3GPP TSG CN Plenary Meeting #17 **NP-020342**
4th - 6th September 2002. Biarritz, France.

Source: TSG CN WG2

Title: CRs on Rel-5 Work Item CAMEL4, CR Pack 3

Agenda item: 8.3

Document for: APPROVAL

Introduction:

This document contains 8 CRs on Rel-5 WI CAMEL4. These CRs have been agreed by TSG CN WG2 and are forwarded to TSG CN Plenary meeting #17 for approval.

Spec	CR	Rev	Doc-2nd-Level	Phase	Subject	Cat	Ver_C
29.078	261		N2-020668	Rel-5	ASN.1 syntax basic corrections	F	5.0.0
23.078	421		N2-020671	Rel-5	Correction of clause 4.3.3 N-CSI	F	5.0.0
23.078	422		N2-020675	Rel-5	Inconsistency for the negotiated Camel Capability handling of the D-CSI	F	5.0.0
29.078	264		N2-020678	Rel-5	Editorial correction of 29.078 CANCEL-gprs	D	5.0.0
29.078	270	1	N2-020741	Rel-5	ERB when VT call is reported in DP T_Busy due to Call Deflection	F	5.0.0
23.078	446	1	N2-020747	Rel-5	Secondary PDP context for DP change of position context	F	5.0.0
29.078	257	1	N2-020782	Rel-5	TC-U-Abort before the TC dialogue is established	F	5.0.0
23.078	447	2	N2-020793	Rel-5	Detail description for applicability of call cases	F	5.0.0

3GPP TSG CN WG2 Meeting #25 ***N2-020668***
Helsinki, Finland, 29th July – 2nd August 2002

CR-Form-v7

CHANGE REQUEST

⌘ **29.078** **CR** **261** ⌘ **rev** **-** ⌘ Current version: **5.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	ASN.1 syntax basic corrections
Source:	⌘	Alcatel
Work item code:	⌘	CAMEL4
Date:	⌘	17/07/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
Rel-4 *(Release 4)*
Rel-5 *(Release 5)*
Rel-6 *(Release 6)*

Reason for change: ⌘ Currently 29.078 contains several syntactical and semantic ASN.1 errors.

As ASN.1 modules contains a lot of interdependencies between the various modules it is difficult to specify separate CRs for this but to have all basic corrections in one single CR. This CR must be checked by a ASN.1 Syntax checker. The modules of the current CR 261 has been ASN.1 Syntax checked.

Detailed corrections and notes (see also CR Editor's Notes in the CR body text):

- Spelling mistakes are corrected, e.g. parameter names must start with a lower case character.

- Missing or duplicate IMPORTS are corrected.

- Parameterized datatypes must use "bounds" correctly. Inclusion / deletion of "bounds" have been done.

- Correct some duplicate tag values.

- Use the Application Context version 3 for GPRS. Use also version 3 for GPRS contracts, abstract syntaxes and operation packages.

- Use the Module version 4 for GPRS.

- Other Object Identifier versions shall be 4, except for some Object Identifiers for MO-SMS which shall be 3.

- Use MAP module version 8, i.e. 29.002 v 5.2.0.

- The IN CS2 datatype CallSegmentID {} is no longer imported from IN CS2-datatypes, but it is re-defined in CAP. Otherwise we would also to have to import the CS2 PARAMETERS-BOUND and the CS2 networkSpecificBoundSet See also

	the CR Editor's Note in CR main text below. - Use corrected ASN.1 ITU-T modules for X.880 and Q.773 for Syntax checking. The main related item is "TCInvokeIdSet". - Correction of the syntax of CHOICE default values. - It is assumed that the 29.002 uses also 'itu-t' instead of 'ccitt' in its Module Identifiers in the next version. If not, 29.078 shall keep 'itu-t'. - Editorial: between a tag [..] and the tagged type there shall be a Space but not a Horizontal Tabulator character. - CR Editor's Notes in this CR shall not be included into the new 29.078 v5.1.0. - Further corrections.
Summary of change: ⌘	Correction of all above indicated errors. Note: The text between the 29.078 clause headers 5, 6, 7 and 8 are the modified modules. The marked up changes are applicable to the 29.078 text as well.
Consequences if not approved: ⌘	Non working CAMEL protocol.

Clauses affected:	⌘	ASN.1 modules of clauses 5, 6, 7 and 8.			
Other specs affected:	⌘	**Y** / **N**		⌘	
			X Other core specifications		
			X Test specifications		
			X O&M Specifications		
Other comments:	⌘	The ASN.1 modules are available at: `http://www.itu.int/ITU-T/asn1/database/itu-t/index.html`			

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

— First modified section —

2.1 Specifications used for IMPORTS for CAP

The following table lists the modules from which CAP V4 imports. For each module, the table indicates in which formal specification this module can be found.

Table 2-1: Module IMPORTS specifications

Module Name	Specification	Ref
CS1-DataTypes {itu-t~~itu-t~~(0) identified-organization(4) etsi(0) mobileDomain(0) umts-network(1) modules(3) cs1-datatypes(2) version1(0)}	ETS 300 374-1	[24]
CS2-datatypes {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0) umts-network(1) modules(3) in-cs2-datatypes (0) version1(0)}	EN 301 140-1	[26]
MAP-CommonDataTypes {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0) gsm-Network(1) modules(3) map-CommonDataTypes(18) version~~8~~6(~~8~~6)}	3GPP TS 29.002	[11
MAP-MS-DataTypes {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0) gsm-Network(1) modules(3) map-MS-DataTypes(11) version~~8~~6(~~8~~6)}	3GPP TS 29.002	[11]
MAP-CH-DataTypes {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0) gsm-Network(1) modules(3) map-CH-DataTypes(13) version~~8~~6(~~8~~6)}	3GPP TS 29.002	[11]
MAP-ExtensionDataTypes {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0) gsm-Network(1) modules(3) map-ExtensionDataTypes(21) version~~8~~6(~~8~~6)}	3GPP TS 29.002	[11]
TCAPMessages {itu-t recommendation q 773 modules(2) messages(1) version3(3)}	ITU-T Q.773	[46]
Remote-Operations-Information-Objects {joint-iso-itu-t remote-operations(4) informationObjects(5) version1(0)}	ITU-T X.880	[58]
TC-Notation-Extensions {itu-t recommendation q 775 modules(2) notation-extension (4) version1(1)}	ETS 300 287-1	[22]

CR Editor's Note: the references to Q.773 and X.880 may need enhancements as soon Q.773 and X.880 are updated.

— First modified modules —

5 Common CAP Types

```
-- CR Editor's Note: The 29.002 MAP module shall use 'itu-t' instead of 'ccitt'.
-- CR Editor's Note: This module use "TCInvokeIdSet".
-- 5    Common CAP Types
-- 5.1  Data types
CAP-datatypes {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0) umts-network(1)
modules(3) cap-datatypes(52) version4(3)}

DEFINITIONS IMPLICIT TAGS ::= BEGIN

IMPORTS

    Duration,
    Integer4,
    Interval,
    LegID,
    ServiceKey
FROM CS1-DataTypes {itu-t(0) identified-organization(4) etsi(0) inDomain(1) in-network(1)
modules(0) cs1-datatypes(2) version1(0)}

    BothwayThroughConnectionInd,
    CallSegmentID {},
-- CR Editor's Note: The CallSegmentID {} from CS2-datatypes is parameterized by
-- IN-CS2-classes.PARAMETERS-BOUND (and not by CAP-classes.PARAMETERS-BOUND). So we
-- would also need to parameterize all types which are using CallSegmentID {}
-- and those types themself (e.g. by addition of "IN-CS2-classes.PARAMETERS-BOUND: bound-CS2"
-- in addition). To be done in a transitive closure.
-- Furtheron also the value IN-CS2-classes.networkSpecificBoundSet  needs to be imported
-- and possibly to be re-defined (in respect to .&numOfCSs) and to be used.
```

```
-- So it is proposed not to import CallSegmentID {} but to re-define it.
    CriticalityType,
    MiscCallInfo
FROM CS2-datatypes {itu-t(0) identified-organization(4) etsi(0) inDomain(1) in-network(1)
cs2(20) modules(0) in-cs2-datatypes(0) version1(0)}

    IMSI,
    ISDN-AddressString,
    Ext-BasicServiceCode,
    NAEA-CIC
FROM MAP-CommonDataTypes {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
gsm-Network(1) modules(3) map-CommonDataTypes(18) version8~~6~~(8~~6~~)}
    Ext-QoS-Subscribed,
    GeographicalInformation,
    GSN-Address,
    LocationInformation,
    LSAIdentity,
    QoS-Subscribed,
    SubscriberState,
    GPRSChargingID,
    LocationInformationGPRS
FROM MAP-MS-DataTypes {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
gsm-Network(1) modules(3) map-MS-DataTypes(11) version8~~6~~(8~~6~~)}

    CallReferenceNumber,
    SuppressionOfAnnouncement
FROM MAP-CH-DataTypes {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
gsm-Network(1) modules(3) map-CH-DataTypes(13) version8~~6~~(8~~6~~)}

    tc-Messages,
    classes
FROM CAP-object-identifiers {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
umts-network(1) modules(3) cap-object-identifiers(100) version4(3)}

-- CR Editor's Note: The Q.773 (06/97) module TCAPMessages {itu-t recommendation q 773 modules(2)
-- messages(1) version3(3)} needs some corrections. E.g. also in respect to the TCInvokeldSet.
-- In addition "TCInvokeldSet" could be replaced by "TCInvokeIdSet", as assumed in the following.
    TCInvokeIdSet
FROM TCAPMessages tc-Messages

    EXTENSION,
    PARAMETERS-BOUND,
    SupportedExtensions
FROM CAP-classes classes

    ExtensionContainer
FROM MAP-ExtensionDataTypes {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
gsm-Network(1) modules(3) map-ExtensionDataTypes(21) version8~~6~~(8~~6~~)}

;

AccessPointName {PARAMETERS-BOUND: bound} ::= OCTET STRING (SIZE(
    bound.&minAccessPointNameLength .. bound.&maxAccessPointNameLength))
-- Indicates the AccessPointName, refer to 3GPP TS 24.008 [9] for the encoding.
-- It shall be coded as in the value part defined in 3GPP TS 24.008,
-- i.e. the 3GPP TS 24.008 IEI and 3GPP TS 24.008 octet length indicator
-- shall not be included.

AChBillingChargingCharacteristics {PARAMETERS-BOUND : bound} ::= OCTET STRING (SIZE
    (bound.&minAChBillingChargingLength .. bound.&maxAChBillingChargingLength))
    (CONSTRAINED BY {-- shall be the result of the BER-encoded value of the type --
    CAMEL-AChBillingChargingCharacteristics {bound}})
-- The AChBillingChargingCharacteristics parameter specifies the charging related information
-- to be provided by the gsmSSF and the conditions on which this information has to be reported
-- back to the gsmSCF with the ApplyChargingReport operation. The value of the
-- AChBillingChargingCharacteristics of type OCTET STRING carries a value of the ASN.1 data type:
-- CAMEL-AChBillingChargingCharacteristics. The normal encoding rules are used to encode this
-- value.
-- The violation of the UserDefinedConstraint shall be handled as an ASN.1 syntax error.

AChChargingAddress {PARAMETERS-BOUND : bound} ::= CHOICE {
    legID               [2] LegID,
    srfConnection       [50] CallSegmentID {bound}
    }

AdditionalCallingPartyNumber {PARAMETERS-BOUND : bound} ::= Digits {bound}
-- Indicates the Additional Calling Party Number.
```

```
AlertingPattern ::= OCTET STRING (SIZE(3))
-- Indicates a specific pattern that is used to alert a subscriber
-- (e.g. distinctive ringing, tones, etc.).
-- The encoding of the last octet of this parameter is as defined in 3GPP TS 29.002 [11].
-- Only the trailing OCTET is used, the remaining OCTETS shall be sent as NULL (zero)
-- The receiving side shall ignore the leading two OCTETS.

AOCBeforeAnswer ::= SEQUENCE {
    aOCInitial                          [0] CAI-GSM0224,
    aOCSubsequent                       [1] AOCSubsequent                       OPTIONAL
    }

AOCGPRS ::= SEQUENCE {
    aOCInitial                          [0] CAI-GSM0224,
    aOCSubsequent                       [1] AOCSubsequent                       OPTIONAL
    }

AOCSubsequent ::= SEQUENCE {
    cAI-GSM0224                         [0] CAI-GSM0224 ,
    tariffSwitchInterval                [1] INTEGER (1..86400)                  OPTIONAL
    }
-- tariffSwitchInterval is measured in 1 second units

AppendFreeFormatData ::= ENUMERATED {
    overwrite   (0),
    append      (1)
    }

ApplicationTimer ::=INTEGER (0..2047)
-- Used by the gsmSCF to set a timer in the gsmSSF. The timer is in seconds.

AssistingSSPIPRoutingAddress {PARAMETERS-BOUND : bound} ::= Digits {bound}
-- Indicates the destination address of the gsmSRF for the assist procedure.

AudibleIndicator ::= CHOICE {
    tone                                BOOLEAN,
    burstList                           [1] BurstList
    }

BackwardServiceInteractionInd ::= SEQUENCE {
    conferenceTreatmentIndicator        [1] OCTET STRING (SIZE(1))              OPTIONAL,
    -- acceptConferenceRequest  'xxxx xx01'B
    -- rejectConferenceRequest  'xxxx xx10'B
    -- if absent from Connect or ContinueWithArgument,
    -- then CAMEL service does not affect conference treatement
    callCompletionTreatmentIndicator     [2] OCTET STRING (SIZE(1))             OPTIONAL,
    -- acceptCallCompletionServiceRequest   'xxxx xx01'B,
    -- rejectCallCompletionServiceRequest   'xxxx xx10'B
    -- if absent from Connect or ContinueWithArgument,
    -- then CAMEL service does not affect call completion treatment
    ...
    }

BasicGapCriteria {PARAMETERS-BOUND : bound} ::= CHOICE {
    calledAddressValue                  [0] Digits {bound},
    gapOnService                        [2] GapOnService,
    calledAddressAndService             [29] SEQUENCE {
        calledAddressValue                  [0] Digits {bound},
        serviceKey                          [1] ServiceKey,
        ...
        },
    callingAddressAndService            [30] SEQUENCE {
        callingAddressValue                 [0] Digits {bound},
        serviceKey                          [1] ServiceKey,
        ...
        }
    }
-- Both calledAddressValue and callingAddressValue can be
-- incomplete numbers, in the sense that a limited amount of digits can be given.
-- For the handling of numbers starting with the same digit string refer to the detailed
-- procedure of the CallGap operation

BCSMEvent ::= SEQUENCE {
    eventTypeBCSM                       [0] EventTypeBCSM,
    monitorMode                         [1] MonitorMode,
    legID                               [2] LegID                               OPTIONAL,
    dpSpecificCriteria                  [30] DpSpecificCriteria                 OPTIONAL,
    automaticRearm                      [50] NULL                               OPTIONAL
```

```
    }
-- Indicates the BCSM Event information for monitoring.

BCSM-Failure {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    ~~l~~legID                          [0] LegID                                   OPTIONAL,
    cause                               [2] Cause {bound}                           OPTIONAL,
    ...
    }

BearerCapability {PARAMETERS-BOUND : bound} ::= CHOICE {
    bearerCap                           [0] OCTET STRING (SIZE(2..bound.&maxBearerCapabilityLength))
    }
-- Indicates the type of bearer capability connection to the user. For bearerCap, the ISUP User
-- Service Information, ETSI EN 300 356-1 [23]
-- encoding shall be used.

Burst ::= SEQUENCE {
    numberOfBursts                      [0] INTEGER (1..3)  DEFAULT 1,
    burstInterval                       [1] INTEGER (1..20)                         OPTIONAL,
    numberOfTonesInBurst                [2] INTEGER (1..3)  DEFAULT 3,
    toneDuration                        [3] INTEGER (1..20) DEFAULT 2,
    toneInterval                        [4] INTEGER (1..20) DEFAULT 2
    }
-- burstInterval, toneDurartion and toneInterval are measured in 100 millisecond units

BurstList ::= SEQUENCE {
    warningPeriod                       [0] INTEGER (1..1200) DEFAULT 30,
    bursts                              [1] Burst
    }
-- warningPeriod is measured in 1 second units.

CAI-GSM0224 ::= SEQUENCE {
    e1                                  [0] INTEGER (0..8191)                       OPTIONAL,
    e2                                  [1] INTEGER (0..8191)                       OPTIONAL,
    e3                                  [2] INTEGER (0..8191)                       OPTIONAL,
    e4                                  [3] INTEGER (0..8191)                       OPTIONAL,
    e5                                  [4] INTEGER (0..8191)                       OPTIONAL,
    e6                                  [5] INTEGER (0..8191)                       OPTIONAL,
    e7                                  [6] INTEGER (0..8191)                       OPTIONAL
    }
-- Indicates Charge Advice Information to the Mobile Station. For information regarding
-- parameter usage, refer to 3GPP TS 22.024 [2].

CalledPartyBCDNumber {PARAMETERS-BOUND : bound} ::= OCTET STRING (SIZE(
    bound.&minCalledPartyBCDNumberLength .. bound.&maxCalledPartyBCDNumberLength))
-- Indicates the Called Party Number, including service selection information.
-- Refer to 3GPP TS 24.008 [9] for encoding.
-- This data type carries only the "type of number", "numbering plan
-- identification" and "number digit" fields defined in 3GPP TS 24.008 [9];
-- it does not carry the "called party BCD number IEI" or "length of called
-- party BCD number contents".

CalledPartyNumber {PARAMETERS-BOUND : bound} ::= OCTET STRING (SIZE(
    bound.&minCalledPartyNumberLength .. bound.&maxCalledPartyNumberLength))
-- Indicates the Called Party Number. Refer to ETS EN 300 356-1 [23] for encoding.

-- A CalledPartyNumber may contain national-specific values of the Nature Of Address
-- indicator. The filling-in of the national-specific Nature Of Address indicator
-- values shall be done in accordance with the national ISUP of the gsmSSF country, e.g.
-- ANSI T1.113-1995 [92].
-- In terms of ETS EN 300 356-1 [23], the Destination Address Field is not present if the
-- destination address length is set to zero. This is the case e.g. when the ANSI
-- ISUP Nature Of Address indicator indicates no number present, operator requested
-- (1110100) or no number present, cut-through call to carrier (1110101).
-- See also see 3GPP TS 23.078 [7].

CallingPartyNumber {PARAMETERS-BOUND : bound} ::= OCTET STRING (SIZE(
    bound.&minCallingPartyNumberLength .. bound.&maxCallingPartyNumberLength))
-- Indicates the Calling Party Number. Refer to ETSI EN 300 356-1 [23] for encoding.

CallResult {PARAMETERS-BOUND : bound} ::= OCTET STRING (SIZE(
    bound.&minCallResultLength .. bound.&maxCallResultLength))
    (CONSTRAINED BY {-- shall be the result of the BER-encoded value of type -
    CAMEL-CallResult {bound}})
-- The violation of the UserDefinedConstraint shall be handled as an ASN.1 syntax error.

-- This parameter provides the gsmSCF with the charging related information previously requested
-- using the ApplyCharging operation. This shall include the partyToCharge parameter as
```

```
-- received in the related ApplyCharging operation to correlate the result to the request

CallSegmentFailure {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    callSegmentID                   [0] CallSegmentID {bound}                   OPTIONAL,
    cause                           [2] Cause {bound}                           OPTIONAL,
    ...
    }

CallSegmentID {PARAMETERS-BOUND : bound} ::= INTEGER (1..bound.&numOfCSs)
--CR Editor's note: if you import CallSegmentID then CallSegmentID is using the PARAMETERS-BOUND of
--the exporting Module CS2-datatypes. That is you would have also to define the value of the
--PARAMETERS-BOUNDs of that module.

CallSegmentToCancel {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    invokeID                        [0] Invoke-ID                               OPTIONAL,
    callSegmentID                   [1] CallSegmentID {bound}                   OPTIONAL,
    ...
    }

CAMEL-AChBillingChargingCharacteristics {PARAMETERS-BOUND : bound} ::= CHOICE {
    timeDurationCharging            [0] SEQUENCE {
        maxCallPeriodDuration           [0] INTEGER (1..864000),
        releaseIfdurationExceeded       [1] BOOLEAN DEFAULT FALSE,
        tariffSwitchInterval            [2] INTEGER (1..86400)                  OPTIONAL,
        audibleIndicator                [3] AudibleIndicator DEFAULT {tone: FALSE},
        extensions                      [4] Extensions {bound}                  OPTIONAL,
        ...
        }
    }
-- tariffSwitchInterval is measured in 1 second units.
-- maxCallPeriodDuration is measured in100 millisecond units

CAMEL-CallResult {PARAMETERS-BOUND : bound} ::= CHOICE {
    timeDurationChargingResult      [0] SEQUENCE {
        partyToCharge                   [0] ReceivingSideID,
        timeInformation                 [1] TimeInformation,
        callActive                      [2] BOOLEAN DEFAULT TRUE,
        callReleasedAtTcpExpiry         [3] NULL                                OPTIONAL,
        extensions                      [4] Extensions {bound}                  OPTIONAL,
        aChChargingAddress              [5] AChChargingAddress {bound}
                                                DEFAULT legID:receivingSideID:leg1,
        ...
        }
    }

CAMEL-FCIBillingChargingCharacteristics {PARAMETERS-BOUND : bound} ::= CHOICE{
    fCIBCCCAMELsequence1            [0] SEQUENCE {
            freeFormatData                  [0] OCTET STRING (SIZE(
                bound.&minFCIBillingChargingDataLength .. bound.&maxFCIBillingChargingDataLength)),
        partyToCharge                   [1] SendingSideID DEFAULT sendingSideID-: leg1,
        appendFreeFormatData            [2] AppendFreeFormatData DEFAULT overwrite
        }
    }

CAMEL-FCIGPRSBillingChargingCharacteristics {PARAMETERS-BOUND : bound} ::= SEQUENCE{
    fCIBCCCAMELsequence1            [0] SEQUENCE {
        freeFormatData                  [0] OCTET STRING (SIZE(
            bound.&minFCIBillingChargingDataLength .. bound.&maxFCIBillingChargingDataLength)),
        pDPID                           [1] PDPID OPTIONAL,
        appendFreeFormatData            [2] AppendFreeFormatData DEFAULT overwrite,
        ...
        }
    }

CAMEL-FCISMSBillingChargingCharacteristics {PARAMETERS-BOUND : bound} ::= CHOICE{
    fCIBCCCAMELsequence1            [0] SEQUENCE {
        freeFormatData                  [0] OCTET STRING (SIZE(
            bound.&minFCIBillingChargingDataLength .. bound.&maxFCIBillingChargingDataLength)),
        appendFreeFormatData            [1] AppendFreeFormatData DEFAULT overwrite
        }
    }

CAMEL-SCIBillingChargingCharacteristics ::= CHOICE {
    aOCBeforeAnswer                 [0] AOCBeforeAnswer,
    aOCAfterAnswer                  [1] AOCSubsequent
    }

CAMEL-SCIGPRSBillingChargingCharacteristics ::= SEQUENCE {
```

```
    aOCGPRS                         [0] AOCGPRS,
    pDPID                           [1] PDPID                                   OPTIONAL,
    ...
    }

Carrier {PARAMETERS-BOUND : bound} ::= OCTET STRING (SIZE(
    bound.&minCarrierLength .. bound.&maxCarrierLength))
-- This parameter is used for North America (na) only.
-- It contains the carrier selection field (first octet) followed by Carrier ID
-- information (North America (na)).

-- The Carrier selection is one octet and is encoded as:
-- 00000000     No indication
-- 00000001     Selected carrier identification code (CIC) pre subscribed and not
--              input by calling party
-- 00000010     Selected carrier identification code (CIC) pre subscribed and input by
--              calling party
-- 00000011     Selected carrier identification code (CIC) pre subscribed, no
--              indication of whether input by calling party (undetermined)
-- 00000100     Selected carrier identification code (CIC) not pre subscribed and
--              input by calling party
-- 00000101
--  to          Spare
-- 11111110
-- 11111111     Reserved

-- Refer to ANSI T1.113-1995 [92] for encoding of na carrier ID information (3 octets).

Cause {PARAMETERS-BOUND : bound} ::= OCTET STRING (SIZE(
    bound.&minCauseLength .. bound.&maxCauseLength))
-- Indicates the cause for interface related information.
-- Refer to ETSI EN 300 356-1 [23] Cause parameter for encoding.
-- For the use of cause and location values refer to ITU-T Recommendation Q.850 [47]
-- Shall always include the cause value and shall also include the diagnostics field,
-- if available.

CGEncountered ::= ENUMERATED {
    noCGencountered                 (0),
    manualCGencountered             (1),
    scpOverload                     (2)
    }
-- Indicates the type of automatic call gapping encountered, if any.

ChargeNumber {PARAMETERS-BOUND : bound} ::= LocationNumber {bound}
-- Information sent in either direction indicating the chargeable number for the call and
-- consisting of the odd/even indicator, nature of address indicator, numbering plan indicator,
-- and address signals.

-- Uses the LocationNumber format which is based on the Location Number format as defined
-- in ITU-T Recommendation Q.763 [45].
-- For example, the ChargeNumber may be a third party number to which a call is billed for
-- the 3rd party billing service. In this case, the calling party may request operator assistance
-- to charge the call to, for example, their home number.

-- For NA, this parameter uniquely identifies the chargeable number for a call sent into a North
-- American long distance carrier. It transports the ChargeNumber Parameter Field as defined in
-- ANSI T1.113-1995 [92]. This provides
--  - 1 octet for the nature of address indicator field, plus
--  - 1 octet for a numbering plan field, plus
--  - up to 5 octets for the address signal (up to 10 digits)

-- The Charge Number in ANSI T1.113-1995 [92] normally contains a 10 digit national number within
-- the North American Numbering Plan (NANP); longer (e.g. international) charge numbers are not
-- supported in ANSI T1.113-1995 [92].

ChargeUnitsComponent {PARAMETERS-BOUND : bound} ::= SEQUENCE SIZE
            (bound.&minComponentLength .. bound.&maxComponentLength) OF SEQUENCE {
    monitorComponent                [0] MonitorComponent,
    reportingConditionUnits         [1] ReportingConditionUnits
    }

ChargeUnitsTotal ::= SEQUENCE {
    reportingConditionUnits [0] ReportingConditionUnits
    }

ChargingCharacteristics ::= CHOICE {
    maxTransferredVolume            [0] INTEGER (1..4294967295),
    maxElapsedTime                  [1] INTEGER (1..86400)
```

```
    }
--  maxTransferredVolume is measured in number of bytes
--  maxElapsedTime is measured in seconds

ChargingResult ::= CHOICE {
    transferredVolume                   [0] TransferredVolume,
    elapsedTime                         [1] ElapsedTime
    }

ChargingRollOver ::= CHOICE {
    transferredVolumeRollOver           [0] TransferredVolumeRollOver,
    elapsedTimeRollOver                 [1] ElapsedTimeRollOver
    }
-- transferredVolumeRollOver shall be reported if ApplyChargingReportGPRS reports volume and
-- a roll-over has occurred in one or more volume counters. Otherwise, it shall be absent.
-- elapsedTimeRollOver shall be reported if ApplyChargingReportGPRS reports duration and
-- a roll-over has occurred in one or more duration counters. Otherwise, it shall be absent.

CollectedDigits ::= SEQUENCE {
    MminimumNbOfDigits                  [0] INTEGER (1..30) DEFAULT 1,
    maximumNbOfDigits                   [1] INTEGER (1..30),
    endOfReplyDigit                     [2] OCTET STRING (SIZE (1..2))              OPTIONAL,
    cancelDigit                         [3] OCTET STRING (SIZE (1..2))              OPTIONAL,
    startDigit                          [4] OCTET STRING (SIZE (1..2))              OPTIONAL,
    firstDigitTimeOut                   [5] INTEGER (1..127)                        OPTIONAL,
    interDigitTimeOut                   [6] INTEGER (1..127)                        OPTIONAL,
    errorTreatment                      [7] ErrorTreatment DEFAULT stdErrorAndInfo,
    interruptableAnnInd                 [8] BOOLEAN DEFAULT TRUE,
    voiceInformation                    [9] BOOLEAN DEFAULT FALSE,
    voiceBack                           [10] BOOLEAN DEFAULT FALSE
    }
-- The use of voiceBack and the support of voice recognition via voiceInformation
-- is network operator specific.
-- The endOfReplyDigit, cancelDigit, and startDigit parameters have been
-- designated as OCTET STRING, and are to be encoded as BCD, one digit per octet
-- only, contained in the four least significant bits of each OCTET. The following encoding shall
-- be applied for the non-decimal characters:
-- 1011 (*), 1100 (#).
-- The usage is service dependent.
-- firstDigitTimeOut and interDigitTimeOut are measured in seconds.

CollectedInfo ::= CHOICE {
    collectedDigits                     [0] CollectedDigits
    }

ConnectedNumberTreatmentInd ::= ENUMERATED {
    noINImpact                          (0),
    presentationRestricted              (1),
    presentCalledINNumber               (2),
    presentCallINNumberRestricted       (3)
}
-- This parameter is used to suppress or to display the connected number.

ControlType ::= ENUMERATED {
    sCPOverloaded                       (0),
    manuallyInitiated                   (1)
    }

CompoundCriteria {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    BbasicGapCriteria                   [0] BasicGapCriteria {bound},
    scfID                               [1] ScfID {bound}                           OPTIONAL
    }

CorrelationID {PARAMETERS-BOUND : bound} ::= Digits {bound}
-- used by gsmSCF for correlation with a previous operation.

DateAndTime ::= OCTET STRING (SIZE(7))
--  DateAndTime is BCD encoded. The year digit indicating millenium occupies bits
--  0-3 of the first octet, and the year digit indicating century occupies bits
--  4-7 of the first octet.
--  The year digit indicating decade occupies bits 0-3 of the second octet,
--  whilst the digit indicating the year within the decade occupies bits 4-7 of
--  the second octet.
--  The most significant month digit occupies bits 0-3 of the third octet,
--  and the least significant month digit occupies bits 4-7 of the third octet.
--  The most significant day digit occupies bits 0-3 of the fourth octet,
--  and the least significant day digit occupies bits 4-7 of the fourth octet.
--  The most significant hours digit occupies bits 0-3 of the fifth octet,
```

```
--  and the least significant digit occupies bits 4-7 of the fifth octet.
--  The most significant minutes digit occupies bits 0-3 of the sixth octet,
--  and the least significant digit occupies bits 4-7 of the sixth octet.
--  The most significant seconds digit occupies bits 0-3 of the seventh octet,
--  and the least seconds significant digit occupies bits 4-7 of the seventh octet.
--  For the encoding of digits in an octet, refer to the timeAndtimezone parameter.

DestinationRoutingAddress {PARAMETERS-BOUND : bound} ::= SEQUENCE SIZE(1) OF
                                                    CalledPartyNumber {bound}
-- Indicates the Called Party Number.

Digits {PARAMETERS-BOUND : bound} ::= OCTET STRING (SIZE(
    bound.&minDigitsLength .. bound.&maxDigitsLength))
-- Indicates the address signalling digits.
-- Refer to ETSI EN 300 356-1 [23] Generic Number & Generic Digits parameters for encoding.
-- The coding of the subfields "NumberQualifier" in Generic Number and "TypeOfDigits" in
-- Generic Digits are irrelevant to the CAP;
-- the ASN.1 tags are sufficient to identify the parameter.
-- The ISUP format does not allow to exclude these subfields,
-- therefore the value is network operator specific.
--
-- The following parameters shall use Generic Number:
--  - AdditionalCallingPartyNumber for InitialDP
--  - AssistingSSPIPRoutingAddress for EstablishTemporaryConnection
--  - CorrelationID for AssistRequestInstructions
--  - CalledAddressValue for all occurrences, CallingAddressValue for all occurrences.
--
-- The following parameters shall use Generic Digits:
--  - CorrelationID in EstablishTemporaryConnection
--  - number in VariablePart
--  - digitsResponse in ReceivedInformationArg
--  - midCallEvents in oMidCallSpecificInfo and tMidCallSpecificInfo
--
-- In the digitsResponse and midCallevents, the digits may also include the '*', '#',
-- a, b, c and d digits by using the IA5 character encoding scheme. If the BCD even or
-- BCD odd encoding scheme is used, then the following encoding shall be applied for the
-- non-decimal characters: 1011 (*), 1100 (#).

-- Note that when CorrelationID is transported in Generic Digits, then the digits shall
-- always be BCD encoded.

DpSpecificCriteria ::= CHOICE {
    applicationTimer                [1] ApplicationTimer,
    midCallControlInfo              [2] MidCallControlInfo
    }
--  The gsmSCF may set a timer in the gsmSSF for the No_Answer event.
--  If the user does not answer the call within the allotted time,
--  then the gsmSSF reports the event to the gsmSCF.
--  The gsmSCF may define a criterion for the detection of DTMF digits during a call.

ElapsedTime ::= CHOICE {
    ~~t~~timeGPRSIfNoTariffSwitch          [0] INTEGER (0..86400),
    timeGPRSIfTariffSwitch          [1] SEQUENCE {
        timeGPRSSinceLastTariffSwitch       [0] INTEGER (0..86400),
        timeGPRSTariffSwitchInterval        [1] INTEGER (0..86400)                  OPTIONAL
        }
    }
--  timeGPRSIfNoTariffSwitch is measured in seconds
--  timeGPRSSinceLastTariffSwitch and timeGPRSTariffSwitchInterval are measured in seconds

ElapsedTimeRollOver ::= CHOICE {
    rO-TimeGPRSIfNoTariffSwitch         [0] INTEGER (0..255),
    rO-TimeGPRSIfTariffSwitch           [1] SEQUENCE {
        rO-TimeGPRSSinceLastTariffSwitch    [0] INTEGER (0..255)                    OPTIONAL,
        rO-TimeGPRSTariffSwitchInterval     [1] INTEGER (0..255)                    OPTIONAL
        }
    }
--  rO-TimeGPRSIfNoTariffSwitch, rO-TimeGPRSSinceLastTariffSwitch and
--  rO-TimeGPRSTariffSwitchInterval
--  present counters indicating the number of parameter range rollovers.

EndUserAddress {PARAMETERS-BOUND: bound} ::= SEQUENCE {
    pDPTypeOrganization             [0] OCTET STRING (SIZE(1)),
    pDPTypeNumber                   [1] OCTET STRING (SIZE(1)),
    pDPAddress                      [2] OCTET STRING (SIZE(
        bound.&minPDPAddressLength .. bound.&maxPDPAddressLength))                  OPTIONAL
    }
-- Indicates the EndUserAddress, refer to 3GPP TS 29.060 [12] for the encoding.
```

```
-- The pDPTypeOrganization shall use the least significant 4 bits of the octet encoded.
-- The sender of this parameter shall set the most significant 4 bits of the octet to 1.
-- The receiver of this parameter shall ignore the most significant 4 bits of this octet.

ErrorTreatment ::= ENUMERATED {
    stdErrorAndInfo                     (0),
    help                                (1),
    repeatPrompt                        (2)
    }
-- stdErrorAndInfomeans returning the "ImproperCallerResponse" error in the event of an error
-- condition during collection of user info.

EvaluesAndTsw ::= SEQUENCE {
    evalues                             [0] CAI-GSM0224,
    tariffSwitchInterval                [1] TariffSwitchInterval
    }

EvaluesComponent {PARAMETERS-BOUND : bound} ::= SEQUENCE SIZE
        (bound.&minComponentLength .. bound.&maxComponentLength) OF SEQUENCE {
    monitorComponent                    [0] MonitorComponent,
    reportingConditionEvalue            [1] ReportingConditionEvalue
    }

EvaluesTotal ::= SEQUENCE {
    ~~R~~reportingConditionEvalue       [0] ReportingConditionEvalue
    }

EventSpecificChargingInformation {PARAMETERS-BOUND : bound} ::= CHOICE {
    infoChargeUnitsTotal                [0] InfoChargeUnitsTotal,
    infoChargeUnitsComponents           [1] InfoChargeUnitsComponents {bound},
    infoEvalueTotal                     [2] InfoEvalueTotal,
    infoEvalueComponents                [3] InfoEvalueComponents {bound}
    }

EventSpecificInformationBCSM {PARAMETERS-BOUND : bound} ::= CHOICE {
    routeSelectFailureSpecificInfo      [2] SEQUENCE {
        failureCause                        [0] Cause {bound}                   OPTIONAL,
        ...
        },
    oCalledPartyBusySpecificInfo        [3] SEQUENCE {
        busyCause                           [0] Cause {bound}                   OPTIONAL,
        ...
        },
    oNoAnswerSpecificInfo               [4] SEQUENCE {
        -- no specific info defined --
        ...
        },
    oAnswerSpecificInfo                 [5] SEQUENCE {
        destinationAddress                  [50] CalledPartyNumber {bound}      OPTIONAL,
        or-Call                             [51] NULL                           OPTIONAL,
        forwardedCall                       [52] NULL                           OPTIONAL,
        ...
        },
    oMidCallSpecificInfo                [6] SEQUENCE {
        midCallEvents                       [1] CHOICE {
            dTMFDigitsCompleted                 [3] Digits {bound},
            dTMFDigitsTimeOut                   [4] Digits {bound}
            }                                                               OPTIONAL,
        ...
        },
    oDisconnectSpecificInfo             [7] SEQUENCE {
        releaseCause                        [0] Cause {bound}                   OPTIONAL,
        ...
        },
    tBusySpecificInfo                   [8] SEQUENCE {
        busyCause                           [0] Cause {bound}                   OPTIONAL,
        callForwarded                       [50] NULL                           OPTIONAL,
        routeNotPermitted                   [51] NULL                           OPTIONAL,
        forwardingDestinationNumber         [52] CalledPartyNumber {bound}      OPTIONAL,
        ...
        },
    tNoAnswerSpecificInfo               [9] SEQUENCE {
        callForwarded                       [50] NULL                           OPTIONAL,
        forwardingDestinationNumber         [52] CalledPartyNumber {bound}      OPTIONAL,
        ...
        },
    tAnswerSpecificInfo                 [10] SEQUENCE {
        destinationAddress                  [50] CalledPartyNumber {bound}      OPTIONAL,
```

```
        or-Call                             [51] NULL                               OPTIONAL,
        forwardedCall                       [52] NULL                               OPTIONAL,
        ...
        },
    tMidCallSpecificInfo                [11] SEQUENCE {
        midCallEvents                       [1] CHOICE {
            dTMFDigitsCompleted                 [3] Digits {bound},
            dTMFDigitsTimeOut                   [4] Digits {bound}
            }                                                                       OPTIONAL,
        ...
        },
    tDisconnectSpecificInfo             [12] SEQUENCE {
        releaseCause                        [0] Cause {bound}                       OPTIONAL,
        ...
        },
    oTermSeizedSpecificInfo             [13] SEQUENCE {
        locationInformation                 [50] LocationInformation                OPTIONAL,
        ...
        },
    callAcceptedSpecificInfo            [20] SEQUENCE {
        locationInformation                 [50] LocationInformation                OPTIONAL,
        ...
        },
    oAbandonSpecificInfo                [21] SEQUENCE {
        routeNotPermitted                   [50] NULL                               OPTIONAL,
        ...
        },
    oChangeOfPositionSpecificInfo       [50] SEQUENCE {
        locationInformation                 [50] LocationInformation                OPTIONAL,
        ...
        },
    tChangeOfPositionSpecificInfo       [51] SEQUENCE {
        locationInformation                 [50] LocationInformation                OPTIONAL,
        ...
        }
    }
-- Indicates the call related information specific to the event.

EventSpecificInformationSMS ::= CHOICE {
    o-smsFailureSpecificInfo            [0] SEQUENCE {
        failureCause                        [0] MO-SMSCause                         OPTIONAL,
        ...
        },
    o-smsSubmissionSpecificInfo         [1] SEQUENCE {
        -- no specific info defined-
        ...
        },
    t-smsFailureSpecificInfo            [2] SEQUENCE {
        failureCause                        [0] MT-SMSCause                         OPTIONAL,
        ...
        },
    t-smsDeliverySpecificInfo           [3] SEQUENCE {
        -- no specific info defined-
        ...
        }
    }

EventTypeBCSM ::= ENUMERATED {
    collectedInfo                       (2),
    analyzedInformation                 (3),
    routeSelectFailure                  (4),
    oCalledPartyBusy                    (5),
    oNoAnswer                           (6),
    oAnswer                             (7),
    oMidCall                            (8),
    oDisconnect                         (9),
    oAbandon                            (10),
    termAttemptAuthorized               (12),
    tBusy                               (13),
    tNoAnswer                           (14),
    tAnswer                             (15),
    tMidCall                            (16),
    tDisconnect                         (17),
    tAbandon                            (18),
    oTermSeized                         (19),
    callAccepted                        (27),
    oChangeOfPosition                   (50),
    tChangeOfPosition                   (51)
```

```
    }
-- Indicates the BCSM detection point event.
-- Values collectedInfo, analyzedInformation and termAttemptAuthorized may be used
-- for TDPs only.

EventTypeChargingPLMN {PARAMETERS-BOUND : bound} ::= CHOICE {
    ~~C~~chargeUnitsTotal                  [0] ChargeUnitsTotal,
    ~~C~~chargeUnitsComponent              [1] ChargeUnitsComponent {bound},
    ~~E~~evaluesTotal                      [2] EvaluesTotal,
    ~~E~~evaluesComponent                  [3] EvaluesComponent {bound}
    }
-- This parameter indicates the charging event type.

EventTypeSMS ::= ENUMERATED {
    sms-CollectedInfo                  (1),
    o-smsFailure                       (2),
    o-smsSubmission                    (3),
    sms-DeliveryRequested              (11),
    t-smsFailure                       (12),
    t-smsDelivery                      (13)
    }
-- Values sms-CollectedInfo and sms-DeliveryRequested may be used for TDPs only.

Extensions {PARAMETERS-BOUND : bound} ::= SEQUENCE SIZE (1..bound.&numOfExtensions) OF
ExtensionField
ExtensionField ::= SEQUENCE {
    ~~T~~type                              EXTENSION.&id ({SupportedExtensions~~ {bound}~~}),
                                       -- shall identify the value of an EXTENSION type
    criticality                        CriticalityType DEFAULT ignore,
    value                              [1] EXTENSION.&ExtensionType ({SupportedExtensions}{@type}),
    ...
    }
-- This parameter indicates an extension of an argument data type.
-- Its content is network operator specific

FCIBillingChargingCharacteristics {PARAMETERS-BOUND : bound} ::= OCTET STRING (SIZE(
    bound.&minFCIBillingChargingLength .. bound.&maxFCIBillingChargingLength))
    (CONSTRAINED BY {-- shall be the result of the BER-encoded value of type --
    CAMEL-FCIBillingChargingCharacteristics {bound}})
-- This parameter indicates the billing and/or charging characteristics.
-- The violation of the UserDefinedConstraint shall be handled as an ASN.1 syntax error.

FCIGPRSBillingChargingCharacteristics {PARAMETERS-BOUND : bound} ::= OCTET STRING (SIZE(
    bound.&minFCIBillingChargingLength .. bound.&maxFCIBillingChargingLength))
    (CONSTRAINED BY {-- shall be the result of the BER-encoded value of type -
    CAMEL-FCIGPRSBillingChargingCharacteristics {bound}})
-- This parameter indicates the GPRS billing and/or charging characteristics.
-- The violation of the UserDefinedConstraint shall be handled as an ASN.1 syntax error.

FCISMSBillingChargingCharacteristics {PARAMETERS-BOUND : bound} ::= OCTET STRING (SIZE(
    bound.&minFCIBillingChargingLength .. bound.&maxFCIBillingChargingLength))
    (CONSTRAINED BY {-- shall be the result of the BER-encoded value of type -
    CAMEL-FCISMSBillingChargingCharacteristics {bound}})
-- This parameter indicates the SMS billing and/or charging characteristics.
-- The violation of the UserDefinedConstraint shall be handled as an ASN.1 syntax error.

ForwardServiceInteractionInd ::= SEQUENCE {
    conferenceTreatmentIndicator       [1] OCTET STRING (SIZE(1))                OPTIONAL,
    -- acceptConferenceRequest  'xxxx xx01'B
    -- rejectConferenceRequest  'xxxx xx10'B
    -- if absent from Connect or ContinueWithArgument,
    -- then CAMEL service does not affect conference treatment
    callDiversionTreatmentIndicator    [2] OCTET STRING (SIZE(1))                OPTIONAL,
    -- callDiversionAllowed     'xxxx xx01'B
    -- callDiversionNotAllowed  'xxxx xx10'B
    -- if absent from Connect or ContinueWithArgument,
    -- then CAMEL service does not affect call diversion treatment
    callingPartyRestrictionIndicator   [4] OCTET STRING (SIZE(1))                OPTIONAL,
    -- noINImpact               'xxxx xx01'B
    -- presentationRestricted   'xxxx xx10'B
    -- if absent from Connect or ContinueWithArgument,
    -- then CAMEL service does not affect calling party restriction treatment
...
    }

GapCriteria {PARAMETERS-BOUND : bound}::= CHOICE {
    basicGapCriteria                   BasicGapCriteria {bound},
    compoundGapCriteria                CompoundCriteria {bound}
```

```
    }

GapIndicators ::= SEQUENCE {
    duration                        [0] Duration,
    gapInterval                     [1] Interval,
    ...
    }
-- Indicates the call gapping characteristics.
-- No call gapping when gapInterval equals 0.

GapOnService ::= SEQUENCE {
    serviceKey                      [0] ServiceKey,
    ...
    }

GapTreatment {PARAMETERS-BOUND : bound} ::= CHOICE {
    informationToSend               [0] InformationToSend {bound},
    releaseCause                    [1] Cause {bound}
    }
-- The default value for Cause is the same as in ISUP.

GenericNumber {PARAMETERS-BOUND : bound} ::= OCTET STRING (SIZE(
    bound.&minGenericNumberLength .. bound.&maxGenericNumberLength))
-- Indicates a generic number. Refer to ETSI EN 300 356-1 [23] Generic number for encoding.

GenericNumbers {PARAMETERS-BOUND : bound} ::= SET SIZE(1..bound.&numOfGenericNumbers) OF
GenericNumber {bound}

GPRS-QoS ::= CHOICE {
    short-QoS-format                [0] QoS-Subscribed,
    long-QoS-format                 [1] Ext-QoS-Subscribed
    }
-- Short-QoS-format shall be sent for QoS in pre GSM release 99 format.
-- Long-QoS-format shall be sent for QoS in GSM release 99 (and beyond) format.
-- Which of the two QoS formats shall be sent is determined by which QoS
-- format is available in the SGSN at the time of sending.
-- Refer to 3GPP TS 29.002 [11] for encoding details of QoS-Subscribed and
-- Ext-QoS-Subscribed.

GPRSCause {PARAMETERS-BOUND : bound} ::= OCTET STRING (SIZE
            (bound.&minGPRSCauseLength .. bound.&maxGPRSCauseLength))
-- Shall only include the cause value.

--  00000000   Unspecified
--  All other values shall be interpreted as "Unspecified".
--
-- This parameter indicates the cause for CAP interface related information.
-- The GPRSCause mapping to/from GTP cause values specified in the 3GPP TS 29.060 [12] and
-- to/from 3GPP TS 24.008 [9] GMM cause and SM cause values are outside scope of this document.

GPRSEvent ::= SEQUENCE {
    gPRSEventType                   [0] GPRSEventType,
    monitorMode                     [1] MonitorMode
    }
--  Indicates the GPRS event information for monitoring.

GPRSEventSpecificInformation {PARAMETERS-BOUND : bound} ::= CHOICE {

    attachChangeOfPositionSpecificInformation
                                    [0] SEQUENCE {
            locationInformationGPRS     [0] LocationInformationGPRS         OPTIONAL,
            ...
            },

    pdp-ContextchangeOfPositionSpecificInformation
                                    [1] SEQUENCE {
            accessPointName             [0] AccessPointName {bound}         OPTIONAL,
            chargingID                  [1] GPRSChargingID                  OPTIONAL,
            locationInformationGPRS     [2] LocationInformationGPRS         OPTIONAL,
            endUserAddress              [3] EndUserAddress {bound}          OPTIONAL,
            qualityOfService            [4] QualityOfService                OPTIONAL,
            timeAndTimeZone             [5] TimeAndTimezone {bound}         OPTIONAL,
            ...,
            gGSNAddress                 [6] GSN-Address                     OPTIONAL
            },

    detachSpecificInformation       [2] SEQUENCE {
            initiatingEntity            [0] InitiatingEntity                OPTIONAL,
```

```
            ...,
            routeingAreaUpdate              [1] NULL                                OPTIONAL
            },

    disconnectSpecificInformation       [3] SEQUENCE {
            initiatingEntity                [0] InitiatingEntity                    OPTIONAL,
            ...,
            routeingAreaUpdate              [1] NULL                                OPTIONAL
            },

    pDPContextEstablishmentSpecificInformation
                                        [4] SEQUENCE {
            accessPointName                 [0] AccessPointName {bound}             OPTIONAL,
            endUserAddress                  [1] EndUserAddress {bound}              OPTIONAL,
            qualityOfService                [2] QualityOfService                    OPTIONAL,
            locationInformationGPRS         [3] LocationInformationGPRS             OPTIONAL,
            timeAndTimeZone                 [4] TimeAndTimezone {bound}             OPTIONAL,
            pDPInitiationType               [5] PDPInitiationType                   OPTIONAL,
            ...,
            secondaryPDP-context            [6] NULL                                OPTIONAL
            },

    pDPContextEstablishmentAcknowledgementSpecificInformation
                                        [5] SEQUENCE {
            accessPointName                 [0] AccessPointName {bound}             OPTIONAL,
            chargingID                      [1] GPRSChargingID                      OPTIONAL,
            endUserAddress                  [2] EndUserAddress {bound}              OPTIONAL,
            qualityOfService                [3] QualityOfService                    OPTIONAL,
            locationInformationGPRS         [4] LocationInformationGPRS             OPTIONAL,
            timeAndTimeZone                 [5] TimeAndTimezone {bound}             OPTIONAL,
            ...,
            gGSNAddress                     [6] GSN-Address                         OPTIONAL
            }
        }

GPRSEventType ::= ENUMERATED {
    attach                              (1),
    attachChangeOfPosition              (2),
    detached                            (3),
    pdp-ContextEstablishment            (11),
    pdp-ContextEstablishmentAcknowledgement (12),
    disonnect                           (13),
    pdp-ContextChangeOfPosition         (14)
    }

InbandInfo {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    messageID                           [0] MessageID {bound},
    numberOfRepetitions                 [1] INTEGER (1..127)                    OPTIONAL,
    duration                            [2] INTEGER (0..32767)                  OPTIONAL,
    interval                            [3] INTEGER (0..32767)                  OPTIONAL,
...
    }
-- Interval is the time in seconds between each repeated announcement. Duration is the total
-- amount of time in seconds, including repetitions and intervals.
-- The end of announcement is either the end of duration or numberOfRepetitions,
-- whatever comes first.
-- duration with value 0 indicates infinite duration

InfoChargeUnitsComponents {PARAMETERS-BOUND : bound} ::= SEQUENCE SIZE
        (bound.&minComponentLength .. bound.&maxComponentLength) OF SEQUENCE {
    reportingConditionUnits             [0] ReportingConditionUnits,
    units                               [1] Units,
    monitorComponent                    [2] MonitorComponent
    }

InfoChargeUnitsTotal ::= SEQUENCE {
    RreportingConditionUnits                [0] ReportingConditionUnits,
    UunitsUnits                         [1] Units
    }

InfoEvalueComponents {PARAMETERS-BOUND : bound} ::= SEQUENCE SIZE
        (bound.&minComponentLength .. bound.&maxComponentLength) OF SEQUENCE {
    reportingConditionEvalue            [0] ReportingConditionEvalue,
    evaluesAndTsw                       [1] EvaluesAndTsw,
    monitorComponent                    [2] MonitorComponent
    }

InfoEvalueTotal ::= SEQUENCE {
```

```
    ~~R~~reportingConditionEvalue           [0] ReportingConditionEvalue,
    ~~E~~evaluesAndTsw                      [1] EvaluesAndTsw
    }

InformationToSend {PARAMETERS-BOUND : bound} ::= CHOICE {
    inbandInfo                          [0] InbandInfo {bound},
    tone                                [1] Tone
    }

InitiatingEntity ::= ENUMERATED {
    mobileStation                       (0),
    sgsn                                (1),
    hlr                                 (2),
    ggsn                                (3)
    }

-- CR Editor's note: following may need to be changed depending on the solution of Q.773
-- "TCInvokeIdSet" and others.
InvokeID ::= TCInvokeIdSet

IPRoutingAddress {PARAMETERS-BOUND : bound} ::= CalledPartyNumber {bound}
-- Indicates the routeing address for the IP.

IPSSPCapabilities {PARAMETERS-BOUND : bound} ::= OCTET STRING (SIZE(
    bound.&minIPSSPCapabilitiesLength .. bound.&maxIPSSPCapabilitiesLength))
--  Indicates the gsmSRF resources available. The parameter has two parts, a standard and a
--  bilateral part. The standard part indicates capabilities defined as optional in CAP V.2
--  that shall be recognised (but not necessarily supported) by a CAP V.2 gsmSCF. The bilateral
--  part contains further information that is not specified in this standard, but which is set
--  according to bilateral agreements between network operators and/or equipment vendors.
--  The last octet of the standard part is indicated by bit 7 being set to 0, otherwise Bit 7 of
--  a standard part octet is set to 1 indicating that the standard part continues in the following
--  octet. Coding is as follows:

--  Octet 1                 Standard Part for CAP V.3
--  Bit Value               Meaning
--  0   0                   IPRoutingAddress not supported
--      1                   IPRoutingAddress supported
--  1   0                   VoiceBack not supported
--      1                   VoiceBack supported
--  2   0                   VoiceInformation not supported, via speech recognition
--      1                   VoiceInformation supported, via speech recognition
--  3   0                   VoiceInformation not supported, via voice recognition
--      1                   VoiceInformation supported, via voice recognition
--  4   0                   Generation of voice announcements from Text not supported
--      1                   Generation of voice announcements from Text supported
--  5   -                   Reserved
--  6   -                   Reserved
--  7   0                   End of standard part
--      1                   This value is reserved in CAP V.3
--
--  Octets 2 to 4           Bilateral Part: Network operator/equipment vendor specific

LegOrCallSegment {PARAMETERS-BOUND : bound} ::= CHOICE {
    callSegmentID                       [0] CallSegmentID {bound},
    legID                               [1] LegID
    }

LegType ::= OCTET STRING (SIZE(1))
leg1 LegType    ::= '01'H
leg2 LegType    ::= '02'H

LocationNumber {PARAMETERS-BOUND : bound} ::= OCTET STRING (SIZE (
    bound.&minLocationNumberLength .. bound.&maxLocationNumberLength))
-- Indicates the Location Number for the calling party.
-- Refer to ETSI EN 300 356-1 [23] for encoding.

MessageID {PARAMETERS-BOUND : bound} ::= CHOICE {
    elementaryMessageID                 [0] Integer4,
    text                                [1] SEQUENCE {
        messageContent                      [0] IA5String (SIZE(
            bound.&minMessageContentLength .. bound.&maxMessageContentLength)),
        attributes                          [1] OCTET STRING (SIZE(
            bound.&minAttributesLength .. bound.&maxAttributesLength))           OPTIONAL
    },
    elementaryMessageIDs                [29] SEQUENCE SIZE (1.. bound.&numOfMessageIDs) OF Integer4,
    variableMessage                     [30] SEQUENCE {
        elementaryMessageID                 [0] Integer4,
```

```
        variableParts                       [1] SEQUENCE SIZE (1..5) OF VariablePart {bound}
        }
    }
-- Use of the text parameter is network operator/equipment vendor specific.

MidCallControlInfo ::= SEQUENCE {
    MminimumNumberOfDigits              [0] INTEGER (1..30) DEFAULT 1,
    MmaximumNumberOfDigits              [1] INTEGER (1..30) DEFAULT 30,
    endOfReplyDigit                     [2] OCTET STRING (SIZE (1..2))              OPTIONAL,
    cancelDigit                         [3] OCTET STRING (SIZE (1..2))              OPTIONAL,
    startDigit                          [4] OCTET STRING (SIZE (1..2))              OPTIONAL,
    interDigitTimeout                   [6] INTEGER (1..127) DEFAULT 10
    }
--
-- - minimumNumberOfDigits          specifies the minumum number of digits that shall be collected
-- - maximumNumberOfDigits          specifies the maximum number of digits that shall be collected
-- - endOfReplyDigit                specifies the digit string that denotes the end of the digits
--                                  to be collected.
-- - cancelDigit                    specifies the digit string that indicates that the input shall
--                                  be erased and digit collection shall start afresh.
-- - startDigit                     specifies the digit string that denotes the start of the digits
--                                  to be collected.
-- - interDigitTimeout              specifies the maximum duration in seconds between successive
--                                  digits.
--
-- endOfReplyDigit, cancelDigit and startDigit shall contain digits in the range 0..9, '*' and '#'
-- only. The collected digits string, reported to the gsmSCF, shall include the endOfReplyDigit and
-- the startDigit, if present.
--
-- endOfReplyDigit, cancelDigit and startDigit shall be encoded as BCD digits. Each octet shall
-- contain one BCD digit, in the 4 least significant bits of each octet.
-- The following encoding shall be used for the over-decadic digits: 1011 (*), 1100 (#).

MonitorComponent ::= ENUMERATED {
    CchargesTransitNetwork              (0),
    CchargesSpecificPLMN                    (1)
    }

MonitorMode ::= ENUMERATED {
    interrupted                         (0),
    notifyAndContinue                   (1),
    transparent                         (2)
    }
-- Indicates the event is relayed and/or processed by the SSP.
-- Transparent means that the gsmSSF or gprsSSF does not notify the gsmSCF of the event.
-- For the use of this parameter refer to the procedure descriptions in clause 11.
-- For the RequestNotificationCharging operation, "interrupted" shall not be used in MonitorMode.

MO-SMSCause ::= ENUMERATED {
    systemFailure                       (0),
    unexpectedDataValue                 (1),
    facilityNotSupported                (2),
    sM-DeliveryFailure                  (3),
    releaseFromRadioInterface           (4)
    }
-- MO SMS error values which are reported to gsmSCF.
-- Most of these values are received from the SMSC as a response to
-- MO-ForwardSM operation.

MT-SMSCause ::= OCTET STRING (SIZE (1))
-- This variable is sent to the gsmSCF for a Short Message delivery failure
-- notification.
-- If the delivery failure is due to RP-ERROR RPDU received from the MS,
-- then MT-SMSCause shall be set to the RP-Cause component in the RP-ERROR RPDU.
-- Refer to 3G TS 24.011 [10] for the encoding of RP-Cause values.
-- Otherwise, if the delivery failure is due to internal failure in the MSC or SGSN
-- or time-out from the MS, then MT-SMSCause shall be set to "Protocol error,
-- unspecified", as defined in 3G TS 24.011 [10].

NAOliInfo ::= OCTET STRING (SIZE (1))
--  NA Oli information takes the same value as defined in ANSI T1.113-1995 [92]
--  e.g.    '3D'H  - Decimal value 61 - Cellular Service (Type 1)
--          '3E'H  - Decimal value 62 - Cellular Service (Type 2)
--          '3F'H  - Decimal value 63 - Cellular Service (roaming)

OCSIApplicable ::= NULL
--  Indicates that the Originating CAMEL Subscription Information, if present, shall be
--  applied on the outgoing call leg created with a Connect operation. For the use of this
```

```
--  parameter see 3GPP TS 23.078 [7].

OriginalCalledPartyID {PARAMETERS-BOUND : bound} ::= OCTET STRING (SIZE(
    bound.&minOriginalCalledPartyIDLength .. bound.&maxOriginalCalledPartyIDLength))
--  Indicates the original called number. Refer to ETSI EN 300 356-1 [23] Original Called Number
--  for encoding.

PDPID ::= OCTET STRING (SIZE (1))
--  PDP Identifier is a counter used to identify a specific PDP Context within a control
--  relationship between gprsSSF and gsmSCF.

PDPInitiationType ::= ENUMERATED {
    mSInitiated                         (0),
    networkInitiated                    (1)
    }

QualityOfService ::= SEQUENCE {
    requested-QoS                       [0] GPRS-QoS                                OPTIONAL,
    subscribed-QoS                      [1] GPRS-QoS                                OPTIONAL,
    negotiated-QoS                      [2] GPRS-QoS                                OPTIONAL,
    ...
    }
-- The procedure descriptions in clause 11 indicate which one(s) of the
-- QoS variables shall be transported.

ReceivingSideID ::= CHOICE {
    RreceivingSideID                        [1] LegType
    }
-- used to identify LegID in operations sent from gsmSSF to gsmSCF

RedirectingPartyID {PARAMETERS-BOUND : bound} ::= OCTET STRING (SIZE (
    bound.&minRedirectingPartyIDLength .. bound.&maxRedirectingPartyIDLength))
-- Indicates redirecting number.
-- Refer to ETSI EN 300 356-1 [23] Redirecting number for encoding.

ReportingConditionUnits ::= CHOICE {
    EendOfConnection                        [0] IMPLICIT NULL,
    TthresholdCountervalue              [1] IMPLICIT Integer4INTEGER (SIZE(4))
    }

ReportingConditionEvalue ::= CHOICE {
    OoccurranceOfEvent                  [0] IMPLICIT NULL
    }

RequestedInformationList {PARAMETERS-BOUND : bound} ::= SEQUENCE SIZE (1.. numOfInfoItems) OF
RequestedInformation {bound}

RequestedInformationTypeList ::= SEQUENCE SIZE (1.. numOfInfoItems) OF RequestedInformationType

RequestedInformation {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    RrequestedInformationType           [0] RequestedInformationType,
    requestedInformationValue           [1] RequestedInformationValue {bound},
...
    }

RequestedInformationType ::= ENUMERATED {
    CcallAttemptElapsedTime             (0),
    callStopTime                        (1),
    callConnectedElapsedTime            (2),
    releaseCause                        (30)
    }

RequestedInformationValue {PARAMETERS-BOUND : bound} ::= CHOICE {
    callAttemptElapsedTimeValue         [0] INTEGER (0..255),
    callStopTimeValue                   [1] DateAndTime,
    callConnectedElapsedTimeValue       [2] Integer4,
    releaseCauseValue                   [30] Cause {bound}
    }
-- The callAttemptElapsedTimeValue is specified in seconds. The unit for the
-- callConnectedElapsedTimeValue is 100 milliseconds

RPCause ::= OCTET STRING (SIZE (1))
-- RP cause according to 3GPP TS 24.011 [10] or 3G TS 29.002 [11].
-- GsmSCF shall send this cause in the ReleaseSMS operation.
-- For a MO-SMS service, the MSC or SGSN shall send the RP Cause to the originating MS.
-- It shall be used to overwrite the RP-Cause element in the RP-ERROR RPDU.
-- For a MT-SMS service, the MSC or SGSN shall send the RP Cause to the sending SMS-GMSC.
-- It shall be used to overwrite the RP-Cause element in the RP-ERROR RPDU.
```

```
ScfID {PARAMETERS-BOUND : bound} ::= OCTET STRING (SIZE(
    bound.&minScfIDLength .. bound.&maxScfIDLength))
-- defined by network operator.
-- Indicates the gsmSCF identity.

SCIBillingChargingCharacteristics {PARAMETERS-BOUND : bound} ::= OCTET STRING (SIZE (
    bound.&minSCIBillingChargingLength .. bound.&maxSCIBillingChargingLength))
    (CONSTRAINED BY {-- shall be the result of the BER-encoded value of type --
    CAMEL-SCIBillingChargingCharacteristics})
-- Indicates AOC information to be sent to a Mobile Station
-- The violation of the UserDefinedConstraint shall be handled as an ASN.1 syntax error.

SCIGPRSBillingChargingCharacteristics {PARAMETERS-BOUND : bound} ::= OCTET STRING (SIZE (
    bound.&minSCIBillingChargingLength .. bound.&maxSCIBillingChargingLength))
    (CONSTRAINED BY {-- shall be the result of the BER-encoded value of type -
    CAMEL-SCIGPRSBillingChargingCharacteristics})
-- Indicates AOC information to be sent to a Mobile Station
-- The violation of the UserDefinedConstraint shall be handled as an ASN.1 syntax error.

SendingSideID ::= CHOICE {sendingSideID [0] LegType}
-- used to identify LegID in operations sent from gsmSCF to gsmSSF

ServiceInteractionIndicatorsTwo ::= SEQUENCE {
    ~~f~~forwardServiceInteractionInd       [0] ForwardServiceInteractionInd            OPTIONAL,
    -- applicable to operations InitialDP, Connect and ContinueWithArgument.
    backwardServiceInteractionInd       [1] BackwardServiceInteractionInd           OPTIONAL,
    -- applicable to operations Connect and ContinueWithArgument.
    bothwayThroughConnectionInd         [2] BothwayThroughConnectionInd             OPTIONAL,
    -- applicable to ConnectToResource and EstablishTemporaryConnection
    connectedNumberTreatmentInd         [4] ConnectedNumberTreatmentInd             OPTIONAL,
    -- applicable to Connect and ContinueWithArgument
    nonCUGCall                          [13] NULL                                   OPTIONAL,
    -- applicable to Connect and ContinueWithArgument
    -- indicates that no parameters for CUG shall be used for the call (i.e. the call shall
    -- be a non-CUG call).
    -- If not present, it indicates one of three things:
    --  a) continue with modified CUG information (when one or more of either CUG Interlock Code
    --     and Outgoing Access Indicator are present), or
    --  b) continue with original CUG information (when neither CUG Interlock Code or Outgoing
    --     Access Indicator are present), i.e. no IN impact.
    --  c) continue with the original non-CUG call.
    holdTreatmentIndicator              [50] OCTET STRING (SIZE(1))                 OPTIONAL,
    -- applicable to InitialDP, Connect and ContinueWithArgument
    -- acceptHoldRequest    'xxxx xx01'B
    -- rejectHoldRequest    'xxxx xx10'B
    -- if absent from Connect or ContinueWithArgument,
    -- then CAMEL service does not affect call hold treatment
    cwTreatmentIndicator                [51] OCTET STRING (SIZE(1))                 OPTIONAL,
    -- applicable to InitialDP, Connect and ContinueWithArgument
    -- acceptCw 'xxxx xx01'B
    -- rejectCw 'xxxx xx10'B
    -- if absent from Connect or ContinueWithArgument,
    -- then CAMEL service does not affect call waiting treatment
    ectTreatmentIndicator               [52] OCTET STRING (SIZE(1))                 OPTIONAL,
    -- applicable to InitialDP, Connect and ContinueWithArgument
    -- acceptEctRequest 'xxxx xx01'B
    -- rejectEctRequest 'xxxx xx10'B
    -- if absent from Connect or ContinueWithArgument,
    -- then CAMEL service does not affect explicit call transfer treatment
    ...
    }

SGSNCapabilities ::= OCTET STRING (SIZE (1))

--  Indicates the SGSN capabilities. The coding of the parameter is as follows:
--  Bit Value               Meaning
--  0   0                   AoC not supported by SGSN
--      1                   AoC supported by SGSN
--  1   -                   This bit is reserved in CAP V.3
--  2   -                   This bit is reserved in CAP V.3
--  3   -                   This bit is reserved in CAP V.3
--  4   -                   This bit is reserved in CAP V.3
--  5   -                   This bit is reserved in CAP V.3
--  6   -                   This bit is reserved in CAP V.3
--  7   -                   This bit is reserved in CAP V.3

SMSEvent ::= SEQUENCE {
```

```
    eventTypeSMS                        [0] EventTypeSMS,
    monitorMode                         [1] MonitorMode
    }

TariffSwitchInterval ::= INTEGER (1 .. 86400)
-- TariffSwitchInterval is measured in 1 second units

TimeAndTimezone {PARAMETERS-BOUND : bound} ::= OCTET STRING (SIZE(
    bound.&minTimeAndTimezoneLength .. bound.&maxTimeAndTimezoneLength))
--  Indicates the time and timezone, relative to GMT. This parameter BCD encoded.
--  The year digit indicating millenium occupies bits 0-3 of the first octet, and the year
--  digit indicating century occupies bits 4-7 of the first octet.
--  The year digit indicating decade occupies bits 0-3 of the second octet, whilst the digit
--  indicating the year within the decade occupies bits 4-7 of the second octet.
--  The most significant month digit occupies bits 0-3 of the third octet, and the least
--  significant month digit occupies bits 4-7 of the third octet.
--  The most significant day digit occupies bits 0-3 of the fourth octet, and the least
--  significant day digit occupies bits 4-7 of the fourth octet.
--  The most significant hours digit occupies bits 0-3 of the fifth octet, and the least
--  significant hours digit occupies bits 4-7 of the fifth octet.
--  The most significant minutes digit occupies bits 0-3 of the sixth octet, and the least
--  significant minutes digit occupies bits 4-7 of the sixth octet.
--  The most significant seconds digit occupies bits 0-3 of the seventh octet, and the least
--  significant seconds digit occupies bits 4-7 of the seventh octet.
--
--  The timezone information occupies the eighth octet. For the encoding of Timezone refer to
--  3GPP TS 23.040 [6].
--
--  The BCD digits are packed and encoded as follows:
--
--  Bit  7  6  5   4  |  3  2  1  0
--       2nd digit    | 1st digit          Octet 1
--       3rd digit    | 4th digit          Octet 2
--                       ..                  ..
--       nth digit    | n-1th digit        Octet m
--
--       0000       digit 0
--       0001       digit 1
--       0010       digit 2
--       0011       digit 3
--       0100       digit 4
--       0101       digit 5
--       0110       digit 6
--       0111       digit 7
--       1000       digit 8
--       1001       digit 9
--       1010       spare
--       1011       spare
--       1100       spare
--       1101       spare
--       1110       spare
--       1101       spare
--
-- where the leftmost bit of the digit is either bit 7 or bit 3 of the octet.

TimeIfNoTariffSwitch ::= INTEGER(0..864000)
-- TimeIfNoTariffSwitch is measured in 100 millisecond intervals

TimeIfTariffSwitch ::= SEQUENCE {
    timeSinceTariffSwitch               [0] INTEGER(0..864000),
    tariffSwitchInterval                [1] INTEGER(1..864000)                    OPTIONAL
    }
-- timeSinceTariffSwitch and tariffSwitchInterval are measured in 100 millisecond intervals

TimeInformation ::= CHOICE {
    timeIfNoTariffSwitch                [0] TimeIfNoTariffSwitch,
    timeIfTariffSwitch                  [1] TimeIfTariffSwitch
    }
-- Indicates call duration information

TimerID ::= ENUMERATED {
    tssf                                (0)
    }
-- Indicates the timer to be reset.

TimerValue ::= Integer4
-- Indicates the timer value (in seconds).
```

```
Tone ::= SEQUENCE {
    toneID                          [0] Integer4,
    duration                        [1] Integer4                            OPTIONAL,
...
    }
-- The duration specifies the length of the tone in seconds, value 0 indicates infinite duration.

TPDataCodingScheme ::= OCTET STRING (SIZE (1))
-- TP Data Coding Scheme according to 3GPP TS 23.040 [6]

TPProtocolIdentifier ::= OCTET STRING (SIZE (1))
-- indicates the protocol used above the SM-Transfer Layer as specified in 3GPP TS 23.040 [6].

TPShortMessageSpecificInfo ::= OCTET STRING (SIZE (1))
-- contains the 1st octect of the applicable TPDU or the SMS-COMMAND TPDU as specified in
-- 3GPP TS 23.040 [6].

TPValidityPeriod ::= OCTET STRING (SIZE (1..7))
-- indicates the length of the validity period or the absolute time of the validity
-- period termination as specified in 3GPP TS 23.040 [6].
-- the length of ValidityPeriod is either 1 octet or 7 octets

TransferredVolume ::= CHOICE {
    volumeIfNoTariffSwitch          [0] INTEGER (0..4294967295),
    volumeIfTariffSwitch            [1] SEQUENCE {
        volumeSinceLastTariffSwitch     [0] INTEGER (0..4294967295),
        volumeTariffSwitchInterval      [1] INTEGER (0..4294967295)         OPTIONAL
        }
    }
--  volumeIfNoTariffSwitch, volumeSinceLastTariffSwitch and volumeTariffSwitchInterval
--  are measured in bytes.

TransferredVolumeRollOver ::= CHOICE {
    rO-VolumeIfNoTariffSwitch       [0] INTEGER (0..255),
    rO-VolumeIfTariffSwitch         [1] SEQUENCE {
        rO-VolumeSinceLastTariffSwitch  [0] INTEGER (0..255)                OPTIONAL,
        rO-VolumeTariffSwitchInterval   [1] INTEGER (0..255)                OPTIONAL
        }
    }
--  rO-VolumeIfNoTariffSwitch, rO-VolumeSinceLastTariffSwitch and rO-VolumeTariffSwitchInterval
--  present counters indicating the number of parameter range rollovers.

UnavailableNetworkResource ::= ENUMERATED {
    unavailableResources            (0),
    componentFailure                (1),
    basicCallProcessingException    (2),
    resourceStatusFailure           (3),
    endUserFailure                  (4)
    }
-- Indicates the network resource that failed.

Units ::= INTEGER (1 .. 10000)

VariablePart {PARAMETERS-BOUND : bound} ::= CHOICE {
    integer                         [0] Integer4,
    number                          [1] Digits {bound}, -- Generic digits
    time                            [2] OCTET STRING (SIZE(2)), -- HH: MM, BCD coded
    date                            [3] OCTET STRING (SIZE(4)), -- YYYYMMDD, BCD coded
    price                           [4] OCTET STRING (SIZE(4))
    }
--  Indicates the variable part of the message. Time is BCD encoded.
--  The most significant hours digit occupies bits 0-3 of the first octet, and the least
--  significant digit occupies bits 4-7 of the first octet. The most significant minutes digit
--  occupies bits 0-3 of the second octet, and the least significant digit occupies bits 4-7
--  of the second octet.
--
--  Date is BCD encoded. The year digit indicating millenium occupies bits 0-3 of the first octet,
--  and the year digit indicating century occupies bits 4-7 of the first octet. The year digit
--  indicating decade occupies bits 0-3 of the second octet, whilst the digit indicating the year
--  within the decade occupies bits 4-7 of the second octet.
--  The most significant month digit occupies bits 0-3 of the third octet, and the least
--  significant month digit occupies bits 4-7 of the third octet. The most significant day digit
--  occupies bits 0-3 of the fourth octet, and the least significant day digit occupies bits 4-7
--  of the fourth octet.
--  Price is BCD encoded. The digit indicating hundreds of thousands occupies bits 0-3 of the
--  first octet, and the digit indicating tens of thousands occupies bits 4-7 of the first octet.
--  The digit indicating thousands occupies bits 0-3 of the second octet, whilst the digit
--  indicating hundreds occupies bits 4-7 of the second octet. The digit indicating tens occupies
```

```
--  bits 0-3 of the third octet, and the digit indicating 0 to 9 occupies bits 4-7 of the third
--  octet. The tenths digit occupies bits 0-3 of the fourth octet, and the hundredths digit
--  occupies bits 4-7 of the fourth octet.
--
--  For the encoding of digits in an octet, refer to the timeAndtimezone parameter

-- The Definition of range of constants follows
numOfInfoItems INTEGER ::= 4

END

-- 5.2  Error types
CAP-errortypes {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0) umts-network(1)
modules(3) cap-errortypes(51) version4(3)}
-- This module contains the type definitions for the CAP Error Types.
-- Where a parameter of type CHOICE is tagged with a specific tag value, the tag is automatically
-- replaced with an EXPLICIT tag of the same value.

DEFINITIONS IMPLICIT TAGS ::= BEGIN

IMPORTS

    ros-InformationObjects,
    datatypes,
    errorcodes
FROM CAP-object-identifiers {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
umts-network(1) modules(3) cap-object-identifiers(100) version4(3)}

    ERROR
FROM Remote-Operations-Information-Objects ros-InformationObjects

    InvokeID,
    UnavailableNetworkResource
FROM CAP-datatypes datatypes

    errcode-canceled,
    errcode-cancelFailed,
    errcode-eTCFailed,
    errcode-improperCallerResponse,
    errcode-missingCustomerRecord,
    errcode-missingParameter,
    errcode-parameterOutOfRange,
    errcode-requestedInfoError,
    errcode-systemFailure,
    errcode-taskRefused,
    errcode-unavailableResource,
    errcode-unexpectedComponentSequence,
    errcode-unexpectedDataValue,
    errcode-unexpectedParameter,
    errcode-unknownLegID,
    errcode-unknownCSID,
    errcode-unknownPDPID
FROM CAP-errorcodes errorcodes

;

-- TYPE DEFINITION FOR CAP ERROR TYPES FOLLOWS

canceled ERROR ::= {
    CODE    errcode-canceled
    }
-- The operation has been canceled.

cancelFailed ERROR ::= {
    PARAMETER   SEQUENCE {
        problem                 [0] ENUMERATED {
            unknownOperation        (0),
            tooLate                 (1),
            operationNotCancellable (2)
            },
        operation               [1] InvokeID,
        ...
        }
    CODE    errcode-cancelFailed
    }
-- The operation failed to be canceled.

eTCFailed ERROR ::= {
```

```
    CODE    errcode-eTCFailed
    }
-- The establish temporary connection failed.

improperCallerResponse ERROR ::= {
    CODE    errcode-improperCallerResponse
    }
-- The caller response was not as expected.

missingCustomerRecord ERROR ::= {
    CODE    errcode-missingCustomerRecord
    }
-- The Service Logic Program could not be found in the gsmSCF.

missingParameter ERROR ::= {
    CODE    errcode-missingParameter
    }
-- An expected optional parameter was not received.

parameterOutOfRange ERROR ::= {
    CODE    errcode-parameterOutOfRange
    }
-- The parameter was not as expected (e.g. missing or out of range).

requestedInfoError ERROR ::= {
    PARAMETER   ENUMERATED {
            unknownRequestedInfo        (1),
            requestedInfoNotAvailable   (2)
            }
    CODE    errcode-requestedInfoError
    }
-- The requested information cannot be found.

systemFailure ERROR ::= {
    PARAMETER   UnavailableNetworkResource
    CODE    errcode-systemFailure
    }
-- The operation could not be completed due to a system failure at the serving physical entity.

taskRefused ERROR ::= {
    PARAMETER   ENUMERATED {
            generic                     (0),
            unobtainable                (1),
            congestion                  (2)
            }
    CODE    errcode-taskRefused
    }
-- An entity normally capable of the task requested cannot or chooses not to perform the task at
-- this time. This includes error situations like congestion and unobtainable address as used in
-- e.g. the connect operation.)

unavailableResource ERROR ::= {
    CODE    errcode-unavailableResource
    }
-- A requested resource is not available at the serving entity.

unexpectedComponentSequence ERROR ::= {
    CODE    errcode-unexpectedComponentSequence
    }
-- An incorrect sequence of Components was received (e.g."DisconnectForwardConnection"
-- followed by "PlayAnnouncement").

unexpectedDataValue ERROR ::= {
    CODE    errcode-unexpectedDataValue
    }
-- The data value was not as expected (e.g. route number expected but billing number received)

unexpectedParameter ERROR ::= {
    CODE    errcode-unexpectedParameter
    }
-- A parameter received was not expected.

unknownLegID ERROR ::= {
    CODE    errcode-unknownLegID
    }
-- Leg not known to the gsmSSF.

unknownCSID ERROR ::= {
```

```
    CODE    errcode-unknownCSID
    }
-- Call Segment not known to the gsmSSF.

unknownPDPID ERROR ::= {
    CODE    errcode-unknownPDPID
    }
-- PDPID not known by the receiving entity.

END

-- 5.3  Operation codes
CAP-operationcodes {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0) umts-network(1)
modules(3) cap-operationcodes(53) version4(3)}

DEFINITIONS ::= BEGIN

IMPORTS

    ros-InformationObjects
FROM CAP-object-identifiers {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
umts-network(1) modules(3) cap-object-identifiers(100) version4(3)}

    Code
FROM Remote-Operations-Information-Objects ros-InformationObjects

;

-- the operations are grouped by the identified operation packages.

-- gsmSCF activation Package
    opcode-initialDP                        Code ::= local: 0
-- gsmSCF/gsmSRF activation of assist Package
    opcode-assistRequestInstructions        Code ::= local: 16
-- Assist connection establishment Package
    opcode-establishTemporaryConnection     Code ::= local: 17
-- Generic disconnect resource Package
    opcode-disconnectForwardConnection      Code ::= local: 18
    opcode-dFCWithArgument                  Code ::= local: 86
-- Non-assisted connection establishment Package

    opcode-connectToResource                Code ::= local: 19
-- Connect Package (elementary gsmSSF function)
    opcode-connect                          Code ::= local: 20
-- Call handling Package (elementary gsmSSF function)
    opcode-releaseCall                      Code ::= local: 22
-- BCSM Event handling Package
    opcode-requestReportBCSMEvent           Code ::= local: 23
    opcode-eventReportBCSM                  Code ::= local: 24
-- Charging Event handling Package
    opcode-requestNotificationChargingEvent Code ::= local: 25
    opcode-eventNotificationCharging        Code ::= local: 26
-- gsmSSF call processing Package
    opcode-continue                         Code ::= local: 31
    opcode-continueWithArgument             Code ::= local: 56
-- CR Editor's note: duplicate definition of opcode-continueWithArgument
-- gsmSCF call initiation Package
    opcode-initiateCallAttempt              Code ::= local: 32
-- Timer Package
    opcode-resetTimer                       Code ::= local: 33
-- Billing Package
    opcode-furnishChargingInformation       Code ::= local: 34
-- Charging Package
    opcode-applyCharging                    Code ::= local: 35
    opcode-applyChargingReport              Code ::= local: 36
    opcode-playTone                         Code ::= local: 97
-- Traffic management Package
    opcode-callGap                          Code ::= local: 41
-- Call report Package
    opcode-callInformationReport            Code ::= local: 44
    opcode-callInformationRequest           Code ::= local: 45
-- Signalling control Package
    opcode-sendChargingInformation          Code ::= local: 46
-- Specialized resource control Package
    opcode-playAnnouncement                 Code ::= local: 47
    opcode-promptAndCollectUserInformation  Code ::= local: 48
    opcode-specializedResourceReport        Code ::= local: 49
-- Cancel Package
```

```
    opcode-cancel                           Code ::= local: 53
-- Activity Test Package
    opcode-activityTest                     Code ::= local: 55
-- CPH Response Package
    opcode-continueWithArgument             Code ::= local: 88
    opcode-disconnectLeg                    Code ::= local: 90
    opcode-moveLeg                          Code ::= local: 93
    opcode-splitLeg                         Code ::= local: 95
-- Exception Inform Package
    opcode-entityReleased                   Code ::= local: 96

-- Sms Activation Package
    opcode-initialDPSMS                     Code ::= local: 60
-- Sms Billing Package
    opcode-furnishChargingInformationSMS    Code ::= local: 61
-- Sms Connect Package
    opcode-connectSMS                       Code ::= local: 62
-- Sms Event Handling Package
    opcode-requestReportSMSEvent            Code ::= local: 63
    opcode-eventReportSMS                   Code ::= local: 64
-- Sms Processing Package
    opcode-continueSMS                      Code ::= local: 65
-- Sms Release Package
    opcode-releaseSMS                       Code ::= local: 66
-- Sms Timer Package
    opcode-resetTimerSMS                    Code ::= local: 67

-- Gprs Activity Test Package
    opcode-activityTestGPRS                 Code ::= local: 70
-- Gprs Charging Package
    opcode-applyChargingGPRS                Code ::= local: 71
    opcode-applyChargingReportGPRS          Code ::= local: 72
-- Gprs Cancel Package
    opcode-cancelGPRS                       Code ::= local: 73
-- Gprs Connect Package
    opcode-connectGPRS                      Code ::= local: 74
-- Gprs Processing Package
    opcode-continueGPRS                     Code ::= local: 75
-- Gprs Exception Information Package
    opcode-entityReleasedGPRS               Code ::= local: 76
-- Gprs Billing Package
    opcode-furnishChargingInformationGPRS   Code ::= local: 77
-- Gprs Scf Activation Package
    opcode-initialDPGPRS                    Code ::= local: 78
-- Gprs Release Package
    opcode-releaseGPRS                      Code ::= local: 79
-- Gprs Event Handling Package
    opcode-eventReportGPRS                  Code ::= local: 80
    opcode-requestReportGPRSEvent           Code ::= local: 81
-- Gprs Timer Package
    opcode-resetTimerGPRS                   Code ::= local: 82
-- Gprs Charge Advice Package
    opcode-sendChargingInformationGPRS      Code ::= local: 83

END

-- 5.4  Error codes
CAP-errorcodes {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0) umts-network(1)
modules(3) cap-errorcodes(57) version4(3)}

DEFINITIONS ::= BEGIN

IMPORTS

    ros-InformationObjects
FROM CAP-object-identifiers {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
umts-network(1) modules(3) cap-object-identifiers(100) version4(3)}

    Code
FROM Remote-Operations-Information-Objects ros-InformationObjects

;

errcode-canceled                            Code ::= local: 0
errcode-cancelFailed                        Code ::= local: 1
errcode-eTCFailed                           Code ::= local: 3
errcode-improperCallerResponse              Code ::= local: 4
errcode-missingCustomerRecord               Code ::= local: 6
```

```
errcode-missingParameter                        Code ::= local: 7
errcode-parameterOutOfRange                     Code ::= local: 8
errcode-requestedInfoError                      Code ::= local: 10
errcode-systemFailure                           Code ::= local: 11
errcode-taskRefused                             Code ::= local: 12
errcode-unavailableResource                     Code ::= local: 13
errcode-unexpectedComponentSequence             Code ::= local: 14
errcode-unexpectedDataValue                     Code ::= local: 15
errcode-unexpectedParameter                     Code ::= local: 16
errcode-unknownLegID                            Code ::= local: 17
errcode-unknownPDPID                            Code ::= local: 50
errcode-unknownCSID                             Code ::= local: 51

END

-- 5.5  Classes
CAP-classes {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0) umts-network(1)
modules(3) cap-classes(54) version4(3)}

DEFINITIONS ::= BEGIN

IMPORTS

    ROS-OBJECT-CLASS,
    Code
FROM Remote-Operations-Information-Objects ros-InformationObjects

    id-rosObject-gsmSRF,
    id-rosObject-gsmSSF,
    ros-InformationObjects,
    gsmSSF-gsmSCF-Protocol,
    gsmSCF-gsmSRF-Protocol
FROM CAP-object-identifiers {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
umts-network(1) modules(3) cap-object-identifiers(100) version4(3)}

    capSsfToScfGeneric,
    capAssistHandoffssfToScf
FROM CAP-gsmSSF-gsmSCF-pkgs-contracts-acs gsmSSF-gsmSCF-Protocol

    gsmSRF-gsmSCF-contract
FROM CAP-gsmSCF-gsmSRF-pkgs-contracts-acs gsmSCF-gsmSRF-Protocol

    CriticalityType
FROM CS2-datatypes {itu-t(0) identified-organization(4) etsi(0) inDomain(1) in-network(1) cs2(20)
modules(0) in-cs2-datatypes(0) version1(0)}

;

gsmSSF ROS-OBJECT-CLASS ::= {
    INITIATES   {capSsfToScfGeneric|
                 capAssistHandoffssfToScf}
    RESPONDS    {capSsfToScfGeneric}
    ID          id-rosObject-gsmSSF}

gsmSRF ROS-OBJECT-CLASS ::= {
    INITIATES   {gsmSRF-gsmSCF-contract}
    ID          id-rosObject-gsmSRF}

EXTENSION ::= CLASS {
    &ExtensionType,
    &criticality        CriticalityType DEFAULT ignore,
    &id Code}

WITH SYNTAX {
    EXTENSION-SYNTAX    &ExtensionType
    CRITICALITY         &criticality
    IDENTIFIED BY       &id}
-- Example of addition of an extension named "Some Network Specific Indicator" of type
-- BOOLEAN, with criticality "abort" and to be identified as extension number 1
-- Example of definition using the above information object class:
--
-- SomeNetworkSpecificIndicator EXTENSION ::= {
--  EXTENSION-SYNTAX    BOOLEAN
--  CRITICALITY         abort
--  IDENTIFIED BY       local: 1
--  }

-- Example of transfer syntax, using the ExtensionField datatype as specified in clause 5.
```

```
-- Assuming the value of the extension is set to TRUE, the extensions parameter
-- becomes a Sequence of type INTEGER ::= 1, criticality ENUMERATED ::= 1 and value [1]
-- EXPLICIT BOOLEAN ::= TRUE.
--
-- Use of ITU-T Recommendation Q.1400 [52] defined Extension is for further study.
-- In addition the extension mechanism marker is used to identify the future minor additions
-- to CAP.

firstExtension EXTENSION ::= {
    EXTENSION-SYNTAX    NULL
    CRITICALITY         ignore
    IDENTIFIED BY       local: 1}
-- firstExtension is just an example.

SupportedExtensions EXTENSION ::= {firstExtension, ...
-- full set of network operator extensions --
}
-- SupportedExtension is the full set of the network operator extensions.

PARAMETERS-BOUND ::= CLASS {
    &minAccessPointNameLength                   INTEGER,
    &maxAccessPointNameLength                   INTEGER,
    &minAChBillingChargingLength                INTEGER,
    &maxAChBillingChargingLength                INTEGER,
    &minAttributesLength                        INTEGER,
    &maxAttributesLength                        INTEGER,
    &maxBearerCapabilityLength                  INTEGER,
    &minCalledPartyBCDNumberLength              INTEGER,
    &maxCalledPartyBCDNumberLength              INTEGER,
    &minCalledPartyNumberLength                 INTEGER,
    &maxCalledPartyNumberLength                 INTEGER,
    &minCallingPartyNumberLength                INTEGER,
    &maxCallingPartyNumberLength                INTEGER,
    &minCallResultLength                        INTEGER,
    &maxCallResultLength                        INTEGER,
    &minCarrierLength                           INTEGER,
    &maxCarrierLength                           INTEGER,
    &minCauseLength                             INTEGER,
    &maxCauseLength                             INTEGER,
    &minComponentLength                         INTEGER,
    &maxComponentLength                         INTEGER,
    &minDigitsLength                            INTEGER,
    &maxDigitsLength                            INTEGER,
    &minFCIBillingChargingDataLength            INTEGER,
    &maxFCIBillingChargingDataLength            INTEGER,
    &minFCIBillingChargingLength                INTEGER,
    &maxFCIBillingChargingLength                INTEGER,
    &minGenericNumberLength                     INTEGER,
    &maxGenericNumberLength                     INTEGER,
    &minGPRSCauseLength                         INTEGER,
    &maxGPRSCauseLength                         INTEGER,
    &minIPSSPCapabilitiesLength                 INTEGER,
    &maxIPSSPCapabilitiesLength                 INTEGER,
    &minLocationNumberLength                    INTEGER,
    &maxLocationNumberLength                    INTEGER,
    &minMessageContentLength                    INTEGER,
    &maxMessageContentLength                    INTEGER,
    &minOriginalCalledPartyIDLength             INTEGER,
    &maxOriginalCalledPartyIDLength             INTEGER,
    &minPDPAddressLength                        INTEGER,
    &maxPDPAddressLength                        INTEGER,
    &minRedirectingPartyIDLength                INTEGER,
    &maxRedirectingPartyIDLength                INTEGER,
    &minScfIDLength                             INTEGER,
    &maxScfIDLength                             INTEGER,
    &minSCIBillingChargingLength                INTEGER,
    &maxSCIBillingChargingLength                INTEGER,
    &minTimeAndTimezoneLength                   INTEGER,
    &maxTimeAndTimezoneLength                   INTEGER,
    &numOfBCSMEvents                            INTEGER,
    &numOfCSs                                   INTEGER,
    &numOfSMSEvents                             INTEGER,
    &numOfGPRSEvents                            INTEGER,
    &numOfExtensions                            INTEGER,
    &numOfGenericNumbers                        INTEGER,
    &numOfMessageIDs                            INTEGER}

WITH SYNTAX {
```

```
    MINIMUM-FOR-ACCESS-POINT-NAME              &minAccessPointNameLength
    MAXIMUM-FOR-ACCESS-POINT-NAME              &maxAccessPointNameLength
    MINIMUM-FOR-ACH-BILLING-CHARGING           &minAChBillingChargingLength
    MAXIMUM-FOR-ACH-BILLING-CHARGING           &maxAChBillingChargingLength
    MINIMUM-FOR-ATTRIBUTES                     &minAttributesLength
    MAXIMUM-FOR-ATTRIBUTES                     &maxAttributesLength
    MAXIMUM-FOR-BEARER-CAPABILITY              &maxBearerCapabilityLength
    MINIMUM-FOR-CALLED-PARTY-BCD-NUMBER        &minCalledPartyBCDNumberLength
    MAXIMUM-FOR-CALLED-PARTY-BCD-NUMBER        &maxCalledPartyBCDNumberLength
    MINIMUM-FOR-CALLED-PARTY-NUMBER            &minCalledPartyNumberLength
    MAXIMUM-FOR-CALLED-PARTY-NUMBER            &maxCalledPartyNumberLength
    MINIMUM-FOR-CALLING-PARTY-NUMBER           &minCallingPartyNumberLength
    MAXIMUM-FOR-CALLING-PARTY-NUMBER           &maxCallingPartyNumberLength
    MINIMUM-FOR-CALL-RESULT                    &minCallResultLength
    MAXIMUM-FOR-CALL-RESULT                    &maxCallResultLength
    MINIMUM-FOR-CARRIER                        &minCarrierLength
    MAXIMUM-FOR-CARRIER                        &maxCarrierLength
    MINIMUM-FOR-CAUSE                          &minCauseLength
    MAXIMUM-FOR-CAUSE                          &maxCauseLength
    MINIMUM-FOR-COMPONENT                      &minComponentLength
    MAXIMUM-FOR-COMPONENT                      &maxComponentLength
    MINIMUM-FOR-DIGITS                         &minDigitsLength
    MAXIMUM-FOR-DIGITS                         &maxDigitsLength
    MINIMUM-FOR-FCI-BILLING-CHARGING-DATA      &minFCIBillingChargingDataLength
    MAXIMUM-FOR-FCI-BILLING-CHARGING-DATA      &maxFCIBillingChargingDataLength
    MINIMUM-FOR-FCI-BILLING-CHARGING           &minFCIBillingChargingLength
    MAXIMUM-FOR-FCI-BILLING-CHARGING           &maxFCIBillingChargingLength
    MINIMUM-FOR-GENERIC-NUMBER                 &minGenericNumberLength
    MAXIMUM-FOR-GENERIC-NUMBER                 &maxGenericNumberLength
    MINIMUM-FOR-GPRS-CAUSE-LENGTH              &minGPRSCauseLength
    MAXIMUM-FOR-GPRS-CAUSE-LENGTH              &maxGPRSCauseLength
    MINIMUM-FOR-IP-SSP-CAPABILITIES            &minIPSSPCapabilitiesLength
    MAXIMUM-FOR-IP-SSP-CAPABILITIES            &maxIPSSPCapabilitiesLength
    MINIMUM-FOR-LOCATION-NUMBER                &minLocationNumberLength
    MAXIMUM-FOR-LOCATION-NUMBER                &maxLocationNumberLength
    MINIMUM-FOR-MESSAGE-CONTENT                &minMessageContentLength
    MAXIMUM-FOR-MESSAGE-CONTENT                &maxMessageContentLength
    MINIMUM-FOR-ORIGINAL-CALLED-PARTY-ID       &minOriginalCalledPartyIDLength
    MAXIMUM-FOR-ORIGINAL-CALLED-PARTY-ID       &maxOriginalCalledPartyIDLength
    MINIMUM-FOR-PDP-ADDRESS-LENGTH             &minPDPAddressLength
    MAXIMUM-FOR-PDP-ADDRESS-LENGTH             &maxPDPAddressLength
    MINIMUM-FOR-REDIRECTING-ID                 &minRedirectingPartyIDLength
    MAXIMUM-FOR-REDIRECTING-ID                 &maxRedirectingPartyIDLength
    MINIMUM-FOR-GSMSCF-ID                      &minScfIDLength
    MAXIMUM-FOR-GSMSCF-ID                      &maxScfIDLength
    MINIMUM-FOR-SCI-BILLING-CHARGING           &minSCIBillingChargingLength
    MAXIMUM-FOR-SCI-BILLING-CHARGING           &maxSCIBillingChargingLength
    MINIMUM-FOR-TIME-AND-TIMEZONE              &minTimeAndTimezoneLength
    MAXIMUM-FOR-TIME-AND-TIMEZONE              &maxTimeAndTimezoneLength
    NUM-OF-BCSM-EVENT                          &numOfBCSMEvents
    NUM-OF-CSS                                 &numOfCSs
    NUM-OF-SMS-EVENTS                          &numOfSMSEvents
    NUM-OF-GPRS-EVENTS                         &numOfGPRSEvents
    NUM-OF-EXTENSIONS                          &numOfExtensions
    NUM-OF-GENERIC-NUMBERS                     &numOfGenericNumbers
    NUM-OF-MESSAGE-IDS                         &numOfMessageIDs}

cAPSpecificBoundSet PARAMETERS-BOUND ::= {
    MINIMUM-FOR-ACCESS-POINT-NAME              1
    MAXIMUM-FOR-ACCESS-POINT-NAME              100
    MINIMUM-FOR-ACH-BILLING-CHARGING           5
    MAXIMUM-FOR-ACH-BILLING-CHARGING           177
    MINIMUM-FOR-ATTRIBUTES                     2
    MAXIMUM-FOR-ATTRIBUTES                     10
    MAXIMUM-FOR-BEARER-CAPABILITY              11
    MINIMUM-FOR-CALLED-PARTY-BCD-NUMBER        1
    MAXIMUM-FOR-CALLED-PARTY-BCD-NUMBER        41
    MINIMUM-FOR-CALLED-PARTY-NUMBER            2
    MAXIMUM-FOR-CALLED-PARTY-NUMBER            18
    MINIMUM-FOR-CALLING-PARTY-NUMBER           2
    MAXIMUM-FOR-CALLING-PARTY-NUMBER           10
    MINIMUM-FOR-CALL-RESULT                    12
    MAXIMUM-FOR-CALL-RESULT                    193
    MINIMUM-FOR-CARRIER                        4
    MAXIMUM-FOR-CARRIER                        4
    MINIMUM-FOR-CAUSE                          2
    MAXIMUM-FOR-CAUSE                          32
    MINIMUM-FOR-COMPONENT                      1
```

```
    MAXIMUM-FOR-COMPONENT                       2
    MINIMUM-FOR-DIGITS                          2
    MAXIMUM-FOR-DIGITS                          16
    MINIMUM-FOR-FCI-BILLING-CHARGING-DATA       1
    MAXIMUM-FOR-FCI-BILLING-CHARGING-DATA       160
    MINIMUM-FOR-FCI-BILLING-CHARGING            5
    MAXIMUM-FOR-FCI-BILLING-CHARGING            225
    MINIMUM-FOR-GENERIC-NUMBER                  3
    MAXIMUM-FOR-GENERIC-NUMBER                  11
    MINIMUM-FOR-GPRS-CAUSE-LENGTH               1
    MAXIMUM-FOR-GPRS-CAUSE-LENGTH               1
    MINIMUM-FOR-IP-SSP-CAPABILITIES             1
    MAXIMUM-FOR-IP-SSP-CAPABILITIES             4
    MINIMUM-FOR-LOCATION-NUMBER                 2
    MAXIMUM-FOR-LOCATION-NUMBER                 10
    MINIMUM-FOR-MESSAGE-CONTENT                 1
    MAXIMUM-FOR-MESSAGE-CONTENT                 127
    MINIMUM-FOR-ORIGINAL-CALLED-PARTY-ID        2
    MAXIMUM-FOR-ORIGINAL-CALLED-PARTY-ID        10
    MINIMUM-FOR-PDP-ADDRESS-LENGTH              1
    MAXIMUM-FOR-PDP-ADDRESS-LENGTH              63
    MINIMUM-FOR-REDIRECTING-ID                  2
    MAXIMUM-FOR-REDIRECTING-ID                  10
    MINIMUM-FOR-GSMSCF-ID                       2
    MAXIMUM-FOR-GSMSCF-ID                       10
    MINIMUM-FOR-SCI-BILLING-CHARGING            4
    MAXIMUM-FOR-SCI-BILLING-CHARGING            124
    MINIMUM-FOR-TIME-AND-TIMEZONE               8
    MAXIMUM-FOR-TIME-AND-TIMEZONE               8
    NUM-OF-BCSM-EVENT                           10
    NUM-OF-CSS                                  127
    NUM-OF-SMS-EVENTS                           10
    NUM-OF-GPRS-EVENTS                          10
    NUM-OF-EXTENSIONS                           10
    NUM-OF-GENERIC-NUMBERS                      5
    NUM-OF-MESSAGE-IDS                          16}

END

-- 5.6  Object IDentifiers (IDs)
CAP-object-identifiers {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
umts-network(1) modules(3) cap-object-identifiers(100) version4(3)}

DEFINITIONS ::= BEGIN

-- This module assigns object identifiers for Modules, Packages, Contracts and ACs
-- used by CAP

-- For Modules from TC, ROS,
tc-Messages                                 OBJECT IDENTIFIER ::=
    {itu-t recommendation q 773 modules(2) messages(1) version3(3)}

tc-NotationExtensions                       OBJECT IDENTIFIER ::=
    {itu-t recommendation q 775 modules(2) notation-extension (4) version1(1)}

ros-InformationObjects                      OBJECT IDENTIFIER ::=
    {joint-iso-itu-t remote-operations(4) informationObjects(5) version1(0)}


-- For CAP Modules
datatypes                                   OBJECT IDENTIFIER ::=
    {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0) umts-network(1) modules(3)
    cap-datatypes(52) version43(32)}

errortypes                                  OBJECT IDENTIFIER ::=
    {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0) umts-network(1) modules(3)
    cap-errortypes(51) version43(32)}

operationcodes                              OBJECT IDENTIFIER ::=
    {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0) umts-network(1) modules(3)
    cap-operationcodes(53) version43(32)}

errorcodes                                  OBJECT IDENTIFIER ::=
    {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0) umts-network(1) modules(3)
    cap-errorcodes(57) version43(32)}

classes                                     OBJECT IDENTIFIER ::=
    {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0) umts-network(1) modules(3)
```

```
    cap-classes(54) version43(32)}


gsmSSF-gsmSCF-Operations                        OBJECT IDENTIFIER ::=
    {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0) umts-network(1) modules(3)
    cap-gsmSSF-gsmSCF-ops-args(101) version43(32)}

gsmSSF-gsmSCF-Protocol                          OBJECT IDENTIFIER ::=
    {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0) umts-network(1) modules(3)
    cap-gsmSSF-gsmSCF-pkgs-contracts-acs(102) version43(32)}

gsmSCF-gsmSRF-Operations                        OBJECT IDENTIFIER ::=
    {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0) umts-network(1) modules(3)
    cap-gsmSCF-gsmSRF-ops-args(103) version43(32)}

gsmSCF-gsmSRF-Protocol                          OBJECT IDENTIFIER ::=
    {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0) umts-network(1) modules(3)
    cap-gsmSCF-gsmSRF-pkgs-contracts-acs(104) version43(32)}


sms-Operations                                  OBJECT IDENTIFIER ::=
    {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0) umts-network(1) modules(3)
    cap-SMS-ops-args(105) version4(3)}

smsSSF-gsmSCF-Protocol                          OBJECT IDENTIFIER ::=
    {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0) umts-network(1) modules(3)
    cap-smsSSF-gsmSCF-pkgs-contracts-acs(106) version4(3)}

--CR Editor's Note: we shall put the GPRS modules version to version4(3). The Application Contexts,
--Contracts, Operation Packages and Abstract Syntaxes shall remain verion 3(2).
gprsSSF-gsmSCF-Operations                       OBJECT IDENTIFIER ::=
    {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0) umts-network(1) modules(3)
    cap-GPRS-ops-args(107) version3(2)}

gprsSSF-gsmSCF-Protocol                         OBJECT IDENTIFIER ::=
    {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0) umts-network(1) modules(3)
    cap-gprsSSF-gsmSCF-pkgs-contracts-acs(108) version3(2)}


id-CAP                                          OBJECT IDENTIFIER ::=
    {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
    umts-network(1) cap4(22)}

id-CAP3                                         OBJECT IDENTIFIER ::=
    {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
    umts-network(1) cap3(20)}

id-CAPOE                                        OBJECT IDENTIFIER ::=
    {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
    umts-network(1) cap4OE(23)}

id-CAP3OE                                       OBJECT IDENTIFIER ::=
    {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
    umts-network(1) cap3OE(21)}

id-ac                                           OBJECT IDENTIFIER ::= {id-CAP       ac(3)}
id-ac3                                          OBJECT IDENTIFIER ::= {id-CAP3      ac(3)}
id-acE                                          OBJECT IDENTIFIER ::= {id-CAPOE     ac(3)}
id-ac3E                                         OBJECT IDENTIFIER ::= {id-CAP3OE    ac(3)}
id-as                                           OBJECT IDENTIFIER ::= {id-CAP       as(5)}
id-as3                                          OBJECT IDENTIFIER ::= {id-CAP3      as(5)}
id-asE                                          OBJECT IDENTIFIER ::= {id-CAPOE     as(5)}
id-rosObject                                    OBJECT IDENTIFIER ::= {id-CAP       rosObject(25)}
id-contract                                     OBJECT IDENTIFIER ::= {id-CAP       contract(26)}
id-contract3                                    OBJECT IDENTIFIER ::= {id-CAP3      contract(26)}
id-contractE                                    OBJECT IDENTIFIER ::= {id-CAPOE     contract(26)}
id-package                                      OBJECT IDENTIFIER ::= {id-CAP       package(27)}
id-package3                                     OBJECT IDENTIFIER ::= {id-CAP3      package(27)}
id-packageE                                     OBJECT IDENTIFIER ::= {id-CAPOE     package(27)}

-- for ac, as, rosObject, contract and package, the values are identical to ITU-T Recommendation
-- Q.1218 [49]

-- ROS Objects

id-rosObject-gsmSCF                             OBJECT IDENTIFIER ::= {id-rosObject 4}
id-rosObject-gsmSSF                             OBJECT IDENTIFIER ::= {id-rosObject 5}
id-rosObject-gsmSRF                             OBJECT IDENTIFIER ::= {id-rosObject 6}
```

```
-- Application Contexts

-- gsmSSF/gsmSCF AC
id-ac-CAP-gsmSSF-scfGenericAC                   OBJECT IDENTIFIER ::= {id-acE 4}
id-ac-CAP-gsmSSF-scfAssistHandoffAC             OBJECT IDENTIFIER ::= {id-acE 6}
id-ac-CAP-scf-gsmSSFGenericAC                   OBJECT IDENTIFIER ::= {id-acE 8}

-- gsmSRF/gsmSCF AC
id-ac-gsmSRF-gsmSCF                             OBJECT IDENTIFIER ::= {id-ac 14}

-- gprsSSF/gsmSCF AC
--CR Editor's Note: we shall put the GPRS modules version to version4(3). The Application Contexts,
--Contracts, Operation Packages and Abstract Syntaxes shall remain verion 3(2).
id-ac-CAP-gprsSSF-gsmSCF-AC                     OBJECT IDENTIFIER ::= {id-ac3E 50}
id-ac-CAP-gsmSCF-gprsSSF-AC                     OBJECT IDENTIFIER ::= {id-ac3E 51}

-- gprsSSF/gsmSCF or gsmSSF/gsmSCF AC
id-ac-cap3-sms-AC                               OBJECT IDENTIFIER ::= {id-ac3E 61}
id-ac-cap4-sms-AC                               OBJECT IDENTIFIER ::= {id-acE 61}

-- gsmSSF/gsmSCF Contracts
id-CAPSsfToScfGeneric                           OBJECT IDENTIFIER ::= {id-contractE 3}
id-CAPAssistHandoffssfToScf                     OBJECT IDENTIFIER ::= {id-contractE 5}
id-CAPScfToSsfGeneric                           OBJECT IDENTIFIER ::= {id-contractE 6}

-- gsmSRF/gsmSCF Contracts
id-contract-gsmSRF-gsmSCF                       OBJECT IDENTIFIER ::= {id-contract 13}

-- gprsSSF/gsmSCF Contracts
--CR Editor's Note: we shall put the GPRS modules version to version4(3). The Application Contexts,
--Contracts, Operation Packages and Abstract Syntaxes shall remain verion 3(2).
id-cap3GprsSsfTogsmScf                          OBJECT IDENTIFIER ::= {id-contract3 14}
id-cap3GsmScfToGprsSsf                          OBJECT IDENTIFIER ::= {id-contract3 15}

-- gprsSSF/gsmSCF or gsmSSF/gsmSCF Contracts
id-cap3SmsSsfTogsmScf                           OBJECT IDENTIFIER ::= {id-contract3 16}
id-cap4SmsSsfTogsmScf                           OBJECT IDENTIFIER ::= {id-contract 16}

-- gsmSSF/gsmSCF Operation Packages
id-package-scfActivation                        OBJECT IDENTIFIER ::= {id-package 11}
id-package-gsmSRF-scfActivationOfAssist         OBJECT IDENTIFIER ::= {id-package 15}
id-package-assistConnectionEstablishment        OBJECT IDENTIFIER ::= {id-package 16}
id-package-genericDisconnectResource            OBJECT IDENTIFIER ::= {id-package 17}
id-package-nonAssistedConnectionEstablishment   OBJECT IDENTIFIER ::= {id-package 18}
id-package-connect                              OBJECT IDENTIFIER ::= {id-package 19}
id-package-callHandling                         OBJECT IDENTIFIER ::= {id-packageE 20}
id-package-bcsmEventHandling                    OBJECT IDENTIFIER ::= {id-package 21}
id-package-chargingEventHandling                OBJECT IDENTIFIER ::= {id-package 23}
id-package-ssfCallProcessing                    OBJECT IDENTIFIER ::= {id-packageE 24}
id-package-scfCallInitiation                    OBJECT IDENTIFIER ::= {id-package 25}
id-package-timer                                OBJECT IDENTIFIER ::= {id-package 26}
id-package-billing                              OBJECT IDENTIFIER ::= {id-package 27}
id-package-charging                             OBJECT IDENTIFIER ::= {id-package 28}
id-package-trafficManagement                    OBJECT IDENTIFIER ::= {id-package 29}
id-package-callReport                           OBJECT IDENTIFIER ::= {id-package 32}
id-package-signallingControl                    OBJECT IDENTIFIER ::= {id-package 33}
id-package-activityTest                         OBJECT IDENTIFIER ::= {id-package 34}
id-package-cancel                               OBJECT IDENTIFIER ::= {id-packageE 36}
id-package-cphResponse                          OBJECT IDENTIFIER ::= {id-package 37}
id-package-exceptionInform                      OBJECT IDENTIFIER ::= {id-package 38}

-- gsmSRF/gsmSCF Operation Packages
id-package-specializedResourceControl           OBJECT IDENTIFIER ::= {id-package 42}
id-package-gsmSRF-scfCancel                     OBJECT IDENTIFIER ::= {id-package 43}

-- gprsSSF/gsmSCF Operation Packages
--CR Editor's Note: we shall put the GPRS modules version to version4(3). The Application Contexts,
--Contracts, Operation Packages and Abstract Syntaxes shall remain verion 3(2).
id-package-gprsContinue                         OBJECT IDENTIFIER ::= {id-package3 49}
id-package-gprsExceptionInformation             OBJECT IDENTIFIER ::= {id-package3 50}
id-package-gprsScfCFActivation                  OBJECT IDENTIFIER ::= {id-package3 51}
id-package-gprsConnect                          OBJECT IDENTIFIER ::= {id-package3 52}
id-package-gprsRelease                          OBJECT IDENTIFIER ::= {id-package3 53}
id-package-gprsEventHandling                    OBJECT IDENTIFIER ::= {id-package3 54}
id-package-gprsSCFTimer                         OBJECT IDENTIFIER ::= {id-package3 55}
id-package-gprsSCFBilling                       OBJECT IDENTIFIER ::= {id-package3 56}
id-package-gprsSCFCharging                      OBJECT IDENTIFIER ::= {id-package3 57}
```

```
id-package-gprsSCFActivityTest                  OBJECT IDENTIFIER ::= {id-package3 58}
id-package-gprsSCFCancel                        OBJECT IDENTIFIER ::= {id-package3 59}
id-package-gprsSCFChargeAdvice                  OBJECT IDENTIFIER ::= {id-package3 60}

-- gprsSSF/gsmSCF or gsmSSF/gsmSCF Operation Packages
id-package-smsActivation                        OBJECT IDENTIFIER ::= {id-package 61}
id-package-smsConnect                           OBJECT IDENTIFIER ::= {id-package 62}
id-package-smsContinue                          OBJECT IDENTIFIER ::= {id-package 63}
id-package-smsRelease                           OBJECT IDENTIFIER ::= {id-package 64}
id-package-smsEventHandling                     OBJECT IDENTIFIER ::= {id-package 65}
id-package-smsBilling                           OBJECT IDENTIFIER ::= {id-package 66}
id-package-smsTimer                             OBJECT IDENTIFIER ::= {id-package 67}

-- gsmSSF/gsmSCF Abstract Syntaxes
id-as-gsmSSF-scfGenericAS                       OBJECT IDENTIFIER ::= {id-asE 4}
id-as-assistHandoff-gsmSSF-scfAS                OBJECT IDENTIFIER ::= {id-asE 6}
id-as-scf-gsmSSFGenericAS                       OBJECT IDENTIFIER ::= {id-asE 7}

-- gsmSRF/gsmSCF Abstract Syntaxes
id-as-basic-gsmSRF-gsmSCF                       OBJECT IDENTIFIER ::= {id-as 14}

-- gprsSSF/gsmSCF Abstract Syntaxes
--CR Editor's Note: we shall put the GPRS modules version to version4(3). The Application Contexts,
--Contracts, Operation Packages and Abstract Syntaxes shall remain verion 3(2).
id-as-gprsSSF-gsmSCF-AS                         OBJECT IDENTIFIER ::= {id-as3 50}
id-as-gsmSCF-gprsSSF-AS                         OBJECT IDENTIFIER ::= {id-as3 51}

-- gprsSSF/gsmSCF or gsmSSF/gsmSCF Abstract Syntaxes
id-as-smsSSF-gsmSCF-AS                          OBJECT IDENTIFIER ::= {id-as 61}

END

-- 5.7  User Abort Data
CAP-U-ABORT-Data {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0) umts-network(1)
modules(3) cap-u-abort-data(110) version3(2)}

DEFINITIONS ::= BEGIN

id-CAP-U-ABORT-Reason OBJECT IDENTIFIER ::= {itu-t(0) identified-organization(4) etsi(0)
mobileDomain(0) umts-Network(1) as(1) cap-u-abort-reason(2) version3(2)}

cAP-U-ABORT-Reason-Abstract-Syntax ABSTRACT-SYNTAX ::= {CAP-U-ABORT-REASON IDENTIFIED BY
id-CAP-U-ABORT-Reason}

CAP-U-ABORT-REASON ::= ENUMERATED {
    no-reason-given             (1),
    application-timer-expired   (2),
    not-allowed-procedures      (3),
    abnormal-processing         (4),
    congestion                  (5),
    invalid-reference           (6),
    missing-reference           (7),
    overlapping-dialogue        (8)
    }
-- application-timer-expired    shall be set when application timer (e.g. Tssf) is expired.
-- not-allowed-procedures       shall be set when received signal is not allowed in CAP
--                              procedures.
--                              For example, when a class 4 operation is received from the
--                              gsmSCF and the operation is not allowed in gsmSSF FSM.
--                              (gsmSSF FSM cannot continue state transition). (e.g. ReleaseCall
--                              operation received in Waiting for End of Temporary Connection
--                              state.)
-- abnormal-processing          shall be set when abnormal procedures occur at entity action.
-- congestion                   shall be set when requested resource is unavailable due to
--                              congestion at TC user (CAP) level.
-- invalid-reference            shall be set if the received destinationReference is unknown or
--                              for a known destination Reference the received originationReference
--                              does not match with the stored originationReference.
--                              This abort reason is used for CAP defined GPRS-ReferenceNumber.
-- missing-reference            shall be set when the destinationReference or the
--                              originationReference is absent in the received message but is
--                              required to be present according to the procedures in
--                              subclause 14.1.7.
--                              This abort reason is used for CAP defined GPRS-ReferenceNumber.
-- overlapping-dialogue         shall be used by the gprsSSF to indicate to the gsmSCF that a
--                              specific instance already has a TC dialogue open. This error
--                              cause is typically obtained when both the gsmSCF and gprsSSF
--                              open a new dialogue at the same time.
```

```
-- no-reason-given              shall be set when any other reasons above do not apply
END -- of CAP-U-ABORT-Data
```

— Next modified modules —

6 Circuit Switched Call Control

```
-- 6    Circuit Switched Call Control
-- 6.1  gsmSSF/CCF - gsmSCF Interface
-- 6.1.1    Operations and arguments
CAP-gsmSSF-gsmSCF-ops-args {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
umts-network(1) modules(3) cap-gsmSSF-gsmSCF-ops-args(101) version4(3)}

DEFINITIONS IMPLICIT TAGS ::= BEGIN

-- This module contains the operations and operation arguments used for the
-- gsmSSF - gsmSCF interface, for the control of circuit switched calls.

-- The table in subclause 2.1 lists the specifications that contain the modules
-- that are used by CAP.

IMPORTS

    errortypes,
    datatypes,
    operationcodes,
    classes,
    tc-Messages,
    ros-InformationObjects
FROM CAP-object-identifiers {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
umts-network(1) modules(3) cap-object-identifiers(100) version4(3)}

    OPERATION
FROM Remote-Operations-Information-Objects ros-InformationObjects

    CallingPartysCategory,
    HighLayerCompatibility,
    LegID,
    RedirectionInformation,
    ServiceKey
FROM CS1-DataTypes {itu-t(0) identified-organization(4) etsi(0) inDomain(1) in-network(1)
modules(0) cs1-datatypes(2) version1(0)}

    CallSegmentID {},
    MiscCallInfo
FROM CS2-datatypes {itu-t(0) identified-organization(4) etsi(0) inDomain(1) in-network(1)
cs2(20) modules(0) in-cs2-datatypes (0) version1(0)}

    Ext-BasicServiceCode,
    IMEI,
    IMSI,
    ISDN-AddressString
FROM MAP-CommonDataTypes {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
gsm-Network(1) modules(3) map-CommonDataTypes(18) version8 6(8 6)}

    CUG-Index,
    CUG-Interlock,
    CUG-Info,
    LocationInformation,
    MS-Classmark2,
    SubscriberState,
    SupportedCamelPhases,
    SupportedCamel4Subsets
FROM MAP-MS-DataTypes {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
gsm-Network(1) modules(3) map-MS-DataTypes(11) version8 6(8 6)}

    CallReferenceNumber,
    SuppressionOfAnnouncement
FROM MAP-CH-DataTypes {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
gsm-Network(1) modules(3) map-CH-DataTypes(13) version8 6(8 6)}

    PARAMETERS-BOUND
FROM CAP-classes classes

    opcode-activityTest,
    opcode-applyCharging,
    opcode-applyChargingReport,
```

```
    opcode-assistRequestInstructions,
    opcode-callGap,
    opcode-callInformationReport,
    opcode-callInformationRequest,
    opcode-cancel,
    opcode-connect,
    opcode-connectToResource,
    opcode-continue,
    opcode-continueWithArgument,
    opcode-disconnectForwardConnection,
    opcode-dFCWithArgument,
    opcode-disconnectLeg,
    opcode-entityReleased,
    opcode-eventNotificationCharging,
    opcode-establishTemporaryConnection,
    opcode-eventReportBCSM,
    opcode-furnishChargingInformation,
    opcode-initialDP,
    opcode-initiateCallAttempt,
    opcode-moveLeg,
    opcode-playTone,
    opcode-releaseCall,
    opcode-requestNotificationChargingEvent,
    opcode-requestReportBCSMEvent,
    opcode-resetTimer,
    opcode-sendChargingInformation,
    opcode-splitLeg
FROM CAP-operationcodes operationcodes

    AChBillingChargingCharacteristics {},
    AChChargingAddress {},
    AdditionalCallingPartyNumber {},
    AlertingPattern,
    AssistingSSPIPRoutingAddress {},
    BCSMEvent,
    BCSM-Failure {},
    BearerCapability {},
    Burst,
    CalledPartyNumber {},
    CalledPartyBCDNumber {},
    CallingPartyNumber {},
    CallResult {},
    CallSegmentID {},
    CallSegmentToCancel {},
    CallSegmentFailure {},
    Carrier,
    Cause {},
    CGEncountered,
    ChargeNumber {},
    ControlType,
    CorrelationID {},
    DestinationRoutingAddress {},
    EventSpecificChargingInformation {},
    EventSpecificInformationBCSM {},
    EventTypeBCSM,
    EventTypeChargingPLMN,
    Extensions {},
    FCIBillingChargingCharacteristics {},
    GapCriteria {},
    GapIndicators,
    GapTreatment,
    GenericNumbers {},
    InvokeID,
    IPRoutingAddress {},
    IPSSPCapabilities {},
    leg1,
    LegOrCallSegment {},
    LocationNumber {},
    MonitorMode,
    NAOliInfo,
    OCSIApplicable,
    OriginalCalledPartyID {},
    ReceivingSideID,
    RedirectingPartyID {},
    RequestedInformationList {},
    RequestedInformationTypeList,
    ScfID {},
    SCIBillingChargingCharacteristics {},
```

```
    SendingSideID,
    ServiceInteractionIndicatorsTwo,
    TimeAndTimezone {},
    TimerID,
    TimerValue
FROM CAP-datatypes datatypes

    cancelFailed,
    eTCFailed,
    missingCustomerRecord,
    missingParameter,
    parameterOutOfRange,
    requestedInfoError,
    systemFailure,
    taskRefused,
    unexpectedComponentSequence,
    unexpectedDataValue,
    unexpectedParameter,
    unknownLegID,
    unknownCSID
FROM CAP-errortypes errortypes

;

activityTest OPERATION ::= {
    RETURN RESULT   TRUE
    CODE            opcode-activityTest}
-- Direction: gsmSCF -> gsmSSF, Timer: Tat
-- This operation is used to check for the continued existence of a relationship
-- between the gsmSCF and gsmSSF, assist gsmSSF or gsmSRF. If the relationship is
-- still in existence, then the gsmSSF will respond. If no reply is received,
-- then the gsmSCF will assume that the gsmSSF, assist gsmSSF or grmSRF has failed
-- in some way.

applyCharging {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        ApplyChargingArg {bound_}
    RETURN RESULT   FALSE
    ERRORS          {missingParameter |
                     unexpectedComponentSequence |
                     unexpectedParameter |
                     unexpectedDataValue |
                     parameterOutOfRange |
                     systemFailure |
                     taskRefused |
                     unknownLegID |
                     unknownCSID}
    CODE            opcode-applyCharging}
-- Direction: gsmSCF -> gsmSSF, Timer: Tac
-- This operation is used for interacting from the gsmSCF with the gsmSSF charging mechanisms.
-- The ApplyChargingReport operation provides the feedback from the gsmSSF to the gsmSCF.

ApplyChargingArg {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    aChBillingChargingCharacteristics   [0] AChBillingChargingCharacteristics {bound},
    partyToCharge                       [2] SendingSideID DEFAULT sendingSideID : leg1,
    extensions                          [3] Extensions {bound}                      OPTIONAL,
    aChChargingAddress                  [50] AChChargingAddress {bound}
                                            DEFAULT legID:sendingSideID:leg1,
    ...
    }

-- The partyToCharge parameter indicates the party in the call to which the ApplyCharging operation
-- shall be applied.

applyChargingReport {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        ApplyChargingReportArg {bound}
    RETURN RESULT   FALSE
    ERRORS          {missingParameter |
                     unexpectedComponentSequence |
                     unexpectedParameter |
                     unexpectedDataValue |
                     parameterOutOfRange |
                     systemFailure |
                     taskRefused}
    CODE            opcode-applyChargingReport}
-- Direction: gsmSSF -> gsmSCF, Timer: Tacr
-- This operation is used by the gsmSSF to report to the gsmSCF the occurrence of a
-- specific charging event as requested by the gsmSCF using the ApplyCharging operation.
```

```
ApplyChargingReportArg {PARAMETERS-BOUND : bound} ::= CallResult {bound}

assistRequestInstructions {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        AssistRequestInstructionsArg {bound}
    RETURN RESULT   FALSE
    ERRORS          {missingCustomerRecord |
                    missingParameter |
                    systemFailure |
                    taskRefused |
                    unexpectedComponentSequence |
                    unexpectedDataValue |
                    unexpectedParameter}
    CODE            opcode-assistRequestInstructions}
-- Direction: gsmSSF -> gsmSCF or gsmSRF -> gsmSCF, Timer: Tari
-- This operation is used when there is an assist procedure and may be
-- sent by the gsmSSF or gsmSRF to the gsmSCF. This operation is sent by the
-- assisting gsmSSF to gsmSCF, when the initiating gsmSSF has set up a connection to
-- the gsmSRF or to the assisting gsmSSF as a result of receiving an
-- EstablishTemporaryConnection from
-- the gsmSCF.
-- Refer to clause 11 for a description of the procedures associated with this operation.

AssistRequestInstructionsArg {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    correlationID                   [0] CorrelationID {bound},
    iPSSPCapabilities               [2] IPSSPCapabilities {bound},
    extensions                      [3] Extensions {bound}                  OPTIONAL,
    ...
    }
-- OPTIONAL denotes network operator specific use. The value of the correlationID may be the
-- Called Party Number supplied by the initiating gsmSSF.

callGap {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        CallGapArg {bound}
    RETURN RESULT   FALSE
    ALWAYS RESPONDS FALSE
    CODE            opcode-callGap}
-- Direction: gsmSCF -> gsmSSF, Timer: Tcg
-- This operation is used to request the gsmSSF to reduce the rate at which specific service
-- requests are sent to the gsmSCF.

CallGapArg {PARAMETERS-BOUND : bound}::= SEQUENCE {
    gapCriteria                     [0] GapCriteria {bound},
    gapIndicators                   [1] GapIndicators,
    controlType                     [2] ControlType                         OPTIONAL,
    gapTreatment                    [3] GapTreatment {bound}                OPTIONAL,
    extensions                      [4] Extensions {bound}                  OPTIONAL,
    ...
    }
-- OPTIONAL denotes network operator optional. If gapTreatment is not present, then the gsmSSF will
-- use a default treatment depending on network operator implementation.

callInformationReport {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        CallInformationReportArg {bound}
    RETURN RESULT   FALSE
    ALWAYS RESPONDS FALSE
    CODE            opcode-callInformationReport}
-- Direction: gsmSSF -> gsmSCF, Timer: Tcirp
-- This operation is used to send specific call information for a single call party to the gsmSCF as
-- requested by the gsmSCF in a previous CallInformationRequest.

CallInformationReportArg {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    requestedInformationList        [0] RequestedInformationList {bound},
    extensions                      [2] Extensions {bound}                  OPTIONAL,
    legID                           [3] ReceivingSideID                     OPTIONAL,
    ...
    }

callInformationRequest {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        CallInformationRequestArg {bound}
    RETURN RESULT   FALSE
    ERRORS          {missingParameter |
                    parameterOutOfRange |
                    requestedInfoError |
                    systemFailure |
                    taskRefused |
                    unexpectedComponentSequence |
                    unexpectedDataValue |
                    unexpectedParameter |
```

```
                    unknownLegID}
    CODE            opcode-callInformationRequest}
-- Direction: gsmSCF -> gsmSSF, Timer: Tcirq
-- This operation is used to request the gsmSSF to record specific information about a single
-- call party and report it to the gsmSCF (with a CallInformationReport operation).

CallInformationRequestArg {PARAMETERS-BOUND : bound}::= SEQUENCE {
    requestedInformationTypeList        [0] RequestedInformationTypeList ~~{bound}~~,
    extensions                          [2] Extensions {bound}                    OPTIONAL,
    legID                               [3] SendingSideID                         OPTIONAL,
    ...
    }
-- OPTIONAL denotes network operator optional.

cancel {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        CancelArg {bound}
    RETURN RESULT   FALSE
    ERRORS          {cancelFailed |
                    missingParameter |
                    taskRefused |
                    unknownCSID}
    CODE            opcode-cancel}
-- Direction: gsmSCF -> gsmSSF, or gsmSCF -> gsmSRF, Timer: Tcan
-- This operation cancels the correlated previous operation or all previous requests. The following
-- operations can be canceled: PlayAnnouncement, PromptAndCollectUserInformation.

CancelArg {PARAMETERS-BOUND : bound} ::= CHOICE {
    invokeID                            [0] InvokeID,
    allRequests                         [1] NULL,
    callSegmentToCancel                 [2] CallSegmentToCancel {bound}
    }
-- The InvokeID has the same value as that which was used for the operation to be cancelled.

connect {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        ConnectArg {bound}
    RETURN RESULT   FALSE
    ERRORS          {missingParameter |
                    parameterOutOfRange |
                    systemFailure |
                    taskRefused |
                    unexpectedComponentSequence |
                    unexpectedDataValue |
                    unexpectedParameter}
    CODE            opcode-connect}
-- Direction: gsmSCF-> gsmSSF, Timer: Tcon
-- This operation is used to request the gsmSSF to perform the call processing actions
-- to route or forward a call to a specified destination.

ConnectArg {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    destinationRoutingAddress           [0] DestinationRoutingAddress {bound},
    alertingPattern                     [1] AlertingPattern                       OPTIONAL,
    originalCalledPartyID               [6] OriginalCalledPartyID {bound}         OPTIONAL,
    extensions                          [10] Extensions {bound}                   OPTIONAL,
    carrier                             [11] Carrier {bound}                      OPTIONAL,
    callingPartysCategory               [28] CallingPartysCategory                OPTIONAL,
    redirectingPartyID                  [29] RedirectingPartyID {bound}           OPTIONAL,
    redirectionInformation              [30] RedirectionInformation               OPTIONAL,
    genericNumbers                      [14] GenericNumbers {bound}               OPTIONAL,
    serviceInteractionIndicatorsTwo     [15] ServiceInteractionIndicatorsTwo      OPTIONAL,
    chargeNumber                        [19] ChargeNumber {bound}                 OPTIONAL,
    legToBeCreated                      [21] LegID                                OPTIONAL,
    cug-Interlock                       [31] CUG-Interlock                        OPTIONAL,
    cug-OutgoingAccess                  [32] NULL                                 OPTIONAL,
    suppressionOfAnnouncement           [55] SuppressionOfAnnouncement            OPTIONAL,
    oCSIApplicable                      [56] OCSIApplicable                       OPTIONAL,
    naOliInfo                           [57] NAOliInfo                            OPTIONAL,
    bor-InterrogationRequested          [58] NULL                                 OPTIONAL,
    ...
    }
-- na-Info is included at the discretion of the gsmSCF operator.

connectToResource {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        ConnectToResourceArg {bound}
    RETURN RESULT   FALSE
    ERRORS          {missingParameter |
                    systemFailure |
                    taskRefused |
                    unexpectedComponentSequence |
```

```
                    unexpectedDataValue |
                    unexpectedParameter |
                    unknownCSID}
    CODE            opcode-connectToResource}
-- Direction: gsmSCF -> gsmSSF, Timer: Tctr
-- This operation is used to connect a call segment from the gsmSSF to the
-- gsmSRF.

ConnectToResourceArg {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    resourceAddress CHOICE {
        ipRoutingAddress                [0] IPRoutingAddress {bound},
        none                            [3] NULL
        },
    extensions                          [4] Extensions {bound}                  OPTIONAL,
    serviceInteractionIndicatorsTwo     [7] ServiceInteractionIndicatorsTwo     OPTIONAL,
    callSegmentID                       [50] CallSegmentID {bound}              OPTIONAL,
    ...
    }

continue OPERATION ::= {
    RETURN RESULT   FALSE
    ALWAYS RESPONDS FALSE
    CODE            opcode-continue}
-- Direction: gsmSCF -> gsmSSF, Timer: Tcue
-- This operation is used to request the gsmSSF to proceed with call processing at the
-- DP at which it previously suspended call processing to await gsmSCF instructions
-- (i.e. proceed to the next point in call in the BCSM). The gsmSSF continues call
-- processing without substituting new data from gsmSCF.

continueWithArgument {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        ContinueWithArgumentArg {bound}
    RETURN RESULT   FALSE
    ERRORS          {missingParameter |
                    parameterOutOfRange |
                    unexpectedComponentSequence |
                    unexpectedDataValue |
                    unexpectedParameter |
                    unknownLegID}
    CODE            opcode-continueWithArgument}
-- Direction: gsmSCF -> gsmSSF, Timer: Tcwa
-- This operation is used to request the gsmSSF to proceed with call processing at the
-- DP at which it previously suspended call processing to await gsmSCF instructions
-- (i.e. proceed to the next point in call in the BCSM). The gsmSSF continues call
-- processing with the modified call setup information as received from the gsmSCF.

ContinueWithArgumentArg {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    legID                           [0] LegID                               OPTIONAL,
    alertingPattern                 [1] AlertingPattern                     OPTIONAL,
    extensions                      [6] Extensions {bound}                  OPTIONAL,
    serviceInteractionIndicatorsTwo [7] ServiceInteractionIndicatorsTwo     OPTIONAL,
    callingPartysCategory           [12] CallingPartysCategory              OPTIONAL,
    genericNumbers                  [16] GenericNumbers {bound}             OPTIONAL,
    cug-Interlock                   [17] CUG-Interlock                      OPTIONAL,
    cug-OutgoingAccess              [18] NULL                               OPTIONAL,
    chargeNumber                    [50] ChargeNumber {bound}               OPTIONAL,
    carrier                         [52] Carrier {bound}                    OPTIONAL,
    suppressionOfAnnouncement       [55] SuppressionOfAnnouncement          OPTIONAL,
    naOliInfo                       [56] NAOliInfo                          OPTIONAL,
    bor-InterrogationRequested      [57] NULL                               OPTIONAL,
    suppress-O-CSI                  [58] NULL                               OPTIONAL,
    continueWithArgumentArgExtension— [59] ContinueWithArgumentArgExtension OPTIONAL,
    ...
    }

ContinueWithArgumentArgExtension ::= SEQUENCE {
    suppress-D-CSI                  [0] NULL                                OPTIONAL,
    suppress-N-CSI                  [1] NULL                                OPTIONAL,
    suppressOutgoingCallBarring     [2] NULL                                OPTIONAL,
    ...
    }

disconnectForwardConnection OPERATION ::= {
    RETURN RESULT   FALSE
    ERRORS          {systemFailure |
                    taskRefused |
                    unexpectedComponentSequence}
    CODE            opcode-disconnectForwardConnection}
-- Direction: gsmSCF -> gsmSSF, Timer: Tdfc
```

```
-- This operation is used to disconnect a forward temporary connection or a connection to a
-- resource. Refer to clause 11 for a description of the procedures associated with this operation.

DdisconnectForwardConnectionWithArgument {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        DisconnectForwardConnectionWithArgumentArg {bound}
    RETURN RESULT   FALSE
    ERRORS          {missingParameter |
                     systemFailure |
                     taskRefused |
                     unexpectedComponentSequence |
                     unexpectedDataValue |
                     unexpectedParameter |
                     unknownLegID |
                     unknownCSID}
    CODE            opcode-dFCWithArgument}
-- Direction gsmSCF -> gsmSSF, Timer Tdfcwa
-- This operation is used to disconnect a forward temporary connection or a connection to a
-- resource. Refer to clause 11 for a description of the procedures associated with this operation.

DisconnectForwardConnectionWithArgumentArg {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    callSegmentID                   [1] CallSegmentID {bound}               OPTIONAL,
    extensions                      [2] Extensions {bound}                  OPTIONAL,
    ...
    }

disconnectLeg {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        DisconnectLegArg {bound}
    RETURN RESULT   TRUE
    ERRORS          {missingParameter |
                     systemFailure |
                     taskRefused |
                     unexpectedComponentSequence |
                     unexpectedDataValue |
                     unexpectedParameter |
                     unknownLegIDd}
    CODE            opcode-disconnectLeg}
-- Direction: gsmSCF -> gsmSSF, Timer Tdl
-- This operation is used by the gsmSCF to release a specific leg associated with the call and
-- retain any other legs not specified in the DisconnectLeg. Refer to clause 11 for a description
-- of the procedures associated with this operation.

DisconnectLegArg {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    LlegToBeReleased                    [0] LegID,
    RreleaseCause                   [1] Cause {bound}                       OPTIONAL,
    extensions                      [2] Extensions {bound}                  OPTIONAL,
    ...
    }

entityReleased {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        EntityReleasedArg {bound}
    RETURN RESULT   FALSE
    ALWAYS RESPONDS FALSE
    CODE            opcode-entityReleased}
-- Direction: gsmSSF -> gsmSCF, Timer: Ter
-- This operation is used by the gsmSSF to inform the gsmSCF of an error or exception

EntityReleasedArg {PARAMETERS-BOUND : bound} ::= CHOICE {
    CcallSegmentFailure             [0] CallSegmentFailure {bound},
    bCSM-Failure                    [1] BCSM-Failure {bound}
    }

establishTemporaryConnection {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        EstablishTemporaryConnectionArg {bound}
    RETURN RESULT   FALSE
    ERRORS          {eTCFailed |
                     missingParameter |
                     systemFailure |
                     taskRefused |
                     unexpectedComponentSequence |
                     unexpectedDataValue |
                     unexpectedParameter |
                     unknownCSID}
    CODE            opcode-establishTemporaryConnection}
-- Direction: gsmSCF -> gsmSSF, Timer: Tetc
-- This operation is used to create a connection to a resource for a limited period
-- of time (e.g. to play an announcement, to collect user information); it implies
-- the use of the assist procedure. Refer to clause 11 for a description of the
-- procedures associated with this operation.
```

```
EstablishTemporaryConnectionArg {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    assistingSSPIPRoutingAddress        [0] AssistingSSPIPRoutingAddress {bound},
    correlationID                       [1] CorrelationID {bound}                   OPTIONAL,
    scfID                               [3] ScfID {bound}                           OPTIONAL,
    extensions                          [4] Extensions {bound}                      OPTIONAL,
    carrier                             [5] Carrier {bound}                         OPTIONAL,
    serviceInteractionIndicatorsTwo     [6] ServiceInteractionIndicatorsTwo         OPTIONAL,
    callSegmentID                       [7] CallSegmentID {bound}                   OPTIONAL,
    naOliInfo                           [50] NAOliInfo                              OPTIONAL,
    chargeNumber                        [51] ChargeNumber {bound}                   OPTIONAL,
    ...
    }

eventNotificationCharging {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        EventNotificationChargingArg { bound}
    RETURN RESULT   FALSE
    ALWAYS RESPONDS FALSE
    CODE            opcode-eventNotificationCharging}
-- Direction: gsmSSF -> gsmSCF, Timer: Tenc
-- This operation is used by the gsmSSF to report to the gsmSCF the occurrence of a
-- specific charging event type as previously requested by the gsmSCF in a
-- RequestNotificationChargingEvent operation.

EventNotificationChargingArg {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    EeventSpecificChargingInformation   [1] EventSpecificChargingInformation{ bound},
    legID                               [2] LegID                                   OPTIONAL,
    extensions                          [3] Extensions {bound}                      OPTIONAL,
    ...
    }

eventReportBCSM {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        EventReportBCSMArg {bound}
    RETURN RESULT   FALSE
    ALWAYS RESPONDS FALSE
    CODE            opcode-eventReportBCSM}
-- Direction: gsmSSF -> gsmSCF, Timer: Terb
-- This operation is used to notify the gsmSCF of a call-related event (e.g. BCSM
-- events such as O_Busy or O_No_Answer) previously requested by the gsmSCF in a
-- RequestReportBCSMEvent operation.

EventReportBCSMArg {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    eventTypeBCSM                       [0] EventTypeBCSM,
    eventSpecificInformationBCSM        [2] EventSpecificInformationBCSM {bound}    OPTIONAL,
    legID                               [3] ReceivingSideID                         OPTIONAL,
    miscCallInfo                        [4] MiscCallInfo DEFAULT {messageType request},
    extensions                          [5] Extensions {bound}                      OPTIONAL,
    ...
    }

furnishChargingInformation {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        FurnishChargingInformationArg {bound}
    RETURN RESULT   FALSE
    ERRORS          {missingParameter |
                     taskRefused |
                     unexpectedComponentSequence |
                     unexpectedDataValue |
                     unexpectedParameter |
                     unknownLegIdD}
    CODE            opcode-furnishChargingInformation}
-- Direction: gsmSCF -> gsmSSF, Timer: Tfci
-- This operation is used to request the gsmSSF to generate, register a call record
-- or to include some information in the default call record.
-- The registered call record is intended for off line charging of the call.

FurnishChargingInformationArg {PARAMETERS-BOUND : bound} ::=
    FCIBillingChargingCharacteristics{bound}

initialDP {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        InitialDPArg {bound}
    RETURN RESULT   FALSE
    ERRORS          {missingCustomerRecord |
                     missingParameter |
                     parameterOutOfRange |
                     systemFailure |
                     taskRefused |
                     unexpectedComponentSequence |
```

```
                    unexpectedDataValue |
                    unexpectedParameter}
    CODE            opcode-initialDP}
-- Direction: gsmSSF -> gsmSCF, Timer: Tidp
-- This operation is used after a TDP to indicate request for service.

InitialDPArg {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    serviceKey                      [0] ServiceKey  ,
    calledPartyNumber               [2] CalledPartyNumber {bound}               OPTIONAL,
    callingPartyNumber              [3] CallingPartyNumber {bound}              OPTIONAL,
    callingPartysCategory           [5] CallingPartysCategory                   OPTIONAL,
    cGEncountered                   [7] CGEncountered                           OPTIONAL,
    iPSSPCapabilities               [8] IPSSPCapabilities {bound}               OPTIONAL,
    locationNumber                  [10] LocationNumber {bound}                 OPTIONAL,
    originalCalledPartyID           [12] OriginalCalledPartyID {bound}          OPTIONAL,
    extensions                      [15] Extensions {bound}                     ----
----OPTIONAL,
    highLayerCompatibility          [23] HighLayerCompatibility                 OPTIONAL,
    additionalCallingPartyNumber    [25] AdditionalCallingPartyNumber {bound}   OPTIONAL,
    bearerCapability                [27] BearerCapability {bound}               OPTIONAL,
    eventTypeBCSM                   [28] EventTypeBCSM                          OPTIONAL,
    redirectingPartyID              [29] RedirectingPartyID {bound}             OPTIONAL,
    redirectionInformation          [30] RedirectionInformation                 OPTIONAL,
    cause                           [17] Cause {bound}                          OPTIONAL,
    serviceInteractionIndicatorsTwo [32] ServiceInteractionIndicatorsTwo        OPTIONAL,
    carrier                         [37] Carrier {bound}                        OPTIONAL,
    cug-Index                       [45] CUG-Index                              OPTIONAL,
    cug-Interlock                   [46] CUG-Interlock                          OPTIONAL,
    cug-OutgoingAccess              [47] NULL                                   OPTIONAL,
    iMSI                            [50] IMSI                                   OPTIONAL,
    subscriberState                 [51] SubscriberState                        OPTIONAL,
    locationInformation             [52] LocationInformation                    OPTIONAL,
    ext-basicServiceCode            [53] Ext-BasicServiceCode                   OPTIONAL,
    callReferenceNumber             [54] CallReferenceNumber                    OPTIONAL,
    mscAddress                      [55] ISDN-AddressString                     OPTIONAL,
    calledPartyBCDNumber            [56] CalledPartyBCDNumber {bound}           OPTIONAL,
    timeAndTimezone                 [57] TimeAndTimezone {bound}                OPTIONAL,
    callForwardingSS-Pending        [58] NULL                                   OPTIONAL,
    initialDPArgExtension           [59] InitialDPArgExtension {bound}          OPTIONAL,
    ...
    }

InitialDPArgExtension {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    gmscAddress                     [0] ISDN-AddressString                      OPTIONAL,
    forwardingDestinationNumber     [1] CalledPartyNumber {bound}               OPTIONAL,
    ms-Classmark2                   [2] MS-Classmark2                           OPTIONAL,
    iMEI                            [3] IMEI                                    OPTIONAL,
    supportedCamelPhases            [4] SupportedCamelPhases                    OPTIONAL,
    supportedCamel4Subsets          [5] SupportedCamel4Subsets                  OPTIONAL,
    ...
}
-- If iPSSPCapabilities is not present then this denotes that a colocated gsmSRF is not
-- supported by the gsmSSF. If present, then the gsmSSF supports a colocated gsmSRF capable
-- of playing announcements via elementaryMessageIDs and variableMessages, the playing of
-- tones and the collection of DTMF digits. Other supported capabilities are explicitly
-- detailed in the IPSSPCapabilities parameter itself.
-- Carrier is included at the discretion of the gsmSSF operator.

InitiateCallAttempt {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        InitiateCallAttemptArg {bound}
    RESULT          InitiateCallAttemptRes {bound}
    ERRORS          {missingParameter |
                    parameterOutOfRange |
                    systemFailure |
                    taskRefused |
                    unexpectedComponentSequence |
                    unexpectedDataValue |
                    unexpectedParameter |
                    unknownCSIDd}
    CODE            opcode-initiateCallAttempt}
-- Direction: gsmSCF -> gsmSSF, Timer Tica
-- This operation is used to instruct the gsmSSF to create a new call to a call party using the
-- address information provided by the gsmSCF.

InitiateCallAttemptArg {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    DdestinationRoutingAddress      [0] DestinationRoutingAddress {bound},
    extensions                      [4] Extensions {bound}                      OPTIONAL,
    legToBeCreated                  [5] LegID                                   OPTIONAL,
```

```
    newCallSegment                  [6] CallSegmentID {bound}                   OPTIONAL,
    callingPartyNumber              [30] CallingPartyNumber {bound}             OPTIONAL,
    callReferenceNumber             [51] CallReferenceNumber                    OPTIONAL,
    gsmSCFAddress                   [52] ISDN-AddressString                     OPTIONAL,
    suppress-T-CSI                  [53] NULL                                   OPTIONAL,
    ...
    }

InitiateCallAttemptRes {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    supportedCamelPhases            [0] SupportedCamelPhases                    OPTIONAL,
    supportedCamel4Subsets          [1] SupportedCamel4Subsets                  OPTIONAL,
    extensions                      [2] Extensions {bound}                      OPTIONAL,
    ...
    }

moveLeg {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        MoveLegArg {bound}
    RETURN RESULT   TRUE
    ERRORS          {missingParameter |
                     systemFailure |
                     taskRefused |
                     unexpectedComponentSequence |
                     unexpectedDataValue |
                     unexpectedParameter |
                     unknownLegID}
    CODE            opcode-moveLeg}
-- Direction: gsmSCF -> gsmSSF, Timer: Tml
-- This operation is used by the gsmSCF to move a leg from one call segment to another call seqment
-- within the same call segment association.

MoveLegArg {PARAMETERS-BOUND : bound} ::= SEQUENCE{
    legIDToMove                     [0] LegID,
    extensions                      [2] Extensions {bound}                      OPTIONAL,
    ...
    }

playTone {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        PlayToneArg {bound}
    RETURN RESULT   FALSE
    ERRORS          {missingParameter |
                     parameterOutOfRange |
                     systemFailure |
                     unexpectedComponentSequence |
                     unexpectedDataValue |
                     unexpectedParameter |
                     unknownLegID |
                     unknownCSID}
    CODE            opcode-playTone}
-- Direction: gsmSCF -> gsmSSF, Timer: Tpt
-- This operation is used to play tones to either a leg or a call segment using
-- the MSC's tone generator.

PlayToneArg {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    legOrCallSegment                [0] LegOrCallSegment {bound},
    bursts                          [1] Burst,
    extensions                      [2] Extensions {bound}                      ----
----OPTIONAL,
    ...
    }

releaseCall {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        ReleaseCallArg {bound}
    RETURN RESULT   FALSE
    ALWAYS RESPONDS FALSE
    CODE            opcode-releaseCall}
-- Direction: gsmSCF ->?gsmSSF, Timer: Trc
-- This operation is used to tear down an existing call at any phase of the call for all parties
-- involved in the call.

ReleaseCallArg {PARAMETERS-BOUND : bound} ::= Cause {bound}
-- A default value of decimal 31 (normal unspecified) shall be given.

requestNotificationChargingEvent {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        RequestNotificationChargingEventArg {bound}
    RETURN RESULT   FALSE
    ERRORS          {missingParameter |
                     parameterOutOfRange |
                     systemFailure |
```

```
                    taskRefused |
                    unexpectedComponentSequence |
                    unexpectedDataValue |
                    unexpectedParameter |
                    unknownLegIDd}
    CODE            opcode-requestNotificationChargingEvent}
-- Direction: gsmSCF -> gsmSSF, Timer: Trnc
-- This operation is used by the gsmSCF to instruct the gsmSSF on how to manage the charging events
-- which are received from other FEs and not under control of the service logic instance.

RequestNotificationChargingEventArg {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    EeventTypeChargingPLMN          [0] EventTypeChargingPLMN {bound},
    monitorMode                     [1] MonitorMode,
    legID                           [2] LegID                                   OPTIONAL,
    extensions                      [3] Extensions {bound}                      OPTIONAL,
    ...
    }
-- This argument indicates the charging event type and the corresponding monitor mode and LegID.

requestReportBCSMEvent {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        RequestReportBCSMEventArg {bound}
    RETURN RESULT   FALSE
    ERRORS          {missingParameter |
                    parameterOutOfRange |
                    systemFailure |
                    taskRefused |
                    unexpectedComponentSequence |
                    unexpectedDataValue |
                    unexpectedParameter |
                    unknownLegID}
    CODE            opcode-requestReportBCSMEvent}
-- Direction: gsmSCF -> gsmSSF, Timer: Trrb
-- This operation is used to request the gsmSSF to monitor for a call-related event
-- (e.g. BCSM events such as O_Busy or O_No_Answer) and to send a notification
-- to the gsmSCF when the event is detected.
--
-- NOTE:
-- Every EDP must be explicitly armed by the gsmSCF via a RequestReportBCSMEvent operation.
-- No implicit arming of EDPs at the gsmSSF after reception of any operation (different
-- from RequestReportBCSMEvent) from the gsmSCF is allowed.

RequestReportBCSMEventArg {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    bcsmEvents                      [0] SEQUENCE SIZE(1..bound.&numOfBCSMEvents) OF
                                            BCSMEvent {bound},
    Eextensions                     [2] Extensions {bound}                      OPTIONAL,
    ...
    }
-- Indicates the BCSM related events for notification.

resetTimer {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        ResetTimerArg {bound}
    RETURN RESULT   FALSE
    ERRORS          {missingParameter |
                    parameterOutOfRange |
                    taskRefused |
                    unexpectedComponentSequence |
                    unexpectedDataValue |
                    unexpectedParameter |
                    unknownCSID}
    CODE            opcode-resetTimer}
-- Direction: gsmSCF -> gsmSSF, Timer: Trt
-- This operation is used to request the gsmSSF to refresh an application timer in the gsmSSF.

ResetTimerArg {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    timerID                         [0] TimerID DEFAULT tssf,
    timervalue                      [1] TimerValue,
    extensions                      [2] Extensions {bound}                      OPTIONAL,
    callSegmentID                   [3] CallSegmentID {bound}                   OPTIONAL,
    ...
    }

sendChargingInformation {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        SendChargingInformationArg {bound}
    RETURN RESULT   FALSE
    ERRORS          {missingParameter |
                    unexpectedComponentSequence |
                    unexpectedParameter |
                    parameterOutOfRange |
```

```
                    systemFailure |
                    taskRefused |
                    unexpectedDataValue |
                    unknownLegID}
    CODE            opcode-sendChargingInformation}
-- Direction: gsmSCF -> gsmSSF, Timer: Tsci
-- This operation is used to instruct the gsmSSF on the charging information to send by the gsmSSF.
-- The charging information can either be sent back by means of signalling or internal
-- if the gsmSSF is located in the local exchange. In the local exchange
-- this information may be used to update the charge meter or to create a standard call record.

SendChargingInformationArg {PARAMETERS-BOUND : bound}::= SEQUENCE {
    sCIBillingChargingCharacteristics   [0] SCIBillingChargingCharacteristics {bound},
    partyToCharge                       [1] SendingSideID,
    extensions                          [2] Extensions {bound}                      OPTIONAL,
    ...
    }

splitLeg {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        SplitLegArg {bound}
    RETURN RESULT   TRUE
    ERRORS          {missingParameter |
                    unexpectedComponentSequence |
                    unexpectedParameter |
                    unexpectedDataValue |
                    systemFailure |
                    taskRefused |
                    unknownLegID}
    CODE            opcode-splitLeg}
-- Direction: gsmSCF -> gsmSSF, Timer Tsl
-- This operation is used by the gsmSCF to separate one joined leg from a multi-way connection or
-- a single two party Call Segment.

SplitLegArg {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    legToBeSplit                        [0] LegID,
    newCallSegment                      [1] CallSegmentID {bound}                   OPTIONAL,
    extensions                          [2] Extensions {bound}                      OPTIONAL,
    ...
    }

END

-- 6.1.2    gsmSSF/gsmSCF packages, contracts and ACs
-- 6.1.2.1  gsmSSF/gsmSCF ASN.1 module
CAP-gsmSSF-gsmSCF-pkgs-contracts-acs {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
umts-network(1) modules(3) cap-gsmSSF-gsmSCF-pkgs-contracts-acs(102) version4(3)}

DEFINITIONS ::= BEGIN

-- This module specifies the Operation Packages, Contracts, Application Contexts
-- and Abstract Syntaxes used for the gsmSSF - gsmSCF interface, for the control of
-- circuit switched calls.

-- The table in subclause 2.1 lists the specifications that contain the modules
-- that are used by CAP.

IMPORTS

    PARAMETERS-BOUND,
    cAPSpecificBoundSet
FROM CAP-classes classes

    CONTRACT,
    OPERATION-PACKAGE,
    OPERATION
FROM Remote-Operations-Information-Objects ros-InformationObjects

    TCMessage {}
FROM TCAPMessages tc-Messages

    APPLICATION-CONTEXT,
    dialogue-abstract-syntax
FROM TC-Notation-Extensions tc-NotationExtensions

    activityTest,
    applyCharging {},
    applyChargingReport {},
    assistRequestInstructions {},
```

```
    callGap {},
    callInformationReport {},
    callInformationRequest {},
    cancel {},
    connect {},
    connectToResource {},
    continue,
    continueWithArgument {},
    disconnectForwardConnection,
    disconnectForwardConnectionWithArgument {},
    disconnectLeg {},
    entity–Released {},
    establishTemporaryConnection {},
    eventNotificationCharging {},
    eventReportBCSM {},
    furnishChargingInformation {},
    initialDP {},
    initiateCallAttempt {},
    moveLeg {},
    playTone {},
    releaseCall {},
    requestNotificationChargingEvent {},
    requestReportBCSMEvent {},
    resetTimer {},
    sendChargingInformation {},
    splitLeg {}
FROM CAP-gsmSSF-gsmSCF-ops-args gsmSSF-gsmSCF-Operations

    playAnnouncement {},
    promptAndCollectUserInformation {},
    specializedResourceReport
FROM CAP-gsmSCF-gsmSRF-ops-args gsmSCF-gsmSRF-Operations

    specializedResourceControlPackage {}
FROM CAP-gsmSCF-gsmSRF-pkgs-contracts-acs gsmSCF-gsmSRF-Protocol

    id-ac-CAP-gsmSSF-scfGenericAC,
    id-ac-CAP-gsmSSF-scfAssistHandoffAC,
    id-ac-CAP-scf-gsmSSFGenericAC,
    id-CAPSsfToScfGeneric,
    id-CAPAssistHandoffssfToScf,
    id-CAPScfToSsfGeneric,
    id-as-gsmSSF-scfGenericAS,
    id-as-scf-gsmSSFGenericAS,
    id-as-assistHandoff-gsmSSF-scfAS,
    id-package-scfActivation,
    id-package-gsmSRF-scfActivationOfAssist,
    id-package-assistConnectionEstablishment,
    id-package-genericDisconnectResource,
    id-package-nonAssistedConnectionEstablishment,
    id-package-connect,
    id-package-callHandling,
    id-package-bcsmEventHandling,
    id-package-chargingEventHandling,
    id-package-ssfCallProcessing,
    id-package-scfCallInitiation,
    id-package-timer,
    id-package-billing,
    id-package-charging,
    id-package-trafficManagement,
    id-package-callReport,
    id-package-signallingControl,
    id-package-activityTest,
    id-package-cancel,
    id-package-cphResponse,
    id-package-exceptionInform,
    classes,
    ros-InformationObjects,
    tc-Messages,
    tc-NotationExtensions,
    gsmSSF-gsmSCF-Operations,
    gsmSCF-gsmSRF-Operations,
    gsmSCF-gsmSRF-Protocol
FROM CAP-object-identifiers {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
umts-network(1) modules(3) cap-object-identifiers(100) version4(3)}

;
```

```
-- Application Contexts

capssf-scfGenericAC APPLICATION-CONTEXT ::= {
    CONTRACT                    capSsfToScfGeneric
    DIALOGUE MODE               structured
    ABSTRACT SYNTAXES           {dialogue-abstract-syntax |
                                gsmSSF-scfGenericAbstractSyntax}
    APPLICATION CONTEXT NAME    id-ac-CAP-gsmSSF-scfGenericAC}

capssf-scfAssistHandoffAC APPLICATION-CONTEXT ::= {
    CONTRACT                    capAssistHandoffssfToScf
    DIALOGUE MODE               structured
    ABSTRACT SYNTAXES           {dialogue-abstract-syntax |
                                assistHandoff-gsmSSF-scfAbstractSyntax}
    APPLICATION CONTEXT NAME    id-ac-CAP-gsmSSF-scfAssistHandoffAC}

capscf-ssfGenericAC APPLICATION-CONTEXT ::= {
    CONTRACT                    capScfToSsfGeneric
    DIALOGUE MODE               structured
    ABSTRACT SYNTAXES           {dialogue-abstract-syntax |
                                scf-gsmSSFGenericAbstractSyntax}
    APPLICATION CONTEXT NAME    id-ac-CAP-scf-gsmSSFGenericAC}


-- Contracts

capSsfToScfGeneric CONTRACT ::= {
-- dialogue initiated by gsmSSF with InitialDP Operation
    INITIATOR CONSUMER OF       {exceptionInformPackage {cAPSpecificBoundSet} |
                                scfActivationPackage {cAPSpecificBoundSet}}
    RESPONDER CONSUMER OF       {activityTestPackage |
                                assistConnectionEstablishmentPackage {cAPSpecificBoundSet} |
                                bcsmEventHandlingPackage {cAPSpecificBoundSet} |
                                billingPackage {cAPSpecificBoundSet} |
                                callHandlingPackage {cAPSpecificBoundSet} |
                                callReportPackage {cAPSpecificBoundSet} |
                                cancelPackage {cAPSpecificBoundSet} |
                                chargingEventHandlingPackage {cAPSpecificBoundSet} |
                                chargingPackage {cAPSpecificBoundSet} |
                                connectPackage {cAPSpecificBoundSet} |
                                cphResponsePackage {cAPSpecificBoundSet} |
                                genericDisconnectResourcePackage {cAPSpecificBoundSet} |
                                nonAssistedConnectionEstablishmentPackage {cAPSpecificBoundSet} |
                                signallingControlPackage {cAPSpecificBoundSet} |
                                specializedResourceControlPackage {cAPSpecificBoundSet} |
                                ssfCallProcessingPackage {cAPSpecificBoundSet} |
                                timerPackage {cAPSpecificBoundSet} |
                                trafficManagementPackage {cAPSpecificBoundSet} |
                                scfCallInitiationPackage {cAPSpecificBoundSet}}
    ID                          id-CAPSsfToScfGeneric}

capAssistHandoffssfToScf CONTRACT ::= {
-- dialogue initiated by gsmSSF with AssistRequestInstructions
    INITIATOR CONSUMER OF       {gsmSRF-scfActivationOfAssistPackage {cAPSpecificBoundSet}}
    RESPONDER CONSUMER OF       {activityTestPackage |
                                callHandlingPackage {cAPSpecificBoundSet} |
                                cancelPackage {cAPSpecificBoundSet} |
                                genericDisconnectResourcePackage {cAPSpecificBoundSet} |
                                nonAssistedConnectionEstablishmentPackage {cAPSpecificBoundSet} |
                                specializedResourceControlPackage {cAPSpecificBoundSet} |
                                timerPackage {cAPSpecificBoundSet}}
    ID                          id-CAPAssistHandoffssfToScf}

capScfToSsfGeneric CONTRACT ::= {
-- dialogue initiated by gsmSCF with InitiateCallAttempt, Generic Case
    INITIATOR CONSUMER OF       {activityTestPackage |
                                assistConnectionEstablishmentPackage {cAPSpecificBoundSet} |
                                bcsmEventHandlingPackage {cAPSpecificBoundSet} |
                                billingPackage {cAPSpecificBoundSet} |
                                callHandlingPackage {cAPSpecificBoundSet} |
                                callReportPackage {cAPSpecificBoundSet} |
                                cancelPackage {cAPSpecificBoundSet} |
                                chargingPackage {cAPSpecificBoundSet} |
                                connectPackage {cAPSpecificBoundSet} |
                                cphResponsePackage {cAPSpecificBoundSet} |
                                genericDisconnectResourcePackage {cAPSpecificBoundSet} |
                                nonAssistedConnectionEstablishmentPackage {cAPSpecificBoundSet} |
                                scfCallInitiationPackage {cAPSpecificBoundSet} |
```

```
                                signallingControlPackage {cAPSpecificBoundSet} |
                                specializedResourceControlPackage {cAPSpecificBoundSet} |
                                ssfCallProcessingPackage {cAPSpecificBoundSet} |
                                timerPackage {cAPSpecificBoundSet}}
    RESPONDER CONSUMER OF       {exceptionInformPackage {cAPSpecificBoundSet}}
    ID                          id-~~cap~~CAPScfToSsfGeneric}


-- Operation Packages

chargingEventHandlingPackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {requestNotificationChargingEvent {bound}}
    SUPPLIER INVOKES    {eventNotificationCharging {bound}}
    ID                  id-package-chargingEventHandling}

scfActivationPackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {initialDP {bound}}
    ID                  id-package-scfActivation}

gsmSRF-scfActivationOfAssistPackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {assistRequestInstructions {bound}}
    ID                  id-package-gsmSRF-scfActivationOfAssist}

assistConnectionEstablishmentPackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {establishTemporaryConnection {bound}}
    ID                  id-package-assistConnectionEstablishment}

genericDisconnectResourcePackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {disconnectForwardConnection |
                         disconnectForwardConnectionWithArgument {bound}}
    ID                  id-package-genericDisconnectResource}

nonAssistedConnectionEstablishmentPackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {connectToResource {bound}}
    ID                  id-package-nonAssistedConnectionEstablishment}

connectPackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {connect {bound}}
    ID                  id-package-connect}

callHandlingPackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {releaseCall {bound}}
    ID                  id-package-callHandling}

bcsmEventHandlingPackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {requestReportBCSMEvent {bound}}
    SUPPLIER INVOKES    {eventReportBCSM {bound}}
    ID                  id-package-bcsmEventHandling}

ssfCallProcessingPackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {continueWithArgument {bound} | continue}
    ID                  id-package-ssfCallProcessing}

scfCallInitiation~~e~~Package {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {initiateCallAttempt {bound}}
    ID                  id-package-scfCallInitiation}

timerPackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {resetTimer {bound}}
    ID                  id-package-timer}

billingPackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {furnishChargingInformation {bound}}
    ID                  id-package-billing}

chargingPackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {applyCharging {bound}}
    SUPPLIER INVOKES    {applyChargingReport {bound}}
    ID                  id-package-charging}

trafficManagementPackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {callGap {bound}}
    ID                  id-package-trafficManagement}

callReportPackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {callInformationRequest {bound}}
    SUPPLIER INVOKES    {callInformationReport {bound}}
    ID                  id-package-callReport}
```

```
signallingControlPackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {sendChargingInformation {bound}}
    ID                  id-package-signallingControl}

activityTestPackage OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {activityTest}
    ID                  id-package-activityTest}

cancelPackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {cancel {bound}}
    ID                  id-package-cancel}

cphResponsePackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {continueWithArgument {bound} |
                         disconnectLeg {bound} |
                         moveLeg {bound} |
                         splitLeg {bound}}
    ID                  id-package-cphResponse}

exceptionInformPackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {entityReleased {bound}}
    ID                  id-package-exceptionInform}


-- Abstract Syntaxes

gsmSSF-scfGenericAbstractSyntax ABSTRACT-SYNTAX ::= {
    GenericSSF-gsmSCF-PDUs
    IDENTIFIED BY       id-as-gsmSSF-scfGenericAS}

GenericSSF-gsmSCF-PDUs ::= TCMessage {{SsfToScfGenericInvokable},
                                      {SsfToScfGenericReturnable}}

SsfToScfGenericInvokable OPERATION ::= {
    activityTest |
    applyCharging {cAPSpecificBoundSet} |
    applyChargingReport {cAPSpecificBoundSet} |
    callInformationReport {cAPSpecificBoundSet} |
    callInformationRequest {cAPSpecificBoundSet} |
    cancel {cAPSpecificBoundSet} |
    connect {cAPSpecificBoundSet} |
    continueWithArgument {cAPSpecificBoundSet} |
    connectToResource {cAPSpecificBoundSet} |
    disconnectForwardConnection |
    disconnectForwardConnectionWithArgument {cAPSpecificBoundSet} |
    disconnectLeg {cAPSpecificBoundSet} |
    entityReleased {cAPSpecificBoundSet} |
    establishTemporaryConnection {cAPSpecificBoundSet} |
    eventNotificationCharging {cAPSpecificBoundSet} |
    eventReportBCSM {cAPSpecificBoundSet} |
    furnishChargingInformation {cAPSpecificBoundSet} |
    initialDP {cAPSpecificBoundSet} |
    initiateCallAttempt {cAPSpecificBoundSet} |
    moveLeg {cAPSpecificBoundSet} |
    releaseCall {cAPSpecificBoundSet} |
    requestNotificationChargingEvent {cAPSpecificBoundSet } |
    requestReportBCSMEvent {cAPSpecificBoundSet} |
    resetTimer {cAPSpecificBoundSet} |
    sendChargingInformation {cAPSpecificBoundSet} |
    splitLeg {cAPSpecificBoundSet} |
    playAnnouncement {cAPSpecificBoundSet} |
    promptAndCollectUserInformation {cAPSpecificBoundSet} |
    specializedResourceReport
    }

SsfToScfGenericReturnable OPERATION ::= {
    activityTest |
    applyCharging {cAPSpecificBoundSet} |
    applyChargingReport {cAPSpecificBoundSet} |
    callGap {cAPSpecificBoundSet} |
    callInformationRequest {cAPSpecificBoundSet} |
    cancel {cAPSpecificBoundSet} |
    connect {cAPSpecificBoundSet} |
    connectToResource {cAPSpecificBoundSet} |
    continue |
    continueWithArgument {cAPSpecificBoundSet} |
    disconnectForwardConnection |
```

```
    disconnectForwardConnectionWithArgument {cAPSpecificBoundSet} |
    disconnectLeg {cAPSpecificBoundSet} |
    entityReleased {cAPSpecificBoundSet} |
    establishTemporaryConnection {cAPSpecificBoundSet} |
    furnishChargingInformation {cAPSpecificBoundSet} |
    initialDP {cAPSpecificBoundSet} |
    initiateCallAttempt {cAPSpecificBoundSet} |
    moveLeg {cAPSpecificBoundSet} |
    releaseCall {cAPSpecificBoundSet} |
    requestReportBCSMEvent {cAPSpecificBoundSet} |
    resetTimer {cAPSpecificBoundSet} |
    sendChargingInformation {cAPSpecificBoundSet} |
    splitLeg {cAPSpecificBoundSet} |
    playAnnouncement {cAPSpecificBoundSet} |
    promptAndCollectUserInformation {cAPSpecificBoundSet}
    }

assistHandoff-gsmSSF-scfAbstractSyntax ABSTRACT-SYNTAX ::= {
    AssistHandoffsSF-gsmSCF-PDUs
    IDENTIFIED BY   id-as-assistHandoff-gsmSSF-scfAS}

AssistHandoffsSF-gsmSCF-PDUs ::= TCMessage {{AssistHandoffssfToScfInvokable},
                                            {AssistHandoffssfToScfReturnable}}

AssistHandoffssfToScfInvokable OPERATION ::= {
    activityTest |
    assistRequestInstructions {cAPSpecificBoundSet} |
    cancel {cAPSpecificBoundSet} |
    connectToResource {cAPSpecificBoundSet} |
    disconnectForwardConnection |
    disconnectForwardConnectionWithArgument {cAPSpecificBoundSet} |
    playAnnouncement {cAPSpecificBoundSet} |
    promptAndCollectUserInformation {cAPSpecificBoundSet} |
    resetTimer {cAPSpecificBoundSet} |
    specializedResourceReport
    }

AssistHandoffssfToScfReturnable OPERATION ::= {
    activityTest |
    assistRequestInstructions {cAPSpecificBoundSet} |
    cancel {cAPSpecificBoundSet} |
    connectToResource {cAPSpecificBoundSet} |
    disconnectForwardConnection |
    disconnectForwardConnectionWithArgument {cAPSpecificBoundSet} |
    playAnnouncement {cAPSpecificBoundSet} |
    promptAndCollectUserInformation {cAPSpecificBoundSet} |
    resetTimer {cAPSpecificBoundSet}
    }

scf-gsmSSFGenericAbstractSyntax ABSTRACT-SYNTAX ::= {
    GenericSCF-gsmSSF-PDUs
    IDENTIFIED BY   id-as-scf-gsmSSFGenericAS}

GenericSCF-gsmSSF-PDUs ::= TCMessage {{ScfToSsfGenericInvokable}, {ScfToSsfGenericReturnable}}

ScfToSsfGenericInvokable OPERATION ::= {
    activityTest |
    applyCharging {cAPSpecificBoundSet} |
    applyChargingReport {cAPSpecificBoundSet} |
    callInformationRequest {cAPSpecificBoundSet} |
    cancel {cAPSpecificBoundSet} |
    connect {cAPSpecificBoundSet} |
    connectToResource {cAPSpecificBoundSet} |
    continue |
    continueWithArgument {cAPSpecificBoundSet} |
    disconnectForwardConnection ~~{cAPSpecficBoundSet}~~ |
    disconnectForwardConnectionWithArgument {cAPSpecificBoundSet} |
    disconnectLeg {cAPSpecificBoundSet} |
    establishTemporaryConnection {cAPSpecificBoundSet} |
    furnishChargingInformation {cAPSpecificBoundSet} |
    initiateCallAttempt {cAPSpecificBoundSet} |
    moveLeg {cAPSpecificBoundSet} |
    playTone {cAPSpecificBoundSet} |
    releaseCall {cAPSpecificBoundSet} |
    requestReportBCSMEvent {cAPSpecificBoundSet} |
    resetTimer {cAPSpecificBoundSet} |
    sendChargingInformation {cAPSpecificBoundSet} |
    splitLeg {cAPSpecificBoundSet} |
```

```
    playAnnouncement {cAPSpecificBoundSet} |
    promptAndCollectUserInformation {cAPSpecificBoundSet}
    }

ScfToSsfGenericReturnable OPERATION ::= {
    activityTest |
    applyCharging {cAPSpecificBoundSet} |
    applyChargingReport {cAPSpecificBoundSet} |
    callInformationReport {cAPSpecificBoundSet} |
    callInformationRequest {cAPSpecificBoundSet} |
    cancel {cAPSpecificBoundSet} |
    connect {cAPSpecificBoundSet} |
    connectToResource {cAPSpecificBoundSet} |
    disconnectForwardConnection |
    disconnectForwardConnectionWithArgument {cAPSpecificBoundSet} |
    disconnectLeg {cAPSpecificBoundSet} |
    entityReleased {cAPSpecificBoundSet} |
    establishTemporaryConnection {cAPSpecificBoundSet} |
    eventReportBCSM {cAPSpecificBoundSet} |
    furnishChargingInformation {cAPSpecificBoundSet} |
    initiateCallAttempt {cAPSpecificBoundSet} |
    moveLeg {cAPSpecificBoundSet} |
    requestReportBCSMEvent {cAPSpecificBoundSet} |
    resetTimer {cAPSpecificBoundSet} |
    sendChargingInformation {cAPSpecificBoundSet} |
    splitLeg {cAPSpecificBoundSet} |
    playAnnouncement {cAPSpecificBoundSet} |
    promptAndCollectUserInformation {cAPSpecificBoundSet} |
    specializedResourceReport
    }

END

-- 6.2  gsmSCF/gsmSRF interface
-- 6.2.1    gsmSCF/gsmSRF operations and arguments
CAP-gsmSCF-gsmSRF-ops-args {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
umts-network(1) modules(3) cap-gsmSCF-gsmSRF-ops-args(103) version4(3)}

DEFINITIONS IMPLICIT TAGS ::= BEGIN

-- This module contains the operations and operation arguments used for the
-- gsmSRF - gsmSCF interface, for the control of circuit switched calls.

-- The table in subclause 2.1 lists the specifications that contain the modules
-- that are used by CAP.

IMPORTS

    OPERATION
FROM Remote-Operations-Information-Objects ros-InformationObjects

    opcode-playAnnouncement,
    opcode-promptAndCollectUserInformation,
    opcode-specializedResourceReport
FROM CAP-operationcodes operationcodes

    CallSegmentID {}
FROM CS2-datatypes {itu-t(0) identified-organisation(4) etsi(0) inDomain(1) in-network(1) cs2(20)
modules(0) in-cs2-datatypes(0) version1(0)}
--CR Editor's Note: if the previous change is not accepted then we have to replace
--"identified-organisation" by "identified-organization" (i.e. 's' -> 'z').

    CallSegmentID {},
    CollectedInfo,
    Digits {},
    Extensions {},
    InformationToSend {}
FROM CAP-datatypes datatypes

    canceled,
    improperCallerResponse,
    missingParameter,
    parameterOutOfRange,
    systemFailure,
    taskRefused,
    unavailableResource,
    unexpectedComponentSequence,
    unexpectedDataValue,
```

```
    unexpectedParameter,
    unknownCSID
FROM CAP-errortypes errortypes

    PARAMETERS-BOUND
FROM CAP-classes classes

    ros-InformationObjects,
    operationcodes,
    datatypes,
    errortypes,
    classes
FROM CAP-object-identifiers {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
umts-network(1) modules(3) cap-object-identifiers(100) version4(3)}

;

playAnnouncement {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        PlayAnnouncementArg {bound}
    RETURN RESULT   FALSE
    ERRORS          {canceled |
                     missingParameter |
                     parameterOutOfRange |
                     systemFailure |
                     taskRefused |
                     unexpectedComponentSequence |
                     unexpectedDataValue |
                     unexpectedParameter |
                     unavailableResource |
                     unknownCSID}
    LINKED          {specializedResourceReport}
    CODE            opcode-playAnnouncement}
-- Direction: gsmSCF -> gsmSRF, Timer: Tpa
-- This operation is to be used after Establish Temporary Connection (assist procedure
-- with a second gsmSSF) or a Connect to Resource (no assist) operation. It may be used
-- for inband interaction with a mobile station, or for interaction with an ISDN user.
-- In the former case, the gsmSRF is usually collocated with the gsmSSF for standard
-- tones (congestion tone...) or standard announcements.
-- In the latter case, the gsmSRF is always collocated with the gsmSSF in the switch.
-- Any error is returned to the gsmSCF. The timer associated with this operation must
-- be of a sufficient duration to allow its linked operation to be correctly correlated.

PlayAnnouncementArg {PARAMETERS-BOUND : bound}::= SEQUENCE {
    informationToSend                   [0] InformationToSend {bound},
    disconnectFromIPForbidden           [1] BOOLEAN DEFAULT TRUE,
    requestAnnouncementCompleteNotification [2] BOOLEAN DEFAULT TRUE,
    extensions                          [3] Extensions {bound}                  OPTIONAL,
    callSegmentID                       [5] CallSegmentID {bound}               OPTIONAL,
    requestAnnouncementStartedNotification  [51] BOOLEAN DEFAULT FALSE,
    ...
    }

promptAndCollectUserInformation {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        PromptAndCollectUserInformationArg {bound}
    RESULT          ReceivedInformationArg {bound}
    ERRORS          {canceled |
                     improperCallerResponse |
                     missingParameter |
                     parameterOutOfRange |
                     systemFailure |
                     taskRefused |
                     unexpectedComponentSequence |
                     unavailableResource |
                     unexpectedDataValue |
                     unexpectedParameter |
                     unknownCSID}
    LINKED          {specializedResourceReport}
    CODE            opcode-promptAndCollectUserInformation}
-- Direction: gsmSCF -> gsmSRF, Timer: Tpc
-- This operation is used to interact with a user to collect information.

PromptAndCollectUserInformationArg {PARAMETERS-BOUND : bound}::= SEQUENCE {
    collectedInfo                       [0] CollectedInfo,
    disconnectFromIPForbidden           [1] BOOLEAN DEFAULT TRUE,
    informationToSend                   [2] InformationToSend {bound}           OPTIONAL,
    extensions                          [3] Extensions {bound}                  OPTIONAL,
    callSegmentID                       [4] CallSegmentID {bound}               OPTIONAL,
    requestAnnouncementStartedNotification [51] BOOLEAN DEFAULT FALSE,
```

```
    ...
    }

ReceivedInformationArg {PARAMETERS-BOUND : bound}::= CHOICE {
    digitsResponse                      [0] Digits {bound}
    }

specializedResourceReport OPERATION ::= {
    ARGUMENT        SpecializedResourceReportArg
    RETURN RESULT   FALSE
    ALWAYS RESPONDS FALSE
    CODE            opcode-specializedResourceReport}
-- Direction: gsmSRF -> gsmSCF, Timer: Tsrr
-- This operation is used as the response to a PlayAnnouncement operation when the announcement
-- completed report indication is set.

SpecializedResourceReportArg ::= CHOICE {
    allAnnouncementsComplete            [50] NULL,
    firstAnnouncementStarted            [51] NULL
    }

END

-- 6.2.2    gsmSRF/gsmSCF contracts, packages and ACs
-- 6.2.2.1  gsmSRF/gsmSCF ASN.1 modules
CAP-gsmSCF-gsmSRF-pkgs-contracts-acs {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
umts-network(1) modules(3) cap-gsmSCF-gsmSRF-pkgs-contracts-acs(104) version4(3)}

DEFINITIONS ::= BEGIN

-- This module specifies the Operation Packages, Contracts, Application Contexts
-- and Abstract Syntaxes used for the gsmSRF - gsmSCF interface, for the control of
-- circuit switched calls.

-- The table in subclause 2.1 lists the specifications that contain the modules
-- that are used by CAP.

IMPORTS

    PARAMETERS-BOUND,
    cAPSpecificBoundSet
FROM CAP-classes classes

    CONTRACT,
    OPERATION-PACKAGE,
    OPERATION
FROM Remote-Operations-Information-Objects ros-InformationObjects

    TCMessage {}
FROM TCAPMessages tc-Messages

    APPLICATION-CONTEXT,
    dialogue-abstract-syntax
FROM TC-Notation-Extensions tc-NotationExtensions

    playAnnouncement {},
    promptAndCollectUserInformation {},
    specializedResourceReport
FROM CAP-gsmSCF-gsmSRF-ops-args gsmSCF-gsmSRF-Operations

    activityTest,
    cancel,
    assistRequestInstructions {}
FROM CAP-gsmSSF-gsmSCF-ops-args gsmSSF-gsmSCF-Operations

    gsmSRF-scfActivationOfAssistPackage {}
FROM CAP-gsmSSF-gsmSCF-pkgs-contracts-acs gsmSSF-gsmSCF-Protocol

    id-package-specializedResourceControl,
    id-package-activityTest,
    id-ac-gsmSRF-gsmSCF,
    id-contract-gsmSRF-gsmSCF,
    id-package-gsmSRF-scfCancel,
    id-as-basic-gsmSRF-gsmSCF,
    classes,
    ros-InformationObjects,
    tc-Messages,
    tc-NotationExtensions,
```

```
    gsmSCF-gsmSRF-Operations,
    gsmSSF-gsmSCF-Operations,
    gsmSSF-gsmSCF-Protocol
FROM CAP-object-identifiers {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
umts-network(1) modules(3)r cap-object-identifiers(100) version4(3)}

;

-- Application Contexts

gsmSRF-gsmSCF-ac APPLICATION-CONTEXT ::= {
    CONTRACT                    gsmSRF-gsmSCF-contract
    DIALOGUE MODE               structured
    TERMINATION                 basic
    ABSTRACT SYNTAXES           {dialogue-abstract-syntax |
                                gsmSRF-gsmSCF-abstract-syntax}
    APPLICATION CONTEXT NAME    id-ac-gsmSRF-gsmSCF}

-- Contracts

gsmSRF-gsmSCF-contract CONTRACT ::= {
    INITIATOR CONSUMER OF       {gsmSRF-scfActivationOfAssistPackage {cAPSpecificBoundSet}}
    RESPONDER CONSUMER OF       {specializedResourceControlPackage {cAPSpecificBoundSet} |
                                activityTestPackage |
                                gsmSRF-scfCancelPackage {cAPSpecificBoundSet}}
    ID                          id-contract-gsmSRF-gsmSCF}

-- Operation Packages

specializedResourceControlPackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {playAnnouncement {bound} |
                        promptAndCollectUserInformation {bound}
    }
    SUPPLIER INVOKES    {specializedResourceReport}
    ID                  id-package-specializedResourceControl}

gsmSRF-scfCancelPackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {cancel {bound}}
    ID                  id-package-gsmSRF-scfCancel}

Aactivity TestPackage OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {activityTest}
    ID                  id-package-activityTest}

-- Abstract Syntaxes

gsmSRF-gsmSCF-abstract-syntax ABSTRACT-SYNTAX ::= {
    BASIC-gsmSRF-gsmSCF-PDUs
    IDENTIFIED BY   id-as-basic-gsmSRF-gsmSCF}

BASIC-gsmSRF-gsmSCF-PDUs ::= TCMessage {{GsmSRFgsmSCFInvokable},{GsmSRFgsmSCFReturnable}}

GsmSRFgsmSCFInvokable OPERATION ::= {
    activityTest |
    assistRequestInstructions {cAPSpecificBoundSet} |
    cancel {cAPSpecificBoundSet} |
    playAnnouncement {cAPSpecificBoundSet} |
    promptAndCollectUserInformation {cAPSpecificBoundSet} |
    specializedResourceReport
    }

GsmSRFgsmSCFReturnable OPERATION ::= {
    activityTest |
    assistRequestInstructions {cAPSpecificBoundSet} |
    cancel {cAPSpecificBoundSet} |
    playAnnouncement {cAPSpecificBoundSet} |
    promptAndCollectUserInformation {cAPSpecificBoundSet}
    }

END
```

— Next modified modules —

7 SMS Control

```
-- 7    SMS Control
-- 7.1  SMS operations and arguments
CAP-SMS-ops-args {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0) umts-network(1)
modules(3) cap-SMS-ops-args(105) version4(3)}

DEFINITIONS IMPLICIT TAGS::= BEGIN

-- This module contains the operations and operation arguments used for the
-- smsSSF- gsmSCF interface, for the control of MO-SMS and MT-SMS.

-- The table in subclause 2.1 lists the specifications that contain the modules
-- that are used by CAP.

IMPORTS

    errortypes,
    datatypes,
    operationcodes,
    classes,
    ros-InformationObjects,
    tc-Messages
FROM CAP-object-identifiers {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
umts-network(1) modules(3) cap-object-identifiers(100) version4(3)}

    OPERATION
FROM Remote-Operations-Information-Objects ros-InformationObjects

    ServiceKey
FROM CS1-DataTypes {itu-t(0) identified-organization(4) etsi(0) inDomain(1) in-network(1)
modules(0) cs1-datatypes(2) version1(0)}

    MiscCallInfo
FROM CS2-datatypes {itu-t(0) identified-organization(4) etsi(0) inDomain(1) in-network(1)
cs2(20) modules(0) in-cs2-datatypes (0) version1(0)}

    IMEI,
    IMSI,
    ISDN-AddressString
FROM MAP-CommonDataTypes {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
gsm-Network(1) modules(3) map-CommonDataTypes(18) version8~~6~~(8~~6~~)}

    GPRSMSClass,
    LocationInformation,
    MS-Classmark2
FROM MAP-MS-DataTypes {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
gsm-Network(1) modules(3) map-MS-DataTypes(11) version8~~6~~(8~~6~~)}

    PARAMETERS-BOUND
FROM CAP-classes classes

    opcode-connectSMS,
    opcode-continueSMS,
    opcode-eventReportSMS,
    opcode-furnishChargingInformationSMS,
    opcode-initialDPSMS,
    opcode-releaseSMS,
    opcode-requestReportSMSEvent,
    opcode-resetTimerSMS
FROM CAP-operationcodes operationcodes

    CalledPartyBCDNumber {},
    EventSpecificInformationSMS,
    EventTypeSMS,
    Extensions {},
    FCISMSBillingChargingCharacteristics,
    LocationInformationGPRS,
    RPCause,
    SMSEvent,
    TimeAndTimezone {},
    TimerID,
```

```
    TimerValue,
    TPDataCodingScheme,
    TPProtocolIdentifier,
    TPShortMessageSpecificInfo,
    TPValidityPeriod
FROM CAP-datatypes datatypes

    missingCustomerRecord,
    missingParameter,
    parameterOutOfRange,
    systemFailure,
    taskRefused,
    unexpectedComponentSequence,
    unexpectedDataValue,
    unexpectedParameter
FROM CAP-errortypes errortypes

    CallReferenceNumber,
FROM MAP-CH-DataTypes {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
gsm-nNetwork(1) modules(3) map-CH-DataTypes(13) version86(86)}

;

connectSMS {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        ConnectSMSArg {bound}
    RETURN RESULT   FALSE
    ERRORS          {missingParameter |
                     parameterOutOfRange |
                     systemFailure |
                     taskRefused |
                     unexpectedComponentSequence |
                     unexpectedDataValue |
                     unexpectedParameter}
    CODE            opcode-connectSMS}
--  Direction: gsmSCF -> gsmSSF or gprsSSF, Timer: Tconsms
--  This operation is used to request the smsSSF to perform the SMS processing
--  actions to route
--  or forward a short message to a specified destination.

ConnectSMSArg {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    callingPartysNumber                 [0] ISDN-AddressString                      OPTIONAL,
    destinationSubscriberNumber         [1] CalledPartyBCDNumber {bound}            OPTIONAL,
    sMSCAddress                         [2] ISDN-AddressString                      OPTIONAL,
    extensions                          [10] Extensions {bound}                     OPTIONAL,
    ...
    }

continueSMS OPERATION ::= {
    RETURN RESULT   FALSE
    ALWAYS RESPONDS FALSE
    CODE            opcode-continueSMS}
-- Direction: gsmSCF -> smsSSF, Timer: Tcuesms
-- This operation is used to request the smsSSF to proceed with
-- Short Message processing at the DP at which it previously suspended
-- Short Message processing to await gsmSCF instructions (i.e. proceed
-- to the next Point in Association in the SMS FSM). The smsSSF
-- continues SMS processing without substituting new data from the gsmSCF.

eventReportSMS {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        EventReportSMSArg {bound}
    RETURN RESULT   FALSE
    ALWAYS RESPONDS FALSE
    CODE            opcode-eventReportSMS}
--  Direction: gsmSSF or gprsSSF -> gsmSCF, Timer: Terbsms
--  This operation is used to notify the gsmSCF of a Short Message related event (FSM events
--  such as submission, delivery or failure) previously requested by the gsmSCF in a
--  RequestReportSMSEvent operation.

EventReportSMSArg {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    eventTypeSMS                        [0] EventTypeSMS,
    eventSpecificInformationSMS         [1] EventSpecificInformationSMS             OPTIONAL,
    miscCallInfo                        [2] MiscCallInfo DEFAULT {messageType request},
    extensions                          [10] Extensions {bound}                     OPTIONAL,
    ...
    }

furnishChargingInformationSMS {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        FurnishChargingInformationSMSArg {bound}
```

```
    RETURN RESULT   FALSE
    ERRORS          {missingParameter |
                    taskRefused |
                    unexpectedComponentSequence |
                    unexpectedDataValue |
                    unexpectedParameter}
    CODE            opcode-furnishChargingInformationSMS}
--  Direction: gsmSCF ?? gsmSSF or gprsSSF, Timer: Tfcisms
--  This operation is used to request the smsSSF to generate, register a charging record
--  or to include some information in the default SM record. The registered charging record is
--  intended for off line charging of the Short Message.

FurnishChargingInformationSMSArg {PARAMETERS-BOUND : bound} ::=
    FCISMSBillingChargingCharacteristics {bound}

initialDPSMS {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        InitialDPSMSArg {bound}
    RETURN RESULT   FALSE
    ERRORS          {missingCustomerRecord |
                    missingParameter |
                    parameterOutOfRange |
                    systemFailure |
                    taskRefused |
                    unexpectedComponentSequence |
                    unexpectedDataValue |
                    unexpectedParameter}
    CODE            opcode-initialDPSMS}
--  Direction: gsmSSF or gprsSSF -> gsmSCF, Timer: Tidpsms
--  This operation is used after a TDP to indicate request for service.

InitialDPSMSArg {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    serviceKey                          [0] ServiceKey,
    destinationSubscriberNumber         [1] CalledPartyBCDNumber {bound}        OPTIONAL,
    callingPartyNumber                  [2] ISDN-AddressString                  OPTIONAL,
    eventTypeSMS                        [3] EventTypeSMS                        OPTIONAL,
    iMSI                                [4] IMSI                                OPTIONAL,
    locationInformationMSC              [5] LocationInformation                 OPTIONAL,
    locationInformationGPRS             [6] LocationInformationGPRS             OPTIONAL,
    sMSCAddress                         [7] ISDN-AddressString                  OPTIONAL,
    timeAndTimezone                     [8] TimeAndTimezone {bound}             OPTIONAL,
    tPShortMessageSpecificInfo          [9] TPShortMessageSpecificInfo          OPTIONAL,
    tPProtocolIdentifier                [10] TPProtocolIdentifier               OPTIONAL,
    tPDataCodingScheme                  [11] TPDataCodingScheme                 OPTIONAL,
    tPValidityPeriod                    [12] TPValidityPeriod                   OPTIONAL,
    extensions                          [13] Extensions {bound}                 OPTIONAL,
    ...,
    smsReferenceNumber                  [14] CallReferenceNumber                OPTIONAL,
    mscAddress                          [15] ISDN-AddressString                 OPTIONAL,
    sgsn-Number                         [16] ISDN-AddressString                 OPTIONAL,
    ms-Classmark2                       [17] MS-Classmark2                      OPTIONAL,
    gPRSMSClass                         [18] GPRSMSClass                        OPTIONAL,
    iMEI                                [19] IMEI                               OPTIONAL,
    calledPartyNumber                   [1720] ISDN-AddressString                   OPTIONAL
    }

releaseSMS OPERATION ::= {
    ARGUMENT        ReleaseSMSArg
    RETURN RESULT   FALSE
    ALWAYS RESPONDS FALSE
    CODE            opcode-releaseSMS}
--  Direction: gsmSCF -> gsmSSF or gprsSSF, Timer: Trelsms
--  This operation is used to prevent an attempt to submit or deliver a short message.

ReleaseSMSArg ::= RPCause

requestReportSMSEvent {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        RequestReportSMSEventArg {bound}
    RETURN RESULT   FALSE
    ERRORS          {missingParameter |
                    parameterOutOfRange |
                    systemFailure |
                    taskRefused |
                    unexpectedComponentSequence |
                    unexpectedDataValue |
                    unexpectedParameter}
    CODE            opcode-requestReportSMSEvent}
--  Direction: gsmSCF -> gsmSSF or gprsSSF, Timer: Trrbsms
--  This operation is used to request the gsmSSF or gprsSSF to monitor for a
```

```
--  Short Message related event (FSM events such as submission, delivery or failure)
--  and to send a notification to the gsmSCF when the event is detected.

RequestReportSMSEventArg {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    sMSEvents                           [0] SEQUENCE SIZE (1..bound.&numOfSMSEvents) OF SMSEvent,
    extensions                          [10] Extensions {bound}                     OPTIONAL,
    ...
    }
--  Indicates the Short Message related events(s) for notification.

resetTimerSMS {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        ResetTimerSMSArg {bound}
    RETURN RESULT   FALSE
    ERRORS          {missingParameter |
                     parameterOutOfRange |
                     taskRefused |
                     unexpectedComponentSequence |
                     unexpectedDataValue |
                     unexpectedParameter}
    CODE            opcode-resetTimerSMS}
-- Direction: gsmSCF -> smsSSF, Timer: Trtsms
-- This operation is used to request the smsSSF to refresh an application
-- timer in the smsSSF.

ResetTimerSMSArg {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    timerID                             [0] TimerID DEFAULT tssf,
    timervalue                          [1] TimerValue,
    extensions                          [2] Extensions {bound}                      OPTIONAL,
    ...
    }

END
-- 7.2  SMS contracts, packages and ACs
-- 7.2.1    SMS ASN.1 module
CAP-smsSSF-gsmSCF-pkgs-contracts-acs {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
umts-network(1) modules(3) cap-smsSSF-gsmSCF-pkgs-contracts-acs(106) version4(3)}

DEFINITIONS ::= BEGIN

-- This module specifies the Operation Packages, Contracts, Application Contexts
-- and Abstract Syntaxes used for the smsSSF - gsmSCF interface, for the
-- control of MO-SMS and MT-SMS.

-- The table in subclause 2.1 lists the specifications that contain the modules
-- that are used by CAP.

IMPORTS

    PARAMETERS-BOUND,
    cAPSpecificBoundSet
FROM CAP-classes classes

    CONTRACT,
    OPERATION-PACKAGE,
    OPERATION
FROM Remote-Operations-Information-Objects ros-InformationObjects

    TCMessage {}
FROM TCAPMessages tc-Messages

    APPLICATION-CONTEXT,
    dialogue-abstract-syntax
FROM TC-Notation-Extensions tc-NotationExtensions

    connectSMS{},
    continueSMS,
    eventReportSMS{},
    furnishChargingInformationSMS{},
    initialDPSMS{},
    releaseSMS,
    requestReportSMSEvent{},
    resetTimerSMS{}
FROM CAP-SMS-ops-args sms-Operations

    id-ac-cap3-sms-AC,
    id-ac-cap4-sms-AC,
    id-cap3SmsSsfTogsmScf,
    id-cap4SmsSsfTogsmScf,
```

```
    id-package-smsActivation,
    id-package-smsConnect,
    id-package-smsContinue,
    id-package-smsRelease,
    id-package-smsEventHandling,
    id-package-smsBilling,
    id-package-smsTimer,
    sms-Operations,
    tc-NotationExtensions,
    tc-Messages,
    ros-InformationObjects,
    classes,
    id-as-smsSSF-gsmSCF-AS
FROM CAP-object-identifiers {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
umts-network(1) modules(3) cap-object-identifiers(100) version4(3)}

;

-- Application Contexts

cap3-sms-AC APPLICATION-CONTEXT ::= {
    CONTRACT                    cap3SMS
    DIALOGUE MODE               structured
    ABSTRACT SYNTAXES           {dialogue-abstract-syntax |
                                sms-AbstractSyntax}
    APPLICATION CONTEXT NAME    id-ac-cap3-sms-AC}
-- This application context shall be used for CAMEL support of MO-SMS.

cap4-sms-AC APPLICATION-CONTEXT ::= {
    CONTRACT                    cap4SMS
    DIALOGUE MODE               structured
    ABSTRACT SYNTAXES           {dialogue-abstract-syntax |
                                sms-AbstractSyntax}
    APPLICATION CONTEXT NAME    id-ac-cap4-sms-AC}
-- This application context shall be used for CAMEL support of MT-SMS.


-- Contracts

cap3SMS CONTRACT ::= {
-- dialogue initiated by gprsSSF or gsmSSF with InitialDPSMS Operation
    INITIATOR CONSUMER OF       {smsActivationPackage {cAPSpecificBoundSet}}
    RESPONDER CONSUMER OF       {smsConnectPackage {cAPSpecificBoundSet} |
                                smsReleasePackage |
                                smsEventHandlingPackage {cAPSpecificBoundSet} |
                                smsTimerPackage {cAPSpecificBoundSet} |
                                smsBillingPackage {cAPSpecificBoundSet} |
                                smsProcessingPackage}
    ID                          id-cap3SmsSsfTogsmScf}

cap4SMS CONTRACT ::= {
-- dialogue initiated by gprsSSF or gsmSSF with InitialDPSMS Operation
    INITIATOR CONSUMER OF       {smsActivationPackage {cAPSpecificBoundSet}}
    RESPONDER CONSUMER OF       {smsConnectPackage {cAPSpecificBoundSet} |
                                smsReleasePackage |
                                smsEventHandlingPackage {cAPSpecificBoundSet} |
                                smsTimerPackage {cAPSpecificBoundSet} |
                                smsBillingPackage {cAPSpecificBoundSet} |
                                smsProcessingPackage }
    ID                          id-cap4SmsSsfTogsmScf}


-- Operation Packages

smsActivationPackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {initialDPSMS {bound}}
    ID                  id-package-smsActivation}

smsConnectPackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {connectSMS {bound}}
    ID                  id-package-smsConnect}

smsProcessingPackage OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {continueSMS}
    ID                  id-package-smsContinue}

smsReleasePackage OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {releaseSMS}
```

```
    ID                  id-package-smsRelease}

smsEventHandlingPackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {requestReportSMSEvent {bound}}
    SUPPLIER INVOKES    {eventReportSMS {bound}}
    ID                  id-package-smsEventHandling}

smsBillingPackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {furnishChargingInformationSMS {bound}}
    ID                  id-package-smsBilling}

smsTimerPackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {resetTimerSMS {bound}}
    ID                  id-package-smsTimer}


-- Abstract Syntaxes

sms-AbstractSyntax ABSTRACT-SYNTAX ::= {
    Generic-sms-PDUs
    IDENTIFIED BY   id-as-smsSSF-gsmSCF-AS }

Generic-sms-PDUs ::= TCMessage {{SmsInvokable}, {SmsReturnable}}

SmsInvokable OPERATION ::= {
    connectSMS {cAPSpecificBoundSet} |
    eventReportSMS {cAPSpecificBoundSet} |
    furnishChargingInformationSMS {cAPSpecificBoundSet} |
    initialDPSMS {cAPSpecificBoundSet} |
    requestReportSMSEvent {cAPSpecificBoundSet} |
    resetTimerSMS {cAPSpecificBoundSet}}

SmsReturnable OPERATION ::= {
    connectSMS {cAPSpecificBoundSet} |
    continueSMS |
    furnishChargingInformationSMS {cAPSpecificBoundSet} |
    initialDPSMS {cAPSpecificBoundSet} |
    releaseSMS |
    requestReportSMSEvent {cAPSpecificBoundSet} |
    resetTimerSMS {cAPSpecificBoundSet}}

END
```

— Next modified modules —

8 GPRS Control

```
-- 8    GPRS Control
-- 8.1  gsmSCF/gprsSSF operations and arguments
CAP-gprsSSF-gsmSCF-ops-args {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
umts-network(1) modules(3) cap-GPRS-ops-args(107) version43(32)}
--CR Editor's Note: we shall put the GPRS modules version to version4(3). The Application Contexts,
--Contracts, Operation Packages and Abstract Syntaxes shall remain verion 3(2).

DEFINITIONS IMPLICIT TAGS ::= BEGIN

-- This module contains the operations and operation arguments used for the
-- gprsSSF - gsmSCF interface, for the control of GPRS.

-- The table in subclause 2.1 lists the specifications that contain the modules
-- that are used by CAP.

IMPORTS

    errortypes,
    datatypes,
    operationcodes,
    classes,
    ros-InformationObjects
FROM CAP-object-identifiers {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
umts-network(1) modules(3) cap-object-identifiers(100) version34(23)}

    OPERATION
FROM Remote-Operations-Information-Objects ros-InformationObjects
```

```
    ServiceKey
FROM CS1-DataTypes {itu-t(0) identified-organization(4) etsi(0) inDomain(1) in-network(1)
modules(0) cs1-datatypes(2) version1(0)}

    MiscCallInfo
FROM CS2-datatypes {itu-t(0) identified-organization(4) etsi(0) inDomain(1) in-network(1)
cs2(20) modules(0) in-cs2-datatypes (0) version1(0)}

    IMEI,
    IMSI,
    ISDN-AddressString
FROM MAP-CommonDataTypes {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
gsm-Network(1) modules(3) map-CommonDataTypes(18) version8~~6~~(8~~6~~)}

    GPRSChargingID,
    GPRSMSClass,
    GSN-Address,
    LocationInformationGPRS,
    RAIdentity
FROM MAP-MS-DataTypes {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
gsm-Network(1) modules(3) map-MS-DataTypes(11) version8~~6~~(8~~6~~)}

    PARAMETERS-BOUND
FROM CAP-classes classes

    opcode-activityTestGPRS,
    opcode-applyChargingGPRS,
    opcode-applyChargingReportGPRS,
    opcode-cancelGPRS,
    opcode-connectGPRS,
    opcode-continueGPRS,
    opcode-entityReleasedGPRS,
    opcode-eventReportGPRS,
    opcode-furnishChargingInformationGPRS,
    opcode-initialDPGPRS,
    opcode-releaseGPRS,
    opcode-requestReportGPRSEvent,
    opcode-resetTimerGPRS,
    opcode-sendChargingInformationGPRS
FROM CAP-operationcodes operationcodes

    AccessPointName {},
    GPRSCause {},
    ChargingCharacteristics,
    ChargingResult,
    ChargingRollOver,
    EndUserAddress,

    Extensions,
    FCIGPRSBillingChargingCharacteristics,
    GPRSEventSpecificInformation {},
    GPRSEvent,
    GPRSEventType,
    PDPID,
    PDPInitiationType,
    QualityOfService,
    SCIGPRSBillingChargingCharacteristics {},
    SGSNCapabilities,
    TimeAndTimezone {},
    TimerID,
    TimerValue
FROM CAP-datatypes datatypes

    missingCustomerRecord,
    missingParameter,
    parameterOutOfRange,
    systemFailure,
    taskRefused,
    unexpectedComponentSequence,
    unexpectedDataValue,
    unexpectedParameter,
    unknownPDPID
FROM CAP-errortypes errortypes

;

activityTestGPRS OPERATION ::= {
```

```
    RETURN RESULT   TRUE
    CODE            opcode-activityTestGPRS}
-- Direction: gsmSCF -> gprsSSF, Timer: Tatg
-- This operation is used to check for the continued existence of a relationship between the gsmSCF
-- and gprsSSF. If the relationship is still in existence, then the gprsSSF will respond. If no
-- reply is received, then the gsmSCF will assume that the gprsSSF has failed in some way
-- and will take the appropriate action.

applyChargingGPRS OPERATION ::= {
    ARGUMENT        ApplyChargingGPRSArg
    RETURN RESULT   FALSE
    ERRORS          {missingParameter |
                     unexpectedComponentSequence |
                     unexpectedParameter |
                     unexpectedDataValue |
                     parameterOutOfRange |
                     systemFailure |
                     taskRefused |
                     unknownPDPID}
    CODE            opcode-applyChargingGPRS}
-- Direction gsmSCF -> gprsSSF, Timer Tacg
-- This operation is used for interacting from the gsmSCF with the gprsSSF CSE-controlled
-- GPRS session or PDP Context charging mechanism.

ApplyChargingGPRSArg ::= SEQUENCE {
    cchargingCharacteristics              [0] ChargingCharacteristics,
    tariffSwitchInterval                  [1] INTEGER (1..86400)                    OPTIONAL,
    pDPID                                 [2] PDPID                                 OPTIONAL,
    ...
    }
-- tariffSwitchInterval is measured in 1 second units.

aapplyChargingReportGPRS OPERATION ::= {
    ARGUMENT        ApplyChargingReportGPRSArg
    RETURN RESULT   TRUE
    ERRORS          {missingParameter |
                     unexpectedComponentSequence |
                     unexpectedParameter |
                     unexpectedDataValue |
                     parameterOutOfRange |
                     systemFailure |
                     taskRefused |
                     unknownPDPID}
    CODE            opcode-applyChargingReportGPRS}
--  Direction gprsSSF -> gsmSCF,Timer Tacrg
--  The ApplyChargingReportGPRS operation provides the feedback from the gprsSCF to the gsmSCF
--  CSE-controlled GPRS session charging mechanism.

ApplyChargingReportGPRSArg ::= SEQUENCE {
    cchargingResult                       [0] ChargingResult,
    qqualityOfService                     [1] QualityOfService                      OPTIONAL,
    active                                [2] BOOLEAN DEFAULT TRUE,
    pDPID                                 [3] PDPID                                 OPTIONAL,
    ...,
    chargingRollOver                      [4] ChargingRollOver                      OPTIONAL
    }

cancelGPRS OPERATION ::= {
    ARGUMENT        CancelGPRSArg
    RETURN RESULT   FALSE
    ERRORS          {missingParameter |
                     taskRefused |
                     unknownPDPID}
    CODE            opcode-cancelGPRS}
--  Direction: gsmSCF ?? gprsSSF, Timer: Tcag
--  This generic operation cancels all previous requests,
--  i.e. all EDPs and reports can be cancelled by the gsmSCF.

CancelGPRSArg ::= SEQUENCE {
    pDPID                                 [0] PDPID                                 OPTIONAL,
    ...
    }

connectGPRS {PARAMETERS-BOUND: bound} OPERATION::= {
    ARGUMENT        ConnectGPRSArg {bound}
    RETURN RESULT   FALSE
    ERRORS          {missingParameter |
                     parameterOutOfRange |
```

```
                    unknownPDPID |
                    systemFailure |
                    taskRefused |
                    unexpectedComponentSequence |
                    unexpectedDataValue |
                    unexpectedParameter}
    CODE            opcode-connectGPRS}
-- Direction: gsmSCF -> gprsSSF, Timer: Tcong
-- This operation is used to modify the Access Point Name used when establishing a PDP Context.

ConnectGPRSArg {PARAMETERS-BOUND: bound}::= SEQUENCE {
    accessPointName     [0] AccessPointName {bound},
    pdpID       [1] PDPID           OPTIONAL,
    ...
    }

continueGPRS OPERATION ::= {
    ARGUMENT        ContinueGPRSArg
    RETURN RESULT   FALSE
    ERRORS          {missingParameter |
                    unknownPDPID |
                    unexpectedDataValue}
    CODE            opcode-continueGPRS}
--  Direction: gsmSCF -> gprsSSF, Timer: Tcueg
--  This operation is used to request the gprsSSF to proceed with processing at the DP at
--  which it previously suspended processing to await gsmSCF instructions (i.e., proceed to
--  the next point in processing in the Attach/Detach state model or PDP Context
--  state model) substituting new data from the gsmSCF.

ContinueGPRSArg ::= SEQUENCE {
    pDPID                           [0] PDPID                                   OPTIONAL,
    ...
}

entityReleasedGPRS {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        EntityReleasedGPRSArg {bound}
    RETURN RESULT   TRUE
    ERRORS          {missingParameter |
                    taskRefused |
                    unknownPDPID}
    CODE            opcode-entityReleasedGPRS}
--  Direction: gprsSSF -> gsmSCF, Timer: Terg
--  This operation is used when the GPRS Session is detached or a PDP Context is diconnected and
--  the associated event is not armed for reporting.
--  The usage of this operation is independent of the functional entity that initiates the Detach
--  or PDP Context Disconnection and is independent of the cause of the Detach or PDP Context
--  Disconnect.

EntityReleasedGPRSArg {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    gPRSCause                       [0] GPRSCause {bound},
    pDPID                           [1] PDPID                                   OPTIONAL,
    ...
    }

eventReportGPRS {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        EventReportGPRSArg {bound}
    RETURN RESULT   TRUE
    ERRORS          {unknownPDPID}
    CODE            opcode-eventReportGPRS}
--  Direction gprsSSF -> gsmSCF,Timer Tereg
--      This operation is used to notify the gsmSCF of a GPRS session or PDP context related
--      events (e.g. PDP context activation) previously requested by the gsmSCF in a
--      RequestReportGPRSEventoperation.

EventReportGPRSArg {PARAMETERS-BOUND : bound}::= SEQUENCE {
    ~~g~~gPRSEventType                      [0] GPRSEventType,
    ~~M~~miscGPRSInfo                       [1] MiscCallInfo DEFAULT {messageType request},
    ~~g~~gPRSEventSpecificInformation       [2] GPRSEventSpecificInformation {bound}    OPTIONAL,
    pDPID                           [3] PDPID OPTIONAL,
    ...
    }

furnishChargingInformationGPRS {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        FurnishChargingInformationGPRSArg {bound}
    RETURN RESULT   FALSE
    ERRORS          {missingParameter |
                    taskRefused |
                    unexpectedComponentSequence |
```

```
                    unexpectedDataValue |
                    unexpectedParameter |
                    unknownPDPID}
    CODE            opcode-furnishChargingInformationGPRS}
-- Direction: gsmSCF -> gprsSSF, Timer: Tfcig
-- This operation is used to request the gprsSSF to generate, register a logical record or to
-- include some information in the default logical GPRS record.
-- The registered logical record is intended for off line charging of the GPRS session
-- or PDP Context.

FurnishChargingInformationGPRSArg {PARAMETERS-BOUND : bound} ::=
    FCIGPRSBillingChargingCharacteristics{bound}

initialDPGPRS {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        InitialDPGPRSArg {bound}
    RETURN RESULT   FALSE
    ERRORS          {missingCustomerRecord |
                    missingParameter |
                    parameterOutOfRange |
                    systemFailure |
                    taskRefused |
                    unexpectedComponentSequence |
                    unexpectedDataValue |
                    unexpectedParameter}
    CODE            opcode-initialDPGPRS}
--  Direction gprsSSF -> gsmSCF,Timer Tidpg
--  This operation is used by the gprsSSF when a trigger is detected at a DP in the GPRS state
--  machines to request instructions from the gsmSCF

InitialDPGPRSArg {PARAMETERS-BOUND : bound}::= SEQUENCE {
    sServiceKey                     [0] ServiceKey,
    ggPRSEventType                  [1] GPRSEventType,
    mSISDN                          [2] ISDN-AddressString,
    iMSI                            [3] IMSI,
    timeAndTimeZone                 [4] TimeAndTimezone {bound},
    gPRSMSClass                     [5] GPRSMSClass                         OPTIONAL,
    endUserAddress                  [6] EndUserAddress {bound}              OPTIONAL,
    qualityOfService                [7] QualityOfService                    OPTIONAL,
    accessPointName                 [8] AccessPointName{bound}              OPTIONAL,
    routeingAreaIdentity            [9] RAIdentity                          OPTIONAL,
    chargingID                      [10] GPRSChargingID                     OPTIONAL,
    sGSNCapabilities                [11] SGSNCapabilities                   OPTIONAL,
    locationInformationGPRS         [12] LocationInformationGPRS            OPTIONAL,
    pDPInitiationType               [13] PDPInitiationType                  OPTIONAL,
    extensions                      [14] Extensions {bound}                 OPTIONAL,
    ...,
    gGSNAddress                     [15] GSN-Address                        OPTIONAL,
    secondaryPDP-context            [16] NULL                               OPTIONAL,
    iMEI                            [17] IMEI                               OPTIONAL
    }
--  The RouteingAreaIdentity parameter is not used.
--  The receiving entity shall ignore RouteingAreaIdentity if received.
--  The RouteingAreaIdentity is conveyed in the LocationInformationGPRS parameter.

releaseGPRS {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        ReleaseGPRSArg {bound}
    RETURN RESULT   FALSE
    ERRORS          {missingParameter |
                    taskRefused |
                    unknownPDPID}
    CODE            opcode-releaseGPRS}
--  Direction: gsmSCF -> gprsSSF, Timer: Trg
--  This operation is used to tear down an existing GPRS session or PDP Context at any phase.

ReleaseGPRSArg {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    gprsCause                       [0] GPRSCause {bound},
    pDPID                           [1] PDPID                               OPTIONAL,
    ...
    }

requestReportGPRSEvent {PARAMETERS-BOUND : bound} OPERATION ::= {
    ARGUMENT        RequestReportGPRSEventArg {bound}
    RETURN RESULT   FALSE
    ERRORS          {missingParameter |
                    parameterOutOfRange |
                    systemFailure |
                    taskRefused |
                    unexpectedComponentSequence |
```

```
                    unexpectedDataValue |
                    unexpectedParameter |
                    unknownPDPID}
    CODE            opcode-requestReportGPRSEvent}
-- Direction: gsmSCF -> gprsSSF, Timer: Trrqe
-- This operation is used to request the gprsSSF to monitor for an event (e.g., GPRS events
-- such as attach or PDP Context activiation), then send a notification back to the
-- gsmSCF when the event is detected.

RequestReportGPRSEventArg {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    gPRSEvent                       [0] SEQUENCE SIZE (1..bound.&numOfGPRSEvents) OF GPRSEvent,
    pDPID                           [1] PDPID                                     OPTIONAL,
    ...
    }
-- Indicates the GPRS related events for notification.

RresetTimerGPRS OPERATION ::= {
    ARGUMENT        ResetTimerGPRSArg
    RETURN RESULT   FALSE
    ERRORS          {missingParameter |
                    parameterOutOfRange |
                    taskRefused |
                    unexpectedComponentSequence |
                    unexpectedDataValue |
                    unexpectedParameter |
                    unknownPDPID}
    CODE            opcode-resetTimerGPRS}
--  Direction: gsmSCF -? gprsSSF, Timer: Trtg
--  This operation is used to request the gprsSSF to refresh an application timer in the gprsSSF.

ResetTimerGPRSArg ::= SEQUENCE {
    timerID                         [0] TimerID                 DEFAULT tssf,
    timervalue                      [1] TimerValue,
    ...
    }

sendChargingInformationGPRS {PARAMETERS-BOUND: bound} OPERATION ::= {
    ARGUMENT        SendChargingInformationGPRSArg { bound}
    RETURN RESULT   FALSE
    ERRORS          {missingParameter |
                    unexpectedComponentSequence |
                    unexpectedParameter |
                    parameterOutOfRange |
                    systemFailure |
                    taskRefused |
                    unexpectedDataValue |
                    unknownPDPID}
    CODE            opcode-sendChargingInformationGPRS}
-- Direction: gsmSCF -> gprsSSF, Timer: Tscig
-- This operation is used to instruct the gprsSSF on the charging information which the
-- gprsSSF shall send to the Mobile Station by means of GSM access signalling.

SendChargingInformationGPRSArg {PARAMETERS-BOUND: bound}::= SEQUENCE {
    SsCIGPRSBillingChargingCharacteristics [0] SCIGPRSBillingChargingCharacteristics { bound},
    ...
    }

END


CAP-GPRS-ReferenceNumber {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
umts-network(1) modules(3) cap-dialogueInformation(111) version43(32)}
--CR Editor's Note: we shall put the GPRS modules version to version4(3). The Application Contexts,
--Contracts, Operation Packages and Abstract Syntaxes shall remain verion 3(2).

DEFINITIONS ::= BEGIN

EXPORTS
    id-CAP-GPRS-ReferenceNumber,
    cAP-GPRS-ReferenceNumber-Abstract-Syntax;

IMPORTS

    Integer4
FROM CS1-DataTypes {itu-t(0) identified-organization(4) etsi(0) inDomain(1) in-network(1)
modules(0) cs1-datatypes(2) version1(0)}
;
```

```
id-CAP-GPRS-ReferenceNumber OBJECT IDENTIFIER ::= {itu-t(0) identified-organization(4) etsi(0)
mobileDomain(0) umts-network(1) as(1) cap-GPRS-ReferenceNumber(5) version3(2)}
--CR Editor's Note: keep version3(2).

cAP-GPRS-ReferenceNumber-Abstract-Syntax ABSTRACT-SYNTAX ::= {CAP-GPRS-ReferenceNumber IDENTIFIED BY
id-CAP-GPRS-ReferenceNumber}
--CR Editor's Note: keep version3(2).

CAP-GPRS-ReferenceNumber ::= SEQUENCE {
    ÐdestinationReference               [0] Integer4                                OPTIONAL,
    ÐoriginationReference               [1] Integer4                                OPTIONAL
    }
--  This parameter is used to identify the relationship between SGSN and the gsmSCF.

END -- of CAP-GPRS-ReferenceNumber

-- 8.2  gsmSCF/gprsSSF contracts, packages and ACs
-- 8.2.1    gprsSSF/gsmSCF ASN.1 module
CAP-gprsSSF-gsmSCF-pkgs-contracts-acs {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
umts-network(1) modules(3) cap-gprsSSF-gsmSCF-pkgs-contracts-acs(108) version43(32)}
--CR Editor's Note: we shall put the GPRS modules version to version4(3). The Application Contexts,
--Contracts, Operation Packages and Abstract Syntaxes shall remain verion 3(2).

DEFINITIONS ::= BEGIN

-- This module specifies the Operation Packages, Contracts, Application Contexts
-- and Abstract Syntaxes used for the gprsSSF - gsmSCF interface, for the
-- control of GPRS.

-- The table in subclause 2.1 lists the specifications that contain the modules
-- that are used by CAP.

IMPORTS

    PARAMETERS-BOUND,
    cAPSpecificBoundSet
FROM CAP-classes classes

    CONTRACT,
    OPERATION-PACKAGE,
    OPERATION
FROM Remote-Operations-Information-Objects ros-InformationObjects

    TCMessage {}
FROM TCAPMessages tc-Messages

    APPLICATION-CONTEXT,
    dialogue-abstract-syntax
FROM TC-Notation-Extensions tc-NotationExtensions

    activityTestGPRS,
    applyChargingGPRS,
    applyChargingReportGPRS,
    cancelGPRS,
    connectGPRS {},
    continueGPRS,
    entityReleasedGPRS {},
    furnishChargingInformationGPRS {},
    initialDPGPRS {},
    releaseGPRS {},
    eventReportGPRS {},
    requestReportGPRSEvent {},
    resetTimerGPRS,
    sendChargingInformationGPRS {}
FROM CAP-gprsSSF-gsmSCF-ops-args gprsSSF-gsmSCF-Operations

    id-ac-CAP-gprsSSF-gsmSCF-AC,
    id-ac-CAP-gsmSCF-gprsSSF-AC,
    id-cap3GprsSsfTogsmScf,
    id-cap3GsmScfToGprsSsf,
    id-as-gprsSSF-gsmSCF-AS,
    id-as-gsmSCF-gprsSSF-AS,
    id-package-gprsScfActivation,
    id-package-gprsConnect,
    id-package-gprsContinue,
    id-package-gprsRelease,
    id-package-gprsEventHandling,
    id-package-gprsExceptionInformation,
```

```
    id-package-gprsTimer,
    id-package-gprsBilling,
    id-package-gprsCharging,
    id-package-gprsChargeAdvice,
    id-package-gprsActivityTest,
    id-package-gprsCancel,
    classes,
    ros-InformationObjects,
    tc-Messages,
    tc-NotationExtensions,
    gprsSSF-gsmSCF-Operations
FROM CAP-object-identifiers {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
umts-network(1) modules(3) cap-object-identifiers(100) version43(32)}

;

-- Application Contexts

cap3-gprssf-scfAC APPLICATION-CONTEXT ::= {
    CONTRACT                    cap3GprsSsfToScf
    DIALOGUE MODE               structured
    ABSTRACT SYNTAXES           {dialogue-abstract-syntax |
                                gprsSSF-gsmSCFAbstractSyntax}
    APPLICATION CONTEXT NAME    id-ac-CAP-gprsSSF-gsmSCF-AC}

cap3-gsmscf-gprsssfAC APPLICATION-CONTEXT ::= {
    CONTRACT                    cap3GsmScfToGprsSsf
    DIALOGUE MODE               structured
    ABSTRACT SYNTAXES           {dialogue-abstract-syntax |
                                gsmSCF-gprsSSFAbstractSyntax}
    APPLICATION CONTEXT NAME    id-ac-CAP-gsmSCF-gprsSSF-AC}


-- Contracts

cap3GprsSsfToScf CONTRACT ::= {
-- dialogue initiated by gprsSSF with InitialDPGPRS, ApplyChargingReportGPRS,
-- EntityReleaseGPRS and EventReportGPRS Operations
    INITIATOR CONSUMER OF       {gprsScfActivationPackage {cAPSpecificBoundSet} |
                                gprsEventHandlingPackage {cAPSpecificBoundSet} |
                                gprsChargingPackage |
                                gprsExceptionInformationPackage {cAPSpecificBoundSet}}
    RESPONDER CONSUMER OF       {gprsConnectPackage {cAPSpecificBoundSet} |
                                gprsProcessingPackage |
                                gprsReleasePackage {cAPSpecificBoundSet} |
                                gprsEventHandlingPackage {cAPSpecificBoundSet} |
                                gprsTimerPackage |
                                gprsBillingPackage {cAPSpecificBoundSet} |
                                gprsChargingPackage |
                                gprsCancelPackage |
                                gprsChargeAdvicePackage {cAPSpecificBoundSet}}
    ID                          id-cap3GprsSsfTogsmScf}

cap3GsmScfToGprsSsf CONTRACT ::= {
-- dialogue initiated by gsmSCF with ApplyCharginGPRS, ActivityTestGPRS,
-- CancelGPRS, FurnishChargingInformationGPRS, ReleaseGPRS,
-- RequestReportGPRSEvent and SendChargingInformationGPRS Operations
    INITIATOR CONSUMER OF       {gprsReleasePackage {cAPSpecificBoundSet} |
                                gprsEventHandlingPackage {cAPSpecificBoundSet} |
                                gprsBillingPackage {cAPSpecificBoundSet} |
                                gprsChargingPackage |
                                gprsActivityTestPackage |
                                gprsCancelPackage |
                                gprsChargeAdvicePackage {cAPSpecificBoundSet}}
    ID                          id-cap3GsmScfToGprsSsf}


-- Operation Packages

gprsScfActivationPackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {initialDPGPRS {bound}}
    ID                  id-package-gprsScfActivation}

gprsConnectPackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {connectGPRS {bound}}
    ID                  id-package-gprsConnect}

gprsProcessingPackage OPERATION-PACKAGE ::= {
```

```
    CONSUMER INVOKES    {continueGPRS }
    ID                  id-package-gprsContinue}

gprsReleasePackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {releaseGPRS {bound}}
    ID                  id-package-gprsRelease}

gprsEventHandlingPackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {requestReportGPRSEvent {bound}}
    SUPPLIER INVOKES    {eventReportGPRS {bound}}
    ID                  id-package-gprsEventHandling}

gprsExceptionInformationPackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {entityReleasedGPRS {bound}}
    ID                  id-package-gprsExceptionInformation}

gprsTimerPackage OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {resetTimerGPRS }
    ID                  id-package-gprsTimer}

gprsBillingPackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {furnishChargingInformationGPRS {bound}}
    ID                  id-package-gprsBilling}

gprsChargingPackage {~~PARAMETERS-BOUND : bound}~~ OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {applyChargingGPRS~~ {bound}~~}
    SUPPLIER INVOKES    {applyChargingReportGPRS~~ {bound}~~}
    ID                  id-package-gprsCharging}

gprsChargeAdvicePackage {PARAMETERS-BOUND : bound} OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {sendChargingInformationGPRS {bound}}
    ID                  id-package-gprsChargeAdvice}

gprsActivityTestPackage OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {activityTestGPRS}
    ID                  id-package-gprsActivityTest}

gprsCancelPackage OPERATION-PACKAGE ::= {
    CONSUMER INVOKES    {cancelGPRS }
    ID                  id-package-gprsCancel}


-- Abstract Syntaxes

gprsSSF-gsmSCFAbstractSyntax ABSTRACT-SYNTAX ::= {
    GenericGprsSSF-gsmSCF-PDUs
    IDENTIFIED BY   id-as-gprsSSF-gsmSCF-AS}

GenericGprsSSF-gsmSCF-PDUs ::= TCMessage {{GprsSsfToGsmScfInvokable},
    {GprsSsfToGsmScfReturnable}}

GprsSsfToGsmScfInvokable OPERATION ::= {
    activityTestGPRS |
    applyChargingGPRS |
    applyChargingReportGPRS |
    cancelGPRS |
    connectGPRS {cAPSpecificBoundSet} |
    entityReleasedGPRS {cAPSpecificBoundSet} |
    eventReportGPRS {cAPSpecificBoundSet} |
    furnishChargingInformationGPRS {cAPSpecificBoundSet} |
    initialDPGPRS {cAPSpecificBoundSet} |
    releaseGPRS {cAPSpecificBoundSet} |
    requestReportGPRSEvent {cAPSpecificBoundSet} |
    resetTimerGPRS |
    sendChargingInformationGPRS {cAPSpecificBoundSet}}

GprsSsfToGsmScfReturnable OPERATION ::= {
    activityTestGPRS |
    applyChargingGPRS |
    applyChargingReportGPRS |
    cancelGPRS |
    connectGPRS {cAPSpecificBoundSet} |
    continueGPRS |
    entityReleasedGPRS {cAPSpecificBoundSet} |
    furnishChargingInformationGPRS {cAPSpecificBoundSet} |
    initialDPGPRS {cAPSpecificBoundSet} |
    releaseGPRS {cAPSpecificBoundSet} |
    requestReportGPRSEvent {cAPSpecificBoundSet} |
```

```
    resetTimerGPRS |
    sendChargingInformationGPRS {cAPSpecificBoundSet}}

gsmSCF-gprsSSF~~Generic~~AbstractSyntax ABSTRACT-SYNTAX ::= {
    GenericGsmSCF-gprsSSF-PDUs
    IDENTIFIED BY   id-as-gsmSCF-gprsSSF-AS}

GenericGsmSCF-gprsSSF-PDUs ::= TCMessage {{GsmScfToGprsSsfInvokable}, {GsmScfToGprsSsfReturnable}}

GsmScfToGprsSsfInvokable OPERATION ::= {
    activityTestGPRS |
    applyChargingGPRS |
    cancelGPRS |
    furnishChargingInformationGPRS {cAPSpecificBoundSet} |
    releaseGPRS {cAPSpecificBoundSet} |
    requestReportGPRSEvent {cAPSpecificBoundSet} |
    sendChargingInformationGPRS {cAPSpecificBoundSet}}

GsmScfToGprsSsfReturnable OPERATION ::= {
    activityTestGPRS |
    applyChargingGPRS |
    cancelGPRS |
    furnishChargingInformationGPRS {cAPSpecificBoundSet} |
    releaseGPRS {cAPSpecificBoundSet} |
    requestReportGPRSEvent {cAPSpecificBoundSet} |
    sendChargingInformationGPRS {cAPSpecificBoundSet}}

END
```

3GPP TSG CN WG2 Meeting #25 ***N2-020671***
Helsinki, Finland, 29th July – 2nd August 2002

CR-Form-v7

CHANGE REQUEST

⌘ **23.078** **CR** **421** ⌘ **rev** **-** ⌘ Current version: 5.0.0 ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Correction of clause 4.3.3 N-CSI
Source:	⌘	Alcatel
Work item code:	⌘	CAMEL4
Date:	⌘	16/07/02
Category:	⌘	**F**
Release:	⌘	REL-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)

Reason for change:	⌘	Wrong chapter title for N-CSI
Summary of change:	⌘	Clause 4.3.3 is titled as "Network Service CAMEL subscription information (N-CSI)" instead of "Network CAMEL service information (N-CSI) as 22.078 do. For N-CSI no subscription is needed in the HLR as in case of D-CSI. To associate N-CSI with the word "subscription" may lead to missunderstanding for service designers. See also chapter 3.1 Definitions: **Network CAMEL Service Information (N-CSI):** N-CSI identifies services offered on a per-network basis by the serving PLMN operator for all subscribers
Consequences if not approved:	⌘	Possible missunderstanding of the N-CSI and HLR subscription

Clauses affected:	⌘	Clause 4.3.3

	Y	N		
Other specs affected: ⌘		X	Other core specifications	⌘
		X	Test specifications	
		X	O&M Specifications	

Other comments: ⌘

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm.
Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

modification

4.3.3 Network ~~Service~~ CAMEL Service ~~Subscription~~ Information (N-CSI)

The N-CSI identifies services offered on a per-network basis by the serving PLMN operator for all subscribers. This CSI shall be stored in MSC.

modification end

3GPP TSG CN WG2 Meeting #25 ***N2-020675***
Helsinki, Suomi-Finland 29th-2th August 2002

CR-Form-v7

CHANGE REQUEST

⌘ **23.078** **CR** 422 ⌘ **rev** **-** ⌘ Current version: **5.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Inconsistency for the negotiated Camel capability handling of the D-CSI
Source:	⌘	Alcatel
Work item code:	⌘	Camel phase4
Date:	⌘	16/07/02
Category:	⌘	**F**
Release:	⌘	REL-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The Camel capability handling of the D-CSI can be set to Camel phase 4
Summary of change:	⌘	The handling of a D-CSI at DP3 may occur after the handling of a O-CSI at DP2. In case the O-CSI is phase 4 it is preferable to have a phase 4 D-CSI and doing so to remain in a phase 4 logic.
Consequences if not approved:	⌘	Complex logic in SSF

Clauses affected:	⌘	

	Y	N			
Other specs affected:	X		Other core specifications	⌘	Rel-5 23.008-CR057
		X	Test specifications		
		X	O&M Specifications		

Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be

downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

modification

4.3.2 Dialled Service CAMEL Subscription Information (D-CSI)

This subclause defines the contents of the Dialled Service CAMEL Subscription Information.

4.3.2.1 DP criteria

The DP criteria indicate whether the gsmSSF shall request instructions from the gsmSCF.

4.3.2.2 gsmSCF address

The gsmSCF address indicates the address to be used to access the gsmSCF for a particular subscriber. The address shall be an E.164 number to be used for routeing. A gsmSCF address shall be associated with each DP criterion.

4.3.2.3 Service Key

The Service Key identifies to the gsmSCF the service logic to be used. A Service Key shall be associated with each DP criteria.

4.3.2.4 Default Call Handling

The Default Call Handling indicates whether the call shall be released or continued as requested if there is an error in the gsmSSF to gsmSCF dialogue or if the call is submitted to call gapping in the gsmSSF. A default call handling shall be associated with each DP criteria.

4.3.2.5 CAMEL Capability Handling

CAMEL Capability Handling indicates the phase of CAMEL which is requested by the gsmSCF for the service. ~~It shall indicate CAMEL phase 3.~~

NOTE: If CAMEL is not supported or if a lower phase of CAMEL is supported in the VLR, the HLR can decide on a subscriber basis to apply ODB, perform normal call handling or perform operator specific handling (eventually support of a lower version of CSI).

4.3.2.6 CSI state

The CSI state indicates whether the D-CSI is active or not.

4.3.2.7 Notification flag

The notification flag indicates whether changes of the D-CSI shall trigger the Notification on Change of Subscriber Data.

modification end

3GPP TSG CN WG2 Meeting #25 ***N2-020678***
Helsinki, Finland, 29th July – 2nd August 2002

CR-Form-v7

CHANGE REQUEST

⌘ **29.078** **CR** 264 ⌘ **rev** - ⌘ Current version: 5.0.0 ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Editorial correction of 29.078-CANCELgprs
Source:	⌘	Alcatel
Work item code:	⌘	CAMEL phase4
Date:	⌘	16/07/02
Category:	⌘	**D**
Release:	⌘	REL-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)

Reason for change:	⌘	Update of the gprsSSF postcondition of the gprsSSF after a CANCELgprs operation..
Summary of change:	⌘	The same sentence is replicated 2 times. This CR proposed to delete one sentence.
Consequences if not approved:	⌘	Possible missunderstanding of CANCELGprs handling

Clauses affected:	⌘	Paragraf 13.04

	Y	N		
Other specs affected: ⌘		X	Other core specifications	⌘
		X	Test specifications	
		X	O&M Specifications	

Other comments: ⌘

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

modification

13.4 CancelGPRS procedure

13.4.1 General description

The gsmSCF uses this operation to request the gprsSSF to disarm all pending EDPs and to cancel all pending reports for a GPRS Session or for a specific PDP Context. This enables the gprsSSF FSM to transit to the state "Idle".
This procedure can not be used to cancel a previous operation.

13.4.1.1 Parameters

- pDPID:
  This parameter, identifies the PDP Context, within the GPRS Session dialogue, for which the armed EDPs shall be disarmed and the pending reports shall be cancelled.

13.4.2 Responding entity (gprsSSF)

13.4.2.1 Normal procedure

gprsSSF preconditions:

(1) The gprsSSF FSM is in the state "Waiting_for_Instructions" or in the state "Monitoring".

gprsSSF postconditions:

(1) All pending ApplyChargingReportGPRS are cancelled and all pending EDPs are disarmed. If a PDPID is included in the operation, then the cancelling of the pending reports and the disarming of the armed events applies to the indicated PDP Cont~~y~~ext only.

(2) If the gprsSSF FSM was in the state "Monitoring" and there are no more armed EDPs or pending ApplyChargingReportsGPRS~~reports~~, then the gprsSSF FSM shall transit to the state "Idle". ~~If the gprsSSF FSM was in the state "Monitoring" it shall transit to the state "Idle" if there are no other PDP Contexts pending; or~~

If the gprsSSF FSM was in the state "Waiting_for_Instructions", it shall remain in that state. If there are no more armed EDPs or pending ApplyChargingReportsGPRS ~~reports~~, then ~~s~~ subsequent GPRS Session or PDP Context processing operation will result in the gprsSSF FSM to transit the state "Idle".

The GPRS Session or PDP Context to which the CancelGPRS operation applies, if in active state, shall further be treated by the gprsSSF autonomously as a normal (non-CAMEL) GPRS Session or PDP Context.

13.4.2.2 Error handling

Generic error handling for the operation related errors is described in clause 10 and the TC services which are used for reporting operation errors are described in clause 14.

modification end

3GPP TSG CN WG2 Meeting #25 **N2-020741**
Helsinki, Finland, 29th July – 2nd August 2002

CR-Form-v7

CHANGE REQUEST

⌘ **29.078** **CR** **270** ⌘ **rev** **1** ⌘ Current version: **5.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network **X**

Title:	⌘	ERB when VT call is reported in DP T_Busy due to Call Deflection
Source:	⌘	Siemens AG
Work item code:	⌘	CAMEL4
Date:	⌘	30/07/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)

Reason for change:	⌘	When VT call meets Call Deflection, it is reported as DP T_Busy, if armed, as call forward. The information elements "Cause" could indicate this reason. In the case of CF, the cause IE may be one of the release cause listed in the table 4.1. However for the Call Deflection, it is not mentioned. The lack of description would not be able to make the gsmSCF know the proper forwarding reason.
Summary of change:	⌘	Add "call deflection" to the explanation of the BusyCause parameter, which will be treated as call forward.
Consequences if not approved:	⌘	The MSC would not be able to inform the gsmSCF of this event due to the call deflection. The service logic would not be able to distinguish the difference between CF and CD in T_Busy, hence lead to malfunction.

Clauses affected:	⌘	11.19

Other specs affected: ⌘	Y	N		⌘
		X	Other core specifications	
		X	Test specifications	
		X	O&M Specifications	

Other comments: ⌘

11.19 EventReportBCSM procedure

11.19.1 General description

The gsmSSF uses this operation to notify the gsmSCF of a call related event previously requested by the gsmSCF in a "RequestReportBCSMEvent" operation.

11.19.1.1 Parameters

- eventTypeBCSM:
  This parameter specifies the type of event that is reported.

- eventSpecificInformationBCSM:
  This parameter indicates the call related information specific to the event.

  For Route_Select_Failure it shall contain the "FailureCause", if available.

  For O_Busy it shall contain the "BusyCause", if available.

  - If the busy event is triggered by an ISUP release message, then the BusyCause is a copy of the ISUP release cause, for example: Subscriber absent, 20 or User busy, 17.

  - If the busy event is trigerred by a MAP error, for example: Absent subscriber, received from the HLR, then the MAP cause is mapped to the corresponding ISUP release cause.

NOTE 1: If no BusyCause is received, then the gsmSCF shall assume busy.

  For T_Busy it may contain the following parameters, if available.

  - CallForwarded:
    This parameter indicates that the busy event is triggered by call forwarding at the GMSC or VMSC.

  - ForwardingDestinationNumber:
    This parameter indicates the forwarding destination.

  - RouteNotPermitted:
    This parameter indicates that the busy event is triggered because call forwarding was not invoked in this GMSC due to the rules of Basic Optimal Routeing.

  - BusyCause:

    - If the busy event is triggered by an ISUP release message, then the BusyCause is a copy of the ISUP release cause, for example: Subscriber absent, 20 or User busy, 17.

    - If the busy event is triggered by a MAP error, for example: Absent subscriber, received from the HLR, then the MAP cause is mapped to the corresponding ISUP release cause.

    - If the busy event is triggered by call forwarding or call deflection invocation in the GMSC or VMSC, then the BusyCause will refer to the ~~type of the call forwarding service~~release cause in accordance with the mapping table in 3GPP TS 23.078 [7].

NOTE 2: If no BusyCause is received, then the gsmSCF shall assume busy.

    - If the busy event is triggered by call forwarding at the GMSC, then the BusyCause reflects the forwarding reason (Subscriber Absent, 20 or User busy, 17). The eventSpecificInformationBCSM shall in that case also contain the CallForwarded indication.

  For O_No_Answer it shall be empty.

For T_No_Answer it may contain the CallForwarded indication and the ForwardingDestinationNumber.

- If the No_Answer event is triggered by an ISUP release message or expiry of the CAMEL timer TNRy, then the eventSpecificInformationBCSM shall be empty.

- If the No_Answer event is triggered by call forwarding at the GMSC or VMSC, then the eventSpecificInformationBCSM shall contain the CallForwarded indication and the ForwardingDestinationNumber.

For O_Answer or T_Answer it shall contain the following information, if available:

- The destination address for the call;

- The OR indicator, in the case that the call was subject to Basic Optimal Routeing, as specified in 3GPP TS 23.079 [8];

- The forwarding indicator, in the case that the Call Forwarding Supplementary Service was invoked.

For O_Mid_Call and T_Mid_Call it shall contain the detected digit string, in accordance with the criterion defined in the RequestReportBCSMEvent operation.

For Call_Accepted, O_Term_Seized, O_Change_Of_Position and T_Change_Of_Position it shall contain the following information:

- locationInformation:
  This parameter indicates the location of the MS.

For O_Disconnect and T_Disconnect it shall contain the "releaseCause", if available.

For O_Abandon" it may contain the following parameter, if available.

- routeNotPermitted:
  This parameter indicates that the O-Abondon event is triggered because call set up shall not be invoked in this MSC due to the rules of Basic Optimal Routeing.

- legID:
  This parameters indicates the party in the call for which the event is reported. The gsmSSF shall use the option "receivingSideID" only.

- receivingSideID:
  If not included, then the following defaults are assumed:

  "legID" = 1 for the events O_Abandon and T_Abandon,

  "legID" = 2 for the events Route_Select_Failure, O_Busy, O_No_Answer, O_Answer, T_Busy, O_Term_Seized, Call_Accepted, T_No_Answer and T_Answer.

The "legID" parameter shall always be included for the events O_Disconnect and T_Disconnect.

- miscCallInfo:
  This parameter indicates Detection Point (DP) related information.

- messageType:
  This parameter indicates whether the message is a request, i.e. resulting from a "RequestReportBCSMEvent" with monitorMode = interrupted, or a notification, i.e. resulting from a "RequestReportBCSMEvent" with "monitorMode" = "notifyAndContinue".

3GPP TSG CN WG2 Meeting #25 ***N2-020747***
Helsinki, Finland, 29th July – 2nd August 2002

CR-Form-v7

CHANGE REQUEST

⌘ **23.078** **CR** **446** ⌘ **rev** **1** ⌘ Current version: **5.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Secondary PDP context for DP change of position context
Source:	⌘	Siemens AG
Work item code:	⌘	CAMEL4
Date:	⌘	30/07/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)

Reason for change:	⌘	In Initial DP GPRS, Secondary PDP context IE is sent if this IF is initiated due to the secondary PDP context activation. Although this IF is also sent in the case of the inter SGSN routeing area update at DP Change of Position Context, the new SGSN is not able to distinguish a primary and a secondary PDP contexts.
Summary of change:	⌘	Add a short discription that this IE is not sent at DP Change of Position context.
Consequences if not approved:	⌘	No impact on the technical issue. However, it implies to the readers that the new SGSN sends this IE included in the Initial DP IF in the case of the inter SGSN routeing area update.

Clauses affected:	⌘	6.6.1.5 (Initial DP GPRS)

Other specs affected: ⌘	Y	N	
		X	Other core specifications
		X	Test specifications
		X	O&M Specifications

⌘

Other comments:	⌘	This CR does not change the functionality but clarifies the existing description.

6.6.1.5 Initial DP GPRS

6.6.1.5.1 Description

This IF is generated by the gprsSSF when a trigger is detected at a DP in the GPRS state models, to request instructions from the gsmSCF.

6.6.1.5.2 Information Elements

Information element name	Status	Description
Gprs Reference Number	M	This IE consists of a number assigned by the gprsSSF. It is used for TCAP dialogue segmentation. Refer to 3GPP TS 29.078 [33] for the usage of this element.
ServiceKey	M	This IE indicates to the gsmSCF the requested CAMEL Service. It is used to address the required application/SLP within the gsmSCF.
GPRS Event Type	M	This IE indicates the armed GPRS DP event resulting in the Initial DP IF.
MSISDN	M	This IE contains the basic MSISDN of the MS.
IMSI	M	This IE identifies the mobile subscriber.
Time and Time zone	M	This IE contains the time that the gprsSSF was triggered, and the time zone in which the gprsSSF resides.
GPRS MS Class	C	This IE contains the MS network and radio access capabilities.
End User Address	C	This IE is described in a table below.
Quality of Service	C	This IE is described in a table below.
Access Point Name	C	This IE identifies the Access Point Name: - At DP Change Of Position Context contains the selected APN. - AT DP PDP Context Establishment contains the APN which the MS has requested. - AT DP PDP Context Establishment Acknowledgement contains the selected APN.
Charging ID	C	This IE contains the Charging ID received from the GGSN for the PDP context.
SGSN Capabilities	C	This IE specifies the capabilities of the SGSN to support the CAMEL interworking, e.g. support of Advice of Charge.
Location Information in SGSN	M	This IE is described in subclause 7.6.1.2.2.
PDP Initiation Type	C	This IE indicates whether a PDP context was established as a result of a network-initiated request or as a result of a subscriber request.
GGSN Address	C	This IE contains the GGSN address for control plane to which the MS is connected, see 3GPP TS 23.003 [7].
Secondary PDP context	C	This IE indicates that the PDP context activation was requested for a secondary PDP context. See 3GPP TS 23.060 [15]. This IE is not sent if this IF is initiated at DP Change of Position Context.
IMEI (with software version)	C	This IE contains the IMEISV (as defined in 3GPP TS 23.003 [7]) of the ME in use by the served subscriber.

Quality of Service contains the following information elements:

Information element name	Status	Description
Requested QoS	C	This IE identifies the QoS requested by the subscriber for a new PDP Context. It shall be included if the InitialDPGPRS is sent at PDP Context Establishment, at PDP Context Establishment Acknowledgement and at Change of Position Context.
Subscribed QoS	C	This IE identifies the subscribed QoS. It shall be included if the InitialDPGPRS is sent at PDP Context Establishment, at PDP Context Establishment Acknowledgement and at Change of Position Context.
Negotiated QoS	C	This IE identifies the QoS which was negotiated between the user, the SGSN and the GGSN. It shall be included if the Initial DP GPRS is sent at PDP Context Establishment Acknowledgement and at Change of Position Context.

End User Address shall be populated as follows:

- At DP Change Of Position Context in an Inter-SGSN Routeing Area Update: Initial DP GPRS and EventReportGPRS contain the selected value;
- At DP PDP Context Establishment: Initial DP GPRS and Event Report GPRS contain the value which the MS has requested;
- At DP PDP Context Establishment Acknowledgement: Initial DP GPRS and Event Report GPRS contain the selected value. Note that the PDP Address is not always available at this DP.

For details see 3GPP TS 23.060 [15].

End User Address contains the following information elements:

Information element name	Status	Description
PDP Type Organization	C	This IE identifies the PDP Type Organisation (e.g. IETF).
PDP Type Number	C	This IE identifies the PDP type, e.g. IPv4 or IPv6.
PDP Address	C	This IE identifies the address of the subscriber for a new PDP Context.

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Helsinki, Finland, 29th July – 2nd August 2002

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CHANGE REQUEST

⌘ **29.078** **CR** **257** ⌘ **rev** **1** ⌘ Current version: **5.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	TC-U-Abort before the TC dialogue is established
Source:	⌘	Nokia
Work item code:	⌘	CAMEL 4
Date:	⌘	01/08/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)

Reason for change:	⌘	The incorrect TC behavior in InitialDP- InitialDPSMS- and InitialDPGPRS Error Handling.
Summary of change:	⌘	The abandon cases before the TC dialogue is established are clarified for CS, PS and SMS dialogues and related notes are removed due the conflict with the clause 14 definitions.
Consequences if not approved:	⌘	The incorrect TC behavior may affect confusion during CAMEL 4 implementation.

Clauses affected:	⌘	11.21.2.2, 12.5.2.2 and 13.10.2.2

	Y	N		
Other specs affected: ⌘		X	Other core specifications	⌘
		X	Test specifications	
		X	O&M Specifications	

Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

*** Information ***

Extract from 29.078 v5.0.0

14.1.1.2 Abnormal procedures

…

The following rules shall be applied to terminate the TC dialogue under abnormal situations:

- in the case that abort condition is detected and TC dialogue is established, TC dialogue is terminated by TC-U-ABORT primitive with an Abort reason.
- in the case that abort condition is detected and TC dialogue is not established, TC dialogue is locally terminated by TC-U-ABORT primitive. (in the case such as application time out).

In error situations prearranged end shall not be used to terminate the TC dialogue. In the case any AE encounters an error situation the peer entity shall be explicitly notified of the error, if possible. If from any entity's point of view the error encountered requires the relationship to be ended, then it shall close the dialogue via a TC-END request primitive with basic end or via a TC-U-ABORT request primitive, depending on whether any pending ERROR or REJECT component is to be sent or not.

In the case an entity receives a TC-END indication primitive and after all components have been considered, the FSM is not in a state to terminate the relationship, an appropriate internal error should be provided.

In cases when a dialogue needs to be closed by the initiating entity before its establishment has been completed (before the first TC indication primitive to the TC-BEGIN request primitive has been received from the responding entity), the TC-user shall issue a TC-END request primitive with prearranged end or a TC-U-ABORT request primitive. The result of these primitives will be only local, any subsequent TC indication received for this dialogue will be handled in accordance with the abnormal procedures as specified in ETSI ETS 300 287-1 [22]).

*** First Modification ***

11.21.2.2 Error handling

If the gsmSCF is not accessible, then the call proceeds in accordance with the Default Call Handling parameter in the CSI.

When Tssf expires, then the gsmSSF shall abort the interaction with the gsmSCF by means of an abort to TC and shall call continue the call in accordance with the Default Call Handling parameter in the valid CSI.

If the calling party abandons after the sending of "InitialDP" and before the TC dialogue is established, then the gsmSSF shall abort the -interaction with the gsmSCF by means of an abort to TC.

~~NOTE TC will wait until the first response message from the gsmSCF has been received before it sends an abort to the gsmSCF (see also clause 14).~~

Generic error handling for the operation related errors are described in clause 10 and the TC services which are used for reporting operation errors are described in clause 14.

*** Next Modification ***

12.5.2.2 Error handling

If the gsmSCF is not accessible, then the smsSSF instructs the MSC or SGSN to proceed with the Short Message processing in accordance with the Default SMS Handling parameter of the MO-SMS-CSI or MT-SMS-CSI.

If Tssf expires, then the smsSSF aborts the interaction with the gsmSCF by means of an abort to TC and shall instruct the MSC or SGSN to proceed with the Short Message processing in accordance with the Default SMS Handling parameter of the MO-SMS-CSI CSI or MT-SMS-CSI.

For an MO-SMS Service, if the sending mobile party abandons after the sending of InitialDPSMS and before the TC dialogue is established, then the smsSSF shall abort the interaction with the gsmSCF by means of an abort to TC.

~~NOTE TC will wait until the first response message from the gsmSCF has been received before it sends an abort to the gsmSCF (see also clause 14).~~

Generic error handling for the operation related errors is described in clause 10 and the TC services which are used for reporting operation errors are described in clause 14.

****** Next Modification ******

13.10.2.2 Error handling

If the gsmSCF is not accessible, then the gprsSSF instructs the SGSN to handle the GPRS Session or PDP Context in accordance with the Default GPRS Handling parameter of the valid CSI.

If Tssf expires, then the gprsSSF shall abort the interaction with the gsmSCF by means of an abort to TC and shall instruct the SGSN to handle the GPRS Session or PDP Context in accordance with the Default GPRS Handling parameter of the valid CSI.

If the MS abandons the establishment of a GPRS Session or PDP Context after the sending of InitialDPGPRS and before the TC dialogue is established, then the gprsSSF shall abort the interaction with the gsmSCF by means of an abort to TC.

~~NOTE TC will wait until the first response message from the gsmSCF has been received before it sends an abort to the gsmSCF (see also clause 14).~~

Generic error handling for the operation related errors is described in clause 10 and the TC services which are used for reporting operation errors are described in clause 14.

****** End of Document ******

3GPP TSG CN WG2 Meeting #25 **N2-020793**
Helsinki, Finland, 29th July – 2nd August 2002

CR-Form-v7

CHANGE REQUEST

⌘ **23.078** **CR** **447** ⌘ **rev** **2** ⌘ Current version: **5.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Detail description for applicability of call cases
Source:	⌘	Siemens AG
Work item code:	⌘	CAMEL4
Date:	⌘	02/08/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
Rel-4 *(Release 4)*
Rel-5 *(Release 5)*
Rel-6 *(Release 6)*

Reason for change:	⌘	Call cases in the information element table is not clearly stated. Example: which call case, MO, MF or VT column is applicable when an incoming call at the MSC, or MT call at the GMSC, is due to CAMEL call forwarding and this FTN is modified by the gsmSCF then the FTN matches one of the criteria in D-CSI?
Summary of change:	⌘	This CR improves the description to which column shall apply in terms of the V/GMSC and the CSI. For the MF case, if the dialogue between the gsmSSF and the gsmSCF due to the D-CSI or N-CSI is invoked after the call forwarding procedure, the information elements in the MF column shall apply.
Consequences if not approved:	⌘	Unclear specifiction. Various interpretation would be possible.

Clauses affected:	⌘	4.6, 5.5, 6.6, 7.6, 8.4, 9.4, 10.3, 11.3

Other specs affected:	⌘	Y	N		⌘	
		☐	☐	Other core specifications		
		☐	☐	Test specifications		
		☐	☐	O&M Specifications		

Other comments:	⌘	This CR also improves the description on each traffic case (7), applicable entity (9), otherwise IEs are marked in the "Status" column.

****** First modified part ******

4.6 Description of information flows

This clause contains the detailed description of the information flows used by CAMEL for Circuit Switched call control.

Each Information Element (IE) is marked as Mandatory (M), Conditional (C), Specific conditions (S), mutually Exclusive (E), Optional (O) or not applicable (-) for each different traffic case applicable to the following CSI:

- MO Mobile Originating call in the VMSC (O-CSI, D-CSI or N-CSI dialogue) ~~(MO);~~,
- MF Mobile Forwarded call in the VMSC or the GMSC as in figure 4.7 (O-CSI, D-CSI or N-CSI dialogue)~~(MF);~~,
- MT Mobile Terminating call in the GMSC (T-CSI dialogue) ~~(MT);~~,
- VT Mobile Terminating call in the VMSC (VT-CSI dialogue) ~~(VT);~~,
- NC gsmSCF initiated new call ~~(NC) and~~ ;
- NP gsmSCF initiated new party in an existing call ~~(NP)~~.

If the IEs in one table apply in all the possible cases listed above or no distinction is needed, then the IEs are marked in the "Status" column.

An 'M' IE shall always be included for the corresponding traffic case. A 'C' IE shall be included if the sending entity has the necessary information to populate the IE. The conditions for the inclusion of an 'S' IE are shown in the 'Description' column of the definition table. When a set of 'E' IEs is shown in the definition of an Information Flow or compound IE, only one of those IEs may be included. An 'O' IE may be included or omitted as required by the service logic. A '-' IE shall always be omitted for the corresponding traffic case. This categorization is a functional classification, i.e. it defines the requirements for the stage 2 information. it is not a stage 3 classification to be used for the ASN.1 syntax of the protocol.

The distinction between MO, MF, MT, VT, NC and NP calls is not applicable to all Information Flows.

The following principles apply for the handling of the IEs by the receiving entity:

- The gsmSSF shall functionally support all IEs which can be sent to it.
- The gsmSCF may silently discard any IE which it does not functionally support.
- The gsmSRF shall return an error if it does not functionally support an IE which it receives.
- The HLR may silently discard any IE which it does not functionally support.

Details of errors and exceptions to these rules are specified in are specified in 3GPP TS 29.078 [33].

****** Next modified part ******

5.5 Description of information flows

This subclause contains the detailed description of the information flows used by CAMEL for USSD handling.

Each Information Element (IE) is marked as Mandatory (M), Conditional (C), Specific conditions (S) or Optional (O) in the "Status" column.

An 'M' IE shall always be included. A 'C' IE shall be included if the sending entity has the necessary information to populate the IE. The conditions for the inclusion of an 'S' IE are shown in the 'Description' column of the definition table. An 'O' IE may be included or omitted as required by the service logic. This categorization is a functional

classification, i.e. it defines the requirements for the stage 2 information. It is not a stage 3 classification to be used for the ASN.1 syntax of the protocol.

The following principles apply for the handling of the IEs by the receiving entity:

- The gsmSCF may silently discard any IE which it does not functionally support.
- The HLR shall return an error if it does not functionally support an IE which it receives.

Details of errors and exceptions to these rules are specified in are specified in 3GPP TS 29.002 [32].

****** Next modified part ******

6.6 Description of information flows

This subclause contains the detailed description of the information flows used by CAMEL for GPRS control.

Each Information Element (IE) is marked as Mandatory (M), Conditional (C), Specific conditions (S) or Optional (O) in the "Status" column.

An 'M' IE shall always be included. A 'C' IE shall be included if the sending entity has the necessary information to populate the IE. The conditions for the inclusion of an 'S' IE are shown in the 'Description' column of the definition table. An 'O' IE may be included or omitted as required by the service logic. This categorization is a functional classification, i.e. it defines the requirements for the stage 2 information. It is not a stage 3 classification to be used for the ASN.1 syntax of the protocol.

Details of errors and exceptions to these rules are specified in 3GPP TS 29.002 [32] and TS 29.078 [33].

****** Next modified part ******

7.6 Description of information flows

This subclause contains the detailed description of the information flows used by CAMEL for SMS control.

Each Information Element (IE) is marked as Mandatory (M), Conditional (C), Optional (O), Specific conditions (S), mutually Exclusive (E), or not applicable (-) for each different traffic case: Mobile Originating SMS (MO) and Mobile Terminating SMS (MT). If the IEs in one table apply in both the MO and MT cases, then the IEs are marked in the "Status" column.

An 'M' IE shall always be included. A 'C' IE shall be included if the sending entity has the necessary information to populate the IE. The conditions for the inclusion of an 'S' IE are shown in the 'Description' column of the definition table. When a set of 'E' IEs is shown in the definition of an Information Flow or compound IE, only one of those IEs may be included. An 'O' IE may be included or omitted as required by the service logic. A '-' IE shall always be omitted. This categorization is a functional classification, i.e. it defines the requirements for the stage 2 information. It is not a stage 3 classification to be used for the ASN.1 syntax of the protocol.

The distinction between MO and MT SMS applies only to the Information Flows between the gsmSCF and the gsmSSF or gprsSSF.

Details of errors and exceptions to these rules are specified in 3GPP TS 29.002 [32], TS 29.078 [33].

****** Next modified part ******

8.4 Description of information flows

This subclause contains the detailed description of the information flows used by CAMEL for notification of Supplementary Service invocation.

Each Information Element (IE) is marked as Mandatory (M), Specific conditions (S) or Optional (O) in the "Status" column.

An 'M' IE shall always be included. The conditions for the inclusion of an 'S' IE are shown in the 'Description' column of the definition table. An 'O' IE may be included or omitted as required by the service logic. This categorization is a functional classification, i.e. it defines the requirements for the stage 2 information. It is not a stage 3 classification to be used for the ASN.1 syntax of the protocol.

The following principles apply for the handling of the IEs by the receiving entity:

- The gsmSCF may silently discard any IE which it does not functionally support.

Details of errors and exceptions to these rules are specified in are specified in 3GPP TS 29.002 [32].

****** Next modified part ******

9.4 Description of information flows

This subclause contains the detailed description of the information flows used by CAMEL for Mobility Management control.

Each Information Element (IE) is marked as Mandatory (M), Conditional (C), Specific conditions (S), mutually Exclusive (E), Optional (O) or not applicable (-) for each different entity involved: VLR (VLR) and SGSN (SGSN) where distinction is applicable. If the IEs in one table apply in both VLR and SGSN, then the IEs are marked in the "Status" column.

An 'M' IE shall always be included. A 'C' IE shall be included if the sending entity has the necessary information to populate the IE. The conditions for the inclusion of an 'S' IE are shown in the 'Description' column of the definition table. When a set of 'E' IEs is shown in the definition of an Information Flow or compound IE, only one of those IEs may be included. An 'O' IE may be included or omitted as required by the service logic. A '-' IE shall always be omitted. This categorization is a functional classification, i.e. it defines the requirements for the stage 2 information. It is not a stage 3 classification to be used for the ASN.1 syntax of the protocol.

The following principles apply for the handling of the IEs by the receiving entity:

- The gsmSCF may silently discard any IE which it does not functionally support;
- The VLR shall functionally support all IEs which can be sent to it;
- The SGSN shall functionally support all IEs which can be sent to it.

****** Next modified part ******

10.3 Description of information flows

This subclause contains the detailed description of the information flows used by CAMEL for control and interrogation of subscription data.

Each Information Element (IE) is marked as Mandatory (M), Conditional (C), Specific conditions (S), mutually Exclusive (E) or Optional (O) in the "Status" column.

An 'M' IE shall always be included. A 'C' IE shall be included if the sending entity has the necessary information to populate the IE. The conditions for the inclusion of an 'S' IE are shown in the 'Description' column of the definition table. An 'O' IE may be included or omitted as required by the service logic. This categorization is a functional

classification, i.e. it defines the requirements for the stage 2 information. It is not a stage 3 classification to be used for the ASN.1 syntax of the protocol.

The following principles apply for the handling of the IEs by the receiving entity:

- The gsmSCF may silently discard any IE which it does not functionally support.
- The HLR shall return an error if it does not functionally support an IE which it receives.

Details of errors and exceptions to these rules are specified in 3GPP TS 29.002 [32].

****** Next modified part ******

11.3 Description of information flows

This subclause contains the detailed description of the information flows used by CAMEL for the retrieval of information about the location and state of a subscriber.

Each Information Element (IE) is marked as Mandatory (M), Conditional (C), Specific conditions (S), mutually Exclusive (E) or not applicable (-) in the "Status" column.

An 'M' IE shall always be included. A 'C' IE shall be included if the sending entity has the necessary information to populate the IE. The conditions for the inclusion of an 'S' IE are shown in the 'Description' column of the definition table. When a set of 'E' IEs is shown in the definition of an Information Flow or compound IE, only one of those IEs may be included. A '-' IE shall always be omitted. This categorization is a functional classification, i.e. it defines the requirements for the stage 2 information. It is not a stage 3 classification to be used for the ASN.1 syntax of the protocol.

The following principles apply for the handling of the IEs by the receiving entity:

- The gsmSCF may silently discard any IE which it does not functionally support.
- The GMLC shall return an error if it does not functionally support an IE which it receives.

Details of errors and exceptions to these rules are specified in 3GPP TS 29.002 [32].

****** End of document ******