timer_num,msg_type,param_name}

 [NOTE – The eleven subfields according to ITU-T Rec. Q.850 may occur. Their
 values are defined in detail in the grammar in Annex A. When no
 diagnostics are included, the braces and all between the braces
 are omitted, and only the comma before the di= remains.]

Fields:

Field-01: cs - code standard
 a  definition
 -  ----------
 u - unknown
 c - ITU-T standardized coding
 i - ISO/IEC
 n - national standard
 p - standard defined for the network either public or private

Field-02: loc - location
 aaa  definition
 ---  ----------
 unk - unknown
 usr - user
 lpn - local private network (private network serving local user)
 lln - local public network (public network serving local user)
 tra - transit network
 rln - remote local network (public network serving remote user)
 rpn - remote private network (private network serving remote user)
 int - international network
 bip - network beyond interworking point

Field-03: rec - recommendation (specific standard)
 a   definition
 -   ----------
 u - unknown
 q - ITU-T Rec. Q.763
 p - Public land and mobile networks, Q.1000-series Recommendations
 1 - ITU-T Rec. X.21
 5 - ITU-T Rec. X.25

Field-04: cau - cause indicators
 ddd   definition
 ---   ----------
 000 - unknown
```

```
001 - Unallocated number
002 - no route to specified transit network
003 - no route to destination
004 - send special information tone
005 - misdialed trunk prefix
006 - channel unacceptable
007 - call awarded and being delivered in an established channel
008 - preemption
009 - preemption - circuit reserved for reuse
014 - Query On Release (QOR): ported number
016 - normal call clearing
017 - user busy
018 - no user responding
019 - no answer from user
020 - subscriber absent
021 - call rejected
022 - number changed
023 - redirect to new destination (e.g., release to pivot)
024 - call rejected due to feature at the destination
026 - non-selected user clearing
027 - destination out of order
028 - invalid number format
029 - facility rejected
030 - response to status enquiry
031 - normal unspecified
034 - no circuit/channel available
038 - network out of order
039 - permanent frame mode connection out of service
040 - permanent frame mode connection operational
041 - temporary failure
042 - switching equipment congestion
043 - access information discarded
044 - requested circuit/channel not available
046 - precedence call blocked
047 - resource unavailable unspecified
049 - quality of service unavailable
050 - requested facility not subscribed
053 - outgoing calls barred within CUG
055 - incoming calls barred within CUG
057 - bearer capability not authorized
058 - bearer capability not presently available
062 - Inconsistency in designated outgoing access information and
      subscriber class
063 - service or option not available unspecified
065 - bearer capability not implemented
066 - channel type not implemented
069 - requested facility not implemented
070 - only restricted digital information bearer capability is
      available
079 - service or option not implemented unspecified
081 - invalid call reference value
082 - identified channel does not exist
083 - a suspended call exists but this call identity does not
084 - call identity in use
085 - no call suspended
086 - call having the requested call identity has been cleared
087 - user not member of CUG
088 - incompatible destination
090 - non-existent CUG
091 - invalid transit network selection
095 - invalid message unspecified
096 - mandatory information element missing
097 - message type non-existent or not implemented
098 - message not compatible with call state or
```

```
       message type non-existent or not implemented
 099 - information element/parameter not implemented
 100 - invalid parameter contents
 101 - message not compatible with call state
 102 - recovery on timer expiry
 103 - parameter non-existent or not implemented passed on
 110 - message with unrecognized parameter
 111 - protocol error unspecified
 127 - interworking unspecified

Field-05: di - diagnostics

 di={condition_coding,tni_coding,ccbs_ind,call_rejected_ind,
     cdpn_coding,fac_id_reject,attribute_ids,chan_type,
     incompat_param,timer_num,msg_type,param_name}

[NOTES – Subfields tni_codings and attribute_ids may occur multiple
times. When that occurs, the subfield encoding takes the form of:
... ,(val1,val2,val3), ... in the comma-delimited list within the
di= braces.

The value of the subfield may also be a tuple of values. In
that case, that one subfield takes the form of:
... ,({part1-1,part1-2,part1-3},{part2-1,part2-2,part2-3}), ...
Note that any collective set of related values, be it di={ } or the
set composing the subfield value {part1,part2,part3} are enclosed
with braces. In contrast, parentheses () are used to enclose multiple
instances of the same type of value. Combined example:
,di={val1,({x1,x2,x3},{y1,y2,y3}),,,,,,,,,,} with 2 instances of
value 2 named x and y, each composed of 3 sub-subfields.

The twelve subfields according to Q.850 may occur independently.
Their values are defined in detail in the grammar in Annex A.

When no diagnostics are included, the compact form uses only one
comma: ",di=" becomes "," -- NOT ",di={,,,,,,,,,,}" and
",{,,,,,,,,,,}".
Note that if any subfield is present, the braces and all
placeholder commas are required: ,{,,,,,,,val8,,,,}   ]
```

7.3.24 CCNR Possible Indicator (CCN)

```
Format: CCN,cpi=a

Fields:

Field-01: cpi - ccnr possible indicator
 a  definition
 -  ----------
 u - unknown
 n - CCNR not possible
 y - CCNR possible
```

7.3.25 Charged Party Identification (CPI)

```
Format: CPI,dat=1*(2Hex)

Fields:

Field-01: dat - charge information used in ITU-T Rec. Q.1218 or Q.1228
 1*(2h)   description
 ------   -----------
```

```
 1*(2h) - one or more pairs of characters (0-9, A-F) representing a
          hexadecimal encoding (see clause 5.1).
          (If unknown, parameter is omitted.)
```

7.3.26 Circuit Identification (Call Instance) Code (CIC)

```
Format: CIC,cic=ddddddddd

Field-01: cic - circuit identification code
 ddddddddd   description
 ----------   -----------
 0000000000 - unknown
-4294967295   ten-digit positive integer
```

7.3.27 Closed User Group Interlock Code (GIC)

```
Format: GIC,ni=hhhh,bc=hhhh

Field-01 : ni - network identity
 hhhh   description
 ----   -----------
 0000 - unknown
-FFFF   positive integer of 0-9, A-F

Field-02 : bc - binary code
 hhhh   description
 ----   -----------
 0000 - unknown
-FFFF   four digits of 0-9, A-F.
```

7.3.28 Coding Decoding Processing (CDP)

```
Format: CDP,toc=aaaa,comp=d

Fields:

Field-01: toc - type of compression
 aaaa   description
 ----   --------------
 ulaw - G.711 m-law
 alaw - G.711 A-law
 g726 - G.726 32 kbit/s ADPCM
 g728 - G.728 LD-CELP
 g729 - G.729 CS-ACELP

Field-02: comp - compression status indicator
 d   definition
 -   ----------
 0 - Decompressed
 1 - Compressed
```

7.3.29 Collect Call Request Indicator (COL)

```
Format: COL,cci=a

Fields:

Field-01: cci - collect Call Indicator
 a   description
 -   -----------
 0 - no indication
 y - collect call request
```

7.3.30 Conference Treatment Indicators (CNF)

```
Format: CNF,cai=a

Fields:

Field-01: cai - conference acceptance indicator
 a   definition
 -   ----------
 0 - no indication
 y - accept conference request
 n - reject conference request
```

7.3.31 Connected Number (CNN)

```
Format: CNN,noa=dd,npi=a,pi=a,si=a,#=1*h

Fields:

Field-01: noa - nature of address
 dd  description
 --  -----------
   See definition of "noa=" in clause 7.3.13,
   Call Transfer Number (CTN).

Field-02: npi - numbering plan indicator
 a   description
 -   -----------
 u - unknown
 1 - ISDN numbering plan (ITU-T Rec. E.164)
 2 - Data numbering plan (ITU-T Rec. X.121)
 3 - Telex numbering plan (ITU-T Rec. F.69)
 4 - Private numbering plan
 5 - national

Field-03: pi - presentation indicator
 a   description
 -   -----------
 u - unknown
 y - presentation allowed
 n - presentation restricted
 0 - address not available

Field-04: si - screening indicator
 a   description
 -   -----------
 u - unknown
 1 - user provided not screened
 2 - user provided screening passed
 3 - user provided screening failed
 4 - network provided

Field-05: # - address
 1*h   description
 ---   -----------
 1*h - one or more telephony digits: 0-9, A-F
       (see formal grammar)
```

7.3.32 Connection Request (CNR)

```
Format: CNR,loc=hhhhhh,pc=aaaaaaaaaaa,cls=ddd,cre=ddd

Fields:

Field-01: loc - local reference
 hhhhhh   description
 ------   -----------
 000000 - unknown
-FFFFFF   0-9, A-F

Field-02: pc - Point Code
 aaaaaaaaaaa  description
 -----------  -----------
 nnn.ccc.mmm - nine characters separated by two periods, where
               nnn is for network/zone (most significant 3 or 8 bits),
               ccc is for cluster/area (middle 8 bits),
               mmm is for member (least significant 3 or 8 bits).
               The nnn, ccc, and mmm are 3-digit numbers from 000 to 255
               representing the decimal equivalent of the subfield viewed
               as a binary number. [NOTE - ITU format is 3.8.3 bit.]

Field-03: cls - protocol class
 ddd   description
 ---   -----------
 000 - classes 0-255
-255

Field-04: cre - credit
 ddd   description
 ---   -----------
 000 - credit 0-255
-255
```

7.3.33 Continuity Indicators (CTI)

```
Format: CTI,cti=a

Fields:
Field-01: cti - continuity indicator
 a   description
 -   -----------
 u - unknown
 f - continuity check failed
 s - continuity check successful
```

7.3.34 Correlation Identity (COR)

```
Format: COR,dat=1*(2Hex)

Fields:
Field-01: dat - representation of the parameter contents
 1*(2h)   description
 ------   -----------
 1*(2h) - one or more pairs of characters (0-9, A-F) representing a
          hexadecimal encoding (see clause 5.1).
          (If unknown, parameter is omitted.)
```

7.3.35 Display Information (DIS)

```
Format: DIS,info=1*(2Hex)

Fields:

Field-01: info - display info
 1*(2h)   description
 ------   -----------
 1*(2h) - one or more pairs of characters (0-9, A-F) representing a
          hexadecimal encoding (see clause 5.1).
          (If unknown, parameter is omitted.)
```

7.3.36 Echo Control Information (ECI)

```
Format: ECI,oei=d,iei=d,oer=a,ier=a

Fields:

Field-01: oei - outgoing echo device control information indicator
 d   description
 -   -----------
 0 - no information
 1 - outgoing echo control device included
 2 - outgoing echo control device not included but available
 3 - outgoing echo control device not included and not available

Field-02: iei - incoming echo device control information indicator
 d   description
 -   -----------
 0 - no information
 1 - incoming echo control device included
 2 - incoming echo control device not included but available
 3 - incoming echo control device not included and not available

Field-03: oer - outgoing echo device control request indicator
 a   description
 -   -----------
 0 - no information
 a - outgoing echo control device activation request
 d - outgoing echo control device deactivation request

Field-04: ier - incoming echo device control request indicator
 a   description
 -   -----------
 0 - no information
 a - incoming echo control device activation request
 d - incoming echo control device deactivation request
```

7.3.37 Event Information Indicators (EVI)

```
Format: EVI,evi=a,evr=a

Fields:

Field-01: evi - event information indicator
 a   description
 -   -----------
 u - unknown
 a - Alerting
 p - Progress
 i - in-band information or pattern is now available
 1 - call forwarded on busy
 2 - call forwarded on no reply
```

```
 3 - call forwarded unconditional

Field-02: evr - event presentation restriction indicator
 a   description
 -   -----------
 0 - no indication
 y - presentation restricted
 n - not restricted
```

7.3.38 Facility Indicators (FAI)

```
Format: FAI,fai=a

Fields:

Field-01: fai - facility indicator
 a   definition
 -   ----------
 s - user-to-user service
```

7.3.39 Forward Call indicators (FCI)

```
Format:  FCI,int=a,e2ei=a,e2em=a,inter=a,iupi=a,pref=a,acc=a,
       sccpm=a <NOTE – continued on same line.>

Fields:

Field-01: int - international call indicator
 a   definition
 -   ----------
 u - unknown
 y - yes - call to be treated as an international call
 n - no - call to be treated as a national call

Field-02: e2ei - end-to-end information indicator
 a   definition
 -   ---------
 u - unknown
 y - end-to-end information available (ISUP)/reserved (BICC)
 n – no end-to-end information available

Field-03: e2em - end-to-end method indicator
 a   definition
 -   ----------
 u - unknown
 n - no end-to-end method available (only link-by-link method available)
 1 - pass-along method available (national use)(ISUP)/reserved (BICC)
 2 - SCCP method available (ISUP)/reserved (BICC)
 3 - pass-along and SCCP methods available(national use)(ISUP)/
     reserved (BICC)

Field-04: inter - interworking indicator
 a   definition
 -   ----------
 u - unknown
 y - interworking encountered
 n - no interworking encountered (Signalling System No. 7/BICC all the way)

Field-05: iupi - ISDN user part/BICC indicator
 a   definition
 -   ----------
 u - unknown
 y - ISDN user part/BICC used all the way
 n - ISDN user part/BICC not used all the way
```

```
Field-06: pref - ISDN user part/BICC preference indicator
 a   definition
 -   ----------
 u - unknown
 n - ISDN user part/BICC not required all the way
 1 - ISDN user part/BICC preferred all the way
 2 - ISDN user part/BICC required all the way

Field-07: acc - ISDN access indicator
 a   definition
 -   ----------
 u - unknown
 y - Originating access ISDN
 n - Originating Access not ISDN

Field-08: sccpm - SCCP method indicator
 a   definition
 -   ----------
 0 - no information
 1 - connectionless method available (national use)(ISUP)/reserved (BICC)
 2 - connection oriented method available (ISUP)/reserved (BICC)
 3 - connectionless and connection oriented methods available (national use)
     (ISUP)/reserved (BICC)

 NOTE 1 – For interworking the collect call indicator has
 been superseded by use of the parameter COL.

 NOTE 2 – Ported out of rate center and local service provider
 portability now moved to parameter NPF.
```

7.3.40 Forward Global Virtual Network Services (FVN)

```
Format: FVN,type=aaa,[Field Container]

This parameter can appear multiple times in one message indicating
different types of information.

Fields:

Field-01: type
 aaa   description
 ---   -----------
 osp - Originating Participating Service provider    Field container 1
 cug - GVNS User Group CUG                           Field container 2
 trn - Terminating Network Routing Number            Field container 3

Field container 1

 Format: osp=1*d
 Field-02: osp - originating participating service provider
   1*d   description
   ---   -----------
   1*d - 1 or more digits (0-9) representing the OSPP

Field container 2

 Format: cug=1*d
 Field-02: cug - GVNS User Group CUG
   1*d   description
   ---   -----------
   1*d - 1 or more digits (0-9) representing GVNS User Group CUG
```

```
Field container 3

 Format: noa=dd,npi=a,trn=1*d

 Field-02: noa - nature of address
   dd   description
   --   -----------
        See definition of "noa=" in clause 7.3.13,
        Call Transfer Number (CTN).

 Field-03: npi - numbering plan indicator
   a   description
   -   -----------
   u - unknown
   1 - ISDN numbering plan (ITU-T Rec. E.164)
   2 - Data numbering plan (ITU-T Rec. X.121)
   3 - Telex numbering plan (ITU-T Rec. F.69)
   4 - Private numbering plan
   5 - national

 Field-04: trn - terminating network routing number
   1*d   description
   ---   -----------
   1*d - 1 or more digits (0-9) representing GVNS User Group CUG
```

7.3.41 Generic Number/Address (GEA)

```
Format: GEA,type=aaaa,noa=dd,npi=a,cni=a,pi=a,si=a,#=1*h

Based on the value of type the following parameters will follow.

Fields:

Field-01: type - type of address (number qualifier indicator)
 aaaa   definition
 ----   ----------
 dest - destination number/additional called number
 diad - dialed number
 rsrv - reserved (used in 1993 Q.761)
 sufs - supplemental user provided calling address - failed network
        screening
 suns - supplemental user provided calling address - not screened
 trs1 - redirecting terminating number
 trs2 - additional connected number
 trs3 - additional calling party number
 trs4 - additional original called number
 trs5 - additional redirecting number
 trs6 - additional redirection number

Field-02: noa - nature of address
 dd  description
 --  -----------
     See definition of "noa=" in clause 7.3.13,
     Call Transfer Number (CTN).

Field-03: npi - numbering plan indicator
 a   description
 -   -----------
 u - unknown
 1 - ISDN numbering plan (ITU-T Rec. E.164)
 2 - Data numbering plan (ITU-T Rec. X.121)
 3 - Telex numbering plan (ITU-T Rec. F.69)
 4 - Private numbering plan
 5 - national
```

```
Field-04: cni - complete number indicator
 a   description
 -   -----------
 u - unknown
 y - number complete
 n - number incomplete

Field-05: pi - address presentation indicator
 a   description
 -   -----------
 u - unknown
 y - presentation allowed
 n - presentation restricted
 0 - address not available

Field-06: si - screening indicator
 a   description
 -   -----------
 u - unknown or not applicable
 1 - user provided not screened (verified)
 2 - user provided screening passed
 3 - user provided screening failed
 4 - network provided

Field-07: # - address
 1*h   description
 ---   -----------
 1*h - one or more telephony digits: 0-9, A-F
       (see formal grammar)
```

7.3.42 Generic Digits (GED)

```
Format: GED,tod=d,es=d,#=1*h

Fields:

Field-01: tod - type of digits
 d   definition
 -   ----------
 0 - account code
 1 - authorization code
 2 - private network traveling class mark
 5 - business communication group identity

Field-02: es - Encoding scheme
 d   description
 -   -----------
 0 - BCD even
 1 - BCD odd
 2 - IA5
 3 - binary

 NOTE – Because ISUP IA5 and binary digits may contain
 non-zero most significant bit, each ISUP character must be
 represented as 2 hexadecimal characters (0-9, A-F) in NSS.

Field-03: # - digits
 1*h   description
 ---   -----------
 1*h - one or more telephony digits: 0-9, A-F
       (see formal grammar)
```

7.3.43 Generic Notification Indicator (GNO)

```
Format: GNO,ni=dd

Fields:

Field-01: ni - notification indicator
 dd   description
 --   -----------
 00 - user suspended
 01 - user resumed
 02 - bearer service change
 03 - discriminator for extension to ASN.1 encoded component
 04 - call completion delay
 05 - conference call established
 06 - conference call disconnected
 07 - other party added
 08 - isolated
 09 - reattached
 10 - other party isolated
 11 - other party reattached
 12 - other party split
 13 - other party disconnected
 14 - conference floating
 15 - call is a waiting call
 16 - diversion activated
 17 - call transfer, alerting
 18 - call transfer, active
 19 - remote hold
 20 - remote retrieval
 21 - call is diverting
 99 - unknown
```

7.3.44 Global Call Identification (GCI)

```
The Global Call ID field is a system-wide unique identifier for a
Call. The Global Call ID may be passed in all NSS messages associated
with a given call to aid in correlation.

Format: GCI,gci=1*a

Fields:

Field-01: gci - global Call ID

1*a   definition
---   ----------
IA5 - IA5 printable characters. See Annex A for specific encoding
      details. See Appendix I for suggested implementation details.
```

7.3.45 Hard To Reach (HTR)

```
HTR,noa=dd,npi=d,#=1*h

Fields:

Field-01: noa - nature of address
 dd  description
 --  -----------
     See definition of "noa=" in clause 7.3.13,
     Call Transfer Number (CTN).
```

```
Field-02: npi - numbering plan indicator
 d   description
 -   -----------
 0 - unknown
 1 - ISDN numbering plan (ITU-T Rec. E.164)
 2 - Data numbering plan (ITU-T Rec. X.121)
 3 - Telex numbering plan (ITU-T Rec. F.69)
 4 - Private numbering plan
 5 - national

Field-03: # - digits
 1*h   description
 ---   -----------
 1*h - one or more telephony digits: 0-9, A-F
       (see formal grammar)
```

7.3.46 Hop Counter (HOC)

```
Format: HOC,hc=dd

Fields:

Field-01: hc - Hop Counter
 dd   definition
 --   ----------
 00 - zero
-31   positive integer 0-31
```

7.3.47 Information Indicators (INI)

```
Format: INI,inf=a,resp=a,sol=a

Fields:

Field-01: inf - information requested
 a   definition
 -   ----------
 1 - calling party number
 2 - hold provided indicator
 3 - calling party category
 4 - charge information
 5 - malicious call ID

Field-02: resp - information response
 a   definition
 -   ----------
 i - information included
 x - information not available
 n - information not included

Field-03: sol - solicited
 a   definition
 -   ----------
 u - unknown
 y - solicited information
 n - un-solicited information

[NOTE – This parameter can appear multiple times in an NSS message.]
```

7.3.48 Information Request Indicators (IRI)

```
Format: IRI,inf=a

Fields:

Field-01: inf - information requested
 a   definition
 -   ----------
 1 - calling party number
 2 - holding indicator
 3 - calling party category
 4 - charge information
 5 - malicious call ID

[NOTE – This parameter can appear multiple times in an NSS message.]
```

7.3.49 IN Service Compatibility (INC)

```
Format: INC,dat=1*(2Hex)

Fields:

Field-01: dat - IN Service Compatibility Indication parameter
                defined by ITU-T Rec. Q.1228
 1*(2h)   description
 ------   -----------
 1*(2h) - one or more pairs of characters (0-9, A-F) representing a
          hexadecimal encoding (see clause 5.1).
          (If unknown, parameter is omitted.)
```

7.3.50 Inter-nodal Traffic Group Identifier (ITG)

```
Format: ITG,dat=1*(2Hex)

Fields:

Field-01: dat - ASCII equivalent of binary value representing
                the traffic group for the call
 1*(2h)         description
 ------         -----------
 1*(2h) -       one or more pairs of characters (0-9, A-F) representing a
                hexadecimal encoding (see clause 5.1).
                (If unknown, parameter is omitted.)
```

7.3.51 Known Field Compatibility Information (FDC)

This field is used in order to allow network-specific values of known fields to be transmitted even though the actual field is populated with a best-fit mapping.

All parameters declared in this Recommendation have individual fields numbered. For any field which requires a value not declared in this Recommendation, the encoding application should map the value to a best-fit declared value in the actual field and include a known field compatibility parameter containing the actual value. This should be passed transparently through intermediate nodes which do not understand NSS. This parameter can appear multiple times.

```
Format: FDC,parm=aaa,fname=aaaaa,instr=a,dat=1*(2Hex)

Fields:

Field-01 : parm - parameter name
aaa   definition
---   ----------
aaa - 3 acsii characters as defined at the beginning of clause 7.2
      for NSS parameter names

Field-02 : fname - field name - refers to the field name declared
           against the parameter in this Recommendation
aaaaa      definition
-----      ----------
aaaaa -    five-character maximum lower-case alphabetic field name
           (See Appendix II grammar for nss_field_name.)

Field-03 : instr - instruction
a   definition
-   ----------
u - unknown
1 - release call if not understood, regardless of the ability to
    forward
2 - use the default value if not understood regardless of the
    ability to forward, no notification required, but continue call
3 - use the default value if not understood regardless of the
    ability to forward, send notification (in Confusion) but
    continue call
4 - Attempt to forward value; if unable to forward the value release
    the call
5 - Attempt to forward value; if unable to forward the value use
    default value without notification but continue the call
6 - Attempt to forward value; if unable to forward the value use
    default value and send notification but continue the call

Field-04: dat - hexadecimal representation of the field value
                contents
 1*(2h)   description
 ------   -----------
 1*(2h) - one or more pairs of characters (0-9, A-F) representing a
          hexadecimal encoding (see clause 5.1).
```

7.3.52 Location Number (LON)

```
Format: LON,noa=dd,inn=a,npi=a,pi=a,si=a,#=1*h

Fields:
Field-01: noa - nature of address
 dd    description
 --    -----------
     See definition of "noa=" in clause 7.3.13,
     Call Transfer Number (CTN).

Field-02: inn - Internal network number indicator
 a   description
 -   -----------
 u - unknown
 n - routing to internal network number not allowed
 y - routing to internal network number allowed
```

```
Field-03: npi - numbering plan indicator
 a   description
 -   -----------
 u - unknown
 1 - ISDN numbering plan (ITU-T Rec. E.164)
 2 - Data numbering plan (ITU-T Rec. X.121)
 3 - Telex numbering plan (ITU-T Rec. F.69)
 4 - Private numbering plan
 5 - national

Field-04: pi - presentation indicator
 a   description
 -   -----------
 u - unknown
 y - presentation allowed
 n - presentation restricted
 0 - address not available

Field-05: si - screening indicator
 a   description
 -   -----------
 u - unknown
 1 - user provided not screened
 2 - user provided screening passed
 3 - user provided screening failed
 4 - network provided

Field-06: # - address
 1*h   description
 ---   -----------
 1*h - one or more telephony digits: 0-9, A-F
       (see formal grammar)
```

7.3.53 Loop Prevention Indicator (LPI)

```
Format: LPI,req=d,lpi=a

Fields:

Field-01 : req - request indicator
 d   definition
 -   ----------
 0 - request
 1 - response

Field-02 : lpi - loop indicator
 a   definition
 -   ----------
 u - unknown (insufficient information)
 1 - no loop exists
 2 - loop detected (simultaneous transfer)
```

7.3.54 Mapped Parameter List (MPL)

```
Format: MPL,plist=(aaa,aaa,…)

Fields:

Field-01: plist - parameter list
aaa   description
---   -----------
aaa - Comma-separated list of one or more parameter codes bounded
      by parentheses, e.g., MPL,plist=(GEN,GED,OCN,RNI). Commas
      are used only when two or more parameter codes are present.
      Parentheses are always present. (See ABNF in Annex A.)
```

7.3.55 MCID Request Indicator (MRI)

```
Format: MRI,ri=a,hi=a

Fields:

Field-01 : ri - request indicator
 a   definition
 -   ----------
 u - unknown
 n - MCID not requested
 y - MCID requested

Field-02 : hi - holding indicator
 a   definition
 -   ----------
 u - unknown
 n - Holding not requested
 y - Holding requested
```

7.3.56 MCID Response Indicator (MCR)

```
Format: MCR,rp=a,hp=a

Fields:

Field-01 : rp - response indicator
 a   definition
 -   ----------
 u - unknown
 n - MCID not included
 y - MCID included

Field-02 : hp - hold provided indicator
 a   definition
 -   ----------
 u - unknown
 n - Holding not provided
 y - Holding provided
```

7.3.57 Message Compatibility Information (MCI)

```
This parameter is usually expected to be associated with a UNR
message. This parameter gives explicit information to the next node
on how to proceed when an unrecognized message is forwarded.

Format: MCI,instr=a,tri=d,dat=1*(2Hex)

Fields:

Field-01: instr - instruction
 a   definition
 -   ----------
 u - unknown
 1 - release Call regardless of the ability to forward the message
 2 - discard message regardless of the ability to forward the
     message, no notification required, but continue call
 3 - discard message regardless of the ability to forward the
     message, send notification (in Confusion) but continue call
 4 - Attempt to forward message; if unable to forward the message,
     release the call
 5 - Attempt to forward message; if unable to forward the message,
     discard message without notification but continue the call
 6 - Attempt to forward message; if unable to forward the message,
```

```
     discard the message send notification but continue the call

Field-02 : tri - transit at intermediate exchange indicator
 d   definition
 -   ----------
 0 - no transit (end node interpretation)
 1 - yes transit

Field-03: dat - encapsulation of unrecognized message
 1*(2h)   description
 ------   -----------
 1*(2h) - one or more pairs of characters (0-9, A-F) representing a
          hexadecimal encoding (see clause 5.1).
```

7.3.58 MLPP Precedence (MLP)

```
Format: MLP,lfb=a,pl=a,ni=hhhh,sd=hhhhhh

Fields:

Field-01: lfb - Look-ahead For Busy
 a   definition
 -   ----------
 u - unknown
 y - lfb allowed
 n - lfb not allowed
 r - path reserved (national use)

Field-02: pl - Precedence Level
 a   definition
 -   ----------
 u - unknown
 0 - flash override
 1 - flash
 2 - immediate
 3 - priority
 4 - routine

Field-03: ni - Network ID
 hhhh   definition
 ----   ----------
 0000 - unknown
-9999 - 4 hex digits 0-9

Field-04: sd - MLPP service domain
 hhhhhh   definition
 ------   ----------
 000000 - unknown
-FFFFFF - 6 hex digits 0-9 or A-F
```

7.3.59 Nature Of Connection Indicator (NOC)

```
Format: NOC,sat=d,eco=a,cot=d

Fields:

Field-01: sat - satellite indicator
 d   definition
 -   ----------
 u - unknown
 0 - no satellite in connection
 1 - one satellite in connection
 2 - two satellites in connection
```

```
Field-02: eco - echo control device indicator
 a   definition
 -   ----------
 u - unknown
 n - echo device not included
 y - echo device included

Field-03: cot - continuity indicator
 d   definition
 -   ----------
 0 - not applicable
 1 - continuity check not required/no COT to be expected (BICC)
 2 - continuity check required on this circuit (NOTE – COT may
     not be applicable across a packet-based network. If not
     applicable, then this value must not be used.)
 3 - continuity check performed on a previous circuit/
     COT to be expected (BICC)
```

7.3.60 Network Management Controls (NMC)

```
Format: NMC,tari=a

Fields:

Field-01 : tari - temporary alternative routing indicator
 a   definition
 -   ----------
 0 - no indication
 y - TAR controlled call
```

7.3.61 Network Routing Number (NRN)

```
Format: NRN,npi=a,noa=d,#=1*h

Fields:

Field-01: npi - numbering plan indicator
 a   description
 -   -----------
 u - unknown
 1 - ISDN numbering plan (ITU-T Rec. E.164)

Field-02: noa - nature of address
 d   description
 -   -----------
 0 - unknown
 1 - network routing number in national (significant) number format
 2 - network routing number in network specific number format

Field-03: # - address
 1*h  description
 ---  -----------
 1*h - one or more telephony digits: 0-9, A-F
       (see formal grammar)
```

7.3.62 Network Specific Facilities (NSF)

```
Format: NSF,ton=a,nip=a,nid=1*(2Hex),nsf=1*(2Hex)

Fields:

Field-01: ton - type of network identification
 a   description
 -   -----------
 u - unknown
 c - ITU/CCITT (international network)
 n - national

Field-02: nip - network identification plan
 a  description
 -  -----------
 a - one IA5 character of 0-9, A-F, meaning determined by ton

Field-03: nid - network identification
 1*(2h)   description
 ------   -----------
 1*(2h) - one or more pairs of characters (0-9, A-F) representing a
          hexadecimal encoding (see clause 5.1).

Field-04: nsf - network-specific facility indicator
 1*(2h)   description
 ------   -----------
 1*(2h) - one or more pairs of characters (0-9, A-F) representing a
          hexadecimal encoding (see clause 5.1).
```

7.3.63 Number Portability Forward Information (NPF)

```
Format: NPF,nps=a

Fields:

Field-01: nps - number portability status indicator
 a   definition
 -   ----------
 0 - no indication
 1 - number portability query not done for called number
 2 - number portability query done, non-ported called subscriber
 3 - number portability query done, ported called subscriber
```

7.3.64 Optional Backward Call Indicators (OBI)

```
Format: OBI,inb=a,cf=a,mlpp=a

Fields:

Field-01: inb - inband information Indicator
 a   definition
 -   ----------
 0 - no indication
 y - in-band information or an appropriate pattern is now available
 n - in-band information or an appropriate pattern is not available

Field-02: cf - call forwarding (diversion) may occur indicator
 a   definition
 -   ----------
 0 - no indication
 y - call forwarding (diversion) may occur
 n - call forwarding (diversion) may not occur
```

```
Field-03: mlpp - mlpp user Indicator
 a   definition
 -   ----------
 0 - no indication
 y - MLPP user
 n - not an MLPP user

NOTE – Segmentation is indicated by presence of SEG parameter.
For user-network interaction - see UID Indicators parameter - UID
```

7.3.65 Optional Forward Call Indicators (OFI)

```
Format: OFI,cug=a,cnn=a

Fields:

Field-01: cug - closed user group call indicator
 a   definition
 -   ----------
 u - unknown
 n - non-cug call
 1 - closed user group call, outgoing access allowed
 2 - closed user group call, outgoing access not allowed

Field-02: cnn - connected line identity request Indicator
 a   definition
 -   ----------
 u - unknown
 y - connected line identity requested
 n - connected line identity not requested

NOTE – Segmentation is indicated by presence of SEG parameter.
```

7.3.66 Original Called IN Number (OCI)

```
Format: OCI,noa=dd,npi=a,pi=a,si=a,#=1*h

Fields:

Field-01: noa - nature of address
 dd  description
 --  -----------
     See definition of "noa=" in clause 7.3.13,
     Call Transfer Number (CTN).

Field-02: npi - numbering plan indicator
 a   description
 -   -----------
 u - unknown
 1 - ISDN numbering plan (ITU-T Rec. E.164)
 2 - Data numbering plan (ITU-T Rec. X.121)
 3 - Telex numbering plan (ITU-T Rec. F.69)
 4 - Private numbering plan
 5 - national

Field-03: pi - presentation indicator
 a   description
 -   -----------
 u - unknown
 y - presentation allowed
 n - presentation restricted
 0 - address not available
```

```
Field-04: si - screening indicator
 a   description
 -   -----------
 u - unknown
 1 - user provided not screened
 2 - user provided screening passed
 3 - user provided screening failed
 4 - network provided

Field-05: # - address
 1*h   description
 ---   -----------
 1*h - one or more telephony digits: 0-9, A-F
       (see formal grammar)
```

7.3.67 Original Called Number (OCN)

```
Format: OCN,noa=dd,npi=a,pi=a,#=1*h

[Fields are the same as in OCI directly above, omitting si field.]
```

7.3.68 Originating ISC Point Code (ISC)

```
Format: ISC,pc=aaaaaaaaaaa

Fields:

Field-01: pc - Point Code
 aaaaaaaaaaa   description
 -----------   -----------
 nnn.ccc.mmm - nine characters separated by two periods, where
               nnn is for network/zone (most significant 3 or 8 bits),
               ccc is for cluster/area (middle 8 bits),
               mmm is for member (least significant 3 or 8 bits).
               The nnn, ccc, and mmm are 3-digit numbers from 000 to 255
               representing the decimal equivalent of the subfield viewed
               as a binary number. [NOTE – ITU format is 3.8.3 bit.]
```

7.3.69 Parameter Compatibility Information(PCI)

```
This parameter is used to transmit any unknown parameter across the
network. This parameter includes instructions for the end node on
how to proceed in the event of not being able to interpret the
parameter.

Format: PCI,instr=a,tri=d,dat=1*(2Hex)

Fields:

Field-01: instr - instruction
 a  definition
 -  ----------
 u - unknown
 0 - Release call regardless of the ability to forward the
     parameter
 1 - Discard message regardless of the ability to forward the
     parameter, no notification required, but continue call
 2 - Discard message regardless of the ability to forward the
     parameter, send notification (in Confusion), but continue call
 3 - Discard parameter regardless of the ability to forward the
     parameter, no notification required, but continue call
 4 - Discard parameter regardless of the ability to forward the
     parameter, send notification (in Confusion) but continue call
 5 - Attempt to forward the parameter; if unable to forward the
```

```
     parameter release the call
 6 - Attempt to forward the parameter; if unable to forward the
     parameter discard message without notification but continue
     the call
 7 - Attempt to forward the parameter; if unable to forward the
     parameter, discard message, send notification but continue the
     call
 8 - Attempt to forward the parameter; if unable to forward the
     parameter, discard the parameter; without notification but
     continue the call
 9 - Attempt to forward the parameter; if unable to forward the
     parameter discard the parameter; send notification but
     continue the call

Field-02 : tri - transit at intermediate exchange indicator
 d   definition
 -   ----------
 0 - no transit (end node interpretation)
 1 - yes transit (transit node interpretation)

Field-03: dat - representation of the parameter contents
 1*(2h)   description
 ------   -----------
 1*(2h) - one or more pairs of characters (0-9, A-F) representing a
          hexadecimal encoding (see clause 5.1) of the parameter.
```

7.3.70 Pivot Capability (PCA)

```
Format: PCA,ppi=a,iwri=a

Fields:

Field-01: ppi - pivot possible indicator
 a   definition
 -   ----------
 0 - no indication
 1 - pivot routing possible before ACM
 2 - pivot routing possible before ANM
 3 - pivot routing possible at any time during call

Field-02: iwri - interworking to redirection indicator
 a   definition
 -   ----------
 u - unknown
 y - allowed
 n - not allowed
```

7.3.71 Pivot Counter (PCT)

```
Format: PCT,pct=dd

Fields:

Field-01: pct - pivot counter
 dd   definition
 --   ----------
 00 - unknown or zero
-31   positive integer 0-31
```

7.3.72 Pivot Routing Backward Information (PBI)

```
Format: PBI,tag=a,[Field Container]

Fields:

Field-01: tag - information type tag
 a   description
 -   -----------
 u - unknown
 1 - return to invoking exchange information       field container 1
 2 - return to invoking exchange call identifier   field container 2
 3 - invoking pivot reason                         field container 3

Field containers:

 Field container 1

 Format: dur=d

 Field-01: dur - duration
   ddddd   description
   -----   -----------
   00000 - number of seconds
  -65535

 Field container 2

  Format: cid=hhhhhh,pc=aaaaaaaaaaa

  Fields:

  Field-01: cid - call identity
  hhhhhh  description
  ------  -----------
  00-ff - six characters representing hexadecimal values

  Field-02: pc - point code
  aaaaaaaaaaa   description
  -----------   -----------
  nnn.ccc.mmm - nine characters separated by two periods, where
                nnn is for network/zone (most significant 3 or 8 bits),
                ccc is for cluster/area (middle 8 bits),
                mmm is for member (least significant 3 or 8 bits).
                The nnn, ccc, and mmm are 3-digit numbers from 000 to 255
                representing the decimal equivalent of the subfield viewed
                as a binary number. [NOTE – ITU format is 3.8.3 bit.]

 Field container 3

 Format: rea=ddd

 Field-01: rea - pivot reason
   ddd   description
   ---   -----------
   000 – unknown/not available
   001 - service provider portability
   002 - location portability
   003 - service portability
```

7.3.73 Pivot Routing Forward Information (PFI)

```
Format: PFI,tag=a,[Field Container]

Fields:

Field-01: tag - information type tag
 a   description
 -   -----------
 u - unknown
 1 - return to invoking exchange possible
 2 - return to invoking exchange call identifier   field container 1
 3 - performing pivot indicator                    field container 2
 4 - invoking pivot reason                         field container 3

Field containers:

Field container 1

 Format: cid=hhhhhh,pc=aaaaaaaaaaa

  Fields:

  Field-01: cid - Call identity
  hhhhhh  description
  ------  -----------
  00-ff - six characters representing hexadecimal values

  Field-02: pc - Point Code
  aaaaaaaaaaa   description
  -----------   -----------
  nnn.ccc.mmm - nine characters separated by two periods, where
                nnn is for network/zone (most significant 3 or 8 bits),
                ccc is for cluster/area (middle 8 bits),
                mmm is for member (least significant 3 or 8 bits).
                The nnn, ccc, and mmm are 3-digit numbers from 000 to 255
                representing the decimal equivalent of the subfield viewed
                as a binary number. [NOTE – ITU format is 3.8.3 bit.]

Field container 2

  Format: ppr=ddd,ppi=a

  Field-01: ppr - performing pivot reason
   ddd   description
   ---   -----------
   000 - unknown/not available
   001 - service provider portability
   002 - location portability
   003 - service portability

  Field-02: ppi - pivot possible indicator
   a   definition
   -   ----------
   0 - no indication
   1 - pivot routing possible before ACM
   2 - pivot routing possible before ANM
   3 - pivot possible at any time during call

Field container 3

   Format: rea=ddd
```

```
   Field-01: rea - pivot reason
    ddd   description
    ---   -----------
    000 - unknown/not available
    001 - service provider portability
    002 - location portability
    003 - service portability
```

7.3.74 Pivot Routing Indicator (PVR)

```
Format: PVR,pvr=a

Fields:

Field-01: pvr - pivot routing indicator
 a   definition
 -   ----------
 0 - no indication
 1 - pivot request
 2 - cancel pivot request
 3 - pivot request failure
 4 - interworking to redirection prohibited
```

7.3.75 Pivot Status (PVS)

```
Format: PVS,psi=a

Fields:

Field-01: psi - pivot status indicator
 a   definition
 -   ----------
 0 - no indication
 1 - acknowledgement of pivot routing
 2 - pivot routing will not be invoked
```

7.3.76 Propagation Delay Counter (PDC)

```
Format: PDC,pd=ddddd

Fields:

Field1 : pd - propagation delay

 ddddd   definition
 -----   ----------
 00000 - delay in milliseconds
-65535
```

7.3.77 Protocol Name (PRN)

```
This parameter shall be populated by the node that first
constructs the NSS encoding. This parameter shall appear in the
first forward and first backward messages as a minimum.

Format: PRN,prot=aaaaa

Fields:
Field-01: prot - Protocol base derivative
 aaaaa - 5 char String indicating base variant derivative
 -----   ------------------------------------------------
 uknow - unknown
 q761* - ITU-T Recs Q.761-Q.764
 q1902 - ITU-T Rec. Q.1902.3
```

7.3.78 Query On Release Capability (QOR)

```
Format: QOR,qci=a

Fields:

Field-01: qci - query on release capability indicator
 a   definition
 -   ----------
 0 - no indication
 y - QOR support
```

7.3.79 Redirect Backward Information (RBI)

```
Format: RBI,tag=a,[Field Container]

Fields:

Field-01: tag - information type tag
 a   description
 -   -----------
 u - unknown
 1 - return to invoking exchange information       field container 1
 2 - return to invoking exchange call identifier   field container 2
 3 - invoking redirect reason                      field container 3

Field containers:

 Field container 1

 Format: dur=d

 Field-01: dur - duration
   ddddd   description
   -----   -----------
   00000 - unknown
  -65535   number of seconds

 Field container 2

  Format: cid=hhhhhh,pc=aaaaaaaaaaa

  Fields:

  Field-01: cid - call identity
  hhhhhh   description
  ------   -----------
  000000 - six characters representing hexadecimal values
 -FFFFFF

  Field-02: pc - point code
  aaaaaaaaaaa   description
  -----------   -----------
  nnn.ccc.mmm - nine characters separated by two periods, where
                nnn is for network/zone (most significant 3 or 8 bits),
                ccc is for cluster/area (middle 8 bits),
                mmm is for member (least significant 3 or 8 bits).
                The nnn, ccc, and mmm are 3-digit numbers from 000 to 255
                representing the decimal equivalent of the subfield viewed
                as a binary number. [NOTE – ITU format is 3.8.3 bit.]
```

```
Field container 3

Format: rea=ddd

Field-01: rea - redirect reason
  ddd   description
  ---   -----------
  000 - unknown/not available
  001 - service provider portability
  002 - location portability
  003 - service portability
```

7.3.80 Redirect Capability (RDC)

```
Format: RDC,rc=a

Fields:

Field-01: rc - redirect capability
 a   definition
 -   ----------
 0 - no indication
 1 - redirection possible before ACM
 2 - redirection possible before ANM
 3 - redirection possible at any time during the call
```

7.3.81 Redirect Counter (RCT)

```
Format: RCT,rc=dd

Fields:

Field-01: rc - redirect counter
 dd   definition
 --   ----------
 00 - zero redirections known to application (unknown)
-31 - 1-31 positive integer indicating number of redirections
```

7.3.82 Redirect Forward Information (RFI)

```
Format: RFI,tag=a,[Field Container]

Fields:

Field-01: tag - information type tag
 a   description
 -   -----------
 u - unknown
 1 - return to invoking exchange possible
 2 - return to invoking exchange call identifier   field container 1
 3 - perform redirect indicator                    field container 2
 4 - invoking redirect reason                      field container 3

Field containers:

 Field container 1

 Format: cid=hhhhhh,pc=aaaaaaaaaaa

  Fields:

  Field-01: cid - call identity
  hhhhhh  description
  ------  -----------
  00-ff - six characters representing hexadecimal values
```

```
 Field-02: pc - point code
 aaaaaaaaaaa  description
 -----------  -----------
 nnn.ccc.mmm - nine characters separated by two periods, where
               nnn is for network/zone (most significant 3 or 8 bits),
               ccc is for cluster/area (middle 8 bits),
               mmm is for member (least significant 3 or 8 bits).
               The nnn, ccc, and mmm are 3-digit numbers from 000 to 255
               representing the decimal equivalent of the subfield viewed
               as a binary number. [NOTE – ITU format is 3.8.3 bit.]

Field container 2

 Format: prr=ddd,rpi=d

 Field-01: prr - performing redirect reason
  ddd   description
  ---   -----------
  000 - unknown/not available
  001 - service provider portability
  002 - location portability
  003 - service portability

 Field-02: rpi - redirect possible indicator
  a   definition
  -   ----------
  0 - no indication
  1 - redirection possible before ACM
  2 - redirection possible before ANM
  3 - redirection possible at any time during call

Field container 3

  Format: rea=ddd

  Field-01: rea - redirect reason
   ddd   description
   ---   -----------
   000 - unknown/not available
   001 - service provider portability
   002 - location portability
   003 - service portability
```

7.3.83 Redirect Status (RDS)

```
Format: RDS,rpi=a

Fields:

Field-01: rpi - redirect possible indicator
 a   definition
 -   ----------
 0 - no indication
 1 - acknowledgement of redirection
 2 - redirection will not be invoked
```

7.3.84 Redirecting Number (RGN)

```
Format: RGN,noa=dd,npi=a,pi=a,#=1*h

Fields:

Field-01: noa - nature of address
 dd   description
 --   -----------
      See definition of "noa=" in clause 7.3.13,
      Call Transfer Number (CTN).

Field-02: npi - numbering plan indicator
 a   description
 -   -----------
 u - unknown
 1 - ISDN numbering plan (ITU-T Rec. E.164)
 2 - Data numbering plan (ITU-T Rec. X.121)
 3 - Telex numbering plan (ITU-T Rec. F.69)
 4 - Private numbering plan
 5 - national

Field-03: pi - presentation indicator
 a   description
 -   -----------
 u - unknown
 y - presentation allowed
 n - presentation restricted
 0 - address not available

Field-04: # - address
 1*h   description
 ---   -----------
 1*h - one or more telephony digits: 0-9, A-F
       (see formal grammar)
```

7.3.85 Redirection Information (RNI)

```
Format: RNI,ri=d,orr=a,rc=dd,rr=a

Fields:

Field-01: ri - Redirecting Indicator
 d   definition
 -   ----------
 0 - no redirection
 1 - call rerouted
 2 - call rerouted, all redirection info presentation restricted
 3 - call diverted
 4 - call diverted, all redirection information presentation
     restricted
 5 - call rerouted, redirection number presentation restricted
 6 - call diversion, redirection number presentation restricted

Field-02: orr - original redirection Reason
 a   definition
 -   ----------
 u - unknown/not available
 1 - user busy
 2 - no reply
 3 - unconditional
 4 - deflection during alerting
 5 - deflection immediate response
 6 - mobile subscriber not reachable
```

```
Field-03: rc - redirection counter
 dd   definition
 --   ----------
 00 - zero redirections known to application (unknown)
-31 - 1-31 positive integer indicating number of redirections

Field-04: rr - redirection reason
 a   definition
 -   ----------
 u - unknown/not available
 1 - user busy
 2 - no reply
 3 - unconditional
 4 - deflection during alerting
 5 - deflection immediate response
 6 - mobile subscriber not reachable
```

7.3.86 Redirection Number (RNN)

```
Format: RNN,noa=dd,inn=a,npi=a,#=1*h

Fields: (redirected-to number)

Field-01: noa - nature of address
 dd   description
 --   -----------
      See definition of "noa=" in clause 7.3.13,
      Call Transfer Number (CTN).

Field-02: inn - Internal network number indicator
 a   description
 -   -----------
 u - unknown
 n - routing to internal network number not allowed
 y - routing to internal network number allowed

Field-03: npi - numbering plan indicator
 a   description
 -   -----------
 u - unknown
 1 - ISDN numbering plan (ITU-T Rec. E.164)
 2 - Data numbering plan (ITU-T Rec. X.121)
 3 - Telex numbering plan (ITU-T Rec. F.69)
 4 - Private numbering plan
 5 - national

Field-04: # - address
 1*h   description
 ---   -----------
 1*h - one or more telephony digits: 0-9, A-F
       (see formal grammar)
```

7.3.87 Redirection Number Restriction (RNR)

```
Format: RNR,rnr=a

Fields:

Field-01: rnr - redirection number restriction
 a   definition
 -   ----------
 u - unknown
 y - presentation allowed
 n - presentation restricted
```

7.3.88 Remote Operations (RMO)

```
Format: RMO,pp=a,dat=1*(2Hex)

Fields:

Field-01: pp - protocol profile
 a   description
 -   -----------
 u - unknown
 1 - remote operations protocol

Field-02: dat - representation of the parameter contents
 1*(2h)   description
 ------   -----------
 1*(2h) - one or more pairs of characters (0-9, A-F) representing a
          hexadecimal encoding (see clause 5.1) of the parameter.
          [Follows Q.700 description method based on X.690 encoding
          rules or uses X.680 ASN.1 encoding of this parameter.
          Components are based on ROSE ITU-T Rec. X.880.
          See 6.90/Q.1902.3, for more details.
          This element is viewed as a tunneled opaque object.]
```

7.3.89 SCF ID (SCF)

```
Format: SCF,scf=1*(2Hex)

Fields:

Field-01: scf - SCF id
 1*(2h)   description
 ------   -----------
 1*(2h) - one or more pairs of characters (0-9, A-F) representing a
          hexadecimal encoding (see clause 5.1) of the parameter.
```

7.3.90 Segmentation indicator (SEG)

```
This parameter indicates that more information related to this message will
follow in a subsequent SGM message. The SEG parameter is not tied to a maximum
or minimum message length. SEG in a NSS body part can only be used to indicate
segmentation of the messages used in a NSS body part.

Format: SEG,

Fields: No fields
```

7.3.91 Service Activation (SEA)

```
Format: SEA,fci=dd

Fields:

Field-01: fci - feature code indicator (omit parameter if unknown)
 dd   description
 --   -----------
 20 - call transfer
```

7.3.92 Signalling Point Code (SPC)

```
Format: SPC,pc=aaaaaaaaaaa

Fields:

Field-01: pc - point code
 aaaaaaaaaaa   description
 -----------   -----------
 nnn.ccc.mmm - nine characters separated by two periods, where
               nnn is for network/zone (most significant 3 or 8 bits),
               ccc is for cluster/area (middle 8 bits),
               mmm is for member (least significant 3 or 8 bits).
               The nnn, ccc, and mmm are 3-digit numbers from 000 to 255
               representing the decimal equivalent of the subfield viewed
               as a binary number. [NOTE – ITU format is 3.8.3 bit.]
```

7.3.93 Source Parameter Information (SPI)

```
Format: SPI,mparm=aaa,sparm=hhh

Fields:

Field-01: mparm - mapped-to parameter
aaa   description
---   -----------
aaa - Three-letter NSS parameter name, e.g., DIS for Display.

Field-02: sparm - source parameter
hhh   description
---   -----------------
0-9 - Three ASCII characters representing hex digits that
A-F   identify the Source Parameter ID. For example, 07E
      means User-to-User IE was 1 of N possible source
      parameters. PRN provides context for this value.
```

7.3.94 Subsequent Number (SUN)

```
Format: SUN,#=1*h

Fields:

Field-01: # - address
 1*h   description
 ---   -----------
 1*h - one or more telephony digits: 0-9, A-F
       (see formal grammar)
```

7.3.95 Suspend/Resume Indicators (SRI)

```
Format: SRI,sri=a

Fields:

Field-01: sri - suspend/resume indicator
 a   definition
 -   ----------
 u - unknown
 s - ISDN subscriber initiated
 n - network initiated
```

7.3.96 Transaction Identifier (TID)

```
This parameter is used as a unique identifier for a message. It is
the responsibility of the first NSS entry point from the PSTN
(typically an access server) to construct this parameter and for all
intermediate nodes to pass this on transparently or construct one if
not present. Once created, TID must not be modified by subsequent
nodes. This is used for message event correlation across switching
nodes but does not require call state history to be maintained to
generate this parameter. The distinction between TID and GCI is
that TID typically involves tracing the message only, whereas the
GCI may span multiple messages and multiple call legs.

Format: TID,tid=1*a

Fields:

Field-01: tid - global call ID

1*a   definition
---   ----------
IA5 - IA5 printable characters. See Annex A for specific encoding
      details. See Appendix I for suggested implementation details.
```

7.3.97 Transit Network Selection (TNS)

```
Format: TNS,ton=a,nip=a,tns=1*a

Fields:

Field-01: ton - type of network
 a   definition
 -   ----------
 u - unknown
 c - ITU/CCITT
 n - national

Field-02: nip - network identification plan
 a   definition
 -   ----------
 u - unknown
 1 - public data network identification code
     (DNIC - ITU-T Rec. X.121)
 2 - public land mobile network identification code
     (MNIC - ITU-T Rec. E.212)

  [NOTE – Need to use FDC to carry nip= for national plans.]

Field-03: tns - network identification
 1*a   definition
 ---   ----------
 IA5 - characters of 0-9, A-F of length defined by ton and nip
```

7.3.98 Transmission Medium Required (TMR)

```
Format: TMR,tmr=dd

Fields:

Field-01: tmr - transmission medium required
                (omit parameter if unknown)
 dd   definition
 --   ----------
```

```
00 - speech
01 - 3.1 kHz audio
02 - 7 kbit/s audio/video
03 - 64 kbit/s preferred
04 - 1 x 64 kbit/s unrestricted
05 - 2 x 64 kbit/s unrestricted
06 - 3 x 64 kbit/s unrestricted
07 - 4 x 64 kbit/s unrestricted
08 - 5 x 64 kbit/s unrestricted
09 - 6 x 64 kbit/s unrestricted (384 kbit/s)
10 - 7 x 64 kbit/s unrestricted
11 - 8 x 64 kbit/s unrestricted
12 - 9 x 64 kbit/s unrestricted
13 - 10 x 64 kbit/s unrestricted
14 - 11 x 64 kbit/s unrestricted
15 - 12 x 64 kbit/s unrestricted
16 - 13 x 64 kbit/s unrestricted
17 - 14 x 64 kbit/s unrestricted
18 - 15 x 64 kbit/s unrestricted
19 - 16 x 64 kbit/s unrestricted
20 - 17 x 64 kbit/s unrestricted
21 - 18 x 64 kbit/s unrestricted
22 - 19 x 64 kbit/s unrestricted
23 - 20 x 64 kbit/s unrestricted
24 - 21 x 64 kbit/s unrestricted
25 - 22 x 64 kbit/s unrestricted
26 - 23 x 64 kbit/s unrestricted
27 - 24 x 64 kbit/s unrestricted (1536 kbit/s)
28 - 25 x 64 kbit/s unrestricted
29 - 26 x 64 kbit/s unrestricted
30 - 27 x 64 kbit/s unrestricted
31 - 28 x 64 kbit/s unrestricted
32 - 29 x 64 kbit/s unrestricted
33 - 30 x 64 kbit/s unrestricted (1920 kbit/s)
```

7.3.99 Transmission Medium Required Prime (TMP)

```
Format: TMP,tmr=dd

Fields:

Field-01: tmr - transmission medium required
                (omit parameter if unknown)
 dd  definition
 --  ----------
     See definition of tmr field in TMR parameter above.
```

7.3.100 Transmission Medium Used (TMU)

```
Format: TMU,tmr=dd

Fields:

Field-01: tmr - transmission medium required
                (omit parameter if unknown)
 dd  definition
 --  ----------
     See definition of tmr field in TMR parameter above.
```

7.3.101 UID Action Indicators (UID)

```
Format: UID,tc=a,t9=a

Fields:

Field-01: tc - through connection instruction indicator
 a   definition
 -   ----------
 0 - no indication
 y - through connect in both directions

Field-02: t9 - T9 timer instruction
 a   definition
 -   ----------
 0 - no indication
 y - stop or do not start T9 timer
```

7.3.102 UID Capability Indicators (UCI)

```
Format: UCI,tc=a,t9=a

Fields:

Field-01: tc - through connection indicator
 a  definition
 -  ----------
 0 – no indication
 y - through connection modification possible
 n - through connection modification not possible

Field-02: t9 - T9 timer instruction
 a   definition
 -   ----------
 0 - no indication
 y - stopping of T9 timer possible
 n - stopping of T9 timer not possible
```

7.3.103 Unknown Field Compatibility Information (UFC)

```
This field is used in order to allow network-specific fields not
declared in this Recommendation to be transmitted even though the
actual field does not exist in the Recommendation. The parameter
includes the parameter name in which the field appears, and a free
format description and value area. This will only be able to be
interpreted by the end point if the protocol name and potentially
protocol version match there is a high probability that the
unrecognized values will be understood.

This parameter can appear multiple times.

Format: UFC,parm=aaa,instr=d,fname=aaaaa,dat=1*(2Hex)

Fields:

Field-01: parm - parameter name where field is to be found
aaa   definition
---   ----------
aaa - 3 ASCII characters of a-z denoting NSS parameter name

Field-02: instr - instruction on how to proceed
d   definition
-   ----------
1 - release call if not understood, regardless of the ability to
```

```
    forward
2 - use the default value if not understood, regardless of the
    ability to forward, no notification required, but continue call
3 - use the default value if not understood regardless of the
    ability to forward, send notification (in Confusion) but
    continue call
4 - Attempt to forward value; if unable to forward the value
    release the call
5 - Attempt to forward value; if unable to forward the value use
    default value without notification but continue the call
6 - Attempt to forward value; if unable to forward the value use
    default value and send notification but continue the call

Field-03: fname - field name
aaaaa   definition
-----   ----------
aaaaa - 5 ASCII characters that describe the field
        (See Appendix II grammar for nss_field_name)

Field-04: dat - Value of field
 1*(2h)   description
 ------   -----------
 1*(2h) - one or more pairs of characters (0-9, A-F) representing a
          hexadecimal encoding (see clause 5.1) of the field value.
```

7.3.104 User Service Information (USI)

```
Format: USI,type=aaaa,[field container]

Based on the value of "type", one of the following field containers
will follow. This parameter can appear multiple times, indicating
different types of information with the same message.

Fields:

Field-01: type - type of User Service information
 aaaa   definition
 ----   ----------
 rate - bearer rate information              field container 1
 sup1 - supplementary information 1          field container 2
 symm - symmetry supplementary information   field container 3
 mult - rate multiplier                      field container 4
 lay1 - layer 1  supplementary information   field container 5
 subr - subrate  supplementary information   field container 6
 v110 - v110     supplementary information   field container 7
 v120 - v120     supplementary information   field container 8
 pari - parity   supplementary information   field container 9
 modm - modem    supplementary information   field container 10
 lay2 - layer 2  supplementary information   field container 11
 lay3 - layer 3  supplementary information   field container 12

Field Containers:

Field Container 1 (type=rate)

 Format: cs=a,cap=a,mode=a,rate=d

 Fields:

 Field-02: cs - coding standard
   a   definition
   -   ----------
   u - unknown
   c - ITU-T standardized coding
```

```
    i - ISO/IEC standard
    n - national standard
    p - standard defined for the network either public or private

  Field-03: cap - Information transfer capability
    a   definition
    -   ----------
    u - unknown
    s - speech
    d - unrestricted digital information
    r - restricted digital information
    3 - 3.1 kbit/s audio
    7 - 7 kbit/s audio
    v - video

  Field-04: mode - transfer mode
    a   definition
    -   ----------
    u - unknown
    c - circuit mode
    p - packet mode

  Field-05: rate - Information transfer rate
    d   definition
    -   ----------
    0 - not applicable (used for packet calls)
    1 - 64 kbit/s
    2 - 384 kbit/s
    3 - 1472 kbit/s
    4 - 1536 kbit/s
    5 - 1920 kbit/s
    6 - multirate (64 kbit/s base rate)
    7 - 2 x 64 kbit/s

 Field Container 2 (type = sup1)

  Format: str=d,estab=d,conf=d

  Field-02: str - structure

    d   definition
    -   ----------
    0 - default or unknown
    1 - 8 kHz integrity
    2 - service data unit integrity
    3 - unstructured

  Field-03: estab - establishment
    d   definition
    -   ----------
    u - unknown
    d - demand

  Field-04: conf - configuration
    d   definition
    -   ----------
    u - unknown
    p - point-to-point

 Field Container 3 (type = symm)

  Format: sym=aa,rate=d

  Field-02: sym - symmetry
    aa   definition
```

```
   --   ----------
   uu - unknown
   sb - symmetric bidirectional

 Field-03: rate - information transfer rate in the backwards
                  direction
   d   definition
   -   ----------
   0 - not applicable (used for packet calls)
   1 - 64 kbit/s
   2 - 384 kbit/s
   3 - 1472 kbit/s
   4 - 1536 kbit/s
   5 - 1920 kbit/s
   6 - multirate (64 kbit/s base rate)
   7 - 2 x 64 kbit/s

Field Container 4 (type = mult)

 Format: mult=dd

 Field-02: mult - rate multiplier
   dd   definition
   --   ----------
   00 - unknown
   02 - values 2 to the maximum number of B-channels
  -99   available on the interface

Field Container 5 (type = lay1) Layer 1 Protocol

 Format: lay1=aaaa

 Field-02: lay1 - Layer 1 protocol
   aaaa   definition
   ----   ----------
   uuuu - unknown
   v110 - ITU-T standardized rate adaptation V.110/X.30.
   ulaw - G.711 u-law
   alaw - G.711 a-law
   g721 - G.721 32 kbit/s ADPCM and ITU-T Rec. I.460
   g722 - G.722 and G.725/G.724 7 kHz audio
   h221 - H.221 and H.242
   nonc - non-ITU-T rate adaptation
   v120 - ITU-T standardized rate adaptation V.120
   hdlc - ITU-T standardized X.31 HDLC flag stuffing
   g735 - ITU-T Rec. G.735 for 384 kbit/s video
   h223 - ITU-T Recs H.223 and H.245

Field Container 6 (type = subr)

 Format: subr=dd,neg=a,sync=a

 Field-02: subr - user rate (sub-rate)
   dd   definition
   --   ----------
   00 - rate is indicated by E-bits in ITU-T Rec. I.460
   01 - 0.6       kbit/s     ITU-T Recs V.6 and X.1
   02 - 1.2       kbit/s     ITU-T Rec. V.6
   03 - 2.4       kbit/s     ITU-T Recs V.6 and X.1
   04 - 3.6       kbit/s     ITU-T Rec. V.6
   05 - 4.8       kbit/s     ITU-T Recs V.6 and X.1
   06 - 7.2       kbit/s     ITU-T Rec. V.6
   07 - 8.0       kbit/s     ITU-T Rec. I.460
   08 - 9.6       kbit/s     ITU-T Recs V.6 and X.1
```

```
  09 - 14.4      kbit/s     ITU-T Rec. V.6
  10 - 16.0      kbit/s     ITU-T Rec. I.460
  11 - 19.2      kbit/s     ITU-T Rec. V.6
  12 - 32.0      kbit/s     ITU-T Rec. I.460
  13 - 48.0      kbit/s     ITU-T Recs V.6 and X.1
  14 - 56.0      kbit/s     ITU-T Rec. V.6
  15 - 0.1345    kbit/s     ITU-T Rec. X.1
  16 - 0.1000    kbit/s     ITU-T Rec. X.1
  17 - 0.075/1.2 kbit/s     ITU-T Recs V.6 and X.1
  18 - 1.2/0.075 kbit/s     ITU-T Recs V.6 and X.1
  19 - 0.050     kbit/s     ITU-T Recs V.6 and X.1
  20 - 0.075     kbit/s     ITU-T Recs V.6 and X.1
  21 - 0.110     kbit/s     ITU-T Recs V.6 and X.1
  22 - 0.150     kbit/s     ITU-T Recs V.6 and X.1
  23 - 0.200     kbit/s     ITU-T Recs V.6 and X.1
  24 - 0.300     kbit/s     ITU-T Recs V.6 and X.1
  25 - 12        kbit/s     ITU-T Rec. V.6

 Field-03: neg - negotiation
   a   definition
   -   ----------
   n - in-band negotiation not possible
   y - in-band negotiation possible

 Field-04: sync - synchronization
   a   definition
   -   ----------
   n - asynchronous
   y - synchronous

Field Container 7 (type = v110) V.110/X.30 Rate Adaptation

 Format: int=dd,txnic=a,rxnic=a,txfl=a,rxfl=a

 Field-02: int - intermediate rate
   dd   definition
   --   ----------
   08 - 8 kbit/s
   16 - 16 kbit/s
   32 - 32 kbit/s

 Field-03: txnic - Network independent clock (NIC) on
                   transmission (TX)
   a   definition
   -   ----------
   u - unknown
   y - required to send data with network independent clock
   n - not required to send data with network independent clock

 Field-04: rxnic - Network independent clock (NIC) on reception
                   (RX)
   a   definition
   -   ----------
   u - unknown
   y - can  accept data with network independent clock
   n - cannot accept data with network independent clock

 Field-05: txfl - Flow control on transmission (TX)
   a   definition
   -   ----------
   u - unknown
   y - required to send data with flow control mechanism
   n - not required to send data with flow control mechanism
```

```
 Field-06: rxfl - Flow control on reception (RX)
   a   definition
   -   ----------
   u - unknown
   y - can accept data with flow control mechanism
   n - cannot accept data with flow control mechanism

Field Container 8 (type = v120) V.120 Rate Adaptation

 Format: hdr=a,mf=a,mode=d,lli=d,asgn=d,inbnd=d

 Field-02: hdr - rate adaptation header
   a   definition
   -   ----------
   u - unknown
   y - rate adaptation header included
   n - rate adaptation header not included

 Field-03: mf - multiframe establishment support for data link
   a   definition
   -   ----------
   u - unknown
   y - multiframe frame establishment supported
   n - multiframe frame establishment not supported

 Field-04: mode - Mode of operation
   d   definition
   -   ----------
   0 - bit transparent mode of operation
   1 - protocol sensitive mode of operation

 Field-05: lli - Logical link identifier (LLI) negotiation
   d   definition
   -   ----------
   0 - default LLI of 256 will be used
   1 - full protocol negotiation

 Field-06: asgn - assignor/assignee
   d   definition
   -   ----------
   0 - message originator is "Default Assignee"
   1 - message originator is "Assignor only"

 Field-07: inbnd - inband/out-of-band negotiation
   d   definition
   -   ----------
   0 - not applicable to this standard
   1 - negotiation is done in-band using logical link 0

Field Container 9 (type = pari) Parity

 Format: stp=d,dat=d,par=a

 Field-02: stp - number of stop bits
   d   definition
   -   ----------
   1 - 1  bit
   2 - 2  bits
   3 - 1.5 bits

 Field-03: dat - number of data bits
   d   definition
   -   ----------
   5 - 5 bits
```

```
    7 - 7 bits
    8 - 8 bits

  Field-04: par - parity
    a   definition
    -   ----------
    o - odd
    e - even
    n - none
    0 - forced to 0
    1 - forced to 1

Field Container 10 (type = modm) Modem Type

  Format: modm=dd,dupl=d

  Field-02: modm - modem type
    dd   definition
    --   ----------
    00 - V.22
    01 - V.22 bis
    02 - V.23
    03 - V.26
    04 - V.26 bis
    05 - V.26 ter
    06 - V.27
    07 - V.27 bis
    08 - V.27 ter
    09 - V.29
    10 - V.32
    11 - V.21
    12 - V.34

  Field-03: dupl - duplex
    d  definition
    -  ----------
    h - half-duplex
    f - full-duplex

Field Container 11 (type = lay2) Layer 2 Protocol

  Format: lay2=dd,mode=a,use=a,inf=hh,win=ddd

  Field-02: lay2 - layer 2 protocol
    dd   definition
    --   ----------
    00 - T1.602
    01 - ITU-T Rec. X.25 link level
    02 - ITU-T Rec. Q.921 (I.441)
    03 - LAN LLC (ISO/IEC 8802-2)
    04 - ITU-T Rec. Q.922
    05 - ITU-T Rec. Q.922 core aspects
    06 - Basic Mode ISO 1745
    07 - ITU-T Rec. X.25 Multilink
    08 - Extended LAPB
    09 - HDLC ARM
    10 - HDLC NRM
    11 - HDLC ABM
    12 - ITU-T Rec. X.75
    13 - User specified
    14 - DTE-DCE Operation (ISO/IEC 7776)

  Field-03: mode - Mode of Operation
    a   definition
```

```
  -   ----------
  n - Normal mode of operation
  e - extended mode of operation

 Field-04: use - Q.933 use
  a   definition
  -   ----------
  n - Coding as defined in ITU-T Rec. Q.933 NOT used

 Field-05: inf - User specified layer 2 protocol information
  hh    definition
  --    ----------
  00-FF 2 digit Hex data

 Field-06: win - Window Size (k)
  ddd   definition
  ---   ----------
        3 digit decimal (range 1 to 127)

Field Container 12 (type = lay3) Layer 3 Protocol

 Format: lay3=d,mode=a,pks=d,win=ddd,inf=d

  Field-02: lay3 - layer 3 protocol
  d   definition
  -   ----------
  0 - T1.607
  1 - ITU-T Rec. X.25 packet layer
  2 - ITU-T Rec. Q.931 (I.451)/ANSI T1.607
  3 - ISO/IEC TR 9577
  4 - ISO/IEC 8208
  5 - ITU-T Rec. X.223 and ISO/IEC 8878
  6 - ISO/IEC 8473 (OSI Connectionless mode protocol)
  7 - ITU-T Rec. T.70
  8 - User specified

 Field-03: mode - Mode of Operation
  a   definition
  -   ----------
  n - Normal mode of operation
  e - extended mode of operation

 Field-04: pks - Default Packet size
  d   definition
  -   ----------
  0 - Default packet size 16 octets
  1 - Default packet size 32 octets
  2 - Default packet size 64 octets
  3 - Default packet size 128 octets
  4 - Default packet size 256 octets
  5 - Default packet size 512 octets
  6 - Default packet size 1024 octets
  7 - Default packet size 2048 octets
  8 - Default packet size 4096 octets

 Field-05: win - Window size
  ddd  definition
  ---  ----------
       3 digit decimal in the range of 1-127

 Field-06: inf - Additional Layer 3 protocol information
  d   definition
  -   ----------
  0 - Internet Protocol (IP)
```

```
   1 - Point-to-Point Protocol (PPP)
```

7.3.105 User Service Information Prime (USP)

```
Format: USP,type=aaaa,{field container}

This parameter represents another iteration of the USI. Refer to
parameter USI: for formatting rules.
```

7.3.106 User Teleservice Information (UTI)

```
Format: UTI,cs=a,int=d,pfl=d,hlc=ddd,ehl=ddd

Fields:
Field-01: cs - coding standard
 a   definition
 -   ----------
 u - unknown
 c - ITU-T standardized coding
 i - ISO/IEC standard
 n - national standard
 p - standard defined for the network either public or private

Field-02: int - interpretation
 d   definition
 -   ----------
 0 - unknown
 4 - high-level characteristics identification

Field-03: pfl - presentation method of protocol profile
 d   definition
 -   ----------
 0 - unknown
 1 - high-level protocol profile

Field-04: hlc - High-level characteristics identification
 ddd   definition
 ---   ----------
 000 - no information
 001 - telephony
 002 - group 2/3 fax (ITU-T Rec. F.182)
 003 - group 4 fax class I (ITU-T Rec. F.184)
 004 - group 4 fax class II/III (ITU-T Rec. F.184)
 005 - syntax based videotex (ITU-T Recs F.300 and T.102)
 006 - international videotex interworking
 007 - telex service (ITU-T Rec. F.60)
 008 - message handling systems (ITU-T Rec. X.400)
 009 - OSI application (ITU-T Rec. X.200)
 010 - FTAM application (ISO 8571)
 011 - maintenance
 012 - management
 013 - videotelephony (ITU-T Recs F.720, F.721, F.731)
 014 - videoconferencing (ITU-T Recs F.702, F.731)
 015 - audiographic conferencing (ITU-T Recs F.701, F.731)
 016 - audiovisual service
 017 - multimedia service
 018 - Teletex service, basic mode of operation
       (ITU-T Rec. F.200)
 019 - Teletex service, basic and processable mode of operation
       (ITU-T Rec. F.220)

Field-05: ehl - Extended High-level characteristics identification
 ddd   definition
 ----   ----------
```

```
 000 - no information (use when ehl is not present)
       otherwise use same definitions as hlc field above
```

7.3.107 User-To-User Indicators (UUI)

```
Format:  UUI,type=aaaa,{field container}

Based on the value of type the following parameters will follow.

Fields:

Field-01: type - type of UUI indicator
 aaaa   description
 ----   -----------
 reqt - request    Field Container 1
 resp - response   Field Container 2

Field Containers:

Field Container 1 (type=reqt)

 Format: srv1=a,srv2=a,srv3=a

 Fields:

 Field-02: srv1 - Service 1
   a   description
   -   -----------
   0 - no information
   y - request, essential
   n - request, not essential

 Field-03: srv2 - Service 2
   a   description
   -   -----------
   0 - no information
   y - request, essential
   n - request, not essential

 Field-04: srv3 - Service 3
   a   description
   -   -----------
   0 - no information
   y - request, essential
   n - request, not essential

Field Container 2 (Type = resp)

 Format: srv1=a,srv2=a,srv3=a,ndi=a

 Fields:

 Field-02: srv1 - Service 1
   a   description
   -   -----------
   0 - no information
   y - provided
   n - not provided

 Field-03: srv2 - Service 2
   a   description
   -   -----------
   0 - no information
   y - provided
```

```
  n - not provided

 Field-04: srv3 - Service 3
   a   description
   -   -----------
   0 - no information
   y - provided
   n - not provided

 Field-05: ndi - network discard indicator
   a   description
   -   -----------
   0 - no information
   y - user-to-user information discarded by the network
```

7.3.108 User-To-User Information (UUS)

```
Format: UUS,pd=a,dat=1*(2Hex)

Fields:

Field-01: pd - protocol discriminator
 a   description
 -   -----------
 0 - user-specific protocol
 1 - OSI higher layer protocols
 2 - ITU-T Rec. X.263 (replaces ITU-T Rec. X.244)
 3 - IA5 characters (are contained in field 2)
 4 - ITU-T Recs X.208 and X.209 coded user information
 5 - ITU-T Rec. V.120 rate adaption
 6 - ITU-T Recs Q.931/I.451 user-network call control messages

Field-02: dat - user-to-user info
 1*(2h)   description
 ------   -----------
 1*(2h) - one or more pairs of characters (0-9, A-F) representing a
          hexadecimal encoding (see clause 5.1).
```

7.3.109 Version of NSS (VER)

```
Format: VER,v=aaaa

Fields:

Field-01: v - version
 aaaa   description
 ----   -----------
 x.yy - x and yy are version.sub-version numerical values, e.g.
        "v=2.15". Decimal characters 0-9 must be used for x and
        yy.
```

7.4 BAT ASE parameters

The following parameters may be used to explicitly convey these parameters in NSS rather than tunnelling as ascii-encoded binary inside the apm user information.

7.4.1 Action Indicator (ACT)

```
Format: ACT,instr={d,a,d,a},act=dd

Fields:

Field-01: instr - compatibility information
 The subfields {d,a,d,a} are defined as follows:
```

```
 Subfield-01: Pass-on possible
 d   description
 -   -----------
 0 - pass-on
 1 - discard information element
 2 - discard BICC data
 3 - release call

 Subfield-02: Pass-on possible notification
 a   description
 -   -----------
 y - send notification
 n - do not send notification

 Subfield-03: Pass-on not possible
 d   description
 -   -----------
 0 - release call
 1 - discard information element
 2 - discard BICC data

 Subfield-04: Pass-on not possible notification
 a   description
 -   -----------
 y - send notification
 n - do not send notification

Field-02: act - action indicators
 dd   description
 --   -----------
 00 - no indication
 01 - connect backward
 02 - connect forward
 03 - connect forward, no notification
 04 - connect forward, plus notification
 05 - connect forward, no notification + selected codec
 06 - connect forward, plus notification + selected codec
 07 - use idle
 08 - connected
 09 - switched
 10 - selected codec
 11 - modify codec
 12 - successful codec modification
 13 - codec modification failure
 14 - mid-call codec negotiation
 15 - modify to selected codec information
 16 - mid-call codec negotiation failure
 17 - start signal, notify
 18 - start signal, no notify
 19 - stop signal, notify
 20 - stop signal, no notify
 21 - start signal acknowledge
 22 - start signal reject
 23 - stop signal acknowledge
 24 - bearer redirect
```

7.4.2 Backward Network Connection Identifier (BID)

```
Format: BID,instr={d,a,d,a},bid=1*(2Hex)

Fields:

Field-01: instr - compatibility information
```

```
 The subfields {d,a,d,a} are defined as follows:

 Subfield-01: Pass-on possible
 d   description
 -   -----------
 0 - pass-on
 1 - discard information element
 2 - discard BICC data
 3 - release call

 Subfield-02: Pass-on possible notification
 a   description
 -   -----------
 y - send notification
 n - do not send notification

 Subfield-03: Pass-on not possible
 d   description
 -   -----------
 0 - release call
 1 - discard information element
 2 - discard BICC data

 Subfield-04: Pass-on not possible notification
 a   description
 -   -----------
 y - send notification
 n - do not send notification

Field-02: bid - backward connection identifier
 1*(2h)   description
 ------   -----------
 1*(2h) - one or more pairs of characters (0-9, A-F) representing a
          hexadecimal encoding (see clause 5.1) of the parameter.
```

7.4.3 BAT Compatibility Report (BAT)

```
Format: BAT,instr={d,a,d,a},rea=d,diag=(*{diagnostic_id,diagnostic_index})

Fields:

Field-01: instr - compatibility information
 The subfields {d,a,d,a} are defined as follows:

 Subfield-01: Pass-on possible
 d   description
 -   -----------
 0 - pass-on
 1 - discard information element
 2 - discard BICC data
 3 - release call

 Subfield-02: Pass-on possible notification
 a   description
 -   -----------
 y - send notification
 n - do not send notification

 Subfield-03: Pass-on not possible
 d   description
 -   -----------
 0 - release call
 1 - discard information element
 2 - discard BICC data
```

```
 Subfield-04: Pass-on not possible notification
 a   description
 -   -----------
 y - send notification
 n - do not send notification

Field-02: rea – report reason
 d   description
 -   -----------
 0 - no indication
 1 - information element non-existent or not implemented
 2 - BICC data with unrecognized information element, discarded

Field-03: diag - diagnostics
 diag = (*{diagnostic_id,diagnostic_index})
```

NOTE – The diagnostics field is a parenthesis delimited comma-separated list of diagnostics tuples. The diagnostics tuples are delimited by braces.

7.4.4 Bearer Control Information (BCD)

```
Format: BCD,instr={d,a,d,a},dat=1*(2Hex)

Fields:

Field-01: instr - compatibility information
 The subfields {d,a,d,a} are defined as follows:

 Subfield-01: Pass-on possible
 d   description
 -   -----------
 0 - pass-on
 1 - discard information element
 2 - discard BICC data
 3 - release call

 Subfield-02: Pass-on possible notification
 a   description
 -   -----------
 y - send notification
 n - do not send notification

 Subfield-03: Pass-on not possible
 d   description
 -   -----------
 0 - release call
 1 - discard information element
 2 - discard BICC data

 Subfield-04: Pass-on not possible notification
 a   description
 -   -----------
 y - send notification
 n - do not send notification

Field-02: dat – bearer control tunnelling protocol data unit
 1*(2h)   description
 ------   -----------
 1*(2h) - one or more pairs of characters (0-9, A-F) representing a
          hexadecimal encoding (see clause 5.1).
```

7.4.5 Bearer Control Tunnelling (BCT)

```
Format: BCT,instr={d,a,d,a},bct=d

Fields:

Field-01: instr - compatibility information
 The subfields {d,a,d,a} are defined as follows:

 Subfield-01: Pass-on possible
 d   description
 -   -----------
 0 - pass-on
 1 - discard information element
 2 - discard BICC data
 3 - release call

 Subfield-02: Pass-on possible notification
 a   description
 -   -----------
 y - send notification
 n - do not send notification

 Subfield-03: Pass-on not possible
 d   description
 -   -----------
 0 - release call
 1 - discard information element
 2 - discard BICC data

 Subfield-04: Pass-on not possible notification
 a   description
 -   -----------
 y - send notification
 n - do not send notification

Field-02: bct - bearer control tunnelling indicator
 d   description
 -   -----------
 0 - no indication
 1 - tunnelling to be used
```

7.4.6 Bearer Control Unit Identifier (BDU)

```
Format: BDU,instr={d,a,d,a},lid=hhhhhhhh,nid=0*(2Hex)

Fields:

Field-01: instr - compatibility information
 The subfields {d,a,d,a} are defined as follows:

 Subfield-01: Pass-on possible
 d   description
 -   -----------
 0 - pass-on
 1 - discard information element
 2 - discard BICC data
 3 - release call

 Subfield-02: Pass-on possible notification
 a   description
 -   -----------
 y - send notification
 n - do not send notification
```

```
 Subfield-03: Pass-on not possible
 d   description
 -   -----------
 0 - release call
 1 - discard information element
 2 - discard BICC data

 Subfield-04: Pass-on not possible notification
 a   description
 -   -----------
 y - send notification
 n - do not send notification

Field-02: lid - local identity
 hhhhhhhh   description
 --------   -----------
 0-9, A-F - 8 IA5 characters 0-9, A-F
            representing hexadecimal values

Field-03: nid - network identity
 0*(2h)   description
 ------   -----------
 0*(2h) - one or more pairs of characters (0-9, A-F) representing a
          hexadecimal encoding (see clause 5.1) of the parameter.
```

7.4.7 Bearer Network Connection Characteristics (BNC)

```
Format: BNC,instr={d,a,d,a},bnc=d

Fields:

Field-01: instr - compatibility information
 The subfields {d,a,d,a} are defined as follows:

 Subfield-01: Pass-on possible
 d   description
 -   -----------
 0 - pass-on
 1 - discard information element
 2 - discard BICC data
 3 - release call

 Subfield-02: Pass-on possible notification
 a   description
 -   -----------
 y - send notification
 n - do not send notification

 Subfield-03: Pass-on not possible
 d   description
 -   -----------
 0 - release call
 1 - discard information element
 2 - discard BICC data

 Subfield-04: Pass-on not possible notification
 a   description
 -   -----------
 y - send notification
 n - do not send notification
```

```
Field-02: bnc - bearer network connection characteristics
 d   description
 -   -----------
 0 - no indication
 1 - AAL Type 1
 2 - AAL Type 2
 3 - Structured AAL Type 1
 4 - IP/RTP
```

7.4.8 Bearer Redirection Capability (BRC)

```
Format: BRC,instr={d,a,d,a},brc=d

Fields:

Field-01: instr - compatibility information
 The subfields {d,a,d,a} are defined as follows:

 Subfield-01: Pass-on possible
 d   description
 -   -----------
 0 - pass-on
 1 - discard information element
 2 - discard BICC data
 3 - release call

 Subfield-02: Pass-on possible notification
 a   description
 -   -----------
 y - send notification
 n - do not send notification

 Subfield-03: Pass-on not possible
 d   description
 -   -----------
 0 - release call
 1 - discard information element
 2 - discard BICC data

 Subfield-04: Pass-on not possible notification
 a   description
 -   -----------
 y - send notification
 n - do not send notification

Field-02: brc - bearer redirection capability
 d   description
 -   -----------
 0 - late cut-through not supported
 1 - late cut-through supported
```

7.4.9 Bearer Redirection Indicators (BRI)

```
Format: BRI,instr={d,a,d,a},bri=(dd,dd,…)

Fields:

Field-01: instr - compatibility information
 The subfields {d,a,d,a} are defined as follows:
```

```
 Subfield-01: Pass-on possible
 d   description
 -   -----------
 0 - pass-on
 1 - discard information element
 2 - discard BICC data
 3 - release call

 Subfield-02: Pass-on possible notification
 a   description
 -   -----------
 y - send notification
 n - do not send notification

 Subfield-03: Pass-on not possible
 d   description
 -   -----------
 0 - release call
 1 - discard information element
 2 - discard BICC data

 Subfield-04: Pass-on not possible notification
 a   description
 -   -----------
 y - send notification
 n - do not send notification

Field-02: bri - bearer redirection indicators
 dd   description
 --   -----------
 00 - no indication
 01 - late cut-through request
 02 - redirect temporary reject
 03 - redirect backwards request
 04 - redirect forwards request
 05 - redirect bearer release request
 06 - redirect bearer release proceed
 07 - redirect bearer release complete
 08 - redirect cut-through request
 09 - redirect bearer connected indication
 10 - redirect failure
 11 - new connection identifier

 NOTE – One or more indicators are provided in a parenthesis
 delimited comma-separated list.
```

7.4.10 Codec List (CDL)

```
Format: CDL,instr={d,a,d,a},({<codec-1>},{<codec-2>},{<codec-3>},…)

Fields:

Field-01: instr - compatibility information (for the entire codec list)
 The subfields {d,a,d,a} are defined as follows:

 Subfield-01: Pass-on possible
 d   description
 -   -----------
 0 - pass-on
 1 - discard information element
 2 - discard BICC data
 3 - release call
```

```
 Subfield-02: Pass-on possible notification
 a   description
 -   -----------
 y - send notification
 n - do not send notification

 Subfield-03: Pass-on not possible
 d   description
 -   -----------
 0 - release call
 1 - discard information element
 2 - discard BICC data

 Subfield-04: Pass-on not possible notification
 a   description
 -   -----------
 y - send notification
 n - do not send notification

Field-02: This is a parenthesis-delimited comma-separated list of codecs
 that follow the structure of the COD fields (see clause 7.4.11). The
 codecs are listed in decreasing order of preference (i.e., codec-1 has
 highest preference level).
```

7.4.11 Codec (COD)

```
Format: COD,instr={d,a,d,a},org=ddd,codec=dd,
      confg=(opt-1,opt-2,opt-3,…),cdat=0*(2Hex)

Fields:

Field-01: instr - compatibility information (for a single codec)
 The subfields {d,a,d,a} are defined as follows:

 Subfield-01: Pass-on possible
 d   description
 -   -----------
 0 - pass-on
 1 - discard information element
 2 - discard BICC data
 3 - release call

 Subfield-02: Pass-on possible notification
 a   description
 -   -----------
 y - send notification
 n - do not send notification

 Subfield-03: Pass-on not possible
 d   description
 -   -----------
 0 - release call
 1 - discard information element
 2 - discard BICC data

 Subfield-04: Pass-on not possible notification
 a   description
 -   -----------
 y - send notification
 n - do not send notification
```

Field-02: org - organization name

ddd	description
000	no indication
001	ITU-T
002	ETSI (refer to ETS 126 103)

Field-03: codec - codec name

dd	description
00	no indication
01	G.711 a-law
02	G.711 mu-law
03	G.711 a-law 56 kbit/s
04	G.711 mu-law 56 kbit/s
05	G.722 (sb-adpcm)
06	G.723.1
07	Annex A/G.723.1 (silence suppression)
08	G.726 (adpcm)
09	G.727 (embedded adpcm)
10	G.728
12	G.729 (cs-acelp)
12	Annex B/G.729 (silence suppression)

Field-04: confg - codec configuration (option selection form)

Confg=(opt-1,opt-2,opt-3,…)

The semantic for each option (opt-1, etc.) is codec-specific and usually defined in a standard, e.g., Table 13/Q.765.5. The semantic follows the byte (first to last) and bit order (LSB to MSB) of the standard.

When a configuration option is supported, coding is "y"; when it is not supported, coding is "n".

For ITU-T Recs G.726 and G.727: (Example: confg=(y,n,y,n) means that 16 and 32 kbit/s are supported)

Option#	Description
Opt-1	16 kbit/s rate
Opt-2	24 kbit/s rate
Opt-3	32 kbit/s rate
Opt-4	40 kbit/s rate

For ITU-T Rec. G.728:

Option#	Description
Opt-1	9.6 kbit/s rate
Opt-2	12.8 kbit/s rate
Opt-3	16 kbit/s rate

For ITU-T Rec. G.729 (cs-acelp) or Annex B:

Option#	Description
Opt-1	6.4 kbit/s rate
Opt-2	8 kbit/s rate
Opt-3	11.8 kbit/s rate

NOTE – When the value is "()" the NULL list means that all options are supported, i.e., the equivalent of "(y,y,y…)". When the value is absent this means that there is no configuration data for this codec.

Field-05: cdat - codec alternate configuration (free-form)

0*(2h)	description
0*(2h)	one or more *pairs of* characters (0-9, A-F) representing a hexadecimal encoding (see clause 5.1) of the parameter.

7.4.12 Interworking Function Address (IWF)

```
Format: IWF,instr={d,a,d,a},iwf=1*(2Hex)

Fields:

Field-01: instr - compatibility information
 The subfields {d,a,d,a} are defined as follows:

 Subfield-01: Pass-on possible
 d   description
 -   -----------
 0 - pass-on
 1 - discard information element
 2 - discard BICC data
 3 - release call

 Subfield-02: Pass-on possible notification
 a   description
 -   -----------
 y - send notification
 n - do not send notification

 Subfield-03: Pass-on not possible
 d   description
 -   -----------
 0 - release call
 1 - discard information element
 2 - discard BICC data

 Subfield-04: Pass-on not possible notification
 a   description
 -   -----------
 y - send notification
 n - do not send notification

Field-02: iwf - interworking function address
 1*(2h)   description
 ------   -----------
 1*(2h) - one or more pairs of characters (0-9, A-F) representing a
          hexadecimal encoding (see clause 5.1) of the parameter.
```

7.4.13 Signal (SIG)

```
Format: SIG,instr={d,a,d,a},sig=(1*{sigid=dd,dur=ddddd})

Fields:

Field-01: instr - compatibility information
 The subfields {d,a,d,a} are defined as follows:

 Subfield-01: Pass-on possible
 d   description
 -   -----------
 0 - pass-on
 1 - discard information element
 2 - discard BICC data
 3 - release call

 Subfield-02: Pass-on possible notification
 a   description
 -   -----------
 y - send notification
 n - do not send notification
```

```
  Subfield-03: Pass-on not possible
  d   description
  -   -----------
  0 - release call
  1 - discard information element
  2 - discard BICC data

  Subfield-04: Pass-on not possible notification
  a   description
  -   -----------
  y - send notification
  n - do not send notification

 Field-02: sig - signal
   sig = (1*{sigid,dur})
```

NOTE – The signal field is a parenthesis-delimited comma-separated list of signal tuples. The signal tuples are delimited by braces.

```
 Subfield-01: sigid - signal identifier
  dd   description
  --   -----------
  00 - DTMF 0
  01 - DTMF 1
  02 - DTMF 2
  03 - DTMF 3
  04 - DTMF 4
  05 - DTMF 5
  06 - DTMF 6
  07 - DTMF 7
  08 - DTMF 8
  09 - DTMF 9
  10 - DTMF *
  11 - DTMF #
  12 - DTMF A
  13 - DTMF B
  14 - DTMF C
  15 - DTMF D
  16 - dial tone
  17 - pabx internal dial tone
  18 - special dial tone
  19 - second dial tone
  20 - ringing tone
  21 - special ringing tone
  22 - busy tone
  23 - congestion tone
  24 - special information tone
  25 - warning tone
  26 - intruction tone
  27 - call waiting tone
  28 - pay tone
  29 - payphone recognition tone
  30 - comfort tone
  31 - tone on hold
  32 - record tone
  33 - caller waiting tone
  34 - positive indication tone
  35 - negative indication tone
```

```
Subfield-02: dur - duration
 ddddd   description
 -----   -----------
 ddddd - 0-65535 milliseconds the signal is played
```

8 MIME encoding of NSS body

The following clauses describe the header elements specific to MIME (specified in RFC 2045) that may be used to encapsulate NSS within a SIP message. The MIME headers must be used with SIP messages. MIME headers should not be used with H.323 messages, since ITU-T Rec. H.323 has its own encapsulation mechanisms.

8.1 MIME-Version header field

The MIME-Version header field uses a version number to declare a message to be conformant with MIME and allows mail processing agents to distinguish between such messages and those generated by older or non-conformant software, which are presumed to lack such a field.

8.2 Content-Type header field

The Content-Type header field for the NSS MIME body is "application/nss".

In NSS, the optional 'base' parameter is not used. Instead, the source protocol identity is carried in the NSS PRN parameter.

In NSS, the optional 'version' parameter is not used. Instead, the version of NSS used is carried in the NSS VER parameter. This enables direct transfer from SIP networks to H.323 networks, which do not use the MIME headers in encoding.

The 'charset' parameter indicates that the contents of the MIME body part will only use 7-bit US-ASCII encoding. In some NSS parameters, one-byte ASCII characters are used to represent the hexadecimal equivalent of one nibble binary values. The 7-bit encoding enables transport through text-based e-mail at the cost of doubling bandwidth. That binary-to-ASCII encoding transformation is usually for compatibility parameters, which are of limited size.

8.3 Content-Transfer-Encoding header field

A Content-Transfer-Encoding header field is used to indicate both the encoding transformation that was applied to the body and the domain of the result. Encoding transformations other than the identity transformation are usually applied to data in order to allow it to pass through mail transport mechanisms which may have data or character set limitations.

The mechanism employed for content transfer encoding could be a choice from "7bit", "8bit", "binary", "quoted-printable", "base64", ietf-token, or x-token. ISUP messages are natively binary, but NSS will use US-ASCII to represent all parameter tags and values. Binary values are represented by ASCII representation of the hexadecimal equivalent. This header is optional for NSS.

8.4 Content-Disposition header field

The Content-Disposition header (specified in RFC 2183) describes how the encapsulated NSS is to be processed and how to handle the received Content-Type if it is not recognized. The default disposition-type for a NSS message body is "signal". This type indicates that the body part contains signalling information associated with the session, but does not describe the session. This header is optional for NSS.

8.5 NSS MIME media type specification

This media type is defined by the following information:

– Media type name: application;

– Media subtype name: nss;

– Required parameters: none;

– Optional parameters: charset;

– Encoding scheme: us-ascii;

– Security considerations: See clause 11.

9 Encapsulation in SIP

NSS is encapsulated in SIP by placing it in the message body. The Content-Type must have value "application/nss" and Content-Disposition must have value "signal". For an example of a SIP message using a MIME header to carry a NSS body, see Appendix I.

10 Encapsulation in H.323

NSS may be tunnelled within H.323 version 4 (11/2000) messages.

However, in order to be backward compatible, the NSS messages can be tunnelled in the **non-StandardControl** field of the H323-UU-PDU parameter of H.323v2 and H.323v3 messages.

11 Security considerations

Security of NSS, if needed, should use the mechanisms defined for securing components of the encapsulating protocol (i.e., SIP or H.323).

12 NSS-specific syntactical elements and procedures

12.1 NSS-specific messages

All NSS messages, which are also declared in ISUP, will be used as described in the signalling procedures of ITU-T Rec. Q.761/Q.1902.1. Q.1980.1 will cover handling for new messages or changes to those Recommendations.

12.1.1 Generic Parameter List (GPL)

The GPL message is used when an application needs to transmit any combination of parameters outside the context of the other defined message types. No semantics are associated with GPL and no state-machine changes are implied.

12.1.2 Unrecognized Message (UNR)

UNR extends the concept of handling unrecognized parameters to messages. The UNR message transparently transports any message that is not recognized by the native protocol at ingress. The MCI parameter provides the message handling instruction and carries the content of the unrecognized message that is transported to the final destination that may then dispose of the message accordingly.

12.2 NSS-specific parameters

This clause briefly describes the NSS-specific parameters.

12.2.1 Unrecognized field handling (UFC: Field compatibility mechanism)

UFC extends the concept of handling unrecognized parameters using the parameter compatibility information (PCI) to using field compatibility to handle unrecognized fields within a parameter. Further details of parameter construction are defined in clause 12.3 below.

12.2.2 Unrecognized value handling (FDC: Value compatibility mechanism)

FDC extends the PCI and UFC concept to cases where the field is recognized, but the value is not recognized. Further details of parameter construction are defined in 12.3 below.

12.2.3 Protocol Name/Version (PRN)

PRN provides information about the source protocol for the messages and parameters necessary to interpret them. In particular, compatibility parameters require PRN for interpretation.

12.2.4 Version (VER)

VER provides information about the version of NSS used to construct the NSS message and parameters. Use of the same version ensures that parsing of NSS parameters is done correctly.

12.2.5 Segmentation Indicator (SEG)

SEG indicates that an additional SGM message is to follow with additional parameters related to the message carrying the SEG parameter.

12.2.6 Global Call Identification (GCI)

GCI enables all messages associated with a single "call" to be associated.

12.2.7 Transaction Identifier (TID)

At the first ingress point to an IP network, a unique transaction identifier (TID) may be populated on the message. This may be passed unchanged throughout the network so that external call tracing tools (sniffers) can associate any arriving event with its associated generated events.

12.2.8 Mapped Parameter List (MPL)

MPL is used to indicate which parameters from the source protocol have been mapped into the parameters of the encapsulating protocol. However, when a parameter is carried by both the protocol encapsulating NSS and NSS, the parameter name shall not be carried in MPL. The parameter list from MPL and the NSS indicates the parameters that were present in the original source message. This aids the receiving node in reconstructing the original PSTN message, albeit some values may have changed.

NOTE – Movement of a parameter, e.g., through mapping, between NSS and the protocol that carries it, requires a corresponding adjustment to the MPL. The specification of such an interworking, e.g., SIP/NSS to H.323/NSS, is not in the scope of this Recommendation.

12.2.9 Source Parameter Information (SPI)

SPI is used to indicate what source parameter type provided the initial information, when the source protocol defines more than one parameter type that could carry the same information, and when a subsequent PSTN call leg is required to use the identical parameter type. If two instances of a parameter are carried by the source protocol, then the order of SPI parameters indicates the original order of the source parameters.

12.3 NSS compatibility procedures

The PRN parameter in the message is used to interpret any message/parameter/field compatibility information included in the message. Failure to include this information in the message may

preclude any such information from being utilized or understood. This could result in the call being dropped if the compatibility instructions point to this action.

No field shall be placed in a NSS parameter line unless it has been declared in this Recommendation. All fields which exist in network-specific variants of the source protocol, but not in the corresponding parameter for a given NSS parameter specified in this Recommendation, will be treated as unrecognized fields. The parameter name, unrecognized field name, and value can be indicated in a following UFC parameter using field compatibility procedures. Any parameter exceptions to field values can be referenced by parameter name and field number in the FDC parameter.

NOTE – With respect to the UFC parameter, the ordering of optional fields in national variants of ISUP that may be mapped to UFC is not in the scope of this Recommendation.

The compatibility parameters for unknown fields (UFC) and unknown values (FDC) must directly follow the parameter that they modify. If compatibility for more than one field is required, the order from top to bottom of the compatibility parameters follows the order defined in NSS or indicates the field order from the source protocol parameter, if not found in NSS. Modification of compatibility parameters is consistent with modification of other parameters such that only the current instance of a compatibility parameter is present in the message for each parameter, field, or value. Examples of the ordering of compatibility parameters are shown in Appendix I.

A stand-alone FDC or UFC is a syntax error. Handling in that case is not in the scope of this Recommendation.

When encoding an unrecognized syntax element, the lowest (most granular) compatibility mechanism should be used. For example, with unrecognized:

– field values, use Known Field Compatibility Information (FDC)
– fields, use Unknown Field Compatibility Information (UFC)
– parameter tags, use Parameter Compatibility Information (PCI)
– message tags, use Unrecognized Message (UNR).

In essence, UNR should be the last resort, not the first.

Annex A

Narrowband Signalling Syntax ABNF grammar

Part 1. General format of NSS parameters

```
nss_message = compact_message

compact_message = VER_param CRLF
                  PRN_param CRLF
                  nss_msg_name "," CRLF
                  *compact_nss_param
```

NOTE - For detail on the numbers of compact_fields for nss parameters, see Part 2, Detailed format of individual NSS parameters.

```
nss_msg_name = "ACM" / "ANM" / "APM" / "CFN" / "CON" /
               "COT" / "CPG" / "CRG" / "FAA" / "FAC" /
               "FAR" / "FOT" / "FRJ" / "GPL" / "IAM" /
               "IDR" / "INF" / "INR" / "IRS" / "LOP" /
               "NRM" / "OLM" / "PAM" / "PRI" / "REL" /
               "RES" / "RLC" / "SAM" / "SDN" / "SGM" /
               "SUS" / "UNR" / "USR" / token
```

NOTE - If a field has an unknown value, then it need not be specified explicitly, meaning that there is no value present.

```
opt-unk = ["u"] ; Wherever used "u" may be omitted.

dat_field = 1*(2HEX)

HEX  = DIGIT / %0x41-46 ; 'A-F' case sensitive
             ; see clause 5 for rules to transform octet to ascii

UALPHA = %0x41-5a ; 'A-Z'

LALPHA = %0x61-7a ; 'a-z'

ALPHA = UALPHA / LALPHA

ALPHANUM = ALPHA / DIGIT

LALPHANUM = LALPHA / DIGIT

UALPHANUM = UALPHA / DIGIT

CHAR = %x20-27 / %x2a-2b / %x2d-3c / %x3e-5b / %x5d-7a / %x7c / %x7e
       / NSS_ESCAPED_CHAR

NSS_ESCAPED_CHAR = %x5c %x0a / ; LF
                   %x5c %x0d / ; CR
                   %x5c %x28 / ; opening parenthesis '('
                   %x5c %x29 / ; closing parenthesis ')'
                   %x5c %x2c / ; comma ','
                   %x5c %x3d / ; equal '='
                   %x5c %x5c / ; backslash '\'
                   %x5c %x7b / ; opening brace '{'
                   %x5c %x7d / ; closing brace '}'

CRLF = %x0d %x0a

telephone-number = 1*phonedigit
```

```
phonedigit    = HEX
```

NOTE – The phone digits are encoded in the same order as they would be transmitted in ISUP or BICC, unlike the hex encoding of binary octets.

```
token = 1*(alphanum / "-" / "." / "!" / "%" /
           "*" / "_" / "+" / "`" / "'" / "~" ) ; from RFC 3261, p. 221
```

NOTE – The grammar given in the next part, Part 2, has been simplified and updated to closely match the specification of clause 7. Both parameter and field definitions have been alphabetized to aid in cross-referencing. Also, note that many data structures have the list of possible values embedded directly in the field definitions.

Part 2. Detailed formats of individual NSS parameters

```
compact_nss_param = ( token /
  ACL_param / ACT_param / ADI_param / APP_param / ATP_param /
  BAT_param / BCD_param / BCI_param / BCT_param / BDU_param /
  BID_param / BNC_param / BRC_param / BRI_param / BVN_param /
  CAI_param / CCN_param / CCS_param / CDI_param / CDL_param /
  CDN_param / CDP_param / CDT_param / CGL_param / CGN_param /
  CGV_param / CHI_param / CIC_param / CIN_param / CNF_param /
  CNN_param / CNR_param / COD_param / COL_param / COR_param /
  CPC_param / CPI_param / CPN_param / CRF_param / CSI_param /
  CTI_param / CTN_param / CTR_param / DIS_param / ECI_param /
  EVI_param / FAI_param / FCI_param / FDC_param / FVN_param /
  GCI_param / GEA_param / GED_param / GIC_param / GNO_param /
  HOC_param / HTR_param / INC_param / INI_param / IRI_param /
  ISC_param / ITG_param / IWF_param / LON_param / LPI_param /
  MCI_param / MCR_param / MLP_param / MPL_param / MRI_param /
  NMC_param / NOC_param / NPF_param / NRN_param / NSF_param /
  OBI_param / OCI_param / OCN_param / OCT_param / OFI_param /
  PBI_param / PCA_param / PCI_param / PCT_param / PDC_param /
  PFI_param / PVR_param / PVS_param / QOR_param / RBI_param /
  RCT_param / RDC_param / RDS_param / RFI_param / RGN_param /
  RMO_param / RNI_param / RNN_param / RNR_param / SCF_param /
  SEA_param / SEG_param / SIG_param / SPC_param / SPI_param /
  SRI_param / SUN_param / TID_param / TMP_param / TMR_param /
  TMU_param / TNS_param / UCI_param / UFC_param / UID_param /
  USI_param / USP_param / UTI_param / UUI_param / UUS_param ) CRLF
```

NOTE – Unless specified explicitly, each field can occur in a parameter at most once, in the order specified below.

NOTE – The following is an alphabetized list of parameter definitions.

```
ACL_param = "ACL," acl_field

ACT_param = "ACT," inst_field "," act_field

ADI_param = "ADI," adi_field

APP_param = "APP," aci_field "," sni_field "," rci_field "," sn_field ","
            seg_field "," slr_field "," apm_field

ATP_param = "ATP," dat_field


BAT_param = "BAT," inst_field "," rea_field "," diag_list_field

BCD_param = "BCD," inst_field "," dat_field
```

```
BCI_param = "BCI," charge_field "," status_field "," cpc_field ","
            e2ei_field "," e2em_field "," inter_field "," isup_ind_field ","
            hold_ind_field "," acc_field "," echo_field "," sccpm_field

BCT_param = "BCT," inst_field "," bct_field

BDU_param = "BDU," inst_field "," lid_field "," nid_field

BID_param = "BID," inst_field "," bid_field

BNC_param = "BNC," inst_field "," bnc_field

BRC_param = "BRC," inst_field "," brc_field

BRI_param = "BRI," inst_field "," bri_field

BVN_param = "BVN," bvn_field


CAI_param = "CAI," cs_field "," lc_field "," rec_field "," cause_field ","
            diag_field

CCN_param = "CCN," ccn_field

CCS_param = "CCS," ccs_field

CDI_param = "CDI," nso_field "," rr_field

CDL_param = "CDL," inst_field "," codec_list_field

CDN_param = "CDN," noa_field "," inn_field "," npi_field "," nr_field

CDP_param = "CDP," toc_field "," comp_field

CDT_param = "CDT," cdt_field

CGL_param = ("CGL," cgl_field_0) /
            ("CGL," cgl_field_1) /
            ("CGL," cgl_field_2) /
            ("CGL," cgl_field_3) /
            ("CGL," cgl_field_4) /
            ("CGL," cgl_field_5) /
            ("CGL," cgl_field_6) /
            ("CGL," cgl_field_7) /
            ("CGL," cgl_field_8) /
            ("CGL," cgl_field_9)

CGN_param = "CGN," noa_field "," cni_field "," npi_field "," pi_field ","
            si_field "," nr_field

CGV_param = ("CGV," cgv_field_0) /
            ("CGV," cgv_field_1) /
            ("CGV," cgv_field_2) /
            ("CGV," cgv_field_3) /
            ("CGV," cgv_field_4)

CHI_param = "CHI," chi_field

CIC_param = "CIC," cic_field

CIN_param = "CIN," noa_field "," npi_field "," pi_field "," nr_field

CNF_param = "CNF," cnf_field
```

```
CNN_param = "CNN," noa_field "," npi_field "," pi_field "," si_field ","
            nr_field

CNR_param = "CNR," loc_field "," pc_field "," cls_field "," cre_field

COD_param = "COD," codec_seq_field

COL_param = "COL," col_field

COR_param = "COR," dat_field

CPC_param = "CPC," cpc_field

CPI_param = "CPI," dat_field

CPN_param = "CPN," noa_field "," inn_field "," npi_field "," nr_field

CRF_param = "CRF," call_id_field "," pc_field

CSI_param = "CSI," csi_field

CTI_param = "CTI," cti_field

CTN_param = "CTN," noa_field "," npi_field "," pi_field "," si_field ","
            nr_field

CTR_param = "CTR," ctr_field


DIS_param = "DIS," dis_field


ECI_param = "ECI," out_info_field "," in_info_field "," out_req_field ","
            in_req_field

EVI_param = "EVI," evi "," evr


FAI_param = "FAI," fai_field

FCI_param = "FCI," intnat_field "," e2ei_field "," e2em_field ","
            inter_field "," isup_ind_field "," isdn_pref "," acc_field ","
            sccpm_field

FDC_param = "FDC," nss_param_name "," nss_field_name "," instr_field ","
            dat_field

FVN_param = ("FVN," fvn_field_1) /
            ("FVN," fvn_field_2) /
            ("FVN," fvn_field_3)


GCI_param = "GCI," gci_field

GEA_param = "GEA," gea_type "," noa_field "," npi_field "," cni_field ","
            pi_field "," si_field "," nr_field

GED_param = "GED," type_of_digit "," encoding_scheme "," nr_field

GIC_param = "GIC," net_id_field "," gic_bc_field

GNO_param = "GNO," gno_field
```

```
HOC_param = "HOC," hoc_field

HTR_param = "HTR," noa_field "," npi_field "," nr_field


INC_param = "INC," dat_field

INI_param = "INI," ini_info_field "," ini_resp_field "," ini_sol_field

IRI_param = "IRI," iri_field

ISC_param = "ISC," pc_field

ITG_param = "ITG," dat_field

IWF_param = "IWF," inst_field "," iwf_field


LON_param = "LON," noa_field "," inn_field "," npi_field "," pi_field ","
            si_field "," nr_field

LPI_param = "LPI," req_field "," loop_field


MCI_param = "MCI," mci_inst "," tri_field "," dat_field

MCR_param = "MCR," mcr_resp "," hold_prov

MLP_param = "MLP," mlp_lfb "," mlp_pl "," net_id_field "," mlp_sd

MPL_param = "MPL," mpl_field

MRI_param = "MRI," mlp_req_field "," hold_ind_field


NMC_param = "NMC," nmc_field

NOC_param = "NOC," sat_field "," echo_field "," cot_field

NPF_param = "NPF," nps_field

NRN_param = "NRN," npi_field "," nrn_noa_field "," nr_field

NSF_param = "NSF," ton_field "," nip_field "," nsf_nid "," nsf_ind


OBI_param = "OBI," obi_inb "," obi_cf "," obi_mlpp

OCI_param = "OCI," noa_field "," npi_field "," pi_field "," si_field ","
            nr_field

OCN_param = "OCN," noa_field "," npi_field "," pi_field "," nr_field

OCT_param = "OCT," oct_field

OFI_param = "OFI," cug_call "," con_line_id_req


PBI_param = ("PBI,tag=u"    ) /
            ("PBI," pbi_field_1) /
            ("PBI," pbi_field_2) /
            ("PBI," pbi_field_3)
```

```
PCA_param = "PCA," pca_field "," iwri_field

PCI_param = "PCI," pci_inst "," tri_field "," dat_field

PCT_param = "PCT," pct_field

PDC_param = "PDC," pdc_field

PFI_param = ("PFI,tag=u"    ) /
            ("PFI,tag=1"    ) /
            ("PFI," pfi_field_1) /
            ("PFI," pfi_field_2) /
            ("PFI," pfi_field_3)

PRN_param = "PRN," prot_field

PVR_param = "PVR," pvr_field

PVS_param = "PVS," pvs_field


QOR_param = "QOR," qor_field


RBI_param = ("RBI,tag=u"    ) /
            ("RBI," rbi_field_1) /
            ("RBI," rbi_field_2) /
            ("RBI," rbi_field_3)

RCT_param = "RCT," rct_field

RDC_param = "RDC," rdc_field

RDS_param = "RDS," rds_field

RFI_param = ("RFI,tag=u"    ) /
            ("RFI,tag=1"    ) /
            ("RFI," rfi_field_1) /
            ("RFI," rfi_field_2) /
            ("RFI," rfi_field_3)

RGN_param = "RGN," noa_field "," npi_field "," pi_field "," nr_field

RMO_param = "RMO," protocol_profile "," dat_field

RNI_param = "RNI," redirecting_ind "," orig_red__reason ","
            redirect_count "," redirect_reason

RNN_param = "RNN," noa_field "," inn_field "," npi_field "," nr_field

RNR_param = "RNR," rnr_field


SCF_param = "SCF," scf_field

SEA_param = "SEA," sea_field

SEG_param = "SEG,"

SIG_param = "SIG," inst_field "," sig_list_field

SPC_param = "SPC," pc_field

SPI_param = "SPI," mparm_field "," sparm_field
```

```
SRI_param = "SRI," sri_field

SUN_param = "SUN," sun_field


TID_param = "TID," tid_field

TMP_param = "TMP," tmr_field

TMR_param = "TMR," tmr_field

TMU_param = "TMU," tmr_field

TNS_param = "TNS," ton_field "," nip_field "," trans_field


UCI_param = "UCI," uci_tc_field "," uci_t9_field

UFC_param = "UFC," nss_param_name "," instr_field "," nss_field_name ","
            dat_field

UID_param = "UID," uid_tc_field "," uid_t9_field

USI_param = ("USI," usi_field_1)  /
            ("USI," usi_field_2)  /
            ("USI," usi_field_3)  /
            ("USI," usi_field_4)  /
            ("USI," usi_field_5)  /
            ("USI," usi_field_6)  /
            ("USI," usi_field_7)  /
            ("USI," usi_field_8)  /
            ("USI," usi_field_9)  /
            ("USI," usi_field_10) /
            ("USI," usi_field_11) /
            ("USI," usi_field_12) /

USP_param = USI_param

UTI_param = "UTI," cs_field "," interp_field "," pfl_field "," hlc_field ","
            ehl_field

UUI_param = ("UUI," uui_field_1) /
            ("UUI," uui_field_2)

UUS_param = "UUS," pd_field "," dat_field


VER_param = "VER," ver_field
```

NOTE – The following is an alphabetized list of compact field definitions.

```
acc_field = (opt-unk / "n" / "y")

aci_field = opt-unk / DIGIT

acl_field = (opt-unk / "1" / "2")

act_field = 2DIGIT

adi_field = (opt-unk / "n" / "y")

alt_field = 1*DIGIT
```

```
ang_field = 1*DIGIT

apm_field = 0*(2HEX)

asg_field = ("0" / "1")    ; CGL

attribute_ids = attribute_id /
                ( "(" attribute_id 1*("," attribute_id) ")" )

attribute_id = "{" attribute_num "," rejected_attribs "," avail_attribs "}"

attribute_num = "1" / ; info transfer cap
                "2" / ; info transfer mode
                "3" / ; info transfer rate
                "4" / ; structure
                "5" / ; configuration
                "6" / ; establishment
                "7" / ; symmetry
                "8" / ; info transfer rate_dest_orig
                "9" / ; layer id
                "A"   ; rate multiplier

auc_field = 1*DIGIT

avail_attribs = rejected_attribs


bct_field = DIGIT

bear_field = 3DIGIT

bid_field = 1*(2HEX)

bnc_field = DIGIT

brc_field = ("0" / "1")

bri_field = "(" redir_ind *( "," redir_ind ) ")"

bvn_field = ("0" / "d" / "s")


call_id_field = 6HEX

call_rejected_ind = "{" reject_reason "," reject_cond
                    [ "," user_specific_diag ] [ "," ie_type "," ie_id ]
                    "}"

cap_field = LALPHANUM

cause_field = 3DIGIT

cc_field = opt-unk / "n" / "1" / "2"

ccbs_ind = (opt-unk / "n" / "y") ; y for CCBS possible, n for CCBS not possible
                                 ; u for unknown

ccn_field = (opt-unk / "n" / "y")

ccs_field = ("0" / "y")

cdpn_coding = "{" noa_field "," npi_field "," nr_field "}"
              NOTE - Only short form is used in the 'embedded' field.
```

```
cdt_field = (opt-unk / "n" / "y")

cgl_field_0 = pi_field "," si_field "," opt-unk

cgl_field_1 = pi_field "," si_field "," "0" "," ns_field ","
              lat_field "," lon_field

cgl_field_2 = pi_field "," si_field "," "1" "," ns_field ","
              lat_field "," lon_field "," unc_field "," con_field

cgl_field_3 = pi_field "," si_field "," "2" "," ns_field ","
              lat_field "," lon_field "," unc_field "," asg_field ","
              alt_field "," auc_field "," con_field

cgl_field_4 = pi_field "," si_field "," "3" "," ns_field ","
              lat_field "," lon_field "," maj_field "," min_field ","
              ori_field "," con_field

cgl_field_5 = pi_field "," si_field "," "4" "," ns_field ","
              lat_field "," lon_field "," rad_field "," off_field ","
              ang_field "," con_field

cgl_field_6 = pi_field "," si_field "," "5" "," num_field ","
              pts_fields "," con_field

cgl_field_7 = pi_field "," si_field "," "6" "," ns_field ","
              lat_field "," lon_field "," asg_field "," alt_field

cgl_field_8 = pi_field "," si_field "," "7" "," ns_field ","
              lat_field "," lon_field "," asg_field "," alt_field ","
              maj_field "," min_field "," ori_field "," auc_field ","
              con_field

cgl_field_9 = pi_field "," si_field "," "8" "," ns_field ","
              lat_field "," lon_field "," inr_field "," unc_field ","
              off_field "," ang_field "," con_field

cgv_field_0 = pi_field "," si_field "," "0"

cgv_field_1 = pi_field "," si_field "," "1" "," bear_field ","
              hvel_field

cgv_field_2 = pi_field "," si_field "," "2" "," bear_field ","
              hvel_field "," dir_field "," vvel_field

cgv_field_3 = pi_field "," si_field "," "3" "," bear_field ","
              hvel_field "," hu_field

cgv_field_4 = pi_field "," si_field "," "4" "," bear_field ","
              hvel_field "," hu_field "," dir_field "," vvel_field ","
              vu_field

chan_type = "0" / "1" / "2" / "3" ; B, H0, H11, H12 channel units respectively
                                  ; per Table 4-13/Q.931 octet 3.2
                                  ; not generated by ISUP

charge_field = ("0" / "n" / "y")

chi_field = 5DIGIT

cic_field = 10DIGIT

cls_field = 3DIGIT
```

```
cnf_field = ("0" / "n" / "y")

cni_field = (opt-unk / "n" / "y")

codec_field = 2DIGIT

codec_list_field = "(" "{" codec_seq_field "}"
                       *( "," "{" codec_seq_field "}" ) ")"

codec_seq_field = inst_field "," org_field "," codec_field ","
                  config_field "," config_alt_field

col_field = ("0" / "y")

comp_field = "0" / "1"

con_field = 1*DIGIT

con_line_id_req = (opt-unk / "n" / "y")

condition_coding = "{" cond_c1 "," cond_c2 "," cond_c3 "}"

cond_c1 = (opt-unk / "0" / "1") ; u for unknown, 0 for user, 1 for provider

cond_c2 = (opt-unk / "0" / "1") ; u for unknown, 0 for normal, 1 for abnormal

cond_c3 = reject_cond

conf_field = (opt-unk / "p")

config_alt_field = *(2HEX)

config_field = [ "(" [ option_field *( "," option_field) ] ")" ]

cot_field = DIGIT

cpc_field = 2DIGIT

cre_field = 3DIGIT

cs_field = ( opt-unk / "c" / "i" / "n" / "p" ) ; i from ITU-T Rec. Q.850

csi_field = 2DIGIT

cti_field = opt-unk / "f" / "s"

ctr_field = 3DIGIT

cug_call = opt-unk / "n" / "1" / "2"


dat_field = 1*(2HEX)

data_bit = DIGIT

diag_field = [ "{" [condition_coding]  "," ; Condition, see subfield
                   [tni_coding]        "," ; Transit Network Identity (TNS/NSF)
                   [ccbs_ind]          "," ; CCBS Indicator (ITU-T Rec. Q.733.3)
                   [call_rejected_ind] "," ; Call Rejected Diagnostic
                   [new_dest]          "," ; New destination Called Party Number
                   [fac_id_reject]     "," ; Facility ID/Rejected parameter
                   [attribute_ids]     "," ; Attribute identity
                   [chan_type]         "," ; Channel type
                   [incompat_param]    "," ; Incompatible parameter (IE ID)
```

```
                    [timer_num]          "," ; Timer Number
                    [msg_type]           "," ; Message Type
                    [param_name]         "}" ; Parameter Name
                    ] ; at least one diagnostic or else entire field is empty

diag_list_field =   [ "(" "{" diagnostic_id "," diagnostic_index "}"
                    *( "," "{" diagnostic_id "," diagnostic_index "}" ) ")" ]

diagnostic_id = 2HEX

diagnostic_index = 2(2HEX)

dir_field = DIGIT

dis_field = 1*(2Hex)

dur_field = 5DIGIT

duration_ms = 5DIGIT


e2ei_field = (opt-unk / "n" / "y")

e2em_field = (opt-unk / "n" / "1" / "2" / "3")

echo_field = (opt-unk / "n" / "y")

ehl_field =  3DIGIT

encoding_scheme = DIGIT

estab_field = (opt-unk / "d")

evi = opt-unk / "a" / "p" / "i" / DIGIT

evr = "0" / "y" / "n"


fai_field = "s"

fac_id_reject = 1*(2HEX) ;network dependent, variable length.

fvn_field_1 = "osp," 1*DIGIT

fvn_field_2 = "cug," 1*DIGIT

fvn_field_3 = "trn," noa_field "," npi_field "," trn_field


gci_field = token ["@" token]

gea_type = ( "dest" / "diad" / "rsrv" / "sufs" / "suns" /
             "trs1" / "trs2" / "trs3" / "trs4" / "trs5" / "trs6" )

gic_bc_field       = 4HEX

gno_field          = 2DIGIT


hlc_field          = 3DIGIT

hoc_field          = 2DIGIT

hold_ind_field     = (opt-unk / "n" / "y")
```

```
hold_prov          = (opt-unk / "n" / "y")

hu_field           = 3DIGIT

hvel_field         = 5DIGIT


ie_type            = ("0" / "1")

ie_id              = 1*(2HEX)

in_info_field      = DIGIT

in_req_field       = "0" / "a" / "d"

incompat_param     = 2HEX

ini_info_field     = DIGIT

ini_resp_field     = "i" / "x" / "n"

ini_sol_field      = (opt-unk / "n" / "y")

inn_field          = (opt-unk / "n" / "y")  ; CDN and CPN

inr_field          = 1*DIGIT

inst_field         = "{" pass_field "," not_field "," nopass_field "," not_field
                     "}"

instr_field        = opt-unk / DIGIT

inter_field        = (opt-unk / "n" / "y")

interp_field       = DIGIT  ; UTI parameter

intnat_field       = (opt-unk / "n" / "y")

iri_field          = DIGIT

isdn_pref          = opt-unk / "n" / "1" / "2"

isup_ind_field     = (opt-unk / "n" / "y")

iwf_field          = dat_field

iwri_field         = (opt-unk / "n" / "y") ; PCA


lat_field          = 1*DIGIT

layer1_field       = 4LALPHANUM

layer2_field       = lay2_prot "," lay_mode "," lay2_use "," lay2_inf ","
                     lay_win

layer3_field       = lay3_prot "," lay_mode "," lay3_pks "," lay_win ","
                     lay3_inf

lay_mode           = LALPHA

lay_win            = 3DIGIT
```

```
lay2_prot          = 2DIGIT

lay2_use           = LALPHA

lay2_inf           = 2HEX

lay3_prot          = DIGIT

lay3_pks           = DIGIT

lay3_inf           = DIGIT

lc_field           = ( "unk" / "usr" / "lpn" / "lln" / "tra" /
                     "rln" / "rpn" / "int" / "bip" ) ;CAI

lid_field          = 4(2HEX)

loc_field          = 6HEX ;CNR

lon_field          = 1*DIGIT

loop_field         = (opt-unk / "1" / "2")


maj_field          = 1*DIGIT

mci_inst           = opt-unk / DIGIT

mcr_resp           = (opt-unk / "n" / "y")

min_field          = 1*DIGIT

mlp_lfb            = opt-unk / "y" / "n" / "r"

mlp_pl             = opt-unk / DIGIT

mlp_req_field      = (opt-unk / "n" / "y")

mlp_sd             = 6HEX

mod_field          = opt-unk / "c" / "p"

modem_type         = 2DIGIT

mparm_field        = nss_param_name

mpl_field          = "(" nss_param_name *("," nss_param_name) ")"

msg_type           = 2HEX ; refer to Table 4/Q.763 and Table 4-2/Q.931

mult_rate_field    = 2DIGIT


neg_field          = ("n" / "y")

net_id_field       = 4HEX ; GIC and MLP

new_dest = cdpn_coding / ; CDP alone or CDP plus TNS
           ( "{" cdpn_coding ","
           "{" ton_field "," nip_field "," cc_field "," trans_field "}"
           "}" )

nid_field  = *(2HEX)
```

```
nip_field        = LALPHANUM ; NSF and TNS
nmc_field        = ("0" / "1" / "y")
noa_field        = 2DIGIT
nopass_field     = DIGIT
not_field        = ("n" / "y")
npi_field        = opt-unk / DIGIT
nps_field        = DIGIT
nr_field         = telephone-number
nrn_noa_field    = DIGIT
ns_field         = ("0" / "1")
nso_field        = opt-unk / DIGIT
nsf_nid          = 1*(2HEX)
nsf_ind          = 1*(2HEX)
num_field        = 2DIGIT

obi_cf           = ("0" / "n" / "y")
obi_mlpp         = ("0" / "n" / "y")
obi_inb          = ("0" / "n" / "y")
oct_field        = (opt-unk / "n" / "y")
off_field        = 1*DIGIT
option_field     = ("y" / "n")
org_field        = 3DIGIT
ori_field        = 1*DIGIT
orig_red__reason = opt-unk / DIGIT
out_info_field   = DIGIT
out_req_field    = "0" / "a" / "d"

param_name       = 2HEX ; Table 5/Q.763 (in CAI param)
parity           = "o" / "e" / "n" / "0" / "1"
pass_field       = DIGIT
pbi_field_1      = "1," duration_ms
pbi_field_2      = "2," call_id_field "," pc_field
pbi_field_3      = "3," redirect_reason_field
```

```
pc_cluster       = 3DIGIT

pc_field         = (pc_net "." pc_cluster "." pc_member)

pc_member        = 3DIGIT

pc_net           = 3DIGIT

pca_field        = DIGIT

pci_inst         = opt-unk / DIGIT

pct_field        = 2DIGIT

pdc_field        = 5DIGIT

pd_field         = DIGIT

pfi_field_1      = "2," duration_ms

pfi_field_2      = "3," pfi_ppr "," pfi_ppi

pfi_field_3      = "4," redirect_reason_field

pfi_ppr          = 3DIGIT

pfi_ppi          = DIGIT

pfl_field        = ("0" / "1")

pi_field         = opt-unk / "y" / "n" / "0"

prot_field       = 5CHAR

protocol_profile = (opt-unk / "1")

pts_field        = "{" ns_field "," lat_field "," lon_field "}"

pts_fields       = "(" pts_field 2*14("," pts_field) ")"

pvr_field        = DIGIT

pvs_field        = ("0" / "1" / "2")


qor_field        = ("0" / "y")


rad_field        = 1*DIGIT

rate_field       = DIGIT

rbi_field_1      = "1," duration_ms

rbi_field_2      = "2," call_id_field "," pc_field

rbi_field_3      = "3," redirect_reason_field

rci_field        = (opt-unk / "n" / "y")

rct_field        = 2DIGIT

rdc_field        = DIGIT
```

```
rds_field = ("0" / "1" / "2")

rea_field = DIGIT

rec_field = (opt_unk / "q" / "p" / "1" / "5")

redir_ind = 2DIGIT

redirecting_ind = DIGIT

redirect_count  = 2DIGIT

redirect_reason = opt-unk / DIGIT

redirect_reason_field = 3DIGIT

reject_reason  = ("00" / "01" / "02")
 ; 00 for user_specific,
 ; 01 for IE missing,
 ; 02 for IE contents not sufficient

reject_cond   = (opt-unk / "0" / "1")
 ; u for unknown,
 ; 0 for transient,
 ; 1 for permanent

rejected_attribs = rejected_attrib /
                   "(" rejected_attrib 1*("," rejected_attrib) ")"

rejected_attrib = 1*(2HEX)

req_field     = ("0" / "1")

rfi_field_1   = "2," call_id_field "," pc_field

rfi_field_2   = "3," rfi_prr "," rfi_rpi

rfi_field_3   = "4," redirect_reason_field

rfi_prr     = 3DIGIT

rfi_rpi     = DIGIT

rnr_field   = (opt-unk / "n" / "y")

rr_field    = opt-unk / DIGIT


sat_field   = opt-unk / DIGIT

sccpm_field  = ("0" / "1" / "2" / "3")

scf_field    = 1*(2HEX)

sea_field    = 2DIGIT

seg_field    = 2DIGIT

si_field     = opt-unk / DIGIT

sig_list_field = "(" "{"sigid_field ","dur_field "}"
                 *( "," "{"sigid_field ","dur_field "}" ) ")"

sigid_field = 2DIGIT
```

```
slr_field   = 2HEX

sn_field    = ("0" / "1")

sni_field   = (opt-unk / "n" / "y")

sparm_field  = 3HEX

sri_field   = (opt-unk / "s" / "n")

status_field = (opt-unk / "f" / "c")

stop_bit    = DIGIT

str_field   = DIGIT

sub_add_field = 2DIGIT

sun_field   = nr_field

sym_field   = 2LALPHA

sync_field  = ("n" / "y")


tid_field   = token ["@" token]

timer_num   = 3DIGIT ; not generated by ISUP (in CAI diagnostics)

tmr_field   = DIGIT

tni_coding  = tni_val / "(" tni_val 1*("," tni_val) ")"  ; CAI

tni_val = "{" ("0," ton_field "," nip_field "," nsf_nid "," nsf_ind)   ; NSF
            / ("1," ton_field "," nip_field "," cc_field "," trans_field) ; TNS
            "}"  ; encapsulates the corresponding information element

toc_field   = 4LALPHANUM

ton_field   = (opt-unk / "c" / "n") ; type of network for CID, NSF, and TNS

trans_field  = 1*HEX

trn_field   = 1*DIGIT

tri_field   = ("0" / "1")

type_of_digit = DIGIT ; GED


uci_t9_field = ("0" / "y" / "n")

uci_tc_field = ("0" / "y" / "n")

uid_t9_field = ("0" / "y")

uid_tc_field = ("0" / "y")

unc_field  = 1*DIGIT

user_specific_diag = 1*(2HEX)

usi_asgn_field = ("0" / "1")
```

```
usi_field_1 = "rate," cs_field "," cap_field "," mod_field "," rate_field

usi_field_2 = "sup1," str_field "," estab_field "," conf_field

usi_field_3 = "symm," sym_field "," rate_field

usi_field_4 = "mult," mult_rate_field

usi_field_5 = "lay1," layer1_field

usi_field_6 = "subr," sub_addr_field "," neg_field "," sync_field

usi_field_7 = "v110," usi_int_field "," usi_txnic_field ","
              usi_rxnic_field "," usi_txfl_field "," usi_rxfl_field

usi_field_8 = "v120," usi_hdr_field "," usi_mf_field "," usi_mode_field ","
              usi_lli_field "," usi_asgn_field "," usi_inband_field

usi_field_9 = "pari," stop_bit "," data_bit "," parity

usi_field_10 = "modm," modem_type

usi_field_11 = "lay2," layer2_field

usi_field_12 = "lay3," layer3_field

usi_hdr_field = (opt-unk / "n" / "y")

usi_inband_field = ("0" / "1")

usi_int_field  = 2DIGIT

usi_lli_field  = ("0" / "1")

usi_mf_field   = (opt-unk / "n" / "y")

usi_mode_field = ("0" / "1")

usi_rxfl_field = (opt-unk / "n" / "y")

usi_rxnic_field = (opt-unk / "n" / "y")

usi_txfl_field = (opt-unk / "n" / "y")

usi_txnic_field = (opt-unk / "n" / "y")

uui_field_1 = "reqt," uui_srv1 "," uui_srv2 "," uui_srv3

uui_field_2 = "resp," uui_ssrv1 "," uui_ssrv2 "," uui_ssrv3 "," uui_ndi

uui_ndi   = ("0" / "y")

uui_srv1   = ("0" / "y" / "n")

uui_srv2   = ("0" / "y" / "n")

uui_srv3   = ("0" / "y" / "n")

uui_ssrv1  = ("0" / "y" / "n")

uui_ssrv2  = ("0" / "y" / "n")

uui_ssrv3   = ("0" / "y" / "n")
```

```
ver_field   = DIGIT "." 2DIGIT

vu_field    = 3DIGIT

vvel_field  = 3DIGIT
```

Appendix I

Narrowband Signalling Syntax (NSS) encoding examples

I.1 Message examples

This appendix provides some examples of (verbose) display and (compact) transmission mode NSS messages, as well as the encapsulation of the NSS body using MIME in a SIP message.

Table I.1/Q.1980.1 – Message sequence examples

Display Mode message sequence	Transmission Mode message sequence
VER,v=1.00 PRN,prot=q1902 IAM, GCI,gci=1234567890 TID,tid=4444000010 NOC,sat=0,eco=n,cot=0,vci=n FCI,int=n,e2ei=n,e2em=1,inter=n,iupi=y,pref=n,acc=y,sccpm=0 CPC,cpc=09 USI,type=rate,cs=n,cap=s,mode=c,rate=1 USI,type=lay1,lay1=ulaw CPN,noa=04,inn=y,npi=1,#=7035551234 CGN,noa=04,cni=y,npi=1,pi=y,si=1,#=4085551234	VER,1.00 PRN,q1902 IAM, GCI,1234567890 TID,4444000010 NOC,0,n,0,n FCI,n,n,1,n,y,n,y,0 CPC,09 USI,rate,n,s,c,1 USI,lay1,ulaw CPN,04,y,1,7035551234 CGN,04,y,1,y,1,4085551234
VER,v=1.00 PRN,prot=q1902 ACM, TID,tid=4444000020 GCI,gci=123456789@itsp1.com BCI,cha=y,sta=f,cpc=09,e2ei=n,e2em=1,inter=n,iupi=y,h=n,acc=y,eco=n,sccpm=0	VER,1.00 PRN,q1902 ACM, TID,tid=4444000020 GCI,123456789@itsp1.com BCI,y,f,09,n,1,n,y,n,y,n,0
VER,v=1.00 PRN,prot=q1902 ANM, GCI,gci=1234567890 TID,tid=4444000030	VER,1.00 PRN,q1902 ANM, GCI,1234567890 TID,tid=4444000030
VER,v=1.00 PRN,prot=q1902 REL, GCI,gci=1234567890 TID,tid=4444000040 CAI,cs=c,loc=lln,rec=q,cau=016,di=	VER,1.00 PRN,q1902 REL, GCI,1234567890 TID,4444000040 CAI,c,lln,q,016,
VER,v=1.00 PRN,prot=q1902 RLC, GCI,gci=1234567890 TID,tid=4444000050	VER,1.00 PRN,q1902 RLC, GCI,1234567890 TID,4444000050

To illustrate the use of the 'application/nss' media type, below is an INVITE message which has the originating SDP (specified in RFC 2327) information and the encapsulated ISUP IAM. Note that the two payloads are demarcated by the boundary parameter (specified in RFC 2046) which in the example has the value "unique-boundary". This is part of the specification of MIME multipart and is not related to the 'application/nss' media type.

Example:

```
INVITE sip:7775551212@callagent.company.com SIP/2.0
Via: SIP/2.0/UDP callagent.itsp.com:5060
From: Sip:7775553333@callagent.itsp.com
To: Sip:7775551212@callagent.company.com
Call-ID: Q23ert67@callagent.itsp.com
Cseq: 1
Contact: <sip:johndoe@company.com>
Subject: Transit stuff
Content-Type: multipart-mixed; boundary=unique-boundary
Content-Length: 1234
MIME-Version: 1.0

--unique-boundary
Content-Type: application/sdp; charset=us-ascii

v=0
o=john-doe 200104101630 001 IN IP4 111.22.33.4
s=NSS Call Session
c=IN IP4 callagent.company.com
t= 3034423619 3034443619
m=audio 9092 RTP/AVP 0 3 4

--unique-boundary
Content-Type: application/nss; charset=us-ascii
Content-Transfer-Encoding: 7bit
Content-Disposition: signal; handling=required

VER,1.00
PRN,q1902
IAM,
GCI,1234567890123456
TID,444400001
NOC,0,n,0,n
FCI,n,n,1,n,y,n,y,n
CPC,09
```

USI,rate,n,s,c,1

USI,lay1,ulaw

CPN,04,y,1,7891234567

CGN,04,y,1,y,1,9876543210

--unique-boundary—

I.2 Compatibility ordering example

The following is an example of the order in which compatibility parameters are found in an NSS message. A FDC (or UFC) must immediately follow the parameter whose field value needs the FDC (or UFC). If there are more than one FDC for the same instance of a parameter, the order of those FDCs (or UFCs) shall follow the order of the fields that occur in the parameter.

For example, suppose both the noa and pi fields of the first GEA need FDC and the si field of the second GEA also need FDC, then proper order of parameters shall be:

GEA,<type>,<**noa>**,<npi>,<cni>,<**pi>**,<si>,<#>

FDC for **noa**,,,

FDC for **pi**,,,

GEA,<type>,<noa>,<npi>,<cni>,<pi>,<**si**>,<#>

FDC for **si**,,,

The following is an incorrect message structure, because it would indicate that the values in the three FDC parameters were associated with the number found in the second GEA parameter:

GEA,<type>,<**noa>**,<npi>,<cni>,<**pi>**,<si>,<#>

GEA,<type>,<noa>,<npi>,<cni>,<pi>,<**si**>,<#>

FDC for **noa**,,,

FDC for **pi**,,,

FDC for **si**,,,

I.3 GCI and TID structure example

The following are some suggested guidelines for constructing GCI and TID values.

Use values of the form: locally-unique-identifier@address, where locally-unique-identifier is a value determined by the protocol, and address is a globally unique. Use of an IPv4 address of the form: 123.123.123.123, IPv6 address, or a fully qualified domain name (FQDN) is recommended. An ASCII representation of the 48-bit IEEE 802 address can also be used. It is recommended that the locally-unique-identifier be a 16-character value composed of monotonically increasing IA5 0-9 or A-F characters.

For mapping to the ITU-T H.225 standard for GloballyUniqueID, this could also be a 16-character ASCII representation of a UTC timestamp followed by a 4-character ASCII representation of the clock sequence. That could be expanded directly from the 10-byte 8-bit value from GloballyUniqueID or the UTC timestamp could be ordered with the year in the leftmost position.

The BICC Global Call Reference binary octets could be represented as hex digits in the locally_unique_identifier, followed by the "@" and the FQDN of the gateway. The "dot" character would separate the three parts of the global call reference (e.g., a 3-octet reference value:

msb->1000 0010<-lsb, 0000 0011, and 0001 1010 would appear as: 82.03.1A@gw1-abc.com).

Since the Call-ID is generated by and for SIP, there is no reason to deal with the complexity of URL-encoding and case-ignoring string comparison. The following is extracted from SIP:

The callid MUST be a globally unique identifier and MUST NOT be reused for later calls. Use of crypto-graphically random identifiers is RECOMMENDED. Implementations MAY use the form "localid@host". Call-IDs are case-sensitive and are simply compared byte-by-byte. Using cryptographically random identifiers provides some protection against session hijacking. Call-ID, To and From are needed to identify a call leg. The distinction between call and call leg matters in calls with third-party control.

Appendix II

NSS verbose encoding

It is possible to easily generate the verbose description from compact transmission mode by inserting the field name string literals of the form "tag=" into their fixed positions. Likewise, the compact mode can be generated from the verbose description by removing the "tag=" from all fields.

General format of NSS verbose description ABNF

```
The compact transmission encoding and verbose description use identical message,
parameter, and value formats. Only the field encoding differs. The field formats
include the tag literals as defined below.

verbose_message = VER_param CRLF ; using the field definitions below
         PRN_param CRLF     ; using the field definitions below
         nss_msg_name "," CRLF
         *verbose_nss_param  ; using the field definitions below
```

NOTE - The following is an alphabetized list of verbose field definitions.

```
acc_field = "acc=" (opt-unk / "n" / "y")

aci_field = "aci=" opt-unk / DIGIT

acl_field = "acl=" (opt-unk / "1" / "2")

act_field = "act=" 2DIGIT

adi_field = "adi=" (opt-unk / "n" / "y")

alt_field = "alt=" 1*DIGIT

ang_field = "ang=" 1*DIGIT

apm_field = "apm=" 0*(2HEX)

asg_field = "as=" ("0" / "1")    ; CGL

attribute_ids = attribute_id /
                ( "(" attribute_id 1*("," attribute_id) ")" )

attribute_id = "{" attribute_num "," rejected_attribs "," avail_attribs "}"

attribute_num = "1" / ; info transfer cap
                "2" / ; info transfer mode
                "3" / ; info transfer rate
                "4" / ; structure
                "5" / ; configuration
                "6" / ; establishment
                "7" / ; symmetry
                "8" / ; info transfer rate_dest_orig
                "9" / ; layer id
                "A"   ; rate multiplier

auc_field = "auc=" 1*DIGIT

avail_attribs = rejected_attribs
```

```
bct_field = "bct=" DIGIT

bear_field = "bear=" 3DIGIT

bid_field = "bid=" 1*(2HEX)

bnc_field = "brc=" DIGIT

brc_field = "brc=" ("0" / "1")

bri_field = "bri=" "(" redir_ind *( "," redir_ind ) ")"

bvn_field = "tai=" ("0" / "d" / "s")


call_id_field = "cid=" 6HEX

call_rejected_ind = "{" reject_reason "," reject_cond
                    [ "," user_specific_diag ] [ "," ie_type "," ie_id ]
                    "}"

cap_field = "cap=" LALPHANUM

cause_field = "cau=" 3DIGIT

cc_field = "cc=" opt-unk / "n" / "1" / "2"

ccbs_ind = (opt-unk / "n" / "y") ; y for CCBS possible, n for CCBS not possible
                                 ; u for unknown

ccn_field = "cpi=" (opt-unk / "n" / "y")

ccs_field = "ccss=" ("0" / "y")

cdpn_coding = "{" noa_field "," npi_field "," nr_field "}"
              NOTE - Only short form is used in the 'embedded' field.

cdt_field = "ct=" (opt-unk / "n" / "y")

cgl_field_0 = pi_field "," si_field "," "type=u"

cgl_field_1 = pi_field "," si_field "," "type=0" "," ns_field ","
              lat_field "," lon_field

cgl_field_2 = pi_field "," si_field "," "type=1" "," ns_field ","
              lat_field "," lon_field "," unc_field "," con_field

cgl_field_3 = pi_field "," si_field "," "type=2" "," ns_field ","
              lat_field "," lon_field "," unc_field "," asg_field ","
              alt_field "," auc_field "," con_field

cgl_field_4 = pi_field "," si_field "," "type=3" "," ns_field ","
              lat_field "," lon_field "," maj_field "," min_field ","
              ori_field "," con_field

cgl_field_5 = pi_field "," si_field "," "type=4" "," ns_field ","
              lat_field "," lon_field "," rad_field "," off_field ","
              ang_field "," con_field

cgl_field_6 = pi_field "," si_field "," "type=5" "," num_field ","
              pts_fields "," con_field

cgl_field_7 = pi_field "," si_field "," "type=6" "," ns_field ","
              lat_field "," lon_field "," asg_field "," alt_field
```

```
cgl_field_8 = pi_field "," si_field "," "type=7" "," ns_field ","
              lat_field "," lon_field "," asg_field "," alt_field ","
              maj_field "," min_field "," ori_field "," auc_field ","
              con_field

cgl_field_9 = pi_field "," si_field "," "type=8" "," ns_field ","
              lat_field "," lon_field "," inr_field "," unc_field ","
              off_field "," ang_field "," con_field

cgv_field_0 = pi_field "," si_field "," "type=0"

cgv_field_1 = pi_field "," si_field "," "type=1" "," bear_field ","
              hvel_field

cgv_field_2 = pi_field "," si_field "," "type=2" "," bear_field ","
              hvel_field "," dir_field "," vvel_field

cgv_field_3 = pi_field "," si_field "," "type=3" "," bear_field ","
              hvel_field "," hu_field

cgv_field_4 = pi_field "," si_field "," "type=4" "," bear_field ","
              hvel_field "," hu_field "," dir_field "," vvel_field ","
              vu_field

chan_type = "0" / "1" / "2" / "3" ; B, H0, H11, H12 channel units respectively
                                  ; per Table 4-13/Q.931 octet 3.2
                                  ; not generated by ISUP

charge_field = "cha=" ("0" / "n" / "y")

chi_field = "pd=" 5DIGIT

cic_field = "cic=" 10DIGIT

cls_field = "cls=" 3DIGIT

cnf_field = "cai=" ("0" / "n" / "y")

cni_field = "cni=" (opt-unk / "n" / "y")

codec_field = "codec=" 2DIGIT

codec_list_field = "(" "{" codec_seq_field "}"
                       *( "," "{" codec_seq_field "}" ) ")"

codec_seq_field = inst_field "," org_field "," codec_field ","
                  config_field "," config_alt_field

col_field = "cci=" ("0" / "y")

comp_field = "comp=" "0" / "1"

con_field = "con=" 1*DIGIT

con_line_id_req = (opt-unk / "n" / "y")

condition_coding = "{" cond_c1 "," cond_c2 "," cond_c3 "}"

cond_c1 = (opt-unk / "0" / "1") ; u for unknown, 0 for user, 1 for provider

cond_c2 = (opt-unk / "0" / "1") ; u for unknown, 0 for normal, 1 for abnormal

cond_c3 = reject_cond
```

```
conf_field = "conf=" (opt-unk / "p")

config_alt_field = "cdat=" *(2HEX)

config_field = "confg=" [ "(" [ option_field *( "," option_field) ] ")" ]

cot_field = "cot=" DIGIT

cpc_field = "cpc=" 2DIGIT

cre_field = "cre=" 3DIGIT

cs_field = "cs=" ( opt-unk / "c" / "i" / "n" / "p" ) ; i ITU-T Rec. from Q.850

csi_field = "csi=" 2DIGIT

cti_field = "cti=" opt-unk / "f" / "s"

ctr_field = "ref=" 3DIGIT

cug_call = "cug=" opt-unk / "n" / "1" / "2"


dat_field = "dat=" 1*(2HEX)

data_bit = "dat=" DIGIT

diag_field = [ "{" [condition_coding]       "," ; Condition, see subfield
                   [tni_coding]             "," ; Transit Network Identity
                                                  (TNS/NSF)
                   [ccbs_ind]               "," ; CCBS Indicator (Q.733.3)
                   [call_rejected_ind]      "," ; Call Rejected Diagnostic
                   [new_dest]               "," ; New destination Called Party
                                                  Number
                   [fac_id_reject]          "," ; Facility ID/Rejected parameter
                   [attribute_ids]          "," ; Attribute identity
                   [chan_type]              "," ; Channel type
                   [incompat_param]         "," ; Incompatible parameter (IE ID)
                   [timer_num]              "," ; Timer Number
                   [msg_type]               "," ; Message Type
                   [param_name]             "}" ; Parameter Name
       ] ; at least one diagnostic or else entire field is empty
```

NOTE - The diagnostics subfields do not have tags (tag=) construction.

```
diag_list_field = "diag=" [ "(" "{" diagnostic_id "," diagnostic_index "}"
                  *( "," "{" diagnostic_id "," diagnostic_index "}" ) ")" ]

diagnostic_id = 2HEX

diagnostic_index = 2(2HEX)

dir_field = "dir=" DIGIT

dis_field = "info=" 1*(2Hex)

dur_field = "dur=" 5DIGIT

duration_ms = "dur=" 5DIGIT


e2ei_field = "e2ei=" (opt-unk / "n" / "y")
```

```
e2em_field = "e2em=" (opt-unk / "n" / "1" / "2" / "3")

echo_field = "eco=" (opt-unk / "n" / "y")

ehl_field = "ehl=" 3DIGIT

encoding_scheme = "es=" DIGIT

estab_field = "estab=" (opt-unk / "d")

evi = "evi=" opt-unk / "a" / "p" / "i" / DIGIT

evr = "evr=" "0" / "y" / "n"

fai_field = "fai=" "s"

fac_id_reject = 1*(2HEX) ;network dependent, variable length.

fvn_field_1 = "type=osp,osp=" 1*DIGIT

fvn_field_2 = "type=cug,cug=" 1*DIGIT

fvn_field_3 = "type=trn," noa_field "," npi_field "," trn_field

gci_field = "gci=" token ["@" token]

gea_type = "type=" ("dest" / "diad" / "rsrv" / "sufs" / "suns" /
           "trs1" / "trs2" / "trs3" / "trs4" / "trs5" / "trs6" )

gic_bc_field = "bc=" 4HEX

gno_field  = "ni=" 2DIGIT

hlc_field   = "hlc=" 3DIGIT

hoc_field   = "hc=" 2DIGIT

hold_ind_field = "h=" (opt-unk / "n" / "y")

hold_prov   = "hp=" (opt-unk / "n" / "y")

hu_field    = "hu=" 3DIGIT

hvel_field   = "hvel=" 5DIGIT

ie_type    = ("0" / "1")

ie_id     = 1*(2HEX)

in_info_field = "iei=" DIGIT

in_req_field  = "ier=" "0" / "a" / "d"

incompat_param = 2HEX

ini_info_field = "inf=" DIGIT

ini_resp_field = "inf=" "i" / "x" / "n"

ini_sol_field = "inf=" (opt-unk / "n" / "y")
```

```
inn_field   = "inn=" (opt-unk / "n" / "y")  ; CDN and CPN

inr_field   = "inr=" 1*DIGIT

inst_field = "instr={" pass_field "," not_field "," nopass_field "," not_field
             "}"

instr_field  = "instr=" opt-unk / DIGIT

inter_field  = "inter=" (opt-unk / "n" / "y")

interp_field  = "int=" DIGIT  ; UTI

intnat_field  = "int=" (opt-unk / "n" / "y")

iri_field   = "iri=" DIGIT

isdn_pref   = "pref=" opt-unk / "n" / "1" / "2"

isup_ind_field = "iupi=" (opt-unk / "n" / "y")

iwf_field = "iwf=" dat_field

iwri_field   = "iwri=" (opt-unk / "n" / "y") ; PCA


lat_field   = "lat=" 1*DIGIT

layer1_field  = "lay1=" 4LALPHANUM

layer2_field  = lay2_prot "," lay_mode "," lay2_use "," lay2_inf "," lay_win

layer3_field  = lay3_prot "," lay_mode "," lay3_pks "," lay_win "," lay3_inf

lay_mode    = "mode=" LALPHA

lay_win    = "win=" 3DIGIT

lay2_prot   = "lay2=" 2DIGIT

lay2_use    = "use=" LALPHA

lay2_inf    = "inf=" 2HEX

lay3_prot   = "lay3=" DIGIT

lay3_pks    = "pks=" DIGIT

lay3_inf    = "inf=" DIGIT

lc_field    = "loc=" ( "unk" / "usr" / "lpn" / "lln" / "tra" /
                       "rln" / "rpn" / "int" / "bip" ) ;CAI

lid_field = "lid=" 4(2HEX)

loc_field   = "loc=" 6HEX ;CNR

lon_field   = "lon=" 1*DIGIT

loop_field   = "lpi=" (opt-unk / "1" / "2")


maj_field    = "maj=" 1*DIGIT
```

```
mci_inst    = "instr=" opt-unk / DIGIT

mcr_resp    = "rp=" (opt-unk / "n" / "y")

min_field    = "min=" 1*DIGIT

mlp_lfb     = "lfb=" opt-unk / "y" / "n" / "r"

mlp_pl     = "pl=" opt-unk / DIGIT

mlp_req_field  = "ri=" (opt-unk / "n" / "y")

mlp_sd     = "sd=" 6HEX

mod_field    = "mode=" opt-unk / "c" / "p"

modem_type   = "modm=" 2DIGIT

mparm_field   = "mparm=" nss_param_name

mpl_field    = "plist=" "(" nss_param_name *("," nss_param_name) ")"

msg_type    = 2HEX ; refer to Table 4/Q.763 and Table 4-2/Q.931

mult_rate_field = "mult=" 2DIGIT


neg_field  = "neg=" ("n" / "y")

net_id_field = "ni=" 4HEX ; GIC and MLP

new_dest = cdpn_coding / ; CDP alone or CDP plus TNS
           ( "{" cdpn_coding ","
           "{" ton_field "," nip_field "," cc_field "," trans_field "}"
           "}" )

nid_field = "nid=" *(2HEX)

nip_field  = "nip=" LALPHANUM ; NSF and TNS

nmc_field  = "tari=" ("0" / "1" / "y")

noa_field  = "noa=" 2DIGIT

nopass_field = DIGIT

not_field = ("n" / "y")

npi_field  = "npi=" opt-unk / DIGIT

nps_field  = "nps=" DIGIT

nr_field   = "#=" telephone-number

nrn_noa_field = "noa=" DIGIT


ns_field   = "ns=" ("0" / "1")

nso_field  = "nso=" opt-unk / DIGIT

nsf_nid   = "nid=" 1*(2HEX)
```

```
nsf_ind   = "nsf=" 1*(2HEX)
num_field  = "num=" 2DIGIT

obi_cf     = "cf=" ("0" / "n" / "y")
obi_mlpp     = "mlpp=" ("0" / "n" / "y")
obi_inb     = "inb=" ("0" / "n" / "y")
oct_field    = "coi=" (opt-unk / "n" / "y")
off_field    = "off=" 1*DIGIT
option_field = ("y" / "n")
org_field = "org=" 3DIGIT
ori_field    = "ori=" 1*DIGIT
orig_red__reason = "orr=" opt-unk / DIGIT
out_info_field = "oei=" DIGIT
out_req_field  = "oer=" "0" / "a" / "d"

param_name = 2HEX ; Table 5/Q.763 (in CAI param)
parity   = "parity=" ("o" / "e" / "n" / "0" / "1")
pass_field = DIGIT
pbi_field_1 = "tag=1," duration_ms
pbi_field_2 = "tag=2," call_id_field "," pc_field
pbi_field_3 = "tag=3," redirect_reason_field
pc_cluster = 3DIGIT
pc_field  = "pc=" (pc_net "." pc_cluster "." pc_member)
pc_member  = 3DIGIT
pc_net   = 3DIGIT
pca_field  = "ppi=" DIGIT
pci_inst  = "instr=" (opt-unk / DIGIT)
pct_field  = "pct=" 2DIGIT
pdc_field  = "pd=" 5DIGIT
pd_field  = "pd=" DIGIT
pfi_field_1 = "tag=2," duration_ms
pfi_field_2 = "tag=3," pfi_ppr "," pfi_ppi
pfi_field_3 = "tag=4," redirect_reason_field
```

```
pfi_ppr   = "ppr=" 3DIGIT

pfi_ppi   = "ppi=" DIGIT

pfl_field  = "pfl=" ("0" / "1")

pi_field  = "pi=" opt-unk / "y" / "n" / "0"

prot_field = "prot=" 5CHAR

protocol_profile = "pp=" (opt-unk / "1")

pts_field  = "{" ns_field "," lat_field "," lon_field "}"

pts_fields = "(" pts_field 2*14("," pts_field) ")"

pvr_field  = "pvr=" DIGIT

pvs_field  = "psi=" ("0" / "1" / "2")


qor_field = "qor=" ("0" / "y")


rad_field    = "rad=" 1*DIGIT

rate_field   = "rate=" DIGIT

rbi_field_1   = "tag=1," duration_ms

rbi_field_2   = "tag=2," call_id_field "," pc_field

rbi_field_3   = "tag=3," redirect_reason_field

rci_field    = "rci=" (opt-unk / "n" / "y")

rct_field    = "rc=" 2DIGIT

rdc_field    = "rc=" DIGIT

rds_field    = "rpi=" ("0" / "1" / "2")

rea_field = "rea=" DIGIT

rec_field = "rec=" (opt_unk / "q" / "p" / "1" / "5")

redir_ind = 2DIGIT

redirecting_ind = "ri=" DIGIT

redirect_count = "rc=" 2DIGIT

redirect_reason = "rr=" (opt-unk / DIGIT)

redirect_reason_field = "rea=" 3DIGIT

reject_reason  = ("00" / "01" / "02")
 ; 00 for user_specific,
 ; 01 for IE missing,
 ; 02 for IE contents not sufficient

reject_cond   = (opt-unk / "0" / "1")
 ; u for unknown,
 ; 0 for transient,
```

```
 ; 1 for permanent

rejected_attribs = rejected_attrib /
                   "(" rejected_attrib 1*("," rejected_attrib) ")"

rejected_attrib = 1*(2HEX)

req_field    = "req=" ("0" / "1")

rfi_field_1   = "tag=2," call_id_field "," pc_field

rfi_field_2   = "tag=3," rfi_prr "," rfi_rpi

rfi_field_3   = "tag=4," redirect_reason_field

rfi_prr     = "prr=" 3DIGIT

rfi_rpi     = "rpi=" DIGIT

rnr_field    = "rnr=" (opt-unk / "n" / "y")

rr_field     = "rr=" opt-unk / DIGIT


sat_field   = "sat=" (opt-unk / DIGIT)

sccpm_field  = "sccpm=" ("0" / "1" / "2" / "3")

scf_field   = "scf=" 1*(2HEX)

sea_field   = "fci=" 2DIGIT

seg_field   = "seq=" 2DIGIT

si_field   = "si=" opt-unk / DIGIT

sig_list_field = "sig=" "(" "{"sigid_field ","dur_field "}"
                 *( "," "{"sigid_field ","dur_field "}" ) ")"

sigid_field = "sigid=" 2DIGIT

slr_field   = "slr=" 2HEX

sn_field   = "si=" ("0" / "1")

sni_field   = "sni=" (opt-unk / "n" / "y")

sparm_field  = "sparm=" 3HEX

sri_field   = "sri=" (opt-unk / "s" / "n")

status_field = "sta=" (opt-unk / "f" / "c")

stop_bit   = "stp=" DIGIT

str_field   = "str=" DIGIT

sub_add_field = "subr=" 2DIGIT

sun_field   = nr_field

sym_field   = "sym=" 2LALPHA

sync_field  = "sync=" ("n" / "y")
```

```
tid_field   = "tid=" token ["@" token]

timer_num   = 3DIGIT ; not generated by ISUP (in CAI diagnostics)

tmr_field   = "tmr=" DIGIT

tni_coding  = tni_val / "(" tni_val 1*("," tni_val) ")"  ; CAI

tni_val = "{" ("0," ton_field "," nip_field "," nsf_nid "," nsf_ind)      ; NSF
            / ("1," ton_field "," nip_field "," cc_field "," trans_field) ; TNS
            "}"  ; encapsulates the corresponding information element

toc_field   = "toc=" 4LALPHANUM

ton_field   = "ton=" (opt-unk / "c" / "n") ; type of network for CID, NSF, and
              TNS

trans_field  = "tns=" 1*HEX

trn_field   = "trn=" 1*DIGIT

tri_field   = "tri=" ("0" / "1")

type_of_digit = "tod=" DIGIT ; GED


uci_t9_field = "t9=" ("0" / "y" / "n")

uci_tc_field = "tc=" ("0" / "y" / "n")

uid_t9_field = "t9=" ("0" / "y")

uid_tc_field = "tc=" ("0" / "y")

unc_field  = "unc=" 1*DIGIT

user_specific_diag = 1*(2HEX)

usi_asgn_field = "asgn=" ("0" / "1")

usi_field_1 = "type=rate," cs_field "," cap_field "," mod_field "," rate_field

usi_field_2 = "type=sup1," str_field "," estab_field "," conf_field

usi_field_3 = "type=symm," sym_field "," rate_field

usi_field_4 = "type=mult," mult_rate_field

usi_field_5 = "type=lay1," layer1_field

usi_field_6 = "type=subr," sub_addr_field "," neg_field "," sync_field

usi_field_7 = "type=v110," usi_int_field "," usi_txnic_field ","
              usi_rxnic_field "," usi_txfl_field "," usi_rxfl_field

usi_field_8 = "type=v120," usi_hdr_field "," usi_mf_field "," usi_mode_field ","
              usi_lli_field "," usi_asgn_field "," usi_inband_field

usi_field_9 = "type=pari," stop_bit "," data_bit "," parity

usi_field_10 = "type=modm," modem_type
```

```
usi_field_11 = "type=lay2," layer2_field

usi_field_12 = "type=lay3," layer3_field

usi_hdr_field  = "hdr=" (opt-unk / "n" / "y")

usi_inband_field = "inbnd=" ("0" / "1")

usi_int_field  = "int=" 2DIGIT

usi_lli_field  = "lli=" ("0" / "1")

usi_mf_field   = "mf=" (opt-unk / "n" / "y")

usi_mode_field = "mode=" ("0" / "1")

usi_rxfl_field = "rxfl=" (opt-unk / "n" / "y")

usi_rxnic_field = "rxnic=" (opt-unk / "n" / "y")

usi_txfl_field = "txfl=" (opt-unk / "n" / "y")

usi_txnic_field = "txnic=" (opt-unk / "n" / "y")

uui_field_1 = "type=reqt," uui_srv1 "," uui_srv2 "," uui_srv3

uui_field_2 = "type=resp," uui_ssrv1 "," uui_ssrv2 "," uui_ssrv3 "," uui_ndi

uui_ndi   = "ndi=" ("0" / "y")

uui_srv1   = "srv1=" ("0" / "y" / "n")

uui_srv2   = "srv2=" ("0" / "y" / "n")

uui_srv3   = "srv3=" ("0" / "y" / "n")

uui_ssrv1  = "srv1=" ("0" / "y" / "n")

uui_ssrv2  = "srv2=" ("0" / "y" / "n")

uui_ssrv3  = "srv3=" ("0" / "y" / "n")

ver_field   = "v=" DIGIT "." 2DIGIT

vu_field   = "vu=" 3DIGIT

vvel_field  = "vvel=" 3DIGIT
```

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