**3GPP TSG CN Plenary Meeting #19** **NP-030111**
**12th – 14th March 2003 Birmingham, UK.**

**Source:** TSG CN WG4

**Title:** Small technical Enhancements and Improvements on MAP Rel-6.

**Agenda item:** 9.10

**Document for:** APPROVAL

---

| Spec | CR | Rev | Doc-2nd-Level | Phase | Subject | Cat | Ver_C |
|---|---|---|---|---|---|---|---|
| 29.002 | 526 | | N4-030061 | Rel-6 | Incrementing ASN.1 module versions | F | 6.0.0 |

**3GPP TSG CN WG4 Meeting #18** **N4-030061**
**Dublin, EIRE, 10th – 14th February 2003**

CR-Form-v7

# CHANGE REQUEST

⌘ **29.002** **CR** **526** ⌘ **rev** **-** ⌘ Current version: **6.0.0** ⌘

*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:*** | ⌘ | Incrementing ASN.1 module versions |
| ***Source:*** | ⌘ | CN4 |
| ***Work item code:*** | ⌘ | TEI6 |
| ***Date:*** | ⌘ | 14/01/2003 |
| ***Category:*** | ⌘ | **F** |
| ***Release:*** | ⌘ | Rel-6 |

*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:*** | ⌘ | ASN.1 modules in 29.002 Rel-6 are different from those in 29.002 Rel-5. Therefore they must have different Object Identifiers |
| ***Summary of change:*** | ⌘ | Replace “version8 (8)” with “version9 (9)” wherever it occurs. |
| ***Consequences if not approved:*** | ⌘ | Different ASN.1 modules are identified by the same Object Identifier |

| | | | | | |
|---|---|---|---|---|---|
| ***Clauses affected:*** | ⌘ | 17 | | | |
| ***Other specs affected:*** | ⌘ | **Y** | **N** | | |
| | | | 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.

## 17.3.3 ASN.1 Module for application-context-names

The following ASN.1 module summarises the application-context-name assigned to MAP application-contexts.

```
MAP-ApplicationContexts {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-ApplicationContexts (2) ~~version8 (8)~~version9 (9)}

DEFINITIONS

::=

BEGIN


-- EXPORTS everything


IMPORTS
   gsm-NetworkId,
   ac-Id
FROM MobileDomainDefinitions {
   itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
   mobileDomainDefinitions (0) version1 (1)}
;

-- application-context-names

map-ac  OBJECT IDENTIFIER ::= {gsm-NetworkId ac-Id}

networkLocUpContext-v3  OBJECT IDENTIFIER ::=
     {map-ac networkLocUp(1) version3(3)}

locationCancellationContext-v3  OBJECT IDENTIFIER ::=
     {map-ac locationCancel(2) version3(3)}

roamingNumberEnquiryContext-v3  OBJECT IDENTIFIER ::=
     {map-ac roamingNbEnquiry(3) version3(3)}

authenticationFailureReportContext-v3  OBJECT IDENTIFIER ::=
     {map-ac authenticationFailureReport(39) version3(3)}

locationInfoRetrievalContext-v3  OBJECT IDENTIFIER ::=
     {map-ac locInfoRetrieval(5) version3(3)}

resetContext-v2  OBJECT IDENTIFIER ::=
     {map-ac reset(10) version2(2)}

handoverControlContext-v3  OBJECT IDENTIFIER ::=
     {map-ac handoverControl(11) version3(3)}

equipmentMngtContext-v2  OBJECT IDENTIFIER ::=
     {map-ac equipmentMngt(13) version2(2)}

infoRetrievalContext-v3  OBJECT IDENTIFIER ::=
     {map-ac infoRetrieval(14) version3(3)}

interVlrInfoRetrievalContext-v3  OBJECT IDENTIFIER ::=
     {map-ac interVlrInfoRetrieval(15) version3(3)}

subscriberDataMngtContext-v3  OBJECT IDENTIFIER ::=
     {map-ac subscriberDataMngt(16) version3(3)}

tracingContext-v3  OBJECT IDENTIFIER ::=
     {map-ac tracing(17) version3(3)}

networkFunctionalSsContext-v2  OBJECT IDENTIFIER ::=
     {map-ac networkFunctionalSs(18) version2(2)}

networkUnstructuredSsContext-v2  OBJECT IDENTIFIER ::=
     {map-ac networkUnstructuredSs(19) version2(2)}
```

```
shortMsgGatewayContext-v3  OBJECT IDENTIFIER ::=
     {map-ac shortMsgGateway(20) version3(3)}
```

```
shortMsgMO-RelayContext-v3  OBJECT IDENTIFIER ::=
     {map-ac shortMsgMO-Relay(21) version3(3)}
```

```
shortMsgAlertContext-v2  OBJECT IDENTIFIER ::=
     {map-ac shortMsgAlert(23) version2(2)}
```

```
mwdMngtContext-v3  OBJECT IDENTIFIER ::=
     {map-ac mwdMngt(24) version3(3)}
```

```
shortMsgMT-RelayContext-v3  OBJECT IDENTIFIER ::=
     {map-ac shortMsgMT-Relay(25) version3(3)}
```

```
imsiRetrievalContext-v2  OBJECT IDENTIFIER ::=
     {map-ac imsiRetrieval(26) version2(2)}
```

```
msPurgingContext-v3  OBJECT IDENTIFIER ::=
     {map-ac msPurging(27) version3(3)}
```

```
subscriberInfoEnquiryContext-v3  OBJECT IDENTIFIER ::=
     {map-ac subscriberInfoEnquiry(28) version3(3)}
```

```
anyTimeInfoEnquiryContext-v3  OBJECT IDENTIFIER ::=
     {map-ac anyTimeInfoEnquiry(29) version3(3)}
```

```
callControlTransferContext-v4  OBJECT IDENTIFIER ::=
     {map-ac callControlTransfer(6) version4(4)}
```

```
ss-InvocationNotificationContext-v3  OBJECT IDENTIFIER ::=
     {map-ac ss-InvocationNotification(36) version3(3)}
```

```
sIWFSAllocationContext-v3  OBJECT IDENTIFIER ::=
     {map-ac sIWFSAllocation(12) version3(3)}
```

```
groupCallControlContext-v3  OBJECT IDENTIFIER ::=
     {map-ac groupCallControl(31) version3(3)}
```

```
gprsLocationUpdateContext-v3  OBJECT IDENTIFIER ::=
     {map-ac gprsLocationUpdate(32) version3(3)}
```

```
gprsLocationInfoRetrievalContext-v4  OBJECT IDENTIFIER ::=
     {map-ac gprsLocationInfoRetrieval(33) version4(4)}
```

```
failureReportContext-v3  OBJECT IDENTIFIER ::=
     {map-ac failureReport(34) version3(3)}
```

```
gprsNotifyContext-v3  OBJECT IDENTIFIER ::=
     {map-ac gprsNotify(35) version3(3)}
```

```
reportingContext-v3  OBJECT IDENTIFIER ::=
     {map-ac reporting(7) version3(3)}
```

```
callCompletionContext-v3  OBJECT IDENTIFIER ::=
     {map-ac callCompletion(8) version3(3)}
```

```
istAlertingContext-v3  OBJECT IDENTIFIER ::=
     {map-ac istAlerting(4) version3(3)}
```

```
serviceTerminationContext-v3  OBJECT IDENTIFIER ::=
     {map-ac immediateTermination(9) version3(3)}
```

```
locationSvcGatewayContext-v3  OBJECT IDENTIFIER ::=
     {map-ac locationSvcGateway(37) version3(3)}
```

```
locationSvcEnquiryContext-v3  OBJECT IDENTIFIER ::=
     {map-ac locationSvcEnquiry(38) version3(3)}
```

```
mm-EventReportingContext-v3  OBJECT IDENTIFIER ::=
     {map-ac mm-EventReporting(42) version3(3)}
```

```
anyTimeInfoHandlingContext-v3  OBJECT IDENTIFIER ::=
     {map-ac anyTimeInfoHandling(43) version3(3)}
```

```
subscriberDataModificationNotificationContext-v3  OBJECT IDENTIFIER ::=
     {map-ac subscriberDataModificationNotification(22) version3(3)}
```

```
secureTransportHandlingContext-v3  OBJECT IDENTIFIER ::=
     {map-ac secureTransportHandling(40) version3(3)}
```

```
-- The following Object Identifiers are reserved for application-contexts
--  existing in previous versions of the protocol
```

| -- AC Name & Version | Object Identifier | |
|---|---|---|
| -- | | |
| -- networkLocUpContext-v1 | map-ac networkLocUp (1) | version1 (1) |
| -- networkLocUpContext-v2 | map-ac networkLocUp (1) | version2 (2) |
| -- locationCancellationContext-v1 | map-ac locationCancellation (2) | version1 (1) |
| -- locationCancellationContext-v2 | map-ac locationCancellation (2) | version2 (2) |
| -- roamingNumberEnquiryContext-v1 | map-ac roamingNumberEnquiry (3) | version1 (1) |
| -- roamingNumberEnquiryContext-v2 | map-ac roamingNumberEnquiry (3) | version2 (2) |
| -- locationInfoRetrievalContext-v1 | map-ac locationInfoRetrieval (5) | version1 (1) |
| -- locationInfoRetrievalContext-v2 | map-ac locationInfoRetrieval (5) | version2 (2) |
| -- resetContext-v1 | map-ac reset (10) | version1 (1) |
| -- handoverControlContext-v1 | map-ac handoverControl (11) | version1 (1) |
| -- handoverControlContext-v2 | map-ac handoverControl (11) | version2 (2) |
| -- equipmentMngtContext-v1 | map-ac equipmentMngt (13) | version1 (1) |
| -- infoRetrievalContext-v1 | map-ac infoRetrieval (14) | version1 (1) |
| -- infoRetrievalContext-v2 | map-ac infoRetrieval (14) | version2 (2) |
| -- interVlrInfoRetrievalContext-v2 | map-ac interVlrInfoRetrieval (15) | version2 (2) |
| -- subscriberDataMngtContext-v1 | map-ac subscriberDataMngt (16) | version1 (1) |
| -- subscriberDataMngtContext-v2 | map-ac subscriberDataMngt (16) | version2 (2) |
| -- tracingContext-v1 | map-ac tracing (17) | version1 (1) |
| -- tracingContext-v2 | map-ac tracing (17) | version2 (2) |
| *-- networkFunctionalSsContext-v1* | *map-ac networkFunctionalSs (18)* | *version1 (1)* |
| -- shortMsgGatewayContext-v1 | map-ac shortMsgGateway (20) | version1 (1) |
| -- shortMsgGatewayContext-v2 | map-ac shortMsgGateway (20) | version2 (2) |
| -- shortMsgRelayContext-v1 | map-ac shortMsgRelay (21) | version1 (1) |
| -- shortMsgAlertContext-v1 | map-ac shortMsgAlert (23) | version1 (1) |
| *-- mwdMngtContext-v1* | *map-ac mwdMngt (24)* | *version1 (1)* |
| -- mwdMngtContext-v2 | map-ac mwdMngt (24) | version2 (2) |
| -- shortMsgMT-RelayContext-v2 | map-ac shortMsgMT-Relay (25) | version2 (2) |
| -- msPurgingContext-v2 | map-ac msPurging (27) | version2 (2) |
| -- callControlTransferContext-v3 | map-ac callControlTransferContext (6) | version3 (3) |
| -- gprsLocationInfoRetrievalContext-v3 | map-ac gprsLocationInfoRetrievalContext (33) | version3 (3) |

```
END
```

## 17.4 MAP Dialogue Information

```
MAP-DialogueInformation {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-DialogueInformation (3) ~~version8 (8)~~version9 (9)}

DEFINITIONS

IMPLICIT TAGS

::=

BEGIN

EXPORTS
   map-DialogueAS,
   MAP-DialoguePDU,
   map-ProtectedDialogueAS,
   MAP-ProtectedDialoguePDU

;

IMPORTS
   gsm-NetworkId,
   as-Id
FROM MobileDomainDefinitions {
   itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
   mobileDomainDefinitions (0) version1 (1)}
```

```
   AddressString
FROM MAP-CommonDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network(1) modules (3) map-CommonDataTypes (18) ~~version8 (8)~~version9 (9)}

   ExtensionContainer
FROM MAP-ExtensionDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-ExtensionDataTypes (21) ~~version8 (8)~~version9 (9)}

   SecurityHeader,
   ProtectedPayload
FROM MAP-ST-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-ST-DataTypes (27) ~~version8 (8)~~version9 (9)}

;


-- abstract syntax name for MAP-DialoguePDU

map-DialogueAS  OBJECT IDENTIFIER ::=
    {gsm-NetworkId as-Id map-DialoguePDU (1) version1 (1)}

MAP-DialoguePDU ::= CHOICE {
    map-open                            [0] MAP-OpenInfo,
    map-accept                          [1] MAP-AcceptInfo,
    map-close                           [2] MAP-CloseInfo,
    map-refuse                          [3] MAP-RefuseInfo,
    map-userAbort                       [4] MAP-UserAbortInfo,
    map-providerAbort                   [5] MAP-ProviderAbortInfo}

MAP-OpenInfo ::= SEQUENCE {
    destinationReference                [0] AddressString               OPTIONAL,
    originationReference                [1] AddressString               OPTIONAL,
    ...,
    extensionContainer                  ExtensionContainer              OPTIONAL
    -- extensionContainer must not be used in version 2
    }

MAP-AcceptInfo ::= SEQUENCE {
    ...,
    extensionContainer                  ExtensionContainer              OPTIONAL
    -- extensionContainer must not be used in version 2
    }

MAP-CloseInfo ::= SEQUENCE {
    ...,
    extensionContainer                  ExtensionContainer              OPTIONAL
    -- extensionContainer must not be used in version 2
    }

MAP-RefuseInfo ::= SEQUENCE {
    reason    Reason,
    ...,
    extensionContainer                  ExtensionContainer              OPTIONAL,
    -- extensionContainer must not be used in version 2
    alternativeApplicationContext       OBJECT IDENTIFIER               OPTIONAL
    -- alternativeApplicationContext must not be used in version 2
    }

Reason ::= ENUMERATED {
    noReasonGiven                       (0),
    invalidDestinationReference         (1),
    invalidOriginatingReference         (2),
    encapsulatedAC-NotSupported         (3) ,
    transportProtectionNotAdequate      (4)}
    -- encapsulatedAC-NotSupported and transportProtectionNotAdequate must not be used in
    -- dialogues with an AC different from secureTransportHandling

MAP-UserAbortInfo ::= SEQUENCE {
    map-UserAbortChoice                 MAP-UserAbortChoice,
    ...,
    extensionContainer                  ExtensionContainer              OPTIONAL
    -- extensionContainer must not be used in version 2
    }
```

```
MAP-UserAbortChoice ::= CHOICE {
     userSpecificReason                  [0] NULL,
     userResourceLimitation              [1] NULL,
     resourceUnavailable                 [2] ResourceUnavailableReason,
     applicationProcedureCancellation    [3] ProcedureCancellationReason}
```

```
ResourceUnavailableReason ::= ENUMERATED {
     shortTermResourceLimitation  (0),
     longTermResourceLimitation  (1)}
```

```
ProcedureCancellationReason ::= ENUMERATED {
     handoverCancellation  (0),
     radioChannelRelease  (1),
     networkPathRelease  (2),
     callRelease  (3),
     associatedProcedureFailure  (4),
     tandemDialogueRelease  (5),
     remoteOperationsFailure  (6)}
```

```
MAP-ProviderAbortInfo ::= SEQUENCE {
     map-ProviderAbortReason             MAP-ProviderAbortReason,
     ...,
     extensionContainer                  ExtensionContainer              OPTIONAL
     -- extensionContainer must not be used in version 2
     }
```

```
MAP-ProviderAbortReason ::= ENUMERATED {
     abnormalDialogue  (0),
     invalidPDU  (1)}
```

```
-- abstract syntax name for MAP-ProtectedDialoguePDU
```

```
map-ProtectedDialogueAS  OBJECT IDENTIFIER ::=
     {gsm-NetworkId as-Id map-ProtectedDialoguePDU (3) version1 (1)}
```

```
MAP-ProtectedDialoguePDU ::= SEQUENCE {
     encapsulatedAC                      OBJECT IDENTIFIER,
     securityHeader                      SecurityHeader                  OPTIONAL,
     protectedPayload                    ProtectedPayload                OPTIONAL,
     ...}
     -- The protectedPayload carries the result of applying the security function
     -- defined in 3GPP TS 33.200 to the encoding of the securely transported
     -- MAP-DialoguePDU
```

```
END
```

# 17.5 MAP operation and error codes

```
MAP-Protocol {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-Protocol (4) ~~version8 (8)~~version9 (9)}

DEFINITIONS

::=

BEGIN

IMPORTS
   OPERATION
FROM Remote-Operations-Information-Objects {
   joint-iso-itu-t remote-operations(4) informationObjects(5) version1(0)}

   updateLocation,
   cancelLocation,
   purgeMS,
   sendIdentification,
   updateGprsLocation,
   prepareHandover,
   sendEndSignal,
   processAccessSignalling,
   forwardAccessSignalling,
   prepareSubsequentHandover,
   sendAuthenticationInfo,
   authenticationFailureReport,
   checkIMEI,
```

```
    insertSubscriberData,
    deleteSubscriberData,
    reset,
    forwardCheckSS-Indication,
    restoreData,
    provideSubscriberInfo,
    anyTimeInterrogation,
    anyTimeSubscriptionInterrogation,
    anyTimeModification,
    sendRoutingInfoForGprs,
    failureReport,
    noteMsPresentForGprs,
    noteMM-Event,
    noteSubscriberDataModified


FROM MAP-MobileServiceOperations {
    itu-t identified-organization (4) etsi (0) mobileDomain (0)
    gsm-Network (1) modules (3) map-MobileServiceOperations (5)
    version8 (8)version9 (9)}

    activateTraceMode,
    deactivateTraceMode,
    sendIMSI
FROM MAP-OperationAndMaintenanceOperations {
    itu-t identified-organization (4) etsi (0) mobileDomain (0)
    gsm-Network (1) modules (3) map-OperationAndMaintenanceOperations (6)
    version8 (8)version9 (9)}

    sendRoutingInfo,
    provideRoamingNumber,
    resumeCallHandling,
    provideSIWFSNumber,
    siwfs-SignallingModify,
    setReportingState,
    statusReport,
    remoteUserFree,
    ist-Alert,
    ist-Command
FROM MAP-CallHandlingOperations {
    itu-t identified-organization (4) etsi (0) mobileDomain (0)
    gsm-Network (1) modules (3) map-CallHandlingOperations (7)
    version8 (8)version9 (9)}

    registerSS,
    eraseSS,
    activateSS,
    deactivateSS,
    interrogateSS,
    processUnstructuredSS-Request,
    unstructuredSS-Request,
    unstructuredSS-Notify,
    registerPassword,
    getPassword,
    ss-InvocationNotification,
    registerCC-Entry,
    eraseCC-Entry
FROM MAP-SupplementaryServiceOperations {
    itu-t identified-organization (4) etsi (0) mobileDomain (0)
    gsm-Network (1) modules (3) map-SupplementaryServiceOperations (8)
    version8 (8)version9 (9)}

    sendRoutingInfoForSM,
    mo-ForwardSM,
    mt-ForwardSM,
    reportSM-DeliveryStatus,
    alertServiceCentre,
    informServiceCentre,
    readyForSM
FROM MAP-ShortMessageServiceOperations {
    itu-t identified-organization (4) etsi (0) mobileDomain (0)
    gsm-Network (1) modules (3) map-ShortMessageServiceOperations (9)
    version8 (8)version9 (9)}

    prepareGroupCall,
    processGroupCallSignalling,
    forwardGroupCallSignalling,
    sendGroupCallEndSignal
FROM MAP-Group-Call-Operations {
```

```
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-Group-Call-Operations (22)
   version8 (8)version9 (9)}

   provideSubscriberLocation,
   sendRoutingInfoForLCS,
   subscriberLocationReport
FROM MAP-LocationServiceOperations {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-LocationServiceOperations (24)
   version8 (8)version9 (9)}

secureTransportClass1,
secureTransportClass2,
secureTransportClass3,
secureTransportClass4

FROM MAP-SecureTransportOperations {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-SecureTransportOperations (26)
   version8 (8)version9 (9)}

;
Supported-MAP-Operations OPERATION ::= {updateLocation | cancelLocation | purgeMS |
   sendIdentification | updateGprsLocation | prepareHandover | sendEndSignal |
   processAccessSignalling | forwardAccessSignalling | prepareSubsequentHandover |
   sendAuthenticationInfo | authenticationFailureReport | checkIMEI | insertSubscriberData |
   deleteSubscriberData | reset | forwardCheckSS-Indication | restoreData | provideSubscriberInfo |
   anyTimeInterrogation | anyTimeSubscriptionInterrogation | anyTimeModification |
   sendRoutingInfoForGprs | failureReport |noteMsPresentForGprs | noteMM-Event |
   noteSubscriberDataModified | activateTraceMode | deactivateTraceMode | sendIMSI |
   sendRoutingInfo | provideRoamingNumber | resumeCallHandling | provideSIWFSNumber |
   siwfs-SignallingModify | setReportingState | statusReport | remoteUserFree | ist-Alert |
   ist-Command | registerSS | eraseSS | activateSS | deactivateSS | interrogateSS |
   processUnstructuredSS-Request | unstructuredSS-Request | unstructuredSS-Notify |
   registerPassword | getPassword | ss-InvocationNotification | registerCC-Entry | eraseCC-Entry |
   sendRoutingInfoForSM | mo-ForwardSM | mt-ForwardSM | reportSM-DeliveryStatus |
   alertServiceCentre | informServiceCentre | readyForSM | prepareGroupCall |
   processGroupCallSignalling | forwardGroupCallSignalling | sendGroupCallEndSignal |
   provideSubscriberLocation | sendRoutingInfoForLCS | subscriberLocationReport |
   secureTransportClass1 |secureTransportClass2 | secureTransportClass3 | secureTransportClass4}


-- The following operation codes are reserved for operations
-- existing in previous versions of the protocol
```

| -- Operation Name | AC used | Oper. Code |
|---|---|---|
| -- | | |
| -- sendParameters | map-ac infoRetrieval (14) version1 (1) | local:9 |
| -- processUnstructuredSS-Data | map-ac networkFunctionalSs (18) version1 (1) | local:19 |
| -- performHandover | map-ac handoverControl (11) version1 (1) | local:28 |
| -- performSubsequentHandover | map-ac handoverControl (11) version1 (1) | local:30 |
| -- noteInternalHandover | map-ac handoverControl (11) version1 (1) | local:35 |
| -- noteSubscriberPresent | map-ac mwdMngt (24) version1 (1) | local:48 |
| -- alertServiceCentreWithoutResult | map-ac shortMsgAlert (23) version1 (1) | local:49 |
| -- traceSubscriberActivity | map-ac handoverControl (11) version1 (1) | local:52 |
| -- beginSubscriberActivity | map-ac networkFunctionalSs (18) version1 (1) | local:54 |

```
-- The following error codes are reserved for errors
-- existing in previous versions of the protocol
```

| -- Error Name | AC used | Error Code |
|---|---|---|
| -- | | |
| -- unknownBaseStation | map-ac handoverControl (11) version1 (1) | local:2 |
| -- invalidTargetBaseStation | map-ac handoverControl (11) version1 (1) | local:23 |
| -- noRadioResourceAvailable | map-ac handoverControl (11) version1 (1) | local:24 |

```
END
```

# 17.6 MAP operations and errors

## 17.6.1 Mobile Service Operations

```
MAP-MobileServiceOperations {
```

```
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-MobileServiceOperations (5)
   version8 (8)version9 (9)}

DEFINITIONS

::=

BEGIN

EXPORTS

   -- location registration operations
   updateLocation,
   cancelLocation,
   purgeMS,
   sendIdentification,

   -- gprs location registration operations
   updateGprsLocation,

   -- subscriber information enquiry operations
   provideSubscriberInfo,

   -- any time information enquiry operations
   anyTimeInterrogation,

   -- any time information handling operations
   anyTimeSubscriptionInterrogation,
   anyTimeModification,

   -- subscriber data modification notification operations
   noteSubscriberDataModified,


   -- handover operations
   prepareHandover,
   sendEndSignal,
   processAccessSignalling,
   forwardAccessSignalling,
   prepareSubsequentHandover,

   -- authentication management operations
   sendAuthenticationInfo,
   authenticationFailureReport,

   -- IMEI management operations
   checkIMEI,

   -- subscriber management operations
   insertSubscriberData,
   deleteSubscriberData,

   -- fault recovery operations
   reset,
   forwardCheckSS-Indication,
   restoreData,

-- gprs location information retrieval operations
   sendRoutingInfoForGprs,

   -- failure reporting operations
   failureReport,

   -- gprs notification operations
   noteMsPresentForGprs,

   -- Mobility Management operations
   noteMM-Event




;

IMPORTS
   OPERATION
FROM Remote-Operations-Information-Objects {
   joint-iso-itu-t remote-operations(4)
```

```
  informationObjects(5) version1(0)}

    systemFailure,
    dataMissing,
    unexpectedDataValue,
    unknownSubscriber,
    unknownMSC,
    unidentifiedSubscriber,
    unknownEquipment,
    roamingNotAllowed,
    ati-NotAllowed,
    noHandoverNumberAvailable,
    subsequentHandoverFailure,
    absentSubscriber,
    mm-EventNotSupported,
    atsi-NotAllowed,
    atm-NotAllowed,
    bearerServiceNotProvisioned,
    teleserviceNotProvisioned,
    callBarred,
    illegalSS-Operation,
    ss-ErrorStatus,
    ss-NotAvailable,
    ss-Incompatibility,
    ss-SubscriptionViolation,
    informationNotAvailable,
    targetCellOutsideGroupCallArea


FROM MAP-Errors {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-Errors (10) version8 (8)version9 (9)}

    UpdateLocationArg,
    UpdateLocationRes,
    CancelLocationArg,
    CancelLocationRes,
    PurgeMS-Arg,
    PurgeMS-Res,
    SendIdentificationArg,
    SendIdentificationRes,
    UpdateGprsLocationArg,
    UpdateGprsLocationRes,
    PrepareHO-Arg,
    PrepareHO-Res,
    ForwardAccessSignalling-Arg,
    ProcessAccessSignalling-Arg,
    SendEndSignal-Arg,
    SendEndSignal-Res,
    PrepareSubsequentHO-Res,
    PrepareSubsequentHO-Arg,
    SendAuthenticationInfoArg,
    SendAuthenticationInfoRes,
    AuthenticationFailureReportArg,
    AuthenticationFailureReportRes,
    EquipmentStatus,
    InsertSubscriberDataArg,
    InsertSubscriberDataRes,
    DeleteSubscriberDataArg,
    DeleteSubscriberDataRes,
    ResetArg,
    RestoreDataArg,
    RestoreDataRes,
    ProvideSubscriberInfoArg,
    ProvideSubscriberInfoRes,
    AnyTimeSubscriptionInterrogationArg,
    AnyTimeSubscriptionInterrogationRes,
    AnyTimeModificationArg,
    AnyTimeModificationRes,
    NoteSubscriberDataModifiedArg,
    NoteSubscriberDataModifiedRes,
    AnyTimeInterrogationArg,
    AnyTimeInterrogationRes,
    SendRoutingInfoForGprsArg,
    SendRoutingInfoForGprsRes,
    FailureReportArg,
    FailureReportRes,
    NoteMsPresentForGprsArg,
    NoteMsPresentForGprsRes,
```

```
   NoteMM-EventArg,
   NoteMM-EventRes


FROM MAP-MS-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-MS-DataTypes (11) version8 (8)version9 (9)}

   IMEI
FROM MAP-CommonDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-CommonDataTypes (18) version8 (8)version9 (9)}
;


-- location registration operations

updateLocation  OPERATION ::= {                                          --Timer m
     ARGUMENT
          UpdateLocationArg
     RESULT
          UpdateLocationRes
     ERRORS {
          systemFailure |
          dataMissing |
          unexpectedDataValue |
          unknownSubscriber |
          roamingNotAllowed}
     CODE local:2 }

cancelLocation  OPERATION ::= {                                          --Timer m
     ARGUMENT
          CancelLocationArg
     RESULT
          CancelLocationRes
               -- optional
     ERRORS {
          dataMissing |
          unexpectedDataValue}
     CODE local:3 }

purgeMS  OPERATION ::= {                                                 --Timer m
     ARGUMENT
          PurgeMS-Arg
     RESULT
          PurgeMS-Res
               -- optional
     ERRORS{
          dataMissing |
          unexpectedDataValue|
          unknownSubscriber}
     CODE local:67 }
```

```
sendIdentification  OPERATION ::= {                                    --Timer s
     ARGUMENT
          SendIdentificationArg
     RESULT
          SendIdentificationRes
     ERRORS {
          dataMissing |
          unidentifiedSubscriber}
     CODE local:55 }
```

*-- gprs location registration operations*

```
updateGprsLocation  OPERATION ::= {                                    --Timer m
     ARGUMENT
          UpdateGprsLocationArg
     RESULT
          UpdateGprsLocationRes
     ERRORS {
          systemFailure |
          unexpectedDataValue |
          unknownSubscriber |
          roamingNotAllowed}
     CODE local:23 }
```

*-- subscriber information enquiry operations*

```
provideSubscriberInfo  OPERATION ::= {                                 --Timer m
     ARGUMENT
          ProvideSubscriberInfoArg
     RESULT
          ProvideSubscriberInfoRes
     ERRORS {
          dataMissing |
          unexpectedDataValue}
     CODE local:70 }
```

*-- any time information enquiry operations*

```
anyTimeInterrogation  OPERATION ::= {                                  --Timer m
     ARGUMENT
          AnyTimeInterrogationArg
     RESULT
          AnyTimeInterrogationRes
     ERRORS {
          systemFailure |
          ati-NotAllowed |
          dataMissing |
          unexpectedDataValue |
          unknownSubscriber}
     CODE local:71 }
```

*-- any time information handling operations*

```
anyTimeSubscriptionInterrogation  OPERATION ::= {                      --Timer m
     ARGUMENT
          AnyTimeSubscriptionInterrogationArg
     RESULT
          AnyTimeSubscriptionInterrogationRes
     ERRORS {
          atsi-NotAllowed |
          dataMissing |
          unexpectedDataValue |
          unknownSubscriber |
          bearerServiceNotProvisioned |
          teleserviceNotProvisioned |
          callBarred |
          illegalSS-Operation |
          ss-NotAvailable |
          informationNotAvailable}
     CODE local:62 }
```

```
anyTimeModification  OPERATION ::= {                                    --Timer m
     ARGUMENT
          AnyTimeModificationArg
     RESULT
          AnyTimeModificationRes
     ERRORS {
          atm-NotAllowed |
          dataMissing |
          unexpectedDataValue |
          unknownSubscriber |
          bearerServiceNotProvisioned |
          teleserviceNotProvisioned |
          callBarred |
          illegalSS-Operation |
          ss-SubscriptionViolation |
          ss-ErrorStatus |
          ss-Incompatibility |
          informationNotAvailable}
     CODE local:65 }
```

*-- subscriber data modification notification operations*

```
noteSubscriberDataModified  OPERATION ::= {                              --Timer m
     ARGUMENT
          NoteSubscriberDataModifiedArg
     RESULT
          NoteSubscriberDataModifiedRes
               -- optional
     ERRORS {
          dataMissing |
          unexpectedDataValue |
          unknownSubscriber}
     CODE local:5 }
```

*-- handover operations*

```
prepareHandover  OPERATION ::= {                                        --Timer m
     ARGUMENT
          PrepareHO-Arg
     RESULT
          PrepareHO-Res
     ERRORS {
          systemFailure |
          dataMissing |
          unexpectedDataValue |
          noHandoverNumberAvailable |
          targetCellOutsideGroupCallArea }
     CODE local:68 }
```

```
sendEndSignal  OPERATION ::= {                                          --Timer l
     ARGUMENT
          SendEndSignal-Arg
     RESULT
          SendEndSignal-Res
     CODE local:29 }
```

```
processAccessSignalling  OPERATION ::= {                                --Timer s
     ARGUMENT
          ProcessAccessSignalling-Arg
     CODE local:33 }
```

```
forwardAccessSignalling  OPERATION ::= {                                --Timer s
     ARGUMENT
          ForwardAccessSignalling-Arg
     CODE local:34 }
```

```
prepareSubsequentHandover  OPERATION ::= {                                    --Timer m
     ARGUMENT
          PrepareSubsequentHO-Arg
     RESULT
          PrepareSubsequentHO-Res
     ERRORS {
          unexpectedDataValue |
          dataMissing |
          unknownMSC |
          subsequentHandoverFailure}
     CODE local:69 }
```

*-- authentication management operations*

```
sendAuthenticationInfo  OPERATION ::= {                                       --Timer m
     ARGUMENT
          SendAuthenticationInfoArg
          -- optional
          -- within a dialogue sendAuthenticationInfoArg shall not be present in
          -- subsequent invoke components. If received in a subsequent invoke component
          -- it shall be discarded.

     RESULT
          SendAuthenticationInfoRes
          -- optional
     ERRORS {
          systemFailure |
          dataMissing |
          unexpectedDataValue |
          unknownSubscriber}
     CODE local:56 }
```

```
authenticationFailureReport  OPERATION ::= {                                  --Timer m
     ARGUMENT
          AuthenticationFailureReportArg
     RESULT
          AuthenticationFailureReportRes
          -- optional
     ERRORS {
          systemFailure |
          unexpectedDataValue |
          unknownSubscriber}
     CODE local:15 }
```

*-- IMEI management operations*

```
checkIMEI  OPERATION ::= {                                                    --Timer m
     ARGUMENT
          IMEI
     RESULT
          EquipmentStatus
     ERRORS {
          systemFailure |
          dataMissing |
          unknownEquipment}
     CODE local:43 }
```

*-- subscriber management operations*

```
insertSubscriberData  OPERATION ::= {                                         --Timer m
     ARGUMENT
          InsertSubscriberDataArg
     RESULT
          InsertSubscriberDataRes
          -- optional
     ERRORS {
          dataMissing |
          unexpectedDataValue |
          unidentifiedSubscriber}
     CODE local:7 }
```

```
deleteSubscriberData  OPERATION ::= {                                    --Timer m
     ARGUMENT
          DeleteSubscriberDataArg
     RESULT
          DeleteSubscriberDataRes
          -- optional
     ERRORS {
          dataMissing |
          unexpectedDataValue |
          unidentifiedSubscriber}
     CODE local:8 }
```

*-- fault recovery operations*

```
reset  OPERATION ::= {                                                   --Timer m
     ARGUMENT
          ResetArg
     CODE local:37 }
```

```
forwardCheckSS-Indication  OPERATION ::= {                               --Timer s
     CODE local:38 }
```

```
restoreData  OPERATION ::= {                                             --Timer m
     ARGUMENT
          RestoreDataArg
     RESULT
          RestoreDataRes
     ERRORS {
          systemFailure |
          dataMissing |
          unexpectedDataValue |
          unknownSubscriber}
     CODE local:57 }
```

*-- gprs location information retrieval operations*

```
sendRoutingInfoForGprs  OPERATION ::= {                                  --Timer m
     ARGUMENT
          SendRoutingInfoForGprsArg
     RESULT
          SendRoutingInfoForGprsRes
     ERRORS {
          absentSubscriber |
          systemFailure |
          dataMissing |
          unexpectedDataValue |
          unknownSubscriber |
          callBarred }
     CODE local:24 }
```

*-- failure reporting operations*

```
failureReport  OPERATION ::= {                                           --Timer m
     ARGUMENT
          FailureReportArg
     RESULT
          FailureReportRes
               -- optional
     ERRORS {
          systemFailure |
          dataMissing |
          unexpectedDataValue |
          unknownSubscriber}
     CODE local:25 }
```

*-- gprs notification operations*

```
noteMsPresentForGprs  OPERATION ::= {                                    --Timer m
     ARGUMENT
          NoteMsPresentForGprsArg
     RESULT
          NoteMsPresentForGprsRes
               -- optional
     ERRORS {
          systemFailure |
          dataMissing |
          unexpectedDataValue |
          unknownSubscriber}
     CODE local:26 }
```

```
noteMM-Event  OPERATION ::= {                                            --Timer m
     ARGUMENT
          NoteMM-EventArg
     RESULT
          NoteMM-EventRes
     ERRORS {
          dataMissing |
          unexpectedDataValue |
          unknownSubscriber |
          mm-EventNotSupported}
     CODE local:89 }

END
```

## 17.6.2 Operation and Maintenance Operations

```
MAP-OperationAndMaintenanceOperations {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-OperationAndMaintenanceOperations (6)
   version8 (8)version9 (9)}

DEFINITIONS

::=

BEGIN

EXPORTS
   activateTraceMode,
   deactivateTraceMode,
   sendIMSI
;

IMPORTS
   OPERATION
FROM Remote-Operations-Information-Objects {
   joint-iso-itu-t remote-operations(4)
  informationObjects(5) version1(0)}

   systemFailure,
   dataMissing,
   unexpectedDataValue,
   facilityNotSupported,
   unknownSubscriber,
   unidentifiedSubscriber,
   tracingBufferFull
FROM MAP-Errors {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-Errors (10) version8 (8)version9 (9)}

   ActivateTraceModeArg,
   ActivateTraceModeRes,
   DeactivateTraceModeArg,
   DeactivateTraceModeRes
FROM MAP-OM-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-OM-DataTypes (12) version8 (8)version9 (9)}

   ISDN-AddressString,
   IMSI
FROM MAP-CommonDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-CommonDataTypes (18) version8 (8)version9 (9)}
;
```

```
activateTraceMode  OPERATION ::= {                                    --Timer m
     ARGUMENT
          ActivateTraceModeArg
     RESULT
          ActivateTraceModeRes
          -- optional
     ERRORS {
          systemFailure |
          dataMissing |
          unexpectedDataValue |
          facilityNotSupported |
          unidentifiedSubscriber |
          tracingBufferFull}
     CODE local:50 }
```

```
deactivateTraceMode  OPERATION ::= {                                  --Timer m
     ARGUMENT
          DeactivateTraceModeArg
     RESULT
          DeactivateTraceModeRes
          -- optional
     ERRORS {
          systemFailure |
          dataMissing |
          unexpectedDataValue |
          facilityNotSupported |
          unidentifiedSubscriber}
     CODE local:51 }
```

```
sendIMSI  OPERATION ::= {                                             --Timer m
     ARGUMENT
          ISDN-AddressString
     RESULT
          IMSI
     ERRORS {
          dataMissing |
          unexpectedDataValue |
          unknownSubscriber}
     CODE local:58 }
```

```
END
```

## 17.6.3 Call Handling Operations

```
MAP-CallHandlingOperations {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-CallHandlingOperations (7)
   version8 (8)version9 (9)}

DEFINITIONS

::=

BEGIN

EXPORTS
   sendRoutingInfo,
   provideRoamingNumber,
   resumeCallHandling,
   provideSIWFSNumber,
   siwfs-SignallingModify,
   setReportingState,
   statusReport,
   remoteUserFree,
   ist-Alert,
   ist-Command
;

IMPORTS
   OPERATION
FROM Remote-Operations-Information-Objects {
   joint-iso-itu-t remote-operations(4)
  informationObjects(5) version1(0)}

   systemFailure,
   dataMissing,
```

```
   unexpectedDataValue,
   facilityNotSupported,
   or-NotAllowed,
   unknownSubscriber,
   numberChanged,
   bearerServiceNotProvisioned,
   teleserviceNotProvisioned,
   noRoamingNumberAvailable,
   absentSubscriber,
   busySubscriber,
   noSubscriberReply,
   callBarred,
   forwardingViolation,
   forwardingFailed,
   cug-Reject,
   resourceLimitation,
   incompatibleTerminal,
   unidentifiedSubscriber

FROM MAP-Errors {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-Errors (10) version8 (8)version9 (9)}
   SendRoutingInfoArg,
   SendRoutingInfoRes,
   ProvideRoamingNumberArg,
   ProvideRoamingNumberRes,
   ResumeCallHandlingArg,
   ResumeCallHandlingRes,
   ProvideSIWFSNumberArg,
   ProvideSIWFSNumberRes,
   SIWFSSignallingModifyArg,
   SIWFSSignallingModifyRes,
   SetReportingStateArg,
   SetReportingStateRes,
   StatusReportArg,
   StatusReportRes,
   RemoteUserFreeArg,
   RemoteUserFreeRes,
   IST-AlertArg,
   IST-AlertRes,
   IST-CommandArg,
IST-CommandRes
FROM MAP-CH-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-CH-DataTypes (13) version8 (8)version9 (9)}

;
```

```
sendRoutingInfo  OPERATION ::= {                                          --Timer m
-- The timer is set to the upper limit of the range if the GMSC supports pre-paging.
     ARGUMENT
          SendRoutingInfoArg
     RESULT
          SendRoutingInfoRes
     ERRORS {
          systemFailure |
          dataMissing |
          unexpectedDataValue |
          facilityNotSupported |
          or-NotAllowed |
          unknownSubscriber |
          numberChanged |
          bearerServiceNotProvisioned |
          teleserviceNotProvisioned |
          absentSubscriber |
          busySubscriber |
          noSubscriberReply |
          callBarred |
          cug-Reject |
          forwardingViolation}
     CODE local:22 }
```

```
provideRoamingNumber  OPERATION ::= {                                    --Timer m
-- The timer is set to the upper limit of the range if the HLR supports pre-paging.
     ARGUMENT
          ProvideRoamingNumberArg
     RESULT
          ProvideRoamingNumberRes
     ERRORS {
          systemFailure |
          dataMissing |
          unexpectedDataValue |
          facilityNotSupported |
          or-NotAllowed |
          absentSubscriber |
          noRoamingNumberAvailable}
     CODE local:4 }
```

```
resumeCallHandling  OPERATION ::= {                                      --Timer m
     ARGUMENT
          ResumeCallHandlingArg
     RESULT
          ResumeCallHandlingRes
          -- optional
     ERRORS {
          forwardingFailed |
          or-NotAllowed |
          unexpectedDataValue |
          dataMissing }
     CODE local:6 }
```

```
provideSIWFSNumber  OPERATION ::= {                                      --Timer m
     ARGUMENT
          ProvideSIWFSNumberArg
     RESULT
          ProvideSIWFSNumberRes
     ERRORS {
          resourceLimitation |
          dataMissing |
          unexpectedDataValue |
          systemFailure}
     CODE local:31 }
```

```
siwfs-SignallingModify  OPERATION ::= {                                  --Timer m
     ARGUMENT
          SIWFSSignallingModifyArg
     RESULT
          SIWFSSignallingModifyRes
          -- optional
     ERRORS {
          resourceLimitation |
          dataMissing |
          unexpectedDataValue |
          systemFailure}
     CODE local:32 }
```

```
setReportingState  OPERATION ::= {                                       --Timer m
     ARGUMENT
          SetReportingStateArg
     RESULT
          SetReportingStateRes
          -- optional
     ERRORS {
          systemFailure |
          unidentifiedSubscriber |
          unexpectedDataValue |
          dataMissing |
          resourceLimitation |
          facilityNotSupported}
     CODE local:73 }
```

```
statusReport  OPERATION ::= {                                          --Timer m
     ARGUMENT
          StatusReportArg
     RESULT
          StatusReportRes
          -- optional
     ERRORS {
          unknownSubscriber |
          systemFailure |
          unexpectedDataValue |
          dataMissing}
     CODE local:74 }
```

```
remoteUserFree  OPERATION ::= {                                        --Timer ml
     ARGUMENT
          RemoteUserFreeArg
     RESULT
          RemoteUserFreeRes
     ERRORS {
          unexpectedDataValue |
          dataMissing |
          incompatibleTerminal |
          absentSubscriber |
          systemFailure |
          busySubscriber}
     CODE local:75 }
```

```
ist-Alert  OPERATION ::= {                                             --Timer m
     ARGUMENT
          IST-AlertArg
     RESULT
          IST-AlertRes
          -- optional
     ERRORS {
          unexpectedDataValue |
          resourceLimitation |
          unknownSubscriber |
          systemFailure |
          facilityNotSupported}
     CODE local:87 }
```

```
ist-Command  OPERATION::= {                                            --Timer m
     ARGUMENT
          IST-CommandArg
     RESULT
          IST-CommandRes
          -- optional
     ERRORS {
          unexpectedDataValue |
          resourceLimitation |
          unknownSubscriber |
          systemFailure |
          facilityNotSupported}
     CODE local:88 }
```

```
END
```

## 17.6.4 Supplementary service operations

```
MAP-SupplementaryServiceOperations {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-SupplementaryServiceOperations (8)
   version8 (8)version9 (9)}

DEFINITIONS

::=

BEGIN

EXPORTS
   registerSS,
   eraseSS,
   activateSS,
   deactivateSS,
   interrogateSS,
   processUnstructuredSS-Request,
```

```
   unstructuredSS-Request,
   unstructuredSS-Notify,
   registerPassword,
   getPassword,
   ss-InvocationNotification,
   registerCC-Entry,
   eraseCC-Entry
;

IMPORTS
   OPERATION
FROM Remote-Operations-Information-Objects {
   joint-iso-itu-t remote-operations(4)
  informationObjects(5) version1(0)}

   systemFailure,
   dataMissing,
   unexpectedDataValue,
   unknownSubscriber,
   bearerServiceNotProvisioned,
   teleserviceNotProvisioned,
   callBarred,
   illegalSS-Operation,
   ss-ErrorStatus,
   ss-NotAvailable,
   ss-SubscriptionViolation,
   ss-Incompatibility,
   pw-RegistrationFailure,
   negativePW-Check,
   numberOfPW-AttemptsViolation,
   unknownAlphabet,
   ussd-Busy,
   absentSubscriber,
   illegalSubscriber,
   illegalEquipment,
   shortTermDenial,
   longTermDenial,
   facilityNotSupported
FROM MAP-Errors {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-Errors (10) version8 (8)version9 (9)}

   RegisterSS-Arg,
   SS-Info,
   SS-ForBS-Code,
   InterrogateSS-Res,
   USSD-Arg,
   USSD-Res,
   Password,
   GuidanceInfo,
   SS-InvocationNotificationArg,
   SS-InvocationNotificationRes,
   RegisterCC-EntryArg,
   RegisterCC-EntryRes,
   EraseCC-EntryArg,
   EraseCC-EntryRes
FROM MAP-SS-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-SS-DataTypes (14) version8 (8)version9 (9)}

   SS-Code
FROM MAP-SS-Code {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-SS-Code (15) version8 (8)version9 (9)}
;


-- supplementary service handling operations
```

```
registerSS  OPERATION ::= {                                          --Timer m
     ARGUMENT
          RegisterSS-Arg
     RESULT
          SS-Info
          -- optional
     ERRORS {
          systemFailure |
          dataMissing |
          unexpectedDataValue |
          bearerServiceNotProvisioned |
          teleserviceNotProvisioned |
          callBarred |
          illegalSS-Operation |
          ss-ErrorStatus |
          ss-Incompatibility}
     CODE local:10 }
```

```
eraseSS  OPERATION ::= {                                             --Timer m
     ARGUMENT
          SS-ForBS-Code
     RESULT
          SS-Info
          -- optional
     ERRORS {
          systemFailure |
          dataMissing |
          unexpectedDataValue |
          bearerServiceNotProvisioned |
          teleserviceNotProvisioned |
          callBarred |
          illegalSS-Operation |
          ss-ErrorStatus
          }
     CODE local:11 }
```

```
activateSS  OPERATION ::= {                                          --Timer m
     ARGUMENT
          SS-ForBS-Code
     RESULT
          SS-Info
          -- optional
     ERRORS {
          systemFailure |
          dataMissing |
          unexpectedDataValue |
          bearerServiceNotProvisioned |
          teleserviceNotProvisioned |
          callBarred |
          illegalSS-Operation |
          ss-ErrorStatus |
          ss-SubscriptionViolation |
          ss-Incompatibility |
          negativePW-Check |
          numberOfPW-AttemptsViolation}
     CODE local:12 }
```

```
deactivateSS  OPERATION ::= {                                        --Timer m
     ARGUMENT
          SS-ForBS-Code
     RESULT
          SS-Info
          -- optional
     ERRORS {
          systemFailure |
          dataMissing |
          unexpectedDataValue |
          bearerServiceNotProvisioned |
          teleserviceNotProvisioned |
          callBarred |
          illegalSS-Operation |
          ss-ErrorStatus |
          ss-SubscriptionViolation |
          negativePW-Check |
          numberOfPW-AttemptsViolation}
     CODE local:13 }
```

```
interrogateSS  OPERATION ::= {                                          --Timer m
     ARGUMENT
          SS-ForBS-Code
     RESULT
          InterrogateSS-Res
     ERRORS {
          systemFailure |
          dataMissing |
          unexpectedDataValue |
          bearerServiceNotProvisioned |
          teleserviceNotProvisioned |
          callBarred |
          illegalSS-Operation |
          ss-NotAvailable}
     CODE local:14 }
```

```
processUnstructuredSS-Request  OPERATION ::= {                           --Timer 10
minutes
     ARGUMENT
          USSD-Arg
     RESULT
          USSD-Res
     ERRORS {
          systemFailure |
          dataMissing |
          unexpectedDataValue |
          unknownAlphabet |
          callBarred}
     CODE local:59 }
```

```
unstructuredSS-Request  OPERATION ::= {                                 --Timer ml
     ARGUMENT
          USSD-Arg
     RESULT
          USSD-Res
          -- optional
     ERRORS {
          systemFailure |
          dataMissing |
          unexpectedDataValue |
          absentSubscriber |
          illegalSubscriber |
          illegalEquipment |
          unknownAlphabet |
          ussd-Busy}
     CODE local:60 }
```

```
unstructuredSS-Notify  OPERATION ::= {                                  --Timer ml
     ARGUMENT
          USSD-Arg
     RETURN RESULT TRUE
     ERRORS {
          systemFailure |
          dataMissing |
          unexpectedDataValue |
          absentSubscriber |
          illegalSubscriber |
          illegalEquipment |
          unknownAlphabet |
          ussd-Busy}
     CODE local:61 }
```

```
registerPassword  OPERATION ::= {                                    --Timer ml
     ARGUMENT
          SS-Code
     RESULT
          Password
     ERRORS {
          systemFailure |
          dataMissing |
          unexpectedDataValue |
          callBarred |
          ss-SubscriptionViolation |
          pw-RegistrationFailure |
          negativePW-Check |
          numberOfPW-AttemptsViolation}
     LINKED {
          getPassword}
     CODE local:17 }
```

```
getPassword  OPERATION ::= {                                         --Timer m
     ARGUMENT
          GuidanceInfo
     RESULT
          Password
     CODE local:18 }
```

```
ss-InvocationNotification  OPERATION ::= {                           --Timer m
     ARGUMENT
          SS-InvocationNotificationArg
     RESULT
          SS-InvocationNotificationRes
          -- optional
     ERRORS {
          dataMissing |
          unexpectedDataValue |
          unknownSubscriber}
     CODE local:72 }
```

```
registerCC-Entry  OPERATION ::= {                                    --Timer m
     ARGUMENT
          RegisterCC-EntryArg
     RESULT
          RegisterCC-EntryRes
     ERRORS {
          systemFailure |
          dataMissing |
          unexpectedDataValue |
          callBarred |
          illegalSS-Operation |
          ss-ErrorStatus |
          ss-Incompatibility |
          shortTermDenial |
          longTermDenial |
          facilityNotSupported}
     CODE local:76 }
```

```
eraseCC-Entry  OPERATION ::= {                                       --Timer m
     ARGUMENT
          EraseCC-EntryArg
     RESULT
          EraseCC-EntryRes
     ERRORS {
          systemFailure |
          dataMissing |
          unexpectedDataValue |
          callBarred |
          illegalSS-Operation |
          ss-ErrorStatus}
     CODE local:77 }
```

```
END
```

## 17.6.5 Short message service operations

```
MAP-ShortMessageServiceOperations {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-ShortMessageServiceOperations (9)
   version8 (8)version9 (9)}
```

```
DEFINITIONS

::=

BEGIN

EXPORTS
   sendRoutingInfoForSM,
   mo-ForwardSM,
   mt-ForwardSM,
   reportSM-DeliveryStatus,
   alertServiceCentre,
   informServiceCentre,
   readyForSM
;

IMPORTS
   OPERATION
FROM Remote-Operations-Information-Objects {
   joint-iso-itu-t remote-operations(4)
  informationObjects(5) version1(0)}

   systemFailure,
   dataMissing,
   unexpectedDataValue,
   facilityNotSupported,
   unknownSubscriber,
   unidentifiedSubscriber,
   illegalSubscriber,
   illegalEquipment,
   teleserviceNotProvisioned,
   callBarred,
   subscriberBusyForMT-SMS,
   sm-DeliveryFailure,
   messageWaitingListFull,
   absentSubscriberSM
FROM MAP-Errors {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-Errors (10) version8 (8)version9 (9)}

   RoutingInfoForSM-Arg,
   RoutingInfoForSM-Res,
   MO-ForwardSM-Arg,
   MO-ForwardSM-Res,
   MT-ForwardSM-Arg,
   MT-ForwardSM-Res,
   ReportSM-DeliveryStatusArg,
   ReportSM-DeliveryStatusRes,
   AlertServiceCentreArg,
   InformServiceCentreArg,
   ReadyForSM-Arg,
   ReadyForSM-Res
FROM MAP-SM-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-SM-DataTypes (16) version8 (8)version9 (9)}


;
```

```
sendRoutingInfoForSM  OPERATION ::= {                                    --Timer m
     ARGUMENT
          RoutingInfoForSM-Arg
     RESULT
          RoutingInfoForSM-Res
     ERRORS {
          systemFailure |
          dataMissing |
          unexpectedDataValue |
          facilityNotSupported |
          unknownSubscriber |
          teleserviceNotProvisioned |
          callBarred |
          absentSubscriberSM}
     CODE local:45 }
```

```
mo-ForwardSM  OPERATION ::= {                                          --Timer ml
     ARGUMENT
          MO-ForwardSM-Arg
     RESULT
          MO-ForwardSM-Res
          -- optional
     ERRORS {
          systemFailure |
          unexpectedDataValue |
          facilityNotSupported |
          sm-DeliveryFailure}
     CODE local:46 }
```

```
mt-ForwardSM  OPERATION ::= {                                          --Timer ml
     ARGUMENT
          MT-ForwardSM-Arg
     RESULT
          MT-ForwardSM-Res
          -- optional
     ERRORS {
          systemFailure |
          dataMissing |
          unexpectedDataValue |
          facilityNotSupported |
          unidentifiedSubscriber |
          illegalSubscriber |
          illegalEquipment |
          subscriberBusyForMT-SMS |
          sm-DeliveryFailure |
          absentSubscriberSM}
     CODE local:44 }
```

```
reportSM-DeliveryStatus  OPERATION ::= {          --Timer s
     ARGUMENT
          ReportSM-DeliveryStatusArg
     RESULT
          ReportSM-DeliveryStatusRes
          -- optional
     ERRORS {
          dataMissing |
          unexpectedDataValue |
          unknownSubscriber |
          messageWaitingListFull}
     CODE local:47 }
```

```
alertServiceCentre  OPERATION ::= {                                    --Timer s
     ARGUMENT
          AlertServiceCentreArg
     RETURN RESULT TRUE
     ERRORS {
          systemFailure |
          dataMissing |
          unexpectedDataValue}
     CODE local:64 }
```

```
informServiceCentre  OPERATION ::= {                                   --Timer s
     ARGUMENT
          InformServiceCentreArg
     CODE local:63 }
```

```
readyForSM  OPERATION ::= {                                            --Timer m
     ARGUMENT
          ReadyForSM-Arg
     RESULT
          ReadyForSM-Res
          -- optional
     ERRORS {
          dataMissing |
          unexpectedDataValue |
          facilityNotSupported |
          unknownSubscriber}
     CODE local:66 }
```

```
END
```

### 17.6.6 Errors

```
MAP-Errors {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-Errors (10) version8 (8)version9 (9)}

DEFINITIONS

::=

BEGIN

EXPORTS

   -- generic errors
   systemFailure,
   dataMissing,
   unexpectedDataValue,
   facilityNotSupported,
   incompatibleTerminal,
   resourceLimitation,

   -- identification and numbering errors
   unknownSubscriber,
   numberChanged,
   unknownMSC,
   unidentifiedSubscriber,
   unknownEquipment,

   -- subscription errors
   roamingNotAllowed,
   illegalSubscriber,
   illegalEquipment,
   bearerServiceNotProvisioned,
   teleserviceNotProvisioned,

   -- handover errors
   noHandoverNumberAvailable,
   subsequentHandoverFailure,
   targetCellOutsideGroupCallArea,

   -- operation and maintenance errors
   tracingBufferFull,

   -- call handling errors
   or-NotAllowed,
   noRoamingNumberAvailable,
   busySubscriber,
   noSubscriberReply,
   absentSubscriber,
   callBarred,
   forwardingViolation,
   forwardingFailed,
   cug-Reject,

   -- any time interrogation errors
   ati-NotAllowed,

   -- any time information handling errors
   atsi-NotAllowed,
   atm-NotAllowed,
   informationNotAvailable,

   -- supplementary service errors
   illegalSS-Operation,
   ss-ErrorStatus,
   ss-NotAvailable,
   ss-SubscriptionViolation,
   ss-Incompatibility,
   unknownAlphabet,
   ussd-Busy,
   pw-RegistrationFailure,
   negativePW-Check,
   numberOfPW-AttemptsViolation,
   shortTermDenial,
   longTermDenial,

   -- short message service errors
   subscriberBusyForMT-SMS,
   sm-DeliveryFailure,
   messageWaitingListFull,
```

```
   absentSubscriberSM,

   -- Group Call errors
   noGroupCallNumberAvailable,

   -- location service errors
   unauthorizedRequestingNetwork,
   unauthorizedLCSClient,
   positionMethodFailure,
   unknownOrUnreachableLCSClient,

   -- Mobility Management errors
   mm-EventNotSupported,

   -- Secure transport errors
   secureTransportError


;

IMPORTS
   ERROR
FROM Remote-Operations-Information-Objects {joint-iso-itu-t remote-operations(4)
  informationObjects(5) version1(0) }

   SS-Status
FROM MAP-SS-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-SS-DataTypes (14) ~~version8 (8)~~version9 (9)}

   SS-IncompatibilityCause,
   PW-RegistrationFailureCause,
   SM-DeliveryFailureCause,
   SystemFailureParam,
   DataMissingParam,
   UnexpectedDataParam,
   FacilityNotSupParam,
   UnknownSubscriberParam,
   NumberChangedParam,
   UnidentifiedSubParam,
   RoamingNotAllowedParam,
   IllegalSubscriberParam,
   IllegalEquipmentParam,
   BearerServNotProvParam,
   TeleservNotProvParam,
   TracingBufferFullParam,
   NoRoamingNbParam,
   OR-NotAllowedParam,
   AbsentSubscriberParam,
   BusySubscriberParam,
   NoSubscriberReplyParam,
   CallBarredParam,
   ForwardingViolationParam,
   ForwardingFailedParam,
   CUG-RejectParam,
   ATI-NotAllowedParam,
   SubBusyForMT-SMS-Param,
   MessageWaitListFullParam,
   AbsentSubscriberSM-Param,
   ResourceLimitationParam,
   NoGroupCallNbParam,
   IncompatibleTerminalParam,
   ShortTermDenialParam,
   LongTermDenialParam,
   UnauthorizedRequestingNetwork-Param,
   UnauthorizedLCSClient-Param,
   PositionMethodFailure-Param,
   UnknownOrUnreachableLCSClient-Param,
   MM-EventNotSupported-Param,
   ATSI-NotAllowedParam,
   ATM-NotAllowedParam,
   IllegalSS-OperationParam,
   SS-NotAvailableParam,
   SS-SubscriptionViolationParam,
   InformationNotAvailableParam,
   TargetCellOutsideGCA-Param,
   SecureTransportErrorParam
```

```
FROM MAP-ER-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-ER-DataTypes (17) ~~version8 (8)~~version9 (9)}
;

-- generic errors

systemFailure  ERROR ::= {
     PARAMETER
          SystemFailureParam
          -- optional
     CODE local:34 }

dataMissing  ERROR ::= {
     PARAMETER
          DataMissingParam
          -- optional
          -- DataMissingParam must not be used in version <3
     CODE local:35 }

unexpectedDataValue  ERROR ::= {
     PARAMETER
          UnexpectedDataParam
          -- optional
          -- UnexpectedDataParam must not be used in version <3
     CODE local:36 }

facilityNotSupported  ERROR ::= {
     PARAMETER
          FacilityNotSupParam
          -- optional
          -- FacilityNotSupParam must not be used in version <3
     CODE local:21 }

incompatibleTerminal  ERROR ::= {
     PARAMETER
          IncompatibleTerminalParam
          -- optional
     CODE local:28 }

resourceLimitation  ERROR ::= {
     PARAMETER
          ResourceLimitationParam
          -- optional
     CODE local:51 }

-- identification and numbering errors

unknownSubscriber  ERROR ::= {
     PARAMETER
          UnknownSubscriberParam
          -- optional
          -- UnknownSubscriberParam must not be used in version <3
     CODE local:1 }

numberChanged  ERROR ::= {
     PARAMETER
          NumberChangedParam
          -- optional
     CODE local:44 }

unknownMSC  ERROR ::= {
     CODE local:3 }

unidentifiedSubscriber  ERROR ::= {
     PARAMETER
          UnidentifiedSubParam
          -- optional
          -- UunidentifiedSubParam must not be used in version <3
     CODE local:5 }

unknownEquipment  ERROR ::= {
     CODE local:7 }
```

```
-- subscription errors

roamingNotAllowed  ERROR ::= {
     PARAMETER
          RoamingNotAllowedParam
     CODE local:8 }

illegalSubscriber  ERROR ::= {
     PARAMETER
          IllegalSubscriberParam
          -- optional
          -- IllegalSubscriberParam must not be used in version <3
     CODE local:9 }

illegalEquipment  ERROR ::= {
     PARAMETER
          IllegalEquipmentParam
          -- optional
          -- IllegalEquipmentParam must not be used in version <3
     CODE local:12 }

bearerServiceNotProvisioned  ERROR ::= {
     PARAMETER
          BearerServNotProvParam
          -- optional
          -- BearerServNotProvParam must not be used in version <3
     CODE local:10 }

teleserviceNotProvisioned  ERROR ::= {
     PARAMETER
          TeleservNotProvParam
          -- optional
          -- TeleservNotProvParam must not be used in version <3
     CODE local:11 }

-- handover errors

noHandoverNumberAvailable  ERROR ::= {
     CODE local:25 }

subsequentHandoverFailure  ERROR ::= {
     CODE local:26 }

targetCellOutsideGroupCallArea  ERROR ::= {
     PARAMETER
          TargetCellOutsideGCA-Param
          -- optional
     CODE local:42 }

-- operation and maintenance errors

tracingBufferFull  ERROR ::= {
     PARAMETER
          TracingBufferFullParam
          -- optional
     CODE local: 40 }

-- call handling errors

noRoamingNumberAvailable  ERROR ::= {
     PARAMETER
          NoRoamingNbParam
          -- optional
     CODE local:39 }

absentSubscriber  ERROR ::= {
     PARAMETER
          AbsentSubscriberParam
          -- optional
          -- AbsentSubscriberParam must not be used in version <3
     CODE local:27 }
```

```
busySubscriber  ERROR ::= {
     PARAMETER
          BusySubscriberParam
          -- optional
     CODE local:45 }
```

```
noSubscriberReply  ERROR ::= {
     PARAMETER
          NoSubscriberReplyParam
          -- optional
     CODE local:46 }
```

```
callBarred  ERROR ::= {
     PARAMETER
          CallBarredParam
          -- optional
     CODE local:13 }
```

```
forwardingViolation  ERROR ::= {
     PARAMETER
          ForwardingViolationParam
          -- optional
     CODE local:14 }
```

```
forwardingFailed  ERROR ::= {
     PARAMETER
          ForwardingFailedParam
          -- optional
     CODE local:47 }
```

```
cug-Reject  ERROR ::= {
     PARAMETER
          CUG-RejectParam
          -- optional
     CODE local:15 }
```

```
or-NotAllowed  ERROR ::= {
     PARAMETER
          OR-NotAllowedParam
          -- optional
     CODE local:48 }
```

```
-- any time interrogation errors
ati-NotAllowed  ERROR ::= {
     PARAMETER
          ATI-NotAllowedParam
          -- optional
     CODE local:49 }
```

```
-- any time information handling errors
atsi-NotAllowed  ERROR ::= {
     PARAMETER
          ATSI-NotAllowedParam
          -- optional
     CODE local:60 }
```

```
atm-NotAllowed  ERROR ::= {
     PARAMETER
          ATM-NotAllowedParam
          -- optional
     CODE local:61 }
```

```
informationNotAvailable  ERROR ::= {
     PARAMETER
          InformationNotAvailableParam
          -- optional
     CODE local:62 }
```

```
-- supplementary service errors
```

```
illegalSS-Operation  ERROR ::= {
     PARAMETER
          IllegalSS-OperationParam
          -- optional
          -- IllegalSS-OperationParam must not be used in version <3
```

```
     CODE local:16 }
```

```
ss-ErrorStatus  ERROR ::= {
     PARAMETER
          SS-Status
          -- optional
     CODE local:17 }
```

```
ss-NotAvailable  ERROR ::= {
     PARAMETER
          SS-NotAvailableParam
          -- optional
          -- SS-NotAvailableParam must not be used in version <3
     CODE local:18 }
```

```
ss-SubscriptionViolation  ERROR ::= {
     PARAMETER
          SS-SubscriptionViolationParam
          -- optional
          -- SS-SubscriptionViolationParam must not be used in version <3
     CODE local:19 }
```

```
ss-Incompatibility  ERROR ::= {
     PARAMETER
          SS-IncompatibilityCause
          -- optional
     CODE local:20 }
```

```
unknownAlphabet  ERROR ::= {
     CODE local:71 }
```

```
ussd-Busy  ERROR ::= {
     CODE local:72 }
```

```
pw-RegistrationFailure  ERROR ::= {
     PARAMETER
          PW-RegistrationFailureCause
     CODE local:37 }
```

```
negativePW-Check  ERROR ::= {
     CODE local:38 }
```

```
numberOfPW-AttemptsViolation  ERROR ::= {
     CODE local:43 }
```

```
shortTermDenial  ERROR ::= {
     PARAMETER
          ShortTermDenialParam
          -- optional
     CODE local:29 }
```

```
longTermDenial  ERROR ::= {
     PARAMETER
          LongTermDenialParam
          -- optional
     CODE local:30 }
```

```
-- short message service errors
```

```
subscriberBusyForMT-SMS  ERROR ::= {
     PARAMETER
          SubBusyForMT-SMS-Param
          -- optional
     CODE local:31 }
```

```
sm-DeliveryFailure  ERROR ::= {
     PARAMETER
          SM-DeliveryFailureCause
     CODE local:32 }
```

```
messageWaitingListFull  ERROR ::= {
     PARAMETER
          MessageWaitListFullParam
          -- optional
     CODE local:33 }
```

```
absentSubscriberSM  ERROR ::= {
     PARAMETER
          AbsentSubscriberSM-Param
          -- optional
     CODE local:6 }
```

```
-- Group Call errors
```

```
noGroupCallNumberAvailable  ERROR ::= {
     PARAMETER
          NoGroupCallNbParam
          -- optional
     CODE local:50 }
```

```
-- location service errors
```

```
unauthorizedRequestingNetwork  ERROR ::= {
     PARAMETER
          UnauthorizedRequestingNetwork-Param
          -- optional
     CODE local:52 }
```

```
unauthorizedLCSClient  ERROR ::= {
     PARAMETER
          UnauthorizedLCSClient-Param
          -- optional
     CODE local:53 }
```

```
positionMethodFailure  ERROR ::= {
     PARAMETER
          PositionMethodFailure-Param
          -- optional
     CODE local:54 }
```

```
unknownOrUnreachableLCSClient  ERROR ::= {
     PARAMETER
          UnknownOrUnreachableLCSClient-Param
          -- optional
     CODE local:58 }
```

```
mm-EventNotSupported  ERROR ::= {
     PARAMETER
          MM-EventNotSupported-Param
          -- optional
     CODE local:59 }
```

```
   -- Secure transport errors
```

```
secureTransportError  ERROR ::= {
     PARAMETER
          SecureTransportErrorParam
     CODE local:4 }
```

```
END
```

## 17.6.7 Group Call operations

```
MAP-Group-Call-Operations {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-Group-Call-Operations (22)
   version8 (8)version9 (9)}

DEFINITIONS

::=

BEGIN

EXPORTS
   prepareGroupCall,
```

```
   sendGroupCallEndSignal,
   forwardGroupCallSignalling,
   processGroupCallSignalling
;

IMPORTS
   OPERATION
FROM Remote-Operations-Information-Objects {
   joint-iso-itu-t remote-operations(4)
  informationObjects(5) version1(0)}

   systemFailure,
   unexpectedDataValue,
   noGroupCallNumberAvailable
FROM MAP-Errors {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-Errors (10) ~~version8 (8)~~version9 (9)}

   PrepareGroupCallArg,
   PrepareGroupCallRes,
   SendGroupCallEndSignalArg,
   SendGroupCallEndSignalRes,
   ForwardGroupCallSignallingArg,
   ProcessGroupCallSignallingArg
FROM MAP-GR-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-GR-DataTypes (23) ~~version8 (8)~~version9 (9)}


;
```

```
prepareGroupCall  OPERATION ::= {                                    --Timer m
     ARGUMENT
          PrepareGroupCallArg
     RESULT
     PrepareGroupCallRes
     ERRORS {
          systemFailure |
          noGroupCallNumberAvailable |
          unexpectedDataValue}
     CODE local:39 }
```

```
sendGroupCallEndSignal  OPERATION ::= {                              --Timer l
     ARGUMENT
          SendGroupCallEndSignalArg
     RESULT
          SendGroupCallEndSignalRes
     CODE local:40 }
```

```
processGroupCallSignalling  OPERATION ::= {                           --Timer s
     ARGUMENT
          ProcessGroupCallSignallingArg
     CODE local:41 }
```

```
forwardGroupCallSignalling  OPERATION ::= {                           --Timer s
     ARGUMENT
          ForwardGroupCallSignallingArg
     CODE local:42 }
```

```
END
```

## 17.6.8 Location service operations

```
MAP-LocationServiceOperations {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-LocationServiceOperations (24)
   ~~version8 (8)~~version9 (9)}

DEFINITIONS

::=

BEGIN

EXPORTS
   provideSubscriberLocation,
   sendRoutingInfoForLCS,
   subscriberLocationReport
;

IMPORTS
   OPERATION
FROM Remote-Operations-Information-Objects {
   joint-iso-itu-t remote-operations(4)
  informationObjects(5) version1(0)}

   systemFailure,
   dataMissing,
   unexpectedDataValue,
   facilityNotSupported,
   unknownSubscriber,
   absentSubscriber,
   unauthorizedRequestingNetwork,
   unauthorizedLCSClient,
   positionMethodFailure,
   resourceLimitation,
   unknownOrUnreachableLCSClient,
   unidentifiedSubscriber,
   illegalEquipment,
   illegalSubscriber
FROM MAP-Errors {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-Errors (10) ~~version8 (8)~~version9 (9)}

   RoutingInfoForLCS-Arg,
   RoutingInfoForLCS-Res,
   ProvideSubscriberLocation-Arg,
   ProvideSubscriberLocation-Res,
   SubscriberLocationReport-Arg,
   SubscriberLocationReport-Res
FROM MAP-LCS-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-LCS-DataTypes (25) ~~version8 (8)~~version9 (9)}
;

sendRoutingInfoForLCS  OPERATION ::= {                                  --Timer m
    ARGUMENT
         RoutingInfoForLCS-Arg
    RESULT
         RoutingInfoForLCS-Res
    ERRORS {
         systemFailure |
         dataMissing |
         unexpectedDataValue |
         facilityNotSupported |
         unknownSubscriber |
         absentSubscriber |
         unauthorizedRequestingNetwork }
    CODE local:85 }
```

```
provideSubscriberLocation  OPERATION ::= {                                --Timer ml
     ARGUMENT
          ProvideSubscriberLocation-Arg
     RESULT
          ProvideSubscriberLocation-Res
     ERRORS {
          systemFailure |
          dataMissing |
          unexpectedDataValue |
          facilityNotSupported |
          unidentifiedSubscriber |
          illegalSubscriber |
          illegalEquipment |
          absentSubscriber |
          unauthorizedRequestingNetwork |
          unauthorizedLCSClient |
          positionMethodFailure }
     CODE local:83 }

subscriberLocationReport  OPERATION ::= {                                 --Timer m
     ARGUMENT
          SubscriberLocationReport-Arg
     RESULT
          SubscriberLocationReport-Res
     ERRORS {
          systemFailure |
          dataMissing |
          resourceLimitation |
          unexpectedDataValue |
          unknownSubscriber |
          unauthorizedRequestingNetwork |
          unknownOrUnreachableLCSClient}
     CODE local:86 }


END
```

## 17.6.9 Secure transport operations

```
MAP-SecureTransportOperations {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-SecureTransportOperations (26)
   version8 (8)version9 (9)}

DEFINITIONS

::=

BEGIN

EXPORTS
   secureTransportClass1,
   secureTransportClass2,
   secureTransportClass3,
   secureTransportClass4
;

IMPORTS
   OPERATION
FROM Remote-Operations-Information-Objects {
   joint-iso-itu-t remote-operations(4)
  informationObjects(5) version1(0)}

   dataMissing,
   secureTransportError,
   unexpectedDataValue

FROM MAP-Errors {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-Errors (10) version8 (8)version9 (9)}

   SecureTransportArg,
   SecureTransportRes

FROM MAP-ST-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-ST-DataTypes (27) version8 (8)version9 (9)}
```

```
;

secureTransportClass1  OPERATION ::= {              --Timer shall be the same as for the
                                                    --securely transported operation
    ARGUMENT
         SecureTransportArg
    RESULT
         SecureTransportRes
    ERRORS {
         secureTransportError |
         dataMissing |
         unexpectedDataValue}
    CODE local:78 }

secureTransportClass2  OPERATION ::= {              --Timer shall be the same as for the
                                                    --securely transported operation
    ARGUMENT
         SecureTransportArg
    ERRORS {
         secureTransportError |
         dataMissing |
         unexpectedDataValue}
    CODE local:79 }

secureTransportClass3  OPERATION ::= {              --Timer shall be the same as for the
                                                    --securely transported operation
    ARGUMENT
         SecureTransportArg
    RESULT
         SecureTransportRes
    CODE local:80 }

secureTransportClass4  OPERATION ::= {              --Timer shall be the same as for the
                                                    --securely transported operation
    ARGUMENT
         SecureTransportArg
    CODE local:81 }

END
```

# 17.7 MAP constants and data types

## 17.7.1 Mobile Service data types

```
MAP-MS-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-MS-DataTypes (11) ~~version8 (8)~~version9 (9)}

DEFINITIONS

IMPLICIT TAGS

::=

BEGIN

EXPORTS

   -- location registration types
   UpdateLocationArg,
   UpdateLocationRes,
   CancelLocationArg,
   CancelLocationRes,
   PurgeMS-Arg,
   PurgeMS-Res,
   SendIdentificationArg,
   SendIdentificationRes,
   UpdateGprsLocationArg,
   UpdateGprsLocationRes,
   IST-SupportIndicator,
   SupportedLCS-CapabilitySets,
```

```
   -- gprs location registration types
   GSN-Address,

   -- handover types
   ForwardAccessSignalling-Arg,
   PrepareHO-Arg,
   PrepareHO-Res,
   PrepareSubsequentHO-Arg,
   PrepareSubsequentHO-Res,
   ProcessAccessSignalling-Arg,
   SendEndSignal-Arg,
   SendEndSignal-Res,


   -- authentication management types
   SendAuthenticationInfoArg,
   SendAuthenticationInfoRes,
   AuthenticationFailureReportArg,
   AuthenticationFailureReportRes,

   -- security management types
   EquipmentStatus,
   Kc,

   -- subscriber management types
   InsertSubscriberDataArg,
   InsertSubscriberDataRes,
   LSAIdentity,
   DeleteSubscriberDataArg,
   DeleteSubscriberDataRes,
   Ext-QoS-Subscribed,
   SubscriberData,
   ODB-Data,
   SubscriberStatus,
   ZoneCodeList,
   maxNumOfZoneCodes,
   O-CSI,
   D-CSI,
   O-BcsmCamelTDPCriteriaList,
   T-BCSM-CAMEL-TDP-CriteriaList,
   SS-CSI,
   ServiceKey,
   DefaultCallHandling,
   CamelCapabilityHandling,
   BasicServiceCriteria,
   SupportedCamelPhases,
   OfferedCamel4CSIs,
   OfferedCamel4Functionalities,
   maxNumOfCamelTDPData,
   CUG-Index,
   CUG-Info,
   CUG-Interlock,
   InterCUG-Restrictions,
   IntraCUG-Options,
   NotificationToMSUser,
   QoS-Subscribed,
   IST-AlertTimerValue,
   T-CSI,
   T-BcsmTriggerDetectionPoint,
   APN,

   -- fault recovery types
   ResetArg,
   RestoreDataArg,
   RestoreDataRes,

-- provide subscriber info types
   GeographicalInformation,
   MS-Classmark2,
   GPRSMSClass,

   -- subscriber information enquiry types
   ProvideSubscriberInfoArg,
   ProvideSubscriberInfoRes,
   SubscriberInfo,
   LocationInformation,
   LocationInformationGPRS,
   RAIdentity,
   SubscriberState,
```

```
    GPRSChargingID,

    -- any time information enquiry types
    AnyTimeInterrogationArg,
    AnyTimeInterrogationRes,

    -- any time information handling types
    AnyTimeSubscriptionInterrogationArg,
    AnyTimeSubscriptionInterrogationRes,
    AnyTimeModificationArg,
    AnyTimeModificationRes,

    -- subscriber data modification notification types
    NoteSubscriberDataModifiedArg,
    NoteSubscriberDataModifiedRes,

    -- gprs location information retrieval types
    SendRoutingInfoForGprsArg,
    SendRoutingInfoForGprsRes,

    -- failure reporting types
    FailureReportArg,
    FailureReportRes,

    -- gprs notification types
    NoteMsPresentForGprsArg,
    NoteMsPresentForGprsRes,

    -- Mobility Management types
    NoteMM-EventArg,
    NoteMM-EventRes



;

IMPORTS
    maxNumOfSS,
    SS-SubscriptionOption,
    SS-List,
    SS-ForBS-Code,
    Password
FROM MAP-SS-DataTypes {
    itu-t identified-organization (4) etsi (0) mobileDomain (0)
    gsm-Network (1) modules (3) map-SS-DataTypes (14) version8 (8)version9 (9)}

    SS-Code
FROM MAP-SS-Code {
    itu-t identified-organization (4) etsi (0) mobileDomain (0)
    gsm-Network (1) modules (3) map-SS-Code (15) version8 (8)version9 (9)}

    Ext-BearerServiceCode
FROM MAP-BS-Code {
    itu-t identified-organization (4) etsi (0) mobileDomain (0)
    gsm-Network (1) modules (3) map-BS-Code (20) version8 (8)version9 (9)}

    Ext-TeleserviceCode
FROM MAP-TS-Code {
    itu-t identified-organization (4) etsi (0) mobileDomain (0)
    gsm-Network (1) modules (3) map-TS-Code (19) version8 (8)version9 (9)}


    AddressString,
    ISDN-AddressString,
    ISDN-SubaddressString,
    FTN-AddressString,
    AccessNetworkSignalInfo,
    IMSI,
    IMEI,
    TMSI,
    HLR-List,
    LMSI,
    Identity,
    GlobalCellId,
    CellGlobalIdOrServiceAreaIdOrLAI,
    Ext-BasicServiceCode,
    NAEA-PreferredCI,
    EMLPP-Info,
    MC-SS-Info,
```

```
   SubscriberIdentity,
   AgeOfLocationInformation,
   LCSClientExternalID,
   LCSClientInternalID,
   Ext-SS-Status,
   LCSServiceTypeID


FROM MAP-CommonDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-CommonDataTypes (18) version8 (8)version9 (9)}

   ExtensionContainer
FROM MAP-ExtensionDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-ExtensionDataTypes (21) version8 (8)version9 (9)}

   AbsentSubscriberDiagnosticSM
FROM MAP-ER-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-ER-DataTypes (17) version8 (8)version9 (9)}


;


-- location registration types
```

```
UpdateLocationArg ::= SEQUENCE {
    imsi                                IMSI,

    msc-Number                          [1] ISDN-AddressString,
    vlr-Number                          ISDN-AddressString,
    lmsi                                [10] LMSI OPTIONAL,
    extensionContainer                  ExtensionContainer              OPTIONAL,
    ... ,
    vlr-Capability                      [6] VLR-Capability              OPTIONAL,
    informPreviousNetworkEntity         [11] NULL                       OPTIONAL,
    cs-LCS-NotSupportedByUE             [12] NULL                       OPTIONAL,
    v-gmlc-Address                      [2]  GSN-Address                OPTIONAL }
```

```
VLR-Capability ::= SEQUENCE{
    supportedCamelPhases                [0] SupportedCamelPhases        OPTIONAL,
    extensionContainer                  ExtensionContainer              OPTIONAL,
    ... ,
    solsaSupportIndicator               [2] NULL                        OPTIONAL,
    istSupportIndicator                 [1] IST-SupportIndicator        OPTIONAL,
    superChargerSupportedInServingNetworkEntity   [3] SuperChargerInfo  OPTIONAL,
    longFTN-Supported                   [4]  NULL                       OPTIONAL,
    supportedLCS-CapabilitySets         [5]  SupportedLCS-CapabilitySets OPTIONAL,
    offeredCamel4CSIs                   [6] OfferedCamel4CSIs           OPTIONAL }
```

```
SuperChargerInfo ::= CHOICE {
    sendSubscriberData                  [0] NULL,
    subscriberDataStored                [1] AgeIndicator }
```

```
AgeIndicator ::= OCTET STRING (SIZE (1..6))
    -- The internal structure of this parameter is implementation specific.
```

```
IST-SupportIndicator ::=  ENUMERATED {
    basicISTSupported                   (0),
    istCommandSupported                 (1),
    ...}
-- exception handling:
-- reception of values > 1 shall be mapped to ' istCommandSupported '
```

```
SupportedLCS-CapabilitySets ::= BIT STRING {
     lcsCapabilitySet1 (0),
     lcsCapabilitySet2 (1),
     lcsCapabilitySet3 (2) } (SIZE (2..16))
-- Core network signalling capability set1 indicates LCS Release98 or Release99 version.
-- Core network signalling capability set2 indicates LCS Release4.
-- Core network signalling capability set3 indicates LCS Release5 or later version.
-- A node shall mark in the BIT STRING all LCS capability sets it supports.
-- If no bit is set then the sending node does not support LCS.
-- If the parameter is not sent by an VLR then the VLR may support at most capability set1.
-- If the parameter is not sent by an SGSN then no support for LCS is assumed.
-- An SGSN is not allowed to indicate support of capability set1.
-- Other bits than listed above shall be discarded.
```

```
UpdateLocationRes ::= SEQUENCE {
     hlr-Number                          ISDN-AddressString,

     extensionContainer                  ExtensionContainer              OPTIONAL,
     ... }
```

```
CancelLocationArg ::= [3] SEQUENCE {
     identity                            Identity,
     cancellationType                    CancellationType                OPTIONAL,
     extensionContainer                  ExtensionContainer              OPTIONAL,
     ...}
```

```
CancellationType ::= ENUMERATED {
     updateProcedure                     (0),
     subscriptionWithdraw                (1),
     ...}
     -- The HLR shall not send values other than listed above
```

```
CancelLocationRes ::= SEQUENCE {
     extensionContainer                  ExtensionContainer              OPTIONAL,
     ...}
```

```
PurgeMS-Arg ::= [3] SEQUENCE {
     imsi                                IMSI,
     vlr-Number                          [0] ISDN-AddressString          OPTIONAL,
     sgsn-Number                         [1]  ISDN-AddressString         OPTIONAL,
     extensionContainer                  ExtensionContainer              OPTIONAL,
     ...}
```

```
PurgeMS-Res ::= SEQUENCE {
     freezeTMSI                          [0]  NULL                       OPTIONAL,
     freezeP-TMSI                        [1]  NULL                       OPTIONAL,
     extensionContainer                  ExtensionContainer              OPTIONAL,
     ...}
```

```
SendIdentificationArg ::= SEQUENCE {
     tmsi                                TMSI,
     numberOfRequestedVectors            NumberOfRequestedVectors        OPTIONAL,
     -- within a dialogue numberOfRequestedVectors shall be present in
     -- the first service request and shall not be present in subsequent service requests.
     -- If received in a subsequent service request it shall be discarded.
     segmentationProhibited              NULL                            OPTIONAL,
     extensionContainer                  ExtensionContainer              OPTIONAL,
     ...}
```

```
SendIdentificationRes ::= [3] SEQUENCE {
     imsi                                IMSI                            OPTIONAL,
     -- IMSI shall be present in the first (or only) service response of a dialogue.
     -- If multiple service requests are present in a dialogue then IMSI
     -- shall not be present in any service response other than the first one.
     authenticationSetList               AuthenticationSetList           OPTIONAL,
     currentSecurityContext              [2]CurrentSecurityContext       OPTIONAL,
     extensionContainer                  [3] ExtensionContainer          OPTIONAL,
     ...}
```

```
-- authentication management types
```

```
AuthenticationSetList ::= CHOICE {
     tripletList                         [0] TripletList,
     quintupletList                      [1] QuintupletList }
```

```
TripletList ::= SEQUENCE SIZE (1..5) OF
                                        AuthenticationTriplet
```

```
QuintupletList ::= SEQUENCE SIZE (1..5) OF
                                        AuthenticationQuintuplet
```

```
AuthenticationTriplet ::= SEQUENCE {
    rand                                RAND,
    sres                                SRES,
    kc                                  Kc,
    ...}
```

```
AuthenticationQuintuplet ::= SEQUENCE {
    rand                                RAND,
    xres                                XRES,
    ck                                  CK,
    ik                                  IK,
    autn                                AUTN,
    ...}
```

```
CurrentSecurityContext ::= CHOICE {
    gsm-SecurityContextData             [0] GSM-SecurityContextData,
    umts-SecurityContextData            [1] UMTS-SecurityContextData }
```

```
GSM-SecurityContextData ::= SEQUENCE {
    kc                                  Kc,
    cksn                                Cksn,
    ... }
```

```
UMTS-SecurityContextData ::= SEQUENCE {
    ck                                  CK,
    ik                                  IK,
    ksi                                 KSI,
    ... }
```

```
RAND ::= OCTET STRING (SIZE (16))
```

```
SRES ::= OCTET STRING (SIZE (4))
```

```
Kc ::= OCTET STRING (SIZE (8))
```

```
XRES ::= OCTET STRING (SIZE (4..16))
```

```
CK ::= OCTET STRING (SIZE (16))
```

```
IK ::= OCTET STRING (SIZE (16))
```

```
AUTN ::= OCTET STRING (SIZE (16))
```

```
AUTS ::= OCTET STRING (SIZE (14))
```

```
Cksn ::= OCTET STRING (SIZE (1))
    -- The internal structure is defined in 3GPP TS 24.008
```

```
KSI ::= OCTET STRING (SIZE (1))
    -- The internal structure is defined in 3GPP TS 24.008
```

```
AuthenticationFailureReportArg ::= SEQUENCE {
    imsi                                IMSI,
    failureCause                        FailureCause,
    extensionContainer                  ExtensionContainer              OPTIONAL,
    ... ,
    re-attempt                          BOOLEAN                         OPTIONAL,
    accessType                          AccessType                      OPTIONAL,
    rand                                RAND                            OPTIONAL,
    vlr-Number                          [0] ISDN-AddressString          OPTIONAL,
    sgsn-Number                         [1] ISDN-AddressString          OPTIONAL }
```

```
AccessType ::= ENUMERATED {
    call (0),
    emergencyCall (1),
    locationUpdating (2),
    supplementaryService (3),
    shortMessage (4),
    gprsAttach (5),
```

```
    routingAreaUpdating (6),
    serviceRequest (7),
    pdpContextActivation (8),
    pdpContextDeactivation (9),
    ...}
    -- exception handling:
    -- received values greater than 9 shall be ignored.
```

```
AuthenticationFailureReportRes ::= SEQUENCE {
    extensionContainer                  ExtensionContainer              OPTIONAL,
    ...}
```

```
FailureCause ::= ENUMERATED {
    wrongUserResponse  (0),
    wrongNetworkSignature  (1)}
```

*-- gprs location registration types*

```
UpdateGprsLocationArg ::= SEQUENCE {
    imsi                                IMSI,
    sgsn-Number                         ISDN-AddressString,
    sgsn-Address                        GSN-Address,
    extensionContainer                  ExtensionContainer              OPTIONAL,
    ... ,
    sgsn-Capability                     [0] SGSN-Capability             OPTIONAL,
    informPreviousNetworkEntity         [1]  NULL                       OPTIONAL,
    ps-LCS-NotSupportedByUE             [2]  NULL                       OPTIONAL,
    v-gmlc-Address                      [3]  GSN-Address                OPTIONAL }
```

```
SGSN-Capability ::= SEQUENCE{
    solsaSupportIndicator               NULL                            OPTIONAL,
    extensionContainer                  [1] ExtensionContainer          OPTIONAL,
    ... ,
    superChargerSupportedInServingNetworkEntity   [2] SuperChargerInfo  OPTIONAL ,
    gprsEnhancementsSupportIndicator    [3] NULL                        OPTIONAL,
    supportedCamelPhases                [4] SupportedCamelPhases        OPTIONAL,
    supportedLCS-CapabilitySets         [5]  SupportedLCS-CapabilitySets OPTIONAL,
    offeredCamel4CSIs                   [6] OfferedCamel4CSIs           OPTIONAL }
```

```
GSN-Address ::= OCTET STRING (SIZE (5..17))
    -- Octets are coded according to TS 3GPP TS 23.003 [17]
```

```
UpdateGprsLocationRes ::= SEQUENCE {
    hlr-Number                          ISDN-AddressString,
    extensionContainer                  ExtensionContainer              OPTIONAL,
    ...}
```

*-- handover types*

```
ForwardAccessSignalling-Arg ::= [3] SEQUENCE {
    an-APDU                             AccessNetworkSignalInfo,
    integrityProtectionInfo             [0] IntegrityProtectionInformation  OPTIONAL,
    encryptionInfo                      [1] EncryptionInformation           OPTIONAL,
    keyStatus                           [2]  KeyStatus                  OPTIONAL,
    allowedGSM-Algorithms               [4]  AllowedGSM-Algorithms      OPTIONAL,
    allowedUMTS-Algorithms              [5]  AllowedUMTS-Algorithms     OPTIONAL,
    radioResourceInformation            [6] RadioResourceInformation    OPTIONAL,
    extensionContainer                  [3]  ExtensionContainer         OPTIONAL,
    ...,
    radioResourceList                   [7]  RadioResourceList          OPTIONAL,
    bssmap-ServiceHandover              [9]  BSSMAP-ServiceHandover     OPTIONAL,
    ranap-ServiceHandover               [8]  RANAP-ServiceHandover      OPTIONAL,
    bssmap-ServiceHandoverList          [10] BSSMAP-ServiceHandoverList OPTIONAL,
    currentlyUsedCodec                  [11] Codec                      OPTIONAL,
    availableCodecsList                 [12] AvailableCodecsList        OPTIONAL,
    rab-ConfigurationIndicator          [13] NULL                       OPTIONAL }
```

```
AllowedGSM-Algorithms ::= OCTET STRING (SIZE (1))
    -- internal structure is coded as Algorithm identifier octet from
    -- Permitted Algorithms defined in 3GPP TS 48.008
    -- A node shall mark all GSM algorithms that are allowed in MSC-B
```

```
AllowedUMTS-Algorithms ::= SEQUENCE {
     integrityProtectionAlgorithms        [0]  PermittedIntegrityProtectionAlgorithms
     OPTIONAL,
     encryptionAlgorithms                 [1]  PermittedEncryptionAlgorithms  OPTIONAL,
     extensionContainer                   [2]  ExtensionContainer             OPTIONAL,
     ...}
```

```
PermittedIntegrityProtectionAlgorithms ::=
          OCTET STRING (SIZE (1..maxPermittedIntegrityProtectionAlgorithmsLength))
     -- Octets contain a complete PermittedIntegrityProtectionAlgorithms data type
     -- as defined in 3GPP TS 25.413, encoded according to the encoding scheme
     -- mandated by 3GPP TS 25.413.
     -- Padding bits are included, if needed, in the least significant bits of the
     -- last octet of the octet string.
```

```
maxPermittedIntegrityProtectionAlgorithmsLength INTEGER ::= 9
```

```
PermittedEncryptionAlgorithms ::=
          OCTET STRING (SIZE (1..maxPermittedEncryptionAlgorithmsLength))
     -- Octets contain a complete PermittedEncryptionAlgorithms data type
     -- as defined in 3GPP TS 25.413, encoded according to the encoding scheme
     -- mandated by 3GPP TS 25.413
     -- Padding bits are included, if needed, in the least significant bits of the
     -- last octet of the octet string.
```

```
maxPermittedEncryptionAlgorithmsLength INTEGER ::= 9
```

```
KeyStatus ::= ENUMERATED {
     old  (0),
     new  (1),
     ...}
     -- exception handling:
     -- received values in range 2-31 shall be treated as "old"
     -- received values greater than 31 shall be treated as "new"
```

```
PrepareHO-Arg ::= [3] SEQUENCE {
     targetCellId                         [0] GlobalCellId                  OPTIONAL,
     ho-NumberNotRequired                 NULL                              OPTIONAL,
     targetRNCId                          [1] RNCId                         OPTIONAL,
     an-APDU                              [2] AccessNetworkSignalInfo       OPTIONAL,
     multipleBearerRequested              [3] NULL                          OPTIONAL,
     imsi                                 [4] IMSI                          OPTIONAL,
     integrityProtectionInfo              [5] IntegrityProtectionInformation  OPTIONAL,
     encryptionInfo                       [6] EncryptionInformation          OPTIONAL,
     radioResourceInformation             [7] RadioResourceInformation      OPTIONAL,
     allowedGSM-Algorithms                [9]  AllowedGSM-Algorithms        OPTIONAL,
     allowedUMTS-Algorithms               [10] AllowedUMTS-Algorithms       OPTIONAL,
     radioResourceList                    [11] RadioResourceList            OPTIONAL,
     extensionContainer                   [8] ExtensionContainer            OPTIONAL,
     ... ,
     rab-Id                               [12] RAB-Id                       OPTIONAL,
     bssmap-ServiceHandover               [13] BSSMAP-ServiceHandover       OPTIONAL,
     ranap-ServiceHandover                [14] RANAP-ServiceHandover        OPTIONAL,
     bssmap-ServiceHandoverList           [15] BSSMAP-ServiceHandoverList   OPTIONAL,
     geran-classmark                      [16] GERAN-Classmark              OPTIONAL,
     currentlyUsedCodec                   [17] Codec                        OPTIONAL,
     availableCodecsList                  [18] AvailableCodecsList          OPTIONAL,
     rab-ConfigurationIndicator           [19] NULL                         OPTIONAL   }
```

```
BSSMAP-ServiceHandoverList ::= SEQUENCE SIZE (2.. maxNumOfServiceHandovers) OF
                               BSSMAP-ServiceHandoverInfo
```

```
BSSMAP-ServiceHandoverInfo ::= SEQUENCE {
     bssmap-ServiceHandover               BSSMAP-ServiceHandover,
     rab-Id                               RAB-Id,
     -- RAB Identity is needed to relate the service handovers with the radio access bearers.
     ...}
```

```
maxNumOfServiceHandovers  INTEGER ::= 7
```

```
BSSMAP-ServiceHandover ::= OCTET STRING (SIZE (1))
     -- Octets are coded according the Service Handover information element in
     -- 3GPP TS 48.008.
```

```
RANAP-ServiceHandover ::= OCTET STRING (SIZE (1))
     -- Octet contains a complete Service-Handover data type
     -- as defined in 3GPP TS 25.413, encoded according to the encoding scheme
     -- mandated by 3GPP TS 25.413
     -- Padding bits are included in the least significant bits.
```

```
RadioResourceList ::= SEQUENCE SIZE (2.. maxNumOfRadioResources) OF
                                   RadioResource
```

```
RadioResource ::= SEQUENCE {
     radioResourceInformation            RadioResourceInformation,
     rab-Id                              RAB-Id,
     -- RAB Identity is needed to relate the radio resources with the radio access bearers.
     ...}
```

```
maxNumOfRadioResources  INTEGER ::= 7
```

```
PrepareHO-Res ::= [3] SEQUENCE {
     handoverNumber                      [0] ISDN-AddressString            OPTIONAL,
     relocationNumberList                [1]  RelocationNumberList         OPTIONAL,
     an-APDU                             [2]  AccessNetworkSignalInfo      OPTIONAL,
     multicallBearerInfo                 [3]  MulticallBearerInfo          OPTIONAL,
     multipleBearerNotSupported          NULL                              OPTIONAL,
     selectedUMTS-Algorithms             [5]  SelectedUMTS-Algorithms      OPTIONAL,
     chosenRadioResourceInformation      [6] ChosenRadioResourceInformation OPTIONAL,
     extensionContainer                  [4]  ExtensionContainer           OPTIONAL,
     ...,
     selectedCodec                       [7] Codec                         OPTIONAL }
```

```
SelectedUMTS-Algorithms ::= SEQUENCE {
     integrityProtectionAlgorithm        [0]  ChosenIntegrityProtectionAlgorithm   OPTIONAL,
     encryptionAlgorithm                 [1]  ChosenEncryptionAlgorithm    OPTIONAL,
     extensionContainer                  [2]  ExtensionContainer           OPTIONAL,
     ...}
```

```
ChosenIntegrityProtectionAlgorithm ::= OCTET STRING (SIZE (1))
     -- Octet contains a complete IntegrityProtectionAlgorithm data type
     -- as defined in 3GPP TS 25.413, encoded according to the encoding scheme
     -- mandated by 3GPP TS 25.413
     -- Padding bits are included in the least significant bits.
```

```
ChosenEncryptionAlgorithm ::= OCTET STRING (SIZE (1))
     -- Octet contains a complete EncryptionAlgorithm data type
     -- as defined in 3GPP TS 25.413, encoded according to the encoding scheme
     -- mandated by 3GPP TS 25.413
     -- Padding bits are included in the least significant bits.
```

```
ChosenRadioResourceInformation ::= SEQUENCE {
     chosenChannelInfo                   [0] ChosenChannelInfo             OPTIONAL,
     chosenSpeechVersion                 [1] ChosenSpeechVersion           OPTIONAL,
     ...}
```

```
ChosenChannelInfo ::= OCTET STRING (SIZE (1))
     -- Octets are coded according the Chosen Channel information element in 3GPP TS 48.008
```

```
ChosenSpeechVersion ::= OCTET STRING (SIZE (1))
     -- Octets are coded according the Speech Version (chosen) information element in 3GPP TS
     -- 48.008
```

```
PrepareSubsequentHO-Arg ::= [3] SEQUENCE {
     targetCellId                        [0] GlobalCellId                  OPTIONAL,
     targetMSC-Number                    [1] ISDN-AddressString,
     targetRNCId                         [2] RNCId                         OPTIONAL,
     an-APDU                             [3]  AccessNetworkSignalInfo      OPTIONAL,
     selectedRab-Id                      [4]  RAB-Id                       OPTIONAL,
     extensionContainer                  [5]  ExtensionContainer           OPTIONAL,
     ...,
     geran-classmark                     [6] GERAN-Classmark               OPTIONAL,
     rab-ConfigurationIndicator          [7] NULL                          OPTIONAL }
```

```
PrepareSubsequentHO-Res ::= [3] SEQUENCE {
     an-APDU                          AccessNetworkSignalInfo,
     extensionContainer               [0]  ExtensionContainer          OPTIONAL,
     ...}
```

```
ProcessAccessSignalling-Arg ::= [3] SEQUENCE {
     an-APDU                          AccessNetworkSignalInfo,
     selectedUMTS-Algorithms          [1]  SelectedUMTS-Algorithms      OPTIONAL,
     selectedGSM-Algorithm            [2]  SelectedGSM-Algorithm        OPTIONAL,
     chosenRadioResourceInformation   [3] ChosenRadioResourceInformation OPTIONAL,
     selectedRab-Id                   [4] RAB-Id                        OPTIONAL,
     extensionContainer               [0]  ExtensionContainer           OPTIONAL,
     ...,
     selectedCodec                    [5] Codec                         OPTIONAL }
```

```
AvailableCodecsList ::= SEQUENCE {
     utranCodecList                   [0] CodecList                     OPTIONAL,
     geranCodecList                   [1] CodecList                     OPTIONAL,
     extensionContainer               [2] ExtensionContainer            OPTIONAL,
     ...}
```

```
CodecList ::= SEQUENCE {
     codec1                           [1] Codec,
     codec2                           [2] Codec                         OPTIONAL,
     codec3                           [3] Codec                         OPTIONAL,
     codec4                           [4] Codec                         OPTIONAL,
     codec5                           [5] Codec                         OPTIONAL,
     codec6                           [6] Codec                         OPTIONAL,
     codec7                           [7] Codec                         OPTIONAL,
     codec8                           [8] Codec                         OPTIONAL,
     extensionContainer               [9] ExtensionContainer            OPTIONAL,
     ...}
     -- Codecs are sent in priority order where codec1 has highest priority
```

```
Codec ::= OCTET STRING (SIZE (1..4))

     -- The internal structure is defined as follows:
     -- octet 1                       Coded as Codec Identification code in 3GPP TS 26.103
     -- octets 2,3,4                  Parameters for the Codec as defined in 3GPP TS
     --                               26.103, if available, length depending on the codec
```

```
GERAN-Classmark ::= OCTET STRING (SIZE (2..87))
     -- Octets are coded according the GERAN Classmark information element in 3GPP TS 48.008
```

```
SelectedGSM-Algorithm ::= OCTET STRING (SIZE (1))
     -- internal structure is coded as Algorithm identifier octet from Chosen Encryption
     -- Algorithm defined in 3GPP TS 48.008
     -- A node shall mark only the selected GSM algorithm
```

```
SendEndSignal-Arg ::= [3] SEQUENCE {
     an-APDU                          AccessNetworkSignalInfo,
     extensionContainer               [0]  ExtensionContainer          OPTIONAL,
     ...}
```

```
SendEndSignal-Res ::= SEQUENCE {
     extensionContainer               [0]  ExtensionContainer          OPTIONAL,
     ...}
```

```
RNCId ::= OCTET STRING (SIZE (7))
     -- The internal structure is defined as follows:
     -- octet 1 bits 4321             Mobile Country Code 1st digit
     --         bits 8765             Mobile Country Code 2nd digit
     -- octet 2 bits 4321             Mobile Country Code 3rd digit
     --         bits 8765             Mobile Network Code 3rd digit
     --                               or filler (1111) for 2 digit MNCs
     -- octet 3 bits 4321             Mobile Network Code 1st digit
     --         bits 8765             Mobile Network Code 2nd digit
     -- octets 4 and 5                Location Area Code according to 3GPP TS 24.008
     -- octets 6 and 7                RNC Id value according to 3GPP TS 25.413
```

```
RelocationNumberList ::= SEQUENCE SIZE (1..maxNumOfRelocationNumber) OF
                                      RelocationNumber
```

```
MulticallBearerInfo ::= INTEGER (1..maxNumOfRelocationNumber)
```

```
RelocationNumber ::= SEQUENCE {
    handoverNumber                  ISDN-AddressString,
    rab-Id                          RAB-Id,
    -- RAB Identity is needed to relate the calls with the radio access bearers.
    ...}
```

```
RAB-Id ::= INTEGER (1..maxNrOfRABs)
```

```
maxNrOfRABs INTEGER ::= 255
```

```
maxNumOfRelocationNumber  INTEGER ::= 7
```

```
RadioResourceInformation ::= OCTET STRING (SIZE (3..13))
    -- Octets are coded according the Channel Type information element in 3GPP TS 48.008
```

```
IntegrityProtectionInformation ::= OCTET STRING (SIZE (18..maxNumOfIntegrityInfo))
    -- Octets contain a complete IntegrityProtectionInformation data type
    -- as defined in 3GPP TS 25.413, encoded according to the encoding scheme
    -- mandated by 3GPP TS 25.413
    -- Padding bits are included, if needed, in the least significant bits of the
    -- last octet of the octet string.
```

```
maxNumOfIntegrityInfo INTEGER ::= 100
```

```
EncryptionInformation ::= OCTET STRING (SIZE (18..maxNumOfEncryptionInfo))
    -- Octets contain a complete EncryptionInformation data type
    -- as defined in 3GPP TS 25.413, encoded according to the encoding scheme
    -- mandated by 3GPP TS 25.413
    -- Padding bits are included, if needed, in the least significant bits of the
    -- last octet of the octet string.
```

```
maxNumOfEncryptionInfo INTEGER ::= 100
```

```
-- authentication management types
```

```
SendAuthenticationInfoArg ::= SEQUENCE {
    imsi                            [0] IMSI,
    numberOfRequestedVectors        NumberOfRequestedVectors,
    segmentationProhibited          NULL                            OPTIONAL,
    immediateResponsePreferred      [1] NULL                         OPTIONAL,
    re-synchronisationInfo          Re-synchronisationInfo          OPTIONAL,
    extensionContainer              [2] ExtensionContainer          OPTIONAL,
    ...,
    requestingNodeType              [3] RequestingNodeType          OPTIONAL}
```

```
NumberOfRequestedVectors ::= INTEGER (1..5)
```

```
Re-synchronisationInfo ::= SEQUENCE {
    rand                            RAND,
    auts                            AUTS,
    ...}
```

```
SendAuthenticationInfoRes ::= [3] SEQUENCE {
    authenticationSetList           AuthenticationSetList           OPTIONAL,
    extensionContainer              ExtensionContainer              OPTIONAL,
    ...}
```

```
RequestingNodeType ::= ENUMERATED {
    vlr  (0),
    sgsn  (1),
    ...}
    -- exception handling:
    -- received values in the range 2-15 shall be treated as "vlr"
    -- received values greater than 15 shall be treated as "sgsn"
```

```
-- security management types
```

```
EquipmentStatus ::= ENUMERATED {
     whiteListed  (0),
     blackListed  (1),
     greyListed  (2)}
```

*-- subscriber management types*

```
InsertSubscriberDataArg ::= SEQUENCE {
     imsi                                 [0] IMSI                          OPTIONAL,
     COMPONENTS OF                        SubscriberData,
     extensionContainer                   [14] ExtensionContainer           OPTIONAL,
     ... ,
     naea-PreferredCI                     [15] NAEA-PreferredCI             OPTIONAL,
     -- naea-PreferredCI is included at the discretion of the HLR operator.
     gprsSubscriptionData                 [16] GPRSSubscriptionData         OPTIONAL,
     roamingRestrictedInSgsnDueToUnsupportedFeature [23]                    NULL
                                                                            OPTIONAL,
     networkAccessMode                    [24] NetworkAccessMode            OPTIONAL,
     lsaInformation                       [25] LSAInformation               OPTIONAL,
     lmu-Indicator                        [21] NULL                         OPTIONAL,
     lcsInformation                       [22] LCSInformation               OPTIONAL,
          istAlertTimer                   [26] IST-AlertTimerValue          OPTIONAL,
          superChargerSupportedInHLR      [27] AgeIndicator                 OPTIONAL,
          mc-SS-Info                      [28] MC-SS-Info                   OPTIONAL,
     cs-AllocationRetentionPriority       [29] CS-AllocationRetentionPriority   OPTIONAL,
     sgsn-CAMEL-SubscriptionInfo          [17] SGSN-CAMEL-SubscriptionInfo  OPTIONAL,
     chargingCharacteristics              [18] ChargingCharacteristics      OPTIONAL
 }
     -- If the Network Access Mode parameter is sent, it shall be present only in
     -- the first sequence if seqmentation is used
```

```
CS-AllocationRetentionPriority ::= OCTET STRING (SIZE (1))
     -- This data type encodes each priority level defined in TS 23.107 as the binary value
     -- of the priority level.
```

```
IST-AlertTimerValue ::= INTEGER (15..255)
```

```
LCSInformation ::= SEQUENCE {
     gmlc-List [0]                        GMLC-List OPTIONAL,
     lcs-PrivacyExceptionList             [1]  LCS-PrivacyExceptionList     OPTIONAL,
     molr-List                            [2]  MOLR-List                    OPTIONAL,
     ...,
     add-lcs-PrivacyExceptionList         [3]  LCS-PrivacyExceptionList     OPTIONAL }
     -- add-lcs-PrivacyExceptionList may be sent only if lcs-PrivacyExceptionList is
     -- present and contains four instances of LCS-PrivacyClass. If the mentioned condition
     -- is not satisfied the receiving node shall discard add-lcs-PrivacyExceptionList.
     -- If an LCS-PrivacyClass is received both in lcs-PrivacyExceptionList and in
     -- add-lcs-PrivacyExceptionList with the same SS-Code, then the error unexpected
     -- data value shall be returned.
```

```
GMLC-List ::= SEQUENCE SIZE (1..maxNumOfGMLC) OF
                                          ISDN-AddressString
     -- if segmentation is used, the complete GMLC-List shall be sent in one segment
```

```
maxNumOfGMLC  INTEGER ::= 5
```

```
NetworkAccessMode ::= ENUMERATED {
     bothMSCAndSGSN                       (0),
     onlyMSC                              (1),
     onlySGSN                             (2),
     ...}
     -- if unknown values are received in NetworkAccessMode
     -- they shall be discarded.
```

```
GPRSDataList ::= SEQUENCE SIZE (1..maxNumOfPDP-Contexts) OF
                                          PDP-Context
```

```
maxNumOfPDP-Contexts  INTEGER ::= 50
```

```
PDP-Context ::= SEQUENCE {
     pdp-ContextId                        ContextId,
     pdp-Type                             [16] PDP-Type,
     pdp-Address                          [17] PDP-Address                  OPTIONAL,
     qos-Subscribed                       [18] QoS-Subscribed,
     vplmnAddressAllowed                  [19] NULL OPTIONAL,
     apn                                  [20] APN,
     extensionContainer                   [21] ExtensionContainer           OPTIONAL,
     ... ,
     ext-QoS-Subscribed                   [0] Ext-QoS-Subscribed            OPTIONAL,
     pdp-ChargingCharacteristics          [1] ChargingCharacteristics       OPTIONAL }
     -- qos-Subscribed shall be discarded if ext-QoS-Subscribed is received and supported
```

```
ContextId ::= INTEGER (1..maxNumOfPDP-Contexts)
```

```
GPRSSubscriptionData ::= SEQUENCE {
     completeDataListIncluded             NULL                              OPTIONAL,

          -- If segmentation is used, completeDataListIncluded may only be present in the
          -- first segment.
     gprsDataList                         [1]  GPRSDataList,
     extensionContainer                   [2] ExtensionContainer            OPTIONAL,
     ... }
```

```
SGSN-CAMEL-SubscriptionInfo ::= SEQUENCE {
     gprs-CSI                             [0]  GPRS-CSI                     OPTIONAL,
     mo-sms-CSI                           [1]  SMS-CSI                      OPTIONAL,
     extensionContainer                   [2]  ExtensionContainer           OPTIONAL,
     ...,
     mt-sms-CSI                           [3]  SMS-CSI                      OPTIONAL,
     mt-smsCAMELTDP-CriteriaList          [4]  MT-smsCAMELTDP-CriteriaList  OPTIONAL,
     mg-csi                               [5]  MG-CSI                       OPTIONAL
     }
```

```
GPRS-CSI ::= SEQUENCE {
     gprs-CamelTDPDataList                [0] GPRS-CamelTDPDataList         OPTIONAL,
     camelCapabilityHandling              [1] CamelCapabilityHandling       OPTIONAL,
     extensionContainer                   [2] ExtensionContainer            OPTIONAL,
     notificationToCSE                    [3]  NULL                         OPTIONAL,
     csi-Active                           [4]  NULL                         OPTIONAL,
     ...}
--   notificationToCSE and csi-Active shall not be present when GPRS-CSI is sent to SGSN.
--   They may only be included in ATSI/ATM ack/NSDC message.
--   GPRS-CamelTDPData and  camelCapabilityHandling shall be present in
--   the GPRS-CSI sequence.
--   If GPRS-CSI is segmented, gprs-CamelTDPDataList and camelCapabilityHandling shall be
--   present in the first segment
```

```
GPRS-CamelTDPDataList ::= SEQUENCE SIZE (1..maxNumOfCamelTDPData) OF
     GPRS-CamelTDPData
--   GPRS-CamelTDPDataList shall not contain more than one instance of
--   GPRS-CamelTDPData containing the same value for gprs-TriggerDetectionPoint.
```

```
GPRS-CamelTDPData ::= SEQUENCE {
     gprs-TriggerDetectionPoint           [0] GPRS-TriggerDetectionPoint,
     serviceKey                           [1] ServiceKey,
     gsmSCF-Address                       [2] ISDN-AddressString,
     defaultSessionHandling               [3] DefaultGPRS-Handling,
     extensionContainer                   [4] ExtensionContainer            OPTIONAL,
     ...
     }
```

```
DefaultGPRS-Handling ::= ENUMERATED {
     continueTransaction (0) ,
     releaseTransaction (1) ,
     ...}
-- exception handling:
-- reception of values in range 2-31 shall be treated as "continueTransaction"
-- reception of values greater than 31 shall be treated as "releaseTransaction"
```

```
GPRS-TriggerDetectionPoint ::= ENUMERATED {
    attach                                  (1),
    attachChangeOfPosition                  (2),
    pdp-ContextEstablishment                (11),
    pdp-ContextEstablishmentAcknowledgement  (12),
    pdp-ContextChangeOfPosition             (14),
    ... }
-- exception handling:
-- For GPRS-CamelTDPData sequences containing this parameter with any
-- other value than the ones listed the receiver shall ignore the whole
-- GPRS-CamelTDPDatasequence.
```

```
APN ::=  OCTET STRING (SIZE (2..63))
    -- Octets are coded according to TS 3GPP TS 23.003 [17]
```

```
PDP-Type ::= OCTET STRING (SIZE (2))
    -- Octets are coded according to TS 3GPP TS 29.060 [105]
```

```
PDP-Address ::= OCTET STRING (SIZE (1..16))
    -- Octets are coded according to TS 3GPP TS 29.060 [105]

    -- The possible size values are:
    -- 1-7 octets  X.25 address type
    --  4  octets  IPv4 address type
    -- 16  octets  Ipv6 address type
```

```
QoS-Subscribed ::= OCTET STRING (SIZE (3))
    -- Octets are coded according to TS 3GPP TS 24.008 [35].
```

```
Ext-QoS-Subscribed ::= OCTET STRING (SIZE (1..9))
    -- OCTET 1:
    --  Allocation/Retention Priority (This octet encodes each priority level defined in
    --     23.107 as the binary value of the priority level, declaration in 29.060)
    -- Octets 2-9 are coded according to 3GPP TS 24.008 Quality of Service Octets
    -- 6-13.
```

```
ChargingCharacteristics ::= OCTET STRING (SIZE (2))
    -- Octets are coded according to 3GPP TS 32.015.
```

```
LSAOnlyAccessIndicator ::= ENUMERATED {
    accessOutsideLSAsAllowed  (0),
    accessOutsideLSAsRestricted (1)}
```

```
LSADataList ::= SEQUENCE SIZE (1..maxNumOfLSAs) OF
                                    LSAData
```

```
maxNumOfLSAs  INTEGER ::= 20
```

```
LSAData ::= SEQUENCE {
    lsaIdentity                     [0] LSAIdentity,
    lsaAttributes                   [1] LSAAttributes,
    lsaActiveModeIndicator          [2] NULL                        OPTIONAL,
    extensionContainer              [3] ExtensionContainer          OPTIONAL,
    ...}
```

```
LSAInformation ::= SEQUENCE {
    completeDataListIncluded            NULL                            OPTIONAL,

        -- If segmentation is used, completeDataListIncluded may only be present in the
        -- first segment.
    lsaOnlyAccessIndicator              [1]  LSAOnlyAccessIndicator       OPTIONAL,
    lsaDataList                         [2]  LSADataList                  OPTIONAL,
    extensionContainer                  [3] ExtensionContainer            OPTIONAL,
    ...}
```

```
LSAIdentity ::= OCTET STRING (SIZE (3))
    -- Octets are coded according to TS 3GPP TS 23.003 [17]
```

```
LSAAttributes ::= OCTET STRING (SIZE (1))
    -- Octets are coded according to TS 3GPP TS 48.008 [49]
```

```
SubscriberData ::= SEQUENCE {
     msisdn                                [1] ISDN-AddressString            OPTIONAL,
     category                              [2] Category                      OPTIONAL,
     subscriberStatus                      [3] SubscriberStatus              OPTIONAL,
     bearerServiceList                     [4] BearerServiceList             OPTIONAL,
     -- The exception handling for reception of unsupported / not allocated
     -- bearerServiceCodes is defined in section 8.8.1
     teleserviceList                       [6] TeleserviceList               OPTIONAL,
     -- The exception handling for reception of unsupported / not allocated
     -- teleserviceCodes is defined in section 8.8.1
     provisionedSS                         [7] Ext-SS-InfoList               OPTIONAL,
     odb-Data                              [8] ODB-Data                      OPTIONAL,
     roamingRestrictionDueToUnsupportedFeature  [9] NULL                     OPTIONAL,
     regionalSubscriptionData              [10] ZoneCodeList                 OPTIONAL,
     vbsSubscriptionData                   [11] VBSDataList                  OPTIONAL,
     vgcsSubscriptionData                  [12] VGCSDataList                 OPTIONAL,
     vlrCamelSubscriptionInfo              [13] VlrCamelSubscriptionInfo     OPTIONAL
     }
```

```
Category ::= OCTET STRING (SIZE (1))
     -- The internal structure is defined in ITU-T Rec Q.763.
```

```
SubscriberStatus ::= ENUMERATED {
     serviceGranted  (0),
     operatorDeterminedBarring  (1)}
```

```
BearerServiceList ::= SEQUENCE SIZE (1..maxNumOfBearerServices) OF
                                       Ext-BearerServiceCode
```

```
maxNumOfBearerServices  INTEGER ::= 50
```

```
TeleserviceList ::= SEQUENCE SIZE (1..maxNumOfTeleservices) OF
                                       Ext-TeleserviceCode
```

```
maxNumOfTeleservices  INTEGER ::= 20
```

```
ODB-Data ::= SEQUENCE {
     odb-GeneralData                   ODB-GeneralData,
     odb-HPLMN-Data                    ODB-HPLMN-Data                    OPTIONAL,
     extensionContainer                ExtensionContainer                OPTIONAL,
     ...}
```

```
ODB-GeneralData ::= BIT STRING {
     allOG-CallsBarred  (0),
     internationalOGCallsBarred  (1),
     internationalOGCallsNotToHPLMN-CountryBarred  (2),
     interzonalOGCallsBarred (6),
     interzonalOGCallsNotToHPLMN-CountryBarred (7),
     interzonalOGCallsAndInternationalOGCallsNotToHPLMN-CountryBarred (8),
     premiumRateInformationOGCallsBarred  (3),
     premiumRateEntertainementOGCallsBarred  (4),
     ss-AccessBarred  (5),
     allECT-Barred (9),
     chargeableECT-Barred (10),
     internationalECT-Barred (11),
     interzonalECT-Barred (12),
     doublyChargeableECT-Barred (13),
     multipleECT-Barred (14),
     allPacketOrientedServicesBarred (15),
     roamerAccessToHPLMN-AP-Barred  (16),
     roamerAccessToVPLMN-AP-Barred  (17),
     roamingOutsidePLMNOG-CallsBarred  (18),
     allIC-CallsBarred  (19),
     roamingOutsidePLMNIC-CallsBarred  (20),
     roamingOutsidePLMNICountryIC-CallsBarred  (21),
     roamingOutsidePLMN-Barred  (22),
     roamingOutsidePLMN-CountryBarred  (23),
     registrationAllCF-Barred  (24),
     registrationCFNotToHPLMN-Barred  (25),
     registrationInterzonalCF-Barred  (26),
     registrationInterzonalCFNotToHPLMN-Barred  (27),
     registrationInternationalCF-Barred  (28)} (SIZE (15..32))
     -- exception handling: reception of unknown bit assignments in the
     -- ODB-GeneralData type shall be treated like unsupported ODB-GeneralData
     -- When the ODB-GeneralData type is removed from the HLR for a given subscriber,
     -- in NoteSubscriberDataModified operation sent toward the gsmSCF
     -- all bits shall be set to “0“.
```

```
ODB-HPLMN-Data ::= BIT STRING {
     plmn-SpecificBarringType1  (0),
     plmn-SpecificBarringType2  (1),
     plmn-SpecificBarringType3  (2),
     plmn-SpecificBarringType4  (3)} (SIZE (4..32))
     -- exception handling: reception of unknown bit assignments in the
     -- ODB-HPLMN-Data type shall be treated like unsupported ODB-HPLMN-Data
     -- When the ODB-HPLMN-Data type is removed from the HLR for a given subscriber,
     -- in NoteSubscriberDataModified operation sent toward the gsmSCF
     -- all bits shall be set to “0“.
```

```
Ext-SS-InfoList ::= SEQUENCE SIZE (1..maxNumOfSS) OF
                                        Ext-SS-Info
```

```
Ext-SS-Info ::= CHOICE {
     forwardingInfo                     [0] Ext-ForwInfo,
     callBarringInfo                    [1] Ext-CallBarInfo,
     cug-Info                           [2] CUG-Info,
     ss-Data                            [3] Ext-SS-Data,
     emlpp-Info                         [4] EMLPP-Info}
```

```
Ext-ForwInfo ::= SEQUENCE {
     ss-Code                            SS-Code,
     forwardingFeatureList              Ext-ForwFeatureList,
     extensionContainer                 [0] ExtensionContainer          OPTIONAL,
     ...}
```

```
Ext-ForwFeatureList ::= SEQUENCE SIZE (1..maxNumOfExt-BasicServiceGroups) OF
                                        Ext-ForwFeature
```

```
Ext-ForwFeature ::= SEQUENCE {
    basicService                        Ext-BasicServiceCode            OPTIONAL,
    ss-Status                           [4] Ext-SS-Status,
    forwardedToNumber                   [5] ISDN-AddressString          OPTIONAL,
    -- When this data type is sent from an HLR which supports CAMEL Phase 2
    -- to a VLR that supports CAMEL Phase 2 the VLR shall not check the
    -- format of the number
    forwardedToSubaddress               [8] ISDN-SubaddressString       OPTIONAL,
    forwardingOptions                   [6] Ext-ForwOptions             OPTIONAL,
    noReplyConditionTime                [7] Ext-NoRepCondTime           OPTIONAL,
    extensionContainer                  [9] ExtensionContainer          OPTIONAL,
    ...,
    longForwardedToNumber               [10] FTN-AddressString          OPTIONAL }
```

```
Ext-ForwOptions ::= OCTET STRING (SIZE (1..5))

    -- OCTET 1:

    --  bit 8: notification to forwarding party
    --   0  no notification
    --   1  notification

    --  bit 7: redirecting presentation
    --   0 no presentation
    --   1  presentation

    --  bit 6: notification to calling party
    --   0  no notification
    --   1  notification

    --  bit 5: 0 (unused)

    --  bits 43: forwarding reason
    --   00  ms not reachable
    --   01  ms busy
    --   10  no reply
    --   11  unconditional

    -- bits 21: 00 (unused)

    -- OCTETS 2-5: reserved for future use. They shall be discarded if
    -- received and not understood.
```

```
Ext-NoRepCondTime ::= INTEGER (1..100)
    -- Only values 5-30 are used.
    -- Values in the ranges 1-4 and 31-100 are reserved for future use
    -- If received:
    --       values 1-4 shall be mapped on to value 5
    --       values 31-100 shall be mapped on to value 30
```

```
Ext-CallBarInfo ::= SEQUENCE {
    ss-Code                             SS-Code,
    callBarringFeatureList              Ext-CallBarFeatureList,
    extensionContainer                  ExtensionContainer              OPTIONAL,
    ...}
```

```
Ext-CallBarFeatureList ::= SEQUENCE SIZE (1..maxNumOfExt-BasicServiceGroups) OF
                                        Ext-CallBarringFeature
```

```
Ext-CallBarringFeature ::= SEQUENCE {
    basicService                        Ext-BasicServiceCode            OPTIONAL,
    ss-Status                           [4] Ext-SS-Status,
    extensionContainer                  ExtensionContainer              OPTIONAL,
    ...}
```

```
CUG-Info ::= SEQUENCE {
    cug-SubscriptionList                CUG-SubscriptionList,
    cug-FeatureList                     CUG-FeatureList                 OPTIONAL,
    extensionContainer                  [0] ExtensionContainer          OPTIONAL,
    ...}
```

```
CUG-SubscriptionList ::= SEQUENCE SIZE (0..maxNumOfCUG) OF
                                        CUG-Subscription
```

```
CUG-Subscription ::= SEQUENCE {
    cug-Index CUG-Index,
    cug-Interlock                       CUG-Interlock,
    intraCUG-Options                    IntraCUG-Options,
    basicServiceGroupList               Ext-BasicServiceGroupList         OPTIONAL,
    extensionContainer                  [0] ExtensionContainer            OPTIONAL,
    ...}
```

```
CUG-Index ::= INTEGER (0..32767)
    -- The internal structure is defined in ETS 300 138.
```

```
CUG-Interlock ::= OCTET STRING (SIZE (4))
```

```
IntraCUG-Options ::= ENUMERATED {
    noCUG-Restrictions  (0),
    cugIC-CallBarred  (1),
    cugOG-CallBarred  (2)}
```

```
maxNumOfCUG  INTEGER ::= 10
```

```
CUG-FeatureList ::= SEQUENCE SIZE (1..maxNumOfExt-BasicServiceGroups) OF
                                    CUG-Feature
```

```
Ext-BasicServiceGroupList ::= SEQUENCE SIZE (1..maxNumOfExt-BasicServiceGroups) OF
                                    Ext-BasicServiceCode
```

```
maxNumOfExt-BasicServiceGroups  INTEGER ::= 32
```

```
CUG-Feature ::= SEQUENCE {
    basicService                    Ext-BasicServiceCode            OPTIONAL,
    preferentialCUG-Indicator       CUG-Index OPTIONAL,
    interCUG-Restrictions           InterCUG-Restrictions,
    extensionContainer              ExtensionContainer              OPTIONAL,
    ...}
```

```
InterCUG-Restrictions ::= OCTET STRING (SIZE (1))

    -- bits 876543: 000000 (unused)
    -- Exception handling:
    -- bits 876543 shall be ignored if received and not understood

    -- bits 21
    --   00  CUG only facilities
    --   01  CUG with outgoing access
    --   10  CUG with incoming access
    --   11  CUG with both outgoing and incoming access
```

```
Ext-SS-Data ::= SEQUENCE {
    ss-Code                         SS-Code,
    ss-Status [4] Ext-SS-Status,
    ss-SubscriptionOption           SS-SubscriptionOption           OPTIONAL,
    basicServiceGroupList           Ext-BasicServiceGroupList       OPTIONAL,
    extensionContainer              [5] ExtensionContainer          OPTIONAL,
    ...}
```

```
LCS-PrivacyExceptionList ::= SEQUENCE SIZE (1..maxNumOfPrivacyClass) OF
                                    LCS-PrivacyClass
```

```
maxNumOfPrivacyClass  INTEGER ::= 4
```

```
LCS-PrivacyClass ::= SEQUENCE {
     ss-Code                              SS-Code,
     ss-Status                            Ext-SS-Status,
     notificationToMSUser                 [0] NotificationToMSUser          OPTIONAL,
     -- notificationToMSUser may be sent only for SS-codes callSessionRelated
     -- and callSessionUnrelated. If not received for SS-codes callSessionRelated
     -- and callSessionUnrelated,
     -- the default values according to 3GPP TS 23.271 shall be assumed.
     externalClientList                   [1] ExternalClientList            OPTIONAL,
     -- externalClientList may be sent only for SS-code callSessionUnrelated to a
     -- visited node that does not support LCS Release 4 or later versions.
     -- externalClientList may be sent only for SS-codes callSessionUnrelated and
     -- callSessionRelated to a visited node that supports LCS Release 4 or later versions.
     plmnClientList                       [2] PLMNClientList                OPTIONAL,
     -- plmnClientList may be sent only for SS-code plmnoperator.
     extensionContainer                   [3] ExtensionContainer            OPTIONAL,
     ...,
     ext-externalClientList               [4] Ext-ExternalClientList        OPTIONAL,
     -- Ext-externalClientList may be sent only if the visited node supports LCS Release 4 or
     -- later versions, the user did specify more than 5 clients, and White Book SCCP is used.
     serviceTypeList                      [5]  ServiceTypeList              OPTIONAL
     -- serviceTypeList may be sent only for SS-code serviceType and if the visited node
     -- supports LCS Release 5 or later versions.
     --
     -- if segmentation is used, the complete LCS-PrivacyClass shall be sent in one segment
}
```

```
ExternalClientList ::= SEQUENCE SIZE (0..maxNumOfExternalClient) OF
                                      ExternalClient
```

```
maxNumOfExternalClient  INTEGER ::= 5
```

```
PLMNClientList ::= SEQUENCE SIZE (1..maxNumOfPLMNClient) OF
                                      LCSClientInternalID
```

```
maxNumOfPLMNClient  INTEGER ::= 5
```

```
Ext-ExternalClientList ::= SEQUENCE SIZE (1..maxNumOfExt-ExternalClient) OF
                                      ExternalClient
```

```
maxNumOfExt-ExternalClient  INTEGER ::= 35
```

```
ExternalClient ::= SEQUENCE {
     clientIdentity                       LCSClientExternalID,
     gmlc-Restriction                     [0] GMLC-Restriction              OPTIONAL,
     notificationToMSUser                 [1] NotificationToMSUser          OPTIONAL,
     -- If notificationToMSUser is not received, the default value according to
     -- 3GPP TS 23.271 shall be assumed.
     extensionContainer                   [2] ExtensionContainer            OPTIONAL,
     ... }
```

```
GMLC-Restriction ::= ENUMERATED {
     gmlc-List                            (0),
     home-Country                         (1) ,
     ... }
-- exception handling:
-- At reception of any other value than the ones listed the receiver shall ignore
-- GMLC-Restriction.
```

```
NotificationToMSUser ::= ENUMERATED {
     notifyLocationAllowed                (0),
     notifyAndVerify-LocationAllowedIfNoResponse   (1),
     notifyAndVerify-LocationNotAllowedIfNoResponse(2),
     ...,
     locationNotAllowed (3) }
-- exception handling:
-- At reception of any other value than the ones listed the receiver shall ignore
-- NotificationToMSUser.
```

```
ServiceTypeList ::= SEQUENCE SIZE (1..maxNumOfServiceType) OF
                                      ServiceType
```

```
maxNumOfServiceType  INTEGER ::= 32
```

```
ServiceType ::= SEQUENCE {
     serviceTypeIdentity                LCSServiceTypeID,
     gmlc-Restriction                   [0] GMLC-Restriction              OPTIONAL,
     notificationToMSUser               [1] NotificationToMSUser          OPTIONAL,
     -- If notificationToMSUser is not received, the default value according to
     -- 3GPP TS 23.271 shall be assumed.
     extensionContainer                 [2] ExtensionContainer            OPTIONAL,
     ... }
```

```
MOLR-List ::= SEQUENCE SIZE (1..maxNumOfMOLR-Class) OF
                                        MOLR-Class
```

```
maxNumOfMOLR-Class  INTEGER ::= 3
```

```
MOLR-Class ::= SEQUENCE {
     ss-Code                            SS-Code,
     ss-Status                          Ext-SS-Status,
     extensionContainer                 [0] ExtensionContainer            OPTIONAL,
     ...}
```

```
ZoneCodeList ::= SEQUENCE SIZE (1..maxNumOfZoneCodes)
                                        OF ZoneCode
```

```
ZoneCode ::= OCTET STRING (SIZE (2))
     -- internal structure is defined in TS 3GPP TS 23.003 [17]
```

```
maxNumOfZoneCodes  INTEGER ::= 10
```

```
InsertSubscriberDataRes ::= SEQUENCE {
     teleserviceList                    [1] TeleserviceList               OPTIONAL,
     bearerServiceList                  [2] BearerServiceList             OPTIONAL,
     ss-List                            [3] SS-List                       OPTIONAL,
     odb-GeneralData                    [4] ODB-GeneralData               OPTIONAL,
     regionalSubscriptionResponse       [5] RegionalSubscriptionResponse  OPTIONAL,
     supportedCamelPhases               [6] SupportedCamelPhases          OPTIONAL,
     extensionContainer                 [7] ExtensionContainer            OPTIONAL,
     ... ,
     offeredCamel4CSIs                  [8] OfferedCamel4CSIs             OPTIONAL }
```

```
RegionalSubscriptionResponse ::= ENUMERATED {
     networkNode-AreaRestricted         (0),
     tooManyZoneCodes                   (1),
     zoneCodesConflict                  (2),
     regionalSubscNotSupported          (3)}
```

```
DeleteSubscriberDataArg ::= SEQUENCE {
     imsi                               [0] IMSI,
     basicServiceList                   [1] BasicServiceList              OPTIONAL,
     -- The exception handling for reception of unsupported/not allocated
     -- basicServiceCodes is defined in section 6.8.2
     ss-List                            [2] SS-List                       OPTIONAL,
     roamingRestrictionDueToUnsupportedFeature [4] NULL                   OPTIONAL,
     regionalSubscriptionIdentifier     [5] ZoneCode                      OPTIONAL,
     vbsGroupIndication                 [7] NULL                          OPTIONAL,
     vgcsGroupIndication                [8] NULL   OPTIONAL,
     camelSubscriptionInfoWithdraw      [9] NULL   OPTIONAL,
     extensionContainer                 [6] ExtensionContainer OPTIONAL,
     ...,
     gprsSubscriptionDataWithdraw       [10] GPRSSubscriptionDataWithdraw OPTIONAL,
     roamingRestrictedInSgsnDueToUnsuppportedFeature [11] NULL            OPTIONAL,
     lsaInformationWithdraw             [12] LSAInformationWithdraw       OPTIONAL,
     gmlc-ListWithdraw                  [13] NULL                         OPTIONAL,
     istInformationWithdraw             [14] NULL                         OPTIONAL,
     specificCSI-Withdraw               [15] SpecificCSI-Withdraw         OPTIONAL }
```

```
SpecificCSI-Withdraw ::= BIT STRING {
     o-csi (0),
     ss-csi (1),
     tif-csi (2),
     d-csi (3),
     vt-csi (4),
     mo-sms-csi (5),
     m-csi (6),
     gprs-csi (7),
     t-csi (8),
     mt-sms-csi (9),
     mg-csi (10),
     o-IM-CSI (11),
     d-IM-CSI (12),
     vt-IM-CSI (13) } (SIZE(8..32))
-- exception handling:
-- bits 11 to 31 shall be ignored if received by a non-IP Multimedia Core Network entity.
-- bits 0-10 and 14-31 shall be ignored if received by an IP Multimedia Core Network entity.
-- bits 11-13 are only applicable in an IP Multimedia Core Network.
-- Bit 8 and bits 11-13 are only applicable for the NoteSubscriberDataModified operation.
```

```
GPRSSubscriptionDataWithdraw ::= CHOICE {
     allGPRSData                         NULL,
     contextIdList                       ContextIdList}
```

```
ContextIdList ::= SEQUENCE SIZE (1..maxNumOfPDP-Contexts) OF
                                         ContextId
```

```
LSAInformationWithdraw ::= CHOICE {
     allLSAData                          NULL,
     lsaIdentityList                     LSAIdentityList }
```

```
LSAIdentityList ::= SEQUENCE SIZE (1..maxNumOfLSAs) OF
                                         LSAIdentity
```

```
BasicServiceList ::= SEQUENCE SIZE (1..maxNumOfBasicServices) OF
                                         Ext-BasicServiceCode
```

```
maxNumOfBasicServices  INTEGER ::= 70
```

```
DeleteSubscriberDataRes ::= SEQUENCE {
     regionalSubscriptionResponse        [0] RegionalSubscriptionResponse  OPTIONAL,
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
VlrCamelSubscriptionInfo ::= SEQUENCE {
     o-CSI                               [0] O-CSI                         OPTIONAL,
     extensionContainer                  [1] ExtensionContainer            OPTIONAL,
     ...,
     ss-CSI                              [2] SS-CSI                        OPTIONAL,
     o-BcsmCamelTDP-CriteriaList         [4] O-BcsmCamelTDPCriteriaList    OPTIONAL,
     tif-CSI                             [3] NULL                          OPTIONAL,
     m-CSI                               [5] M-CSI                         OPTIONAL,
     mo-sms-CSI                          [6] SMS-CSI                       OPTIONAL,
     vt-CSI                              [7] T-CSI                         OPTIONAL,
     t-BCSM-CAMEL-TDP-CriteriaList       [8] T-BCSM-CAMEL-TDP-CriteriaList OPTIONAL,
     d-CSI                               [9] D-CSI                         OPTIONAL,
     mt-sms-CSI                          [10] SMS-CSI                      OPTIONAL,
     mt-smsCAMELTDP-CriteriaList         [11] MT-smsCAMELTDP-CriteriaList  OPTIONAL
     }
```

```
MT-smsCAMELTDP-CriteriaList ::= SEQUENCE SIZE (1.. maxNumOfCamelTDPData) OF
     MT-smsCAMELTDP-Criteria
```

```
MT-smsCAMELTDP-Criteria ::= SEQUENCE {
     sms-TriggerDetectionPoint           SMS-TriggerDetectionPoint,
     tpdu-TypeCriterion                  [0]  TPDU-TypeCriterion            OPTIONAL,
     ... }
```

```
TPDU-TypeCriterion ::= SEQUENCE SIZE (1..maxNumOfTPDUTypes) OF
     MT-SMS-TPDU-Type
```

```
maxNumOfTPDUTypes INTEGER ::= 5
```

```
MT-SMS-TPDU-Type ::= ENUMERATED {
     sms-DELIVER                          (0),
     sms-SUBMIT-REPORT                    (1),
     sms-STATUS-REPORT                    (2),
     ... }

--   exception handling:
--   For TPDU-TypeCriterion sequences containing this parameter with any
--   other value than the ones listed above the receiver shall ignore
--   the whole TPDU-TypeCriterion sequence.
--   In CAMEL phase 4, sms-SUBMIT-REPORT shall not be used and a received TPDU-TypeCriterion
--   sequence containing sms-SUBMIT-REPORT shall be wholly ignored.
```

```
D-CSI ::= SEQUENCE {
     dp-AnalysedInfoCriteriaList          [0] DP-AnalysedInfoCriteriaList   OPTIONAL,
     camelCapabilityHandling              [1] CamelCapabilityHandling       OPTIONAL,
     extensionContainer                   [2] ExtensionContainer            OPTIONAL,
     notificationToCSE                    [3]  NULL                         OPTIONAL,
     csi-Active                           [4]  NULL                         OPTIONAL,
     ...}
--   notificationToCSE and csi-Active shall not be present when D-CSI is sent to VLR/GMSC.
--   They may only be included in ATSI/ATM ack/NSDC message.
--   DP-AnalysedInfoCriteria and  camelCapabilityHandling shall be present in
--   the D-CSI sequence.
--   If D-CSI is segmented, dp-AnalysedInfoCriteriaList and camelCapabilityHandling shall be
--   present in the first segment
```

```
DP-AnalysedInfoCriteriaList  ::= SEQUENCE SIZE (1..maxNumOfDP-AnalysedInfoCriteria) OF
                                 DP-AnalysedInfoCriterium
```

```
maxNumOfDP-AnalysedInfoCriteria INTEGER ::= 10
```

```
DP-AnalysedInfoCriterium ::= SEQUENCE {
     dialledNumber                        ISDN-AddressString,
     serviceKey                           ServiceKey,
     gsmSCF-Address                       ISDN-AddressString,
     defaultCallHandling                  DefaultCallHandling,
     extensionContainer                   ExtensionContainer                OPTIONAL,
     ...}
```

```
SS-CSI ::= SEQUENCE {
     ss-CamelData                         SS-CamelData,
     extensionContainer                   ExtensionContainer                OPTIONAL,
     ...,
     notificationToCSE                    [0]  NULL                         OPTIONAL,
     csi-Active                           [1]  NULL                         OPTIONAL
--   notificationToCSE and csi-Active shall not be present when SS-CSI is sent to VLR.
--   They may only be included in ATSI/ATM ack/NSDC message.
}
```

```
SS-CamelData  ::= SEQUENCE {
     ss-EventList                         SS-EventList,
     gsmSCF-Address                       ISDN-AddressString,
     extensionContainer                   [0] ExtensionContainer            OPTIONAL,
     ...}
```

```
SS-EventList  ::= SEQUENCE SIZE (1..maxNumOfCamelSSEvents) OF SS-Code
     -- Actions for the following SS-Code values are defined in CAMEL Phase 3:
     -- ect                               SS-Code ::= '00110001'B
     -- multiPTY                          SS-Code ::= '01010001'B
     -- cd                                SS-Code ::= '00100100'B
     -- ccbs                              SS-Code ::= '01000100'B
     -- all other SS codes shall be ignored
     -- When SS-CSI is sent to the VLR, it shall not contain a marking for ccbs.
     -- If the VLR receives SS-CSI containing a marking for ccbs, the VLR shall discard the
     -- ccbs marking in SS-CSI.
```

```
maxNumOfCamelSSEvents INTEGER ::= 10
```

```
O-CSI ::= SEQUENCE {
    o-BcsmCamelTDPDataList              O-BcsmCamelTDPDataList,
    extensionContainer                  ExtensionContainer                OPTIONAL,
    ...,
    camelCapabilityHandling             [0] CamelCapabilityHandling       OPTIONAL,
    notificationToCSE                   [1]  NULL                         OPTIONAL,
    csiActive                           [2]  NULL                         OPTIONAL}
--  notificationtoCSE and csiActive shall not be present when O-CSI is sent to VLR/GMSC.
--  They may only be included in ATSI/ATM ack/NSDC message.
--  O-CSI shall not be segmented.
```

```
O-BcsmCamelTDPDataList ::= SEQUENCE SIZE (1..maxNumOfCamelTDPData) OF
    O-BcsmCamelTDPData
    -- O-BcsmCamelTDPDataList shall not contain more than one instance of
    -- O-BcsmCamelTDPData containing the same value for o-BcsmTriggerDetectionPoint.
    -- For CAMEL Phase 2, this means that only one instance of O-BcsmCamelTDPData is allowed
    -- with o-BcsmTriggerDetectionPoint being equal to DP2.
```

```
maxNumOfCamelTDPData  INTEGER ::= 10
```

```
O-BcsmCamelTDPData ::= SEQUENCE {
    o-BcsmTriggerDetectionPoint         O-BcsmTriggerDetectionPoint,
    serviceKey                          ServiceKey,
    gsmSCF-Address                      [0] ISDN-AddressString,
    defaultCallHandling                 [1] DefaultCallHandling,
    extensionContainer                  [2] ExtensionContainer            OPTIONAL,
    ...
    }
```

```
ServiceKey ::= INTEGER (0..2147483647)
```

```
O-BcsmTriggerDetectionPoint ::= ENUMERATED {
    collectedInfo (2),
    ...,
    routeSelectFailure (4) }
    -- exception handling:
    -- For O-BcsmCamelTDPData sequences containing this parameter with any
    -- other value than the ones listed the receiver shall ignore the whole
    -- O-BcsmCamelTDPDatasequence.
    -- For O-BcsmCamelTDP-Criteria sequences containing this parameter with any
    -- other value than the ones listed the receiver shall ignore the whole
    -- O-BcsmCamelTDP-Criteria sequence.
```

```
O-BcsmCamelTDPCriteriaList ::= SEQUENCE SIZE (1..maxNumOfCamelTDPData) OF
    O-BcsmCamelTDP-Criteria
```

```
T-BCSM-CAMEL-TDP-CriteriaList ::= SEQUENCE SIZE (1..maxNumOfCamelTDPData) OF
    T-BCSM-CAMEL-TDP-Criteria
```

```
O-BcsmCamelTDP-Criteria ::= SEQUENCE {
    o-BcsmTriggerDetectionPoint         O-BcsmTriggerDetectionPoint,
    destinationNumberCriteria           [0] DestinationNumberCriteria     OPTIONAL,
    basicServiceCriteria                [1] BasicServiceCriteria          OPTIONAL,
    callTypeCriteria                    [2] CallTypeCriteria              OPTIONAL,
    ...,
    o-CauseValueCriteria                [3] O-CauseValueCriteria          OPTIONAL,
    extensionContainer                  [4] ExtensionContainer            OPTIONAL }
```

```
T-BCSM-CAMEL-TDP-Criteria ::= SEQUENCE {
    t-BCSM-TriggerDetectionPoint        T-BcsmTriggerDetectionPoint,
    basicServiceCriteria                [0] BasicServiceCriteria          OPTIONAL,
    t-CauseValueCriteria                [1] T-CauseValueCriteria          OPTIONAL,
    ... }
```

```
DestinationNumberCriteria  ::= SEQUENCE {
    matchType                           [0] MatchType,
    destinationNumberList               [1] DestinationNumberList         OPTIONAL,
    destinationNumberLengthList         [2] DestinationNumberLengthList   OPTIONAL,
    -- one or both of destinationNumberList and destinationNumberLengthList
    -- shall be present
    ...}
```

```
DestinationNumberList  ::= SEQUENCE SIZE   (1..maxNumOfCamelDestinationNumbers) OF
                                    ISDN-AddressString
    -- The receiving entity shall not check the format of a number in
    -- the dialled number list
```

```
DestinationNumberLengthList  ::= SEQUENCE SIZE (1..maxNumOfCamelDestinationNumberLengths)
OF
                                        INTEGER(1..maxNumOfISDN-AddressDigits)
```

```
BasicServiceCriteria   ::= SEQUENCE SIZE(1..maxNumOfCamelBasicServiceCriteria) OF
    Ext-BasicServiceCode
```

```
maxNumOfISDN-AddressDigits  INTEGER ::= 15
```

```
maxNumOfCamelDestinationNumbers  INTEGER ::= 10
```

```
maxNumOfCamelDestinationNumberLengths  INTEGER ::= 3
```

```
maxNumOfCamelBasicServiceCriteria  INTEGER ::= 5
```

```
CallTypeCriteria       ::= ENUMERATED {
    forwarded                       (0),
    notForwarded                    (1)}
```

```
MatchType       ::= ENUMERATED {
    inhibiting                      (0),
    enabling                        (1)}
```

```
O-CauseValueCriteria   ::= SEQUENCE SIZE(1..maxNumOfCAMEL-O-CauseValueCriteria) OF
    CauseValue
```

```
T-CauseValueCriteria   ::= SEQUENCE SIZE(1..maxNumOfCAMEL-T-CauseValueCriteria) OF
    CauseValue
```

```
maxNumOfCAMEL-O-CauseValueCriteria  INTEGER ::= 5
```

```
maxNumOfCAMEL-T-CauseValueCriteria  INTEGER ::= 5
```

```
CauseValue ::= OCTET STRING (SIZE(1))
-- Type extracted from Cause parameter in ITU-T Recommendation Q.763.
-- For the use of cause value refer to ITU-T Recommendation Q.850.
```

```
DefaultCallHandling ::= ENUMERATED {
    continueCall (0) ,
    releaseCall (1) ,
    ...}
    -- exception handling:
    -- reception of values in range 2-31 shall be treated as "continueCall"
    -- reception of values greater than 31 shall be treated as "releaseCall"
```

```
CamelCapabilityHandling ::= INTEGER(1..16)
    -- value 1 = CAMEL phase 1,
    -- value 2 = CAMEL phase 2,
    -- value 3 = CAMEL Phase 3,
    -- value 4 = CAMEL phase 4:
    -- reception of values greater than 4 shall be treated as CAMEL phase 4.
```

```
SupportedCamelPhases ::= BIT STRING {
    phase1 (0),
    phase2 (1),
    phase3 (2),
    phase4 (3)} (SIZE (1..16))
-- A node shall mark in the BIT STRING all CAMEL Phases it supports.
-- Other values than listed above shall be discarded.
```

```
OfferedCamel4CSIs ::= BIT STRING {
    o-csi                           (0),
    d-csi                           (1),
    vt-csi                          (2),
    t-csi                           (3),
    mt-sms-csi                      (4),
    mg-csi                          (5),
    psi-enhancements                (6)
} (SIZE (7..16))
-- A node supporting Camel phase 4 shall mark in the BIT STRING all Camel4 CSIs
-- it offers.
-- Other values than listed above shall be discarded.
```

```
OfferedCamel4Functionalities ::= BIT STRING {
     initiateCallAttempt                (0),
     splitLeg                           (1),
     moveLeg                            (2),
     disconnectLeg                      (3),
     entityReleased                     (4),
     dfc-WithArgument                   (5),
     playTone                           (6),
     dtmf-MidCall                       (7),
     chargingIndicator                  (8),
     alertingDP                         (9),
     locationAtAlerting                 (10),
     changeOfPositionDP                 (11),
     or-Interactions                    (12),
     warningToneEnhancements            (13),
     cf-Enhancements                    (14)
} (SIZE (15..32))
-- A node supporting Camel phase 4 shall mark in the BIT STRING all Camel4
-- functionalities it offers.
-- Other values than listed above shall be discarded.
```

```
SMS-CSI ::= SEQUENCE {
     sms-CAMEL-TDP-DataList             [0] SMS-CAMEL-TDP-DataList        OPTIONAL,
     camelCapabilityHandling            [1] CamelCapabilityHandling       OPTIONAL,
     extensionContainer                 [2] ExtensionContainer            OPTIONAL,
     notificationToCSE                  [3] NULL                          OPTIONAL,
     csi-Active                         [4] NULL                          OPTIONAL,
     ...}
--   notificationToCSE and csi-Active shall not be present
--   when MO-SMS-CSI or MT-SMS-CSI is sent to VLR or SGSN.
--   They may only be included in ATSI/ATM ack/NSDC message.
--   SMS-CAMEL-TDP-Data and  camelCapabilityHandling shall be present in
--   the SMS-CSI sequence.
--   If SMS-CSI is segmented, sms-CAMEL-TDP-DataList and camelCapabilityHandling shall be
--   present in the first segment
```

```
SMS-CAMEL-TDP-DataList ::= SEQUENCE SIZE (1..maxNumOfCamelTDPData) OF
     SMS-CAMEL-TDP-Data
--   SMS-CAMEL-TDP-DataList shall not contain more than one instance of
--   SMS-CAMEL-TDP-Data containing the same value for sms-TriggerDetectionPoint.
```

```
SMS-CAMEL-TDP-Data ::= SEQUENCE {
     sms-TriggerDetectionPoint          [0] SMS-TriggerDetectionPoint,
     serviceKey                         [1] ServiceKey,
     gsmSCF-Address                     [2] ISDN-AddressString,
     defaultSMS-Handling                [3] DefaultSMS-Handling,
     extensionContainer                 [4] ExtensionContainer            OPTIONAL,
     ...
     }
```

```
SMS-TriggerDetectionPoint ::= ENUMERATED {
     sms-CollectedInfo (1),
     ...,
     sms-DeliveryRequest (2)
     }
--   exception handling:
--   For SMS-CAMEL-TDP-Data and MT-smsCAMELTDP-Criteria sequences containing this
--   parameter with any other value than the ones listed the receiver shall ignore
--   the whole sequence.
--
--   If this parameter is received with any other value than sms-CollectedInfo
--   in an SMS-CAMEL-TDP-Data sequence contained in mo-sms-CSI, then the receiver shall
--   ignore the whole SMS-CAMEL-TDP-Data sequence.
--
--   If this parameter is received with any other value than sms-DeliveryRequest
--   in an SMS-CAMEL-TDP-Data sequence contained in mt-sms-CSI then the receiver shall
--   ignore the whole SMS-CAMEL-TDP-Data sequence.
--
--   If this parameter is received with any other value than sms-DeliveryRequest
--   in an MT-smsCAMELTDP-Criteria sequence then the receiver shall
--   ignore the whole MT-smsCAMELTDP-Criteria sequence.
```

```
DefaultSMS-Handling ::= ENUMERATED {
     continueTransaction (0) ,
     releaseTransaction (1) ,
     ...}
--   exception handling:
--   reception of values in range 2-31 shall be treated as "continueTransaction"
--   reception of values greater than 31 shall be treated as "releaseTransaction"
```

```
M-CSI ::= SEQUENCE {
     mobilityTriggers                    MobilityTriggers,
     serviceKey                          ServiceKey,
     gsmSCF-Address                      [0]  ISDN-AddressString,
     extensionContainer                  [1]  ExtensionContainer          OPTIONAL,
     notificationToCSE                   [2] NULL                         OPTIONAL,
     csi-Active                          [3] NULL                         OPTIONAL,
     ...}
--   notificationToCSE and csi-Active shall not be present when M-CSI is sent to VLR.
--   They may only be included in ATSI/ATM ack/NSDC message.
```

```
MG-CSI ::= SEQUENCE {
     mobilityTriggers                    MobilityTriggers,
     serviceKey                          ServiceKey,
     gsmSCF-Address                      [0]  ISDN-AddressString,
     extensionContainer                  [1]  ExtensionContainer          OPTIONAL,
     notificationToCSE                   [2] NULL                         OPTIONAL,
     csi-Active                          [3] NULL                         OPTIONAL,
     ...}
--   notificationToCSE and csi-Active shall not be present when MG-CSI is sent to SGSN.
--   They may only be included in ATSI/ATM ack/NSDC message.
```

```
MobilityTriggers  ::= SEQUENCE SIZE (1..maxNumOfMobilityTriggers) OF
     MM-Code
```

```
maxNumOfMobilityTriggers INTEGER ::= 10
```

```
MM-Code ::= OCTET STRING (SIZE (1))
--   This type is used to indicate a Mobility Management event.
--   Actions for the following MM-Code values are defined in CAMEL Phase 4:
--
--   CS domain MM events:
--   Location-update-in-same-VLR         MM-Code ::= '00000000'B
--   Location-update-to-other-VLR        MM-Code ::= '00000001'B
--   IMSI-Attach                         MM-Code ::= '00000010'B
--   MS-initiated-IMSI-Detach            MM-Code ::= '00000011'B
--   Network-initiated-IMSI-Detach       MM-Code ::= '00000100'B
--
--   PS domain MM events:
--   Routeing-Area-update-in-same-SGSN   MM-Code ::= '10000000'B
--   Routeing-Area-update-to-other-SGSN-update-from-new-SGSN
--                                       MM-Code ::= '10000001'B
--   Routeing-Area-update-to-other-SGSN-disconnect-by-detach
--                                       MM-Code ::= '10000010'B
--   GPRS-Attach                         MM-Code ::= '10000011'B
--   MS-initiated-GPRS-Detach            MM-Code ::= '10000100'B
--   Network-initiated-GPRS-Detach       MM-Code ::= '10000101'B
--   Network-initiated-transfer-to-MS-not-reachable-for-paging
--                                       MM-Code ::= '10000110'B
--
--   If the MSC receives any other MM-code than the ones listed above for the
--   CS domain, then the MSC shall ignore that MM-code.
--   If the SGSN receives any other MM-code than the ones listed above for the
--   PS domain, then the SGSN shall ignore that MM-code.
```

```
T-CSI ::= SEQUENCE {
     t-BcsmCamelTDPDataList              T-BcsmCamelTDPDataList,
     extensionContainer                  ExtensionContainer               OPTIONAL,
     ...,
     camelCapabilityHandling             [0] CamelCapabilityHandling      OPTIONAL,
     notificationToCSE                   [1] NULL                         OPTIONAL,
     csi-Active                          [2] NULL                         OPTIONAL}
--   notificationToCSE and csi-Active shall not be present when VT-CSI/T-CSI is sent
--   to VLR/GMSC.
--   They may only be included in ATSI/ATM ack/NSDC message.
--   T-CSI shall not be segmented.
```

```
T-BcsmCamelTDPDataList ::= SEQUENCE SIZE (1..maxNumOfCamelTDPData) OF
    T-BcsmCamelTDPData
    --- T-BcsmCamelTDPDataList shall not contain more than one instance of
    --- T-BcsmCamelTDPData containing the same value for t-BcsmTriggerDetectionPoint.
    --- For CAMEL Phase 2, this means that only one instance of T-BcsmCamelTDPData is
allowed
    --- with t-BcsmTriggerDetectionPoint being equal to DP12.
    --- For CAMEL Phase 3, more TDP's are allowed.
```

```
T-BcsmCamelTDPData ::= SEQUENCE {
    t-BcsmTriggerDetectionPoint         T-BcsmTriggerDetectionPoint,
    serviceKey                          ServiceKey,
    gsmSCF-Address                      [0] ISDN-AddressString,
    defaultCallHandling                 [1] DefaultCallHandling,
    extensionContainer                  [2] ExtensionContainer          OPTIONAL,
    ...}
```

```
T-BcsmTriggerDetectionPoint ::= ENUMERATED {
    termAttemptAuthorized (12),
    ... ,
    tBusy (13),
    tNoAnswer (14)}
    -- exception handling:
    -- For T-BcsmCamelTDPData sequences containing this parameter with any other
    -- value than the ones listed above, the receiver shall ignore the whole
    -- T-BcsmCamelTDPData sequence.
```

*-- gprs location information retrieval types*

```
SendRoutingInfoForGprsArg ::= SEQUENCE {
    imsi                                [0] IMSI,
    ggsn-Address                        [1] GSN-Address             OPTIONAL,
    ggsn-Number                         [2]  ISDN-AddressString,
    extensionContainer                  [3] ExtensionContainer      OPTIONAL,
    ...}
```

```
SendRoutingInfoForGprsRes ::= SEQUENCE {
    sgsn-Address                        [0] GSN-Address,
    ggsn-Address                        [1]  GSN-Address            OPTIONAL,
    mobileNotReachableReason            [2]  AbsentSubscriberDiagnosticSM    OPTIONAL,
    extensionContainer                  [3] ExtensionContainer      OPTIONAL,
    ...}
```

*-- failure report types*

```
FailureReportArg ::= SEQUENCE {
    imsi                                [0] IMSI,
    ggsn-Number                         [1] ISDN-AddressString      ,
    ggsn-Address                        [2] GSN-Address             OPTIONAL,
    extensionContainer                  [3] ExtensionContainer      OPTIONAL,
    ...}
```

```
FailureReportRes ::= SEQUENCE {
    ggsn-Address                        [0] GSN-Address             OPTIONAL,
    extensionContainer                  [1] ExtensionContainer      OPTIONAL,
    ...}
```

*-- gprs notification types*

```
NoteMsPresentForGprsArg ::= SEQUENCE {
    imsi                                [0] IMSI,
    sgsn-Address                        [1] GSN-Address,
    ggsn-Address                        [2] GSN-Address             OPTIONAL,
    extensionContainer                  [3] ExtensionContainer      OPTIONAL,
    ...}
```

```
NoteMsPresentForGprsRes ::= SEQUENCE {
    extensionContainer                  [0] ExtensionContainer      OPTIONAL,
    ...}
```

*-- fault recovery types*

```
ResetArg ::= SEQUENCE {
     hlr-Number                          ISDN-AddressString,
     hlr-List                            HLR-List                          OPTIONAL,
     ...}
```

```
RestoreDataArg ::= SEQUENCE {
     imsi                                IMSI,
     lmsi                                LMSI                              OPTIONAL,
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ... ,
     vlr-Capability                      [6] VLR-Capability                OPTIONAL }
```

```
RestoreDataRes ::= SEQUENCE {
     hlr-Number                          ISDN-AddressString,
     msNotReachable                      NULL                              OPTIONAL,
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
-- VBS/VGCS types
VBSDataList ::= SEQUENCE SIZE (1..maxNumOfVBSGroupIds) OF
                                         VoiceBroadcastData
```

```
VGCSDataList ::= SEQUENCE SIZE (1..maxNumOfVGCSGroupIds) OF
                                         VoiceGroupCallData
```

```
maxNumOfVBSGroupIds  INTEGER ::= 50
```

```
maxNumOfVGCSGroupIds  INTEGER ::= 50
```

```
VoiceGroupCallData  ::= SEQUENCE {
     groupId                             GroupId,
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
VoiceBroadcastData ::= SEQUENCE {
     groupid                             GroupId,
     broadcastInitEntitlement            NULL                              OPTIONAL,
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
GroupId  ::= OCTET STRING (SIZE (3))
     -- Refers to the Group Identification as specified in GSM TS 03.03
     -- and 03.68/ 03.69
```

```
-- provide subscriber info types
```

```
ProvideSubscriberInfoArg ::= SEQUENCE {
     imsi     [0] IMSI,
     lmsi     [1] LMSI                   OPTIONAL,
     requestedInfo                       [2] RequestedInfo,
     extensionContainer                  [3] ExtensionContainer            OPTIONAL,
     ...}
```

```
ProvideSubscriberInfoRes ::= SEQUENCE {
     subscriberInfo                      SubscriberInfo,
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
SubscriberInfo ::= SEQUENCE {
     locationInformation                 [0] LocationInformation           OPTIONAL,
     subscriberState                     [1] SubscriberState               OPTIONAL,
     extensionContainer                  [2] ExtensionContainer            OPTIONAL,
     ... ,
     locationInformationGPRS             [3] LocationInformationGPRS       OPTIONAL,
     ps-SubscriberState                  [4] PS-SubscriberState            OPTIONAL,
     imei                                [5] IMEI                          OPTIONAL,
     ms-Classmark2                       [6] MS-Classmark2                 OPTIONAL,
     gprs-MS-Class                       [7] GPRSMSClass                   OPTIONAL}

--   If the HLR receives locationInformation, subscriberState or ms-Classmark2 from an SGSN
--   it shall discard them.
--   If the HLR receives locationInformationGPRS, ps-SubscriberState or gprs-MS-Class from
--   a VLR it shall discard them.
--   If the HLR receives parameters which it has not requested, it shall discard them.
```

```
MS-Classmark2 ::= OCTET STRING (SIZE (3))
     -- This parameter carries the value part of the MS Classmark 2 IE defined in
     -- 3GPP TS 24.008 [35].
```

```
GPRSMSClass ::= SEQUENCE {
     mSNetworkCapability                [0] MSNetworkCapability,
     mSRadioAccessCapability            [1] MSRadioAccessCapability       OPTIONAL
     }
```

```
MSNetworkCapability ::= OCTET STRING (SIZE (1..8))
     -- This parameter carries the value part of the MS Network Capability IE defined in
     -- 3GPP TS 24.008 [35].
```

```
MSRadioAccessCapability ::= OCTET STRING (SIZE (1..50))
     -- This parameter carries the value part of the MS Radio Access Capability IE defined in
     -- 3GPP TS 24.008 [35].
```

```
RequestedInfo ::= SEQUENCE {
     locationInformation                [0] NULL                          OPTIONAL,
     subscriberState                    [1] NULL                          OPTIONAL,
     extensionContainer                 [2] ExtensionContainer            OPTIONAL,
     ...,
     currentLocation                    [3] NULL                          OPTIONAL,
     requestedDomain                    [4] DomainType                    OPTIONAL,
     imei                               [6] NULL                          OPTIONAL,
     ms-classmark                       [5] NULL                          OPTIONAL }

--   currentLocation shall be absent if locationInformation is absent
```

```
DomainType ::=  ENUMERATED {
     cs-Domain                          (0),
     ps-Domain                          (1),
     ...}
-- exception handling:
-- reception of values > 1 shall be mapped to 'cs-Domain'
```

```
LocationInformation ::= SEQUENCE {
     ageOfLocationInformation           AgeOfLocationInformation          OPTIONAL,
     geographicalInformation            [0] GeographicalInformation       OPTIONAL,
     vlr-number                         [1] ISDN-AddressString            OPTIONAL,
     locationNumber                     [2] LocationNumber                OPTIONAL,
     cellGlobalIdOrServiceAreaIdOrLAI   [3] CellGlobalIdOrServiceAreaIdOrLAI  OPTIONAL,
     extensionContainer                 [4] ExtensionContainer            OPTIONAL,
     ... ,
     selectedLSA-Id                     [5] LSAIdentity                   OPTIONAL,
     msc-Number                         [6] ISDN-AddressString            OPTIONAL,
     geodeticInformation                [7] GeodeticInformation           OPTIONAL,
     currentLocationRetrieved           [8] NULL                          OPTIONAL,
     sai-Present                        [9] NULL                          OPTIONAL }
-- sai-Present indicates that the cellGlobalIdOrServiceAreaIdOrLAI parameter contains
-- a Service Area Identity.
-- currentLocationRetrieved shall be present
-- if the location information were retrieved after a successfull paging.
```

```
LocationInformationGPRS ::= SEQUENCE {
     cellGlobalIdOrServiceAreaIdOrLAI   [0] CellGlobalIdOrServiceAreaIdOrLAI OPTIONAL,
     routeingAreaIdentity               [1] RAIdentity                    OPTIONAL,
     geographicalInformation            [2] GeographicalInformation       OPTIONAL,
     sgsn-Number                        [3] ISDN-AddressString            OPTIONAL,
     selectedLSAIdentity                [4] LSAIdentity                   OPTIONAL,
     extensionContainer                 [5] ExtensionContainer            OPTIONAL,
     ...,
     sai-Present                        [6] NULL                          OPTIONAL,
     geodeticInformation                [7] GeodeticInformation           OPTIONAL,
     currentLocationRetrieved           [8] NULL                          OPTIONAL,
     ageOfLocationInformation           [9] AgeOfLocationInformation      OPTIONAL }
-- sai-Present indicates that the cellGlobalIdOrServiceAreaIdOrLAI parameter contains
-- a Service Area Identity.
-- currentLocationRetrieved shall be present if the location information
-- was retrieved after successful paging.
```

```
RAIdentity ::= OCTET STRING (SIZE (6))
-- Routing Area Identity is coded in accordance with 3GPP TS 29.060 [105].
-- It shall contain the value part defined in 3GPP TS 29.060 only. I.e. the 3GPP TS 29.060
-- type identifier octet shall not be included.
```

```
GeographicalInformation ::= OCTET STRING (SIZE (8))
--   Refers to geographical Information defined in 3GPP TS 23.032.
--   Only the description of an ellipsoid point with uncertainty circle
--   as specified in 3GPP TS 23.032 is allowed to be used
--   The internal structure according to 3GPP TS 23.032 is as follows:
--        Type of shape (ellipsoid point with uncertainty circle)          1 octet
--        Degrees of Latitude                                              3 octets
--        Degrees of Longitude                                             3 octets
--        Uncertainty code                                                 1 octet
```

```
GeodeticInformation ::= OCTET STRING (SIZE (10))
--   Refers to Calling Geodetic Location defined in Q.763 (1999).
--   Only the description of an ellipsoid point with uncertainty circle
--   as specified in Q.763 (1999) is allowed to be used
--   The internal structure according to Q.763 (1999) is as follows:
--        Screening and presentation indicators                            1 octet
--        Type of shape (ellipsoid point with uncertainty circle)          1 octet
--        Degrees of Latitude                                              3 octets
--        Degrees of Longitude                                             3 octets
--        Uncertainty code                                                 1 octet
--        Confidence                                                       1 octet
```

```
LocationNumber ::= OCTET STRING (SIZE (2..10))
     -- the internal structure is defined in ITU-T Rec Q.763
```

```
SubscriberState ::= CHOICE {
     assumedIdle                    [0] NULL,
     camelBusy                      [1] NULL,
     netDetNotReachable             NotReachableReason,
     notProvidedFromVLR             [2] NULL}
```

```
PS-SubscriberState ::= CHOICE {
     notProvidedFromSGSN                [0] NULL,
     ps-Detached                        [1] NULL,
     ps-AttachedNotReachableForPaging   [2] NULL,
     ps-AttachedReachableForPaging      [3] NULL,
     ps-PDP-ActiveNotReachableForPaging [4] PDP-ContextInfoList,
     ps-PDP-ActiveReachableForPaging    [5] PDP-ContextInfoList,
     netDetNotReachable                 NotReachableReason }
```

```
PDP-ContextInfoList ::= SEQUENCE SIZE (1..maxNumOfPDP-Contexts) OF
                                    PDP-ContextInfo
```

```
PDP-ContextInfo ::= SEQUENCE {
     pdp-ContextIdentifier          [0] ContextId,
     pdp-ContextActive              [1] NULL                        OPTIONAL,
     pdp-Type                       [2] PDP-Type,
     pdp-Address                    [3] PDP-Address                 OPTIONAL,
     apn-Subscribed                 [4] APN                         OPTIONAL,
     apn-InUse                      [5] APN                         OPTIONAL,
     nsapi                          [6] NSAPI                       OPTIONAL,
     transactionId                  [7] TransactionId               OPTIONAL,
     teid-ForGnAndGp                [8] TEID                        OPTIONAL,
     teid-ForIu                     [9] TEID                        OPTIONAL,
     ggsn-Address                   [10] GSN-Address                OPTIONAL,
     qos-Subscribed                 [11] Ext-QoS-Subscribed         OPTIONAL,
     qos-Requested                  [12] Ext-QoS-Subscribed         OPTIONAL,
     qos-Negotiated                 [13] Ext-QoS-Subscribed         OPTIONAL,
     chargingId                     [14] GPRSChargingID             OPTIONAL,
     chargingCharacteristics        [15] ChargingCharacteristics    OPTIONAL,
     rnc-Address                    [16] GSN-Address                OPTIONAL,
     extensionContainer             [17] ExtensionContainer         OPTIONAL,
     ...}
```

```
NSAPI ::= INTEGER (0..15)
--   This type is used to indicate the Network layer Service Access Point
```

```
TransactionId ::= OCTET STRING (SIZE (1..2))
--   This type carries the value part of the transaction identifier which is used in the
--   session management messages on the access interface. The encoding is defined in
--   3GPP TS 24.008
```

```
TEID ::= OCTET STRING (SIZE (4))
--   This type carries the value part of the Tunnel Endpoint Identifier which is used to
--   distinguish between different tunnels between the same pair of entities which communicate
--   using the GPRS Tunnelling Protocol The encoding is defined in 3GPP TS 29.060.
```

```
GPRSChargingID ::= OCTET STRING (SIZE (4))
--   The Charging ID is a unique four octet value generated by the GGSN when
--   a PDP Context is activated. A Charging ID is generated for each activated context.
--   The encoding is defined in 3GPP TS 29.060.
```

```
NotReachableReason ::= ENUMERATED {
     msPurged (0),
     imsiDetached (1),
     restrictedArea (2),
     notRegistered (3)}
```

*-- any time interrogation info types*

```
AnyTimeInterrogationArg ::= SEQUENCE {
     subscriberIdentity                  [0] SubscriberIdentity,
     requestedInfo                       [1] RequestedInfo,
     gsmSCF-Address                      [3] ISDN-AddressString,
     extensionContainer                  [2] ExtensionContainer            OPTIONAL,
     ...}
```

```
AnyTimeInterrogationRes ::= SEQUENCE {
     subscriberInfo                     SubscriberInfo,
     extensionContainer                 ExtensionContainer                OPTIONAL,
     ...}
```

*-- any time information handling types*

```
AnyTimeSubscriptionInterrogationArg ::= SEQUENCE {
     subscriberIdentity                  [0] SubscriberIdentity,
     requestedSubscriptionInfo           [1] RequestedSubscriptionInfo,
     gsmSCF-Address                      [2] ISDN-AddressString,
     extensionContainer                  [3] ExtensionContainer            OPTIONAL,
     longFTN-Supported                   [4]  NULL                         OPTIONAL,
     ...}
```

```
AnyTimeSubscriptionInterrogationRes ::= SEQUENCE {
     callForwardingData                  [1] CallForwardingData            OPTIONAL,
     callBarringData                     [2] CallBarringData               OPTIONAL,
     odb-Info                            [3] ODB-Info                      OPTIONAL,
     camel-SubscriptionInfo              [4] CAMEL-SubscriptionInfo        OPTIONAL,
     supportedVLR-CAMEL-Phases           [5] SupportedCamelPhases          OPTIONAL,
     supportedSGSN-CAMEL-Phases          [6] SupportedCamelPhases          OPTIONAL,
     extensionContainer                  [7] ExtensionContainer            OPTIONAL,
     ... ,
     offeredCamel4CSIsInVLR              [8] OfferedCamel4CSIs             OPTIONAL,
     offeredCamel4CSIsInSGSN             [9] OfferedCamel4CSIs             OPTIONAL }
```

```
RequestedSubscriptionInfo ::= SEQUENCE {
     requestedSS-Info                    [1] SS-ForBS-Code                 OPTIONAL,
     odb                                 [2] NULL                          OPTIONAL,
     requestedCAMEL-SubscriptionInfo     [3] RequestedCAMEL-SubscriptionInfo   OPTIONAL,
     supportedVLR-CAMEL-Phases           [4] NULL                          OPTIONAL,
     supportedSGSN-CAMEL-Phases          [5] NULL                          OPTIONAL,
     extensionContainer                  [6] ExtensionContainer            OPTIONAL,
     ...,
     additionalRequestedCAMEL-SubscriptionInfo
                                         [7] AdditionalRequestedCAMEL-SubscriptionInfo
                                                                           OPTIONAL }
```

```
RequestedCAMEL-SubscriptionInfo ::= ENUMERATED {
     o-CSI                               (0),
     t-CSI                               (1),
     vt-CSI                              (2),
     tif-CSI                             (3),
     gprs-CSI                            (4),
     mo-sms-CSI                          (5),
     ss-CSI                              (6),
     m-CSI                               (7),
     d-csi                               (8)}
```

```
AdditionalRequestedCAMEL-SubscriptionInfo ::= ENUMERATED {
     mt-sms-CSI                          (0),
     mg-csi                              (1),
     o-IM-CSI                            (2),
     d-IM-CSI                            (3),
     vt-IM-CSI                           (4),
     ...}
--   exception handling: unknown values shall be discarded by the receiver.
```

```
CallForwardingData ::= SEQUENCE {
     forwardingFeatureList               Ext-ForwFeatureList,
     notificationToCSE                   NULL                                OPTIONAL,
     extensionContainer                  [0] ExtensionContainer              OPTIONAL,
     ...}
```

```
CallBarringData ::= SEQUENCE {
     callBarringFeatureList              Ext-CallBarFeatureList,
     password                            Password                            OPTIONAL,
     wrongPasswordAttemptsCounter        WrongPasswordAttemptsCounter        OPTIONAL,
     notificationToCSE                   NULL                                OPTIONAL,
     extensionContainer                  ExtensionContainer                  OPTIONAL,
     ...}
```

```
WrongPasswordAttemptsCounter ::= INTEGER (0..4)
```

```
ODB-Info ::= SEQUENCE {
     odb-Data                            ODB-Data,
     notificationToCSE                   NULL                                OPTIONAL,
     extensionContainer                  ExtensionContainer                  OPTIONAL,
     ...}
```

```
CAMEL-SubscriptionInfo ::= SEQUENCE {
     o-CSI                               [0]  O-CSI                          OPTIONAL,
     o-BcsmCamelTDP-CriteriaList         [1]  O-BcsmCamelTDPCriteriaList     OPTIONAL,
     d-CSI                               [2]  D-CSI                          OPTIONAL,
     t-CSI                               [3]  T-CSI                          OPTIONAL,
     t-BCSM-CAMEL-TDP-CriteriaList       [4]  T-BCSM-CAMEL-TDP-CriteriaList OPTIONAL,
     vt-CSI                              [5]  T-CSI                          OPTIONAL,
     vt-BCSM-CAMEL-TDP-CriteriaList      [6]  T-BCSM-CAMEL-TDP-CriteriaList OPTIONAL,
     tif-CSI                             [7]  NULL                           OPTIONAL,
     tif-CSI-NotificationToCSE           [8]  NULL                           OPTIONAL,
     gprs-CSI                            [9]  GPRS-CSI                       OPTIONAL,
     mo-sms-CSI                          [10] SMS-CSI                        OPTIONAL,
     ss-CSI                              [11] SS-CSI                         OPTIONAL,
     m-CSI                               [12] M-CSI                          OPTIONAL,
     extensionContainer                  [13] ExtensionContainer             OPTIONAL,
     ...,
     specificCSIDeletedList              [14] SpecificCSI-Withdraw           OPTIONAL,
     mt-sms-CSI                          [15] SMS-CSI                        OPTIONAL,
     mt-smsCAMELTDP-CriteriaList         [16] MT-smsCAMELTDP-CriteriaList    OPTIONAL,
     mg-csi                              [17] MG-CSI                         OPTIONAL,
     o-IM-CSI                            [18] O-CSI                          OPTIONAL,
     o-IM-BcsmCamelTDP-CriteriaList      [19] O-BcsmCamelTDPCriteriaList     OPTIONAL,
     d-IM-CSI                            [20] D-CSI                          OPTIONAL,
     vt-IM-CSI                           [21] T-CSI                          OPTIONAL,
     vt-IM-BCSM-CAMEL-TDP-CriteriaList   [22] T-BCSM-CAMEL-TDP-CriteriaList OPTIONAL
     }
```

```
AnyTimeModificationArg ::= SEQUENCE {
     subscriberIdentity                  [0]  SubscriberIdentity,
     gsmSCF-Address                      [1]  ISDN-AddressString,
     modificationRequestFor-CF-Info      [2]  ModificationRequestFor-CF-Info OPTIONAL,
     modificationRequestFor-CB-Info      [3]  ModificationRequestFor-CB-Info OPTIONAL,
     modificationRequestFor-CSI          [4]  ModificationRequestFor-CSI     OPTIONAL,
     extensionContainer                  [5]  ExtensionContainer             OPTIONAL,
     longFTN-Supported                   [6]  NULL                           OPTIONAL,
     ...,
     modificationRequestFor-ODB-data     [7]  ModificationRequestFor-ODB-data OPTIONAL }
```

```
AnyTimeModificationRes ::= SEQUENCE {
     ss-InfoFor-CSE                      [0]  Ext-SS-InfoFor-CSE             OPTIONAL,
     camel-SubscriptionInfo              [1]  CAMEL-SubscriptionInfo         OPTIONAL,
     extensionContainer                  [2]  ExtensionContainer             OPTIONAL,
     ...,
     odb-Info                            [3]  ODB-Info                       OPTIONAL }
```

```
ModificationRequestFor-CF-Info ::= SEQUENCE {
     ss-Code                          [0]  SS-Code,
     basicService                     [1]  Ext-BasicServiceCode         OPTIONAL,
     ss-Status                        [2]  Ext-SS-Status                OPTIONAL,
     forwardedToNumber                [3]  AddressString                OPTIONAL,
     forwardedToSubaddress            [4]  ISDN-SubaddressString        OPTIONAL,
     noReplyConditionTime             [5]  Ext-NoRepCondTime            OPTIONAL,
     modifyNotificationToCSE          [6]  ModificationInstruction      OPTIONAL,
     extensionContainer               [7]  ExtensionContainer           OPTIONAL,
     ...}
```

```
ModificationRequestFor-CB-Info ::= SEQUENCE {
     ss-Code                          [0]  SS-Code,
     basicService                     [1]  Ext-BasicServiceCode         OPTIONAL,
     ss-Status                        [2]  Ext-SS-Status                OPTIONAL,
     password                         [3]  Password                     OPTIONAL,
     wrongPasswordAttemptsCounter     [4]  WrongPasswordAttemptsCounter OPTIONAL,
     modifyNotificationToCSE          [5]  ModificationInstruction      OPTIONAL,
     extensionContainer               [6]  ExtensionContainer           OPTIONAL,
     ...}
```

```
ModificationRequestFor-ODB-data ::= SEQUENCE {
     odb-data                         [0]  ODB-Data                     OPTIONAL,
     modifyNotificationToCSE          [1]  ModificationInstruction      OPTIONAL,
     extensionContainer               [2]  ExtensionContainer           OPTIONAL,
     ...}
```

```
ModificationRequestFor-CSI ::= SEQUENCE {
     requestedCamel-SubscriptionInfo  [0]  RequestedCAMEL-SubscriptionInfo,
     modifyNotificationToCSE          [1]  ModificationInstruction      OPTIONAL,
     modifyCSI-State                  [2]  ModificationInstruction      OPTIONAL,
     extensionContainer               [3]  ExtensionContainer           OPTIONAL,
     ...,
     additionalRequestedCAMEL-SubscriptionInfo
                                      [4] AdditionalRequestedCAMEL-SubscriptionInfo
                                                                        OPTIONAL }
-- requestedCamel-SubscriptionInfo shall be discarded if
-- additionalRequestedCAMEL-SubscriptionInfo is received
```

```
ModificationInstruction ::= ENUMERATED {
     deactivate                       (0),
     activate                         (1)}
```

*-- subscriber data modification notification types*

```
NoteSubscriberDataModifiedArg ::= SEQUENCE {
     imsi                             IMSI,
     msisdn                           ISDN-AddressString,
     forwardingInfoFor-CSE            [0] Ext-ForwardingInfoFor-CSE     OPTIONAL,
     callBarringInfoFor-CSE           [1] Ext-CallBarringInfoFor-CSE    OPTIONAL,
     odb-Info                         [2] ODB-Info                      OPTIONAL,
     camel-SubscriptionInfo           [3] CAMEL-SubscriptionInfo        OPTIONAL,
     allInformationSent               [4] NULL                          OPTIONAL,
     extensionContainer               ExtensionContainer                OPTIONAL,
     ...}
```

```
NoteSubscriberDataModifiedRes ::= SEQUENCE {
     extensionContainer               ExtensionContainer                OPTIONAL,
     ...}
```

```
-- mobility management event notificatioon info types
```

```
NoteMM-EventArg::= SEQUENCE {
     serviceKey                       ServiceKey,
     eventMet                         [0]  MM-Code,
     imsi                             [1]  IMSI,
     msisdn                           [2]  ISDN-AddressString,
     locationInformation              [3]  LocationInformation          OPTIONAL,
     supportedCAMELPhases             [5]  SupportedCamelPhases         OPTIONAL,
     extensionContainer               [6]  ExtensionContainer           OPTIONAL,
     ...,
     locationInformationGPRS          [7]  LocationInformationGPRS      OPTIONAL,
     offeredCamel4Functionalities     [8] OfferedCamel4Functionalities  OPTIONAL
}
```

```
NoteMM-EventRes ::= SEQUENCE {
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
Ext-SS-InfoFor-CSE ::= CHOICE {
     forwardingInfoFor-CSE               [0] Ext-ForwardingInfoFor-CSE,
     callBarringInfoFor-CSE              [1] Ext-CallBarringInfoFor-CSE
     }
```

```
Ext-ForwardingInfoFor-CSE ::= SEQUENCE {
     ss-Code                             [0]  SS-Code,
     forwardingFeatureList               [1]  Ext-ForwFeatureList,
     notificationToCSE                   [2]  NULL                         OPTIONAL,
     extensionContainer                  [3]  ExtensionContainer           OPTIONAL,
     ...}
```

```
Ext-CallBarringInfoFor-CSE ::= SEQUENCE {
     ss-Code                             [0]  SS-Code,
     callBarringFeatureList              [1]  Ext-CallBarFeatureList,
     password                            [2]  Password                     OPTIONAL,
     wrongPasswordAttemptsCounter        [3]  WrongPasswordAttemptsCounter OPTIONAL,
     notificationToCSE                   [4]  NULL                         OPTIONAL,
     extensionContainer                  [5]  ExtensionContainer           OPTIONAL,
     ...}
```

```
END
```

## 17.7.2 Operation and maintenance data types

```
MAP-OM-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-OM-DataTypes (12) ~~version8 (8)~~version9 (9)}

DEFINITIONS

IMPLICIT TAGS

::=

BEGIN

EXPORTS
   ActivateTraceModeArg,
   ActivateTraceModeRes,
   DeactivateTraceModeArg,
   DeactivateTraceModeRes
;

IMPORTS
   AddressString,
   IMSI
FROM MAP-CommonDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-CommonDataTypes (18) ~~version8 (8)~~version9 (9)}

   ExtensionContainer
FROM MAP-ExtensionDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-ExtensionDataTypes (21) ~~version8 (8)~~version9 (9)}


;
```

```
ActivateTraceModeArg ::= SEQUENCE {
     imsi                                [0] IMSI                          OPTIONAL,
     traceReference                      [1] TraceReference,
     traceType                           [2] TraceType,
     omc-Id                              [3] AddressString                 OPTIONAL,
     extensionContainer                  [4] ExtensionContainer            OPTIONAL,
     ...}
```

```
TraceReference ::= OCTET STRING (SIZE (1..2))
```

```
TraceType ::= INTEGER
    (0..255)
    -- Trace types are fully defined in TS GSM 12.08.
```

```
ActivateTraceModeRes ::= SEQUENCE {
    extensionContainer                  [0] ExtensionContainer          OPTIONAL,
    ...}
```

```
DeactivateTraceModeArg ::= SEQUENCE {
    imsi                                [0] IMSI                        OPTIONAL,
    traceReference                      [1] TraceReference,
    extensionContainer                  [2] ExtensionContainer          OPTIONAL,
    ...}
```

```
DeactivateTraceModeRes ::= SEQUENCE {
    extensionContainer                  [0] ExtensionContainer          OPTIONAL,
    ...}
```

```
END
```

## 17.7.3 Call handling data types

```
MAP-CH-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-CH-DataTypes (13) version8 (8)version9 (9)}

DEFINITIONS

IMPLICIT TAGS

::=

BEGIN

EXPORTS
   SendRoutingInfoArg,
   SendRoutingInfoRes,
   ProvideRoamingNumberArg,
   ProvideRoamingNumberRes,
   ResumeCallHandlingArg,
   ResumeCallHandlingRes,
   NumberOfForwarding,
   SuppressionOfAnnouncement,
   CallReferenceNumber,
   ProvideSIWFSNumberArg,
   ProvideSIWFSNumberRes,
   SIWFSSignallingModifyArg,
   SIWFSSignallingModifyRes,
   SetReportingStateArg,
   SetReportingStateRes,
   StatusReportArg,
   StatusReportRes,
   RemoteUserFreeArg,
   RemoteUserFreeRes,
   IST-AlertArg,
   IST-AlertRes,
   IST-CommandArg,
   IST-CommandRes
;

IMPORTS
   SubscriberInfo,
   SupportedCamelPhases,
   OfferedCamel4CSIs,
   CUG-Interlock,
   O-CSI,
   D-CSI,
   O-BcsmCamelTDPCriteriaList,
   T-BCSM-CAMEL-TDP-CriteriaList,
   IST-SupportIndicator,
   IST-AlertTimerValue,
   T-CSI


FROM MAP-MS-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-MS-DataTypes (11) version8 (8)version9 (9)}
```

```
   ForwardingOptions,
   SS-List,
   CCBS-Feature
FROM MAP-SS-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-SS-DataTypes (14) ~~version8 (8)~~version9 (9)}

   ISDN-AddressString,
   ISDN-SubaddressString,
   FTN-AddressString,
   ExternalSignalInfo,
   Ext-ExternalSignalInfo,
   IMSI,
   LMSI,
   Ext-BasicServiceCode,
   AlertingPattern,
   NAEA-PreferredCI


FROM MAP-CommonDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-CommonDataTypes (18) ~~version8 (8)~~version9 (9)}

   ExtensionContainer
FROM MAP-ExtensionDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-ExtensionDataTypes (21) ~~version8 (8)~~version9 (9)}
;
```

```
CUG-CheckInfo ::= SEQUENCE {
     cug-Interlock                  CUG-Interlock,
     cug-OutgoingAccess             NULL                          OPTIONAL,
     extensionContainer             ExtensionContainer            OPTIONAL,
     ...}
```

```
NumberOfForwarding ::= INTEGER (1..5)
```

```
SendRoutingInfoArg ::= SEQUENCE {
     msisdn                              [0] ISDN-AddressString,
     cug-CheckInfo                       [1] CUG-CheckInfo                 OPTIONAL,
     numberOfForwarding                  [2] NumberOfForwarding            OPTIONAL,
     interrogationType                   [3] InterrogationType,
     or-Interrogation                    [4] NULL                          OPTIONAL,
     or-Capability                       [5] OR-Phase                      OPTIONAL,
     gmsc-OrGsmSCF-Address               [6] ISDN-AddressString,
     callReferenceNumber                 [7] CallReferenceNumber           OPTIONAL,
     forwardingReason                    [8] ForwardingReason              OPTIONAL,
     basicServiceGroup                   [9] Ext-BasicServiceCode          OPTIONAL,
     networkSignalInfo                   [10] ExternalSignalInfo           OPTIONAL,
     camelInfo                           [11] CamelInfo                    OPTIONAL,
     suppressionOfAnnouncement           [12] SuppressionOfAnnouncement    OPTIONAL,
     extensionContainer                  [13] ExtensionContainer           OPTIONAL,
     ...,
     alertingPattern                     [14] AlertingPattern              OPTIONAL,
     ccbs-Call                           [15] NULL                          OPTIONAL,
     supportedCCBS-Phase                 [16]  SupportedCCBS-Phase         OPTIONAL,
     additionalSignalInfo                [17] Ext-ExternalSignalInfo       OPTIONAL,
     istSupportIndicator                 [18] IST-SupportIndicator         OPTIONAL,
     pre-pagingSupported                 [19] NULL                         OPTIONAL,
     callDiversionTreatmentIndicator     [20] CallDiversionTreatmentIndicator   OPTIONAL,
     longFTN-Supported                   [21] NULL                         OPTIONAL,
     suppress-VT-CSI                     [22] NULL                         OPTIONAL,
     suppressIncomingCallBarring         [23] NULL                         OPTIONAL,
     gsmSCF-InitiatedCall                [24] NULL                         OPTIONAL
      }
```

```
SuppressionOfAnnouncement ::= NULL
```

```
InterrogationType ::= ENUMERATED {
     basicCall  (0),
     forwarding  (1)}
```

```
OR-Phase ::= INTEGER (1..127)
```

```
CallReferenceNumber ::= OCTET STRING (SIZE (1..8))
```

```
ForwardingReason ::= ENUMERATED {
     notReachable  (0),
     busy  (1),
     noReply  (2)}
```

```
SupportedCCBS-Phase ::= INTEGER (1..127)
-- exception handling:
-- Only value 1 is used.
-- Values in the ranges 2-127 are reserved for future use.
-- If received values 2-127 shall be mapped on to value 1.
```

```
CallDiversionTreatmentIndicator ::= OCTET STRING (SIZE(1))
--   callDiversionAllowed (xxxx xx01)
--   callDiversionNotAllowed (xxxx xx10)
--   network default is call diversion allowed
```

```
SendRoutingInfoRes ::= [3] SEQUENCE {
     imsi                                [9] IMSI                              OPTIONAL,
     -- IMSI must be present if SendRoutingInfoRes is not segmented.
     -- If the TC-Result-NL segmentation option is taken the IMSI must be
     -- present in one segmented transmission of SendRoutingInfoRes.
     extendedRoutingInfo                 ExtendedRoutingInfo                   OPTIONAL,
     cug-CheckInfo                       [3] CUG-CheckInfo                     OPTIONAL,
     cugSubscriptionFlag                 [6] NULL                              OPTIONAL,
     subscriberInfo                      [7] SubscriberInfo                    OPTIONAL,
     ss-List                             [1] SS-List                           OPTIONAL,
     basicService                        [5] Ext-BasicServiceCode              OPTIONAL,
     forwardingInterrogationRequired     [4] NULL                              OPTIONAL,
     vmsc-Address                        [2] ISDN-AddressString                OPTIONAL,
     extensionContainer                  [0] ExtensionContainer                OPTIONAL,
     ... ,
     naea-PreferredCI                    [10] NAEA-PreferredCI                 OPTIONAL,
     -- naea-PreferredCI is included at the discretion of the HLR operator.
     ccbs-Indicators                     [11] CCBS-Indicators                  OPTIONAL,
     msisdn                              [12] ISDN-AddressString               OPTIONAL,
     numberPortabilityStatus             [13] NumberPortabilityStatus          OPTIONAL,
     istAlertTimer                       [14] IST-AlertTimerValue              OPTIONAL,
     supportedCamelPhasesInVMSC          [15] SupportedCamelPhases             OPTIONAL,
     offeredCamel4CSIsInVMSC             [16] OfferedCamel4CSIs                OPTIONAL
     }
```

```
NumberPortabilityStatus ::= ENUMERATED {
     notKnownToBePorted                  (0),
     ownNumberPortedOut                  (1),
     foreignNumberPortedToForeignNetwork (2),
     ...}
     --   exception handling:
     --  reception of other values than the ones listed the receiver shall ignore the
     --  whole NumberPortabilityStatus
```

```
CCBS-Indicators ::= SEQUENCE {
     ccbs-Possible                       [0]  NULL                             OPTIONAL,
     keepCCBS-CallIndicator              [1]  NULL                             OPTIONAL,
     extensionContainer                  [2]  ExtensionContainer               OPTIONAL,
     ...}
```

```
RoutingInfo ::= CHOICE {
     roamingNumber                       ISDN-AddressString,
     forwardingData                      ForwardingData}
```

```
ForwardingData ::= SEQUENCE {
     forwardedToNumber                   [5] ISDN-AddressString                OPTIONAL,
     -- When this datatype is sent from an HLR which supports CAMEL Phase 2
     -- to a GMSC which supports CAMEL Phase 2 the GMSC shall not check the
     -- format of the number
     forwardedToSubaddress               [4] ISDN-SubaddressString             OPTIONAL,
     forwardingOptions                   [6] ForwardingOptions                 OPTIONAL,
     extensionContainer                  [7] ExtensionContainer                OPTIONAL,
     ...,
     longForwardedToNumber               [8] FTN-AddressString                 OPTIONAL}
```

```
ProvideRoamingNumberArg ::= SEQUENCE {
    imsi                              [0] IMSI,
    msc-Number                        [1] ISDN-AddressString,
    msisdn                            [2] ISDN-AddressString            OPTIONAL,
    lmsi                              [4] LMSI                          OPTIONAL,
    gsm-BearerCapability              [5] ExternalSignalInfo            OPTIONAL,
    networkSignalInfo                 [6] ExternalSignalInfo            OPTIONAL,
    suppressionOfAnnouncement         [7] SuppressionOfAnnouncement     OPTIONAL,
    gmsc-Address                      [8] ISDN-AddressString            OPTIONAL,
    callReferenceNumber               [9] CallReferenceNumber           OPTIONAL,
    or-Interrogation                  [10] NULL                         OPTIONAL,
    extensionContainer                [11] ExtensionContainer           OPTIONAL,
    ... ,
    alertingPattern                   [12] AlertingPattern              OPTIONAL,
    ccbs-Call                         [13] NULL                         OPTIONAL,
    supportedCamelPhasesInGMSC        [15] SupportedCamelPhases         OPTIONAL,
    additionalSignalInfo              [14] Ext-ExternalSignalInfo       OPTIONAL,
    orNotSupportedInGMSC              [16] NULL                         OPTIONAL,
    pre-pagingSupported               [17] NULL                         OPTIONAL,
    longFTN-Supported                 [18] NULL                         OPTIONAL,
    suppress-VT-CSI                   [19] NULL                         OPTIONAL,
    offeredCamel4CSIsInGMSC           [20] OfferedCamel4CSIs            OPTIONAL
     }
```

```
ProvideRoamingNumberRes ::= SEQUENCE {
    roamingNumber                     ISDN-AddressString,
    extensionContainer                ExtensionContainer                OPTIONAL,
    ...}
```

```
ResumeCallHandlingArg ::= SEQUENCE {
    callReferenceNumber               [0] CallReferenceNumber           OPTIONAL,
    basicServiceGroup                 [1] Ext-BasicServiceCode          OPTIONAL,
    forwardingData                    [2] ForwardingData                OPTIONAL,
    imsi                              [3] IMSI                          OPTIONAL,
    cug-CheckInfo                     [4] CUG-CheckInfo                 OPTIONAL,
    o-CSI                             [5] O-CSI                         OPTIONAL,
    extensionContainer                [7] ExtensionContainer            OPTIONAL,
    ccbs-Possible                     [8]  NULL                         OPTIONAL,
    msisdn                            [9]  ISDN-AddressString           OPTIONAL,
    uu-Data                           [10] UU-Data                      OPTIONAL,
    allInformationSent                [11] NULL                         OPTIONAL,
    ...,
    d-csi                             [12] D-CSI                        OPTIONAL,
    o-BcsmCamelTDPCriteriaList        [13] O-BcsmCamelTDPCriteriaList   OPTIONAL }
```

```
UU-Data ::= SEQUENCE {
    uuIndicator                       [0] UUIndicator                   OPTIONAL,
    uui                               [1] UUI                           OPTIONAL,
    uusCFInteraction                  [2] NULL                          OPTIONAL,
    extensionContainer                [3] ExtensionContainer            OPTIONAL,
    ...}
```

```
UUIndicator ::= OCTET STRING (SIZE (1))
    -- Octets are coded according to ETS 300 356
```

```
UUI  ::= OCTET STRING (SIZE (1..131))
    -- Octets are coded according to ETS 300 356
```

```
ResumeCallHandlingRes ::= SEQUENCE {
    extensionContainer                ExtensionContainer                OPTIONAL,
    ...}
```

```
CamelInfo ::= SEQUENCE {
    supportedCamelPhases              SupportedCamelPhases,
    suppress-T-CSI                    NULL                              OPTIONAL,
    extensionContainer                ExtensionContainer                OPTIONAL,
    ... ,
    offeredCamel4CSIs                 [0] OfferedCamel4CSIs             OPTIONAL }
```

```
ExtendedRoutingInfo ::= CHOICE {
    routingInfo                       RoutingInfo,
    camelRoutingInfo                  [8] CamelRoutingInfo}
```

```
CamelRoutingInfo ::= SEQUENCE {
    forwardingData                  ForwardingData                  OPTIONAL,
    gmscCamelSubscriptionInfo       [0] GmscCamelSubscriptionInfo,
    extensionContainer              [1] ExtensionContainer          OPTIONAL,
    ...}
```

```
GmscCamelSubscriptionInfo ::= SEQUENCE {
    t-CSI                           [0] T-CSI OPTIONAL,
    o-CSI                           [1] O-CSI OPTIONAL,
    extensionContainer              [2] ExtensionContainer          OPTIONAL,
    ...,
    o-BcsmCamelTDP-CriteriaList     [3] O-BcsmCamelTDPCriteriaList  OPTIONAL,
    t-BCSM-CAMEL-TDP-CriteriaList   [4]  T-BCSM-CAMEL-TDP-CriteriaList OPTIONAL,
    d-csi                           [5]  D-CSI                      OPTIONAL}
```

```
ProvideSIWFSNumberArg ::= SEQUENCE {
    gsm-BearerCapability            [0] ExternalSignalInfo,
    isdn-BearerCapability           [1] ExternalSignalInfo,
    call-Direction                  [2] CallDirection,
    b-Subscriber-Address            [3] ISDN-AddressString,
    chosenChannel                   [4] ExternalSignalInfo,
    lowerLayerCompatibility         [5] ExternalSignalInfo          OPTIONAL,
    highLayerCompatibility          [6] ExternalSignalInfo          OPTIONAL,
    extensionContainer              [7] ExtensionContainer          OPTIONAL,
    ...}
```

```
CallDirection ::= OCTET STRING (SIZE (1))
    -- OCTET 1

    -- bit 1 (direction of call)
    -- 0  Mobile Originated Call (MOC)
    -- 1  Mobile Terminated Call (MTC)
```

```
ProvideSIWFSNumberRes ::= SEQUENCE {
    sIWFSNumber                     [0] ISDN-AddressString,
    extensionContainer              [1] ExtensionContainer          OPTIONAL,
    ...}
```

```
SIWFSSignallingModifyArg ::= SEQUENCE {
    channelType                     [0] ExternalSignalInfo          OPTIONAL,
    chosenChannel                   [1] ExternalSignalInfo          OPTIONAL,
    extensionContainer              [2] ExtensionContainer          OPTIONAL,
    ...}
```

```
SIWFSSignallingModifyRes ::= SEQUENCE {
    chosenChannel                   [0] ExternalSignalInfo          OPTIONAL,
    extensionContainer              [1] ExtensionContainer          OPTIONAL,
    ...}
```

```
SetReportingStateArg ::= SEQUENCE {
    imsi                            [0]  IMSI                       OPTIONAL,
    lmsi                            [1]  LMSI                       OPTIONAL,
    ccbs-Monitoring                 [2]  ReportingState             OPTIONAL,
    extensionContainer              [3]  ExtensionContainer         OPTIONAL,
    ...}
```

```
ReportingState ::= ENUMERATED {
    stopMonitoring                  (0),
    startMonitoring                 (1),
    ...}
    -- exception handling:
    -- reception of values 2-10 shall be mapped to 'stopMonitoring'
    -- reception of values > 10 shall be mapped to 'startMonitoring'
```

```
SetReportingStateRes ::= SEQUENCE{
    ccbs-SubscriberStatus           [0]  CCBS-SubscriberStatus      OPTIONAL,
    extensionContainer              [1]  ExtensionContainer         OPTIONAL,
    ...}
```

```
CCBS-SubscriberStatus ::= ENUMERATED {
     ccbsNotIdle                          (0),
     ccbsIdle                             (1),
     ccbsNotReachable                     (2),
     ...}
     --  exception handling:
     --  reception of values 3-10 shall be mapped to 'ccbsNotIdle'
     --  reception of values 11-20 shall be mapped to 'ccbsIdle'
     --  reception of values > 20 shall be mapped to 'ccbsNotReachable'
```

```
StatusReportArg ::= SEQUENCE{
     imsi                                 [0]  IMSI,
     eventReportData                      [1]  EventReportData              OPTIONAL,
     callReportdata                       [2]  CallReportData               OPTIONAL,
     extensionContainer                   [3]  ExtensionContainer           OPTIONAL,
     ...}
```

```
EventReportData ::= SEQUENCE{
     ccbs-SubscriberStatus                [0]  CCBS-SubscriberStatus        OPTIONAL,
     extensionContainer                   [1]  ExtensionContainer           OPTIONAL,
     ...}
```

```
CallReportData ::= SEQUENCE{
     monitoringMode                       [0]  MonitoringMode               OPTIONAL,
     callOutcome                          [1]  CallOutcome                  OPTIONAL,
     extensionContainer                   [2]  ExtensionContainer           OPTIONAL,
     ...}
```

```
MonitoringMode ::= ENUMERATED {
     a-side                               (0),
     b-side                               (1),
     ...}
     --   exception handling:
     --  reception of values 2-10 shall be mapped 'a-side'
     --  reception of values > 10 shall be mapped to 'b-side'
```

```
CallOutcome ::= ENUMERATED {
     success                              (0),
     failure                              (1),
     busy                                 (2),
     ...}
     --   exception handling:
     --  reception of values 3-10 shall be mapped to 'success'
     --  reception of values 11-20 shall be mapped to 'failure'
     --  reception of values > 20 shall be mapped to 'busy'
```

```
StatusReportRes ::= SEQUENCE {
     extensionContainer                   [0]  ExtensionContainer           OPTIONAL,
     ...}
```

```
RemoteUserFreeArg ::= SEQUENCE{
     imsi                                 [0]  IMSI,
     callInfo                             [1]  ExternalSignalInfo,
     ccbs-Feature                         [2]  CCBS-Feature,
     translatedB-Number                   [3]  ISDN-AddressString,
     replaceB-Number                      [4]  NULL                         OPTIONAL,
     alertingPattern                      [5]  AlertingPattern              OPTIONAL,
     extensionContainer                   [6]  ExtensionContainer           OPTIONAL,
     ...}
```

```
RemoteUserFreeRes ::= SEQUENCE{
     ruf-Outcome                          [0]  RUF-Outcome,
     extensionContainer                   [1]  ExtensionContainer           OPTIONAL,
     ...}
```

```
RUF-Outcome ::= ENUMERATED{
     accepted (0),
     rejected (1),
     noResponseFromFreeMS (2), -- T4 Expiry
     noResponseFromBusyMS (3), -- T10 Expiry
     udubFromFreeMS (4),
     udubFromBusyMS (5),
     ...}
     -- exception handling:
     -- reception of values 6-20 shall be mapped to 'accepted'
     -- reception of values 21-30 shall be mapped to 'rejected'
     -- reception of values 31-40 shall be mapped to 'noResponseFromFreeMS'
     -- reception of values 41-50 shall be mapped to 'noResponseFromBusyMS'
     -- reception of values 51-60 shall be mapped to 'udubFromFreeMS'
     -- reception of values > 60 shall be mapped to 'udubFromBusyMS'
```

```
IST-AlertArg ::= SEQUENCE{
     imsi                              [0]  IMSI,
     extensionContainer                [1]  ExtensionContainer           OPTIONAL,
     ...}
```

```
IST-AlertRes ::= SEQUENCE{
     istAlertTimer                     [0]  IST-AlertTimerValue          OPTIONAL,
     istInformationWithdraw            [1]  NULL                         OPTIONAL,
     callTerminationIndicator          [2]  CallTerminationIndicator     OPTIONAL,
     extensionContainer                [3]  ExtensionContainer           OPTIONAL,
     ...}
```

```
IST-CommandArg ::= SEQUENCE{
     imsi                              [0]  IMSI,
     extensionContainer                [1]  ExtensionContainer           OPTIONAL,
     ...}
```

```
IST-CommandRes ::= SEQUENCE{
     extensionContainer                ExtensionContainer                OPTIONAL,
     ...}
```

```
CallTerminationIndicator ::= ENUMERATED {
     terminateCallActivityReferred       (0),
     terminateAllCallActivities          (1),
     ...}
     -- exception handling:
     -- reception of values 2-10 shall be mapped to ' terminateCallActivityReferred '
     -- reception of values > 10 shall be mapped to ' terminateAllCallActivities '

     -- In MSCs not supporting linkage of all call activities, any value received shall
     -- be interpreted as ' terminateCallActivityReferred '
```

```
END
```

## 17.7.4 Supplementary service data types

```
MAP-SS-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-SS-DataTypes (14) ~~version8 (8)~~version9 (9)}

DEFINITIONS

IMPLICIT TAGS

::=

BEGIN

EXPORTS
   RegisterSS-Arg,
   SS-Info,
   SS-Status,
   SS-SubscriptionOption,
   SS-ForBS-Code,
   InterrogateSS-Res,
   USSD-Arg,
   USSD-Res,
   USSD-DataCodingScheme,
   USSD-String,
   Password,
   GuidanceInfo,
```

```
   SS-List,
   SS-InfoList,
   OverrideCategory,
   CliRestrictionOption,
   NoReplyConditionTime,
   ForwardingOptions,
   maxNumOfSS,
   SS-Data,
   SS-InvocationNotificationArg,
   SS-InvocationNotificationRes,
   CCBS-Feature,
   RegisterCC-EntryArg,
   RegisterCC-EntryRes,
   EraseCC-EntryArg,
   EraseCC-EntryRes
;

IMPORTS
   AddressString,
   ISDN-AddressString,
   ISDN-SubaddressString,
   FTN-AddressString,
   IMSI,
   BasicServiceCode,
   AlertingPattern,
   EMLPP-Priority,
   MaxMC-Bearers,
   MC-Bearers,
   ExternalSignalInfo

FROM MAP-CommonDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-CommonDataTypes (18) version8 (8)version9 (9)}

   ExtensionContainer
FROM MAP-ExtensionDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-ExtensionDataTypes (21) version8 (8)version9 (9)}

   SS-Code
FROM MAP-SS-Code {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-SS-Code (15) version8 (8)version9 (9)}
;
```

```
RegisterSS-Arg ::= SEQUENCE {
     ss-Code                         SS-Code,
     basicService                    BasicServiceCode                OPTIONAL,
     forwardedToNumber               [4] AddressString               OPTIONAL,
     forwardedToSubaddress           [6] ISDN-SubaddressString       OPTIONAL,
     noReplyConditionTime            [5] NoReplyConditionTime        OPTIONAL,
     ...,
     defaultPriority                 [7] EMLPP-Priority              OPTIONAL,
     nbrUser                         [8] MC-Bearers                  OPTIONAL,
     longFTN-Supported               [9]  NULL                       OPTIONAL }
```

```
NoReplyConditionTime ::= INTEGER (5..30)
```

```
SS-Info ::= CHOICE {
     forwardingInfo                  [0] ForwardingInfo,
     callBarringInfo                 [1] CallBarringInfo,
     ss-Data                         [3] SS-Data}
```

```
ForwardingInfo ::= SEQUENCE {
     ss-Code                         SS-Code                         OPTIONAL,
     forwardingFeatureList           ForwardingFeatureList,
     ...}
```

```
ForwardingFeatureList ::=
     SEQUENCE SIZE (1..maxNumOfBasicServiceGroups) OF
                                     ForwardingFeature
```

```
ForwardingFeature ::= SEQUENCE {
     basicService                        BasicServiceCode                OPTIONAL,
     ss-Status                           [4] SS-Status                   OPTIONAL,
     forwardedToNumber                   [5] ISDN-AddressString          OPTIONAL,
     forwardedToSubaddress               [8] ISDN-SubaddressString       OPTIONAL,
     forwardingOptions                   [6] ForwardingOptions           OPTIONAL,
     noReplyConditionTime                [7] NoReplyConditionTime        OPTIONAL,
     ...,
     longForwardedToNumber               [9] FTN-AddressString           OPTIONAL }
```

```
SS-Status ::= OCTET STRING (SIZE (1))

     -- bits 8765: 0000 (unused)
     -- bits 4321: Used to convey the "P bit","R bit","A bit" and "Q bit",
     --            representing supplementary service state information
     --            as defined in TS 3GPP TS 23.011 [22]

     -- bit 4: "Q bit"

     -- bit 3: "P bit"

     -- bit 2: "R bit"

     -- bit 1: "A bit"
```

```
ForwardingOptions ::= OCTET STRING (SIZE (1))

     -- bit 8: notification to forwarding party
     --   0  no notification
     --   1  notification

     -- bit 7: redirecting presentation
     --   0 no presentation
     --   1  presentation

     -- bit 6: notification to calling party
     --   0  no notification
     --   1  notification

     -- bit 5: 0 (unused)

     -- bits 43: forwarding reason
     --   00  ms not reachable
     --   01  ms busy
     --   10  no reply
     --   11  unconditional when used in a SRI Result,
     --       or call deflection when used in a RCH Argument
     -- bits 21: 00 (unused)
```

```
CallBarringInfo ::= SEQUENCE {
     ss-Code                             SS-Code                         OPTIONAL,
     callBarringFeatureList              CallBarringFeatureList,
     ...}
```

```
CallBarringFeatureList ::= SEQUENCE SIZE (1..maxNumOfBasicServiceGroups) OF
                                         CallBarringFeature
```

```
CallBarringFeature ::= SEQUENCE {
     basicService                        BasicServiceCode                OPTIONAL,
     ss-Status [4] SS-Status             OPTIONAL,
     ...}
```

```
SS-Data ::= SEQUENCE {
     ss-Code                             SS-Code                         OPTIONAL,
     ss-Status                           [4] SS-Status                   OPTIONAL,
     ss-SubscriptionOption               SS-SubscriptionOption           OPTIONAL,
     basicServiceGroupList               BasicServiceGroupList           OPTIONAL,
     ...,
     defaultPriority                     EMLPP-Priority                  OPTIONAL,
     nbrUser                             [5] MC-Bearers                  OPTIONAL
     }
```

```
SS-SubscriptionOption ::= CHOICE {
     cliRestrictionOption                [2] CliRestrictionOption,
     overrideCategory                    [1] OverrideCategory}
```

```
CliRestrictionOption ::= ENUMERATED {
     permanent  (0),
     temporaryDefaultRestricted  (1),
     temporaryDefaultAllowed  (2)}
```

```
OverrideCategory ::= ENUMERATED {
     overrideEnabled  (0),
     overrideDisabled  (1)}
```

```
SS-ForBS-Code ::= SEQUENCE {
     ss-Code                          SS-Code,
     basicService                     BasicServiceCode                 OPTIONAL,
     ...,
     longFTN-Supported                [4]  NULL                        OPTIONAL }
```

```
GenericServiceInfo ::= SEQUENCE {
     ss-Status SS-Status,
     cliRestrictionOption             CliRestrictionOption             OPTIONAL,
     ...,
     maximumEntitledPriority          [0] EMLPP-Priority               OPTIONAL,
     defaultPriority                  [1] EMLPP-Priority               OPTIONAL,
     ccbs-FeatureList                 [2] CCBS-FeatureList             OPTIONAL,
     nbrSB                            [3] MaxMC-Bearers                OPTIONAL,
     nbrUser                          [4] MC-Bearers                   OPTIONAL,
     nbrSN                            [5] MC-Bearers                   OPTIONAL }
```

```
CCBS-FeatureList ::= SEQUENCE SIZE (1..maxNumOfCCBS-Requests) OF
                                      CCBS-Feature
```

```
maxNumOfCCBS-Requests  INTEGER ::= 5
```

```
CCBS-Feature ::= SEQUENCE {
     ccbs-Index                       [0] CCBS-Index                   OPTIONAL,
     b-subscriberNumber               [1] ISDN-AddressString           OPTIONAL,
     b-subscriberSubaddress           [2] ISDN-SubaddressString        OPTIONAL,
     basicServiceGroup                [3] BasicServiceCode             OPTIONAL,
     ...}
```

```
CCBS-Index  ::= INTEGER (1..maxNumOfCCBS-Requests)
```

```
InterrogateSS-Res ::= CHOICE {
     ss-Status                        [0] SS-Status,
     basicServiceGroupList            [2] BasicServiceGroupList,
     forwardingFeatureList            [3] ForwardingFeatureList,
     genericServiceInfo               [4]  GenericServiceInfo }
```

```
USSD-Arg ::= SEQUENCE {
     ussd-DataCodingScheme            USSD-DataCodingScheme,
     ussd-String                      USSD-String,
     ... ,
     alertingPattern                  AlertingPattern                  OPTIONAL,
     msisdn                           [0] ISDN-AddressString           OPTIONAL }
```

```
USSD-Res ::= SEQUENCE {
     ussd-DataCodingScheme            USSD-DataCodingScheme,
     ussd-String                      USSD-String,
     ...}
```

```
USSD-DataCodingScheme ::= OCTET STRING (SIZE (1))
     -- The structure of the USSD-DataCodingScheme is defined by
     -- the Cell Broadcast Data Coding Scheme as described in
     -- TS 3GPP TS 23.038 [25]
```

```
USSD-String ::= OCTET STRING (SIZE (1..maxUSSD-StringLength))
     -- The structure of the contents of the USSD-String is dependent
     -- on the USSD-DataCodingScheme as described in TS 3GPP TS 23.038 [25].
```

```
maxUSSD-StringLength  INTEGER ::= 160
```

```
Password ::= NumericString
     (FROM ("0"|"1"|"2"|"3"|"4"|"5"|"6"|"7"|"8"|"9"))
     (SIZE (4))
```

```
GuidanceInfo ::= ENUMERATED {
     enterPW  (0),
     enterNewPW  (1),
     enterNewPW-Again  (2)}
     -- How this information is really delivered to the subscriber
     -- (display, announcement, ...) is not part of this
     -- specification.
```

```
SS-List ::= SEQUENCE SIZE (1..maxNumOfSS) OF
                                        SS-Code
```

```
maxNumOfSS  INTEGER ::= 30
```

```
SS-InfoList ::= SEQUENCE SIZE (1..maxNumOfSS) OF
                                        SS-Info
```

```
BasicServiceGroupList ::= SEQUENCE SIZE (1..maxNumOfBasicServiceGroups) OF
                                        BasicServiceCode
```

```
maxNumOfBasicServiceGroups  INTEGER ::= 13
```

```
SS-InvocationNotificationArg ::= SEQUENCE {
     imsi                               [0] IMSI,
     msisdn                             [1] ISDN-AddressString,
     ss-Event                           [2] SS-Code,
     -- The following SS-Code values are allowed :
     -- ect                             SS-Code ::= '00110001'B
     -- multiPTY                        SS-Code ::= '01010001'B
     -- cd                              SS-Code ::= '00100100'B
     -- ccbs                            SS-Code ::= '01000100'B
     ss-EventSpecification              [3] SS-EventSpecification         OPTIONAL,
     extensionContainer                 [4] ExtensionContainer            OPTIONAL,
     ...,
     b-subscriberNumber                 [5]  ISDN-AddressString           OPTIONAL,
     ccbs-RequestState                  [6]  CCBS-RequestState            OPTIONAL
     }
```

```
CCBS-RequestState ::= ENUMERATED {
     request   (0),
     recall    (1),
     active    (2),
     completed (3),
     suspended (4),
     frozen    (5),
     deleted   (6)
     }
```

```
SS-InvocationNotificationRes ::= SEQUENCE {
     extensionContainer                 ExtensionContainer                OPTIONAL,
     ...
     }
```

```
SS-EventSpecification ::= SEQUENCE SIZE (1..maxEventSpecification) OF
                                        AddressString
```

```
maxEventSpecification  INTEGER ::= 2
```

```
RegisterCC-EntryArg ::= SEQUENCE {
     ss-Code                            [0]  SS-Code,
     ccbs-Data                          [1]  CCBS-Data                    OPTIONAL,
     ...}
```

```
CCBS-Data ::= SEQUENCE {
     ccbs-Feature                       [0]  CCBS-Feature,
     translatedB-Number                 [1]  ISDN-AddressString,
     serviceIndicator                   [2]  ServiceIndicator             OPTIONAL,
     callInfo                           [3]  ExternalSignalInfo,
     networkSignalInfo                  [4]  ExternalSignalInfo,
     ...}
```

```
ServiceIndicator ::= BIT STRING {
     clir-invoked (0),
     camel-invoked (1)} (SIZE(2..32))
     -- exception handling:
     -- bits 2 to 31 shall be ignored if received and not understood
```

```
RegisterCC-EntryRes ::= SEQUENCE {
     ccbs-Feature                        [0] CCBS-Feature                 OPTIONAL,
     ...}
```

```
EraseCC-EntryArg ::= SEQUENCE {
     ss-Code                             [0]  SS-Code,
     ccbs-Index                          [1]  CCBS-Index                  OPTIONAL,
     ...}
```

```
EraseCC-EntryRes ::= SEQUENCE {
     ss-Code                             [0]  SS-Code,
     ss-Status                           [1] SS-Status                    OPTIONAL,
     ...}
```

```
END
```

## 17.7.5 Supplementary service codes

```
MAP-SS-Code {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-SS-Code (15) ~~version8 (8)~~version9 (9)}

DEFINITIONS

::=

BEGIN
```

```
SS-Code ::= OCTET STRING (SIZE (1))
     -- This type is used to represent the code identifying a single
     -- supplementary service, a group of supplementary services, or
     -- all supplementary services. The services and abbreviations
     -- used are defined in TS 3GPP TS 22.004 [5]. The internal structure is
     -- defined as follows:
     --
     -- bits 87654321: group (bits 8765), and specific service
     -- (bits 4321)
```

```
allSS                                    SS-Code ::= '00000000'B
     -- reserved for possible future use
     -- all SS
```

```
allLineIdentificationSS                  SS-Code ::= '00010000'B
     -- reserved for possible future use
     -- all line identification SS
clip                                     SS-Code ::= '00010001'B
     -- calling line identification presentation
clir                                     SS-Code ::= '00010010'B
     -- calling line identification restriction
colp                                     SS-Code ::= '00010011'B
     -- connected line identification presentation
colr                                     SS-Code ::= '00010100'B
     -- connected line identification restriction
mci                                      SS-Code ::= '00010101'B
     -- reserved for possible future use
     -- malicious call identification

allNameIdentificationSS                  SS-Code ::= '00011000'B
     -- all name identification SS
cnap                                     SS-Code ::= '00011001'B
     -- calling name presentation

     -- SS-Codes '00011010'B to '00011111'B are reserved for future
     -- NameIdentification Supplementary Service use.
```

```
allForwardingSS                         SS-Code ::= '00100000'B
     -- all forwarding SS
cfu                                     SS-Code ::= '00100001'B
     -- call forwarding unconditional
allCondForwardingSS                     SS-Code ::= '00101000'B
     -- all conditional forwarding SS
cfb                                     SS-Code ::= '00101001'B
     -- call forwarding on mobile subscriber busy
cfnry                                   SS-Code ::= '00101010'B
     -- call forwarding on no reply
cfnrc                                   SS-Code ::= '00101011'B
     -- call forwarding on mobile subscriber not reachable
cd                                      SS-Code ::= '00100100'B
     -- call deflection
```

```
allCallOfferingSS                       SS-Code ::= '00110000'B
     -- reserved for possible future use
     -- all call offering SS includes also all forwarding SS
ect                                     SS-Code ::= '00110001'B
          -- explicit call transfer
mah                                     SS-Code ::= '00110010'B
     -- reserved for possible future use
     -- mobile access hunting
```

```
allCallCompletionSS                     SS-Code ::= '01000000'B
     -- reserved for possible future use
     -- all Call completion SS
cw                                      SS-Code ::= '01000001'B
     -- call waiting
hold                                    SS-Code ::= '01000010'B
     -- call hold
ccbs-A                                  SS-Code ::= '01000011'B
     -- completion of call to busy subscribers, originating side
ccbs-B                                  SS-Code ::= '01000100'B
     -- completion of call to busy subscribers, destination side
     -- this SS-Code is used only in InsertSubscriberData and DeleteSubscriberData
mc                                      SS-Code ::= '01000101'B
     -- multicall
```

```
allMultiPartySS                         SS-Code ::= '01010000'B
     -- reserved for possible future use
     -- all multiparty SS
multiPTY                                SS-Code ::= '01010001'B
     -- multiparty
```

```
allCommunityOfInterest-SS               SS-Code ::= '01100000'B
     -- reserved for possible future use
     -- all community of interest SS
cug                                     SS-Code ::= '01100001'B
     -- closed user group
```

```
allChargingSS                           SS-Code ::= '01110000'B
     -- reserved for possible future use
     -- all charging SS
aoci                                    SS-Code ::= '01110001'B
     -- advice of charge information
aocc                                    SS-Code ::= '01110010'B
     -- advice of charge charging
```

```
allAdditionalInfoTransferSS             SS-Code ::= '10000000'B
     -- reserved for possible future use
     -- all additional information transfer SS
uus1                                    SS-Code ::= '10000001'B
     -- UUS1 user-to-user signalling
uus2                                    SS-Code ::= '10000010'B
     -- UUS2 user-to-user signalling
uus3                                    SS-Code ::= '10000011'B
     -- UUS3 user-to-user signalling
```

```
allBarringSS                            SS-Code ::= '10010000'B
     -- all barring SS
barringOfOutgoingCalls                  SS-Code ::= '10010001'B
     -- barring of outgoing calls
baoc                                    SS-Code ::= '10010010'B
     -- barring of all outgoing calls
boic                                    SS-Code ::= '10010011'B
     -- barring of outgoing international calls
boicExHC                                SS-Code ::= '10010100'B
     -- barring of outgoing international calls except those directed
     -- to the home PLMN
barringOfIncomingCalls                  SS-Code ::= '10011001'B
     -- barring of incoming calls
baic                                    SS-Code ::= '10011010'B
     -- barring of all incoming calls
bicRoam                                 SS-Code ::= '10011011'B
     -- barring of incoming calls when roaming outside home PLMN
     -- Country
```

```
allPLMN-specificSS                      SS-Code ::= '11110000'B
plmn-specificSS-1                       SS-Code ::= '11110001'B
plmn-specificSS-2                       SS-Code ::= '11110010'B
plmn-specificSS-3                       SS-Code ::= '11110011'B
plmn-specificSS-4                       SS-Code ::= '11110100'B
plmn-specificSS-5                       SS-Code ::= '11110101'B
plmn-specificSS-6                       SS-Code ::= '11110110'B
plmn-specificSS-7                       SS-Code ::= '11110111'B
plmn-specificSS-8                       SS-Code ::= '11111000'B
plmn-specificSS-9                       SS-Code ::= '11111001'B
plmn-specificSS-A                       SS-Code ::= '11111010'B
plmn-specificSS-B                       SS-Code ::= '11111011'B
plmn-specificSS-C                       SS-Code ::= '11111100'B
plmn-specificSS-D                       SS-Code ::= '11111101'B
plmn-specificSS-E                       SS-Code ::= '11111110'B
plmn-specificSS-F                       SS-Code ::= '11111111'B
```

```
allCallPrioritySS                       SS-Code ::= '10100000'B
     -- reserved for possible future use
     -- all call priority SS
emlpp                                   SS-Code ::= '10100001'B
     -- enhanced Multilevel Precedence Pre-emption (EMLPP) service
```

```
allLCSPrivacyException                  SS-Code ::= '10110000'B
     -- all LCS Privacy Exception Classes
universal                               SS-Code ::= '10110001'B
     -- allow location by any LCS client
callSessionRelated                      SS-Code ::= '10110010'B
     -- allow location by any value added LCS client to which a call/session
     -- is established from the target MS
callSessionUnrelated                    SS-Code ::= '10110011'B
     -- allow location by designated external value added LCS clients
plmnoperator                            SS-Code ::= '10110100'B
     -- allow location by designated PLMN operator LCS clients
serviceType                             SS-Code ::= '10110101'B
     -- allow location by LCS clients of a designated LCS service type
```

```
allMOLR-SS                              SS-Code ::= '11000000'B
     -- all Mobile Originating Location Request Classes
basicSelfLocation                       SS-Code ::= '11000001'B
     -- allow an MS to request its own location
autonomousSelfLocation                  SS-Code ::= '11000010'B
     -- allow an MS to perform self location without interaction
     -- with the PLMN for a predetermined period of time
transferToThirdParty                    SS-Code ::= '11000011'B
     -- allow an MS to request transfer of its location to another LCS client
```

```
END
```

## 17.7.6 Short message data types

```
MAP-SM-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-SM-DataTypes (16) version8 (8)version9 (9)}

DEFINITIONS

IMPLICIT TAGS
```

```
::=

BEGIN

EXPORTS
   RoutingInfoForSM-Arg,
   RoutingInfoForSM-Res,
   MO-ForwardSM-Arg,
   MO-ForwardSM-Res,
   MT-ForwardSM-Arg,
   MT-ForwardSM-Res,
   ReportSM-DeliveryStatusArg,
   ReportSM-DeliveryStatusRes,
   AlertServiceCentreArg,
   InformServiceCentreArg,
   ReadyForSM-Arg,
   ReadyForSM-Res,
   SM-DeliveryOutcome,
   AlertReason,
   Additional-Number
;

IMPORTS
   AddressString,
   ISDN-AddressString,
   SignalInfo,
   IMSI,
   LMSI
FROM MAP-CommonDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-CommonDataTypes (18) version8 (8)version9 (9)}

   AbsentSubscriberDiagnosticSM
FROM MAP-ER-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-ER-DataTypes (17) version8 (8)version9 (9)}

   ExtensionContainer
FROM MAP-ExtensionDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-ExtensionDataTypes (21) version8 (8)version9 (9)}
;
```

```
RoutingInfoForSM-Arg ::= SEQUENCE {
    msisdn                          [0] ISDN-AddressString,
    sm-RP-PRI                       [1] BOOLEAN,
    serviceCentreAddress            [2] AddressString,
    extensionContainer              [6] ExtensionContainer          OPTIONAL,
    ... ,
    gprsSupportIndicator            [7]  NULL                       OPTIONAL,
    -- gprsSupportIndicator is set only if the SMS-GMSC supports
    -- receiving of two numbers from the HLR
    sm-RP-MTI                       [8] SM-RP-MTI                   OPTIONAL,
    sm-RP-SMEA                      [9] SM-RP-SMEA                  OPTIONAL }
```

```
SM-RP-MTI ::= INTEGER (0..10)
    -- 0 SMS Deliver
    -- 1 SMS Status Report
    -- other values are reserved for future use and shall be discarded if
    -- received
```

```
SM-RP-SMEA ::= OCTET STRING (SIZE (1..12))
    -- this parameter contains an address field which is encoded
    -- as defined in 3GPP TS 23.140. An address field contains 3 elements :
    --       address-length
    --       type-of-address
    --       address-value
```

```
RoutingInfoForSM-Res ::= SEQUENCE {
    imsi                            IMSI,
    locationInfoWithLMSI            [0] LocationInfoWithLMSI,
    extensionContainer              [4] ExtensionContainer          OPTIONAL,
    ...}
```

```
LocationInfoWithLMSI ::= SEQUENCE {
     networkNode-Number                  [1] ISDN-AddressString,
     lmsi                                LMSI                              OPTIONAL,
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...,
     gprsNodeIndicator                   [5]  NULL                         OPTIONAL,
     -- gprsNodeIndicator is set only if the SGSN number is sent as the
     -- Network Node Number
     additional-Number                   [6] Additional-Number             OPTIONAL
     -- NetworkNode-number can be either msc-number or sgsn-number
     }
```

```
Additional-Number ::= CHOICE {
     msc-Number                          [0] ISDN-AddressString,
     sgsn-Number                         [1] ISDN-AddressString}
     -- additional-number can be either msc-number or sgsn-number
     -- if received networkNode-number is msc-number then the
     -- additional number is sgsn-number
     -- if received networkNode-number is sgsn-number then the
     -- additional number is msc-number
```

```
MO-ForwardSM-Arg ::= SEQUENCE {
     sm-RP-DA                            SM-RP-DA,
     sm-RP-OA                            SM-RP-OA,
     sm-RP-UI                            SignalInfo,
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ... ,
     imsi                                IMSI                              OPTIONAL }
```

```
MO-ForwardSM-Res ::= SEQUENCE {
     sm-RP-UI                            SignalInfo                        OPTIONAL,
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
MT-ForwardSM-Arg ::= SEQUENCE {
     sm-RP-DA                            SM-RP-DA,
     sm-RP-OA                            SM-RP-OA,
     sm-RP-UI                            SignalInfo,
     moreMessagesToSend                  NULL                              OPTIONAL,
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
MT-ForwardSM-Res ::= SEQUENCE {
     sm-RP-UI                            SignalInfo                        OPTIONAL,
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
SM-RP-DA ::= CHOICE {
     imsi                                [0] IMSI,
     lmsi                                [1] LMSI,
     serviceCentreAddressDA              [4] AddressString,
     noSM-RP-DA                          [5] NULL}
```

```
SM-RP-OA ::= CHOICE {
     msisdn                              [2] ISDN-AddressString,
     serviceCentreAddressOA              [4] AddressString,
     noSM-RP-OA                          [5] NULL}
```

```
ReportSM-DeliveryStatusArg ::= SEQUENCE {
    msisdn                          ISDN-AddressString,
    serviceCentreAddress            AddressString,
    sm-DeliveryOutcome              SM-DeliveryOutcome,
    absentSubscriberDiagnosticSM    [0] AbsentSubscriberDiagnosticSM
                                                                OPTIONAL,
    extensionContainer              [1] ExtensionContainer      OPTIONAL,
    ...,
    gprsSupportIndicator            [2]  NULL                   OPTIONAL,
    -- gprsSupportIndicator is set only if the SMS-GMSC supports
    -- handling of two delivery outcomes
    deliveryOutcomeIndicator        [3]  NULL                   OPTIONAL,
    -- DeliveryOutcomeIndicator is set when the SM-DeliveryOutcome
    -- is for GPRS
    additionalSM-DeliveryOutcome    [4]  SM-DeliveryOutcome     OPTIONAL,
    -- If received, additionalSM-DeliveryOutcome is for GPRS
    -- If DeliveryOutcomeIndicator is set, then AdditionalSM-DeliveryOutcome shall be absent
    additionalAbsentSubscriberDiagnosticSM   [5]  AbsentSubscriberDiagnosticSM OPTIONAL
    -- If received additionalAbsentSubscriberDiagnosticSM is for GPRS
    -- If DeliveryOutcomeIndicator is set, then AdditionalAbsentSubscriberDiagnosticSM
    -- shall be absent
    }
```

```
SM-DeliveryOutcome ::= ENUMERATED {
    memoryCapacityExceeded  (0),
    absentSubscriber  (1),
    successfulTransfer  (2)}
```

```
ReportSM-DeliveryStatusRes ::= SEQUENCE {
    storedMSISDN                    ISDN-AddressString          OPTIONAL,
    extensionContainer              ExtensionContainer          OPTIONAL,
    ...}
```

```
AlertServiceCentreArg ::= SEQUENCE {
    msisdn                          ISDN-AddressString,
    serviceCentreAddress            AddressString,
    ...}
```

```
InformServiceCentreArg ::= SEQUENCE {
    storedMSISDN                    ISDN-AddressString          OPTIONAL,
    mw-Status MW-Status             OPTIONAL,
    extensionContainer              ExtensionContainer          OPTIONAL,
    ... ,
    absentSubscriberDiagnosticSM    AbsentSubscriberDiagnosticSM    OPTIONAL,
    additionalAbsentSubscriberDiagnosticSM   [0]  AbsentSubscriberDiagnosticSM OPTIONAL }
    -- additionalAbsentSubscriberDiagnosticSM may be present only if
    -- absentSubscriberDiagnosticSM is present.
    -- if included, additionalAbsentSubscriberDiagnosticSM is for GPRS and
    -- absentSubscriberDiagnosticSM is for non-GPRS
```

```
MW-Status ::= BIT STRING {
    sc-AddressNotIncluded  (0),
    mnrf-Set  (1),
    mcef-Set  (2) ,
    mnrg-Set   (3)} (SIZE (6..16))
    -- exception handling:
    -- bits 4 to 15 shall be ignored if received and not understood
```

```
ReadyForSM-Arg ::= SEQUENCE {
    imsi                            [0] IMSI,
    alertReason                     AlertReason,
    alertReasonIndicator            NULL                        OPTIONAL,
    -- alertReasonIndicator is set only when the alertReason
    -- sent to HLR is for GPRS
    extensionContainer              ExtensionContainer          OPTIONAL,
    ...}
```

```
ReadyForSM-Res ::= SEQUENCE {
    extensionContainer              ExtensionContainer          OPTIONAL,
    ...}
```

```
AlertReason ::= ENUMERATED {
    ms-Present  (0),
    memoryAvailable  (1)}
```

```
END
```

## 17.7.7 Error data types

```
MAP-ER-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-ER-DataTypes (17) ~~version8 (8)~~version9 (9)}

DEFINITIONS

IMPLICIT TAGS

::=

BEGIN

EXPORTS
   RoamingNotAllowedParam,
   CallBarredParam,
   CUG-RejectParam,
   SS-IncompatibilityCause,
   PW-RegistrationFailureCause,
   SM-DeliveryFailureCause,
   SystemFailureParam,
   DataMissingParam,
   UnexpectedDataParam,
   FacilityNotSupParam,
   OR-NotAllowedParam,
   UnknownSubscriberParam,
   NumberChangedParam,
   UnidentifiedSubParam,
   IllegalSubscriberParam,
   IllegalEquipmentParam,
   BearerServNotProvParam,
   TeleservNotProvParam,
   TracingBufferFullParam,
   NoRoamingNbParam,
   AbsentSubscriberParam,
   BusySubscriberParam,
   NoSubscriberReplyParam,
   ForwardingViolationParam,
   ForwardingFailedParam,
   ATI-NotAllowedParam,
   SubBusyForMT-SMS-Param,
   MessageWaitListFullParam,
   AbsentSubscriberSM-Param,
   AbsentSubscriberDiagnosticSM,
   ResourceLimitationParam,
   NoGroupCallNbParam,
   IncompatibleTerminalParam,
   ShortTermDenialParam,
   LongTermDenialParam,
   UnauthorizedRequestingNetwork-Param,
   UnauthorizedLCSClient-Param,
   PositionMethodFailure-Param,
   UnknownOrUnreachableLCSClient-Param,
   MM-EventNotSupported-Param,
   SecureTransportErrorParam,
   ATSI-NotAllowedParam,
   ATM-NotAllowedParam,
   IllegalSS-OperationParam,
   SS-NotAvailableParam,
   SS-SubscriptionViolationParam,
   InformationNotAvailableParam,
   TargetCellOutsideGCA-Param



;

IMPORTS
   SS-Status
FROM MAP-SS-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-SS-DataTypes (14) ~~version8 (8)~~version9 (9)}

   SignalInfo,
```

```
   BasicServiceCode,
   NetworkResource
FROM MAP-CommonDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-CommonDataTypes (18) ~~version8 (8)~~version9 (9)}

   SecurityHeader,
   ProtectedPayload
FROM MAP-ST-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-ST-DataTypes (27) ~~version8 (8)~~version9 (9)}


   SS-Code
FROM MAP-SS-Code {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-SS-Code (15) ~~version8 (8)~~version9 (9)}

   ExtensionContainer
FROM MAP-ExtensionDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-ExtensionDataTypes (21) ~~version8 (8)~~version9 (9)}
;
```

```
RoamingNotAllowedParam ::= SEQUENCE {
    roamingNotAllowedCause              RoamingNotAllowedCause,
    extensionContainer                  ExtensionContainer              OPTIONAL,
    ...}
```

```
RoamingNotAllowedCause ::= ENUMERATED {
    plmnRoamingNotAllowed  (0),
    operatorDeterminedBarring  (3)}
```

```
CallBarredParam ::= CHOICE {
    callBarringCause                    CallBarringCause,
    -- call BarringCause must not be used in version 3 and higher
    extensibleCallBarredParam           ExtensibleCallBarredParam
    -- extensibleCallBarredParam must not be used in version <3
    }
```

```
CallBarringCause ::= ENUMERATED {
    barringServiceActive  (0),
    operatorBarring  (1)}
```

```
ExtensibleCallBarredParam ::= SEQUENCE {
    callBarringCause                    CallBarringCause                OPTIONAL,
    extensionContainer                  ExtensionContainer              OPTIONAL,
    ... ,
    unauthorisedMessageOriginator       [1] NULL                        OPTIONAL }
```

```
CUG-RejectParam ::= SEQUENCE {
    cug-RejectCause                     CUG-RejectCause                 OPTIONAL,
    extensionContainer                  ExtensionContainer              OPTIONAL,
    ...}
```

```
CUG-RejectCause ::= ENUMERATED {
    incomingCallsBarredWithinCUG  (0),
    subscriberNotMemberOfCUG  (1),
    requestedBasicServiceViolatesCUG-Constraints  (5),
    calledPartySS-InteractionViolation  (7)}
```

```
SS-IncompatibilityCause ::= SEQUENCE {
    ss-Code                             [1] SS-Code                     OPTIONAL,
    basicService                        BasicServiceCode                OPTIONAL,
    ss-Status                           [4] SS-Status                   OPTIONAL,
    ...}
```

```
PW-RegistrationFailureCause ::= ENUMERATED {
    undetermined  (0),
    invalidFormat  (1),
    newPasswordsMismatch  (2)}
```

```
SM-EnumeratedDeliveryFailureCause ::= ENUMERATED {
     memoryCapacityExceeded  (0),
     equipmentProtocolError  (1),
     equipmentNotSM-Equipped  (2),
     unknownServiceCentre  (3),
     sc-Congestion  (4),
     invalidSME-Address  (5),
     subscriberNotSC-Subscriber  (6)}
```

```
SM-DeliveryFailureCause ::= SEQUENCE {
     sm-EnumeratedDeliveryFailureCause    SM-EnumeratedDeliveryFailureCause,
     diagnosticInfo                       SignalInfo                        OPTIONAL,
     extensionContainer                   ExtensionContainer                OPTIONAL,
     ...}
```

```
AbsentSubscriberSM-Param ::= SEQUENCE {
     absentSubscriberDiagnosticSM         AbsentSubscriberDiagnosticSM      OPTIONAL,
     -- AbsentSubscriberDiagnosticSM can be either for non-GPRS
     -- or for GPRS
     extensionContainer                   ExtensionContainer                OPTIONAL,
     ...,
     additionalAbsentSubscriberDiagnosticSM   [0]  AbsentSubscriberDiagnosticSM OPTIONAL }
     -- if received, additionalAbsentSubscriberDiagnosticSM
     -- is for GPRS and absentSubscriberDiagnosticSM is
     -- for non-GPRS
```

```
AbsentSubscriberDiagnosticSM ::= INTEGER (0..255)
     -- AbsentSubscriberDiagnosticSM values are defined in ETS 300 536 (3GPP TS 23.140)
```

```
SystemFailureParam ::= CHOICE {
     networkResource                      NetworkResource,
     -- networkResource must not be used in version 3
     extensibleSystemFailureParam         ExtensibleSystemFailureParam
     -- extensibleSystemFailureParam must not be used in version <3
     }
```

```
ExtensibleSystemFailureParam ::= SEQUENCE {
     networkResource                      NetworkResource                   OPTIONAL,
     extensionContainer                   ExtensionContainer                OPTIONAL,
     ...}
```

```
DataMissingParam ::= SEQUENCE {
     extensionContainer                   ExtensionContainer                OPTIONAL,
     ...}
```

```
UnexpectedDataParam ::= SEQUENCE {
     extensionContainer                   ExtensionContainer                OPTIONAL,
     ...}
```

```
FacilityNotSupParam ::= SEQUENCE {
     extensionContainer                   ExtensionContainer                OPTIONAL,
     ...,
     shapeOfLocationEstimateNotSupported [0]  NULL                          OPTIONAL,
     neededLcsCapabilityNotSupportedInServingNode [1] NULL                  OPTIONAL }
```

```
OR-NotAllowedParam ::= SEQUENCE {
     extensionContainer                   ExtensionContainer                OPTIONAL,
     ...}
```

```
UnknownSubscriberParam ::= SEQUENCE {
     extensionContainer                   ExtensionContainer                OPTIONAL,
     ...,
     unknownSubscriberDiagnostic          UnknownSubscriberDiagnostic       OPTIONAL}
```

```
UnknownSubscriberDiagnostic ::= ENUMERATED {
     imsiUnknown  (0),
     gprsSubscriptionUnknown  (1),
     ...,
     npdbMismatch  (2)}
     -- if unknown values are received in
     -- UnknownSubscriberDiagnostic they shall be discarded
```

```
NumberChangedParam ::= SEQUENCE {
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
UnidentifiedSubParam ::= SEQUENCE {
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
IllegalSubscriberParam ::= SEQUENCE {
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
IllegalEquipmentParam ::= SEQUENCE {
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
BearerServNotProvParam ::= SEQUENCE {
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
TeleservNotProvParam ::= SEQUENCE {
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
TracingBufferFullParam ::= SEQUENCE {
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
NoRoamingNbParam ::= SEQUENCE {
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
AbsentSubscriberParam ::= SEQUENCE {
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...,
     absentSubscriberReason              [0] AbsentSubscriberReason        OPTIONAL}
```

```
AbsentSubscriberReason ::= ENUMERATED {
     imsiDetach (0),
     restrictedArea (1),
     noPageResponse (2),
     ... ,
     purgedMS (3)}
-- exception handling: at reception of other values than the ones listed the
-- AbsentSubscriberReason shall be ignored.
-- The AbsentSubscriberReason: purgedMS is defined for the Super-Charger feature
-- (see TS 23.116). If this value is received in a Provide Roaming Number response
-- it shall be mapped to the AbsentSubscriberReason: imsiDetach in the Send Routeing
-- Information response
```

```
BusySubscriberParam ::= SEQUENCE {
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...,
     ccbs-Possible                       [0] NULL                          OPTIONAL,
     ccbs-Busy                           [1] NULL                          OPTIONAL}
```

```
NoSubscriberReplyParam ::= SEQUENCE {
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
ForwardingViolationParam ::= SEQUENCE {
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
ForwardingFailedParam ::= SEQUENCE {
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
ATI-NotAllowedParam ::= SEQUENCE {
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
ATSI-NotAllowedParam ::= SEQUENCE {
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
ATM-NotAllowedParam ::= SEQUENCE {
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
IllegalSS-OperationParam ::= SEQUENCE {
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
SS-NotAvailableParam ::= SEQUENCE {
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
SS-SubscriptionViolationParam ::= SEQUENCE {
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
InformationNotAvailableParam ::= SEQUENCE {
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
SubBusyForMT-SMS-Param ::= SEQUENCE {
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ... ,
     gprsConnectionSuspended             NULL                              OPTIONAL }
     -- If GprsConnectionSuspended is not understood it shall
     -- be discarded
```

```
MessageWaitListFullParam ::= SEQUENCE {
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
ResourceLimitationParam ::= SEQUENCE {
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
NoGroupCallNbParam ::= SEQUENCE {
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
IncompatibleTerminalParam ::= SEQUENCE {
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
ShortTermDenialParam ::= SEQUENCE {
     ...}
```

```
LongTermDenialParam ::= SEQUENCE {
     ...}
```

```
UnauthorizedRequestingNetwork-Param ::= SEQUENCE {
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
UnauthorizedLCSClient-Param ::= SEQUENCE {
     unauthorizedLCSClient-Diagnostic    [0] UnauthorizedLCSClient-Diagnostic  OPTIONAL,
     extensionContainer                  [1] ExtensionContainer                OPTIONAL,
     ... }
```

```
UnauthorizedLCSClient-Diagnostic ::= ENUMERATED {
     noAdditionalInformation (0),
     clientNotInMSPrivacyExceptionList (1),
     callToClientNotSetup (2),
     privacyOverrideNotApplicable (3),
     disallowedByLocalRegulatoryRequirements (4),
     ... }
--   exception handling:
--   any unrecognized value shall be ignored
```

```
PositionMethodFailure-Param ::= SEQUENCE {
     positionMethodFailure-Diagnostic     [0] PositionMethodFailure-Diagnostic   OPTIONAL,
     extensionContainer                   [1] ExtensionContainer                 OPTIONAL,
     ... }
```

```
PositionMethodFailure-Diagnostic ::= ENUMERATED {
     congestion  (0),
     insufficientResources  (1),
     insufficientMeasurementData  (2),
     inconsistentMeasurementData  (3),
     locationProcedureNotCompleted  (4),
     locationProcedureNotSupportedByTargetMS  (5),
     qoSNotAttainable  (6),
     positionMethodNotAvailableInNetwork  (7),
     positionMethodNotAvailableInLocationArea (8),
     ... }
--   exception handling:
--   any unrecognized value shall be ignored
```

```
UnknownOrUnreachableLCSClient-Param ::= SEQUENCE {
     extensionContainer                   ExtensionContainer                 OPTIONAL,
     ...}
```

```
MM-EventNotSupported-Param ::= SEQUENCE {
     extensionContainer                   ExtensionContainer                 OPTIONAL,
     ...}
```

```
TargetCellOutsideGCA-Param ::= SEQUENCE {
     extensionContainer                   ExtensionContainer                 OPTIONAL,
     ...}
```

```
SecureTransportErrorParam ::= SEQUENCE {
     securityHeader                       SecurityHeader,
     protectedPayload                     ProtectedPayload                   OPTIONAL
     }
     -- The protectedPayload carries the result of applying the security function
     -- defined in 3GPP TS 33.200 to the encoding of the securely transported error
     -- parameter
```

```
END
```

## 17.7.8 Common data types

```
MAP-CommonDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-CommonDataTypes (18) version8 (8)version9 (9)}

DEFINITIONS

IMPLICIT TAGS

::=

BEGIN

EXPORTS

   -- general data types and values
   AddressString,
   ISDN-AddressString,
   maxISDN-AddressLength,
   FTN-AddressString,
   ISDN-SubaddressString,
   ExternalSignalInfo,
   Ext-ExternalSignalInfo,
   AccessNetworkSignalInfo,
   SignalInfo,
   maxSignalInfoLength,
   AlertingPattern,

   -- data types for numbering and identification
   IMSI,
   TMSI,
   Identity,
   SubscriberId,
```

```
   IMEI,
   HLR-List,
   LMSI,
   GlobalCellId,
   NetworkResource,
   NAEA-PreferredCI,
   NAEA-CIC,
   ASCI-CallReference,
   SubscriberIdentity,

   -- data types for CAMEL
   CellGlobalIdOrServiceAreaIdOrLAI,

   -- data types for subscriber management
   BasicServiceCode,
   Ext-BasicServiceCode,
   EMLPP-Info,
   EMLPP-Priority,
   MC-SS-Info,
   MaxMC-Bearers,
   MC-Bearers,
   Ext-SS-Status,

   -- data types for geographic location
   AgeOfLocationInformation,
   LCSClientExternalID,
   LCSClientInternalID,
   LCSServiceTypeID
;

IMPORTS
   TeleserviceCode,
   Ext-TeleserviceCode
FROM MAP-TS-Code {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-TS-Code (19) version8 (8)version9 (9)}

   BearerServiceCode,
   Ext-BearerServiceCode
FROM MAP-BS-Code {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-BS-Code (20) version8 (8)version9 (9)}

   SS-Code
FROM MAP-SS-Code {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-SS-Code (15) version8 (8)version9 (9)}

   ExtensionContainer
FROM MAP-ExtensionDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-ExtensionDataTypes (21) version8 (8)version9 (9)}
;


-- general data types

TBCD-STRING ::= OCTET STRING
     -- This type (Telephony Binary Coded Decimal String) is used to
     -- represent several digits from 0 through 9, *, #, a, b, c, two
     -- digits per octet, each digit encoded 0000 to 1001 (0 to 9),
     -- 1010 (*), 1011 (#), 1100 (a), 1101 (b) or 1110 (c); 1111 used
     -- as filler when there is an odd number of digits.

     -- bits 8765 of octet n encoding digit 2n
     -- bits 4321 of octet n encoding digit 2(n-1) +1
```

```
AddressString ::= OCTET STRING (SIZE (1..maxAddressLength))
     -- This type is used to represent a number for addressing
     -- purposes. It is composed of
     --   a)   one octet for nature of address, and numbering plan
     --        indicator.
     --   b)   digits of an address encoded as TBCD-String.

     -- a)     The first octet includes a one bit extension indicator, a
     --        3 bits nature of address indicator and a 4 bits numbering
     --        plan indicator, encoded as follows:

     -- bit 8: 1  (no extension)

     -- bits 765: nature of address indicator
     --   000  unknown
     --   001  international number
     --   010  national significant number
     --   011  network specific number
     --   100  subscriber number
     --   101  reserved
     --   110  abbreviated number
     --   111  reserved for extension

     -- bits 4321: numbering plan indicator
     --   0000  unknown
     --   0001  ISDN/Telephony Numbering Plan (Rec ITU-T E.164)
     --   0010  spare
     --   0011  data numbering plan (ITU-T Rec X.121)
     --   0100  telex numbering plan (ITU-T Rec F.69)
     --   0101  spare
     --   0110  land mobile numbering plan (ITU-T Rec E.212)
     --   0111  spare
     --   1000  national numbering plan
     --   1001  private numbering plan
     --   1111  reserved for extension

     --   all other values are reserved.

     -- b)     The following octets representing digits of an address
     --        encoded as a TBCD-STRING.
```

```
maxAddressLength  INTEGER ::= 20
```

```
ISDN-AddressString ::=
              AddressString (SIZE (1..maxISDN-AddressLength))
     -- This type is used to represent ISDN numbers.
```

```
maxISDN-AddressLength  INTEGER ::= 9
```

```
FTN-AddressString ::=
              AddressString (SIZE (1..maxFTN-AddressLength))
     -- This type is used to represent forwarded-to numbers.
     -- For long forwarded-to numbers (longer than 15 digits) NPI shall be unknown;
     -- if NAI = international the first digits represent the country code (CC)
     -- and the network destination code (NDC) as for E.164.
```

```
maxFTN-AddressLength  INTEGER ::= 15
```

```
ISDN-SubaddressString ::=
            OCTET STRING (SIZE (1..maxISDN-SubaddressLength))
    -- This type is used to represent ISDN subaddresses.
    -- It is composed of
    --   a)   one octet for type of subaddress and odd/even indicator.
    --   b)   20 octets for subaddress information.

    --   a)   The first octet includes a one bit extension indicator, a
    --        3 bits type of subaddress and a one bit odd/even indicator,
    --        encoded as follows:

    --   bit 8: 1  (no extension)

    --   bits 765: type of subaddress
    --        000  NSAP (X.213/ISO 8348 AD2)
    --        010  User Specified
    --        All other values are reserved

    --   bit 4: odd/even indicator
    --        0  even number of address signals
    --        1  odd number of address signals
    --        The odd/even indicator is used when the type of subaddress
    --        is "user specified" and the coding is BCD.

    --   bits 321: 000 (unused)

    --   b) Subaddress information.
    --   The NSAP X.213/ISO8348AD2 address shall be formatted as specified
    --   by octet 4 which contains the Authority and Format Identifier
    --   (AFI). The encoding is made according to the "preferred binary
    --   encoding" as defined in X.213/ISO834AD2. For the definition
    --   of this type of subaddress, see ITU-T Rec I.334.

    --   For User-specific subaddress, this field is encoded according
    --   to the user specification, subject to a maximum length of 20
    --   octets. When interworking with X.25 networks BCD coding should
    --   be applied.
```

```
maxISDN-SubaddressLength  INTEGER ::= 21
```

```
ExternalSignalInfo ::= SEQUENCE {
    protocolId                      ProtocolId,
    signalInfo                      SignalInfo,
    -- Information about the internal structure is given in
    -- clause 7.6.9.
    extensionContainer              ExtensionContainer          OPTIONAL,
    -- extensionContainer must not be used in version 2
    ...}
```

```
SignalInfo ::= OCTET STRING (SIZE (1..maxSignalInfoLength))
```

```
maxSignalInfoLength  INTEGER ::= 200
    -- This NamedValue represents the theoretical maximum number of octets which is
    -- available to carry a single instance of the SignalInfo data type,
    -- without requiring segmentation to cope with the network layer service.
    -- However, the actual maximum size available for an instance of the data
    -- type may be lower, especially when other information elements
    -- have to be included in the same component.
```

```
ProtocolId ::= ENUMERATED {
    gsm-0408  (1),
    gsm-0806  (2),
    gsm-BSSMAP  (3),
    -- Value 3 is reserved and must not be used
    ets-300102-1  (4)}
```

```
Ext-ExternalSignalInfo ::= SEQUENCE {
    ext-ProtocolId                  Ext-ProtocolId,
    signalInfo                      SignalInfo,
    -- Information about the internal structure is given in
    -- clause 7.6.9.10
    extensionContainer              ExtensionContainer          OPTIONAL,
    ...}
```

```
Ext-ProtocolId ::= ENUMERATED {
     ets-300356  (1),
     ...
      }
-- exception handling:
-- For Ext-ExternalSignalInfo sequences containing this parameter with any
-- other value than the ones listed the receiver shall ignore the whole
-- Ext-ExternalSignalInfo sequence.
```

```
AccessNetworkSignalInfo ::= SEQUENCE {
     accessNetworkProtocolId             AccessNetworkProtocolId,
     signalInfo                          LongSignalInfo,
     -- Information about the internal structure is given in clause 7.6.9.1

     extensionContainer                  ExtensionContainer              OPTIONAL,
     ...}
```

```
LongSignalInfo ::= OCTET STRING (SIZE (1..maxLongSignalInfoLength))
```

```
maxLongSignalInfoLength  INTEGER ::= 2560
     -- This Named Value represents the maximum number of octets which is available
     -- to carry a single instance of the LongSignalInfo data type using
     -- White Book SCCP with the maximum number of segments.
     -- It takes account of the octets used by the lower layers of the protocol, and
     -- other information elements which may be included in the same component.
```

```
AccessNetworkProtocolId ::= ENUMERATED {
     ts3G-48006   (1),
     ts3G-25413 (2),
     ...}
     -- exception handling:
     -- For AccessNetworkSignalInfo sequences containing this parameter with any
     -- other value than the ones listed the receiver shall ignore the whole
     -- AccessNetworkSignalInfo sequence.
```

```
AlertingPattern ::= OCTET STRING (SIZE (1) )
     -- This type is used to represent Alerting Pattern

     --   bits 8765 : 0000 (unused)

     --   bits 43 : type of Pattern
     --        00 level
     --        01 category
     --        10 category
     --        all other values are reserved.

     --   bits 21 : type of alerting

alertingLevel-0   AlertingPattern ::= '00000000'B
alertingLevel-1   AlertingPattern ::= '00000001'B
alertingLevel-2   AlertingPattern ::= '00000010'B
     -- all other values of Alerting level are reserved
     -- Alerting Levels are defined in GSM 02.07

alertingCategory-1   AlertingPattern ::= '00000100'B
alertingCategory-2   AlertingPattern ::= '00000101'B
alertingCategory-3   AlertingPattern ::= '00000110'B
alertingCategory-4   AlertingPattern ::= '00000111'B
alertingCategory-5   AlertingPattern ::= '00001000'B
     -- all other values of Alerting Category are reserved
     -- Alerting categories are defined in GSM 02.07
```

```
-- data types for numbering and identification
```

```
IMSI ::= TBCD-STRING (SIZE (3..8))
     -- digits of MCC, MNC, MSIN are concatenated in this order.
```

```
Identity ::= CHOICE {
     imsi                                IMSI,
     imsi-WithLMSI                       IMSI-WithLMSI}
```

```
IMSI-WithLMSI ::= SEQUENCE {
    imsi                                IMSI,
    lmsi                                LMSI,
    -- a special value 00000000 indicates that the LMSI is not in use
    ...}
```

```
ASCI-CallReference ::= TBCD-STRING (SIZE (1..8))
    -- digits of VGCS/VBC-area,Group-ID are concatenated in this order.
```

```
TMSI ::= OCTET STRING (SIZE (1..4))
```

```
SubscriberId ::= CHOICE {
    imsi                                [0] IMSI,
    tmsi                                [1] TMSI}
```

```
IMEI ::= TBCD-STRING (SIZE (8))
    --   Refers to International Mobile Station Equipment Identity
    --   and Software Version Number (SVN) defined in TS 3GPP TS 23.003 [17].
    --   If the SVN is not present the last octet shall contain the
    --   digit 0 and a filler.
    --   If present the SVN shall be included in the last octet.
```

```
HLR-Id ::= IMSI
    -- leading digits of IMSI, i.e. (MCC, MNC, leading digits of
    -- MSIN) forming HLR Id defined in TS 3GPP TS 23.003 [17].
```

```
HLR-List ::= SEQUENCE SIZE (1..maxNumOfHLR-Id) OF
                                        HLR-Id
```

```
maxNumOfHLR-Id  INTEGER ::= 50
```

```
LMSI ::= OCTET STRING (SIZE (4))
```

```
GlobalCellId ::= OCTET STRING (SIZE (5..7))
    -- Refers to Cell Global Identification defined in TS 3GPP TS 23.003 [17].
    -- The internal structure is defined as follows:
    -- octet 1 bits 4321                Mobile Country Code 1st digit
    --         bits 8765                Mobile Country Code 2nd digit
    -- octet 2 bits 4321                Mobile Country Code 3rd digit
    --         bits 8765                Mobile Network Code 3rd digit
    --                                  or filler (1111) for 2 digit MNCs
    -- octet 3 bits 4321                Mobile Network Code 1st digit
    --         bits 8765                Mobile Network Code 2nd digit
    -- octets 4 and 5                   Location Area Code according to TS 3GPP TS 24.008
[35]
    -- octets 6 and 7                   Cell Identity (CI) according to TS 3GPP TS 24.008
[35]
```

```
NetworkResource ::= ENUMERATED {
    plmn  (0),
    hlr  (1),
    vlr  (2),
    pvlr  (3),
    controllingMSC  (4),
    vmsc  (5),
    eir  (6),
    rss  (7)}
```

```
NAEA-PreferredCI ::= SEQUENCE {
    naea-PreferredCIC                   [0] NAEA-CIC,
    extensionContainer                  [1] ExtensionContainer          OPTIONAL,
    ...}
```

```
NAEA-CIC ::= OCTET STRING (SIZE (3))
    -- The internal structure is defined by the Carrier Identification
    -- parameter in ANSI T1.113.3. Carrier codes between “000” and “999” may
    -- be encoded as 3 digits using “000” to “999” or as 4 digits using
    -- “0000” to “0999”. Carrier codes between “1000” and “9999” are encoded
    -- using 4 digits.
```

```
SubscriberIdentity ::= CHOICE {
    imsi                                [0] IMSI,
    msisdn                              [1] ISDN-AddressString
    }
```

```
LCSClientExternalID ::= SEQUENCE {
     externalAddress                    [0] AddressString               OPTIONAL,
     extensionContainer                 [1] ExtensionContainer          OPTIONAL,
     ... }
```

```
LCSClientInternalID ::= ENUMERATED {
     broadcastService                   (0),
     o-andM-HPLMN                       (1),
     o-andM-VPLMN                       (2),
     anonymousLocation                  (3),
     targetMSsubscribedService          (4),
     ... }
-- for a CAMEL phase 3 PLMN operator client, the value targetMSsubscribedService shall be used
```

```
LCSServiceTypeID ::= INTEGER (0..127)
     -- the integer values 0-63 are reserved for Standard LCS service types
     -- the integer values 64-127 are reserved for Non Standard LCS service types
```

```
emergencyServices                           LCSServiceTypeID ::= 0
emergencyAlertServices                      LCSServiceTypeID ::= 1
personTracking                              LCSServiceTypeID ::= 2
fleetManagement                             LCSServiceTypeID ::= 3
assetManagement                             LCSServiceTypeID ::= 4
trafficCongestionReporting                  LCSServiceTypeID ::= 5
roadsideAssistance                          LCSServiceTypeID ::= 6
routingToNearestCommercialEnterprise        LCSServiceTypeID ::= 7
navigation                                  LCSServiceTypeID ::= 8
citySightseeing                             LCSServiceTypeID ::= 9
localizedAdvertising                        LCSServiceTypeID ::= 10
mobileYellowPages                           LCSServiceTypeID ::= 11
-- The values of LCSServiceTypeID are defined according to 3GPP TS 22.071.
```

*-- data types for CAMEL*

```
CellGlobalIdOrServiceAreaIdOrLAI ::= CHOICE {
     cellGlobalIdOrServiceAreaIdFixedLength   [0] CellGlobalIdOrServiceAreaIdFixedLength,
     laiFixedLength                     [1] LAIFixedLength}
```

```
CellGlobalIdOrServiceAreaIdFixedLength ::= OCTET STRING (SIZE (7))
     -- Refers to Cell Global Identification or Service Are Identification
     -- defined in 3GPP TS 23.003.
     -- The internal structure is defined as follows:
     -- octet 1 bits 4321               Mobile Country Code 1st digit
     --         bits 8765               Mobile Country Code 2nd digit
     -- octet 2 bits 4321               Mobile Country Code 3rd digit
     --         bits 8765               Mobile Network Code 3rd digit
     --                                 or filler (1111) for 2 digit MNCs
     -- octet 3 bits 4321               Mobile Network Code 1st digit
     --         bits 8765               Mobile Network Code 2nd digit
     -- octets 4 and 5                  Location Area Code according to 3GPP TS 24.008
     -- octets 6 and 7                  Cell Identity (CI) value or
     --                                 Service Area Code (SAC) value
     --                                 according to 3GPP TS 23.003
```

```
LAIFixedLength ::= OCTET STRING (SIZE (5))
     -- Refers to Location Area Identification defined in TS 3GPP TS 23.003 [17].
     -- The internal structure is defined as follows:
     -- octet 1 bits 4321               Mobile Country Code 1st digit
     --         bits 8765               Mobile Country Code 2nd digit
     -- octet 2 bits 4321               Mobile Country Code 3rd digit
     --         bits 8765               Mobile Network Code 3rd digit
     --                                 or filler (1111) for 2 digit MNCs
     -- octet 3 bits 4321               Mobile Network Code 1st digit
     --         bits 8765               Mobile Network Code 2nd digit
     -- octets 4 and 5                  Location Area Code according to TS 3GPP TS 24.008
[35]
```

*-- data types for subscriber management*

```
BasicServiceCode ::= CHOICE {
     bearerService                      [2] BearerServiceCode,
     teleservice                        [3] TeleserviceCode}
```

```
Ext-BasicServiceCode ::= CHOICE {
     ext-BearerService                  [2] Ext-BearerServiceCode,
     ext-Teleservice                    [3] Ext-TeleserviceCode}
```

```
EMLPP-Info ::= SEQUENCE {
     maximumentitledPriority            EMLPP-Priority,
     defaultPriority                    EMLPP-Priority,
     extensionContainer                 ExtensionContainer              OPTIONAL,
     ...}
```

```
EMLPP-Priority ::= INTEGER (0..15)
     -- The mapping from the values A,B,0,1,2,3,4 to the integer-value is
     -- specified as follows where A is the highest and 4 is the lowest
     -- priority level
     -- the integer values 7-15 are spare and shall be mapped to value 4
```

```
priorityLevelA                          EMLPP-Priority ::= 6
priorityLevelB                          EMLPP-Priority ::= 5
priorityLevel0                          EMLPP-Priority ::= 0
priorityLevel1                          EMLPP-Priority ::= 1
priorityLevel2                          EMLPP-Priority ::= 2
priorityLevel3                          EMLPP-Priority ::= 3
priorityLevel4                          EMLPP-Priority ::= 4
```

```
MC-SS-Info ::= SEQUENCE {
     ss-Code                            [0] SS-Code,
     ss-Status                          [1] Ext-SS-Status,
     nbrSB                              [2] MaxMC-Bearers,
     nbrUser                            [3] MC-Bearers,
     extensionContainer                 [4] ExtensionContainer          OPTIONAL,
     ...}
```

```
MaxMC-Bearers ::= INTEGER (2..maxNumOfMC-Bearers)
```

```
MC-Bearers ::= INTEGER (1..maxNumOfMC-Bearers)
```

```
maxNumOfMC-Bearers  INTEGER ::= 7
```

```
Ext-SS-Status ::= OCTET STRING (SIZE (1..5))

     -- OCTET 1:
     --
     -- bits 8765: 0000 (unused)
     -- bits 4321: Used to convey the "P bit","R bit","A bit" and "Q bit",
     --            representing supplementary service state information
     --            as defined in TS 3GPP TS 23.011 [22]

     -- bit 4: "Q bit"

     -- bit 3: "P bit"

     -- bit 2: "R bit"

     -- bit 1: "A bit"

     -- OCTETS 2-5: reserved for future use. They shall be discarded if
     -- received and not understood.
```

```
   -- data types for geographic location

AgeOfLocationInformation ::= INTEGER (0..32767)
-- the value represents the elapsed time in minutes since the last
-- network contact of the mobile station (i.e. the actuality of the
-- location information).
-- value “0” indicates that the MS is currently in contact with the
--           network
-- value “32767” indicates that the location information is at least
--               32767 minutes old
```

```
END
```

## 17.7.9 Teleservice Codes

```
MAP-TS-Code {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-TS-Code (19) ~~version8 (8)~~version9 (9)}

DEFINITIONS

::=

BEGIN

TeleserviceCode ::= OCTET STRING (SIZE (1))
     -- This type is used to represent the code identifying a single
     -- teleservice, a group of teleservices, or all teleservices. The
     -- services are defined in TS GSM 22.003 [4].
     -- The internal structure is defined as follows:

     -- bits 87654321: group (bits 8765) and specific service
     -- (bits 4321)

Ext-TeleserviceCode ::= OCTET STRING (SIZE (1..5))
     -- This type is used to represent the code identifying a single
     -- teleservice, a group of teleservices, or all teleservices. The
     -- services are defined in TS GSM 22.003 [4].
     -- The internal structure is defined as follows:

     -- OCTET 1:
     -- bits 87654321: group (bits 8765) and specific service
     -- (bits 4321)

     -- OCTETS 2-5: reserved for future use. If received the
    -- Ext-TeleserviceCode shall be
     -- treated according to the exception handling defined for the
     -- operation that uses this type.

     -- Ext-TeleserviceCode includes all values defined for TeleserviceCode.

allTeleservices                         TeleserviceCode ::= '00000000'B

allSpeechTransmissionServices           TeleserviceCode ::= '00010000'B
telephony                               TeleserviceCode ::= '00010001'B
emergencyCalls                          TeleserviceCode ::= '00010010'B

allShortMessageServices                 TeleserviceCode ::= '00100000'B
shortMessageMT-PP                       TeleserviceCode ::= '00100001'B
shortMessageMO-PP                       TeleserviceCode ::= '00100010'B

allFacsimileTransmissionServices        TeleserviceCode ::= '01100000'B
facsimileGroup3AndAlterSpeech           TeleserviceCode ::= '01100001'B
automaticFacsimileGroup3                TeleserviceCode ::= '01100010'B
facsimileGroup4                         TeleserviceCode ::= '01100011'B

-- The following non-hierarchical Compound Teleservice Groups
-- are defined in TS 3GPP TS 22.030:
allDataTeleservices                     TeleserviceCode ::= '01110000'B
     -- covers Teleservice Groups 'allFacsimileTransmissionServices'
     -- and 'allShortMessageServices'
allTeleservices-ExeptSMS                TeleserviceCode ::= '10000000'B
     -- covers Teleservice Groups 'allSpeechTransmissionServices' and
     -- 'allFacsimileTransmissionServices'
--
-- Compound Teleservice Group Codes are only used in call
-- independent supplementary service operations, i.e. they
-- are not used in InsertSubscriberData or in
-- DeleteSubscriberData messages.

allVoiceGroupCallServices               TeleserviceCode ::= '10010000'B
voiceGroupCall                          TeleserviceCode ::= '10010001'B
voiceBroadcastCall                      TeleserviceCode ::= '10010010'B
```

```
allPLMN-specificTS                  TeleserviceCode ::= '11010000'B
plmn-specificTS-1                   TeleserviceCode ::= '11010001'B
plmn-specificTS-2                   TeleserviceCode ::= '11010010'B
plmn-specificTS-3                   TeleserviceCode ::= '11010011'B
plmn-specificTS-4                   TeleserviceCode ::= '11010100'B
plmn-specificTS-5                   TeleserviceCode ::= '11010101'B
plmn-specificTS-6                   TeleserviceCode ::= '11010110'B
plmn-specificTS-7                   TeleserviceCode ::= '11010111'B
plmn-specificTS-8                   TeleserviceCode ::= '11011000'B
plmn-specificTS-9                   TeleserviceCode ::= '11011001'B
plmn-specificTS-A                   TeleserviceCode ::= '11011010'B
plmn-specificTS-B                   TeleserviceCode ::= '11011011'B
plmn-specificTS-C                   TeleserviceCode ::= '11011100'B
plmn-specificTS-D                   TeleserviceCode ::= '11011101'B
plmn-specificTS-E                   TeleserviceCode ::= '11011110'B
plmn-specificTS-F                   TeleserviceCode ::= '11011111'B
```

```
END
```

## 17.7.10 Bearer Service Codes

```
MAP-BS-Code {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-BS-Code (20) ~~version8 (8)~~version9 (9)}

DEFINITIONS

::=

BEGIN
```

```
BearerServiceCode ::= OCTET STRING (SIZE (1))
     -- This type is used to represent the code identifying a single
     -- bearer service, a group of bearer services, or all bearer
     -- services. The services are defined in TS 3GPP TS 22.002 [3].
     -- The internal structure is defined as follows:
     --
     -- plmn-specific bearer services:
     -- bits 87654321: defined by the HPLMN operator

     -- rest of bearer services:
     -- bit 8: 0 (unused)
     -- bits 7654321: group (bits 7654), and rate, if applicable
     -- (bits 321)
```

```
Ext-BearerServiceCode ::= OCTET STRING (SIZE (1..5))
     -- This type is used to represent the code identifying a single
     -- bearer service, a group of bearer services, or all bearer
     -- services. The services are defined in TS 3GPP TS 22.002 [3].
     -- The internal structure is defined as follows:
     --
     -- OCTET 1:
     -- plmn-specific bearer services:
     -- bits 87654321: defined by the HPLMN operator
     --
     -- rest of bearer services:
     -- bit 8: 0 (unused)
     -- bits 7654321: group (bits 7654), and rate, if applicable
     -- (bits 321)

     -- OCTETS 2-5: reserved for future use. If received the
    -- Ext-TeleserviceCode shall be
     -- treated according to the exception handling defined for the
     -- operation that uses this type.


     -- Ext-BearerServiceCode includes all values defined for BearerServiceCode.
```

```
allBearerServices                   BearerServiceCode ::= '00000000'B
```

```
allDataCDA-Services                     BearerServiceCode ::= '00010000'B
dataCDA-300bps                          BearerServiceCode ::= '00010001'B
dataCDA-1200bps                         BearerServiceCode ::= '00010010'B
dataCDA-1200-75bps                      BearerServiceCode ::= '00010011'B
dataCDA-2400bps                         BearerServiceCode ::= '00010100'B
dataCDA-4800bps                         BearerServiceCode ::= '00010101'B
dataCDA-9600bps                         BearerServiceCode ::= '00010110'B
general-dataCDA                         BearerServiceCode ::= '00010111'B
```

```
allDataCDS-Services                     BearerServiceCode ::= '00011000'B
dataCDS-1200bps                         BearerServiceCode ::= '00011010'B
dataCDS-2400bps                         BearerServiceCode ::= '00011100'B
dataCDS-4800bps                         BearerServiceCode ::= '00011101'B
dataCDS-9600bps                         BearerServiceCode ::= '00011110'B
general-dataCDS                         BearerServiceCode ::= '00011111'B
```

```
allPadAccessCA-Services                 BearerServiceCode ::= '00100000'B
padAccessCA-300bps                      BearerServiceCode ::= '00100001'B
padAccessCA-1200bps                     BearerServiceCode ::= '00100010'B
padAccessCA-1200-75bps                  BearerServiceCode ::= '00100011'B
padAccessCA-2400bps                     BearerServiceCode ::= '00100100'B
padAccessCA-4800bps                     BearerServiceCode ::= '00100101'B
padAccessCA-9600bps                     BearerServiceCode ::= '00100110'B
general-padAccessCA                     BearerServiceCode ::= '00100111'B
```

```
allDataPDS-Services                     BearerServiceCode ::= '00101000'B
dataPDS-2400bps                         BearerServiceCode ::= '00101100'B
dataPDS-4800bps                         BearerServiceCode ::= '00101101'B
dataPDS-9600bps                         BearerServiceCode ::= '00101110'B
general-dataPDS                         BearerServiceCode ::= '00101111'B
```

```
allAlternateSpeech-DataCDA              BearerServiceCode ::= '00110000'B
```

```
allAlternateSpeech-DataCDS              BearerServiceCode ::= '00111000'B
```

```
allSpeechFollowedByDataCDA              BearerServiceCode ::= '01000000'B
```

```
allSpeechFollowedByDataCDS              BearerServiceCode ::= '01001000'B
```

```
-- The following non-hierarchical Compound Bearer Service
-- Groups are defined in TS 3GPP TS 22.030:
allDataCircuitAsynchronous              BearerServiceCode ::= '01010000'B
     -- covers "allDataCDA-Services", "allAlternateSpeech-DataCDA" and
     -- "allSpeechFollowedByDataCDA"
allAsynchronousServices                 BearerServiceCode ::= '01100000'B
     -- covers "allDataCDA-Services", "allAlternateSpeech-DataCDA",
     -- "allSpeechFollowedByDataCDA" and "allPadAccessCDA-Services"
allDataCircuitSynchronous               BearerServiceCode ::= '01011000'B
     -- covers "allDataCDS-Services", "allAlternateSpeech-DataCDS" and
     -- "allSpeechFollowedByDataCDS"
allSynchronousServices                  BearerServiceCode ::= '01101000'B
     -- covers "allDataCDS-Services", "allAlternateSpeech-DataCDS",
     -- "allSpeechFollowedByDataCDS" and "allDataPDS-Services"
--
-- Compound Bearer Service Group Codes are only used in call
-- independent supplementary service operations, i.e. they
-- are not used in InsertSubscriberData or in
-- DeleteSubscriberData messages.
```

```
allPLMN-specificBS                      BearerServiceCode ::= '11010000'B
plmn-specificBS-1                       BearerServiceCode ::= '11010001'B
plmn-specificBS-2                       BearerServiceCode ::= '11010010'B
plmn-specificBS-3                       BearerServiceCode ::= '11010011'B
plmn-specificBS-4                       BearerServiceCode ::= '11010100'B
plmn-specificBS-5                       BearerServiceCode ::= '11010101'B
plmn-specificBS-6                       BearerServiceCode ::= '11010110'B
plmn-specificBS-7                       BearerServiceCode ::= '11010111'B
plmn-specificBS-8                       BearerServiceCode ::= '11011000'B
plmn-specificBS-9                       BearerServiceCode ::= '11011001'B
plmn-specificBS-A                       BearerServiceCode ::= '11011010'B
plmn-specificBS-B                       BearerServiceCode ::= '11011011'B
plmn-specificBS-C                       BearerServiceCode ::= '11011100'B
plmn-specificBS-D                       BearerServiceCode ::= '11011101'B
plmn-specificBS-E                       BearerServiceCode ::= '11011110'B
plmn-specificBS-F                       BearerServiceCode ::= '11011111'B
```

```
END
```

## 17.7.11 Extension data types

```
MAP-ExtensionDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-ExtensionDataTypes (21) version8 (8)version9 (9)}

DEFINITIONS

IMPLICIT TAGS

::=

BEGIN

EXPORTS

   PrivateExtension,
   ExtensionContainer;


-- IOC for private MAP extensions

MAP-EXTENSION  ::= CLASS {
    &ExtensionType                                              OPTIONAL,
    &extensionId                    OBJECT IDENTIFIER }
    -- The length of the Object Identifier shall not exceed 16 octets and the
    -- number of components of the Object Identifier shall not exceed 16


-- data types

ExtensionContainer ::= SEQUENCE {
    privateExtensionList            [0]PrivateExtensionList         OPTIONAL,
    pcs-Extensions                  [1]PCS-Extensions               OPTIONAL,
    ...}

PrivateExtensionList ::= SEQUENCE SIZE (1..maxNumOfPrivateExtensions) OF
                                    PrivateExtension

PrivateExtension ::= SEQUENCE {
    extId                           MAP-EXTENSION.&extensionId
                                    ({ExtensionSet}),
    extType                         MAP-EXTENSION.&ExtensionType
                                    ({ExtensionSet}{@extId})        OPTIONAL}

maxNumOfPrivateExtensions  INTEGER ::= 10

ExtensionSet                        MAP-EXTENSION ::=
        {...
         -- ExtensionSet is the set of all defined private extensions
    }

    -- Unsupported private extensions shall be discarded if received.


PCS-Extensions ::= SEQUENCE {
    ...}

END
```

## 17.7.12 Group Call data types

```
MAP-GR-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-GR-DataTypes (23) version8 (8)version9 (9)}

DEFINITIONS

IMPLICIT TAGS

::=

BEGIN
```

```
EXPORTS
   PrepareGroupCallArg,
   PrepareGroupCallRes,
   SendGroupCallEndSignalArg,
   SendGroupCallEndSignalRes,
   ForwardGroupCallSignallingArg,
   ProcessGroupCallSignallingArg
;

IMPORTS
   ISDN-AddressString,
   IMSI,
   EMLPP-Priority,
   ASCI-CallReference
FROM MAP-CommonDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-CommonDataTypes (18) ~~version8 (8)~~version9 (9)}

   Ext-TeleserviceCode
FROM MAP-TS-Code {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-TS-Code (19) ~~version8 (8)~~version9 (9)}

   Kc
FROM MAP-MS-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-MS-DataTypes (11) ~~version8 (8)~~version9 (9)}


   ExtensionContainer
FROM MAP-ExtensionDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-ExtensionDataTypes (21) ~~version8 (8)~~version9 (9)}
;
```

```
PrepareGroupCallArg ::= SEQUENCE {
    teleservice                 Ext-TeleserviceCode,
    asciCallReference           ASCI-CallReference,
    codec-Info                  CODEC-Info,
    cipheringAlgorithm          CipheringAlgorithm,
    groupKeyNumber              [0] GroupKeyNumber              OPTIONAL,
    groupKey                    [1] Kc                          OPTIONAL,
    priority                    [2] EMLPP-Priority              OPTIONAL,
    uplinkFree                  [3] NULL                        OPTIONAL,
    extensionContainer          [4] ExtensionContainer          OPTIONAL,
    ...}
```

```
PrepareGroupCallRes ::= SEQUENCE {
    groupCallNumber             ISDN-AddressString,
    extensionContainer          ExtensionContainer              OPTIONAL,
    ...}
```

```
SendGroupCallEndSignalArg ::= SEQUENCE {
    imsi                        IMSI                            OPTIONAL,
    extensionContainer          ExtensionContainer              OPTIONAL,
    ...}
```

```
SendGroupCallEndSignalRes ::= SEQUENCE {
    extensionContainer          ExtensionContainer              OPTIONAL,
    ...}
```

```
ForwardGroupCallSignallingArg ::= SEQUENCE {
    imsi                        IMSI                            OPTIONAL,
    uplinkRequestAck            [0] NULL                        OPTIONAL,
    uplinkReleaseIndication     [1] NULL                        OPTIONAL,
    uplinkRejectCommand         [2] NULL                        OPTIONAL,
    uplinkSeizedCommand         [3] NULL                        OPTIONAL,
    uplinkReleaseCommand        [4] NULL                        OPTIONAL,
    extensionContainer          ExtensionContainer              OPTIONAL,
    ...,
    stateAttributes             [5] StateAttributes             OPTIONAL }
```

```
ProcessGroupCallSignallingArg ::= SEQUENCE {
    uplinkRequest                   [0] NULL                    OPTIONAL,
    uplinkReleaseIndication         [1] NULL                    OPTIONAL,
    releaseGroupCall                [2] NULL                    OPTIONAL,
    extensionContainer              ExtensionContainer          OPTIONAL,
    ...}
```

```
GroupKeyNumber ::= INTEGER (0..15)
```

```
CODEC-Info ::= OCTET STRING (SIZE (5..10))
    -- Refers to channel type
    -- coded according to 3GPP TS 48.008 [49] and including Element identifier and Length
```

```
CipheringAlgorithm ::= OCTET STRING (SIZE (1))
    -- Refers to 'permitted algorithms' in 'encryption information'
    -- coded according to 3GPP TS 48.008 [49]:

    -- Bits 8-1
    -- 8765 4321
    -- 0000 0001                    No encryption
    -- 0000 0010                    GSM A5/1
    -- 0000 0100                    GSM A5/2
    -- 0000 1000                    GSM A5/3
    -- 0001 0000                    GSM A5/4
    -- 0010 0000                    GSM A5/5
    -- 0100 0000                    GSM A5/6
    -- 1000 0000                    GSM A5/7
```

```
StateAttributes ::= SEQUENCE {
    downlinkAttached                [5] NULL                OPTIONAL,
    uplinkAttached                  [6] NULL                OPTIONAL,
    dualCommunication               [7] NULL                OPTIONAL,
    callOriginator                  [8] NULL                OPTIONAL }

    -- Refers to 3GPP TS 44.068 for definitions of StateAttributes fields.
```

```
END
```

## 17.7.13 Location service data types

```
1  MAP-LCS-DataTypes {
2     itu-t identified-organization (4) etsi (0) mobileDomain (0)
3     gsm-Network (1) modules (3) map-LCS-DataTypes (25) version8 (8)version9 (9)}
4
5  DEFINITIONS
6  IMPLICIT TAGS
7  ::=
8  BEGIN
9
10 EXPORTS
11    RoutingInfoForLCS-Arg,
12    RoutingInfoForLCS-Res,
13    ProvideSubscriberLocation-Arg,
14    ProvideSubscriberLocation-Res,
15    SubscriberLocationReport-Arg,
16    SubscriberLocationReport-Res,
17    LocationType,
18    LCSClientName,
19    LCS-QoS,
20    Horizontal-Accuracy,
21    ResponseTime,
22    Ext-GeographicalInformation,
23    SupportedGADShapes,
24    Add-GeographicalInformation,
25    LCSRequestorID,
26    LCSCodeword
27 ;
28
```

```
IMPORTS
   AddressString,
   ISDN-AddressString,
   IMEI,
   IMSI,
   LMSI,
   SubscriberIdentity,
   AgeOfLocationInformation,
   LCSClientExternalID,
   LCSClientInternalID,
   LCSServiceTypeID
FROM MAP-CommonDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-CommonDataTypes (18) version8 (8)version9 (9)}

   ExtensionContainer
FROM MAP-ExtensionDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-ExtensionDataTypes (21) version8 (8)version9 (9)}

   USSD-DataCodingScheme,
   USSD-String
FROM MAP-SS-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0) gsm-Network (1) modules (3)
   map-SS-DataTypes (14) version8 (8)version9 (9)}

   APN,
   GSN-Address
FROM MAP-MS-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-MS-DataTypes (11) version8 (8)version9 (9)}

   Additional-Number
FROM MAP-SM-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-SM-DataTypes (16) version8 (8)version9 (9)}
;


RoutingInfoForLCS-Arg ::= SEQUENCE {
     mlcNumber                          [0] ISDN-AddressString,
     targetMS                           [1] SubscriberIdentity,
     extensionContainer                 [2] ExtensionContainer          OPTIONAL,
     ...}

RoutingInfoForLCS-Res ::= SEQUENCE {
     targetMS                           [0] SubscriberIdentity,
     lcsLocationInfo                    [1] LCSLocationInfo,
     extensionContainer                 [2] ExtensionContainer          OPTIONAL,
     ...,
     v-gmlc-Address                     [3]  GSN-Address                OPTIONAL,
     h-gmlc-Address                     [4]  GSN-Address                OPTIONAL,
     ppr-Address                        [5]  GSN-Address                OPTIONAL }


LCSLocationInfo ::= SEQUENCE {
     networkNode-Number                 ISDN-AddressString,
     -- NetworkNode-number can be either msc-number or sgsn-number
     lmsi                               [0] LMSI                        OPTIONAL,
     extensionContainer                 [1] ExtensionContainer          OPTIONAL,
     ... ,
     gprsNodeIndicator                  [2] NULL                        OPTIONAL,
     -- gprsNodeIndicator is set only if the SGSN number is sent as the Network Node Number
     additional-Number                  [3] Additional-Number           OPTIONAL
     }
```

```
ProvideSubscriberLocation-Arg ::= SEQUENCE {
     locationType                        LocationType,
     mlc-Number                          ISDN-AddressString,
     lcs-ClientID                        [0] LCS-ClientID                  OPTIONAL,
     privacyOverride                     [1] NULL                          OPTIONAL,
     imsi                                [2] IMSI                          OPTIONAL,
     msisdn                              [3] ISDN-AddressString            OPTIONAL,
     lmsi                                [4] LMSI                          OPTIONAL,
     imei                                [5] IMEI                          OPTIONAL,
     lcs-Priority                        [6] LCS-Priority                  OPTIONAL,
     lcs-QoS                             [7] LCS-QoS                       OPTIONAL,
     extensionContainer                  [8] ExtensionContainer            OPTIONAL,
     ... ,
     supportedGADShapes                  [9]  SupportedGADShapes           OPTIONAL,
     lcs-ReferenceNumber                 [10] LCS-ReferenceNumber          OPTIONAL,
     lcsServiceTypeID                    [11] LCSServiceTypeID             OPTIONAL,
     lcsCodeword                         [12] LCSCodeword                  OPTIONAL }

     -- one of imsi or msisdn is mandatory
     -- If a location estimate type indicates activate deferred location or cancel deferred
     -- location, a lcs-Reference number shall be included.
```

```
LocationType ::= SEQUENCE {
     locationEstimateType                [0] LocationEstimateType,
     ...,
     deferredLocationEventType           [1] DeferredLocationEventType     OPTIONAL }
```

```
LocationEstimateType ::= ENUMERATED {
     currentLocation                     (0),
     currentOrLastKnownLocation          (1),
     initialLocation                     (2),
     ...,
     activateDeferredLocation            (3),
     cancelDeferredLocation              (4) }
--   exception handling:
--   a ProvideSubscriberLocation-Arg containing an unrecognized LocationEstimateType
--   shall be rejected by the receiver with a return error cause of unexpected data value
```

```
DeferredLocationEventType ::= BIT STRING {
     msAvailable                         (0) } (SIZE (1..16))
-- exception handling
-- a ProvideSubscriberLocation-Arg containing other values than listed above in
-- DeferredLocationEventType shall be rejected by the receiver with a return error cause of
-- unexpected data value.
```

```
LCS-ClientID ::= SEQUENCE {
     lcsClientType                       [0] LCSClientType,
     lcsClientExternalID                 [1] LCSClientExternalID           OPTIONAL,
     lcsClientDialedByMS                 [2] AddressString                 OPTIONAL,
     lcsClientInternalID                 [3] LCSClientInternalID           OPTIONAL,
     lcsClientName                       [4] LCSClientName                 OPTIONAL,
     ...,
     lcsAPN                              [5] APN                           OPTIONAL,
     lcsRequestorID                      [6] LCSRequestorID                OPTIONAL }
```

```
LCSClientType ::= ENUMERATED {
     emergencyServices                   (0),
     valueAddedServices                  (1),
     plmnOperatorServices                (2),
     lawfulInterceptServices             (3),
     ... }
     --   exception handling:
     --   unrecognized values may be ignored if the LCS client uses the privacy override
     --   otherwise, an unrecognized value shall be treated as unexpected data by a receiver
     --   a return error shall then be returned if received in a MAP invoke
```

```
LCSClientName ::= SEQUENCE {
     dataCodingScheme                    [0] USSD-DataCodingScheme,
     nameString                          [2] NameString,
     ...,
     lcs-FormatIndicator                 [3] LCS-FormatIndicator           OPTIONAL }

-- The USSD-DataCodingScheme shall indicate use of the default alphabet through the
-- following encoding
--   bit  7 6 5 4 3 2 1 0
--        0 0 0 0 1 1 1 1
```

```
NameString ::= USSD-String (SIZE (1..maxNameStringLength))
```

```
maxNameStringLength  INTEGER ::= 63
```

```
LCSRequestorID ::= SEQUENCE {
     dataCodingScheme                    [0] USSD-DataCodingScheme,
     requestorIDString                   [1] RequestorIDString,
     ...,
     lcs-FormatIndicator                 [2] LCS-FormatIndicator           OPTIONAL }
```

```
RequestorIDString ::= USSD-String (SIZE (1..maxRequestorIDStringLength))
```

```
maxRequestorIDStringLength  INTEGER ::= 127
```

```
LCS-FormatIndicator ::= ENUMERATED {
     logicalName                         (0),
     e-mailAddress                       (1),
     msisdn                              (2),
     url                                 (3),
     sipUrl                              (4),
     ... }
```

```
LCS-Priority ::= OCTET STRING (SIZE (1))
     -- 0 = highest priority
     -- 1 = normal priority
     -- all other values treated as 1
```

```
LCS-QoS ::= SEQUENCE {
     horizontal-accuracy                 [0] Horizontal-Accuracy           OPTIONAL,
     verticalCoordinateRequest           [1] NULL                          OPTIONAL,
     vertical-accuracy                   [2] Vertical-Accuracy             OPTIONAL,
     responseTime                        [3] ResponseTime                  OPTIONAL,
     extensionContainer                  [4] ExtensionContainer            OPTIONAL,
     ...}
```

```
Horizontal-Accuracy ::= OCTET STRING (SIZE (1))
     -- bit 8 = 0
     -- bits 7-1 = 7 bit Uncertainty Code defined in 3GPP TS 23.032. The horizontal location
     -- error should be less than the error indicated by the uncertainty code with 67%
     -- confidence.
```

```
Vertical-Accuracy ::= OCTET STRING (SIZE (1))
     -- bit 8 = 0
     -- bits 7-1 = 7 bit Vertical Uncertainty Code defined in 3GPP TS 23.032.
     -- The vertical location error should be less than the error indicated
     -- by the uncertainty code with 67% confidence.
```

```
ResponseTime ::= SEQUENCE {
     responseTimeCategory                ResponseTimeCategory,
     ...}
--   note: an expandable SEQUENCE simplifies later addition of a numeric response time.
```

```
ResponseTimeCategory ::= ENUMERATED {
     lowdelay  (0),
     delaytolerant  (1),
     ... }
--   exception handling:
--   an unrecognized value shall be treated the same as value 1 (delaytolerant)
```

```
SupportedGADShapes ::= BIT STRING {
     ellipsoidPoint  (0),
     ellipsoidPointWithUncertaintyCircle (1),
     ellipsoidPointWithUncertaintyEllipse (2),
     polygon (3),
     ellipsoidPointWithAltitude (4),
     ellipsoidPointWithAltitudeAndUncertaintyElipsoid (5),
     ellipsoidArc  (6) } (SIZE (7..16))
-- A node shall mark in the BIT STRING all Shapes defined in 3GPP TS 23.032 it supports.
-- exception handling: bits 7 to 15 shall be ignored if received.
```

```
LCS-ReferenceNumber::= OCTET STRING (SIZE(1))
```

```
LCSCodeword ::= SEQUENCE {
     dataCodingScheme                    [0] USSD-DataCodingScheme,
     lcsCodewordString                   [1] LCSCodewordString,
     ...}
```

```
LCSCodewordString ::= USSD-String (SIZE (1..maxLCSCodewordStringLength))
```

```
maxLCSCodewordStringLength  INTEGER ::= 127
```

```
ProvideSubscriberLocation-Res ::= SEQUENCE {
     locationEstimate                    Ext-GeographicalInformation,
     ageOfLocationEstimate               [0] AgeOfLocationInformation      OPTIONAL,
     extensionContainer                  [1] ExtensionContainer            OPTIONAL,
     ... ,
     add-LocationEstimate                [2] Add-GeographicalInformation   OPTIONAL,
     deferredmt-lrResponseIndicator      [3] NULL                          OPTIONAL }

--   if deferredmt-lrResponseIndicator is set, locationEstimate is ignored.

-- the add-LocationEstimate parameter shall not be sent to a node that did not indicate the
-- geographic shapes supported in the ProvideSubscriberLocation-Arg
-- The locationEstimate and the add-locationEstimate parameters shall not be sent if
-- the supportedGADShapes parameter has been received in ProvideSubscriberLocation-Arg
-- and the shape encoded in locationEstimate or add-LocationEstimate is not marked
-- as supported in supportedGADShapes. In such a case ProvideSubscriberLocation
-- shall be rejected with error FacilityNotSupported with additional indication
-- shapeOfLocationEstimateNotSupported
```

```
Ext-GeographicalInformation ::= OCTET STRING (SIZE (1..maxExt-GeographicalInformation))
    -- Refers to geographical Information defined in 3GPP TS 23.032.
    -- This is composed of 1 or more octets with an internal structure according to
    -- 3GPP TS 23.032
    -- Octet 1: Type of shape, only the following shapes in 3GPP TS 23.032 are allowed:
    --       (a) Ellipsoid point with uncertainty circle
    --       (b) Ellipsoid point with uncertainty ellipse
    --       (c) Ellipsoid point with altitude and uncertainty ellipsoid
    --       (d) Ellipsoid Arc
    --       (e) Ellipsoid Point
    -- Any other value in octet 1 shall be treated as invalid
    -- Octets 2 to 8 for case (a) – Ellipsoid point with uncertainty circle
    --       Degrees of Latitude                                        3 octets
    --       Degrees of Longitude                                       3 octets
    --       Uncertainty code                                           1 octet
    -- Octets 2 to 11 for case (b) – Ellipsoid point with uncertainty ellipse:
    --       Degrees of Latitude                                        3 octets
    --       Degrees of Longitude                                       3 octets
    --       Uncertainty semi-major axis                                1 octet
    --       Uncertainty semi-minor axis                                1 octet
    --       Angle of major axis                                        1 octet
    --       Confidence                                                 1 octet
    -- Octets 2 to 14 for case (c) – Ellipsoid point with altitude and uncertainty ellipsoid
    --       Degrees of Latitude                                        3 octets
    --       Degrees of Longitude                                       3 octets
    --       Altitude                                                   2 octets
    --       Uncertainty semi-major axis                                1 octet
    --       Uncertainty semi-minor axis                                1 octet
    --       Angle of major axis                                        1 octet
    --       Uncertainty altitude                                       1 octet
    --       Confidence                                                 1 octet
    -- Octets 2 to 13 for case (d) – Ellipsoid Arc
    --       Degrees of Latitude                                        3 octets
    --       Degrees of Longitude                                       3 octets
    --       Inner radius                                               2 octets
    --       Uncertainty radius                                         1 octet
    --       Offset angle                                               1 octet
    --       Included angle                                             1 octet
    --       Confidence                                                 1 octet
    -- Octets 2 to 7 for case (e) – Ellipsoid Point
    --       Degrees of Latitude                                        3 octets
    --       Degrees of Longitude                                       3 octets

    --
    -- An Ext-GeographicalInformation parameter comprising more than one octet and
    -- containing any other shape or an incorrect number of octets or coding according
    -- to 3GPP TS 23.032 shall be treated as invalid data by a receiver.
    --
    -- An Ext-GeographicalInformation parameter comprising one octet shall be discarded
    -- by the receiver if an Add-GeographicalInformation parameter is received
    -- in the same message.
    --
    -- An Ext-GeographicalInformation parameter comprising one octet shall be treated as
    -- invalid data by the receiver if an Add-GeographicalInformation parameter is not
    -- received in the same message.

maxExt-GeographicalInformation  INTEGER ::= 20
    -- the maximum length allows for further shapes in 3GPP TS 23.032 to be included in later
    -- versions of 3GPP TS 29.002
```

```
Add-GeographicalInformation ::= OCTET STRING (SIZE (1..maxAdd-GeographicalInformation))
     -- Refers to geographical Information defined in 3GPP TS 23.032.
     -- This is composed of 1 or more octets with an internal structure according to
     -- 3GPP TS 23.032
     -- Octet 1: Type of shape, all the shapes defined in 3GPP TS 23.032 are allowed:
     -- Octets 2 to n (where n is the total number of octets necessary to encode the shape
     -- according to 3GPP TS 23.032) are used to encode the shape itself in accordance with
the
     -- encoding defined in 3GPP TS 23.032
     --
     -- An Add-GeographicalInformation parameter, whether valid or invalid, received
     -- together with a valid Ext-GeographicalInformation parameter in the same message
     -- shall be discarded.
     --
     -- An Add-GeographicalInformation parameter containing any shape not defined in
     -- 3GPP TS 23.032 or an incorrect number of octets or coding according to
     -- 3GPP TS 23.032 shall be treated as invalid data by a receiver if not received
     -- together with a valid Ext-GeographicalInformation parameter in the same message.

maxAdd-GeographicalInformation  INTEGER ::= 91
     -- the maximum length allows support for all the shapes currently defined in 3GPP TS
23.032

SubscriberLocationReport-Arg ::= SEQUENCE {
     lcs-Event                          LCS-Event,
     lcs-ClientID                       LCS-ClientID,
     lcsLocationInfo                    LCSLocationInfo,
     msisdn                             [0] ISDN-AddressString            OPTIONAL,
     imsi                               [1] IMSI                          OPTIONAL,
     imei                               [2] IMEI                          OPTIONAL,
     na-ESRD                            [3] ISDN-AddressString            OPTIONAL,
     na-ESRK                            [4] ISDN-AddressString            OPTIONAL,
     locationEstimate                   [5] Ext-GeographicalInformation   OPTIONAL,
     ageOfLocationEstimate              [6] AgeOfLocationInformation      OPTIONAL,
     extensionContainer                 [7] ExtensionContainer            OPTIONAL,
     ... ,
     add-LocationEstimate               [8] Add-GeographicalInformation   OPTIONAL,
     deferredmt-lrData                  [9] Deferredmt-lrData             OPTIONAL,
     lcs-ReferenceNumber                [10] LCS-ReferenceNumber          OPTIONAL }

     -- one of msisdn or imsi is mandatory
     -- a location estimate that is valid for the locationEstimate parameter should
     -- be transferred in this parameter in preference to the add-LocationEstimate.
     -- the deferredmt-lrData parameter shall be included if and only if the lcs-Event
     -- indicates a deferredmt-lrResponse.
     -- if the lcs-Event indicates a deferredmt-lrResponse then the locationEstimate
     -- and the add-locationEstimate parameters shall not be sent if the
     -- supportedGADShapes parameter had been received in ProvideSubscriberLocation-Arg
     -- and the shape encoded in locationEstimate or add-LocationEstimate was not marked
     -- as supported in supportedGADShapes. In such a case terminationCause
     -- in deferredmt-lrData shall be present with value
     -- shapeOfLocationEstimateNotSupported.
     -- If a lcs event indicates deferred mt-lr response, the lcs-Reference number shall be
     -- included.


Deferredmt-lrData ::= SEQUENCE {
     deferredLocationEventType          DeferredLocationEventType,
     terminationCause                   [0] TerminationCause              OPTIONAL,
     lcsLocationInfo                    [1] LCSLocationInfo               OPTIONAL,
     ...}
     -- lcsLocationInfo may be included only if a terminationCause is present
     -- indicating mt-lrRestart.

LCS-Event ::= ENUMERATED {
     emergencyCallOrigination  (0),
     emergencyCallRelease  (1),
     mo-lr  (2),
     ...,
     deferredmt-lrResponse  (3) }
     --   exception handling:
     --   a SubscriberLocationReport-Arg containing an unrecognized LCS-Event
     --   shall be rejected by a receiver with a return error cause of unexpected data value
```

```
TerminationCause ::= ENUMERATED {
     normal  (0),
     errorundefined  (1),
     internalTimeout  (2),
     congestion  (3),
     mt-lrRestart  (4),
     privacyViolation  (5),
     ...,
     shapeOfLocationEstimateNotSupported (6) }
-- mt-lrRestart shall be used to trigger the GMLC to restart the location procedure,
-- either because the sending node knows that the terminal has moved under coverage
-- of another MSC or SGSN (e.g. Send Identification received), or because the subscriber
-- has been deregistered due to a Cancel Location received from HLR.
--
-- exception handling
-- an unrecognized value shall be treated the same as value 1 (errorundefined)
```

```
SubscriberLocationReport-Res ::= SEQUENCE {
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
END
```

## 17.7.14 Secure transport data types

```
MAP-ST-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-ST-DataTypes (27) version8 (8)version9 (9)}

DEFINITIONS
IMPLICIT TAGS
::=
BEGIN

EXPORTS
   SecureTransportArg,
   SecureTransportRes,
   SecurityHeader,
   ProtectedPayload
;

IMPORTS
   IMSI

FROM MAP-CommonDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-CommonDataTypes (18) version8 (8)version9 (9)}
;
```

```
SecureTransportArg ::= SEQUENCE {
     securityHeader                          SecurityHeader,
     protectedPayload                        ProtectedPayload            OPTIONAL
     }
     -- The protectedPayload carries the result of applying the security function
     -- defined in 3GPP TS 33.200 to the encoding of the argument of the securely
     -- transported operation
```

```
SecureTransportRes ::= SEQUENCE {
     securityHeader                          SecurityHeader,
     protectedPayload                        ProtectedPayload            OPTIONAL
     }
     -- The protectedPayload carries the result of applying the security function
     -- defined in 3GPP TS 33.200 to the encoding of the result of the securely
     -- transported operation
```

```
SecurityHeader ::= SEQUENCE {
     securityParametersIndex             SecurityParametersIndex,
     originalComponentIdentifier         OriginalComponentIdentifier,
     initialisationVector                InitialisationVector            OPTIONAL,
     ...}
```

```
ProtectedPayload ::= OCTET STRING(SIZE(1.. 3438))
     -- In protection mode 0 (noProtection) the ProtectedPayload carries the transfer
          -- syntax value of the component parameter identified by the
          -- originalComponentIdentifier.
     -- In protection mode 1 (integrityAuthenticity) the protectedPayload carries
          --  the transfer syntax value of the component
          -- parameter identified by the originalComponentIdentifier, followed by
          -- the 32 bit integrity check value.
          -- The integrity check value is the result of applying the hash algorithm
          -- to the concatenation of the transfer syntax value of the SecurityHeader,
          -- and the transfer syntax value of the component parameter.
     -- In protection mode 2 (confidentialityIntegrityAuthenticity) the protected
          -- payload carries the encrypted transfer syntax
          -- value of the component parameter identified by the
          -- originalComponentIdentifier, followed by the 32 bit integrity check value.
          -- The integrity check value is the result of applying the hash algorithm
          -- to the concatenation of the transfer syntax value of the SecurityHeader,
          -- and the encrypted transfer syntax value of the component parameter.
     -- See 33.200.
     -- The length of the protectedPayload is adjusted according to the capabilities of
     -- the lower protocol layers
```

```
SecurityParametersIndex ::= OCTET STRING (SIZE(4))
```

```
InitialisationVector ::= OCTET STRING (SIZE(14))
    -- the internal structure is defined as follows:
    -- Octets 1 to 4 : TVP. The TVP is a 32 bit time stamp. Its value is binary coded
    --                 and indicates the number of intervals of 100 milliseconds
    --                 elapsed since 1st January 2002, 0:00:00 UTC
    -- Octets 5 to 10: NE-Id. The NE-Id uniquely identifies the sending network entity
    --                 within the PLMN. It is the entity's E.164 number without CC and
    --                 NDC. It is TBCD-coded, padded with zeros.
    -- Octets 11 to 14: PROP. This 32 bit value is used to make the
    --                 InitialisationVector unique within the same TVP period.
    --                 The content is not standardized.
```

```
OriginalComponentIdentifier ::= CHOICE {
    operationCode                       [0] OperationCode,
    errorCode                           [1] ErrorCode,
    userInfo                            [2] NULL}
```

```
OperationCode ::= CHOICE {
    localValue                          INTEGER,
    globalValue                         OBJECT IDENTIFIER}
```

```
ErrorCode ::= CHOICE {
    localValue                          INTEGER,
    globalValue                         OBJECT IDENTIFIER}
```

```
END
```