3GPP TSG CN Plenary Meeting #12
Stockholm, Sweden, 13th - 15th June 2001

Tdoc NP- 010314

Source: TSG CN WG2

Title: CRs on R99 and Rel-4 Work Item "CAMEL3

Agenda item: 7.2

Document for: APPROVAL

Introduction:

This document contains 4 CRs on R99 and Rel-4 Work Item "CAMEL3", that have been agreed by TSG CN WG2, and are forwarded to TSG CN Plenary meeting #12 for approval.

Spec	CR	Rev	Doc-2nd-Level	Phase	Subject	Cat	Ver_C
23.078	304	1	N2-010472	R99	Indication of gsmSCF Address in Continue GPRS and Connect GPRS IFs	F	3.8.0
23.078	305		N2-010473	Rel-4	Indication of gsmSCF Address in Continue GPRS and Connect GPRS IFs	A	4.0.0
29.078	183	1	N2-010474	R99	Indication of gsmSCF Address in Continue GPRS and Connect GPRS IFs	F	3.7.0
29.078	184		N2-010475	Rel-4	Indication of gsmSCF Address in Continue GPRS and Connect GPRS IFs	A	4.0.0

CR-Form-v3

CHANGE REQUEST

⌘ **23.078** CR **304** ⌘ rev **1** ⌘ Current version: **3.8.0** ⌘

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

Proposed change affects: ⌘   (U)SIM ☐   ME/UE ☐   Radio Access Network ☐   Core Network ☐

Title: ⌘	Indication of gsmSCF Address in Continue GPRS and Connect GPRS IFs
Source: ⌘	CN2
Work item code: ⌘	CAMEL3
Date: ⌘	18 May 2001
Category: ⌘	**F** (essential correction)
Release: ⌘	R99

Use <u>one</u> 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 <u>one</u> 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)

Reason for change: ⌘	29.078 specifies that the gprsSSF shall memorise the gsmSCF address that is returned by the gsmSCF. The gprsSSF needs this address for the possible follow-up TC dialogues comprising a common GPRS dialogue. However the gsmSCF itself does not return this address. Neither the TC interface itself does provide this address to its TC user.
Summary of change: ⌘	It is proposed to include the required information in the Continue GPRS and Connect GPRS IFs.
Consequences if not approved: ⌘	The usage of SCP loadsharing is not possible if the standard TC user interface is used internally in the SGSN.

Clauses affected: ⌘	6.6.2.5 Connect GPRS, 6.6.2.6 Continue GPRS
Other specs affected: ⌘	☐ Other core specifications ⌘ 29.078 CR 183
	☐ Test specifications
	☐ O&M Specifications
Other comments: ⌘	

— **First modified section** —

6.6.2 gsmSCF to gprsSSF Information Flows

...

6.6.2.5 Connect GPRS

6.6.2.5.1 Description

This IF is used by the gsmSCF to request the gprsSSF to modify the APN used when establishing a PDP Context. This IF shall not be used for a secondary PDP context or for a network initiated PDP context.

6.6.2.5.2 Information Elements

The following information elements are required:

Information element name	Required	Description
Access Point Name	M	This IE contains the Access Point Name (APN) to be used when establishing the PDP Context. The gsmSCF should provide an APN which is allowed by the served subscriber's subscription. The APN provided by the gsmSCF is used for selecting the primary PDP context as specified in 3GPP TS 23.060 [11]. The gsmSCF provided APN may consist of Network Identity (NI) only, or Network Identity and Operator Identity (OI). The APN provided by the gsmSCF replaces entirely the APN requested by the MS. If the gsmSCF does not provide OI in APN then the SGSN selects the OI independent of MS.
PDP Id	C	This IE identifies the PDP Context where the new Access Point Name shall be used. If not present the dialogue corresponds to one single PDP context.
gsmSCF Address	C1	This IE is the E.164 address of the gsmSCF involved in the GPRS dialogue.

M Mandatory (The IE shall always be sent).

C Conditional

C1 Conditional (This IE shall be sent if the Connect GPRS IF is sent in response to an Initial DP GPRS IF. Otherwise it shall be absent.)

6.6.2.6 Continue GPRS

6.6.2.6.1 Description

This information flow requests the gprsSSF to proceed with processing at the DP at which it previously suspended processing to await gsmSCF instructions. The gprsSSF completes DP processing, and continues processing (i.e., proceeds to the next point in the Attach/Detach State Model or PDP Context State Model) without substituting new data from the gsmSCF.

6.6.2.6.2 Information Elements

The following information element is required:

Information element name	Required	Description
PDP ID	C	This IE identifies the PDP context which processing shall continue for. If not present the dialogue corresponds to the GPRS session or to one single PDP context.
gsmSCF Address	C1	This IE is the E.164 address of the gsmSCF involved in the GPRS dialogue.

C Conditional (The IE shall be sent, if available).

C1 Conditional (This IE shall be sent if the Continue GPRS IF is sent in response to an Initial DP GPRS IF. Otherwise it shall be absent.).

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CR-Form-v3

CHANGE REQUEST

⌘ **23.078** CR **305** ⌘ rev ⌘ Current version: **4.0.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network ☐

Title:	⌘	Indication of gsmSCF Address in Continue GPRS and Connect GPRS IFs
Source:	⌘	CN2

Work item code:	⌘	CAMEL3	***Date:*** ⌘	18 May 2001

Category:	⌘	**A**	***Release:*** ⌘	Rel-4

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)

Reason for change:	⌘	29.078 specifies that the gprsSSF shall memorise the gsmSCF address that is returned by the gsmSCF. The gprsSSF needs this address for the possible follow-up TC dialogues comprising a common GPRS dialogue. However the gsmSCF itself does not return this address. Neither the TC interface itself does provide this address to its TC user.
Summary of change:	⌘	It is proposed to include the required information in the Continue GPRS and Connect GPRS IFs.
Consequences if not approved:	⌘	The usage of SCP loadsharing is not possible if the standard TC user interface is used internally in the SGSN.

Clauses affected:	⌘	6.6.2.5 Connect GPRS, 6.6.2.6 Continue GPRS

Other specs affected:	⌘	☐ Other core specifications	⌘	29.078 CR 184
		☐ Test specifications		
		☐ O&M Specifications		

Other comments:	⌘	

— **First modified section** —

6.6.2   gsmSCF to gprsSSF Information Flows

...

6.6.2.5   Connect GPRS

6.6.2.5.1   Description

This IF is used by the gsmSCF to request the gprsSSF to modify the APN used when establishing a PDP Context. This IF shall not be used for a secondary PDP context or for a network initiated PDP context.

6.6.2.5.2   Information Elements

The following information elements are required:

Information element name	Required	Description
Access Point Name	M	This IE contains the Access Point Name (APN) to be used when establishing the PDP Context. The gsmSCF should provide an APN which is allowed by the served subscriber's subscription. The APN provided by the gsmSCF is used for selecting the primary PDP context as specified in 3GPP TS 23.060 [11]. The gsmSCF provided APN may consist of Network Identity (NI) only, or Network Identity and Operator Identity (OI). The APN provided by the gsmSCF replaces entirely the APN requested by the MS. If the gsmSCF does not provide OI in APN then the SGSN selects the OI independent of MS.
PDP Id	C	This IE identifies the PDP Context where the new Access Point Name shall be used. If not present the dialogue corresponds to one single PDP context.
gsmSCF Address	C1	This IE is the E.164 address of the gsmSCF involved in the GPRS dialogue.

M   Mandatory (The IE shall always be sent).

C   Conditional

C1 Conditional (This IE shall be sent if the Connect GPRS IF is sent in response to an Initial DP GPRS IF. Otherwise it shall be absent.)

6.6.2.6   Continue GPRS

6.6.2.6.1   Description

This information flow requests the gprsSSF to proceed with processing at the DP at which it previously suspended processing to await gsmSCF instructions. The gprsSSF completes DP processing, and continues processing (i.e., proceeds to the next point in the Attach/Detach State Model or PDP Context State Model) without substituting new data from the gsmSCF.

6.6.2.6.2   Information Elements

The following information element is required:

Information element name	Required	Description
PDP ID	C	This IE identifies the PDP context which processing shall continue for. If not present the dialogue corresponds to the GPRS session or to one single PDP context.
gsmSCF Address	C1	This IE is the E.164 address of the gsmSCF involved in the GPRS dialogue.

C   Conditional (The IE shall be sent, if available).

C1 Conditional (This IE shall be sent if the Continue GPRS IF is sent in response to an Initial DP GPRS IF. Otherwise it shall be absent.).

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CR-Form-v3

CHANGE REQUEST

29.078 CR 183		rev	**1**	Current version:	**3.7.0**	

Proposed change affects: (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network ☒

Title:	Indication of gsmSCF Address in Continue GPRS and Connect GPRS IFs
Source:	CN2
Work item code:	CAMEL3
Date:	18 May 2001
Category:	**F** (essential correction)
Release:	R99

Use <u>one</u> 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 <u>one</u> 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)

Reason for change:	29.078 specifies that the gprsSSF shall memorise the gsmSCF address that is returned by the gsmSCF. The gprsSSF needs this address for the possible follow-up TC dialogues comprising a common GPRS dialogue. However the gsmSCF itself does not return this address. Neither the TC interface itself does provide this address to its TC user.
Summary of change:	It is proposed to include the required information in the ContinueGPRS and ConnectGPRS operations
Consequences if not approved:	The usage of SCP loadsharing is not possible if the standard TC user interface is used internally in the SGSN.

Clauses affected:	8.1, 11.14, 11.18, 11.31, 12.1.7.1.3

Other specs affected:	☒ Other core specifications	3G TS 23.078 CR 304
	☐ Test specifications	
	☐ O&M Specifications	

Other comments:	

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— First modified section —
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8.1   gsmSCF/gprsSSF operations and arguments

```
CAP-gprsSSF-gsmSCF-ops-args {ccitt(0) identified-organization(4) etsi(0) mobileDomain(0)
umts-network(1) modules(3) cap-GPRS-ops-args(107) version3(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 section 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 {ccitt(0) identified-organization(4) etsi(0) mobileDomain(0)
umts-network(1) modules(3) cap-object-identifiers(100) version3(2)}

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

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

    MiscCallInfo
FROM CS2-datatypes {ccitt(0) identified-organization(4) etsi(0) inDomain(1) in-network(1)
cS2(20) modules(0) in-cs2-datatypes (0) version1(0)}

    IMSI,
    ISDN-AddressString
FROM MAP-CommonDataTypes {ccitt(0) identified-organization(4) etsi(0) mobileDomain(0)
gsm-Network(1) modules(3) map-CommonDataTypes(18) version6(6)}

    GSN-Address
FROM MAP-MS-DataTypes {ccitt(0) identified-organization(4) etsi(0) mobileDomain(0)
gsm-network(1) modules(3) map-MS-DataTypes(11) version6(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,
    FCIGPRSBillingChargingCharacteristics,
    GPRSChargingID,
    GPRSEventSpecificInformation {},
    GPRSEvent,
    GPRSEventType,
    GPRSMSClass,
    LocationInformationGPRS,
    PDPID,
    EndUserAddress,
    QualityOfService,
    RAIdentity,
    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: T_atg
-- 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 T_acg
-- This operation is used for interacting from the gsmSCF with the gprsSSF CSE-controlled
-- GPRS session or PDP Context charging mechanism.

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

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

ApplyChargingReportGPRSArg              ::= SEQUENCE {
    chargingResult                  [0] ChargingResult,
    qualityOfService                [1] QualityOfService        OPTIONAL,
    active                          [2] BOOLEAN                 DEFAULT TRUE,
    pDPID                           [3] PDPID                   OPTIONAL,
    ...
    }

cancelGPRS                              OPERATION ::= {
    ARGUMENT        CancelGPRSArg
    RETURN RESULT   FALSE
    ERRORS          {missingParameter |
                    taskRefused |
                    unknownPDPID}
    CODE            opcode-cancelGPRS
    }
-- Direction: gsmSCF -> gprsSSF, Timer: T_cag
-- 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: T_cong
-- 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,
    ...,
    gsmSCF-Address              [2] ISDN-AddressString        OPTIONAL
    }

continueGPRS                        OPERATION ::= {
    ARGUMENT        ContinueGPRSArg
    RETURN RESULT   FALSE
    ERRORS          {missingParameter |
                    unknownPDPID |
                    unexpectedDataValue}
    CODE            opcode-continueGPRS
    }
-- Direction: gsmSCF -> gprsSSF, Timer: T_cueg
-- 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,
    ...,
    gsmSCF-Address              [1] ISDN-AddressString        OPTIONAL
    }
```

— **Next modified section** —

11.14   ConnectGPRS procedure

11.14.1 General description

This operation is used to request the gprsSSF to modify the APN used when establishing a PDP context.

11.14.1.1 Parameters

- accessPointName:
   This parameter contains the Access Point Name (see 3GPP TS 29.060 [43]) towards which the PDP context shall be established. The encoding of this parameter is defined in 3GPP TS 24.008 [12].

- pDPID:
   This parameter identifies the PDP context for which the modified Access Point Name shall be used.

- gsmSCF-Address:
   This parameter contains the Global Title of the gsmSCF. For encoding see 3GPP TS 29.002 [13]. The gprsSSF shall use this address to initiate subsequent TC dialogues within the same GPRS dialogue.

11.14.2 Responding entity (gprsSSF)

11.14.2.1 Normal procedure

gprsSSF preconditions:

(1) A control relationship exists between the gprsSSF and the gsmSCF.

(2) The GPRS PDP context FSM idenntified by the PDPID is supsended at DP PDP_Context_Establishment.

(3) The gprsSSF is in state "Waiting for Instructions".

gprsSSF postcondition:

(1) The gprsSSF performs the actions to establish the PDP context identified by PDPID using the given Access Point Name.

(2) the gprsSSF cancels T_{SSF};

(3) if no EDPs are armed, the gprsSSF transits to state "Idle". Otherwise the gprsSSF transits to state "Monitoring".

No implicit activation or deactivation of DPs occurs.

11.14.2.2 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 12.

— Next modified section —

11.18 ContinueGPRS procedure

11.18.1 General description

This operation is used to request the gprsSSF to proceed with GPRS session or PDP context processing at the DP at which it previously suspended processing to await gsmSCF instructions. The gprsSSF continues processing without substituting new data from the gsmSCF.

11.18.1.1 Parameters

- pDPID:
  This parameter if present identifies the PDP context within the control relationship for which the processing shall continue.

- gsmSCF-Address:
  This parameter contains the Global Title of the gsmSCF. For encoding see 3GPP TS 29.002 [13]. The gprsSSF shall use this address to initiate subsequent TC dialogues within the same GPRS dialogue.

11.18.2 Responding entity (gprsSSF)

11.18.2.1 Normal procedure

gprsSSF precondition:

(1) GPRS session or PDP context processing has been suspended at any DP.

(2) gprsSSF is in state "Waiting for Instructions".

gsmSSF postcondition:

(1) GPRS session or PDP context processing continues.

(2) gprsSSF is in one of the following states:

- State "Monitoring" because at least one EDP was armed or an ApplyChargingReportGPRS was requested; or

- State "Idle" because no EDPs were armed and no ApplyChargingReportGPRS was requested.

The gprsSSF is in state "Waiting for instructions". The gprsSSF transits to state "Idle" in case no EDPs are armed and no outstanding report requests are present. The gprsSSF transits to state "Monitoring" if at least one EDP is armed, or if there is at least one outstanding ApplyChargingReportGPRS request. GPRS session or PDP context processing is resumed.

11.18.2.2 Error handling

Operation related error handling is not applicable, due to class 4 operation.

— **Next modified section** —

11.31 InitialDPGPRS procedure

11.31.1 General description

This operation is used by the gprsSSF after detection of a TDP-R in the GPRS session or PDP context state machine, to request the gsmSCF for instructions to complete the GPRS session or PDP context.

For a GPRS Session, the 'Attach' and 'Change of Position Session' TDP's may result in the InitialDPGPRS Procedure.

For a PDP Context, the 'PDP Context Establishment', the 'PDP Context Establishment Acknowledgement' and the 'Change of Position Context' TDP's may result in the InitialDPGPRS Procedure.

If a PDP Context related TDP is met, and there is at that moment a GPRS dialogue for the GPRS Session, then the gprsSSF shall not initiate the InitialDPGPRS Procedure for that PDP Context.

If the 'PDP Context Establishment Acknowledgement' event occurs and this event is armed as a TDP, and there is at that moment a GPRS dialogue for the PDP Context, then the gprsSSF shall not initiate a new InitialDPGPRS Procedure for that PDP Context.

11.31.1.1 Parameters

- serviceKey:
  This parameter indicates to the gsmSCF the requested IN service. It is used to address the required application/SLP within the gsmSCF (not for SCP addressing).

- gPRSEventType:
  This parameter indicates the armed GPRS Attach/Detach SM or PDP Context SM DP event, resulting in the InitialDPGPRS operation.

- mSISDN:
  MSISDN of the mobile subscriber for which the CAMEL service is invoked. For encoding see 3GPP TS 29.002 [13].

- iMSI:
  IMSI of the mobile subscriber for which the CAMEL service is invoked. For encoding see 3GPP TS 29.002 [13].

- timeAndTimezone:
  This parameter contains the time that the gprsSSF was triggered, and the time zone that the invoking gprsSSF resides in.

- gPRSMSClass:
  This parameter contains the MS Station capabilites of the mobile subscriber for which the CAMEL service is invoked.

  - MSNetworkCapabilities:
    This parameter contains the Network Capabilities of the GPRS session.

  - MSRadioAccessCapabilities:
    This parameter contains the Radio Access Capabilities of the MS.

- endUserAddress:
  This parameter identifies the PDP type, PDP type organisation and the actual PDP address. For encoding see 3GPP TS 29.060 [43].

- qualityOfService:
  This parameter contains the Quality of Service.
  If the InitialDPGPRS operation is sent as a result of the 'PDP Context Establishment' TDP, then the Quality of Service parameter shall contain the Requested QoS and the Subscribed QoS.
  If the InitialDPGPRS operation is sent as a result of the 'PDP Context Establishment Ackonwledgement' TDP, then the Quality of Service parameter shall contain the Requested QoS, the Subscribed QoS and the Negotiated QoS.

- accessPointName:
  This parameter contains the requested address that the MS for which the CAMEL service is invoked for wants to connect to. For encoding see 3GPP TS 29.060 [43].

- routeingAreaIdentity:
  This parameter contains the location information of the MS for which the CAMEL service is invoked from. For encoding see 3GPP TS 29.060 [43].

- chargingID:
  This parameter contains the charging ID that uniquely identifies together with the gGSNAddress the PDP context for the MS for which the CAMEL service is invoked from. For encoding see 3GPP TS 32.015.

- sGSNcapabilities:
  This parameter specifies the capabilities which the SGSN node can provide for the CAMEL service control.

- locationInformationInSGSN:
  This parameter indicates the location of the sending MS.

- pDPInitiationType:
  This parameter indicates whether a PDP context was established as a result of a network-initiated request or as a result of a subscriber request.

- gGSNAddress:
  This parameter refers to the IP address of the GGSN where the PDP context terminates. It is used together with the chargingID for uniquely identification of the PDP context for which the CAMEL service is invoked from. For encoding see 3GPP TS 23.003.

- secondaryPDP-context
  This parameter indicates that the PDP context is requested as a secondary PDP context.

11.31.2 Invoking entity (gprsSSF)

11.31.2.1 Normal procedure

gprsSSF preconditions:

(1) An event has been met that is armed as TDP.

(2) There is no GPRS dialogue active for that PDP Context or for the GPRS Session.

gprsSSF postcondition:

(1) A control relationship has been established and the gprsSSF is in state "waiting for instructions".

The address of the gsmSCF that the InitialDPGPRS operation shall be sent to is fetched from the valid CSI. The gprsSSF provides all available parameters.

A control relationship is established with the gsmSCF. The gprsSSF application timer T_{SSF} is set when the gprsSSF sends InitialDPGPRS for requesting instructions from the gsmSCF. It is used to prevent from excessive GPRS session or PDP context duration or volume usage.

11.31.2.2 Error handling

If the destination gsmSCF is not accessible then the gprsSSF instructs the SGSN to handle the GPRS session or PDP context according to the Default GPRS handling parameter of the valid CSI.

On expiration of T_{SSF} before receiving any operation, the gprsSSF aborts the interaction with the gsmSCF and instructs the SGSN to handle the call according to 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 InitialGPRSEvent, then the gprsSSF aborts the control relationship after the first response from the gsmSCF has been received.

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 12.

— Next modified section —

12.1.7 gprsSSF-gsmSCF interface

...

12.1.7.1.3 gprsSSF-to-gsmSCF messages

This subclause defines the normal procedures for TC messages from the gprsSSF to the gsmSCF.

gprsSSF-FSM related messages

A GPRS dialogue and a TC dialogue shall be established when the gprsSSF moves from the state Idle to the state Waiting for Instructions. The InitialDPGPRS operation shall be transmitted in the same TC message, i.e. TC-BEGIN. It shall contain the GPRS-Reference as assigned by the SGSN in the originationReference. The gprsSSF may intiate the subsequent TC dialogues for this GPRS dialogue with the following operations:

- ApplyChargingReportGPRS

- EntityReleasedGPRS

- EventReportGPRS

The gsmSCF shall memorise the gprsSSF address received along with the InitialDPGPRS, and use it in the further TC dialogues for the relationship between these processes.

The gsmSCF may open subsequent TC dialogues with the following CAP operations:

- ActivityTestGPRS;

- ApplyChargingGPRS;

- CancelGPRS;

- FurnishChargingInformationGPRS;

- ReleaseGPRS;

- RequestReportGPRSEvent;

- SendChargingInformationGPRS.

The CAP operation that opens a TC dialogue shall be sent with a TC-BEGIN request primitive. This message shall contain the GPRS-ReferenceNumber assigned by the sender of this message in the originationReference. If the operation opens a subsequent TC dialogue this message shall contain also the previously received destinationReference. If an operation opens a GPRS dialogue then the TC message reply shall contain the originationReference as assigned by the sender, i.e. the gsmSCF.

The TC dialogue shall be closed for the idle periods, i.e. when the gprsSSF moves from the Waiting for Instructions state to the Idle state, if the gprsSSF is in the Monitoring state and has received all replies or time-outs for the operations sent, after standalone operations of the SCF in Monitoring state if gprsSSF is not going to the Idle state (ActivityTestGPRS, ApplyChargingGPRS, CancelGPRS, FurnishChargingInformationGPRS, RequestReportGPRSEvent, SendChargingInformationGPRS), or at the end of a GPRS dialogue.
Each TC dialogue shall be terminated by the gprsSSF using TC-END (basic end). The following operations can cause the end of the GPRS dialogue:

- ContinueGPRS;

- ConnectGPRS;

- ApplyChargingReportGPRS result;

- EntityReleasedGPRS rersult;

- EventReportGPRS (EDP-N) result;

- CancelGPRS;

- ReleaseGPRS;

- RequestReportGPRSEvent (disarming of DPs).

When the gprsSSF makes a non-error case state transition to the state Idle and there is one or more pending operation and TC dialogue is established, TC dialogue may be terminated by TC-END primitive with zero component(s) after all pending operations have been sent. When the gsmSSF sends the last EventReportGPRS or ApplyChargingReportGPRS the GPRS dialogue may be ended from the gprsSSF by a TC-END request primitive with basic end.

In the case that there is no pending operation, result nor error, and TC dialogue is established, TC dialogue shall be terminated by TC-END primitive with zero component.

In the case where a PDP context release or detach is initiated by any other entity than an gsmSCF, the gprsSSF shall end a GPRS dialogue with the EntityReleasedGPRS operation if the gprsSSF has no armed DP to report nor pending ApplyChargingReportGPRS which should reported.

In the case of overlapping dialogues for the same GPRS dialogue the gsmSCF opened TC dialogue is aborted by the gprsSSF with the abort reason overlapping-dialogue as specified in clause 5.7. This abort reason is used to indicate to the gsmSCF that a specific instance already has a TC dialogue open. It is typically obtained when both the gsmSCF and gprsSSF open a new dialogue at the same time. While the gprsSSF waits for a response to an operation sent in TC-BEGIN it may receive an operation from the gsmSCF in TC-BEGIN. In such cases the dialogue opened by the gprsSSF is maintained and the dialogue opened by the gsmSCF is aborted with this abort reason.

SSME-FSM related messages

The following procedures shall be followed:

- The dialogue shall be ended with basic end when the ActivityTestGPRS Return Result is sent.

**** End of Document ****

CR-Form-v3

CHANGE REQUEST

	29.078 CR **184**	rev	**-**	Current version:	4.0.0

Proposed change affects: (U)SIM ☐   ME/UE ☐   Radio Access Network ☐   Core Network ☒

Title:	Indication of gsmSCF Address in Continue GPRS and Connect GPRS IFs
Source:	CN2
Work item code:	CAMEL3	*Date:*	18 May 2001
Category:	**A**	*Release:*	Rel-4

Use <u>one</u> 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 <u>one</u> 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)

Reason for change:	29.078 specifies that the gprsSSF shall memorise the gsmSCF address that is returned by the gsmSCF. The gprsSSF needs this address for the possible follow-up TC dialogues comprising a common GPRS dialogue. However the gsmSCF itself does not return this address. Neither the TC interface itself does provide this address to its TC user.
Summary of change:	It is proposed to include the required information in the ContinueGPRS and ConnectGPRS operations
Consequences if not approved:	The usage of SCP loadsharing is not possible if the standard TC user interface is used internally in the SGSN.

Clauses affected:	8.1, 11.14, 11.18, 11.31, 12.1.7.1.3

Other specs affected:	☒ Other core specifications	3G TS 23.078 CR 305
	☐ Test specifications	
	☐ O&M Specifications	
Other comments:		

— First modified section —

8.1 gsmSCF/gprsSSF operations and arguments

```
CAP-gprsSSF-gsmSCF-ops-args {ccitt(0) identified-organization(4) etsi(0) mobileDomain(0)
umts-network(1) modules(3) cap-GPRS-ops-args(107) version3(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 section 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 {ccitt(0) identified-organization(4) etsi(0) mobileDomain(0)
umts-network(1) modules(3) cap-object-identifiers(100) version3(2)}

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

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

    MiscCallInfo
FROM CS2-datatypes {ccitt(0) identified-organization(4) etsi(0) inDomain(1) in-network(1)
cS2(20) modules(0) in-cs2-datatypes (0) version1(0)}

    IMSI,
    ISDN-AddressString
FROM MAP-CommonDataTypes {ccitt(0) identified-organization(4) etsi(0) mobileDomain(0)
gsm-Network(1) modules(3) map-CommonDataTypes(18) version6(6)}

    GSN-Address
FROM MAP-MS-DataTypes {ccitt(0) identified-organization(4) etsi(0) mobileDomain(0)
gsm-network(1) modules(3) map-MS-DataTypes(11) version6(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,
    FCIGPRSBillingChargingCharacteristics,
    GPRSChargingID,
    GPRSEventSpecificInformation {},
    GPRSEvent,
    GPRSEventType,
    GPRSMSClass,
    LocationInformationGPRS,
    PDPID,
    EndUserAddress,
    QualityOfService,
    RAIdentity,
    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: T_{atg}
```
-- 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 T_{acg}
```
-- This operation is used for interacting from the gsmSCF with the gprsSSF CSE-controlled
-- GPRS session or PDP Context charging mechanism.

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

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

ApplyChargingReportGPRSArg              ::= SEQUENCE {
    chargingResult                  [0] ChargingResult,
    qualityOfService                [1] QualityOfService           OPTIONAL,
    active                          [2] BOOLEAN                    DEFAULT TRUE,
    pDPID                           [3] PDPID                      OPTIONAL,
    ...
    }

cancelGPRS                              OPERATION ::= {
    ARGUMENT        CancelGPRSArg
    RETURN RESULT   FALSE
    ERRORS          {missingParameter |
                    taskRefused |
                    unknownPDPID}
    CODE            opcode-cancelGPRS
    }
```
-- Direction: gsmSCF -> gprsSSF, Timer: T_{cag}
```
-- 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: T_cong
-- 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,
    ...,
    gsmSCF-Address             [2] ISDN-AddressString       OPTIONAL
    }
continueGPRS                        OPERATION ::= {
    ARGUMENT        ContinueGPRSArg
    RETURN RESULT   FALSE
    ERRORS          {missingParameter |
                    unknownPDPID |
                    unexpectedDataValue}
    CODE            opcode-continueGPRS
    }
-- Direction: gsmSCF -> gprsSSF, Timer: T_cueg
-- 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,
    ...,
    gsmSCF-Address             [1] ISDN-AddressString       OPTIONAL
    }
```

— Next modified section —

11.14 ConnectGPRS procedure

11.14.1 General description

This operation is used to request the gprsSSF to modify the APN used when establishing a PDP context.

11.14.1.1 Parameters

- accessPointName:
  This parameter contains the Access Point Name (see 3GPP TS 29.060 [43]) towards which the PDP context shall be established. The encoding of this parameter is defined in 3GPP TS 24.008 [12].

- pDPID:
  This parameter identifies the PDP context for which the modified Access Point Name shall be used.

- gsmSCF-Address:
  This parameter contains the Global Title of the gsmSCF. For encoding see 3GPP TS 29.002 [13]. The gprsSSF shall use this address to initiate subsequent TC dialogues within the same GPRS dialogue.

11.14.2 Responding entity (gprsSSF)

11.14.2.1 Normal procedure

gprsSSF preconditions:

(1) A control relationship exists between the gprsSSF and the gsmSCF.

(2) The GPRS PDP context FSM idenntified by the PDPID is supsended at DP PDP_Context_Establishment.

(3) The gprsSSF is in state "Waiting for Instructions".

gprsSSF postcondition:

(1) The gprsSSF performs the actions to establish the PDP context identified by PDPID using the given Access Point Name.

(2) the gprsSSF cancels T_{SSF};

(3) if no EDPs are armed, the gprsSSF transits to state "Idle". Otherwise the gprsSSF transits to state "Monitoring".

No implicit activation or deactivation of DPs occurs.

11.14.2.2 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 12.

— **Next modified section** —

11.18 ContinueGPRS procedure

11.18.1 General description

This operation is used to request the gprsSSF to proceed with GPRS session or PDP context processing at the DP at which it previously suspended processing to await gsmSCF instructions. The gprsSSF continues processing without substituting new data from the gsmSCF.

11.18.1.1 Parameters

- pDPID:
  This parameter if present identifies the PDP context within the control relationship for which the processing shall continue.

- gsmSCF-Address:
  This parameter contains the Global Title of the gsmSCF. For encoding see 3GPP TS 29.002 [13]. The gprsSSF shall use this address to initiate subsequent TC dialogues within the same GPRS dialogue.

11.18.2 Responding entity (gprsSSF)

11.18.2.1 Normal procedure

gprsSSF precondition:

(1) GPRS session or PDP context processing has been suspended at any DP.

(2) gprsSSF is in state "Waiting for Instructions".

gsmSSF postcondition:

(1) GPRS session or PDP context processing continues.

(2) gprsSSF is in one of the following states:

- State "Monitoring" because at least one EDP was armed or an ApplyChargingReportGPRS was requested; or

- State "Idle" because no EDPs were armed and no ApplyChargingReportGPRS was requested.

The gprsSSF is in state "Waiting for instructions". The gprsSSF transits to state "Idle" in case no EDPs are armed and no outstanding report requests are present. The gprsSSF transits to state "Monitoring" if at least one EDP is armed, or if there is at least one outstanding ApplyChargingReportGPRS request. GPRS session or PDP context processing is resumed.

11.18.2.2 Error handling

Operation related error handling is not applicable, due to class 4 operation.

— **Next modified section** —

11.31 InitialDPGPRS procedure

11.31.1 General description

This operation is used by the gprsSSF after detection of a TDP-R in the GPRS session or PDP context state machine, to request the gsmSCF for instructions to complete the GPRS session or PDP context.

For a GPRS Session, the 'Attach' and 'Change of Position Session' TDP's may result in the InitialDPGPRS Procedure.

For a PDP Context, the 'PDP Context Establishment', the 'PDP Context Establishment Acknowledgement' and the 'Change of Position Context' TDP's may result in the InitialDPGPRS Procedure.

If a PDP Context related TDP is met, and there is at that moment a GPRS dialogue for the GPRS Session, then the gprsSSF shall not initiate the InitialDPGPRS Procedure for that PDP Context.

If the 'PDP Context Establishment Acknowledgement' event occurs and this event is armed as a TDP, and there is at that moment a GPRS dialogue for the PDP Context, then the gprsSSF shall not initiate a new InitialDPGPRS Procedure for that PDP Context.

11.31.1.1 Parameters

- serviceKey:
  This parameter indicates to the gsmSCF the requested IN service. It is used to address the required application/SLP within the gsmSCF (not for SCP addressing).

- gPRSEventType:
  This parameter indicates the armed GPRS Attach/Detach SM or PDP Context SM DP event, resulting in the InitialDPGPRS operation.

- mSISDN:
  MSISDN of the mobile subscriber for which the CAMEL service is invoked. For encoding see 3GPP TS 29.002 [13].

- iMSI:
  IMSI of the mobile subscriber for which the CAMEL service is invoked. For encoding see 3GPP TS 29.002 [13].

- timeAndTimezone:
  This parameter contains the time that the gprsSSF was triggered, and the time zone that the invoking gprsSSF resides in.

- gPRSMSClass:
  This parameter contains the MS Station capabilites of the mobile subscriber for which the CAMEL service is invoked.

  - MSNetworkCapabilities:
    This parameter contains the Network Capabilities of the GPRS session.

  - MSRadioAccessCapabilities:
    This parameter contains the Radio Access Capabilities of the MS.

- endUserAddress:
  This parameter identifies the PDP type, PDP type organisation and the actual PDP address. For encoding see 3GPP TS 29.060 [43].

- qualityOfService:
  This parameter contains the Quality of Service.
  If the InitialDPGPRS operation is sent as a result of the 'PDP Context Establishment' TDP, then the Quality of Service parameter shall contain the Requested QoS and the Subscribed QoS.
  If the InitialDPGPRS operation is sent as a result of the 'PDP Context Establishment Ackonwledgement' TDP, then the Quality of Service parameter shall contain the Requested QoS, the Subscribed QoS and the Negotiated QoS.

- accessPointName:
  This parameter contains the requested address that the MS for which the CAMEL service is invoked for wants to connect to. For encoding see 3GPP TS 29.060 [43].

- routeingAreaIdentity:
  This parameter contains the location information of the MS for which the CAMEL service is invoked from. For encoding see 3GPP TS 29.060 [43].

- chargingID:
  This parameter contains the charging ID that uniquely identifies together with the gGSNAddress the PDP context for the MS for which the CAMEL service is invoked from. For encoding see 3GPP TS 32.015.

- sGSNcapabilities:
  This parameter specifies the capabilities which the SGSN node can provide for the CAMEL service control.

- locationInformationInSGSN:
  This parameter indicates the location of the sending MS.

- pDPInitiationType:
  This parameter indicates whether a PDP context was established as a result of a network-initiated request or as a result of a subscriber request.

- gGSNAddress:
  This parameter refers to the IP address of the GGSN where the PDP context terminates. It is used together with the chargingID for uniquely identification of the PDP context for which the CAMEL service is invoked from. For encoding see 3GPP TS 23.003.

- secondaryPDP-context
  This parameter indicates that the PDP context is requested as a secondary PDP context.

11.31.2 Invoking entity (gprsSSF)

11.31.2.1 Normal procedure

gprsSSF preconditions:

   (1) An event has been met that is armed as TDP.

(2) There is no GPRS dialogue active for that PDP Context or for the GPRS Session.

gprsSSF postcondition:

(1) A control relationship has been established and the gprsSSF is in state "waiting for instructions".

The address of the gsmSCF that the InitialDPGPRS operation shall be sent to is fetched from the valid CSI. The gprsSSF provides all available parameters.

A control relationship is established with the gsmSCF. The gprsSSF application timer T_{SSF} is set when the gprsSSF sends InitialDPGPRS for requesting instructions from the gsmSCF. It is used to prevent from excessive GPRS session or PDP context duration or volume usage.

11.31.2.2 Error handling

If the destination gsmSCF is not accessible then the gprsSSF instructs the SGSN to handle the GPRS session or PDP context according to the Default GPRS handling parameter of the valid CSI.

On expiration of T_{SSF} before receiving any operation, the gprsSSF aborts the interaction with the gsmSCF and instructs the SGSN to handle the call according to 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 InitialGPRSEvent, then the gprsSSF aborts the control relationship after the first response from the gsmSCF has been received.

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 12.

— Next modified section —

12.1.7 gprsSSF-gsmSCF interface

...

12.1.7.1.3 gprsSSF-to-gsmSCF messages

This subclause defines the normal procedures for TC messages from the gprsSSF to the gsmSCF.

gprsSSF-FSM related messages

A GPRS dialogue and a TC dialogue shall be established when the gprsSSF moves from the state Idle to the state Waiting for Instructions. The InitialDPGPRS operation shall be transmitted in the same TC message, i.e. TC-BEGIN. It shall contain the GPRS-Reference as assigned by the SGSN in the originationReference. The gprsSSF may intiate the subsequent TC dialogues for this GPRS dialogue with the following operations:

- ApplyChargingReportGPRS

- EntityReleasedGPRS

- EventReportGPRS

The gsmSCF shall memorise the gprsSSF address received along with the InitialDPGPRS, and use it in the further TC dialogues for the relationship between these processes.

The gsmSCF may open subsequent TC dialogues with the following CAP operations:

- ActivityTestGPRS;

- ApplyChargingGPRS;

- CancelGPRS;

- FurnishChargingInformationGPRS;

- ReleaseGPRS;

- RequestReportGPRSEvent;

- SendChargingInformationGPRS.

The CAP operation that opens a TC dialogue shall be sent with a TC-BEGIN request primitive. This message shall contain the GPRS-ReferenceNumber assigned by the sender of this message in the originationReference. If the operation opens a subsequent TC dialogue this message shall contain also the previously received destinationReference. If an operation opens a GPRS dialogue then the TC message reply shall contain the originationReference as assigned by the sender, i.e. the gsmSCF.

The TC dialogue shall be closed for the idle periods, i.e. when the gprsSSF moves from the Waiting for Instructions state to the Idle state, if the gprsSSF is in the Monitoring state and has received all replies or time-outs for the operations sent, after standalone operations of the SCF in Monitoring state if gprsSSF is not going to the Idle state (ActivityTestGPRS, ApplyChargingGPRS, CancelGPRS, FurnishChargingInformationGPRS, RequestReportGPRSEvent, SendChargingInformationGPRS), or at the end of a GPRS dialogue.
Each TC dialogue shall be terminated by the gprsSSF using TC-END (basic end). The following operations can cause the end of the GPRS dialogue:

- ContinueGPRS;

- ConnectGPRS;

- ApplyChargingReportGPRS result;

- EntityReleasedGPRS rersult;

- EventReportGPRS (EDP-N) result;

- CancelGPRS;

- ReleaseGPRS;

- RequestReportGPRSEvent (disarming of DPs).

When the gprsSSF makes a non-error case state transition to the state Idle and there is one or more pending operation and TC dialogue is established, TC dialogue may be terminated by TC-END primitive with zero component(s) after all pending operations have been sent. When the gsmSSF sends the last EventReportGPRS or ApplyChargingReportGPRS the GPRS dialogue may be ended from the gprsSSF by a TC-END request primitive with basic end.

In the case that there is no pending operation, result nor error, and TC dialogue is established, TC dialogue shall be terminated by TC-END primitive with zero component.

In the case where a PDP context release or detach is initiated by any other entity than an gsmSCF, the gprsSSF shall end a GPRS dialogue with the EntityReleasedGPRS operation if the gprsSSF has no armed DP to report nor pending ApplyChargingReportGPRS which should reported.

In the case of overlapping dialogues for the same GPRS dialogue the gsmSCF opened TC dialogue is aborted by the gprsSSF with the abort reason overlapping-dialogue as specified in clause 5.7. This abort reason is used to indicate to the gsmSCF that a specific instance already has a TC dialogue open. It is typically obtained when both the gsmSCF and gprsSSF open a new dialogue at the same time. While the gprsSSF waits for a response to an operation sent in TC-BEGIN it may receive an operation from the gsmSCF in TC-BEGIN. In such cases the dialogue opened by the gprsSSF is maintained and the dialogue opened by the gsmSCF is aborted with this abort reason.

SSME-FSM related messages

The following procedures shall be followed:

- The dialogue shall be ended with basic end when the ActivityTestGPRS Return Result is sent.

**** End of Document ****